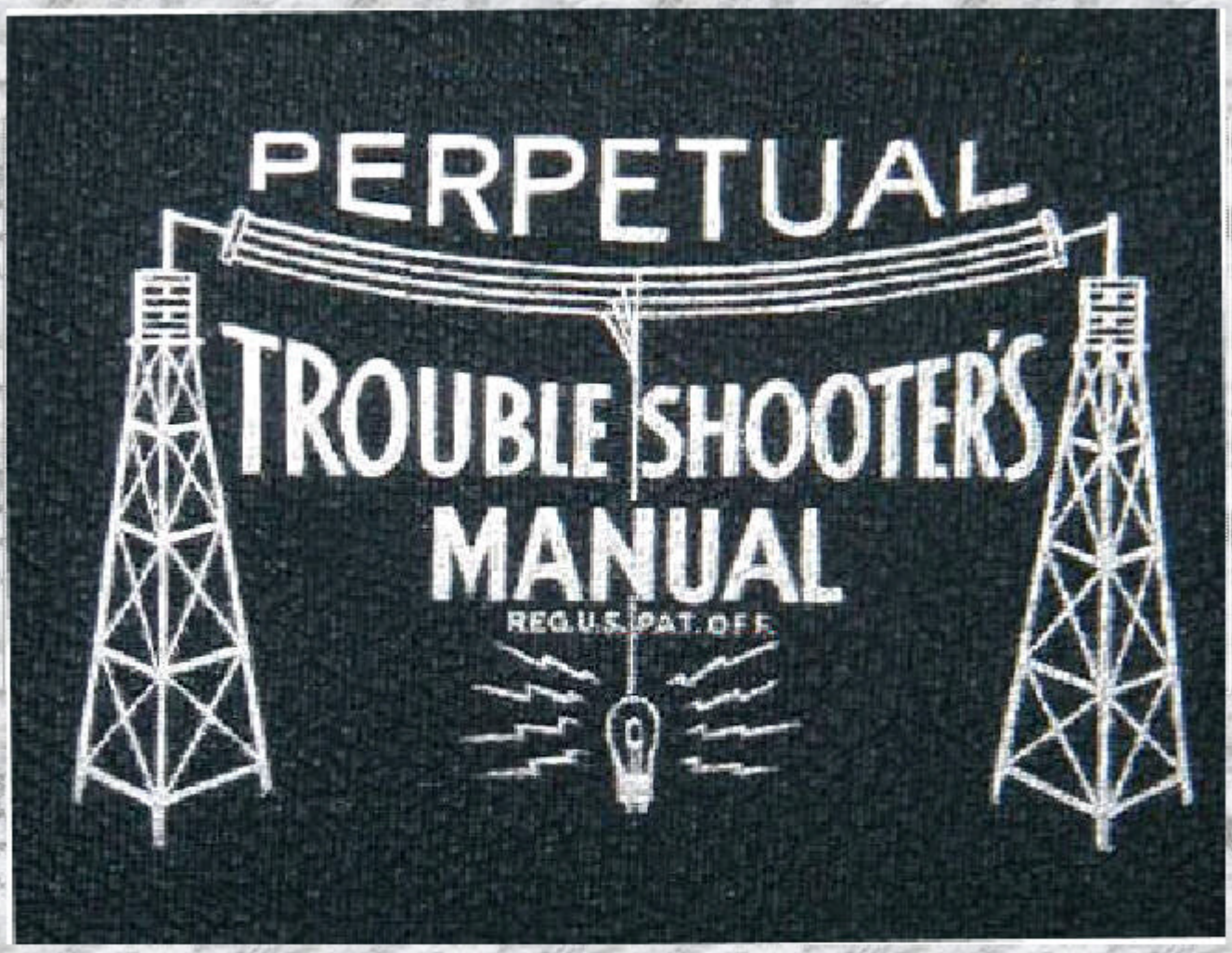
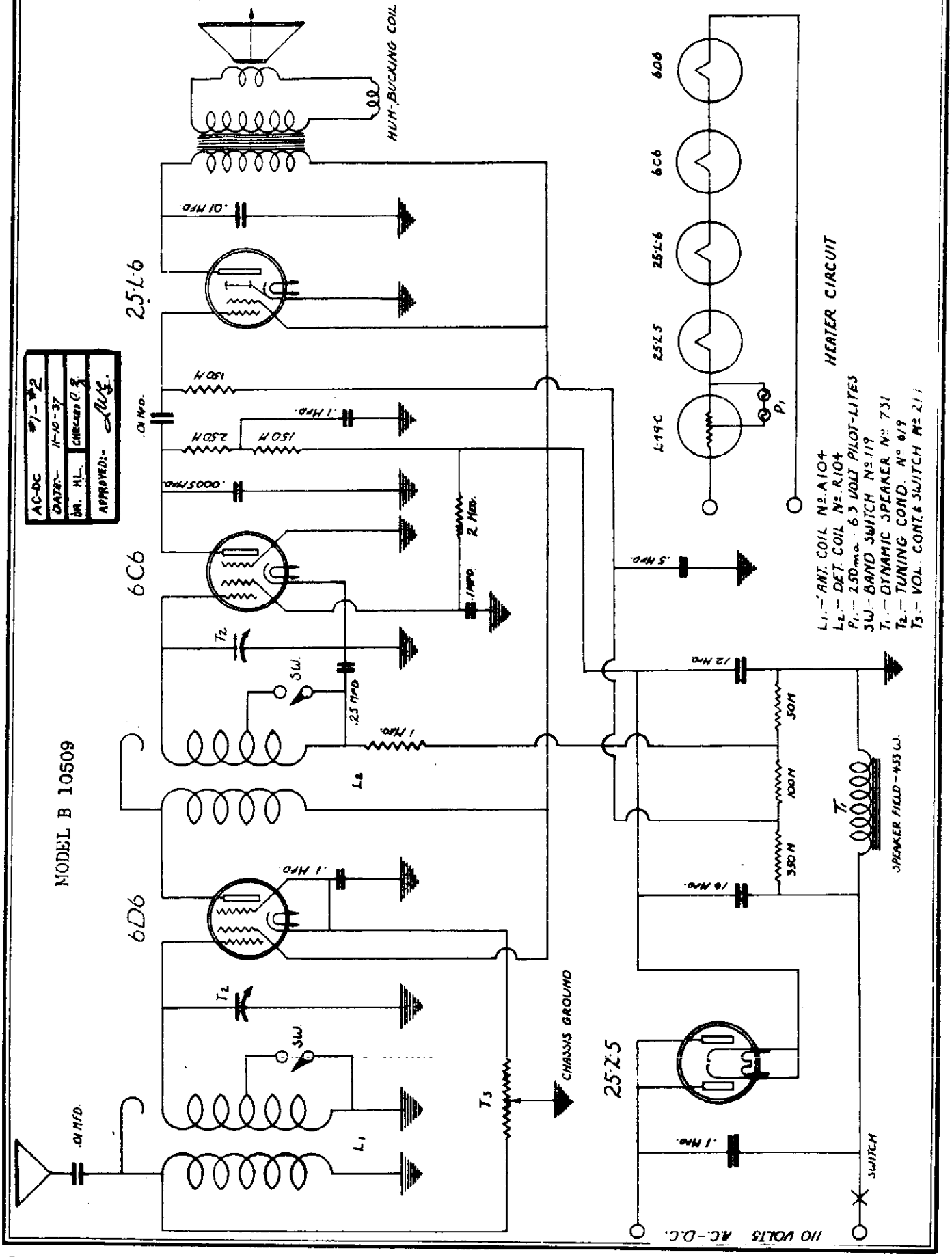
RIDER'S
VOLUME - XIII

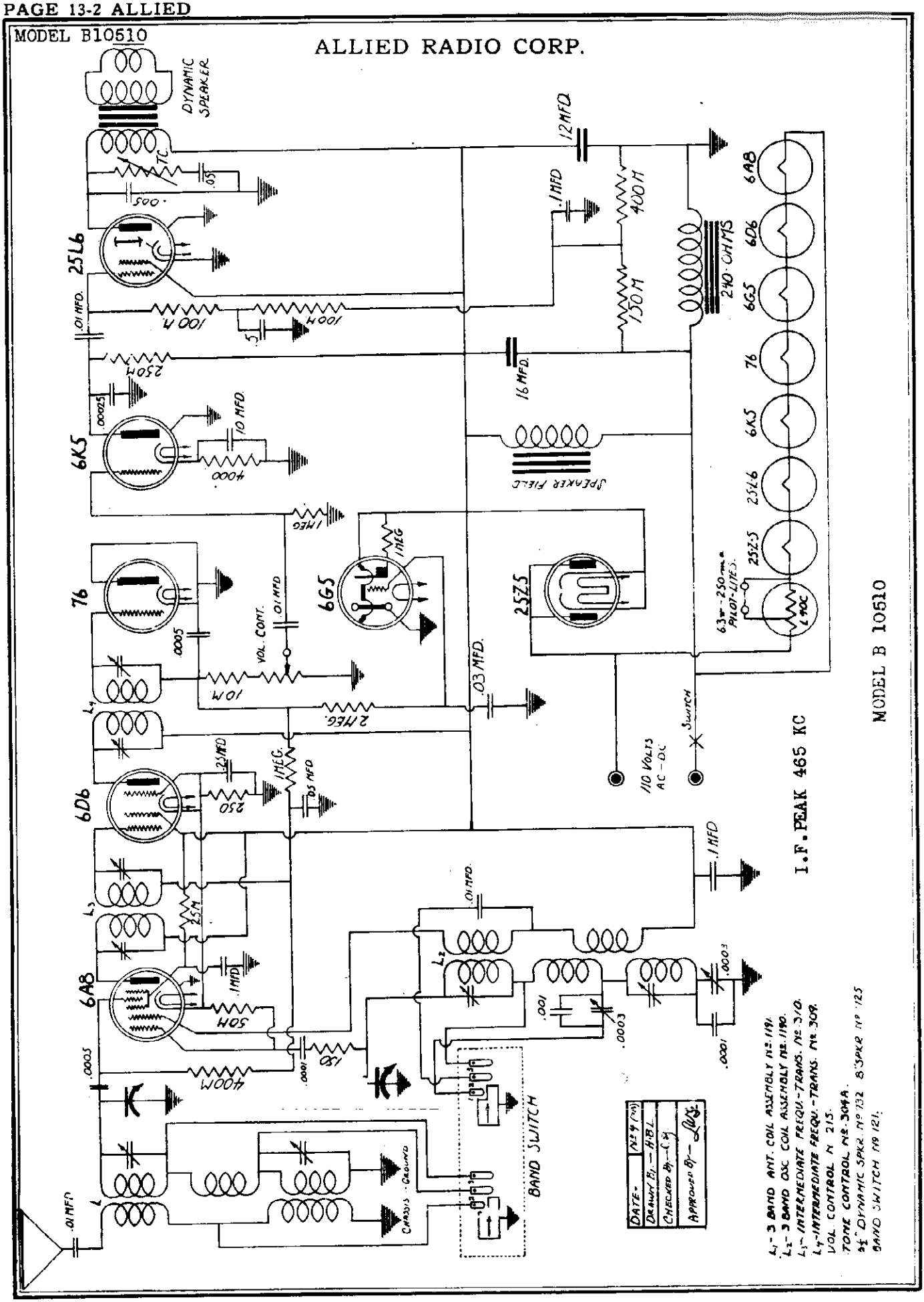


COVERING LATE 1941
THROUGH
TO EARLY 1942

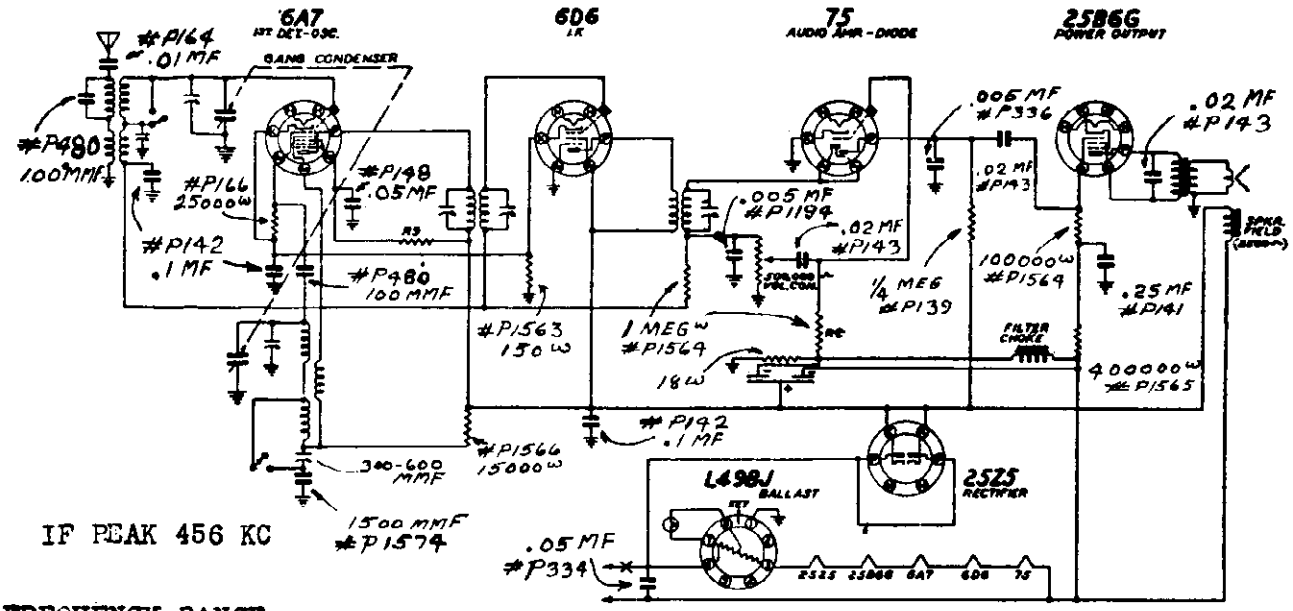
MODEL B10509

ALLIED RADIO CORP.



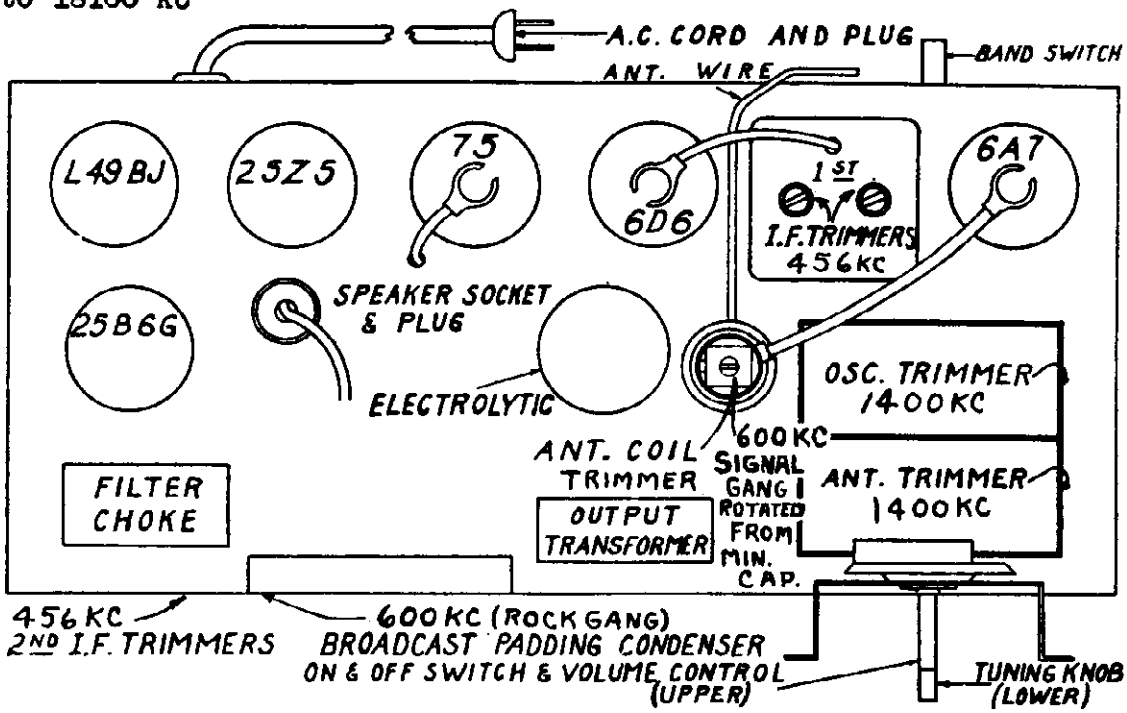

MODEL B10510
ALLIED RADIO CORP.
DYNAMIC SPEAKER
25L6
6K5
76
6D6
6A8
6G5
6Q6
6A8
25Z5
2525
6E5
12MFD
.1MFD
400H
150H
240 OHMS
16 MFD.
SPEAKER FIELD
.03 MFD.
2 MEG.
10M
VOL. CONT.
.01MFD
.05 MFD
.25M
50M
400M
.001
.0003
.0001
.0005
.00025
.005
500
4000
100H
250M
1MEG
.25MFD
250
150
10 MFD
.05
110 VOLTS AC-DC
SWITCH
6.3V-250 mA PILOT-LITES
I.F. PEAK 465 KC
MODEL B 10510
BAND SWITCH
CHASSIS GROUND
L1- 3 BAND ANT. COIL ASSEMBLY NO. 1191.
L2- 3 BAND OSC. COIL ASSEMBLY NO. 1190.
L3- INTERMEDIATE FREQU.-TRANS. NO. 310.
L4- INTERMEDIATE FREQU.-TRANS. NO. 309.
VOL. CONTROL N 215.
TONE CONTROL NO. 3044.
5" DYNAMIC SPKR. NO. 132 8" SPKR NO. 125
BAND SWITCH NO 121.
DATE-
DRAWN BY- H.B.L.
CHECKED BY-
APPROVED BY-

ALLIED RADIO CORP.



FREQUENCY RANGE-
535 to 1750 KC
5600 to 18100 KC

CONVENTIONAL ALIGNMENT SEE VOL.VIII



Part No.	Description
P506	Socket, Type 6A7
P521	Socket, Type 75
P536	Socket, Type 6D6
P555	Socket, Type 25Z5
P1549	Socket, Type L49BJ
P1550	Socket, Type 25B6G
P530	Tube Shield
P1547	Trimmer
P915	1st I.F. Transformer
P929	AC Cord & Plug
P1489	Pointer
P1491	Dial Glass
P1496	Rubberized Belt
P1497	Takeup Spring
P1498	Drive Bushing
P1503	Pilot Light Socket
P1504	Pilot Light Bulb
P1508	Baffle Board
P1542	Gang Condenser
P1543	Dial Scale
P1551	Iron Core Filter Choke
P1552	Output Transformer
P1555	Volume Control & Switch
P1556	Antenna Coil
P1558	2nd I.F. Transformer
P1559	Oscillator Coil
P1560	Speaker
P1561	Electrolytic Condenser
P1562	Band Change Switch
P1568	Knob, (Specify Color)
P1656	20 Antenna Cord

CONDENSERS

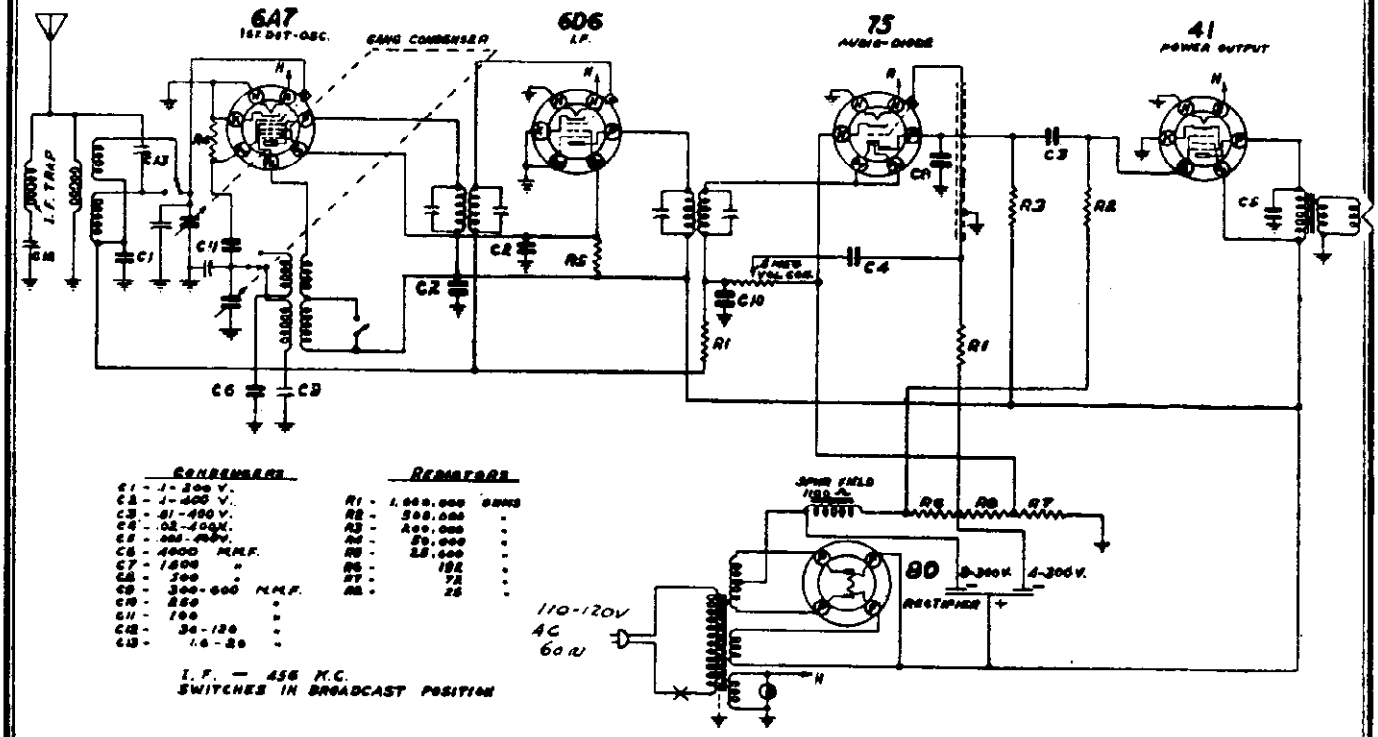
P141	.25 Mfd. 200 V
P142	.1 Mfd. 200 V
P143	.02 Mfd. 200 V
P148	.05 Mfd. 200 V
P164	.01 Mfd. 400 V
P334	.05 Mfd. 400 V
P336	.0005 Mica Condenser
P480	.0001 Mica Condenser
P1574	.0015 plus or 5% Mica
P1557	Riveted Mica Condenser

RESISTORS

P1567	Candohm Resistor
P165	25,000 1/4 Watt
P419	20,000 1/4 Watt
P1563	150 1/2 Watt
P139	250,000 1/4 Watt
P182B	1 Megohm 1/2 Watt
P1564	100,000 Ohm 1/2 Watt
P1565	400,000 Ohm 1/2 Watt
P1566	15,000 Ohm 1/2 Watt

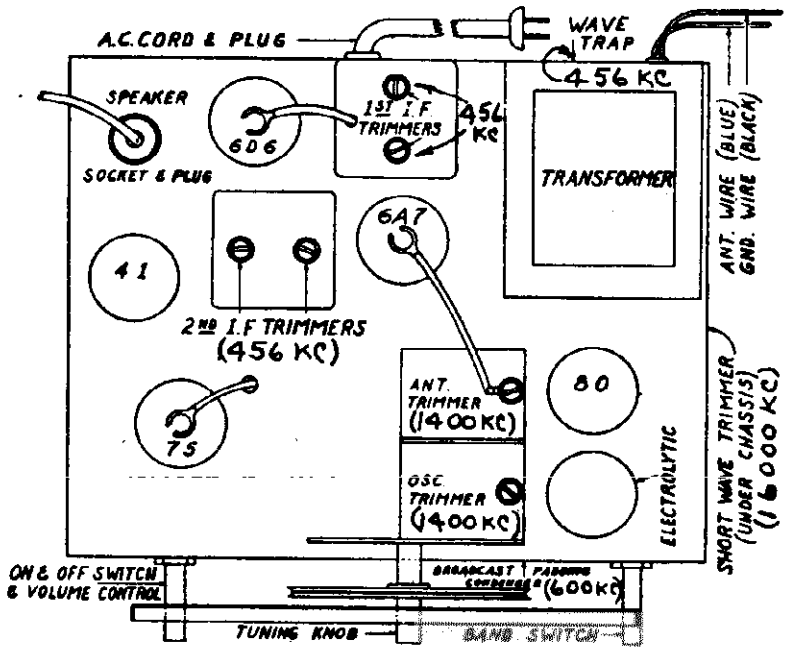
MODEL B10536

ALLIED RADIO CORP.



FREQUENCY RANGE -
535 to 1750 - KC
5600 to 18100 - KC

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOL. VIII

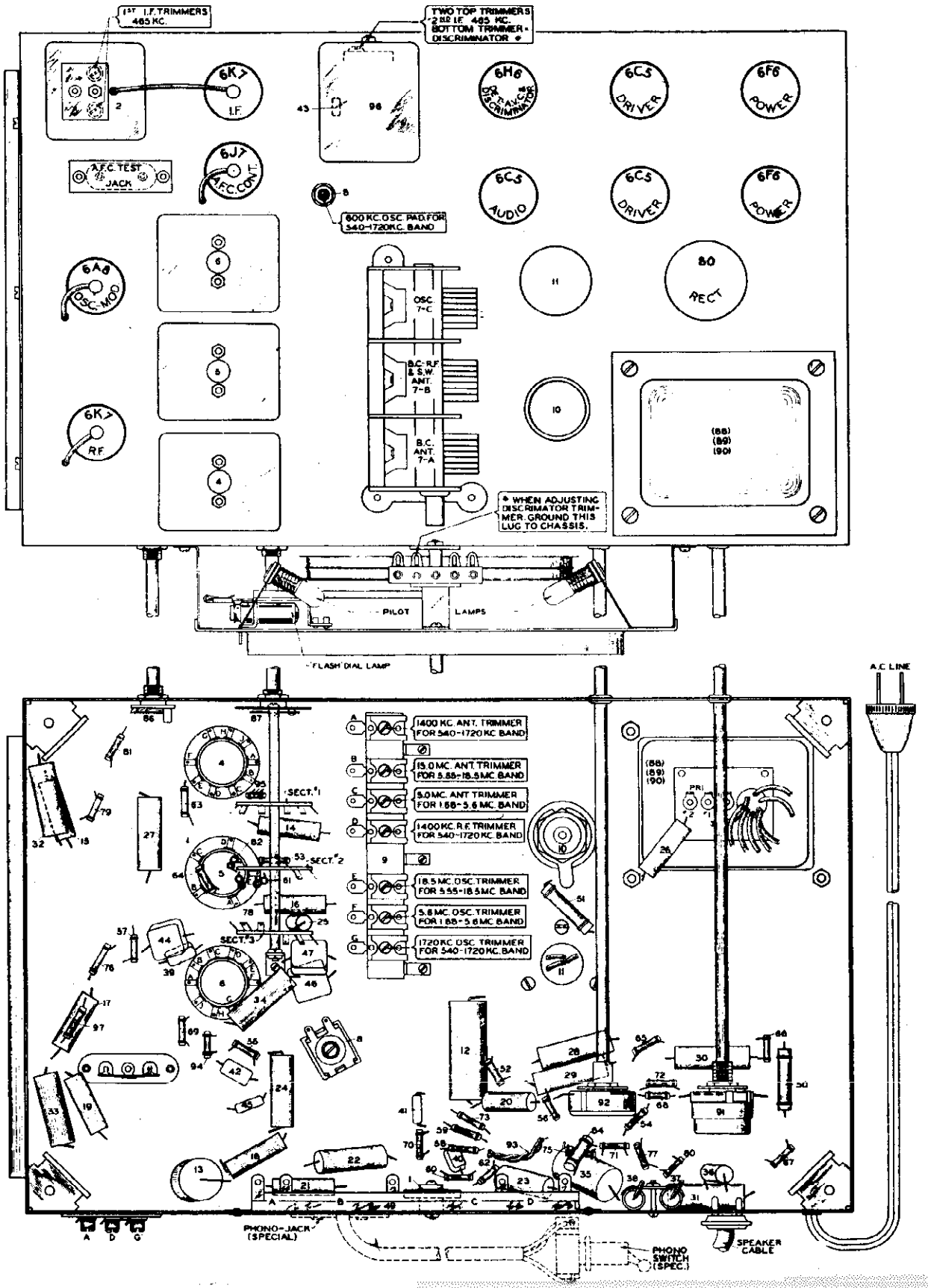


IF PEAK 456 KC

ALLIED RADIO CORP.

MODELS B10580,B10581,B10582

FOR OTHER DATA, SEE INDEX



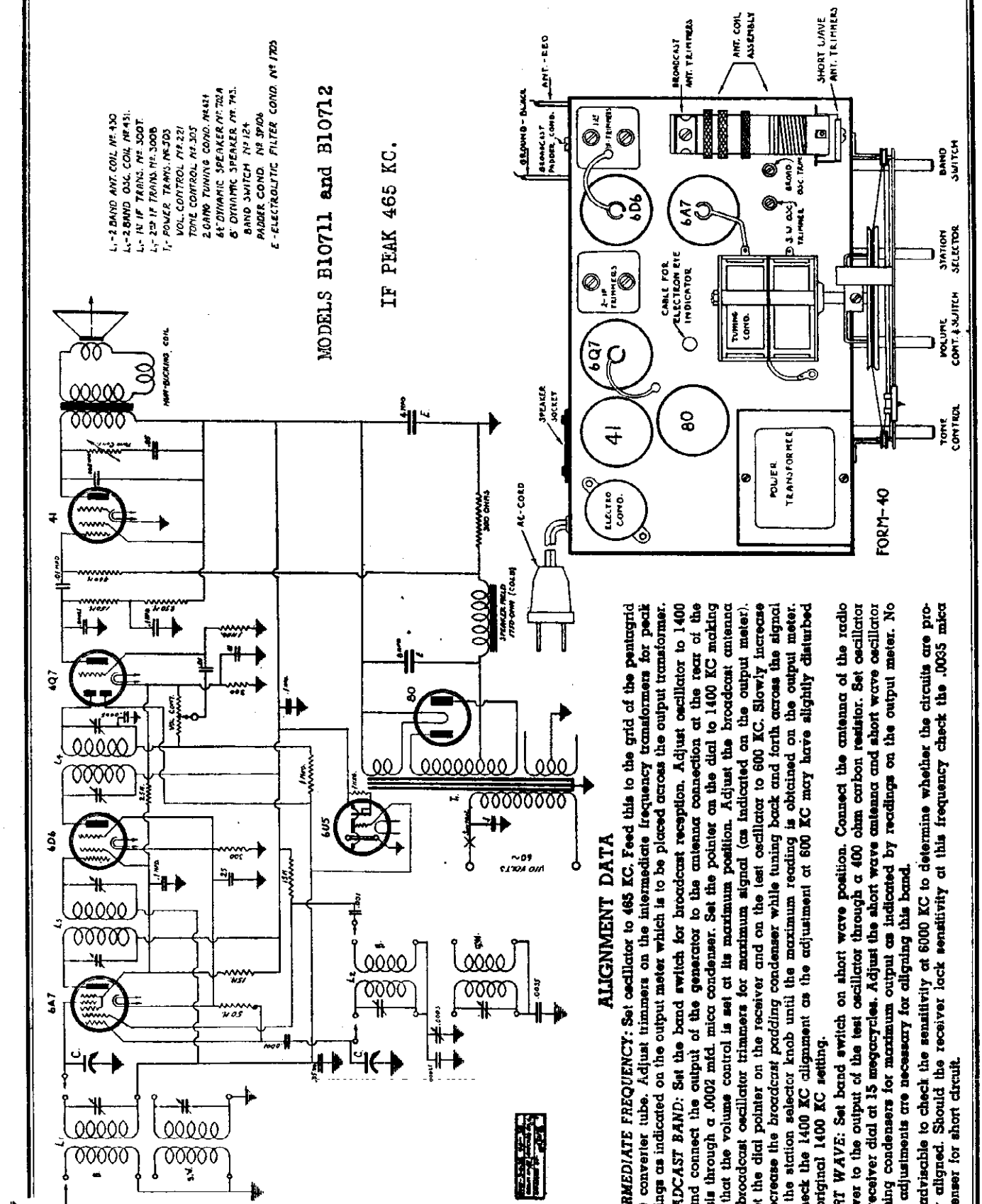
MODELS B10711, B10712

ALLIED RADIO CORP.

MODELS B10711 and B10712

IF PEAK 465 KC.

L1-2 BAND ANT. COIL Nº 430
L2-2 BAND OSC. COIL Nº 431
L3-1ST IF TRANS. Nº 3007
L4-2ND IF TRANS. Nº 3008
T1-POWER TRANS. Nº 303
VOL. CONTROL Nº 221
TONE CONTROL Nº 305
2 GANG TUNING COND. Nº 431
6½" DYNAMIC SPEAKER Nº 702A
6" DYNAMIC SPEAKER Nº 745
BAND SWITCH Nº 124
PADDER COND. Nº 3906
E-ELECTROLYTIC FILTER COND. Nº 1705



ALIGNMENT DATA

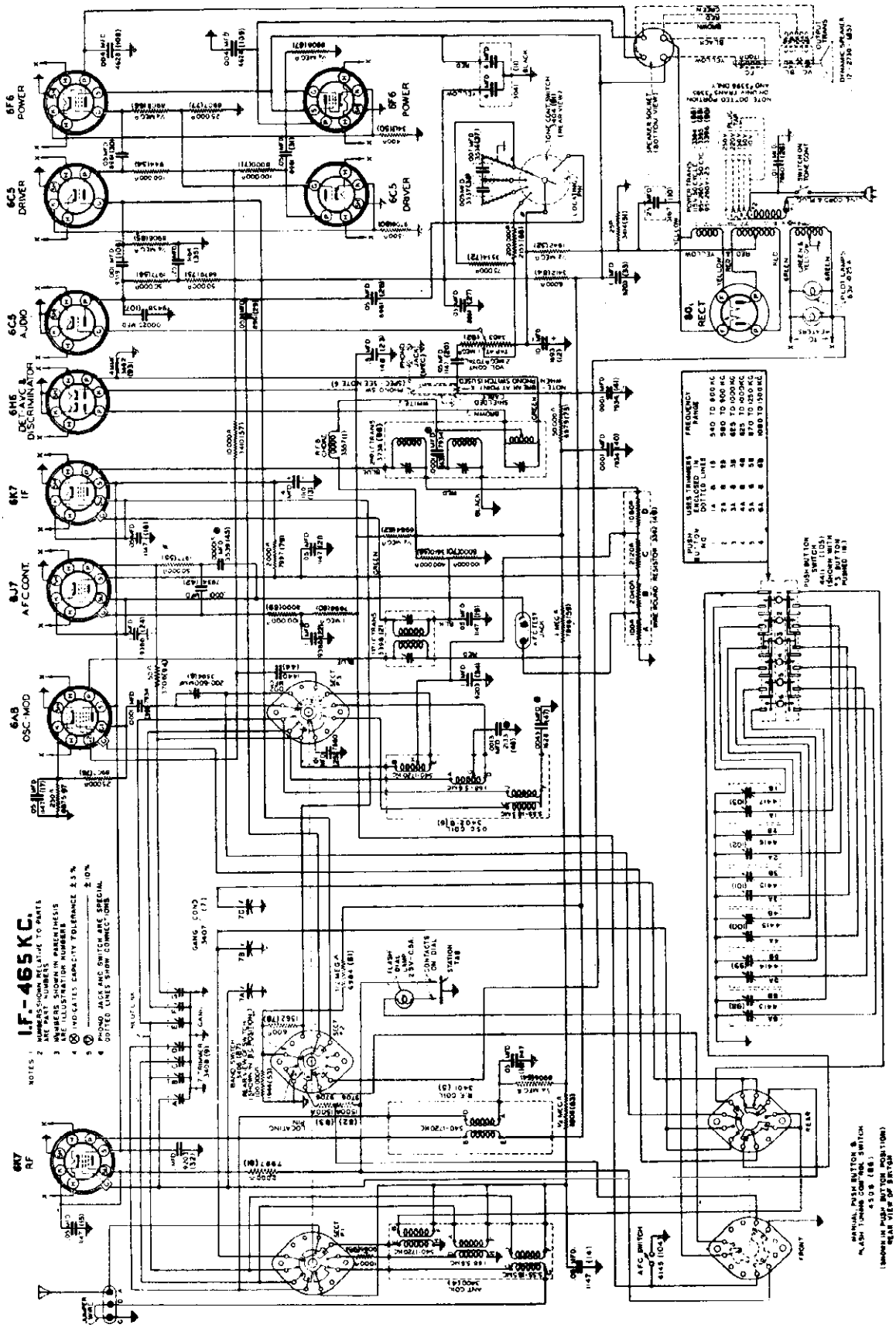
INTERMEDIATE FREQUENCY: Set oscillator to 465 KC. Feed this to the grid of the pentagrid (6A7) converter tube. Adjust trimmers on the intermediate frequency transformers for peak readings as indicated on the output meter which is to be placed across the output transformer.

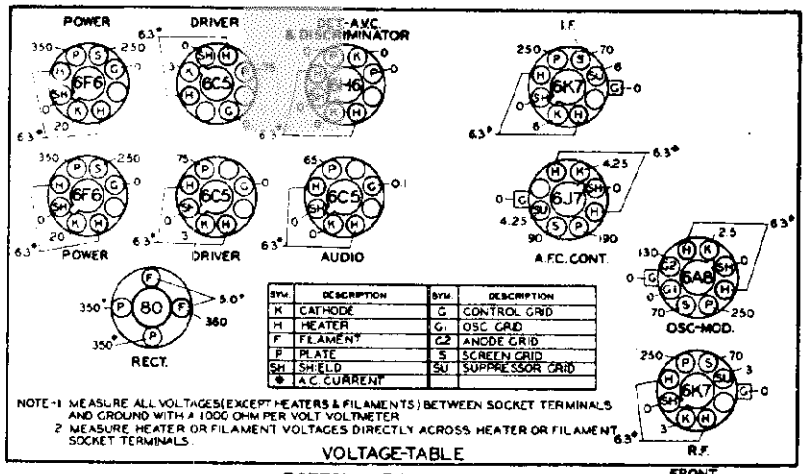
BROADCAST BAND: Set the band switch for broadcast reception. Adjust oscillator to 1400 KC and connect the output of the generator to the antenna connection at the rear of the chassis through a .0002 mfd. mica condenser. Set the pointer on the dial to 1400 KC making sure that the volume control is set at its maximum position. Adjust the broadcast antenna and broadcast oscillator trimmers for maximum signal (as indicated on the output meter). Re-set the dial pointer on the receiver and on the test oscillator to 600 KC. Slowly increase or decrease the *broadcast padding* condenser while tuning back and forth across the signal with the station selector knob until the maximum reading is obtained on the output meter. Re-check the 1400 KC alignment as the adjustment at 600 KC may have slightly disturbed the original 1400 KC setting.

SHORT WAVE: Set band switch on short wave position. Connect the antenna of the radio receiver to the output of the test oscillator through a 400 ohm carbon resistor. Set oscillator and receiver dial at 15 megacycles. Adjust the short wave antenna and short wave oscillator trimming condensers for maximum output as indicated by readings on the output meter. No other adjustments are necessary for aligning this band.

It is advisable to check the sensitivity at 6000 KC to determine whether the circuits are properly aligned. Should the receiver lack sensitivity at this frequency check the .0035 mica condenser for short circuit.

ALLIED RADIO CORP.





BOTTOM VIEW OF CHASSIS

ALIGNMENT PROCEDURE:

SHOULD REALIGNMENT BE NECESSARY, THERE ARE SEVERAL PRECAUTIONS THAT MUST BE CAREFULLY OBSERVED, THESE ARE:

1. Do not align set until it has reached normal operating temperature. Place the receiver in operation at least 15 minutes before attempting to realign the set.
2. The importance of using the proper type of test equipment and FOLLOWING THE ALIGNMENT PROCEDURE EXACTLY AS GIVEN CANNOT BE TOO STRONGLY EMPHASIZED—failure to do so will result in low sensitivity, poor selectivity, incorrect dial calibration, distortion and unsatisfactory operation of the automatic frequency control.
3. It is absolutely necessary that an accurately calibrated test oscillator with some type of output measuring device and a double scale milliammeter—0 to 1 M. A. and 0 to 5 M.A. be used.

ALIGNING I.F. STAGE AT 465 KILOCYCLES:

(a) Place automatic frequency control knob in the middle A.F.C. "off" position.

(b) Attach the ground lead of the test oscillator to the chassis. Connect the other lead to the grid cap of the 6A8 tube through a .02 Mfd. series condenser. DO NOT REMOVE GRID CLIP.

(c) Set test oscillator to EXACTLY 465 kilocycles and turn volume control on full.

(d) Remove shields held in position by snap fasteners over A.F.C. test jack and over trimmer screw holes in the first and second I.F. transformer shield cans.

(e) Peak second I.F. transformer trimmers for maximum 465 kilocycle output by adjusting the two trimmers accessible through the two top holes in the second I.F. transformer shield can. DO NOT TOUCH DISCRIMINATOR (BOTTOM) SCREW.

(f) Peak each of the first I.F. transformer trimmers for maximum 465 kilocycle signal output.

ALIGNING DISCRIMINATOR CIRCUIT:

(a) Place switch underneath push button plate assembly (above gang condenser) in A.F.C. "on" position. Leave test oscillator set to EXACTLY 465 KILOCYCLES and connect to grid of 6A8 tube through a .02 Mfd. Condenser—Insert lead of double scale 0 to 1 and 0 to 5 milliammeter into A.F.C. test jack located on top of chassis adjacent to the 6J7 tube. To avoid possibility of damaging the meter should one of the milliammeter leads short to the metal chassis,

ALWAYS TURN OFF RECEIVER WHEN INSERTING OR REMOVING MILLIAMMETER LEADS FROM A.F.C. TEST JACK.

(b) Short out A.F.C. mute switch by grounding the second from the left (looking at the front of the chassis) of the four lugs mounted on top of the dial assembly. The proper lug to ground is indicated in the "Note X" on chassis top parts view.

(c) Turn receiver on, place A.F.C. switch knob in left position and if meter needle jumps off scale adjust output of test oscillator until an approximate 2 M.A. deflection is obtained on the 0 to 5 milliammeter scale.

(d) Place band selector switch for operation on 1720-540 K.C. broadcast band—and set receiver dial somewhere near 1000 kilocycles at a point where no station is heard.

(e) Rotate A.F.C. switch knob from maximum left hand to middle position and note whether the milliammeter reading changes as the position of the A.F.C. switch is changed. No change in reading indicates probable proper discriminator trimmer adjustment, while a noticeable change indicates improper discriminator trimmer adjustment.

(f) IMPORTANT: DO NOT ADJUST DISCRIMINATOR TRIMMER UNLESS IT IS ABSOLUTELY NECESSARY. Place A.F.C. switch in middle position and note milliammeter reading, then place A.F.C. switch in maximum left hand position. With A.F.C. switch in maximum left hand position, CAREFULLY ADJUST DISCRIMINATOR TRIMMER UNTIL MILLIAMMETER READING IS EXACTLY THE SAME IN BOTH POSITIONS.

NOTE: As the discriminator trimmer screw is screwed in (increasing capacity) the milliammeter reading should decrease and as the discriminator trimmer is unscrewed (decreasing capacity) the milliammeter reading should increase. IF WHEN ADJUSTING THE DISCRIMINATOR TRIMMER THE MILLIAMMETER READING DOES NOT SHARPLY INCREASE OR DECREASE AS THE TRIMMER IS ADJUSTED EVEN AFTER SEVERAL TURNS OF THE TRIMMER SCREW, THIS DOES NOT INDICATE PROPER BALANCING BUT DOES INDICATE INCORRECT ADJUSTMENT AND THE DISCRIMINATOR TRIMMER SHOULD BE SET TO ABOUT ½ CAPACITY AND THE ADJUSTMENT OF THE DISCRIMINATOR TRIMMER MADE ALL OVER AGAIN.

ALIGNING 1720-540 KILOCYCLE BAND:

(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh), at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If the dial needle does not point exactly to the last line, move needle to correct position.

(b) Remove test oscillator lead from grid of 6A8 tube and connect to receiver "A" antenna post through a .00025 Mfd. condenser.

(c) Place A.F.C. control knob in middle A.F.C. "off" position. Adjust band selector switch for operation on the 1720-540 kilocycle band.

(d) Set test oscillator frequency and receiver dial to EXACTLY 1720 kilocycles, and BRING IN 1720 KILOCYCLE TEST OSCILLATOR SIGNAL TO MAXIMUM OUTPUT BY ADJUSTING 1720 KILOCYCLE OSCILLATOR TRIMMER.

(e) Tune receiver dial and set test oscillator frequency to EXACTLY 1400 kilocycles. Adjust 1400 K.C. R.F. and antenna trimmers for maximum sensitivity.

(f) Set test oscillator frequency and receiver dial to approximately 600 kilocycles. Then while rocking gang condenser slightly to right and left, adjust 600 K.C. oscillator padder for maximum signal response.

ALIGNING 1.68-5.6 MEGACYCLE BAND:

(a) Replace .00025 Mfd. test oscillator antenna lead series condenser with a 400 ohm resistor.

(b) Adjust band selector switch to 1.68-5.6 megacycles, tune receiver dial and set test oscillator frequency to EXACTLY 5.6 megacycles. Bring in 5.6 megacycle test signal to maximum output by adjusting 5.6 M. C. oscillator trimmer.

(c) Tune receiver dial and test oscillator frequency to EXACTLY 5 Megacycles and adjust 5 M.C. antenna trimmer for maximum sensitivity.

ALIGNING 5.55-18.5 MEGACYCLE BAND:

(a) Leave 400 ohm resistor in series with test oscillator lead and place band selector switch for operation on 5.55-18.5 megacycle band, tune receiver dial and set test oscillator frequency to EXACTLY 18.5 megacycles.

(b) Adjust 18.5 M.C. oscillator trimmer to bring in 18.5 megacycle test signal to maximum output.

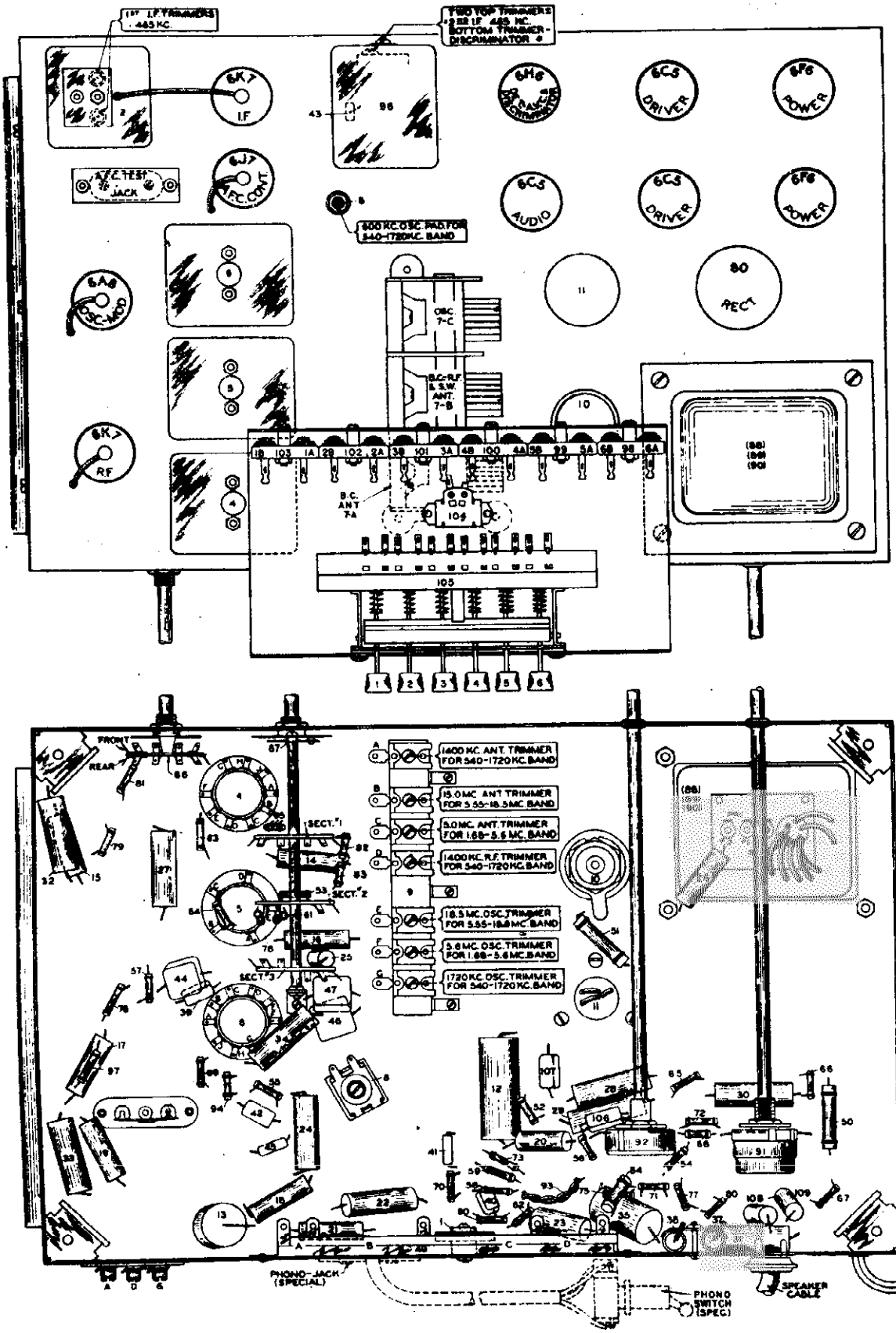
NOTE: When adjusting this trimmer two peaks, the fundamental and the image peak will be noticed. CARE MUST BE TAXEN THAT THE FUNDAMENTAL PEAK AND NOT THE IMAGE PEAK IS USED FOR ALIGNING THE RECEIVER AT 18.5 MEGACYCLES. Always back off the trimmer to minimum capacity, then screw down the trimmer (add capacity) until the FIRST peak which is the fundamental and the proper one to use is tuned in. If the trimmer is screwed down beyond the point where the first peak is received the incorrect image peak will be tuned in. After completing adjustment of the oscillator trimmer at 18.5 megacycles, always check to see if the proper peak has been used. To do this leave test oscillator frequency at 18.5 megacycles, increase the output of the test oscillator and tune receiver dial to approximately 17.5 megacycles. Then vary the receiver dial slightly to the right and left of 17.5 megacycles, and if the fundamental peak was used in aligning at 18.5 megacycles the test oscillator signal will be heard at approximately 17.5 megacycles on the receiver dial.

(c) Tune receiver dial and set test oscillator frequency to EXACTLY 15 megacycles.

Rock gang condenser slightly to right and left and adjust 15 M.C. antenna trimmer for maximum 15 megacycle test signal response.

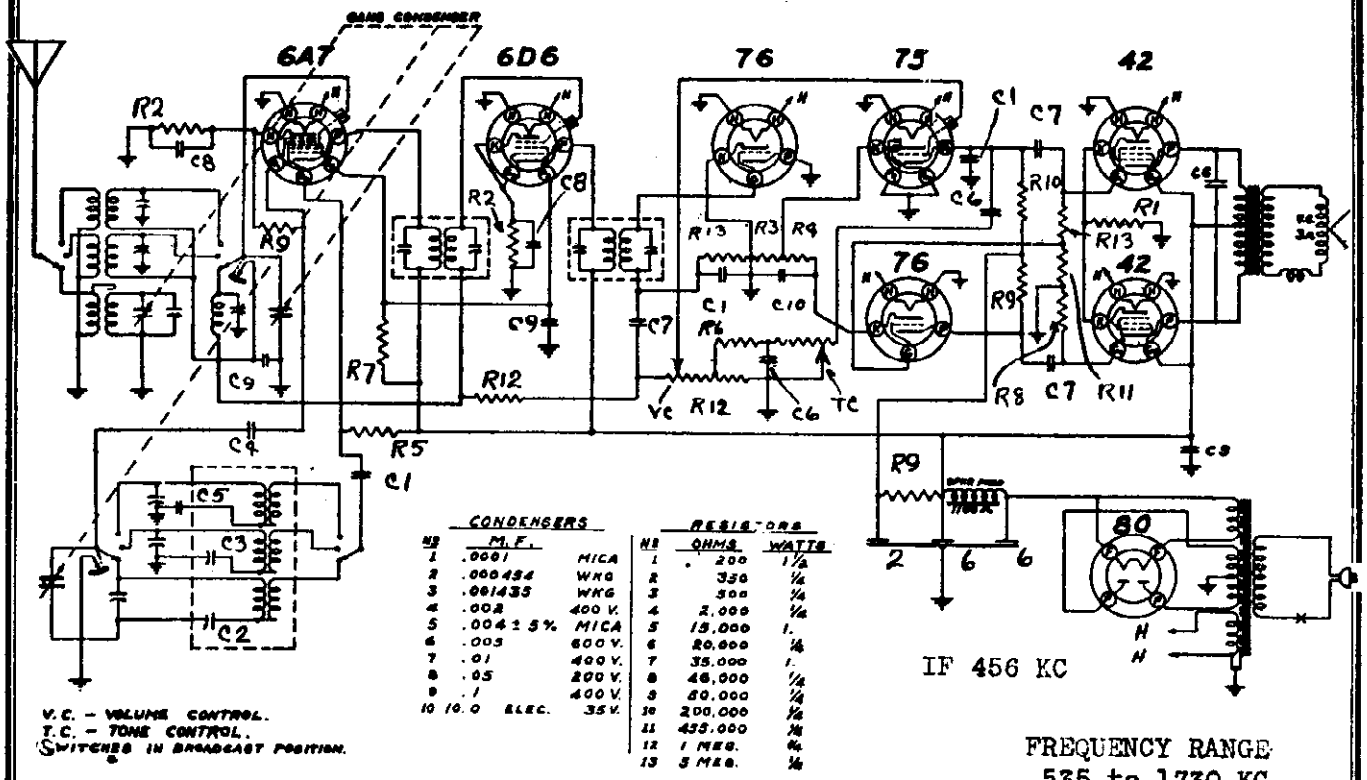
To assure more accurate trimmer setting, repeat all above adjustments several times always using lowest possible test oscillator output consistent with readable output meter scale deflection.

ALLIED RADIO CORP.



MODEL B10773

ALLIED RADIO CORP.



CONDENSERS

NO	M.F.	
1	.0001	MICA
2	.000454	WKG
3	.001435	WKG
4	.002	400 V.
5	.004 ± 5%	MICA
6	.005	600 V.
7	.01	400 V.
8	.05	200 V.
9	.1	400 V.
10	10.0	ELEC. 35 V.

RESISTORS

NO	OHMS	WATTS
1	200	1/2
2	350	1/4
3	500	1/4
4	2,000	1/4
5	15,000	1.
6	20,000	1/4
7	35,000	1.
8	46,000	1/4
9	80,000	1/4
10	200,000	1/2
11	455,000	1/4
12	1 MEG.	1/4
13	5 MEG.	1/4

FREQUENCY RANGE
535 to 1730 KC
1.7 to 5.6 MC
5.6 to 18.1 MC

Eight Tube AC Superheterodyne

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. 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 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.

ALLIED RADIO 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) ½ 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.

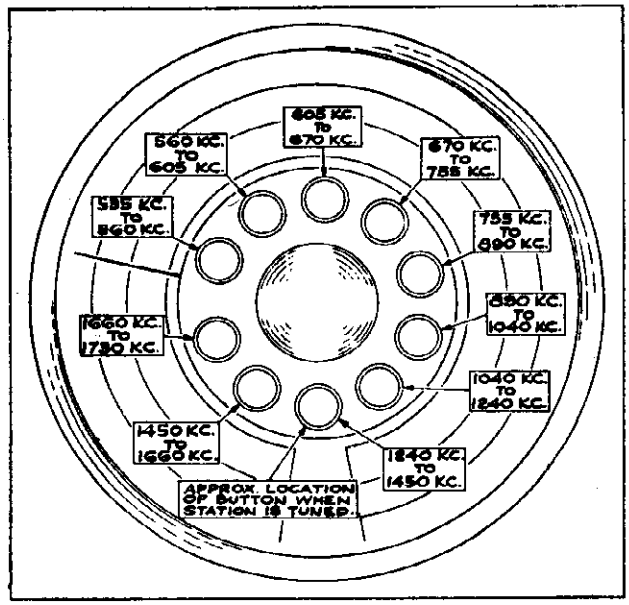
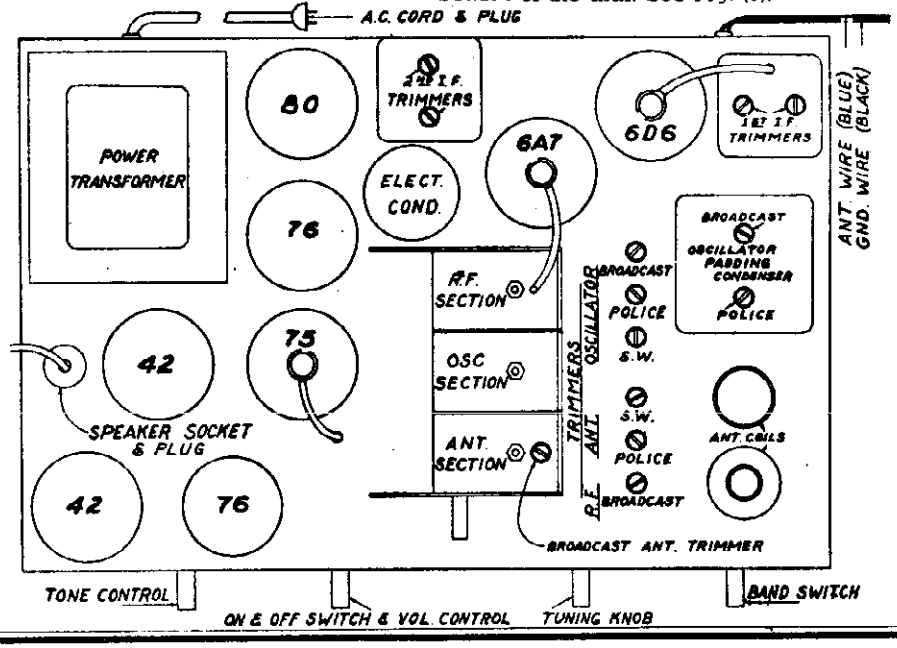


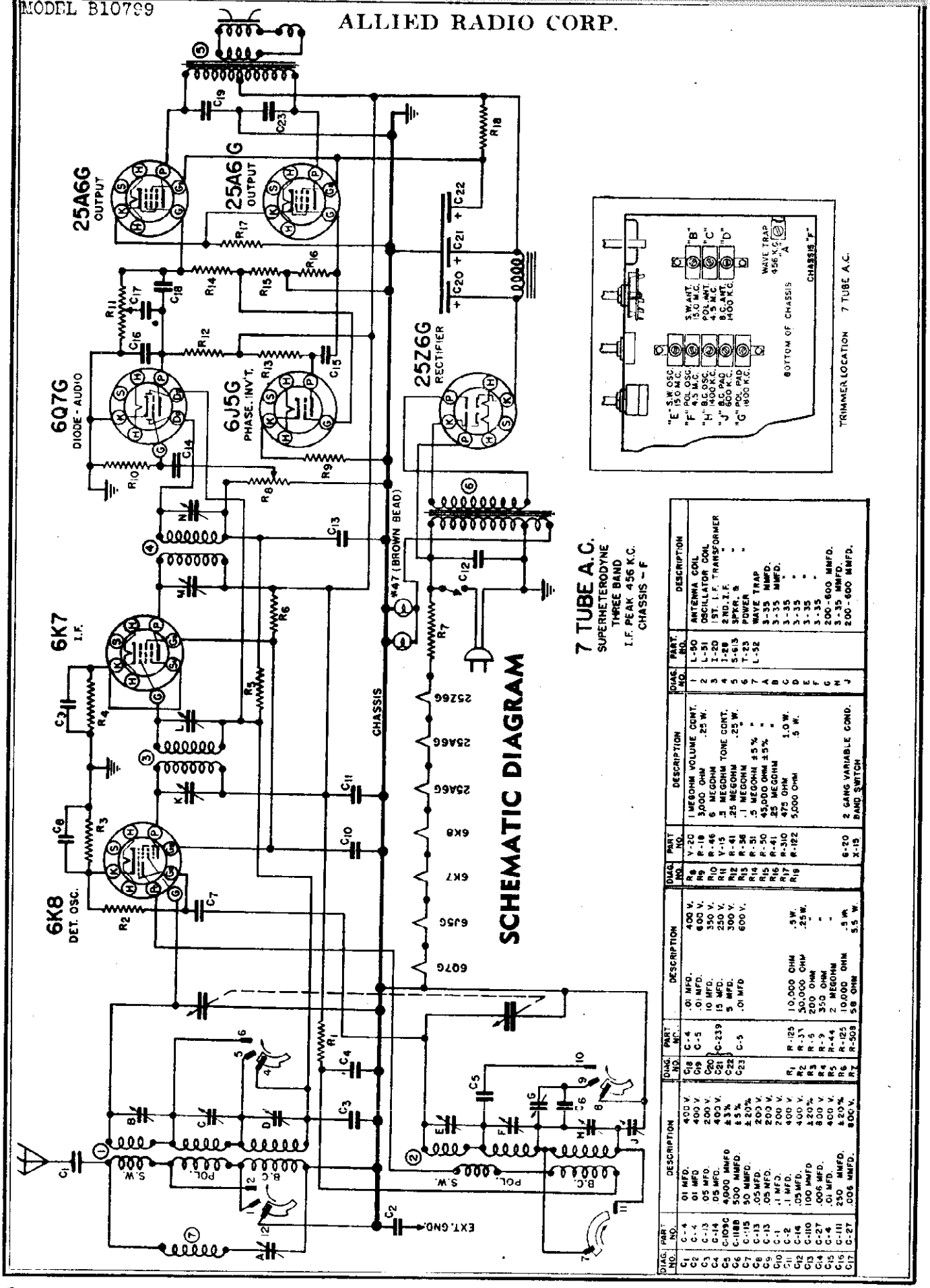
Figure 1

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).



MODEL B10799

ALLIED RADIO CORP.



DIAG. NO.	PART NO.	DESCRIPTION
C1	C-4	.01 MFD. 400 V.
C2	C-4	.01 MFD. 400 V.
C3	C-13	.05 MFD. 200 V.
C4	C-14	.05 MFD. 400 V.
C5	C-1098	4,000 MMFD ±5%
C6	C-1188	500 MMFD. ±5%
C7	C-115	50 MMFD. ±20%
C8	C-13	.05 MFD. 200 V.
C9	C-13	.05 MFD. 200 V.
C10	C-1	.1 MFD. 200 V.
C11	C-2	.05 MFD. 400 V.
C12	C-116	100 MMFD ±20%
C13	C-110	.006 MFD. 800 V.
C14	C-27	.01 MFD. 400 V.
C15	C-4	250 MMFD. ±20%
C16	C-111	.006 MMFD. 800 V.
C17	C-27	
C18	C-4	.01 MFD. 400 V.
C19	C-5	.01 MFD. 600 V.
C20	C-239	10 MFD. 350 V.
C21		15 MFD. 250 V.
C22		5 MFD. 300 V.
C23	C-5	.01 MFD 600 V.
R1	R-125	10,000 OHM .5 W.
R2	R-31	30,000 OHM .25 W.
R3	R-5	200 OHM -
R4	R-9	350 OHM -
R5	R-44	2 MEGOHM -
R6	R-125	10,000 OHM .5 W.
R7	R-503	58 OHM 5.5 W.
R8	Y-20	1 MEGOHM VOLUME CONT.
R9	R-18	3,000 OHM .25 W.
R10	R-46	6 MEGOHM
R11	V-15	.5 MEGOHM TONE CONT.
R12	R-41	.25 MEGOHM .25 W.
R13	R-38	.1 MEGOHM "
R14	R-51	.5 MEGOHM ±5% "
R15	R-50	45,000 OHM ±5% "
R16	R-41	.25 MEGOHM
R17	R-310	475 OHM 1.0 W.
R18	R-122	5,000 OHM .5 W.
S	6-20	2 GANG VARIABLE COND.
	X-15	BAND SWITCH
1	L-50	ANTENNA COIL
2	L-51	OSCILLATOR COIL
3	T-20	1ST I.F. TRANSFORMER
4	T-28	2ND I.F. "
5	S-613	SPKR. "
6	T-23	POWER "
7	L-52	WAVE TRAP
A		3-35 MMFD.
B		3-35 MMFD.
C		3-35 "
D		3-35 "
E		3-35 "
F		3-35 "
G		200-600 MMFD.
H		3-35 MMFD.
J		200-600 MMFD.

AUTOMATIC TUNING

ADJUSTMENT. All adjustments are simply made from the front of the cabinet without the use of tools since the push-button knobs serve this purpose.

To make adjustments, turn each knob to the left about 1 complete turn. The knob is knurled to provide a positive grip for this purpose. A groove is also provided across the knob for use of a small coin to lock each setting with ease and surety.

With the knob turned free, depress as far as possible and hold down, meanwhile tune to any desired station with the manual tuning control. At this point, the automatic push button knob should be turned to the right until securely tightened. Be sure the knob is being held down in position while it is being tightened. To assure accurate adjustment, the volume control should be set at a moderate level and the station tuned in slowly to a point of maximum volume and clarity.
It is not necessary to follow any particular sequence of stations since each button is adjustable to any station.

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, 1800, 4500, 6000 and 15000 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.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the wave trap and then the Short Wave, Police and Broadcast bands in the order given, should be the next procedure.

I. F. AND WAVE TRAP 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 (6K8) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the chassis ground. Align all four I.F. trimmers to peak or maximum reading on the output meter. After aligning the I.F.'s, have the band switch in the broadcast band and the generator set at 456 KC. Connect the antenna lead to the generator through a 200 MMF condenser. Adjust the wave trap trimmer to give a minimum signal. It will be necessary to increase the output of the generator to secure an accurate minimum with the wave trap. (A)

SHORT WAVE BAND ALIGNMENT. Change the band switch to the S. W. position and connect the generator to the antenna with a 400 ohm dummy. Adjust the S. W. oscillator to give a maximum output with the dial at 1500 KC. Next adjust the S. W. antenna to give a maximum peak and check dial to prevent alignment on the image frequency. With a strong signal input turn the dial to approximately 1 M. C. lower in frequency and pick up the image frequency. If the image is not received, it will be necessary to return the dial to 15000 KC to reduce the capacity in the oscillator trimmer until a second signal is received. Proceed as before with the alignment of the antenna and recheck for image frequency. Check the sensitivity at 6000 KC to determine if the coils and mica pad are not defective.

POLICE BAND ALIGNMENT. Change the band switch to the police position and, with the same dummy antenna, line up the police oscillator trimmer and police antenna trimmer in the same way as for the short wave band, setting the dial at 4500 KC and the generator at the same frequency. Check for image frequency at approximately 1 MC lower on the dial as described for the short wave band. Next, set the generator at 1800 KC and tune in the signal with the dial. Adjust the police pad by rocking the gang back and forth while adjusting the pad until maximum output is attained. Recheck the adjustment at 4500 KC as the pad adjustment may have caused misalignment.

BROADCAST BAND ALIGNMENT. With the switch turned to the broadcast position, connect the antenna to the generator through a 200 MMF dummy and set the dial and generator at 1400 KC. Align the BC oscillator trimmer and BC antenna trimmer. Set the generator at 600 KC and adjust the BC pad as described for the police band. Return to 1400 KC and recheck alignment at this point.

STANDARD BROADCAST BAND (BC). (174 to 580 Meters)

POLICE BAND (PB). (53 to 175 Meters)—

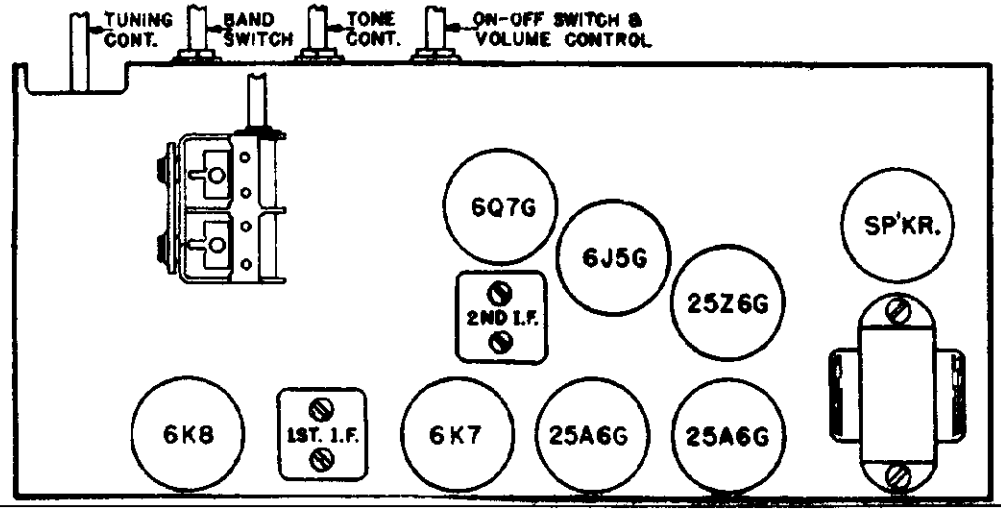
FOREIGN AND AMERICAN SHORT WAVE BAND (SW). (15.8 to 53 Meters)—

49 METER BAND.

31 METER BAND.

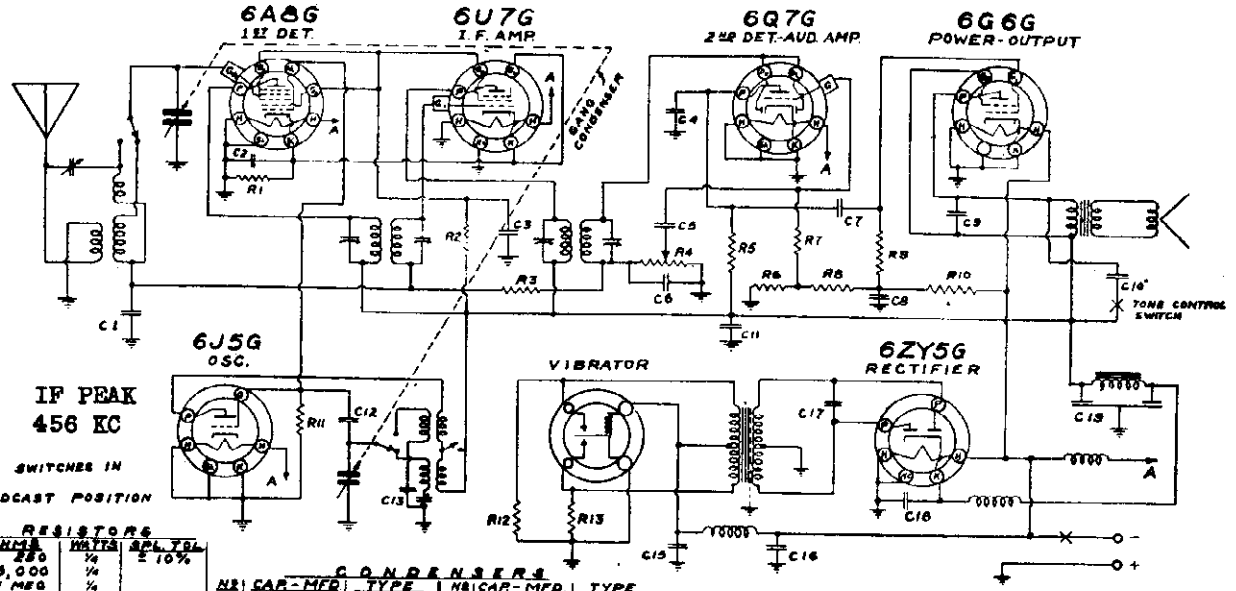
25 METER BAND.

19 METER BAND.



MODELS B10780, B10781

ALLIED RADIO CORP.



RESISTORS

NO	OHMS	WATTS	APL. TOL.
1	220	½	± 10%
2	15,000	½	
3	1 MEG.	½	
4	500,000	½	(VOL. CON)
5	150,000	½	
6	150,000	½	± 10%
7	500,000	½	
8	400,000	½	± 10%
9	400,000	½	
10	100,000	½	
11	40,000	½	
12	180	½	
13	180	½	

CONDENSERS

NO	CAP-MFD	TYPE	NO	CAP-MFD	TYPE
1	.05	200 V.	11	.1	200V.
2	.25	200 V.	12	.00005	MICA
3	.1	200 V.	13	.004 (± 5%)	MICA
4	.000 25	MICA	14		
5	.01	400 V.	15	.5	50 V.
6	.000 25	MICA	16	.5	50 V.
7	.01	400 V.	17	.015	1000 V.
8	.05	200 V.	18	.01	400 V.
9	.005	600 V.	19	8-8 CCCW	200 W.V.
10	.02	400 V.			

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 of test oscillator or signal generator to the grid of the first detector tube (6A8G) 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.

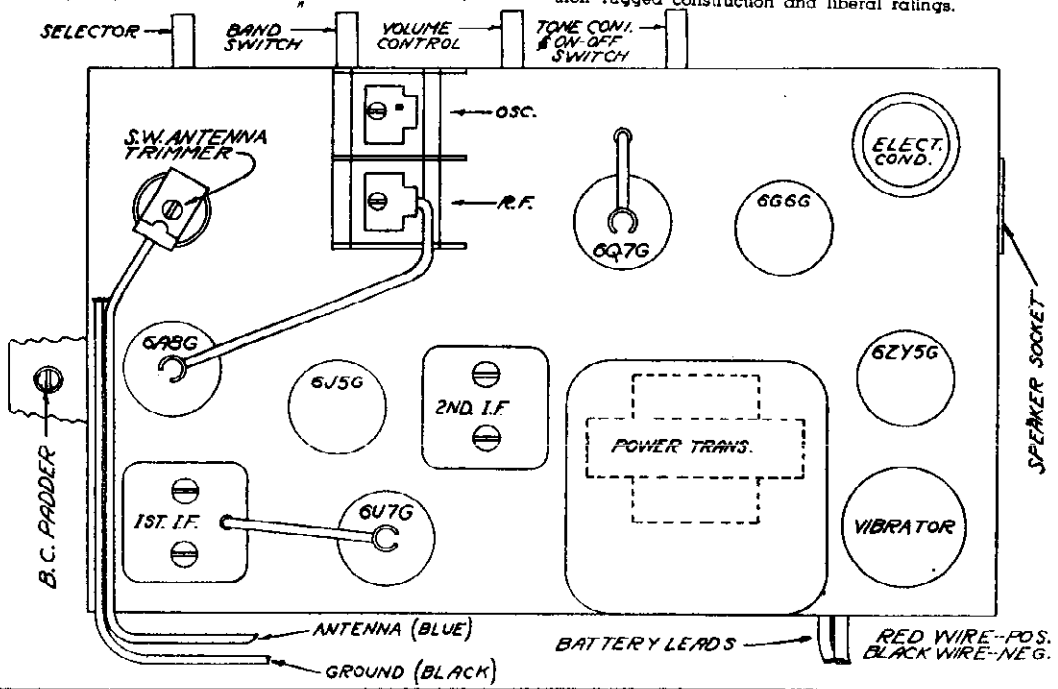
BROADCAST BAND ALIGNMENT

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 Broadcast "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 Broadcast "antenna" trimmer to a maximum signal. Set the signal generator to 600 KC and tune in the signal on the receiver.

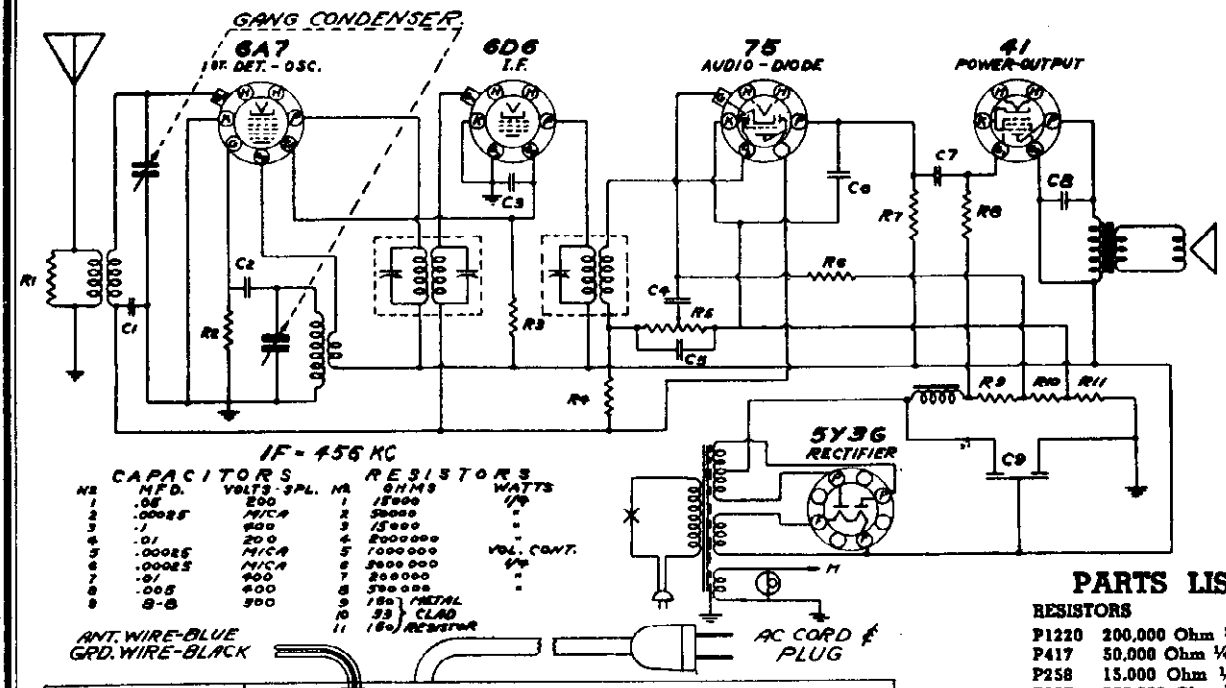
Note: Approximately the same sensitivity should be noted at this point as was at 1400 KC. The signal strength may sometimes be improved by padding the circuits. This is done by slowly increasing or decreasing the oscillator padding condenser and, at the same time, continuously tuning back and forth across 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. 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.

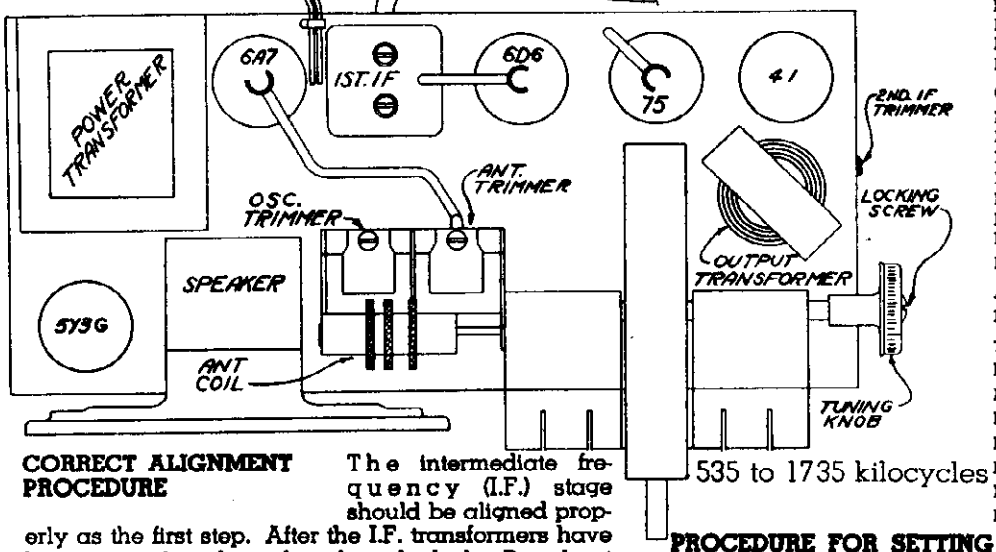
SHORT WAVE BAND ALIGNMENT

The short wave band is adjusted by setting the generator to 16,000 KC and tuning in the signal. Adjust the "short wave antenna" 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.



ALLIED RADIO CORP.





PARTS LIST

RESISTORS

P1220	200,000 Ohm ¼ Watt
P417	50,000 Ohm ¼ Watt
P258	15,000 Ohm ¼ Watt
P137	500,000 Ohm ¼ Watt
P1114	2,000,000 Ohm ¼ Watt
P2438	Candohm Resistor

CONDENSERS

P164	.01 Mfd. 400 Volt
P1322	.005 Mfd. 600 Volt
P334	.05 Mfd. 400 Volt
P148	.05 Mfd. 200 Volt

MICA CONDENSERS

P817	.00025

ELECTROLYTIC CONDENSERS

P2397	Dual 8 Mfd. 300 W.V.

ADJUSTABLE CONDENSERS

P2411	Gang Condenser

TRANSFORMERS AND COILS

P2395	110 V. Power Transform
P2396	125 V. Power Transform
P2391	Output Transformer
P1506	1st I.F. Transformer
P2394	2nd I.F. Transformer
P2412	Oscillator Coil
P2393	Antenna Coil

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 alignment should be the next procedure.

I.F. ALIGNMENT 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 three I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT Adjust the oscillator to 1730 KC and connect the output to the antenna lead (Blue) through a .0002 mfd. mica condenser. Set the gang condenser to minimum capacity and adjust the gang condenser trimmer (oscillator) to receive this signal. After this has been carefully done, the next step is to set the generator to 1400 KC and after tuning in the signal adjust the antenna trimmer to peak. This is all that is necessary for the alignment unless the plates of the gang condenser have been bent out of shape. In case of bent plates, set the test oscillator and the receiver to 600 KC and bend the plates into the position for maximum output.

PROCEDURE FOR SETTING UP AND OPERATING AUTOMATIC PUSH BUTTONS

Select four strong local stations tuned in regularly. Now loosen **Locking Screw** (see chassis layout) several turns with a coin or a screw driver and press in any one of the four push buttons. Holding the button down, tune in any one of four selected stations by rotating the tuning knob (side knob) slowly back and forth until the signal is cleared.

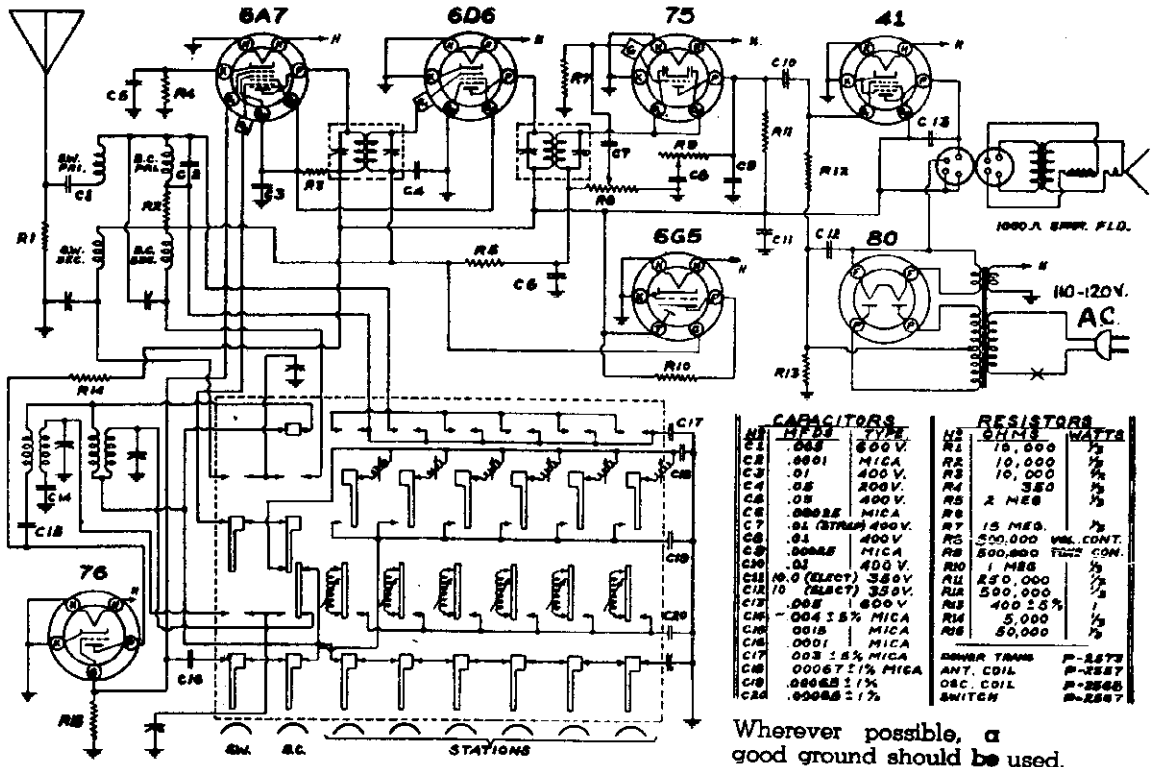
Release the push button and press in another button and hold down, tuning in another favorite station with tuning knob. Follow the same procedure for the remaining stations. Now hold tuning knob (side knob) securely and with coin or screw driver, tighten locking screw. This screw holds all stations in adjustment.

In order to change any station already set up, to another, hold tuning knob securely, loosen locking screw and select the new station as explained above. Tear the correct station call letter tabs from the set of sheets supplied and push them into rectangular windows above each push button.

The automatic push button dial is now set up for quick tuning.

MODEL E10870

ALLIED RADIO CORP.



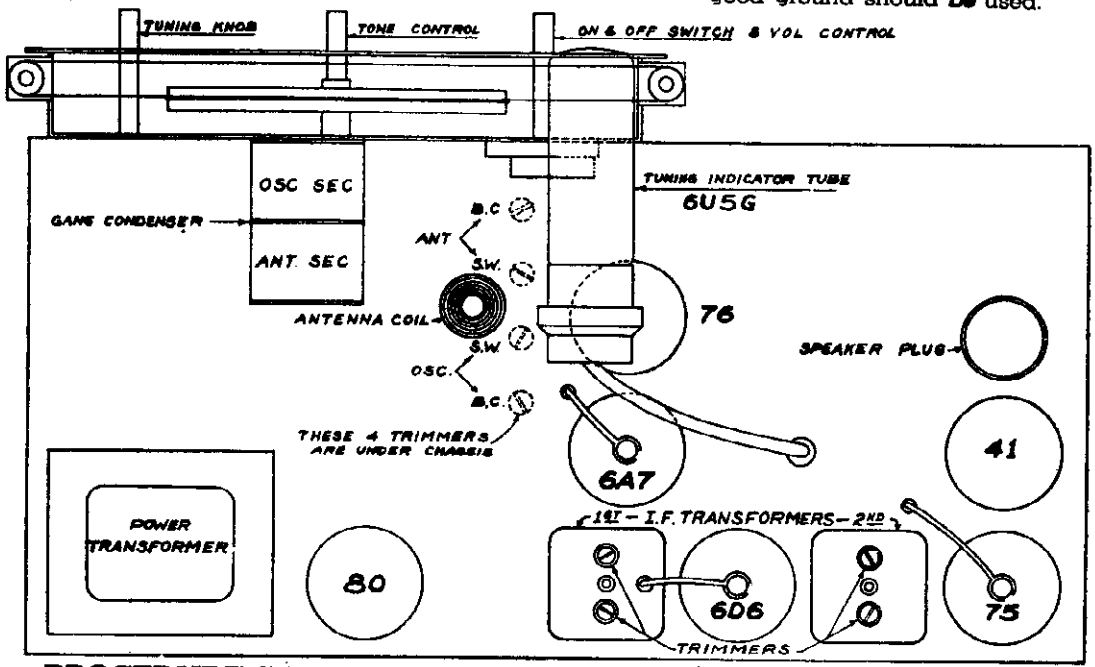
IF PEAK
456 KC

CAPACITORS		
NO.	MFDS	TYPE
C1	.005	600 V.
C2	.0001	MICA
C3	.01	400 V.
C4	.05	200 V.
C5	.05	400 V.
C6	.00025	MICA
C7	.01 (STRAY)	400 V.
C8	.01	400 V
C9	.00025	MICA
C10	.03	400 V.
C11	10-0 (ELECT)	350 V.
C12	10 (ELECT)	350 V.
C13	.005	1,600 V.
C14	.004 ± 5%	MICA
C15	.0015	MICA
C16	.0001	MICA
C17	.003 ± 5%	MICA
C18	.00067 ± 1%	MICA
C19	.00025 ± 1%	
C20	.00025 ± 1%	

RESISTORS		
NO.	OHMS	WATTS
R1	10,000	½
R2	10,000	½
R3	10,000	½
R4	350	½
R5	2 MEG	½
R6		
R7	15 MEG.	½
R8	500,000	VOL. CONT.
R9	500,000	TONE CON.
R10	1 MEG	½
R11	250,000	½
R12	500,000	½
R13	400 ± 5%	1
R14	5,000	½
R15	50,000	½

POWER TRANS	P-2573
ANT. COIL	P-2587
OSC. COIL	P-2586
SWITCH	P-2567

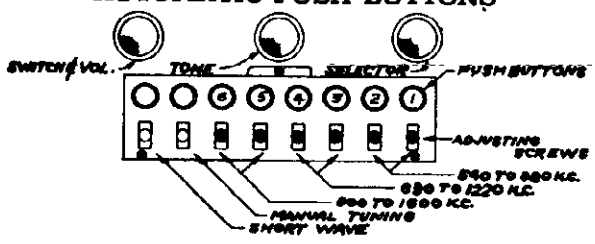
Wherever possible, a good ground should be used.



This receiver is designed to operate over two tuning ranges: the broadcast range which extends from 545 to 1720 kc (174.4 to 550.4 meters) and the international short wave band which extends from 5800 to 18,100 kc (16.5 to 51.7 meters). This latter range is the one which includes the 5 internationally assigned bands—the 16, 19, 25, 31 and 49 meter bands.

CONVENTIONAL ALIGNMENT, SEE SPECIAL SECTION, VOL. VIII.

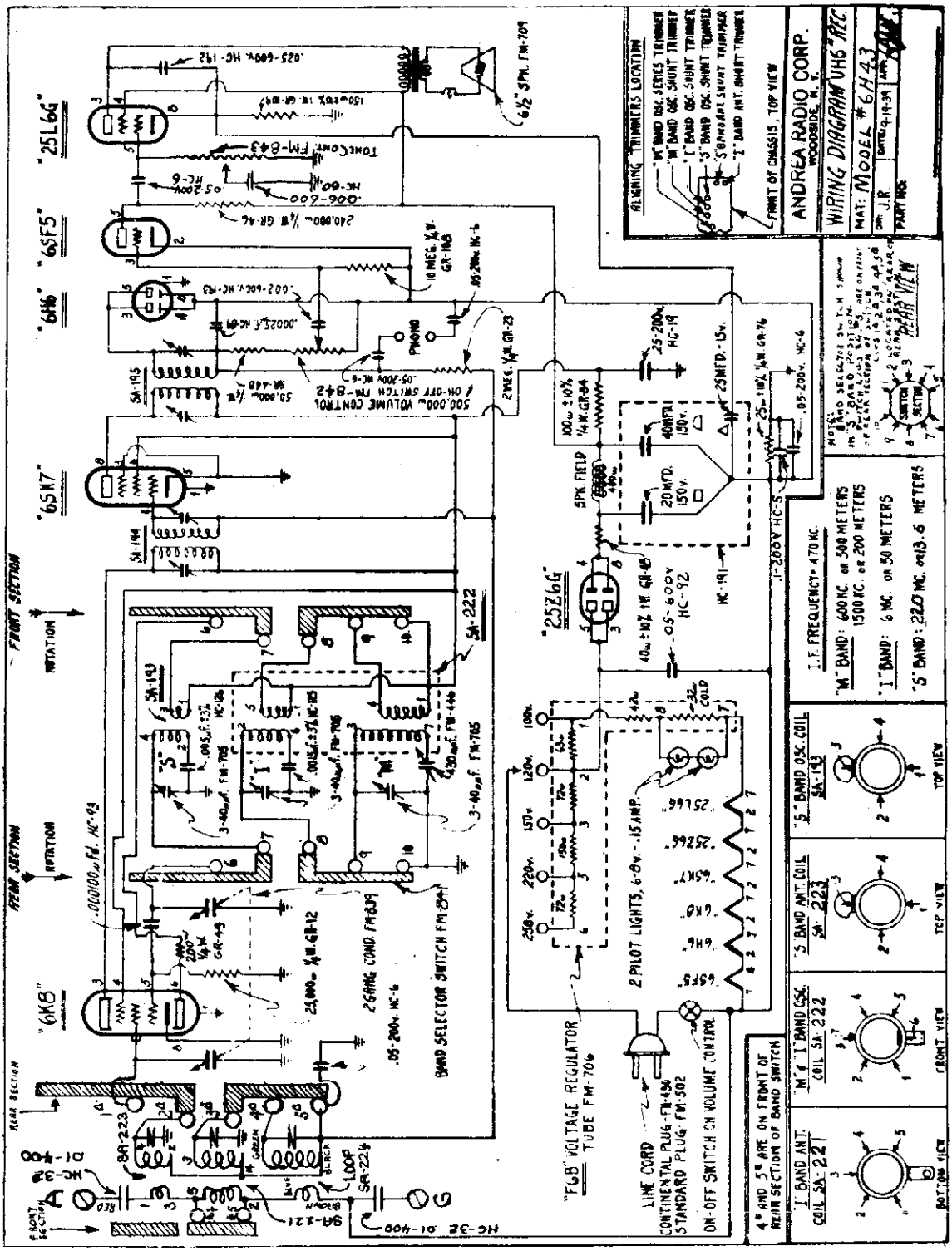
PROCEDURE FOR SETTING UP AUTOMATIC PUSH BUTTONS



1. Choose a station having a frequency within the range of button No. 1 (540 to 980 kc).
2. Press "Manual Tuning" button and tune this station conventionally by using the selector knob.
3. Now press button No. 1 and turn adjusting screw in either direction until the previously selected station is heard. Adjust the screw until the dark area of the "electric eye" is smallest. This setting will give the best tonal response with maximum sensitivity.
4. Remove the call letters of the station from the call letter sheet furnished and insert in the window of the adjusting screw.
5. Repeat the above procedure for the remaining five (5) stations.

NOTE: It is advisable to retain the call letter sheet in case of station change later on.

ANDREA RADIO CORP.



TUBES: The following tubes are required for this receiver: 6K8 oscillator and modulator, 6SK7 I.F. amplifier, 6H6 2nd detector and AVC, 6F5 1st audio, 25L6G beam power output, 25Z6G rectifier, F6B ballast tube.

I. F. REALIGNMENT GENERALLY SUFFICIENT: As a rule, it is not necessary to readjust the short wave oscillator and antenna shunt and series trimmers unless they have been tampered with, or require replacing. Consequently, careful realignment of the I.F. system is all that requires attention, ordinarily. Before making any adjustments, tune in one particular station and note the quality of reception so that you can check the improvement after the I.F. system has been realigned.

USE SIGNAL GENERATOR AND OUTPUT VOLTMETER: For realigning, use a signal generator to supply a modulated carrier of 470, 600, 1,500, 6,000, and 22,000 kc., plus an output voltmeter. Alignment by any other means is not recommended. Your service test generator should be checked frequently for change in calibration by getting a zero beat between the generator and broadcast stations of known frequency.

SPECIAL NOTES: Always check the pointer setting with the alignment scale located on the top rear flocked plate before you start alignment adjustments. Otherwise, inaccuracies will be introduced.

When the variable plates are completely closed, the back extension of the pointer should be exactly in line with the end of the vertical marking at the left side of the alignment scale looking from the front of the chassis.

After installing the chassis in the cabinet, it is essential that you check the pointer alignment with the glass scale on the cabinet by turning the pointer fully to the left. Then clamp the chassis loosely in position so that the pointer lines up with the left end of the calibration line on the glass scale. Tighten the chassis firmly in the cabinet, making certain that the chassis does not move its position, and thereby cause the pointer position to shift with respect to the calibrated scale on the cabinet. Otherwise, poor calibration will result.

NOTES ON REALIGNING THE BANDS: During the aligning measurements, the output of the signal generator must be kept so low that it will not cause the AVC circuit in the set to function. In other words, when the volume control on the set is turned to maximum, the output should not show more than .5 volt across the voice coil, or 50 milliwatts in the plate circuit of the output tube.

Generally, at frequencies above 7,000 kc., the signal generator frequency will change with each adjustment of the generator output attenuator control. Hence, the receiver must be retuned each time the attenuator is adjusted.

Some generators cause trouble by direct radiation to the set at frequencies above 8 mc. Experience indicates that more accurate alignment is possible when the generator is separated by several feet from the receiver under test, in order to eliminate this direct pickup.

470 KC. I. F. ALIGNMENT: Connect the high-potential lead of the signal generator in series with a .1 mfd. condenser to the grid of the 6K8 tube. Set the generator at 470 kc., and adjust the output until a small deflection is obtained in the output meter. Adjust the trimmer condensers on the top of the 1st and 2nd I.F. transformers (see circuit diagram) for maximum deflection on the output meter. After this adjustment has been made, disconnect the generator from the grid of the 6K8 tube. This completes the alignment of the I.F. system.

"S" BAND ALIGNMENT: Connect the high-potential lead from the generator in series with a 400-ohm resistor to the antenna (red) lead of the set, and the low side of the generator to the ground (black) lead of the set. Put the wave band switch at the S position, adjust the generator to22,000 kc., and the receiver to 22.0 mc. Vary the S band oscillator shunt trimmer slowly from maximum to minimum. You will hear the signal at two settings of the trimmer, one nearer the minimum capacity (plates open) and one near the maximum capacity (plates closed). The setting near minimum capacity is correct, because the setting near maximum capacity is at the image frequency.

Now adjust the antenna shunt trimmer. During this adjustment, be sure to rock the gang condenser back and forth slowly each time you make an adjustment of the trimmer. As you continue to do this, you will reach a point where further turning of the trimmer screw, while rocking the gang condenser, will not increase the signal response. This is the correct adjustment.

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

Set the signal generator at 22,000 kc. and tune the receiver slowly from 21,000 to 23,000 kc. Two signals should be heard, 940 kc. apart. One will be lower in frequency than 22,000 kc. and the other will be higher. The higher frequency, as indicated on the dial, is the correct aligning frequency, and the lower one is the image.

As a further check, leave the receiver tuned to the higher frequency. Very slowly, increase the generator frequency from 22,000 kc. to about 23,000 kc.

A signal will be heard near 23,000 kc. if all the settings are correct for alignment. If there is no signal, the original settings were on the image frequency. In that case, you must start again from the beginning, in order to be sure of accurate results.

After you have found the correct settings, the image, or lower, frequency response on the receiver will always sound weaker than the true signal.

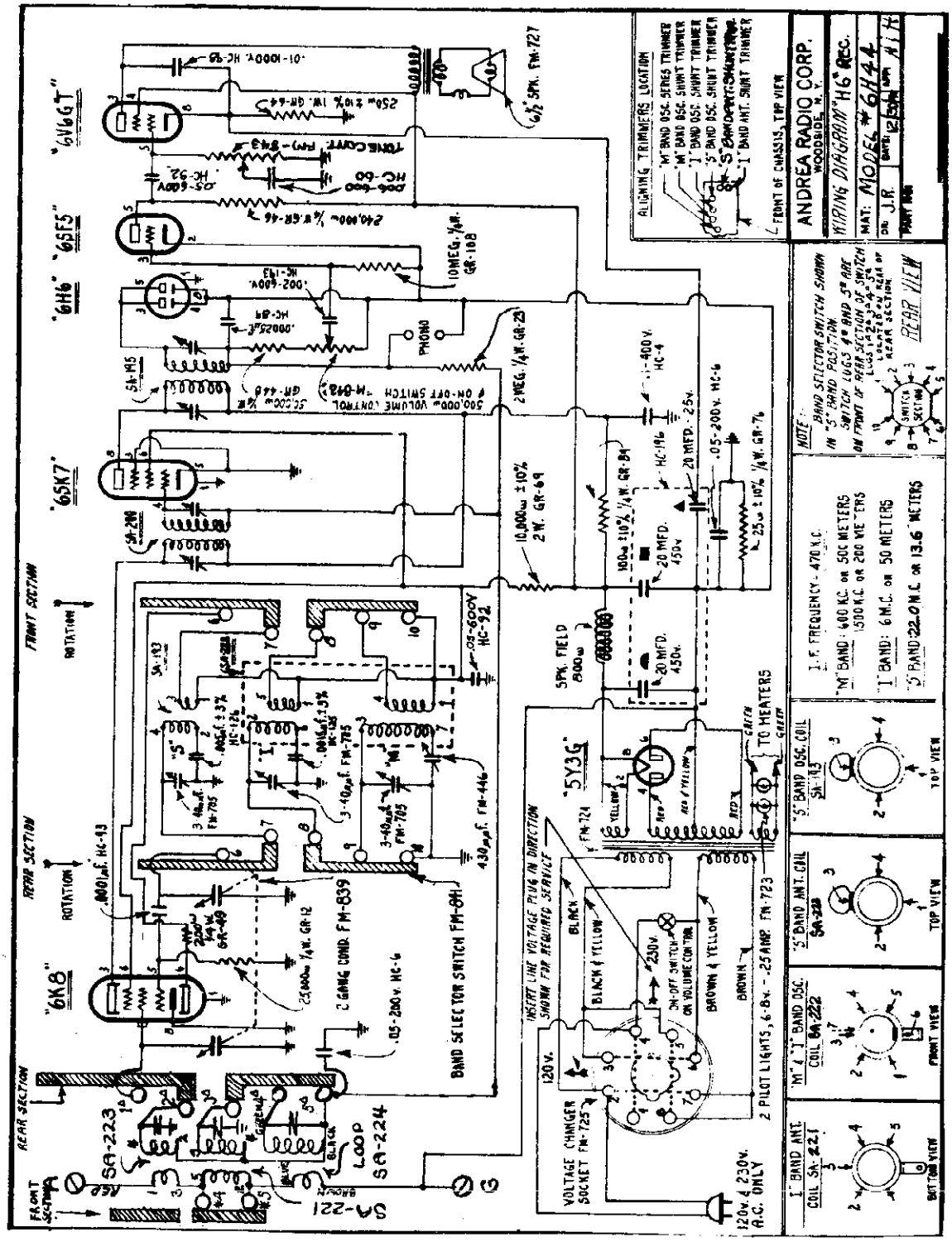
"I" BAND ALIGNMENT: With the signal generator connected in accordance with the preceding instructions, set the generator at 6,000 kc., turn the wave band switch to the I position, and adjust the dial to 6 mc. Following the procedure just described, adjust the I band oscillator shunt trimmer for maximum signal response. Next, adjust the I band antenna shunt trimmer. Rock the gang condenser back and forth slowly as you adjust the trimmer, in accordance with the instructions for the S band adjustment. This completes the adjustment for the I band.

"M" BAND ALIGNMENT: Replace the 400-ohm resistor in the generator lead by a .00025 mfd. condenser. Set the generator at 1,500 kc., turn the wave band switch to the M position, and set the dial of the receiver at 1,500 kc. Adjust the M band oscillator shunt trimmer for maximum signal response. Next adjust the antenna shunt trimmer for maximum response.

This band must be aligned at 600 kc. also. Set the generator accordingly, and tune the receiver to 600 kc. Adjust the M band oscillator *series* trimmer for maximum response. During this adjustment, be sure to rock the gang condenser for each small change of capacity of the series trimmer. When this adjustment has been completed, recheck the antenna adjustment at 1,500 kc. This completes the adjustment of the M band.

WARNING! Always remove the line plug from the electric outlet before removing the chassis from the cabinet. Also—connect the speaker plug to the receiver before switching on the power. Otherwise, damage will result.

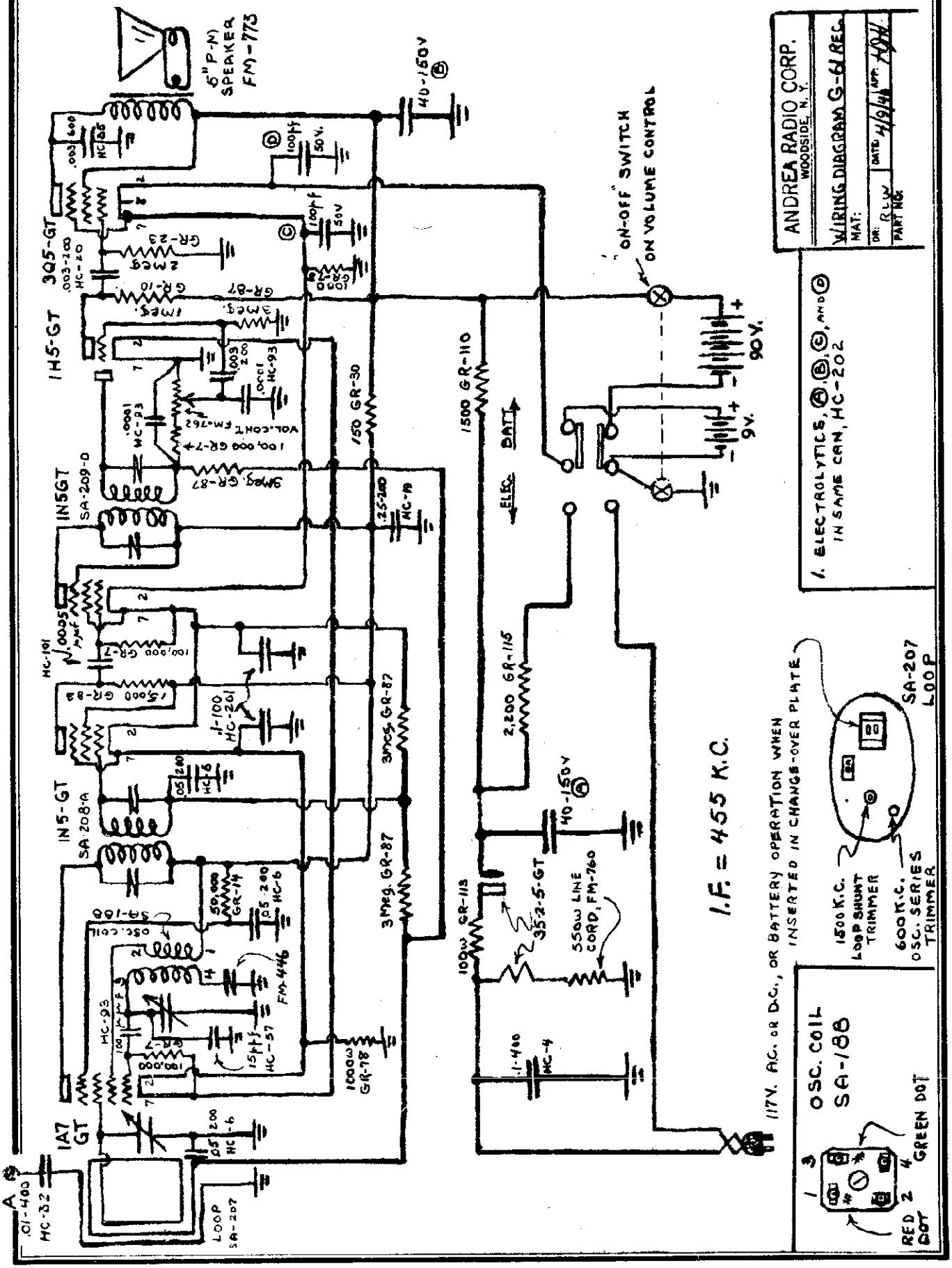
ANDREA RADIO CORP.



TUBES: 6K8 Oscillator & Modulator 6SF5 1st Audio
6V6GTBeam Power Output 5Y3G Rectifier
6H6 2nd Detector & AVC 6SK7 I.F. Amplifier

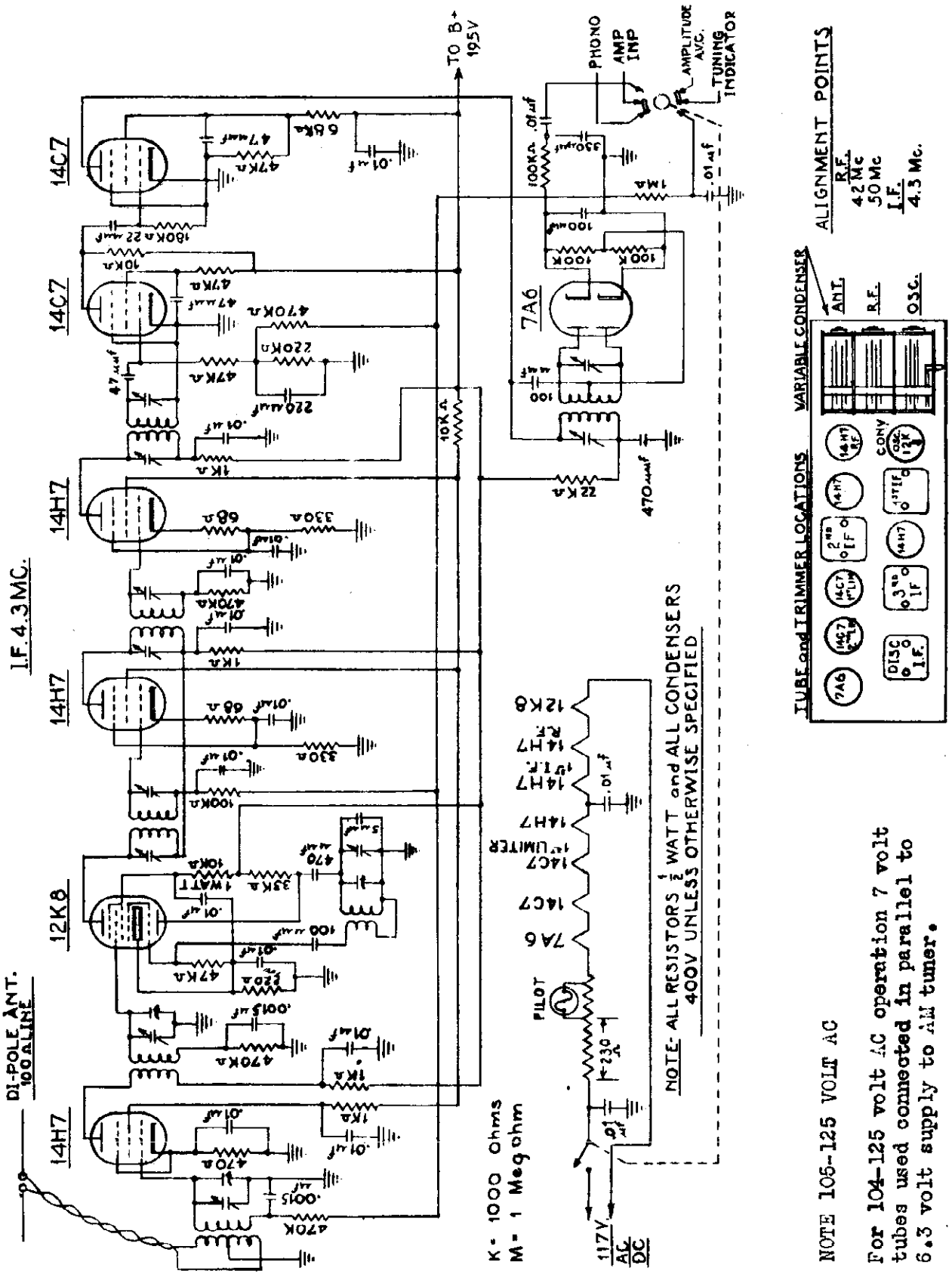
MODELS 6G61, 6G61A, Chassis G61

ANDREA RADIO CORP.



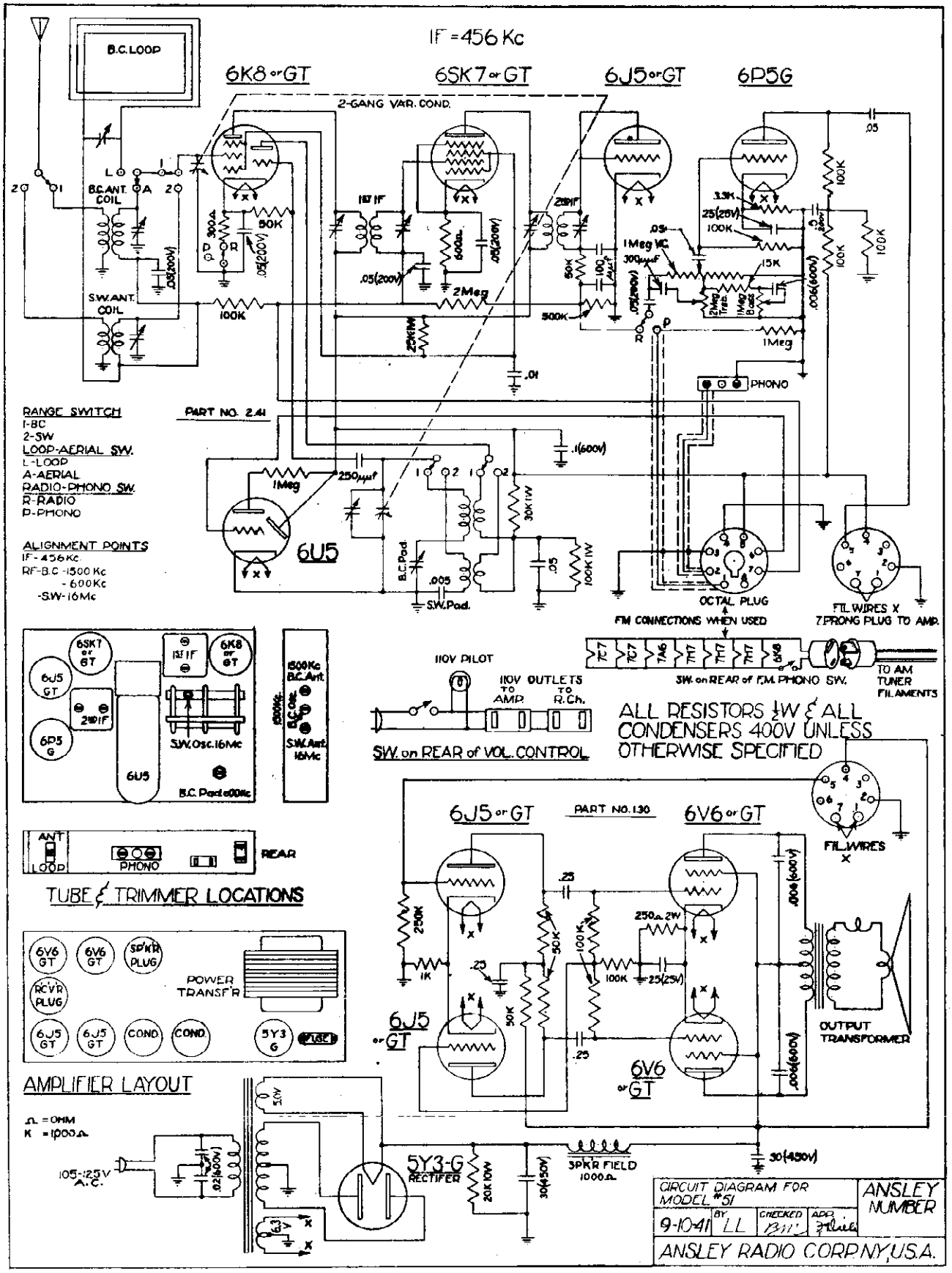
MODEL FT15

ANSLEY RADIO CORP.

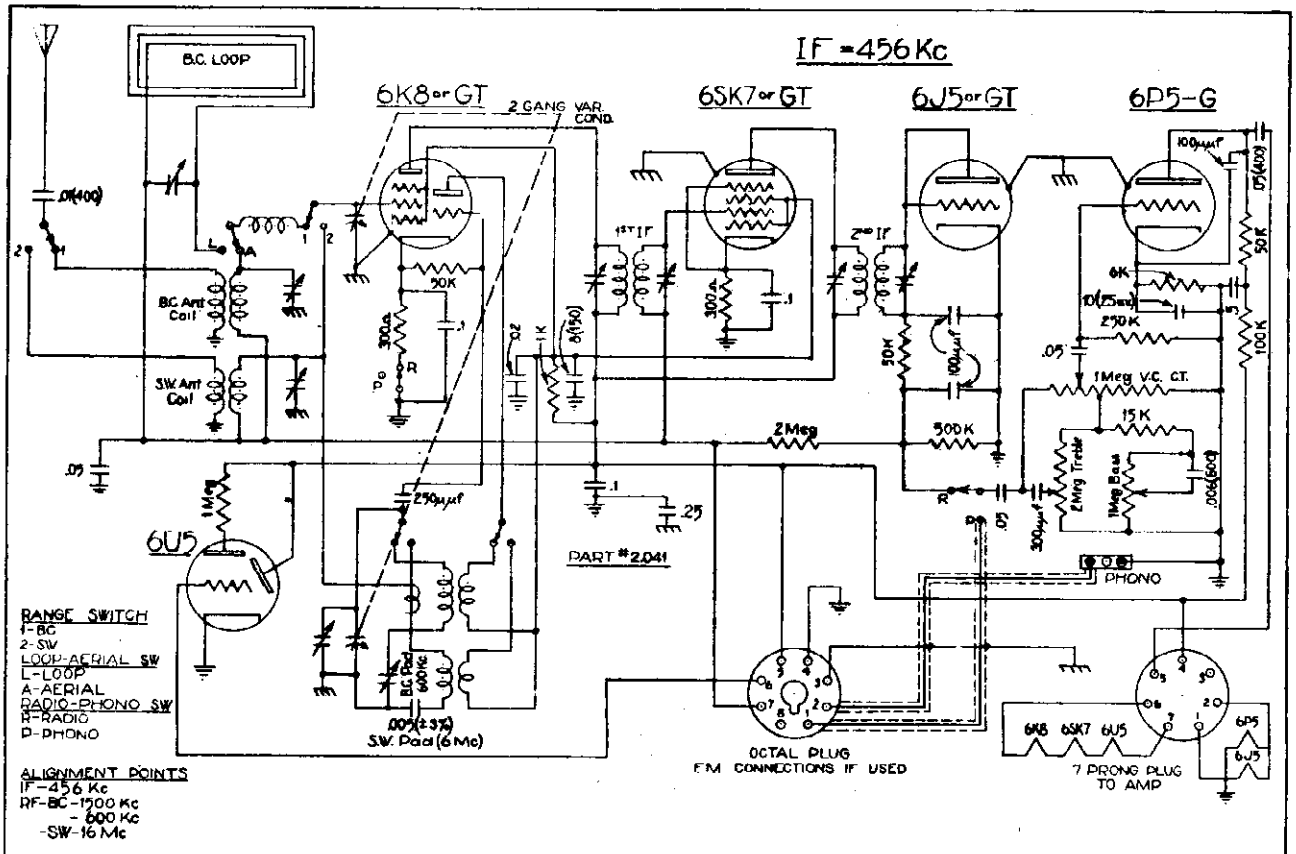


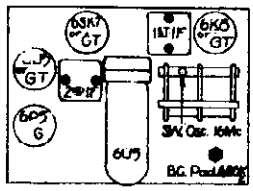
MODEL 51

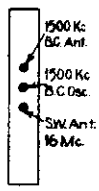
ANSLEY RADIO CORP.



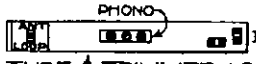
ANSLEY RADIO CORP.



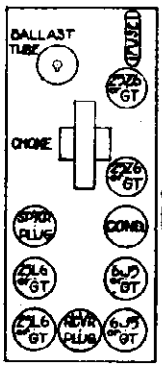




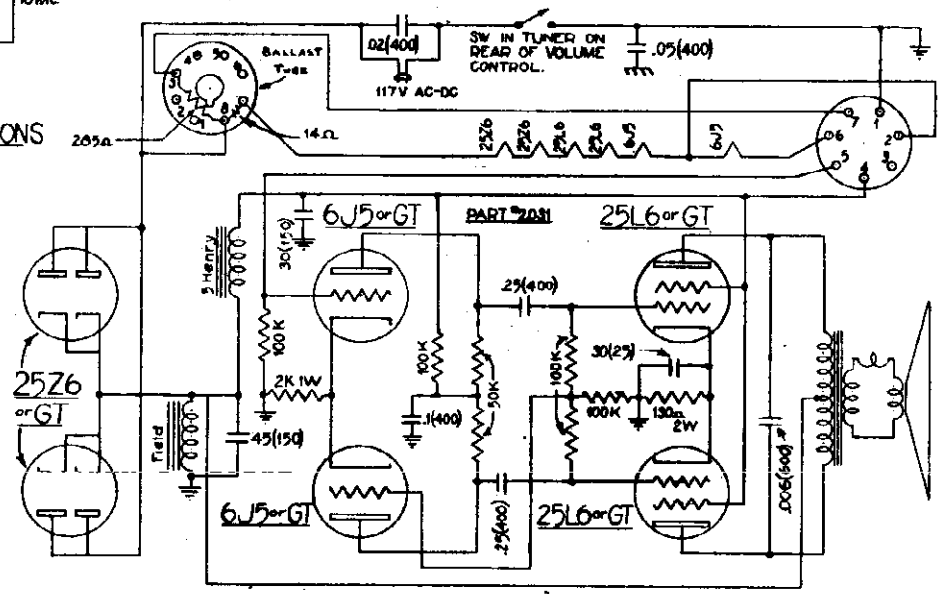
ALL RESISTORS ½W & ALL CONDENSERS 200V UNLESS OTHERWISE SPECIFIED

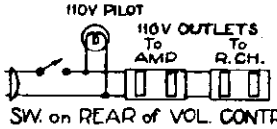


TUBE & TRIMMER LOCATIONS



AMPLIFIER LAYOUT





SW. on REAR of VOL. CONTROL

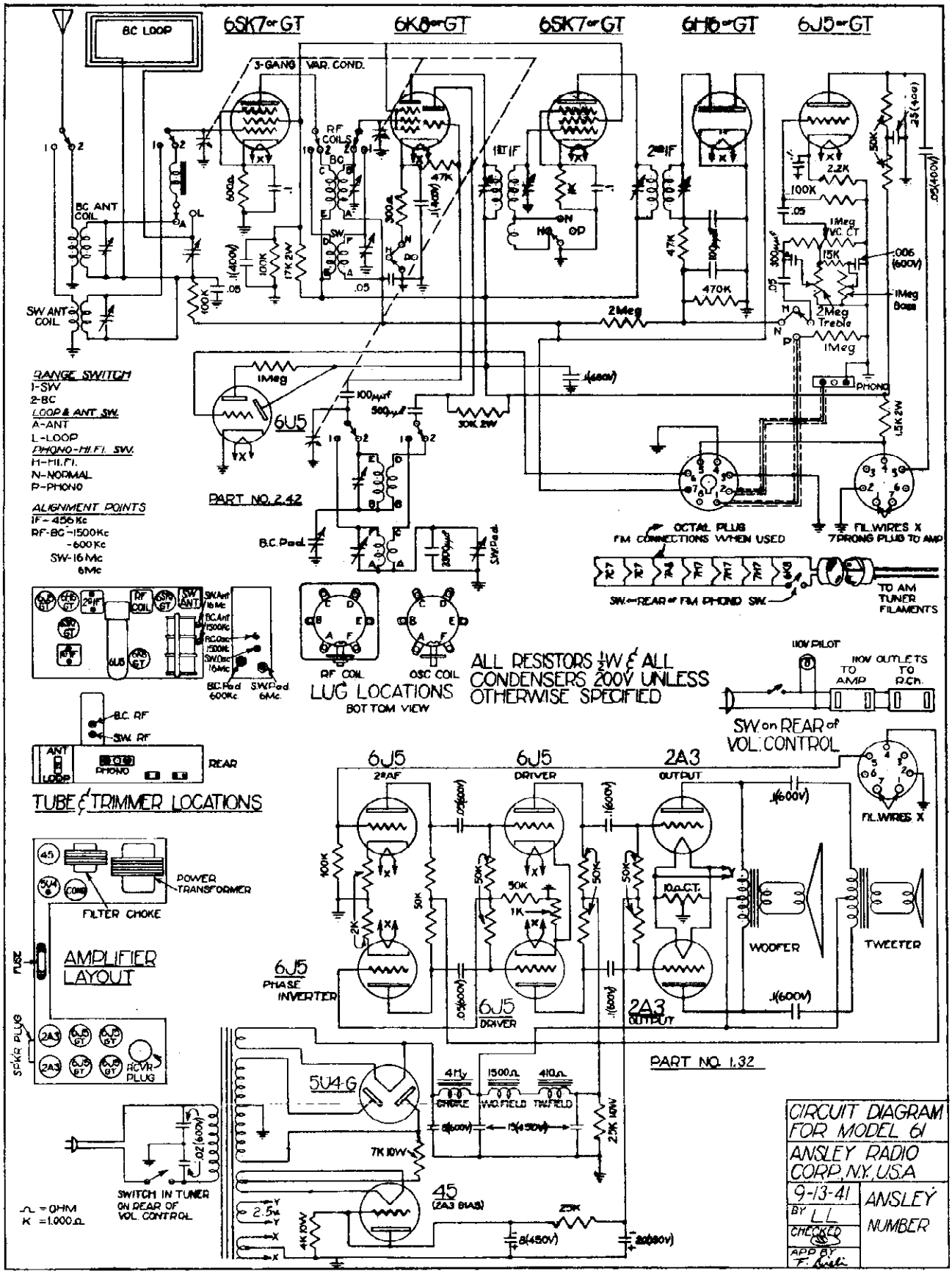
Ω = OHM
K = 1000 Ω

⏚ = B-
⏚ = CHASSIS

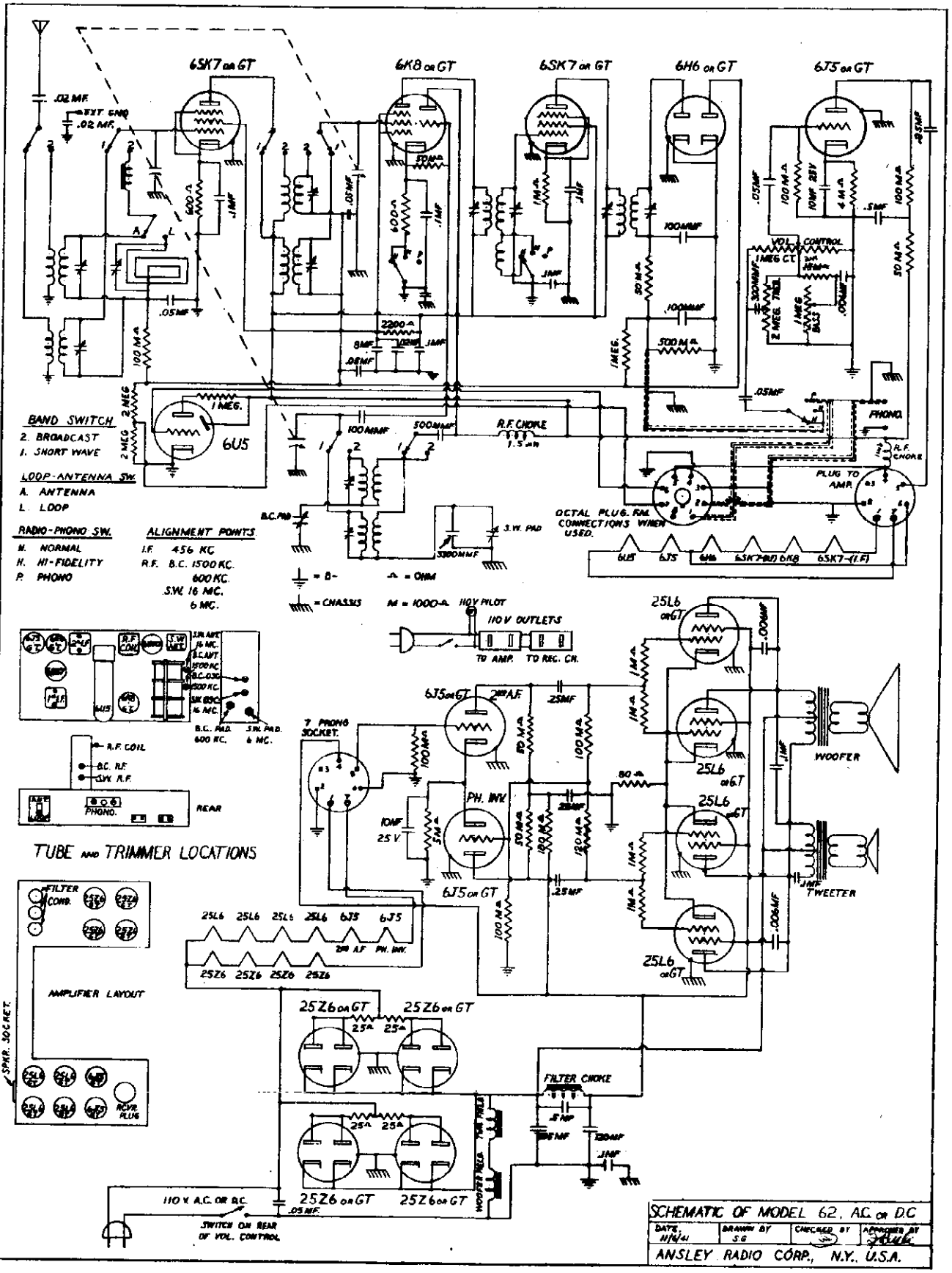
CIRCUIT DIAGRAM FOR MODEL 52
10-15-41 BY L.L. CHECKED APPROVED
ANSLEY RADIO CORP. N.Y. U.S.A.

MODEL 61

ANSLEY RADIO CORP.



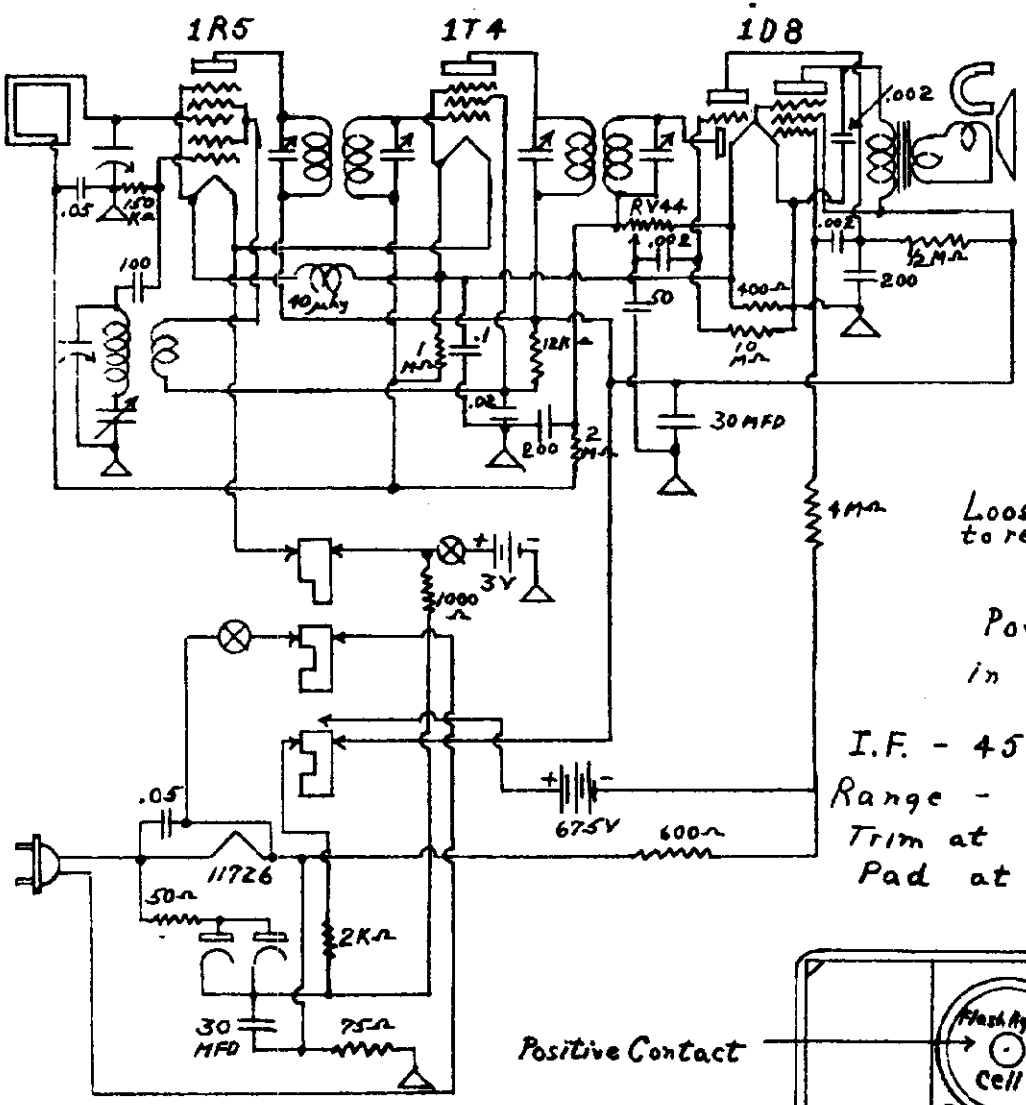
ANSLEY RADIO CORP.

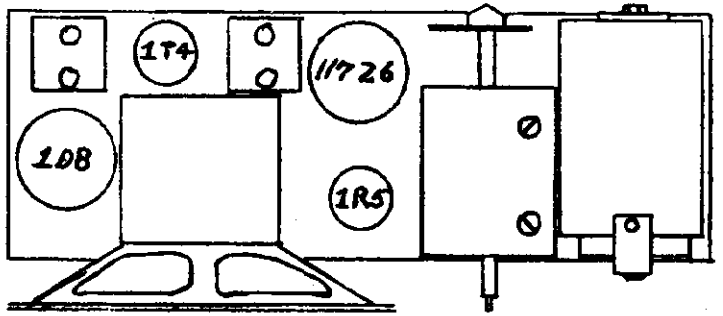


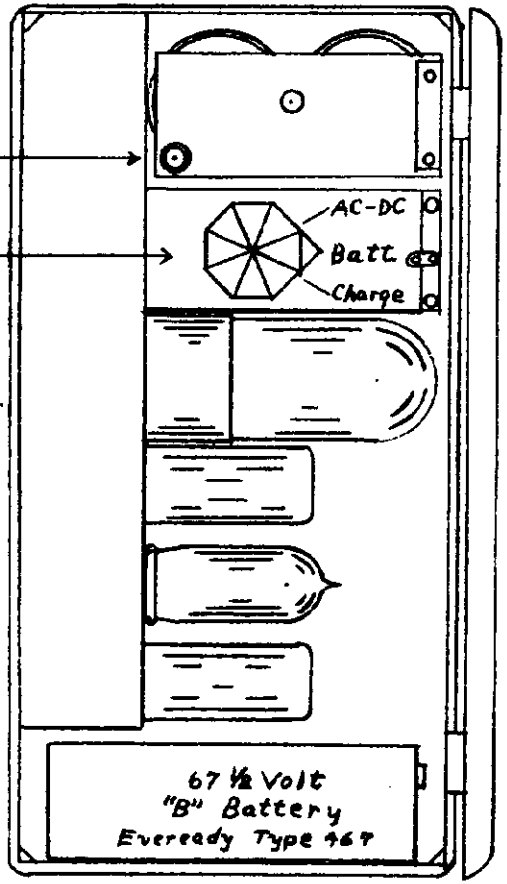
SCHEMATIC OF MODEL 62, AC OR DC

DATE 11/4/41	DRAWN BY S.G.	CHECKED BY	APPROVED BY

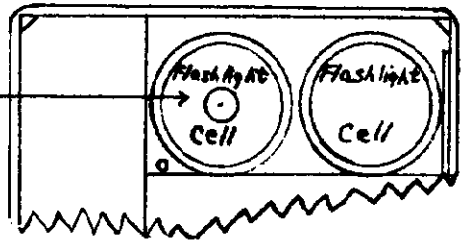
ANSLEY RADIO CORP., N.Y. U.S.A.





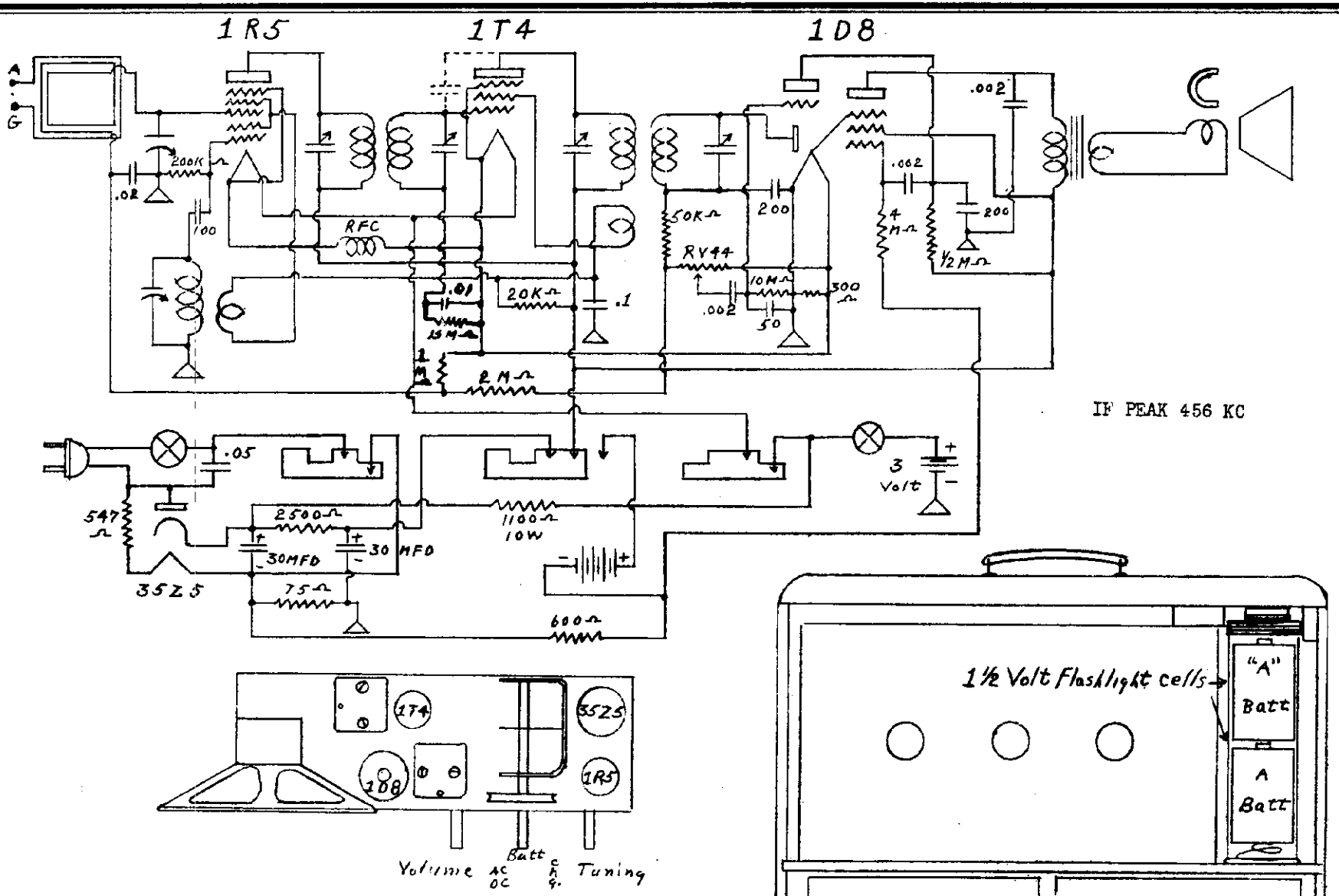


I.F. - 456 K.C.
Range - 1620 - 542 K.C.
Trim at 1400 K.C.
Pad at 600 K.C.



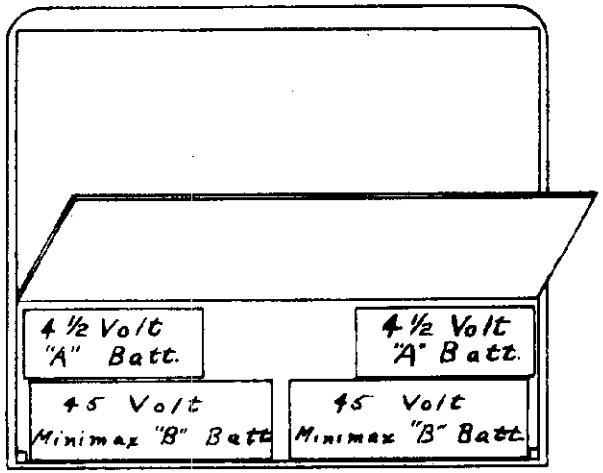
When replacing "A" cells be sure center contact of left hand cell only is facing out.

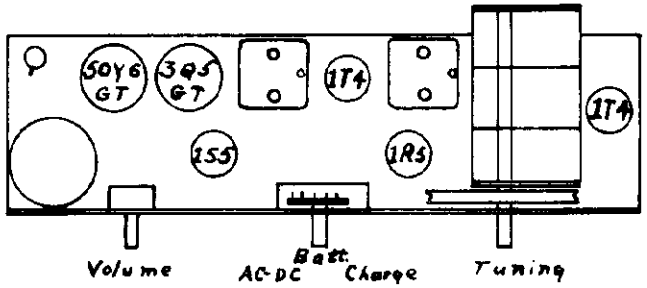
BATTERIES: 2 ordinary flashlight cells type D, size 1 1/4" diameter by 2 3/8" long; 1-67 1/2 volt "B" battery, Eveready type 467 or equivalent, size 1 1/4" by 2 5/8" by 3 5/8".



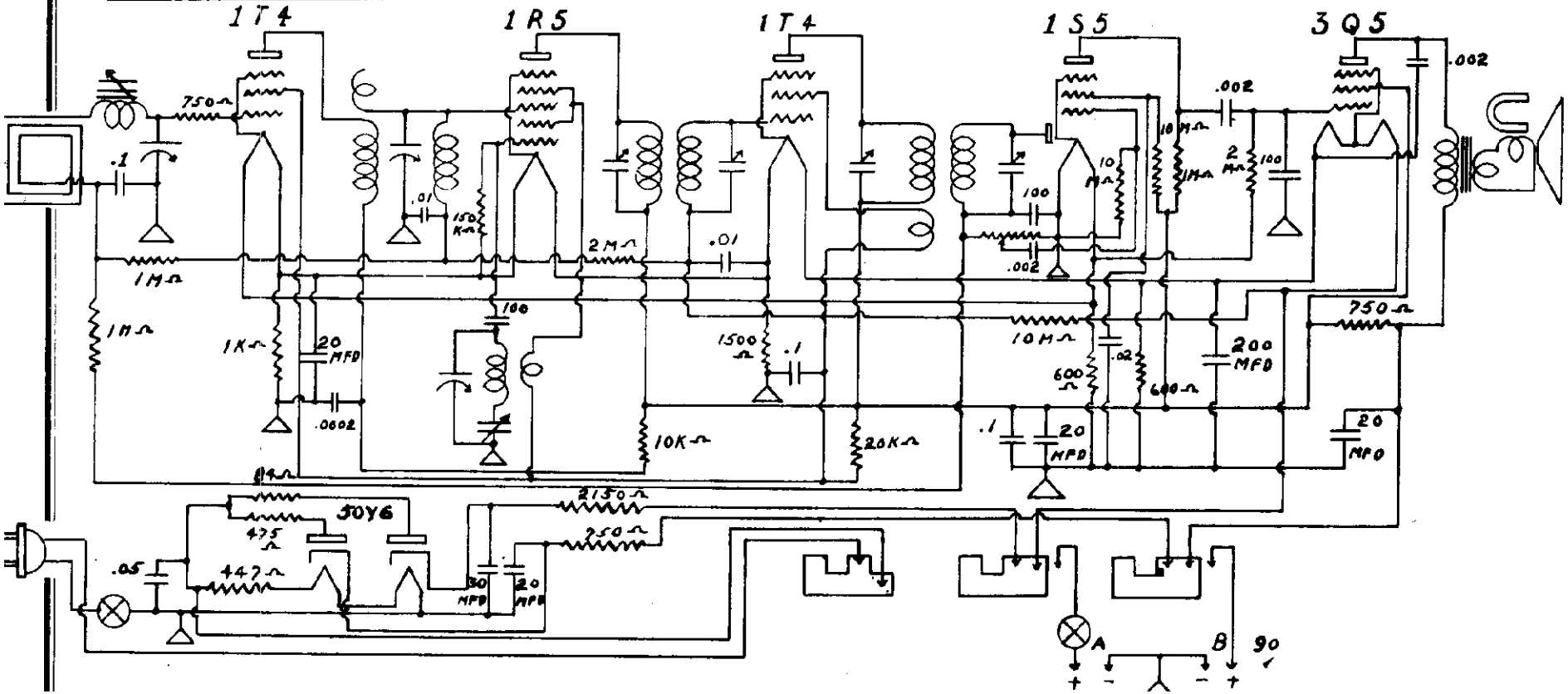
Alignment data:

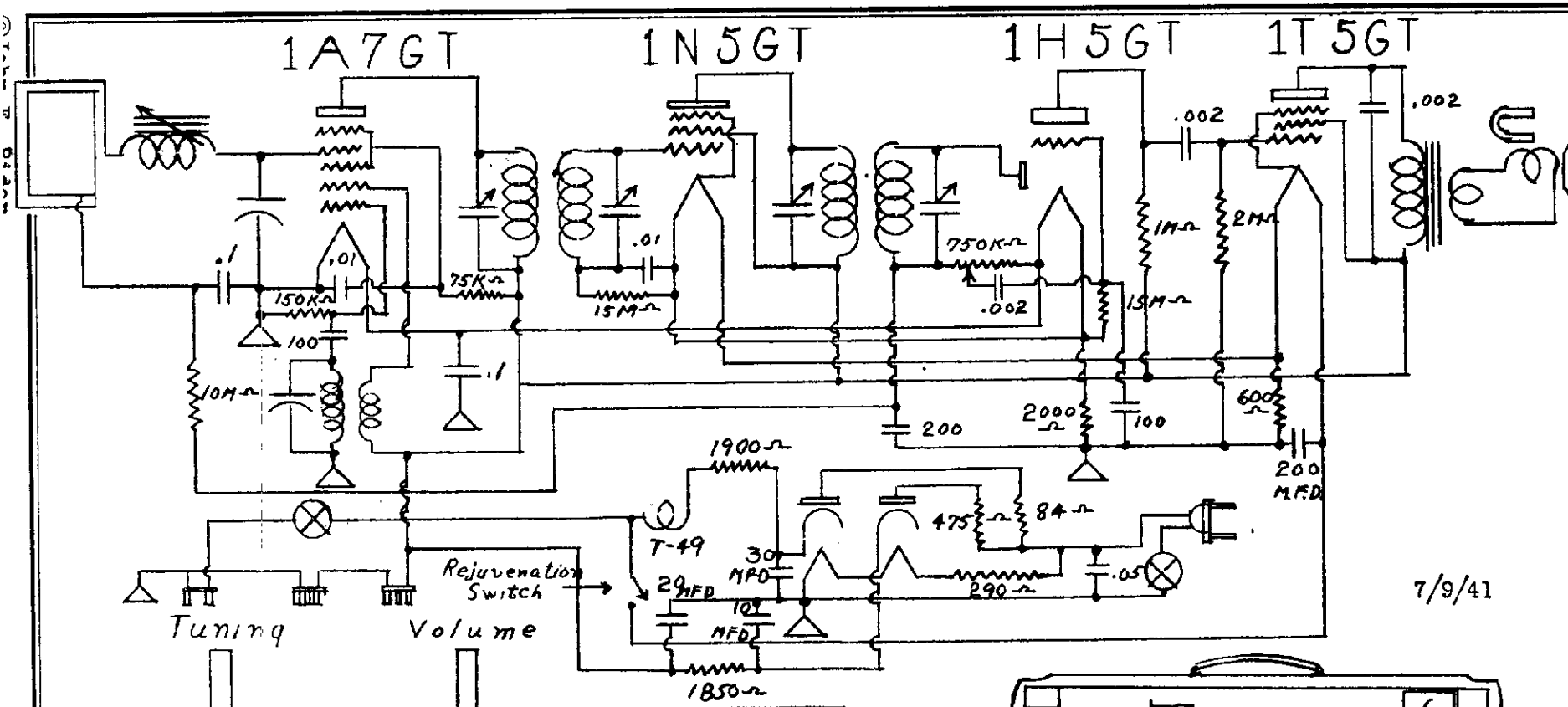
1. IF-456 K.C.
2. Oscillator - (Rear trimmer on gang) 1620 K.C. with variable condenser set to minimum capacity
3. Trim loop at 1400 K.C. (front trimmer)

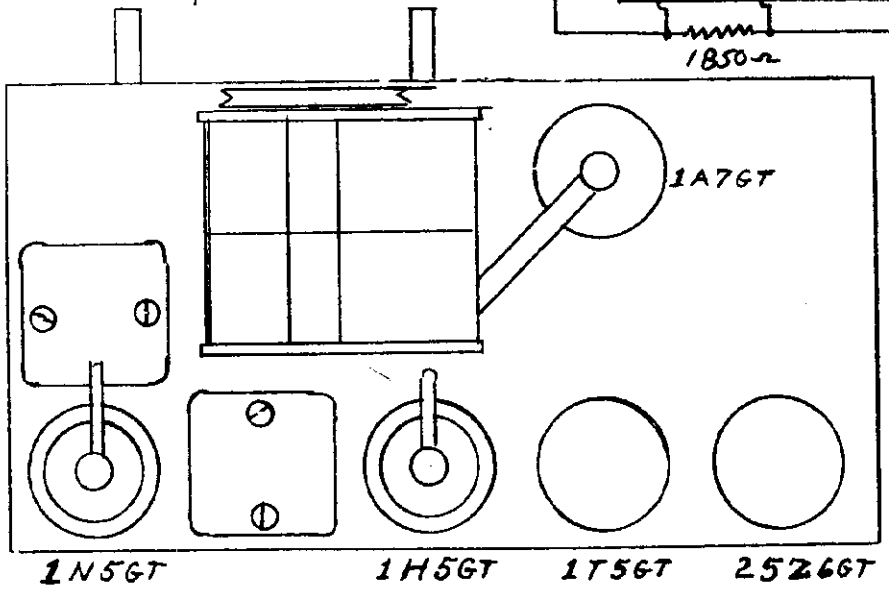


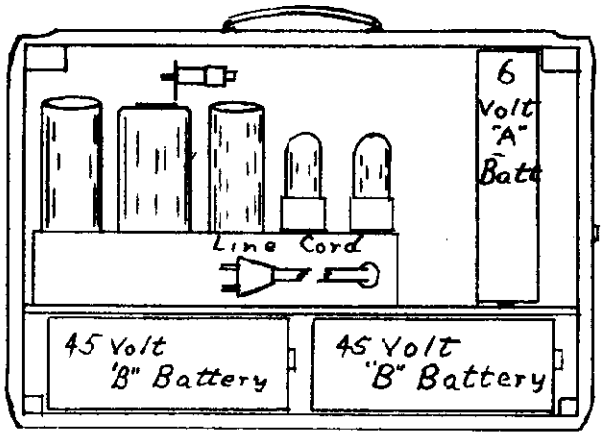


ALIGNMENT DATA: (1) I.F. 456 kc. (2) Osc. (middle trimmer on gang) set at 1620 kc. (3) Trim R.F. stage (front trim.) at 1400 kc, pad at 600 kc. (4) Trim ant. stage (back trim.) at 1400 kc, adjust loop load coil at 600 kc.





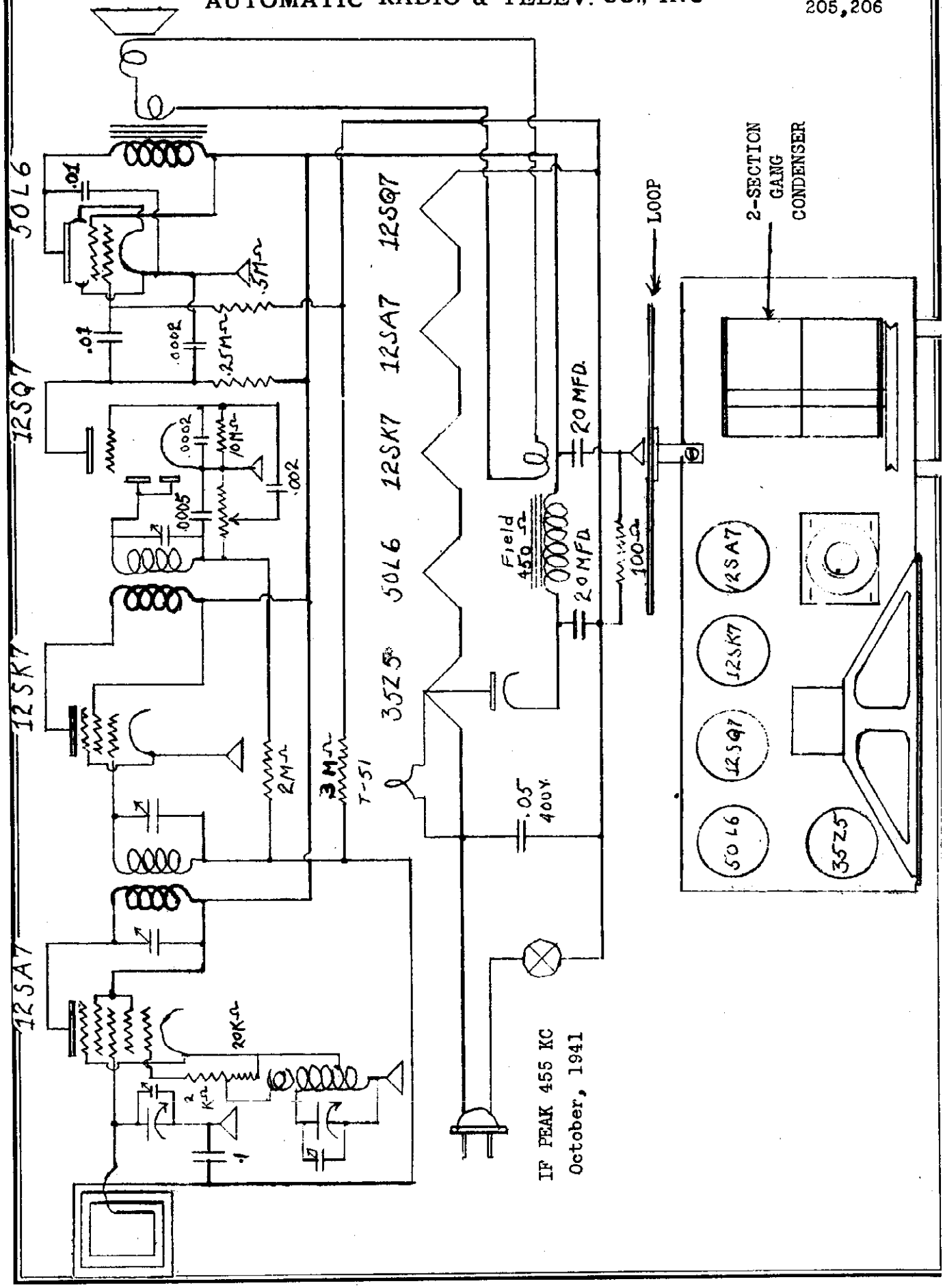




ALIGN. DATA: (1) I.F. 456 kc. (2) Osc. (left trim. on gang) 1560 kc. Variable cond. at minimum capacity. (3) Trimmer loop (right trim. on gang) 1400 kc. (4) Pad loop 600 kc.

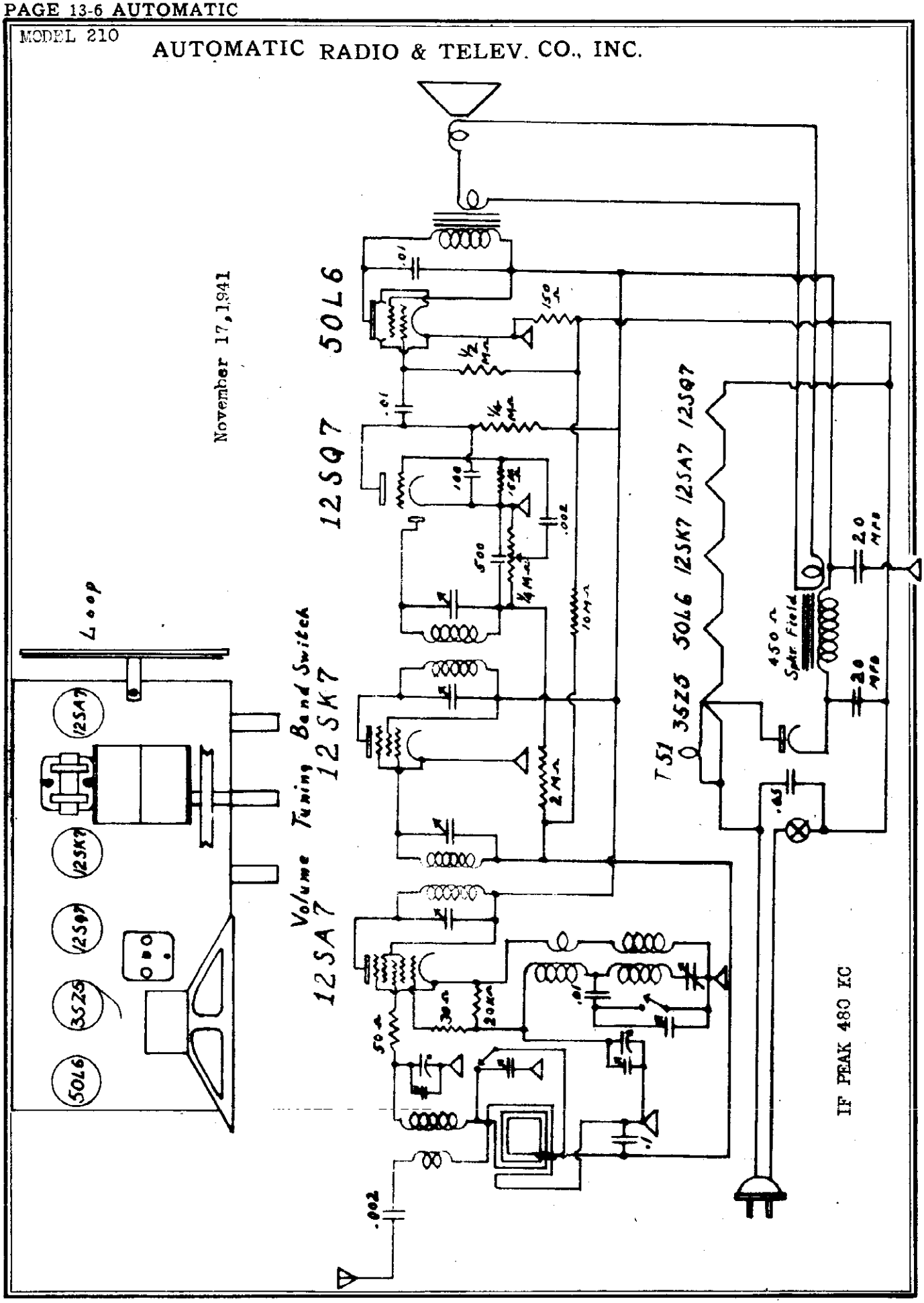
AUTOMATIC RADIO & TELEV. CO., INC

MODELS 202,203,204
205,206

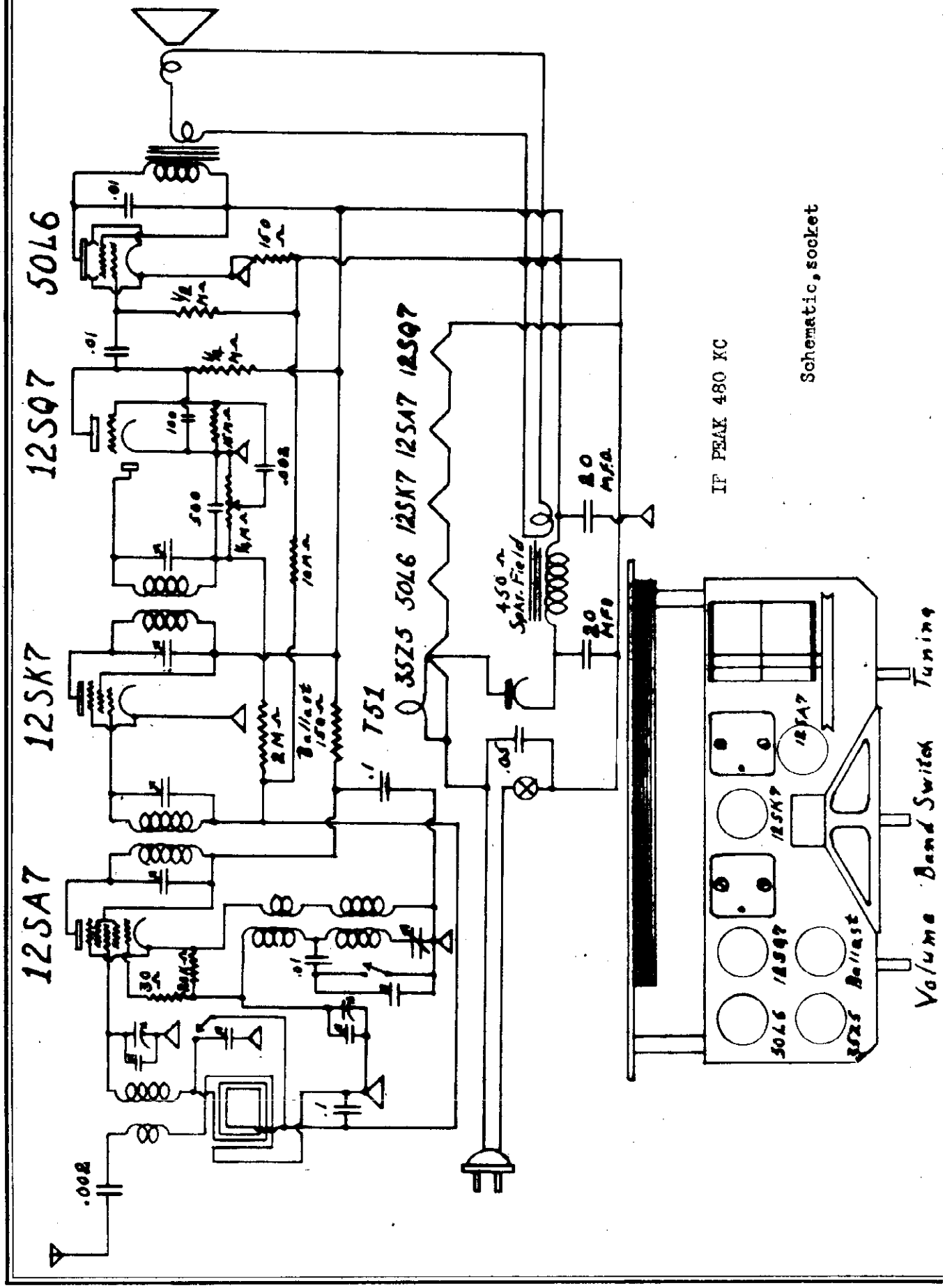


MODEL 210

AUTOMATIC RADIO & TELEV. CO., INC.

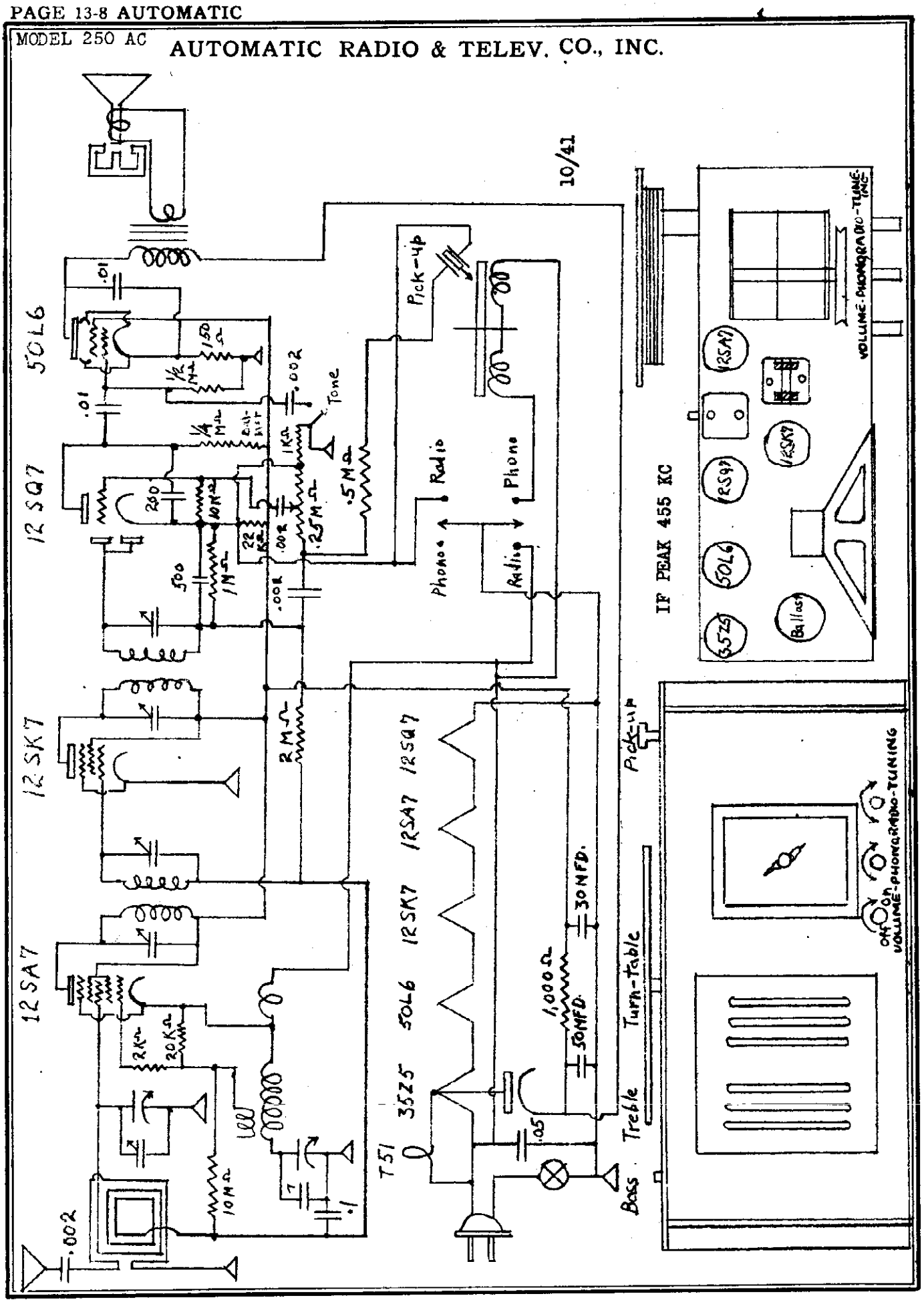


AUTOMATIC RADIO & TELEV. CO., INC.



MODEL 250 AC

AUTOMATIC RADIO & TELEV. CO., INC.



Code No.	Part No.	Description

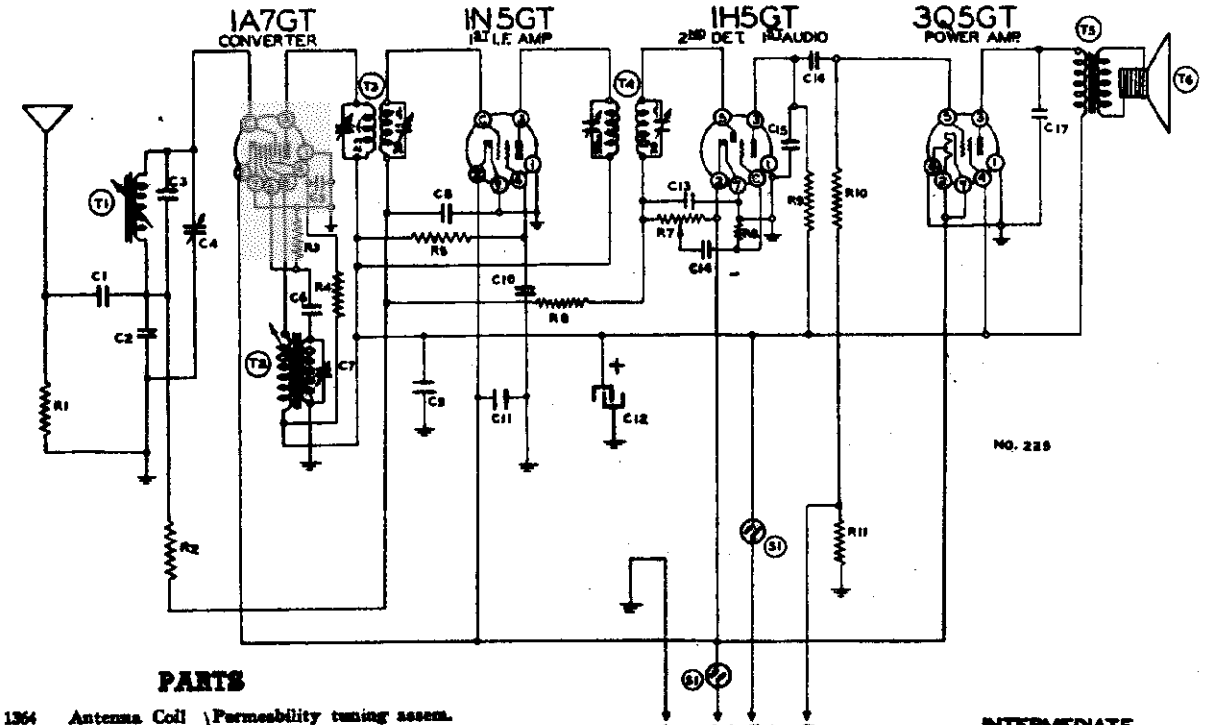
RESISTORS

R1	13017	10M ohm—½ w.
R2	1304	3 megohm—½ w.
R3	1309	200M ohm—½ w.
R4	130194	35M ohm—½ w.
R5	13094	50M ohm—½ w.
R6	1304	3 megohm—½ w.
R7	101250	1 megohm—Volume control and switch—½ w.
R8	130257	5 megohm—½ w.
R9	13019	1 megohm—½ w.
R10	130146	2 megohm—½ w.
R11	13079	400 ohm—½ w.

CONDENSERS

C1	12936	.0003 mica
C2	100112	.001 x 200 v.
C3	129177	.000045—Ceramicon
C4	124165	Antenna trimmer
C5	1009	.05 x 200 v.—Condenser
C6	12912	.00025 mica
C7	124165	Oscillator trimmer
C8	1009	.05 x 200 v. Condenser
C9	1006	.25 x 200 v. Condenser
C10	10080	.1 x 200 v.
C11	10017	.5 x 120 v.
C12	119117B	10 mfd. x 150 v. Lytic
C13	1295	.0001 mica
C14	10012	.008 x 600 v. Condenser
C15	1295	.0001 mica
C16	10026	.02 x 400 v. Condenser
C17	1007	.005 x 600 v.

C4 and C7 are in same unit.

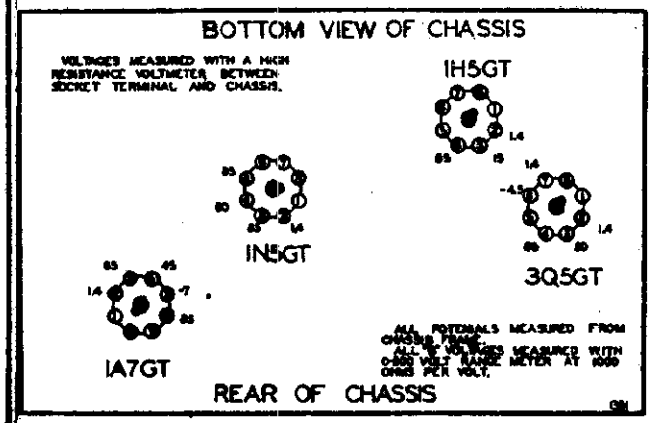


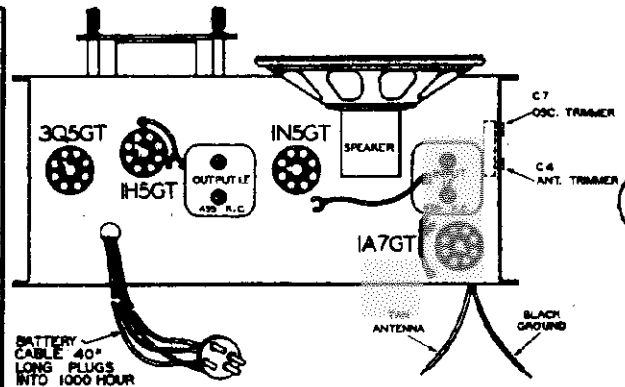
PARTS

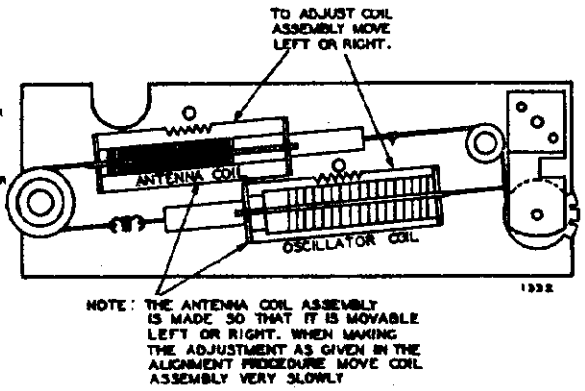
T1	1364	Antenna Coil) Permeability tuning assem.
T2	1364	Oscillator Coil) Complete.
T3	108208	Input I. F. Coil 455 kc.
T4	108153B	Output I. F. Coil 455 kc.
T5	10691B	Output transformer
T6	114238	5" P.M. speaker
S1		Switch-on Volume control

INTERMEDIATE FREQUENCY 455 K.C.

February 1941







NOTE: THE ANTENNA COIL ASSEMBLY IS MADE SO THAT IT IS MOVABLE LEFT OR RIGHT. WHEN MAKING THE ADJUSTMENT AS GIVEN IN THE ALIGNMENT PROCEDURE MOVE COIL ASSEMBLY VERY SLOWLY

COIL ASSEMBLY VIEW

ALIGNMENT PROCEDURE

The following equipment is required for aligning:

Dummy antenna .1mfd. and 200 mmf.

Vol. control- Max.all adjs.

Conn. grd. lead of radio chassis to grd. post of signal genorator.

MODEL 4BA1 TECHNICAL DATA

Power Consumption - - - A—.250 Amp. B .014 Amps.
Power Output - - - - - - - 160 Milliwatts Undistorted
Sensitivity for 50 Milliwatt Output: 45 Microvolts Average
Selectivity - 48 KC at 1000 Times Signal at 1000 KC
Tuning Frequency Range - - - - - 540 to 1700 KC

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Position of Iron Cores (Dial Setting)	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
455 Kc. I. F.	455 Kc.	.1 MFD.	Connect to Grid of 1A7	Iron Cores All the way out	Two trimmers on top of output I. F. can	Output I. F.	maximum output
	455 Kc.	.1 MFD.	Connect to Grid of 1A7	Iron Cores All the way out	Two trimmers on top of input I. F. can	Input I. F.	maximum output
BROAD-CAST BAND	1700 Kc.	.1 MFD.	Connect to Grid of 1A7	Iron Cores All the way out	Trimmer (C7) (See chassis view)	Oscillator	maximum output
	1700 Kc.	200 MMF.	Connect to Antenna Clip	Iron Cores All the way out	Trimmer (C4) (See chassis view)	Antenna	maximum output
	1400 Kc.	200 MMF.	Connect to Antenna Clip	Turn Dial to 1400 Kc.	Adjust position of antenna coil (See coil assembly view)	Antenna Coil Adjustment	maximum output (See Note "A")
	1700 Kc.	200 MMF.	Connect to Antenna Clip	Turn Dial to 1700 Kc.	Adjust trimmer (C4) (See chassis view)	Antenna	Check for tracking (See Note "B")

NOTE "A"—The antenna coil assembly is made so that it is movable. When making the adjustment as given in the alignment procedure move the coil assembly very slowly. It can be moved by hand or by pivoting one edge of the blade of a screwdriver in the hole and engaging the blade in the gear teeth of the coil form.

NOTE "B"—After the antenna coil has been tracked at 1400 Kc. it is necessary to check the antenna trimmer (C4) adjustment again at 1700 Kc. If no appreciable change in trimmer adjustment is made the coil is in track, if the trimmer requires considerable change it will be necessary to again adjust the position of the antenna coil at 1400 Kc. These two adjustments should be tried several times until no change of trimmer adjustment is required at 1700 Kc.

TECHNICAL DATA MODEL 5DA1

Power Consumption - - - - - - 25 Watts
Power Output - - - 800 Milliwatts Undistorted
Sensitivity (for .05 Watts Output) - 30 Microvolts Average
Selectivity - 59 KC Broad at 1000 Times Signal at 1000 KC
Tuning Frequency Range - - - 535 to 1720 KC
Intermediate Frequency - - - - - - 455 KC
Speaker - - - - - - 5 in. P. M. Dynamic

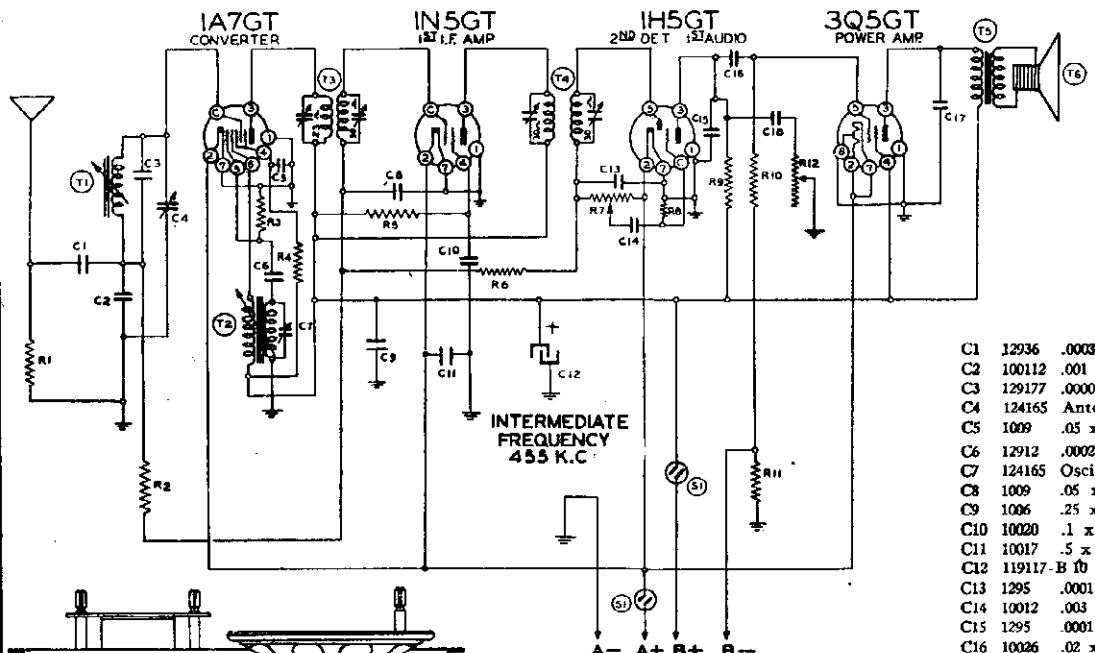
ALIGNMENT PROCEDURE

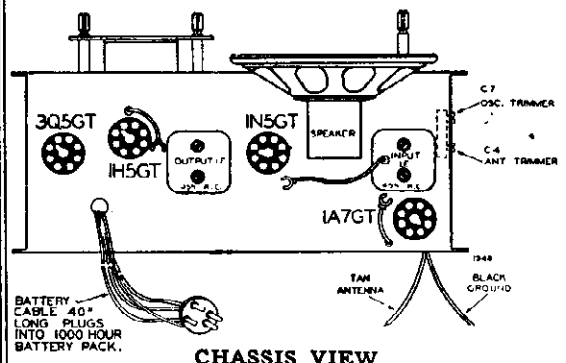
BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Position of Iron Cores (Dial Setting)	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Connect to Grid of 12SA7	Iron Cores All the way out	Two trimmers on top of output I. F. can	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Connect to Grid of 12SA7	Iron Cores All the way out	Two trimmers on top of input I. F. can	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1720 Kc.	.1 MFD.	Connect to Grid of 12SA7	Iron Cores All the way out	Trimmer (C6) (See chassis view)	Oscillator	Adjust to maximum output
	1720 Kc.	200 MMF.	Connect to Outside Antenna Clip	Iron Cores All the way out	Trimmer (C3) (See chassis view)	Antenna	Adjust to maximum output
	1400 Kc.	200 MMF.	Connect to Outside Antenna Clip	Turn Dial to 1400 Kc.	Adjust position of antenna coil (See coil assembly view)	Antenna Coil Adjustment	Adjust to maximum output (See Note "A")
	1720 Kc.	200 MMF.	Connect to Outside Antenna Clip	Turn Dial to 1720 Kc.	Adjust trimmer (C3) (See chassis view)	Antenna	Check for tracking (See Note "B")

NOTE "A"—The antenna coil assembly is made so that it is movable. When making the adjustment as given in the alignment procedure move the coil assembly very slowly. It can be moved by hand or by pivoting one edge of the blade of a screwdriver in the hole and engaging the blade in the gear teeth of the coil form.

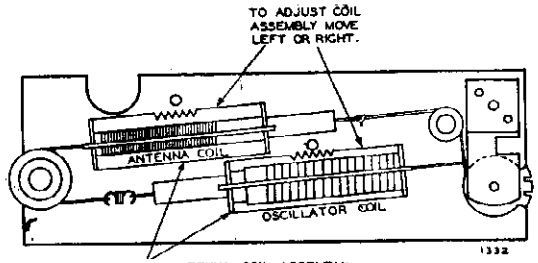
NOTE "B"—After the antenna coil has been tracked at 1400 Kc. it is necessary to check the antenna trimmer (C3) adjustment again at 1720 Kc. If no appreciable change in trimmer adjustment is made the coil is in track, if the trimmer requires considerable change it will be necessary to again adjust the position of the antenna coil at 1400 Kc. These two adjustments should be tried several times until no change of trimmer adjustment is required at 1720 Kc.

BELMONT RADIO CORP.





CHASSIS VIEW



NOTE: THE ANTENNA COIL ASSEMBLY IS MADE SO THAT IT IS MOVABLE LEFT OR RIGHT. WHEN MAKING THE ADJUSTMENT AS GIVEN IN THE ALIGNMENT PROCEDURE MOVE COIL ASSEMBLY VERY SLOWLY

COIL ASSEMBLY VIEW

RESISTORS

R1	13017	10M ohm—½ w.
R2	1304	3 megohm—½ w.
R3	1309	200M ohm—½ w.
R4	130194	35M ohm—½ w.
R5	13094	50M ohm—½ w.
R6	1304	3 megohm—½ w.
R7	101250	1 megohm—Volume control and switch—½ w.
R8	130257	5 megohm—½ w.
R9	13019	1 megohm—½ w.
R10	130146	2 megohm—½ w.
R11	13079	400 ohm—½ w.
R12	101231	1 megohm tone control

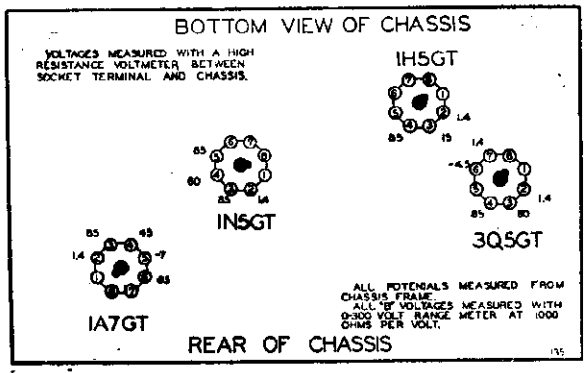
CONDENSERS

C1	12936	.0003 mica
C2	100112	.001 x 200 v.
C3	129177	.000045—Ceramicon
C4	124165	Antenna trimmer
C5	1009	.05 x 200 v.—Condenser
C6	12912	.00025 mica
C7	124165	Oscillator trimmer
C8	1009	.05 x 200 v. Condenser
C9	1006	.25 x 200 v. Condenser
C10	10020	.1 x 200 v.
C11	10017	.5 x 120 v.
C12	119117-B	10 mfd. x 150 v. Lytic
C13	1295	.0001 mica
C14	10012	.003 x 600 v. Condenser
C15	1295	.0001 mica
C16	10026	.02 x 400 v. Condenser
C17	1007	.005 x 600 v.
C18	100112	.001 x 200 v.

C4 and C7 are in same unit

PARTS

T1	1364	Antenna Coil
T2	1364	Oscillator Coil Permeability tuning assem. Complete.
T3	108202	Input I. F. Coil 455 kc.
T4	108153B	Output I. F. Coil 455 kc.
T5	10591B	Output transformer
T6	114215R	6" P.M. Speaker
S1		Switch-on volume control



Power Consumption - A—.250 Amp. B .014 Amps.
Power Output - - - - 160 Milliwatts Undistorted
Sensitivity for 50 Milliwatt Output: 45 Microvolts Average
Selectivity - 48 KC at 1000 Times Signal at 1000 KC
Tuning Frequency Range - - - - - 540 to 1700 KC

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Position of Iron Cores (Dial Setting)	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
455 Kc. I. F.	455 Kc.	.1 MFD.	Connect to Grid of 1A7	Iron Cores All the way out	Two trimmers on top of output I. F. can	Output I. F.	maximum output
	455 Kc.	.1 MFD.	Connect to Grid of 1A7	Iron Cores All the way out	Two trimmers on top of input I. F. can	Input I. F.	maximum output
BROAD-CAST BAND	1700 Kc.	.1 MFD.	Connect to Grid of 1A7	Iron Cores All the way out	Trimmer (C7) (See chassis view)	Oscillator	maximum output
	1700 Kc.	200 MMF.	Connect to Antenna Clip	Iron Cores All the way out	Trimmer (C4) (See chassis view)	Antenna	maximum output
	1400 Kc.	200 MMF.	Connect to Antenna Clip	Turn Dial to 1400 Kc.	Adjust position of antenna coil (See coil assembly view)	Antenna Coil Adjustment	maximum output (See Note "A")
	1700 Kc.	200 MMF	Connect to Antenna Clip	Turn Dial to 1700 Kc.	Adjust trimmer (C4) (See chassis view)	Antenna	Check for tracking (See Note "B")

NOTE "A"—The antenna coil assembly is made so that it is movable. When making the adjustment as given in the alignment procedure move the coil assembly very slowly. It can be moved by hand or by pivoting one edge of the blade of a screwdriver in the hole and engaging the blade in the gear teeth of the coil form.

NOTE "B"—After the antenna coil has been tracked at 1400 Kc. it is necessary to check the antenna trimmer (C4) adjustment again at 1700 Kc. If no appreciable change in trimmer adjustment is made the coil is in track, if the trimmer requires considerable change it will be necessary to again adjust the position of the antenna coil at 1400 Kc. These two adjustments should be tried several times until no change of trimmer adjustment is required at 1700 Kc.

● Volume control—Maximum all adjustments.

◆ Dummy antenna .1 mfd. and 200 mmf.

Code No.	Part No.	Description

RESISTORS

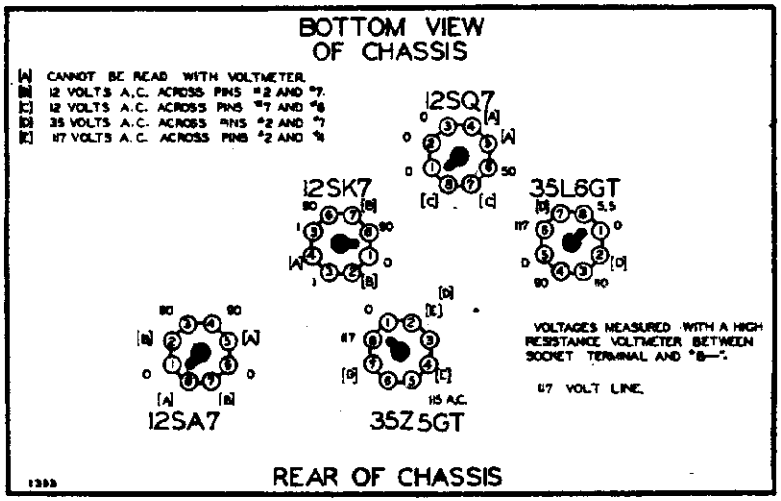
R1	1301	25M ohm—½ w.
R2	130215	25 ohm—½ w.
R3	130168	100 ohm—½ w.
R4	130315	75 ohm—1½ w.
R5	1304	3 megohm—½ w.
R6	101251	1 megohm volume control and switch
R7	1309	200M ohm—½ w.
R8	130257	5 megohm—½ w.
R9	1309	200M ohm—½ w.
R10	1303	500M ohm—½ w.
R11	130166	150 ohm—½ w.
R12	130287	1200 ohm—1 w.

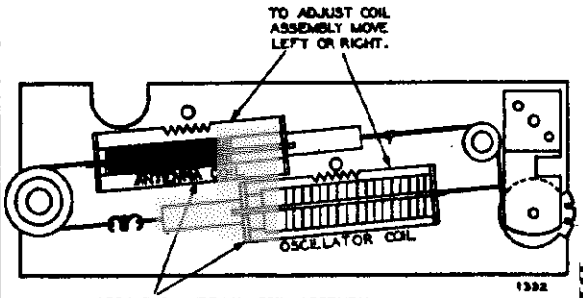
CONDENSERS

C1	131262	Washer cond. (ant. clip on ant. plate)
C2	12912	.00025 mica
C3	124150	Antenna section dual trimmer
C4	12938	.00005 mica
C5	1001	.1 x 400 v.
C6	124150	Oscillator section dual trimmer
C7	1009	.05 x 200 v.
C8	1295	.0001 mica
C9	10025	.002 x 600 v.
C10	100110	.2 x 400 v.
C11	12921	.0002 mica
C12	100106	.004 x 600 v.
C13	11992	20 mfd. x 150 v. lytic
C14	11992	40 mfd. x 150 v. lytic
C15	100-9	.05 x 200 v.
C16	10026	.02 x 400 v.

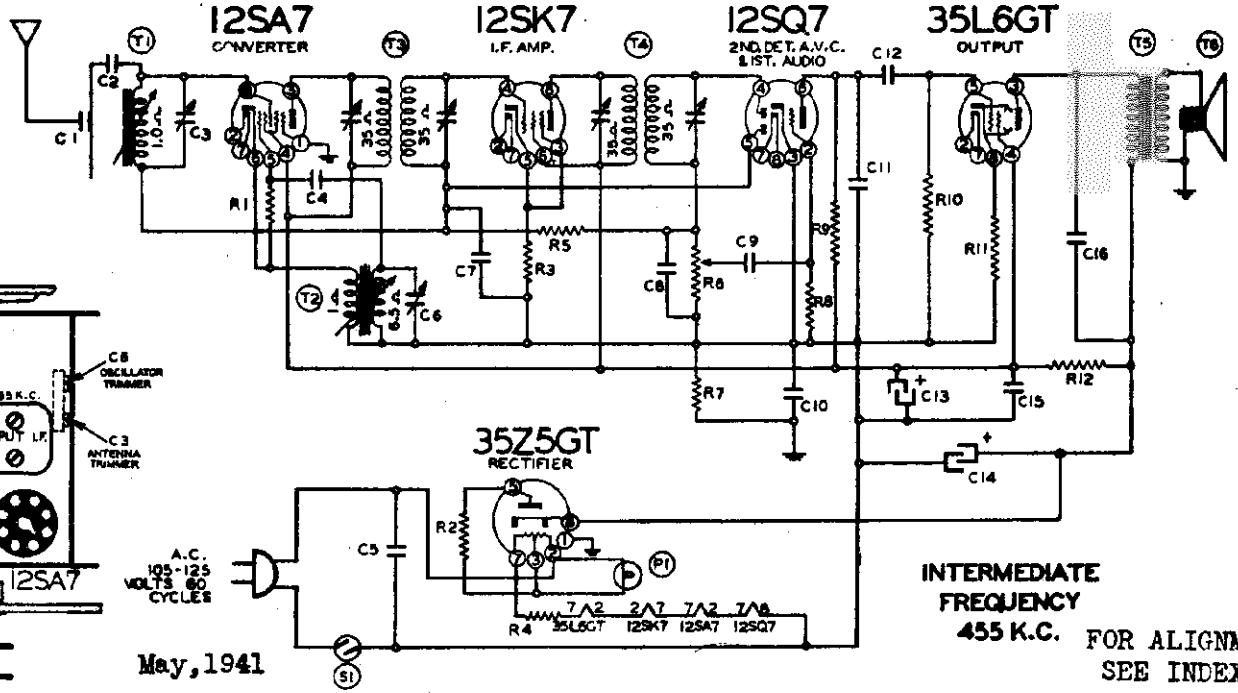
C3 and C6 are in same unit.
C13 and C14 are in same unit.

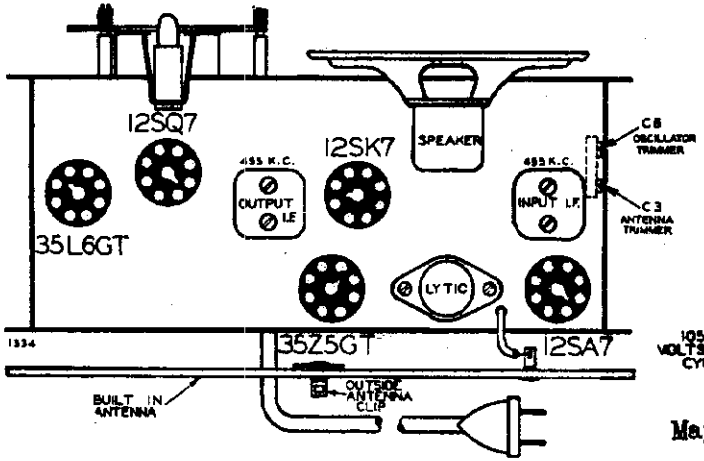
T1	13611	Antenna Assembly (Permeability tuning Antenna Section)
T2	13611	Permeability tuning assembly (Oscillator Section)
T3	108140J	Input I.F. coil 455 kc.
T4	108141E	Output I.F. coil 455 kc.
T5	10595B	Output transformer.
T6	114239	5" P.M. speaker
		T1 and T2 are in one complete unit.
S1		On-off switch on volume control
P1	107249	Pilot lite bulb T47





COIL ASSEMBLY VIEW



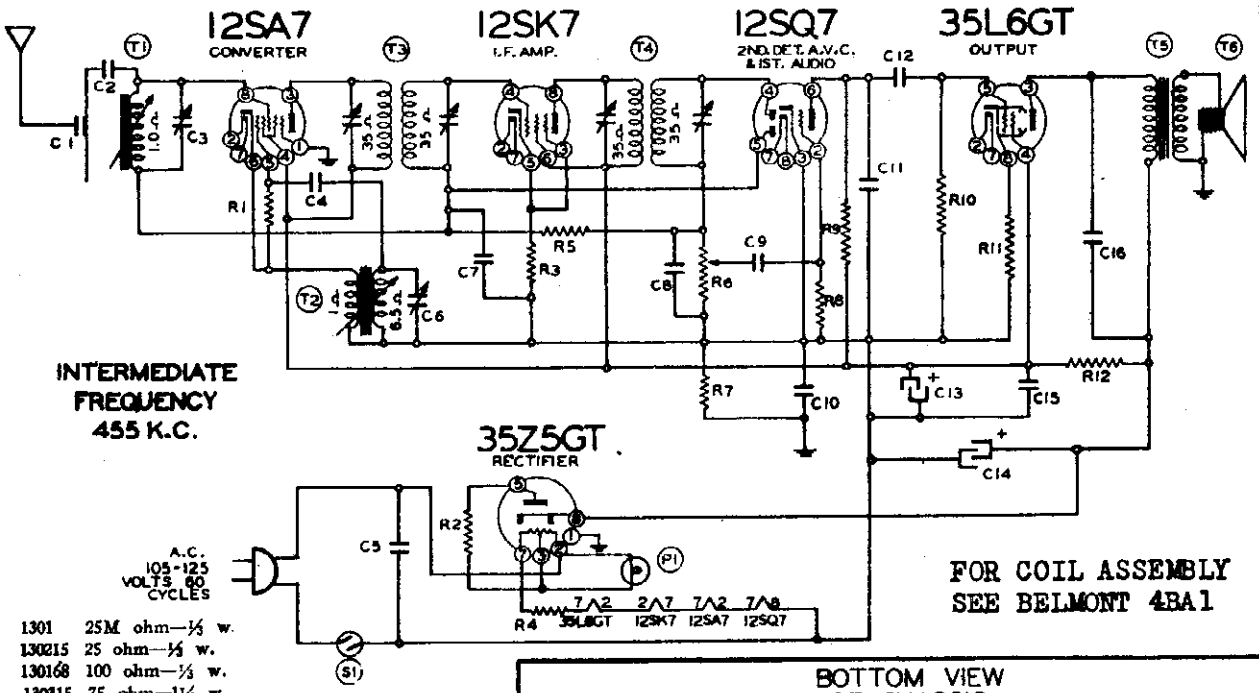


INTERMEDIATE FREQUENCY 455 K.C.

FOR ALIGNMENT SEE INDEX

May, 1941

BELMONT RADIO CORP

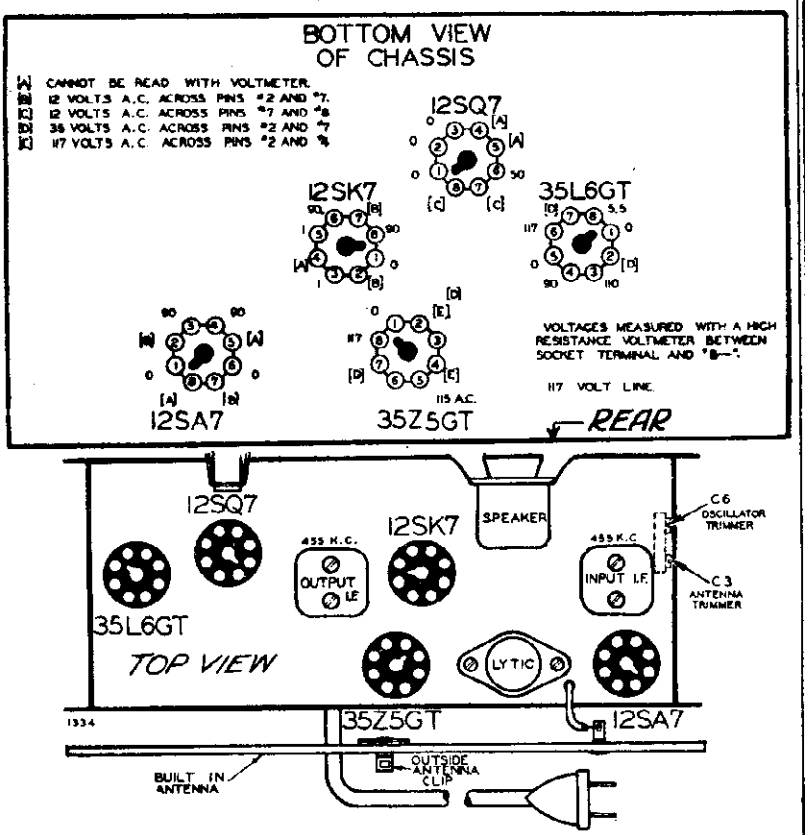


FOR COIL ASSEMBLY SEE BELMONT 4BA1

R1	1301	25M ohm—½ w.
R2	130215	25 ohm—½ w.
R3	130168	100 ohm—½ w.
R4	130315	75 ohm—1½ w.
R5	1304	3 megohm—½ w.
R6	101251	1 megohm volume control and switch
R7	1309	200M ohm—½ w.
R8	130257	5 megohm—½ w.
R9	1309	200M ohm—½ w.
R10	1303	500M ohm—½ w.
R11	130166	150 ohm—½ w.
R12	130287	1200 ohm—1 w.
C1	131262	Washer cond. (ant. clip on ant. plate)
C2	12912	.00025 mica
C3	124150	Antenna section dual trimmer
C4	12938	.00005 mica
C5	1001	.1 x 400 v.
C6	124150	Oscillator section dual trimmer
C7	1009	.05 x 200 v.
C8	1295	.0001 mica
C9	10025	.002 x 600 v.
C10	100110	.2 x 400 v.
C11	12921	.0002 mica
C12	100106	.004 x 600 v.
C13	11992	20 mfd. x 150 v. lytic
C14	11992	40 mfd. x 150 v. lytic
C15	100-9	.05 x 200 v.
C16	10026	.02 x 400 v.

C3 and C6 are in same unit.
C13 and C14 are in same unit.

T1	13611	Antenna Assembly (Permeability tuning Antenna Section)
T2	13611	Permeability tuning assembly (Oscillator Section)
T3	108140J	Input I.F. coil 455 kc.
T4	108141E	Output I.F. coil 455 kc.

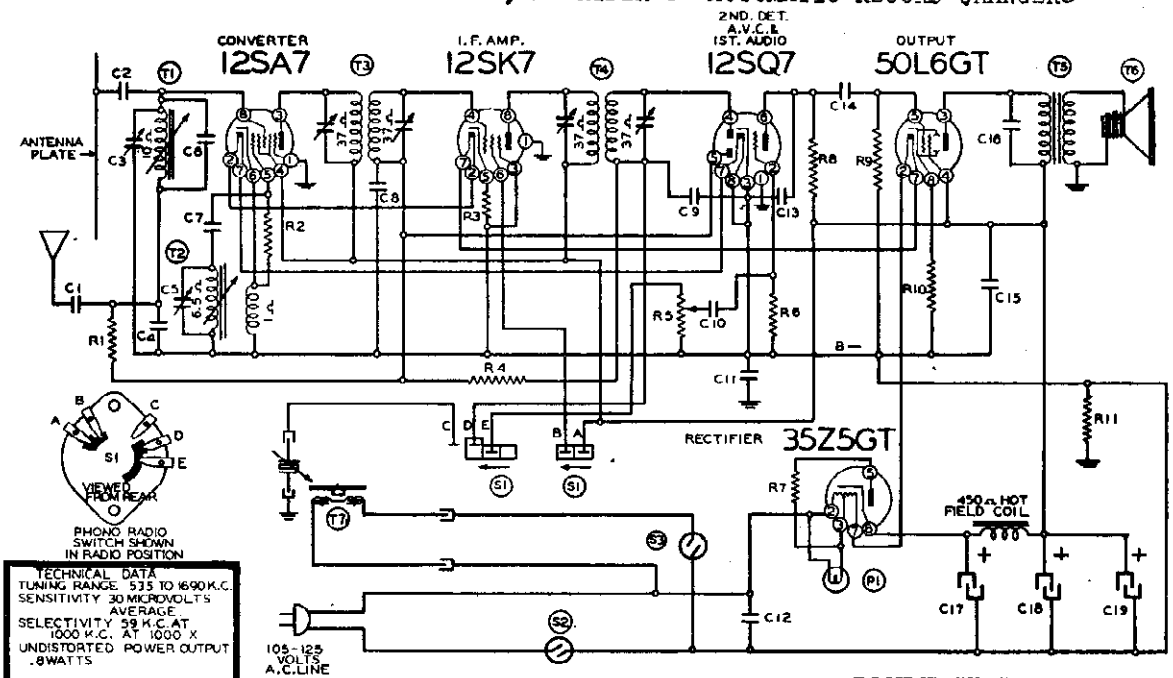


BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Iron Cores (Dial Setting)	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Connect to Grid of 12SA7	Iron Cores All the way out	Two trimmers on top of output I. F. can	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Connect to Grid of 12SA7	Iron Cores All the way out	Two trimmers on top of input I. F. can	Input I. F.	Adjust to maximum output
BROADCAST BAND	1720 Kc.	.1 MFD.	Connect to Grid of 12SA7	Iron Cores All the way out	Trimmer (C6) (See chassis view)	Oscillator	Adjust to maximum output
	1720 Kc.	200 MMF.	Connect to Outside Antenna Clip	Iron Cores All the way out	Trimmer (C3) (See chassis view)	Antenna	Adjust to maximum output
	1400 Kc.	200 MMF.	Connect to Outside Antenna Clip	Turn Dial to 1400 Kc.	Adjust position of antenna coil (See coil assembly view)	Antenna Coil Adjustment	Adjust to maximum output (See Note "A")
	1720 Kc.	200 MMF.	Connect to Outside Antenna Clip	Turn Dial to 1720 Kc.	Adjust trimmer (C3) (See chassis view)	Antenna	Check for tracking (See Note "B")

MODEL 5D16

BELMONT RADIO CORP.

" FOR OAK RECORD CHANGER, SEE RIDER'S "AUTOMATIC RECORD CHANGERS"



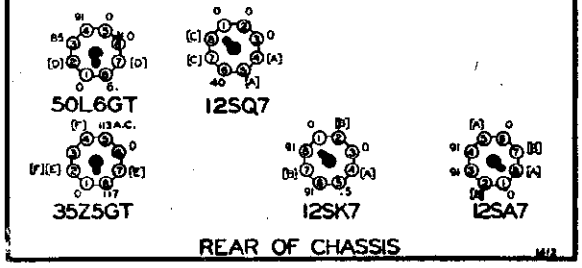
TECHNICAL DATA
TUNING RANGE 535 TO 1690 K.C.
SENSITIVITY 30 MICROVOLTS AVERAGE
SELECTIVITY 59 K.C. AT 1000 K.C. AT 1000 X
UNDISTORTED POWER OUTPUT .8 WATTS
MAX. POWER OUTPUT 1.4 WATTS IN VOICE COIL
POWER CONSUMPTION
RADIO CHASSIS 35 WATTS
PHONO MOTOR 20 WATTS
I.F. 455 K.C.

IF PEAK 455 KC

BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH A HIGH RESISTANCE VOLTMETER BETWEEN SOCKET TERMINALS & 'B' MINUS.
PHONO-RADIO SWITCH TO BE IN RADIO POSITION.
VOLUME CONTROL AT MINIMUM & NO SIGNAL.
117 VOLT LINE.

[a]- CANNOT BE MEASURED WITH VOLTMETER.
[b]- 11 VOLTS A.C. ACROSS PINS 2 & 7.
[c]- 11 VOLTS A.C. ACROSS PINS 7 & 8.
[d]- 47 VOLTS A.C. ACROSS PINS 2 & 7.
[e]- 24 VOLTS A.C. ACROSS PINS 2 & 7.
[f]- 117 VOLTS A.C. ACROSS PINS 2 & 4.



VOLTAGE CHART

CONDENSERS

C8, C15	.05 x 200 Volt Tubular Condenser.
C11	.1 x 400 Volt Tubular Condenser.
C10	.002 x 600 Volt Tubular Condenser.
C14	.006 x 600 Volt Tubular Condenser
C16	.01 x 400 Volt Tubular Condenser.
C12	.1 x 400 Volt Tubular Condenser.
C17, C18, C19	Electrolytic Filter Condenser. 50 to 60 Cycles. 40 Mfd. x 150 V.; 20 Mfd. x 150 V.; 20 Mfd. x 150 V.
C17, C18, C19	Electrolytic Filter Condenser. 25 Cycles. 60 Mfd. x 150 V.; 40 Mfd. x 150 V.; 40 Mfd. x 150 V.
C3, C5	Ant. and Osc. Dual Trimmer Condenser
C2	.0003 Mica Type Condenser—20%
C1, C7, C9	.0001 Mica Type Condenser—20%
C4	.0008 Mica Type Condenser—10%
C13	.00025 Mica Type Condenser—20%
C6	.00005 Ceramicon Condenser—10%.

RESISTORS

R5, S2	Volume Control and Switch (500M Ohms)
R1, R11	200M Ohm—½ Watt Resistor—20%
R2	20M Ohm—½ Watt Resistor—10%
R3	100 Ohm—½ Watt Resistor—10%
R4	3 Megohm—½ Watt Resistor—20%
R8	250M Ohm—½ Watt Resistor—20%
R6	5 Megohm—½ Watt Resistor—25%
R7	25 Ohm—½ Watt Resistor—10%
R9	750M Ohm—½ Watt Resistor—20%
R12	30 Ohm—1 Watt Resistor—20%
	Following Resistors Used Only When P.M. Dynamic Speaker is Used:
R10	150 Ohm—½ Watt Resistor—10%
	200 Ohm—½ Watt Resistor—10%
	1200 Ohm—1 Watt Resistor—10%

- Connect B - of radio chassis to ground post of signal generator through .1 Mfd. condenser.
- Volume control—Maximum all adjustments.

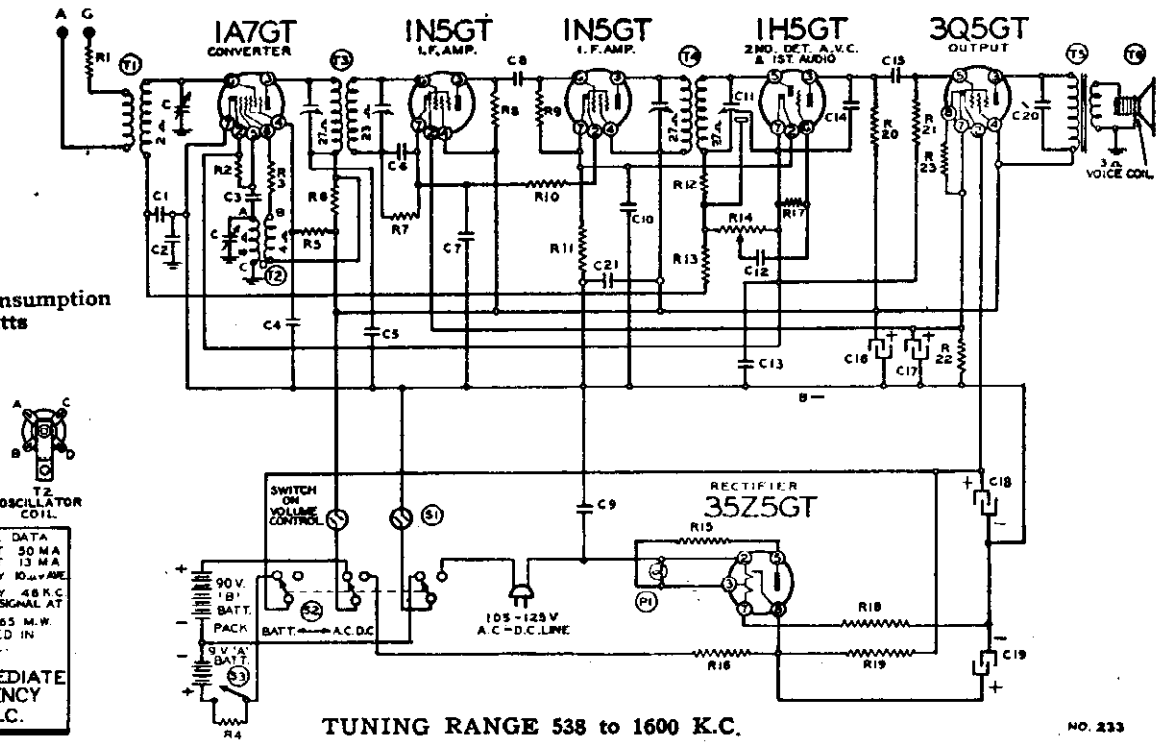
BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Iron Cores (Dial Setting)	Trimmers Adjusted to Maximum (In Order Shown)
I. F.	455 Kc.	.1 MFD.	Connect to Antenna Plate	Iron Cores All the way out	Two trimmers on top of output I.F. (See Chassis View)
	455 Kc.	.1 MFD.	Connect to Antenna Plate	Iron Cores All the way out	Two trimmers on top of input I.F. (See Chassis View)
BROAD-CAST BAND	1690 Kc.	.1 MFD.	Connect to Antenna Plate	Iron Cores All the way out	Oscillator trimmer (C5) (See Chassis View)
	1690 Kc.	200 MMF.	Connect to Antenna Plate	Iron Cores All the way out	Antenna trimmer (C3) (See Chassis View)
	1400 Kc.	200 MMF.	Connect to Antenna Plate	Turn Dial to 1400 Kc.	Adjust position of antenna coil right or left. (See Note "A")
	1690 Kc.	200 MMF.	Connect to Antenna Plate	Turn Dial to 1690 Kc.	Adjust antenna trimmer (C3) (See Chassis View) (See Note "B")

NOTE "A"—The antenna coil assembly is made so that it is movable right or left. When making the adjustment as given in the alignment procedure move the coil assembly very slowly. It can be moved by hand or by pivoting one edge of the blade of a screwdriver in the hole and engaging the blade in the gear teeth of the coil form.

NOTE "B"—After the antenna coil has been tracked at 1400 Kc. it is necessary to check the antenna trimmer (C3) adjustment again at 1690 Kc. If no appreciable change in trimmer adjustment is made the coil is in track, if the trimmer requires considerable change it will be necessary to again adjust the position of the antenna coil at 1400 Kc. These two adjustments should be tried several times until no change of trimmer adjustment is required at 1690 Kc.

FOR ADDITIONAL DATA SEE INDEX

BELMONT RADIO CORP.



Power Consumption
35 Watts

TECHNICAL DATA
A CURRENT 50 MA
B CURRENT 13 MA
SENSITIVITY 10 μv AVE.
SELECTIVITY 48 K.C. AT 1000 K.C. X SIGNAL AT 1000 K.C.
OUTPUT 165 M.W. UNDISTORTED IN VOICE COIL.

INTERMEDIATE FREQUENCY 455 K.C.

TUNING RANGE 538 to 1600 K.C.

NO. 233

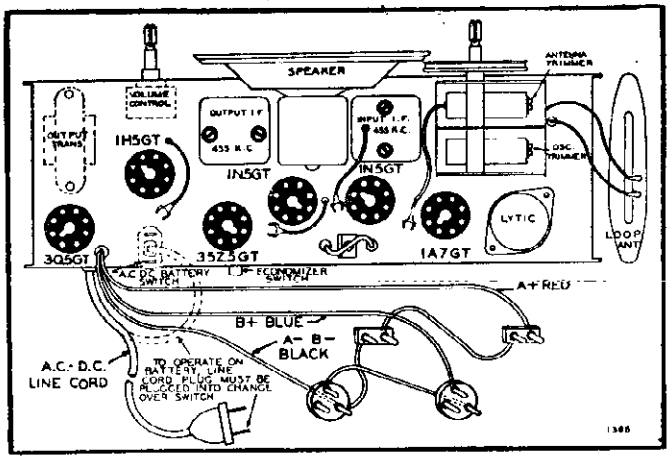
ALIGNMENT PROCEDURE

The following equipment is required for aligning.
- Dummy antenna .1 mfd. and 200 mmf.
- Volume control—Maximum all adjustments.
- Connect B— of radio chassis to ground post of signal generator.

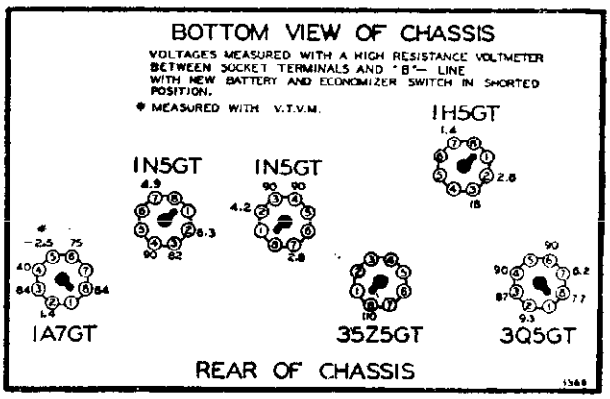
BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Dial Setting	Trimmers Adjusted (in Order Shown)	Adjustment
455 Kc. I. F.	455 Kc.	.1 MFD.	Connect to Grid of 1A7	Rotor full open (Plates out of mesh)	Input and Output Trimmers on Top of I. F. cans	Maximum output (See Note "A")
BROAD-CAST BAND	1600 Kc.	.1 MFD.	Connect to Grid of 1A7	Rotor full open (Plates out of mesh)	Osc. Trimmer on gang (See chassis view)	Maximum output (See Note "A")
	1400 Kc.	200 MMF.	Connect to Antenna Clip	Set dial at 1400 Kc.	Ant. Trimmer on gang (See chassis view)	Maximum output (See Note "B")

NOTE "A"—The loop antenna need not be connected to the radio when making these adjustments, but a 1. Meg. Resistor must be substituted across the loop clips. The ground of the signal generator is connected to the B— and the other lead from the signal generator in series with .1 MFD. dummy to the grid of the 1A7GT tube.

NOTE "B"—This adjustment should be made with the ground lead of the signal generator connected to the external ground terminal. The other lead of the signal generator is connected in series with a 200 Mmf. dummy to the external antenna terminal.



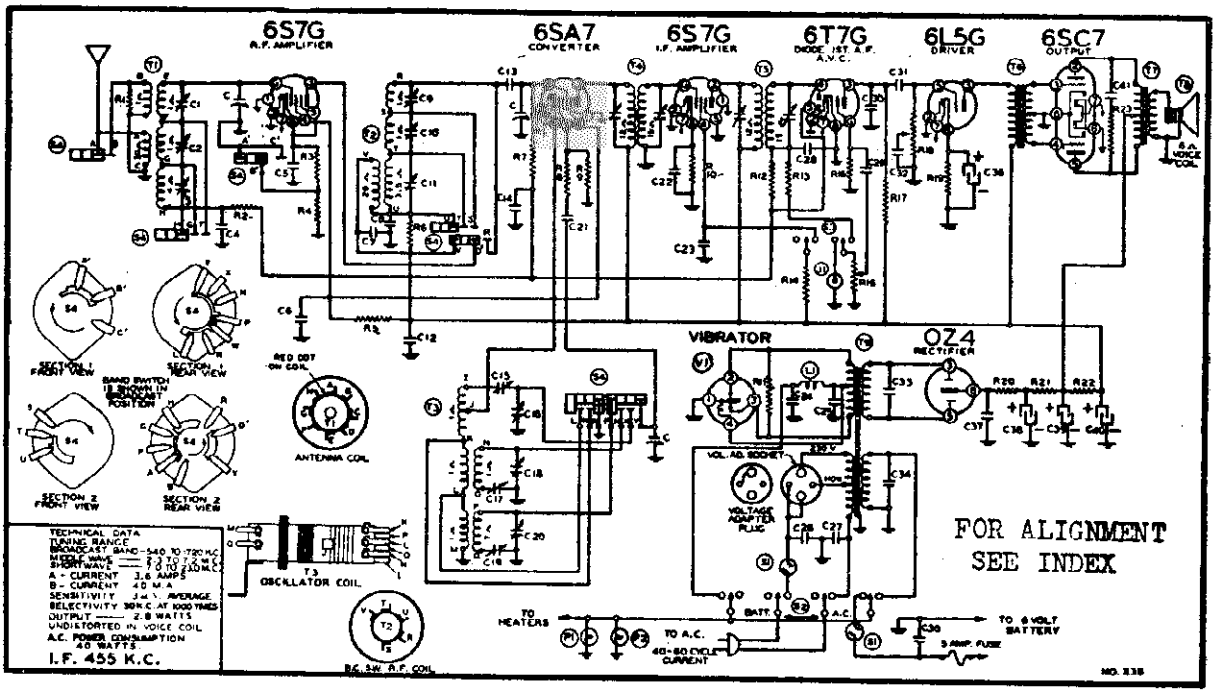
CHASSIS VIEW showing tube location and battery cables.
NOTE: To operate on battery, line cord must be plugged into AC-DC battery switch shown in view above.



VOLTAGE CHART

MODEL 7H31

BELMONT RADIO CORP.

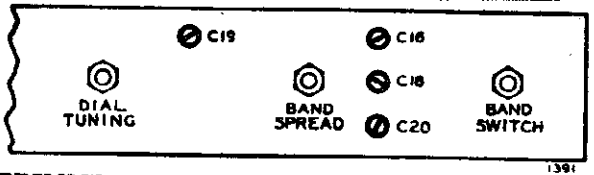


CONDENSERS

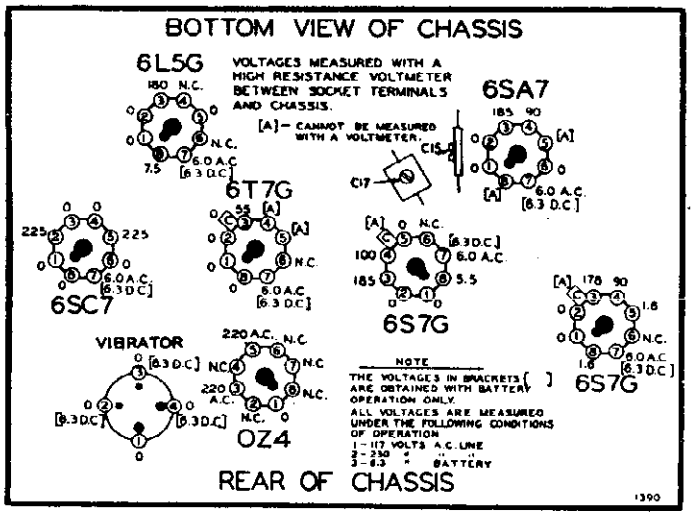
Part No.	Schematic Diagram Reference	Description	No. Used In Set	Selling Price Each
1001	C6, C37	.1 x 400 Volt Tubular Condenser	2	.25
10011	C26, C27, C31, C32, C34	.01 x 400 Volt Tubular Condenser	5	.25
10013	C8, C23	.05 x 400 Volt Tubular Condenser	2	.25
10020	C5	.1 x 200 Volt Tubular Condenser	1	.25
10022	C4, C22, C35	.05 x 200 Volt Tubular Condenser	3	.25
10025	C29	.002 x 600 Volt Tubular Condenser	1	.25
10026	C13, C14	.02 x 400 Volt Tubular Condenser	2	.25
10031	C24, C25	.5 x 120 Volt Tubular Condenser	2	.60
10071	C41	.004 x 600 Volt Tubular Condenser	1	.25
100100	C33	.008 x 1600 Volt Tubular Condenser	1	.25
100117	C12	.25 x 400 Volt Tubular Condenser—With Bracket	1	.35
119127	C36, C38, C39, C40	Electrolytic Filter Condenser. 40 Mfd. x 25 V.—40 Mfd. x 300 V.—20 Mfd. x 300 V.—20 Mfd. x 300 V.	1	1.50
124169	C9, C10, C11	S.W.—M.W.—B.C.—Triple Unit Antenna Trimmer Condenser Strip	1	.60
124170	C1, C2, C3	S.W.—M.W.—B.C.—Triple Unit Antenna Trimmer Condenser Strip	1	.60
124172	C16, C18, C20	S.W.—M.W.—B.C.—Triple Unit Antenna Trimmer Condenser Strip	1	.55
129178	C19	B.C. Osc. Series Pad Condenser	1	.35
129179	C17	M.W. Osc. Series Pad Condenser	1	.45
129180	C15	S.W. Osc. Series Pad Condenser	1	.55
1295	C21, C28	.0001 Mica Type Condenser—20%	2	.25
12912	C30	.00025 Mica Type Condenser—20%	1	.25
12940	C7	.0001 Mica Type Condenser—10%	1	.25

RESISTORS

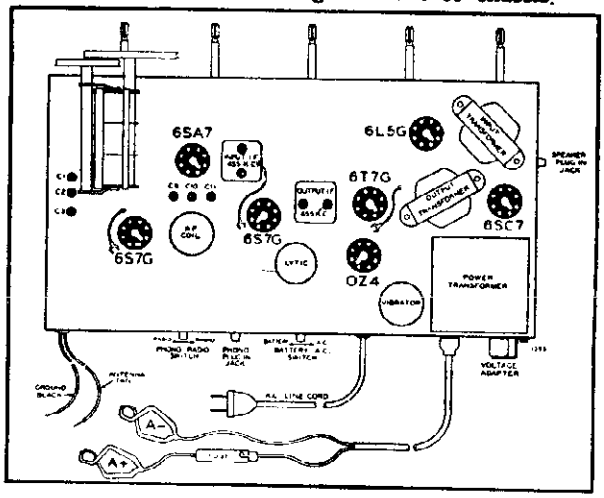
1304	R12	3 Megohm—½ Watt Resistor—20%	1	.20
1309	R17	200M Ohm—½ Watt Resistor—20%	1	.20
13012	R13	50M Ohm—½ Watt Resistor—20%	1	.20
13019	R7	1 Megohm—½ Watt Resistor—20%	1	.20
13020	R2	100M Ohm—½ Watt Resistor—20%	1	.20
13027	R20	50 Ohm—½ Watt Resistor—20%	1	.20
13031	R6	1500 Ohm—½ Watt Resistor—20%	1	.20
13057	R9	35M Ohm—½ Watt Resistor—20%	1	.20
13064	R4	3500 Ohm—½ Watt Resistor—20%	1	.20
13066	R14	75M Ohm—½ Watt Resistor—10%	1	.20
13084	R11, R21	200 Ohm—½ Watt Resistor—20%	2	.20
13099	R3	300 Ohm—½ Watt Resistor—20%	1	.20
130199	R22	1500 Ohm—1 Watt Resistor—10%	1	.20
130235	R19	1500 Ohm—½ Watt Resistor—10%	1	.20
130257	R16	5 Megohm—½ Watt Resistor—25%	1	.20
130304	R5	12M Ohm —2 Watt Resistor—10%	1	.20
130345	R10	1M Ohm—½ Watt Resistor—10%	1	.20
13025	R1	2M Ohm—½ Watt Resistor—20%	1	.20
130149	R23	15M Ohm—½ Watt Resistor—20%	1	.20
130327	R8	10 Ohm—½ Watt Resistor—20%	1	.20



TRIMMER VIEW—Looking at front of chassis.

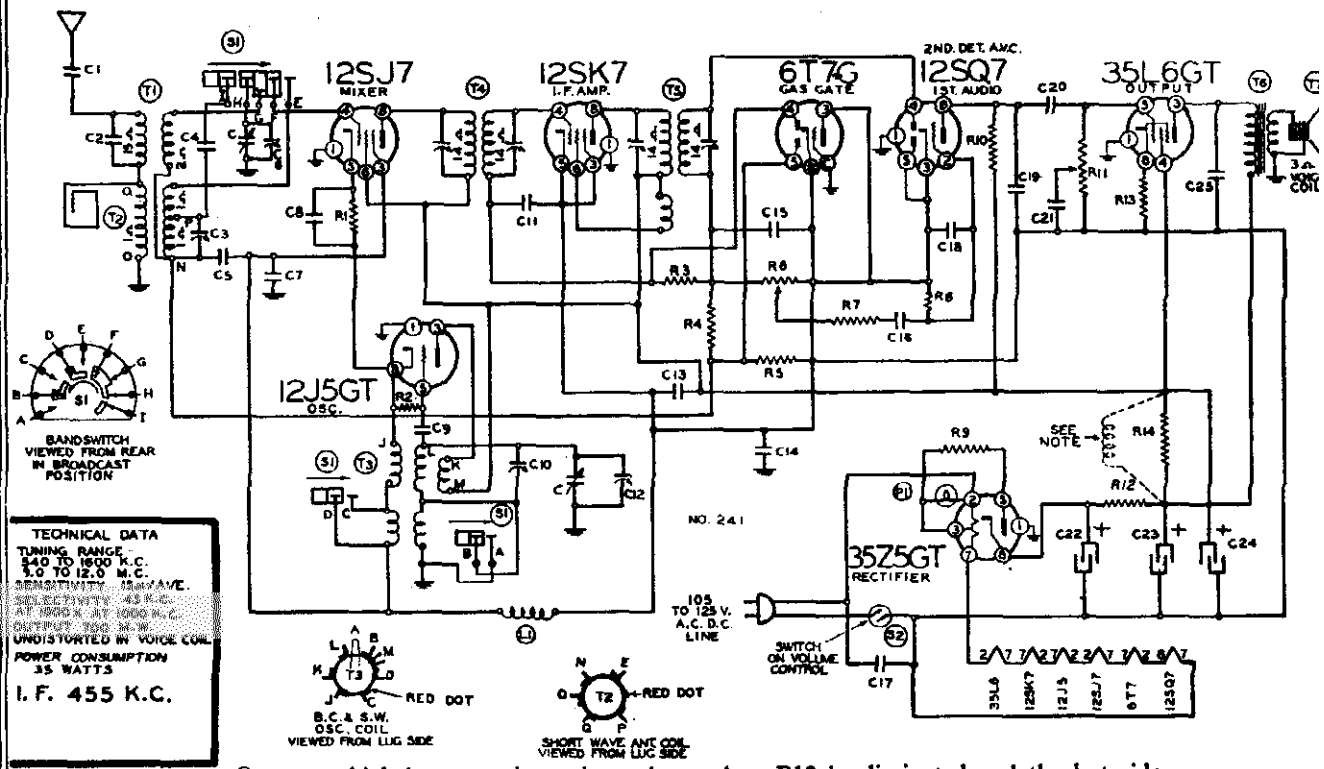


VOLTAGE CHART



CHASSIS VIEW showing tube location.
NOTE: Antenna and ground leads at back of chassis.

BELMONT RADIO CORP.



On sets which have an electrodynamic speaker, R12 is eliminated and the hot side of C22 is connected in parallel with C23. R14 is replaced by the speaker field. B+ of output transformer is connected to No. 4 pin of 35L6 tube.

CONDENSERS

Part No.	Schematic Diagram Reference	Description	No. Used In Set	Selling Price Each
100128	C5	.05 x 120 Volt Tubular Condenser	1	.25
100119	C7, C14	.1 x 400 Volt Tubular Condenser	2	.25
100127	C8	.01 x 120 Volt Tubular Condenser	1	.25
10060	C13	.1 x 200 Volt Tubular Condenser	1	.25
1009	C11	.05 x 200 Volt Tubular Condenser	1	.25
100138	C17, C20	.03 x 400 Volt Tubular Condenser	2	.25
10026	C25	.02 x 400 Volt Tubular Condenser	1	.25
10019	C16, C21	.006 x 600 Volt Tubular Condenser	2	.25
10037	C1	.003 x 600 Volt Tubular Condenser	1	.25
119129		Electrolytic Filter Cond. Added for 25 Cycle Only. 40 Mfd. x 150 Volts Across C22 and 20 Mfd. x 150 Volts Across C23	1	1.25
119128	C22, C23, C24	Electrolytic Filter Condenser. 40 Mfd.—20 Mfd.—20 Mfd. x 150 Volts, 50-60 Cycles	1	1.25
124139	*C3, C10*	*S.W. Antenna and Oscillator Trimmer* Condenser	2	.25
129181	C4	.000445 Mica Type Condenser—3%	1	.30
12921	C15	.0002 Mica Type Condenser—20%	1	.25
1295	C9, C18	.0001 Mica Type Condenser—20%	2	.25
12960	C2	.00015 Mica Type Condenser—20%	1	.25
12912	C19	.00025 Mica Type Condenser—20%	1	.25

RESISTORS

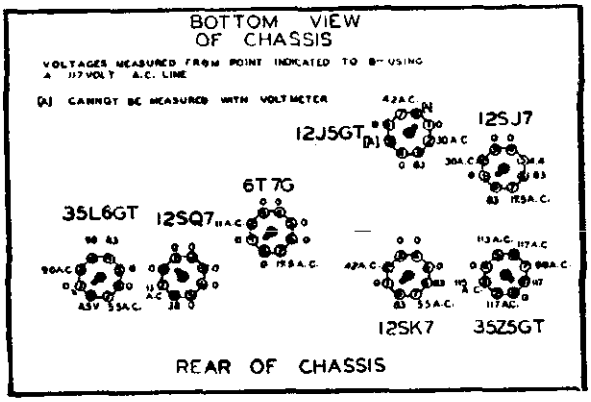
130218	R1	5M Ohm—½ Watt Resistor—10%	1	.2
130166	R13	150 Ohm—½ Watt Resistor—10%	1	.2
13084	R12	200 Ohm—½ Watt Resistor—20%	1	.2
130128	R9	20 Ohm—½ Watt Resistor—20%	1	.2
13012	R2, R7	50M Ohm—½ Watt Resistor—20%	2	.2
130287	R14	1200 Ohm—1 Watt Resistor—10%	1	.2
130350	R3, R5	3.2 Megohm—½ Watt Resistor—20%	2	.2
13038	R4	2 Megohm—½ Watt Resistor—20%	1	.2
130257	R5	5 Megohm—½ Watt Resistor—25%	1	.2
1309	R10	200M Ohm—½ Watt Resistor—20%	1	.2

COILS

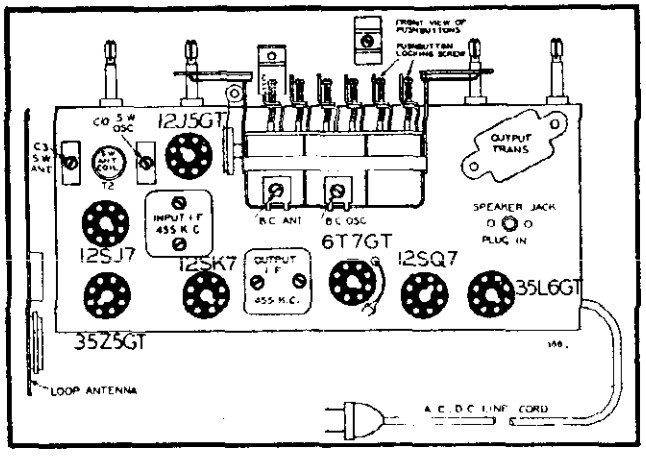
108206	T4	Input I.F. Coil Complete in Can	1	1.
108205	T5	Output I.F. Coil Complete in Can	1	1.
110184	T3	B.C.-S.W.—Oscillator Coil	1	.
111249	T2	S.W. Antenna Coil Complete	1	.
111251	T1	Loop Antenna Assembly	1	1.
12316	L1	Choke Coil		.

SPEAKER

114262	T7	Six Inch Electro Dynamic Speaker (Less Output Transformer)	1	4.
105134	T6	Output Transformer for Speaker	1	.



Voltage Chart



Chassis View, showing Tube Location and the Outside Antenna Clip.

MODEL 7H31
MODEL 7D22
MODEL 590

BELMONT RADIO CORP.

ALIGNMENT PROCEDURE MODEL 7D22

- Volume control—Maximum all adjustments.
- Connect B—of radio chassis to ground post of signal generator through .1 Mfd. condenser.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted to Maximum
I. F.	455 Kc.	.1 MFD.	Grid of 12SK7 I. F.	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top of Output I. F.
	455 Kc.	.1 MFD.	Grid of 12SJ7 Mixer	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top of Input I. F.
SHORT WAVE BAND	12 Mc.	400 Ohms	External Antenna and B—	Short Wave	Set Dial at 12 Mc.	S.W. Osc. trimmer C10 S.W. Ant. trimmer C3
BROAD-CAST BAND	1600 Kc.	.1 mmf.	Grid of 12SJ7	Broadcast	Rotor full open (Plates out of mesh)	B.C. Osc. trimmer C12 on Gang
	1400 Kc.	200 mmf.	External Antenna and B—	Broadcast	Set Dial at 1400 Kc.	B.C. Ant. trimmer C6

NOTE: The Oscillator Frequency is lower than the signal frequency and should be aligned accordingly.

The loop antenna should be connected to the radio when making all adjustments.

ALIGNMENT PROCEDURE MODEL 7H31

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted to Max.
I. F.	455 Kc.	.1 MFD.	Grid of 6S7 I. F.	Broadcast	Tuning & Bandspread Plates out of mesh	Two trimmers on top of Output I. F.
	455 Kc.	.1 MFD.	Grid of 6SA7 I. F.	Broadcast	Tuning & Bandspread Plates out of mesh	Two trimmers on top of Input I. F.
SHORT WAVE BAND	17 Mc.	400 ohms	Antenna lead	Short Wave	Set Dial at 17 Mc.	Trimmer C16—S. W. osc. (See Note A)
	17 Mc.	400 ohms	Antenna lead	Short Wave	Set Dial at 17 Mc.	Trimmer C1-C9 S. W. ant. and R. F.
	8 Mc.	400 ohms	Antenna lead	Short Wave	Set Dial at 8 Mc.	Trimmer C15 S. W. osc. series pad (See note "B")
MEDIUM WAVE BAND	6 Mc.	400 ohms	Antenna lead	Medium Wave	Set Dial at 6 Mc.	Trimmer C18 M. W. osc.
	6 Mc.	400 ohms	Antenna lead	Medium Wave	Set Dial at 6 Mc.	Trimmer C2-C10 ant. and R. F.
	2.5 Mc.	400 ohms	Antenna lead	Medium Wave	Set Dial at 2.5 Mc.	Trimmer C17 osc. series pad (See note "B")
BROADCAST BAND	1720 Kc.	200 mmf.	Antenna lead	Broadcast	Tuning & Bandspread Plates out of mesh	Trimmer C20 B. C. osc.
	1400 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1400 Kc.	Trimmer C3-C11 B. C. ant. R. F.
	600 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 600 Kc.	Trimmer C19 B. C. osc. series pad (See note "B")

NOTE "A"—It is extremely necessary that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental.

NOTE "B"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained. **After each range is completed, repeat the procedure as a final check.**

ALIGNMENT PROCEDURE MODEL 590

The following equipment is required for aligning.

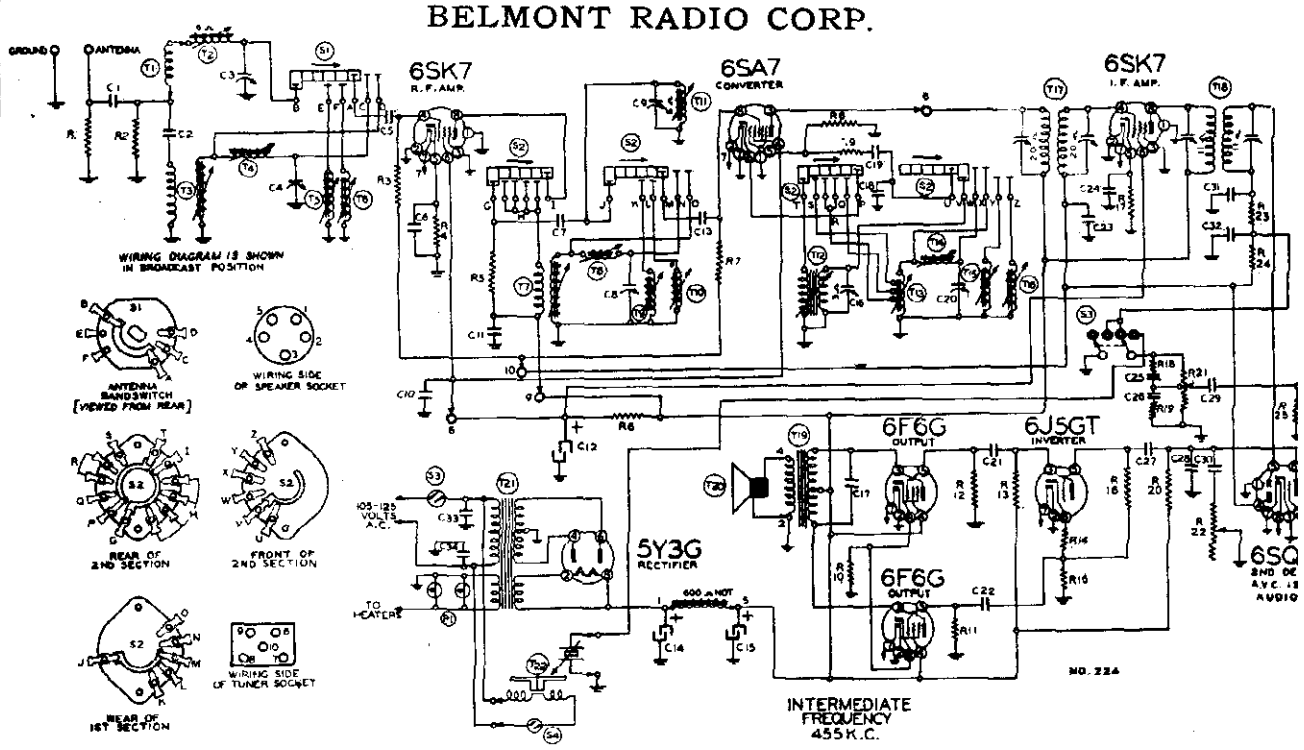
- Dummy antenna .1 mfd. and 200 mmf.
- Volume control—Maximum all adjustments.
- Connect ground lead of radio chassis to ground post of signal generator.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Iron Cores (Dial Setting)	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
455 Kc. I. F.	455 Kc.	.1 MFD.	Connect to Grid of 1A7	Rotor full open (Plates out of mesh)	Trimmers on top of I. F. cans	Output and input I. F.	maximum output (See Note "A")
BROAD CAST BAND	1600 Kc.	.1 MFD.	Connect to Grid of 1A7	Rotor full open (Plates out of mesh)	Trimmer on gang (See chassis view)	Oscillator	maximum output (See Note "A")
	1400 Kc.	200 MMF.	Connect to Antenna Clip	Set dial at 1400 Kc.	Trimmer on gang (See chassis view)	Antenna	maximum output (See Note "B")

NOTE "A"—The loop antenna need not be connected to the radio when making these adjustments, but a 1. Meg. Resistor must be substituted across the loop clips. The ground of the signal generator is connected to the chassis and the other lead from the signal generator in series with .1 MFD. dummy to the grid of the 1A7GT tube.

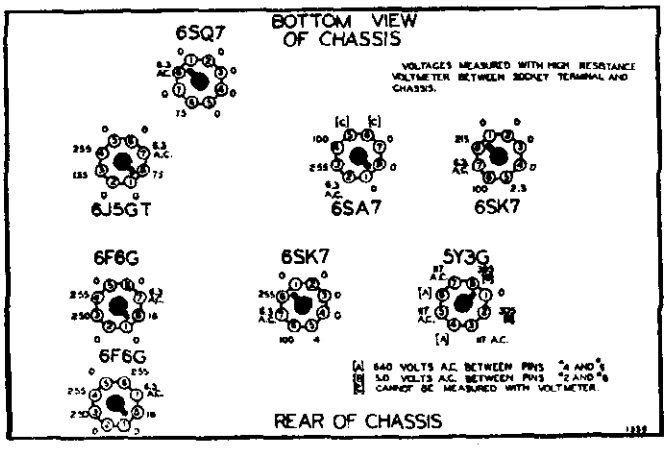
NOTE "B"—This adjustment should be made with the ground lead of the signal generator connected to the external ground terminal. The other lead of the signal generator is connected in series with a 200 Mmf. dummy to the external antenna terminal.

BELMONT RADIO CORP.



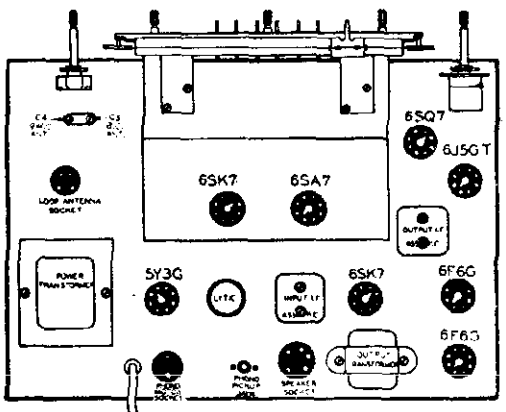
RESISTORS

R1	1301	25M ohm—½ w.
R2	1301	25M ohm—½ w.
R3	13019	1 megohm—½ w.
R4	130239	250 ohm—½ w.
R5	130218	5M ohm—½ w.
R6	10662	12,500 ohm—3 w.
R7	13019	1 megohm—½ w.
R8	130232	25M ohm—½ w.
R9	130174	50 ohm—½ w.
R10	130220	300 ohm—1 w.
R11	1303	500M ohm—½ w.
R12	1303	500M ohm—½ w.
R13	130103	100M ohm—½ w.
R14	130218	5M ohm—½ w.
R15	130103	100M ohm—½ w.
R16	13019	1 megohm—½ w.
R17	13070	500 ohm—½ w.
R18	13011	250M ohm—½ w.
R19	130149	15M ohm—½ w.
R20	13011	250M ohm—½ w.
R21	101253	½ megohm—volume control
R22	101254	1 megohm—tone control
R23	13012	50M ohm—½ w.
R24	1304	3 megohm—½ w.
R25	130257	5 megohm—½ w.



CONDENSERS

C1	1292	.0005 mica
C2	10047	.002 x 600 v.
C3	124143	B.C. antenna trimmer
C4	124143	9 mc. antenna trimmer
C5	1292	.0005 mica
C6	10020	.1 x 200 v.
C7	129168	.0001 mica
C8	124138	9 mc. R.F. trimmer
C9	124139	B.C. R.F. trimmer
C10	10074	.1 x 400 v.
C11	10074	.1 x 400 v.
C12	119109	10.0 x 350 w.v. lytic
C13	1292	.0005 mica
C14	119109	15.0 x 450 w.v. lytic
C15	119109	15.0 x 450 w.v. lytic
C16	124144	B.C. oscillator trimmer
C17	10071	.004 x 600 v.
C18	129167	.0002 Silver mica
C19	129165	.00005 mica
C20	124145	9 mc. osc. trimmer
C21	10085	.05 x 400 v.
C22	10085	.05 x 400 v.
C23	10026	.02 x 400 v.
C24	10020	.1 x 200 v.
C25	129114	.0003 mica
C26	100122	.03 x 200 v.
C27	10026	.02 x 400 v.
C28	12921	.0002 mica
C29	10019	.006 x 600 v.
C30	10019	.006 x 600 v.
C31	129165B	.00005 mica
C32	129165B	.00005 mica
C33	10061	.02 x 600 v. Bakelite
C34	10061	.02 x 600 v. Bakelite



C3 and C4 are in the same unit
C12 and C14 and C15 are in the same unit

PARTS

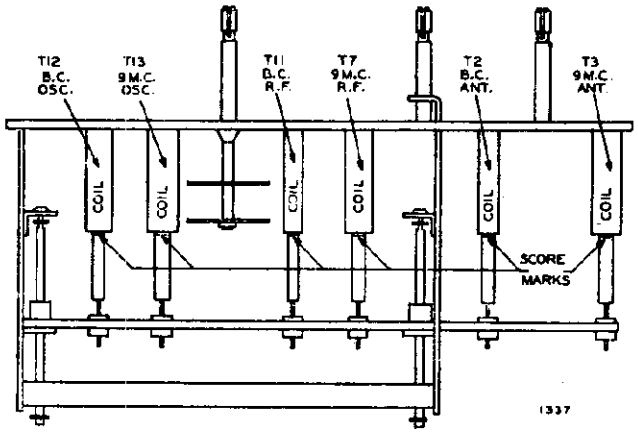
T1	111238	Loop ant. assembly
T2	111195	B.C. ant. coil
T3	111190	9 mc. ant. coil
T4	111189	6 mc. ant. coil
T5	111191	12 mc. ant coil
T6	111192	15 mc. ant. coil
T7	10959	9 mc. R.F. coil
T8	10958	6 mc. R.F. coil
T9	10960	12 mc. R.F. coil
T10	10961	15 mc. R.F. coil
T11	10962	B.C. R.F. coil
T12	110161	B.C. oscillator coil
T13	110157	9 mc. oscillator coil
T14	110156	6 mc. oscillator coil
T15	110158	12 mc. oscillator coil
T16	110159	15 mc. oscillator coil
T17	108177	Input I.F. coil 455 kc.
T18	108176C	Output I.F. coil 455 kc.

- Tone control—Treble.
- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

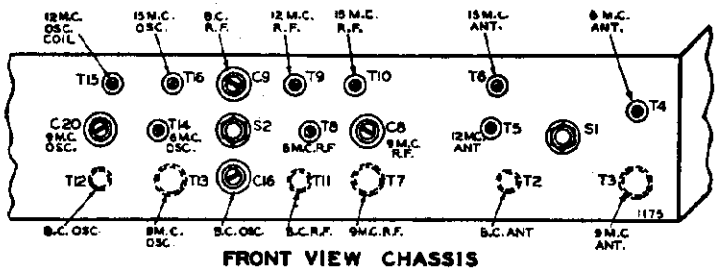
The following equipment is required for aligning:

- 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.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Dial Pointer Setting	Trimmers Adjusted in Order Shown	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Grid of 6SK7 (I.F.)	Broadcast	Set Dial at 1600 Kc.	Two Trimmers on Top	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 6SA7	Broadcast	Set Dial at 1600 Kc.	Two Trimmers on Top	Input I. F.	Adjust to maximum output
31 METER BAND	9.6 Mc.	400 ohms.	Antenna lead	31M	Set Dial at 9.6 Mc.	(See Trimmer View) C20 (See Trimmer View) C8 (See Trimmer on Top) C4	Osc. R. F. Ant.	Adjust to maximum output
49 METER BAND	6.1 Mc.	400 ohms.	Antenna lead	49M	Set Dial at 6.1 Mc.	(See Trimmer View) T14 (See Trimmer View) T8 (See Trimmer View) T4	Osc. R. F. Ant.	Adjust to maximum output
25 METER BAND	11.8 Mc.	400 ohms.	Antenna lead	25M	Set Dial at 11.8 Mc.	(See Trimmer View) T15 (See Trimmer View) T9 (See Trimmer View) T5	Osc. R. F. Ant.	Adjust to maximum output
19 METER BAND	15.2 Mc.	400 ohms.	Antenna lead	19M	Set Dial at 15.2 Mc.	(See Trimmer View) T16 (See Trimmer View) T10 (See Trimmer View) T6	Osc. R. F. Ant.	Adjust to maximum output
BROAD-CAST BAND	1600 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1600 Kc.	(See Trimmer View) C16 (See Trimmer View) C9 (See Trimmer on Top) C3	Osc. R. F. Ant.	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1400 Kc.	Rotate Core T11 Rotate Core T2 (See Iron Core Adjustment View)	R. F. Ant.	Adjust to maximum output



VIEW LOOKING AT BOTTOM OF CHASSIS



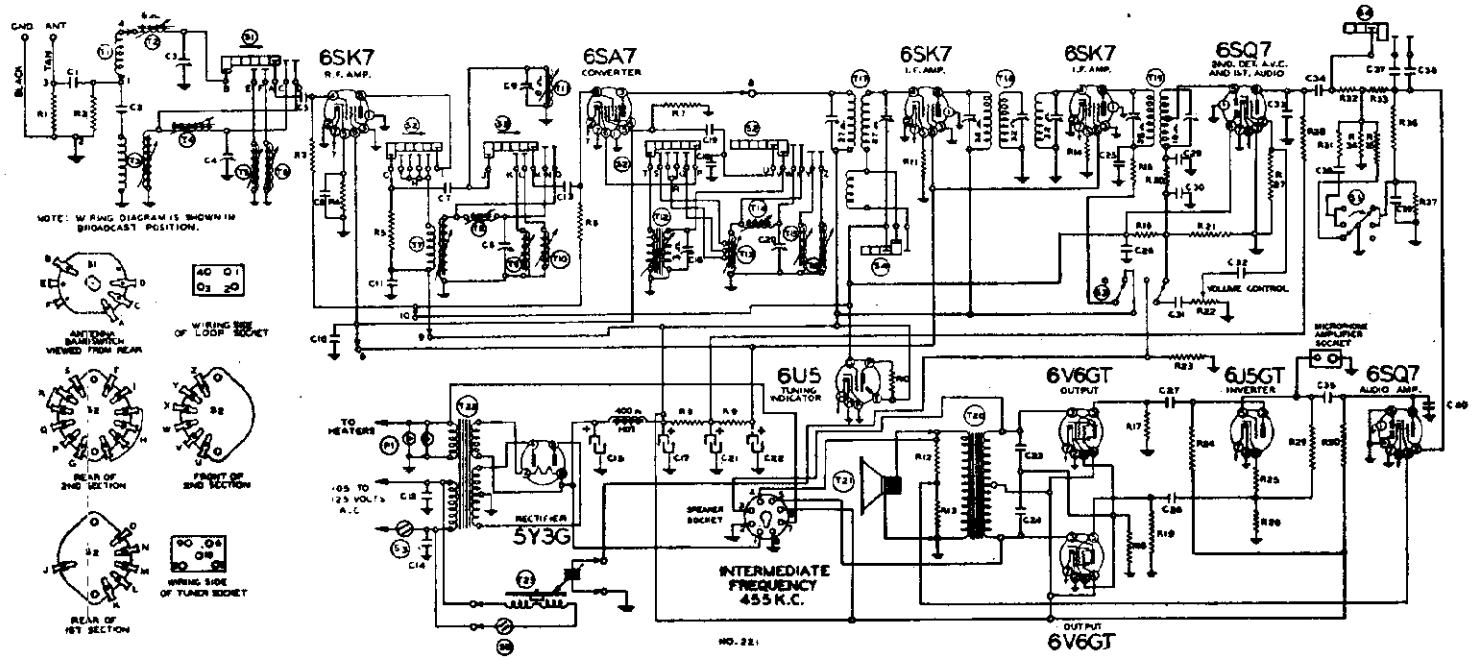
FRONT VIEW CHASSIS

Power Consumption, Radio only - - - 100 Watts
Power Output - - - - - 5 Watts Undistorted
Sensitivity for 500 Milliwatt Output: 10 Microvolts Average
Selectivity - 35 KC Broad at 1000 Times Signal at 1000 KC
Tuning Frequency Range Broadcast Band - 540 to 1600 KC
49M Band - - - 5.9 to 6.1 MC
31M Band - - - 9.1 to 10 MC
25M Band - - 11.4 to 12.1 MC
19M Band - - 14.9 to 15.4 MC
Intermediate Frequency - - - - - - 455 KC
Speaker - - - - - - 12 in. Electro Dynamic

Do not realign the band spread scales unless you are positive they are out of adjustment. When adjustment is necessary proceed as follows.

Rotate each iron core until the fine score marks are even with the edge of the coil forms.

You are now ready to continue with the trimmer adjustments as shown on the alignment chart.



Code No.	Part No.	Description
		RESISTORS
R1	130232	25M ohm—½ w.
R2	130232	25M ohm—½ w.
R3	13019	1 megohm—½ w.
R4	130239	250 ohm—½ w.
R5	130218	5M ohm—½ w.
R6	13019	1 megohm—½ w.
R7	130232	25M ohm—½ w.
R8	130318	6M ohm—2 w.
R9	130319	10M ohm—2 w.
R10		1 megohm in tuning indicator cable
R11	13016	900 ohm—½ w.
R12	13082	10M ohm—½ w.
R13	130235	1500 ohm—½ w.
R14	130192	2M ohm—½ w.
R15	130192	2M ohm—½ w.
R16	13019	1 megohm—½ w.
R17	1303	500M ohm—½ w.
R18	130317	250 ohm—2 w.
R19	1303	500M ohm—½ w.
R20	13094	50M ohm—½ w.
R21	130316	120M ohm—½ w.
R22	101229	500M ohm volume control
R23	1303	500M ohm—½ w.
R24	13094	50M ohm—½ w.
R25	130218	5M ohm—½ w.
R26	13094	50M ohm—½ w.
R27	130257	5 Megohm—½ w.
R28	130172	250M ohm—½ w.
R29	1303	500M ohm—½ w.
R30	130172	250M ohm—½ w.
R31	130232	25M ohm—½ w.
R32	13080	150M ohm—½ w.
R33	130309	350M ohm—½ w.
R34	130172	250M ohm—½ w.
R35	13066	75M ohm—½ w.
R36	13080	150M ohm—½ w.
		CONDENSERS
C1	1292	.0005 mica
C2	10047	.002 x 600 v.
C3	124143	B.C. antenna trimmer
C4	124143	9 mc. antenna trimmer
C5	1292	.0005 mica
C6	10020	.1 x 200 v. tubular
C7	129168	.00001 mica
C8	124138	9 mc. R.F. trimmer
C9	124139	B.C. R.F. trimmer
C10	10074	.1 x 400 v.
C11	10074	.1 x 400 v.
C12	10061	.02 x 600 v.
C13	1292	.0005 mica
C14	10061	.02 x 600 v.
C15	119112	30.0 mfd. lytic
C16	124144	B.C. oscillator trimmer
C17	119112	30.0 mfd. lytic x 450 w.v.
C18	129167	.0002 silver mica
C19	129165	.00005 mica
C20	124145	9 mc. oscillator trimmer
C21	119112	10.0 mfd. lytic
C22	11969	.16 mfd. x 350 w.v.
C23	10065	.015 x 600 v.
C24	10065	.015 x 600 v.
C25	1001	.1 x 400 v.
C26	10020	.1 x 200 v.
C27	10013	.05 x 400 v.
C28	1009	.5 x 200 v.
C29	1295	.0001 mica
C30	1295	.0001 mica
C31	10020	.1 x 200 v.
C32	10019	.006 x 600 v.
C33	12912	.00025 mica
C34	1001	.1 x 400 v.
C35	10013	.05 x 400 v.
C36	100118	.008 x 600 v.
C37	12938	.00005 mica
C38	129166	.000125 mica
C39	10037	.003 x 600 v.
C40	12912	.00025 mica

C3 and C4 in same unit

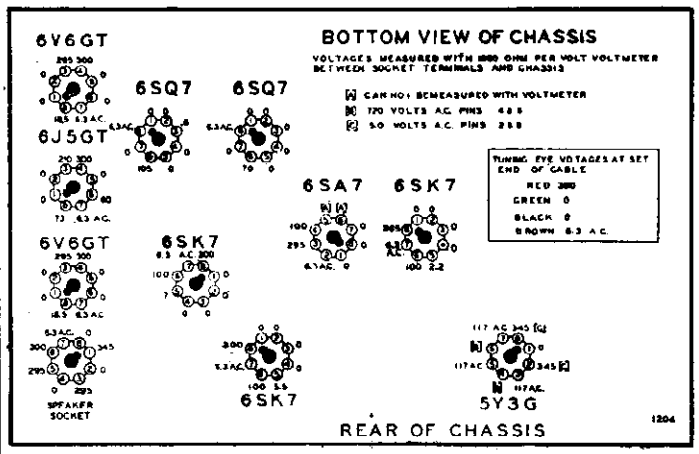
C15, C17 and C21 in same unit

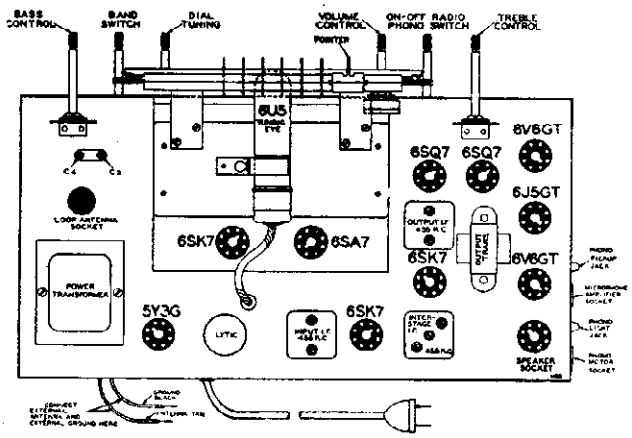
		PARTS
T1	111237	Loop antenna assembly
T2	111195	B.C. antenna coil
T3	111190	9 mc. antenna coil
T4	111189	6 mc. antenna coil
T5	111191	12 mc. antenna coil
T6	111192	15 mc. antenna coil
T7	10959	9 mc. R.F. coil
T8	10958	6 mc. R.F. coil
T9	10960	12 mc. R.F. coil
T10	10961	15 mc. R.F. coil
T11	10962	B.C. R.F. coil
T12	110161	B.C. oscillator coil
T13	110157	9 mc. oscillator coil
T14	110156	6 mc. oscillator coil
T15	110158	12 mc. oscillator coil
T16	110159	15 mc. oscillator coil
T17	108181	Input I.F. coil—455 kc.
T18	108155B	Interstage I.F. coil
T19	108182	Output I.F. coil—455 kc.
T20	105115	Output Transformer
T21	114209	12" dynamic speaker
T22	104217	Power transformer—50/60 cycles
	104218	Power transformer—25 cycle
T23	104258	Automatic record changer, Seeburg 50 cycle completed with turntable
	104257	Automatic record changer, complete—25 cycle Seeburg—with turntable
	104252	Automatic record changer—Seeburg—60 cycle complete with turntable
S1	125154	Antenna bandswitch
S2	125122	R.F.—oscillator bandswitch
S3	125150	On-off radio phono switch
S4	125151	Treble switch
S5	125152	Bass switch
S6		Switch on record changer
P1	10794	2 6-8 volts pilot light T44

MODEL 11AE2

BELMONT RADIO CORP.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Dial Pointer Setting	Trimmers Adjusted in Order Shown	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Grid of 6SK7 (I.F.)	Broadcast	Set Dial at 1600 Kc.	Two Trimmers on Top	Output I. F.	Adjust to Maximum output
	455 Kc.	.1 MFD.	Grid of 6SA7	Broadcast	Set Dial at 1600 Kc.	Two Trimmers on Top	Input I. F.	Adjust to Maximum output
31 METER BAND	9.6 Mc.	400 ohms	Antenna lead	31M	Set Dial at 9.6 Mc.	(See Trimmer View) C20 (See Trimmer View) C8 (See Trimmer on Top) C4	Osc. R. F. Ant.	Adjust to Maximum output
49 METER BAND	6.1 Mc.	400 ohms	Antenna lead	49M	Set Dial at 6.1 Mc.	(See Trimmer View) T14 (See Trimmer View) T8 (See Trimmer View) T4	Osc. R. F. Ant.	Adjust to Maximum output
25 METER BAND	11.8 Mc.	400 ohms	Antenna lead	25M	Set Dial at 11.8 Mc.	(See Trimmer View) T15 (See Trimmer View) T9 (See Trimmer View) T5	Osc. R. F. Ant.	Adjust to Maximum output
19 METER BAND	15.2 Mc.	400 ohms	Antenna lead	19M	Set Dial at 15.2 Mc.	(See Trimmer View) T16 (See Trimmer View) T10 (See Trimmer View) T6	Osc. R. F. Ant.	Adjust to Maximum output
BROAD-CAST BAND	1600 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1600 Kc.	(See Trimmer View) C16 (See Trimmer View) C9 (See Trimmer on Top) C3	Osc. R. F. Ant.	Adjust to Maximum output
	1400 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1400 Kc.	Rotate Core T11 Rotate Core T2 (See Iron Core Adjustment View)	R. F. Ant.	Adjust to Maximum output





Power Consumption
Radio Only - - - - 120 Watts

Power Output - - - 10 Watts
Undistorted

Sensitivity for 500 Milliwatt Output: - 10 Microvolts Average

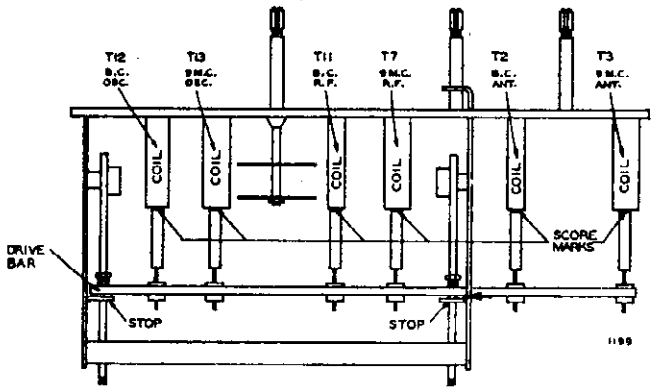
Selectivity - 27 KC Broad at 1000 Times Signal at 1000 KC

Tuning Frequency Range Broadcast Band - - 540 to 1600 KC

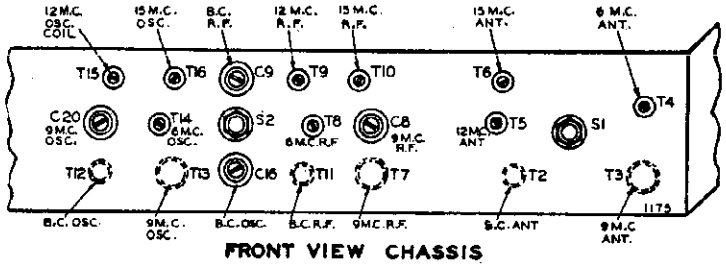
49M Band - 5.9 to 6.1 MC
31M Band - 9.1 to 10 MC
25M Band -11.4 to 12.1 MC
19M Band -14.9 to 15.4 MC

Intermediate Frequency - - - 455 KC

Speaker - - 12 in. Electro Dynamic



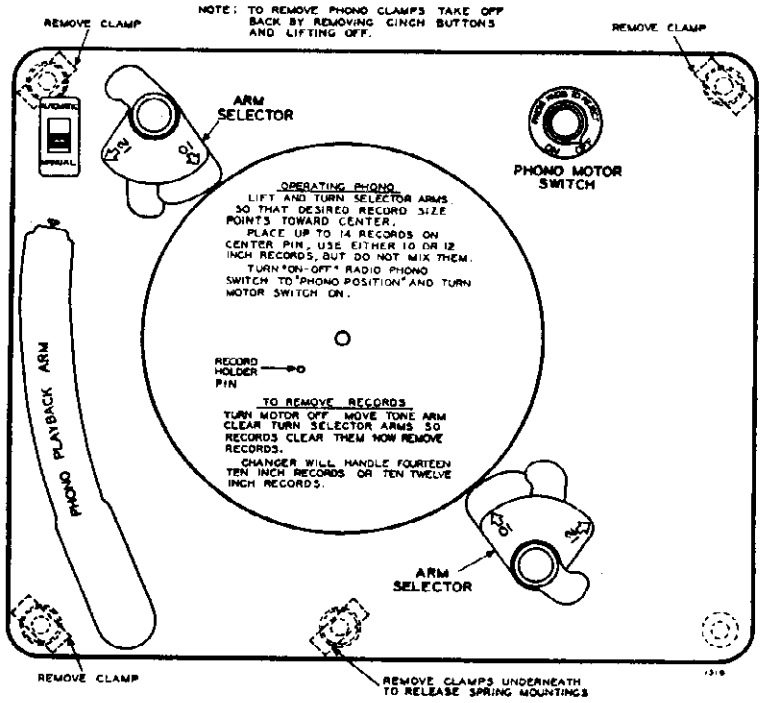
IRON CORE ADJUSTMENT VIEW



FRONT VIEW CHASSIS

BELMONT RADIO CORP.

Automatic Record Changer--Operating Instructions



Setting for Size of Record

The Changer plays up to fourteen 10" or ten 12" records at one loading. **All records must be the same size for each loading.**

On each post you will see selecting arms. The position of these arms determines the setting for different size records. To set for 10 or 12 inch records, it is merely necessary to grasp the posts by the knobs at the top, lift, and turn until the 10" or 12" arrows are pointing toward the center of the turntable. When in either the 10" or 12" position, the posts will snap into place except when they are lifted by hand. Be sure to set both posts for the same size record.

Loading

See that the selecting arms of both posts are turned toward the center of the turntable as indicated by the engraved arrows, and that both sets of arms are set for the same size (10" or 12") records as described in the preceding paragraph.

Place the stack of records (up to fourteen 10" or ten 12") over the center pin so that they will rest on the selecting arms.

Starting the Changer

1. Turn on the radio (allowing approximately 30 seconds for the tubes to warm up) and turn the phonograph-radio knob, to the phonograph position.

2. Turn the switch knob on the Record Changer panel to "ON". The motor will then start and the record changer will go into automatic operation of its own accord.

How to Reject a Record

Merely press the switch knob on the Changer panel. You can do it any time after the needle has come into contact with that record.

Automatic—Manual Switch

When this switch is pushed towards the manual position the selector arms can be turned out of the way and individual records played without the automatic changer working—To operate the changer again push the switch to automatic, start the motor and press the reject button.

Unloading

First switch off the motor. Grasp each post by its knob at the top and turn them out of the way.

Lift the played records from the turntable. Then return the posts to the proper playing position as indicated by the arrows on the selecting arms.

The Changer may then be loaded with a new stack of records according to the size shown on the selecting arms.

Turning Off Changer

Throw Changer switch knob to "OFF" position.

Lift tone arm and place it in the rest position. (If you happen to turn off the Changer switch while the mechanism is going through a "change cycle," you will notice that it does not stop until the cycle has been completed, and the tone arm is again in playing position, at which point it is ready to be lifted to the rest position. If you prefer to turn off your Changer with the radio switch, be sure to turn it off while needle is resting upon a record; otherwise, the selecting arms cannot be correctly reset.

To avoid warping of records, never leave records resting on posts.

If Changer is Left Running

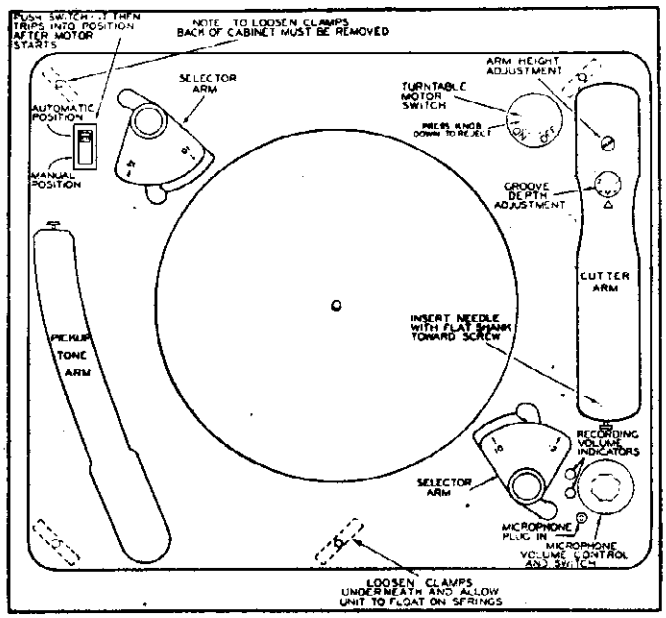
No damage will be done if you forget to turn off Changer after it has played its entire load of records. It will simply repeat the last record until stopped or reloaded.

Phonograph Needles

In general there are two types of needles which can be satisfactorily used on an Automatic Record Changer: those which require changing after approximately 12 records, and the so-called permanent type needles which are rated in terms of "hours of service." In no case should the manufacturers' claims for these needles be exceeded, since in all probability the needles are rated in terms of their maximum life.

MODEL 11AE2

BELMONT RADIO CORP.



NOTE—Some radios of this model are equipped with a recording arm on the record changer with which you can make your own records. If your radio has the recording unit follow the instructions below for making records.

The Mike volume control must be turned off (all the way left) except when recording with the microphone.

The two volume indicator lights along side the microphone volume control are used for setting the proper recording level. When recording radio programs the radio volume control should be adjusted so that the red indicator light remains off while the white continues to flicker. When recording with the microphone the lights should be adjusted in the same manner but using the microphone volume control.

Operating the Phono on Home Recordings

Turn radio on. Put phono switch in "Phono" position.

Push manual switch toward manual side to play home recordings.

Put your record on turntable and start motor. Place playback arm on record and control tone and volume with the radio volume and tone control knobs.

Be sure mike control is turned off when playing records.

Recording Radio Programs

Turn the radio on and tune in the program you wish to record. Put manual switch in manual position. Start motor and then gently lower cutting needle onto blank record, about ¼" from outer edge. Radio Volume will drop—Adjust volume control so red volume indicator light is off and white indicator light continues to flicker.

Microphone Recording

Turn the mike volume control well up. Phono pushbutton should be in "Phono" position. Put manual switch in manual position. Start motor, and set cutting needle gently on start of record. Adjust volume indicator lights the same as in recording radio programs.

NOTE: The cutting arm must be raised about three inches to move it freely across the record.

How to Make Perfect Recordings

Cutting Needle

The cutting stylus is razor sharp and must not be dropped on the record or allowed to rest on the turntable.

For best operation, the instrument should be level in all directions. To check this, place a small level, if you have one, on the turntable. If you do not have a level, a marble will do. If the marble rolls off the turntable, it is low in the direction in which it rolls. Place something under the cabinet until the machine is reasonably level.

Shavings

The cutting stylus cuts out a fine shaving that is just a little thicker than a human hair. These shavings should not be allowed to gather under the cutting stylus.

While cutting, gently brush the shavings from the left side of the record in, toward the center pin, allowing them to collect there until the recording is completed.

Do Not Use Too Much Volume

The most frequent cause of poor recordings is too much volume or overloading. If some passages of your recording are smooth and clear while others are raspy, rough and distorted, you are probably using too much volume. Overloading occurs most often on strong passages. The remedy is to reduce the volume slightly and watch the volume indicator lights.

Too little volume will show up when you play the record back. The volume control on playbacks will have to be turned up quite high and needle scratch will be excessive.

Cutting Arm Adjustments

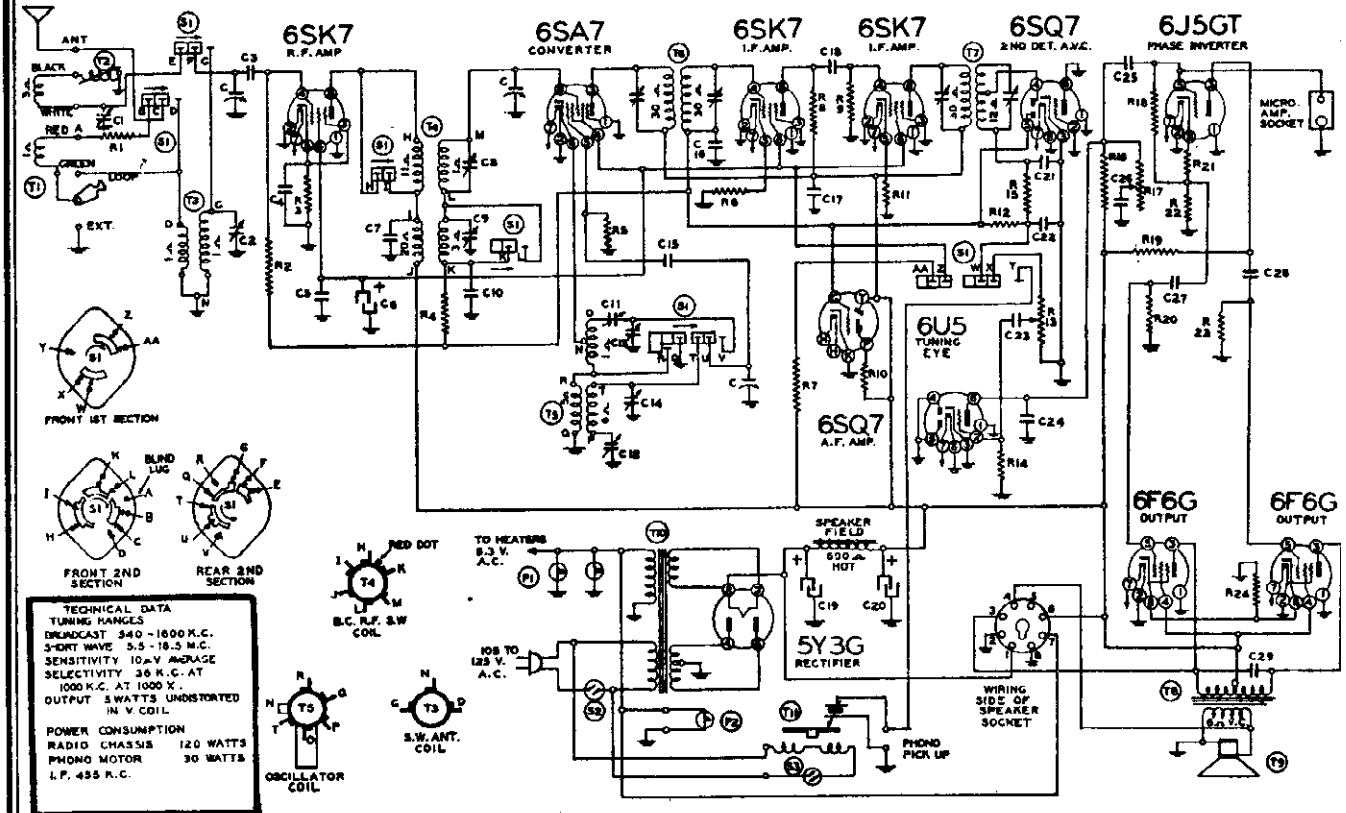
The cutting arm is adjusted at the factory for proper operation, however, with various types of blanks this adjustment may sometimes have to be altered. With a blank record on the table, the height adjustment on the cutter arm should be adjusted so that the needle screw is centered in the slot when the needle rests on a blank record.

Several blank grooves should now be cut to see if the groove is the proper depth. The depth adjustment screw on the cutter arm will increase the depth of the groove if turned to the letter "H" and will decrease the groove if turned to the letter "L"—For a medium groove turn to "M".

If the groove is too shallow, the playback needle will not stay in the groove. If it is too deep, not enough wall will be left between grooves and the playback needle will break through from one track to the next after a few playings.

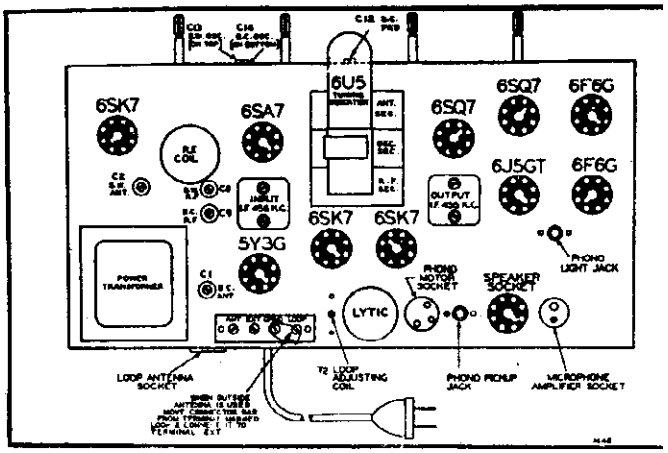
A properly cut groove will leave a shaving just a little heavier than a human hair.

BELMONT RADIO CORP



Part No.	Schematic Diagram Reference	Description	No. Used In Set	Price Each
		CONDENSERS		
102152	C	Three Gang Variable Condenser	1	4.00
10020	C4	.1 x 200 Volt Tubular Condenser	1	.25
10026	C10, C16, C25	.02 x 400 Volt Tubular Condenser	3	.25
10025	C23	.002 x 600 Volt Tubular Condenser	1	.25
1009	C27	.05 x 200 Volt Tubular Condenser	1	.25
10013	C28	.05 x 400 Volt Tubular Condenser	1	.25
10011	C26	.01 x 400 Volt Tubular Condenser	1	.25
10071	C29	.004 x 600 Volt Tubular Condenser	1	.25
100117	C5, C17	.25 x 400 Volt Tubular Condenser	2	.35
119124	C6, C19, C20	Electrolytic Filter Condenser—10 Mfd. x 350 V.; 25 Mfd. x 450 V.; 25 Mfd. x 450 V.	1	1.50
124180	C2	S.W. Antenna Trimmer	1	.55
124179	C8, C9	S.W. and B.C. R.F. Trimmer—Dual	1	.45
124181	C13, C14	S.W. and B.C. Osc. Trimmer—Dual	1	.40
124182	C1	B.C. Antenna Trimmer	1	.20
129157	C12	.000525 Compression Cond.—B.C. Pad	1	.35
1292	C3, C18	.0005 Mica Type Condenser—20%	2	.25
129160	C7	.0004 Mica Type Condenser—20%	1	.35
12939	C15	.00005 Mica Type Condenser—20%	1	.25
1295	C21, C22	.0001 Mica Type Condenser—2%	2	.25
129156	C11	.0024 Compression Mica Condenser	1	.50
12912	C24	.00025 Mica Type Condenser—20%	1	.25
		RESISTORS		
101270	R13, S2	Volume Control and Switch (500M Ohms)	1	1.25
101271	R17	Tone Control (1 Megohm)	1	.90
13019	R2, R18	1 Megohm—½ Watt Resistor—20%	2	.20
1305	R4	300M Ohm—½ Watt Resistor—20%	1	.20
130208	R5	40M Ohm—½ Watt Resistor—20%	1	.20
13054	R6, R11	500 Ohm—½ Watt Resistor—20%	2	.20
130263	R8	12M Ohm—½ Watt Resistor—20%	1	.20
13020	R9, R19, R22	100M Ohm—½ Watt Resistor—20%	3	.20
130304	R7	12M Ohm—2 Watt Resistor—10%	1	.20
13012	R15	50M Ohm—½ Watt Resistor—20%	1	.20
130170	R12	3 Megohm—½ Watt Resistor—25%	1	.20
130225	R14	15 Megohm—½ Watt Resistor—30%	1	.20
13043	R21	2500 Ohm—½ Watt Resistor—20%	1	.20
1303	R20, R23	500M Ohm—½ Watt Resistor—20%	2	.20
13011	R16	250M Ohm—½ Watt Resistor—20%	1	.20
130311	R24	300 Ohm—1 Watt Resistor—20%	1	.20
13099	R3	300 Ohm—½ Watt Resistor—20%	1	.20
13024	R1	400 Ohm—½ Watt Resistor—20%	1	.20
	R10	1 Megohm In Eye Socket	1	.20
		COILS		
108169J	T6	Input I. F. Coil Complete in Can	1	1.00
108130C	T7	Output I.F. Coil Complete in Can	1	1.25
10957	T4	B.C.—S.W. R.F. Coil Complete in Can	1	1.25
110149	T5	B.C.—S.W. Oscillator Coil	1	.75
111176	T3	S.W. Antenna Coil	1	.50
111153	T2	Loop Adjusting Coil With Iron Slug	1	.50
111257	T1	Loop Antenna Assembly	1	2.00
114261B	T9	**SPEAKER** Ten Inch Electrodynamic Speaker (Less Output Transformer)	1	6.00

FOR NEW PRODUCTS RECORD CHANGER 320 SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".



CHASSIS VIEW

ANTENNA AND GROUND TERMINALS

When using an external antenna and ground, move the metal strap (connector bar(from terminal marked LOOP and connect it to terminal marked EXT.

The antenna and ground wires should then be connected to the terminals marked "Ant." -"Gnd."

Alignment Procedure

MODEL 11A24

- Volume control—Maximum all adjustments.
- Connect dummy antenna value in series with generator output lead.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connect on to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted to Maximum (in Order Shown)
I. F.	455 Kc.	.1 MFD.	Grid of 6SK7 I. F.	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top Output I. F.
	455 Kc.	.1 MFD.	Grid of 6SA7 Mixer	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top Input I. F.
SHORT WAVE BAND	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	C13, S.W. Osc.
	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	C8, S.W. R.F., C2 S.W. Antenna
	6 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 6 Mc.	C11 S.W. Osc. Series Pad See Note "A"
BROAD-CAST BAND	1580 Kc.	200 mmf.	Grid of 6SK7 R. F. Tube	Broadcast	Rotor full open (Plates out of mesh)	C14 B.C. Osc.
	540 Kc.	200 mmf.	Grid of 6SK7 R. F. Tube	Broadcast	Set Dial at 540 Kc. (Plates in Mesh)	C12 B.C. Osc. Series Pad
	1400 Kc.	200 mmf.	Grid of 6SK7 R. F. Tube	Broadcast	Set Dial at 1400 Kc.	C9 B.C. R.F.
LOOP ALIGN-MENT	1400 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 1400 Kc.	C1 B.C. Ant.
	600 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 600 Kc.	T2 Iron Core Tracking Coil

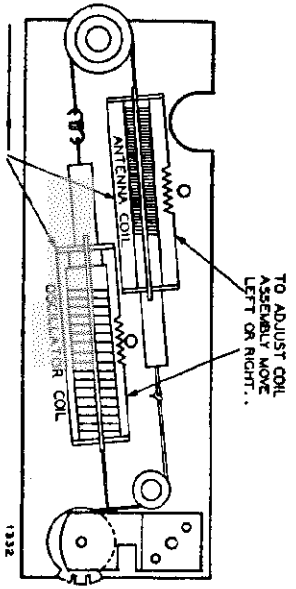
NOTE "A"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

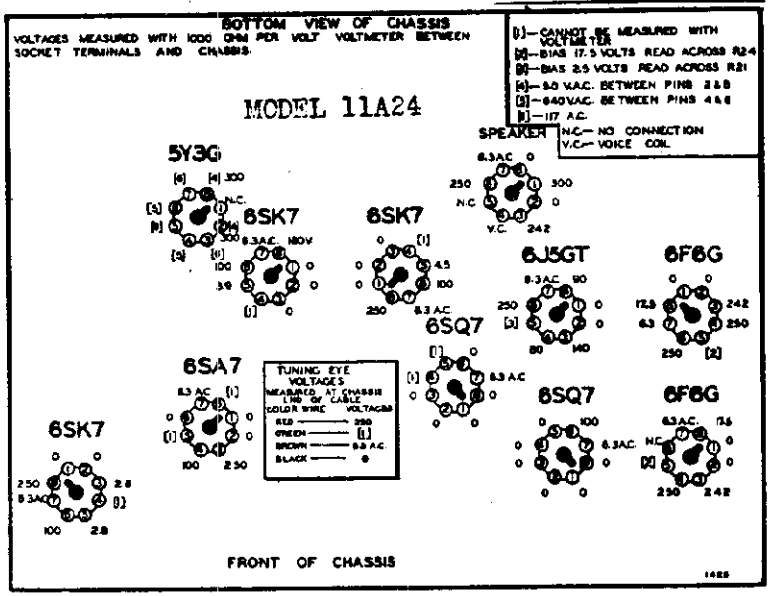
After each band is completed, repeat the procedure as a final check.

MODEL 5D16

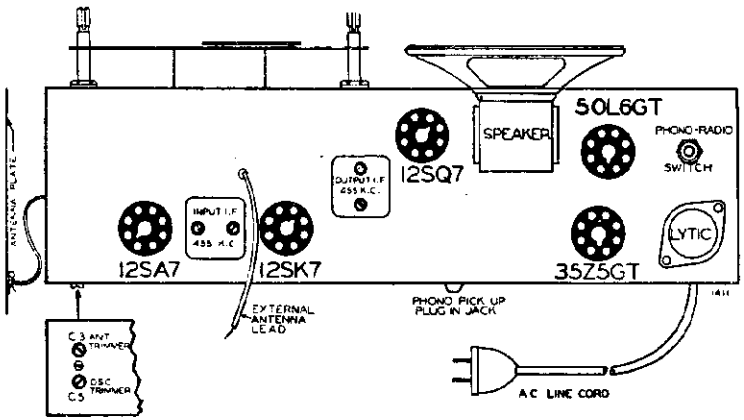
NOTE: THE ANTENNA COIL ASSEMBLY IS MADE SO THAT IT IS MOVABLE LEFT OR RIGHT. WHEN MAKING THE ADJUSTMENT AS GIVEN IN THE ALIGNMENT PROCEDURE MOVE COIL ASSEMBLY VERY SLOWLY

COIL ASSEMBLY VIEW

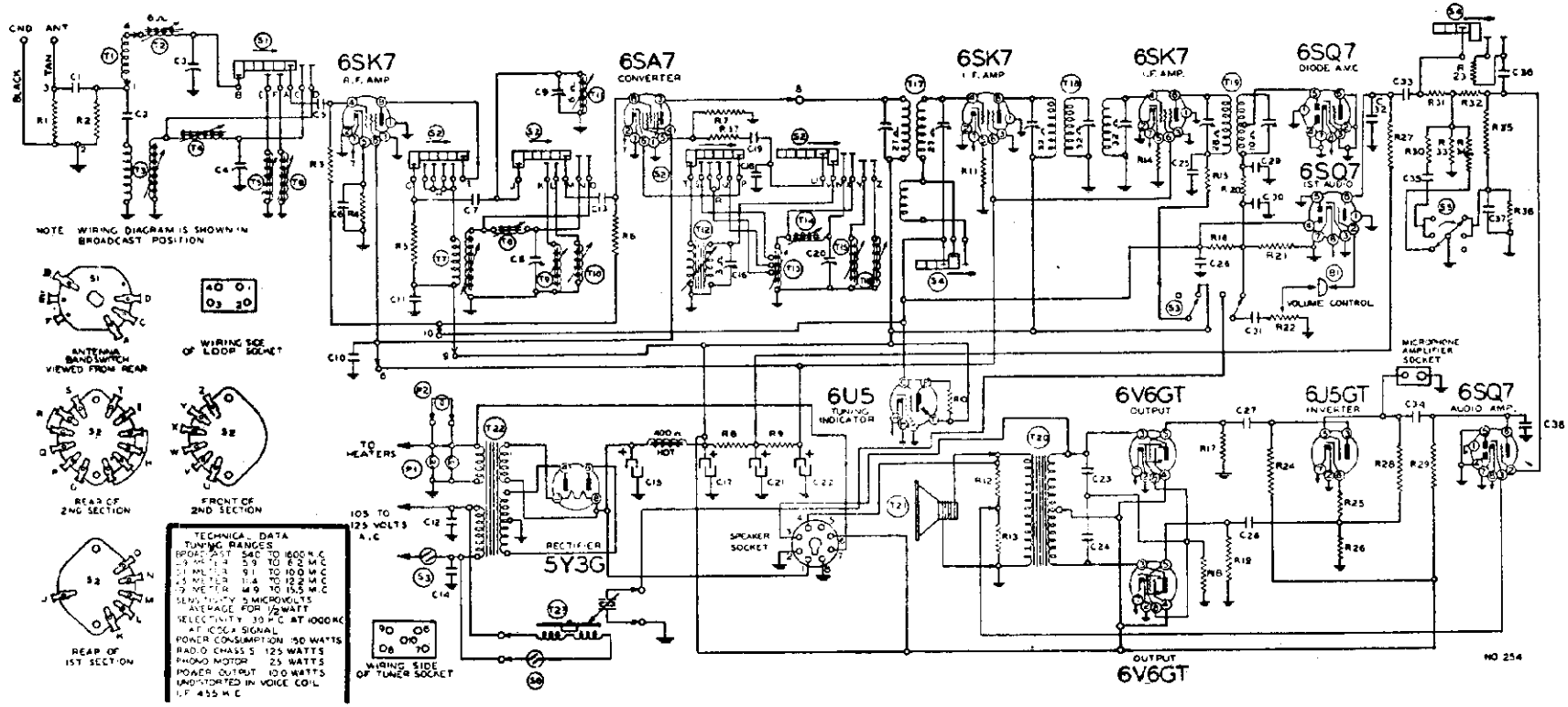


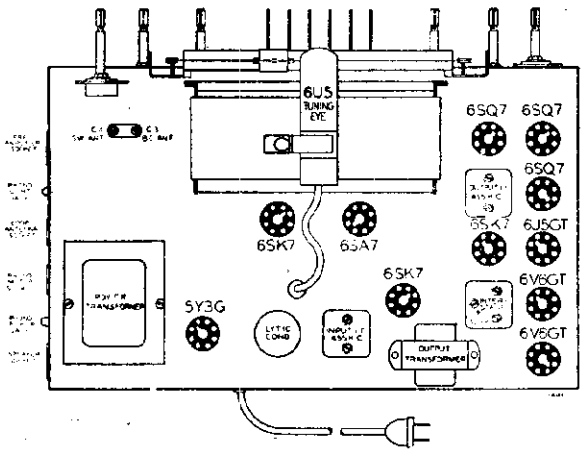


MODEL 5D16



CHASSIS VIEW—Showing tube location and type. Note External Antenna Lead at back of chassis.





CONDENSERS

C1	1292	.0005 mica
C2	10047	.002 x 600 v.
C3	124143	B.C. antenna trimmer
C4	124143	9 mc. antenna trimmer
C5	1292	.0005 mica
C6	10020	.1 x 200 v. tubular
C7	129168	.00001 mica
C8	124138	9 mc. R. F. trimmer
C9	124139	B.C. R.F. trimmer
C10	10074	.1 x 400 v.
C11	10074	.1 x 400 v.
C12	10061	.02 x 600 v.
C13	1292	.0005 mica
C14	10061	.02 x 600 v.
C15	119112	30.0 mfd. lytic
C16	124144	B.C. oscillator trimmer
C17	119112	30.0 mfd. lytic x 450 w.v.
C18	129167	.0002 silver mica
C19	129165	.00005 mica
C20	124145	9 mc. oscillator trimmer
C21	119112	10.0 mfd. lytic
C22	11969	16 mfd. x 350 w.v.
C23	10065	.015 x 600 v.
C24	10065	.015 x 600 v.
C25	1001	.1 x 400 v.
C26	10020	.1 x 200 v.
C27	10013	.05 x 400 v.
C28	1009	.05 x 200 v.
C29	1295	.0001 mica
C30	1295	.0001 mica
C31	10020	.1 x 200 v.
C32	12912	.00025 mica
C33	1001	.1 x 400 v.
C34	10013	.05 x 400 v.
C35	100118	.008 x 600 v.
C36	129185	.00009 mica
C37	10037	.003 x 600 v.
C38	12912	.00025 mica

C3 and C4 in same unit

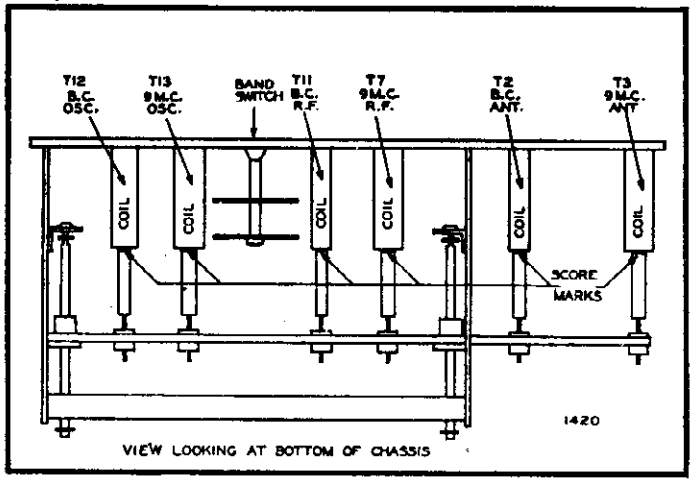
C15 C17 and C21 in same unit

RESISTORS

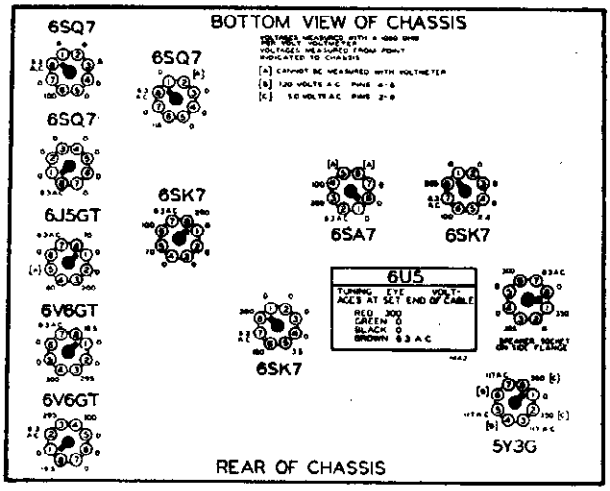
R1	130232	25M ohm—1/3 w.
R2	130232	25M ohm—1/3 w.
R3	13019	1 megohm—1/3 w.
R4	130239	250 ohm—1/3 w.
R5	130218	5M ohm—1/3 w.
R6	13019	1 megohm—1/3 w.
R7	130232	25M ohm—1/3 w.
R8	130318	6M ohm—2 w.
R9	130319	10M ohm—2 w
R10		1 megohm in tuning indicator cable
R11	13070	500 ohm—1/3 w.
R12	13082	10M ohm—1/3 w.
R13	130235	1500 ohm—1/3 w.
R14	130192	2M ohm—1/3 w.
R15	130192	2M ohm—1/3 w.
R16	13019	1 megohm—1/3 w.
R17	1303	500M ohm—1/3 w.
R18	130317	250 ohm—2 w.
R19	1303	500M ohm—1/3 w.
R20	13094	50M ohm—1/3 w.
R21	130316	120M ohm—1/3 w.
R22	101229	500M ohm volume control
R23	130191	1.5 megohm—1/3 w.
R24	13094	50M ohm—1/3 w.
R25	130218	5M ohm—1/3 w.
R26	13094	50M ohm—1/3 w.
R27	130172	250M ohm—1/3 w.
R28	1303	500M ohm—1/3 w.
R29	130172	250M ohm—1/3 w.
R30	130232	25M ohm—1/3 w.
R31	13080	150M ohm—1/3 w.
R32	130309	350M ohm—1/3 w.
R33	130266	200M ohm—1/3 w.
R34	13066	75M ohm—1/3 w.
R35	13080	150M ohm—1/3 w.
R36	130146	2 megohm—1/3 w.
R37	130174	50 ohm—1/3 w.

MODEL 12A51

BELMONT RADIO CORP.



IRON CORE ADJUSTMENT VIEW



VOLTAGE CHART

Aligning Instructions

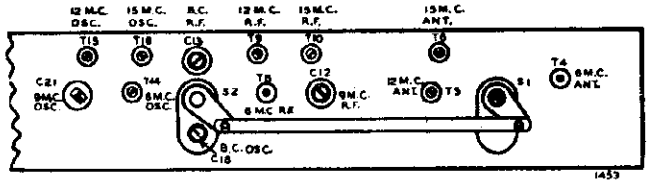
CAUTION:—No aligning adjustments should be attempted without first thoroughly checking over all other possible causes of trouble, such as poor installations, open or grounded antenna systems, low line voltage, defective tubes, condensers and resistors. In order to properly align this radio, the chassis should be removed from the cabinet. Although the short wave bands on this radio are of the band spread type the Alignment Procedure is not difficult. However because each short wave scale covers only a small portion of the short wave spectrum you must do the work carefully and your oscillator must be accurate.

Do not realign the band spread scales unless you are positive they are out of adjustment. When adjustment is necessary proceed as follows.

Tune set to high frequency end of dial scale on any band.

Rotate each iron core until the fine score marks are even with the edge of the coil forms.

You are now ready to continue with the trimmer adjustments as shown on the alignment chart.



TRIMMER VIEW

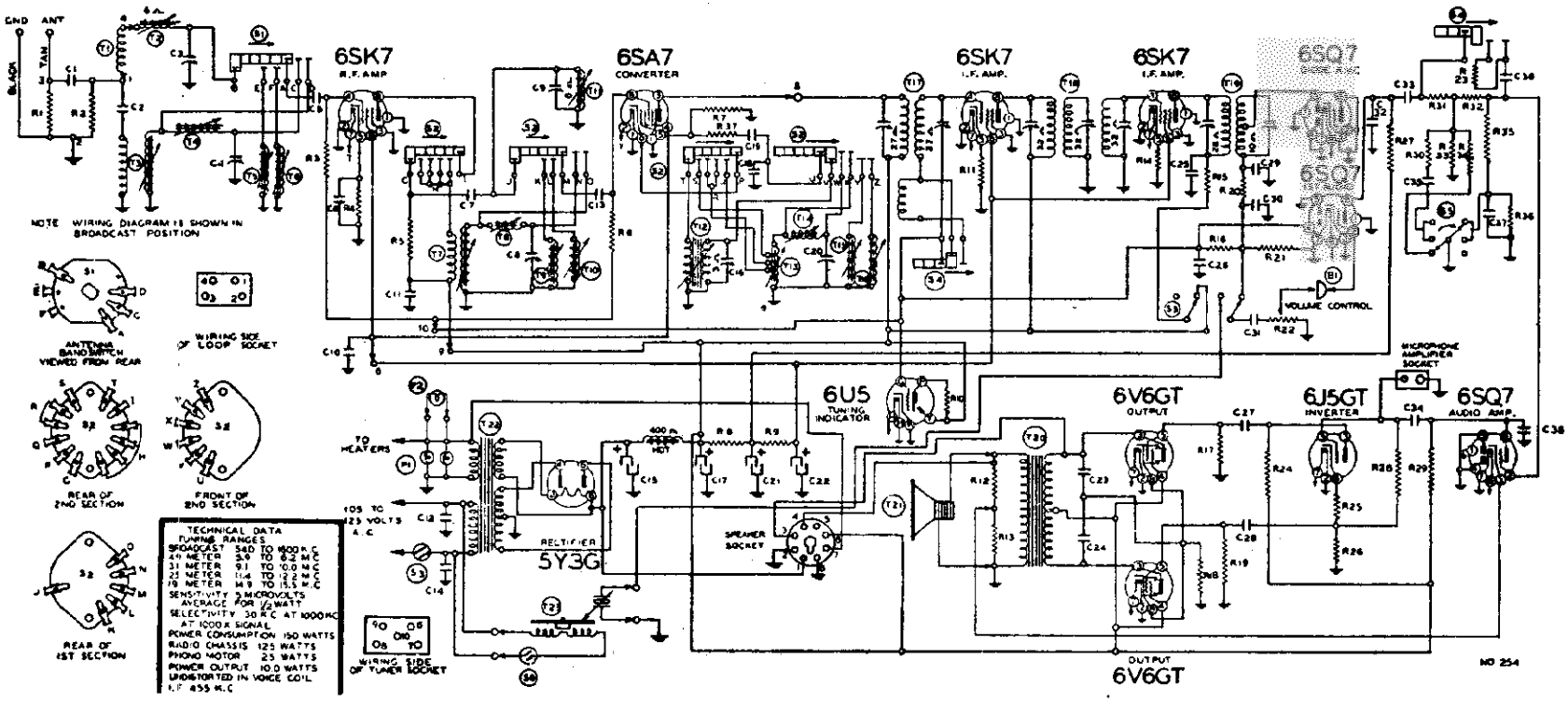
ALIGNMENT PROCEDURE

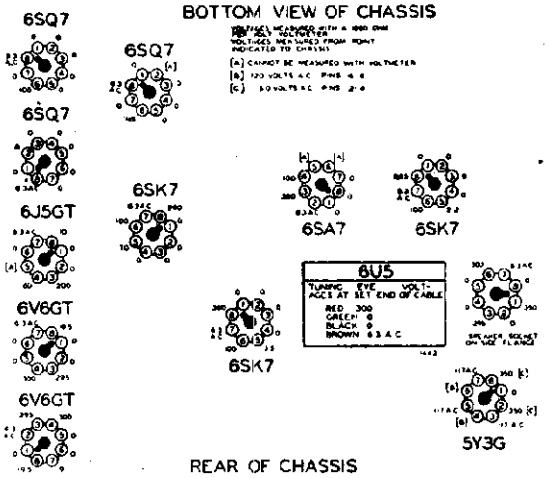
- Tone control—Treble.
- Volume control—Maximum all adjustments.
- Connect dummy antenna value in series with generator output lead.
- Use an all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Dial Pointer Setting	Trimmers Adjusted To Maximum
I. F.	455 Kc.	.1 MFD.	Grid of 6SK7 (I.F.)	Broadcast	Set Dial at 1600 Kc.	On Top of Output I. F.
	455 Kc.	.1 MFD.	Grid of 6SA7	Broadcast	Set Dial at 1600 Kc.	On Top of Input I. F.
31 METER BAND	9.6 Mc.	400 ohms	Antenna lead	31M	Set Dial at 9.6 Mc.	(See Trimmer View) C21—Osc. (See Trimmer View) C12—R.F. (See Chassis View) C4—Ant.
49 METER BAND	6.1 Mc.	400 ohms	Antenna lead	49M	Set Dial at 6.1 Mc.	(See Trimmer View) T14—Osc. (See Trimmer View) T8—R.F. (See Trimmer View) T4—Ant.
25 METER BAND	11.8 Mc.	400 ohms	Antenna lead	25M	Set Dial at 11.8 Mc.	(See Trimmer View) T15—Osc. (See Trimmer View) T9—R.F. (See Trimmer View) T5—Ant.
19 METER BAND	15.2 Mc.	400 ohms	Antenna lead	19M	Set Dial at 15.2 Mc.	(See Trimmer View) T16—Osc. (See Trimmer View) T10—R.F. (See Trimmer View) T6—Ant.
BROAD-CAST BAND	1600 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1600 Kc.	(See Trimmer View) C18—Osc. (See Trimmer View) C13—R.F. (See Chassis View) C3—Ant.
	1400 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1400 Kc.	Rotate Core T11—R.F. Rotate Core T2—Ant. (See Iron Core Adjustment View)

BELMONT RADIO CORP.

MODEL 12A52





CONDENSERS

1001	C25, C33	.1 x 400 Volt Tubular Condenser	2
10020	C26, C31	.1 x 200 Volt Tubular Condenser	2
10037	C37	.003 x 600 Volt Tubular Condenser	1
10013	C27, C34	.05 x 400 Volt Tubular Condenser	2
1009	C28	.05 x 200 Volt Tubular Condenser	1
10065	C23, C24	.015 x 600 Volt Tubular Condenser	2
100118	C35	.008 x 600 Volt Tubular Condenser	1
10061	C12, C14	.02 x 600 Volt Bakelite Condenser	2
119112	C15, C17, C21	Electrolytic Filter Condenser 30 Mfd.; 30 Mfd., 10 Mfd. x 450 Volts	1
		OR	
119112B	C15, C17, C21	Electrolytic Filter Condenser 30 Mfd.; 30 Mfd.; 10 Mfd.; x 450 Volts	1
11969	C22	Electrolytic Filter Condenser 16 Mfd. x 350 Volts	1
1292	C13	.0005 Mica Type Condenser	1
12912	C32, C38	.00025 Mica Type Condenser	2
1295	C29, C30	.0001 Mica Type Condenser	2
129185	C36	.00009 Mica Type Condenser	1
10020	C6	.1 x 200 Volt Tubular Condenser	1
10047	C2	.002 x 600 Volt Tubular Condenser	1
10074	C10, C11	.1 x 400 Volt Tubular Condenser	2
124138	C8	9 Mc., R.F. Adjustable Trimmer Condenser	1
124139	C9	B.C., R.F. Adjustable Trimmer Condenser	1
124143	C3, C4	B.C. and 9 Mc. Dual Adjustable Antenna Trimmer Condenser	1
124144	C16	B.C. Oscillator Adjustable Trimmer Condenser	1
124145	C20	9 Mc. Oscillator Adjustable Trimmer Condenser	1
1292	C1, C5	.0005 Mica Type Condenser—20%	1
129165	C19	.00005 Mica Type Condenser—10%	1
129168	C7	.00001 Mica Type Condenser—20%	1
129167	C18	.0002 Silver Mica Type Condenser—3%	1

RESISTORS

101229	R22	Volume Control (500M Ohms)	1
130232	R1, R2, R30	25M Ohm—1/2 Watt Resistor—10%	3
130318	R8	6M Ohm—2 Watt Resistor—10%	1
130319	R9	10M Ohm—2 Watt Resistor—10%	1
13070	R11	500 Ohm—1/2 Watt Resistor—10%	1
130235	R13	1500 Ohm—1/2 Watt Resistor—10%	1
13082	R12	10M Ohm—1/2 Watt Resistor—10%	1
1303	R17, R19, R28	500M Ohm—1/4 Watt Resistor—20%	3
130317	R18	250 Ohm—2 Watt Resistor—10%	1
13094	R20, R24, R26	50M Ohm—1/2 Watt Resistor—10%	3
130218	R25	5M Ohm—1/2 Watt Resistor—10%	1
13019	R3, R6	1 Megohm—1/2 Watt Resistor—20%	2
130218	R5	5M Ohm—1/2 Watt Resistor—10%	1
130232	R7	25M Ohm—1/2 Watt Resistor—10%	1
130239	R4	250 Ohm—1/2 Watt Resistor—10%	1
	R10	1 Megohm—In Tuning Eye Cable	1
130174	R37	50 Ohm—1/2 Watt Resistor	1
130192	R14, R15	2M Ohm—1/2 Watt Resistor—10%	2
130172	R27, R29	250M Ohm—1/2 Watt Resistor—10%	2
130316	R21	120M Ohm—1/2 Watt Resistor—10%	1
13019	R16	1 Megohm—1/2 Watt Resistor—20%	1
13080	R31, R35	150M Ohm—1/2 Watt Resistor—10%	2
130146	R36	2 Megohm—1/2 Watt Resistor—10%	1
130309	R32	350M Ohm—1/2 Watt Resistor—10%	1
130268	R33	200M Ohm—1/2 Watt Resistor—10%	1
13066	R34	75M Ohm—1/2 Watt Resistor—10%	1
130191	R23	1.5 Megohm—1/2 Watt Resistor—10%	1

MODEL 12A52

BELMONT RADIO CORP.

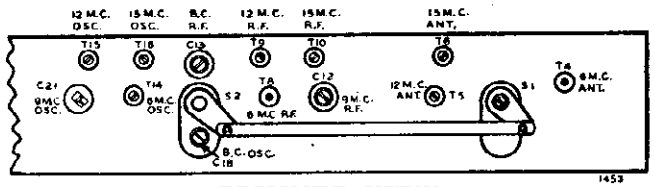
ALIGNMENT PROCEDURE

October, 1941

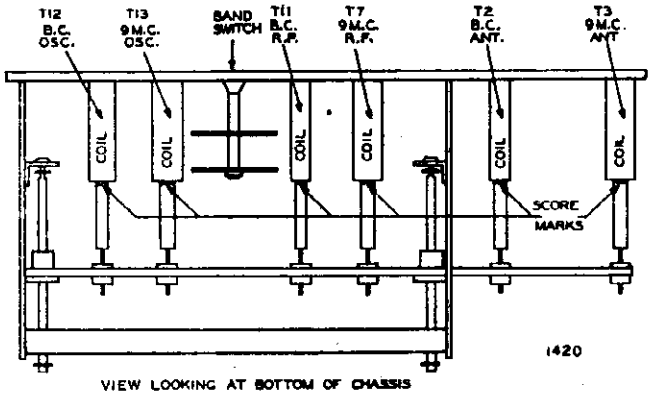
- Tone control—Treble.
- Volume control—Maximum all adjustments.
- Use an all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Dial Pointer Setting	Trimmers Adjusted To Maximum
I. F.	455 Kc.	.1 MFD.	Grid of 6SK7 (I.F.)	Broadcast	Set Dial at 1600 Kc.	On Top of Output I.F.
	455 Kc.	.1 MFD.	Grid of 6SA7	Broadcast	Set Dial at 1600 Kc.	On Top of Input I.F.
31 METER BAND	9.6 Mc.	400 ohms	Antenna lead	31M	Set Dial at 9.6 Mc.	(See Trimmer View) C21—Osc. (See Trimmer View) C12—R.F. (See Chassis View) C4—Ant.
49 METER BAND	6.1 Mc.	400 ohms	Antenna lead	49M	Set Dial at 6.1 Mc.	(See Trimmer View) T14—Osc. (See Trimmer View) T8—R.F. (See Trimmer View) T4—Ant.
25 METER BAND	11.8 Mc.	400 ohms	Antenna lead	25M	Set Dial at 11.8 Mc.	(See Trimmer View) T15—Osc. (See Trimmer View) T9—R.F. (See Trimmer View) T5—Ant.
19 METER BAND	15.2 Mc.	400 ohms	Antenna lead	19M	Set Dial at 15.2 Mc.	(See Trimmer View) T16—Osc. (See Trimmer View) T10—R.F. (See Trimmer View) T6—Ant.
BROADCAST BAND	1600 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1600 Kc.	(See Trimmer View) C18—Osc. (See Trimmer View) C13—R.F. (See Chassis View) C3—Ant.
	1400 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1400 Kc.	Rotate Core T11—R.F. Rotate Core T2—Ant. (See Iron Core Adjustment View)

IMPORTANT: Before removing chassis, remove the escutcheon and dial scale and then the pointer which is fastened to the pointer carriage by a small screw.



TRIMMER VIEW



VIEW LOOKING AT BOTTOM OF CHASSIS

IRON CORE ADJUSTMENT VIEW

COILS

108210 T17	Input I. F. Coil	1	1.25
108155C T18	Interstage I. F. Coil	1	1.25
108209 T19	Output I. F. Coil	1	1.25
111209 T1	Loop Antenna Assembly	1	2.00

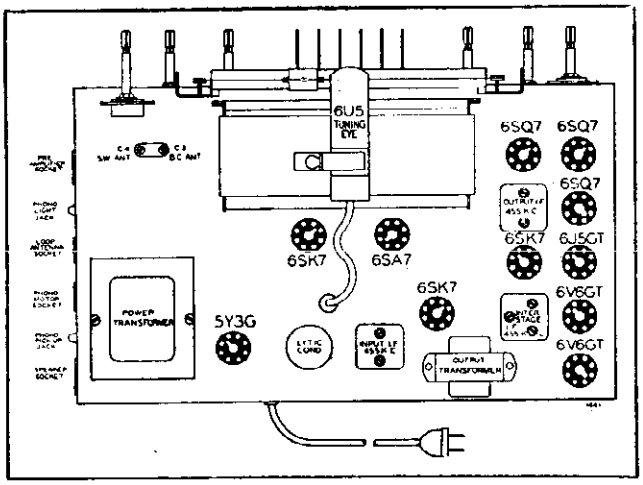
SPEAKER

114269 T21	Twelve Inch Electrodynamic Speaker (Less Output Transformer)	1	9.00
105115B T20	Output Transformer for Speaker	1	1.25

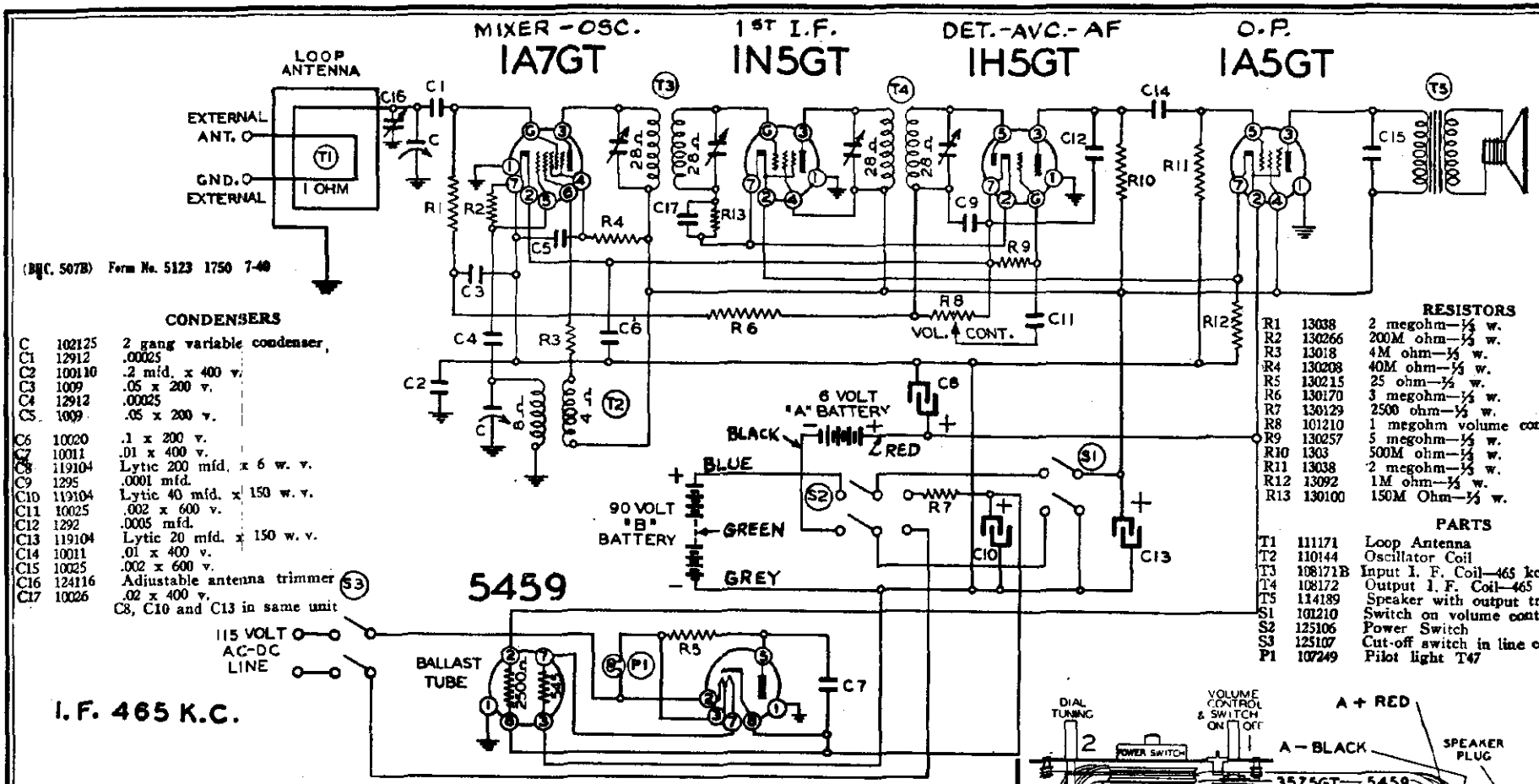
Setting the Pushbuttons

Make a list of your 6 favorite stations. Push out the call letters of these stations from the call letter sheets supplied. Insert a call letter in the slot on top of each pushbutton.

Next pull one of the pushbuttons all the way out as far as it will come. Now tune in the station you want with the tuning knob—Tune back and forth until the station is clear and distinct. Now push the button hard all the way in to lock the station in place, (push directly on front of button). Continue setting each pushbutton in the same way. Pressing the proper button will now tune the station you want. If it does not do so you did not push the button hard enough to lock it in place when setting up the station.



CHASSIS VIEW



(BJC. 507B) Form No. 5123 1750 7-40

CONDENSERS

C	102125	2 gang variable condenser
C1	12912	.00025
C2	100110	.2 mfd. x 400 v.
C3	1009	.05 x 200 v.
C4	12912	.00025
C5	1009	.05 x 200 v.
C6	10020	.1 x 200 v.
C7	10011	.01 x 400 v.
C8	119104	Lytic 200 mfd. x 6 w. v.
C9	1295	.0001 mfd.
C10	119104	Lytic 40 mfd. x 150 w. v.
C11	10025	.002 x 600 v.
C12	1292	.0005 mfd.
C13	119104	Lytic 20 mfd. x 150 w. v.
C14	10011	.01 x 400 v.
C15	10025	.002 x 600 v.
C16	124116	Adjustable antenna trimmer
C17	10026	.02 x 400 v.

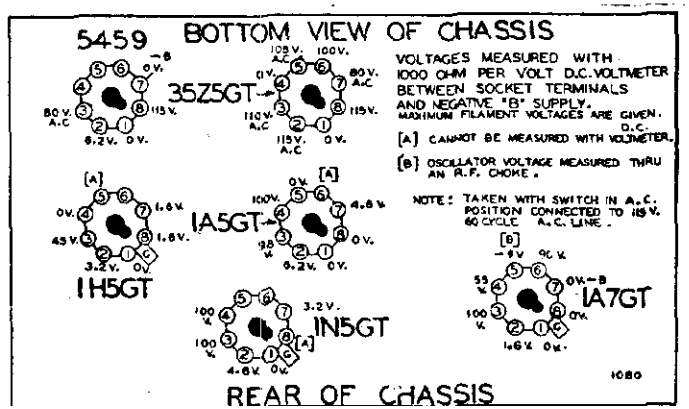
C8, C10 and C13 in same unit

RESISTORS

R1	13038	2 megohm—½ w.
R2	130266	200M ohm—½ w.
R3	13018	4M ohm—½ w.
R4	130208	40M ohm—½ w.
R5	130215	25 ohm—½ w.
R6	130170	3 megohm—½ w.
R7	130129	2500 ohm—½ w.
R8	101210	1 megohm volume cont
R9	130257	5 megohm—½ w.
R10	1303	500M ohm—½ w.
R11	13038	2 megohm—½ w.
R12	13092	1M ohm—½ w.
R13	130100	150M Ohm—½ w.

PARTS

T1	111171	Loop Antenna
T2	110144	Oscillator Coil
T3	108171B	Input I. F. Coil—465 kc.
T4	108172	Output I. F. Coil—465 kc.
T5	114189	Speaker with output trans
S1	101210	Switch on volume control
S2	125106	Power Switch
S3	125107	Cut-off switch in line cord
P1	107249	Pilot light T47



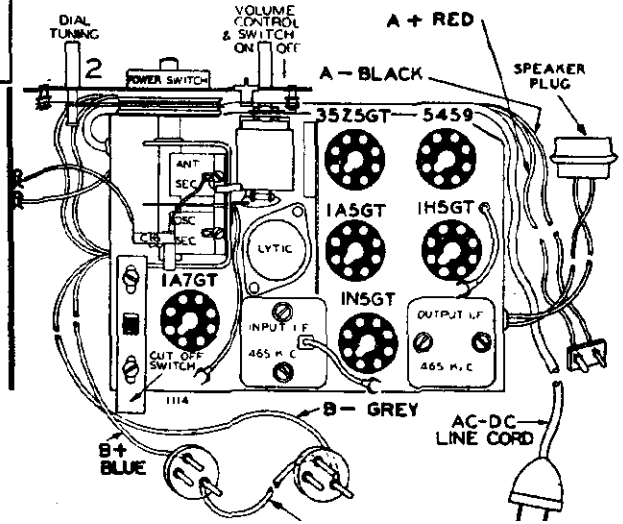
RECT.
35Z5GT

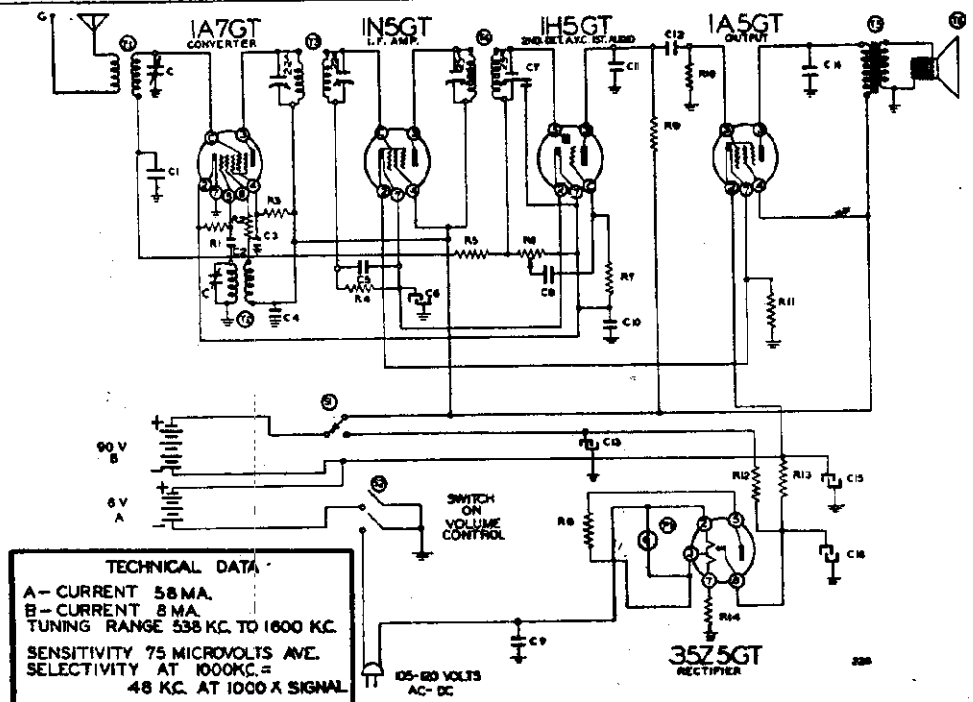
ALIGNMENT FREQUENCIES:

IF - 465kc, 4 trims. thru .1mf dummy

BC - 1500kc, osc. trim. thru .1mf dummy
1400 kc, ant. trim C16 thru 200 mmf dummy

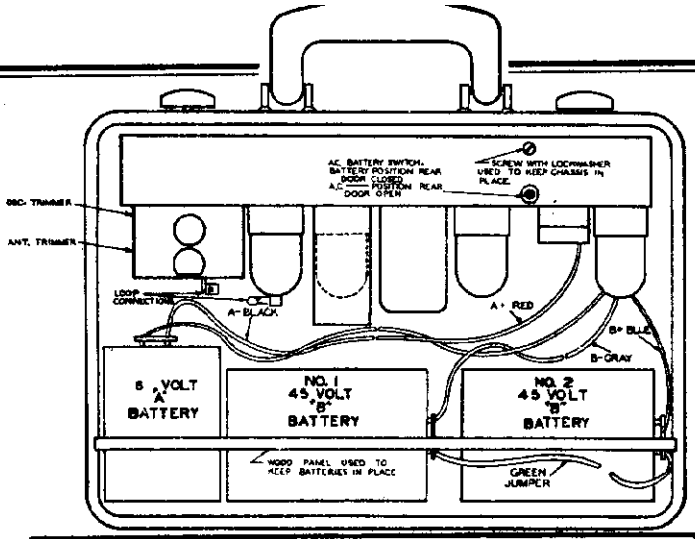
POWER CONSUMPTION - 35 watts
POWER O.P. - 100 to 200 Max.

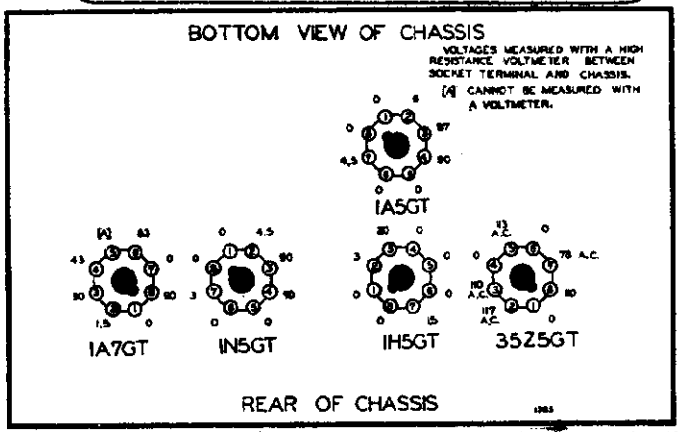


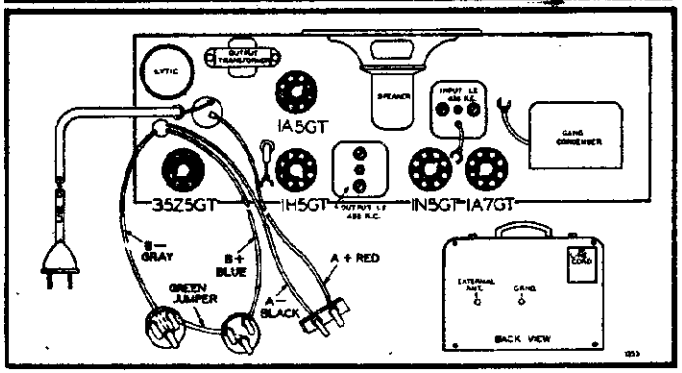


TECHNICAL DATA

A – CURRENT 58 MA.
B – CURRENT 8 MA.
TUNING RANGE 538 KC. TO 1600 KC.
SENSITIVITY 75 MICROVOLTS AVE.
SELECTIVITY AT 1000KC. = 48 K.C. AT 1000 X SIGNAL
OUTPUT 180 MW UNDISTORED 3 OHM VOICE COIL
I.F. 455 K.C.







CHASSIS VIEW showing tube location and battery cables —INSET back view, shows external ant. and ground connections.

Code No.	Part No.	Description

RESISTORS

R1	1309	200M ohm—⅓ w.
R2	130193	3M ohm—⅓ w.
R3	130305	65M ohm—⅓ w.
R4	130225	15 megohm—⅓ w.
R5	1304	3 megohm—⅓ w.
R6	101252	1 megohm—Volume control
R7	130223	10 megohm—⅓ w.
R8	130197	20 ohm—⅓ w.
R9	13019	1 megohm—⅓ w.
R10	1304	3 megohm—⅓ w.
R11	130345	1M ohm—⅓ w.
R12	130129	2500 ohm—⅓ w.
R13	130344	1975 ohm—6 watt
R14	130343	545 ohm—14 watt

CONDENSERS

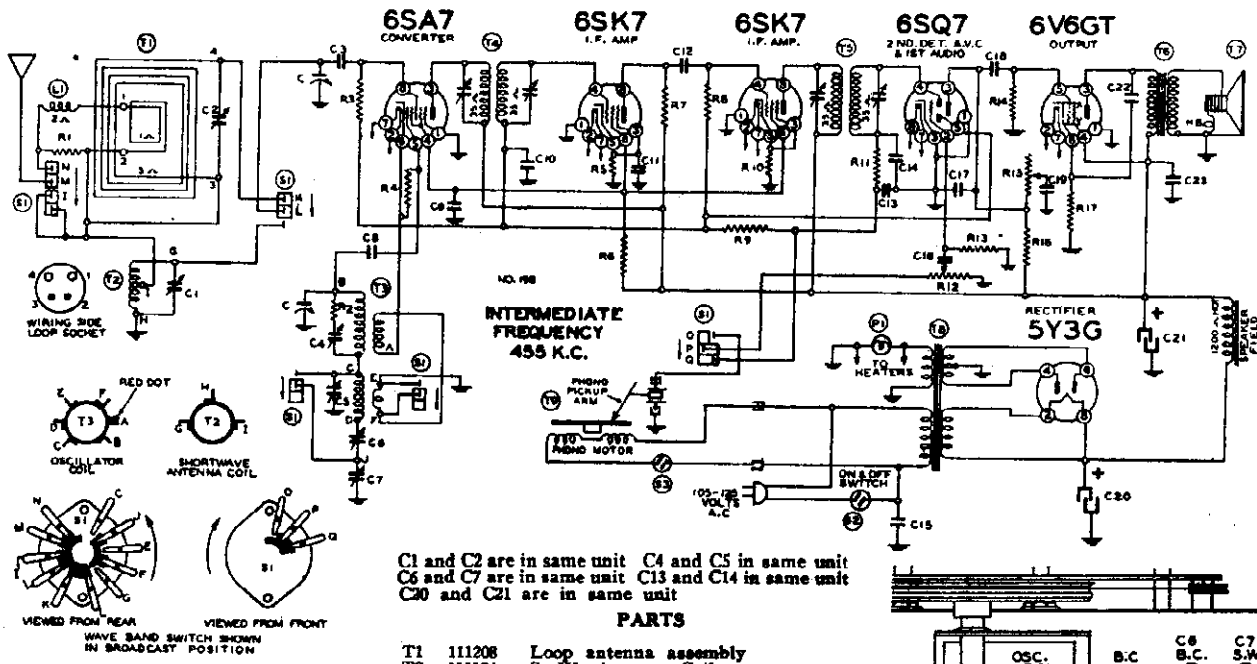
C	102141	Gang condenser
C1	1009	.05 x 200 v. condenser
C2	1295	.0001 mica
C3	100128	.05 x 120 v. condenser
C4	100135	.25 x 120 v. condenser
C5	100127	.01 x 120 v. condenser
C6	119123	20.0 mfd.—50 w. v. Lytic
C7		Approximately 100 mfd. in I.F. can
C8	100134	.006 x 120 v. condenser
C9	10013	.05 x 400 v. condenser
C10	100133	.1 x 120 v. condenser
C11	1295	.0001 mica
C12	100127	.01 x 120 v. condenser
C13	119123	40.0 mfd.—150 w. v. Lytic
C14	10025	.002 x 600 v. condenser
C15	119123	200.0 mfd.—10 w. v. Lytic
C16	119123	40.0 mfd.—150 w. v. Lytic
		C6, C13, C15 and C16 are in one unit

PARTS

T1	111241	Loop antenna assembly
T2	110179	Oscillator coil
T3	108201	Input I. F. coil
T4	108200	Output I. F. coil
T5	105127	Output transformer
T6	114240	Speaker 5" P.M.
S1	125153	A. C. Battery switch
S2	101252	Switch on Volume control
P1	107362	Pilot Lite bulb—T47

FOR ALIGNMENT SEE INDEX

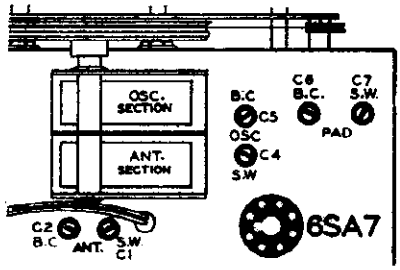
BELMONT RADIO CORP.



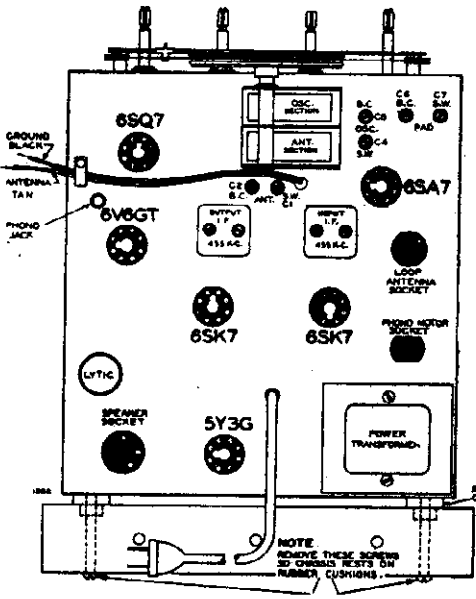
C1 and C2 are in same unit C4 and C5 in same unit
C6 and C7 are in same unit C13 and C14 in same unit
C20 and C21 are in same unit

PARTS

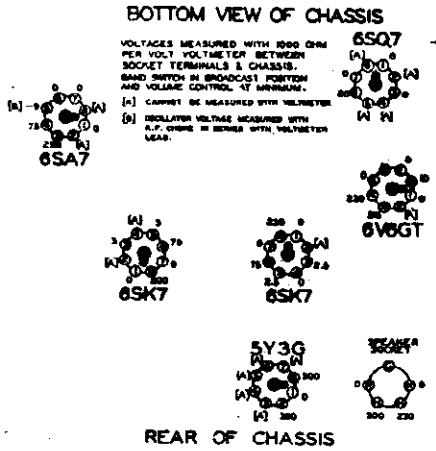
T1	111208	Loop antenna assembly
T2	111184	S. W. Antenna Coil
T3	110154	B. C. and S. W. Oscillator Coil
T4	108169E	Input I. F. Coil—455 kc.
T5	108106U	Output I.F. Coil—455 kc.
T6	105118	Output Transformer
T7	114216	8" Electro Dynamic Speaker
T7	114222	10" Electro Dynamic Speaker
T8	104225B	60 cycle power transformer
and	104238B	25 cycle power transformer
T9	104263	60 cycle G. I. Record Changer and Phono Assembly
S1	125132	Phono-band switch
S2		Switch on volume control
S3		Switch on record changer
L1	12312	R. F. Choke coil
P1	10794	Pilot light bulb No. T-44



TRIMMER VIEW



BOTTOM VIEW OF CHASSIS



REAR OF CHASSIS

Code No.	Part No.	Description
		RESISTORS
R1	13071	4000 ohm—⅓ w.
R2	130128	20 ohm—½ w.
R3	13019	1 megohm—½ w.
R4	130236	30M ohm—½ w.
R5	130283	750 ohm—½ w.
R6	130324	18M ohm—1 watt
R7	130218	5M ohm—½ w.
R8	13020	100M ohm—½ w.
R9	130170	3 megohm—½ w.
R10	130222	350 ohm—½ w.
R11	13012	50M ohm—½ w.
R12	101232	1 megohm volume control
R13	130223	10 megohm—½ w.
R14	1303	500M ohm—½ w.
R15	101231	1 megohm tone control
R16	130172	250M ohm—½ w.
R17	130323	270 ohm—1 watt
		CONDENSERS
C	102137	Two gang variable condenser
C1	124149	S. W. Antenna trimmer
C2	124149	B. C. Antenna trimmer
C3	1292	.0005 mica
C4	124142	S. W. Oscillator trimmer
C5	124142	B. C. Oscillator trimmer
C6	124146	B. C. Padding Condenser
C7	124146	S. W. Padding Condenser
C8	12960	150 mmfd. mica
C9	10013	.05 x 400 v.
C10	10022	.05 x 200 v.
C11	1009	.05 x 200 v.
C12	1292	.0005 mica
C13	129161	.0001 mica
C14	129161	.0001 mica
C15	10061	.02 x 600 v.
C16	10025	.002 x 600 v.
C17	12912	.00025 mica
C18	10026	.02 x 400 v.
C19	10071	.004 x 600 v.
C20	119115	16 mfd. x 400 w. v. lytic
C21	119115	16 mfd. x 400 w. v. lytic
C22	10019	.006 x 600 v.
C23	1001	.1 x 400 v.

FOR GENERAL INSTRUMENT 102 RECORD CHANGER, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

Power Consumption — Radio Only - - - - - 70 Watts; Motor Only - - - - - 20 Watts
Power Output - - - - - - - - 2.1 Watts Undistorted
Sensitivity for 500 Milliwatt Output: 15 Microvolts Average
Selectivity - 51 KC Broad at 1000 Times Signal at 1000 KC
Tuning Frequency Range Broadcast Band - 530 to 1600 KC
Shortwave Band - 5.46 to 18.3 MC
Intermediate Frequency - - - - - - - - - - 455 KC
Speaker - - - - - - - - - 8 in. Electro Dynamic or 10 in. Electro Dynamic

MODEL 671B

BELMONT RADIO CORP.

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio ground to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- 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., 400 ohms.

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (In Order Shown)	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD	Grid of 6SA7 Mixer	Broadcast	Rotor full open (Plates out of mesh)	Trimmers on top (See Top View)	Input and Output I. F.	Adjust to maximum output
SHORT WAVE BAND (See Note A)	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C4	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C1	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 6 Mc.	Trimmer C7	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "C")
BROAD-CAST BAND (See Note A)	1600 Kc.	200 mmf.	Grid of 6SA7	Broadcast	Rotor full open (Plates out of mesh)	Trimmer C5	Broadcast oscillator	Adjust to maximum output
	530 Kc	200 mmf.	Grid of 6SA7	Broadcast	Rotor full closed	Trimmer C6	Broadcast oscillator series pad	Adjust to maximum output
LOOP ALIGN-MENT (See Note B)	1400 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 1400 Kc.	Trimmer C2 (See Top View)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 600 Kc.	Trimmer C6 (See Top View)	Broadcast oscillator series pad	Adjust to maximum output

NOTE "A"—The signal generator is connected to the "ANT." and "GND" leads when aligning the **Short Wave Band** and to the grid of the 6SA7 tube and ground terminal when setting the **Broadcast Band** oscillator end frequencies, (1600 and 530 K. C.).

The loop antenna should be connected to the radio when making these adjustments.

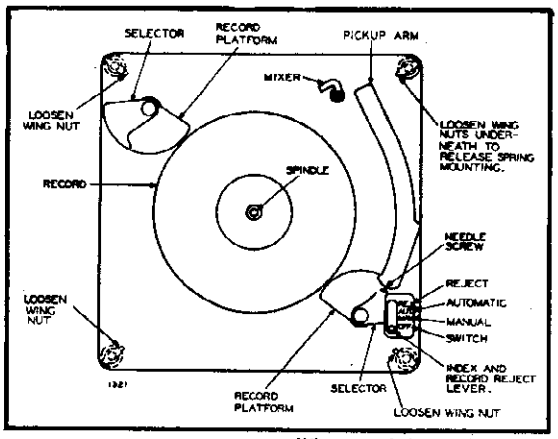
NOTE "B"—Loop alignment is made with the chassis mounted in the cabinet and the loop antenna connected. The signal generator is connected to the "ANT." and "GND." leads.

NOTE "C"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each band is completed, repeat the procedure as a final check.

Automatic Record Changer—Operating Instructions



General

This Record Changer will play automatically a series of standard 10- or 12 inch records of the type generally available today, or records of any size up to 12 inches changed manually. This Changer does not require any adjustment by operator for playing different size records. Stacks of mixed sizes may be played but this is not recommended or guaranteed. Records of the last few years with the standard eccentric or spiral finishing groove will operate the automatic mechanism.

Controls and Moving Mechanism

Index and Record Reject Lever: This lever is located near the right front corner of the phonograph with its index plate marked for four positions—

OFF.-MAN.-AUT.-REJ.

When you desire to change record selections manually, this lever should be set in the "MAN." (MANUAL) position.

To play a series of records, the lever should be set at the "AUT." (AUTOMATIC) position.

To reject a record being played, or to start the record-changing cycle, in case the record just played does not have the standard eccentric or spiral stopping groove; simply push the lever to the "REJ." (REJECT) position and let go. The pickup arm will raise up and swing outwards and the next record will drop.

Keep the lever in its "MAN." position when not actually playing records automatically.

To start the turntable set the switch to the "MAN." or "AUT." position. To stop the turntable, set the switch to the "OFF" position.

Manual Operation

1. Insert Needle in pickup and clamp securely with needle screw protruding from front of pickup arm.
2. Lift record platforms and rotate away from turntable.
3. Place record to be played on turntable.
4. Advance index and reject lever to "MAN."
5. Place needle on blank edge of record and push pickup arm gently toward center to start needle in groove.
6. When playing is completed lift pickup arm slightly to clear record and replace same on rest.
7. Return index and reject lever to "OFF".

Automatic Operation

1. Insert long playing needle in pickup and clamp securely with needle screw protruding from front of pickup arm. Return arm to rest.
2. Rotate record platforms to index position (locked in place by pin).
3. Place records to be played over the turntable spindle and on the record platforms.
4. Push index and reject lever to "REJ." position and release.

The first record will then feed and play thru, followed by the balance of the records.

5. After last record has been played, allow pickup arm to reset on record. Return arm to rest and push lever to "OFF".
6. Raise and turn record platforms away from turntable.
7. Remove records carefully from turntable. Be careful not to strain spindle.

CAUTION—This Changer is designed and built to play standard 10- and 12-inch records in good condition automatically. To obtain the benefit of satisfactory operation it is necessary that instructions be followed explicitly and in no case use force, as this may cause damage.

Mechanism

Do not rotate turntable in reverse direction or bend or strain turntable spindle when loading or unloading records.

Do not overload with records. The maximum load is either:

10 - 12 inch records
12 - 10 inch records
10 - 10 and 12 inch records mixed

Do not touch pickup arm when it is in motion during automatic function or stop the mechanism until pickup arm reaches playing position and is returned to rest provided.

Do not move platforms by selector. Always raise and turn by hub of record platform.

Records

Do not use warped records; records with rough, square, or uneven edges; records that are extra thin or extra thick.

Do not use other than standard 10 inch or 12 inch records.

Do not leave records on record platforms. This will cause warpage.

Needles

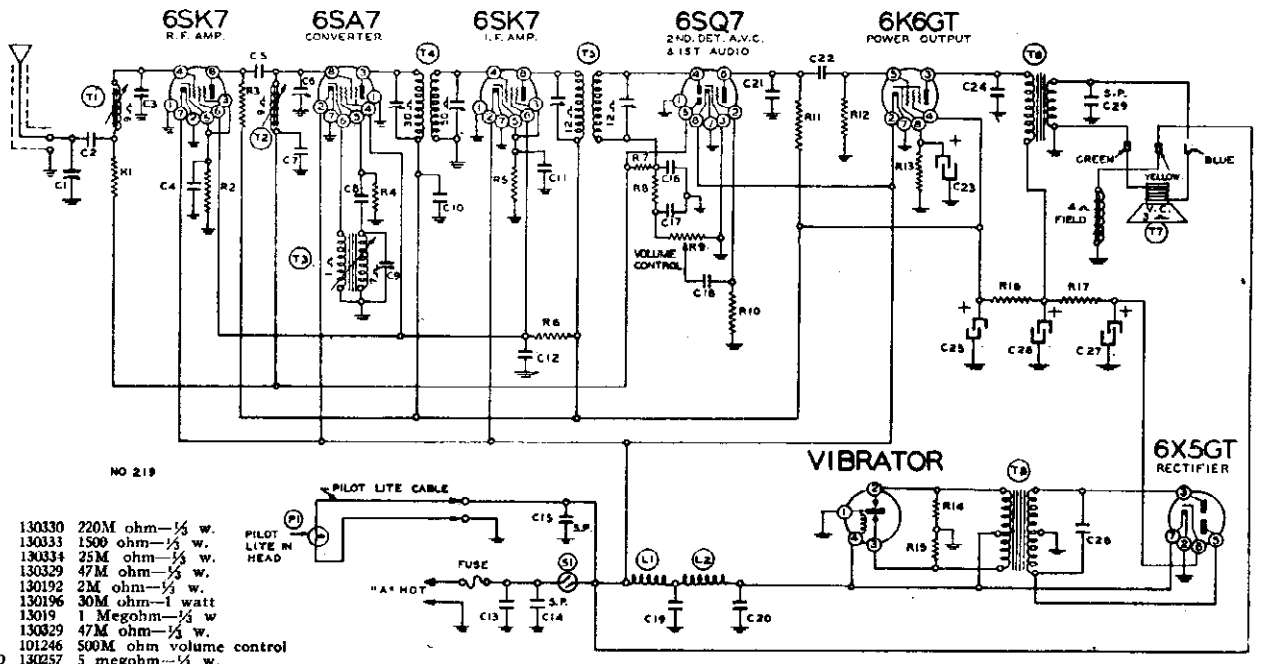
Single-playing needles may be used for manual operation, but they are somewhat inconvenient.

Multiple-playing needles are essential for automatic operation to conserve record life, as well as being a convenience for manual operation.

NEVER put a needle into pickup, once it has been removed, since this will result in unnecessary wear on the records—many times that resulting from normal use.

BELMONT RADIO CORP.

MODEL 679, Series A

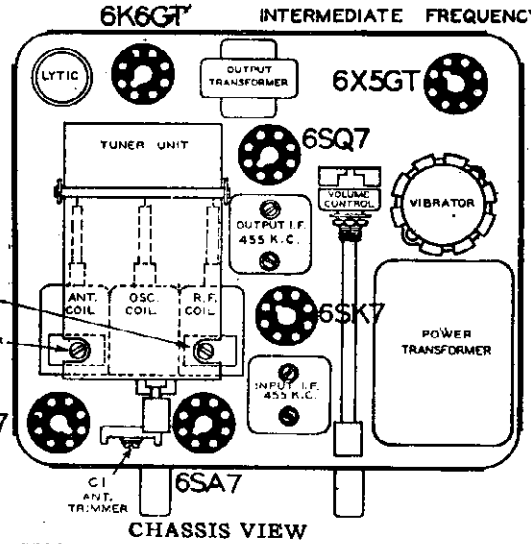


R1	130330	220M ohm—½ w.
R2	130333	1500 ohm—½ w.
R3	130334	25M ohm—½ w.
R4	130329	47M ohm—½ w.
R5	130192	2M ohm—½ w.
R6	130196	30M ohm—1 watt
R7	13019	1 Megohm—½ w
R8	130329	47M ohm—½ w.
R9	101246	500M ohm volume control
R10	130257	5 megohm—½ w.
R11	13011	250M ohm—½ w.
R12	13019	1 Megohm—½ w.
R13	130267	550 ohm—½ w.
R14	130168	100 ohm—½ w.
R15	130168	100 ohm—½ w.
R16	130199	1500 ohm—1 watt
R17	130168	100 ohm—½ w.
C1	124157	Antenna Trimmer
C2	100127	.01 x 120 v.
C3	129172	.0001 Ceramicon
C4	100128	.05 x 120 v.
C5	129145	.00001 Ceramicon
C6	124159	R.F. Trimmer
C7	100129	.02 x 120 v.
C8	100172	.0001 Ceramicon
C9	124158	Oscillator Trimmer
C10	1001	.1 x 400 v.
C11	100128	.05 x 120 v.
C12	10053	.25 x 400 v.
C13	10031	.5 x 120 v.
C14	115687	Spark Plate
C15	115710	Spark Plate
C16	129165B	.00005 Mica
C17	129165B	.00005 Mica
C18	100127	.01 x 120 v.
C19	10031	.5 x 120 v.
C20	10031	.5 x 120 v.
C21	100130	.00025 x 400 v.
C22	100130	.02 x 400 v.
C23	11975	10.0 mfd. x 25 volt lytic
C24	10087	.01 x 600 v.
C25	119120	15.0 mfd. x 350 v. lytic
C26	119120	15.0 mfd. x 350 v. lytic
C27	119120	15.0 mfd. x 350 v. lytic
C28	100100	.008 x 1600 v.
C29	115710	Spark Plate

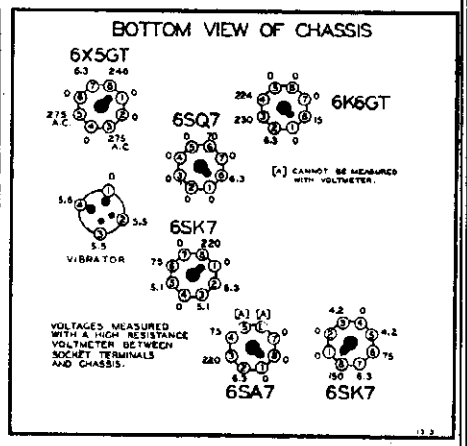
C16 and C17 are in same unit.
C21 and C22 are in same unit.
C25, C26, and C27 are in same unit.

6K6GT INTERMEDIATE FREQUENCY 455 K.C. BRC. Form No. 6287—1M—1-41

PRO. 183

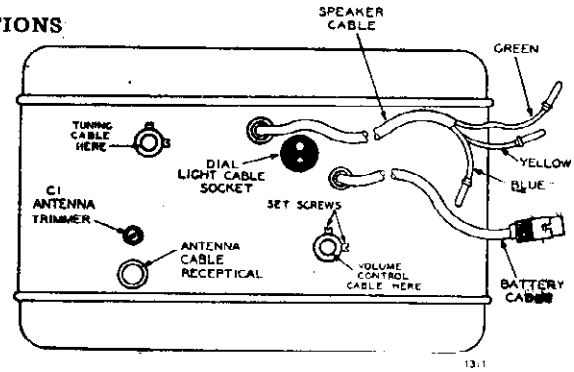


CHASSIS VIEW SHOWING TRIMMER POSITIONS



SPECIFICATIONS

Battery Drain	7 Amps.
Power Output	1.8 Watts Undistorted
Sensitivity for 1 Watt Output	6 Microvolt Average
Selectivity - 38 KC Broad at 1000 Times Signal at 1000 KC	
Tuning Frequency Range	540 to 1600 KC
Intermediate Frequency	455 KC
Speaker	6 in. Electro Dynamic

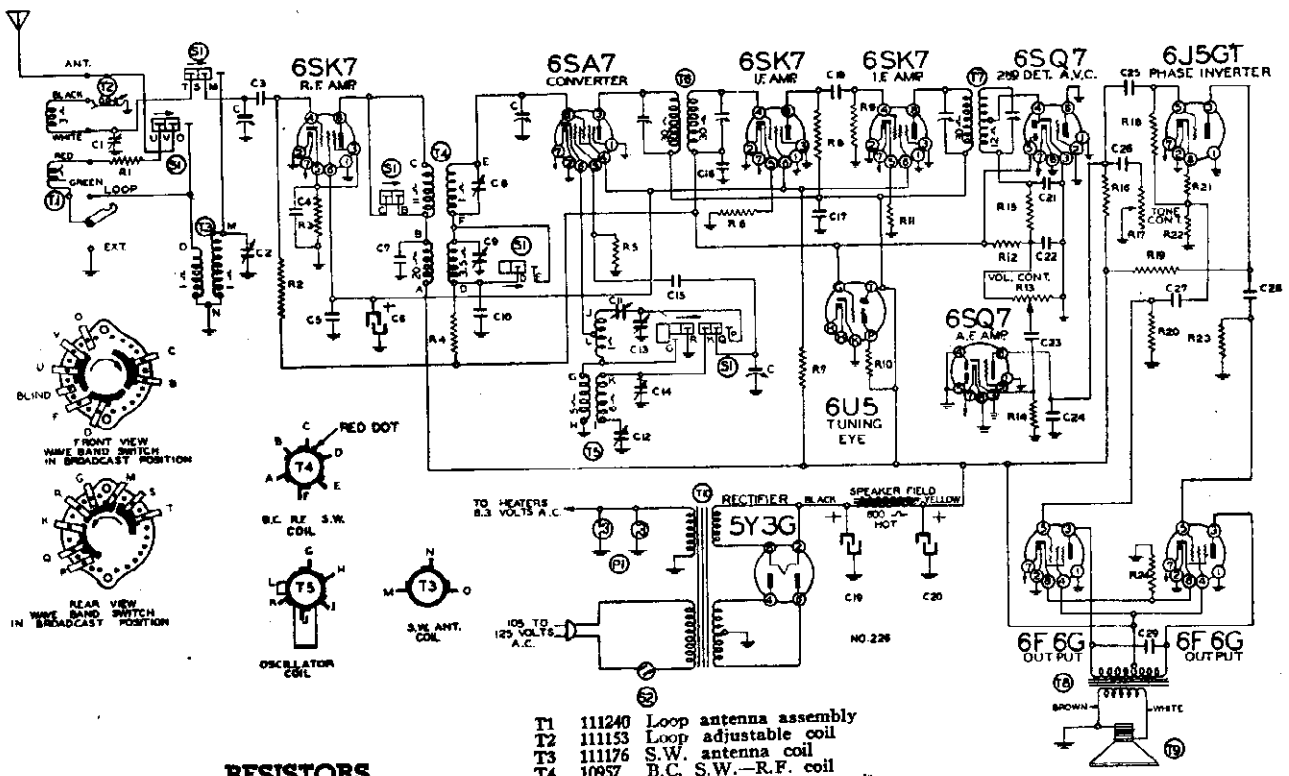


BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Remote Tuner Dial Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Grid of 6SK7 I. F. Tube	Set dial at 1400 Kc.	See Chassis View	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 6SA7 I. F. Tube	Set dial at 1400 Kc.	See Chassis View	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1600 Kc.	35 mmf.	Antenna lead	Set dial at 1600 Kc.	Trimmer C9, C6, C1 See Chassis View	Oscillator R. F. antenna	Adjust to maximum output
	1400 Kc.	35 mmf.	Antenna lead	Set dial at 1400 Kc.	Rotate cores of antenna and R. F. coils	Antenna and R. F.	Adjust to maximum output

● Dummy antennas—.1 mf., 35 mmf.

MODEL 1131, Series A

BELMONT RADIO CORP.



RESISTORS

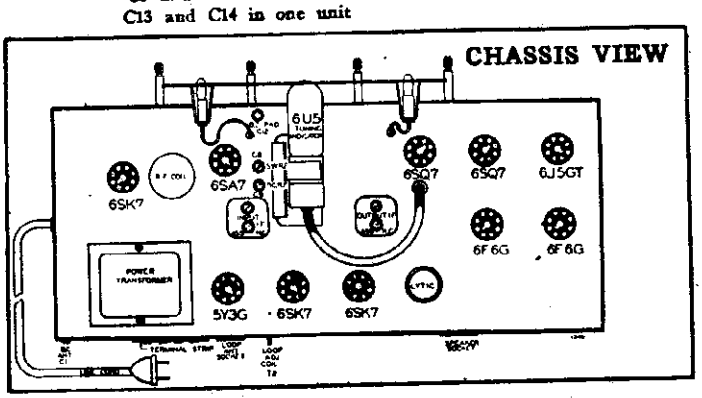
R1	13024	400 ohms—½ w.
R2	13019	1 megohm—½ w.
R3	13099	300 ohms—½ w.
R4	1305	300M ohm—½ w.
R5	130208	40M ohm—½ w.
R6	13054	500 ohm—½ w.
R7	130304	12M ohm—2 w.
R8	130263	12M ohm—½ w.
R9	13020	100M ohm—½ w.
R10		1 megohm—in eye socket
R11	13054	500 ohm—½ w.
R12	130170	3 megohm—½ w.
R13	101214	Volume control (500M ohm)
R14	130225	15 megohm—½ w.
R15	13012	50M ohm—½ w.
R16	13011	250M ohm—½ w.
R17	101213	Tone control (1 megohm)
R18	13019	1 megohm—½ w.
R19	13020	100M ohm—½ w.
R20	1303	500M ohm—½ w.
R21	13043	2500 ohm—½ w.
R22	13020	100M ohm—½ w.
R23	1303	500M ohm—½ w.
R24	130311	300 ohm—1 w.

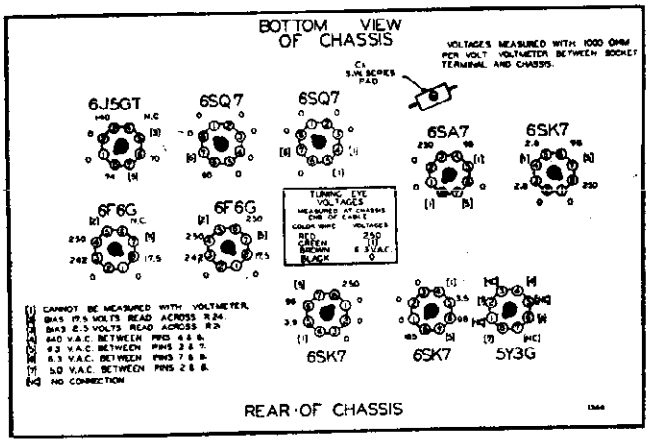
CONDENSERS

C	102129	Three gang variable condenser
C1	124132	B.C. antenna trimmer
C2	124117	S.W. antenna trimmer
C3	1292	.0005 mica
C4	10020	.1 x 200 v.
C5	100117	.25 x 400 v.
C6	119124	10 mfd. lytic—350 w. v.
C7	129160	.0004 mica
C8	124131	S.W. R.F. trimmer
C9	124131	B.C. R.F. trimmers
C10	10026	.02 x 400 v.
C11	129156	.0024 compression S.W. pad
C12	129157	.000525 compression B.C. pad
C13	124130	S.W. oscillator trimmer
C14	124130	B.C. oscillator trimmer
C15	12939	.00005 mica
C16	10026	.02 x 400 v.
C17	100117	.25 x 400 v.
C18	1292	.0005 mica
C19	119124	25 mfd. lytic—450 w. v.
C20	119124	25 mfd. lytic—450 w. v.
C21	1295	.0001 mica
C22	1295	.0001 mica
C23	10025	.002 x 600 v.
C24	12913	.00025 mica
C25	10026	.02 x 400 v.
C26	10011	.01 x 400 v.
C27	1009	.05 x 200 v.
C28	10013	.05 x 400 v.
C29	10071	.004 x 600 v.

T1	111240	Loop antenna assembly
T2	111153	Loop adjustable coil
T3	111176	S.W. antenna coil
T4	10957	B.C. S.W.—R.F. coil
T5	110149	B.C. S.W. oscillator coil
T6	108169I	Input I.F. 465 kc.
T7	108130D	Output I.F. 465 kc.
T8	10554B	Output transformer
T9	114192B	10" dynamic speaker (600 ohm field)
T10	104202	Power transformer
S1	125111	Wave band switch
S2		On-off switch on volume control
P1	10794	(2) pilot light bulbs T-44

C6, C19 and C20 in one unit
C8 and C9 in one unit
C13 and C14 in one unit





ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio ground to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.

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.
- Dummy antennas—.1 mf., 200 mmf., 400 ohms.

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Grid of 6SK7 I. F.	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 6SA7 Mixer	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top	Input I. F.	Adjust to maximum output
SHORT WAVE BAND (See Note A)	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C13	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmers C8, C2	Short Wave R. F. and S. W. Antenna	Adjust to maximum output
	6 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 6 Mc.	Trimmer C11 (See voltage chart)	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "C")
BROAD-CAST BAND (See Note A)	1580 Kc.	200 mmf.	Grid of 6SK7 R. F. Tube	Broadcast	Rotor full open (Plates out of mesh)	Trimmer C14	Broadcast oscillator	Adjust to maximum output
	540 Kc.	200 mmf.	Grid of 6SK7 R. F. Tube	Broadcast	Set Dial at 540 Kc. (Plates in Mesh)	Trimmer C12	Broadcast oscillator series pad	Adjust to maximum output
	1400 Kc.	200 mmf.	Grid of 6SK7 R. F. Tube	Broadcast	Set Dial at 1400 Kc.	Trimmer C9	Broadcast R. F.	Adjust to maximum output
LOOP ALIGN-MENT (See Note B)	1400 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 1400 Kc.	Trimmer C1	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 600 Kc.	Trimmer T2	Iron Core Tracking Coil	Adjust to maximum output

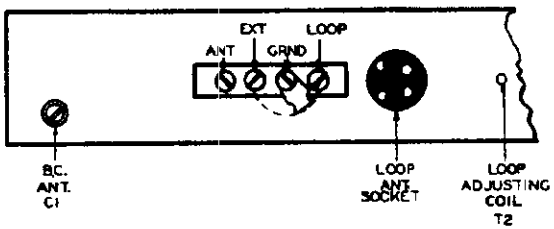
NOTE "A"—The signal generator is connected to the "ANT." and "GND." terminals on the rear of the chassis when aligning the Short Wave Band and to the grid of the 6SK7 R. F. Tube and ground terminal when setting the Broadcast Band oscillator end frequencies, (1580 and 540 K. C.).

The loop antenna need not be connected to the radio when making these adjustments.

NOTE "B"—Loop alignment is made with the chassis mounted in the cabinet and the loop antenna connected to the terminal board. The signal generator is connected to the "ANT." and "GND." terminals and the jumper on the terminal board connected to "EXT." terminal.

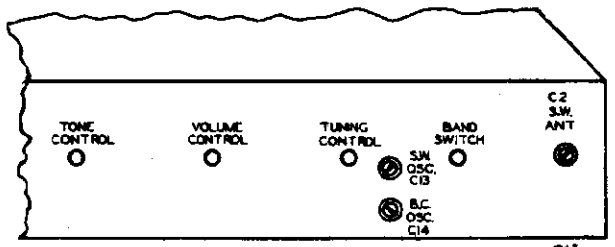
NOTE "C"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.
Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each band is completed, repeat the procedure as a final check.



ANT. & GROUND TERMINALS—When using an external antenna and ground, move the metal strap shown above and fasten it under the screw marked "Ext."

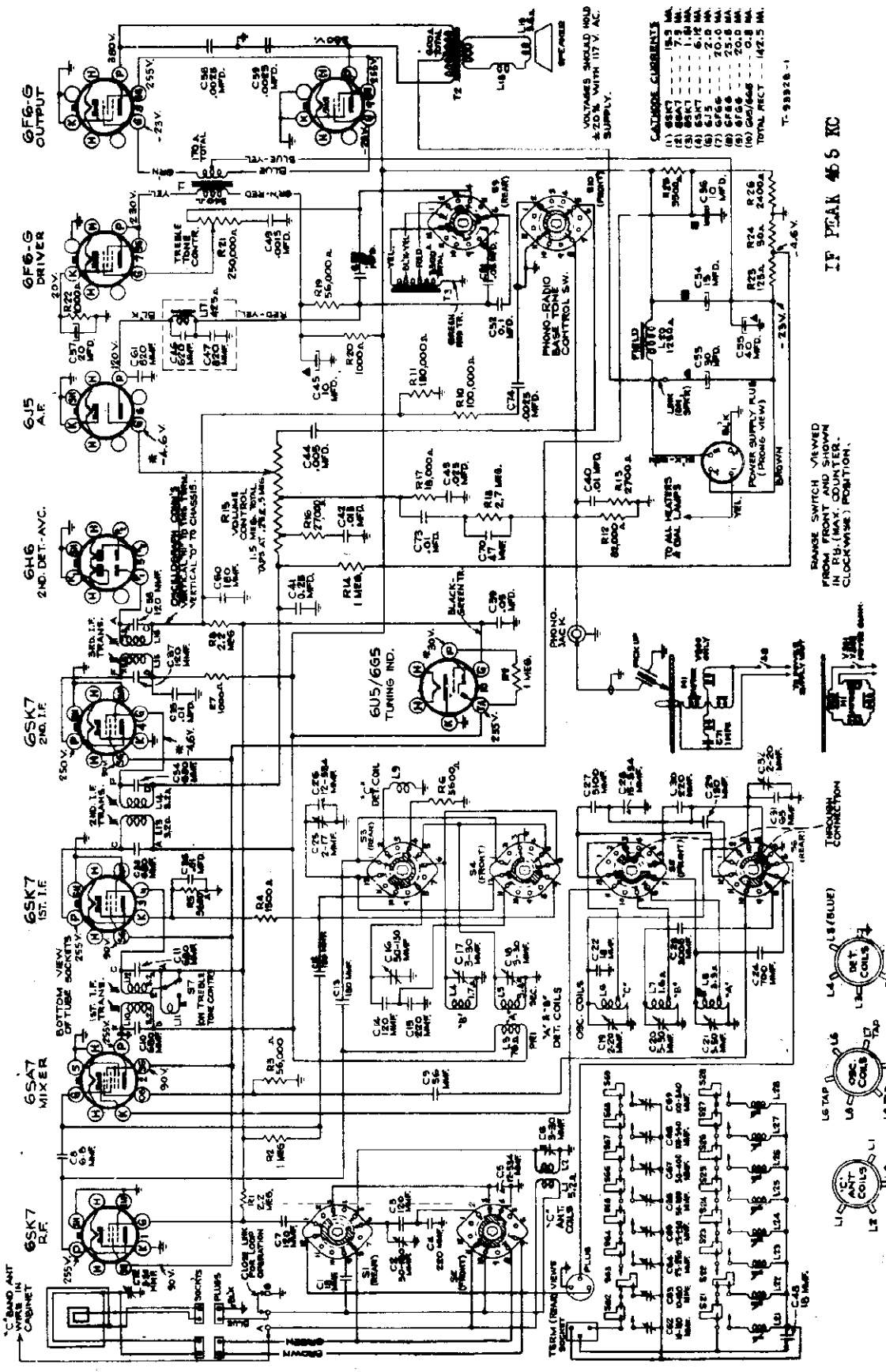
The antenna and ground wires should then be connected to the terminals marked "Ant." — "Grnd."



TRIMMER VIEW—FRONT OF CHASSIS

Tuning Frequency Range Broadcast Band - 540 to 1580 KC
Short Wave Band - - 5.5 to 18.5 MC

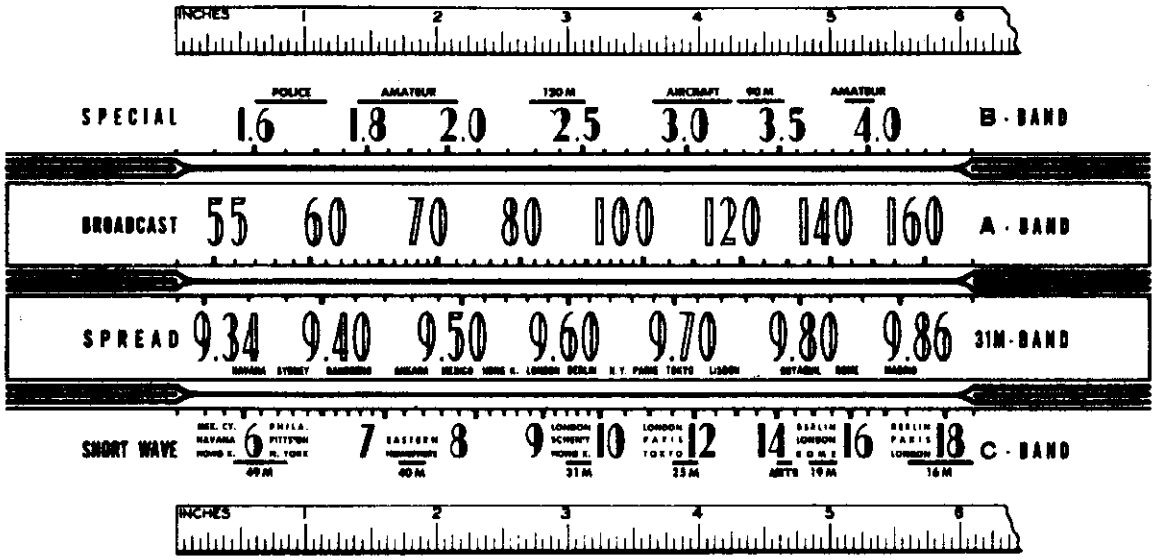
BRUNSWICK RADIO DIV.— RADIO & TELEVISION, INC.



MODELS 275,276,277

BRUNSWICK RADIO DIV. RADIO & TELEVISION, INC.

Alignment Procedure



Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic diagram.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration Scale.—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the chassis for quick reference during alignment. In the event that only the chassis is returned for service, and the cabinet with its tuning dial is left in the customer's home, the calibration scale printed in this service note can be used in conjunction with an ordinary 12-inch ruler as an accurate and convenient substitute for the regular dial.

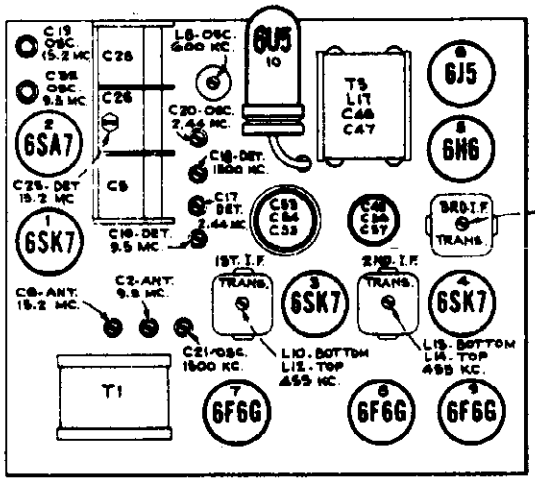
Each method is described below.

Using Tuning Dial.—

1. Slide out the flat spring clamp at each end of the dial, and remove the glass dial from the cabinet.

2. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.

3. Place the glass dial under the pointer so that the extreme left scale graduations coincide with the pointer. Use scotch tape to hold the glass dial in this position.



Using Calibration Scale.—

1. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.

2. Place a flat 12-inch ruler on the dial backing plate so the left-end of ruler is at the reference mark at left-end of backing plate. Temporarily fasten the ruler with scotch tape to the backing plate.

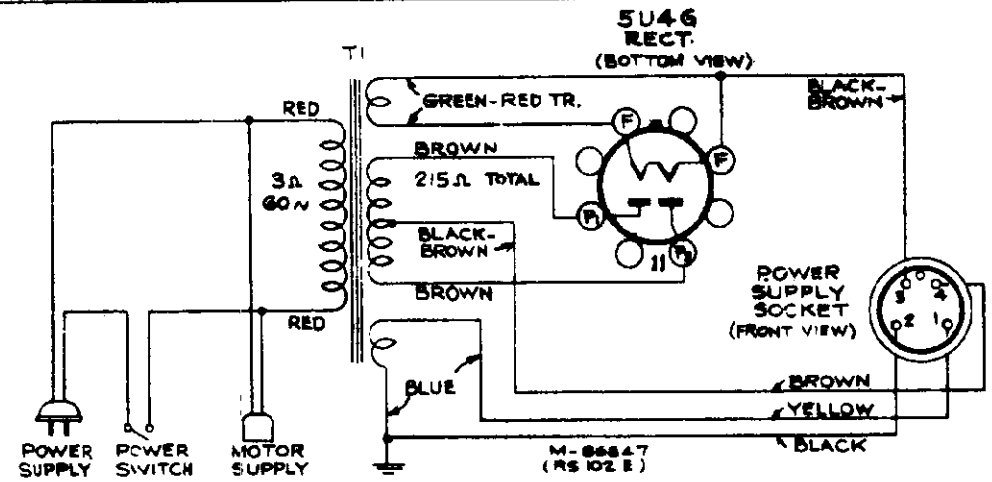
3. Refer to calibration scale printed in this service note. This is a reduced reproduction of the dial with an inch-scale drawn at top and bottom. To find the correct pointer position in inches for any desired frequency, draw a vertical line through this frequency on the calibration scale.

Dial-Pointer Adjustment.—After the chassis is replaced in cabinet, move the dial pointer (if necessary) so that it is at the left-hand graduation on the dial with the gang in full mesh.

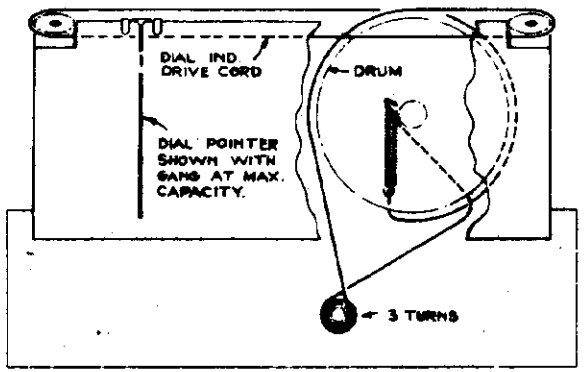
Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	Turn "Treble Tone Control" (center knob) counter-clockwise so that I-F is in "Sharp" position.			
2	2nd I-F grid, in series with .01 mfd.	455 kc	"A" Band Quiet Point at HF end	L15 and L16* (3rd I-F Trans.)
3	1st I-F grid, in series with .01 mfd.			L13 and L14* (2nd I-F Trans.)
4	1st-Det. grid, in series with .01 mfd.			L10 and L12* (1st I-F Trans.)
5	Turn Treble Tone Control full clockwise to "Broad" position. Response on CRO should be the conventional double-humped type. If necessary, retouch 3rd I-F transformer slightly (so as not to disturb the "Sharp" curve appreciably). Leave control in sharp position for the following steps.			
6	Ant. terminal, in series with 47 mmfd. (link closed)	15.2 mc	"C" Band 15.2 mc	C19 (osc.)** C25 (det.) C9 (ant.)
7		9.5 mc	"31M" Band 9.5 mc	C28 (osc.)** C18 (det.) C2 (ant.)
8	Rear stator of gang, in series with .01 mfd.	2.44 mc	"B" Band 2.44 mc	C20 (osc.) C17 (det.)
9		600 kc	"A" Band 600 kc	L8 (osc.) Rock in
10		1,500 kc	"A" Band 1,500 kc	C21 (osc.) C18 (det.)
11	Repeat steps 9 and 10.			
12	Install and connect chassis in cabinet. Tune in a radiated oscillator signal at 1,500 kc and peak the "A" band trimmer C72 (on loop). Rock in L8 for peak output.			

* Adjust for coincidental curves and maximum gain.

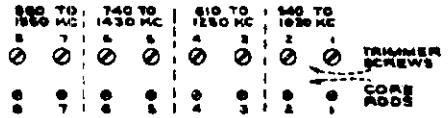
** Use minimum capacity peak if two peaks can be obtained. (Check for correct peak on "C" band by tuning receiver to 14.20 mc, where a weaker signal should be received.)



FOR RCA RECORD CHANGER RP-152D SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS"



Push Button Adjustment

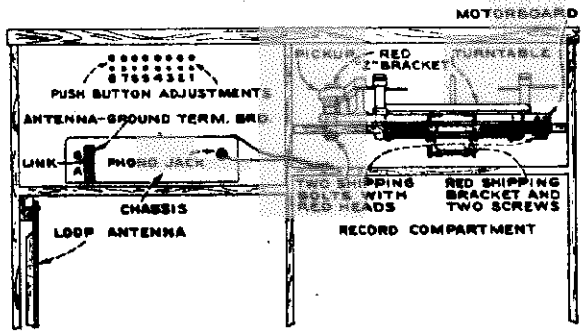


The station push buttons connect to separate magnetite-core oscillator coils and separate antenna trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool. Allow at least five minutes warm-up period before making adjustments.

In the event that the receiver is to be used with an external antenna use one or two feet of wire (as an antenna) to ensure sharp peaking during the final adjustment procedure. For loop operation, the link should be strapped across terminals on back of set. In either case the procedure is as follows:

1. Make a list of the desired stations, arranged in order from low to high frequencies.
2. Turn the range selector to "A" band, and manually tune in the first station on the list.
3. Turn range selector to "Electric Tuning" (PB) position, push in station button No. 1 (extreme left). Then adjust the No. 1 oscillator core to receive the station.
4. After oscillator core is set correctly, adjust No. 1 antenna trimmer for maximum output.
   Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.
5. Adjust for each of the remaining stations in the same manner.
6. Make a final careful adjustment of the oscillator cores and antenna trimmers.

On the 880 to 1,550 kc push-buttons the higher frequency stations may be received with No. 7 or 8 either in or out (oscillator frequency either 455 kc below or 455 kc above the station frequency). The adjustment with this core in its out position (oscillator frequency 455 kc above the station frequency) is the correct one.



POWER OUTPUT RATING	
Undistorted	18 w.
Maximum	20 w.
POWER SUPPLY RATINGS	
105-125 v., 60 c. ...	200 w.
105-125 v., 50 c. ...	200 w.
SPREAD BAND ...	9.34-9.86 mc

FREQUENCY RANGES	
Broadcast "A" ..	540-1,600 kc
Med. Wave "B" ...	1.55-4.0 mc
Short Wave "C" ..	5.8-18.0 mc
LOUDSPEAKER (RL-94-1)	
Type ..	15-in. Electrodynamic
V.C. Imp. ..	7.2 ohms at 400 c.

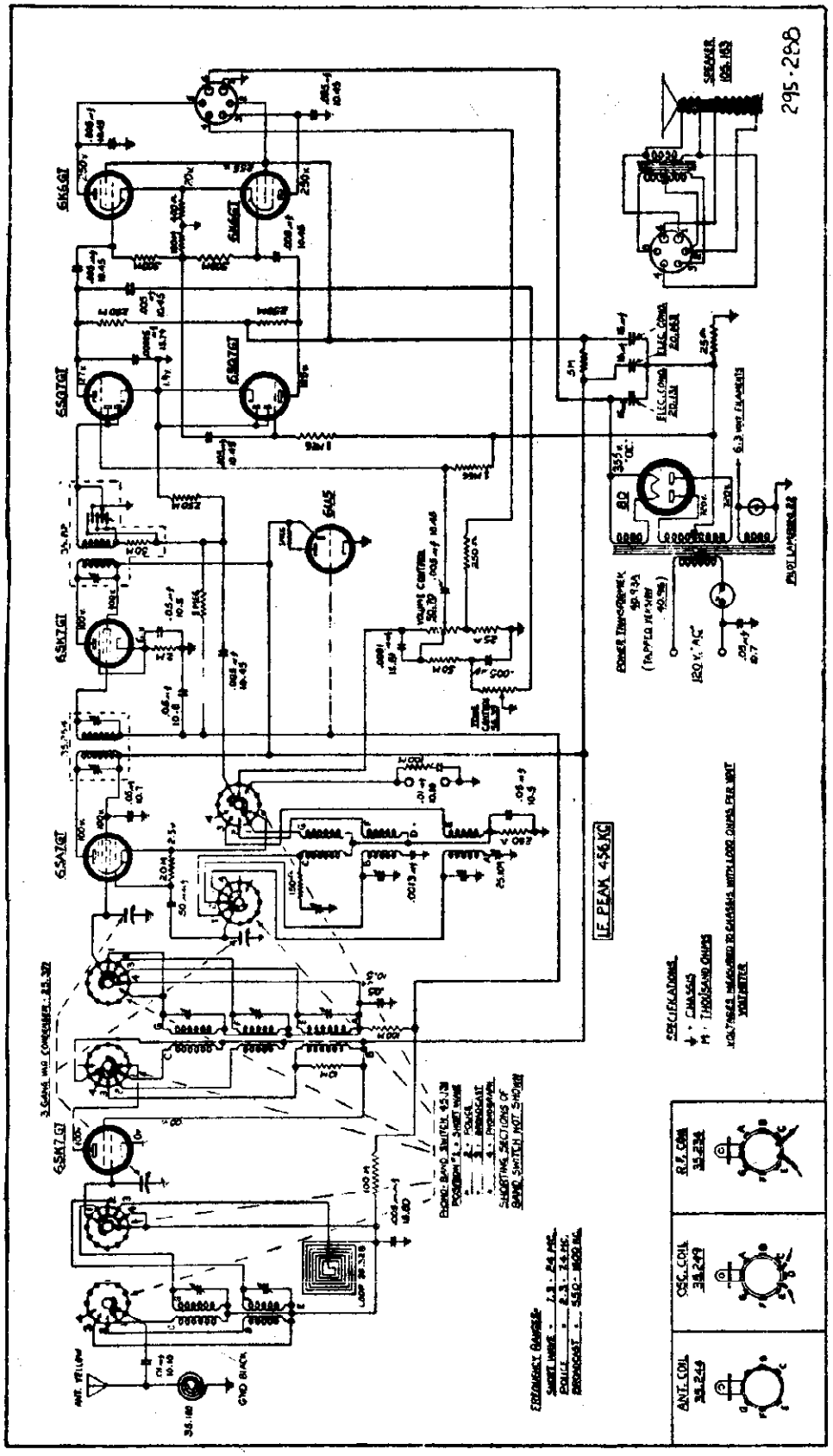
MODELS 288,288 1/2

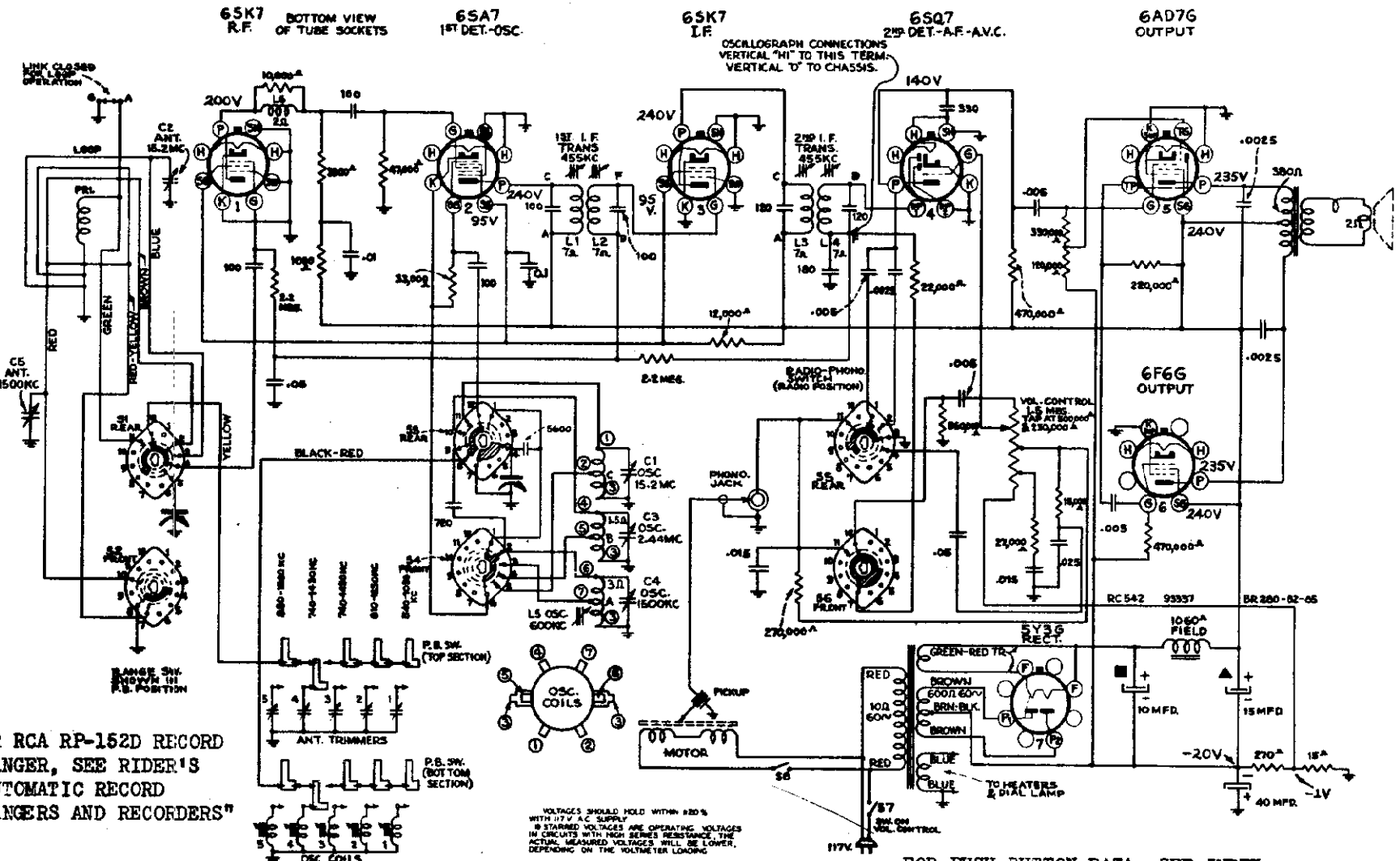
BRUNSWICK RADIO DIV.— RADIO & TELEVISION, INC.

FOR RCA RP-160 RECORD CHANGER, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

This model is a 9 tube (including tuning eye) three wave band Superheterodyne Receiver designed to operate on 105-125 Volts, 50-60 cycles Alternating Current (AC) only.

TUNING RANGE: 550 to 1600 kilocycles (KC) (Domestic Broadcast), 2.3 to 7.0MC (Megacycles) (Police Call Band), 7.5 to 24.MC (Megacycles) (International Short Wave).





FOR RCA RP-152D RECORD CHANGER, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS"

VOLTAGES SHOULD HOLD WITHIN ±20% WITH 117 V A.C. SUPPLY
STARRED VOLTAGES ARE OPERATING VOLTAGES IN CIRCUITS WITH HIGH SERIES RESISTANCE. THE ACTUAL MEASURED VOLTAGES WILL BE LOWER, DEPENDING ON THE VOLTMETER LOADING

FOR PUSH-BUTTON DATA, SEE INDEX

LOUDSPEAKER (RL-70L-6)

Diameter	12 in.
Voice coil imp. at 400 c.	2.2 ohms

POWER OUTPUT RATING

Undistorted	4.5 w.
Maximum	5.0 w.

INTERMEDIATE FREQUENCY .... 455 kc

FREQUENCY RANGES

Broadcast "A"	540-1,560 kc
Med. Wave "B"	1.4-4.5 mc
Short Wave "C"	5.8-18 mc

POWER SUPPLY RATINGS

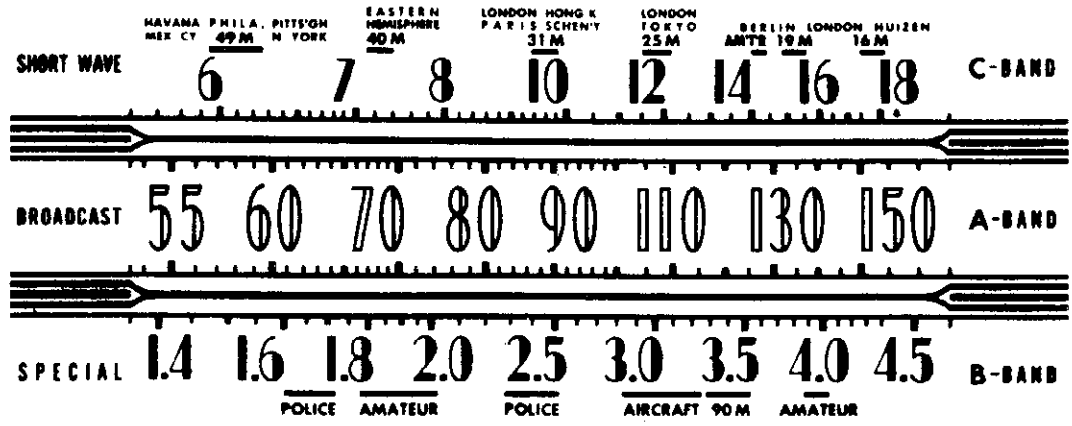
105-125 v., 60 c.	100 w.
105-125 v., 50 c.	100 w.

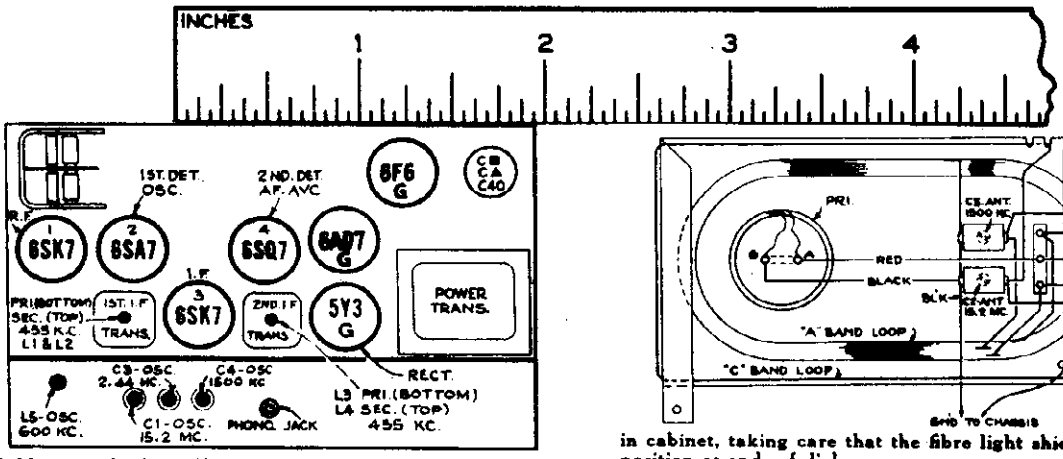
PHONOGRAPH (RP-152-D

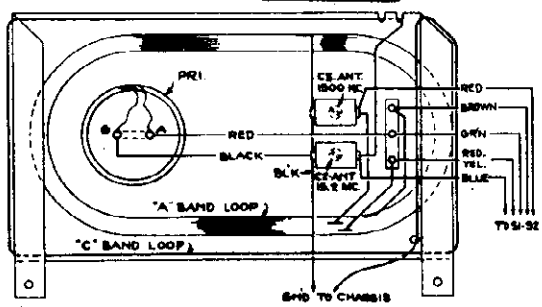
Type	Automatic
Record Cap.	8 10-in. or 7 12-in.
Turntable Speed	78 rpm
Type Pickup	Crystal
Pickup imp.	100,000 ohms @ 1000 c.
Average O.P.	1½ v. @ 1000 c. acr ½ meg.

MODELS 280, 282, 285, 285-1

BRUNSWICK RADIO DIV.— RADIO & TELEVISION, INC.







Calibration Scale.—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the chassis for quick reference during alignment. Or, if necessary, the calibration scale printed in this service note can be used in conjunction with an ordinary 12-inch ruler as an accurate and convenient substitute for the regular dial.

Each method is described below.

Using Tuning Dial.—

1. Slide out the flat spring clamp at each end of the dial, and remove the glass dial from the cabinet.

2. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.

3. Place the glass dial under the pointer so that the extreme left scale graduations coincide with the pointer. Use scotch tape to hold the glass dial in this position.

4. After completion of the alignment, replace the glass dial in cabinet, taking care that the fibre light shields are in correct position at ends of dial.

Using Calibration Scale.—

1. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.

2. Place a flat 12-inch ruler on the dial backing plate so the left-end of ruler is at the reference mark at left-end of backing plate. Temporarily fasten the ruler with scotch tape to the backing plate.

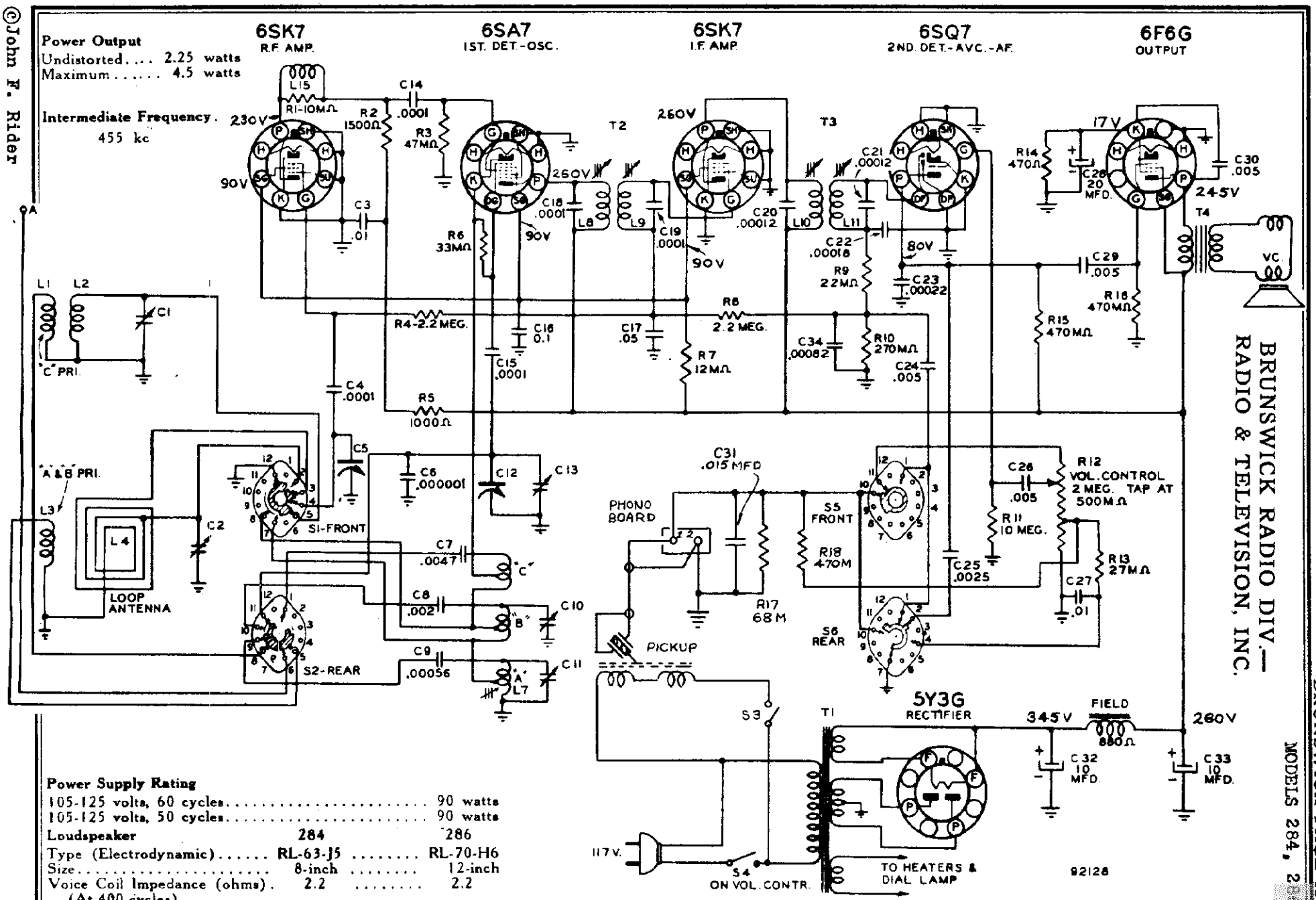
3. Refer to calibration scale printed in this service note. This is a reproduction of the dial with an inch-scale drawn at top and bottom. To find the correct pointer position in inches for any desired frequency, draw a vertical line through this frequency on the calibration scale. For example, 1,500 kc is approximately 4 inches from the reference mark.

Dial-Pointer Adjustment.—After the chassis is replaced in cabinet, move the dial pointer (if necessary) so that it is at the left-hand graduation on the dial with the gang in full mesh.

Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output—
1	I-F grid, in series with .01	455 kc	"A" band, Quiet point at 1,500 kc end of dial	L3 and L4 (2nd I.F. trans.)
2	1st-Det. grid, in series with .01			L1 and L2 (1st I.F. trans.)
3	Antenna terminal, in series with 300 ohms (link open)	15.2 mc	15.2 mc "C" band	C1 (osc.)* C2 (ant.)
4		2.44 mc	2.44 mc "B" band	C3 (osc.) Rock in
5	Antenna terminal, in series with 200 mmfd. (link open)	1,500 kc	1,500 kc "A" band	C4 (osc.) C5 (ant.)
6		600 kc	600 kc "A" band	L5 Rock in
7	Repeat steps 5 and 6.			

* Use minimum capacity peak if two peaks can be obtained. Check to determine that the correct peak has been used, by tuning receiver to 14.29 mc, where a weaker signal should be received.

Note: Oscillator tracks above signal on all bands.



Power Supply Rating

105-125 volts, 60 cycles	90 watts
105-125 volts, 50 cycles	90 watts

Loudspeaker	284	286
Type (Electrodynamic)	RL-63-J5	RL-70-H6
Size	8-inch	12-inch
Voice Coil Impedance (ohms) (At 400 cycles)	2.2	2.2

MODELS 284,286

BRUNSWICK RADIO DIV.— RADIO & TELEVISION, INC.

Alignment Procedure

Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	6SK7 grid in series with .01 mfd.	455 kc	"A" band Quiet point between 550-750 kc	L10 and L11 (2nd I-F trans.)
2	6SA7 grid in series with .01 mfd.			L8 and L9 (1st I-F trans.)
3	Ant. terminal in series with 47 mmfd.	15 mc	15 mc "C" band	C13 (osc.)* C1 (ant.)
4	Ant. terminal in series with 300 ohms	2.44 mc	2.44 mc "B" band	C10 (osc.)*
5	Ant. terminal in series with 200 mmfd.	1,500 kc	1,500 kc "A" band	C11 (osc.) C2 (ant.)
6		600 kc	600 kc "A" band	L7 (osc.) Rock gang
7	Repeat steps 5 and 6.			

* Use minimum capacity peak if two peaks can be obtained.

The oscillator tracks above the signal frequency on all bands.

Frequency Range

Standard Broadcast (A) . . . . . 540-1,600 kc
Medium Wave (B) . . . . . 1.6-4.5 mc
Short Wave (C) . . . . . 5.8-18 mc

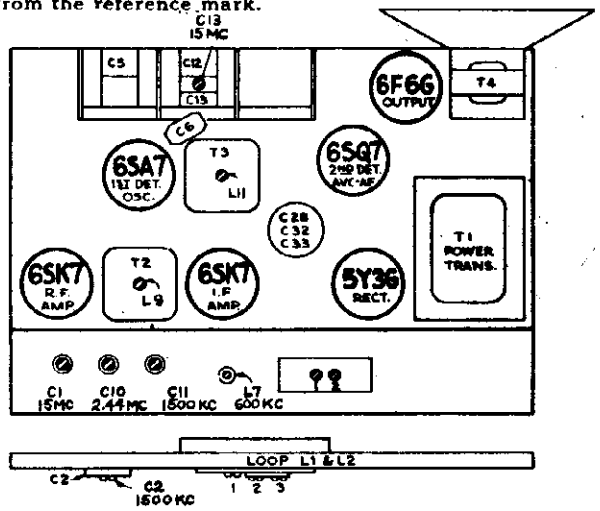
Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

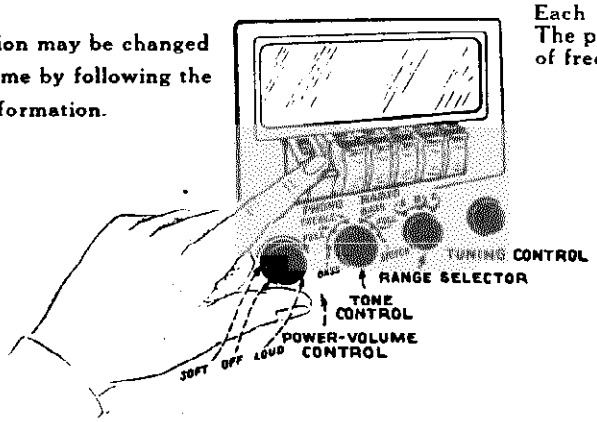
Calibration Scale.—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the chassis for quick reference during alignment. Or, if necessary, the calibration scale printed in this service note can be used in conjunction with an ordinary 6-inch ruler as an accurate and convenient substitute for the regular dial.

Using Calibration Scale:

1. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.
2. Place a flat 6-inch ruler on the dial backing plate so the left-end of the ruler is at the reference mark at the left-end of backing plate. Temporarily fasten the ruler with scotch tape to the backing plate.
3. Refer to calibration scale printed in this service note. This is a reduced reproduction of the dial with an inch-scale drawn at top and bottom. To find the correct pointer position in inches for any desired frequency, draw a line through this frequency on the calibration scale. For example, 1,500 kc is approximately 3¾ inches from the reference mark.



A station may be changed at any time by following the above information.



The push-buttons should be adjusted for six favorite stations after the receiver has been operating for a brief warm-up period. Each button may be set up to any standard broadcast station. The preferable arrangement is to adjust for stations in the order of frequency, from low to high. Proceed as follows:

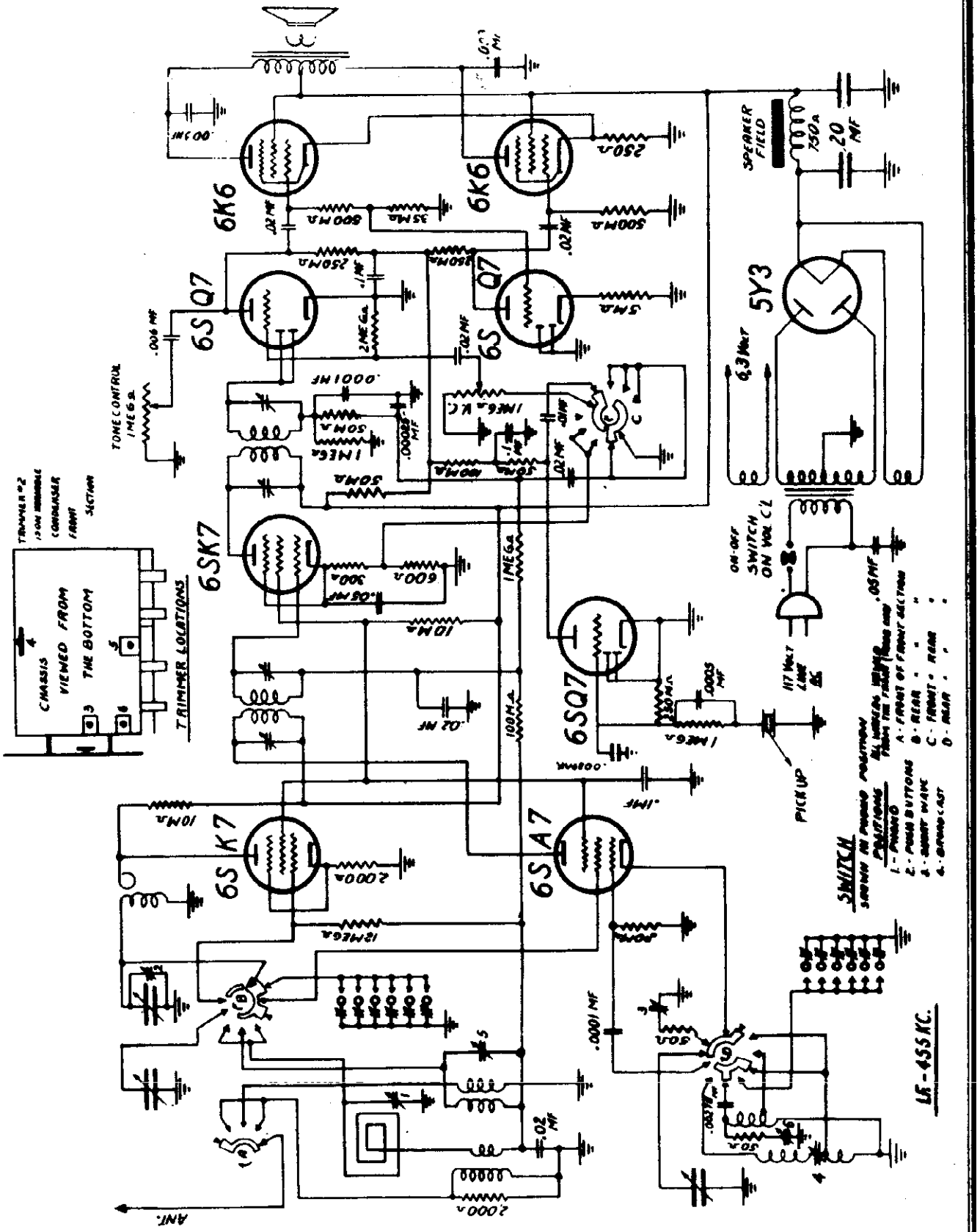
Cut out the tabs for your six favorite stations and arrange them in order of frequency in the recesses on the push-buttons.

Press down on the first push-button and hold it down. The screw in back of the push-button is now accessible and should be loosened one or two turns with a screw-driver.

While still holding down the push-button, tune in the first station represented by the station tab with the tuning knob, by Dial Tuning. When the station is heard at its best, tighten up the screw in back of the push-button. Now let go of the push-button, turn the tuning knob in order to detune and again press down the button and let go. The station should be heard again. If not, repeat the above adjustment process until reception is satisfactory.

Proceed to set up the other five push-buttons in a similar manner.

BRUNSWICK RADIO DIV.— RADIO & TELEVISION, INC.



RADIO-PHONOGRAPH COMBINATIONS
MODELS 289-291-294

These models employ a 9 tube radio chassis in conjunction with a new type automatic record changer, using a feather-weight pickup which reduces record wear and objectionable needle scratch. A permanent needle is built into the phono pickup so that no other needles need be used.

This combination will operate only on 105-125 volt, 60 cycle current.

For PHONOGRAPH operation, the band switch knob is rotated all the way to the left (counter-clockwise). The records are stacked up on the changer, and the turntable switch is slid to the "on" position. Push the lever adjacent to it, momentarily to "start", and operation will commence. The Volume and Tone controls are then set as desired.

For PUSH BUTTON operation, the Band Switch is turned to the second position. Any of the six pre-set stations may now be tuned in by depressing the corresponding button. The procedure for setting up these buttons will be described later.

The Short Wave band covers the frequencies from 5.5 to 18.5 Megacycles. The channels used for local and international short wave broadcasts are indicated by meter blocks and are designated on the lower part of the dials as 16M, 19M, 25M, 31M, 39M and 49M. Tuning is the same as for the regular broadcasts except that greater care must be exercised since tuning is extremely sharp and many stations may be passed over if the tuning knob is rotated too rapidly.

The Broadcast band covers the range from 535 to 1650 kilocycles. All of the American broadcast stations and some police calls may be heard on this band.

In tuning on either band, for best results, the station should be tuned for maximum. The volume is then reduced to the desired level. Never reduce volume by detuning, as distortion and noisy reception may result.

Push Button Alignment
To set up the receiver for push button operation, proceed as follows:

Looking into the back of the cabinet directly behind the buttons, above the dial will be seen two rows of screws. These are painted in various colors. Viewed from the rear these are; from left to right, YELLOW, BLUE, BLUE, BROWN, BROWN, and ORANGE. Each of these may be adjusted to cover a band of frequencies as tabulated below:

Yellow - 850 to 1570 kilocycles
Blue - 850 to 1450 kilocycles
Brown — 570 to 1250 kilocycles
Orange - 535 to 950 kilocycles

The bottom row of adjusting screws are the oscillator trimmers which determine the frequency of the station to be received. The upper row is for the antenna adjustment.

The simplest procedure, when a suitable oscillator is available, is to feed the desired frequency into the antenna, depress the button; turn the oscillator trimmer till the signal is picked up, then reduce the output from the oscillator so that it is just audible. Now adjust the antenna trimmer for maximum. Proceed to the next button and repeat the operation.

In the absence of such equipment, turn the Band Switch all the way to the right for dial tuning of broadcast stations. Start at the low frequency end of the band and tune in the program of the station it is desired to receive. Note the frequency of this station. Without touching the tuning, throw the Band Switch over to the second or Push Button position. Depress the first button, corresponding to the orange screws. Slowly rotate the lower (oscillator) orange screw till the same program is received. Check this by switching back to dial tuning. (Broadcast position on the band switch). When this has been determined, the signal may now be clarified by carefully adjusting the trimmer of the same color (orange) directly above it. Now repeat the operation by tuning in, on the dial, the next station, of a higher frequency that it is desired to set up; and so on until all six have been aligned. Note that there are two BLUE and two BROWN SETS of screws. Each button will cover only a range of frequencies as noted above, and therefore a group of stations falling within these limits must be selected. The antenna trimmer in each case is directly over the corresponding oscillator.

The station markers may now be inserted into the recesses in the buttons and the celluloid covers forced in over them.

ALIGNMENT INSTRUCTIONS

Re-alignment of this receiver should not be attempted unless all other possible causes of faulty operation have been thoroughly investigated. An accurately calibrated signal generator which will cover the necessary wave bands, and an output meter for indicating the effect of adjjustments are required.

During the alignment procedure all adjustments should be made under the following conditions:

1) Line Voltage as indicated on instruction sheet.
2) Volume & Tone control at maximum volume positions.
3) Minimum Input from signal generator.

If this procedure is not adhered to, all adjustments will appear very broad. This is due to the action of the automatic volume control.

I. F. Adjustment - The signal generator is set at 455 KC and is connected to the grid of the converter tube (6SA7) through a .5 MFD condenser. Be sure to connect a resistor of approximately 25,000 Ohms between the converter grid and ground so that the grid circuit is at ground potential for D. C. It is unnecessary to disconnect the grid from the rest of the circuit.

The input I. F. Transformer trimmers - are both adjusted for maximum output as indicated by the output meter connected across either the voice coil or the primary coil of the loud speaker.

The Output I. F. Transformer trimmers - are adjusted for maximum output as indicated on the output meter. The Input I. F. should now be rechecked for maximum output.

Short Wave - Set the band switch to the third position which is the short wave band. Connect the signal generator thru a standard dummy antenna to the antenna and ground leads of the receiver. Set the generator at 17 MC; turn the condenser until a response is indicated. The pointer should coincide with the 17 MC mark on the dial. Adjust the short wave antenna trimmer(#5, see diagram) for maximum output while rocking the condenser gang from left to right.

Broadcast Band
It is desirable to align this band on the loop. The signal generator is coupled to the receiver by means of a 2 or 3 turn loop. Set the band switch in the broadcast position and condenser plates completely out of mesh. Set the signal generator at 1650 KC and adjust the broadcast oscillator trimmer(#3, see diagram) until a response is indicated on the output meter. The generator is now set at 1400 KC. Turn the variable condenser until a response is indicated. The dial pointer should now coincide with the 1400 KC mark on the dial. Now adjust the broadcast inter-stage trimmer (#2) for maximum. This trimmer is located on the right side of the front section of the variable condenser. Set the generator at 600 KC and rotate the variable condenser until a response is indicated. Adjust the broadcast oscillator padder condenser (#4) for maximum response while "Rocking" the gang condenser. The High frequency adjustment should now be re-checked.

BUICK MOTOR

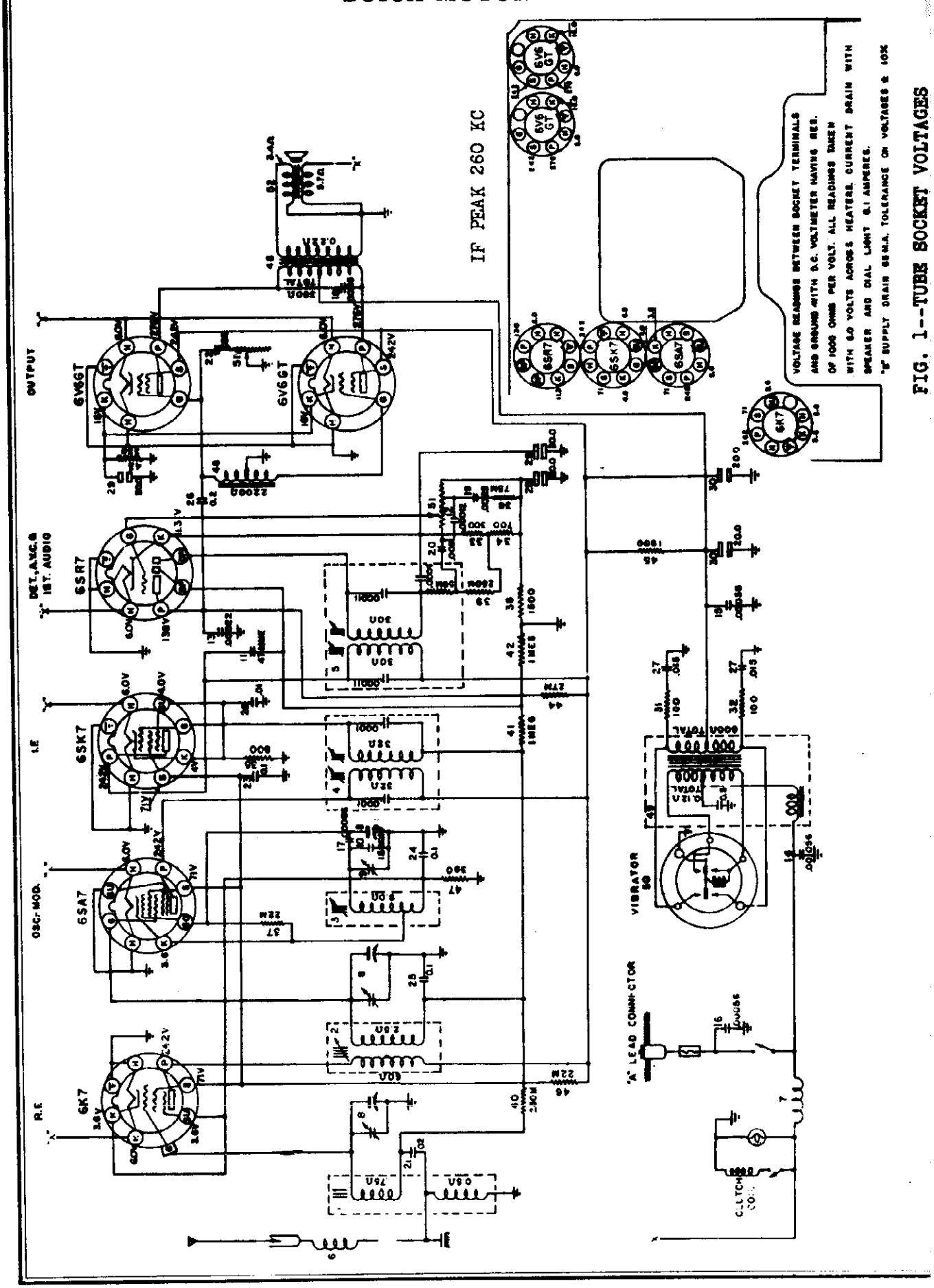


FIG. 1--TUBE SOCKET VOLTAGES

MODEL 980650

BUICK MOTOR

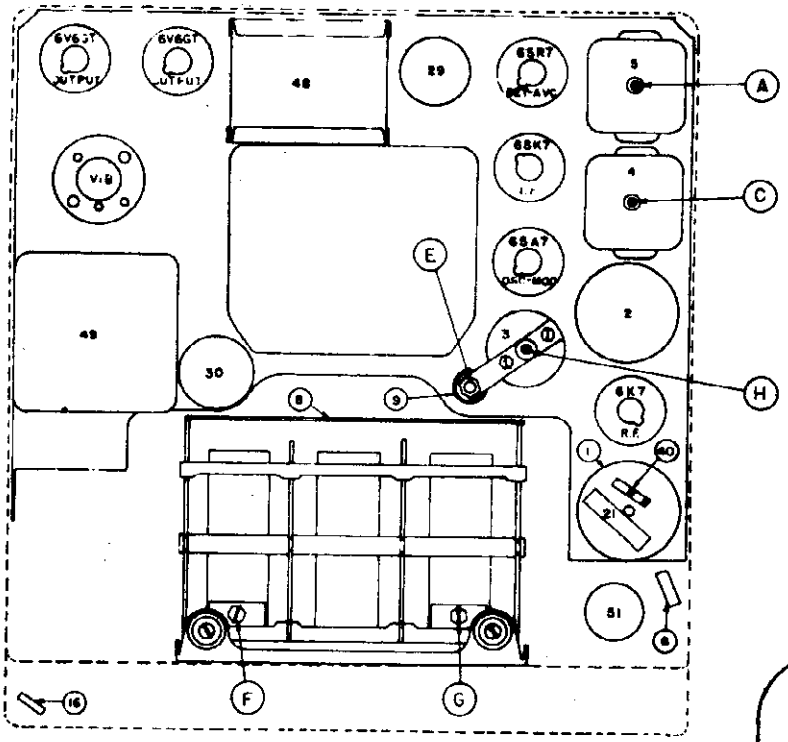


FIG. 3--PARTS LAYOUT--Top View

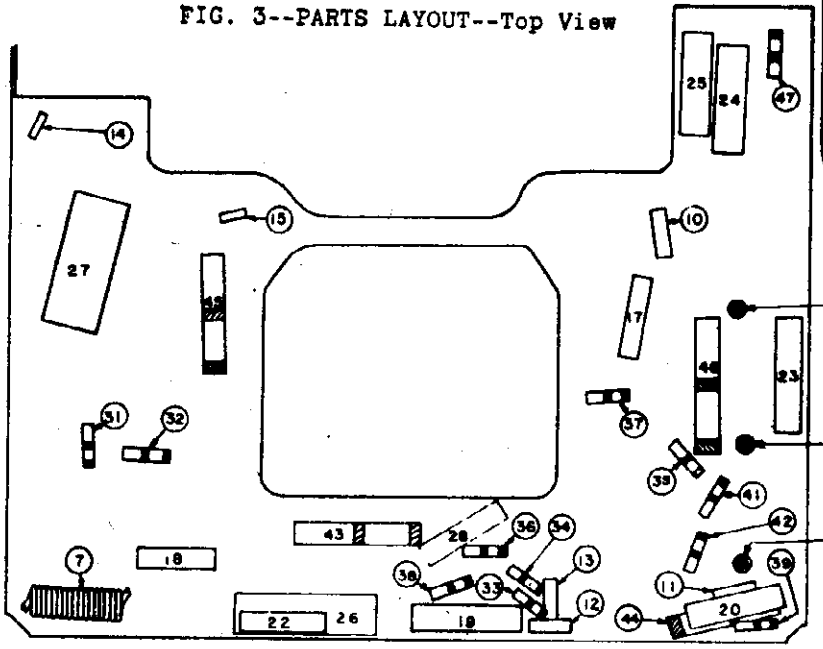
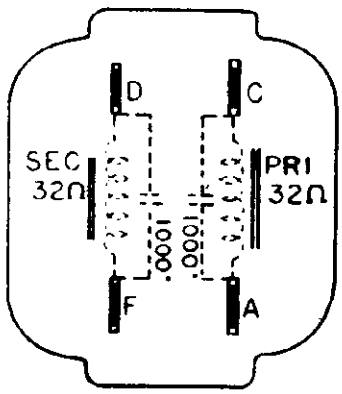
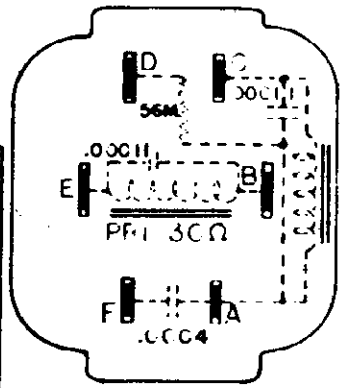


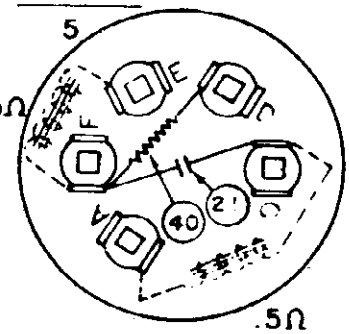
FIG. 4--PARTS LAYOUT--Bottom View



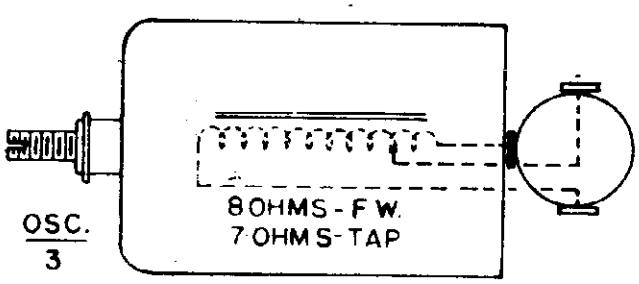
1ST I.F.
4



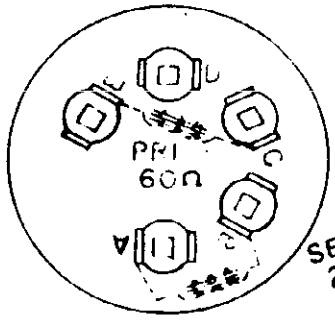
2ND I.F.
5



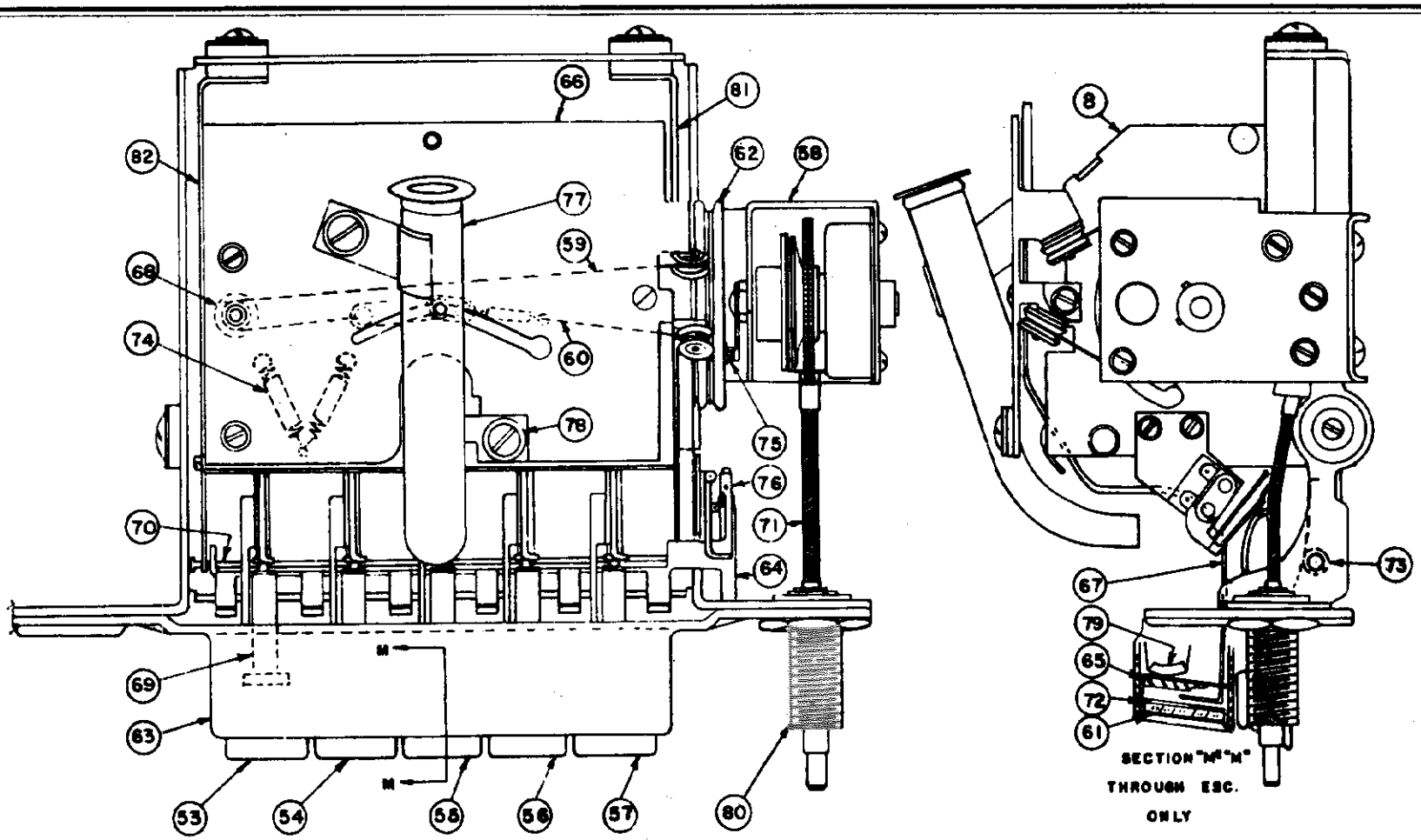
ANT.
1



OSC.
3



R.F.
2



ANTENNA SYSTEM: The 1941 Buick uses a roof peak antenna as standard equipment.

TUNING CONTROLS: Tuning is accomplished by means of the conventional manual tuning control or by means of a five push button mechanical tuner which may be set up for any desired group of stations.

An electric clutch is provided which automatically disconnects the manual tuning mechanism when any one of the buttons is pressed.

NOTE: Do not attempt to operate the push button tuning unless the set is connected to a six volt battery and turned on.

MODEL 980650

BUICK MOTOR

CIRCUIT ALIGNMENT

Should realignment be necessary, the circuits can be properly adjusted only by the use of a calibrated test oscillator or signal generator and an output meter.

1. Aligning I-F Stages at 260 Kilocycles

(a) Connect the ground lead of the signal generator to the chassis.
(b) Connect the signal lead of the signal generator to the R.F. section of the gang condenser (Illus. F, Fig. 3) through a .1 mfd. condenser.
(c) Connect the output meter from the plate prong of one 6V6GT tube to the plate prong of the other 6V6GT tube.
(d) Set the signal generator to 260 Kilocycles and turn volume control on full.
(e) Set the condenser gang to a point around 600 Kilocycles where no station is received.
(f) Adjust the four screws on the two I.F. coils (Illus. A,B,C & D, Figs. 3 & 4) until maximum output is obtained. Repeat these adjustments with as low an output from the signal generator as possible for a readable indication on the output meter.

2. Aligning at 1560 Kilocycles

(a) Leave the signal generator connected as before.
(b) Turn the tuning condenser plates all the way out and against the high frequency stop.
(c) Set the signal generator to 1560 Kilocycles.
(d) Adjust the trimmer (Illus. E, Fig. 3) for maximum output.

3. Aligning at 1400 Kilocycles

(a) Connect the signal lead of the signal generator to the antenna connection of the receiver through a .00005 mfd. mica condenser.
(b) Set the signal generator to 1400 Kilocycles.
(c) Rotate the variable plates of the gang condenser until the signal is tuned for maximum output.
(d) Adjust the trimmers (Illus. F, G, Fig. 3) for maximum output.

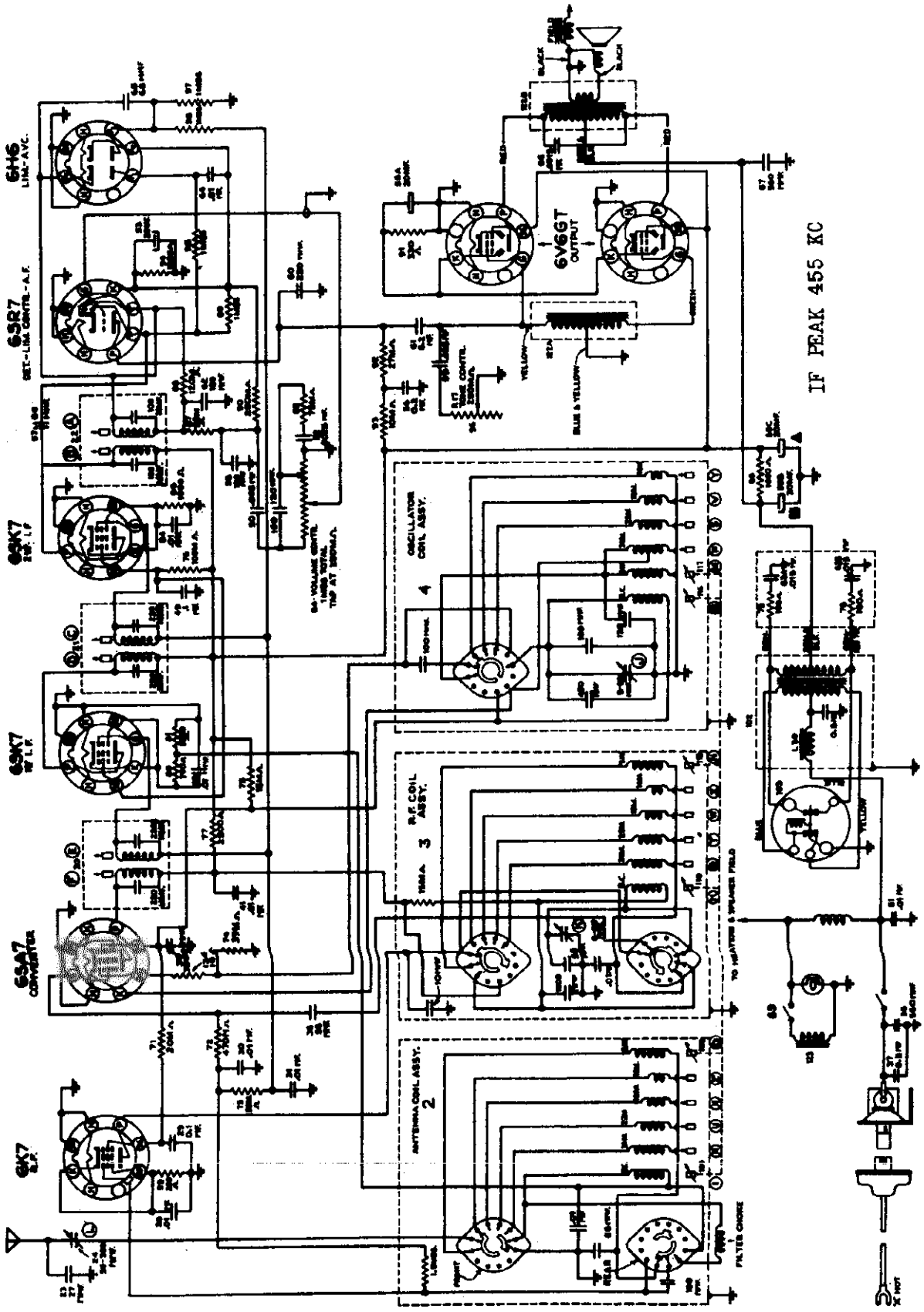
4. Aligning at 600 Kilocycles

(a) Leave the signal generator connected as before.
(b) Set the signal generator to 600 Kilocycles.
(c) Tune this signal in on the set.
(d) Adjust the oscillator coil iron core aligning screw (Illus. H, Fig. 3) while rocking the condenser gang back and forth through the signal until maximum output is obtained.
(e) Adjust screw (Illus. J, Fig. 4) for maximum output.
(f) Repeat adjustments made under 3 and 4 above.

5. Adjustment of Radio to Car Antenna

The radio should be adjusted to the car antenna after mounting in the car. The following adjustment should be made:
(a) Tune in a weak station near the high frequency end of the dial (approximately 1400 KC.)
(b) Adjust the antenna trimmer (Illus. G, Fig. 3) for maximum output.

BUICK MOTOR


6H6
6SR7
6SK7
6SK7
6SA7
6K7
6V6GT
OUTPUT
OSCILLATOR COIL ASSY.
4
R.F. COIL ASSY.
3
ANTENNA COIL ASSY.
2
IF PEAK 455 KC

MODEL 980660

BUICK MOTOR

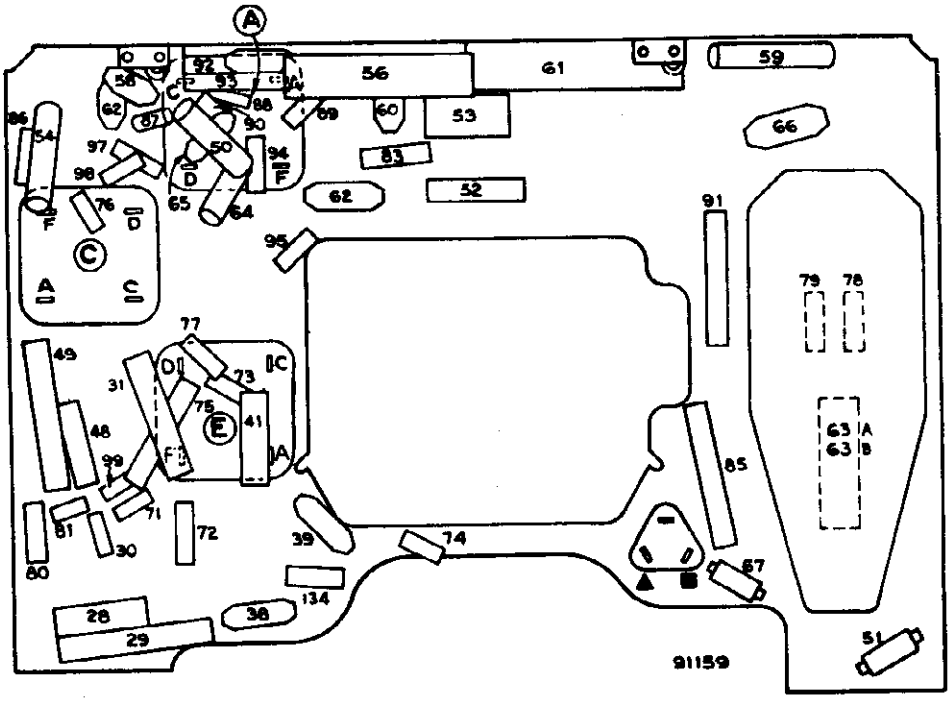


FIG. 4--PARTS LAYOUT--Bottom View

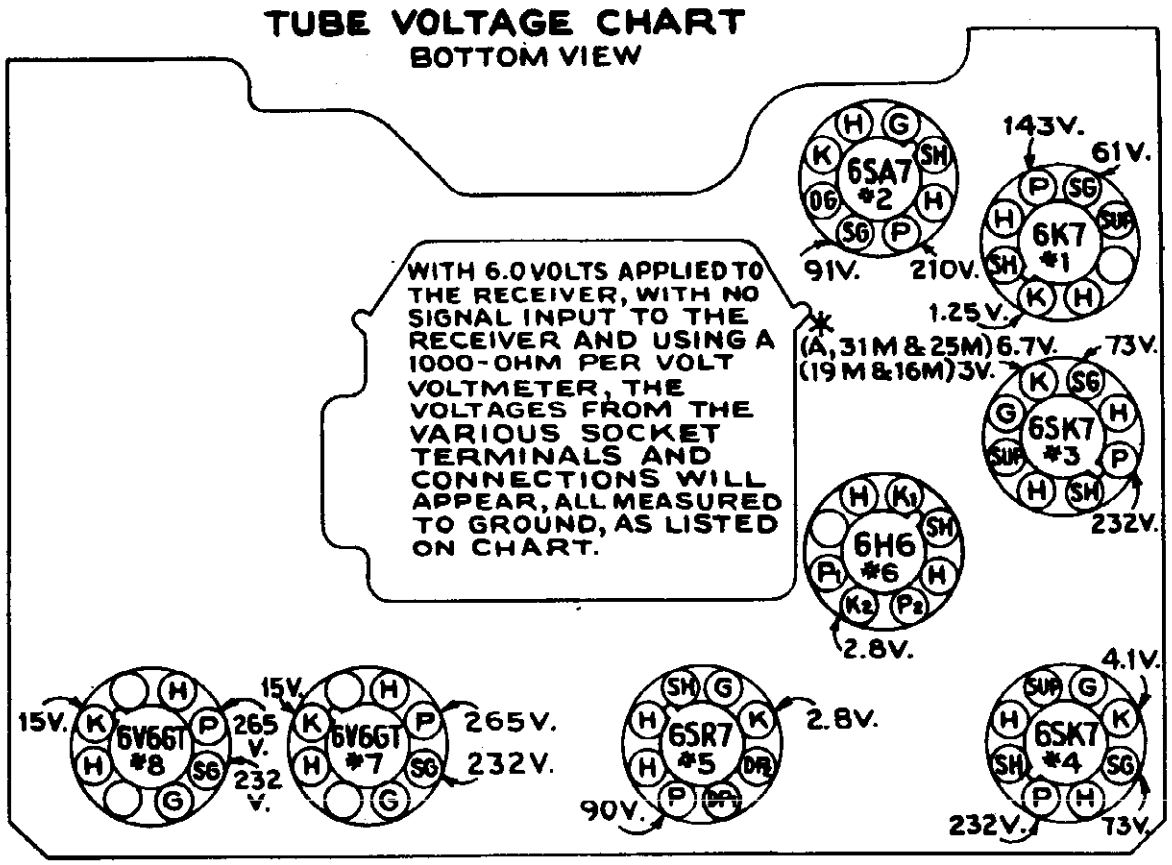


FIG. 1--TUBE SOCKET VOLTAGES

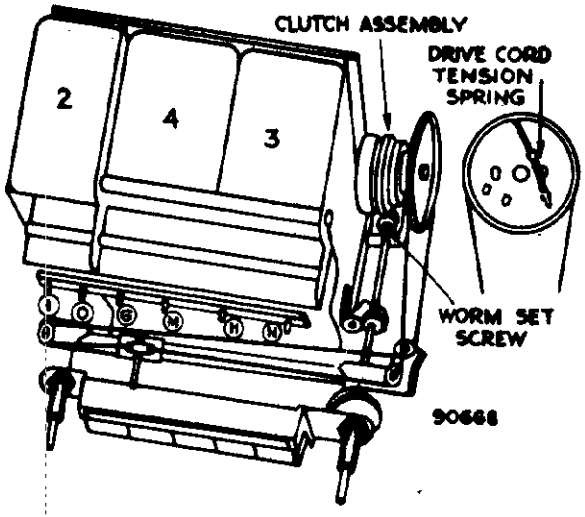


FIG. 5--DIAL CORD LAYOUT

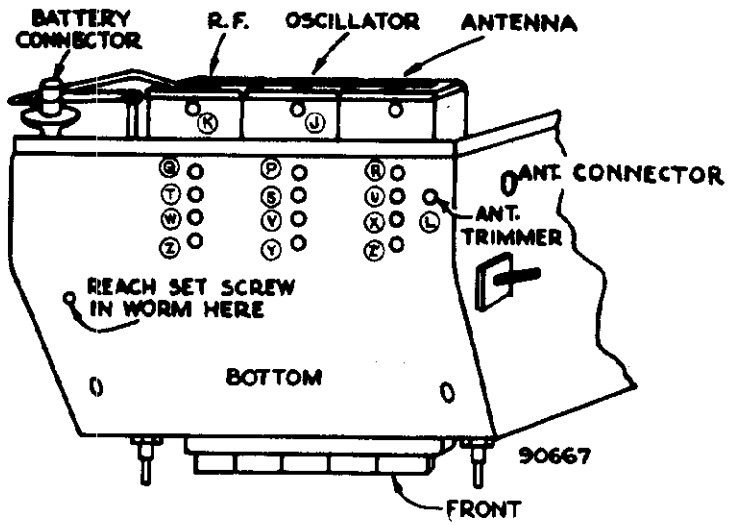


FIG. 6--TRIMMER LOCATIONS

CIRCUIT ALIGNMENT

ALIGNMENT PROCEDURE: The adjustable trimmers and iron cores in this receiver have been very carefully adjusted at the factory and should require no further adjustment (except the antenna trimmer item L), unless tampered with or a defective unit has been replaced. It is, therefore, advisable not to attempt any adjustment unless it is definitely known that an adjustment is necessary.

Should realignment be necessary the circuits can be properly adjusted only by the use of a calibrated test oscillator or signal generator and an output meter.

To align the circuits of this receiver correctly, an accurately calibrated oscillator or signal generator and an output meter must be used. In aligning this receiver it is very important that the correct frequencies be used and that all alignment adjustments be made in sequence specified below starting with the I.F. Amplifier, then aligning the broadcast band and finally the short wave bands. Slight misalignment of either the I.F. or R.F. circuits will result in a loss of sensitivity over most of the dial.

All R.F. and I.F. adjustments are accessible after removing the speaker cover and rear cover. The I.F. primary windings are adjusted by iron core screws B, D, F, located on top of the I.F. transformers, Fig. 3, and the secondary windings A, C, E are adjusted by core screws located at the bottom of each I.F. transformer, Fig. 4.

1. Aligning I.F. Stages at 455 K.C.

(a) Connect output meter across the voice coil of the speaker.
(b) Connect the high side of the signal generator to the grid of the second I.F. tube 6SK7, (Pin #4, Fig. 2) through a .01 mfd. condenser and the low side of the signal generator should be connected to the frame of the chassis.
(c) Turn the volume control on full.
(d) Adjust signal generator to 455 K.C.
(e) Adjust core screws (Illus. A & B, Figs. 4 & 3) on the 3rd I.F. transformer for maximum reading on the output meter.
NOTE: Always use the lowest signal generator output that will give a reasonable deflection on the output meter.
(f) Connect the signal generator lead through the .01 condenser to the grid of the first I.F. tube--6SK7, Pin #4--and adjust core screws (Illus. C & D, Figs. 4 & 3), in the 2nd I.F. transformer for maximum output as in (e).
(g) Connect the signal generator lead through the .01 condenser to the grid of the tube 6SA7, (Pin #8) and adjust core screws (Illus. E & F, Figs. 4 & 3) in the first I.F. transformer for maximum output.
NOTE: These adjustments should be repeated several times and during alignment, the signal generator output should be kept to as low a value as is consistent with obtaining a readable indication on the output meter.

2. Broadcast Band Alignment

Six trimming adjustments are provided which include trimmers L, K, J, associated with Illus. #2, 3, 4 and the three iron cores I, H, G, which are mounted in front of the coil assemblies in conjunction with the core draw bar. If realignment is found necessary, the R.F. circuits should be adjusted in the following sequence:

(a) Tune the receiver to the extreme high frequency end of the dial and against the stop.

2. Broadcast Band Alignment--Cont'd.

(b) Turn each of the three core screws (Illus. G, H, & I, Fig. 5) in a counter-clockwise direction 8 TURNS. (This is done in order to separate the cores from the coil windings far enough so that the cores will have no effect on the frequency of the circuits.)
(c) Connect the "high" side of the signal generator, through a 30 mmf. condenser, to the Buick shielded antenna lead-in cable, (Part No. 1321036), and the "low" side to the shield of the cable.
(d) Connect the output meter across the voice coil and turn the volume control to maximum.
(e) Adjust the frequency of the signal generator to exactly 1590 K.C. and peak trimmers (Illus. J, K & L, Fig. 6) for maximum signal output, at the same time reducing the signal generator output to as low a value as is consistent with a reliable indication on the output meter.
(f) Change the frequency of the signal generator to 1560 K.C. and turn the oscillator core screw (Illus. G, Fig. 5) clockwise until maximum output is obtained.
(g) Change the frequency of the signal generator to 1200 K.C. and TUNE the RECEIVER by means of the manual tuning knob for maximum signal at approximately 1200 K.C. Check the dial calibration at 1200 K.C. (between 110 and 130 on the dial) and if the receiver does not appear to track at this point repeat paragraph F.
(h) Adjust the core screws (Illus. H & I, Fig. 5) for maximum signal output.
(i) Change the frequency of the signal generator to 600 K.C.
(j) TUNE the RECEIVER by means of manual tuning knob for maximum signal at 600 K.C.
(k) Adjust the antenna and R.F. trimmers (Illus. L & K, Fig. 6) for maximum output.
(l) Reset signal generator to 1200 K.C. and tune receiver for maximum output at 1200 K.C.
(m) Adjust antenna and R.F. cores (Illus. H & I, Fig. 5) for maximum output.

3. Short Wave Alignment

Because of the extensive frequency range of this receiver it is necessary that the short wave bands be aligned in exact accordance with the following procedure. Be sure to make all adjustments in the order specified below.

(a) Do not attempt to align the short wave bands without having first completed the broadcast alignment.
NOTE: THIS IS VERY IMPORTANT.
(b) Turn the band indicator to "31 METERS", and the volume control to maximum.
(c) Tune the receiver so that the dial pointer is at the extreme high frequency end of the 31 meter band and adjust iron core screws (Illus. M, N & O, Fig. 5) so that each core end is flush with the coil forms, which extend beyond the shield.
(d) Turn iron trimmer core screws (Illus. R,U,X,Z,Q,T,W,Z,P,S,V,Y, Fig. 6) in a counter-clockwise direction as far as they will go.
NOTE: Do not force the cores against their stops as too much force may fracture the core.
(e) Connect the "high" side of the signal generator through a 30 mmf. condenser, and the Buick shielded antenna lead-in to the antenna connection of the receiver, and the "low" side to the shield of the lead-in.
(f) Adjust the signal generator frequency to 9.6 MC. and move the pointer to 9.6 MC. on the dial scale.
(g) Turn core screw (Illus. P, Fig. 6) in a CLOCKWISE direction until the FIRST peak is obtained and adjust carefully for maximum reading on the output meter.
(h) Turn core screw (Illus. Q, Fig. 6) in a clockwise direction until the SECOND peak is obtained if more than one peak can be found and adjust for maximum reading on the output meter, at the same time reducing the signal generator output to as low a value as is consistent with a reliable indication on the output meter.
(i) Adjust core screw (Illus. R, Fig. 6) as in (h) above.
(j) Change the signal generator frequency to 11.8 MC., the band indicator to "25 METERS" and move the pointer to 11.8 MC. on the dial scale.
(k) Adjust core screw (Illus. S, Fig. 6) as in (g) above.
(l) Adjust core screws (Illus. T & U, Fig. 6) as in (h) above.
(m) Change the signal generator frequency to 15.2 MC., the band indicator to "19 METERS", and move the dial pointer to 15.2 MC. on the dial scale.
(n) Adjust core screw (Illus. V, Fig. 6) as in (g) above.
(o) Adjust core screws (Illus. W & X, Fig. 6) as in (h) above.
(p) Change the signal generator frequency to 17.8 MC, the band indicator to "16 METERS", and move the pointer to 17.8 MC. on the dial scale.
(q) Adjust core screw (Illus. Y, Fig. 6) as in (h).
(r) Adjust core screws (Illus. Z & Z^1, Fig. 6) as in (g).
(s) Repeat operations e, f, g, h, i, j, k, l, m, n, o, p, q, and r, described above at least three times.

4. General Alignment Information

Alignment of the short wave bands should never be attempted without first completing the broadcast alignment.

The most satisfactory method of aligning or checking the "Spread-Band" ranges is on actual reception of short wave stations of KNOWN FREQUENCY, by adjusting the iron oscillator coil for each band (Illus. P, S, V & Y, Fig. 6) so that these stations come in at the correct points on the dial. (Note: Repeat E, F & Ant.).

In exceptional cases, when the set is being serviced in a location where the noise level is high enough to prevent reception of short wave stations, a signal generator should be used for alignment, but an extremely high degree of accuracy is required in the frequency settings of the signal generator, as a slight error will produce considerable inaccuracy on the spread-band dial.

MODEL 980660

5. Adjusting Antenna Compensating Condenser

This adjustment should only be made after the receiver has been properly installed in the car with the antenna connected to the receiver. Tune the receiver to a weak signal at the high frequency end of the broadcast band at about 1200 K.C. and with the antenna fully extended, adjust the antenna compensating trimmer (Illus. L, Fig. 6) for maximum signal strength.
Do not attempt to make any other alignment adjustments with the receiver installed in the car.

(a) Remove speaker (front) cover, rear cover and the bottom of tuner section. Unsolder the connecting leads from the volume control and other points in the chassis.

(b) Remove the link and arm arrangement that operates the band switches by first removing the two units, (A), holding the short link arm (B) to the band indicator shaft.

(c) Remove screws (C) and link arms (D) from each of the band switch shafts, but in removing the center one, care should be taken not to lose the two steel rollers and "S" spring (which are loose on the assembly) from the detent device at the base of the center coil unit.

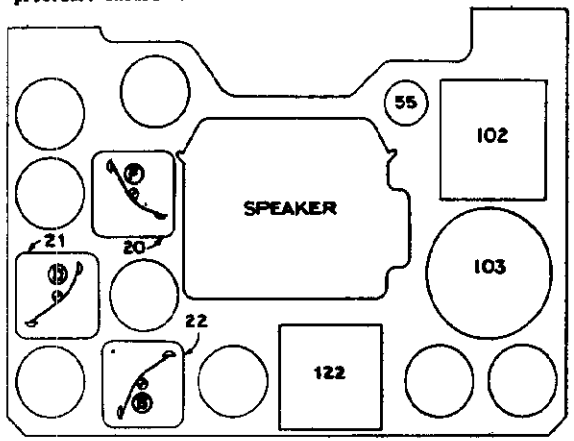
(d) Remove the four units (E) which hold the coil plate (F) to the tuner assembly and withdraw the coil plate from the assembly, being careful to prevent the coil cores from striking any part of the assembly which may result in breakage of the core.

(e) After removing the two small screws located at the base of each coil unit, the coil units can then be removed from the coil plate.

(f) In re-assembling the cores into the coil units, hold the coil plate (F) slightly "off-square" from the cores, then insert the core nearest its coil, one by one, as the coil plate is brought square with the tuner assembly frame.

REMOVAL OF COIL UNIT

Should it become necessary to remove a coil unit, the following procedure should be followed:



Illus. No.	Service Part No.	TUNER SERVICE PARTS Part Name	Description MODEL 1323457
56	7240927	Coil	Ant.,R.F. & Osc. coil & bkt. assy.
57	7240179	Coil	Oscillator series
58	7241066	Coil	Oscillator shunt
59	7239816	Control	Volume-tone-on-off switch
61	7241622	Condenser	.000125 mfd. compensating
62	7231178	Condenser	.0002 mfd. molded
63	7230912	Condenser	.005 mfd. 800 V. tub.
64	7241199	Condenser	Ant. trimmer
65	7241204	Tuner assy.	Push button--latching device (Includes 75 to 89)
66	7240033	Cord	Pointer cord & link assy.
67	7240022	Core	Connecting link and core assy.
68	7240001	Diffuser	
69	7240036	Plate	Pointer plate assy.
70	7240007	Spring	Pointer return
71	7239990	Spring	Latch bar spring
72	7240215	Bracket	Light bkt. & lead assy.
73	7238461	Bulb	
74	7238985	"C" washer	Pointer cord & link mtg.
75	7241863	Button	Push button & shaft assy.
76	7240472	Tip	(P.B.) tuning shaft tip
77	7241834	Tip	Latching button-manual
78	7239986	Bumper	Rubber bumper strip
79	7240925	Nut	Tuning nut (P.B.)
80	7240090	Nut	Tuning nut (manual)
81	7240109	Nut	Nut & sleeve-manual tuning screw
82	7240246	Spring	P. B. shaft--friction spring
83	7240074	Spring	Manual shaft friction spring
84	7239987	Shaft	Manual tuning screw
85	7240108	"C" washer	Manual tuning nut retainer
86	7239991	"C" washer	Spring retaining washer--P.B.
87	7239971	Spring	Push button return
88	7240111	Spring	Manual tuning shaft return
89	7240112	Washer	Cup washer--man. tuning spring

CAR ANTENNA CAPACITY--.000052 to .000068 Mfd. MODELS 980690, 980691

Volume Control Maximum.
Signal Generator output minimum for satisfactory output indication.

Series Condenser Or Dummy Antenna	Connect To	Signal Generator Frequency	Adjust Screws In Order
0.1 Mfd.	Grid side of R.F. Sec. (14B) of Gang Condenser	262 K.C.	A B C D
0.1 Mfd.	Grid Side of R.F. Sec. (14B) of Gang Cond.	1615 K.C.	E
.000060 Mfd.	Antenna Connector	1430 K.C.	F G
.000060 Mfd.	Antenna Connector	600 K.C.	H J
.000060 Mfd.	Antenna Connector	1430 K.C.	F G
.000060 Mfd.	Antenna Connector	600 K.C.	H J

Adjust trimmer G to match car antenna (1430 KC) when radio is installed.

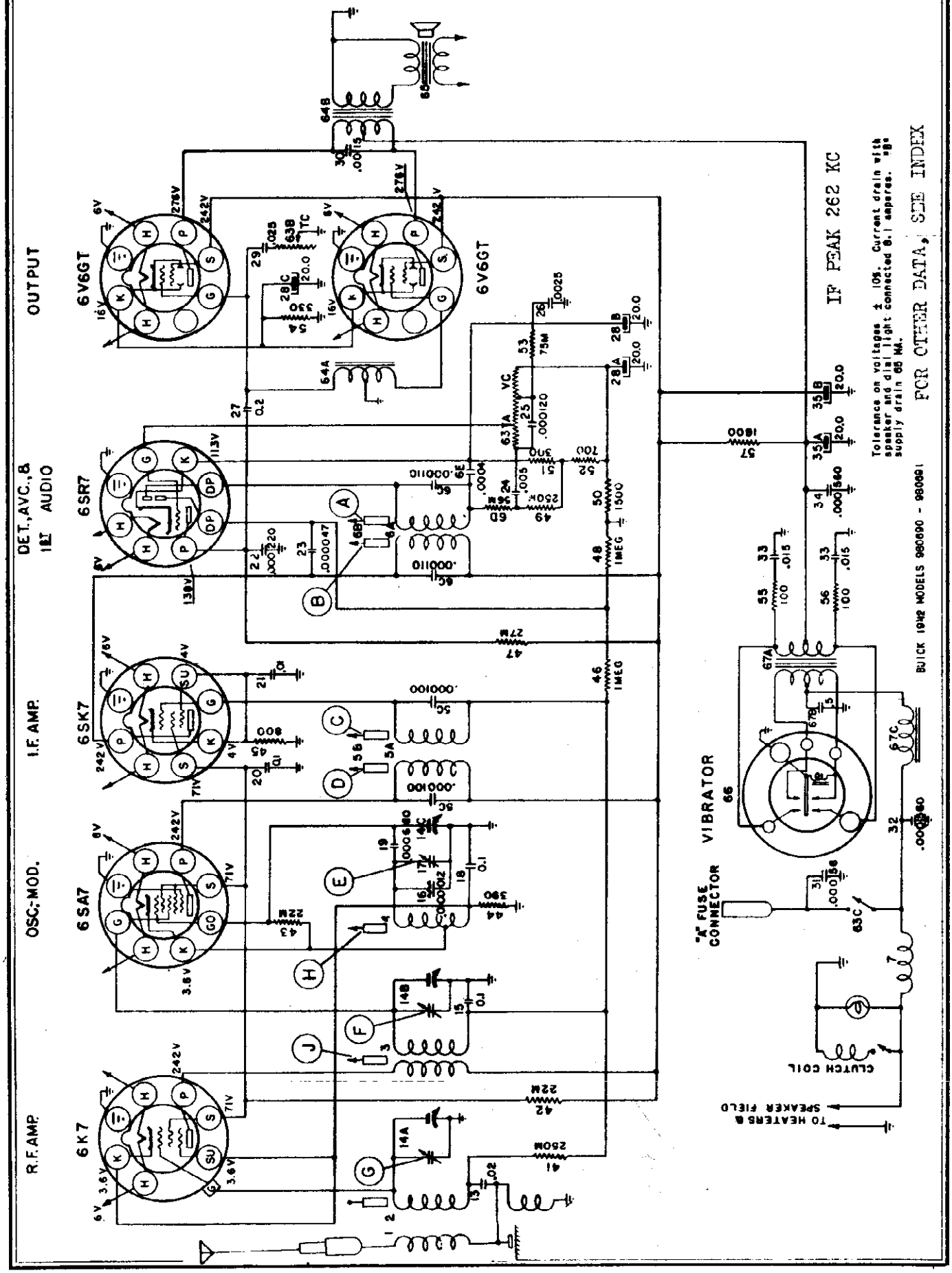
Rock gang condenser back and forth through signal during 600 K.C. adjustment of screws H & J. See Bulletin 6D-2 for complete Alignment Procedure.

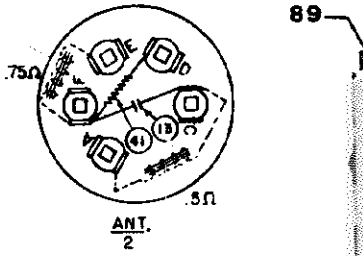
PUSH BUTTON SET-UP

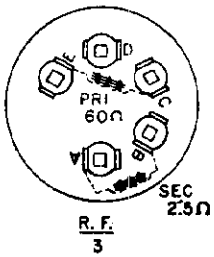
Release holding spring in bottom of button, pull button off. Loosen re-set screw, tune in desired station. Push in re-set screw until it bottoms. Release and tighten screw. Replace button.

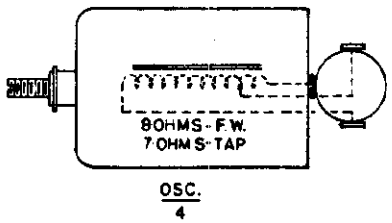
MODELS 980690,980691

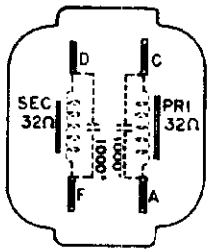
BUICK MOTOR

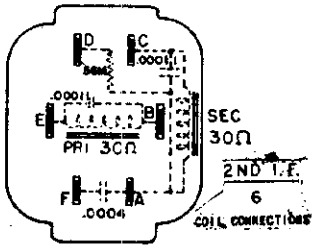


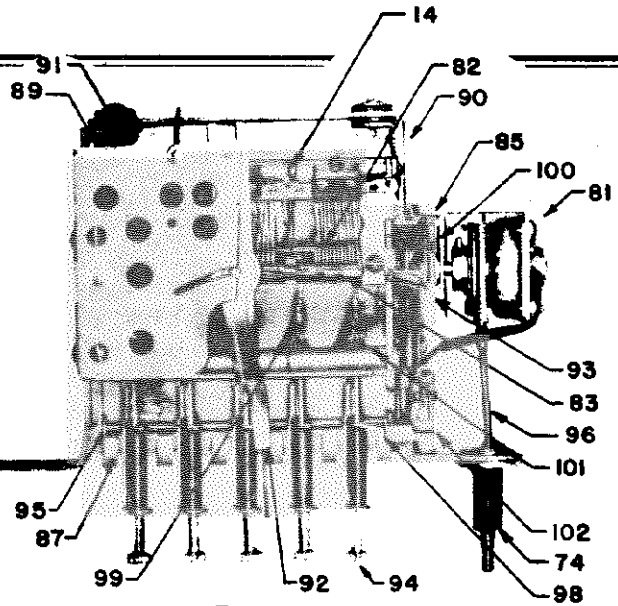




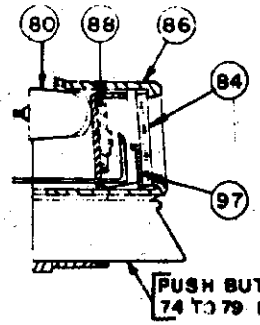




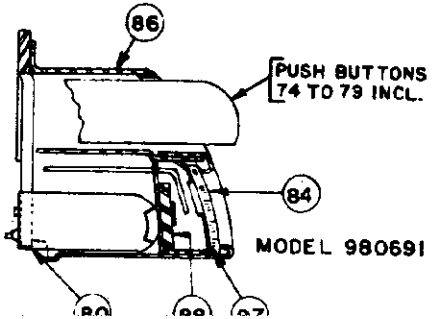


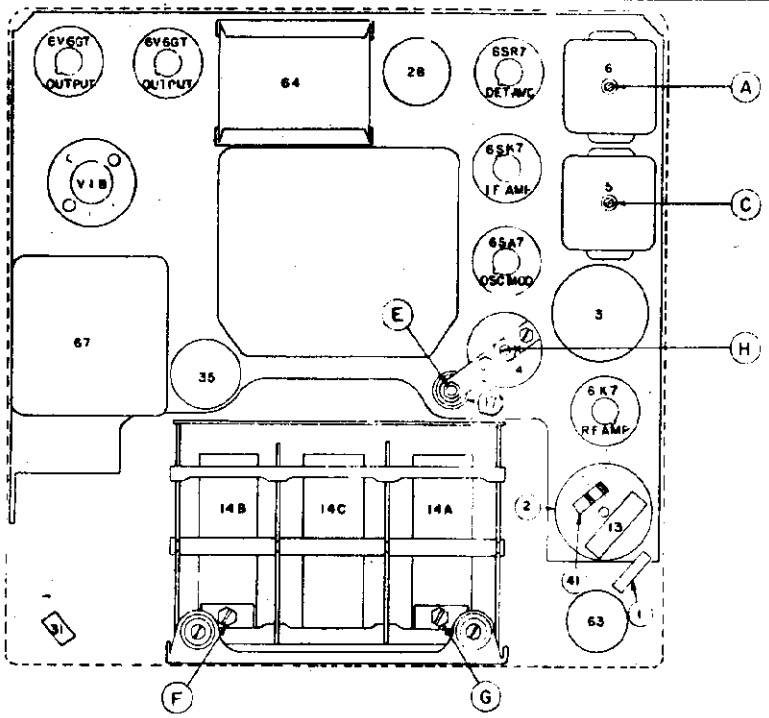


TUNER PICTURE

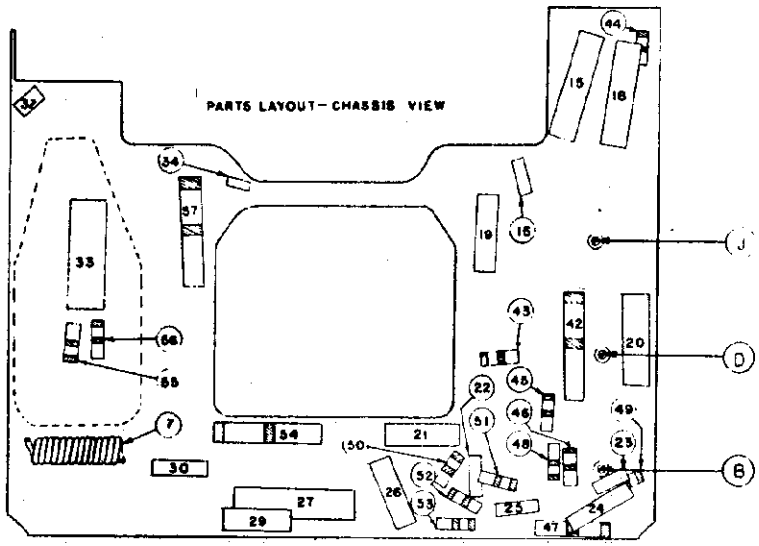


MODEL 980690
ESCUTCHEON CROSS SECTION





PARTS LAYOUT—TUBE VIEW



PARTS LAYOUT—CHASSIS VIEW

MODEL 1323457

BUICK MOTOR

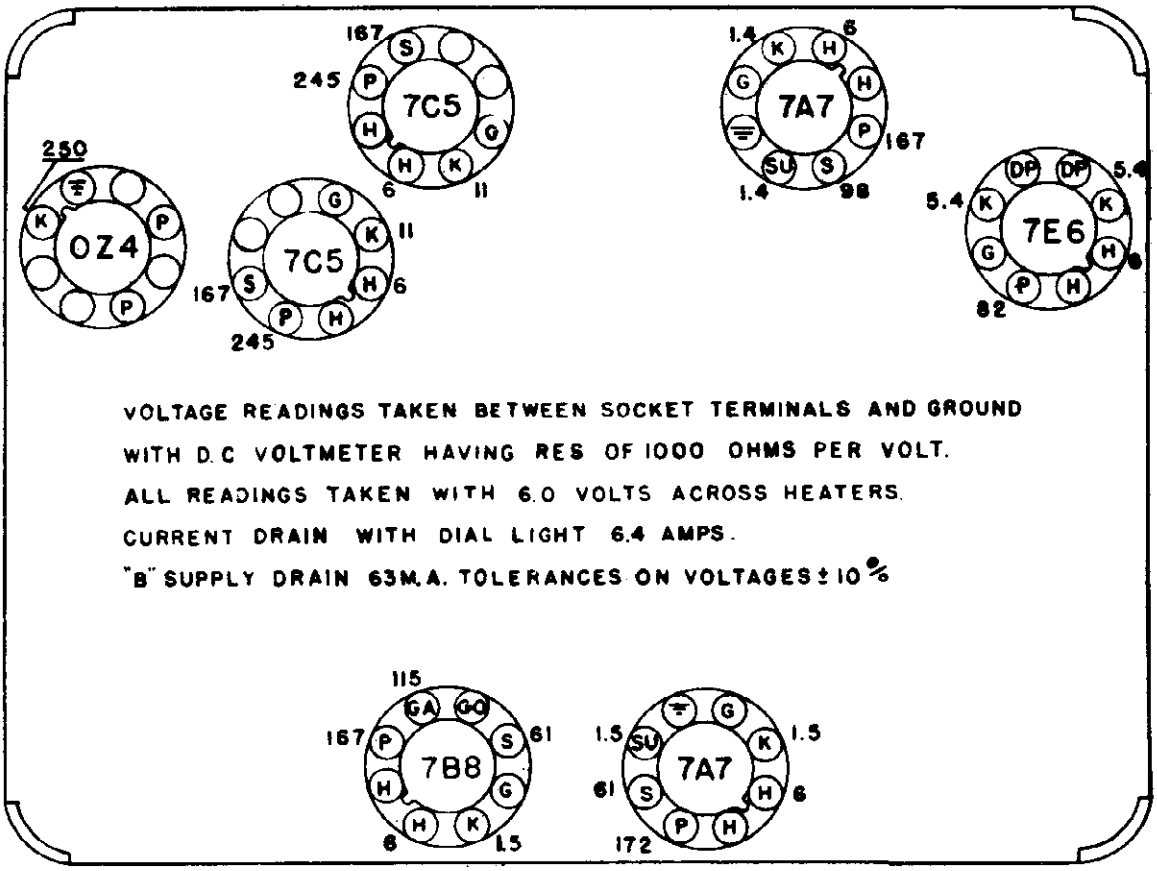
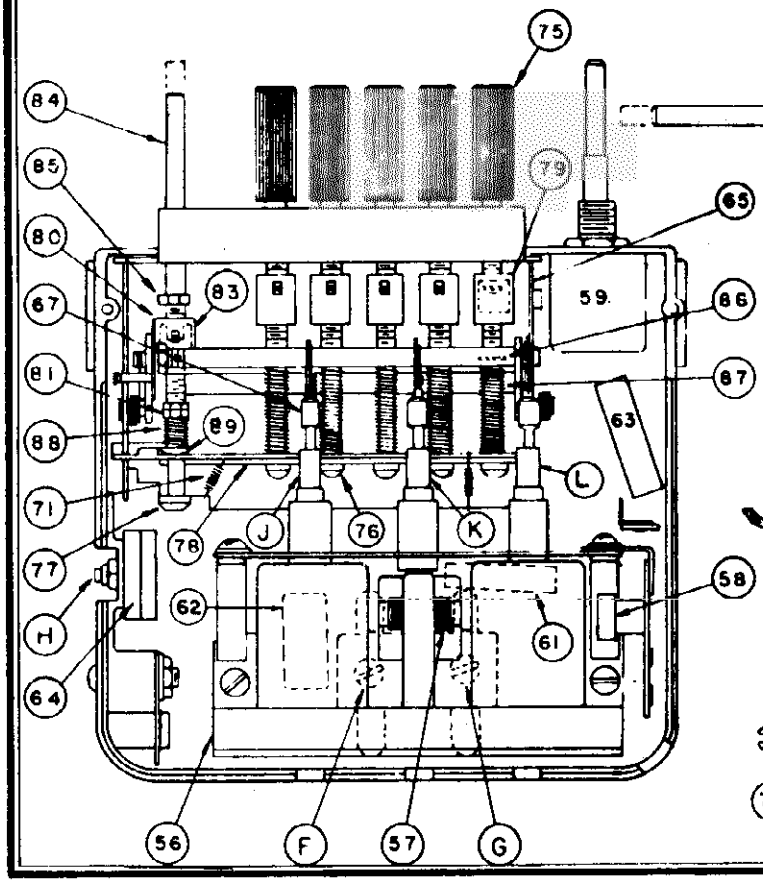


FIG. 1--TUBE SOCKET VOLTAGES



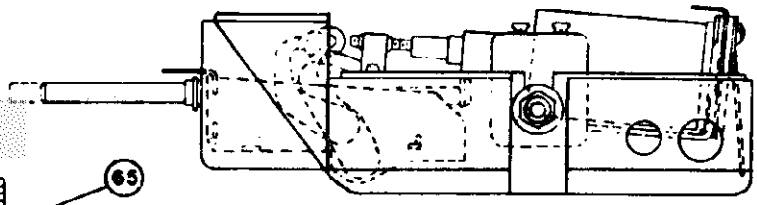
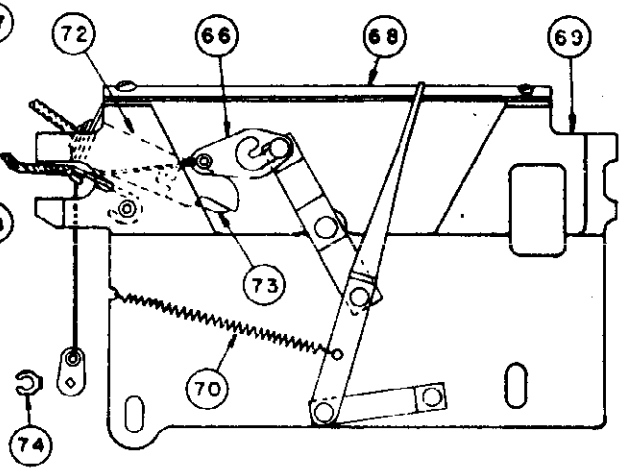


FIG. 5--PARTS LAYOUT--Tuner



BUICK MOTOR

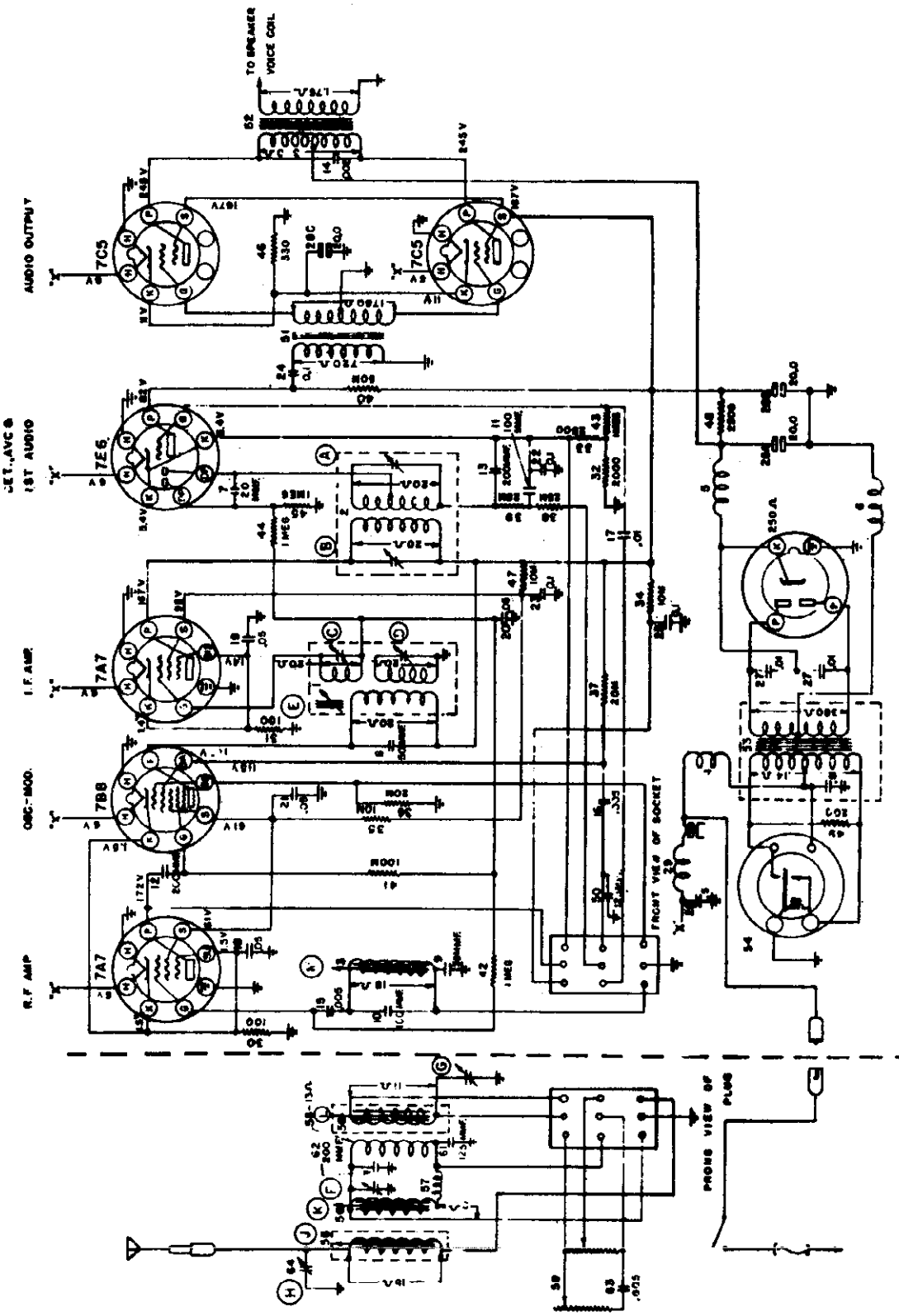


FIG. 2--BUICK MODEL 1323457 CIRCUIT DIAGRAM

GENERAL: The Buick model 1323457 is a 7 tube three unit radio built especially for 1941 Buick cars. It is arranged with an arm rest mounting tuner, and amplifier unit for trunk mounting and a header speaker to be mounted in the rear of the car.

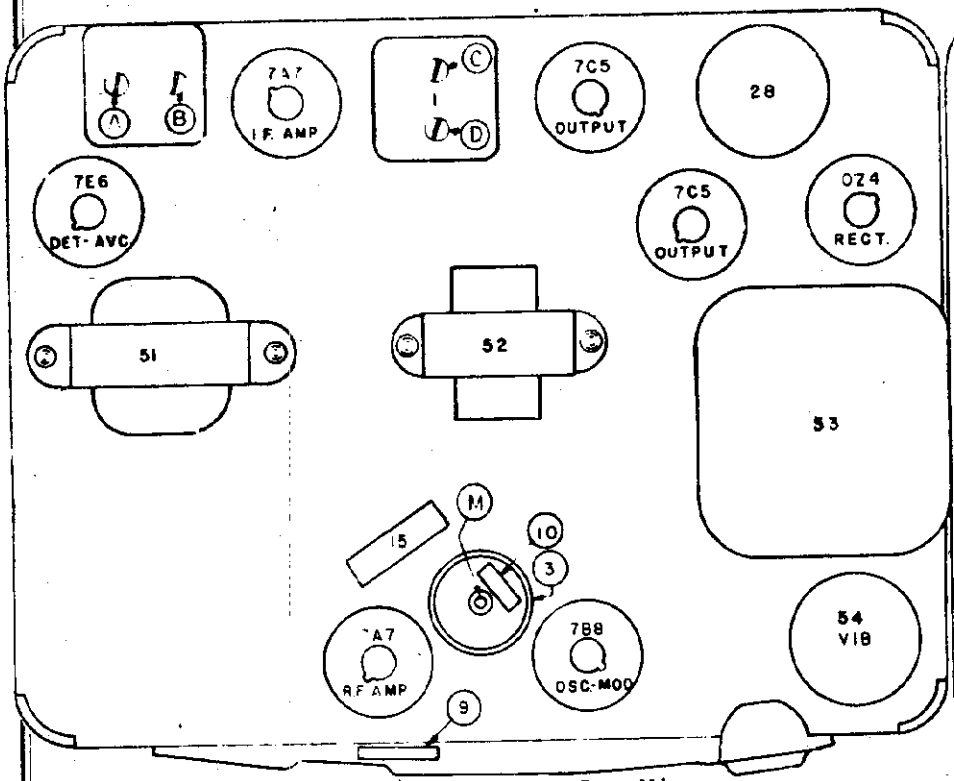


FIG. 3--PARTS LAYOUT--Top View

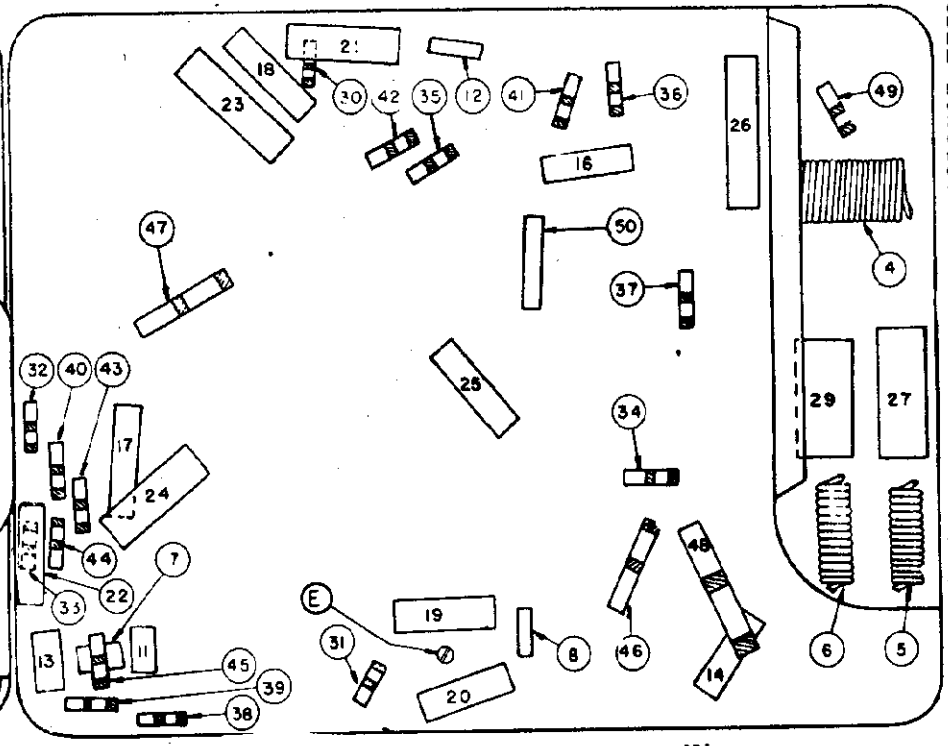


FIG. 4--PARTS LAYOUT--Bottom View

TUNING CONTROL: Tuning is accomplished by means of a manual tuning control or by means of five push buttons each of which adjusts the position of three iron cores in the tuning unit to preselected frequencies.

Setting up the push buttons for any desired station is accomplished by pressing the button into its latched position and rotating in the manner of a manual tuning control until the desired station is tuned in. No locking device is required to retain this setting.

Note: Do not hold button in beyond its normal latching position when setting up station.

The manual control operates by pressing the tuning knob into its latched position and tuning in the conventional manner.

CIRCUIT ALIGNMENT

If realignment is found necessary, the circuits can be properly aligned only with the use of a calibrated test oscillator or signal generator and an output meter. Extreme care should be exercised in following the alignment instructions in order to obtain the best performance possible.

ALIGNMENT PROCEDURE

Two separate alignent procedures are included in these instructions. The first or capacity alignment is to be considered the usual alignment procedure and the second or capacity and inductance alignment is to be used only when there is definite evidence that the iron cores of the tuning coils are out of alignment.

CAPACITY ALIGNMENT

1. Aligning I.F. stages at 455 K.C.

   (a) Connect the ground lead of the signal generator to the chassis frame.
   (b) Connect the signal lead of the signal generator to the grid of the 7B8 tube (Grid side of condenser 12) through a 0.1 mfd. condenser.
   (c) Connect an output meter across the speaker voice coil. (If speaker is disconnected a 4 ohm load may be used instead.)
   (d) Set signal generator to 455 K.C.
   (e) Turn the set volume control on full and tune the set to a position where no squeals or beat notes may be heard, and so that when the tuning control knob is rotated within narrow limits there is no appreciable change in output. The tone control should be rotated to its extreme high position (clockwise.)
   (f) Adjust the I.F. trimers (Illus. A,B,C,D, Fig. 3) and the I.F. core adjustment (Illus. E, Fig. 4) until maximum output is obtained.
   (g) Repeat these adjustments with as low an output from the signal generator as possible for more accurate alignment.
   (h) Connect the signal generator to the antenna connection of the set through an 80 mmfd. condenser.
   (i) Adjust the I.F. trap adjustment (Illus. M, Fig. 3) for MINIMUM output.

2. Alignment at 1560 K.C.

   (a) Leave signal generator connected the same as for the I.F. trap adjustment.
   (b) Tune the set to the extreme high frequency position against the stop.
   (c) Set the signal generator to 1560 K.C.
   (d) Adjust the oscillator trimmer (Illus. F, Fig. 5) for maximum output.

3. Alignment at 600 K.C.

   (a) Set the signal generator to 600 K.C. and tune the set to this signal.
   (b) Adjust the R.F. trimmer (Illus. G, Fig. 5) and the antenna trimmer (Illus. H, Fig. 5) for maximum output.

CAPACITY ALIGNMENT

1. Aligning I.F. stages at 455 K.C.

   (a) Connect the ground lead of the signal generator to the chassis frame.
   (b) Connect the signal lead of the signal generator to the grid of the 7B8 tube (Grid side of condenser 12) through a 0.1 mfd. condenser.

2. Mechanical alignment of cores--Cont'd.

   (b) Remove the pointer plate (note insulating washers under mounting screw) without disturbing the tuning mechanism.
   (c) Using a spare core as a gauge, adjust the oscillator core K so that its rear surface is exactly flush with the front end of the oscillator coil winding.
   (d) Manually tune the set to a point where the front surface of the oscillator core is flush with the front end of the oscillator coil fiber mounting bushing.
   (e) Adjust the antenna and R.F. cores (Illus. J,L, Fig. 5) so that the front surfaces of these cores are flush with the front ends of the coil fiber mounting bushing. Paragraphs (c), (d) and (e) mechanically align the cores so that all three are just at the point of entering their respective windings when the tuning mechanism is against the high frequency stop.
   (f) Replace the pointer plate assembly.

3. Aligning at 1560 K.C.

   (a) Connect the signal lead of the signal generator to the antenna connection of the receiver through an .000075 mfd. condenser.
   (b) Turn the manual control of the set to the high frequency end against stop.
   (c) Set signal generator to 1560 K.C.
   (d) Adjust the oscillator trimmer (Illus. F, Fig. 5) for maximum output.

4. Aligning at 600 K.C.

   (a) Leave the signal generator connected the same as before and set frequency to 600 K.C.
   (b) Tune in this frequency on the set.
   (c) Adjust the R.F. trimmer (Illus. G, Fig. 5) for maximum output.
   (d) Adjust the antenna trimmer (Illus. H, Fig. 5) for maximum output.

5. Aligning at 1400 K.C.

   (a) Set the signal generator to 1400 K.C. and tune set to this signal.
   (b) Adjust the antenna core (Illus. J, Fig. 5) and the R.F. core (Illus. L, Fig. 5) for maximum output.

6. Realigning at 600 and 1400 K.C.

   (a) Repeat the alignment outlined under paragraphs 4 and 5 with as low an output from the signal generator as possible.
   (b) Apply cement to the core screws to prevent their changing alignment.

7. Adjusting receiver to car antenna.

   After the receiver is installed in the car readjust the antenna trimmer (Illus. H, Fig. 5) on a weak station near 1400 K.

CADILLAC DIV.—GEN. MOTORS

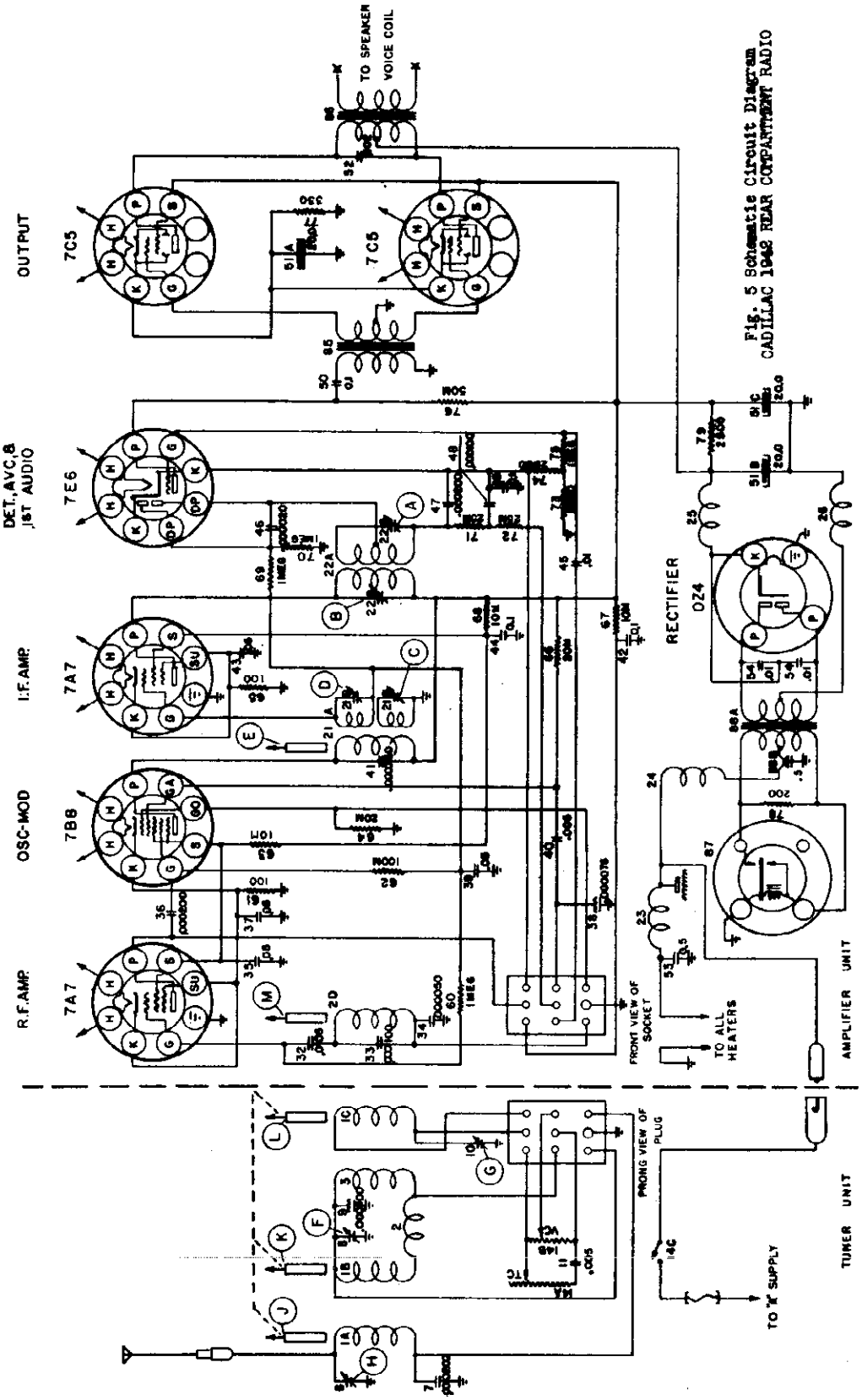


Fig. 5 Schematic Circuit Diagram
CADILLAC 1942 REAR COMPARTMENT RADIO

MODEL 7241938

CADILLAC DIV.—GEN. MOTORS

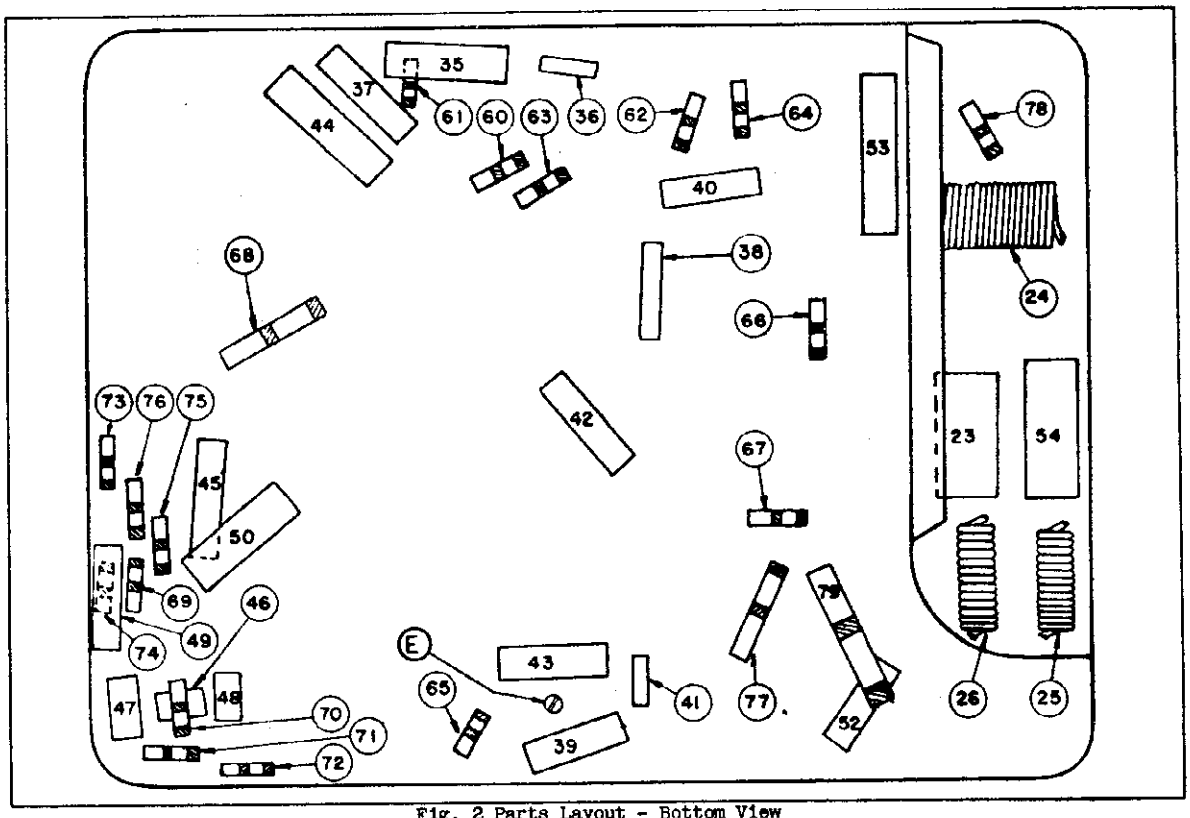


Fig. 2 Parts Layout - Bottom View
CADILLAC 1942 REAR COMPARTMENT RADIO

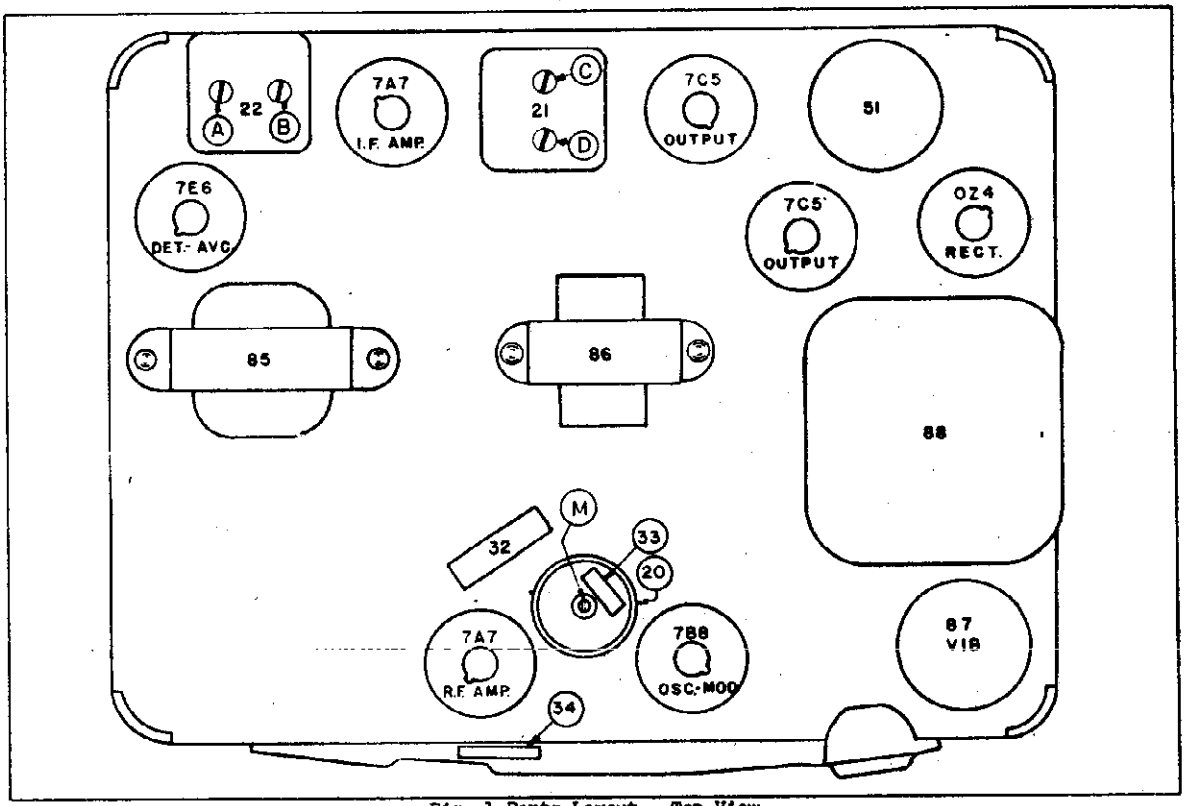


Fig. 1 Parts Layout - Top View
CADILLAC 1942 REAR COMPARTMENT RADIO

SPECIFICATIONS

Power Output	5 Watts Undistorted
Power Consumption	7.5 Amperes at 6 Volts
Sensitivity	6 Microvolts at 1 Watt Output
Selectivity at 1000 times signal	35 KC
Tuning Range	545 to 1600 KC
Manual Tuning	545 to 1600 KC
Automatic Tuning (all 5 buttons)	545 to 1600 KC
Speaker	21 oz. Permanent Magnet, Elliptical Cone
Intermediate Frequency Peak	455

Antenna Trimmer - Designed for 80 mmf. vacuum trunk antenna

TUBE COMPLEMENT

Quantity	Part No.	Type	Function
2	1213583	7A7	RF and IF Amplifier
1	1213585	7B8	First Detector - Oscillator
1	1213582	7E6	Second Detector AVC and First Audio Amplifier
2	1213586	7C5	Power Amplifier
1	7237180	0Z4	Rectifier

CIRCUIT

This model is a 7-tube three unit radio covering the standard broadcast band and designed for installation in the rear trunk compartment with the remote control in the right rear arm rest. The speaker is mounted in the trunk on the ledge behind the rear seat back, the sound being projected through an opening in this ledge.

The permeability tuned remote control unit contains the complete tuning and control mechanism and coils.

The receiver unit contains the RF tubes, the IF amplifier, audio system and power supply. This unit is connected to the remote tuner unit by a shielded plug-in cable.

Tuning is accomplished by means of the conventional manual control or by means of five push buttons. Pushing any of the buttons operates a small mechanical motor which moves the tuning cores in or out of the coils to a preselected position.

The separate rear compartment speaker is a new elliptical design and is 6-1/4" x 9-1/4". The speaker's 21 ounce permanent magnet insures excellent tone quality under all operating conditions.

TO CONTROL THE VACUUM AERIAL

To the left of the volume control rod is the knob which controls the vacuum aerial. Pulling this button upward will raise the aerial and pushing it downward will lower the aerial. The vacuum aerial has two rods, one sliding within the other. For maximum reception both rods should be extended to their full height, the inner rod being extended manually.

TO CHANGE STATION SETTING OF PUSH BUTTONS

The five push buttons should be set up for five stations which are received favorably in your vicinity. The procedure for setting up the push buttons is as follows:

1. Turn on the radio and allow it to warm up from ten to fifteen minutes.
2. Depress button to be set up until it latches and remains depressed.
3. Without pressing or holding the button down, turn it, as in manual tuning, until the desired station is tuned in. This should be done very carefully until the station comes in sharp and clear, free from background noise.
4. Repeat this process for any other buttons which you wish to change.

The setting of any button may be changed at any time by following this procedure.

CAUTION: TURNING ANY OF THE PUSH BUTTONS CHANGES ITS STATION SETTING. DO NOT TURN ANY BUTTON UNLESS YOU WISH TO CHANGE THE SETTING.

CIRCUIT ALIGNMENT

If realignment is found necessary, the circuits can be properly aligned only with the use of a calibrated test oscillator or signal generator and an output meter. Extreme care should be exercised in following the alignment instructions in order to obtain the best performance possible.

ALIGNMENT PROCEDURE

Two separate alignment procedures are included in these instructions. The first or capacity alignment is to be considered the usual alignment procedure and the second or capacity and inductance alignment is to be used only when there is definite evidence that the iron cores of the tuning coils are out of alignment.

CAPACITY ALIGNMENT

1. Aligning I.F. stages at 455 KC.
   (a) Connect the ground lead of the signal generator to the chassis frame.
   (b) Connect the signal lead of the signal generator to the grid of the 7B8 (Grid side of condenser 36) through a 0.1 mfd condenser.
   (c) Connect an output meter across the speaker voice coil. (If speaker is disconnected a 4 ohm load may be used instead).
   (d) Set signal generator to 455 KC.
   (e) Turn the set volume control on full and tune the set to a position

Capacity Alignment (Cont'd.)

where no squeals or beat notes may be heard, and so that when the tuning control knob is rotated within narrow limits there is no appreciable change in output. The tone control should be rotated to its extreme high position (clockwise).

(f) Adjust the I.F. trimmers A, B, C, and D, and the I.F. core adjustment E until maximum output is obtained.

(g) Repeat these adjustments with as low an output from the signal generator as possible for more accurate alignment.

(h) Connect the signal generator to the antenna connection of the set through a 70 mmfd. condenser.

(i) Adjust the I.F. trap adjustment M for minimum output.

2. Alignment at 1615 KC.

(a) Leave signal generator connected the same as for the I.F. trap adjustment.

(b) Tune the set to the extreme high frequency position against the stop.

(c) Set the signal generator to 1615 KC.

(d) Adjust the oscillator trimmer F for maximum output.

3. Alignment at 600 KC.

(a) Set the signal generator to 600 KC and tune the set to this signal.

(b) Adjust the R.F. trimmer G and the antenna trimmer H for maximum output.

CAPACITY AND INDUCTANCE ALIGNMENT

1. Aligning I.F. stages at 455 KC.

Align the I.F. stages as outlined under paragraph 1 under "Capacity Alignment".

2. Mechanical Alignment of Cores.

(a) Turn the manual control of the set to the high frequency end, against stop.

(b) Remove the pointer plate (note insulating washers under mounting screws) without disturbing the tuning mechanism.

(c) Using a spare core as a gauge, adjust the oscillator core K so that its rear surface is exactly flush with the front end of the oscillator coil winding.

(d) Manually tune the set to a point where the front surface of the oscillator core is flush with the front end of the oscillator coil fibre mounting bushing.

Capacity and Inductance Alignment (Cont'd.)

(e) Adjust the antenna and R.F. cores J and L so that the front surfaces of these cores are flush with the front ends of the coil fibre mounting bushing. Mechanically align the cores so that all three are just at the point of entering their respective windings when the tuning mechanism is against the high frequency stop.

(f) Replace the pointer plate assembly.

3. Aligning at 1615 KC.

(a) Connect the signal lead of the signal generator to the antenna connection of the receiver through a 70 mmfd. condenser.

(b) Turn the manual control of the set to the high frequency end against stop.

(c) Set signal generator to 1615 KC.

(d) Adjust the oscillator trimmer "F" for maximum output.

4. Aligning at 600 KC.

(a) Leave the signal generator connected the same as before and set frequency to 600 KC.

(b) Tune in this frequency on the set.

(c) Adjust the R.F. trimmer G for maximum output.

(d) Adjust the antenna trimmer H for maximum output.

5. Aligning at 1400 KC.

(a) Set the signal generator to 1400 KC and tune set to this signal.

(b) Adjust the antenna core J and the R.F. core L for maximum output.

6. Realigning at 600 and 1400 KC.

(a) Repeat the alignment outlined under paragraphs 4 and 5 with as low an output from the signal generator as possible.

(b) Apply cement to the core screws to prevent their changing alignment.

7. Adjusting receiver to car antenna.

After the receiver is installed in the car, readjust the antenna trimmer H on a weak station near 1400 KC.

MODEL 7241938

CADILLAC DIV.—GEN. MOTORS

Part No.	Illust. No.	Part Name	Description	List Price
			TUNER MECHANICAL PARTS	
7242580	95	Tuner Assy.	Push Button latching devise - Includes item 96 to 110.	$8.50
7241863	96	Button	Push Button & Shaft	
7239986	97	Bumper	Rubber Strip	
7240925	98	Nut	P. B. Tuning.	.36
7240090	99	Nut	Manual Tuning	
7240109	100	Nut	Nut & Sleeve-Manual Screw	.12
7239987	101	Shaft	Manual Tuning	
7240246	102	Spring	P. B. Shaft Friction	
7240074	103	Spring	Manual Shaft Friction	
7239971	104	Spring	P. B. Return	
7240111	105	Spring	Man. Shaft Return	
7240472	106	Tip	P. B. Tuning Shaft.	.05
7241834	107	Tip	Manual Shaft Latching	.05
7240108	108	Washer	Manual Tuning Nut Retainer	
7239991	109	Washer	Spring Retainer-P. B.	
7240112	110	Washer	Cup-Manual Tuning Spring.	.03
7242588	111	Core	Connecting Link & Core Assy.	.70
7240036	112	Plate	Pointer Plate Assy.-Includes Items 113 to 117.	1.60
7240033	113	Cord	Pointer Cord & Link Assy.	.20
7240001	114	Diffuser		.20
7240215	115	Light	Light Bracket & Lead Assy	.40
7240007	116	Spring	Pointer Return.	.05
7238985	117	Washer	Holding Pointer Cord & Link	.03
7239990	118	Spring	Latch Bar	
			MISCELLANEOUS PARTS	
7241084		Cable	Tuner Cable & Plug to Set.	4.00
7241503		Cable	Speaker.	.85
7242591		Escutcheon	Tuner Front Cover & Dial Assy. . . .	2.10
7241082		Knob	Control.	
7239940		Knob	Dummy.	.25
7239545		Knob	Tone Control	.30
7241078		Lead	"A" Lead Assy.-Fuse to Tuner	.35
7241070		Lead	"A" Lead Assy.-Tuner to Set.	.40
5272607		Lead	Fuse to Ammeter.	1.60
7238455		Socket	Loktal Tube Base	
7236279		Socket	Octal Tube Base.	
7233944		Socket	Vibrator	
7241514		Speaker	. . . . .	9.00
			TUBE COMPLEMENT	
1213583		7A7	R.F. Amp	1.25
1213585		7B8	Osc. Modulator	1.25
1213583		7A7	I.F. Amplifier	1.25
1213852		7E6	Det. AVC & First Audio	
1213586		7C5	Push-Pull Output	1.25
7237180		0Z4	Rectifier.	1.60
			INSTALLATION PARTS	
7241060		Parts Pkg. Assy.		
1880659			Generator Condenser	$ .45
1879526			Coil Condenser.	.35
1435482			Distributor Suppressor.	.30
7240138			Front Wheel Static Collector.	.20
7240808			Insulating Ferrule.	.12
147685			Fuse 14 Amp	.10
120617			Screw	
131015			Washer	
113987			Screw	
132900			Screw	
121801			Lockwasher	

CADILLAC DIV.—GEN. MOTORS

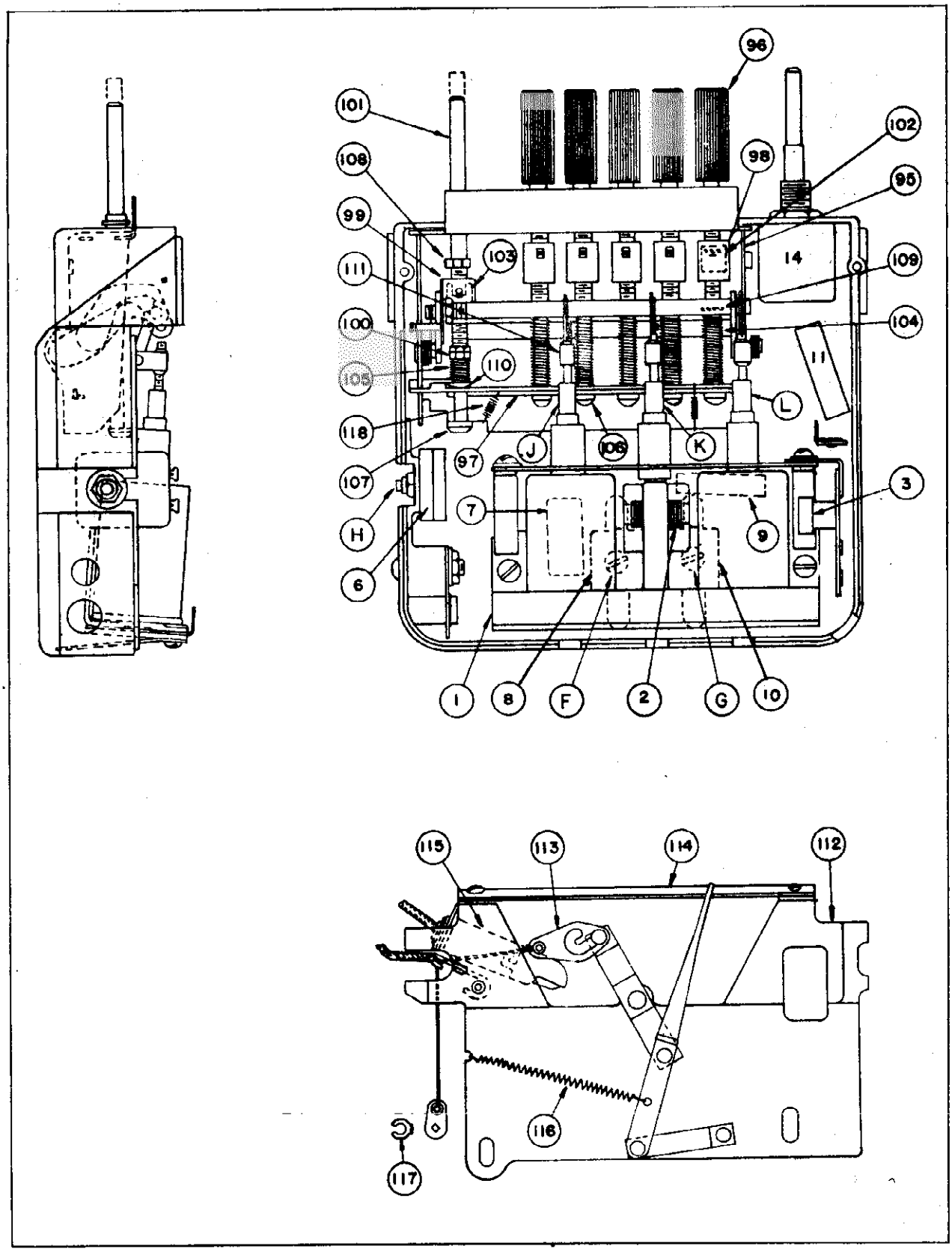


Fig. 3 Parts Layout - Tuner
CADILLAC 1942 REAR COMPARTMENT RADIO

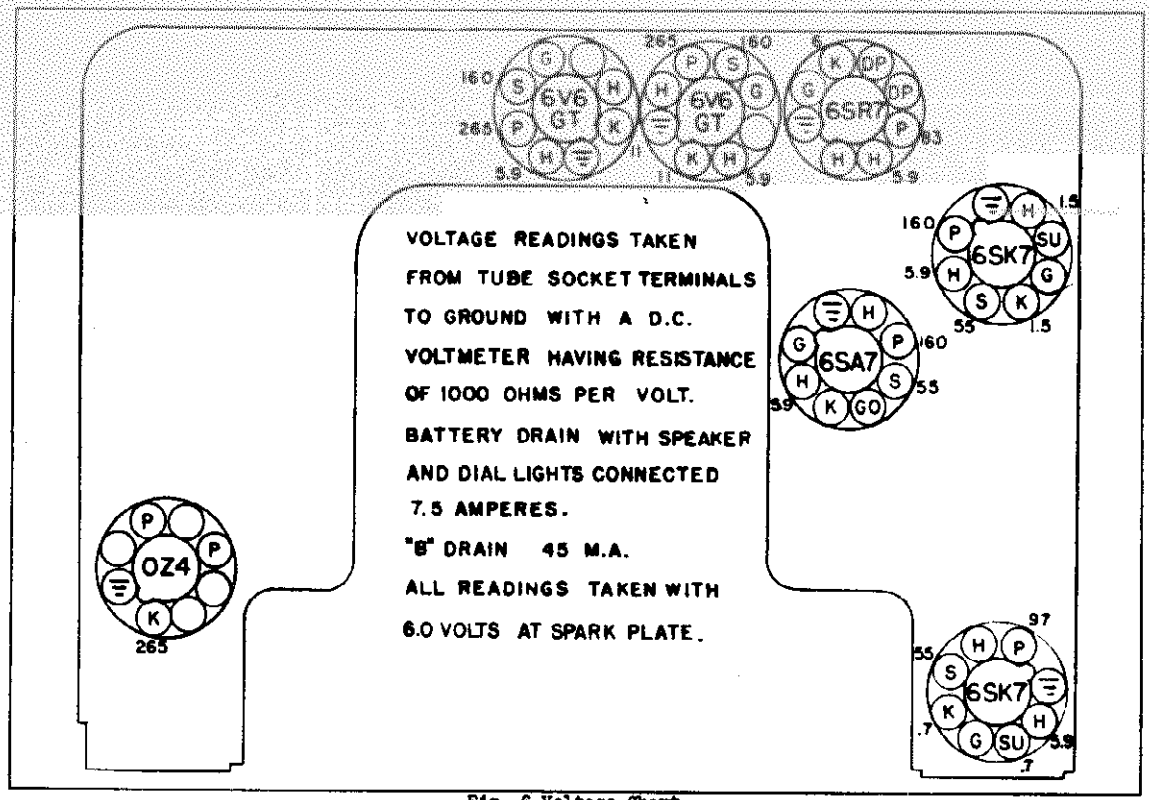


Fig. 6 Voltage Chart
CADILLAC 1942 AUTOMATIC RADIO

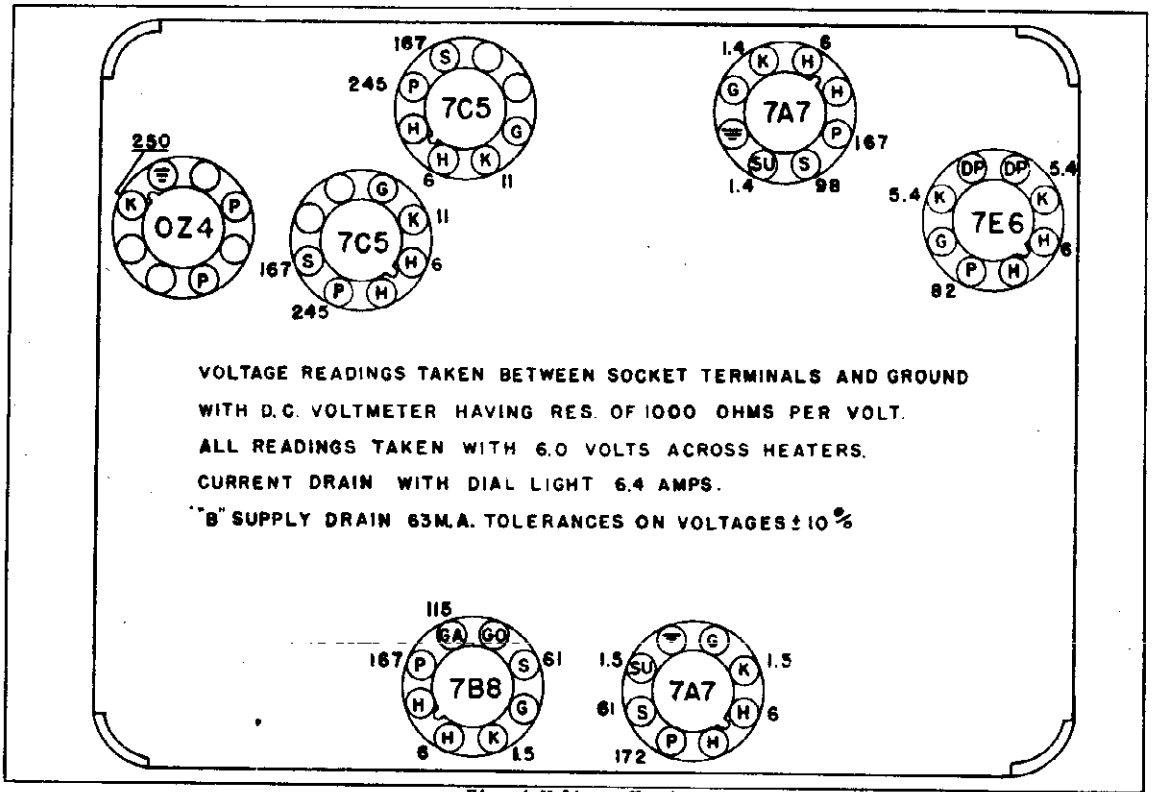


Fig. 4 Voltage Chart
CADILLAC 1942 REAR COMPARTMENT RADIO

MODEL 7241951

CADILLAC DIV.—GEN. MOTORS

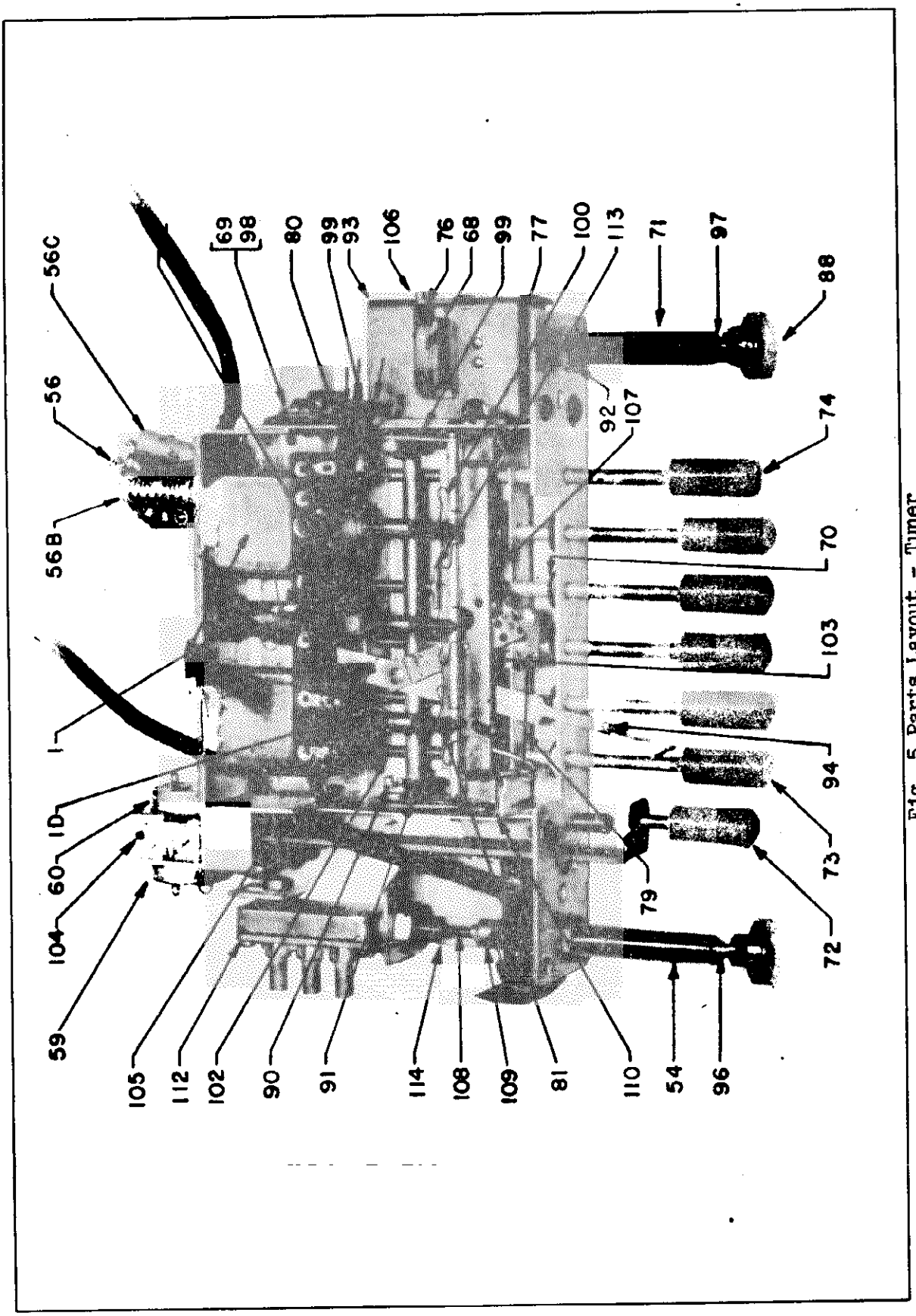


Fig. 5 Parts Layout - Tuner
CADILLAC 1942 AUTOMATIC RADIO

CADILLAC DIV.—GEN. MOTORS

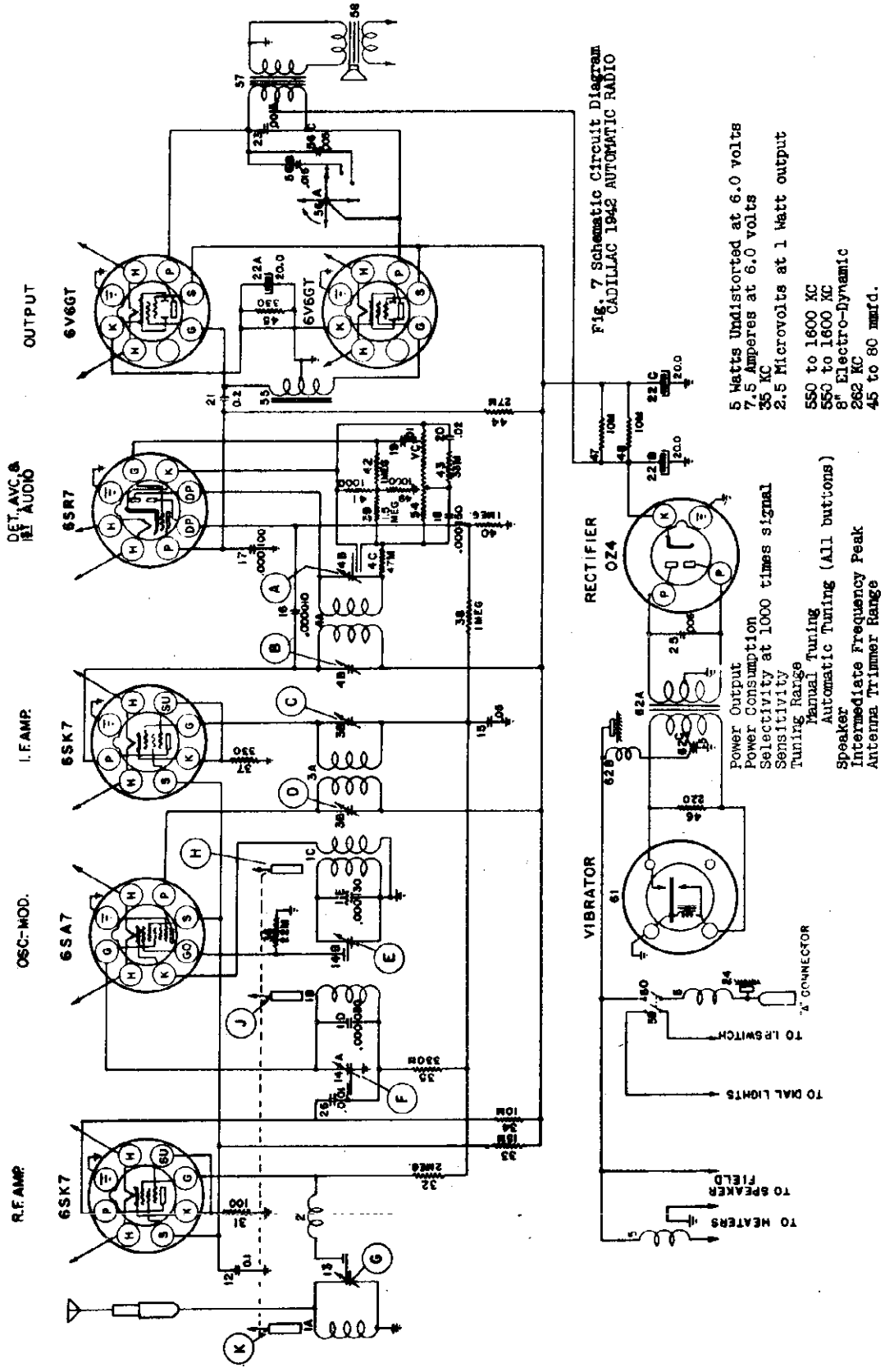


Fig. 7 Schematic Circuit Diagram
CADILLAC 1942 AUTOMATIC RADIO

Power Output	5 Watts Undistorted at 6.0 volts
Power Consumption	7.5 Amperes at 6.0 volts
Selectivity at 1000 times signal	35 KC
Sensitivity	2.5 Microvolts at 1 Watt output
Tuning Range	
Manual Tuning	550 to 1600 KC
Automatic Tuning (All buttons)	550 to 1600 KC
Speaker	8" Electro-Dynamic
Intermediate Frequency Peak	262 KC
Antenna Trimmer Range	45 to 80 mmfd.

MODEL 7241951

CADILLAC DIV—GEN MOTORS

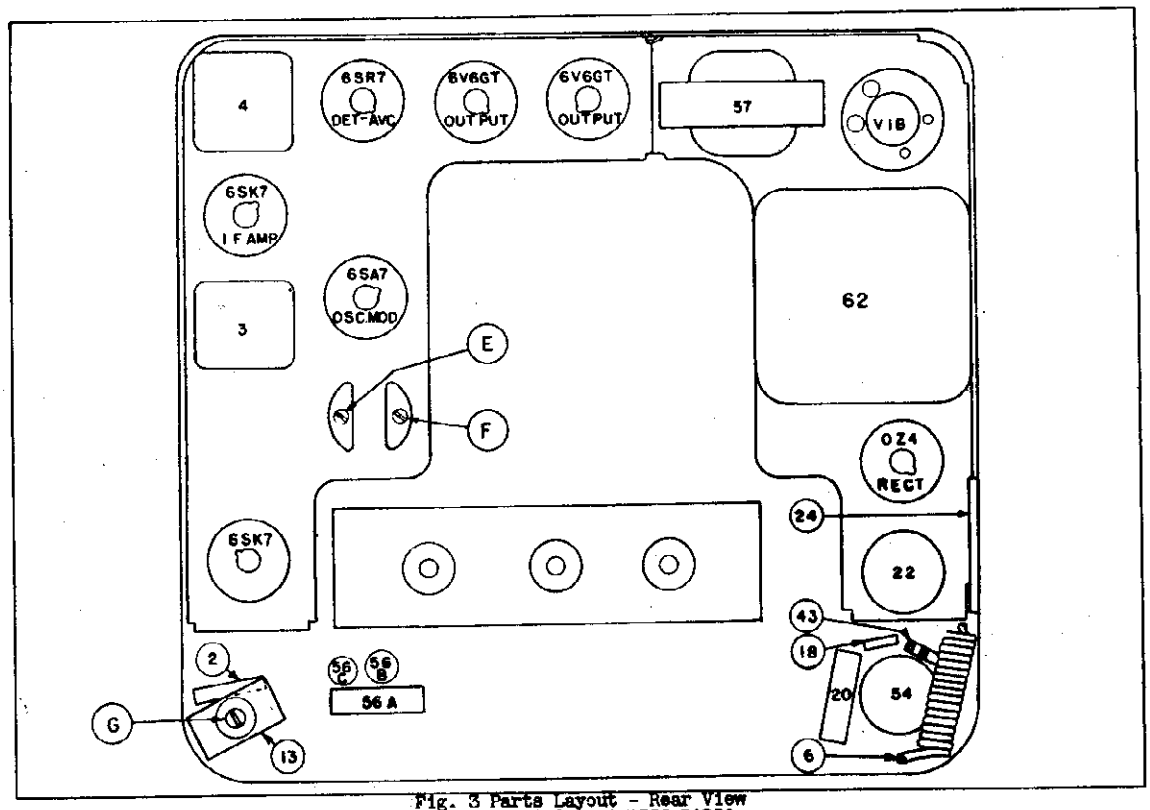


Fig. 3 Parts Layout - Rear View
CADILLAC 1942 AUTOMATIC RADIO

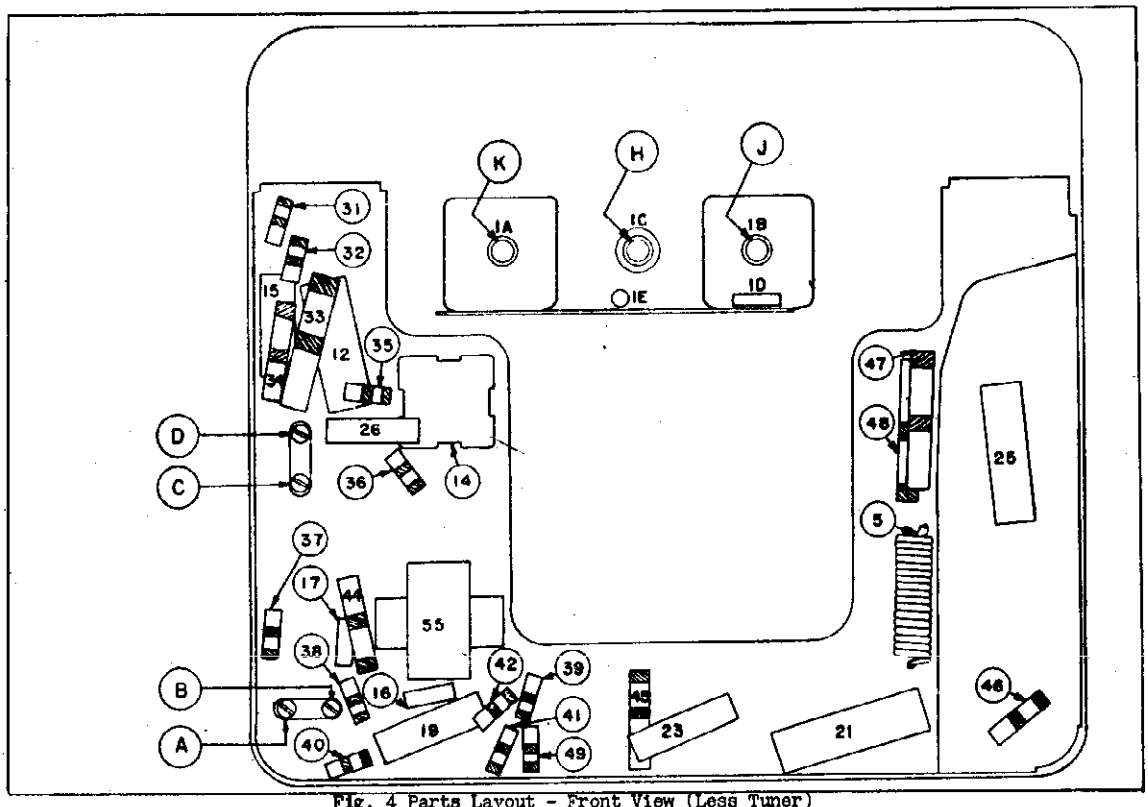


Fig. 4 Parts Layout - Front View (Less Tuner)
CADILLAC 1942 AUTOMATIC RADIO

CIRCUIT ALIGNMENT

Alignment Procedure: The trimmer condensers in this receiver have been carefully adjusted at the factory and should require no further adjustment (except the antenna trimmer) unless tampered with or unless a defective coil has been replaced. It is advisable not to attempt any adjustment unless it is definitely known that an adjustment is necessary.

An accurately calibrated test oscillator or signal generator and an output meter must be used to align the receiver circuits correctly. To make all alignment adjustments, the front and back covers must be removed. All trimmers are readily accessible. The antenna trimmer is adjusted in the rear of the case near the antenna socket.

Due to the fact that the iron cores have been sealed in place at the factory, only the trimmer adjustments as outlined under capacity alignment should be made unless the coils of the iron cored tuning unit are changed.

CAPACITY ALIGNMENT

1. I.F. Alignment at 262 KC

   (a) Connect an output meter across the voice coil terminals of the speaker leaving the speaker connected.

   (b) Connect the ground lead of the signal generator to the chassis frame.

   (c) Connect the signal lead of the signal generator to the grid of the 6SA7 tube through the 0.1 mfd condenser.

   (d) Turn set volume control on full and tone control to the extreme treble end. Set the signal generator at 262 KC. Tune the receiver to a frequency where no squeals or beat notes may be heard and so that when the tuning control is moved in narrow limits no appreciable change in output may be noted.

   (e) Adjust the I.F. trimmers A, B, C, & D for maximum output, beginning with trimmer A.

2. Alignment at 1615 KC

   (a) Connect the signal lead of the signal generator to the receiver antenna connection through a .000070 mfd condenser or 7241619 alignment dummy.

   (b) Turn the manual tuning control of the receiver to the stop at the extreme high frequency end of the dial.

   (c) Set the signal generator to 1615 KC.

   (d) Adjust the oscillator trimmer E for maximum output.

3. Alignment at 1400 KC

   (a) Set the signal generator to 1400 KC.

Capacity Alignment (Cont'd.)

   (b) Tune the receiver to the signal and adjust the trimmers F and G for Maximum output. Signal generator signal should be as low as possible and still give a satisfactory meter reading.

   This type of tuning circuit does not require alignment at 600 KC.

4. Alignment with Car Antenna

Antenna trimmer G must be adjusted to match car antenna when receiver is installed; use a weak station signal between 1000 and 1500 KC. The antenna should be fully extended when making this adjustment.

CAPACITY AND INDUCTANCE ALIGNMENT

1. I.F. Alignment at 262 KC.

Follow the procedure as outlined under I.F. Alignment at 262 KC Capacity Alignment.

2. Alignment at 1615 KC.

   (a) Connect the signal lead of the signal generator to the antenna connection of the set through a .000070 mfd condenser.

   (b) Set signal generator to 1615 kilocycles.

   (c) Rotate the manual tuning mechanism until the high frequency stop is reached. Mechanically align the iron cores K, H, & J by setting the oscillator core H so that its front edges project out 1-5/32" from the end of the coil form and the antenna and R.F. cores K & J project 1-5/32" from the end of their respective coil forms.

   (d) Adjust the oscillator trimmer E, R.F. trimmer F, and antenna trimmer G for maximum output.

3. Alignment at 1400 KC.

   (a) Set signal generator to 1400 K.C. and tune set to this signal.

   (b) Adjust the R.F. core J for maximum output.

   (c) Adjust the antenna core K for maximum output.

4. Realignment at 1615 and 1400 KC.

   (a) Repeat alignment of trimmer E and trimmers F and G at 1615 KC.

   (b) Repeat alignment of cores K and J at 1400 KC. Apply shellac to the core screws to seal the adjustment.

5. Alignment with car antenna.

Antenna trimmer G must be adjusted to match car antenna when receiver is installed; use a weak station signal between 1000 and 1500 KC. The antenna should be fully extended when making this adjustment.

Part No.	Illust. No.	Part Name	Description	List Price
			TUNER MECHANICAL PARTS	
7241957	68	Bearing	Face Worm	$ .12
7242321	69	Bracket	Slide Assy	.25
7242421	70	*Bumper	Plunger Shock Absorber	.03
7242385	71	Bushing	Manual Drive	.50
7242481	72	Button	On-Off Switch Button & Plunger	.60
7242387	73	*Button	Push Button & Screw	.30
7242389	74	*Button	T.C. Button & Plunger	.30
7242847	75	Clamp	Core Clamp(Not shown on tuner Picture)	
7240893	76	Clutch	Assy	.80
7241867	77	Collar	Man Drive Shaft	.20
7242506	78	Collar	Tone Plunger Assy	.28
7241671	79	Cord	Pointer Drive	
7242138	80	Core	Iron Tuning	.40
7240921	81	Coupling	Core	
	82			
7242494	83	Dial	Calibrated	1.25
7242397	84	Escutcheon	Assy. (Includes Items 86-87-& 96**)	3.00
	85			
7242277	86	**Frame	Dial Glass	.15
7242285	87	**Glass	Dial Glass	.08
7242507	88	Knob	Control	.90
7242560	89	Light	Dial Light & Lead Assy	.45
7241370	90	Lever	String Drive Assy	.12
7240922	91	Link	Connecting	
7236481	92	Nut	Thin-On Control Bushing	.05
7242384	93	Outrigger	Assy	.30
7242392	94	Pointer	Assy	1.00
	95			
7242286	96	**Retainer	Dial Glass	.03
7242386	97	Shaft	Manual Assy	.92
7240882	98	Spacer	Shoulder-Spacing Latch Bar	.03
7241042	99	Spring	Connecting Link-Also Manual Latch Bar Return	.15
7241045	100	Spring	Core Coupling	.05
7241039	101	*Spring	Latch Bar(Not shown on tuner picture)	.04
7241169	102	*Spring	Plunger Return	.04
7241835	103	*Spring	Tuning Nut Yoke	.03
7242513	104	Spring	Switch Coupling	.08
7240815	105	Spring	Switch-Plunger Return	.03
7240915	106	Spring	Tension-Clutch Shaft	
7241694	107	Spring	Pointer Return	.08
7240812	108	Spring	Vacuum Valve Yoke	
7242514	109	Sleeve	Volume Control Shaft	
7242509	110	Tuner	Staked Assy. Includes items 70,73,74,101,102,103,111,& 113 (*)	10.00
7242425	111	*Tip	Latching Button (Not shown on tuner picture)	.20
7240845	112	Valve	Vacuum	
7240740	113	*Yoke	Tuning Nut	
7240752	114	Yoke	Vacuum Valve Drive	

Part No.	Illust. No.	Part Name	Description	List Price
			MISCELLANEOUS CHASSIS & TUNER PARTS	
5274994		Cable	Volume Control	$ .40
7242381		Cover	Front	1.60
7242413		Cover	Rear	1.60
5274973		Cable	Tone Control	
7242478		Lead	"A" Lead & Connector-Set to Fuse	.25
7242290		Nut	Spacer	.25
7242399		Shroud	Mounting Plate Assy	1.35
7239475		Socket	Antenna Connector	.12
7236279		Socket	Octel Base Tube	.16
9233944		Socket	Vibrator	.16
7238456		Lead	"A" Lead & Connector-Fuse to Ammeter	.25
147685		Fuse	14 Ampere	.10
			TUBE COMPLEMENT	
7237887		6SK7	R.F. Amp	1.00
7237886		6SA7	Oscillator-Modulator	1.00
7237887		6SK7	I.F. Amp	1.00
7240267		6SR7	Det. A.V.C.& 1st Audio	1.05
1213637		6V6GT	Push Pull Output	1.05
7237180		0Z4	Rectifier	1.60
			MOUNTING & INSTALLATION PARTS	
7242412			Bracket Radio Support	.40
7242535			Parts Pkg. Assy	
1880659			Gen. Cond	.45
1879526			Coil Cond	.35
1435482			Dist. Suppressor	.30
7240138			Front Wheel Static Collector	.20
120395			Washer	
7242686			Ground Spring	.05
5274049			Ground Strap	.15
7240761			Serrated Washer	
120380			Lockwasher	
120375			Hex. Nut	
7240808			Insulating Ferrule	.12
155343			Screw	
120854			Screw	
120392			Washer	
161627			Screw	
7242536			Parts Pkg. Assy.	
7242335			Trim Plate Assy	.80
1305217			Hex. Nut	

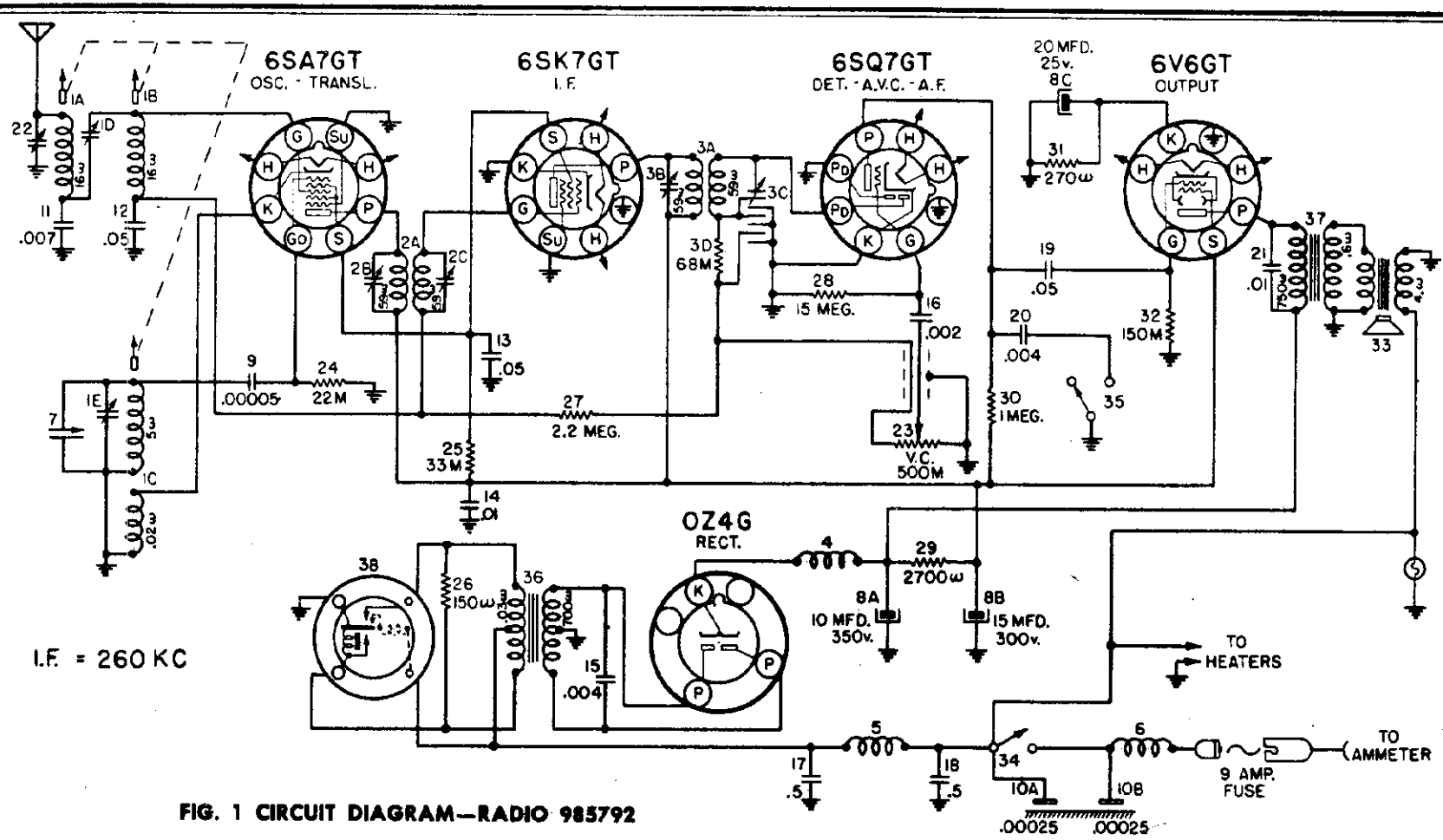


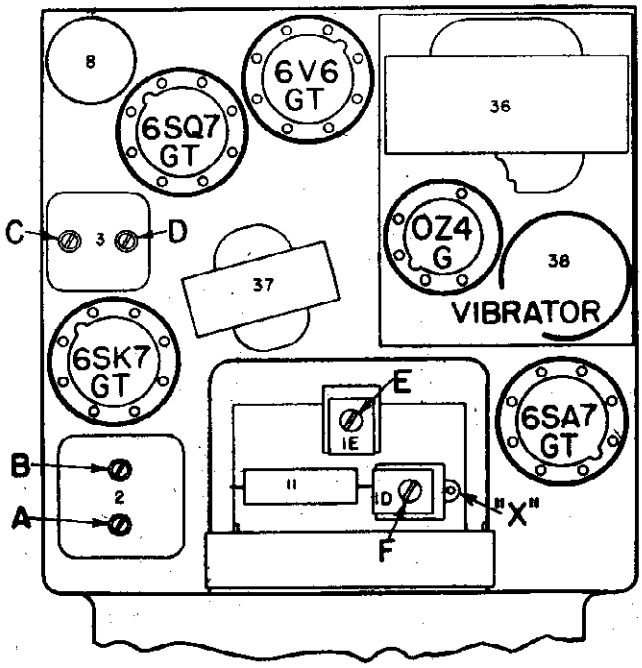
FIG. 1 CIRCUIT DIAGRAM—RADIO 985792

GENERAL: This auto radio is a five-tube single unit universal receiver with automatic push-button tuning. The power supply consists of an 0Z4G rectifier tube used in conjunction with a full wave plug-in vibrator. The receiver is designed to mount through the instrument panel in all 1942 Chevrolet cars, and may be mounted under the instrument panel in other cars and trucks.

Antenna System: The antenna system used with this receiver consists of a rod-type antenna with a specially designed low capacity lead-in.

MODEL 985792

CHEVROLET DIV.—GEN. MOTORS



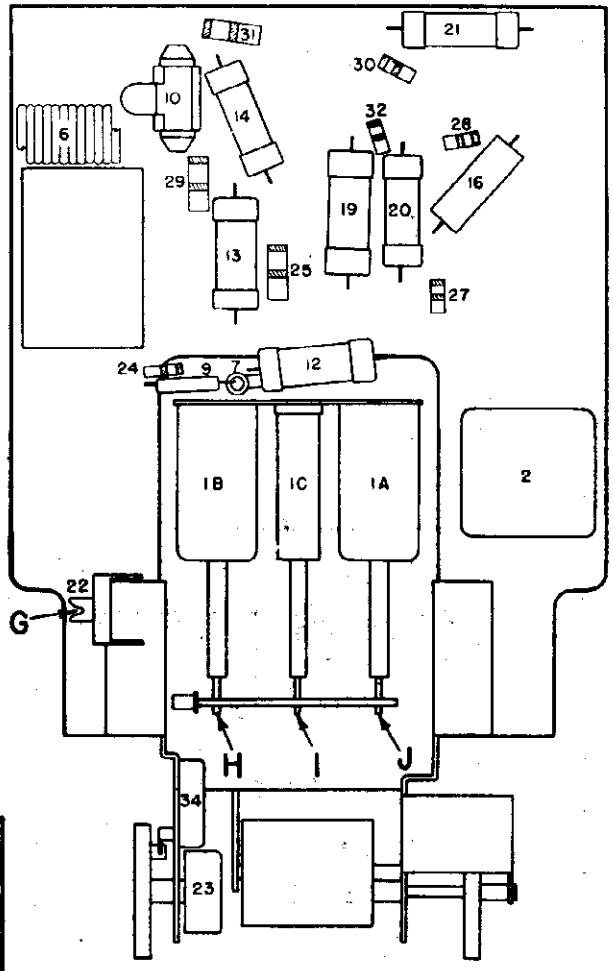
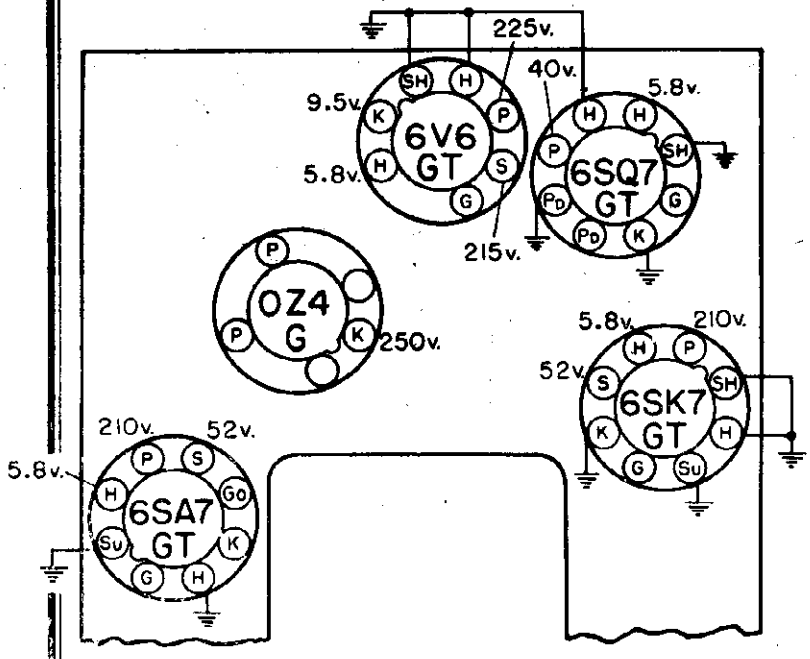


FIG. 2 PARTS LAYOUT—RADIO 985792



BOTTOM VIEW OF TUBE SOCKETS

READINGS TAKEN FROM TUBE SOCKET CONTACTS TO GROUND WITH A D.C. VOLTMETER HAVING A RESISTANCE OF 1000 OHMS PER VOLT. ALL VOLTAGES EXCEPT THE HEATER VOLTAGES MEASURED ON THE 0-250 VOLT SCALE.
"A" BATTERY 6.0 VOLTS. CURRENT DRAIN 6.2 AMPERES.
"B" SUPPLY DRAIN APPROXIMATELY 45 MA.

FIG. 3 VOLTAGE CHART—RADIO 985792

RADIO DATA

MODEL NUMBER — 985792
SERIAL NUMBER — B-42-1000 AND UP
TUBE COMPLEMENT — 6SA7GT, 6SK7GT, 6SQ7GT, 6V6GT, OZ4G
BATTERY CURRENT — 6.2 AMPERES
B+ VOLTS — 250 VOLTS
I.F. K C — 260
R.F. K C — 1610-540
VIBRATOR TYPE — NON SYNCHRONOUS
YEAR — 1942

RADIO BULLETIN 3-37
Part No. 985792
Date 10-1-41

Circuit Alignment

All of the adjustable condensers in this receiver are very accurately adjusted at the factory and will need no further adjustment (excepting antenna trimmer condenser), unless tampered with or a defective coil has been replaced. If realignment is found to be necessary, the circuits can be properly adjusted only with the use of a calibrated test oscillator or signal generator and output meter. **NOTE:** Do not attempt to align this receiver without carefully noting the following instructions.

1. Aligning I.F. Stage at 260 Kilocycles

Turn volume control to the maximum position.

(a) Connect the signal lead of the test oscillator to terminal "X" (see parts layout), which is the control grid lead of the 6SA7GT tube, through a .1 mfd. condenser.

(b) Connect the ground lead of the test oscillator to the chassis frame.

(c) Connect the output meter from the plate prong of the 6V6GT output tube to ground. Care should be taken when connecting the output meter to insert a series condenser to protect the meter from d.c. voltages.

(d) Set the test oscillator to exactly 260 kilocycles.

(e) Adjust the trimmers "A," "B," "C" and "D" on the I.F. transformers for maximum output (see parts layout). 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 1610 Kilocycles

(a) Leave the test oscillator leads connected the same as for aligning the I.F. circuits.

(b) Set the test osciallor to 1610 kilocycles.

(c) Adjust the condenser "E" (see parts layout) 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 high frequency end of the dial.

3. Aligning at 1400 Kilocycles

(a) Remove the signal lead of the test oscillator from the grid of the 6SA7GT tube and connect to the antenna terminal of the receiver THROUGH A .000075 MFD. MICA CONDENSER connected in place of the .1 mfd. condenser previously used. (It is very important that a .000075 mfd. mica condenser be used when aligning the antenna stage of these receivers in order that this circuit can be made to track properly.)

(b) Set the test oscillator to 1400 kilocycles.

(c) Tune the receiver until this frequency is tuned in with maximum output.

(d) Adjust the antenna compensating condenser "G" (see parts layout) for maximum output.

(e) Adjust the grid coil trimmer condenser "F" for maximum output.

NOTE: With permeability tuning it is necessary to adjust the capacity at only one frequency. The coils are so wound that tracking is automatic and the usual low frequency adjustments are not necessary. If the entire alignment procedure has been accomplished accurately, the receiver should be uniformly sensitive over the entire frequency range.

Instructions for the Replacement of Tuning Core Assembly Part No. 1216034

1. Remove broken or defective core assembly (part No. 1216034) consisting of the three cores. This is accomplished by removing the coupling springs (two part Nos. 1216038) and sliding the cores out (as a complete unit) of the coils.
2. Install new core assembly, using the reverse of procedure No. 1.
3. Tune receiver to high frequency stop position by turning manual station selector control. With cores at high frequency stop position make sure that the dial is correctly set to the reference line above the 1600 kilocycle graduation line.
4. Connect the signal generator to the antenna terminal of the receiver and the output meter to the output of the receiver as outlined in the Alignment Instructions.
5. Set the signal generator to exactly 1610 kilocycles, **taking care not to change the receiver dial position.**
6. Adjust the oscillator and grid coil trimmers (see Parts Layout—"E" and "F") for maximum output meter indication.
7. Set the receiver **dial** to the 1300 kilocycle graduation line. (In order to make certain that the 1300 kilocycle point on the dial will be used for reference throughout this procedure it is suggested that one of the push buttons be set up for this position.)
8. Set signal generator to exactly 1300 kilocycles, **taking care not to change the receiver dial position.**
9. Align the oscillator core (see Parts Layout—"I") for maximum output. Then adjust the other two cores for maximum output indication (see Parts Layout—"H" and "J").
10. Repeat operations 3, 5, 6, 7, 8 and 9 until no further improvement can be made.

IMPORTANT NOTE: Never attempt to remove or replace one core at a time. The entire assembly (Part No. 1216034) should be removed and replaced as such.

Tube Complement

Type	Function	Type	Function
6SA7GT	Oscillator-Modulator	6V6GT	Audio Output
6SK7GT	I.F. Amplifier	0Z4G	Rectifier
6SQ7GT	Detector A.V.C.-1st Audio		

Circuit Description

The circuit used in this receiver is the superheterodyne type, employing the permeability method of tuning. An adjustable condenser is provided for matching the antenna circuit to the antenna. This adjustment is made near the high frequency end of the band (1400 kilocycles).

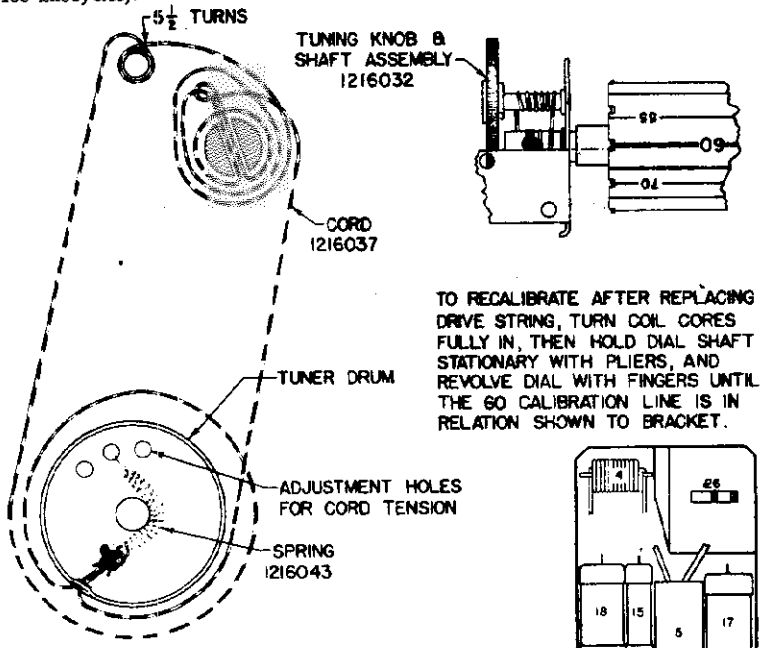


FIG. 4 DIAL CORD HOOK-UP—RADIO 985792

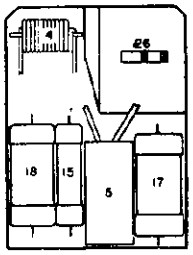


FIG. 5 POWER PACK PARTS LAYOUT RADIO 985792

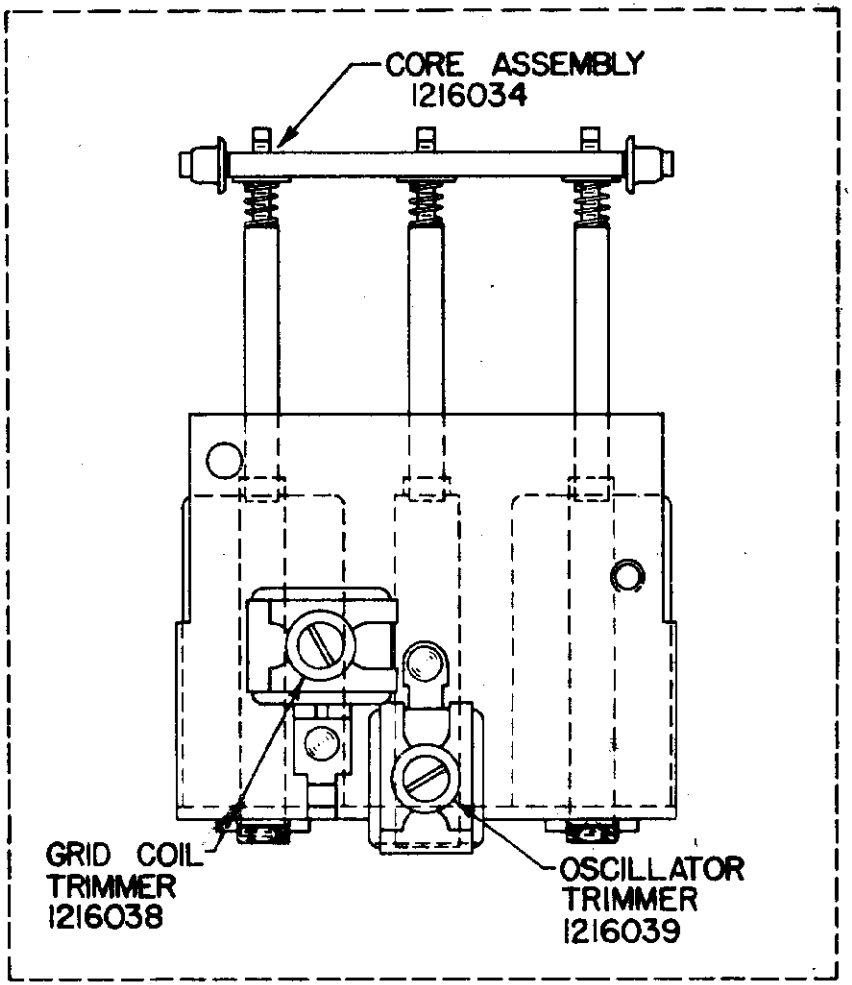
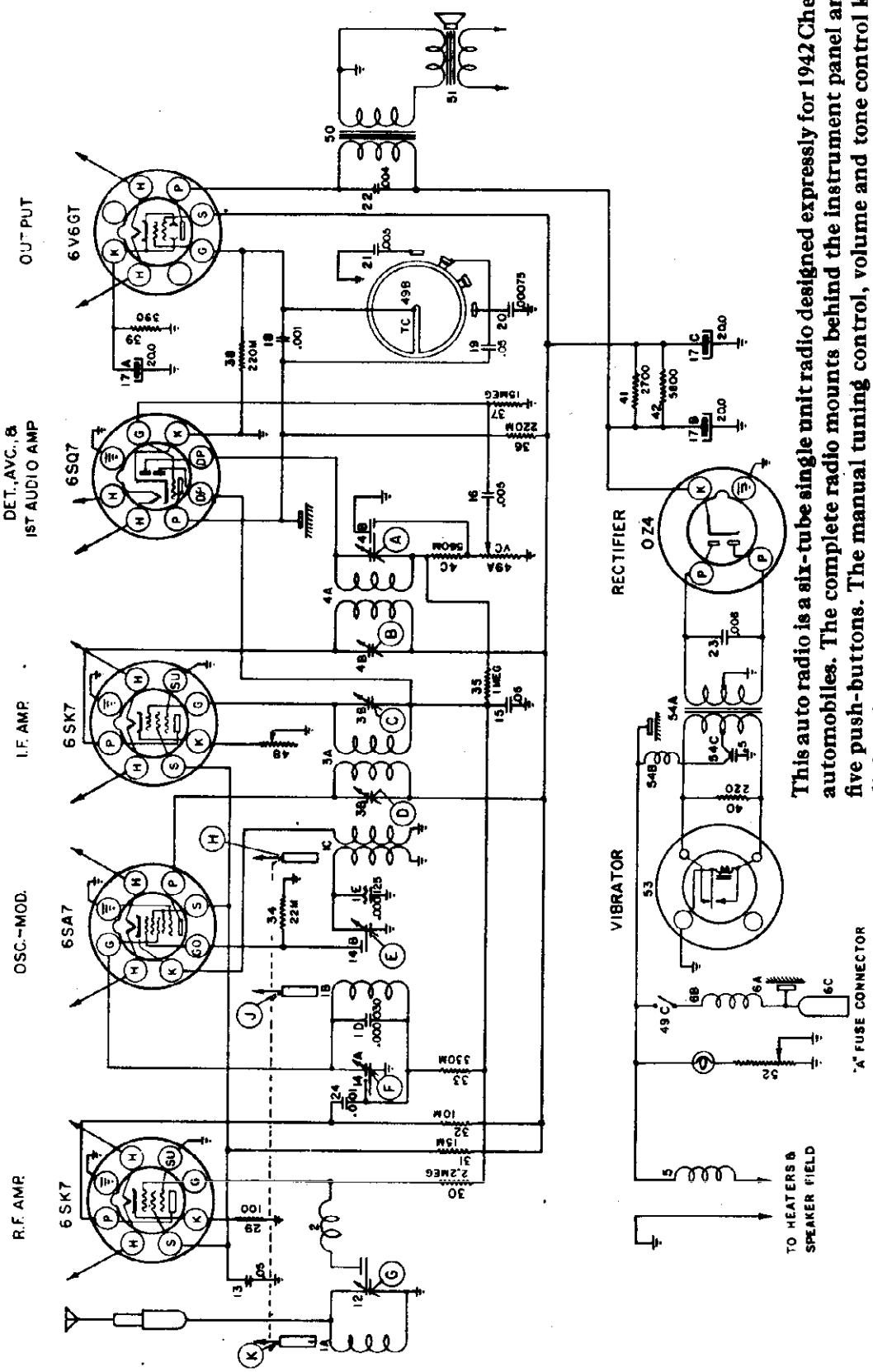


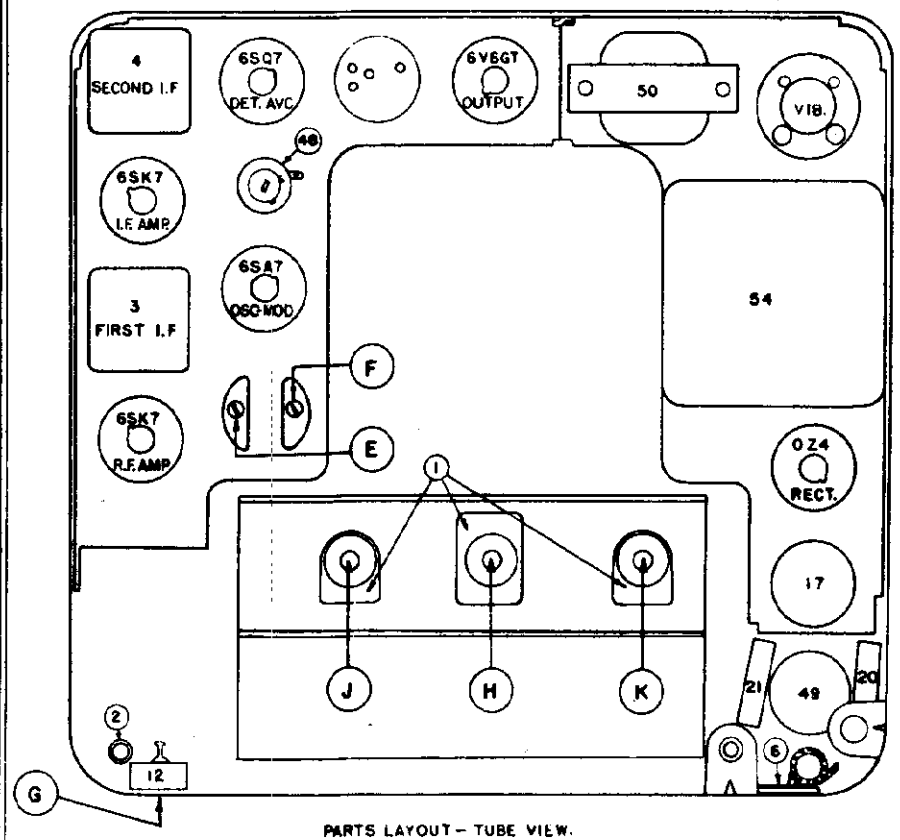
FIG. 6 PERMEABILITY COIL ASSEMBLY PARTS—RADIO 985792

CHEVROLET DIV.—GEN. MOTORS



This auto radio is a six-tube single unit radio designed expressly for 1942 Chevrolet automobiles. The complete radio mounts behind the instrument panel and has five push-buttons. The manual tuning control, volume and tone control knobs, dial and push-buttons extend through the instrument panel, blending with the design of the car interior. An elliptical speaker is used and is mounted in the front of the receiver, projecting sound through the ornamental grille of the instrument panel. Tuning is accomplished by a mechanical unit of rugged construction assuring accuracy. A special compensating condenser in the oscillator circuit minimizes tuning circuit changes due to normal variations in car voltages and temperature ranges. The power supply consists of a full wave primary type vibrator, a power transformer and an 0Z4 rectifier tube.

FIG. 1 CIRCUIT DIAGRAM—RADIO 985793



PARTS LAYOUT – TUBE VIEW.

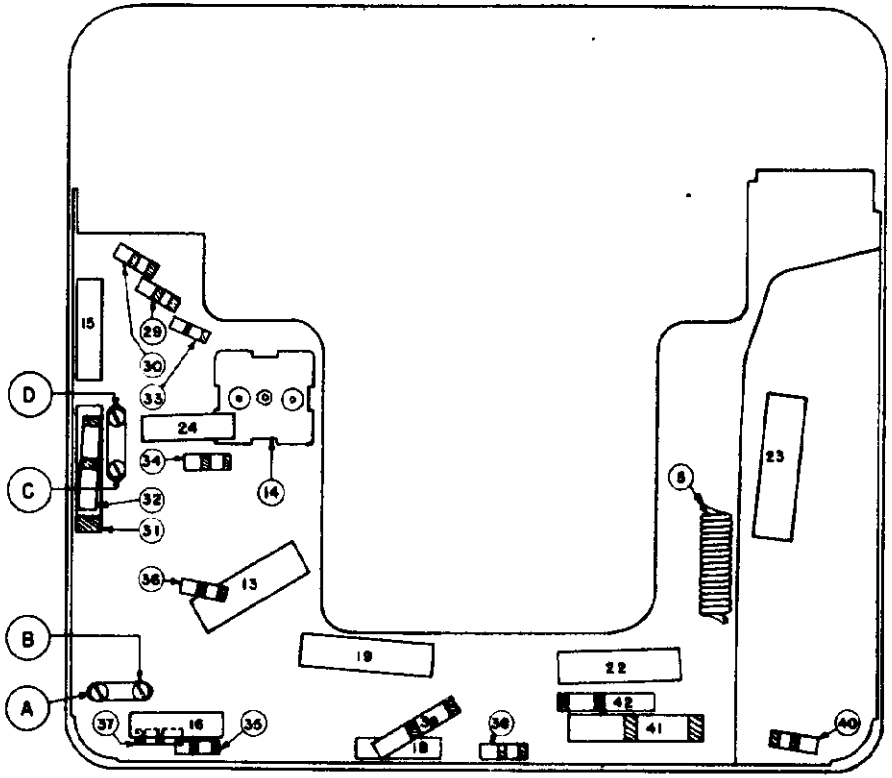


FIG. 3 PARTS LAYOUT—RADIO 985793

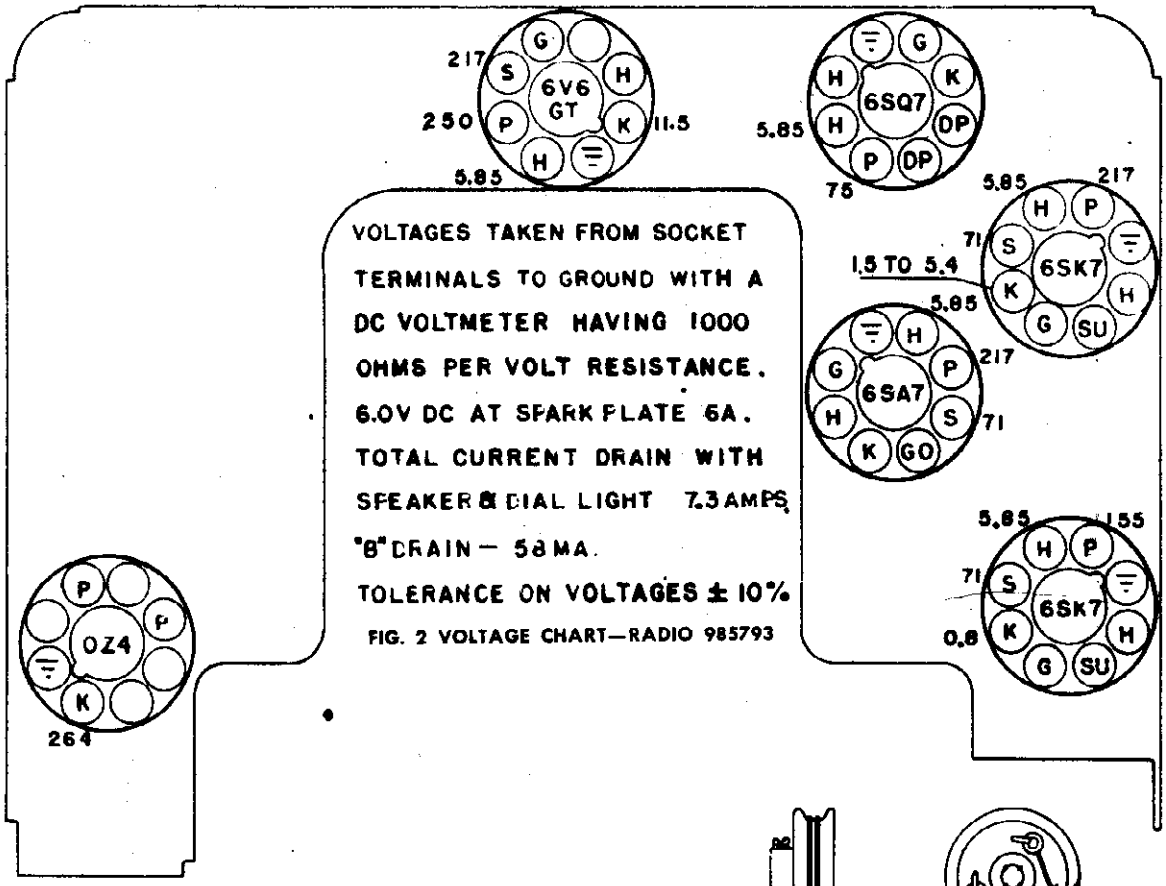
Circuit Description

The circuit used in this receiver is the conventional superheterodyne type and uses no regeneration. The tuning circuits are tuned by varying the inductance of the antenna, R.F. and oscillator coils by means of iron cores which slide in and out of the coils like pistons. The alignment of the cores has been sealed at the factory and further adjustment should not be required unless the coils have been changed or an iron core has been replaced. A special tone control circuit is employed to give the desired tone without distortion.

Antenna Circuit: The antenna circuit is directly coupled to the antenna. The antenna, oscillator and R.F. circuits are tuned by means of iron cores. The antenna circuit is adjusted for slight variations in antenna capacity by means of an antenna trimmer located on the bottom of the receiver case.

Date 10-1-41

CHEVROLET DIV.—GEN. MOTORS



VOLTAGES TAKEN FROM SOCKET TERMINALS TO GROUND WITH A DC VOLTMETER HAVING 1000 OHMS PER VOLT RESISTANCE. 6.0V DC AT SPARK PLATE 6A. TOTAL CURRENT DRAIN WITH SPEAKER & DIAL LIGHT 7.3 AMPS. "B" DRAIN — 58 MA. TOLERANCE ON VOLTAGES ± 10%

FIG. 2 VOLTAGE CHART—RADIO 985793

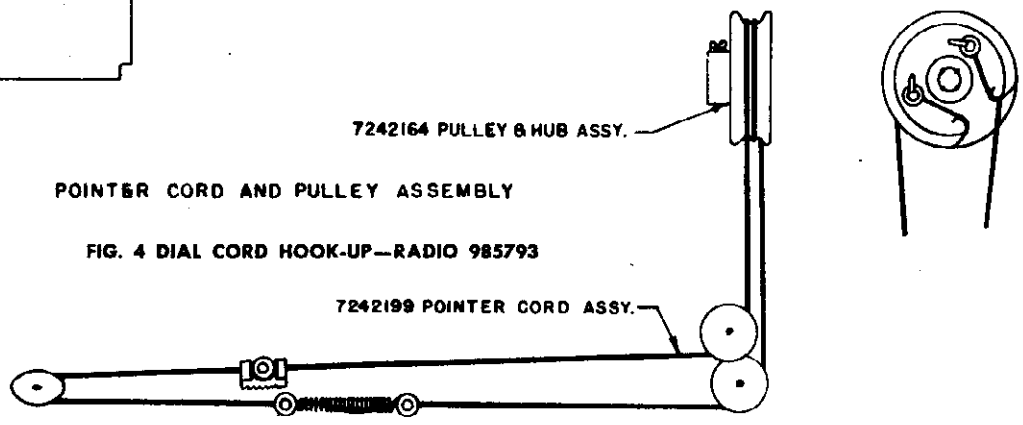


FIG. 4 DIAL CORD HOOK-UP—RADIO 985793

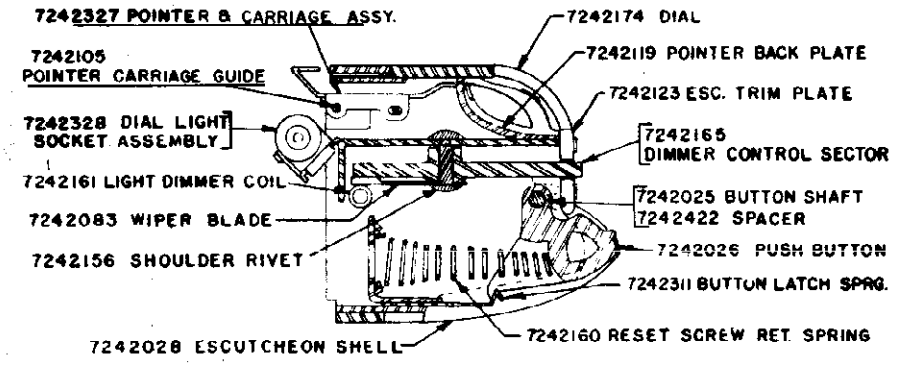


FIG. 5 ESCUTCHEON CROSS SECTION—RADIO 985793

Capacity Alignment

1. I.F. Alignment at 262 Kilocycles

(a) Connect a 0.1 mfd. condenser between the plate prong of the 6V6GT output tube and one terminal of the output meter, to protect the meter from DC voltages. Connect the other terminal of the output meter to ground.

(b) Connect the ground lead of the signal generator to the chassis frame.

(c) Connect the signal lead of the signal generator to the grid (G) prong of the 6SA7 tube socket through a 0.1 mfd. condenser.

(d) Turn the set volume control on full and rotate the tone control knob to the center (Music) position. Adjust the signal generator to 262 kilocycles, and tune the receiver to a frequency where no squeals or beat notes may be heard and so that when the tuning control is moved through narrow limits no appreciable change in output is noticeable.

(e) Adjust the I.F. trimmers A, B, C, and D for maximum output.

2. Aligning at 1615 Kilocycles

(a) Connect the signal lead of the signal generator to the receiver antenna connection through a .000070 mfd. condenser.

(b) Turn the manual control of the receiver to the stop at the extreme high frequency end of the dial.

(c) Set the signal generator to 1615 kilocycles.

(d) Adjust the oscillator trimmer "E" for maximum output.

(e) Adjust the R.F. trimmer "F" for maximum output.

(f) Adjust the antenna trimmer "G" for maximum output.

3. Aligning at 1400 Kilocycles

(a) Set the signal generator frequency to 1400 kilocycles.

(b) Tune the receiver to this signal and readjust the R.F. trimmer "F" and antenna trimmer "G" for maximum output. The signal generator output should be as low as possible and still give a satisfactory output meter reading.

NOTE: This type of tuning circuit does not require alignment at 600 kilocycles.

4. Alignment with Car Antenna

Antenna trimmer "G" must be adjusted to match the car antenna when receiver is installed. With the antenna fully extended tune in a weak station near 1400 on the dial and adjust the antenna trimmers for maximum volume.

Capacity and Inductance Alignment

This alignment should be used only when there is definite evidence that the iron cores are out of adjustment.

1. I.F. Alignment at 262 Kilocycles

The same procedure as previously outlined should be followed.

2. Aligning at 1615 Kilocycles

(a) Connect the signal lead of the signal generator to the antenna connection of the set through a .000070 mfd. condenser.

(b) Set the signal generator to 1615 kilocycles.

(c) Rotate the manual tuning knob until the pointer is against the high frequency stop. Mechanically align the iron cores H, J and K by setting the oscillator core "H" so that its front edge sticks out 1/16" from the end of the coil form. The antenna core "K" and the R.F. core "J" should be approximately lined up with the oscillator core by aligning their front edge with that of the oscillator core.

(d) Adjust the oscillator trimmer "E," the R.F. trimmer "F" and the antenna trimmer "G" for maximum output.

3. Aligning at 1400 Kilocycles

(a) Adjust the signal generator to 1400 kilocycles and tune set to this signal.

(b) Adjust the R.F. core "J" for maximum output.

(c) Adjust the antenna core "K" for maximum output.

NOTE: When checking maximum output remove hand from the vicinity of the cores as body capacity will affect reading.

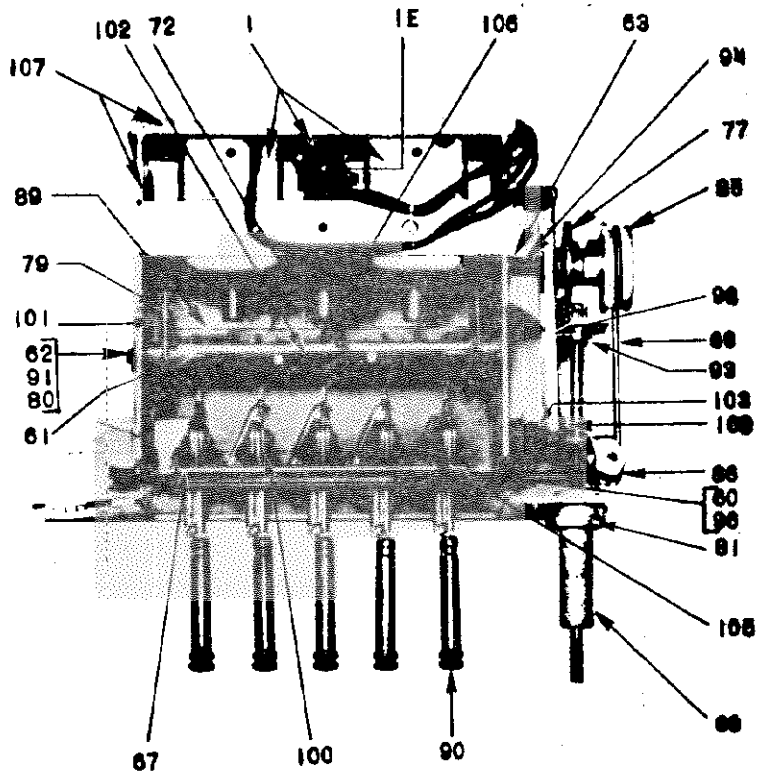
4. Realignment at 1615 and 1400 Kilocycles

(a) Repeat alignment of trimmers "F" and "G" at 1615 kilocycles.

(b) Repeat alignment of cores "K" and "J" at 1400 kilocycles. Do not change adjustment of oscillator core "H." Make sure insulated core spring is properly in place.

5. Alignment with Car Antenna

Antenna trimmer "G" must be adjusted to match the car antenna when receiver is installed. With the antenna fully extended tune in a weak station near 1400 on the dial and adjust the antenna trimmer for maximum volume.



TUNER UNIT PARTS—RADIO 985793

Tuner Unit and Parts—Cont'd

Production Part No.	Service Part No.	Part Name	Description—Function	Illus. No.
7242028	.....	Escutcheon	Shell	75
7241590	.....	Gear	Crown Gear Assy	77
7242105	.....	Guide	Dial Pointer Carriage	78
7240922	.....	Link	Connecting Link	79
7242143	.....	Nut	Adjusting—Rotor Arm Bearing (No. 12-28)	80
7241191	.....	Nut	Spacer	81
7242119	.....	Plate	Dial Pointer Back	82
7242123	.....	Plate	Escutcheon Trim (Chrome)	83
7242327	.....	Pointer	Dial—With Carriage Assy	84
7242164	.....	Pulley	Dial Pointer Drive Pulley Assy	85
7242058	.....	Pulley	With Stud	86
7242156	.....	Rivet	Shoulder—Dimmer Control	88
7242356	.....	Rotor	Rotor Arm and Gear Assembly	89
7242163	.....	Screw	Reset—For Station Setting	90
7242144	.....	Screw	Set—For adjusting Rotor Arm Bearing	91
7242025	.....	Shaft	Push Button	92
7242128	.....	Shaft	Manual Tuning Shaft and Bracket Assy	93
7242438	.....	Shaft	Pulley Shaft and Pinion Assy	94
7242328	.....	Socket	Dial Light Socket Assy	95
7238531	.....	Spacer	Latch Bar	96
7242422	.....	Spacer	Tuning Button Shaft (Washer)	97
7242355	.....	Spring	Brake Assy	98
**7242311	.....	Spring	Push Button Latch	99
***7242951	.....	Spring	Push Button Latch Spring and Back Plate Assy.	99
7241042	.....	Spring	Connecting Link	101
7242552	.....	Spring	Iron Tuning Core	102
7242253	.....	Spring	Latch Bar Hook-Up	103
7242160	.....	Spring	Reset Screw Return	104
7242189	.....	Spring	Slide Bar Return	105
7242180	.....	Strip	Limiter (on oscillator coil)	106
7242374	.....	Tuner Unit	Mechanical Staked Assy	107
7242946	.....	Washer	Latch Bar Hook-Up	108

Tuner Unit and Parts

7242203	.....	Bar	Latch Assembly Bar	60
7242361	.....	Bar	Parallel Guide Bar Assembly	61
115529	145635	Bearing	Ball—Rotor Arm Bearing	62
7242152	.....	Bearing	Pulley Shaft	63
7242026	.....	Button	Push—Tuning	65
7242083	.....	Blade	Dial Light Dimmer Wiper	66
7242354	.....	Bumper	Rubber—Slide Bar Return Shock Absorber	67
7242084	.....	Bushing	Manual Tuning Shaft Drive	68
7242199	.....	Cord	Dial Pointer Cord Assy	69
7242485	.....	Coil Assy.	Permeability Tuning Unit	1
7242161	.....	Coil	Dial Light Dimmer	52
7242251	.....	Core	Iron Tuning Core	72
7242165	.....	Control	Dial Light Dimmer Sector	73
7242174	.....	Dial	Calibrated (Glass)	74

Miscellaneous Chassis Parts

Production Part No.	Service Part No.	Part Name	Description—Function	
125588	.....	Bulb	Dial Light	.....
7242271	.....	Cable	Speaker Cable and Plug	.....
7241179	.....	Cable	Volume Control	.....
7242310	.....	Cover	Front Case Cover Assy	.....
7242445	.....	Cover	Rear Case Cover Assy	.....
5274907	.....	Lead	Antenna Lead Assy	.....
7236279	.....	Socket	Octal Tube	.....
7242273	.....	Socket	Speaker Plug	.....
7239125	.....	Socket	Vibrator	.....

MODEL 985794

CHEVROLET DIV.—GEN. MOTORS

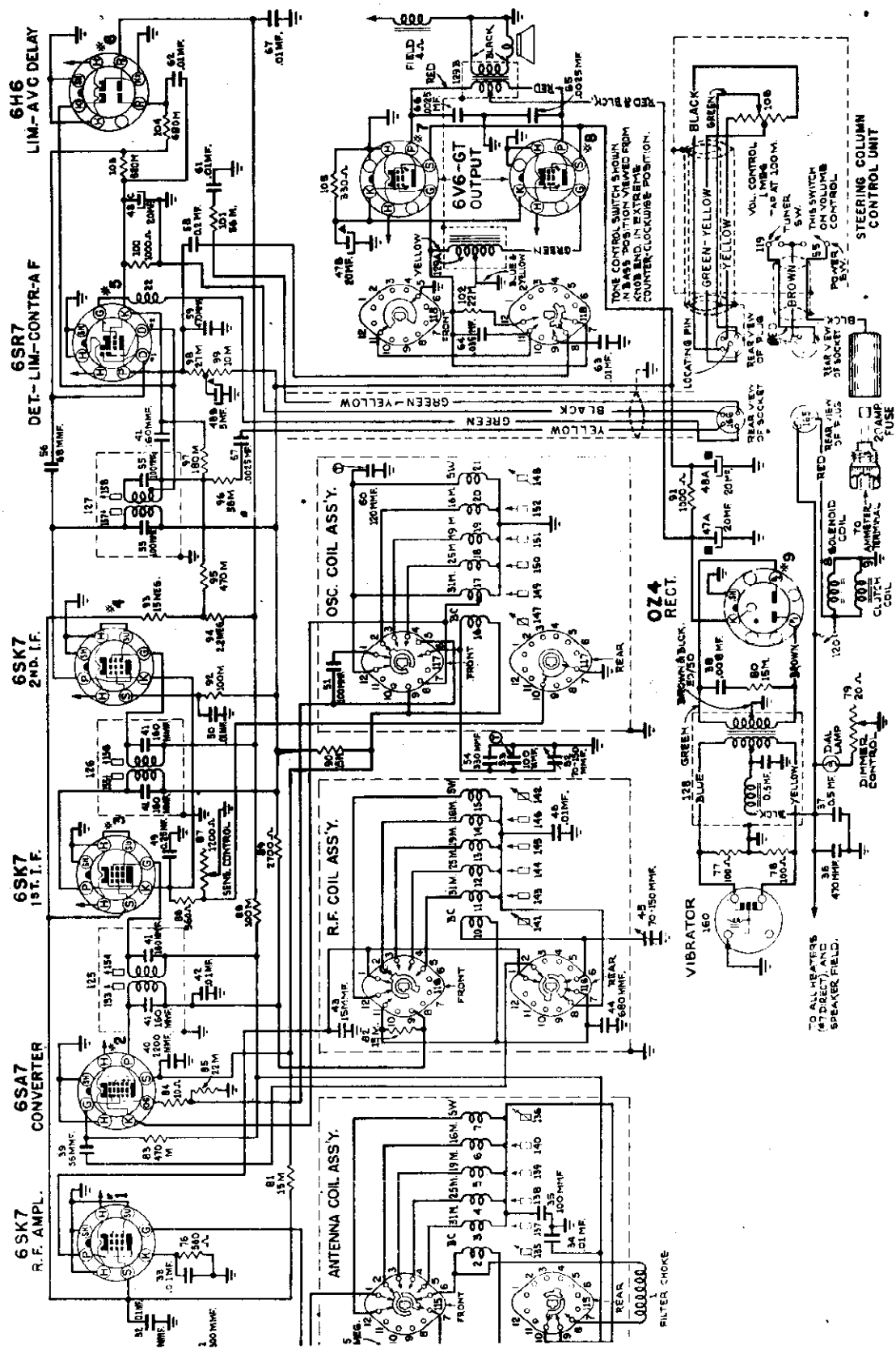


FIG. 1 CIRCUIT DIAGRAM—RADIO 985794 Date 10-1-41

CHEVROLET DIV.—GEN. MOTORS

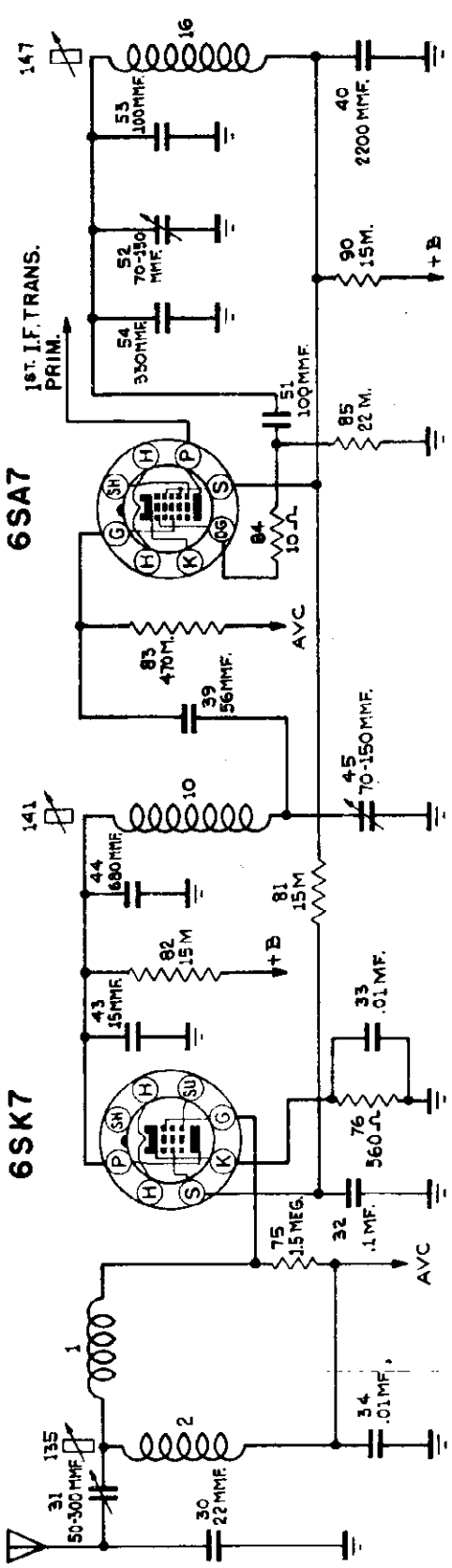


FIG. 2 "A" BAND COIL CIRCUIT—RADIO 985794

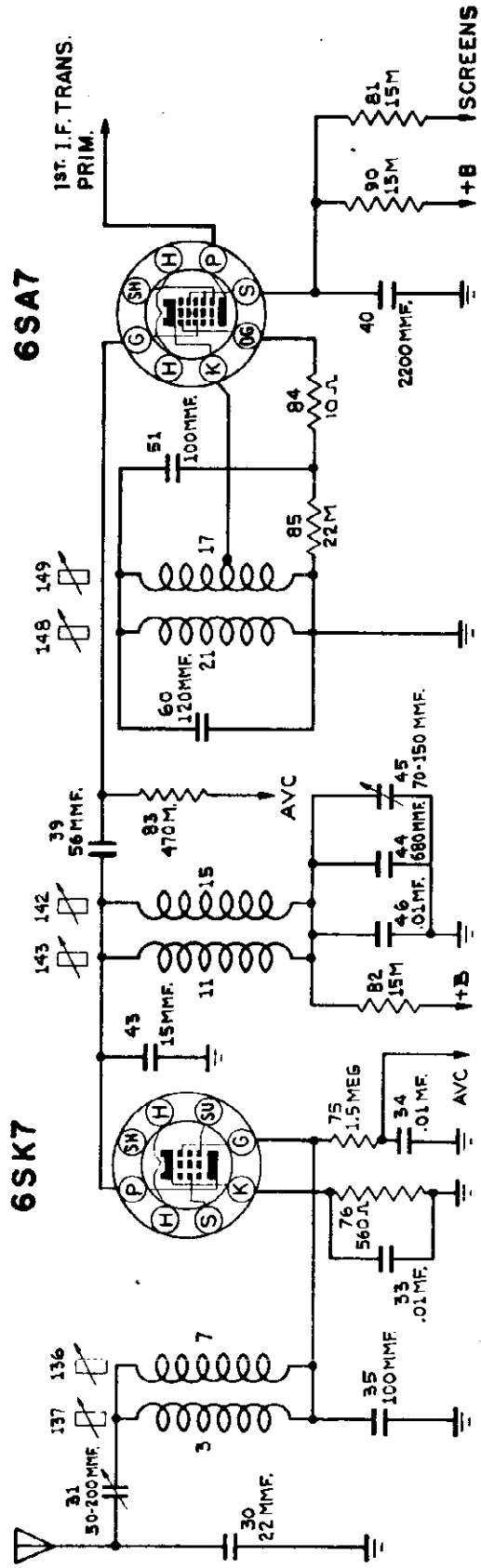


FIG. 3—31 METER BAND COIL CIRCUIT—RADIO 985794

MODEL 985794

CHEVROLET DIV.—GEN. MOTORS

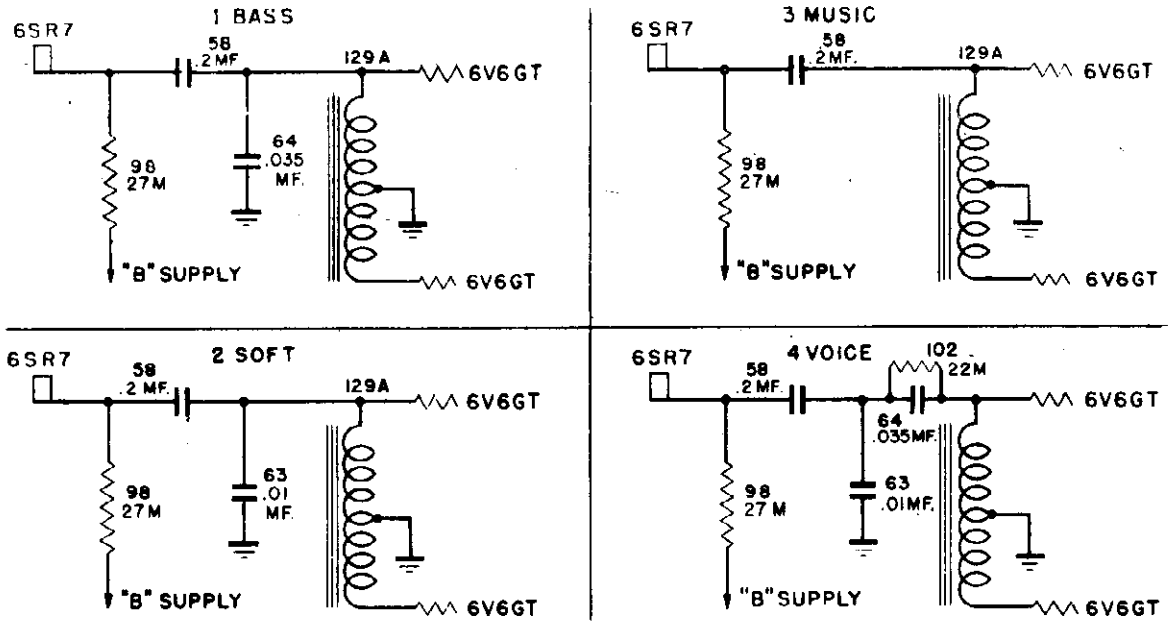


FIG. 4 TONE CONTROL POSITION WIRING—RADIO 985794

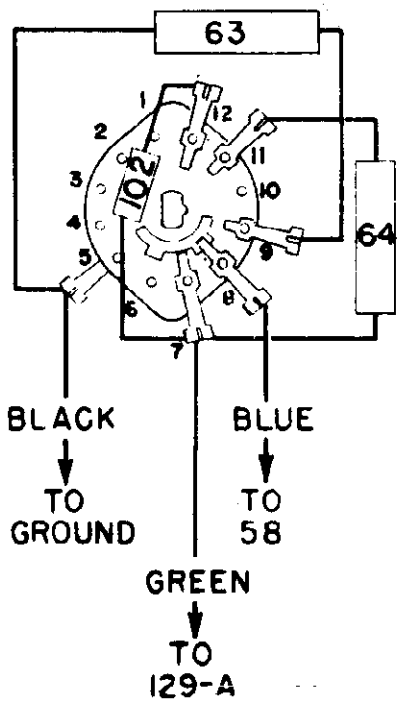


FIG. 5 TONE CONTROL WIRING—RADIO 985794

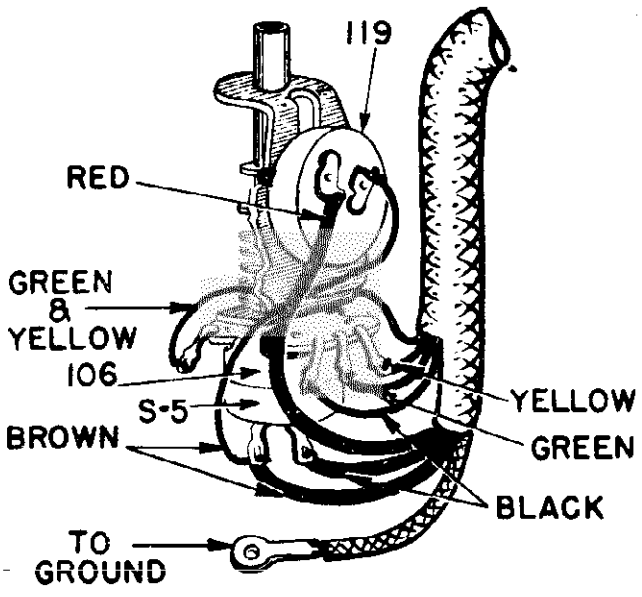


FIG. 6 VOLUME CONTROL AND ON-OFF SWITCH—RADIO 985794

CHEVROLET DIV.—GEN. MOTORS

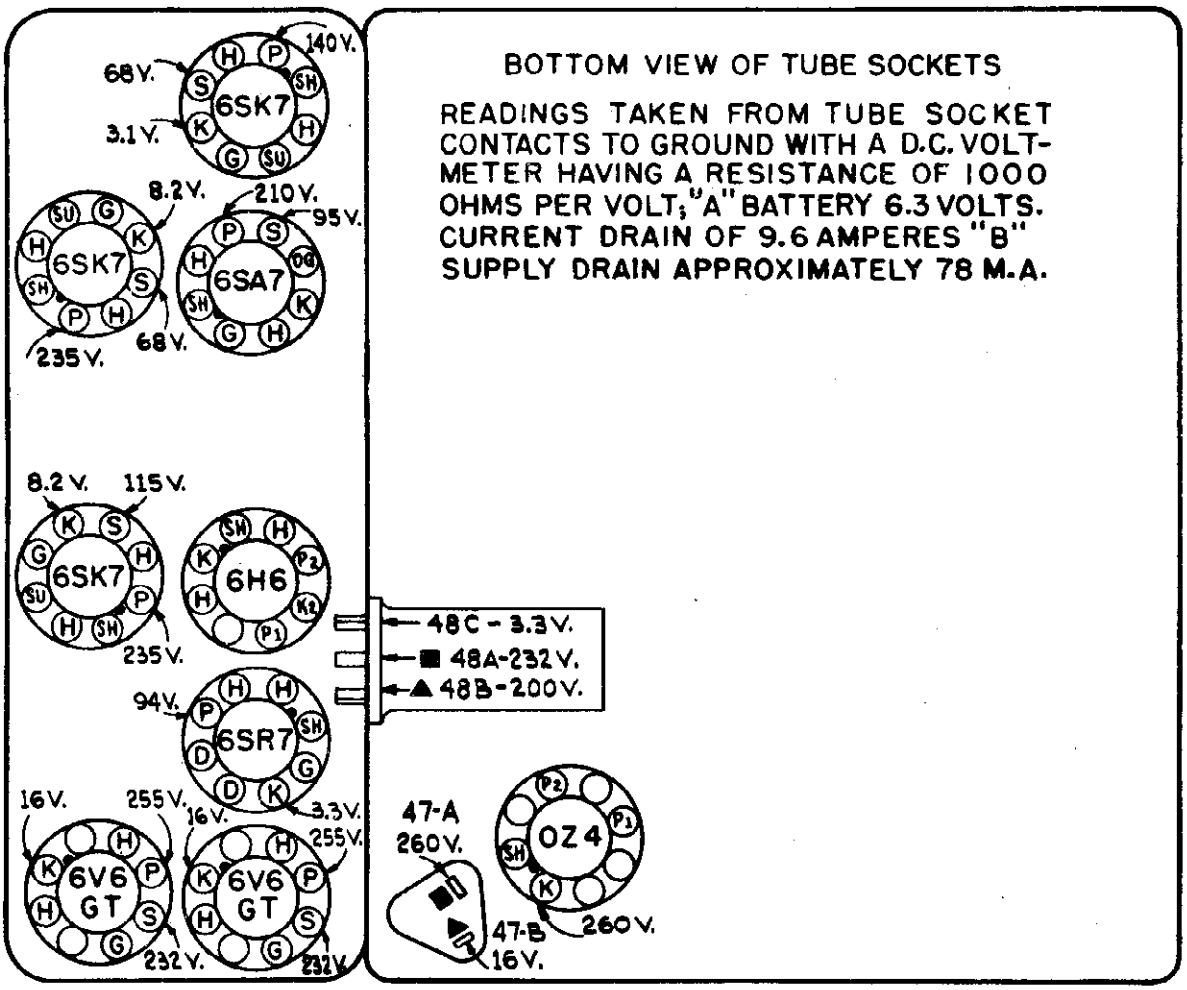


FIG. 8 VOLTAGE CHART—RADIO 985794

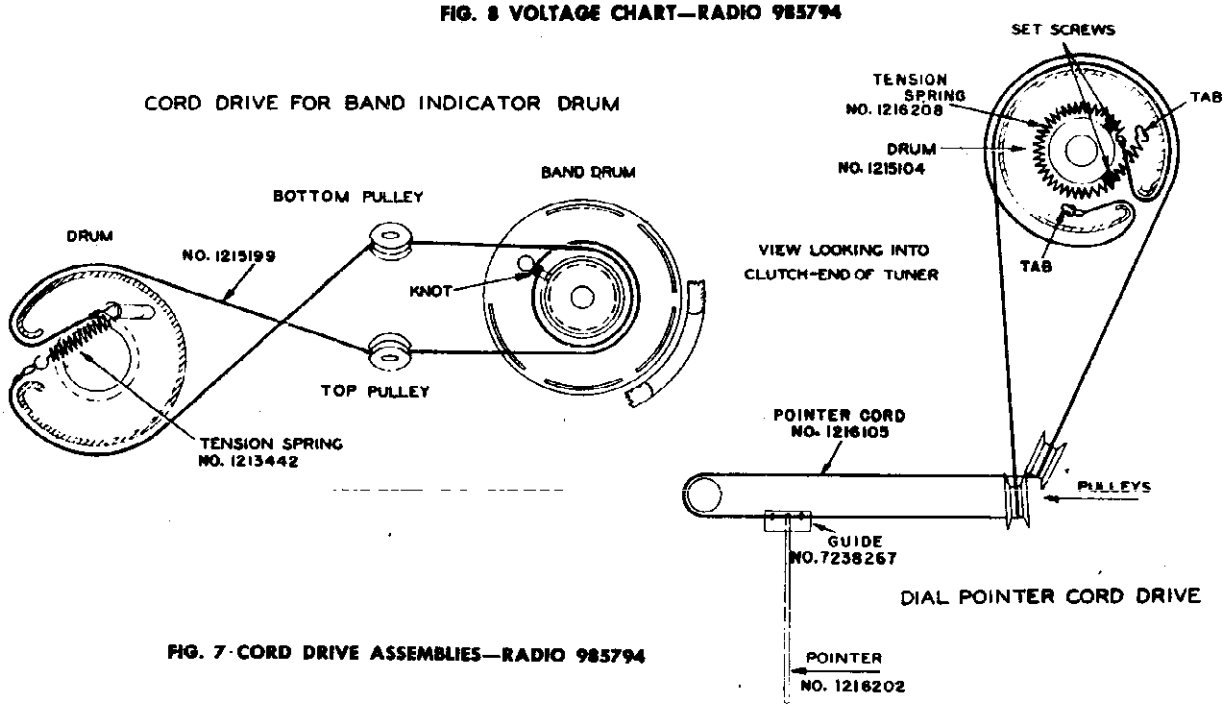


FIG. 7 CORD DRIVE ASSEMBLIES—RADIO 985794

MODEL 985794

CHEVROLET DIV.—GEN. MOTORS

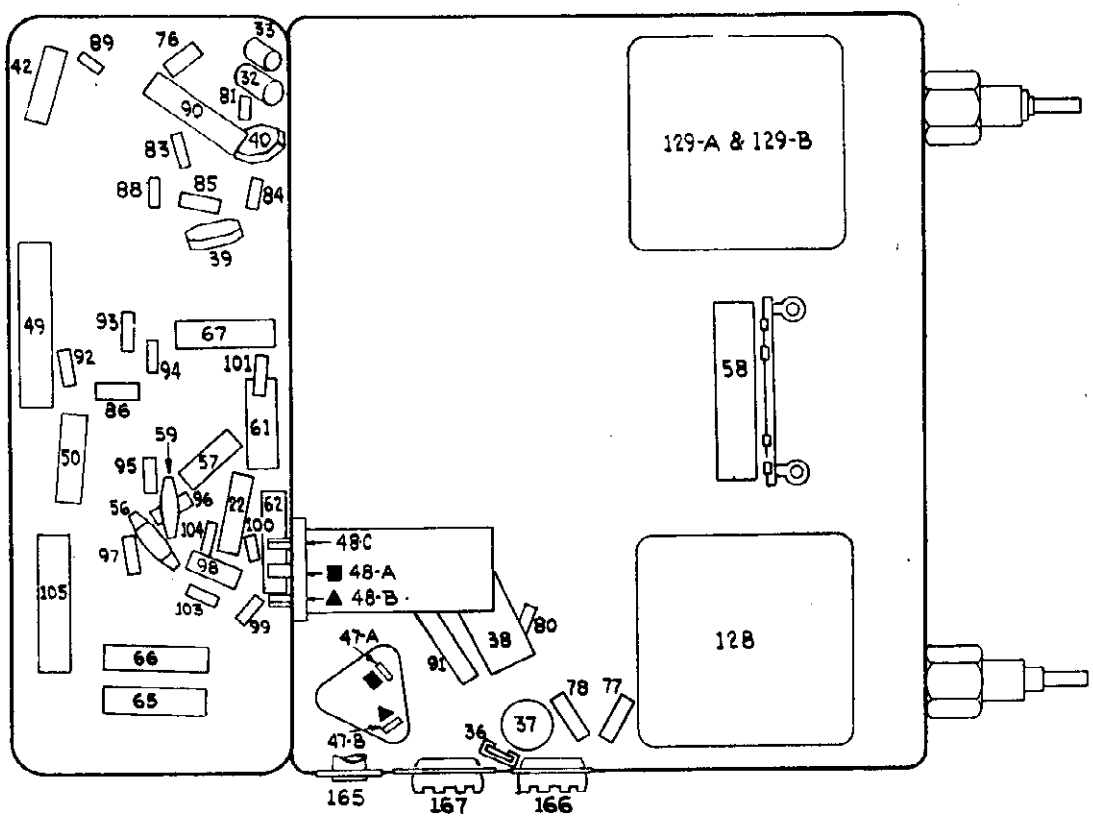


FIG. 9 PARTS LOCATING DIAGRAM (TOP VIEW)—RADIO 985794

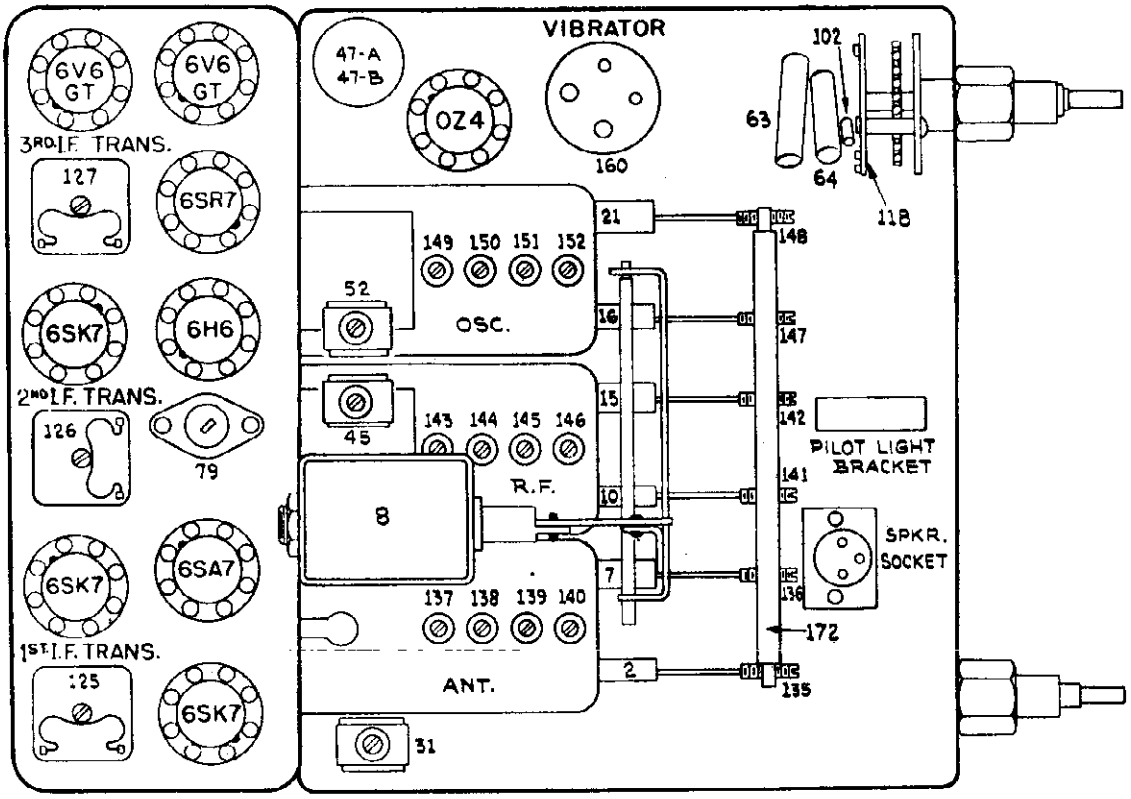


FIG. 10 PARTS LOCATING DIAGRAM (BOTTOM VIEW)—RADIO 985794

CHEVROLET DIV.—GEN. MOTORS

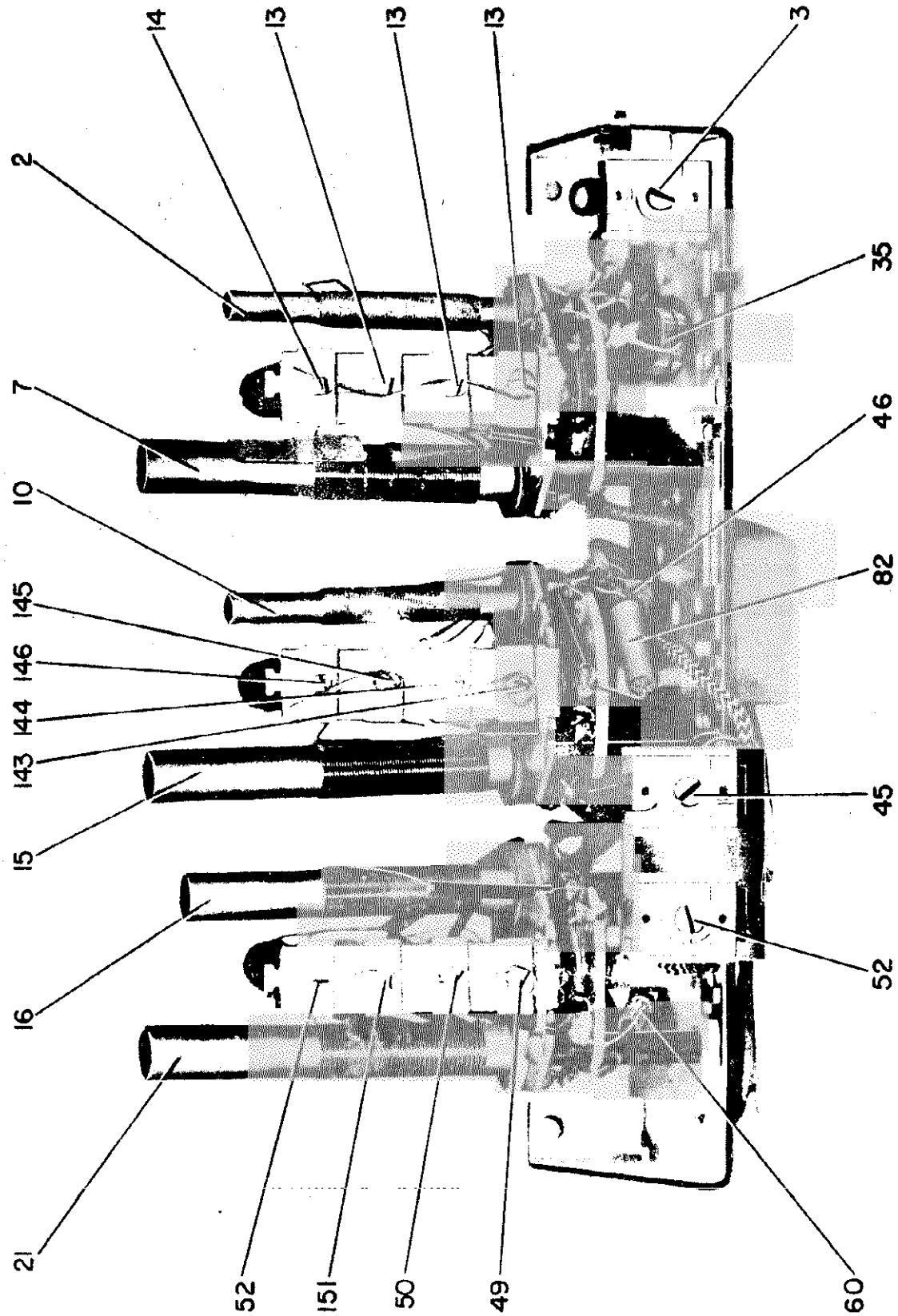


FIG. 11 COIL ASSEMBLY (BOTTOM VIEW)—RADIO 985794

MODEL 985794

CHEVROLET DIV.—GEN. MOTORS

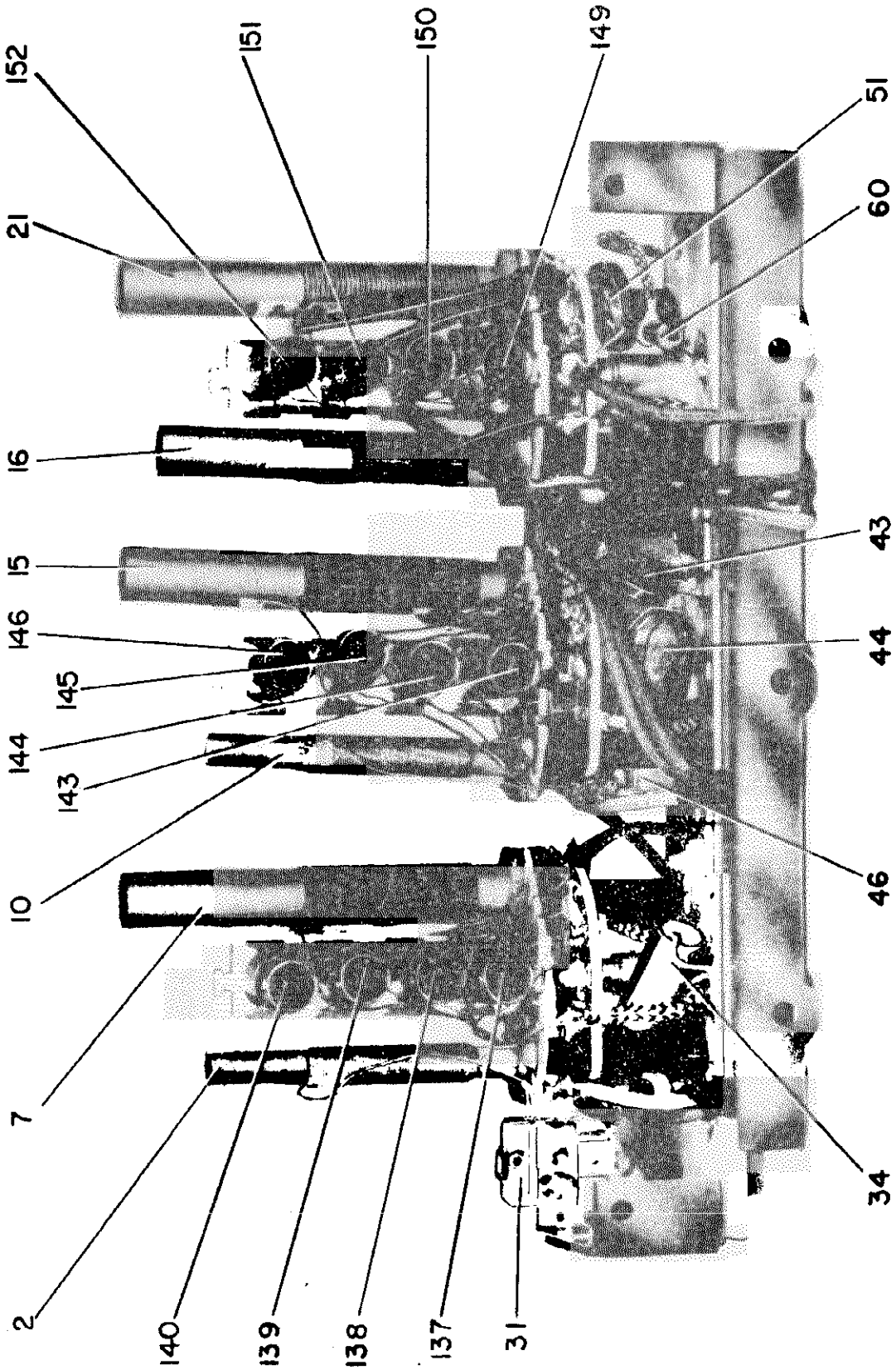


FIG. 12 COIL ASSEMBLY (TOP VIEW)—RADIO 985794

CHEVROLET DIV.—GEN. MOTORS

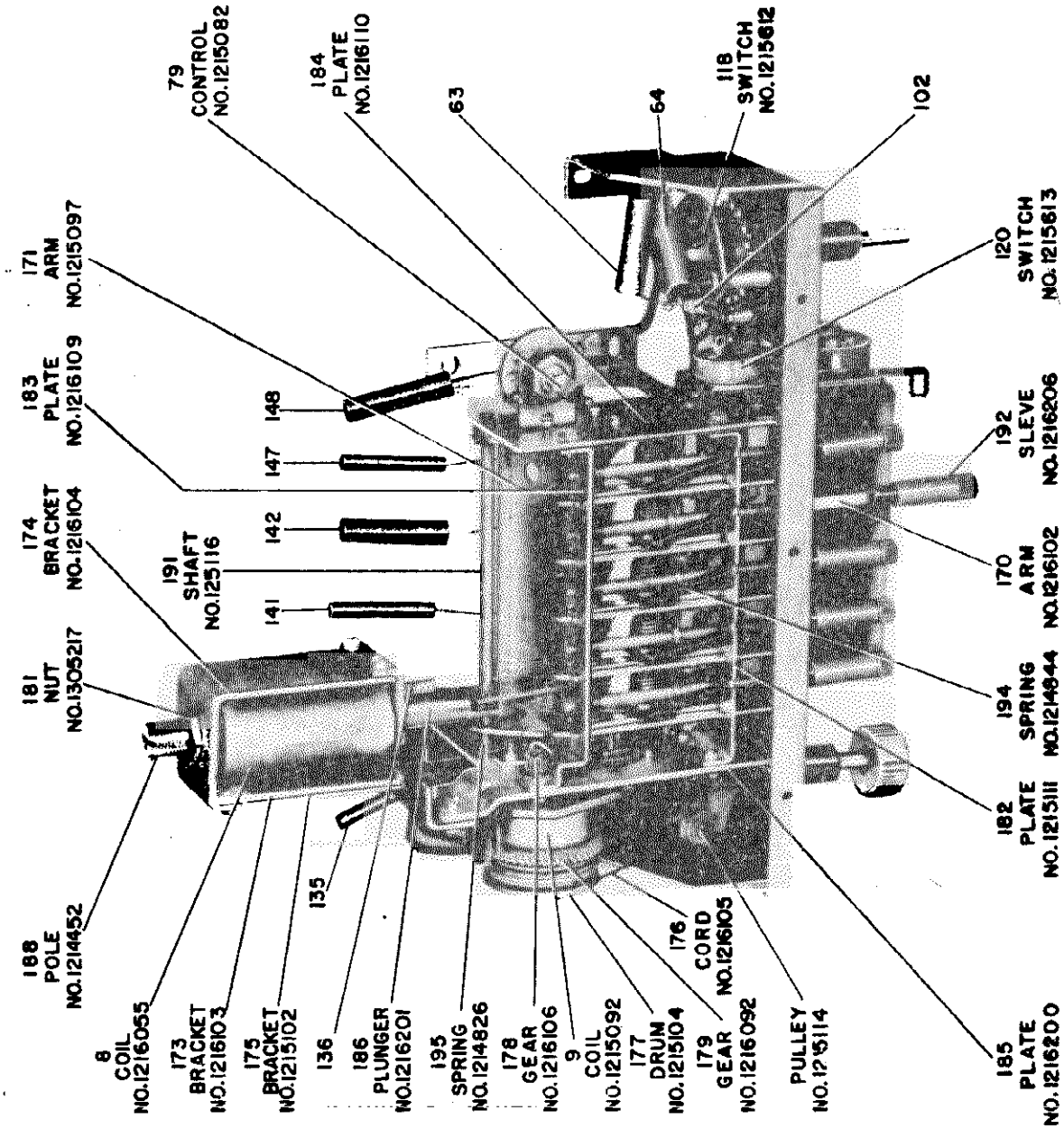


FIG. 13 TUNER UNIT (BOTTOM VIEW)—RADIO 985794

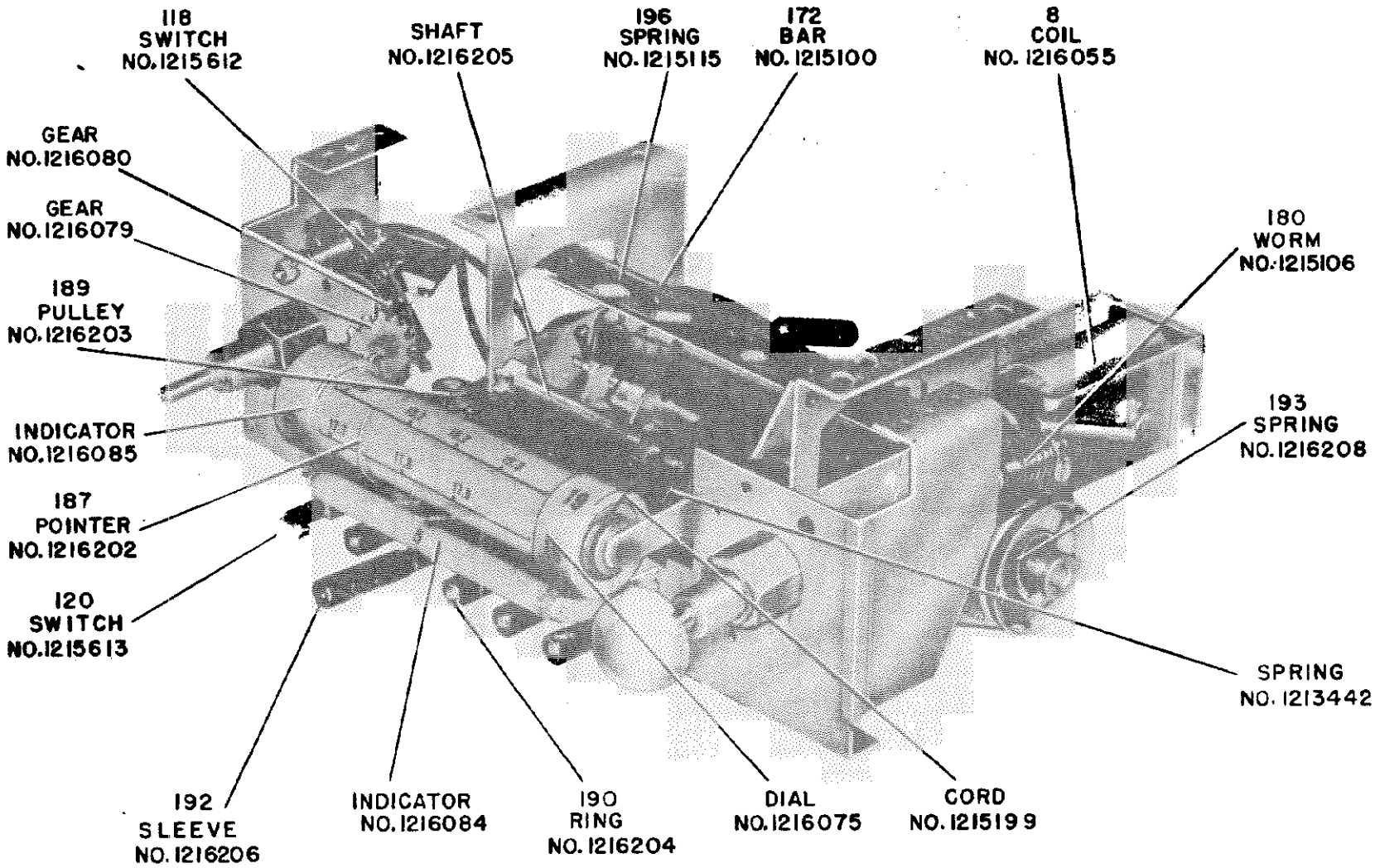


FIG. 14 TUNER UNIT (TOP VIEW)—RADIO 985794

Service Parts List

Production Part No.	Service Part No.	Part Name	Description—Function	Illus. No.
1215060	.....	Coil	Choke coil—R.F. grid	1
1216050	.....	Coil	Antenna coil—"A" band	2
1216051	.....	Coil	Antenna shunt coil—31 meter band	3
1216052	.....	Coil	Antenna shunt coil—25 meter band	4
1216053	.....	Coil	Antenna shunt coil—19 meter band	5
1216054	.....	Coil	Antenna shunt coil—16 meter band	6
1215066	.....	Coil	Solenoid coil, (Fig. 13-14)	7
1216055	.....	Coil	Clutch coil, (Fig. 13)	8
1215092	.....	Coil	Clutch coil	9
1216050	.....	Coil	R.F. coil—"A" band	10
1216051	.....	Coil	R.F. shunt coil—31 meter band	11
1216052	.....	Coil	R.F. shunt coil—25 meter band	12
1216053	.....	Coil	R.F. shunt coil—19 meter band	13
1216054	.....	Coil	R.F. shunt coil—16 meter band	14
1215066	.....	Coil	R.F. coil—S.W.	15
1216056	.....	Coil	Oscillator coil—"A" band	16
1216057	.....	Coil	Oscillator shunt coil—31 meter band	17
1216058	.....	Coil	Oscillator shunt coil—25 meter band	18
1216059	.....	Coil	Oscillator shunt coil—19 meter band	19
1216060	.....	Coil	Oscillator shunt coil—16 meter band	20
1215068	.....	Coil	Oscillator coil—S.W.	21
1216061	.....	Coil	Choke coil—Grid 6SR7	22
7242577	.....	Condenser	Moulded—.000022 mfd.—antenna filter	30
1215074	.....	Condenser	Trimmer—50-300 mmfd., antenna tuning	31
1215201	.....	Condenser	Tubular—0.1 mfd., 300 volts—screen filter	32
1215200	1215192	Condenser	Tubular—.01 mfd., 1000 volts—R.F. cathode	33
1215200	1215192	Condenser	Tubular—.01 mfd., 1000 volts—A.V.C.	34
7236146	.....	Condenser	Silvered mica moulded—.0001 mfd. S.W. tuning	35
1214168	.....	Condenser	Mica—.00047 mfd. "A" filter	36
7232580	.....	Condenser	Tubular—0.5 mfd., 150 volts "A" filter	37
1215191	.....	Condenser	Tubular—.006 mfd., 1200 volts—secondary buffer	38
1215077	.....	Condenser	Moulded—.000056 mfd., 6SA7—signal grid	39
7236157	.....	Condenser	Silvered mica moulded—.0022 mfd. 6SA7 Screen	40
Not Serviced		Condenser	.00016 mfd.,—I.F. circuit—(See Ill. 125, 126, 127)	41
1215200	1215192	Condenser	Tubular—.01 mfd., 1000 volts—B+ filter	42
7238891	.....	Condenser	Moulded—.000015 mfd., R.F. plate	43
7242579	.....	Condenser	Moulded—.00068 mfd., R.F. plate	44
1216097	.....	Condenser	Trimmer—70-150 mmfd., R.F. tuning	45
1215200	1215192	Condenser	Tubular—.01 mfd., 1000 volts—B+ filter	46
1214489	.....	Condenser	Electrolytic A—20 mfd., 400 volts—filter. B—20 mfd., 25 volts—by-pass.	47
1215184	.....	Condenser	Electrolytic A—20 mfd., 350 volts—filter. B— 5 mfd., 300 volts—hum filter. C—20 mfd., 25 volts—by-pass.	48
7238787	7231594	Condenser	Tubular—0.25 mfd., 200 volts—6SK7 cathode	49
1215200	1215192	Condenser	Tubular—.01 mfd., 1000 volts—3rd 6SK7 screen	50
1215076	1210275	Condenser	Moulded—.0001 mfd., oscillator grid coupling	51
1216097	.....	Condenser	Trimmer—70-150 mmfd., oscillator tuning	52
1214932	.....	Condenser	Ceramic—.0001 mfd., "A" oscillator grid	53
7236158	.....	Condenser	Silvered mica moulded—.00033 mfd., "A" oscillator grid	54
Not Serviced	.....	Condenser	.0001 mfd.—I.F. circuit (See Ill. 127)	55
1215078	1215081	Condenser	Moulded—.000068 mfd., limiter coupling	56
1215195	.....	Condenser	Tubular—.0025 mfd., 1400 volts—audio coupling	57
1215194	7235836	Condenser	Tubular—0.2 mfd., 300 volts, audio coupling	58
1215080	1209878	Condenser	Moulded—.00047 mfd., 6SR7—plate filter	59
1215186	.....	Condenser	Ceramic—.00012 mfd., S.W. oscillator grid	60
1215192	.....	Condenser	Tubular—.01 mfd., 1000 volts, V.C. Comp.	61
1215200	1215192	Condenser	Tubular—.01 mfd., 1000 volts—Limiter Filter	62
1215192	.....	Condenser	Tubular—.01 mfd., 1000 volts—Tone Control, (Fig. 13)	63
7242448	.....	Condenser	Tubular—.035 mfd., 400 volts—Tone Control, (Fig. 13)	64
1215195	.....	Condenser	Tubular—.0025 mfd., 1400 volts—6V6 Plate	65
1215195	.....	Condenser	Tubular—.0025 mfd., 1400 volts—6V6 Plate	66
1215200	1215192	Condenser	Tubular—.01 mfd., 1000 volts, A.V.C. Filter	67
1211141	.....	Resistor	Insulated—1.5 meg., ¼ watt R.F. Grid	75
7233314	.....	Resistor	Insulated—560 ohms, ¼ watt 6SK7 Cathode	76
1211000	.....	Resistor	Insulated—100 ohms, ½ watt, Primary Buffer	77
1211000	.....	Resistor	Insulated—100 ohms, ½ watt, Primary Buffer	78
1216042	.....	Control	Dimmer control (20 ohm resistance), (Fig. 13)	79
1215181	.....	Resistor	Insulated—15,000 ohms, ½ watt, Secondary Buffer	80
1214567	1211089	Resistor	Insulated—15,000 ohms, ¼ watt, 6SK7 Screen	81
1211089	.....	Resistor	Insulated—15,000 ohms, ½ watt, R.F. Plate	82
7240588	1210470	Resistor	Insulated—470,000 ohms, ¼ watt, 6SA7 Grid	83
1215107	.....	Resistor	Insulated—10 ohms, ¼ watt, 6SA7 Oscillator Grid	84
1215182	.....	Resistor	Insulated—22,000 ohms, ¼ watt, 6SA7 Osc. Grid Leak	85
7233314	.....	Resistor	Insulated—560 ohms, ¼ watt, 6SK7 Cathode	86
1215179	.....	Control	Sensitivity control (1200 ohm)	87
7236812	1209883	Resistor	Insulated—100,000 ohms, ¼ watt A.V.C. Filter	88
7236689	1211049	Resistor	Insulated—2700 ohms, ¼ watt, B+ Filter	89
7233653	.....	Resistor	Insulated—15,000 ohms, 2 watt, Screen Dropping	90
1215183	.....	Resistor	Insulated—1000 ohms, 2 watt B+ Filter	91
7236812	1209883	Resistor	Insulated—100,000 ohms, ¼ watt, 3rd 6SK7 Screen	92
1213343	.....	Resistor	Insulated—15 meg., ½ watt, Screen Dropping	93
1214170	1214563	Resistor	Insulated—2.2 meg., ¼ watt, Noise Limiter	94
7240588	1210470	Resistor	Insulated—470,000 ohms, ¼ watt, Noise Limiter	95
1211194	1211112	Resistor	Insulated—56,000 ohms, ¼ watt, Audio Diode Filter	96

Service Parts List—Cont'd

Production Part No.	Service Part No.	Part Name	Description—Function	Illus. No.
7242582	7242583	Resistor	Insulated—180,000 ohms, ⅛ watt, Audio Diode Filter	97
1214551	.....	Resistor	Insulated—27,000 ohms, ⅛ watt, 6SR7 Plate	98
7236701	1210834	Resistor	Insulated—10,000 ohms, ¼ watt, 6SR7 Plate Filter	99
7236664	1211035	Resistor	Insulated—1000 ohms, ¼ watt, 6SR7 Cathode	100
7236632	7236248	Resistor	Insulated—56,000 ohms, ¼ watt, Compensation	101
1215182	.....	Resistor	Insulated—22,000 ohms, ¼ watt Tone Control, (Fig. 13)	102
1213488	.....	Resistor	Insulated—680,000 ohms, ¼ watt Limited Bias Load	103
1213488	.....	Resistor	Insulated—680,000 ohms, ¼ watt Limiter Filter	104
1214572	.....	Resistor	Insulated—330 ohms, 2 watt—6V6 Cathode	105
1215610	.....	Control	Steering post volume control and power switch	106
1216062	.....	Switch	Antenna coil switch wafer	115
1215094	.....	Switch	R.F. coil switch wafer	116
1216063	.....	Switch	Oscillator coil switch wafer	117
1215612	.....	Switch	Tone control switch (in radio set), (Fig. 13-14)	118
1216064	.....	Switch	Steering post tuning switch	119
1215613	.....	Switch	Tuning switch and arm complete (in radio set), (Fig. 13-14)	120
1215608	.....	Transformer	First I.F. transformer	125
1215608	.....	Transformer	Second I.F. transformer	126
1215609	.....	Transformer	Third I.F. transformer	127
1215611	.....	Transformer	Vibrator transformer	128
1215091	.....	Transformer	Audio pack A—Driver B—Output	129
1216065	.....	Core	Tuning core for "A" band antenna coils—"Red"	135
1216066	.....	Core	Tuning core for "A" band antenna coils—"Green"	135
1216067	.....	Core	Tuning core for "A" band antenna coils—"Yellow"	135
1215089	.....	Core	Tuning core for S.W. Antenna coil, (Fig. 13)	136
1215090	.....	Core	Trimmer, for antenna coil—31 meter band	137
1215090	.....	Core	Trimmer, for antenna coil—25 meter band	138
1215090	.....	Core	Trimmer, for antenna coil—19 meter band	139
1215090	.....	Core	Trimmer, for antenna coil—16 meter band	140
1216065	.....	Core	Tuning core for "A" band R.F. coils—"Red"	141
1216066	.....	Core	Tuning core for "A" band R.F. coils—"Green"	141
1216067	.....	Core	Tuning core for "A" band R.F. coils—"Yellow"	141
1215089	.....	Core	Tuning core for S.W.—R.F. coil	142
1215090	.....	Core	Trimmer, for R.F. coil—31 meter band	143
1215090	.....	Core	Trimmer, for R.F. coil—25 meter band	144
1215090	.....	Core	Trimmer, for R.F. coil—19 meter band	145
1215090	.....	Core	Trimmer, for R.F. coil—16 meter band	146
1216065	.....	Core	Tuning core for "A" band oscillator coil—"Red"	147
1216066	.....	Core	Tuning core for "A" band oscillator coil—"Green"	147
1216067	.....	Core	Tuning core for "A" band oscillator coil—"Yellow"	147
1215089	.....	Core	Tuning core for S. W. oscillator coil	148
1215090	.....	Core	Trimmer, for oscillator coil, 31 meter band	149
1215090	.....	Core	Trimmer, for oscillator coil, 25 meter band	150
1215090	.....	Core	Trimmer, for oscillator coil, 19 meter band	151
1215090	.....	Core	Trimmer, for oscillator coil, 16 meter band	152
1215084	1214928	Speaker	Complete elliptical speaker	.....
1215616	.....	Coil	Antenna coil, switch, and can assembly	.....
1215615	.....	Coil	R.F. coil, switch, and can assembly	.....
1215614	.....	Coil	Oscillator coil, switch, and can assembly	.....
1215198	7239439	Vibrator	Plug-in-Unit	160

Tuner Unit Parts

Production Part No.	Service Part No.	Part Name	Description—Function	Illus. No.
1216045	.....	Unit	Tuner—mechanical staked assy. (includes push arm and reset screws), (Fig. 13-14)	.....
1216101	.....	Arm	Pawl arm—operates push bar indicator	.....
1216102	.....	Arm	Push arm assembly and set-up sleeve (Fig. 13)	170
1215097	.....	Arm	Selector arm and link assembly, (Fig. 13)	171
145635	.....	Ball	⅛" dia.—steel ball for worm gear	.....
1215099	.....	Bar	Pointer slide bar	.....
1215100	.....	Bar	Rocker bar, gear sector, and core rail assy., (Fig. 14)	172
1216103	.....	Bracket	Solenoid coil holder (plunger end), (Fig. 13)	173
1216104	.....	Bracket	Solenoid coil holder (pole piece end), (Fig. 13)	174
1215102	.....	Bracket	Solenoid mounting bracket, (Fig. 13)	175
1214822	.....	Clip	Retaining clip for selector arm shaft	.....
1216105	.....	Cord	Pointer cord, (Fig. 13)	176
1214464	.....	Cover	Clutch coil cover	.....
7235945	.....	Disc	Rubber disc for clutch	.....
1215104	.....	Drum	Pointer drive cord and clutch disc, (Fig. 13)	177
1216106	.....	Gear	Clutch pinion gear and spindle, (Fig. 13)	178
1216092	.....	Gear	Scissors gear and disc for clutch, (Fig. 13)	179
1215106	.....	Gear	Worm gear, (Fig. 14)	180
7238267	.....	Guide	Dial pointer guide (carriage)	.....
1216107	.....	Guide	Pointer cord guide	.....
368319	.....	Nut	5/16—32 hex. nut for clutch spindle sleeve	.....
7231480	.....	Nut	⅜—32 hex. nut for dimmer control	.....
1305217	.....	Nut	Locknut for solenoid pole piece, (Fig. 13)	181
1214821	.....	Nut	Locknut for worm gear bearing screw	.....
1216108	.....	Plate	Front bearing plate	.....
1215111	.....	Plate	Push arm stop plate, (Fig. 13)	182
1216109	.....	Plate	Rear bearing plate, (Fig. 13)	183
1216110	.....	Plate	L.H. end plate, (Fig. 13)	184
1216200	.....	Plate	R.H. end plate, (Fig. 13)	185
1216201	.....	Plunger	Solenoid plunger and stud, (Fig. 13)	186
1216202	.....	Pointer	Dial pointer only, (Fig. 14)	187
1214452	.....	Pole	Solenoid pole piece, (Fig. 13)	188

Tuner Unit Parts—Cont'd

Production Part No.	Service Part No.	Part Name	Description—Function	Illus. No.
1216203	.....	Pulley	L.H. pulley and bracket assembly (1 pulley). (Fig. 14)	189
1215114	.....	Pulley	R.H. pulley and bracket assembly (2 pulleys) (see Illus.), (Fig. 13)	.....
7232972	.....	Retainer	Clip to fasten cam shaft pawl arm to selector arm	.....
1216206	.....	Screw	Push arm set-up screw and sleeve assembled (Fig. 13-14)	192
1214845	.....	Screw	No. 6—32x¼ self-tapping, for tuner frame	.....
1215127	.....	Screw	No. 8—32x¼ self-tapping, for solenoid bracket	.....
1215128	.....	Screw	No. 10—32x⅝ hex. head, for solenoid coil	.....
7240316	.....	Screw	No. 10—32x⅝ screw for worm gear bearing	.....
127555	128036	Screw	Set screw for worm gear	.....
1216205	.....	Shaft	Camshaft (See Illus.), (Fig. 14)	.....
1215116	.....	Shaft	Selector arm and link pivot shaft, (Fig. 13)	191
1214466	.....	Spring	Clutch spring	.....
1215120	.....	Spring	Core rail tension spring—L.H.	.....
1215234	.....	Spring	Core rail tension spring—R.H.	.....
1216207	.....	Spring	Pawl arm spring	.....
1216208	.....	Spring	Pointer cord spring, (Fig. 14)	193
1214844	.....	Spring	Push arm return spring, (Fig. 13)	194
1215235	.....	Spring	Rocker bar gear sector spring	.....
1216209	.....	Spring	Rocker bar tension spring	.....
1214826	.....	Spring	Selector arm and link spring, (Fig. 13)	195
7236121	Not Serviced	Spring	Tension spring for clutch scissors gear	.....
1215115	.....	Spring	Tuning core holding spring, (Fig. 14)	196
1216210	.....	Washer	"C" washer for pawl arm	.....
1214609	.....	Washer	"C" washer to hold indicator drum pawl arm	.....
7235892	.....	Washer	Fibre washer for worm gear bearing	.....
1214837	.....	Washer	Flat washer for selector arm shaft	.....
1213909	.....	Washer	Rubber, for push arm	.....
1214823	.....	Washer	Spring washer for worm gear bearing	.....

Chassis Parts—Miscellaneous

189066	.....	Ball	⅛" dia. steel ball for switch detent	.....
1216068	.....	Bar	Tuning push bar	.....
1216069	.....	Board	Terminal board for antenna coil shield can	.....
1215123	.....	Bracket	S.W. shunt coil mounting bracket	.....
1216070	.....	Bushing	Tuning shaft bushing	.....
1215130	.....	Cable	Antenna cable and socket	165
1216071	.....	Can	Antenna coil assembly shield can	.....
1216072	.....	Can	R.F. or oscillator coil assembly shield can	.....
1216073	.....	Case	Receiver case—less control panel	.....
1216074	.....	Clip	Mounting clip for shunt coils	.....
1215134	.....	Clip	Retaining clip for coil shield can (fastens on end of coil bracket)	.....
1215199	.....	Cord	Band indicator drive cord (See Illus.), (Fig. 14)	.....
1216075	.....	Dial	Dial cylinder and band indicator strip (See Illus.), (Fig. 14)	.....

Chassis Parts—Miscellaneous—Cont'd

Production Part No.	Service Part No.	Part Name	Description—Function	Illus. No.
1216076	.....	Drum	Range switch intermediate shaft drive cord drum	.....
1216077	.....	Escutcheon	Control panel escutcheon and window	.....
1215143	.....	Gasket	Rubber gasket for speaker cover	.....
1216078	.....	Gear	Range switch intermediate shaft gear—less set screws	.....
1216079	.....	Gear Assy.	Tone control, drum drive gear (See Illus.), (Fig. 14) Includes: 1—gear 1—stud 1—washer	.....
1216080	.....	Gear	Tone control intermediate gear (See Illus.), (Fig. 14)	.....
1216081	.....	Grommet	Rubber grommet for "A" band antenna or R.F. coil can opening	.....
1216082	.....	Grommet	Rubber grommet for "A" band antenna or R.F. coil mounting	.....
1215147	.....	Grommet	Rubber grommet "A" band oscillator coil can opening	.....
1216083	.....	Grommet	Rubber grommet for "A" band oscillator coil mounting	.....
1215148	.....	Grommet	Rubber grommet for S.W. band antenna, R.F. or oscillator coil can opening	.....
7232948	.....	Grommet	Rubber grommet for S.W. band antenna R.F. or oscillator coil mounting	.....
1216084	.....	Indicator	Push bar tuning indicator drum (See Illus.), (Fig. 14)	.....
1216085	.....	Indicator	Tone indicator drum (See Illus.), (Fig. 14)	.....
125588	.....	Lamp	Dial lamp—Mazda No. 55	.....
1216086	.....	Link	Coil switch link and arm assembly	.....
7238510	.....	Nut	Hex nut for volume control or tuning shaft bushing	.....
1216227	.....	Nut	No. 5-40 nut for tone control switch	.....
1216087	.....	Panel	Control panel, bracket and pulleys, and gear assembled	.....
1216088	.....	Plate	Coil mounting and range switch detent plate assembly	.....
1215154	.....	Pulley	Bracket and 2 pulleys for control panel	.....
1215157	.....	Screw	Guide screw for tuning knob shaft	.....
1216229	.....	Screw	No. 6-32x3/16" screw for push bar indicator drum index spring	.....
1215160	.....	Screw	No. 6-32x¼" hex head for coil switch link	.....
1216047	.....	Screw	No. 8-32x⅛" set screw for range switch shaft cord drum or gear	.....
1215161	.....	Shaft	Coil assembly switch shaft	.....
1215162	.....	Shaft	Dial shaft	.....
1216089	.....	Shaft	Manual tuning flexible shaft	.....
1216090	.....	Shaft	Pivot shaft for push bar indicator drum	.....
1215165	.....	Shaft	Range switch intermediate shaft	.....
1216091	.....	Shaft	Range switch knob shaft and gear	.....
1216093	.....	Socket	Dial lamp socket and lead	.....
1215174	.....	Socket	Speaker plug socket	.....
1213439	.....	Socket	Tube socket	.....

Mounting and Installation Parts

Production Part No.	Service Part No.	Part Name	Description—Function	Illus. No.
605302	.....	Condenser	.5 mfd., generator (1)	.....
1882272	.....	Condenser	.5 mfd., ignition coil (1)	.....
605303	.....	Condenser	.5 mfd., regulator (1)	.....
605301	.....	Condenser	.5 mfd., voltage regulator (1)	.....
7230032	.....	Suppressor	Distributor suppressor (1)	.....
1882054	.....	Washer	For mounting coil condenser (1)	.....
1215229	.....	Package	Electrical Mounting Parts (Accessory Bag No. 3)—Consists of the following parts:	
1853686	.....	Adapter	Suppressor adapter (1)	.....
1882053	.....	Clip	Ground clip for coil condenser (1)	.....
605307	.....	Coil	Regulator choke (1)	.....
605204	.....	Condenser	.01 mfd., regulator field (1)	.....
1849161	.....	Condenser	.5 mfd., ammeter (1)	.....
1215660	.....	Control Assy.	Steering Post Control (Accessory Bag No. 6)	.....
606218	.....	Cover	Cable Cover (1)	.....
606347	.....	Spring	Cable cover spring (1)	.....

Circuit Description

The circuit used in this receiver is the conventional superheterodyne type with two stages of I.F. and six tuned I.F. circuits. In the short wave position the band switch operates by shunting respective coils (with their magnetite trimmer cores) across the main variable tuning inductances in the antenna, R.F. and oscillator circuits. When tuning either of the four short wave bands the signal is fed to the grid of the R.F. amplifier tube 6SK7 which also receives its A.V.C. bias through the 1.5 megohm resistor (item 75).

In the broadcast band position the filter choke (item 1) is included in the circuit and in conjunction with the input capacity of the tube constitutes a low-pass filter which effectively prevents unwanted disturbances from reaching the R.F. tube. The variable trimmer (item 31) is used for compensating the slight variations in the effective capacities of the antenna and the shielded lead-in cable. Bias for the 6SK7 tube is developed across the 560 ohm resistor (item 76).

The 6SA7 tube serves the combined functions of 1st detector and oscillator. In the short wave position the oscillator section of 6SA7 uses the conventional Hartley circuit, however the band switching arrangement of this section differs slightly from that of the antenna and R.F. sections, in that a 31-meter auxiliary oscillator coil (item 17) is permanently shunted across the main tuning coil (item 21) and a tap is brought out for return to the cathode. In changing to the 25, 19 and 16 meter bands, the respective auxiliary oscillator coils (items 18, 19 and 20) are shunted in parallel to the previous combination. The negative coefficient 120 mmf. condenser (item 60) in parallel to the main tuning coil (item 21) constitutes the temperature compensating arrangement for the short wave bands. In the broadcast band the oscillator uses a modified Colpitts

Circuit Description—Cont'd

circuit arrangement formed by the main tuning inductance (item 16) 2200 mmf. condenser (item 40) and condensers consisting of items 52, 53 and 54 in which item 53 is the negative temperature coefficient condenser.

The two 6SK7 tubes are used in the two stage I.F. amplifier. In the short wave position, both tubes get their bias from the 560 ohm resistor (item 86), but in the broadcast position a 1200 ohm variable resistor (item 87) is connected in series with the 560 ohm resistor and is adjusted in the factory for uniform sensitivity. The variable resistor (item 87) increases the bias on the 6SK7 tubes, therefore, the I.F. stage gain in the broadcast position is less than that in the short wave position so that the desired sensitivity is obtained on all bands.

The 6SR7 tube serves three distinct functions. The diode plate No. 2 is used for signal detection. Diode No. 1 is used for supplying bias for the noise limiter circuit, while the triode part is used for the audio amplifier. Diode plate No. 1 gets its signal from the primary of the 3rd I.F. transformer through the 68 mmf. condenser (item 56) and inasmuch as the secondary of the transformer is tapped down the bias for the noise-limiter circuit is greater than the DC voltage of the rectified signal. The bias for the tube is developed across the 1000 ohm resistor (item 100).

The 6H6 tube performs two functions: plate No. 1 is used in the noise limiter circuit and plate No. 2 is used for providing A.V.C. delay. A.V.C. is derived from the high end of diode load resistor (item 97) and the delay is provided by means of a bleeding resistor (item 93) from +B. For signals below the A.V.C. level, diode plate No. 2 of the 6H6 is conducting because of the + voltage from resistors 93 and 94. Under these conditions the A.V.C. line is therefore at essentially zero potential, but as signal input increases the junction of resistor 97 and the low side of the 3rd I.F. transformer secondary assumes a negative potential and when this counteracts the positive voltage from resistors 93 and 94 on 6H6 diode plate No. 2 this diode ceases to conduct. As signal input increases further, A.V.C. is applied to the R.F. and I.F. tubes.

The noise limiter functions automatically whenever a noise pulse appearing at the 3rd I.F. transformer exceeds 100 per cent modulation. Cathode No. 1 of the 6H6 is connected to the second detector diode (No. 2 of the 6SR7) and diode plate No. 1 of the 6H6, does not conduct in the absence of noise because of the negative control voltage applied through resistor 104 to diode plate No. 1 of the 6H6. This voltage is derived from the primary of the 3rd I.F. transformer by diode No. 2 of the 6SR7 and varies with the signal input in such a way that the ratio of control voltage to the second detector diode voltage is constant. This ratio determines the modulation percentage at which the noise limiter functions. If the ratio is too low, the noise limiter will cut modulation peaks and if the ratio is too high the limiter will not eliminate noise as effectively as it could. The voltage ratio is determined by the design of the complete 3rd I.F. transformer circuit and should not be changed.

Circuit Alignment

The adjustable condensers and magnetite cores in this receiver have been very carefully adjusted at the factory and should require no further adjustment (except antenna compensating condenser, item 31) unless tampered with or a defective unit has been replaced. It is advisable not to attempt any adjustment unless it is definitely known that an adjustment is necessary.

To align the circuits of this receiver correctly a signal generator and an output meter must be used. In aligning the receiver it is very important that the correct frequencies be used and that all alignment adjustments be made in sequence, starting with the I.F. amplifier, then aligning the broadcast band, and finally the short wave bands. Slight misadjusting of either the I.F. or R.F. circuits will result in a weak set over most of the dial. All R.F. and I.F. adjustments are accessible after removing the speaker cover, top cover and rear bottom cover. The I.F. primary windings are adjusted by magnetite core screws Nos. 153, 155 and 157, located on top of the I.F. transformers (Fig. 1); and the secondary windings are adjusted by core screws Nos. 154, 156 and 158, located at the bottom of each I.F. transformer (Fig. 1).

1. Aligning I.F. Stages at 455 Kilocycles

(a) Connect one terminal of the output meter to the plate of one of the 6V6GT output tubes and connect the other terminal through a .1 mfd. condenser to the plate of the other 6V6GT output tube.

(b) Connect the output of the signal generator through a .01 mfd. condenser to the grid of the 2nd I.F. tube, 6SK7 (Pin No. 4). Connect the ground lead from the signal generator to the frame of the receiver chassis.

(c) Turn the volume control on full.

(d) Adjust the signal generator to 455 kilocycles.

(e) Adjust core screws (157 and 158) on the 3rd I.F. transformer for maximum reading on the output meter.

NOTE: Aways use the lowest signal generator output that will give a reasonable deflection on the output meter.

(f) Connect the signal generator lead through the .01 condenser to the grid of the 1st I.F. tube, 6SK7 (Pin No. 4), and adjust core screws (155 and 156) in the 2nd I.F. transformer for maximum output.

(g) Connect the signal generator lead through the .01 condenser to the grid of the 6SA7 tube (Pin No. 8) and adjust core screws (153 and 154) in the 1st I.F. transformer for maximum output.

2. Aligning the R.F. Amplifier

The main tuning cores should never be touched unless a coil or core is replaced. Where one of these parts has been replaced the complete broadcast band alignment procedure (No. 3) should be followed. Generally when checking the R.F. circuits for proper peaking the following procedure and sequence must be used. There are fifteen trimmer screws properly labeled "Antenna," "Oscillator," and "R.F." The broadcast band is designated by the letter "A" and the four short wave bands are designated by the numbers indicating the bands—31, 25, 19 and 16. The labels all appear on the coil assembly shields.

(a) "A" Band, or Broadcast:

If the dial pointer is right on calibration, merely trim the "A" band, antenna and R.F. trimmers at 1200 kilocycles. If the pointer is slightly off calibration it can be corrected by bending.

NOTE: When the radio is installed in the car the antenna trimmer should be aligned on the "A" band between 1000 and 1200 kilocycles.

(b) 31 Meter Band:

Using a signal of 9.6 megacycles, tune in the signal with the receiver. If the pointer is slightly off calibration readjust the oscillator trimmer and then trim antenna and R.F. trimmers for maximum output at 9.6 megacycles.

(c) 25 Meter Band:

Using a signal of 11.8 megacycles tune in the signal with the receiver. If the pointer is slightly off calibration readjust the oscillator trimmer and then trim the antenna and R.F. trimmer for maximum output at 11.8 megacycles.

(d) 19 Meter Band:

Using a signal of 15.2 megacycles tune in the signal with the receiver. If the pointer is slightly off calibration readjust the oscillator trimmer and then trim the antenna and R.F. trimmers for maximum output at 15.2 megacycles.

(e) 16 Meter Band:

Using a signal of 17.8 megacycles tune in the signal with the receiver. If the pointer is slightly off calibration readjust the oscillator trimmer and then trim the antenna and R.F. trimmers for maximum output at 17.8 megacycles.

NOTE: The 31-meter band affects the tuning of the other short wave bands, therefore it must always be aligned first. It is equally important that the antenna trimmer (item 31) be aligned first on the broadcast band for proper tracking.

3. Broadcast Band Alignment

Six adjustments are provided which include trimmers Nos. 31, 45 and 52 associated with circuits Nos. 2, 10, 16 and the three iron cores Nos. 135, 141, and 147, which are mounted in front of the coil assemblies in conjunction with the core draw-bar No. 172. If complete realignment is found necessary the R.F. circuits should be adjusted in the following sequence.

(a) Tune the receiver to the extreme high frequency end of the band.

(b) Turn each of the three core screws (135, 141 and 147) in a counterclockwise direction ten turns.

NOTE: This is done in order to separate the cores from the coil windings far enough so that the cores will have no effect on the frequency of the circuits.

Circuit Alignment—Cont'd

(c) Connect the signal generator through a 35 mmf. condenser to the standard Chevrolet shielded antenna lead-in. Connect the ground lead from the signal generator to the shield of the antenna lead-in cable.

(d) Connect one terminal of the output meter to the plate of one of the 6V6GT output tubes, and connect the other terminal through a .1 mfd. condenser to the plate of the other 6V6GT output tube.

(e) Adjust the frequency of the signal generator to 1645 kilocycles and peak trimmers Nos. 31, 45 and 52 for maximum signal output, at the same time reducing the signal generator output to as low a value as is consistent with a reliable indication on the output meter.

(f) Change the frequency of the signal generator to 1620 kilocycles and turn the oscillator core screw (147) clockwise until maximum output is obtained.

(g) Change the frequency of the signal generator to 1200 kilocycles and tune the receiver for maximum signal at 1200 kilocycles.

(h) Adjust core screws (135 and 141) for maximum signal output.

(i) Change the frequency of the signal generator to 600 kilocycles.

(j) Tune the receiver for maximum signal output at 600 kilocycles.

(k) Adjust the antenna and R.F. trimmers (31 and 45) for maximum output.

(l) Reset the signal generator to 1200 kilocycles and tune the receiver for maximum output at 1200 kilocycles.

(m) Adjust the antenna and R.F. cores (135 and 141) for maximum output.

4. Complete Short Wave Alignment

Because of the extensive range of this receiver, it is necessary that the short wave bands be completely aligned in exact accordance with the following procedure. Be sure to make all adjustments in the order specified.

(a) Check broadcast band antenna trimmer (item 31) for maximum peaking at 1200 kilocycles. This is very important.

(b) Tune the receiver so that the dial pointer is at the extreme high frequency end of the 31-meter band, and adjust the magnetite core screws (136, 142 and 148) so that each core end is flush with the coil forms (items No. 7, No. 15 and No. 21) which extend beyond the shield.

(c) Turn the magnetite trimmer core screws (137, 138, 139, 140, 143, 144, 145, 146, 149, 150, 151 and 152) in a counter-clockwise direction, as far as they will go.

NOTE: Do not force the cores against their stops as too much force may fracture the core.

(d) Connect the signal generator through a 35 mmf. condenser and the Chevrolet shielded antenna lead-in, to the antenna connection of the receiver. Connect the ground lead from the signal generator to the shield of the lead-in.

(e) Turn the band indicator to 31 meters and turn the volume control to the maximum position.

(f) Adjust the signal generator frequency to 9.6 megacycles and move the pointer to 9.6 megacycles on the dial scale.

(g) Turn the core screw (149) in a clockwise direction until the first peak is obtained, and then adjust carefully for maximum reading on the output meter.

(h) Turn the core screw (143) in a clockwise direction until the 2nd peak is obtained, if more than one peak can be found, and adjust for maximum reading on the output meter at the same time reducing the signal generator output to as low a value as is consistent with a reliable indication on the output meter.

(i) Turn the core screw (137) in a clockwise direction or until 2nd peak is obtained, and adjust for maximum reading on the output meter.

(j) Change the signal generator frequency to 11.8 megacycles, the band indicator to 25 meters, and move the pointer to 11.8 megacycles on the dial scale.

(k) Turn the core screw (150) in a clockwise direction, until 1st peak is obtained, and adjust for maximum reading on the output meter.

(l) Turn core screws (144 and 138) in a clockwise direction until 2nd peak is obtained, and adjust for maximum reading on output meter.

(m) Change the signal generator frequency to 15.2 megacycles, the band indicator to 19 meters, and move the dial pointer to 15.2 megacycles on the dial scale.

(n) Turn core screw (151) in a clockwise direction until the 1st peak is obtained and adjust for maximum reading on the output meter.

(o) Turn core screws (145 and 139) in a clockwise direction until 2nd peak is obtained, and adjust for maximum reading on output meter.

(p) Change the signal generator frequency to 17.8 megacycles, the band indicator to 16 meters, and move the pointer to 17.8 megacycles on the dial scale.

(q) Adjust core screw (152) by turning in a clockwise direction until 2nd peak is obtained and adjust for maximum output.

(r) Adjust core screws (146 and 140) by turning in a clockwise direction until 1st peak is obtained and adjust for maximum reading on output meter.

(s) Repeat all operations starting with (e) until no further improvement can be obtained.

5. General Alignment Information

Alignment of the short wave bands should never be attempted without first peaking trimmer condenser No. 31 in accordance with the procedure outlined under "Broadcast Band Alignment" (3). A slight misalignment of this trimmer condenser will result in unsatisfactory short wave operation, the reason being that trimmer condenser No. 31 is in the circuit on all bands but it should be peaked on the broadcast band only.

The most satisfactory method of aligning or checking the spread band ranges is on actual reception of short wave stations of known frequency by adjusting the magnetite core oscillator coil for each band, so that the short wave stations come in at the correct points on the dial. In exceptional cases, when the set is being serviced in a location where the noise level is high enough to prevent reception of short wave stations a signal

Circuit Alignment—Cont'd

generator should be used for alignment, but an extremely high degree of accuracy is required in the frequency settings of the signal generator as a slight error will produce considerable inaccuracy on the spread band dial.

When adjusting the magnetite core trimmer in the auxiliary short wave coils, if more than one peak is found, select the peak specified in the alignment procedure for each band.

6. Adjusting Antenna Compensating Condenser

This adjustment should be made after the receiver has been properly installed in the car. Tune the receiver to a weak signal at the high frequency end of the broadcast band at about 1200 kilocycles. This signal should be just audible with volume control on full. Adjust the antenna compensating condenser for maximum signal strength.

NOTE: When aligning the antenna trimmer condenser, be sure that the antenna is fully extended.

7. Instructions for Removal of Coil Unit

(a) Remove the top, rear bottom, and speaker cover from the receiver.

(b) Remove the row of tubes immediately behind coil unit assembly.

(c) Remove the two No. 8 self-tapping screws that hold the antenna connector to the side of the case, then unsolder the antenna cable shielding from the two grounding lances which will leave this part entirely free. Remove cable clamps which hold the leads from the oscillator coils to the chassis. Free these leads. Unsolder the leads from the antenna, R.F. and oscillator coil assembly whichever is to be removed.

(d) Remove the two No. 8 screws which hold the solenoid mounting bracket to the main tuner frame. Place the solenoid out of the way, taking care that the armature does not get damaged. Unsolder the small condenser (item 30) from the case. Remove No. 8 self-tapping screw which anchors the coil mounting bracket to the side of the case.

(e) Remove the 5/32 hex. head screw from the end of the switch shaft to be found at the center of the coil unit base. Remove the two nuts from the end of the band indicator shaft. The short link arm which is retained by these nuts is to be removed after the main assembly is free. Remove the two 5/32 hex. head screws that hold the coil unit base to the main coil assembly bracket.

(f) Turn the tuning indicator to the high frequency end of the band, then remove the three No. 8 self-tapping screws and the two No. 8 machine screws that hold the coil unit mounting bracket to the chassis. Remove the sleeve covered tension wire on the core bar, part No. 1215115, and back out the threaded portion of the two cores. This will leave the wire only passing through the threaded holes in the core bar. Carefully pull the cores from the coil forms by drawing the whole assembly towards the I.F. transformers. With the coil unit assembly in this position the affected coil can be removed by first moving it away from the coil unit assembly bracket until the projections at its base just clear the bracket, then raising the base end and withdrawing the unit over the I.F. transformer. CAUTION: When performing this operation take care that the band indicator shaft is not withdrawn with the coil unit assembly bracket, and that shield can is disengaged from the spring clip on the chassis at the front end of the coil can.

8. To Disassemble Coil Units

(a) Turn all trimmer screws until they are within the coil unit cover.

(b) Remove the small spring steel clip, part No. 1215134, which anchors the coil bracket to the end of the cover. Two corners of this clip dig into the metal of the cover and care must be exercised when removing it so that no damage is done to the protruding coil tubes.

(c) Remove the two 5/32 nuts holding the shield can in place and slide the cover off.

9. Reassembling Coil Units

(a) Replace the cable clamp which holds the coil leads located between the 6SK7 and the 6SR7.

(b) In replacing the cores into the coil tubes, grasp the threaded stud end, raise the core and work it into the coil tube.

(c) When the oscillator coil is removed be sure that the two detent balls at the switch shaft do not get lost.

(d) The two nuts which hold the short link arm to the band indicator shaft must be taken up tight.

(e) While replacing the coil unit mounting bracket be sure that the three spring clips enter their slots in the shield cans properly.

10. Stiff Manual Tuning

Excessive stress on the worm bearing caused by tension or compression in the flexible manual tuning shaft may cause stiff manual tuning. Such stress can readily be eliminated by loosening and retightening the set screw in the worm.

11. Tone Control

The four positions of the tone control are: Bass, Soft, Music and Voice. The tone control and its tone compensating network in the circuit are between the audio amplifier and the output stage. When the switch is in the "bass" position, a .035 mfd. condenser (item 64) shunts the output of the 6SR7 audio frequency amplifier stage resulting in minimum highs, since a large portion of the high audio frequencies are by-passed to ground. In the "soft" position, a .01 mfd. condenser (item 63) shunts the output of the 6SR7 audio frequency amplifier stage to ground (the same as item 64 does in the "bass" position), but because the shunting capacity is less, the reduction of high frequencies will not be so pronounced as in the "bass" position. Neither high nor low frequencies are attenuated over the normal amplifier response in the "music" position, resulting in a maximum high and low frequency response.

Circuit Alignment—Cont'd

With the tone control in the "voice" position, the output of the 6SR7 audio amplifier stage is shunted to ground with a .01 mfd. condenser (item 63) thus by-passing some of the high frequencies. A parallel combination consisting of a 22,000 ohm resistor (item 102) and a .035 mfd. condenser (item 64) is connected in series with the output of the 6SR7 audio amplifier stage, resulting in a reduced low frequency response since this combination has a higher impedance at low frequencies than at high frequencies, thus both the high and the low frequencies are attenuated resulting in optimum tone balance for speech programs.

12. Band Switching Circuits

The two switch sections as shown on the schematic diagram in the antenna stage and in the R.F. stage are actually one switch wafer in each case. The top section on the diagram is that set of contacts toward the coils as viewed from the coils. The lower set of contacts is that set of contacts away from the coils. The switch sections are all shown in the 16-meter band position. Referring to the top wafer sections, when the upper rotor fingers touch terminals No. 2, the 16-meter band is in the circuit. Terminals No. 3 are the 19-meter band contacts. Terminals No. 4 are the 25-meter band contacts. Terminals No. 5 are the 31-meter band contacts. Terminals No. 6 are the "A" band or broadcast band contacts.

The "A" band coil circuit shows the actual simplified circuit diagram for the "A" band without the switch contacts being shown. The same applies to the 31-meter band coil circuit. Coils 7, 15, 21 and 17 remain in the circuit at all times for short wave operation. When switching to the 25-meter band, coil No. 3 is replaced by coil No. 4. Coil No. 11 is replaced by coil No. 12. Coil No. 18 is switched across coils Nos. 21 and 17, thus on each of the 25, 19 and 16-meter bands there are three oscillator coils in parallel at the same time. The sensitivity control is removed from the circuit for short wave operation thereby giving full sensitivity on short waves.

In order to provide good tracking sensitivity only perfectly matched main tuning cores are used in the receivers on the "A" band (Nos. 135, 141 and 147). The cores are color coded with a spot of red, yellow or green paint on the stud-end of the core. Only one particular color will be used in each receiver. When servicing one of these cores always replace the defective core assembly with a replacement core bearing the exact color coding, or replace all three cores with a new set of cores of another color code.

13. Adjustment of Clutch Assembly

(a) Remove bottom covers (front and rear).

(b) Loosen both set screws on hub of pointer drive cord drum (item 177, Fig. 13).

(c) Move core bar (item 172, Fig. 14) against stop pin with tuning cores all the way inside the coils.

(d) Scissors bakelite gear and clutch assembly (item 179, Fig. 13) counter-clockwise one tooth and engage with worm (item 180, Fig. 14), taking care not to lose scissors action.

(e) Rotate drum (item 177, Fig. 13) until dial pointer (item 187, Fig. 14) lines up with the last mark at the low frequency end of the dial drum.

(f) Insert a .010 metal shim between brass gear and clutch lining. Press entire assembly firmly together and tighten set screws on drum hub after which remove the metal shim.

CAUTION: During the preceding steps of adjustment, it is very important that the core bar position is maintained and that neither the bakelite nor the brass gear become disengaged from the worm.

14. Solenoid Pole Piece Adjustment

(a) Insert plunger (item 186, Fig. 13) all the way in solenoid assembly until link strikes extruded lip on end of solenoid. (No push arm engaged to selector bar.)

(b) Loosen lock nut (item 181, Fig. 13) and screw in pole piece until it touches the plunger.

(c) Back off pole piece 1½ turns and tighten lock nut in place.

GENERAL: This auto radio is a nine tube self-contained receiver built expressly for installation in 1942 Chevrolet automobiles. Special features incorporated in this receiver are: automatic tuning; single band sequence tuning from instrument panel; steering column station selection and volume control; elliptical speaker; permeability tuning; sensitivity control; automatic noise limiter circuit; four position tone control; 0Z4 rectifier; and a primary type vibrator.

Antenna System: There are two antenna systems available for use with this receiver; the cowl rod antenna, and the telescopic reel type antenna. Either of the antennas will operate very efficiently with this Chevrolet radio.

Tube Complement

Type	Function	Type	Function
6SK7	R.F. Amplifier	6H6	Noise Limiter and A.V.C.
6SA7	Oscillator-Modulator	6V6GT	Output (2)
6SK7	I.F. Amplifier (2)	OZ4	Rectifier
6SR7	2nd Detector and A.F.		

CHEVROLET DIV.—GEN. MOTORS

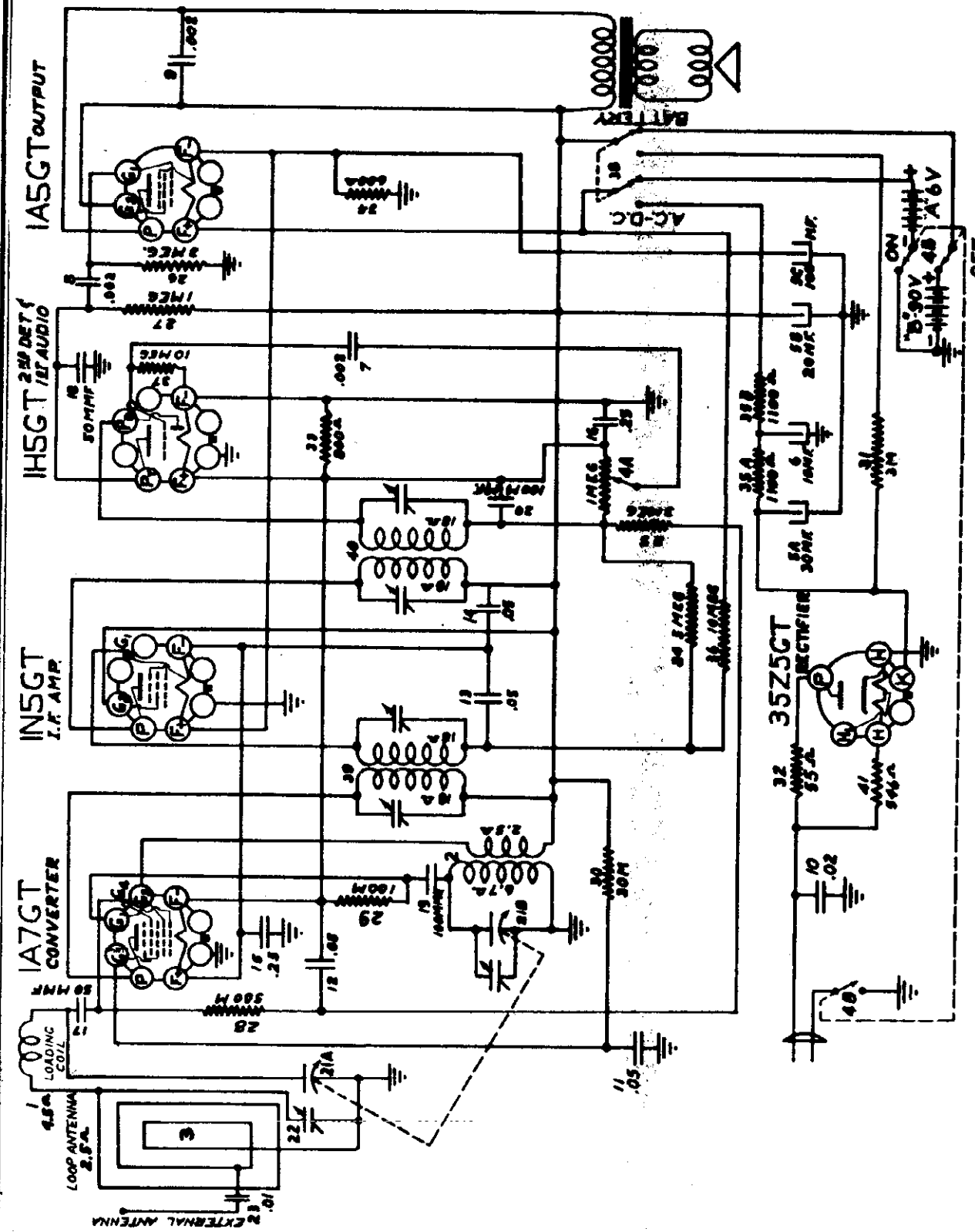


FIG. 5 CIRCUIT DIAGRAM PORTABLE RADIO #985866

MODEL 985866

CHEVROLET DIV.—GEN. MOTORS

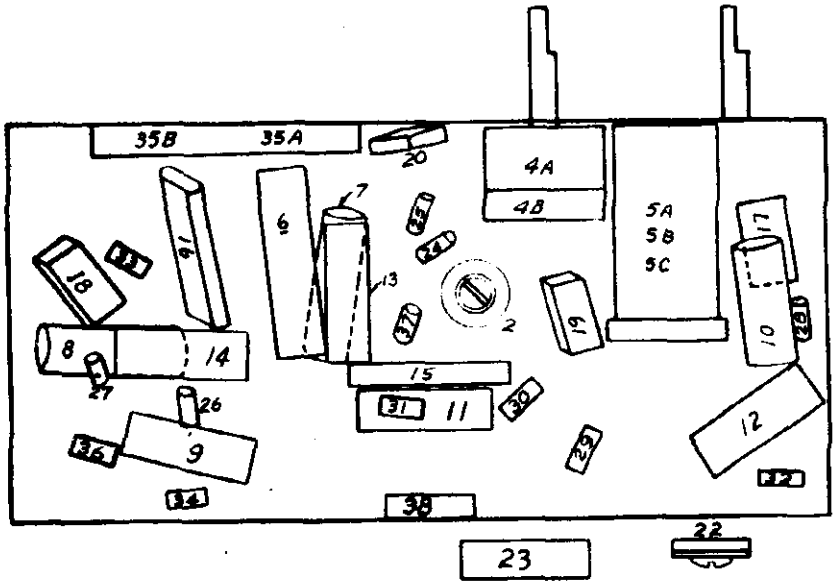
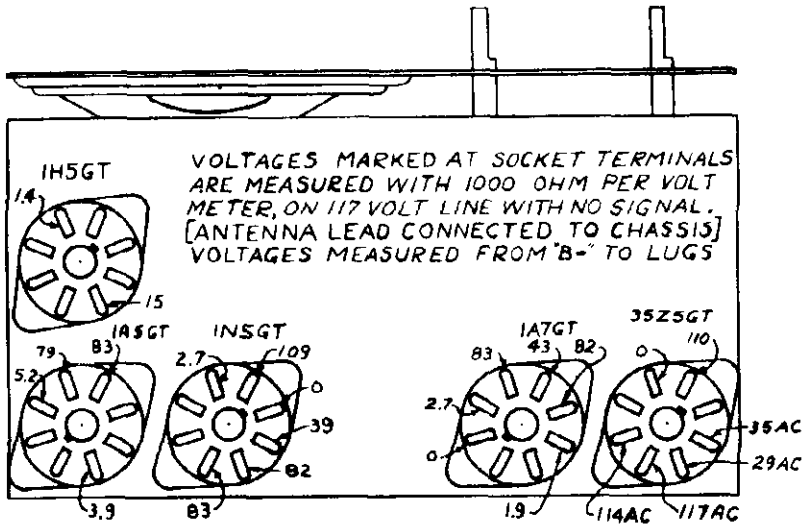


FIG. 3 PARTS LOCATING DIAGRAM PORTABLE RADIO #985866



BOTTOM VIEW OF CHASSIS

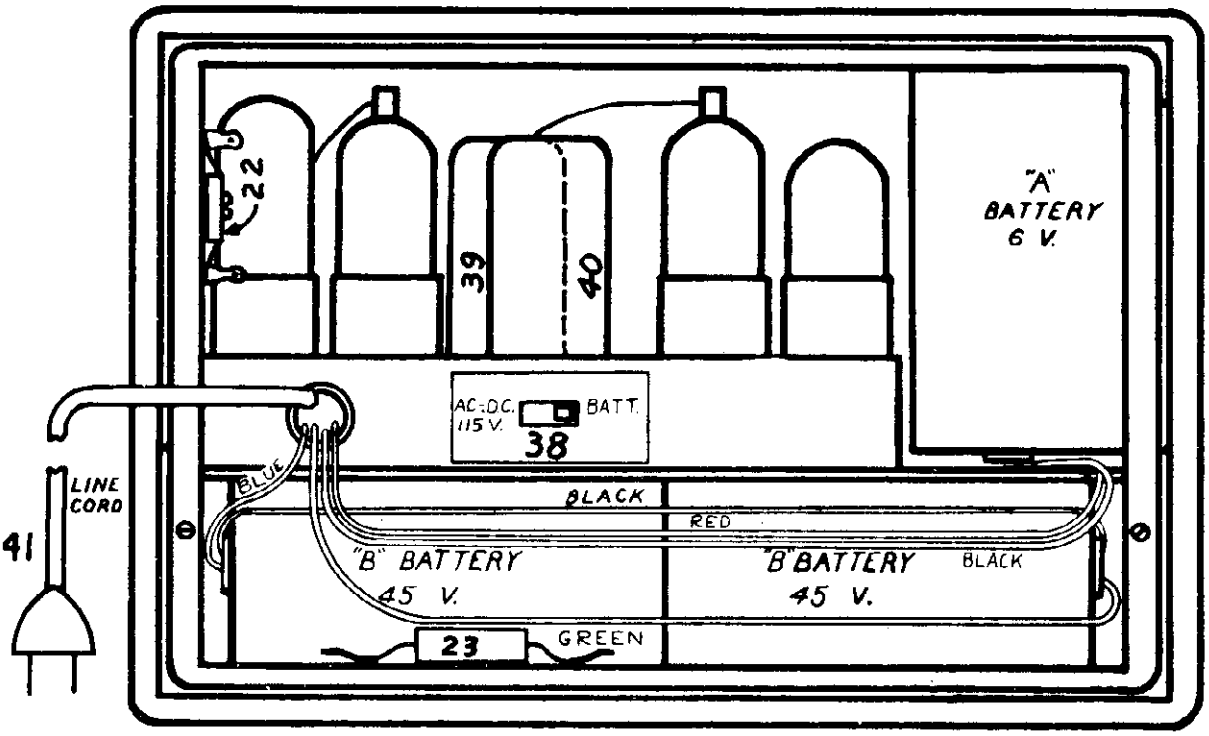
FIG. 4 Tube Voltage Chart

NOTES FOR VOLTAGE CHART

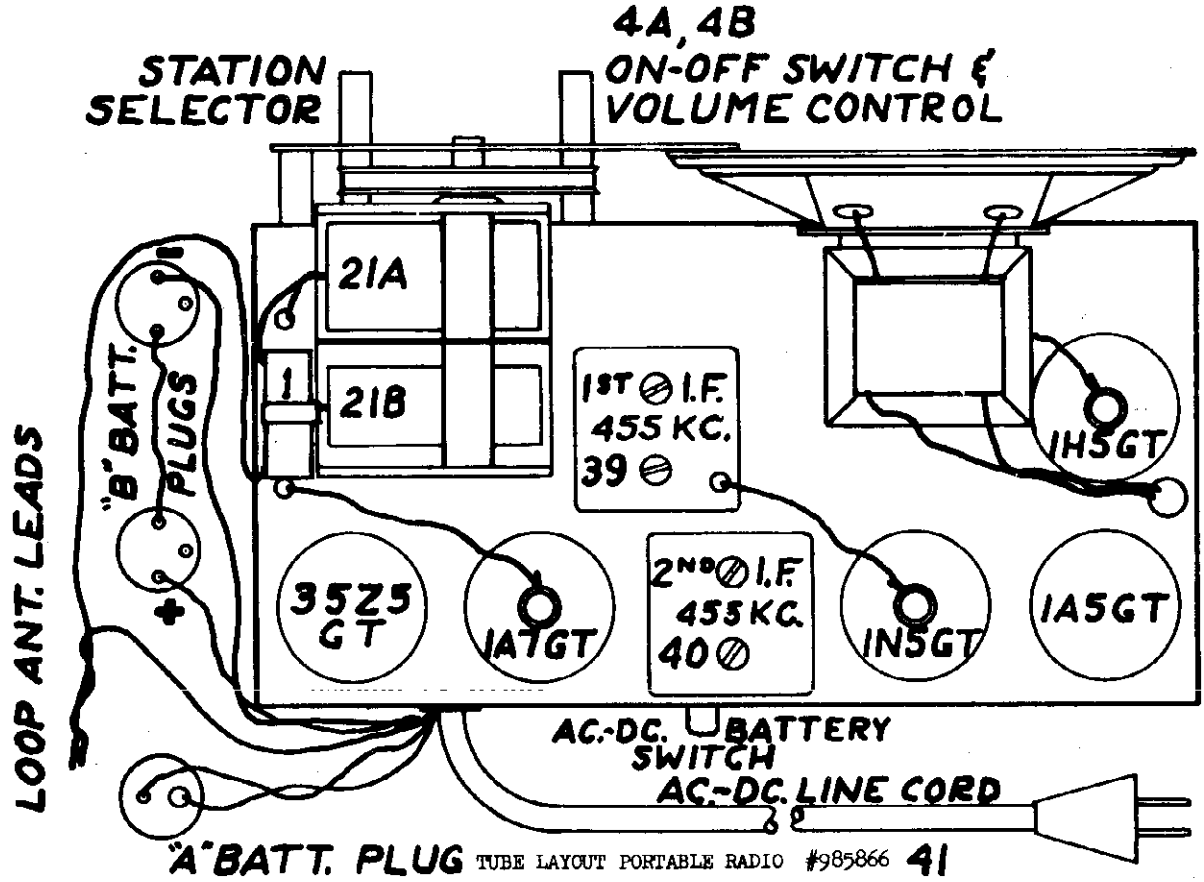
Voltages measured with 1000 ohm per volt D.C. voltmeter between socket terminals and negative "B" supply.
*-Oscillator voltage measured with R.F. choke in series with voltmeter lead.

NOTE: Voltages as indicated are measured with power switch in AC-DC position and radio connected to 115 volt 60 cycle AC line.

CHEVROLET DIV.—GEN. MOTORS



PORTABLE RADIO #985866



TUBE LAYOUT PORTABLE RADIO #985866 41

SUBJECT: TECHNICAL SERVICE INSTRUCTIONS

GENERAL: This Plug-in Portable radio is a five tube receiver designed to operate from either self-contained dry batteries or from 105-125 volt, 50/60 cycle A.C. or D.C. house lighting current.

ANTENNA: The antenna is a loop type inside the cabinet and, under normal operating conditions, no other antenna is necessary. For remote locations, where reception may be weak, provision is made for attachment of an outside antenna to a wire extending from the back of the cabinet.

TUBE COMPLEMENT

TYPE	FUNCTION	TYPE	FUNCTION
1A7GT	Mixer, 1st Detector-Oscillator	1H5GT	2nd Det.-A.V.C.-1st A.F. Amplifier
1N5GT	I.F. Amplifier	1A5GT	Power Output
		35Z5GT	Rectifier

CIRCUIT DESCRIPTION

The circuit used in this receiver is the conventional superheterodyne type designed for loop antenna operation.

The range of frequencies covered is from 540 to 1620 kilocycles.

POWER SUPPLY: This radio is designed to operate from either batteries or from 105-125 volts A.C. (50/60) or D.C. supply line.

A switch accessible from the rear of the radio switches the radio for either battery or A.C.-D.C. operation.

CIRCUIT ALIGNMENT

The adjustable condensers in this receiver have been very carefully adjusted at the factory and will require no further adjustment unless tampered with or a defective coil has been replaced. If re-alignment is found necessary, the circuits can be adjusted only with the use of a calibrated test oscillator or signal generator and an output meter.

IMPORTANT: If maximum sensitivity is to be obtained from this receiver, after re-alignment, it is very important that the following procedure be closely observed:

1. Aligning I.F. stages at 455 kilocycles.

   a. Connect the signal lead of the test oscillator to the grid of the 1A7GT tube, through a .1 mfd. condenser.

   b. Connect the ground lead of the test oscillator to the chassis.

CIRCUIT ALIGNMENT (Cont'd)

   c. Connect the output meter across primary winding of the output transformer.

   b. Set the test oscillator to exactly 455 kilocycles.

   e. Adjust the trimmers on the 1st and 2nd I.F. transformers carefully for maximum output.

   These adjustments should be repeated several times and during the 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. Alignment at 1620 kilocycles.

   a. Leave the test oscillator leads connected the same as for aligning the I.F. circuits.

   b. Turn the rotor plates of the gang condenser all the way out and against the high frequency stop.

   c. Set the test oscillator to 1620 kilocycles.

   d. Adjust the trimmer of the oscillator section of the condenser gang for maximum output. It is very important that this frequency be set accurately as a slight mis-setting will cause the receiver to be out of track over the entire high frequency end of the dial.

3. Aligning at 1400 kilocycles.

   a. This adjustment should be made with the chassis, loop antenna, and batteries installed in the cabinet.

   b. Connect the signal lead of the test oscillator to the external antenna terminal on the loop antenna through a 200 mmfd. dummy.

   c. Connect the ground lead of the test oscillator to the chassis.

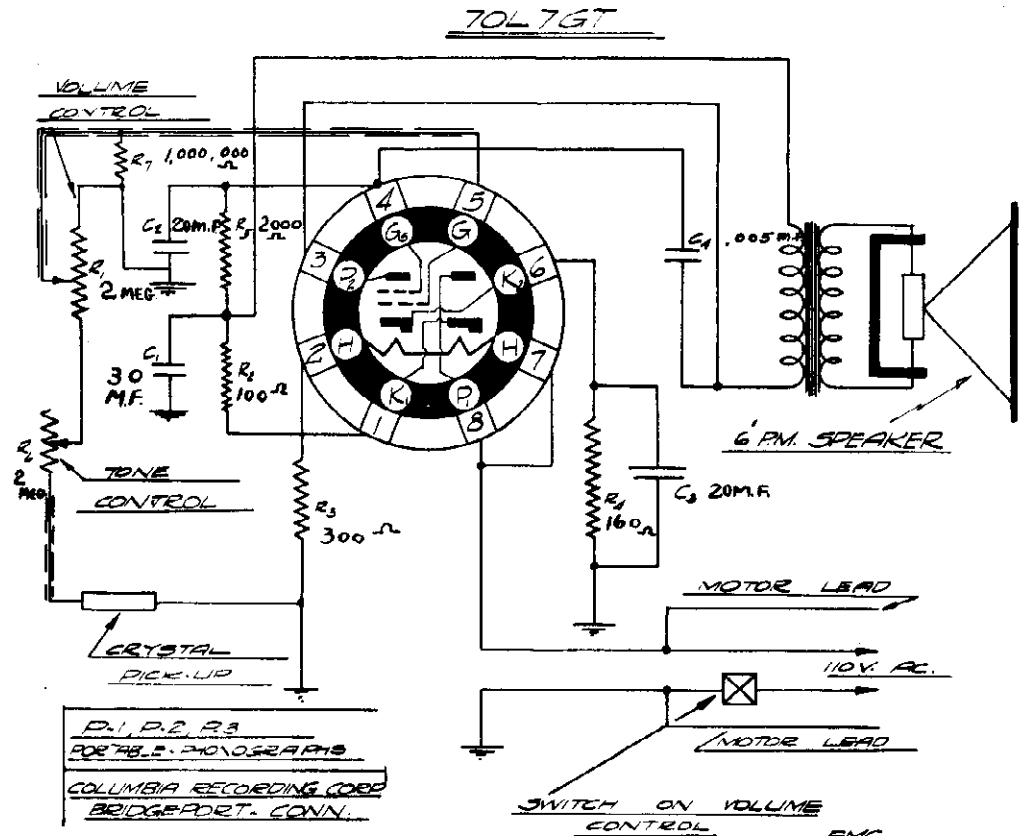
   d. Set the test oscillator to 1400 K.C.

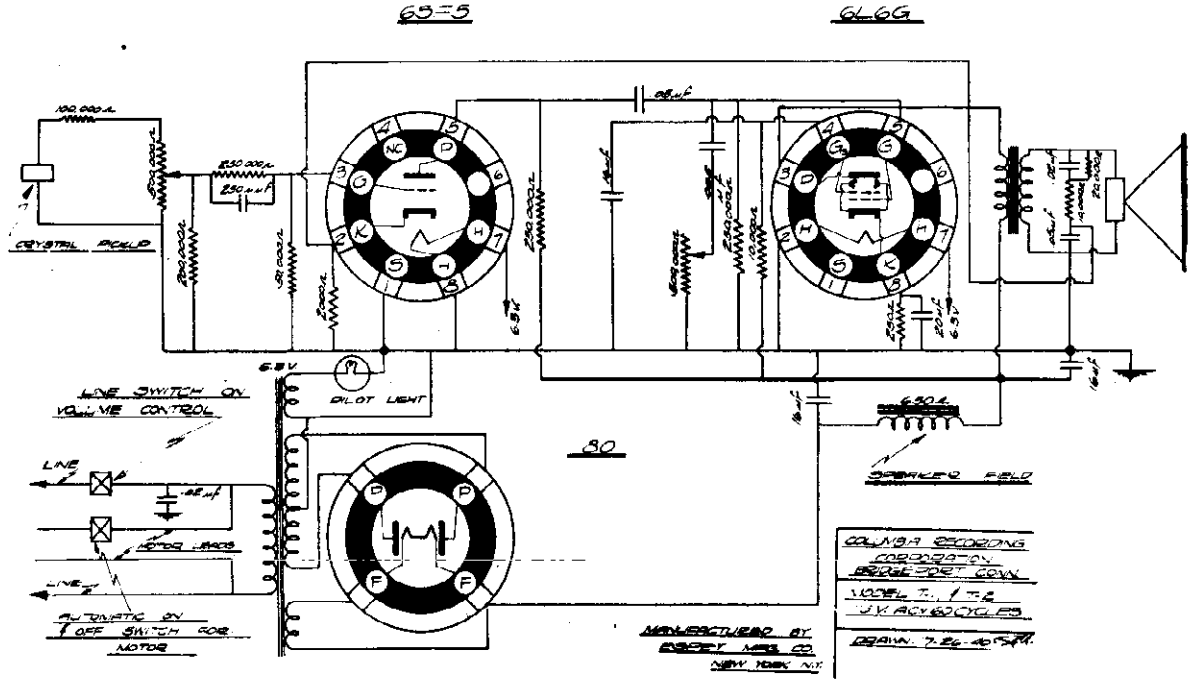
   e. Turn the condenser rotor plates until this frequency is tuned in with maximum output.

   f. Adjust the trimmer on the condenser gang for maximum output.

COLUMBIA

MODELS P1,P2,P3
Phonograph
MODELS T1,T2
Phonograph





MODEL D1
Demonstrator
MODEL D3

COLUMBIA

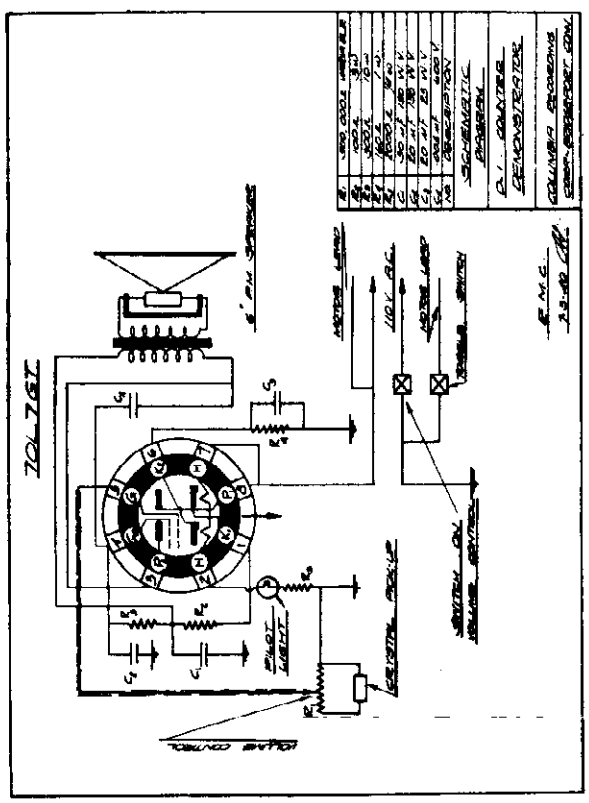
INSTRUCTIONS FOR OPERATING

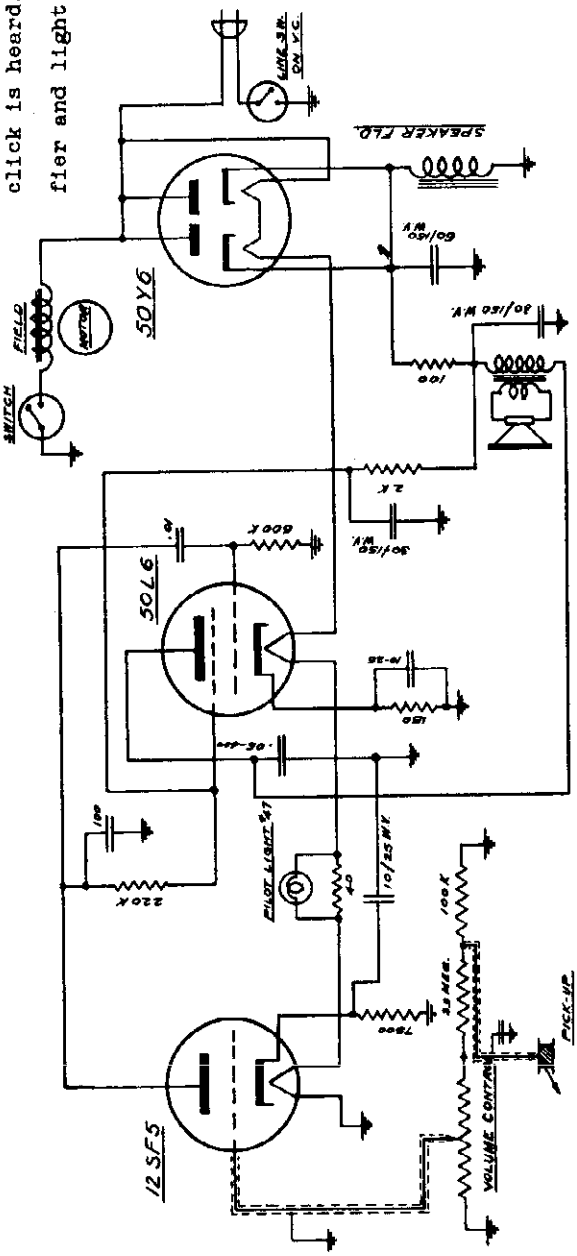
MODEL D1 COUNTER DEMONSTRATOR
OPERATE ON 110-120 VOLTS A. C. 60 CYCLES ONLY

To turn the amplifier on, rotate the knob marked "Volume" in a clockwise position until a click is heard. After about thirty seconds the machine will be ready to operate. This knob can then be used to control the volume required.

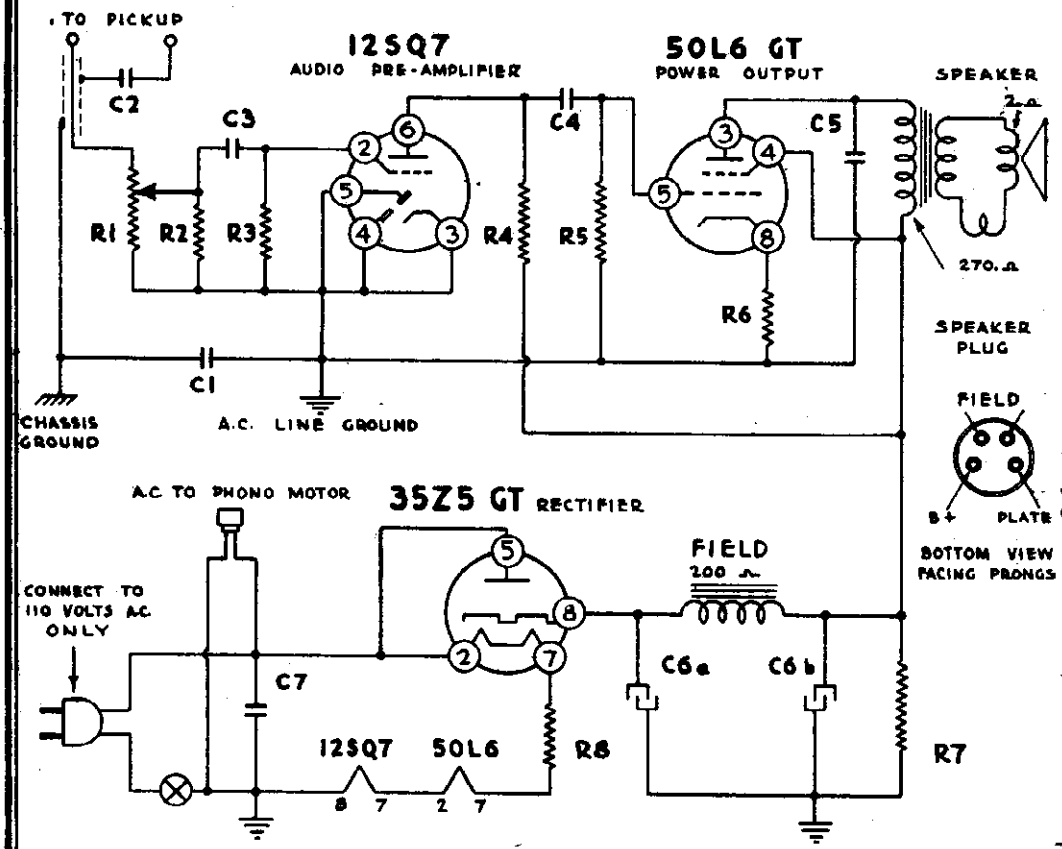
The toggle switch is for starting and stopping the motor without turning the amplifier off.

When the demonstrator is not being used, turn the "Volume" knob counter-clockwise until a click is heard. This will turn off the amplifier and light.





CONTINENTAL RADIO & TELEV. CORP.



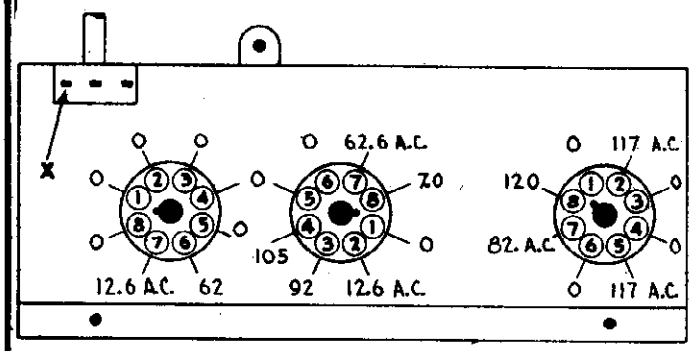
SCHEMATIC DIAGRAM-XA3

RESISTORS

NO.	OHMS	WATTS
R1	2,000,000	V. C.
R2	1,000,000	½ W.
R3	10,000,000	½ W.
R4	250,000	½ W.
R5	500,000	½ W.
R6	150	½ W.
R7	2,500	5 W.
R8	130	5 W.

CONDENSERS

NO.	CAPACITY	VOLTS
C1	.16	400
C2	.2	400
C3	.005	600
C4	.01	400
C5	.01	400
C6a	30. ELECT.	150
C6b	50. ELECT.	150
C7	.05	400



Operation on 110-120 volts, (RC50) 60 cycle A. C. (Alternating Current), ONLY.
Power Consumption: 55 watts.

NOTE: RC50 may be changed to RC51, 50 cycle Model by the purchase of 50 cycle speed reduction spring bushing. This bushing is placed over the motor shart (thereby increasing its diameter) running against the idler wheel. Turntable must be removed for this change.

All prices quoted are list and subject to trade discount.

All parts should be ordered from local Admiral Distributor. Shipments are F.O.B. if ordered direct from the factory. When remitting in advance please include postage.

A handling charge of $0.25 will be made on all orders under $0.75 list.

Prices are subject to change without notice.

PAPER CONDENSERS

P1194	.005 mfd. 600 volt	.15
P164	.01 mfd. 400 volt	.25
P334	.05 mfd. 400 volt	.30
P4950	.16 mfd. 400 volt	.30
P4881	.2 mfd. 400 volt	.30

ELECTROLYTIC CONDENSERS

P4932	(50 mfd. 150 volt) (30 mfd. 150 volt)	1.50

RESISTORS

P5161	150 ohm, 5 watt	.25
P3803	150 ohm, ½ watt	.15
P5162	2,500 ohm, 5 watt W. W	.45
P3868	250,000 ohm, ½ watt	.15
P3876	500,000 ohm, ½ watt	.15
P3882	1,000,000 ohm, ½ watt	.15
P3889	10,000,000 ohm, ½ watt	.15

VARIABLE RESISTORS

P5141	2 Meg. Volume Control and Switch	1.00

MISCELLANEOUS

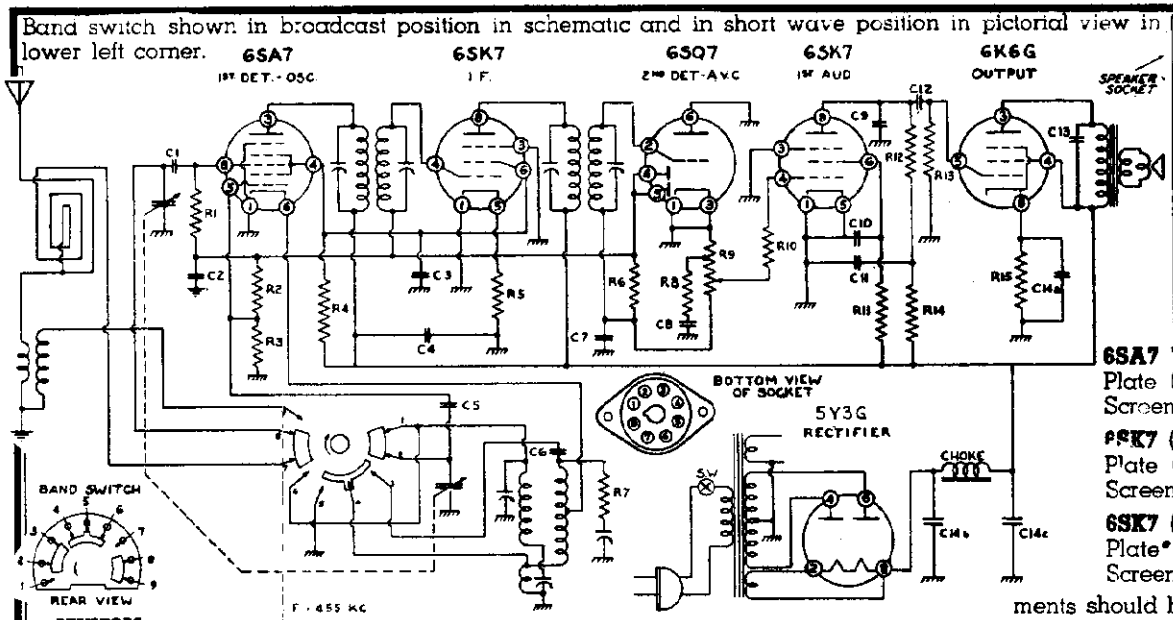
P5164	Speaker and Output Transformer	4.40
P946	Speaker Plug	.10
P945	Speaker Socket	.10
P4583	Tube Socket	.15
P4894	Line Cord	.55
P3557	Line Cord Clamp	.10
P4496	Motor A. C. Cord and Socket	.40
P5166	Asbestos Plate	.05
P5165	Knob	.10

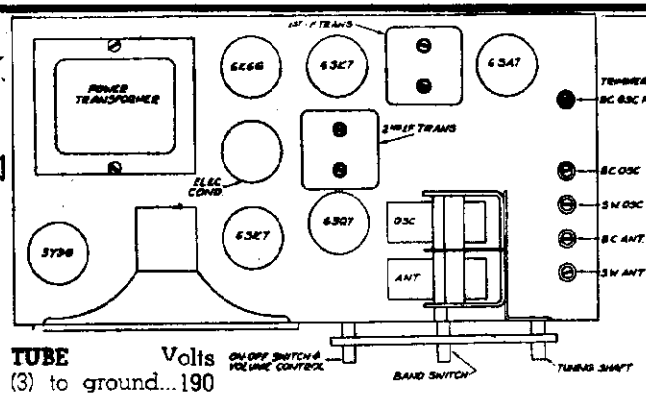
PHONOGRAPH PARTS

(See Record Changer Service Manual For Detailed List)

RC4010	Record changer mounting spring, ½ doz.	.10
RC7017	Record changer mounting screw	.05
P4781	Record changer mounting bracket	.10
RC6008	Admiral Lifetime Needle	1.50
RC3020	Center post	1.35
RC50	Record changer (60 cycle)	
RC51	Record changer (50 cycle) 60 to 50 cycle, speed reduction spring bushing	.15

Band switch shown in broadcast position in schematic and in short wave position in pictorial view in lower left corner.





6SA7 TUBE Volts
Plate (3) to ground...190
Screen (4) to ground 90

6SK7 (IF) TUBE
Plate (8) to ground...190
Screen (6) to ground 90

6SK7 (AF) TUBE
Plate (8) to ground... 28
Screen (6) to ground. 8

6K6G TUBE
Plate (3) to ground.....185
Screen (4) to ground.....195
Cathode (8) to ground..... 13.5

5Y3G TUBE
Filament (8) to ground...205

All voltages measured with a 1,000 ohm per volt meter on the 250 volt scale. Line voltage 117 volts A.C. Volume control maximum and no signal tuned in. Power consumption 45 watts.

Speaker (Part No. P-4464) 8" PM Type
D.C. voice coil resistance.....3.1 ohms
Voice coil impedance at 400 cycles.....3.5 ohms

Short Wave Antenna Coil (Part No. P3378)
Looking at the connection end in a clockwise direction starting at the mounting lug side the connections are: No. 1, AVC; No. 2, Ant; No. 3, Grid; No. 4, Ground.
Primary—No. 2 and No. 4—Resistance..... .3 ohm
Secondary—No. 1 and No. 3—Resistance..... .07 ohm

Oscillator Coil (Part No. P4135)
Looking at the mounting bracket end in a clockwise direction starting at the chassis the connections are: No. 1, pad; No. 2, B.C. grid; looking at the other end in a clockwise direction starting at the chassis the connections are: No. 3, ground; No. 4, sec. tap; No. 5, open; No. 6, S.W. grid; No. 7, tickler.
Tickler—No. 3 and No. 7—Resistance..... .8 ohm
S.W. Secondary—No. 6 and No. 7—Resistance..... .07 ohm
B.C. Secondary—No. 2 and No. 1—Resistance.....5.1 ohms

First I.F. Transformer (Part No. P4108)
Primary—Blue, plate; red, B+—Resistance.....18.2 ohms
Secondary—White, grid; black, AVC—Resistance.....15.1 ohms

Second I.F. Transformer (Part No. P4109)
Primary—Blue, plate; red, B+—Resistance.....20.8 ohms
Secondary—White, diode; black, AVC—Resistance.....17.4 ohms

RESISTORS

No.	Ohms	Watts
R1	500,000	¼
R2	10,000,000	¼
R3	20,000	¼
R4	10,000	1
R5	100—10%	¼
R6	2,000,000	¼
R7	30	¼
R8	20,000	¼
R9	500,000	V.C.
R10	150,000	¼
R11	1,000,000	¼
R12	200,000	¼
R13	500,000	¼
R14	50,000	¼
R15	500—10%	½

CONDENSERS

No.	Capacity (Mfd.)	Volts
C1	.00025	Mica
C2	.05	200
C3	.05	400
C4	.05	400
C5	.00005	Mica
C6	.004 —5%	Mica
C7	.00025	Mica
C8	.02	200
C9	.00025	Mica
C10	.05	200
C11	.1	200
C12	.01	400
C13	.005	800
C14a	20.	25
C14b	20.	350
C14c	20.	350

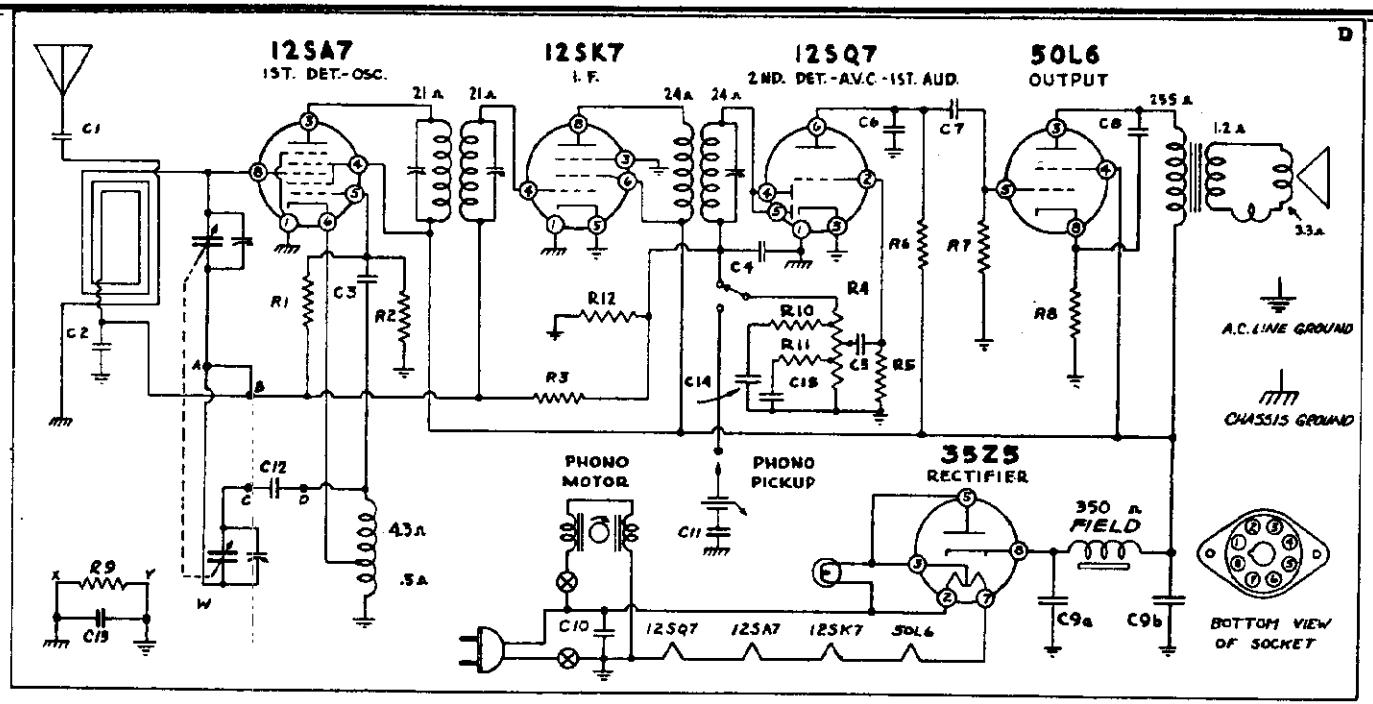
MODEL K63

ISSUE A AUGUST 1940

I.F. ALIGNMENT
Adjust the signal generator to 455 K.C. and connect the output to the grid of the first detector tube (6SA7) through a .05 or .1 mfd. condenser. Align all I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT
Adjust the signal generator to 1630 K.C. and connect the output to the antenna lead, through a .0002 mfd. mica condenser. Set the gang condenser to minimum capacity and adjust the B.C. oscillator trimmer to receive this signal. After this has been carefully done, the next step is to set the signal generator to 1400 K.C. and after tuning in the signal adjust the B.C. antenna trimmer to peak. Set the signal generator to 600 K.C., tune the signal and then slowly increase or decrease the B.C. oscillator padding condenser and at the same time continuously tune back and forth across the signal with the receiver until the maximum reading is obtained on the output meter.
Return to 1400 K.C. 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
Adjust the signal generator to 18,100 K.C. and connect the output to the antenna lead, through a 400 ohm resistor. Set the gang condenser to minimum capacity and adjust the S.W. oscillator trimmer to receive this signal. Set the signal generator to 16,000 K.C., tune signal and adjust the S.W. antenna trimmer to peak.



Volume control tapped at 300,000 ohms and 600,000 ohms from zero end.

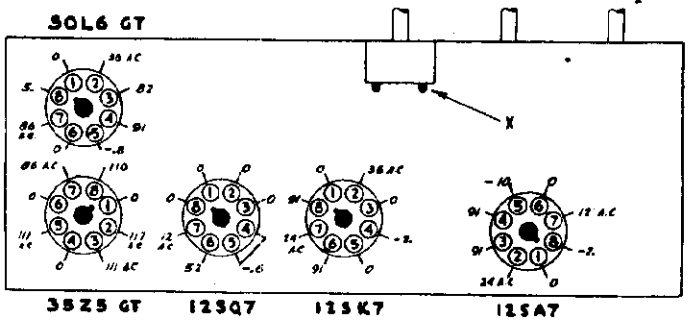
In model M5-PH only, connect points w, x, and y together. R9 and C13 are not used. Also C12 is not used, and point C connects to D. Disconnect points A and B.

CONDENSERS

No.	Cap. (Mfd.)	Volts
C1	.001	600
C2	.1	200
C3	.00005	Mica
C4	.00025	Mica
C5	.005	600
C6	.0005	Mica
C7	.01	400
C8	.02	400
C9a	50. Elect.	150
C9b	30. Elect.	150
C10	.05	400
C11	.2	400
C12	.02	400
C13	.16	200
C14	.005	400
C15	.005	400

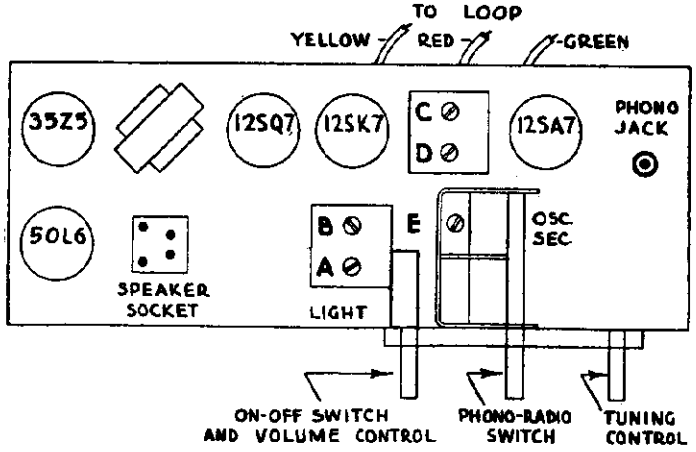
RESISTORS

No.	Ohms	Watts
R1	10,000,000	¼
R2	25,000	¼
R3	2,000,000	¼
R4	1,000,000	V.C.
R5	5,000,000	¼
R6	250,000	¼
R7	500,000	¼
R8	150-10%	¼
R9	150,000	½
R10	100,000	½
R11	50,000	½
R12	1,000,000	½



Bottom View

Voltage Chart



Top View

Tube and Trimmer Location

Line—117 volts, 60 cycles, A.C.—Set volume control at max.

Wattage: Radio only, 30 watts; Record changer only, 15 watts.

Voltages shown are positive D.C. from chassis to socket terminal unless noted.

20,000 ohm per volt meter used. No station tuned in.

MODELS M5, XM5
MODELS B6, XB6
MODEL C6

CONTINENTAL RADIO & TELEV. CORP.

ALIGNMENT PROCEDURE

STEP	Connect Signal Generator To—	Dummy Antenna Between Radio and Generator	Set Generator Controls To—	Set Radio Controls To—	Adj. Following Trimmers to Max. Output	Special Instructions
1	Green Loop Lead	.1 mfd.	455 Kc.	1630 Kc.	A, B, C, D, I.F.	Note I - II
2	Green Loop Lead	.1 mfd.	1630 Kc.	1630 Kc.	E Bc. Osc.	Note I
3	Loop Radiator	Two Feet From Radio No Connection	1400 Kc.	1400 Kc.	F Bc. Ant. (On Loop)	Note III

NOTE I —Chassis may be connected or disconnected from cabinet loop during these adjustments.
NOTE II —Trimmer B not in later production models.
NOTE III—Chassis must be connected to cabinet loop. Use Aerometer or 10" diameter one turn loop on signal generator.

ALIGNMENT PROCEDURE

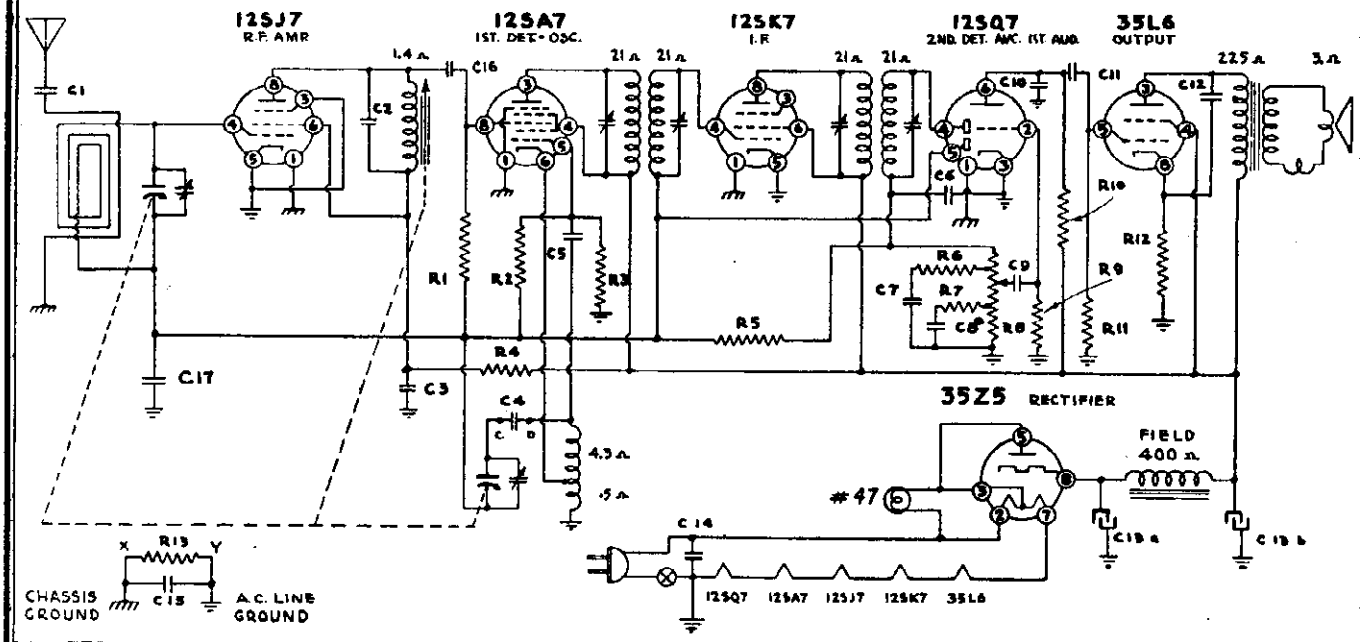
STEP	Connect Signal Generator to—	Dummy Antenna Between Radio and Generator	Set Generator Controls to—	Set Radio Controls to—	Adj. Following Trimmers to Max. Output
1	Tuning Cond. Ant. Stator	.1	455 Kc.	1630 Kc.	A, B, C, D, I. F.
2	Tuning Cond. Ant. Stator	.1	1630 Kc.	1630 Kc.	E Osc.
3	Tuning Cond. Ant. Stator	.1	1400 Kc.	1400 Kc.	F R. F.
4	Loop Radiator	Two feet from Radio No Connection	1400 Kc.	1400 Kc.	G Ant.

Use Aerometer or 10" diameter one turn loop on Signal Generator in Step 4.

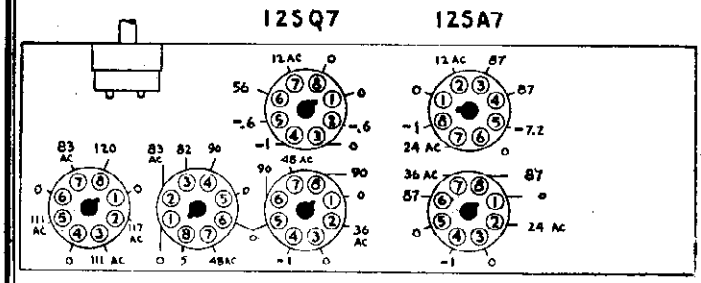
STEP	Connect Signal Generator To—	Dummy Antenna Between Radio and Generator	Set Generator Controls To—	Set Radio Controls To—	Adj. Following Trimmers to Max. Output	Special Instructions
1	Tuning Cond. Ant. Stator	.1 mfd.	455 Kc.	1630 Kc. BC Range	A, B, C, D, I.F.	Note A
2	Tuning Cond. Ant. Stator	.1 mfd.	1630 Kc.	1630 Kc. BC Range	E Bc. Osc.	Note A
3	Green Loop Lead	400 ohms	9.5 Mc.	9.5 Mc. SW Range	G Sw. Osc.	Note A
4	Green Loop Lead	400 ohms	9.5 Mc.	9.5 Mc. SW Range	H Sw. Ant.	Note A
5	Loop Radiator	Two Feet From Radio No Connection	1400 Kc.	1400 Kc. BC Range	F Bc. Ant.	Note B

NOTE A—Chassis may be connected or disconnected from cabinet loop during these adjustments.
NOTE B—Chassis must be connected to cabinet loop. Use Aerometer or 10" diameter one turn loop on signal generator.

CONTINENTAL RADIO & TELEV. CORP.



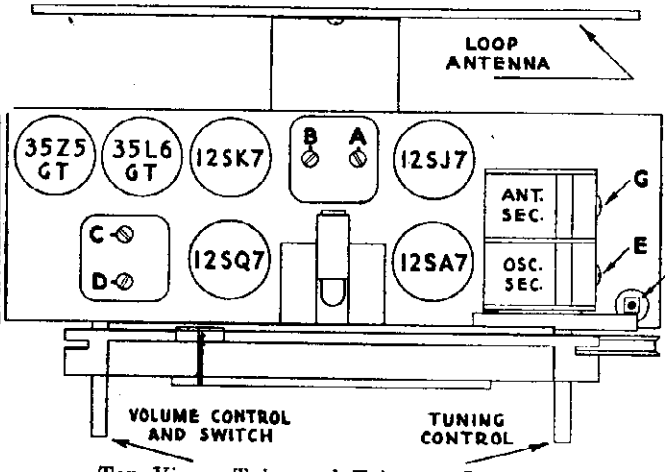
In model B6 only, X and Y are connected together. R13, C15, and C4 are not used. C is connected to D.



Bottom View—Voltage Chart

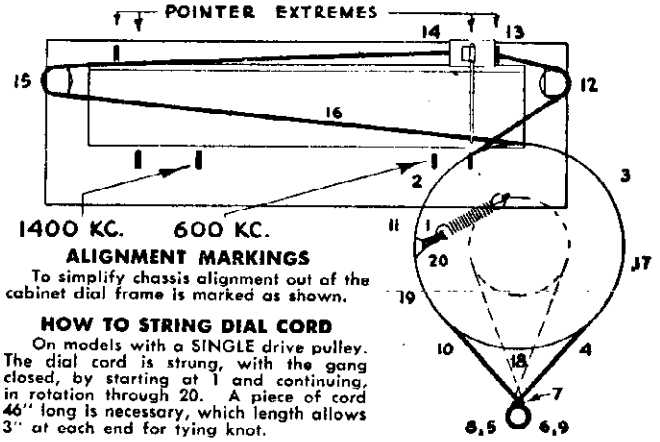
Voltages are positive D. C. unless noted. Measured from chassis with 20,000 ohm per volt meter. On XB6 Series use floating ground instead of chassis.

Line—117 volts, 60 cycle A.C. Volume control at maximum. No station tuned in.



Top View—Tube and Trimmer Location

Volume control tapped at 100,000 ohms and 200,000 ohms from zero end.



ALIGNMENT MARKINGS

To simplify chassis alignment out of the cabinet dial frame is marked as shown.

HOW TO STRING DIAL CORD

On models with a SINGLE drive pulley. The dial cord is strung, with the gang closed, by starting at 1 and continuing, in rotation through 20. A piece of cord 46" long is necessary, which length allows 3" at each end for tying knot.

On models with DOUBLE drive pulley the dial cord is in two pieces. The pointer cord is on the large pulley starting at 1 and continuing through 20 BUT in the following special order, 1, 2, 3, 4, 18, 19, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20. The drive cord is on the smaller dotted pulley, in the dotted position.

To clarify dial cord arrangement the dial frame is shown as transparent.

RESISTORS

No.	Ohms
R1	10,000
R2	10,000,000
R3	25,000
R4	100
R5	1,000,000
R6	50,000
R7	30,000
R8 V. C.	500,000
R9	5,000,000
R10	250,000
R11	500,000
R12	150
R13	150,000

CONDENSERS

No.	Capacity (Mfd.)
C1	.005
C2	.000785
C3	.05
C4	.02
C5	.00005
C6	.00025
C7	.01
C8	.01
C9	.01
C10	.0005
C11	.01
C12	.02
C13a	30. Elect.
C13b	50. Elect.
C14	.05
C15	.2
C16	.00025
C17	.1

Set to be used on 110-120 volts D.C. (Direct Current) or A.C. (Alternating Current) 40 to 60 cycles, ONLY. Current consumption: 30 watts.

MODEL C6

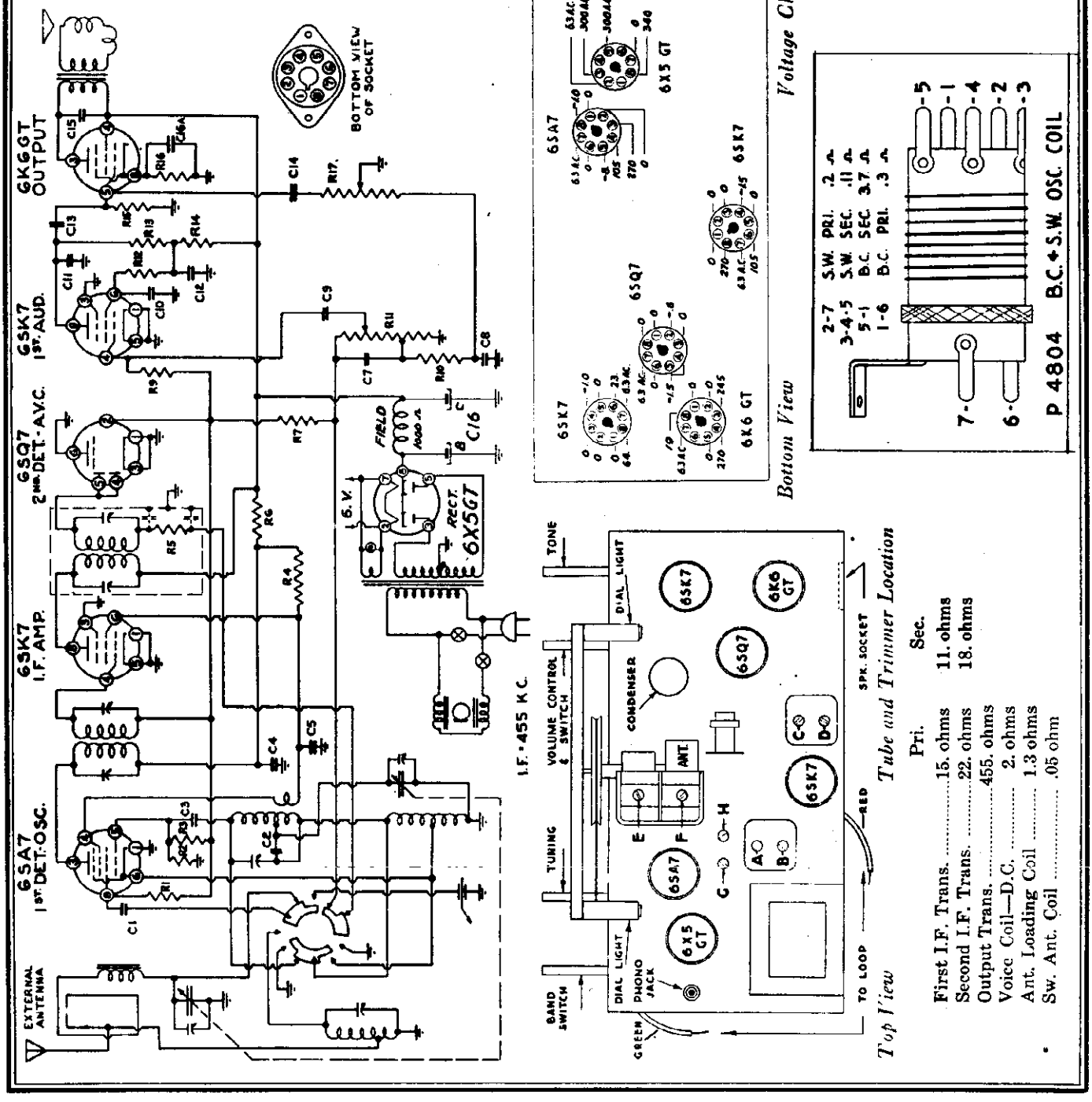
CONTINENTAL RADIO & TELEV. CORP.

RESISTORS

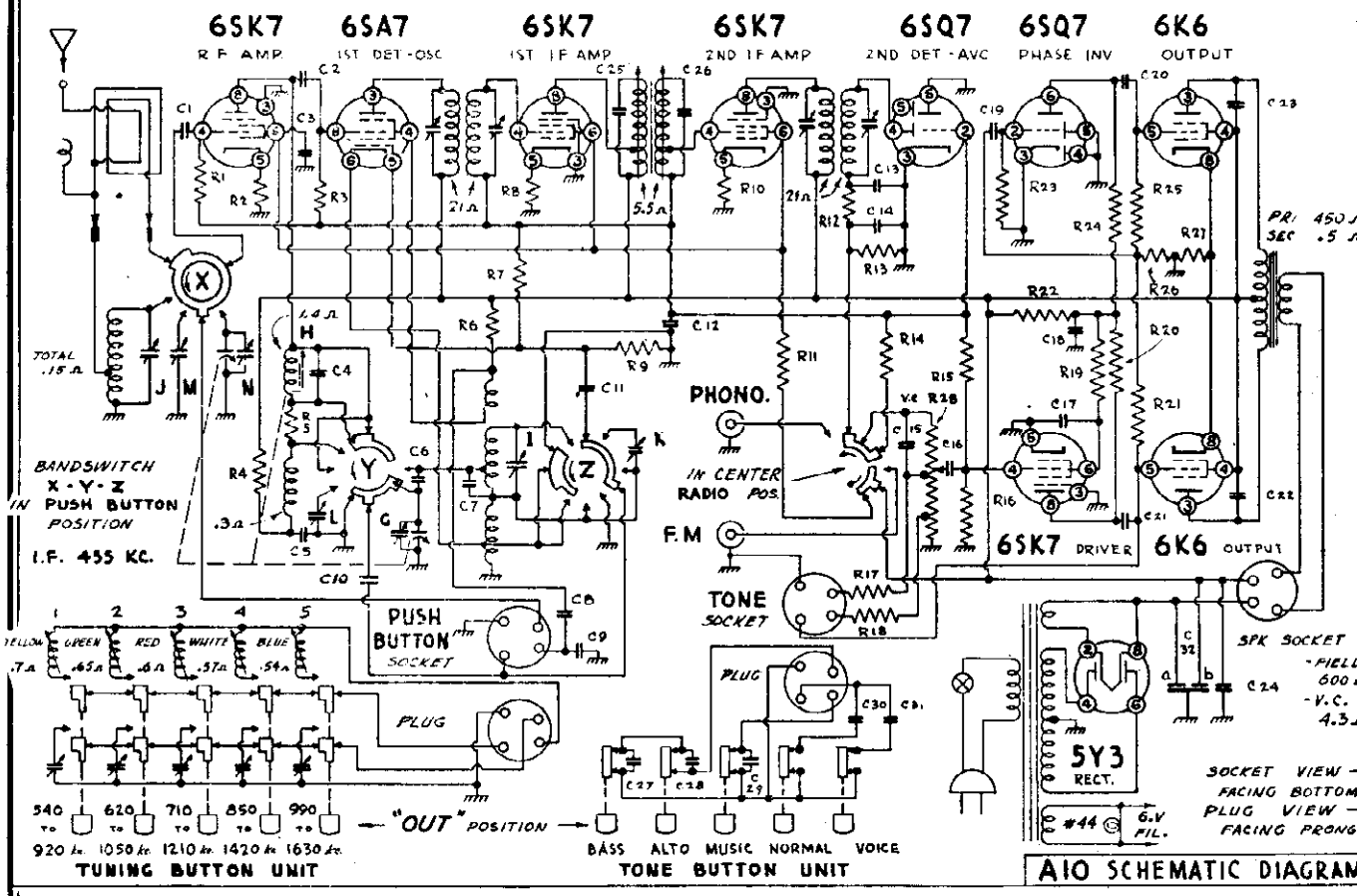
No.	Ohms
R1	2,000,000
R2	20,000
R3	10,000,000
R4	15,000
R5	70,000
R6	100,000
R7	1,000,000
R9	1,000,000
R10	20,000
R11	500,000
R12	1,000,000
R13	200,000
R14	50,000
R15	500,000
R16	600,000
R17	500,000

CONDENSERS

No.	Capacity (Mfd.)
C1	.00025
C2	.00025—10%
C3	.00005
C4	.05
C5	.05
C7	.00025
C8	.02
C9	.01
C10	.05
C11	.00025
C12	.1
C13	.01
C14	.002
C15	.005
C16a	20.
C16b	20.
C16c	20.



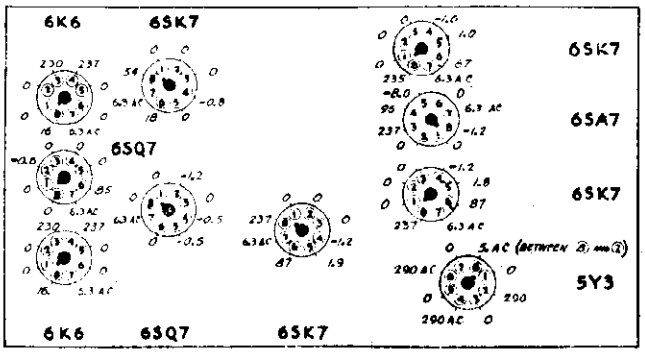
CONTINENTAL RADIO & TELEV. CORP.



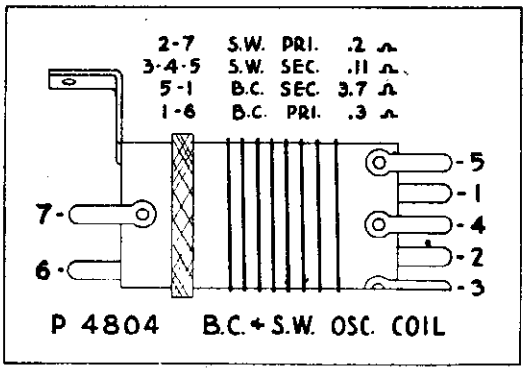
A10 SCHEMATIC DIAGRAM

For Condenser and Resistor values see Replacement Parts List.

Volume control tapped at 300,000 ohms and 600,000 ohms from ground end.



Bottom View *Voltage Chart*



Voltages measured with 20,000 ohm per volt meter, from terminal to chassis and are positive D.C., unless noted otherwise.

Line—117 volts, 60 cycles, A.C. Vol. max, No station.

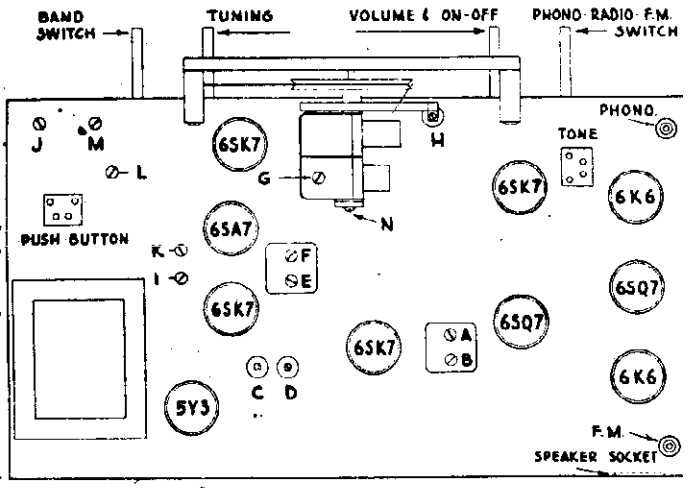
Switches set at RADIO and BROADCAST.

Changer only, 15 watts.

Radio only, 90 watts—RADIO position.

Radio only, 80 watts—PHONO position.

(R.F. and I.F. screens disconnected in PHONO position which also makes plate voltages higher.)



Top View *Tube and Trimmer Locatio*

MODEL A-10

CONTINENTAL RADIO & TELEV. CORP.

STEP	Connect Signal Generator To—	Dummy Ant. Between Radio and Generator	Set Generator Controls To—	Set Radio Controls To—	Adj. Following Trimmers To Max. Output
1	6SA7 Grid	.1 mfd.	455 Kc.	1630 Kc. B. C. Range	A, B, C, D, E, F I.F.
2	Green Loop Lead (Grid)	.1 mfd.	1630 Kc.	1630 Kc. B. C. Range	G Bc. Osc.
3	Green Loop Lead (Grid)	.1 mfd.	1400 Kc.	1400 Kc. B. C. Range	H Bc. RF.
4	Yellow Loop Lead (Ground)	400 ohms	11.7 Mc.	11.7 Mc. 25M Range	I 25m Osc.
5	Yellow Loop Lead (Ground)	400 ohms	11.7 Mc.	11.7 Mc. 25M Range	J 25m Ant.
6	Yellow Loop Lead (Ground)	400 ohms	9.5 Mc.	9.5 Mc. 31M Range	K 31m Osc.
7	Yellow Loop Lead (Ground)	400 ohms	9.5 Mc.	9.5 Mc. 31M Range	L - M 31m R.F. Ant.
8	Loop Radiator	Two Feet From Radio No Connection	1400 Kc.	1400 Kc. B. C. Range	N Bc. Ant.

Use Aerometer or 10" diameter one turn loop on Signal Generator in Step 8

REPLACEMENT PARTS LIST

RESISTORS

		Ohms	Watts	
P3800	R2	100	½	.15
P3806	R8, R10	200	½	.15
P5178	R27	320	1-10%	.25
P3820	R4	500	½	.15
P3833	R5	3,000	½	.15
P3841	R3	10,000	½	.15
P1944	R6	15,000	2	.25
P3844	R9	20,000	½	.15
P2184	R11	25,000	1	.20
P3853	R12, R18, R22	50,000	½	.15
P3860	R17	100,000	½	.15
P3864	R20, R24	200,000	½	.15
P3876	R13, R21, R25, R26	500,000	½	.15
P3882	R14, R19	1 megohm	½	.15
P3883	R1	2 megohm	½	.15
P3886	R7, R15, R16, R23	5 megohm	½	.15

VARIABLE RESISTORS

P5152	R28	V. C. 1 megohm..	1.10

PAPER CONDENSERS

		Mfd.	Volts	
P3203	C30	.001	600	.15
P904	C31	.002	600	.15
P1322	C22, C23, C27, C29	.005	600	.15
P164	C19, C20, C21, C28	.01	400	.25
P143	C16	.02	400	.25
P334	C3, C5, C8, C12 C17, C24	.05	400	.30
P276	C18	.1	400	.30

MICA CONDENSERS

		Mfd.		
P1382	C11, C13	.00005	....	.15
P480	C14	.0001	....	.15
P5184	C6	.0002	10%	.25
P817	C1, C2, C7, C15	.00025	....	.20
P4368	C10	.0005	2½%	.40
P5163	C25, C26	.0005	10%	.25
P5087	C4	.000785	2½%	.50
P2565	C9	.003	5%	.40

TRANSFORMERS AND COILS

G6502	Loop Assembly	2.50
G6500	Sw. Choke Coil	.25
G6476	R.F. Coil Assembly	.40
P4802	Sw. Ant. Coil	.40
P4804	Bc. and Sw. Osc. Coil	.80
G6532	2nd I.F Transformer	1.25
P5114	1st and 3rd I.F. Trans.	1.15
P5159	Output Transformer	1.90
P5119	Power Trans., 60 cylce	5.20

PERMEABILITY UNIT

G6521	Unit Complete	7.50
P5106	Push Button Switch	2.50
P5093	Trimmer Strip	1.25
P4363	Iron Core	.15
P5171	Iron Core Lock Nut....set	.05
P4352	Coil Clip .....set	.05
G6522	Coil, 1 Yellow dot	.25
G6523	Coil, 2, Green dot	.25
G6524	Coil, 3, Red dot	.25
G6525	Coil, 4, White dot	.25
G6526	Coil, 5, Blue dot	.25
P1957	Plug only	.10
P5088	Push Button	.10
P5104	Mtg. Bracket .....pair	.05

TONE CONTROL UNIT

G6528	Unit Complete	3.75
P5107	Push Button Switch	2.20
G6530	Fibre Strip and All Condehsers	1.00
P3596	Cinch Clips .....pair	.05
P1957	Plug	.10
P5088	Push Button	.10
P5142	Upper Mtg. Bracket	.05
P5143	Lower Mtg. Bracket	

ELECTROLYTIC CONDENSERS

P4372	C32 a 20 mfd. 450 volt C32 b 16 mfd. 450 volt	1.15

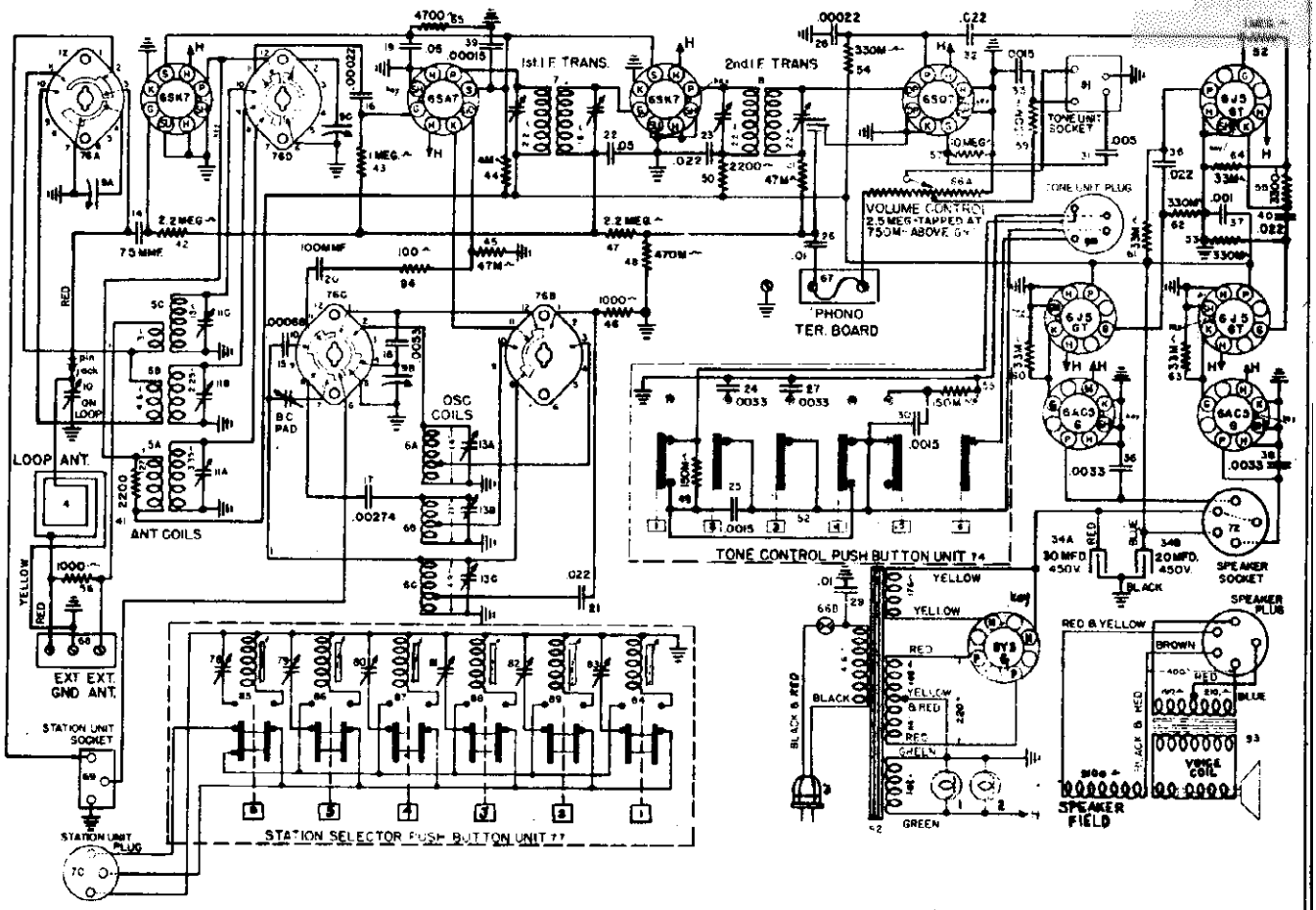
VARIABLE CONDENSERS

P5092	Gang Condenser	2.70
P5003	Trimmer (on gang)	.80
P5147	Double Trimmer	.40
P5156	Trimmer with bracket	.25

MISCELLANEOUS

P5180	Speaker	7.25
P5084	Speaker Socket	.15
P4583	Tube Socket	.15
P5065	Socket, for Push Button Units	.15
P3005	5Y3 Socket	.15
P4404	Phono—F. M. Jack	.10
P5149	Phono, Radio, F. M. Switch	.90
P5105	Band Switch	2.00
P3557	Line Cord Clamp	.15
P4894	Line Cord	.65
P4787	Shielded Cable and Plug	.60
P2739	A.C. Phono Cable & Socket	.60
P4139	Pilot Light Socket and Leads	.25
P1713	Pilot Light	.25
P4248	Pilot Light Shield	.05
G6516	Drive Drum and Cam Assembly	.25
P5066	Drive Shaft	.10
P1399	Horseshoe Washer	.05
P1587	Spring Washer	.05
P2925	Tension Spring	.05
P4979	Iron Slug	.35
G6517	Iron Slug Lift Assembly	.35
P5032	"T" Ferrule	
P269	Washer	
P5109	Spring	.10 set
P931	Screw	
G6518	Dial Scale Assembly	1.00
G6519	Band Indicator Assembly	.50
P5135	"U" Lever Only	.10
P5053	Pointer	.15
P3911	Pointer Clip	.05
P5047	Dial Crystal	.60
P5151	Large Escutcheon	1.85
P5112	Left Escutcheon	.55
P5110	Right Escutcheon	.40
P5111	Removable Piece for above	.35
P5121	Spring Clip for above	.15
P4626	Tinnerman Clips for above	.05
P5136	Plain Knobs	.15
P5137	Marked Knob	.15
P5088	Push Button	.10
P4444	Chassis Mtg. Screws	.05
G6101	Mtg. Foot Assembly	.25
4207	Cabinet	

THE CROSLEY CORP.



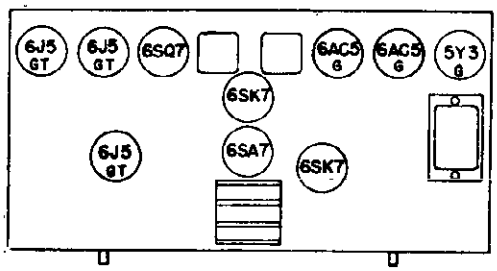
WIRING DIAGRAM, MODELS 02CA AND 02CB — CHASSIS MODEL No. 55

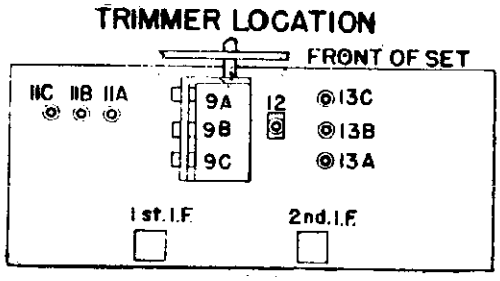
TUNING RANGES

American Broadcast Band—540 to 1630 KC (555 to 184 Meters)
Police, Amateur, etc.—1600 to 5200 KC (187 to 57.5 Meters)
Short Wave (Foreign)—5.2 to 18.0 MC (57.5 to 16.6 Meters)

TUBES

2—6SK7, 1—6SA7, 1—6SQ7, 3—6J5, 2—6AC5GT, and 1—5Y3G. (Tubes may be metal or Bantam (GT) equivalents.)





TUBE AND TRIMMER LAYOUT

MODELS 02CA, 02CB, Chassis 55 THE CROSLEY CORP.

Preliminary

Output Meter Connections.....Plate to Plate of 6AC5G's

Generator Ground Connection.....To chassis or Ground Lead

Dummy Antenna to be in series with generator output.....See Chart Below

Position of Volume Control.....Fully On

Position of Master Tone Control.....All Buttons Out

ALIGNMENT PROCEDURE CHART

Alignment Sequence	Signal Generator: Dummy Antenna	Signal Generator: Frequency Setting	Signal Generator: Input Connection to Receiver	Band Switch	Tuning Cond. Setting	Trimmer Adjusted	Remarks
1.	.02 MF.	455 Kc.	Stator lug Rear section of Gang Cond.	B. C.	Fully open	2nd I-F (2) 1st I-F (2)	Adjust for Maximum. Adjust for Maximum.
2.	.0002 MF.	1630 Kc.	Ant. Terminal	B. C.	Fully open	B. C. "OSC" Trimmer	Adjust for peak; gang does not have to tune thru signal. Loop must be connected.
3.	.0002 MF.	600 Kc.	Ant. Terminal	B. C.	Approx. 60 on dial	B. C. "OSC" Series Trimmer	Adjust for maximum output while rocking gang thru signal.
4.	Repeat Step No. 2 to check possible shift due to series adjustment.						
5.	.0002 MF.	1400 Kc.	Ant. Terminal	B. C.	Approx. 140 on dial	B. C. "ANT" Trimmer B. C. "R-F" Trimmer	Adjust for maximum output do not touch B. C. Osc. Trimmer. Adjust for maximum output.
6.	400 ohm (carbon)	5.3 Mc.	Ant. Terminal	Police	Fully open	Pol "OSC"	Adjust for peak; gang does not have to tune thru signal.
7.	400 ohm (carbon)	5.0 Mc.	Ant. Terminal	Police	Approx. 5.0	Pol "ANT" Trimmer	Adjust for maximum output.
8.	400 ohm (carbon)	18.3 Mc.	Ant. Terminal	S. W.	Fully open	S. W. "OSC"	Adjust for peak. Gang does not have to tune thru signal.
9.	400 ohm (carbon)	18.0 Mc.	Ant. Terminal	S. W.	Approx. 18	S. W. "ANT" Trimmer	Adjust for maximum output while rocking gang thru signal.
10.	Repeat the above alignment procedure for more accurate adjustments. Always keep signal generator output as low as possible to prevent action of the A. V. C. circuit.						

IMPORTANT ALIGNMENT NOTES

When aligning the shortwave bands "OSC" trimmers care must be exercised to see that the circuits are aligned on the correct frequency and not on the image which is approximately 910 kilocycles less as indicated on the Receiver dial. To check, increase generator output, tune-in the generator frequency and then tune-in the image frequency which should be weaker than the fundamental and come in approximately 910 kilocycles lower on the Receiver dial than the fundamental. If image cannot be tuned-in, the"OSC" trimmer is adjusted to the wrong peak. (Correct peak is the second peak on trimmer from the closed position).

TUBE VOLTAGE CHART

SOCKET VOLTAGES MEASURED AT 117.5 V. LINE (BETWEEN SOCKET PIN AND CHASSIS) WITH 1000 OHM PER VOLT, 500 V. RANGE VOLTMETER (D. C.)

TUBE	FUNCTION	PIN NUMBER 1	2	3	4	5	6	7	8
6SK7	R. F. Amplifier	Gnd.	Gnd.	Gnd.	0	Gnd.	74	6.3 A. C.	180
6SA7	Converter	Gnd.	Gnd.	180	74	0	(0-S. W.) (4.0 B. C.)	6.3 A. C.	0
6SK7	I. F. Amplifier	Gnd.	Gnd.	Gnd.	0	Gnd.	74	6.3 A. C.	180
6SQ7	Det. A. S. C. 1st A. F.	Gnd.	0	Gnd.	0	0	75	6.3 A. C.	Gnd.
6J5GT	Phase Inverter	Gnd.	Gnd.	145	J. B.	0	J. B.	6.3 A. C.	40
6J5GT(2)	P. P. A. F. Drivers	Gnd.	Gnd.	180	0	0	J. B.	6.3 A. C.	6.5
6AC5GT(2)	P. P. Output	Gnd.	Gnd.	304	J. B.	6.5	J. B.	6.3 A. C.	Gnd.
5Y3G	Rectifier	N. C.	310	J. B.	308 A. C.	J. B.	308 A. C.	J. B.	310

MAX. POWER OUTPUT.....12.0 WATTS

POWER CONSUMPTION.....90 WATTS

DROP ACROSS SPEAKER FIELD.....120 VOLTS

J. B.—Junction Block N. C.—No Connection

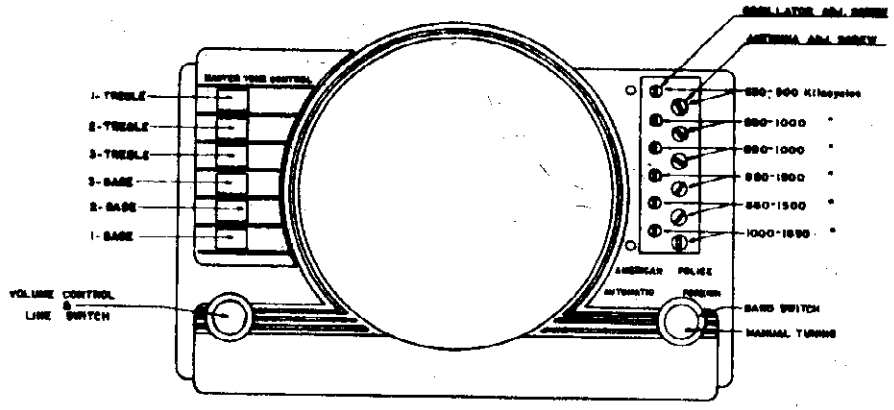
Voltages may vary 10% of values given.

THE CROSLEY CORP.

SETTING THE PUSH BUTTONS (Station Selector)

The six station selector push buttons are set up by means of two adjusting screws per button. These adjusting screws are made accessible by removing the station selector push button escutcheon. Pry off carefully being carefully not to scratch the main escutcheon.

Select the call letter tabs of your six favorite broadcast stations from the station call letter sheets supplied. Place the call letter tabs in the window above that push button which is to be adjusted for that station. It is not essential that all push buttons be set at one time.



Note: When placing call tabs in the window be sure to arrange them according to their frequency (kilocycles) that is: the station whose frequency is well within the range covered by the No. 1 button, should be placed above that button and so on with the rest of the buttons to be set. After tabs are in place break off the celluloid covers from the strip furnished and snap in place over the call letters to protect and hold them in place.

The frequencies of your favorite stations may be found in your local paper or by consulting a station listing sheet.

SET-UP PROCEDURE

Remove station selector push button escutcheon. Turn the receiver on and let it operate for a sufficient length of time to permit the tubes to reach their normal operating conditions.
Note: To simplify the set up and insure accurate adjustments the following pre-adjustments should be made.

Tighten all Antenna Trimmer screws moderately tight. See Fig. 1. Turn the Oscillator adjusting screws to the left (counter clockwise) until the threaded portion extends approximately ½ inch. Note: Care should be taken when adjusting the oscillator screws so that the selected station is not passed over. Turn the screws slowly.

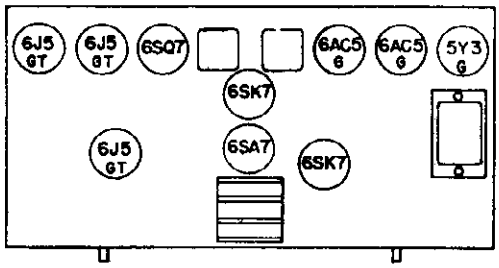
It is essential that the frequency (kilocycles) of the station selected is within the range of the push button to be set for that station. See Fig. 1.

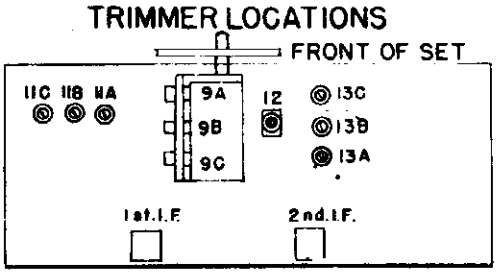
1. Turn the band change switch to the "American" position. Using the station selector knob, carefully tune in the station to which the No. 1 push button is to be set. Note program.
2. Turn the band change switch to the "Automatic" position and using a small screw driver, carefully turn in a clockwise direction the Oscillator adjusting screw until the station previously tuned in manually is heard again. Adjust for maximum output in the speaker.
3. Adjust the Antenna adjusting screw for maximum volume in the speaker.
4. Turn band change switch from "Automatic" to "American" and back again to check if adjustment has been correctly made. There should be no change in tone quality when switched from one to the other.
5. Repeat above procedure for the remaining push buttons.

To tune the receiver with the push buttons, set the band change switch on "Automatic" and depress completely the button corresponding to the station you wish to hear.

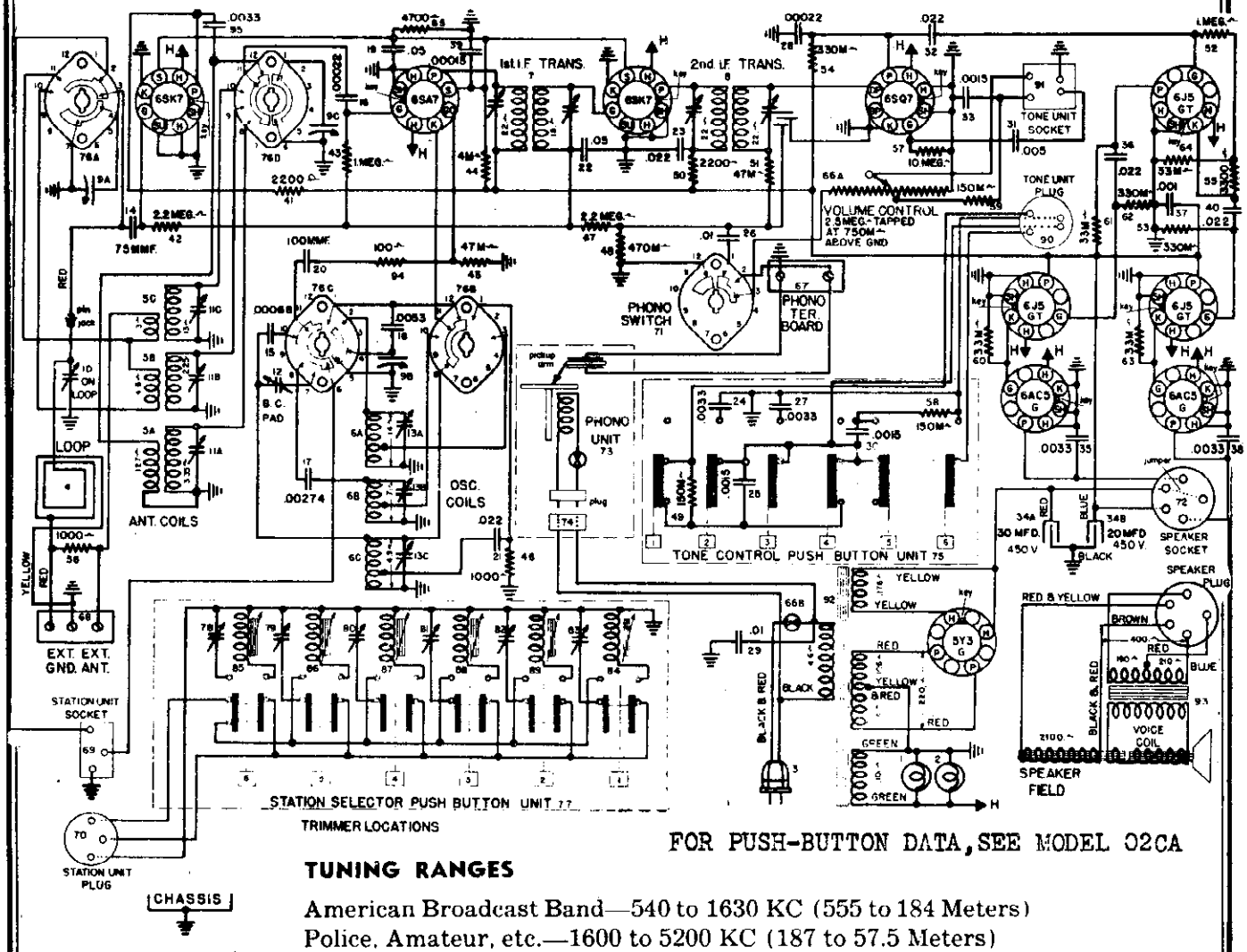
MODELS 02CP, 02CQ,
Chassis 70

THE CROSLEY CORP.





WIRING DIAGRAM, MODELS 02CP AND 02CQ — CHASSIS MODEL No. 70



FOR PUSH-BUTTON DATA, SEE MODEL 02CA

TUNING RANGES

American Broadcast Band—540 to 1630 KC (555 to 184 Meters)
Police, Amateur, etc.—1600 to 5200 KC (187 to 57.5 Meters)
Short Wave (Foreign)—5.2 to 18.0 MC (57.5 to 16.6 Meters)

FEATURES

Some of the features of these outstanding phonocombinations that will add greatly to your enjoyment are as follows: a large efficient built-in antenna; Litz wound coils; a three gang tuning condenser providing maximum selectivity and sensitivity; push-pull audio tubes, dynamically coupled to push-pull triode output for maximum distortionless reproduction; six station selector pushbuttons; a full twelve inch concert dynamic speaker; six push buttons controlling a "Master Tone Control" system which provides more than 60 different combinations of bass and high notes; and an extremely high quality unit for the reproduction of phonograph records, including the "Floating Jewel Tone System" (a Crosley invention) which assures a quality of reproduction never before obtainable.

THE CROSLEY CORP.

MODELS 02CP, 02CQ,
Chassis 70

Preliminary

Output Meter Connections.....Plate to Plate of 6AC5G's
Generator Ground Connection.....To chassis or Ground Lead
Dummy Antenna to be in series with generator output.....See Chart Below
Position of Volume Control.....Fully On
Position of Master Tone Control.....All Buttons Out

ALIGNMENT PROCEDURE CHART

Alignment Sequence	Signal Generator: Dummy Antenna	Signal Generator: Frequency Setting	Input Connection to Receiver	Band Switch	Tuning Cond. Setting	Trimmer Adjusted	Remarks
1.	.02 MF.	455 Kc.	Stator lug Rear section of Gang Cond.	B. C.	Fully open	2nd I-F (2) 1st I-F (2)	Adjust for Maximum. Adjust for Maximum.
2.	.0002 MF.	1630 Kc.	Ant. Terminal	B. C.	Fully open	B. C. "OSC" Trimmer	Adjust for peak; gang does not have to tune thru signal. Loop must be connected.
3.	.0002 MF.	600 Kc.	Ant. Terminal	B. C.	Approx. 60 on dial	B. C. "OSC" Series Trimmer	Adjust for maximum output while rocking gang thru signal.
4.	Repeat Step No. 2 to check possible shift due to series adjustment.						
5.	.0002 MF.	1400 Kc.	Ant. Terminal	B. C.	Approx. 140 on dial	B. C. "ANT" Trimmer B. C. "R-F" Trimmer	Adjust for maximum output do not touch B. C. Osc. Trimmer. Adjust for maximum output.
6.	400 ohm (carbon)	5.3 Mc.	Ant. Terminal	Police	Fully open	Pol "OSC"	Adjust for peak; gang does not have to tune thru signal.
7.	400 ohm (carbon)	5.0 Mc.	Ant. Terminal	Police	Approx. 5.0	Pol "ANT" Trimmer	Adjust for maximum output.
8.	400 ohm (carbon)	18.3 Mc.	Ant. Terminal	S. W.	Fully open	S. W. "OSC"	Adjust for peak. Gang does not have to tune thru signal.
9.	400 ohm (carbon)	18.0 Mc.	Ant. Terminal	S. W.	Approx. 18	S. W. "ANT" Trimmer	Adjust for maximum output while rocking gang thru signal.
10.	Repeat the above alignment procedure for more accurate adjustments. Always keep signal generator output as low as possible to prevent action of the A. V. C. circuit.						

IMPORTANT ALIGNMENT NOTES

When aligning the shortwave bands "OSC" trimmers care must be exercised to see that the circuits are aligned on the correct frequency and not on the image which is approximately 910 kilocycles less as indicated on the Receiver dial. To check, increase generator output, tune-in the generator frequency and then tune-in the image frequency which should be weaker than the fundamental and come in approximately 910 kilocycles lower on the Receiver dial than the fundamental. If image cannot be tuned-in, the"OSC" trimmer is adjusted to the wrong peak. (Correct peak is the second peak on trimmer from the closed position).

TUBE VOLTAGE CHART

SOCKET VOLTAGES MEASURED AT 117.5 V. LINE (BETWEEN SOCKET PIN AND CHASSIS) WITH 1000 OHM PER VOLT, 500 V. RANGE VOLTMETER (D. C.)

TUBE	FUNCTION	PIN NUMBER 1	2	3	4	5	6	7	8
6SK7	R. F. Amplifier	Gnd.	Gnd.	Gnd.	0	Gnd.	74	6.3 A. C.	180
6SA7	Converter	Gnd.	Gnd.	180	74	0	0-S. W. 4.0 B. C.	6.3 A. C.	0
6SK7	I. F. Amplifier	Gnd.	Gnd.	Gnd.	0	Gnd.	74	6.3 A. C.	180
6SQ7	Det. A. S. C. 1st A. F.	Gnd.	0	Gnd.	0	0	75	6.3 A. C.	Gnd.
6J5GT	Phase Inverter	Gnd.	Gnd.	145	J. B.	0	J. B.	6.3 A. C.	40
6J5GT(2)	P. P. A. F. Drivers	Gnd.	Gnd.	180	0	0	J. B.	6.3 A. C.	6.5
6AC5GT(2)	P. P. Output	Gnd.	Gnd.	304	J. B.	6.5	J. B.	6.3 A. C.	Gnd.
5Y3G	Rectifier	N. C.	310	J. B.	308 A. C.	J. B.	308 A. C.	J. B.	310

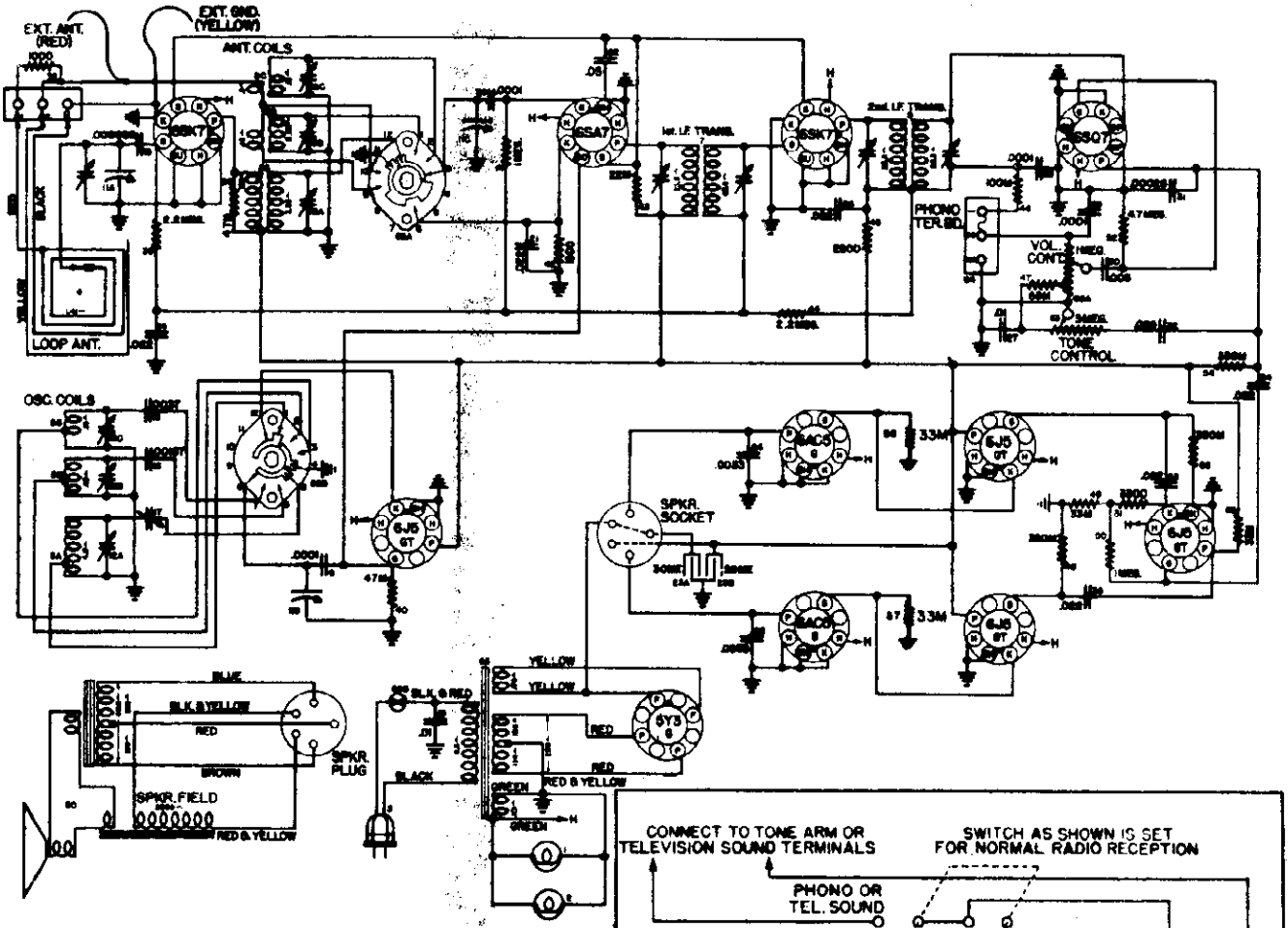
MAX. POWER OUTPUT.....12.0 WATTS
POWER CONSUMPTION.....90 WATTS
DROP ACROSS SPEAKER FIELD.....120 VOLTS

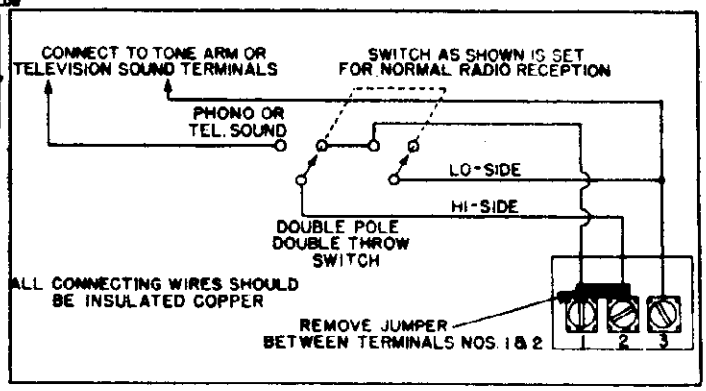
J. B.—Junction Block
N. C.—No Connection

Voltages may vary 10% of values given.

MODEL CA12

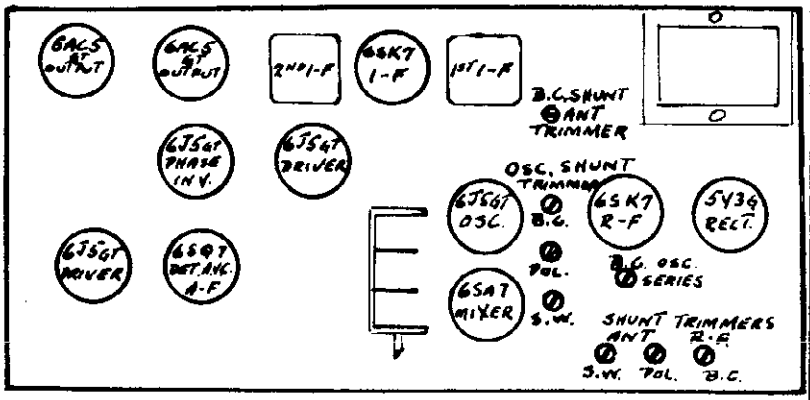
THE CROSLEY CORP.





PHONO CONNECTIONS

This chassis is so constructed as to be adaptable to a phonograph pick-up (high impedance type) for the reproduction of recordings. The terminals may also be used for the reproduction of television sound as supplied by a suitable television converter unit. The double pole double throw switch for changing from Radio to Phono or television sound, should be connected as shown in the diagram. The terminals are coded as follows: 1, 2, 3, respectively. The No. 2 terminal connects to the high side of the phono pickup or television A-F connections.



NOTE: The jumper wire between No. 1 and No. 2 terminals must be removed when phono-radio switch is connected. If phono switch is removed, it is absolutely essential that the jumper wire between No. 1 and No. 2 terminals be replaced. Be sure all connections are tight.

The No. 3 terminal is the ground or low side connection. The No. 1 terminals should be connected to the No. 3 terminals by some means (as indicated in the above diagram). This prevents any radio signals from the receiver proper interfering with the Phono or Television sound reproduction.

THE CROSLEY CORP.

ALIGNMENT PROCEDURE

Preliminary

Output Meter Connections.....Plate to Plate of 6AC5G's
Generator Ground Connection.....To chassis or Ground Lead
Dummy Antenna to be in series with generator output.....See Chart Below
Position of Volume Control.....Fully On
Position of Tone Control.....Treble or Speech

ALIGNMENT PROCEDURE CHART

Alignment Sequence	Signal Generator: Dummy Antenna	Signal Generator: Frequency Setting	Input Connection to Receiver	Band Switch	Tuning Cond. Setting	Trimmer Adjusted	Remarks
1.	.02 MF.	455 Kc.	Stator lug Rear section of Gang Cond.	B. C.	Fully open	2nd I-F (2) 1st I-F (2)	Adjust for Maximum. Adjust for Maximum.
2.	.0002 MF.	1600 Kc.	Ant. Lead (Red)	B. C.	Fully open	B. C. "OSC" Trimmer	Adjust for peak; gang does not have to tune thru signal. Loop must be connected.
3.	.0002 MF.	600 Kc.	Ant. Lead (Red)	B. C.	Approx. 60 on dial	B. C. "OSC" Series Trimmer	Adjust for maximum output while rocking gang thru signal.
4.	Repeat Step No. 2 to check possible shift due to series adjustment						
5.	.0002 MF.	1400 Kc.	Ant. Lead (Red)	B. C.	Approx. 140 on dial	B. C. "ANT" Trimmer B. C. "R-F" Trimmer	Adjust for maximum output do not touch B. C. Osc. Trimmer. Adjust for maximum output.
6.	400 ohm (carbon)	5.3 Mc.	Ant. Lead (Red)	Police	Fully open	Pol "OSC"	Adjust for peak; gang does not have to tune thru signal.
7.	400 ohm (carbon)	5.0 Mc.	Ant. Lead (Red)	Police	Approx. 5.0	Pol "ANT" Trimmer	Adjust for maximum output while rocking gang thru signal.
8.	400 ohm (carbon)	18.3 Mc.	Ant. Lead (Red)	S. W.	Fully open	S. W. "OSC"	Adjust for peak. Gang does not have to tune thru signal.
9.	400 ohm (carbon)	18.0 Mc.	Ant. Lead (Red)	S. W.	Approx. 18	S. W. "ANT" Trimmer	Adjust for maximum output while rocking gang thru signal.
10.	Repeat the above alignment procedure for more accurate adjustments. Always keep signal generator output as low as possible to prevent action of the A.V.C. circuit.						

IMPORTANT ALIGNMENT NOTES

When aligning the shortwave bands "OSC" trimmers care must be exercised to see that the circuits are aligned on the correct frequency and not on the image which is approximately 910 kilocycles less **as indicated on the dial.** To check, increase generator output, tune-in the generator frequency and then tune-in the image frequency which should be weaker than the fundamental and come in approximately 910 kilocycles **lower on the dial** than the fundamental. If image cannot be tuned-in, the "OSC" trimmer is adjusted to the wrong peak. (Correct peak is the second peak on trimmer from the closed position).

SOCKET VOLTAGES MEASURED @ 117.5 VOLTS LINE (BETWEEN SOCKET PIN AND CHASSIS) WITH 1000 OHM PER VOLT, 500 VOLT RANGE VOLTMETER (D. C.)

TUBE FUNCTION		PIN NUMBER 1	2	3	4	5	6	7	8
6SK7—R. F. Amplifier	GND	GND	GND	0	0	59		6.3 NC	217
6SA7—Converter	GND	GND	217	59	0	3.0	B.C.O.-S.W.	6.3 NC	0
6J5GT—Oscillator	GND	GND	217	0	0	0		6.3 NC	0
6SK7—I. F. Amplifier	GND	GND	GND	0	GND	59		6.3 NC	204
6SQ7—Det. A. V. C. 1st A. F.	GND	0	0	0	0	74		6.3 NC	GND
6J5GT—Phase Inverter	GND	0	153	J. B.	0	0		6.3 NC	3.5
6J5GT (2)—P. P. A. F. Drivers	GND	GND	217	J. B.	0	0		6.3 NC	8.5
6AC5GT(2)—P. P. Output	GND	GND	305	0	8.5	0		6.3 NC	GND
5Y3G—Rectifier	NC	310	0	308 AC	0	308 AC		5 AC	0

MAX. POWER OUTPUT @ 117.5 V. LINE.....8.0 Watts
POWER CONSUMPTION @ 117.5 V. LINE.....80 Watts
DROP ACROSS SPEAKER FIELD.....90 Volts

J.B.—JUNCTION BLOCK. Voltages may vary 10% of values given. N.C.—NO CONNECTION.

MODEL CR26,Wireless
Record Player

THE CROSLEY CORP.

THE CROSLEY AUTOMATIC WIRELESS RECORD PLAYER MODEL CR26

The Crosley Automatic Wireless Record Player Model CR26, with the automatic record changer will enable one to greatly increase his enjoyment of recorded music.

After correct adjustments have been made, it will be possible to place the Record Player in any part of the room, place the selected recordings on the changer, set the volume control of the receiver at the desired level, and enjoy your favorite recorded music.

RECORDED MUSIC

Modern records are made by electrical processes and the bringing out of their full tonal perfection requires a well-designed electrical tone arm such as is provided in this Record Changer Model CR26.

Fully as remarkable is the wide variety of selections that are obtainable. They range from the latest hit tunes played by the most popular bands, to complete operas and symphonies recorded by the world's leading artists. These longer works are to be had in the form of a set of double sided records so arranged that the first half of the work is heard by playing one side of all the records, and the last half by playing the other side. Be sure to purchase records so arranged if it is desired to use them on an Automatic Changer.

POWER SUPPLY FOR AUTOMATIC WIRELESS RECORD CHANGER

The Changer is equipped with a constant-speed self-starting motor. Under all normal conditions it starts automatically and runs at correct speed.

Each Changer is designed to operate on a certain voltage and frequency (cycles) only. Be sure to look at your radio nameplate and see that the instrument you have conforms to your power supply before plugging in cord. The rating of your power supply can be determined by calling the local electric company.

PLACING UNIT IN OPERATION

The Crosley Automatic Wireless Record Player will operate on 850 to 600 Kilocycles (usually 85 to 60 on the radio dial). Turn the receiver "ON" and adjust the dial pointer to a position between 85 and 60 where there is no station interference. Turn volume control fully on. Plug the unit power cord into a convenient wall receptacle. Place a 10-inch record on turntable of unit and turn "OFF-ON" motor switch to "ON" position (Fig. 1). Allow approximately 30 seconds for the unit to warm up, then gently lift tone arm onto recording, or merely depress "Reject" knob.

Turn the adjusting screw (Fig. 1) until record being played is heard through the receiver. Turning the adjustment screw to the left increases the frequency, that is, the signal from unit will be picked up closer to 85 on the dial of the receiver. Turning to the right decreases the frequency and the signal will be picked by the receiver closer to 60 on the dial.

The adjusting screw should be turned so as to obtain the sharpest signal. Adjust radio volume control to desired level for recordings being played.

SETTING FOR SIZE OF RECORD

The Changer plays up to fourteen 10" or ten 12" records at one loading. All records must be the same size for each loading.

On each post you will see selecting arms. The position of these arms determines the setting for different size records. To set for 10 or 12-inch records, it is merely necessary to grasp the posts by the knobs at the top, lift, and turn until the 10" or 12" arrows are pointing toward the center of the turntable. When in either the 10" or 12" position, the posts will snap into place except when they are lifted by hand. Be sure to set both posts for the same size record.

Figure (1) shows the Changer with the selecting arms set for 10" records and ready to be loaded; the tone arm in the rest position.

Figure (2) shows the Changer set for 12" records and ready to be loaded the tone arm in the rest position.

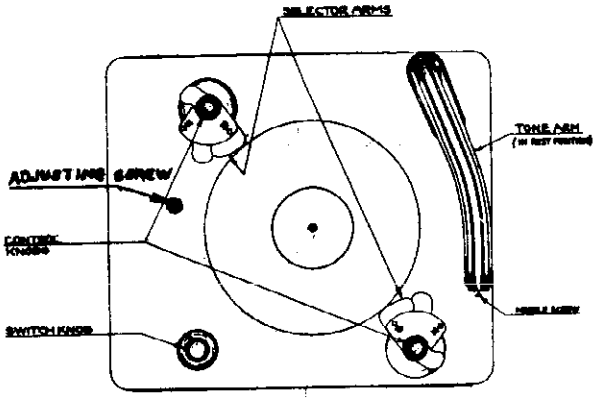


Fig. 1

THE CROSLEY CORP.

TURNING OFF CHANGER

(1) Throw Changer switch knob to "OFF" position.

(2) Lift tone arm and place it in the rest position. (If you happen to turn off the Changer switch whi the mechanism is going through a "change cycle", you will notice that it does not stop until the cycle h been completed, and the tone arm is again in playing position, at which point it is ready to be lifted to t rest position. If you prefer to turn off your Changer by the use of any other switch than the one on t Changer itself, be sure to turn it off while needle is resting upon a record; otherwise, the selecting arr cannot be correctly reset.

(3) To avoid warping of records, never leave records resting on the posts.

IF CHANGER IS LEFT RUNNING

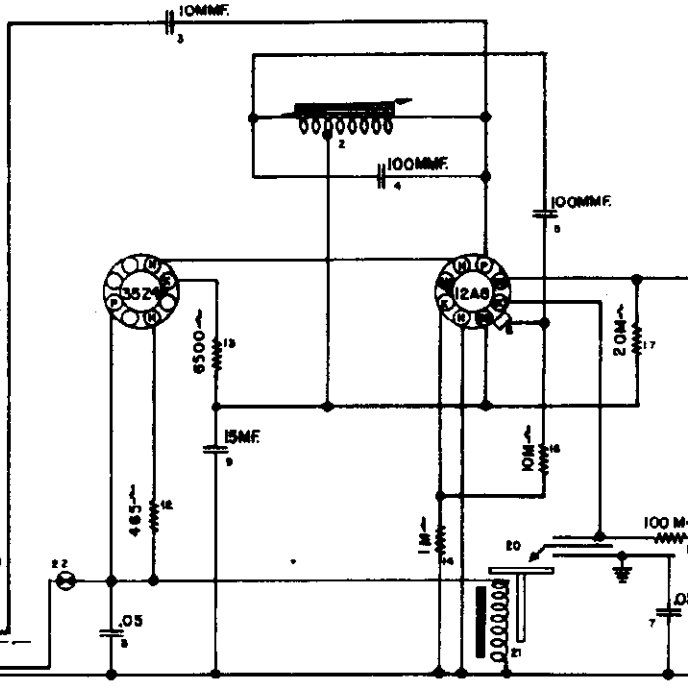
No damage will be done if you forget to turn off Changer after it has played its entire load of records. will simply repeat the last record until stopped or reloaded.

FAILURE TO PLAY THE NEXT RECORD

An old record may occasionally be found (made before the introduction of automatic changers) which do not carry the needle close enough to center-pin of turntable, to set the changer mechanism in operatio Should one of these old records be found in the stack, merely depressing the button will instantly set t Changer mechanism in action again. Any need for doing this can be avoided by placing the old record top of stack to be played, so that it will come into position last.

Item No.	Part No.	Description
1	B-131602	Cable and Plug (4 lead)
2	LW-131609	Osc. Coil
3	G8-34002	Condenser 10 Mmfd. Mica
4	G2-34002	Condenser 100 Mmfd. Mica
5	G2-34002	Condenser 100 Mmfd. Mica
6	W-50105	Condenser .1 Mfd. 200 V.
7	W-32380	Condenser .05 Mfd. 200 V.
8	W-32380	Condenser .05 Mf. 200 V.
9	W-131607	Condenser 2x15 Mfd. 150 V. (Paper Elect.)
10	W-34736	⅜ Dia. Hole Plug
11	B-131604	Chassis
12	W-131606	Resistor 465 ohm 10W. Wire Wd.
13	35934	Resistor 6,500 Ohm ½ W. Ins.
14	50046	Resistor 1,000 Ohm ½ W. Ins.
15	35600	Resistor 100,000 Ohm ½ W. Ins.
16	36317	Resistor 10,000 Ohm ½ W. Ins.
17	36760	Resistor 20,000 Ohm ½ W. Ins.
18		
19		
20	D-131529	Auto. Record Changer Unit
21		Motor with D-131529
22		Switch with D-131529
23		
24		
25	49742	#6-32x 7/16 Rd. Cr. Rec. Hd. Mch. Scr. FS-18
26		
27	W-131603	#8 x ⅜ Rd. Cr. Rec. Hd. P. K. Scr. FS-18
28	131610	Tube Socket
29	W-49674	.120 x ¼ Eyelet
30		
31	W-49982	Coil Form Mtg. Clip
32	W-49859	Iron Core
33		
34	21253	Coil Mtg. Brkt.
35		
36		
37	W-45056	Rubber Grommet
38	N-5062	#6-32 Hex Nut
39		
40		
41	D-131617A	CD Cabinet
42		
43		
44	W-131605	Cable Lock Plate
45		
46	131792	CD Carton
47		
48	W-47217	Grommet
49		

WIRING DIAGRAM — MODEL CR26



CAUSE OF NOISY RECORDS

A background of noise and scratching indicates worn records. Poor tone may be evidence of a worn needl Some records will wear longer than others, even if kept equally clean. This is due not only to quality manufacture, and care given the records, but also to the kind of music recorded.

MODEL CR26, Wireless
Record Player

THE CROSLEY CORP.

LOADING

See that the selecting arms of both posts are turned toward the center of the turntable as indicated by the engraved arrows, and that both sets of arms are set for the same size (10″ or 12″) records as described in the preceding paragraph. Place the stack of records (up to fourteen 10″ or ten 12″) over the center pin so that they will rest on the selecting arms.

STARTING THE CHANGER

Turn the "OFF-ON" motor switch knob to the "ON" position (Fig. 1), the motor will then start and the record changer will go into automatic operation of its own accord.

HOW TO REJECT A RECORD

Merely press the switch knob on the Changer panel. You can do it any time after the needle has come into contact with that record.

PLAYING INDIVIDUAL RECORDS

Should it be desired to play an individual record merely set up the machine as described above for the proper size (10″ or 12″ as indicated on the selecting arms), place the record on top of the arms as described under "Loading", and set the machine in operation by means of the switch knob described under "Starting the Changer". In other words, play an individual record in the same manner as you would play a stack of that size.

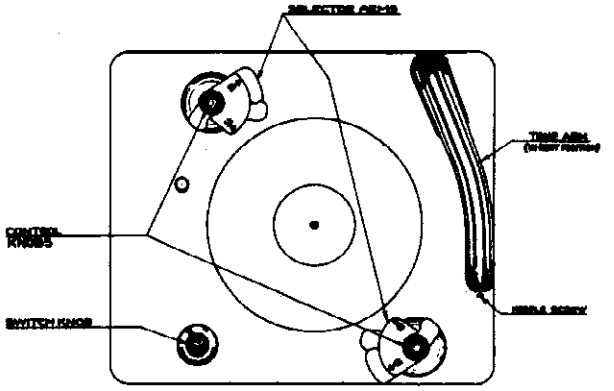


Fig. 2

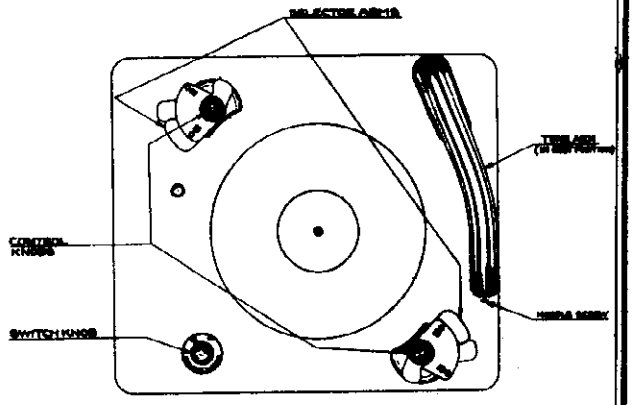


Fig. 3

NOTE: If the record player refuses to operate, CHECK the tubes to be sure they are pushed well down into their respective sockets. The tubes are accessible by removing the bottom of the Record Player.

After correct adjustments have been made it is necessary only to turn "ON" the receiver and tune-in on the frequency setting the Record Player, just as though you are tuning-in a regular broadcasting station, provided, of course, the Record Player is in operating condition.

If at any time extremely noisy conditions are encountered, wind a lead from the radio receiver antenna around the Record Player Power Cord.

UNLOADING

First switch off the motor. Grasp each post by its knob at the top and turn them out of the way. (See Figure 3).

This view shows the Changer with the tone arm in the rest position, and the selecting fingers turned for unloading.

Lift the played records from the turntable. Then return the posts to the proper playing position as indicated by the arrows on the selecting arms. (See Fig. 1 and 2). The Changer may then be loaded with a new stack of records according to the size shown on the selecting arms.

USE OF TONE CONTROL

If the radio through which this Changer is being played has a tone control switch, do not forget to adjust it, as well as the volume control, to the position which best brings out the tonal qualities of the kind of records being played.

THE CROSLEY CORP.

SOCKETS VOLTAGES Chassis No. 57

Measured from "B" minus using 1000 Ω/V Voltmeter, 100 V. Range, no signal inp

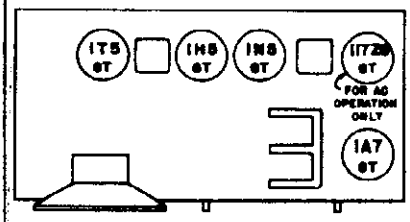
Tube		● 117.5-Volt Line				Battery Pack			
Type	Function	Filament Volt	Plate Volt	Screen Volt	Cathode Volt	Filament Volt	Plate Volt	Screen Volt	Cathode Volt
1A7GT	Osc. Modulator	1.3	80	34	.....	1.7	90	36	.....
1N5GT	I. F. Amplifier	2.8	80	80	.....	4.4	90	90	.....
1H5GT	Det.-A. S. C. 1st A. F.	2.6	7	.....	.....	3.0	8	.....	.....
1T5GT	Out Put	5.1	72	80	.....	6.0	88	90	.....
117Z6GT	Rectifier	117.5 A. C.	117.5 A. C.	.....	115	.....	.....	.....	.....

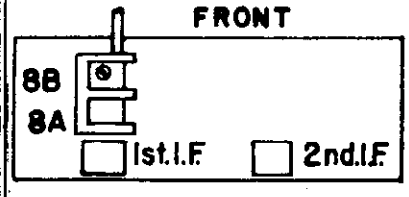
ALIGNMENT PROCEDURE — Volume Control on full Output meter connected to Plate and Screen of 1T5G

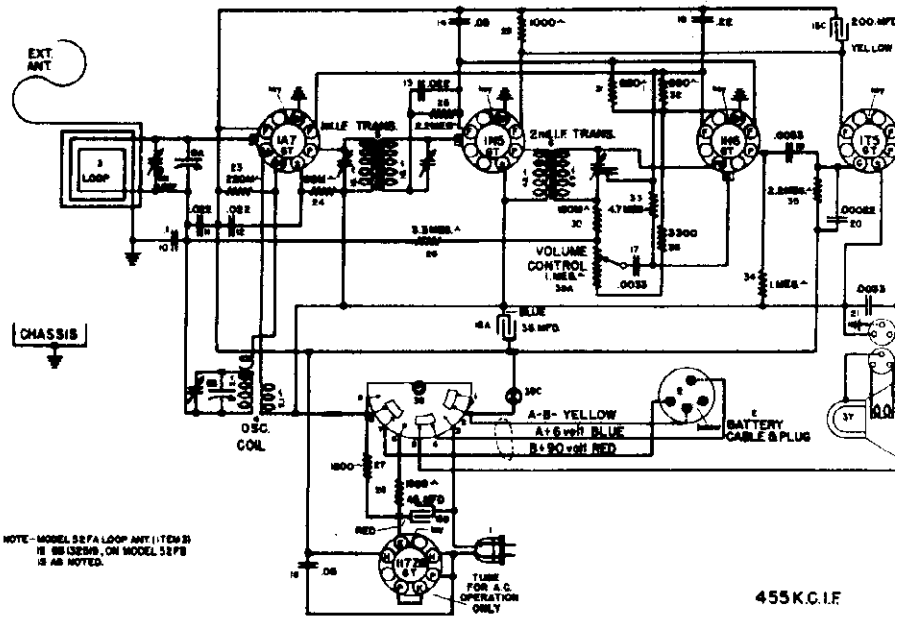
SIGNAL GENERATOR FREQUENCY SETTING	CONNECTION TO RADIO	DUMMY ANTENNA	TUNING COND. SETTING	TRIMMERS TO ADJUST (See Fig. 1)	REMARKS
455 Kc	Ant. Lead	.0001 MF	Fully open	2nd I-F(1)	Adjust for maximum signa
455 Kc	Ant. Lead	.0001 MF	Fully open	1st I-F (2)	Adjust for maximum signa Located top of 1st I-F ass'
1650	Ant. Lead	.0001 MF	Fully open	"OSC" Shunt on gang	Adjust for maximum outpu Gang does not have to tu through signal.
1400	Ant. Lead	.0001 MF	140 on dial	"ANT" shunt on loop	Adjust for maximum outpu

Repeat above procedures for more accurate adjustments
Maximum power output @ 90 V. "B" — approx. 340 M. W.

A Battery drain @ 6 volts, .05 Amp.; "B" Battery drain 90 V., 12 M. A.
Power consumption @ 117.5 volts line — 20 Watts







The chassis as employed in this model receiver is a five tube (including rectifier), single band superheterodyn designed to operate from an "A and B" Battery Pack, or 110 volts A.C. (50-60 cycle) or 110 volt D.C. electric circuit

TUNING RANGE — 550-1600 Kilocycles — 546-187.5 Meters

TUBES USED — one 1A7GT, one—IN5GT, one—IH5GT, one—IT5GT and one—117Z6GT*

BATTERIES REQUIRED — one No. CR-57 Crosley "A and B" Battery Pack (6 Volt "A"—90 Volt "B").

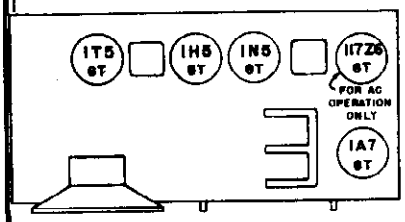
*Note: The 117Z6GT rectifier tube is not required for battery operation and is therefore not supplied as origin equipment with your receiver. If 110 volt current is made available in your home the above tube should be pu chased from your Crosley dealer.

MODEL 52FC, Chassis 90

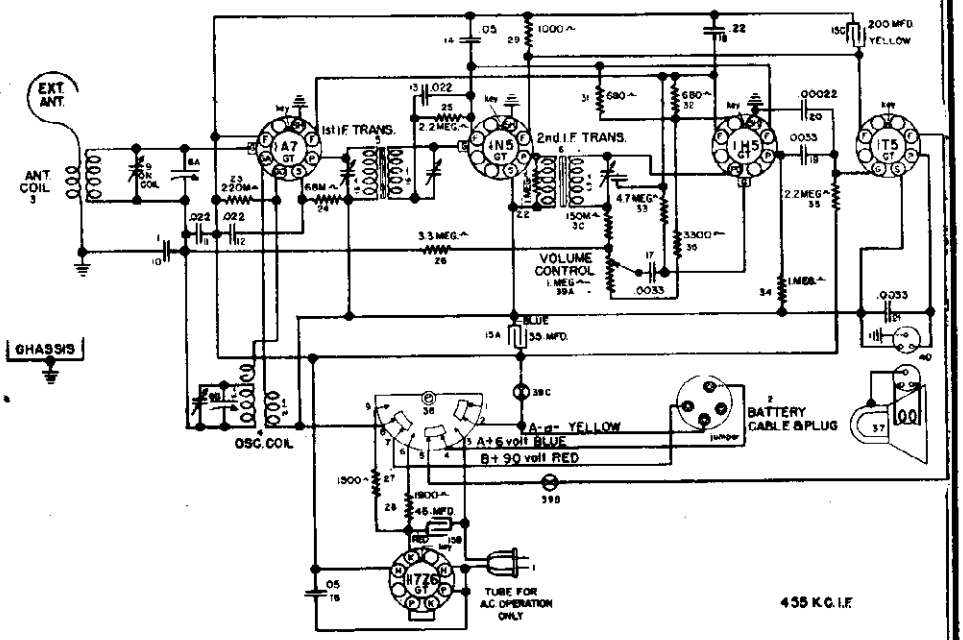
THE CROSLEY CORP.

SERVICE INFORMATION — Model 90 Chassis

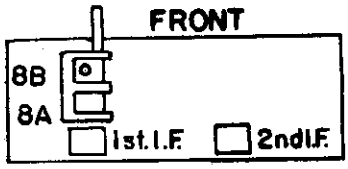
TUBE LAYOUT



WIRING DIAGRAM



TRIMMER LOCATIONS



SOCKETS VOLTAGES — Model 52-PA

Measured from "B" minus using 1000 Ω/V — Voltmeter, 100 V. Range, no signal input

Tube		@ 117.5-Volt Line				Battery Pack			
Type	Function	Filament Volt	Plate Volt	Screen Volt	Cathode Volt	Filament Volt	Plate Volt	Screen Volt	Cathode Volt
1A7GT	Osc. Modulator	1.3	80	34	.....	1.7	90	36	.....
1N5GT	I. F. Amplifier	3.8	80	80	.....	4.4	90	90	.....
1H5GT	Det.-A. S. C. 1st A. F.	2.6	7	.....	.....	3.0	8	.....	.....
1T5GT	Out Put	5.1	72	80	.....	6.0	88	90	.....
117Z6GT	Rectifier	117.5 A. C.	117.5 A. C.	.....	115	.....	.....	.....	.....

ALIGNMENT PROCEDURE — Volume Control on full Output meter connected to Plate and Screen of 1T5GT

SIGNAL GENERATOR		DUMMY ANTENNA	TUNING COND. SETTING	TRIMMERS TO ADJUST (See Fig. 1)	REMARKS
FREQUENCY SETTING	CONNECTION TO RADIO				
455 Kc	Ant. Lead	.0001 MF	Fully open	2nd I-F(1)	Adjust for maximum signal.
455 Kc	Ant. Lead	.0001 MF	Fully open	1st I-F (2)	Adjust for maximum signal. Located top of 1st I-F ass'y.
1650	Ant. Lead	.0001 MF	Fully open	"OSC" Shunt on gang	Adjust for maximum output. Gang does not have to tune through signal.
1400	Ant. Lead	.0001 MF	140 on dial	"ANT" shunt on loop	Adjust for maximum output.

Repeat above procedures for more accurate adjustments
Maximum power output @ 90 V. "B" — approx. 340 M. W.

A Battery drain @ 6 volts, .05 Amp.; "B" Battery drain @ 90 V., 12 M. A.
Power consumption @ 117.5 volts line — 20 Watts

The chassis as employed in this model receiver is a five tube (including rectifier), single band superheterodyne, designed to operate from an "A and B" Battery Pack, or 110 volts A.C. (50-60 cycle) or 110 volt D.C. electric circuits.

TUNING RANGE — 550-1600 Kilocycles — 546-187.5 Meters

TUBES USED — one 1A7GT, one—IN5GT, one—IH5GT, one—IT5GT and one—117Z6GT*

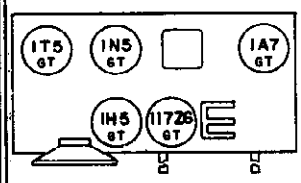
BATTERIES REQUIRED — one No. CR-57 Crosley "A and B" Battery Pack (6 Volt "A"—90 Volt "B").

THE CROSLEY CORP.

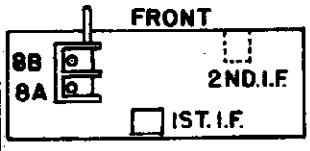
MODEL 52PA, Chassis 67
MODEL 52PB, Chassis 71

SERVICE INFORMATION — Model 67 Chassis

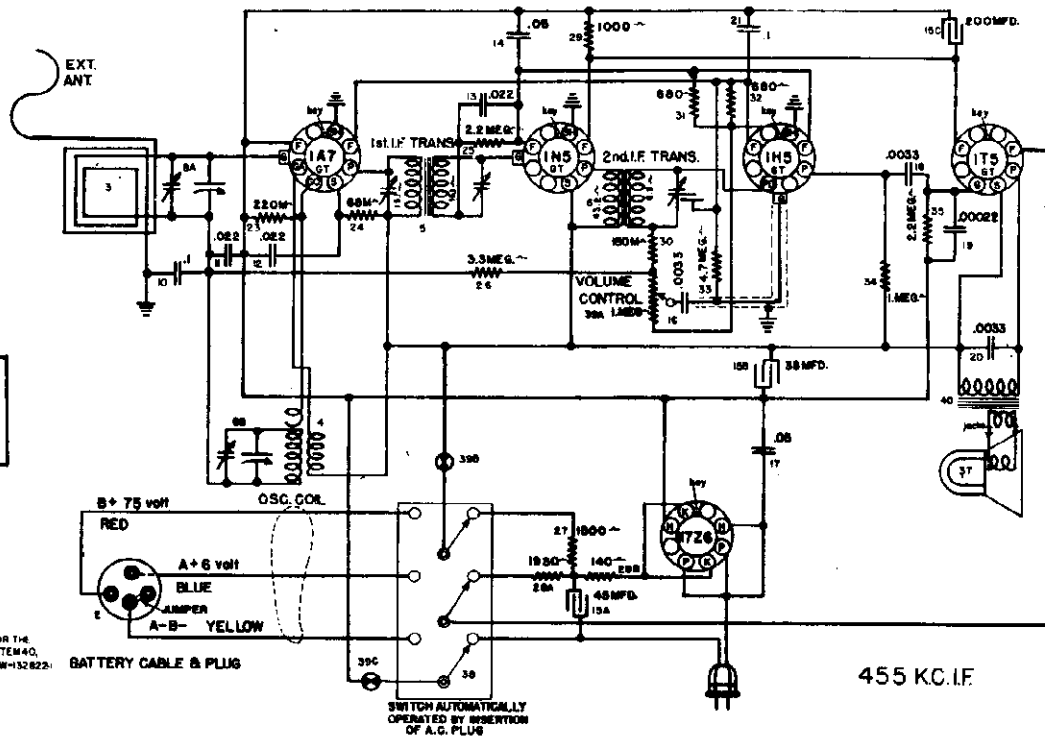
TUBE LAYOUT



TRIMMER LOCATIONS



WIRING DIAGRAM



NOTE: CHASSIS 71 IS SIMILAR TO CHASSIS 67 EXCEPT FOR THE FOLLOWING: ITEM 37, SPEAKER BECOMES L-132825-1. ITEM 40, OUTPUT TRANS. BECOMES ITEM 40, SPK CABLE & SCKT W-132822-1 ALSO ADD ITEM 41, PRONGED PLUG NO. W-132821-1

SOCKET VOLTAGES — Model 52-PA

Measured from "B" minus using 1000 Ω/V — Voltmeter, 100 V. Range, no signal input

Tube		@ 117.5-Volt Line				Battery Pack			
Type	Function	Filament Volt	Plate Volt	Screen Volt	Cathode Volt	Filament Volt	Plate Volt	Screen Volt	Cathode Volt
1A7GT	Osc. Modulator	1.3	80	34	.....	1.7	75	30	.....
1N5GT	I. F. Amplifier	3.8	80	80	.....	4.4	75	75	.....
1H5GT	Det.-A. S. C. 1st A. F.	2.6	7	.....	.....	3.0	6	.....	.....
1T5GT	Out Put	5.1	72	80	.....	6.0	68	75	.....
117Z6GT	Rectifier	117.5 A. C.	117.5 A. C.	.....	100	.....	.....	.....	.....

ALIGNMENT PROCEDURE — Volume Control on full Output meter connected to Plate and Screen of 1T5GT

SIGNAL GENERATOR					
FREQUENCY SETTING	CONNECTION TO RADIO	DUMMY ANTENNA	TUNING COND. SETTING	TRIMMERS TO ADJUST (See Fig. 1)	REMARKS
455 Kc	Ant. Lead	.0001 MF	Fully open	2nd I-F(1) front chassis flange	Adjust for maximum signal.
455 Kc	Ant. Lead	.0001 MF	Fully open	1st I-F (2)	Adjust for maximum signal. Located top of 1st I-F ass'y.
1650	Ant. Lead	.0001 MF	Fully open	"OSC" Shunt on gang	Adjust for maximum output. Gang does not have to tune through signal.
1400	Ant. Lead	.0001 MF	140 on dial	"ANT" shunt on gang	Adjust for maximum output.
600	Ant. Lead	.0001 MF	60 on dial	Iron core in "OSC" coil	Adjust for maximum signal while rocking gang.

Repeat above procedures for more accurate adjustments
Maximum power output @ 75 V. "B" — approx. 200 M. W. undistorted

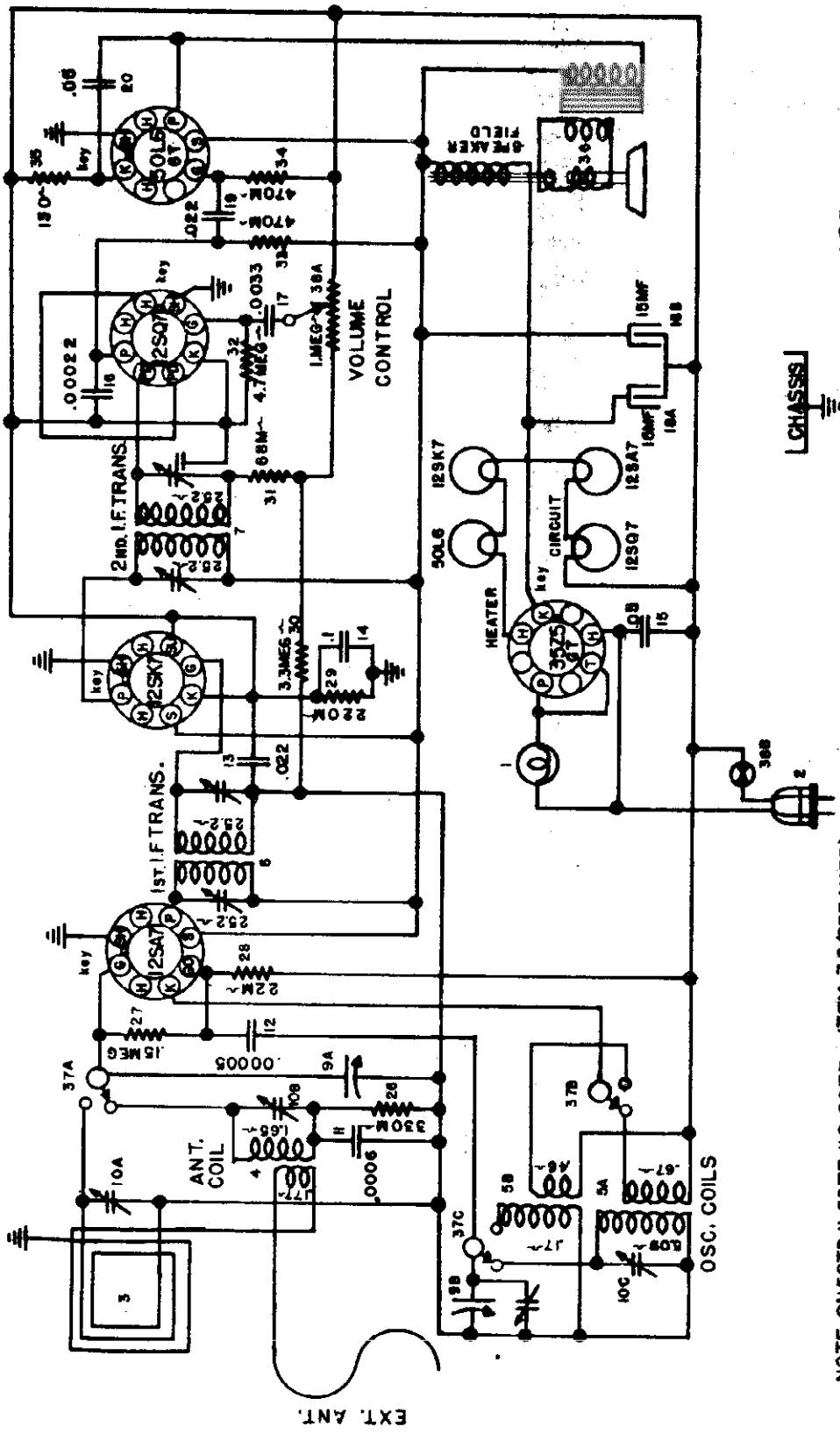
A Battery drain @ 6 volts, .05 Amp.; "B" Battery drain @ 75 V., 9 M. A.
Power consumption @ 117.5 volts line — 20 Watts

The chassis as employed in this model portable receiver is a five tube (including rectifier), single band superheterodyne, designed to operate from an "A and B" Battery Pack, or 110 volts A.C. (50-60 cycle) or 110 volt D.C. electric circuits.

TUNING RANGE — 550-1600 Kilocycles — 546-187.5 Meters
TUBES USED — one 1A7GT, one—IN5GT, one—1H5GT, one—1T5GT and one—117Z6GT
BATTERIES REQUIRED — one No. CR67 Crosley "A and B" Battery Pack (6 Volt "A"—75 Volt "B") or equivalent.

MODELS 52TD, 52TD-U, 52TE, 52TE-U, Chassis 77; 52TF, 52TF-U, Chassis 76

THE CROSLEY CORP.



NOTE-ON 52TD-U, 52TE-U & 52TF-U, ITEM 36 (SPEAKER) BECOMES G3-49675, ALL OTHER PARTS & CONNECTIONS REMAIN THE SAME

NOTE-ON 52TF, ITEM 3 (LOOP ANT.) BECOMES G8132245-1 ALL OTHER PARTS & CONNECTIONS REMAIN THE SAME.

The back on receivers employing the 77 chassis is part of the loop antenna assembly. To gain access to the tubes, carefully pry out two trimount studs which fasten back to top of cabinet. Then remove the two screws at lower edge and carefully lay loop on table. Do not disconnect lead wires to the loop.

The back on receivers employing the 76 chassis is fastened with wood screws. Remove the back, then remove the two screws at lower edge of loop support and carefully lay loop back to gain access to the tubes.

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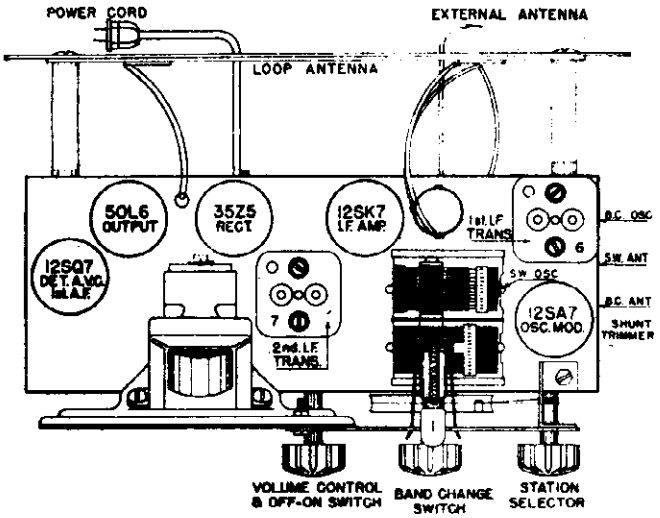
MODELS 52TD, 52TD-U, 52TE
52TE-U, Chassis 77; 52T
52TF-U, Chassis 76

Chassis No. 76 and No. 77 are identical electrically in that they are both five-tube, two band, superheterodyne receivers, designed to operate on either A.C. or D.C. electric circuits, as specified on model label.

TUNING RANGE

Broadcast Band—1600 to 540 kilocycles, or 18.75 to 555 meters
Short Wave Band—15 to 6 megacycles, or 20 to 50 meters.

TUBES	FUNCTION
1 — 12SA7	Oscillator Modulator
1 — 12SK7	Intermediate Frequency Amplifier
1 — 12SQ7	Detector, A.V.C. and 1st Audio Amplifier
1 — 50L6GT	Beam Power Output
1 — 35Z5GT	Rectifier



ALIGNMENT PROCEDURE

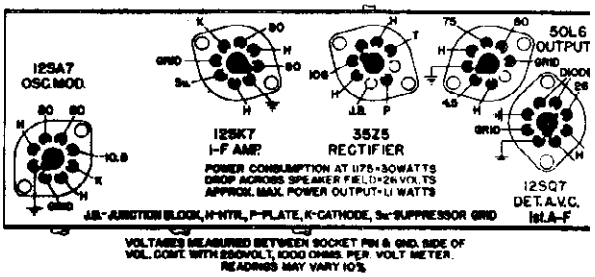
Preliminary

Output Meter Connections . . . . . Plate and screen of 50L6

Generator Ground Connections . . . Ground Lead and Chassis

Dummy Antenna to be in series with generator output

Position of Volume Control . . . . . Fully on



POWER SUPPLY

Make certain that the power rating on the model and license label is the SAME as your lighting circuit BEFORE plugging the receiver power cord into a convenient receptacle. Never put your hand in the receiver cabinet without first disconnecting receiver plug from the electric circuit.

ALIGNMENT PROCEDURE CHART

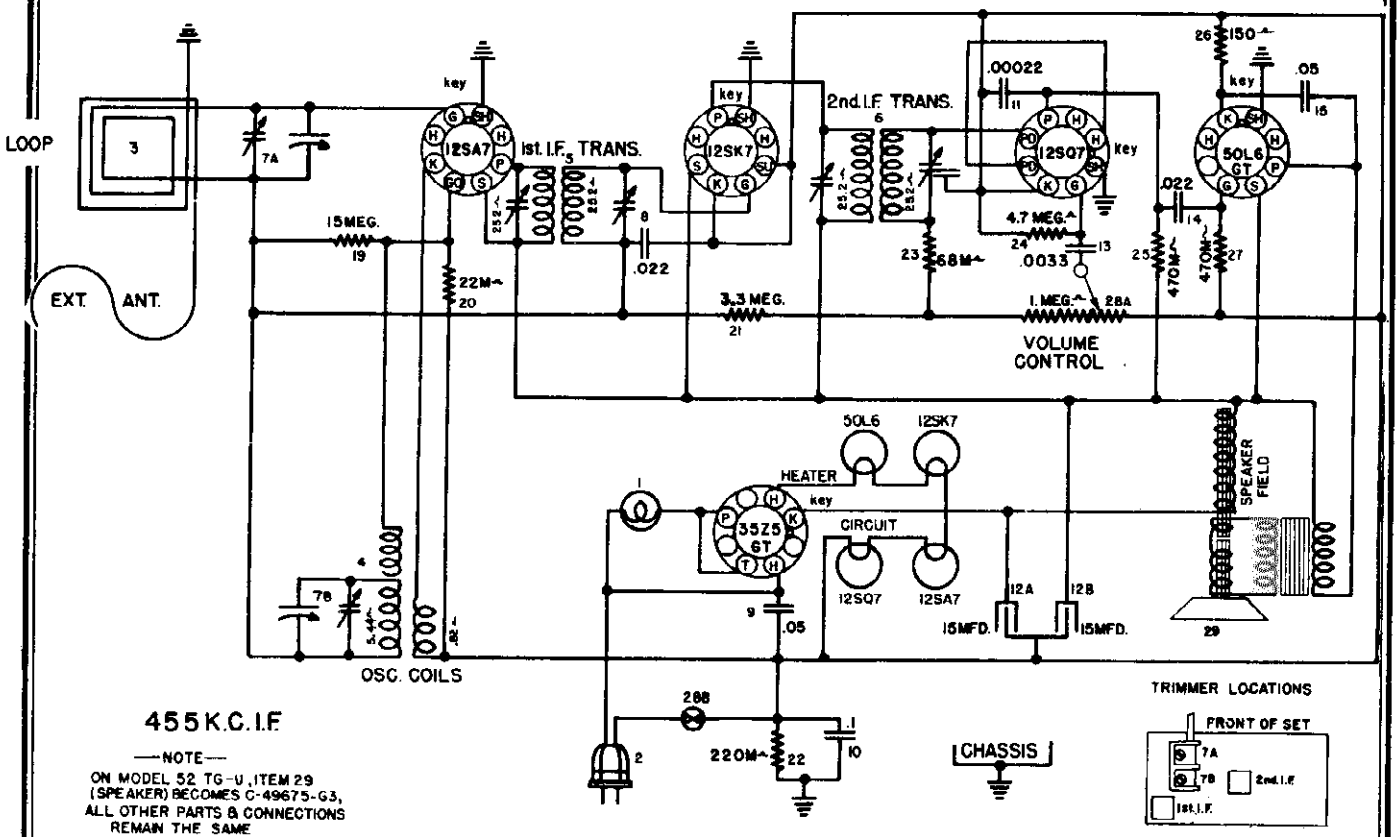
Alignment Sequence	Dummy Antenna	Frequency Setting	Input Connection to Receiver	Band Switch	Tuning Cond. Setting	Trimmer Adjusted	Remarks
1.	Signal Generator .0001 MF.	455 KC.	Antenna Lead	BC	Fully Open	2nd I-F(2) 1st I-F(2)	Adjust for maximum signal. Adjust for maximum signal.
2.	400 ohm Carbon Resistor	15.3 MC.	Antenna Lead (red)	S.W.	Fully Open	S.W. "Osc."	Adjust for maximum output.
3.	400 ohm Carbon	15.0 MC.	Antenna Lead (red)	S.W.	15 on Dial	S.W. "Ant."	Adjust for maximum signal while rocking gang through it.
4.	.0001 MF.	1650 KC.	Antenna Lead (red)	BC	Fully Open	B.C. "Osc."	Adjust for maximum output. Gang does not have to tune through signal
5.	.0001 MF.	1400 KC.	Antenna Lead (red)	BC	140 Dial	B.C. "Ant."	Adjust for maximum output.

When aligning the shortwave band "OSC" trimmer, care must be exercised to see that the circuit is aligned on the correct frequency and not on the image which is approximately 910 kilocycles less as indicated on the dial. To check, increase generator output, tune in the generator frequency and then tune in the image frequency which should be weaker than the fundamental and come in approximately 910 kilocycles lower on the dial than the fundamental. If image cannot be tuned in, the "OSC" trimmer is adjusted to the wrong peak. (Correct peak is the second peak on trimmer from the closed position.)

Repeat the original alignment procedure for more accurate adjustments. Always keep signal generator output as low as possible to prevent action of the A.V.C. circuit.

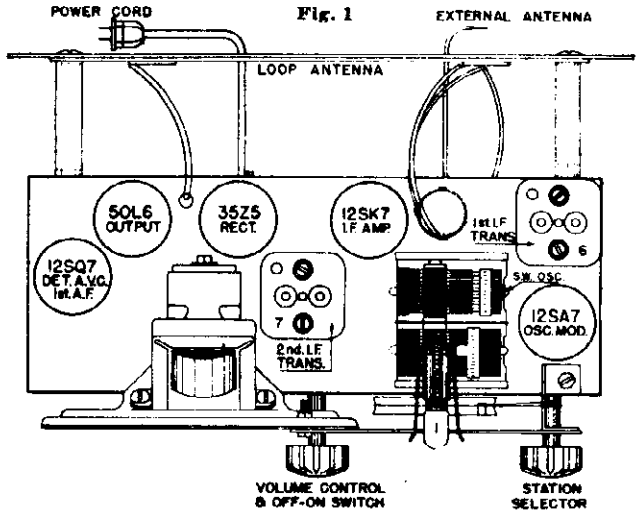
MODELS 52TG, Chassis 74,
52TG-U, Chassis 74U

THE CROSLEY CORP.



TUNING RANGE—Broadcast Band—1600 to 540 kilocycles, or 18.75 to 555 meters.

Fig. 1



ALIGNMENT PROCEDURE

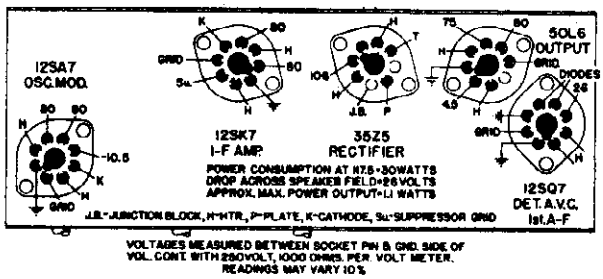
Preliminary

Output Meter Connections . . . . . Plate and screen of 50L6

Generator Ground Connections . . . Ground Lead and Chassis

Dummy Antenna to be in series with generator output

Position of Volume Control . . . . . Fully on

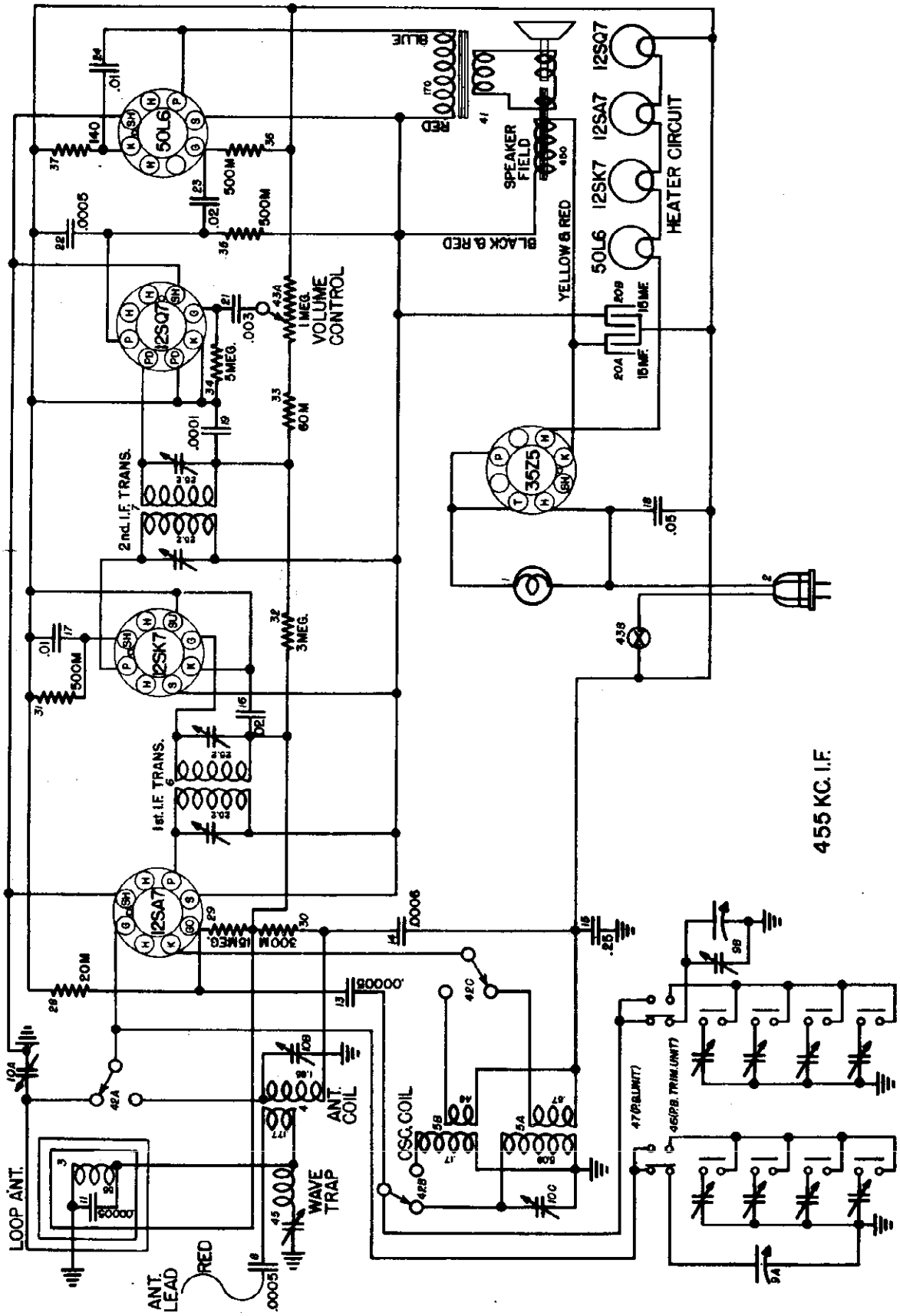


ALIGNMENT PROCEDURE CHART

Alignment Sequence	Dummy Antenna	Frequency Setting	Input Connection to Receiver	Band Switch	Tuning Cond. Setting	Trimmer Adjusted	Remarks
1.	.0001 MF.	455 KC.	Antenna Lead	BC	Fully Open	1st I-F(2) 2nd I-F(2)	Adjust for maximum signal. Adjust for maximum signal.
2.	.0001 MF.	1650 KC.	Antenna Lead	BC	Fully Open	B.C."Osc."	Adjust for maximum output. Gang does not have to tune through signal
3.	.0001 MF.	1400 KC.	Antenna Lead	BC	140 Dial	B.C."Ant."	Adjust for maximum output.

Repeat the original alignment procedure for more accurate adjustments. Always keep signal generator output as low as possible to prevent action of the A.S.C. circuit.

THE CROSLEY CORP.



MODELS TK52, TK52W
Chassis 64

"Set-Up Procedure"
CHASSIS 63 and 64

ALIGNMENT CHART

Sequence	SIGNAL GENERATOR Dummy Antenna	Frequency Setting	Input Connection To Radio	Band Switch	Tuning Cond. Setting	Trimmer Cond. Adjusted	Remarks
1.	.05 Mf.	456 Kc.	Antenna	S. B.	Fully on	2nd I-F (2) 1st I-F (2)	Adjust for maximum output. Adjust for maximum output.
2.	400 Ohm carbon	15.4 Mc.	Antenna	S. W.	Fully open	S. W. "OSC" (Rear section tuning cond.)	Adjust for maximum output.
3.	400 Ohm carbon	15.0 Mc.	Antenna	S. W.	Approx. 15 on dial	S. W. "ANT" (Center trimmer right end of chassis)	Adjust for maximum output while rocking gang thru signal.
4.	.0002 Mf.	1600 Kc.	Antenna	S. B.	Fully on	B. C. "OSC" (Front trimmer right end of Chassis)	Adjust for maximum output. Gang does not have to tune thru signal.
5.	.0002 Mf.	1400 Kc.	Antenna	S. B.	Approx. 140 on dial	B. C. "ANT" (Rear trimmer right end of chassis)	Adjust for maximum output.

(Foot Note) (1). Do not use a ground return from the signal generator unless it is found to be absolutely necessary. If necessary a small condenser (approx. .001 mf. 400 V) should be connected in series with the ground lead of the generator and receiver chassis.

When aligning the short wave band "OSC" trimmer, care must be exercised to see that the circuits are aligned on the correct frequency and not on the image which is approximately 910 kilocycles less as indicated on the dial. To check, increase generator output, tune in the generator frequency and then tune in the image frequency which should be weaker than the fundamental and come in approximately 910 kilocycles **lower on the dial** than the fundamental. If the image cannot be tuned in, the "OSC" trimmer is adjusted to the wrong peak. (Correct peak is the second peak on trimmer from the closed position.)

Repeat the original alignment procedure for more accurate adjustments. Always keep signal generator output as low as possible to prevent action of the A. V. C. circuit.

WAVE TRAP

Some chassis of this model are equipped with a wave trap for the purpose of eliminating interference from code stations which operate on a frequency of approximately 455 kilocycles. This assembly consists of a coil, and a trimmer condenser as illustrated by the dotted lines in the Wiring Diagram. The wave trap should not be adjusted until all other adjustments have been made. To make the adjustment, feed a 455 kilocycle signal from the signal generator through a 50 mmf. condenser into the antenna terminal of the receiver. With the gang condenser open and the volume control fully on, adjust the trimmer condenser on the wave trap for MINIMUM output.

Should the interfering station be operating on a frequency of slightly more or less than 455 kilocycles, the exact frequency should be determined with the aid of the signal generator. Then instead of feeding a 455 kilocycle signal into the receiver the exact frequency of the interfering signal should be used. If it is not possible to determine the exact frequency of the interfering signal the antenna may be attached to the receiver and the receiver tuned to the position where the interfering signal is most noticeable. Then adjust the wave trap for minimum interference.

THE SETTING AND OPERATION OF THE ELECTRIC PUSH BUTTONS

Select and remove the call letter tabs of your four favorite local broadcast stations from the station call letter sheets supplied. Place them in the windows above the push buttons, in the order of their frequency (Kilocycles). That is, the station whose frequency is within the frequency range of the left hand button should be inserted (from top) in the window directly above that button and so on for the following three. The push button on the right MUST be depressed when receiver is to be tuned with the station selector knob. Place the "Manual" or "Dial" tab in window above this button.

The frequencies (Kilocycles) of your local stations may be found in your daily paper or by referring to any station list.

THE CROSLEY CORP.

NOTE: To simplify the set-up and insure correct adjustments of push buttons the following pre-adjustments should be made:

1. Tighten all the padder condensers' screws.
2. Then loosen each "ANT" padder screw approximately two turns.

While adjusting "OSC" padder screws always turn very slowly as they tune very sharp and it is possible to tune past station without hearing the signal.

SET-UP PROCEDURE

1. Turn the set on and leave operate for about ten or twenty minutes before attempting to set the push buttons.

2. Due to the wide range to which each button will tune it is essential that the stations selected are well within each buttons tuning range.

3. Push in the "Manual" button (extreme right) and using the station selector knob, tune in the station to which the No. 1 button is to be set.

4. Push in the No. 1 button and using a long, thin screw driver adjust the "OSC"/A padder screw, turning slowly (extreme right looking at rear of cabinet) until the station you tuned in (MANUALLY) is heard again. The padder condensers are accessible through the long horizontal opening in the upper left side of cabinet back. Be sure to adjust for maximum volume in speaker.

5. Adjust the No. 1 push button "ANT"/AA padder condenser for maximum volume in speaker.

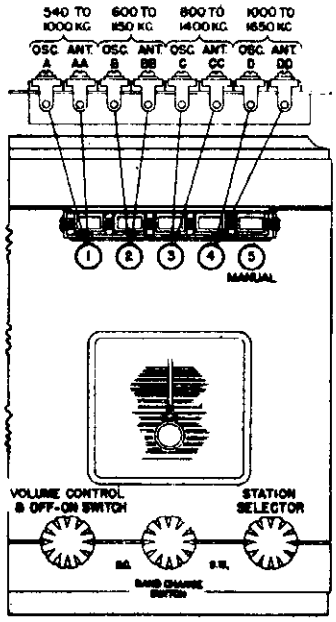


Fig. 3—Front View

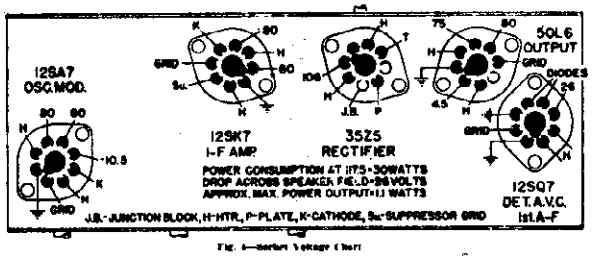
6. Push in "Manual" push button and re-check station to make sure button is correctly set. There should be no change in volume when switched from push button to manual.

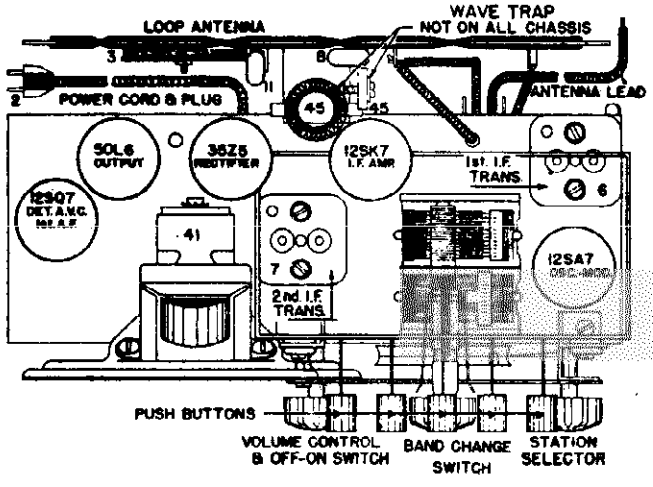
7. The set up for No. 1 button is then complete. Set up remaining buttons, using same procedure; adjust the "OSC" padder first, then the "ANT" padder, etc.

To tune the receiver with the push buttons, simply press in the button which corresponds to the call letters of the desired station: The volume may be adjusted to suit.

Tubes Used	Functions
12SA7	Oscillator—Modulator
12SK7	Intermediate Frequency Amplifier
12SQ7	Detector, A.V.C. 1st Audio Amplifier
50L6	Beam Power Output
35Z5	Rectifier

Tube may be GT (Bantam) or metal equivalents.





MODEL 52TP, Chassis 72

THE CROSLEY CORP.

Model No. 52-TP is a Table Model Phono-Combination incorporating a five-tube, two-band superheterodyne receiver and a sensitive and efficient unit for the reproduction of phonograph recordings. Designed to operate on A.C. electric circuits as specified on model label.

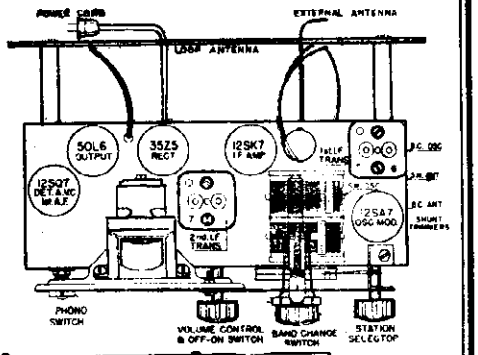
TUNING RANGE—Broadcast Band—1600 to 540 kilocycles, or 18.75 to 555 meters. Short Wave Band—15 to 6 megacycles, or 20 to 50 meters.

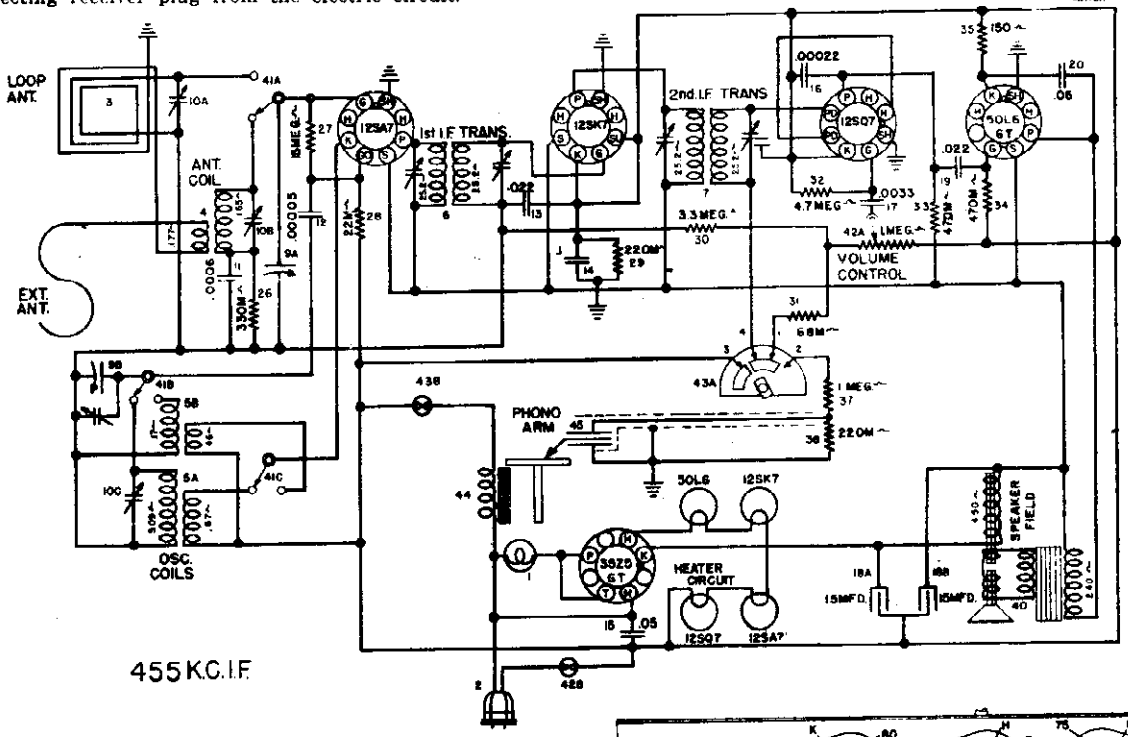
TUBES—1—12SA7, 1—12SK7, 1—12SQ7, 1—50L6GT, 1—35Z5GT. Tubes must be GT (Bantam) or metal equivalent.

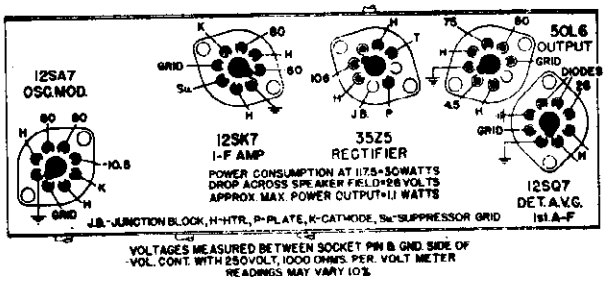
ANTENNA—This model has a built-in loop antenna. Under normal conditions this loop antenna will provide sufficient pickup for satisfactory reception from nearby and powerful stations, whose operating frequency is between 1600 and 540 kilocycles. Due to the slightly directional effect of the loop antenna, reception from some stations may be improved by turning the receiver. For Short Wave or distant reception on the broadcast band, an outdoor antenna should be installed. Connect the antenna lead-in wire to the red lead extending from the rear of the cabinet.

GROUND—NEVER ATTACH A GROUND WIRE TO THIS RECEIVER.

POWER SUPPLY—Make certain that the power rating on the model and license label is the SAME as your lighting circuit BEFORE plugging the receiver power cord into a convenient receptacle. Never put your hand in the receiver cabinet without first disconnecting receiver plug from the electric circuit.







VOLTAGES MEASURED BETWEEN SOCKET PIN & GND. SIDE OF VOL. CONT. WITH 250 VOLT, 1000 OHMS PER VOLT METER READINGS MAY VARY 10%

ALIGNMENT PROCEDURE

Preliminary

Output Meter Connections . . . . . Plate and screen of 50L6

Generator Ground Connections . . . Ground Lead and Chassis

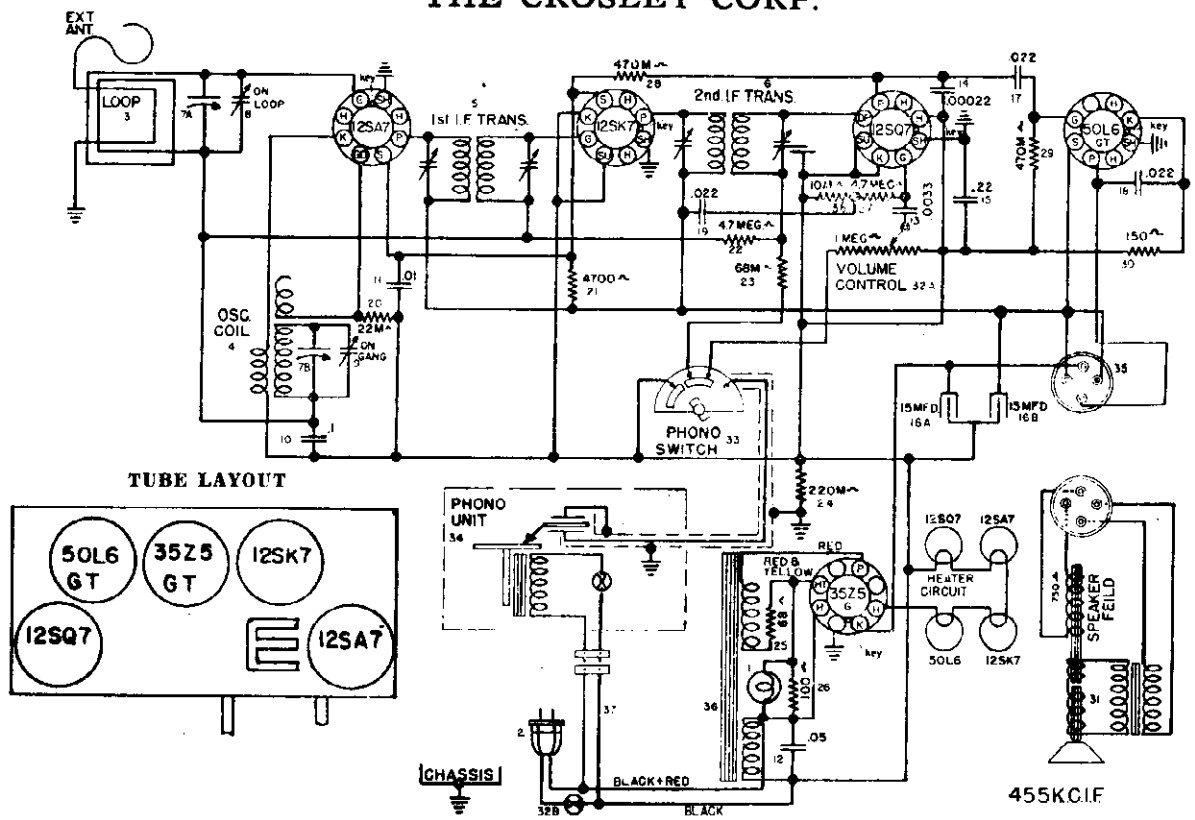
Dummy Antenna to be in series with generator output

Position of Volume Control . . . . . Fully on

Alignment Sequence	Dummy Antenna	Frequency Setting	Input Connection to Receiver	Band Switch	Tuning Cond. Setting	Trimmer Adjusted	Remarks
1.	.0001 MF.	455 KC.	Antenna Lead	BC	Fully Open	1st I-F(2) 2nd I-F(2)	Adjust for maximum signal. Adjust for maximum signal.
2.	400 ohm Carbon Resistor	15.3 MC.	Antenna Lead (red)	S.W.	Fully Open	S.W. "Osc."	Adjust for maximum output.
3.	400 ohm Carbon	15.0 MC.	Antenna Lead (red)	S.W.	15 on Dial	S.W."Ant."	Adjust for maximum signal while rocking gang through it.
4.	.0001 MF.	1650 KC.	Antenna Lead (red)	BC	Fully Open	B.C."Osc."	Adjust for maximum output. Gang does not have to tune through signal
5.	.0001 MF.	1400 KC.	Antenna Lead (red)	BC	140 Dial	B.C."Ant."	Adjust for maximum output.

When aligning the shortwave band "OSC" trimmer, care must be exercised to see that the circuit is aligned on the correct frequency and not on the image which is approximately 910 kilocycles less as indicated on the dial. To check, increase generator output, tune in the generator frequency and then tune in the image frequency which should be weaker than the fundamental and come in approximately 910 kilocycles lower on the dial than the fundamental. If image cannot be tuned in, the "OSC" trimmer is adjusted to the wrong peak. (Correct peak is the second peak on trimmer from the closed position.) Repeat original alignment procedure for more accurate adjustments. Keep signal generator output low as possible to prevent action of A.S.C. circuit.

THE CROSLEY CORP.



TUBE LAYOUT

Connect output meter to plate and screen of 50L6. Connect generator ground to chassis through .C01 mf. Volume control on full.

TUNING RANGE — Broadcast Band — 1600 to 540 kilocycles, or 18.75 to 555 meters

TUBES—1—12SA7, 1—12SK7, 1—12SQ7, 1—50L6GT, 1—35Z5GT. Tubes must be G7 (Bantam) or metal equivalent.

ANTENNA—This model has a built-in loop antenna. Under normal conditions thi loop antenna will provide sufficient pickup for satisfactory reception from nearby an powerful stations, whose operating frequency is between 1600 and 540 kilocycles. Du to the slightly directional effect of the loop antenna, reception from some station may be improved by turning the receiver. For distant reception on the broadcas band, an outdoor antenna should be installed. Connect the antenna lead-in wire t the red lead extending from the rear of the cabinet.

GROUND—NEVER ATTACH A GROUND WIRE TO THIS RECEIVER.

POWER SUPPLY—Make certain that the power rating on the model and license labe is the SAME as your lighting circuit BEFORE plugging the receiver power cord int a convenient receptacle. Never put your hand in the receiver cabinet without firs disconnecting receiver plug from the electric circuit.

ALIGNMENT PROCEDURE CHART

Alignment Sequence	Dummy Antenna	Frequency Setting	Input Connection to Receiver	Phono. Radio Switch	Tuning Cond. Setting	Trimmer Adjusted	Remarks
1.	.0001 MF.	455 KC.	Antenna Lead	Radio	Fully Open	1st I-F(2) 2nd I-F(2)	Adjust for maximum signal. Adjust for maximum signal.
2.	.0001 MF.	1650 KC.	Antenna Lead (red)	Radio	Fully Open	B.C."Osc."	Adjust for maximum output. Gang does not have to tune through signal.
3.	.0001 MF.	1400 KC.	Antenna Lead (red)	Radio	140 Dial	B.C."Ant."	Adjust for maximum output.

Repeat the original alignment procedure for more accurate adjustments. Always keep signal generator output as low as possible to prevent action of the A. S. C. circuit.

Socket Voltage is measured @ 117.5 V line

TUBE VOLTAGE CHART

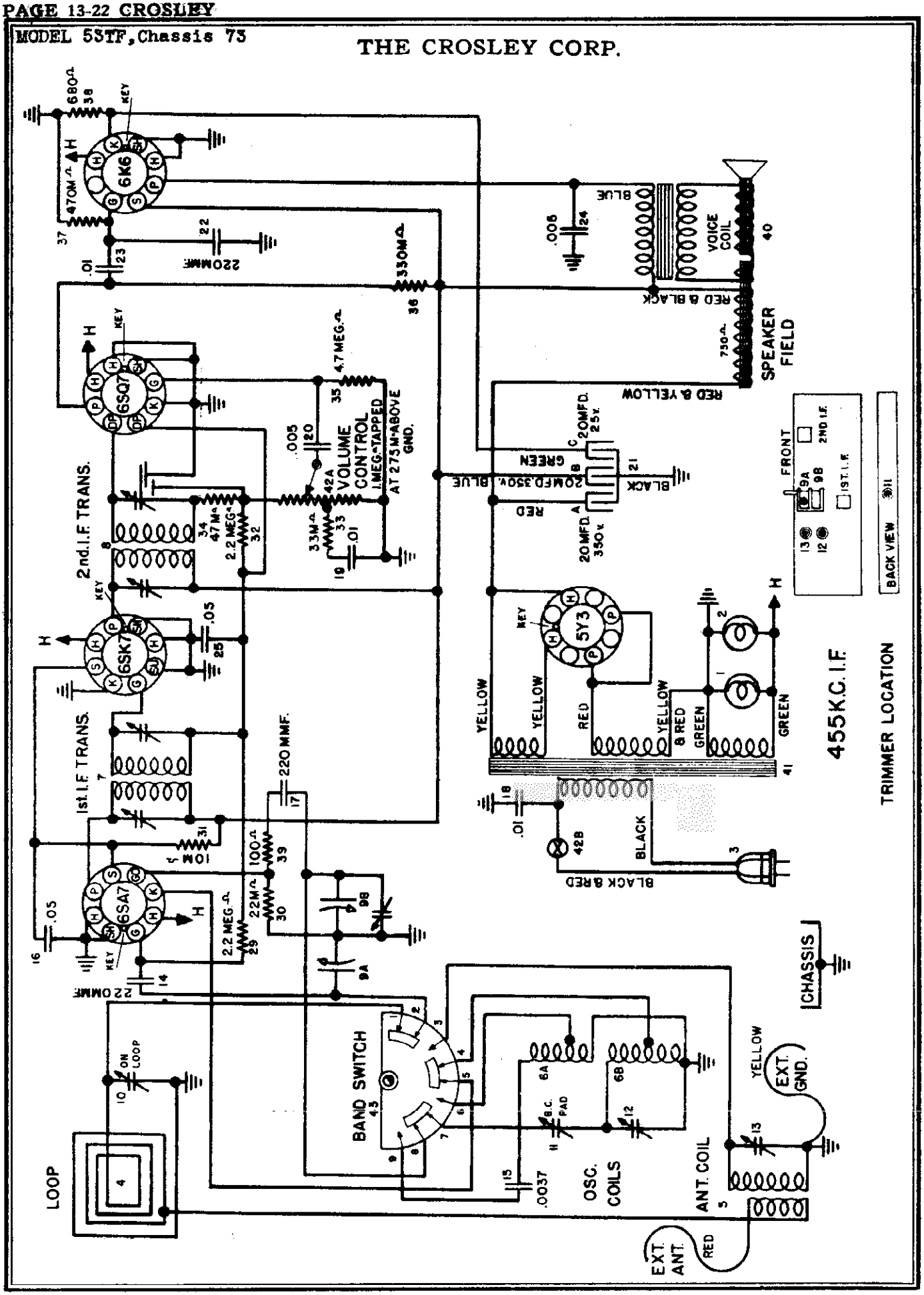
(BETWEEN SOCKET PINS AND B—) WITH 1000 OHM PER VOLT—500 V. RANGE D. C. VOLTMETER

TUBE	FUNCTION	PIN NUMBER							
		1	2	3	4	5	6	7	8
12SA7	Osc. Mod.	....	....	123	78	Neg.	0	....	Neg.
12SK7	I. F. Amp.	....	....	0	Neg.	0	78	....	123
12SQ7	Det., Etc.	....	0	0	0	Neg.	18.5*	....	0
50L6	B. P. O.	....	....	112	123	0	....	....	8.5
35Z5	Rect.	....	....	....	....	208AC	....	....	188

All voltages may vary 10% of values indicated. Neg. indicates Neg. reading on Voltmeter Scale but of too small a value to record accurately. *Measured on 100 V. Scale. Power consumption at 117.5 V. line, 60 watts. Phono Motor 20 watts additional. Drop across Speaker Field—65 V Current thru Speaker Field—90 M. A.

MODEL 53TF, Chassis 73

THE CROSLEY CORP.



THE CROSLEY CORP.

TUBE VOLTAGE CHART

SOCKET VOLTAGES MEASURED AT 117.5 V. LINE (BETWEEN SOCKET PIN AND CHASSIS) WITH 1000 OHM PER VOLT, 500 V. RANGE VOLTMETER (D. C.)

TUBE	FUNCTION	PIN NUMBER 1	2	3	4	5	6	7	8
6SA7	OSC.—Mod.	0	0	180	73		0	6.3 A. C.	0
6SK7	I. F. Amplifier	0	0	0	0	0	73	6.3 A. C.	180
6SQ7	Det. A. S. C. 1st A. F.	0	0	0	0	0	68	6.3 A. C.	0
6K6G or GT	Output	0	0	160	180	0	180	6.3 A. C.	9
5Y3G	Rectifier	0	225		270 A.C.		270 A. C.		225

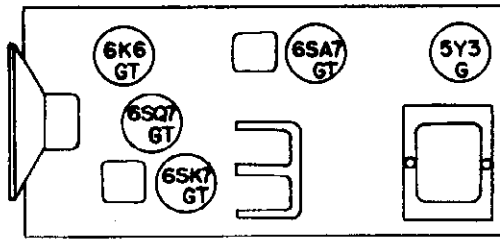
MAX. POWER OUTPUT ..... 3.0 WATTS.
POWER CONSUMPTION ..... 53 WATTS.
DROP ACROSS SPEAKER FIELD ..... 45 VOLTS.

Voltages may vary 10% of values given.

This is a five-tube, two-band superheterodyne receiver, designed for operation on Alternating Current (A. C.) power supply as specified on the Model and License Label.

TUBES	FUNCTION
1—6SA7	Oscillator-Modulator
1—6SK7	Intermediate Frequency Amplifier
1—6SQ7	Detector, A.S.C., 1st Audio Amplifier
1—6K6 G or GT	Pentode Output
1—5Y3G	Rectifier.

TUBE LAYOUT



TUNING RANGE

Broadcast Band—550 Kc. to 1600 Kc.
Short Wave Band—5.2 Mc. to 18.0 Mc.

ALIGNMENT PROCEDURE

Output Meter Connections ..... Plate and Screen of 6K6G
Generator Ground Connection ..... To Chassis or Ground Lead
Dummy Antenna to be in series with generator output ..... See Chart Below
Position of Volume Control ..... Fully On

ALIGNMENT PROCEDURE CHART

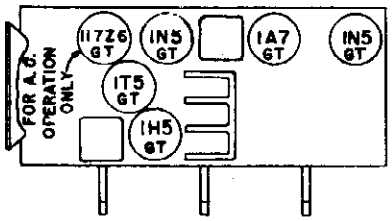
Alignment Sequence	Signal Generator: Dummy Antenna	Signal Generator: Frequency Setting	Input Connection to Receiver	Band Switch	Tuning Cond. Setting	Trimmer Adjusted	Remarks
1.	.02 MF.	455 Kc.	Stator lug Rear section of Gang Cond.	B. C.	Fully open	2nd I-F (2) 1st I-F (2)	Adjust for Maximum. Adjust for Maximum.
2.	400 ohm (carbon)	18.3 Mc.	Ant. Terminal	S. W.	Fully open	S. W. "OSC"	Adjust for peak. Gang does not have to tune thru signal.
3.	400 ohm (carbon)	18.0 Mc.	Ant. Terminal	S. W.	Approx. 18	S. W. "ANT" Trimmer	Adjust for maximum output while rocking gang thru signal. do not touch B. C. Osc. Trimmer.
4.	.0002 MF.	1650 Kc.	Ant. Terminal	B. C.	Fully open	B. C. "OSC" Trimmer	Adjust for peak; gang does not have to tune thru signal. Loop must be connected.
5.	.0002 MF.	600 Kc.	Ant. Terminal	B. C.	Approx. 60 on dial	B. C. "OSC" Series Trimmer	Adjust for maximum output while rocking gang thru signal.
6.	.0002 MF.	1400 Kc.	Ant. Terminal	B. C.	Approx. 140 on dial	B.C. LOOP "ANT" Trimmer	Adjust for maximum output do not touch B. C. Osc. Trimmer.
7.	Repeat the above alignment procedure for more accurate adjustments. Always keep signal generator output as low as possible to prevent action of the A. S. C. circuit.						

IMPORTANT ALIGNMENT NOTES — When aligning the shortwave band "OSC" trimmer care must be exercised to see that the circuit is aligned on the correct frequency and not on the image which is approximately 910 kilocycles less as indicated on the Receiver dial. To check, increase generator output tune-in the generator frequency and then tune-in the image frequency which should be weaker than the fundamental and come in approximately 910 kilocycles lower on the Receiver dial than the fundamental. If image cannot be tuned-in, the "OSC" trimmer is adjusted to the wrong peak. (Correct peak is the second peak on trimmer from the closed position.)

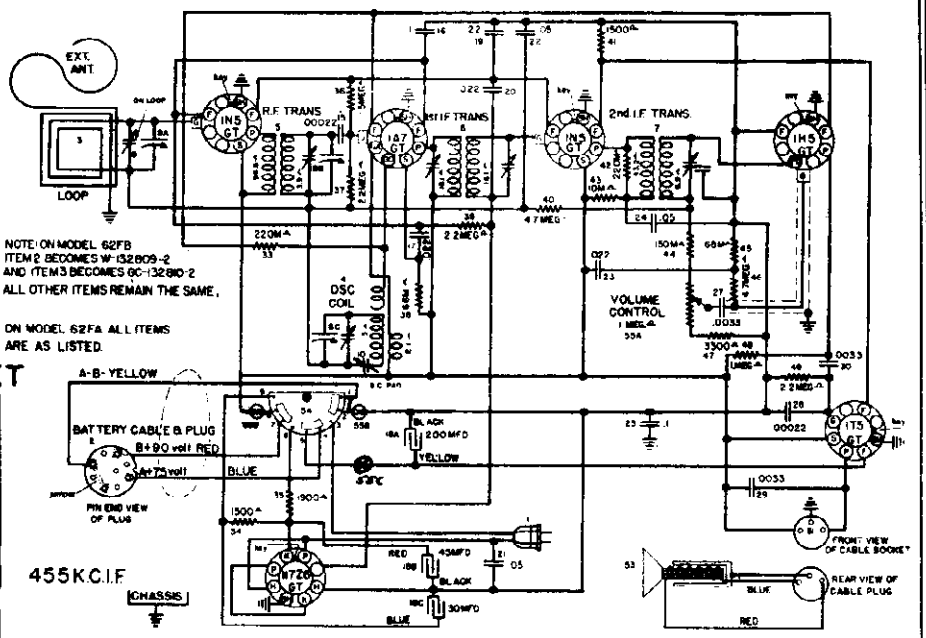
MODELS 62FA, 62FB,
Chassis 58

THE CROSLEY CORP.

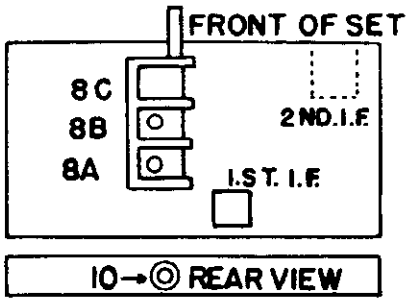
TUBE LAYOUT



WIRING DIAGRAM



TRIMMER LOCATIONS



SOCKETS VOLTAGES — Chassis No. 58

Measured from "B" minus using 1000 Ω/V — Voltmeter, 100 V. Range, no signal input

Tube		@ 117.5-Volt Line				Battery Pack			
Type	Function	Filament Volt	Plate Volt	Screen Volt	Filament Volt	Filament Volt	Plate Volt	Screen Volt	Filament Volt
1N5GT	R. F. Amplifier	2.8	90	90	4.0	2.8	90	90	4.0
1A7GT	Osc. Modulator	1.4	90	36	2.7	1.4	90	90	2.8
1N5GT	I. F. Amplifier	4.0	76	90	5.2	4.0	76	76	5.4
1H5GT	Det.-A. S. C. 1st A. F.	0	12	.....	1.3	0	12	.....	1.4
1T5GT	Out Put	5.4	83	90	6.7	5.4	83	90	7.5
117Z6GT	Rectifier	117.5 A. C.	117.5 A. C.	.....	97	.....	.....	.....	.....

ALIGNMENT PROCEDURE — Volume Control on full Output meter connected to Plate and Screen of 1T5GT

SIGNAL GENERATOR FREQUENCY SETTING	CONNECTION TO RADIO	DUMMY ANTENNA	TUNING COND. SETTING	TRIMMERS TO ADJUST (See Fig. 1)	REMARKS
455 Kc	Ant. Lead	.0001 MF	Fully open	2nd I-F(1)	Adjust for maximum signal.
455 Kc	Ant. Lead	.0001 MF	Fully open	1st I-F (2)	Adjust for maximum signal. Located top of 1st I-F ass'y.
1650	Ant. Lead	.0001 MF	Fully open	"OSC" Shunt on gang	Adjust for maximum output. Gang does not have to tune through signal.
1400	Ant. Lead	.0001 MF	140 on dial	"ANT" shunt on gang	Adjust for maximum output.
1400	Ant. Lead	.0001 MF	140 on dial	"RF" shunt on gang	Adjust for maximum output.
600	Ant. Lead	.0001 MF	60 on dial	"OSC." Series Pad	Adjust for maximum output while rocking gang.

Repeat above for more accurate adjustments
Maximum power output @ 90 V. "B" — approx. 340 M. W.

A Battery drain @ 7.5 volts, .05 Amp.; "B" Battery drain @ 90 V., 12.5 M. A. @
Power consumption @ 117.5 volts line — 22 Watts

The chassis as employed in this model receiver is a six tube (including rectifier), single band superheterodyne, designed to operate from an "A and B" Battery Pack, or 110 volts A.C. (50-60 cycle) or 110 volt D.C. electric circuits.

TUNING RANGE — 550-1600 Kilocycles — 546-187.5 Meters

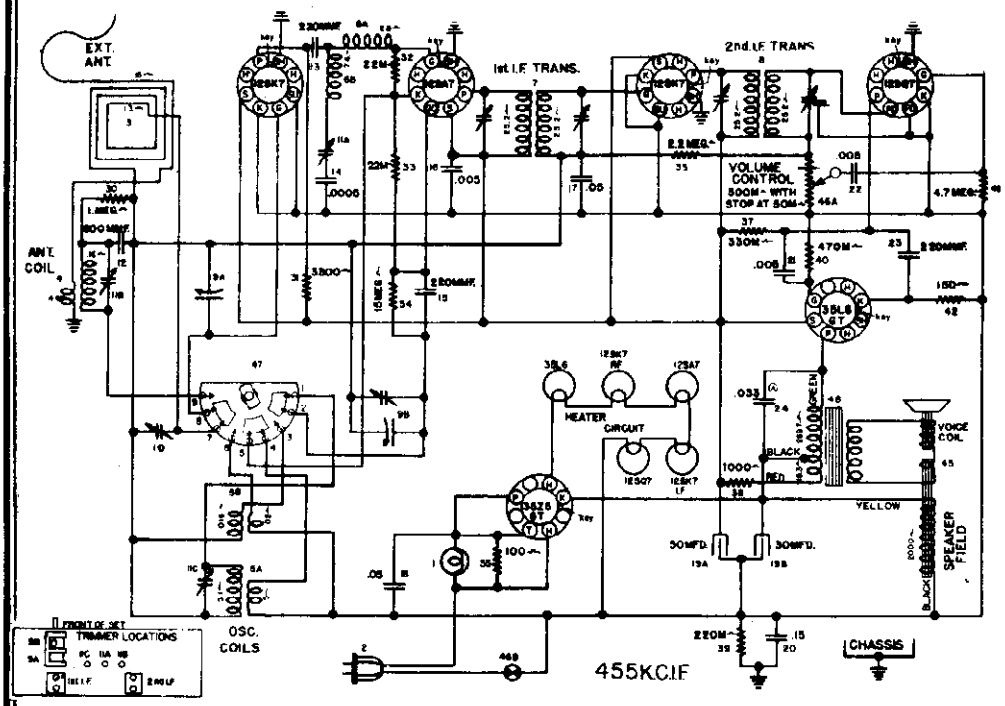
TUBES USED — one 1A7GT, two—IN5GT, one—IH5GT, one—IT5GT and one—117Z6GT*

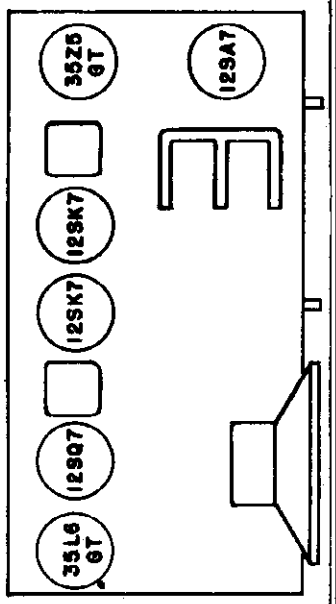
BATTERIES REQUIRED — one No. CR-58 Crosley "A and B" Battery Pack (7.5 Volt "A"—90 Volt "B").

MODELS 62TA, 62TC, 62TD

THE CROSLEY CORP.

Chassis 37





TUBE LOCATION

ALIGNMENT PROCEDURE

Preliminary
Output Meter Connections.....To Voice Coil Terminals of Speaker or to Plate of 35L6GT and Cathode of 35Z5GT
Generator Ground Connections.....In Series with .001 MFD. Condenser
Dummy Antenna.....400 Ohm Carbon Resistor in Series with Generator Output
Position of Volume Control.....Fully On

ALIGNMENT CHART

Step	Signal Generator Frequency Setting	Input	Band Switch	Tuning Cond. Setting	Trimmer Adjusted	Remarks	Location
1 1-A	456 Kc. 456	Antenna Antenna	S. B. S. B.	Fully open Fully open	2nd I-F (2) 1st I-F (2) Wave trap	Adjust for maximum output. Adjust for minimum output.	Tops of I. F. Trans. Center Section of 3 Sec. Trimmer.
2	15.3 Mc.	Antenna	S. W.	Fully open	S. W. "OSC"	Adjust for maximum output.	Top of Tuning Condenser
3	15.0 Mc.	Antenna	S. W.	Approx. 15 on dial	S. W. "Ant."	Adjust for maximum output while rocking gang thru signal.	L. H. Section of 3 Sec. Trimmer.
4	1650 Kc.	Antenna	S. B.	Fully open	B. C. "OSC" (front trimmer right end of chassis)	Adjust for maximum output. Gang does not have to tune thru signal.	R. H. Section of 3 Sec. Trimmer.
5	1400 Kc.	Antenna	S. B.	Approx. 1400 on dial	B. C. "ANT"	Adjust for maximum output.	On Cabinet Back.

When aligning the short wave band "OSC" trimmer care must be exercised to see that the circuits are aligned on the correct frequency and not on the image which is approximately 910 kilocycles less as indicated on the dial. To check, increase generator output, tune-in the generator frequency and then tune-in the image frequency which should be weaker than the fundamental and come in approximately 910 kilocycles lower on the dial than the fundamental. If image cannot be tuned in, the "OSC" trimmer is adjusted to the wrong peak. (Correct peak is the second peak on trimmer from the closed position). Repeat original alignment procedure for more accurate adjustments. Always keep signal generator output low as possible to prevent action of A.S.C. circuit.

Socket Voltage is measured @ 117.5 V line

TUBE VOLTAGE CHART

(BETWEEN SOCKET PINS AND B—) WITH 1000 OHM PER VOLT—500 V. RANGE D. C. VOLTMETER

TUBE	FUNCTION	PIN NUMBER							
		1	2	3	4	5	6	7	8
12SK7	R. F. Amp.	.....	.....	0	Neg.	0	76	.....	40
12SA7	Osc. Mod.	.....	.....	76	76	Neg.	0	.....	Neg.
12SK7	I. F. Amp.	.....	.....	0	Neg.	0	76	.....	76
12SQ7	Det., Etc.	0	0	0	0	Neg.	16*	.....	0
35L6	B. P. O.	.....	.....	92	76	0	.....	.....	4
35Z5	Rect.	.....	.....	.....	.....	113AC	.....	.....	100

All voltages may vary 10% of values indicated. Neg. indicates Neg. reading on Voltmeter Scale but of too small a value to record accurately.
* Measured on 100 V. Scale. Power consumption at 117.5 V. line, 30 watts. Drop across Speaker Field—100 V. Current thru Speaker Field—52 M.A

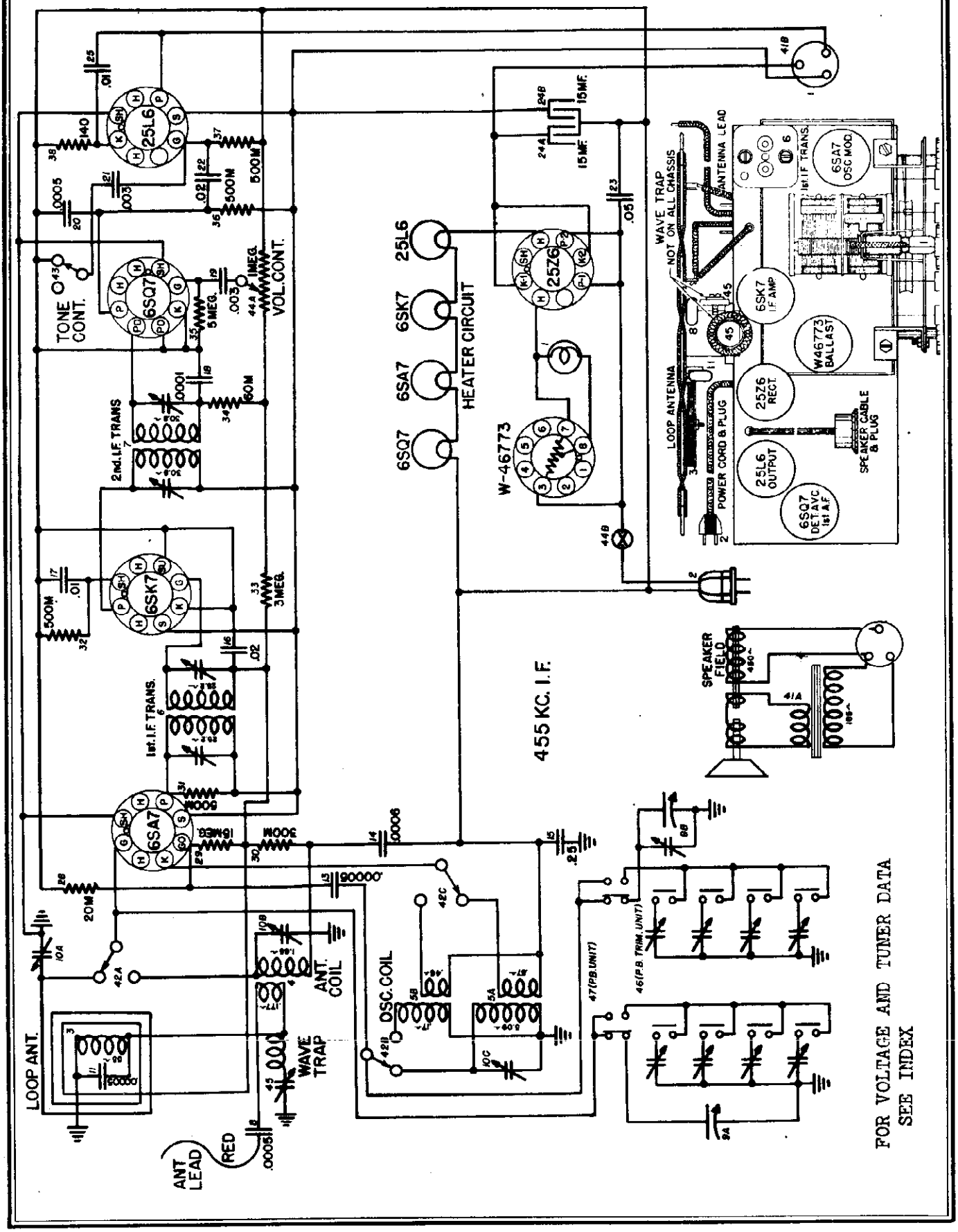
This model Crosley is a six-tube, two-band superheterodyne receiver, designed for operation on 105-130-volt electric circuits, either D. C. or 50-60 cycles A. C.

TUNING RANGE—Standard Broadcast Band—1600 to 540 Kilocycles or 187.5 to 555 meters.
Short Wave Band—5.8 to 15.0 Megacycles or 62.5 to 20 meters.

TUBES—1—12SK7, 1—12SA7, 1—12SK7, 1—12SQ7, 1—35L6, 1—35Z5. Tubes may be GT (Bantam) or metal equivalents.

MODELS TA62, TA62W
Chassis 63

THE CROSLEY CORP.



MODELS TA62, TA62W
Chassis 63

THE CROSLEY CORP.

ALIGNMENT PROCEDURE

Preliminary

Output Meter Connections.....Plate and Screen 25L6GT

Generator Ground Connections.....See foot note (1)

Dummy Antenna in series with Generator output.....See Chart below

Position of Volume Control.....Fully on

Depress Manual Push-Button

	Signal Generator						
Sequence	Dummy Antenna	Frequency Setting	Input Connection for Radio	Band Switch	Tuning Cond. Setting	Trimmer Adjusted	Remarks
1	.05 Mf.	456 Kc.	Antenna	S. B.	Fully open	2nd I-F (2) 1st I-F (2)	Adjust for maximum output. Adjust for maximum output.
2	400 ohm carbon	15.4 Mc.	Antenna	S. W.	Fully open	S. W. "OSC" (rear section of tuning condenser	Adjust for maximum output.
3	400 ohm carbon	15.0 Mc.	Antenna	S. W.	Approx. 15 on dial	S. W. "Ant." (center trimmer right end of chassis)	Adjust for maximum output while rocking gang thru signal.
4	.0002 Mf.	1600 Kc.	Antenna	S. B.	Fully open	B. C. "OSC" (front trimmer right end of chassis)	Adjust for maximum output. Gang does not have to tune thru signal.
5	.002 Mf.	1400 Kc.	Antenna	S. B.	Approx. 1400 on dial	B. C. "ANT" (rear trimmer right end of chassis)	Adjust for maximum output.

(1) Do not use a ground return from the signal generator unless it is found to be absolutely necessary.

If necessary a small condenser (approx. a .001 mf.—400 Volt) should be connected in series with the ground lead of the generator and receiver chassis.

IMPORTANT ALIGNMENT NOTES

When aligning the shortwave band "OSC" trimmer care must be exercised to see that the circuits are aligned on the correct frequency and not on the image which is approximately 910 kilocycles less as indicated on the dial. To check, increase generator output, tune-in the generator frequency and then tune-in the image frequency which should be weaker than the fundamental and come in approximately 910 kilocycles lower on the dial than the fundamental. If image cannot be tuned in, the "OSC" trimmer is adjusted to the wrong peak. (Correct peak is the second peak on trimmer from the closed position).

Repeat the original alignment procedure for more accurate adjustments. Always keep signal generator output as low as possible to prevent action of the A.V.C. circuit.

WAVE TRAP W MODELS

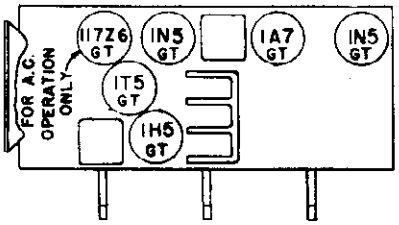
The Wave Trap should not be adjusted until all other adjustments have been made. To make the adjustment feed a 455 kilocycle signal from the signal terminal of the receiver. With the gang condenser open and the volume control fully on, adjust the trimmer condenser on the wave trap for MINIMUM output.

Should the interfering station be operating on a frequency of slightly more or less than 455 kilocycles the exact frequency should be determined with the aid of the signal generator. Then instead of feeding a 455 kilocycle signal into the receiver the exact frequency of the interfering signal should be used. If it is not possible to determine the exact frequency of the interfering signal the antenna may be attached to the receiver and the receiver tuned to the position where the interfering signal is more noticeable. Then adjust the wave trap for minimum interference.

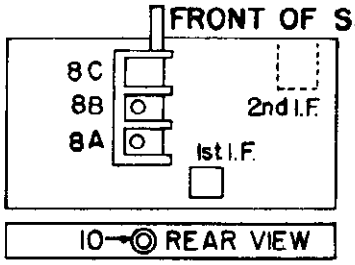
MODEL 63FB, Chassis 93

THE CROSLEY CORP.

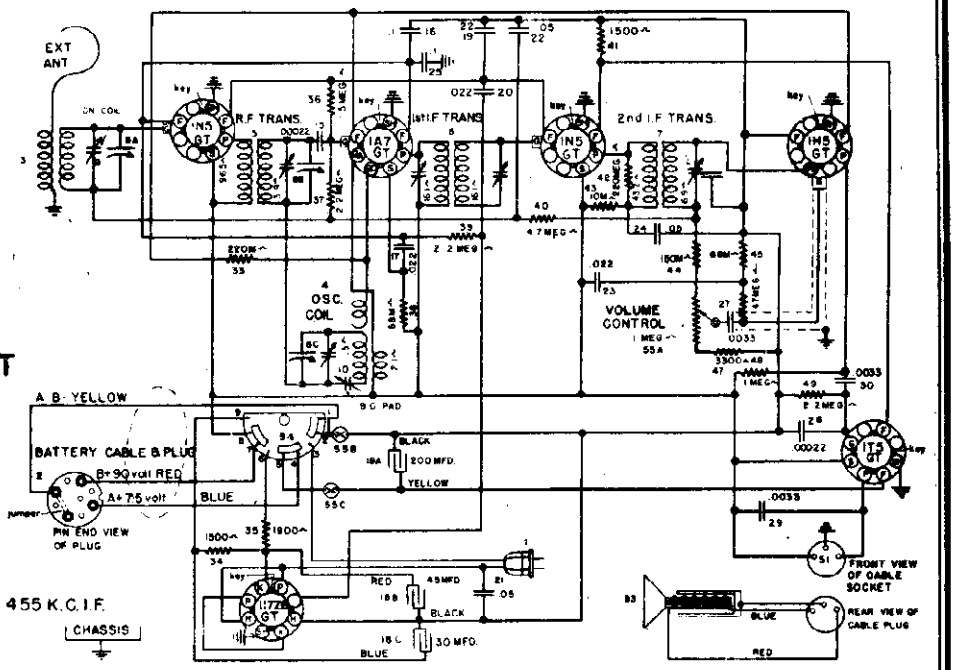
TUBE LAYOUT



TRIMMER LOCATIONS



WIRING DIAGRAM



TUNING RANGE — 550-1600 Kilocycles — 546-187.5 Meters

TUBES USED — one 1A7GT, two—IN5GT, one—IH5GT, one—IT5GT and one—117Z6GT*

BATTERIES REQUIRED — one No. CR-58 Crosley "A and B" Battery Pack (7.5 Volt "A"—90 Volt "B").

*Note: The 117Z6GT rectifier tube is not required for battery operation and is therefore not supplied as original equipment with your receiver. If 110 volt current is made available in your home the above tube should be purchased from your Crosley dealer.

SOCKETS VOLTAGES — Chassis No. 93

Measured from "B" minus using 1000 Ω/V — Voltmeter, 100 V. Range, no signal input

Tube		@ 117.5-Volt Line				Battery Pack			
Type	Function	Filament Volt	Plate Volt	Screen Volt	Filament Volt	Filament Volt	Plate Volt	Screen Volt	Filament Volt
1N5GT	R. F. Amplifier	2.8	90	90	4.0	2.8	90	90	4.0
1A7GT	Osc. Modulator	1.4	90	36	2.7	1.4	90	90	2.8
1N5GT	I. F. Amplifier	4.0	76	90	5.3	4.0	76	76	5.4
1H5GT	Det.-A. S. C. 1st A. F.	0	12	.....	1.3	0	12	.....	1.4
1T5GT	Out Put	5.4	83	90	6.7	5.4	83	90	7.5
117Z6GT	Rectifier	117.5 A. C.	117.5 A. C.	.....	97	.....	.....	.....	.....

ALIGNMENT PROCEDURE — Volume Control on full Output meter connected to Plate and Screen of 1T5GT

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION TO RADIO	DUMMY ANTENNA	TUNING COND. SETTING	TRIMMERS TO ADJUST (See Fig. 1)	REMARKS
455 Kc	Ant. Lead	.0001 MF	Fully open	2nd I-F(1)	Adjust for maximum signal.
455 Kc	Ant. Lead	.0001 MF	Fully open	1st I-F (2)	Adjust for maximum signal. Located top of 1st I-F ass'y.
1650	Ant. Lead	.0001 MF	Fully open	"OSC" Shunt on gang	Adjust for maximum output. Gang does not have to tune through signal.
1400	Ant. Lead	.0001 MF	140 on dial	"ANT" shunt on gang	Adjust for maximum output.
1400	Ant. Lead	.0001 MF	140 on dial	"RF" shunt on gang	Adjust for maximum output.
600	Ant. Lead	.0001 MF	60 on dial	"OSC." Series Pad	Adjust for maximum output while rocking gang.

Repeat above for more accurate adjustments
Maximum power output @ 90 V. "B" — approx. 340 M. W.

A Battery drain @ 7.5 volts, .05 Amp.; "B" Battery drain @ 90 V., 12.5 M. A.; @
Power consumption @ 117.5 volts line — 22 Watts

THE CROSLEY CORP.

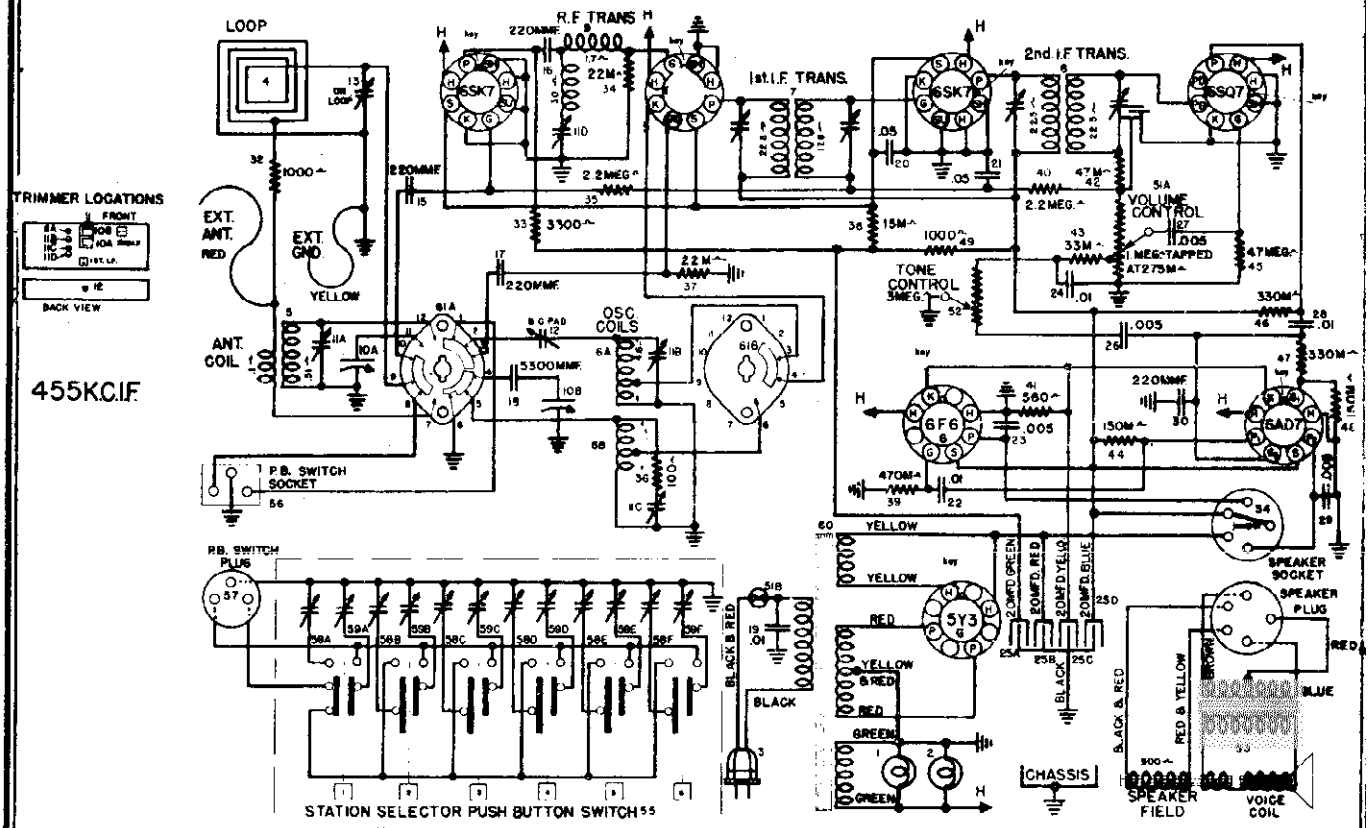
ALIGNMENT PROCEDURE

Output Meter Connections.....Plate of 6AD7 to Plate of 6F6
Generator Ground Connection.....To Chassis or Ground Lead
Dummy Antenna to be in series with generator output.....See Chart Below
Position of Volume Control.....Fully On
Position of Tone Control.....Treble or Speech

ALIGNMENT PROCEDURE CHART

		Signal Generator					
Alignment Sequence	Dummy Antenna	Frequency Setting	Input Connection to Receiver	Band Switch	Tuning Cond. Setting	Trimmer Adjusted	Remarks
1.	.02 MF.	455 Kc.	Stator lug Rear section of Gang Cond.	B. C.	Fully open	2nd I-F (2) 1st I-F (2)	Adjust for Maximum. Adjust for Maximum.
2.	.02 MF.	455 Kc.	Stator lug Rear section of Gang Cond.	B. C.	Fully Open	Adj. Wave Trap Trimmer.	Adjust for Minimum.
3.	.0002 MF.	1650 Kc.	Ant. Terminal	B. C.	Fully open	B. C. "OSC" Trimmer	Adjust for peak; gang does not have to tune thru signal. Loop must be connected.
4.	.0002 MF.	600 Kc.	Ant. Terminal	B. C.	Approx. 60 on dial	B. C. "OSC" Series Trimmer	Adjust for maximum output while rocking gang thru signal.
5.	Repeat Step No. 3 to check possible shift due to series adjustment.						
6.	.0002 MF.	1400 Kc.	Ant. Terminal	B. C.	Approx. 140 on dial	B.C. LOOP "ANT" Trimmer	Adjust for maximum output do not touch B. C. Osc. Trimmer.
7.	400 ohm (carbon)	18.3 Mc.	Ant. Terminal	S. W.	Fully open	S. W. "OSC"	Adjust for peak. Gang does not have to tune thru signal.
8.	400 ohm (carbon)	18.0 Mc.	Ant. Terminal	S. W.	Approx. 18	S. W. "ANT" Trimmer	Adjust for maximum output while rocking gang thru signal. do not touch B. C. Osc. Trimmer.
9.	Repeat the above alignment procedure for more accurate adjustments. Always keep signal generator output as low as possible to prevent action of the A. S. C. circuit.						

IMPORTANT ALIGNMENT NOTES—When aligning the shortwave band "OSC" trimmer care must be exercised to see that the circuit is aligned on the correct frequency and not on the image which is approximately 910 kilocycles less **as indicated on the Receiver dial.** To check, increase generator output, tune-in the generator frequency and then tune-in the image frequency which should be weaker than the fundamental and come in approximately 910 kilocycles **lower on the Receiver dial** than the fundamental. If image cannot be tuned-in, the "OSC" trimmer is adjusted to the wrong peak. (Correct peak is the second peak on trimmer from the closed position.)

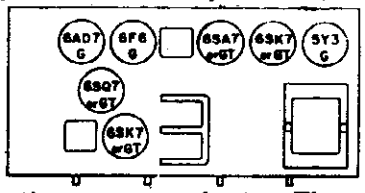


THE CROSLEY CORP.

SOCKET VOLTAGES MEASURED AT 117.5 V. LINE (BETWEEN SOCKET PIN AND CHASSIS) WITH 1000 OHM PER VOLT, 500 V. RANGE VOLTMETER (D. C.)

TUBE	FUNCTION	PIN NUMBER 1	2	3	4	5	6	7	8
6SK7	R. F. Amplifier	0	0	0	0	0	80	6.3 A. C.	235
6SA7	OSC. — Mod.	0	0	260	80	0	0	6.3 A. C.	0
6SK7	I. F. Amplifier	0	0	0	0	0	80	6.3 A. C.	260
6SQ7	Det. A. S. C. 1st A. F.	0	0	0	0	0	85	6.3 A. C.	0
6AD7	Phase Inverter	0	0	255	260	0	180	6.3 A. C.	23
6F6	Output	0	0	255	260	0	235	6.3 A. C.	23
5Y3G	Rectifier	N. C.	330	J. B.	300A.C.	J. B	300 A. C.	J. B.	330

MAX. POWER OUTPUT ..... 6.5 WATTS
POWER CONSUMPTION ..... 85 WATTS
DROP ACROSS SPEAKER FIELD ..... 70 VOLTS
J. B.—Junction Block. N. C.—No Connection



SETTING THE PUSH BUTTONS

The six station selector push buttons are set up by means of two adjusting screws per button. These adjusting screws are made accessible by removing the push button escutcheon.

Select the call letter tabs of your six favorite broadcast stations from the station call letter sheets supplied. Place the call letter tabs in the window above that push button which is to be adjusted for that station. It is not essential that all push buttons be set at one time.

Note: When placing call tabs in the window be sure to arrange them according to their frequency (kilocycles) that is: the station whose frequency is well within the range covered by the No. 1 button, should be placed above that button and so on with the rest of the buttons to be set. After tabs are in place break off the celluloid covers from the strip furnished and snap in place over the call letters to protect and hold them in place.

The frequencies of your favorite stations may be found in your local paper or by consulting a station listing sheet.

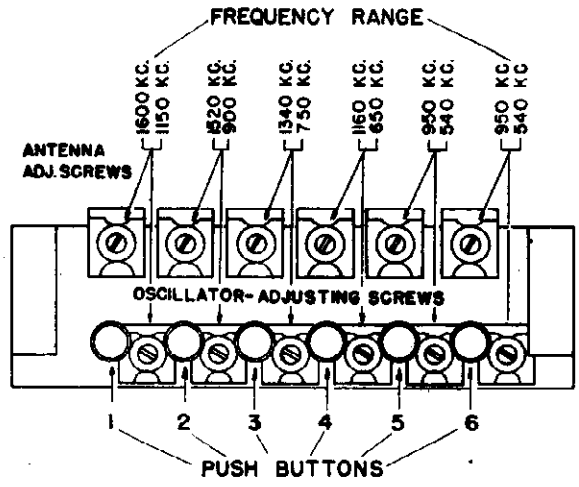


Fig. 1

TUNING THE RECEIVER-MANUAL OPERATION

Turn the band change switch knob to the desired frequency band. Turn the volume control knob approximately half way in a clockwise direction. Rotate the station selector knob (right hand knob) slowly until a station is heard. Increase or decrease the volume as desired by readjusting the volume control knob. For best quality of reception always adjust the station selector to the middle of the range on the dial within which the program is being received. It should be remembered in tuning in stations on the Shortwave band that tuning is much sharper and greater care must be exercised when adjusting the station selector.

SET-UP PROCEDURE

Remove station selector push button escutcheon. Turn the receiver on and let it operate for a sufficient length of time to permit the tubes to reach their normal operating conditions.

It is essential that the frequency (kilocycles) of the station selected be within the range of the push button to be set for that station. See Fig. 1.

1. Turn the band change switch to the "American" position. Using the station selector knob, carefully tune in the station to which the No. 1 push button is to be set. Note program.

2. Turn the band change switch to the "Automatic" position and using a small screw driver, carefully turn in a clockwise direction the Oscillator adjusting screw until the station previously tuned in manually is heard again. Adjust for maximum output in the speaker.

3. Adjust the Antenna adjusting screw for maximum volume in the speaker.

4. Turn band change switch from "Automatic" to "American" and back again to check if adjustment has been correctly made. There should be no change in tone quality when switched from one to the other.

5. Repeat above procedure for the remaining push buttons.

To tune the receiver with the push buttons, set the band change switch on "Automatic" and depress completely the button corresponding to the station you wish to hear.

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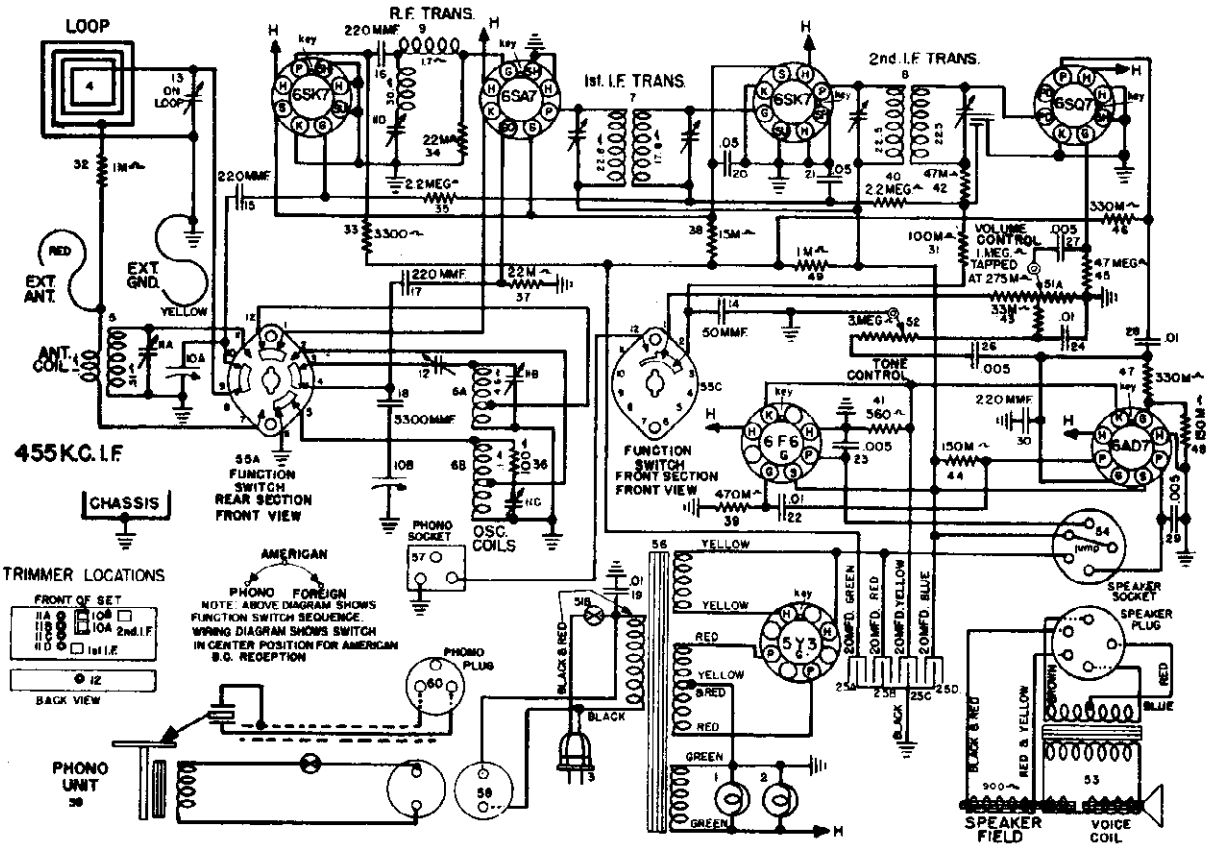
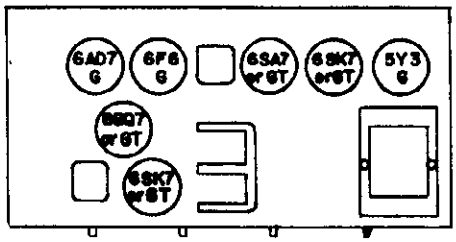


WIRING DIAGRAM

TUNING RANGES

American Broadcast Band—540 to 1600 KC (555 to 187 Meters)
Shortwave (Foreign)—4.7 to 18.0 MC (63.8 to 16.6 Meters)



TUBES

2—6SK7, 1—6SA7, 1—6SQ7, 1—6AD7, 1—6F6, 1—5Y3G.

TUBE VOLTAGE CHART

SOCKET VOLTAGES MEASURED AT 117.5 V. LINE (BETWEEN SOCKET PIN AND CHASSIS) WITH 1000 OHM PER VOLT, 500 V. RANGE VOLTMETER (D. C.)

TUBE	FUNCTION	PIN NUMBER 1	2	3	4	5	6	7	8
6SK7	R. F. Amplifier	0	0	0	0	0	80	6.3 A. C.	235
6SA7	OSC.—Mod.	0	0	260	80	0	0	6.3 A. C.	0
6SK7	I. F. Amplifier	0	0	0	0	0	80	6.3 A. C.	260
6SQ7	Det. A. S. C. 1st A. F.	0	0	0	0	0	85	6.3 A. C.	0
6AD7	Phase Inverter and Output	0	0	255	260	0	180	6.3 A. C.	23
6F6	Output	0	0	255	260	0	235	6.3 A. C.	23
5Y3G	Rectifier	N. C.	330	J. B.	300A.C.	J. B.	300A.C.	J. B.	330

MAX. POWER OUTPUT ..... 6.5 WATTS
POWER CONSUMPTION ..... 85 WATTS
DROP ACROSS SPEAKER FIELD ..... 70 VOLTS
J. B.—Junction Block. N. C.—No Connection

Voltages may vary 10% of values given.

MODELS TA62, TA62W
MODEL 72CP, Chassis 85

THE CROSLEY CORP.

MODEL 72CP

ALIGNMENT PROCEDURE

Output Meter Connections ..... Plate of 6AD7 to Plate of 6F6
Generator Ground Connection ..... To Chassis or Ground Lead
Dummy Antenna to be in series with generator output ..... See Chart Below
Position of Volume Control ..... Fully On
Position of Tone Control ..... Treble or Speech

ALIGNMENT PROCEDURE CHART

	Signal Generator						
Alignment Sequence	Dummy Antenna	Frequency Setting	Input Connection to Receiver	Band Switch	Tuning Cond. Setting	Trimmer Adjusted	Remarks
1.	.02 MF.	455 Kc.	Stator lug Rear section of Gang Cond.	B. C.	Fully open	2nd I-F (2) 1st I-F (2)	Adjust for Maximum. Adjust for Maximum.
2.	.02 MF.	455 Kc.	Stator lug Rear section of Gang Cond.	B. C.	Fully Open	Adj. Wave Trap Trimmer.	Adjust for Minimum.
3.	.0002 MF.	1650 Kc.	Ant. Terminal	B. C.	Fully open	B. C. "OSC" Trimmer	Adjust for peak; gang does not have to tune thru signal. Loop must be connected.
4.	.0002 MF.	600 Kc.	Ant. Terminal	B. C.	Approx. 60 on dial	B. C. "OSC" Series Trimmer	Adjust for maximum output while rocking gang thru signal.
5.	Repeat Step No. 3 to check possible shift due to series adjustment.						
6.	.0002 MF.	1400 Kc.	Ant. Terminal	B. C.	Approx. 140 on dial	B.C. LOOP "ANT" Trimmer	Adjust for maximum output do not touch B. C. Osc. Trimmer.
7.	400 ohm (carbon)	18.3 Mc.	Ant. Terminal	S. W.	Fully open	S. W. "OSC"	Adjust for peak. Gang does not have to tune thru signal.
8.	400 ohm (carbon)	18.0 Mc.	Ant. Terminal	S. W.	Approx. 18	S. W. "ANT" Trimmer	Adjust for maximum output while rocking gang thru signal. do not touch B. C. Osc. Trimmer.
9.	Repeat the above alignment procedure for more accurate adjustments. Always keep signal generator output as low as possible to prevent action of the A. S. C. circuit.						

IMPORTANT ALIGNMENT NOTES—When aligning the shortwave band "OSC" trimmer care must be exercised to see that the circuit is aligned on the correct frequency and not on the image which is approximately 910 kilocycles **less as indicated on the Receiver dial.** To check, increase generator output, tune-in the generator frequency and then tune-in the image frequency which should be weaker than the fundamental and come in approximately 910 kilocycles **lower on the Receiver dial** than the fundamental. If image cannot be tuned-in, the "OSC" trimmer is adjusted to the wrong peak. (Correct peak is the **second** peak on trimmer from the closed position.)

MODELS TA62, TA62W

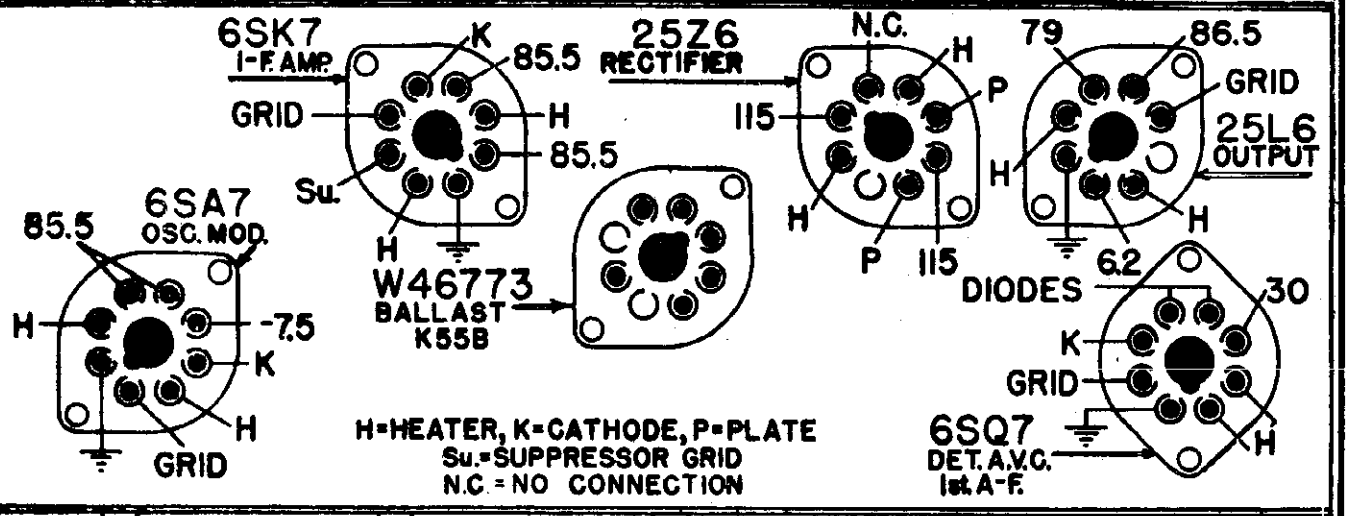
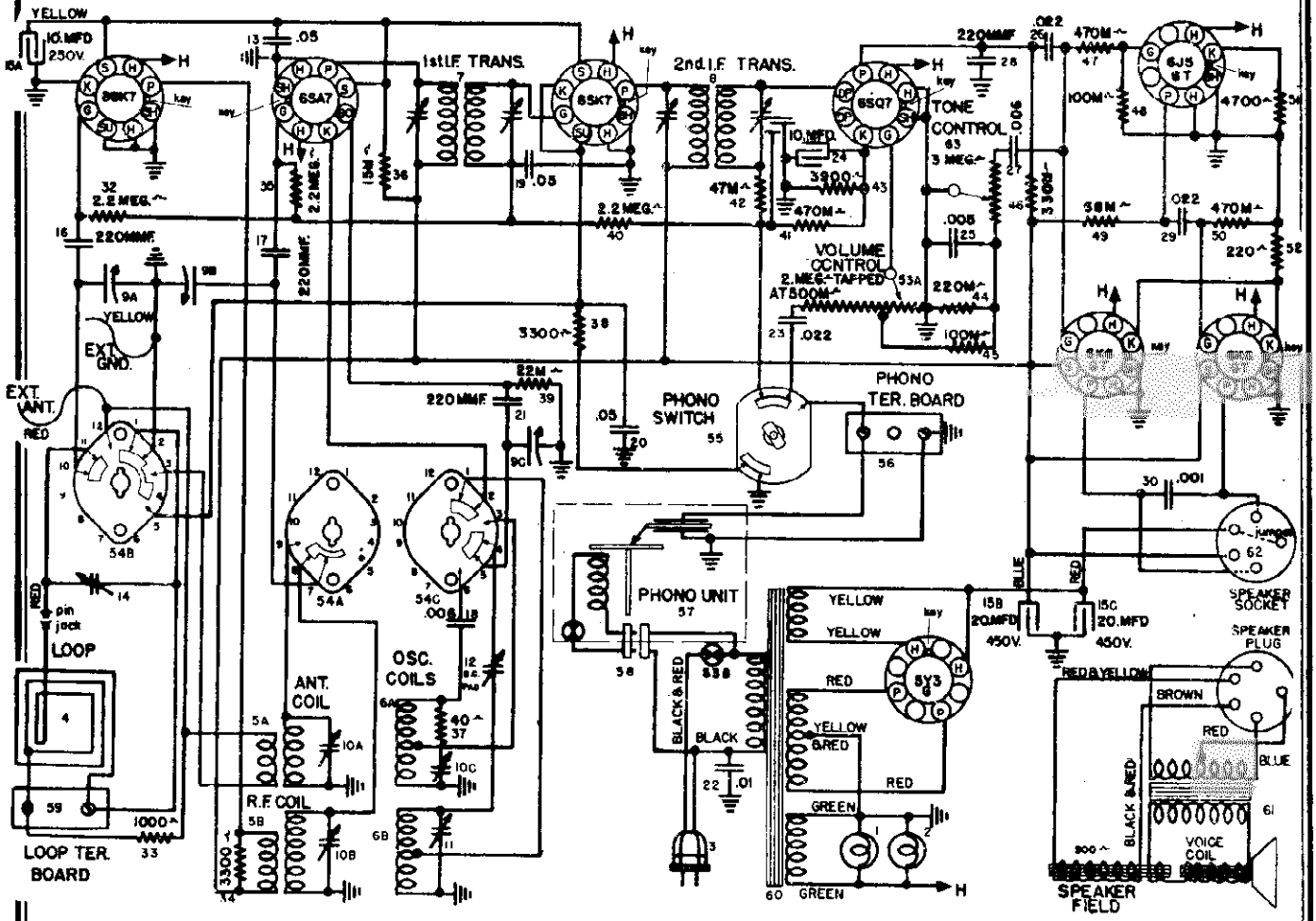


Fig. 4—Socket Voltage Chart

THE CROSLEY CORP.

MODELS 82CP, 82CQ
Chassis 75



PHONO TERMINAL STRIP—The two terminals located on the rear of the chassis and marked 1 and 2 provide connections for the phonograph and automatic record changer assembly. After disconnecting this cable from the terminals they may be used for connecting to the set, adapter units for the reproduction of television sound or F-M programs.

THE DIAL—The tuning range of these receivers is approximately from 540 to 1630 Kilocycles, and from 6000 to 18000 Kilocycles and is divided into two bands. The upper numbers on the Dial are to be used when tuning stations in the American Broadcast Band. Add one zero (0) to these numbers to read directly in kilocycles. The lower numbers on the Dial are for International Short Wave Stations. Short Wave calibrations are directly in megacycles.

ANTENNA—These receivers incorporate an efficient built-in antenna system and under normal operating conditions no outside antenna will be required. When installing the receiver DO NOT place near large metal objects such as metal partitions, radiators, etc. since if this is done reception efficiency may be greatly reduced. For most efficient Short Wave reception, or if it is necessary to install the receiver in a shielded location, the installation of an outdoor antenna is recommended. The antenna lead-in wire is to be attached to red lead extending from rear of chassis. Reception may sometimes be improved by connecting a ground wire to the yellow lead extending from the rear of the chassis.

MODELS 82CP, 82CQ
Chassis 75

THE CROSLEY CORP.

ALIGNMENT PROCEDURE

Preliminary
Output Meter Connections ..... Plate to Plate of 6K6GT's
Generator Ground Connection ..... To Chassis or Ground Lead
Dummy Antenna to be in series with generator output ..... See Chart Below
Position of Volume Control ..... Fully On
Position of Tone Control ..... Treble or Speech

ALIGNMENT PROCEDURE CHART

	Signal Generator						
Alignment Sequence	Dummy Antenna	Frequency Setting	Input Connection to Receiver	Band Switch	Tuning Cond. Setting	Trimmer Adjusted	Remarks
1.	.02 MF.	455 Kc.	Stator lug Rear section of Gang Cond.	B. C.	Fully open	2nd I-F (2) 1st I-F (2)	Adjust for Maximum. Adjust for Maximum.
2.	.0002 MF.	1650 Kc.	Ant. Terminal	B. C.	Fully open	B. C. "OSC" Trimmer	Adjust for peak; gang does not have to tune thru signal. Loop must be connected.
3.	.0002 MF.	600 Kc.	Ant. Terminal	B. C.	Approx. 60 on dial	B. C. "OSC" Series Trimmer	Adjust for maximum output while rocking gang thru signal.
4.	Repeat Step No. 2 to check possible shift due to series adjustment.						
5.	.0002 MF.	1400 Kc.	Ant. Terminal	B. C.	Approx. 140 on dial	B. C. "ANT" Trimmer B. C. "R-F" Trimmer	Adjust for maximum output do not touch B. C. Osc. Trimmer. Adjust for maximum output.
6.	400 ohm (carbon)	18.3 Mc.	Ant. Terminal	S. W.	Fully open	S. W. "OSC"	Adjust for peak. Gang does not have to tune thru signal.
7.	400 ohm (carbon)	18.0 Mc.	Ant. Terminal	S. W.	Approx. 18	S. W. "ANT" Trimmer	Adjust for maximum output while rocking gang thru signal.
8.	Repeat the above alignment procedure for more accurate adjustments. Always keep signal generator output as low as possible to prevent action of the A. V. C. circuit.						

IMPORTANT ALIGNMENT NOTES—When aligning the shortwave bands "OSC" trimmers care must be exercised to see that the circuits are aligned on the correct frequency and not on the image which is approximately 910 kilocycles less **as indicated on the Receiver dial.** To check, increase generator output, tune-in the generator frequency and then tune-in the **image** frequency which should be weaker than the fundamental and come in approximately 910 kilocycles **lower on the Receiver dial** than the fundamental. If image cannot be tuned-in, the "OSC" trimmer is adjusted to the wrong peak. (Correct peak is the second peak on trimmer from the closed position).

TUBE VOLTAGE CHART

SOCKET VOLTAGES MEASURED AT 117.5 V. LINE (BETWEEN SOCKET PIN AND CHASSIS) WITH 1000 OHM PER VOLT, 500 V. RANGE VOLTMETER (D. C.)

	PIN NUMBER							
TUBE FUNCTION	1	2	3	4	5	6	7	8
6SK7GT—R. F. Amplifier	0	0	0	0	0	82	6.3 A. C.	210
6SA7GT—OSC.—Mod.	0	0	210	82BC	0	0	6.3 A. C.	0
6SK7GT—I. F. Amplifier	0	0	0	0	-6.5BC - -0SW -	82	6.3 A. C.	210
6SQ7—Det. A. S. C. 1st A. F.	0	0	1.4	0	0	78	6.3 A. C.	0
6J5GT—Phase Inverter	0	0	125	N. C.	0	0	6.3 A. C.	5.2
6K6GT(2)—Output	0	0	200	210	0	0	6.3 A. C.	13
5Y3G—Rectifier	N. C.	300	N. C.	338	J. B.	338 A. C.	J. B.	300

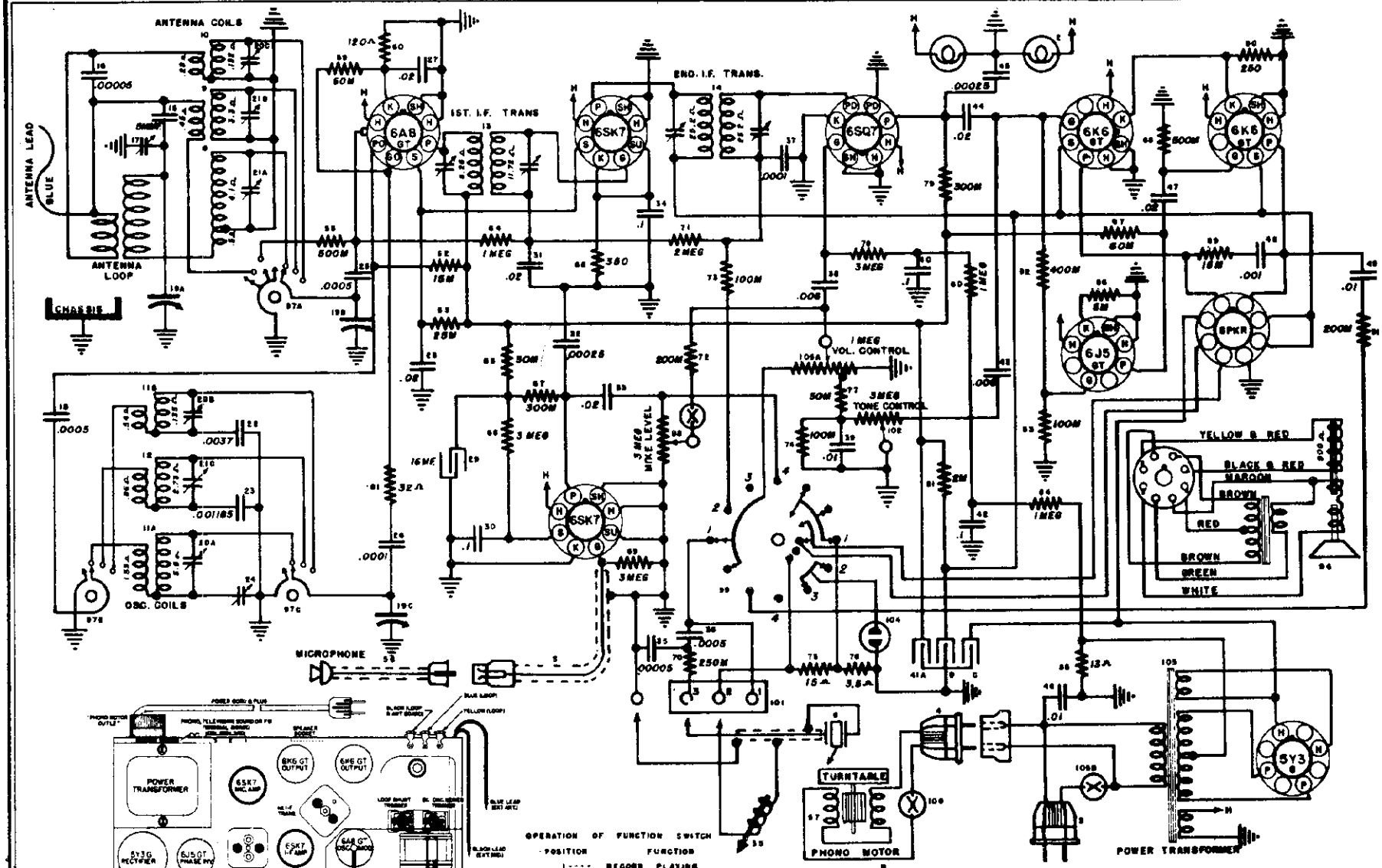
MAX. POWER OUTPUT ..... 6.5 WATTS
POWER CONSUMPTION ..... 85 WATTS
DROP ACROSS SPEAKER FIELD ..... 90 VOLTS
N. C.—No Connection

• Voltages may vary 10% of values given.

THE AUTOMATIC RECORD CHANGER—This record changer will automatically play a series of twelve 10" or ten 12" records of the standard 78 R. P. M. type. The records must be all one size when loading, and may consist of less records than listed above. Records of any size up to 12" may be played manually.

FEATURES—Some of the features of these outstanding phono-combinations that will add greatly to your enjoyment are as follows: a large efficient built-in antenna; Litz wound coils; a three gang tuning condenser providing maximum selectivity and sensitivity; push-pull output tubes for maximum distortionless reproduction; continuously variable tone control; ten inch concert dynamic speaker; and an extremely high quality unit for the reproduction of phonograph records, including the "Floating Jewel Tone System" (a Crosley invention) which assures a quality of reproduction never before obtainable.

FOR RADIO PRODUCTS RECORD CHANGER 50 OR GENERAL INSTRUMENT RECORD CHANGER 201, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".



OPERATION OF FUNCTION SWITCH

POSITION	FUNCTION
1	RECORD PLAYING
2	RADIO RECEIVING
3	RADIO RECORDING
4	MIKE RECORDING

455 KC. I. F.

APPROX. TUNING RANGE

550 to 1600 Kilocycles
6.0 to 18.0 Megacycles
1.6 to 5.0 Megacycles

FOR SEEBURG JR RECORD CHANGER AND RECORDER, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

MODEL CB82-R, Chassis 28

THE CROSLEY CORP.

RADIO RECEIVER ALIGNMENT PROCEDURE

PRELIMINARY

Output Meter Connections.....Plate to Plate of 6K6G's
Generator Ground Connection.....To chassis or Ground Lead
Dummy Antenna to be in series with generator output.....See Chart Below
Position of Volume Control.....Fully On
Position of Tone Control.....Treble or Speech
Position of Function Switch.....Radio
Position of Mike Level Control.....All the Way to Left (Off)

ALIGNMENT PROCEDURE CHART

Alignment Sequence	Signal Generator: Dummy Antenna	Signal Generator: Frequency Setting	Signal Generator: Input Connection to Receiver	Band Switch	Tuning Cond. Setting	Trimmer Adjusted	Remarks
1.	.02 MF.	455 Kc.	Grid of 6A8GT	B. C.	Fully open	2nd I-F (2) 1st I-F (2)	Adjust for Maximum. Adjust for Maximum.
2.	.0002 MF.	1650 Kc.	Ant. Lead (Blue)	B. C.	Fully open	B. C. "OSC" Trimmer	Adjust for peak; gang does not have to tune thru signal.
3.	.0002 MF.	600 Kc.	Ant. Lead (Blue)	B. C.	Approx. 60 on dial	B. C. "OSC" Series Trimmer	Adjust for maximum output while rocking gang thru signal.
4.	Repeat Step No. 2 to check possible shift due to series adjustment						
5.	.0002 MF.	1400 Kc.	Ant. Lead (Blue)	B. C.	Approx. 140 on dial	B. C. "ANT" Trimmer B. C. "PRE" Trimmer	Adjust for maximum output to not touch B. C. Osc. Trimmer. Adjust for maximum output.
6.	400 ohm (carbon)	5.3 Mc.	Ant. Lead (Blue)	Police	Fully open	Pol "OSC"	Adjust for peak gang; does not have to tune thru signal
7.	400 ohm (carbon)	5.0 Mc.	Ant. Lead (Blue)	Police	Approx. 5.0	Pol "ANT"	Adjust for maximum output while rocking gang thru signal.
8.	400 ohm (carbon)	18.3 Mc.	Ant. Lead (Blue)	S. W.	Fully open	S. W. "OSC"	Adjust for peak. Gang does not have to tune thru signal.
9.	400 ohm (carbon)	18.0 Mc.	Ant. Lead (Blue)	S. W.	Approx. 18	S. W. "ANT"	Adjust for maximum output while rocking gang thru signal.

IMPORTANT ALIGNMENT NOTES

When aligning the shortwave bands "OSC" trimmers care must be exercised to see that the circuits are aligned on the correct frequency and not on the image which is approximately 910 kilocycles less **as indicated on the dial.** To check, increase generator output, tune-in the generator frequency and then tune-in the image frequency which should be weaker than the fundamental and come in approximately 910 kilocycles **lower on the dial** than the fundamental. If image cannot be tuned-in, the "OSC" trimmer is adjusted to the wrong peak. (Correct peak is the second peak on trimmer from the closed position).

Repeat the original alignment procedure for more accurate adjustments. Always keep signal generator output as low as possible to prevent action of the A.V.C. circuit.

SOCKET VOLTAGES MEASURED @ 117.5 VOLTS LINE (BETWEEN SOCKET PIN AND CHASSIS) WITH 1000 OHM PER VOLT, 500 VOLT RANGE VOLTMETER (D. C.)

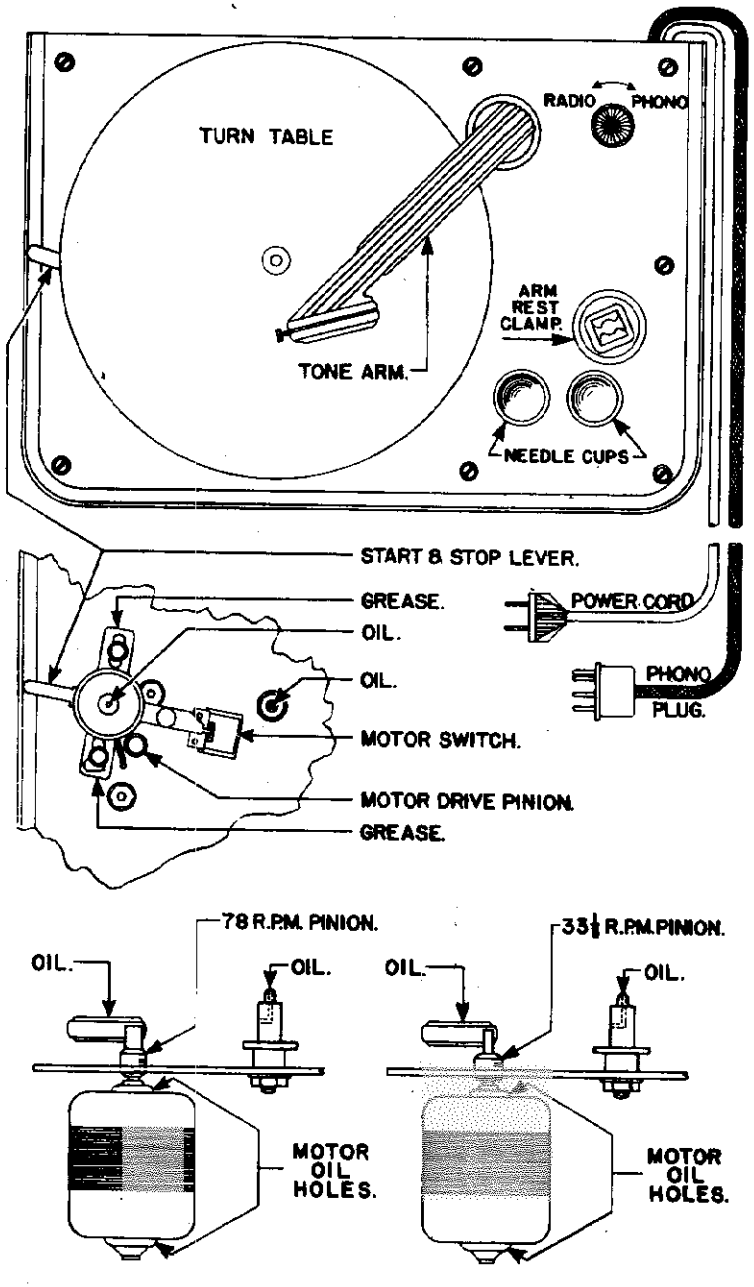
TUBE FUNCTION	PIN NUMBER 1	2	3	4	5	6	7	8
6SK7—Pre-Amp.	0	0	.....	....	0	J. B.	*6.3	52
6A8GT—Osc.-Mod.	0	0	198	76.5	0	132	*6.3	1
6SK7—I. F. Amp.	0	0	2.4	0	2.3	76.5	*6.3	226
6SQ7—Det. A. V.C.-A. F.	0	0	0	0	0	98	*6.3	0
6J5GT—Phase Invert.	0	0	118.5	0	0	J. B.	*6.3	6.0
6K6G—Output	0	0	226	236	0	J. B.	*6.3	15.5
6K6G—Output	0	0	226	236	0	J. B.	*6.3	15.5
5Y3G—Rectifier	NC	310	J. B.	*300	J. B.	*300	J. B.	310

*Measure with A. C. Voltmeter.

MAX. POWER OUTPUT @ 117.5 V. LINE..... 5.0 Watts
POWER CONSUMPTION @ 117.5 V. LINE..... 66 Watts (Radio Only)
TOTAL POWER CONSUMPTION @ 117.5 V. LINE.....110 Watts (Including Phono Motor)
DROP ACROSS SPEAKER FIELD ..... 74 Volts

Voltages may vary 10% of values given.

J. B.—JUNCTION BLOCK N. C.—NO CONNECTION



Model 758 Receiver.
remove the jumper wire from the "PHONO SOCKET" (see Diagram of Connections in the receiver instruction booklet) and insert plug (eight prong) from the Record Player.

If it is desired to change over to 78 R.P.M. records

To change over from one speed to the other is accomplished by changing the drive pinion on the motor shaft. The large pinion is for 78 R.P.M. and the small pinion is for 33⅓ R.P.M. A special wrench is supplied to fit the set screws that hold pinions on motor shaft. The special friction drive takes up the difference in pinions automatically.

CONTROLS

The Phono-Radio Switch when turned to the right (clockwise) connects the pickup to the radio receiver and at the same time shorts radio signals, when turned to the left (counter clockwise) it disconnects the pickup and permits the radio to function normally.

The motor switch is controlled by the starting and stopping lever. This lever, through cam action engages and disengages the special friction drive pulley at the same time it throws the motor switch "On" and "Off".

The Phono Record Player is so wired that the volume control of the receiver is used to vary the amount of output.

OPERATION

After all connections have been made, the Phono Record Player should be placed upon a solid stand and set so that the turn table is level.

Place selected record on the turn table. (33⅓ R.P.M. See note for information on 78 R.P.M.)

Loosen the Pickup rest bracket by rolling the rubber locking ring down.

Insert needle in pickup.

Turn Phono-Radio Switch to the right, Phono position.

Pull starting level forward.

Lift pickup and gently lower it on the record so that the needle point enters the outside groove.

Adjust volume control (on receiver) to the desired level.

CARE OF RECORD PLAYER

1—Never leave Pickup set on the record when not in use. Lock in stand with rubber lock ring.

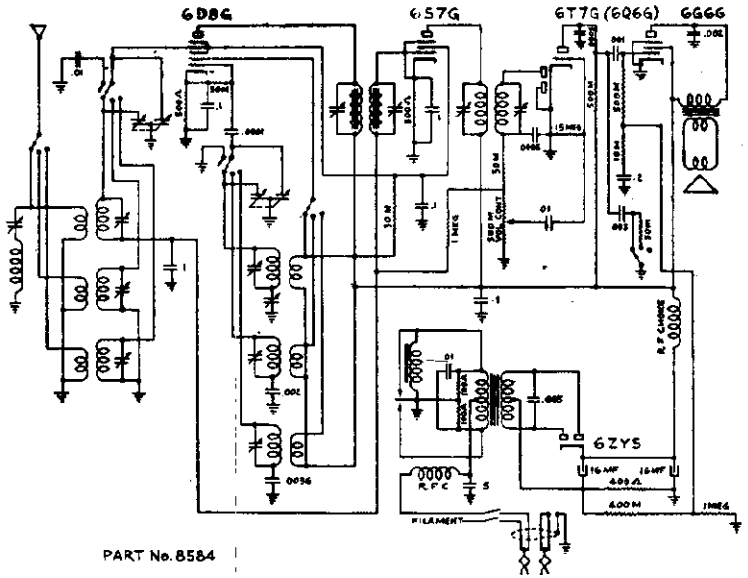
2—Do not rotate needle in the pickup after once used, as this causes excessive record wear, resulting in poor reproduction.

3—Oil the motor once, for about every 200 hours of service. Be sure that the wick in the oil well is saturated but not to the extent that the oil overflows.

4—The friction drive pulley bearing is provided with an oil hole on the top of the bearing stud. Oil as needed.

5—The turn table spindle is provided with an oil hole on top. To oil turn table spindle, remove the turn table and clean bearing, then oil surface of bearing. Replace turn table and fill oil hole in top of spindle.

6—It may be advisable to apply a little light grease to the slide bar studs at least once a year.



ALIGNMENT PROCEDURE

Intermediate Frequency Alignment

Turn the band selector switch to the broadcast position ("B" on the band selector knob). Connect a .1 mfd. condenser to the output terminal of the signal generator and connect the other end of this condenser to the control grid of the 6S7G tube. Do not disconnect the grid clip on the tube. Generate a weak 455 KC signal in the signal generator, and adjust the trimmer of the second I.F. transformer for maximum response in the output meter. If the signal measures above ½ volt during the adjustment, reduce its strength. Now transfer the connection of the signal generator through the .1 mfd. condenser to the grid of the 6D8G tube and align the trimmers of the first I.F. transformer.

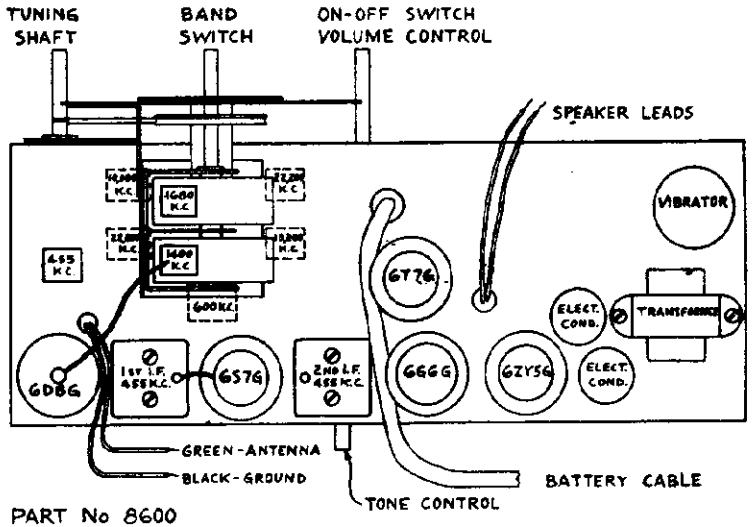
R. F. ALIGNMENT

Broadcast Band

Disconnect the .1 mfd. condenser from the output of the signal generator and in its place substitute a 200 or 250 mmf. condenser, connecting the other end of this condenser to the ANTENNA LEAD of the receiver. Turn the tuning condenser to about 600 KC. With the generator producing a fairly powerful signal of 455 KC, adjust the WAVE TRAP trimmer for MINIMUM RESPONSE. Set the tuning condenser of the receiver at minimum capacity (plates all the way out). Generate a weak signal of 1680 KC in the signal generator. Adjust the BROADCAST OSCILLATOR TRIMMER until the signal is tuned in. Next produce a weak signal of 1400 KC in the signal generator. Tune the receiver very carefully to the signal and adjust the BROADCAST ANTENNA TRIMMER for maximum response in the output meter. Produce a 600 KC signal in the signal generator and tuning the receiver carefully to this signal, adjust the BROADCAST OSCILLATOR PADDER for maximum response. The tuning condenser of the receiver should be rocked back and forth through the signal while varying the padder in order to assure perfect alignment. The last three adjustments should be repeated two or three times for perfect alignment.

Tune in a broadcast station of known frequency between 1200 and 800 KC and set the pointer to the proper calibration on the dial chart. Be sure to use a station whose frequency is reliable as the accuracy of calibration depends on this setting. Note that the square dots in the upper half of the black band are accurately calibrated for the frequencies of the broadcast band.

TUBE LAYOUT *and* CONNECTION DIAGRAM



PART No 8600

ALIGNMENT OF SHORT WAVE BANDS

S. W. Band No. 1

Rotate the band selector switch to the center position (No. 1 on band selector knob). Disconnect the 200 mmf. condenser from the output of the signal generator and in its place substitute a 400 ohm resistor which serves as a dummy antenna for aligning both short wave bands. The other end of the 400 ohm resistor is connected to the antenna lead of the receiver. Set the tuning condenser of the receiver at minimum capacity (plates all the way out). Produce a weak signal of 10,200 KC in the signal generator. Screw the S. W. No. 1 OSCILLATOR TRIMMER all the way down and then unscrew it to the second peak at which the signal is heard. If the trimmer is not unscrewed to the second peak, the circuits will not be in proper relation and the calibration will be incorrect and there may also be a dead spot on some position on the dial. Next produce a signal of 10,000 KC in the signal generator and tune this signal carefully in the receiver. If the signal can be heard at two places, the proper signal to tune is the one which is closest to the 10.2 mark on the dial chart of the receiver. Adjust the S. W. No. 1 ANTENNA TRIMMER until a definite peak is noted in the output meter. During this adjustment, rock the tuning condenser back and forth through the signal, while adjusting this trimmer in order to assure perfect alignment.

S. W. Band No. 2

Using exactly the same procedure and taking the same precautions as for S. W. Band No. 1, turn the band selector switch to the No. 2 position. Align the S. W. No. 2 OSCILLATOR TRIMMER at 22,200 KC, with the signal generator producing a signal of 22,200 KC and with the tuning condenser set at minimum capacity (plates all the way out). Align the S. W. No. 2 ANTENNA TRIMMER at 22,000 KC with the signal generator producing a 22,000 KC signal and be sure to tune the receiver to the signal nearest the 22 mark on the dial chart. The same procedure of screwing the oscillator trimmer all the way down and then unscrewing to the second peak and the same precautions of rocking the tuning condenser back and forth through the signal are followed to secure a proper alignment of this band.

TUBES

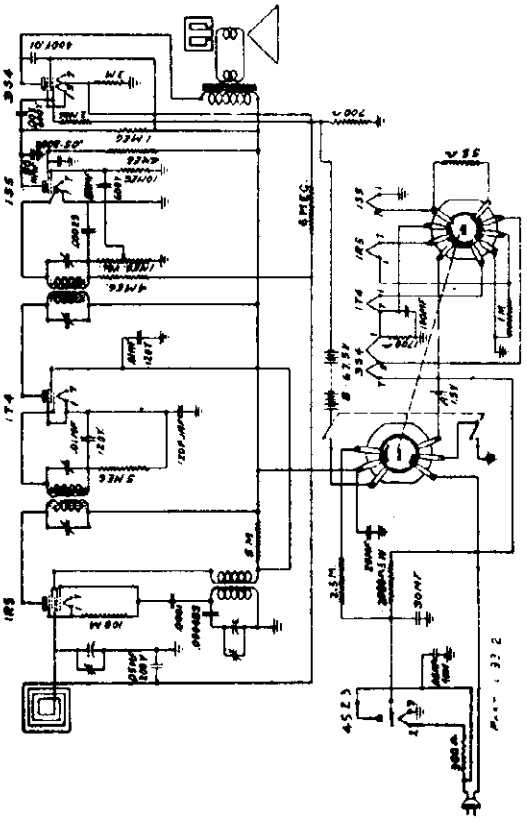
Tubes required are:

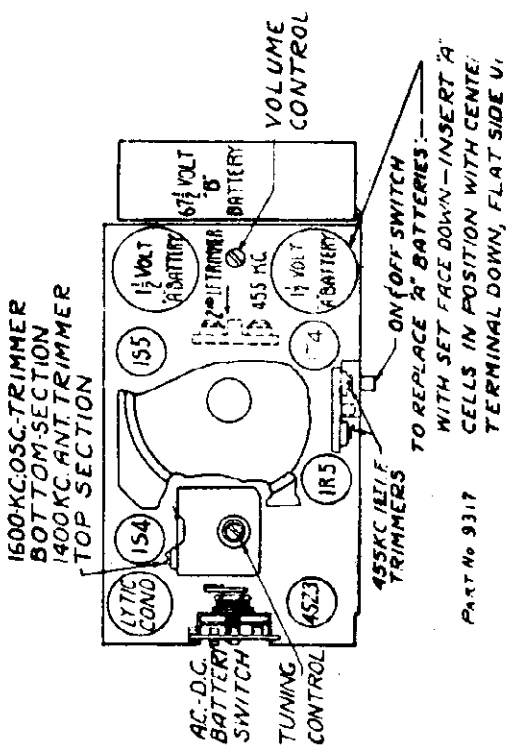
1—6D8G Oscillator Translator
1—6S7G I.F Amplifier
1—6T7G Detector AVC Audio
1—6G6G Power Output
1—6ZY5G Rectifier

MODEL 378
MODEL 3781

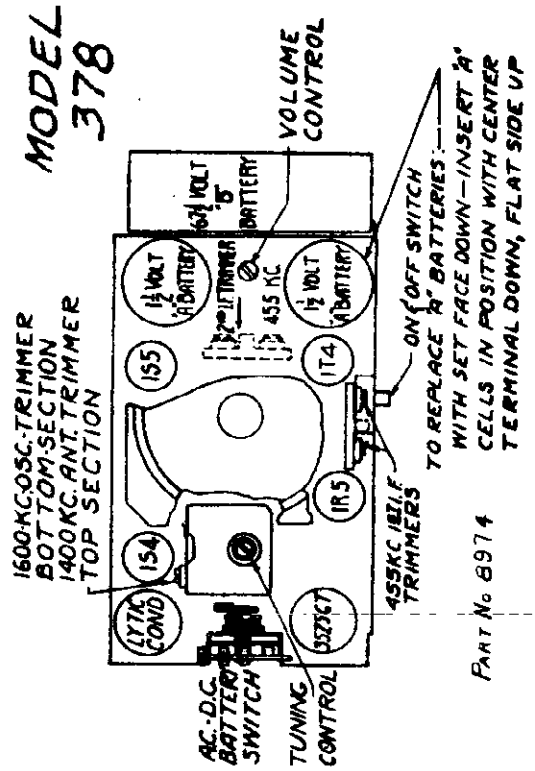
DETROLA CORP.

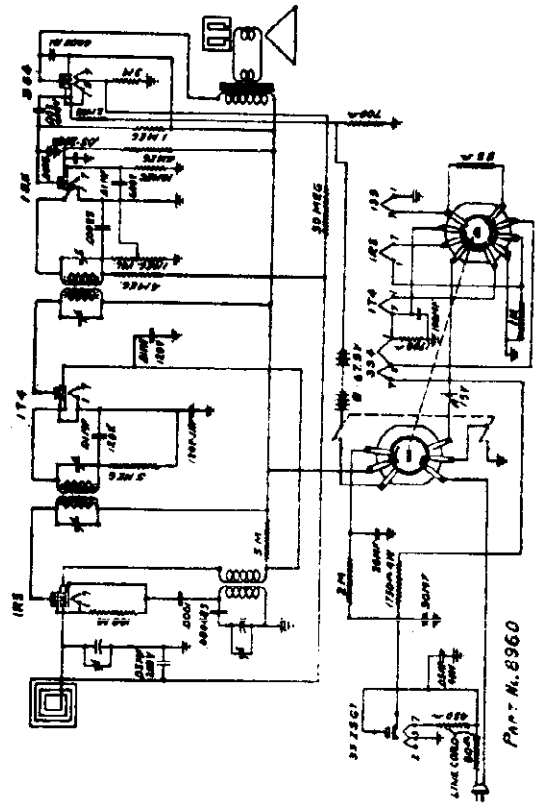
MODEL 3781 AC-DC





MODEL 378





DETROLA CORP.

MODELS 386, 3861 MODEL 379
MODELS 389, 389-1, MODEL 383
389-2

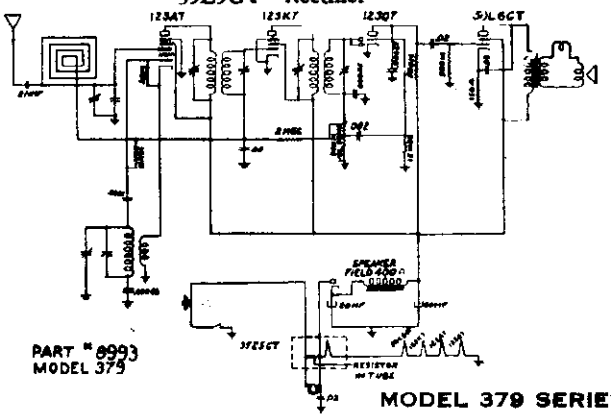
ALIGNMENT PROCEDURE

I.F. Frequency 455 KC. Set Range 510-1580 KC.

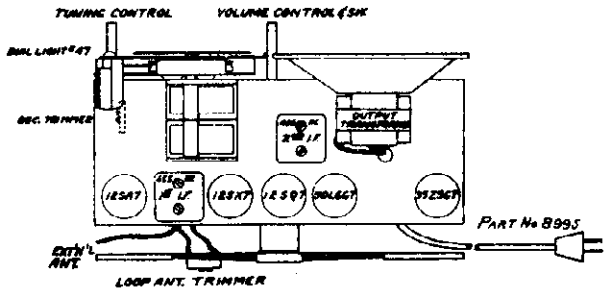
Connect the test oscillator, or signal generator, to the set as follows: Connect the "hot" side of the signal generator to the grid of the 1A7GT tube, and the ground side to the chassis. If the set is alined on AC or DC be sure that the test oscillator or signal generator is isolated from the receiver and line by either a transformer or .2MFD condensers in both test leads. An output meter should be connected across the voice coil leads of the speaker to indicate resonance. Align the I.F. trimmers at 455 KC. for maximum meter reading.

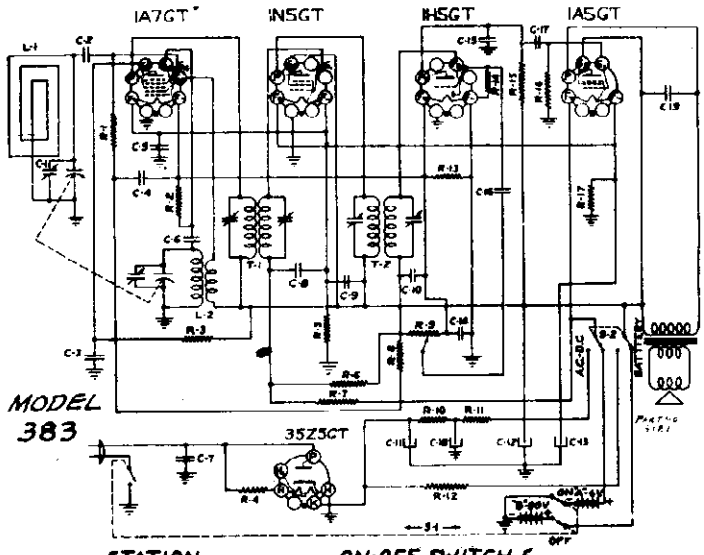
Turn the condenser plates all the way out. Set the test oscillator to 1580 KC and adjust the oscillator trimmer for maximum signal. Disconnect the test oscillator and tune in a weak station near 1400 KC. at full volume. Adjust the trimmer on the front of the variable condenser for maximum signal. When aligning the set do not set the receiver on or near a metal work bench or other large metal object, as it will affect the tracking of the receiver.

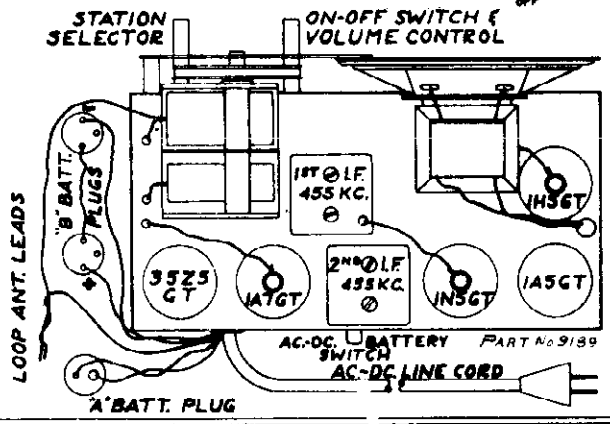
12SA7 Translator **12SQ7 Detector AVC**
12SK7 IF amplifier **50L6GT Output**
35Z5GT Rectifier

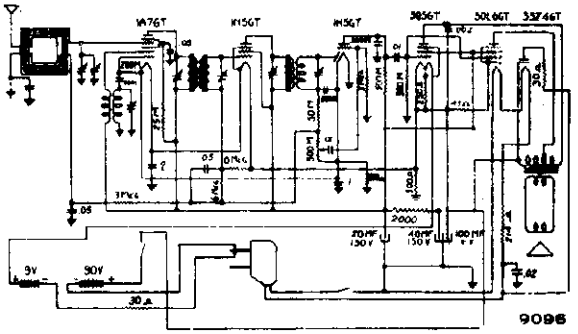


MODEL 379 SERIES

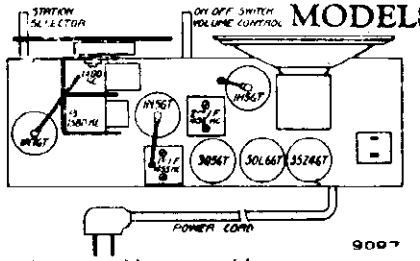


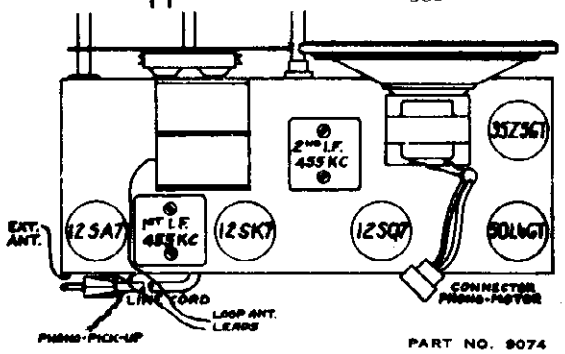






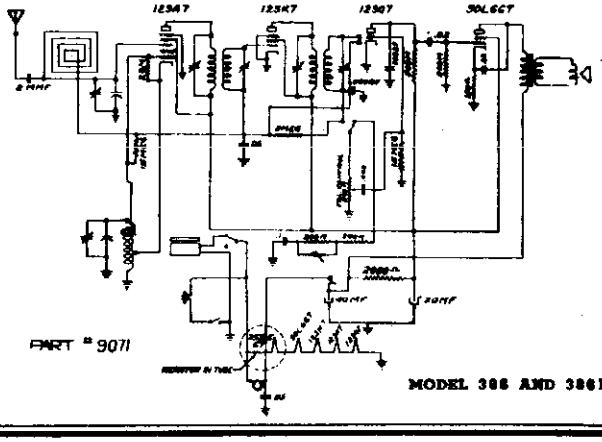
MODELS 389





The following tubes are used in this receiver.

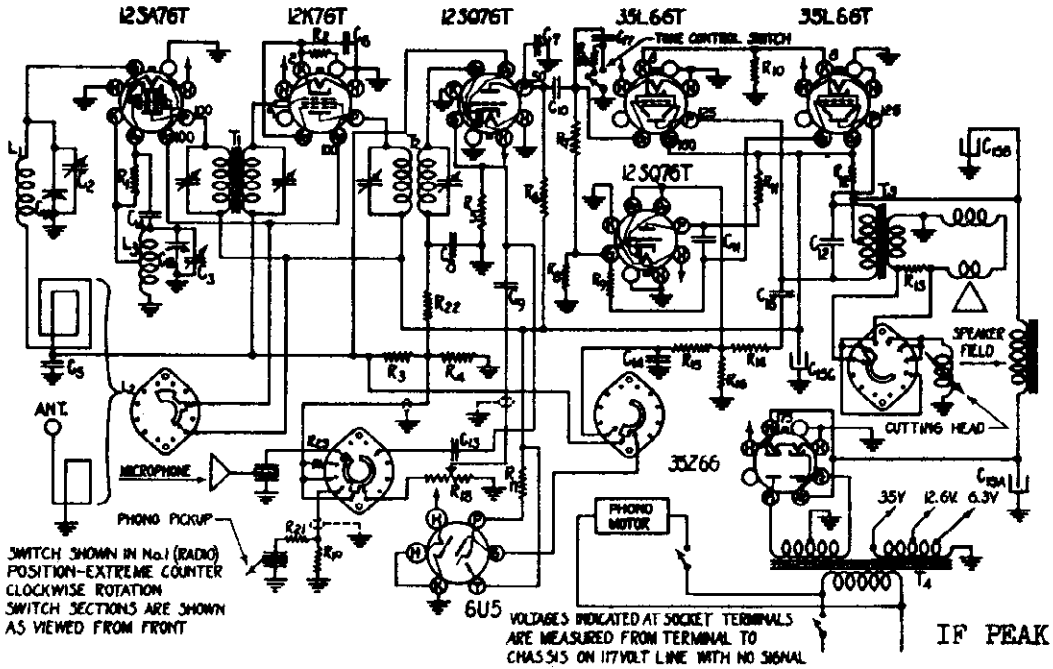
12SA7 Translator **12SQ7 Detector AVC**
12SK7 IF amplifier **50L6GT Output**
35Z5GT Rectifier



MODEL 386 AND 3861

MODEL 390

DETROLA CORP.



Schematic Location	Part Number	Description
		CHASSIS PARTS
	4417	Button, Snap (Dial Mounting)
	8931	Cable, Tuning Tube
	2163	Cable, drive
	3227	Cap, Grid
R18	8910	Control, Volume and Switch
	1732	Cord, Line
	6424	Clamp, Linecord
	4314	Clamp, Tapped—For Tuning Tube
	4315	Clamp, Plain—For Tuning Tube
L3	8422	Coil, Oscillator
L1	8423	Coil, Tracking
C1a,b	8911	Condenser, Variable (with Pulley)
C2,3	8504	Condenser, Dual Trimmer
C15a,b,c	8425	Condenser, Electrolytic (20-250)—(20-150)—(20-150)
C4		Condenser, 100 Mmf. Mica
C5,14		Condenser, 1 Mfd. 200 v.
C6		Condenser, .05 Mfd. 200 v.
C7		Condenser, 250 Mmf. Mica
C8		Condenser, 100 Mmf. Mica
C9		Condenser, .002 Mfd. 600 v.
C10,16		Condenser, .01 Mfd. 400 v.
C11		Condenser, .05 Mfd. 400 v.
C12,13		Condenser, .001 Mfd. 600 v.
C17		Condenser, .005 Mfd. 600 v.
	7209	Grommet, Tuner Assembly Mtg.
	9121	Dial Chart
	8941	Microphone Socket Assembly
	6244	Pulley, Idler
	5026	Pointer
	6158	Pilot Lite
	1207	Retainer, "C" Washer (Holds Tuning Shaft)
R1		Resistor, 20M, 1/3 Watt
R2		Resistor, 200 Ohm, 1/3 Watt
R3,4,14,16		Resistor, 1 Meg. 1/3 Watt
R5		Resistor, 10 Meg. 1/3 Watt
R6,7,8,9,11		Resistor, 200M, 1/3 Watt
R10		Resistor, 120 Ohm, 1/2 Watt
R12		Resistor, 1000 Ohm, 1 Watt
R13		Resistor, 35 Ohm, 1/2 Watt
R15		Resistor, 2 Meg. 1/3 Watt
R17		Resistor, 1 Meg (In Tuning Tube Socket)
R19,20,21,22		Resistor, 50M, 1/3 Watt
R23		Resistor, 4 Meg. 1/3 Watt
	8440	Socket, Dual Dial Lamp
	8648	Spring, Drive Cable
	8427	Shaft, Drive
	8428	Switch, Tone Control

Schematic Location	Part Number	Description
	8932	Switch, Master Control
	8919	Speaker, 6½" Dynamic
T4	8918	Transformer, Power, 60 cycle
T4	8933	Transformer, Power, 50 cycle
T3	89191	Transformer, Output
T1	8434	Transformer, 1st IF
T2	8435	Transformer, 2nd IF
		CABINET ASSEMBLY PARTS
		Back for Cabinet
		Book, Instruction
	8462	Bushing, Rubber (Recorder Unit Mtg.)
	9208	Plate, Instruction
	8477	Plate, Motor-on-off
	8287	Plug, 1 Prong (for Cutter Leads)
	3288	Plug, 1 Prong (for Phono Pickup Leads)
	8493	Plug, 2 Prong (for Motor Leads)
	8454	Switch, Motor
	2997	Washer, Rubber (for Recorder Mtg.)
		RECORDER UNIT PARTS
	6943	Hex Nut for Pivot Post
	6947	Motor Mounting Screw
	6948	Adjusting Screw (Follower Arm)
	9413	Turntable Shaft Locking Screw
	9417	Recorder Arm Rest
	9418	Follower Arm Complete
	9424	Pickup Cartridge
	9426	Pickup Arm Complete
	9428	Cutter Head Tension Spring
	9484	Magnetic Cutter Head with Leads
	9434	Recorder Arm Complete
	9438	Pivot Post Return Spring
	9450	10" One-piece Turntable
	9456	Turntable Drive Disc Stud Clip
	9458	Lead Screw and Pinion Assembly
	9463	Turntable Drive Disc Tension Spring
	9464	Turntable Shaft
	9466	Turntable Drive Disc
	9467	Turntable Drive Disc Mounting Bracket Assembly
		The following parts are for models with ONE-PIECE TURNTABLE ONLY
	9469	Retractable Pin Spring
	9470	Retractable Pin
	9472	Rotor Shaft Pulley
	9474	Rotor Shaft Pulley Set-Screw
	9481	Motor 60 Cycle
	9482	Motor 50 Cycle

DETROLA CORP.

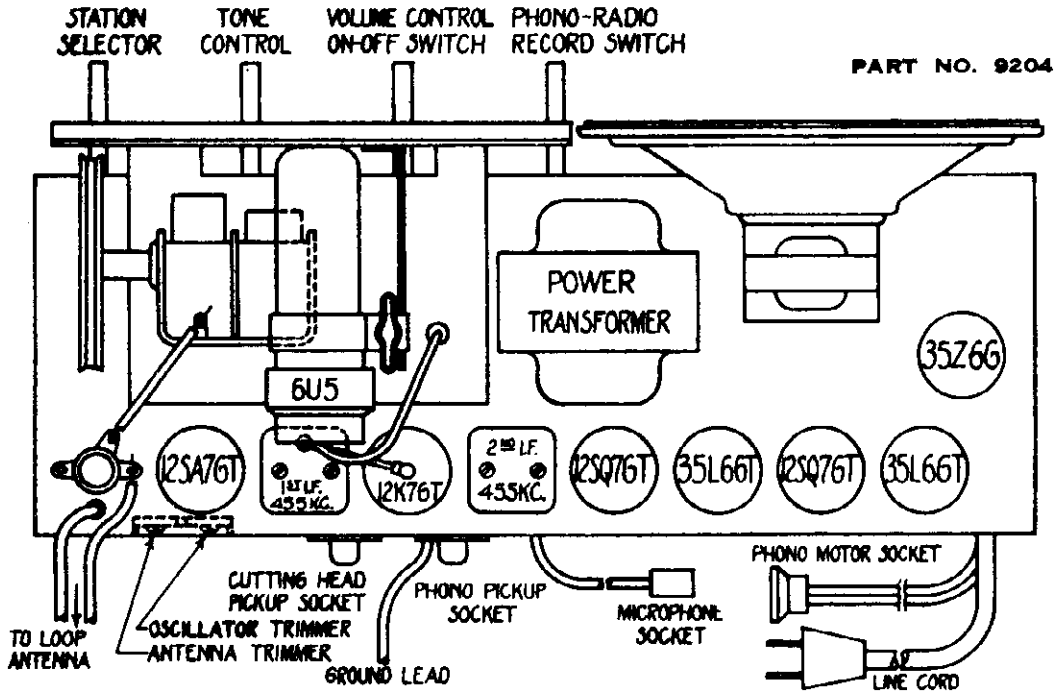
Voltages indicated at socket terminals are measured with 1000 ohm per volt meter, on 117 volt line, no signal.

ALIGNMENT PROCEDURE

Output meter connection . . . . . Across speaker voice coil
Connection of generator ground lead . . . . . To Chassis
Connection of generator output lead . . . . . See chart below
Dummy antenna value to be used in series with generator . . . See chart
Position of volume control . . . . . Full on (Clockwise)

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)
Open (Min. capacity)	455 kc.	.1 mfd.	Ant. section of variable	T2, T1.
Min. capacity	1720 kc.	50 mmf.	Ant. Terminal	Oscillator Trimmer
Tune in signal from generator	1400 kc.	50 mmf.	Ant. Terminal	Antenna Trimmer

ALL ALIGNMENT OPERATIONS MUST BE DONE WITH THE MASTER CONTROL SWITCH IN THE NO. 1 (RADIO) POSITION.



LOOP ANTENNA

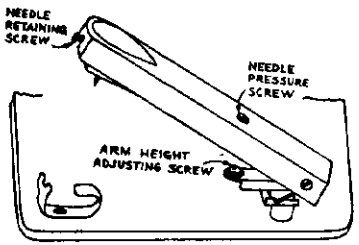
This receiver is equipped with a loop antenna. This antenna is somewhat directional in its reception characteristics, therefore turning the receiver to a particular position will often improve reception or reduce interference.

ANTENNA AND GROUND CONNECTIONS

When this receiver is used inside a building which has metal lath or a large amount of steel in it, or in a location where reception conditions are poor, an outdoor antenna and a ground may be necessary.

Two terminals are provided on the back of the cabinet for connection of antenna and ground.

RECORDING ARM ADJUSTMENTS



The recorder arm and recording head are adjusted at the factory for best operation. The following paragraph tells how to correct these adjustments should they, for any reason, become changed from their factory setting.

The bottom of the recording arm should be exactly 1/4 inch from the surface of the record. This should be measured beside the needle retaining screw on the end of the arm. The screw for making this adjustment can be found when the arm is raised, on a small platform near the hinge. Turning the adjusting screw to the left raises the arm, turning to the right lowers it. In making an adjustment turn the screw only a small fraction of a turn at a time.

Make a cut of at least ten or fifteen turns to see whether or not the needle is exerting the correct pressure on the record. This is correct when the groove cut by the needle is of approximately the same width as the space between grooves. On top of the cutting arms is a flat head screw. Turning this screw to the right increases the depth of cut, to the left decreases it. This adjustment is quite critical and the screw should be turned not more than 1/4 turn at a time.

PHONO OPERATION

Turning the Master Control Switch to the No. 2 or Phono position connects the phono pickup to the audio amplifier of the receiver and disconnects the radio. The Volume control acts for phono the same as for radio.

Always place the pickup arm on the rest provided when not in use.

RECORDING

The recording mechanism will cut records up to 10 inches in diameter. Recordings of excellent quality can be made if the instructions in the following paragraphs are very carefully followed.

INSERTING THE RECORDING NEEDLE IN THE HEAD OF THE RECORDER ARM

Notice that the shank of the recording needle is ground flat on one side. Loosen the screw in the end of the Recorder Arm. Insert the needle into the hole in the under side so that the flat side is towards the front of the cabinet. Tighten the retaining screw so that the needle is held firmly. Check to make sure that the recording needle is tight each time a recording is made.

TO RECORD A RADIO PROGRAM

Place a blank record on the turntable making sure that the small pin on the turntable projects through the hole provided for it in the record. This is necessary to prevent the record from slipping and ruining the recording.

Turn the Master Control Switch to the No. 1 (Radio) position. Tune in the program you desire to record. Observe the tuning eye carefully and be sure that the station is tuned in perfectly.

Turn the Master Control Switch to the "Record Radio" (No. 3) position. Notice that the shadow on the tuning eye screen now varies in width with the volume of sound.

Adjust the Volume Control so that the eye just closes (See paragraph titled "THE TUNING EYE").

Turn the phono motor ON.

Raise the Recorder Arm and move it so that the needle is just inside the edge of the record. Lower the arm carefully on the record.

When the recording arm is lowered on the record an arm on the under side of the recorder unit engages the lead screw which moves the arm across the record. The arm must be raised about three inches to disengage the lead screw so that the arm can be moved.

As the recording is being made, a small shaving is cut out of the record by the recording needle. This piles up in the center of the record.

After the record has been cut, raise the recorder arm, swing it outwardly and place it on the rest. Stop the turntable and remove the shaving which has been cut out of the record.

The record may now be played in the normal manner.

TO RECORD WITH THE MICROPHONE

Plug the Microphone into the socket provided on the rear of the cabinet.

Turn the Master Control Switch to the No. 5 position.

Speak into the microphone and adjust the volume control until the eye just closes as described in the preceding paragraph. Whatever sound is picked up by the microphone will be recorded on the record. Keep the microphone some distance away from the receiver, preferably to one side so that it does not pick up the sound from the speaker. Keep the microphone at least six inches from your mouth and try to keep the same voice level as used initially in setting the volume.

Place the recording arm on the record as described above.

TO RECORD WITH MICROPHONE AND RADIO AT THE SAME TIME

Position No. 4 of the Master Control Switch arranges the circuits so that it is possible to make a recording from a radio program and with the microphone at the same time.

Tune in the program you desire to record exactly as described under "Recording Radio Programs".

Turn the Master Control Switch to the No. 4 position. Adjust eye so that it does not completely close at maximum radio signal.

Speak into the microphone with sufficient volume so that the eye just closes at the maximum combined radio and voice signal. To make the voice predominate, retard the volume setting which reduces the radio volume, and speak a little closer to the microphone.

Place the recorder arm on the record and proceed with the recording.

PUBLIC ADDRESS

The No. 6 position of the Master Control Switch connects the circuits so that the microphone, and the audio amplifier and speaker of the receiver may be used as a small public address system. Keep the microphone as far as possible from the speaker so that the sound from the speaker will not reach the microphone, causing a "Howl" or whistle.

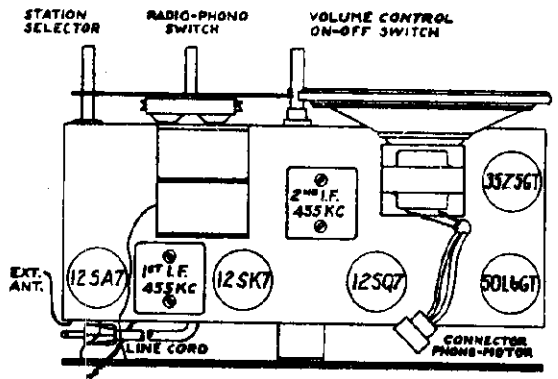
GENERAL INFORMATION

In the recording positions (Positions 3, 4 and 5 of the Master Control Switch) the volume from the speaker is reduced. This is done automatically by the switch for three reasons, some of the power from the output tube is needed for operating the recording head, the volume level necessary for recording is too high for the average size room, and to prevent the sound from the speaker from reaching the microphone.

If the recording needle is not very sharp, the quality of the recording will be poor. A needle which has become dull through use or which has been otherwise damaged should be replaced.

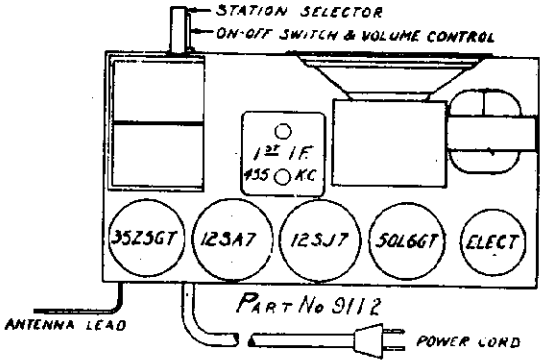
The Master Control Switch should always be turned to the No. 1 (Radio) position when listening to radio programs.

The pickup and the recording arms should always be placed on the rests provided for them when they are not in use, to protect them from damage.



The following tubes are used in this receiver.

12SA7	Translator	12SQ7	Detector AVC
12SK7	IF amplifier	50L6GT	Output
35Z5GT	Rectifier		

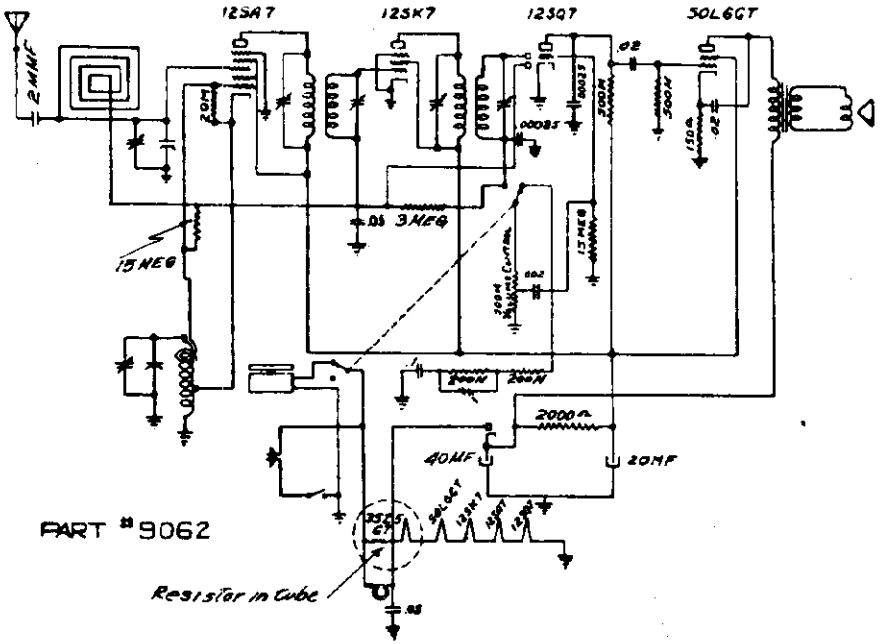


The following tubes are used in this receiver:

12SA7	Translator	50L6GT	Output
12SJ7	Detector	35ZGT	Rectifier

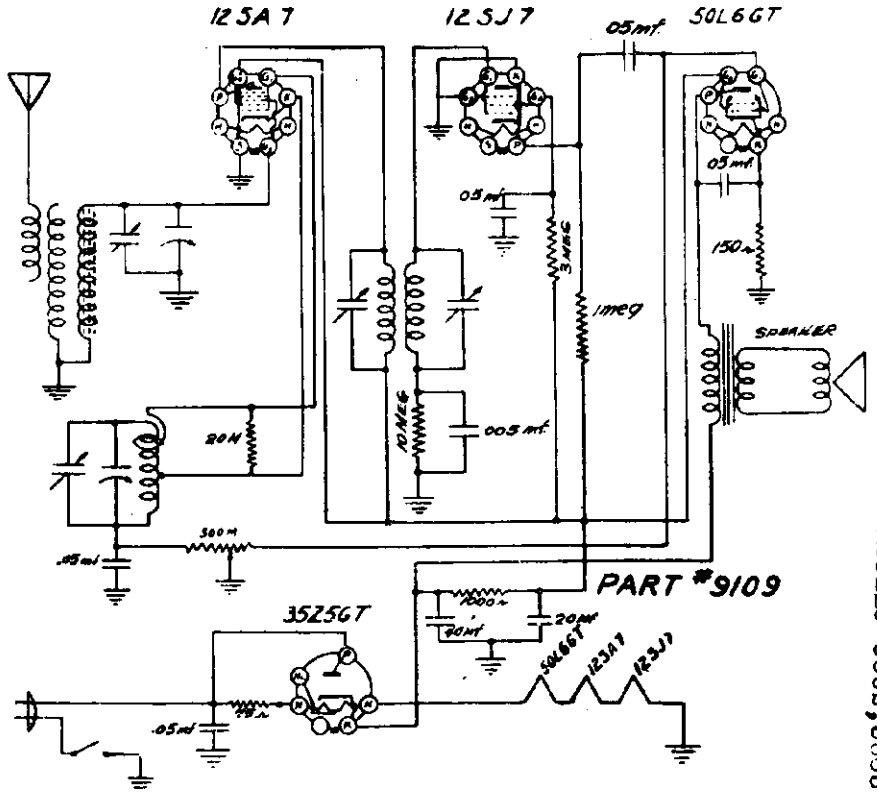
If this receiver should fail to operate when connected to direct current reverse the attachment plug in the light socket.

MODEL 3862 AC-DC PHONO COMBINATION



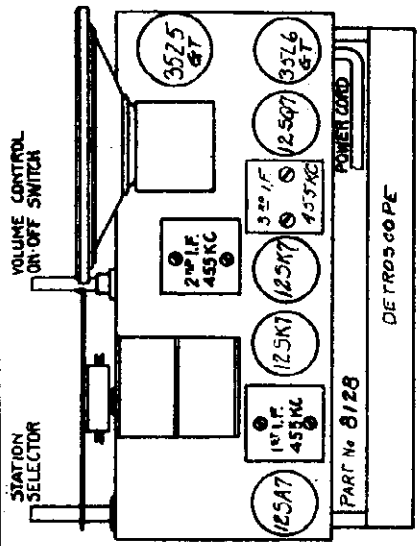
MODEL 3863 AC PHONO COMBINATION

MODEL 392 SERIES



MODEL 393
MODEL 394

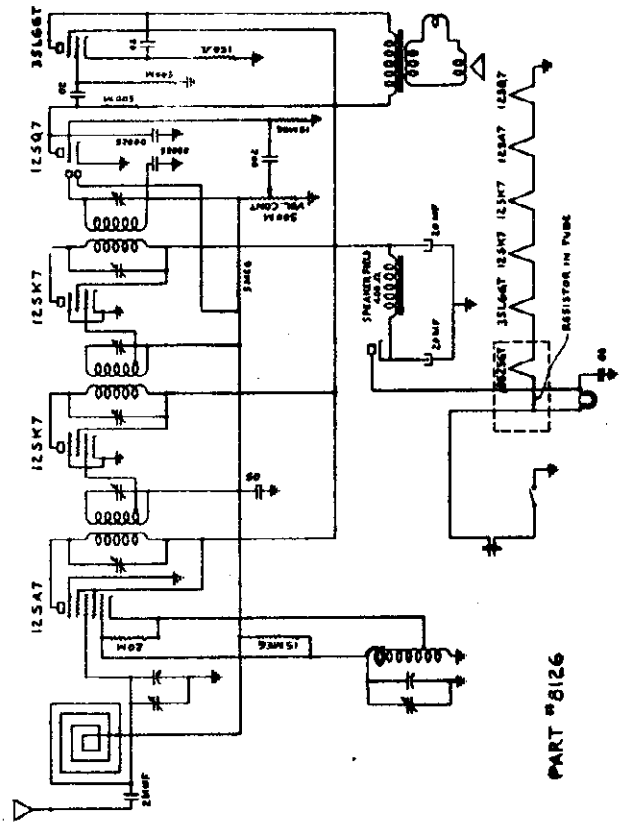
DETROLA CORP.

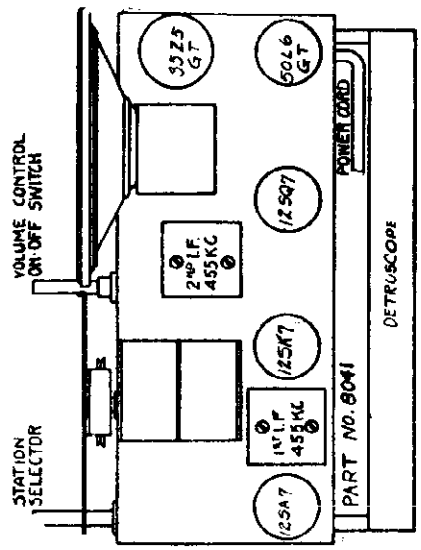


The following tubes are used in this receiver.

12SA7 Translator
12SK7 1st IF Amplifier
12SK7 2nd IF Amplifier
12SQ7 Detector AVC
35L6GT Output
35Z5GT Rectifier

MODEL 394 SERIES

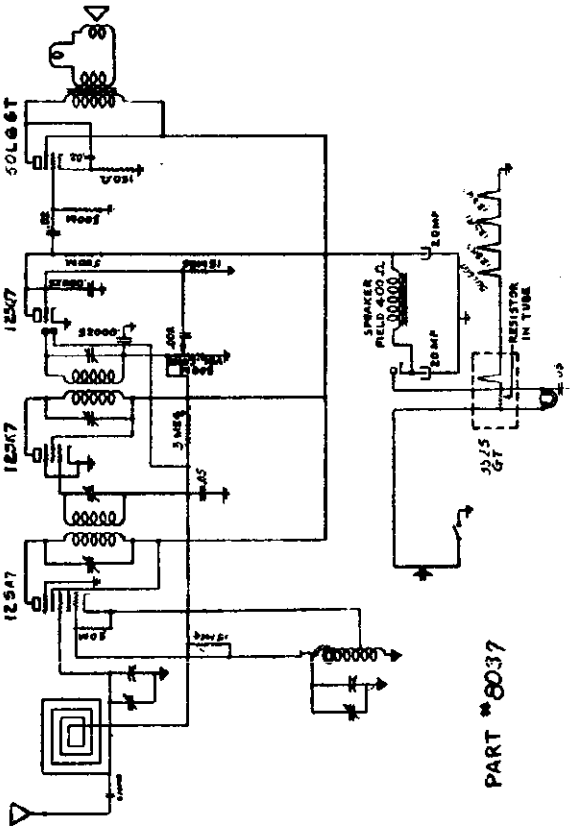




The following tubes are used in this receiver.

12SA7 Translator
12SK7 IF amplifier
12SQ7 Detector AVC
50L6GT Output
35Z5GT Rectifier

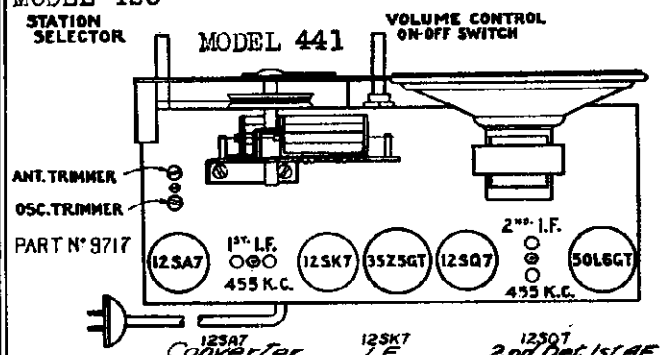
MODEL 393 SERIES

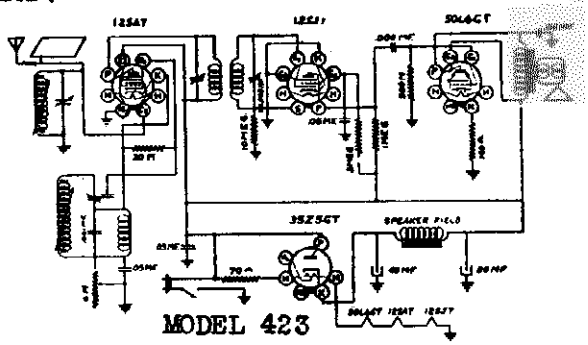


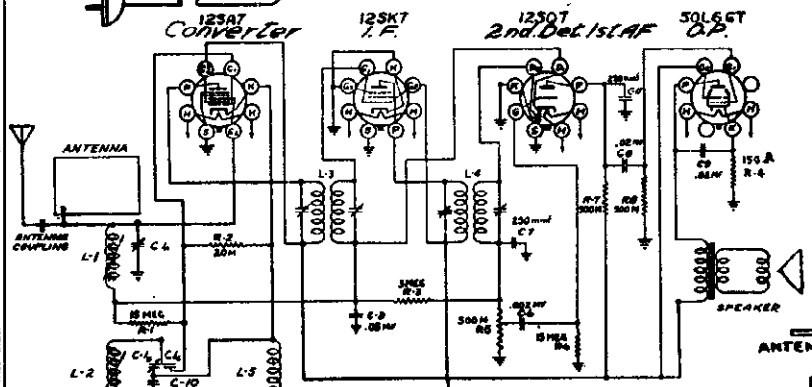
MODEL 441 MODEL 445 MODEL 423

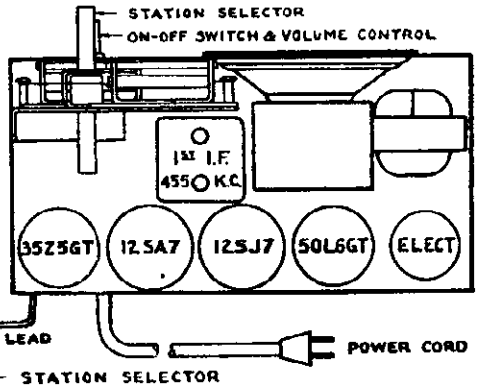
DETROLA CORP.

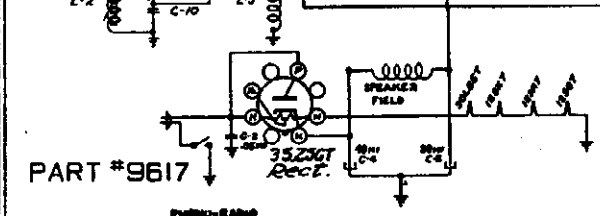
MODEL 42

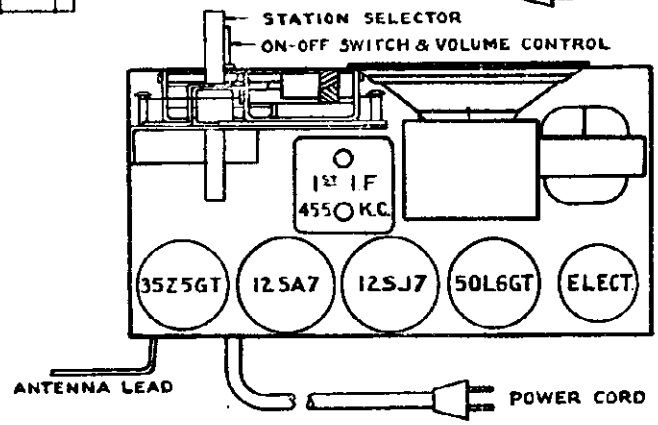


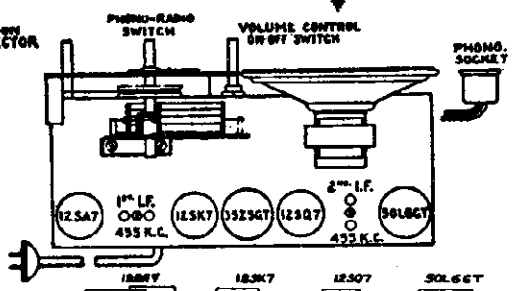




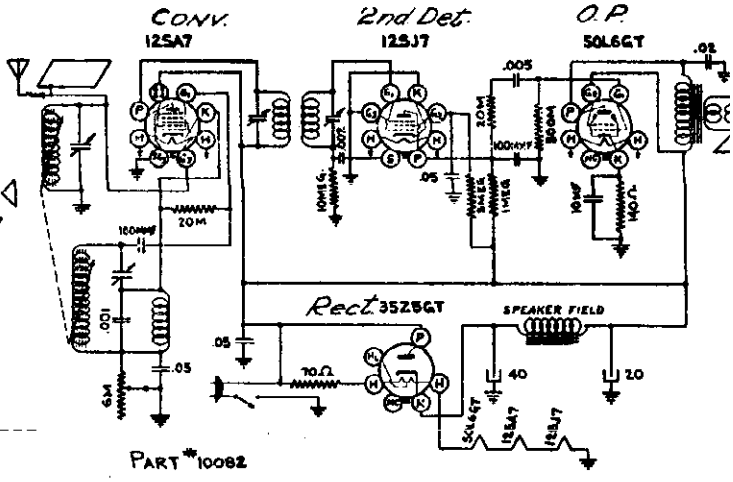


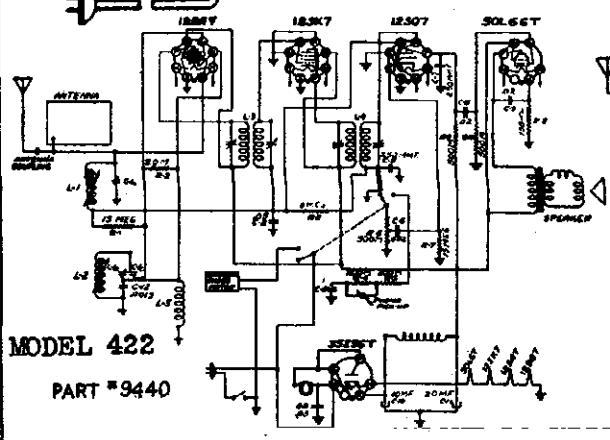






PART*10083 MODEL 445





MODEL 422

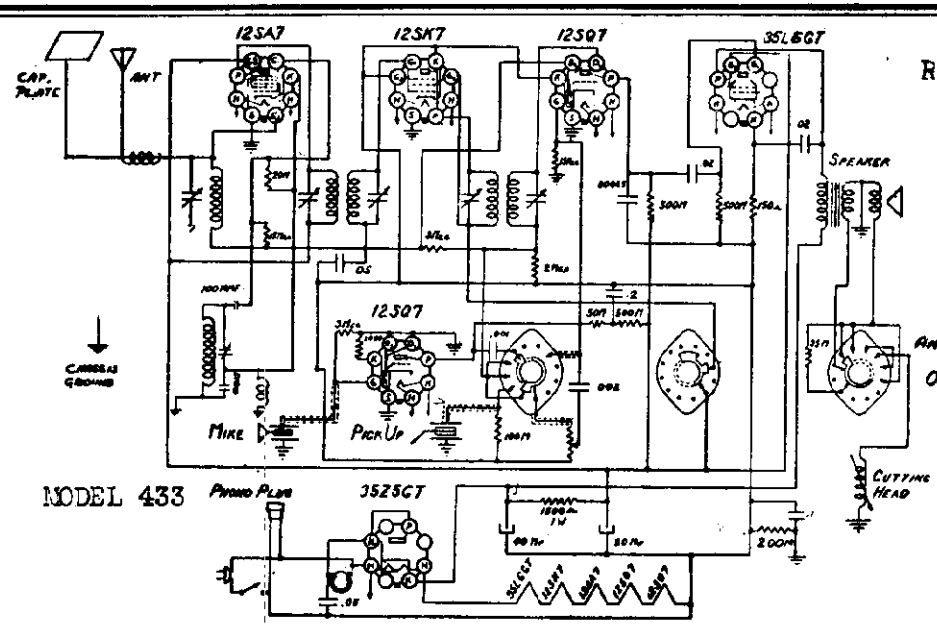
PART *9440

PART*10082

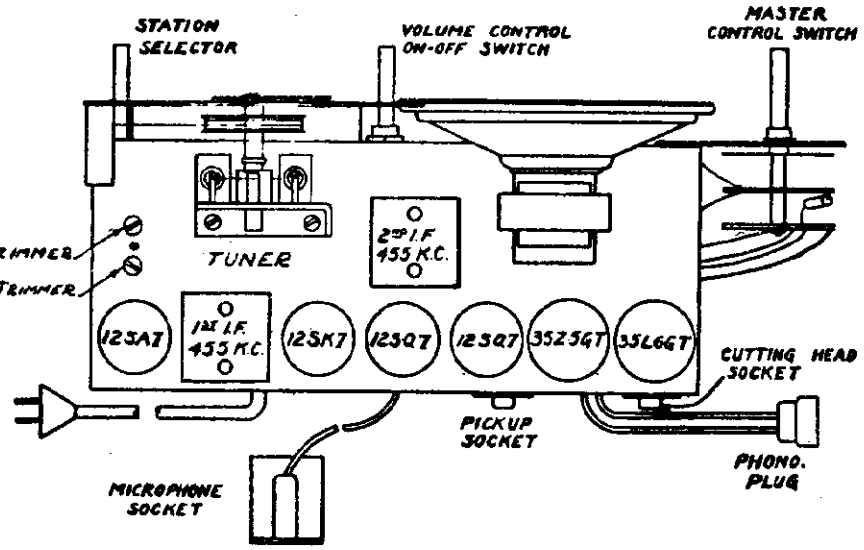
ALIGNMENT FOR MODELS 441 and 445

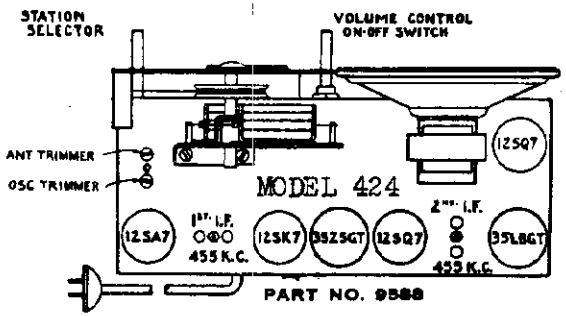
GENERATOR	CONNECTION AT RADIO	DUMMY ANTENNA	DIAL	TRIMMER TO TUNE	REMARKS
I.F. 455 kc.	12SA7 Grid	.1 mfd.	H. F. end	I.F. Transformers	Tune to Max.
1720 kc	Ext. Ant. Wire	200 mmf.	H. F. end	Oscillator Trimmer	Set Limit of band
		Dummy antennae—.1 mfd., 200 mmf.			
1400 kc	Ext. Ant. Wire	200 mmf.	1400	Antenna Trimmer	Tune to Max.

FOR DETROLA N-100, N-200 RECORD CHANGER, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS."



MODEL 433

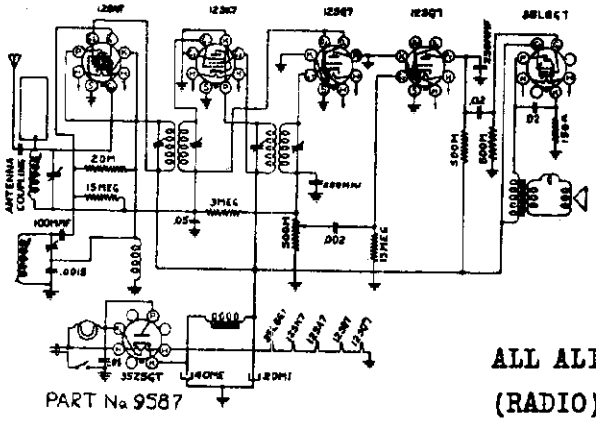




PART NO. 9588

ALIGNMENT PROCEDURE
MODEL 433

Output meter connection . . . . . Across speaker voice coil
Connection of generator ground lead . . . . . To Chassis
Connection of generator output lead . . . . . See chart below
Dummy antenna value to be used in series with generator . . . . . See chart
Position of volume control . . . . . Full on (Clockwise)



PART No. 9587

GENERATOR	CONNECTION AT RADIO	DUMMY ANTENNA	DIAL	TRIMMERS TO TUNE	REMARKS
IF 455 KC	12SA7 Grid	.1 mfd.	H. F. End	IF Transformers 4 Trimmers	Tune to Max.
1720 KC	Antenna	200 mmf.	H. F. End (1720)	Oscillator Trimmer	Set Limit Of Band Tune to Max.
1400 KC	"	"	1400	Antenna Trimmer	

Repeat Above Alignment Procedure at least once more.

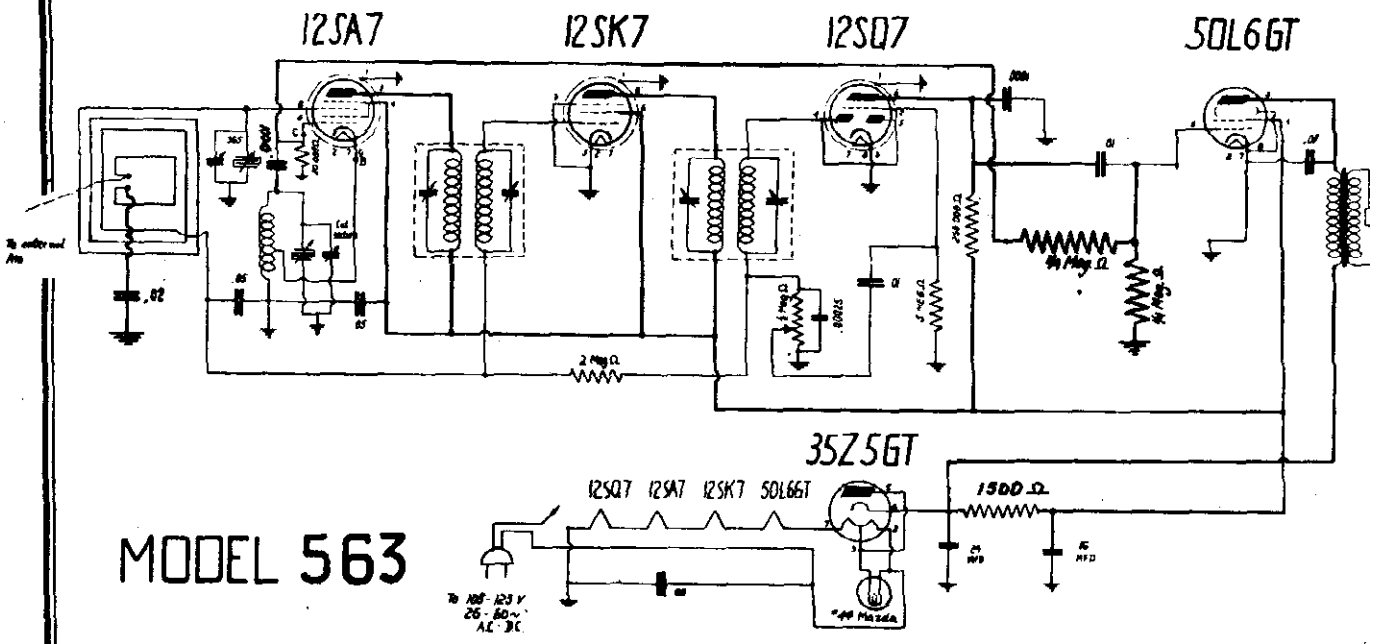
ALL ALIGNMENT OPERATIONS MUST BE DONE WITH THE MASTER CONTROL SWITCH IN THE NO. 1 (RADIO) POSITION.

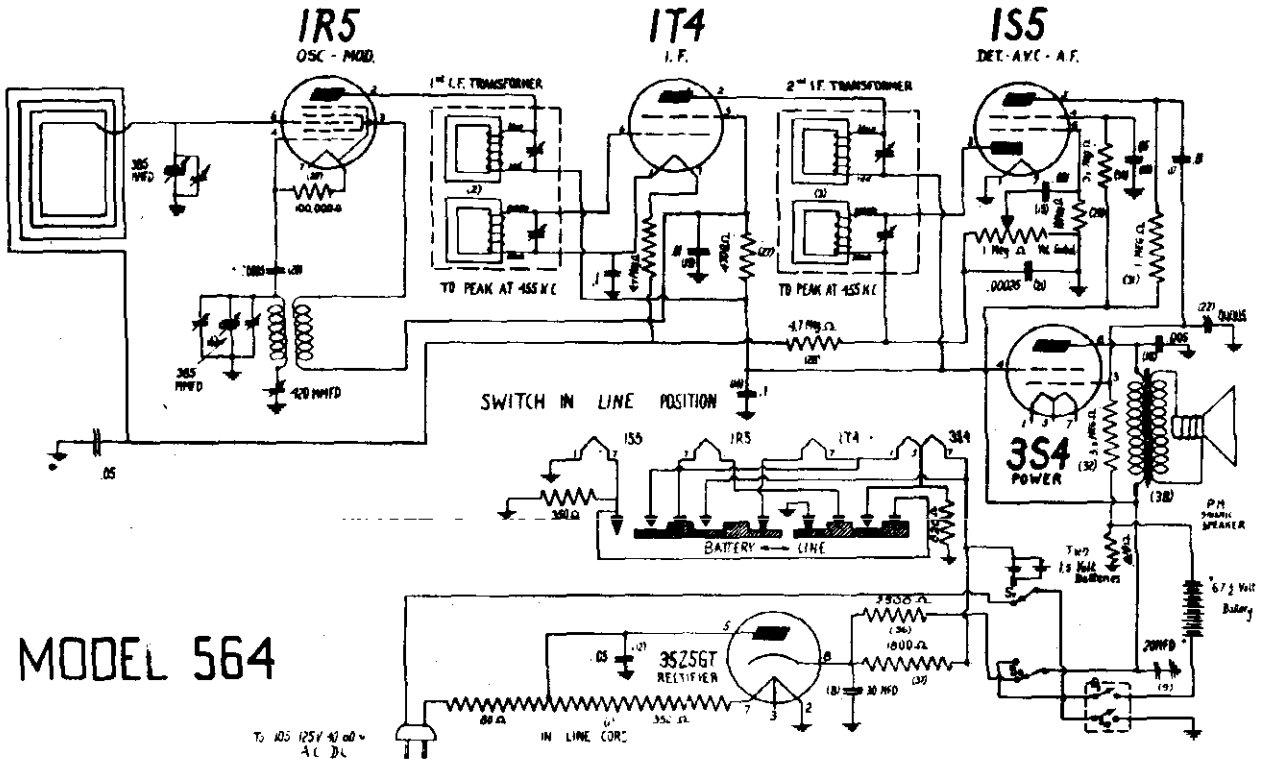
DeWALD RADIO MFG. CORP.

MODEL 5
MODEL 5

TO CALIBRATE RECEIVER

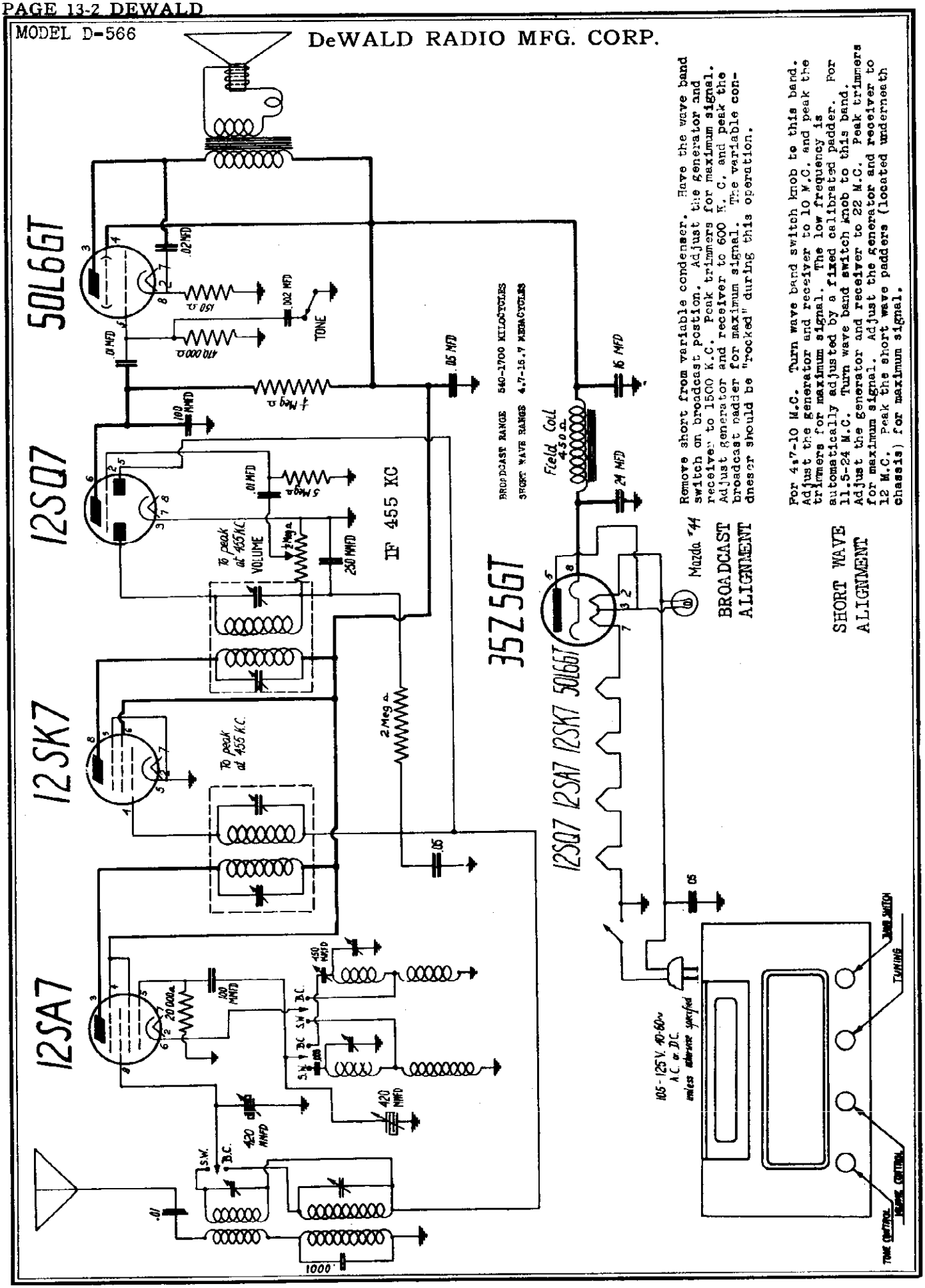
Attach the hot side of signal generator to one of the flexible antenna loop leads. Connect the ground side to the other flexible lead. Adjust the signal generator to 455 KC and peak the I.F. trimmers for maximum signal. Adjust the receiver dial and generator to 1500 KC peak the variable condenser trimmer screws for maximum gain.





MODEL D-566

DeWALD RADIO MFG. CORP.

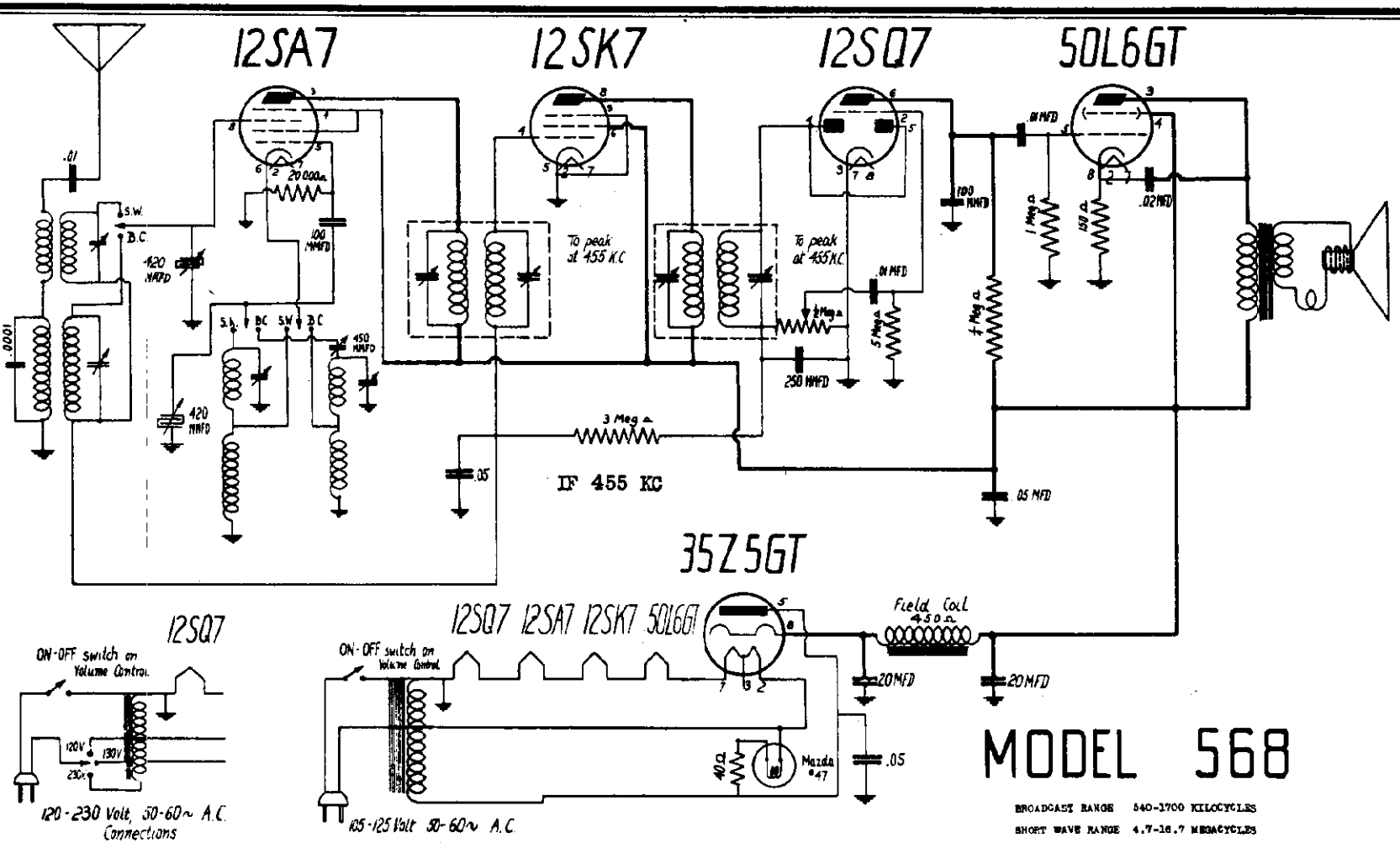


Remove short from variable condenser. Have the wave band switch on broadcast position. Adjust the generator and receiver to 1500 K.C. Peak trimmers for maximum signal. Adjust generator and receiver to 600 K. C. and peak the broadcast padder for maximum signal. The variable condenser should be "rocked" during this operation.

BROADCAST ALIGNMENT

For 4.7-10 M.C. Turn wave band switch knob to this band. Adjust the generator and receiver to 10 M.C. and peak the trimmers for maximum signal. The low frequency is automatically adjusted by a fixed calibrated padder. For 11.5-24 M.C. Turn wave band switch knob to this band. Adjust the generator and receiver to 22 M.C. Peak trimmers for maximum signal. Adjust the generator and receiver to 12 M.C. Peak the short wave padders (located underneath chassis) for maximum signal.

SHORT WAVE ALIGNMENT



MODEL 568

BROADCAST RANGE 540-1700 KILOCYCLES

SHORT WAVE RANGE 4.7-16.7 MEGACYCLES

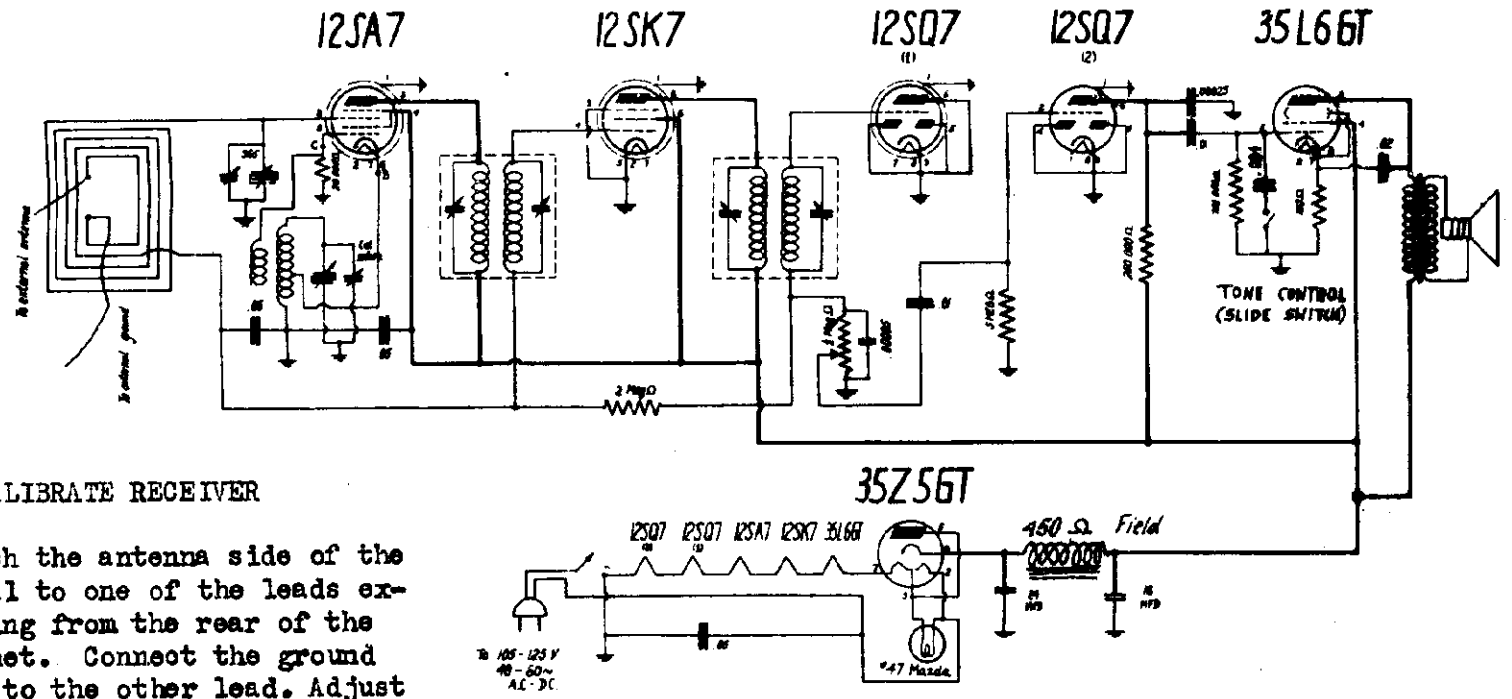
DeWALD RADIO MFG. CORP.

BROADCAST ALIGNMENT

Set the signal generator and receiver dial to 1500 kilocycles. Adjust the broadcast oscillator trimmer screw until the signal from the generator is heard. Peak the antenna trimmer screw for maximum output. Now, set the signal generator and receiver dial to 600 kilocycles. Peak the broadcast padder for maximum output. The variable condenser should be "rocked" during this operation.

SHORT WAVE OPERATION

Slide the wave band switch button to the short wave position. Set the signal generator and receiver to 16 megacycles. Adjust the short wave oscillator coil trimmer until the generator signal is heard. Peak the short wave antenna coil trimmer for maximum output. The low frequency end of the dial is automatically adjusted.



MODEL 666-T

TO CALIBRATE RECEIVER

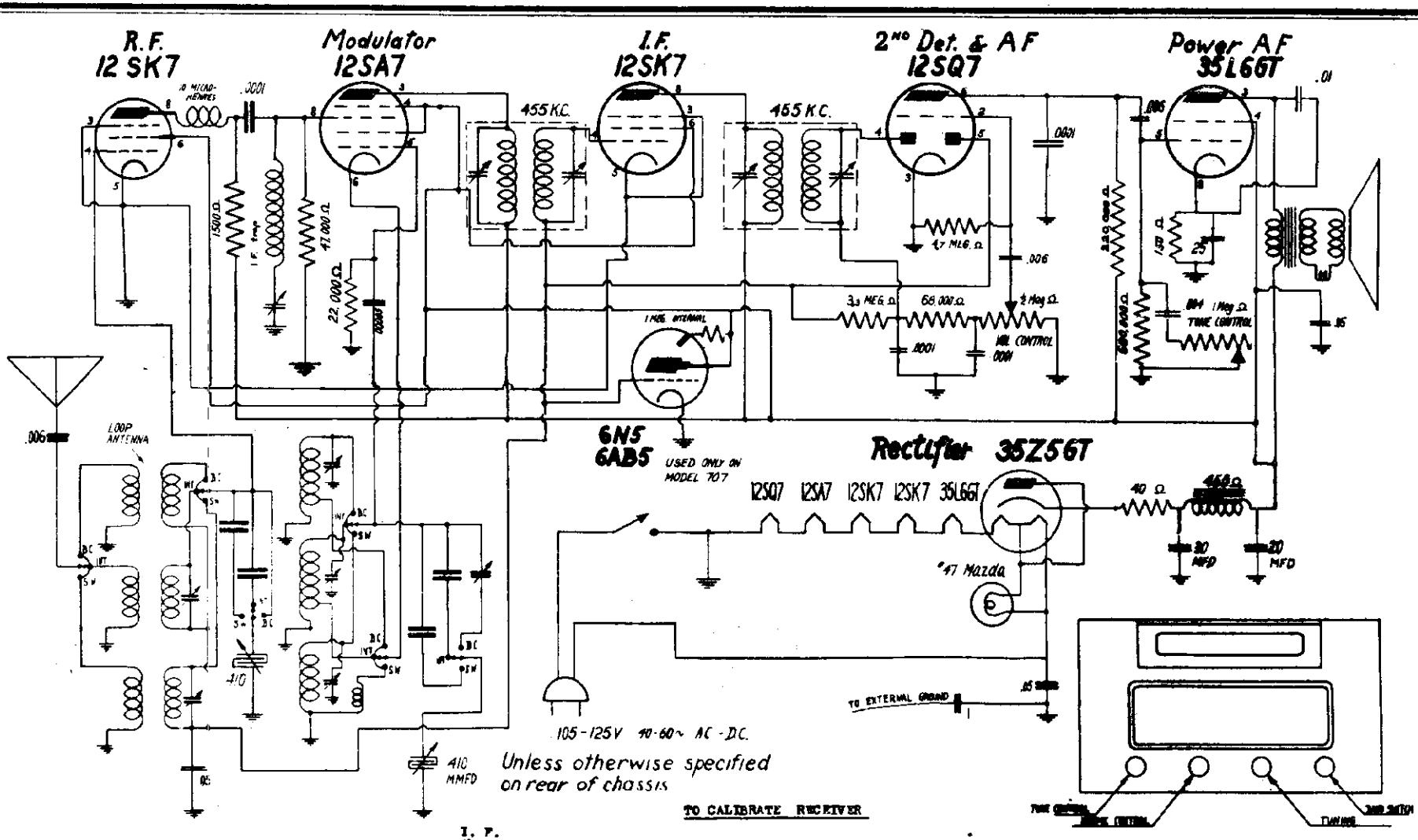
Attach the antenna side of the signal to one of the leads extending from the rear of the cabinet. Connect the ground side to the other lead. Adjust the signal generator to 455 KC and peak the I.F. trimmers for maximum signal. Set the signal generator and the receiver to 1500 KC and peak the variable condenser trimmers for maximum signal. The low frequency end of the dial is automatically calibrate by a cut section variable condenser.

IMPORTANT

Since the loop used has a directional effect, it may be found that it is necessary at times to turn the receiver for best reception on weaker stations.

MODEL 666T

This model is a six tube superheterodyne receiver with full automatic volume control. A self-contained loop is incorporated which makes the use of an antenna unnecessary. The range coverage is 540-1700 kilocycles. The receiver has been designed to operate on 105-125 volts, 40-60 cycles A.C.-D.C. unless otherwise specified.



TO CALIBRATE RECEIVER

ALIGNMENT FOR MODELS 670,707,672-A

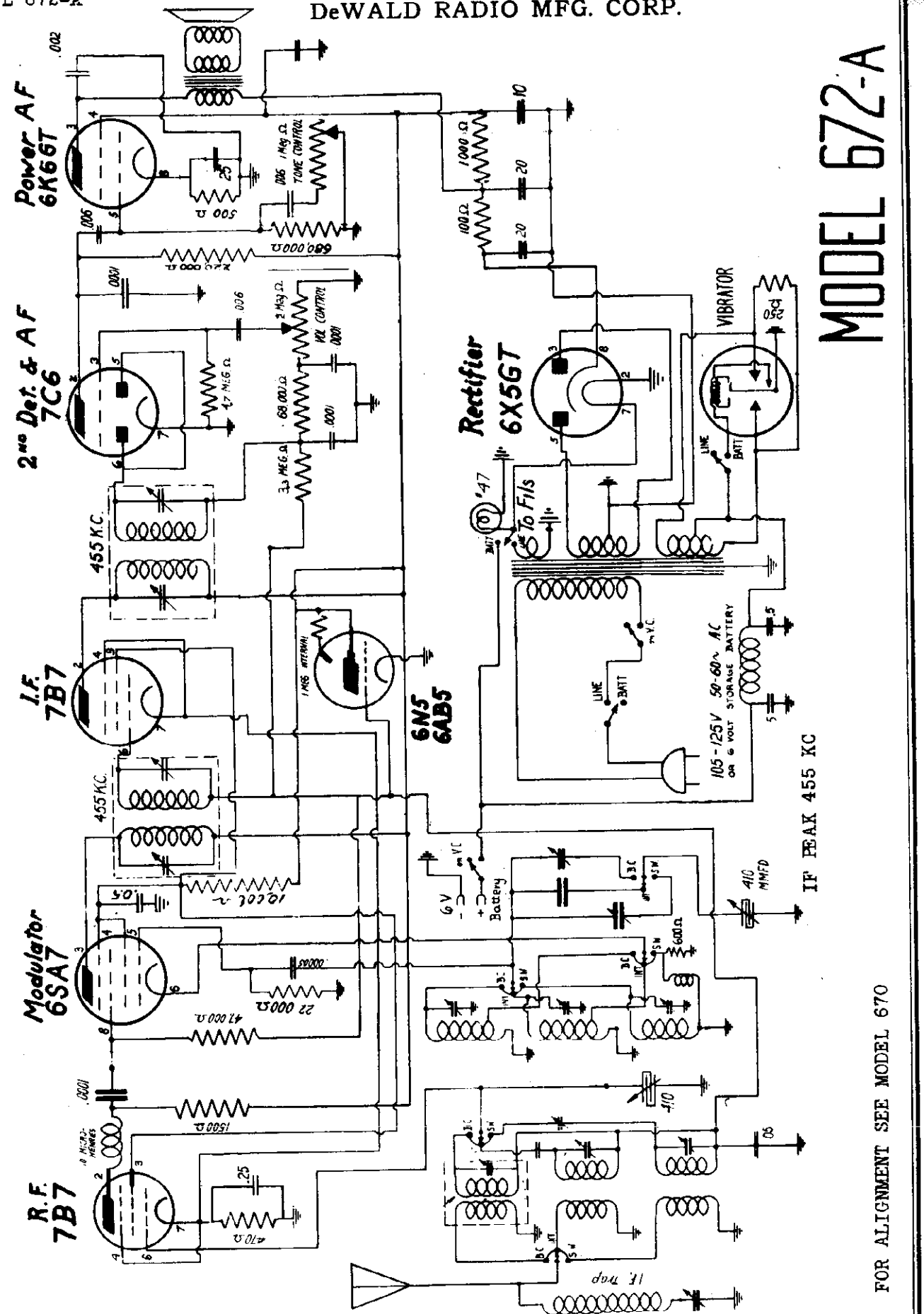
I. F. ALIGNMENT Connect antenna lead of the signal generator to antenna lead of receiver and ground lead of generator to receiver chassis. Short circuit front section of variable condenser. Adjust generator to 455 K.C. and peak I.F. trimmers for maximum signal.

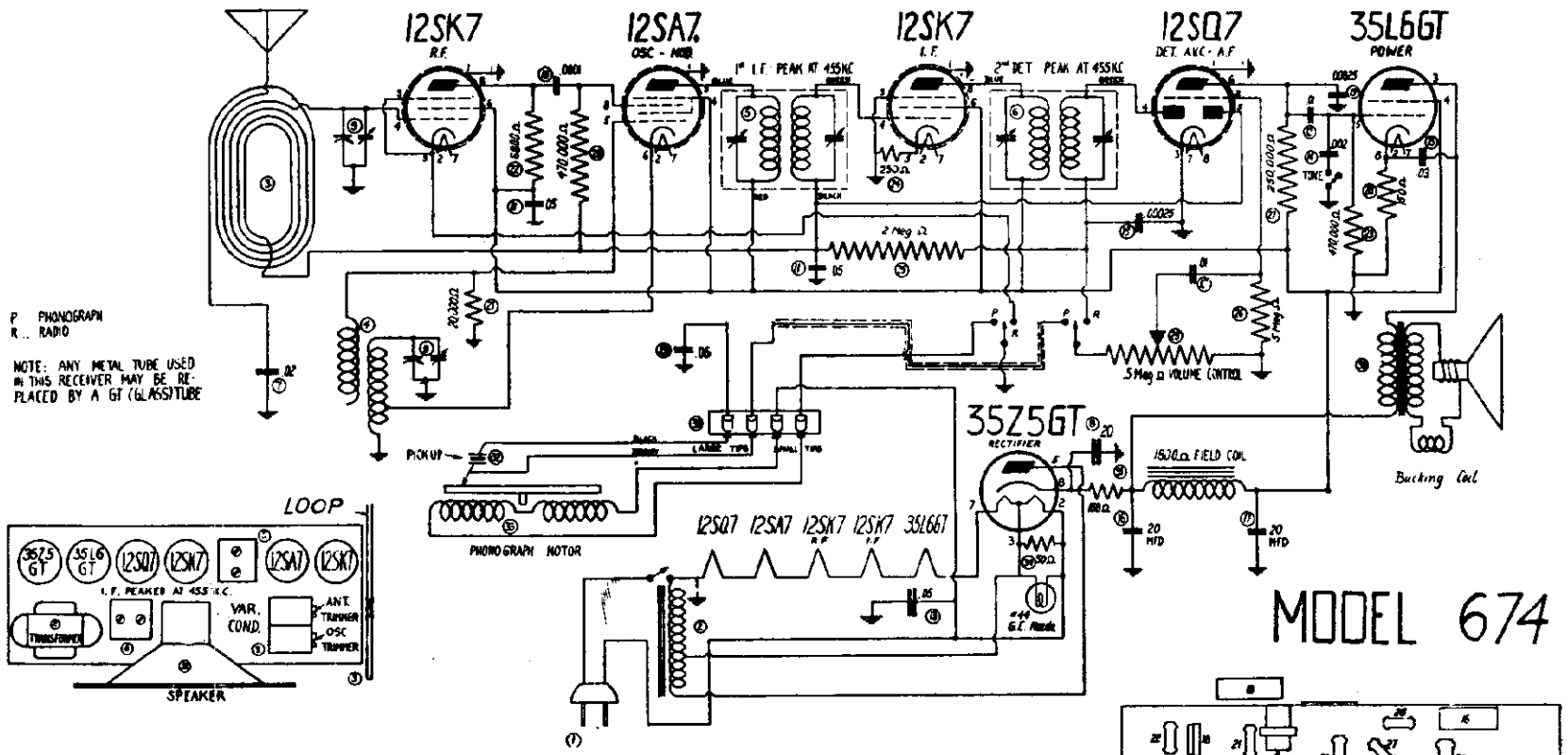
SHORT WAVE ALIGNMENT For 4.7-10 M.C. Turn wave band switch knob to this band. Adjust the generator and receiver to 10 M.C. and peak the trimmers for maximum signal. The low frequency is automatically adjusted by a fixed calibrated padder. For 11.5-24 M.C. Turn wave band switch knob to this band. Adjust the generator and receiver to 22 M.C. Peak trimmers for maximum signal. The low frequency is automatically adjusted by a fixed calibrated padder.

BROADCAST ALIGNMENT Remove short from variable condenser. Have the wave band switch on broadcast position. Adjust the generator and receiver to 1500 K.C. Peak trimmers for maximum signal. Adjust generator and receiver to 600 K.C. and peak the broadcast padder for maximum signal. The variable condenser should be "rocked" during this operation.

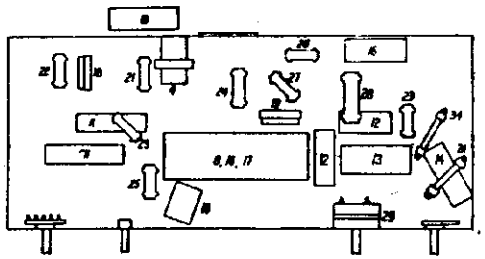
MODEL 672-A

DeWALD RADIO MFG. CORP.





MODEL 674



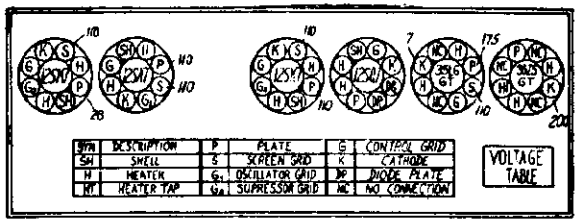
BOTTOM VIEW OF CHASSIS

MODEL 674 INSTRUCTION SHEET

The model 674 is a RADIO-PHONO combination that provides reproduction of recordings with good fidelity as well as regular radio broadcast reception. All types of records up to 12 inches may be played with the lid closed. A self-starting motor together with a crystal pick-up are used for phonograph reproduction. The radio receiver employs a superheterodyne circuit using the latest low drain tubes for low power consumption. A self-contained loop-tenna is incorporated which makes the use of an outside antenna unnecessary in most localities. It will function on 105-125 volts, 60 cycles A.C. only, unless otherwise specified. A range of 540-1700 kilocycles is covered by the receiver.

RADIO-PHONOGRAPH SWITCH

The control on the extreme right is used to operate either the radio or play phonograph disc recordings. When the knob is in the counterclockwise direction, the radio receiver will function. To play records, turn the knob clockwise. This will adjust the instrument for phonograph operation. If a rise in hum level is noticed when handling the phonograph pick-up, reverse the line cord plug in the electric outlet.



SYM	DESCRIPTION	P	PLATE	G	CONTROL GRID
SH	SHELL	S	SCREEN GRID	K	CATHODE
H	HEATER	G_1	OSCILLATOR GRID	DP	DIODE PLATE
HT	HEATER TAP	G_{SUP}	SUPRESSOR GRID	NC	NO CONNECTION

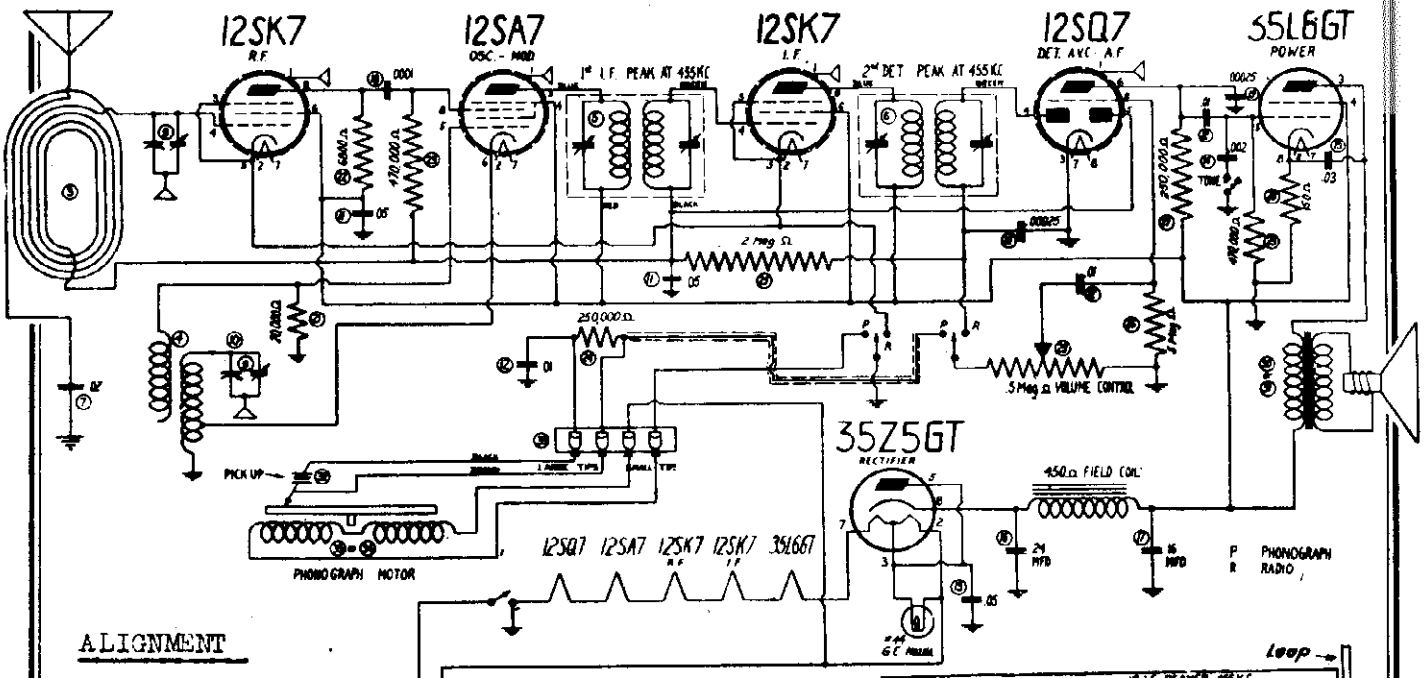
VOLTAGE TABLE

BOTTOM VIEW OF CHASSIS

ALL ABOVE VOLTAGES MEASURED FROM SOCKET TERMINAL TO CHASSIS WITH A 1000 Ω. PER VOLT VOLTMETER

MODEL 675

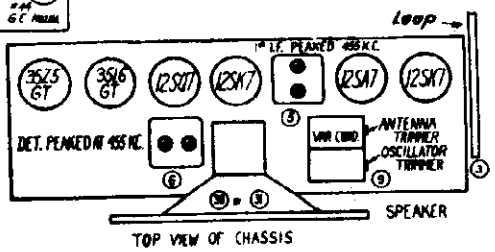
DeWALD RADIO MFG. CORP.



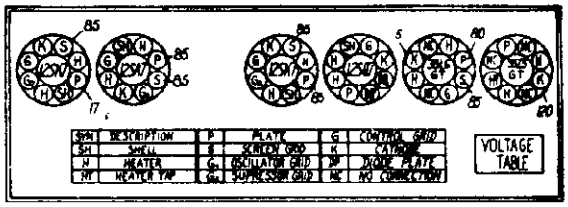
ALIGNMENT

I.F.-----455 K.C.
R.F.-----1700 to
1400 K.C.

FOR CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOL. EIGHT

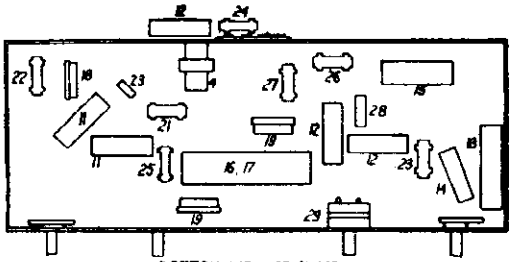


TOP VIEW OF CHASSIS



BOTTOM VIEW OF CHASSIS

ALL ABOVE VOLTAGES MEASURED FROM SOCKET TERMINAL TO CHASSIS WITH A 1000 Ω PER VOLT VOLTMETER



BOTTOM VIEW OF CHASSIS

SERVICE NOTES

Tuning Control Drive Ratio	12:1
Power Consumption (with phono)	40 watts
Intermediate Frequency	455 K.C.
Tuning Frequency Range	540-1700 K.C.
Maximum Power Output	0.9 watts
Loud Speaker ____ Cone Diameter	5 inches
Voice Coil Impedance (at 400 cycles)	3 ohms

Plate (8) of 12SK7 R. F. tube to common ground	17 volts
Screen (6) of 12SK7 R.F. tube to common ground	85 volts
Plate (3) of 12SA7 tube to common ground	85 volts
Screen (4) of 12SA7 tube to common ground	85 volts
Plate (8) of 12SK7 I.F. tube to common ground	85 volts
Screen (6) of 12SK7 I.F. tube to common ground	85 volts
Plate (3) of 35L6GT tube to common ground	80 volts
Screen (4) 35L6GT tube to common ground	85 volts
Cathode (8) 35L6GT tube to common ground	5.0 volts
Cathode (8) 35Z5GT tube to common ground	120 volts
heater (2) and (7) of 12SA7 tube	12.4 volts AC
Heater (2) and (7) of 12SK7 R.F. tube	12.4 volts AC
Heater (2) and (7) of 12SK7 I.F. tube	12.4 volts AC
Heater (8) and (7) of 12SQ7 tube	12.4 volts AC
Heater (2) and (7) of 35L6GT tube	35.0 volts AC
Heater (2) and (7) of 35Z5GT tube	35.0 volts AC

SERVICE INFORMATION

Voltages--Line 117 Volts AC--Power Consumption 40 Watts including Phonograph Motor. Volume Control maximum. Meter 1000 ohms per volt, 250 volt

I.F. Alignment

Connect an output meter across the voice coil. Rotate the volume control to maximum. Set test oscillator to 455 kilocycles and apply signal to control grid of 12SK7 R.F. through a .05 mfd. capacitor. Align the second I.F. transformer trimmers, next adjust the first I.F. transformer trimmers. Keep the test oscillator output to a level that will give a good meter reading.

R.F. Alignment

Attach high side of test oscillator to flexible lead extending from rear of chassis through a .00025 mfd. condenser. Connect the low side to the receiver chassis. Adjust the test oscillator and receiver to 1700 kilocycles. Peak 1700 kilocycles oscillator trimmer for maximum output. Change test oscillator signal and receiver dial to approximately 1400 kilocycles. Then trim 1400 kilocycles antenna trimmer for maximum output.

SERVICE NOTES

DU MONT TELEVISION RECEIVERS

THE FOLLOWING information was compiled by the Service Department and is based on actual experience acquired in the field over the last three years.

ANTENNA INSTALLATION

ERECT the antenna in the clear whenever possible, as high and as far back from the street as possible.

ANTENNAS over 15 feet high should be guyed securely. Mount antenna securely on a chimney or wall, using the hardware and mounting brackets supplied by the antenna manufacturer.

INSTALLATION crew should consist of two men. One man on the roof to rotate the antenna and locate the position. Another man at the set to watch the results. These two men should be in constant communication. Philco phones will serve the purpose. Connect the speaker of the Philco phones to 25 feet of transmission wire with a pair of insulation-piercing clips - this enables you to clip on the lead-in wire without breaking the insulation. Connect the master station in series with the antenna lead-in wire and antenna plug at the set, thereby giving constant communication with the operator on the roof without using extra lead-in wire for the phones.

DIPOLE

THE DIPOLE (both rods) should be equal to one-half wave-length of the radiation to be received, for maximum result, and connected to the receiver by means of a transmission line - twin conductor.

FREQUENCIES assigned to each of the New York stations and dipole needed to match the wave length are listed below:

Station	Frequency in M.C.	Length of Dipole	Length of Reflector
WNBT	50-56	100"	112"
WCBW	60-66	90"	96"
WABD	78-84	72"	76"

THIS does not necessarily mean that a separate antenna is required for each station. It has been found that in most parts of the Metropolitan area, a satisfactory signal can be picked up from all three stations on an antenna tuned to WCBW's frequency, 90 inch dipole (45 inches each rod) with reflector.

HOWEVER, in some of the outlying points in Long Island, Westchester, and New Jersey it may be necessary to erect a second antenna tuned to WABD's frequency, 72 inches (36" each rod) to pick up their signal, until such time as WABD's power is raised to normal strength.

REFLECTOR

WHEN the receiver is located at a considerable distance from the transmitter, better pick-up and directional properties are required, and a second rod connected parallel to, and ¼ wave length behind the dipole will reflect the signal back and aid signal strength considerably. The reflector will also help reduce reflections.

THE LENGTH of the reflector rod should be slightly over the overall length of the dipole (see table).

WHEN two antennas of varying lengths are used, remember that the distance between the dipole and the reflector rod of each antenna should approximate ¼ wave length of the transmitted signal, or ¼ the length of the dipole.

REFLECTIONS

METAL structures, large buildings in the path of the signal, will reflect the transmitted waves and cause multiple "ghost" images on the screen of the receiver. These "ghosts" are very annoying and should be eliminated by rotating the antenna or changing the location. The use of reflector rods may at times serve the purpose.

SOMETIMES, however, the reflected waves are a blessing in disguise, specially in large cities where low buildings are sandwiched in between high buildings. Very often it is possible to pick up a reflected signal below the line-of-sight, or turn the dipole completely away from the line-of-sight to eliminate "ghosts" and pick up a reflected signal with better results than on a direct pick-up.

IN CERTAIN locations, in large cities, signals radiated by the various stations are reflected from many angles and it will be impossible to eliminate "ghosts" on all stations. In such cases, a second antenna will have to be erected. But, bear in mind that a satisfactory signal either direct or reflected, can always be picked up within the transmission radius with the proper equipment.

TRANSMISSION LINE

THE TWISTED pair transmission line or lead-in wire used should have an impedance of 72 ohms per 100 feet. This type of transmission line can be used in most installations, but it must be remembered that there is an appreciable loss of signal strength in ordinary twisted wires - approximating 20% for lengths from 100 feet to 200 feet.

IN CASES where the signal strength is low to begin with, or where an exceptionally long lead-in is required, co-axial cable is recommended. There is very little loss in comparatively long lengths of co-axial cable.

WHEN the signal level is weak the constrast or sensitivity control of the set has to be turned on "full" and all kinds of noises will be picked up, interfering with the picture. This kind of interference will cause small white spots and flashes similar to a snow storm on the screen, and is known as "snow in the picture".

IF CO-AXIAL cable is used in such cases, the signal level will be raised and the noise level lowered proportionately, giving a clear picture at all times.

SERVICE NOTES

HERE are some of the most common service problems encountered in the field:

1. Receiver dead
2. Sound but no picture
3. Picture but no sound
4. Poor sound
5. Poor synch. picture tears out
6. Bright spot on screen of CRT Sound OK

7. No control of focus or intensity
8. Breakdown in raster or test pattern
9. Microphonics
10. Sound in picture
11. Single vertical line or horizontal line on screen of CRT
12. Intermittent sound or picture
13. Poor linearity

1. Receiver dead
   (a) If receiver is dead check a.c. plug and check back of cabinet to make sure safety switch is closed.
   (b) If 3 amp. fuse is blown, look for a shorted or arcing 2X2, 4000 volt, high voltage rectifier tube.
   (c) Check for shorted or arcing 5X3, 1500 volt, high voltage rectifier tube.
   (d) Check for shorted or arcing 2X2. 4500 volt intensifier-rectifier tube mounted in a horizontal position.
   (e) Check for a shorted high voltage filter condenser in the 1500 or 4000 volt supply.
   (f) Check for a shorted .05-4500 volt coupling condenser mounted in a horizontal position under sweep deck.

2. Sound but no picture
   (a) Check video amplifier by touching grid of 1851 first video amplifier tube. You should see broad white bars on CRT indicating that that circuit is OK. If no response is noted, check that portion of the circuit the 1851, or 6V6G video amplifier tubes may be defective.
   (b) Drift in oscillator realign oscillator trimmer.
   (c) Check 1852 video I.F. amplifier tubes for open filament or shorts.

3. Picture but no sound
   (a) Check oscillator for drift realign oscillator trimmer.
   (b) Check 6V6G audio amplifier tube. Check 6Q7G, 6J7G, also 1851 first audio I.F amplifier tube. These tubes will also cause the sound to be distorted, weak and intermittent.

4. Poor sound
   (a) Defective 6V6G audio amplifier tube.
   (b) Shorted or gassy 1st audio 1851 tube.
   (c) 6Q7G audio amplifier tubes not all the way in sockets - press tubes all the way in socket.

5. Poor synch. Picture tears out
   (a) A weak signal due to a broken or shorted antenna lead-in or a defective synch. separator tube, will cause the picture to lose synch. Also check frequency controls for correct adjustment.

6. Bright spot on screen of CRT Sound OK
   (a) If this condition exists. turn intensity off at once as this will burn a spot on the screen of the CRT. Look for a defective 5X3, 1500 volt rectifier tube. If tube is OK look for a shorted 4 mfd. 1500 volt filter condenser.

7. No control of focus or intensity
   (a) Fibre tongue is usually broken on controls. The fibre tongue insulates the intensity and focus control pots from ground as they are 4000 volts above ground. If no fibre tongues are available, turn controls with an insulated screwdriver to the proper intensity and focus.
   (b) The 750K and 2 meg.bleeder resistors mounted on the front panel between the focus and intensity pots may be open.

8. Breakdown in raster or test pattern
   (a) Check for leakage at CRT socket and base.
   (b) If breakdown is due to leakage at CRT socket, you will hear a sizzling noise at base of CRT socket. If socket hasn't arced across causing complete breakdown, you can put a 25 watt lamp in tube socket to dry out moisture. If that doesn't do it, replace CRT socket and if CRT base is badly burned from arcing send CRT to plant to be rebased.
   (c) Breakdown is noticed on the raster by the separation of the line structure.

9. Microphonics
   (a) Check the 6J5 oscillator, 1852 mixer and the 1851 first audio tubes for microphonic conditions.

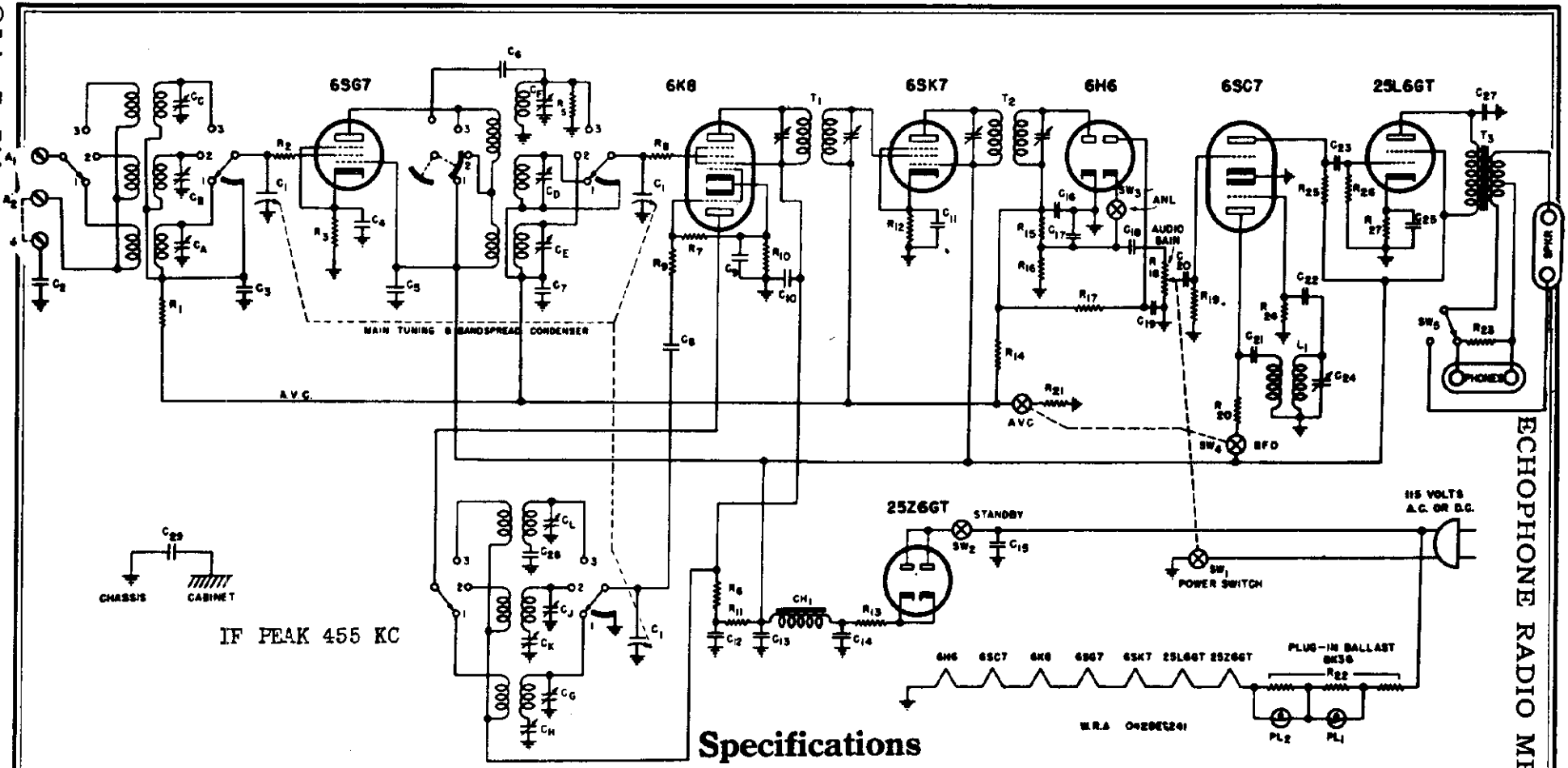
10. Sound in picture
   (a) Check 1851 first video amplifier tube.
   (b) Check 6V6G video amplifier tube.
   (c) R.F. and detector circuits being off, frequency due to drift or misalignment. Realignment will be necessary.

11. Vertical or horizontal lines on screen
   (a) Caused by no plate voltage on 6AD5 horizontal or vertical sweep oscillator, due to open plate supply resistors. On the vertical side there are four 100K 1 watt resistors. Always tu n down the intensity control if there is a bright horizontal or vert ical line on screen or it will become burned.

12. Intermittent sound or picture
   (a) Due to shorted antenna line.

13. Poor linearity
   (a) Due to defective 6R6G horizontal or vertical amplifier tube. On the right side of the sweep deck, you will find the horiz ontal linearity control. On the left side you will find the vertical linearity control. By adjusting controls, poor linearity can be corrected.

ALLEN B. DU MONT LABORATORIES, INC.
PASSAIC, NEW JERSEY



IF PEAK 455 KC

Specifications

TUBES -

1 - 6SG7 R.F. Amplifier
1 - 6K8 Mixer - H.F. Oscillator
1 - 6SK7 I.F. Amplifier
1 - 6H6 2nd Detector-AVC-ANL
1 - 6SC7 BFO - 1st Audio
1 - 25L6GT Audio Output
1 - 25Z6GT Rectifier
1 - BK36 Ballast Tube

Power Consumption - 40 Watts
Power Source - 115 volts AC or DC
Power Output - One watt undistorted
Intermediate Frequency - 455 KC
Frequency Range - 550 KC to 30 mc.

FOR PARTS LIST SEE NEXT PAGE

MODEL EC-2

ECHOPHONE RADIO MFG. CO.

RESISTORS

SYMBOL	OHMS	WATTAGE	SYMBOL	OHMS	WATTAGE
R_1	250,000	1/3	16	250,000	1/3
2	30	1/3	17	1 meg	1/3
3	200	1/3	18	500,000	Audio Gain #25-048
5	10,000	1/3			
6	300	1/3	19	5 meg	1/3
7	50,000	1/3	20	10,000	1/3
8	30	1/3	21	150	1/3
9	100	1/3	22	Ballast Resistor	BK 36
10	300	1/3			
11	1,000	1/3	23	300	1/2
12	200	1/3	24	50,000	1/3
13	15	1/2	25	250,000	1/3
14	3 meg	1/3	26	500,000	1/3
15	100,000	1/3	27	150	1/3

CONDENSERS

SYMBOL	CAPACITY	VOLTAGE	TYPE	SYMBOL	CAPACITY	VOLTAGE	TYPE
C_1	Main tuning and bandspread			15	.02 mfd	400	Paper
2	.01 mfd	400	Paper	16	100 mmf		Mica
3	.05 mfd	200	Paper	17	100 mmf		Mica
4	.05 mfd	200	Paper	18	.01 mfd	400	Paper
5	.1 mfd	200	Paper	19	.05 mfd	200	Paper
6	5-6½ mmf		Ceramicon	20	.005 mfd	400	Paper
7	.05 mfd	200	Paper	21	.01 mfd	200	Paper
8	25 mmf		Mica	22	100 mfd	#44-055	
9	.05 mfd	200	Paper	23	.01 mfd	400	Paper
10	.02 mfd	200	Paper	24	450 mmf	#44-055	
11	0.1 mfd	200	Paper	25	10 mfd	25	Electrolytic
12	30 mfd	150	Electrolytic	27	.02 mfd	600	Paper
13	30 mfd	150	Electrolytic	28	.0054 mfd		Mica
14	40 mfd	150	Electrolytic	29	0.1 mfd	200	Paper

Alignment Procedure

EQUIPMENT NEEDED FOR ALIGNING AND PRELIMINARY ADJUSTMENTS:

An all wave signal generator which will provide an accurately calibrated signal at the test frequencies listed.
Output indicating meter
Non-metallic screw driver
Dummy antenna 400 ohm, 200 mmf. and 0.1 mfd.
Connect signal generator ground to ground terminal (G) of receiver.
Set bandspread at 100.
Connect output meter across primary of output transformer.
Gain controls - Maximum all adjustments.

I.F. ALIGNMENT

Connect 0.1 mfd. dummy antenna between high side of generator and 6K8 grid.
Set signal generator to 455 kc.
Adjust all trimmers on T_1, T_2 and T_3 for maximum output.
Adjust the BFO control to give the desired beat note with the 455 kc I.F. signal. This adjustment, C24, is located under chassis.

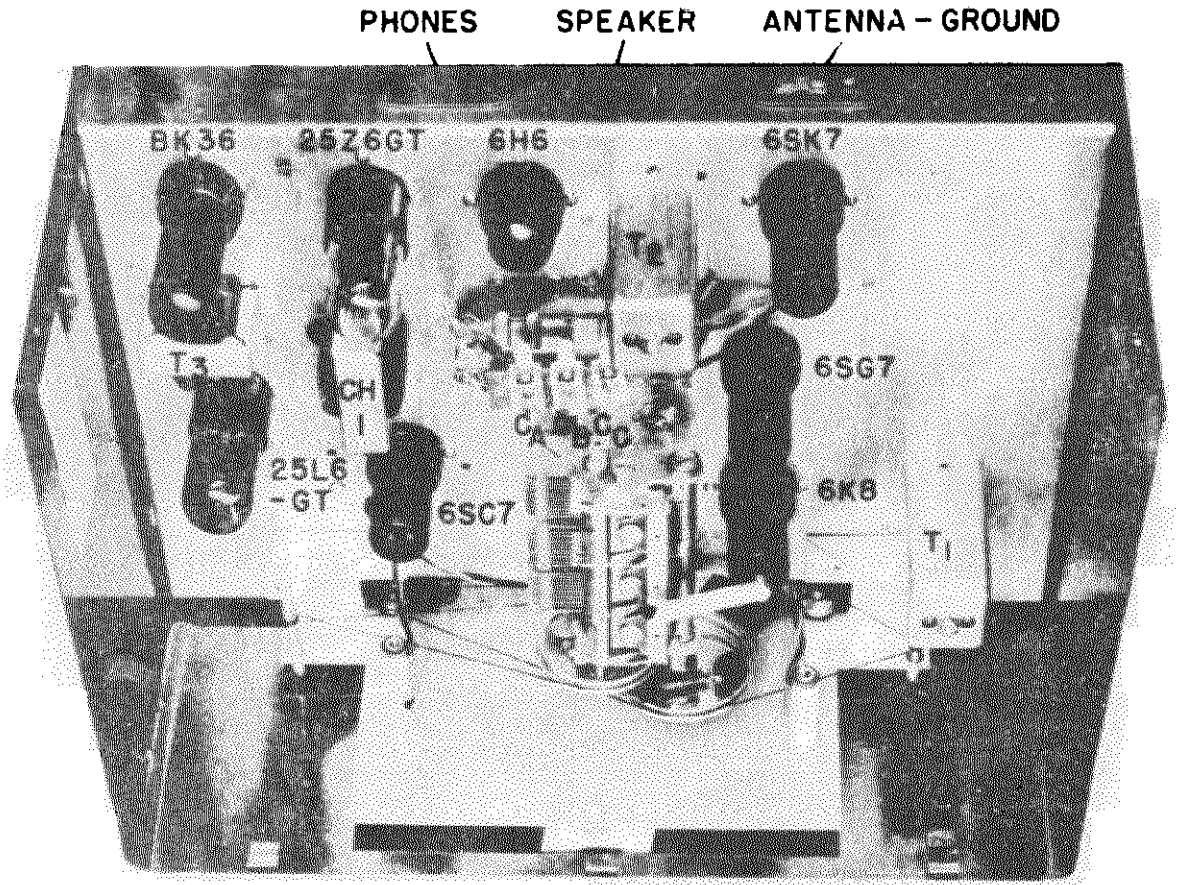
R. F. ALIGNMENT

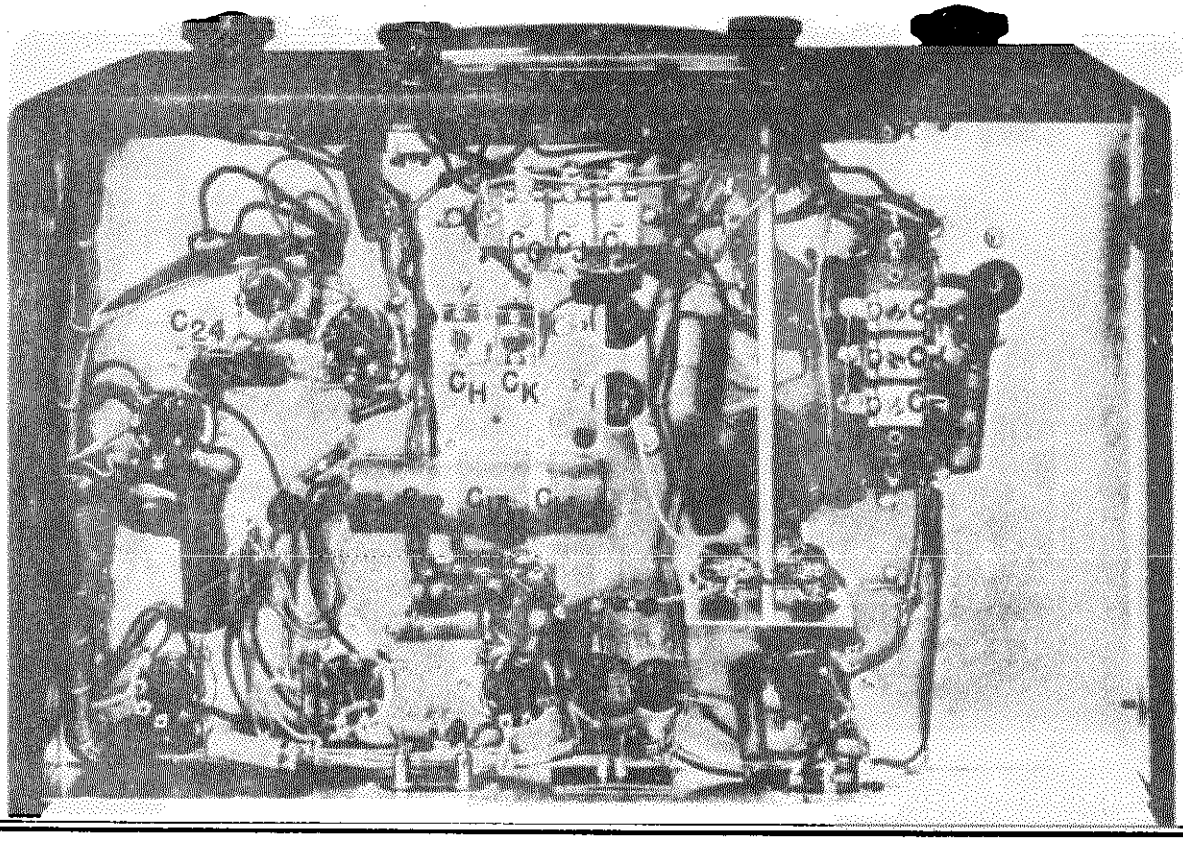
The following table indicates R.F. alignment procedure.

Band	Signal Generator Frequency Setting	Signal Generator Dummy Antenna	Pad	Trimmers	Adjustment
1	600 kc	200 mmf	C_H	none	maximum output
	1800 kc	200 mmf	none	C_A C_E C_G	maximum output
2	2.5 mc	400 ohm	C_K	none	maximum output
	7.0 mc	400 ohm	none	C_B C_D C_J	
3	no padding condenser on this band				
	28 mc	400 ohm		C_C C_F C_L	maximum output

ECHOPHONE RADIO MFG. CO.

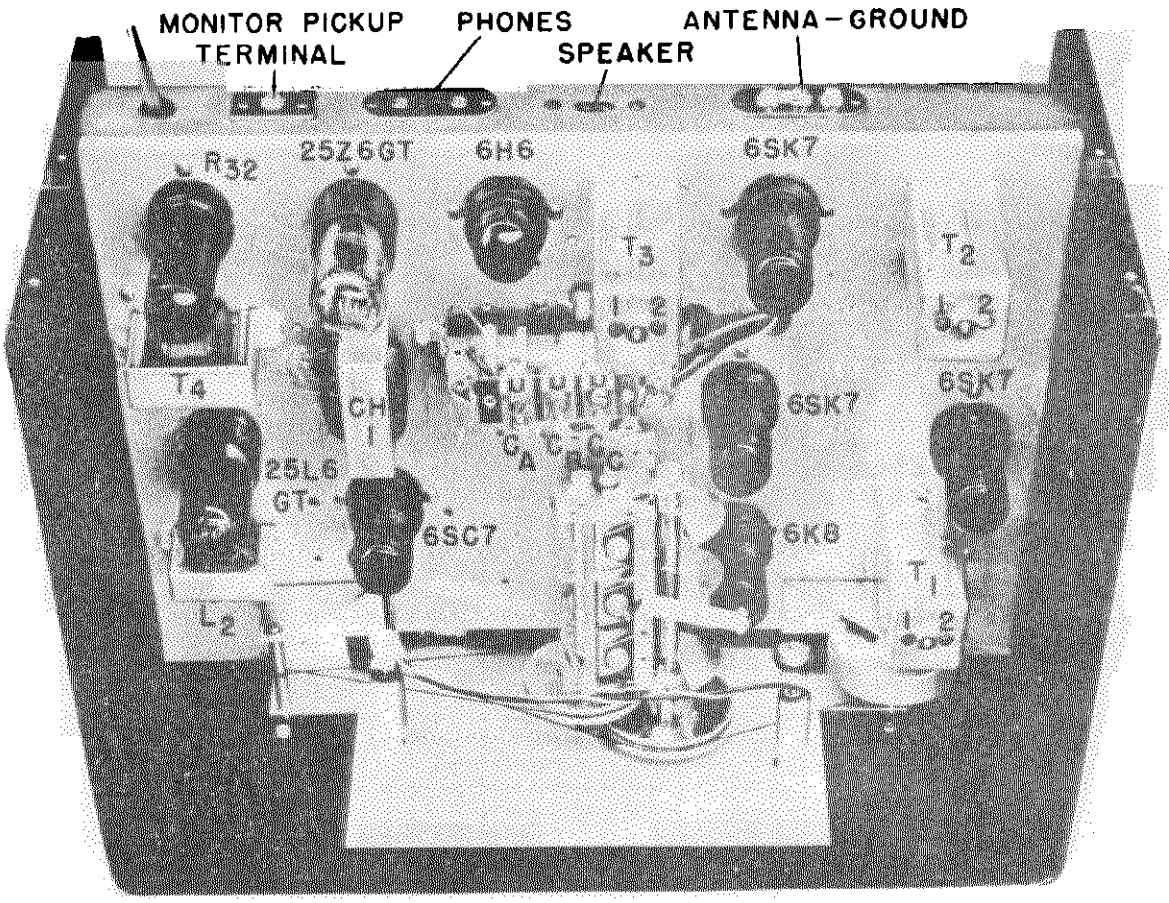
MODEL EC-2

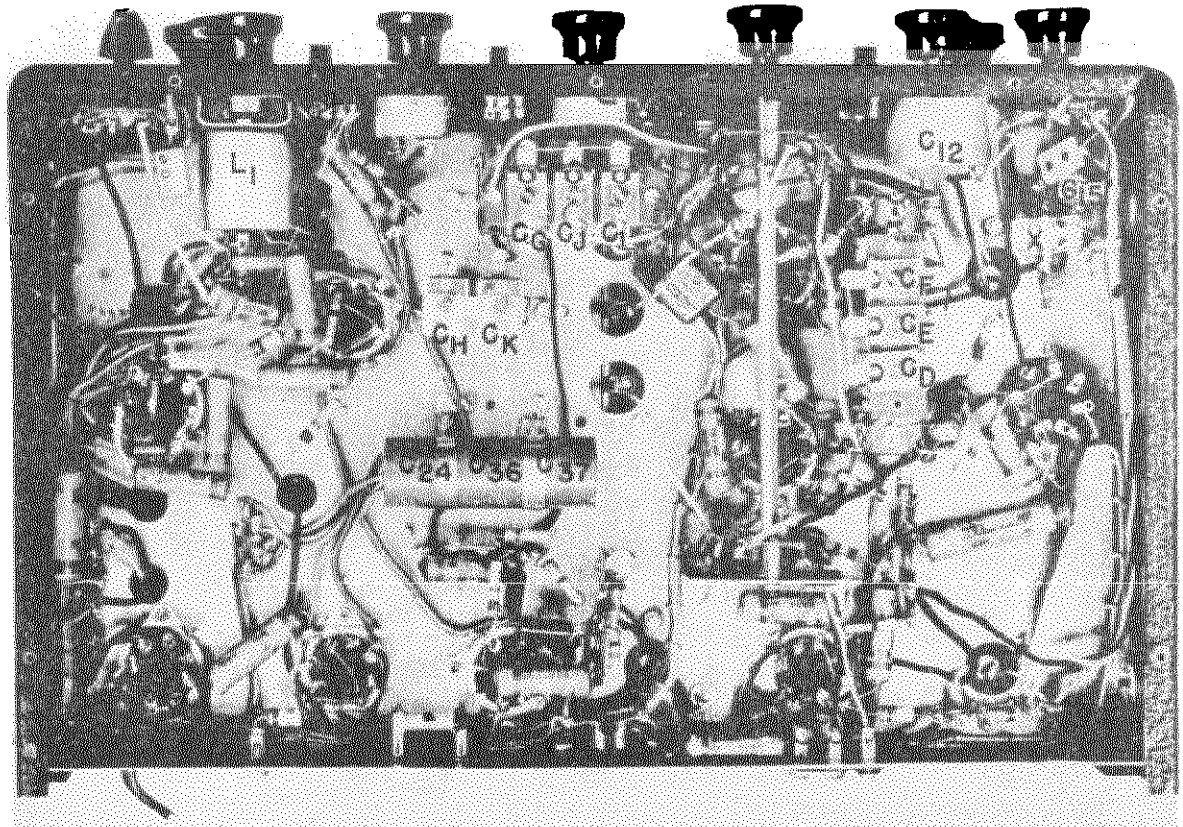


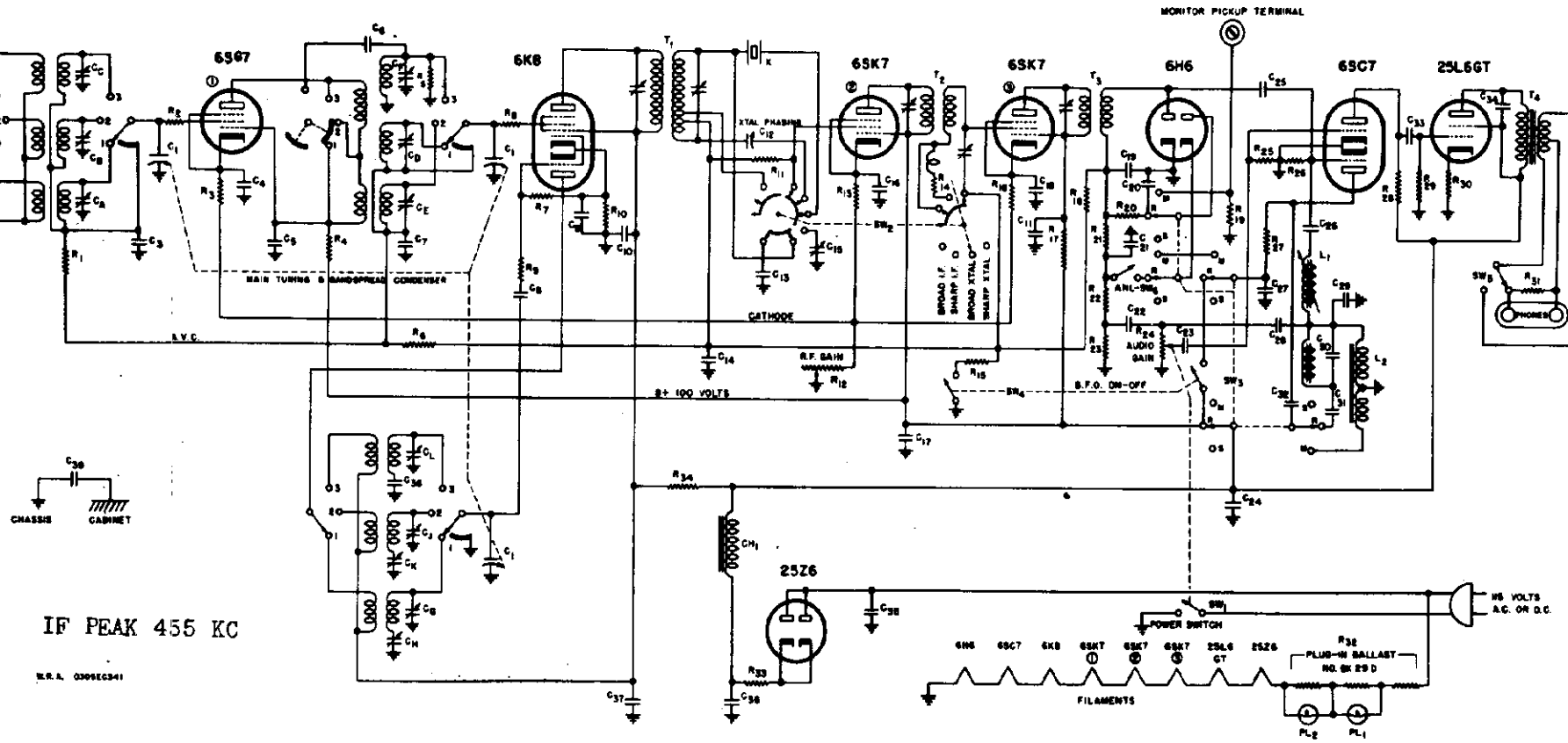


MODEL EC-3

ECHOPHONE RADIO MFG. CO.







FOR PARTS LIST SEE NEXT PAGE

Specifications

TUBES -

1 - 6SG7 R.F. Amplifier
1 - 6K8 Mixer - H.F. Oscillator
1 - 6SK7 Xtal 1st I.F. Amplifier
1 - 6SK7 2nd I.F. Amplifier
1 - 6H6 2nd Detector-AVC-ANL
1 - 6SC7 BFO - Monitor - 1st Audio
1 - 25L6GT Audio Output
1 - 25Z6 Rectifier
1 - BK29D Ballast Tube

Power Consumption - 46 watts
Power Source - 115 volts AC or DC
Power Output - One watt undistorted
Selectivity - Single signal crystal to broad I.F. in four steps
Intermediate Frequency - 455 KC
Frequency Range - 550 KC to 30 mc.

Alignment Procedure

EQUIPMENT NEEDED FOR ALIGNING AND PRELIMINARY ADJUSTMENTS:

An all wave signal generator which will provide an accurately calibrated signal at the test frequencies listed.
Output indicating meter
Non-metallic screw driver
Dummy antenna 400 ohm, 200 mmf. and 0.1 mfd.
Connect signal generator ground to ground terminal (G) of receiver.
Set bandspread at 100.
Connect output meter across primary of output transformer.
Gain controls - Maximum all adjustments.

I.F. ALIGNMENT

Connect 0.1 mfd. dummy antenna between high side of generator and 6K8 grid.
Set signal generator to 455 kc.
Set receiver selectivity in "I.F. SHARP" position.
Adjust all trimmers on T_1, T_2 and T_3 for maximum output.
Remove knob from PITCH CONTROL (L_1) and loosen the set screw holding the shaft extension. This is located on the underside of the chassis.
Adjust the BFO control to give a beat note with the 455 kc. I.F signal.
If necessary, change the setting by adjusting the screw located under the PITCH CONTROL knob.
Tighten the set screw holding the extension shaft and replace the knob.
Place the SELECTIVITY switch in the CRYSTAL BROAD POSITION.
Detune the signal generator so that a high pitched note is heard (BFO "ON").
Adjust the crystal phasing control for maximum rejection or until minimum volume is obtained.
Adjust #2 trimmer on T_1 noting that the output reaches a maximum, goes through a dip and then back to maximum. Wobbulate the signal generator tuning adjustment and align to the dip between the two peaks. A distinct change in the crystal note to a swishy sound will be noted when the correct adjustment has been reached.
Now readjust the other trimmers for maximum gain without changing any other adjustments.
Set the selectivity switch to the I.F. Sharp position and adjust the trimmer (C_{15}) under T_1 for maximum output.

R. F. ALIGNMENT

The following table indicates R.F. Alignment procedure.

Band	Signal Generator Frequency Setting	Signal Generator Dummy Antenna	Pad	Trimmers	Adjustment
1	600 kc	200 mmf	C_H	none	maximum output
	1800 kc	200 mmf	none	C_A C_E C_G	maximum output
2	2.5 mc	400 ohm	C_K	none	maximum output
	7.0 mc	400 ohm	none	C_B C_D C_J	
3	no padding condenser on this band				
	28 mc	400 ohm		C_C C_F C_I	maximum output

CONDENSERS

SYMBOL	CAPACITY	VOLTAGE	TYPE	SYMBOL	CAPACITY	VOLTAGE	TYPE
C1	Main Tuning & Bandspread			C21	50 mmf		Mica
2	.01 mfd	400	Paper	22	.01 mfd	400	Paper
3	.05 mfd	200	Paper	23	.005 mfd	400	Paper
4	.05 mfd	200	Paper	24	40 mfd	150	Electrolytic
5	.02 mfd	200	Paper	25	Twisted Leads		
6	5-6½ mmf		Ceramicon	26	.02 mfd	200	Paper
7	.05 mfd	200	Paper	27	.02 mfd	200	Paper
8	25 mmf		Mica	28	.0001 mfd		Mica
9	.05 mfd	200	Paper	29	.0054 mfd		Mica
10	.05 mfd	200	Paper	30	.0005 mfd		Mica
11	.02 mfd	200	Paper	31	25 mmf		Mica
12	25 mmf	Variable		32	.05 mfd	200	Paper
13	4-5 mmf		Mica	33	.02 mfd	400	Paper
14	.02 mfd	200	Paper	34	.02 mfd	600	Paper
15	1-9 mmf	Variable		35	.05 mfd	400	Paper
16	.05 mfd	200	Paper	36	30 mfd	150	Electrolytic
17	.25 mfd	200	Paper	37	30 mfd	150	Electrolytic
18	.05 mfd	200	Paper	38	.0054 mfd		Mica
19	50 mmf		Mica	39	.25 mfd	200	Paper
20	.05 mfd	200	Paper				

RESISTORS

SYMBOL	OHMS	WATTAGE	SYMBOL	OHMS	WATTAGE
R1	50,000	1/3	R18	2 meg	1/3
2	30	1/3	19	4,000	1/3
3	200	1/3	20	1 meg	1/3
4	1,000	1/3	21	100,000	1/3
5	10,000	1/3	22	250,000	1/3
6	50,000	1/3	23	250,000	1/3
7	50,000	1/3	24	500,000	Audio Gain #25-048
8	30	1/3			
9	100	1/3	25	5 meg	1/3
10	300	1/3	26	50,000	1/3
11	1 meg	1/3	27	10,000	1/3
12	10,000	R.F.Gain #25-066	28	250,000	1/3
			29	500,000	1/3
13	400	1/3	30	150	1/3
14	200	1/3	31	300	1/2
15	100	1/3	32	Ballast Resistor	BK 29D
16	300	1/3			
17	1,000	1/3	33	15	1/2
			34	1,000	1/3

MISCELLANEOUS

SYMBOL	DESCRIPTION
T1	1st I.F. Transformer
T2	2nd I.F. Transformer
T3	3rd I.F. Transformer
T4	Audio output transformer
CH_1	Filter Choke
L_1	B.F.O. Coil
L_2	Monitor Oscillator coil
SW_1	Power switch on audio gain control
SW_2	Selectivity switch
SW_3	Send-Receive-Monitor switch
SW_4	BFO-AVC switch
SW_5	Speaker-Phones switch
SW_6	ANL switch

IMPORTANT:- This receiver, unless otherwise marked, must be operated from 115-125 volts - Alternating OR Direct Current power. If the set does not operate in one minute when connected to Direct Current, reverse the power plug in the receptacle.

Make sure the antenna is not grounded at some point, and is securely connected to the antenna terminal.

The speaker wires may not be plugged into the speaker terminal strip. Be sure the PHONES-SPKR switch is in the SPKR position and the STANDBY switch is in the RECEIVE position.

ANTENNA:- A wire approximately 50 to 75 feet long, including the leadin, will provide very satisfactory reception throughout the tuning range of the receiver. It should be connected to the A_1 terminal of the antenna terminal strip located on the rear apron of the chassis; the jumper between A_2 and G should remain in place. A good antenna of this type should be erected as high as possible; insulated from ground, and at right angles to interference producing power lines. A ground connected to the G terminal may be used if it is found to materially improve the operation of the receiver. DO NOT GROUND CHASSIS DIRECT.

A doublet antenna should be connected to terminals A_1 and A_2. The jumper may remain connected between A_2 and G or removed depending upon its favorable effect on reception.

NOTE:- If a ground is used it should always be connected to the G terminal, NEVER to the chassis itself.

CONTROLS & THEIR FUNCTIONS:

A.F. GAIN:- The ON-OFF switch is part of the A.F. Gain Control. Turning this knob to the right turns the receiver ON and increases the volume. Turning it all the way to the left decreases the volume until the switch clicks and the receiver goes off. The pilot lights indirectly illuminate the dial scale when the power is on.

MAIN TUNING:- The main tuning control, when rotated, will tune the receiver to any frequency throughout its range.

BAND SWITCH:- Turning this knob connects the proper coils in the circuit to tune the desired frequency range.

Band 1 - 550 to 2100 K.C.
Band 2 - 2.1 to 8.1 M.C.
Band 3 - 8 to 30 M.C.

BAND SPREAD TUNING:- The band spread control acts as an electrical vernier on the main tuning condenser. The 80, 40, 20 and 10 meter amateur bands are calibrated on the band spread scale together with a logging scale. To use these amateur band calibrations it is necessary that careful adjustment of the main tuning pointer be made; the most convenient way being to set the BAND SPREAD TUNING pointer to your transmitter frequency or some known receiver frequency, then adjust the MAIN TUNING pointer until the signal is heard. If this is not possible it will be necessary to locate the bands by setting the main tuning pointer at the high frequency end of the desired amateur band; then adjust the band spread pointer until amateur signals are heard. The band may then be scanned by the BAND SPREAD TUNING to check the calibration. Slight readjustment of the main tuning may be necessary for best accuracy of the BAND SPREAD scale.

"STDBY-RECEIVE"- This switch must be in the RECEIVE position for normal operation of the receiver. The STANDBY position renders the EC-2 inoperative for standby purposes.

BFO-ON-OFF:- This switch removes the AVC and places the BEAT FREQUENCY OSCILLATOR in operation for the reception of CW signals, and for locating weak DX signals.

ANL-ON-OFF:- The AUTOMATIC NOISE LIMITER switch will effectively minimize ignition and similar types of interference which would be objectionable to short wave reception.

PHONES - SPKR:- On the rear apron of the chassis will be found two phone tip jacks. Headphones may remain permanently connected to the receiver. The PHONES-SPKR switch makes it possible to select either.

CONTROLS & THEIR FUNCTIONS:

A.F. GAIN:- The ON-OFF switch is part of the A.F. Gain Control. Turning this knob to the right turns the receiver ON and increases the volume. Turning it all the way to the left decreases the volume until the switch clicks and the receiver goes off. The pilot lights indirectly illuminate the dial scale when the power is on.

MAIN TUNING:- The main tuning control, when rotated, will tune the receiver to any frequency throughout its range.

R.F. GAIN:- This control adjusts the sensitivity of the receiver by varying the cathode bias on the R.F. and I.F. amplifier. Maximum sensitivity will be obtained when this control is rotated as far as it will go to the right.

BAND SWITCH:- Turning this knob connects the proper coils in the circuit to tune the desired frequency range.

Band 1 - 550 to 2100 K.C.
Band 2 - 2.1 to 8.1 M.C.
Band 3 - 8 to 30 M.C.

BAND SPREAD TUNING:- The band spread control acts as an electrical vernier on the main tuning condenser. The 80, 40, 20 and 10 meter amateur bands are calibrated on the band spread scale together with a logging scale. To use these amateur band calibrations it is necessary that careful adjustment of the main tuning pointer be made; the most convenient way being to set the BAND SPREAD TUNING pointer to your transmitter frequency or some known receiver frequency, then adjust the MAIN TUNING pointer until the signal is heard. If this is not possible it will be necessary to locate the bands by setting the main tuning pointer at the high frequency end of the desired amateur band; then adjust the band spread pointer until amateur signals are heard. The band may then be scanned by the BAND SPREAD TUNING to check the calibration. Slight readjustment of the main tuning may be necessary for best accuracy of the BAND SPREAD scale.

"STDBY-RECEIVE-MONITOR"- This switch must be in the RECEIVE position for normal operation of the receiver. The STANDBY position renders the EC-3 inoperative for standby purposes. The MONITOR position places the CW MONITOR in operation to allow the C.W. operator to listen to his keying.

BFO-ON-OFF:- This switch removes the AVC and places the BEAT FREQUENCY OSCILLATOR in operation for the reception of CW signals, and for locating weak DX signals. Code signal intensity should be adjusted by the R.F. GAIN CONTROL.

PITCH CONTROL:- Allows adjustment of the beat note obtained from the BEAT OSCILLATOR to a pitch most pleasing to the listener.

ANL-ON-OFF:- The AUTOMATIC NOISE LIMITER switch will effectively minimize ignition and similar types of interference which would be objectionable to short wave reception. Best results are obtained with the R.F. Gain full on and the A.F. Gain set near minimum.

Amateurs who operate on C.W. will find the MONITOR circuit in the Ec-3 an aid to easier and more efficient operating

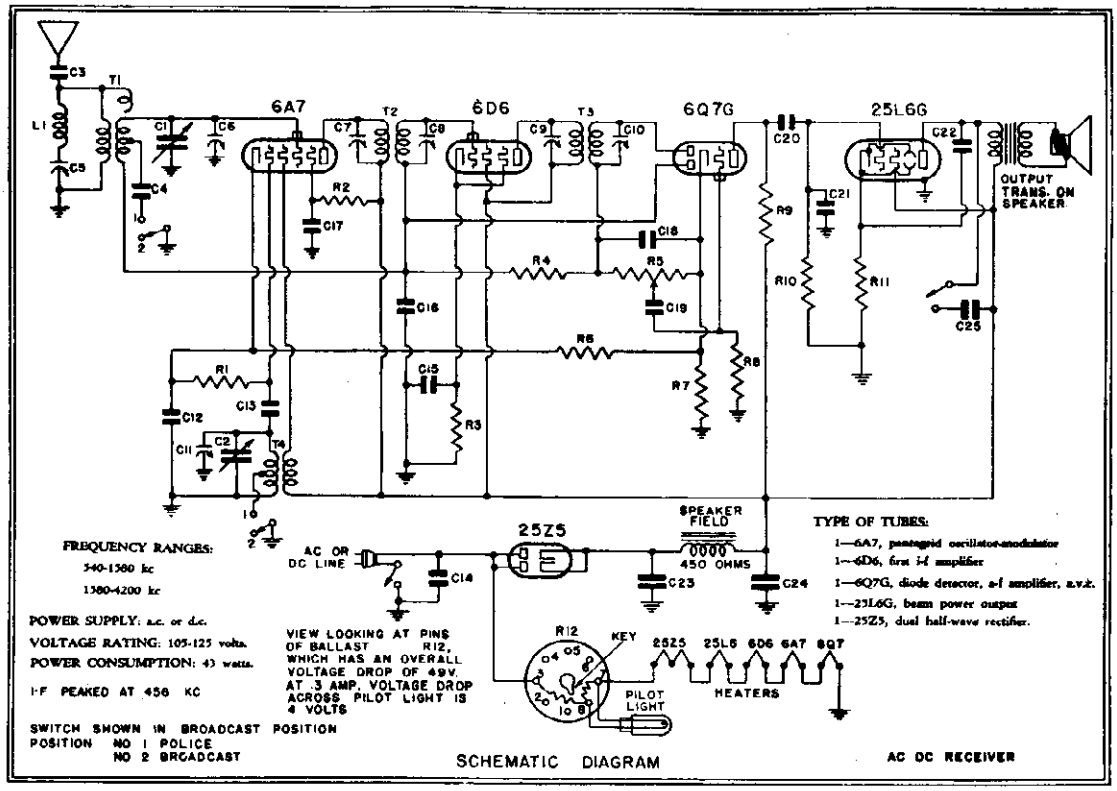
A short wire must be connected to the single MONITOR PICKUP TERMINAL at the rear of the receiver to allow a small amount of R.F. energy to be picked up from the transmitter by the monitor circuit. The length of this wire and its proximity to the transmitter can only be determined experimently, because it depends entirely on the power of your transmitter. Too much coupling is indicated by a raspy note when the monitor circuit is in operation.

The value of the "CRYSTAL SHARP" SELECTIVITY position will be apparent when it is desired to receive CW signals on any of the amateur bands. The tremendous sideband interference encountered will be reduced to a minimum when the SELECTIVITY knob is in the "CRYSTAL SHARP" position and the CRYSTAL PHASING control is adjusted for maximum reduction of unwanted signals. Since tuning becomes easier with decreasing selectivity the receiver should not be set at a SELECTIVITY greater than is necessary. Thus, for best fidelity on the Broadcast band the SELECTIVITY should be "IF BROAD". For amateur phone work the SELECTIVITY may be "IF SHARP" or

SELECTIVITY:- This switch allows four step selectivity to meet all receiving requirements.

CRYSTAL PHASING:- This control is in the circuit only when the SELECTIVITY switch is in the "CRYSTAL SHARP" or "CRYSTAL BROAD" positions. The function of the PHASING control is to eliminate the unwanted interfering sideband signal.

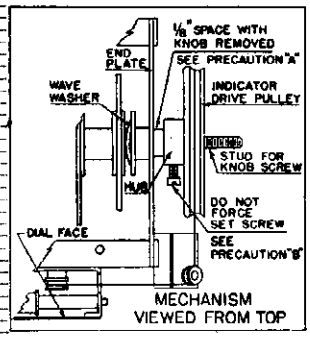
EMERSON RADIO & PHONOGRAPH CORP Chassis BE



SCHEMATIC DIAGRAM — AC DC RECEIVER

REPLACEMENT PARTS LIST

*Item	Part No.	DESCRIPTION
T1	3RT-384A	Two-band antenna coil
T2	3RT-320B	456 kc first i-f transformer
T3	3RT-321B	456 kc second i-f transformer
T4	3RT-319A	Two-band oscillator coil
L1	4DT-343	456 kc adjustable wave-trap
R1	KR-53	50,000 ohm ½ watt carbon resistor
R2	ZZR-196	30,000 ohm ½ watt carbon resistor
R3	3CR-295	410 ohm 3/8 watt wire wound resistor
R4, R8	HR-42	2 megohm ½ watt carbon resistor
R5	3FR-256	Volume control with line switch—500,000 ohms
R6, R7	3CR-294	240 ohm ½ watt wire-wound resistor
R9	KR-55	250,000 ohm ½ watt carbon resistor
R10	KR-56	500,000 ohm ½ watt carbon resistor
R11	3FR-293	140 ohm 3/8 watt wire-wound resistor
R12	2UR-224	Plug-in type ballast resistor
C1, C2	5HC-387	Two-gang variable condenser
C3	3HC-274	0.002 mf, 600 volt tubular condenser
C4	4DC-367	0.0012 mf mica condenser
†C3		Trimmer, part of wave-trap assembly
‡C6, C11		Trimmer, part of variable condenser
†C7, C8		Trimmer, part of first i-f transformer assembly
†C9, C10		Trimmer, part of second i-f transformer assembly
C12, C17	AC-6	0.1 mf, 200 volt tubular condenser
C13	AAC-106A	0.00005 mf mica condenser
C14	2VC-242A	0.1 mf, 400 volt molded condenser
C15	FC-29	0.02 mf, 200 volt tubular condenser
C16, C23	BC-12	0.05 mf, 200 volt tubular condenser
C18, C21	5AC-384	0.0002 mf, 600 volt tubular condenser
C19	KC-58	0.01 mf, 400 volt tubular condenser
C20	LC-65	0.02 mf, 400 volt tubular condenser
C22	FC-336	0.025 mf, 400 volt tubular condenser
C23, C24	3OC-261	20 mf, 150 volt wet electrolytic condenser
	3BS-231A	Wave-band switch
	3PS-251	5½" dynamic speaker
	4BL-94	Pilot light, 6.3 volt, .25 amp., Mazda No. 44
	3BS-256A	Tone control switch
	5HD-49	Six-button mechanical tuning unit
	5HZ-801	Station name tabs (complete set)
	5HZ-802	Celluloid station name tab caps (set of 6)
	5EB-58	Pilot light socket



The color coding of the i-f transformer leads is as follows:
Grid—green Plate—blue
Grid return—black B plus—red

*Item number locates the article on the schematic diagram.

†These trimmers are part of coil assemblies and cannot be supplied separately.

‡These trimmers are part of variable condenser and cannot be supplied separately.

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. All readings except cathodes and heaters were taken on 250 volt scale.

Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
6A7	100	50	2.3	100	6.3
6D6	100	100	3.5	—	6.3
6Q7G	43	—	1.2	—	6.3
25L6G	92	100	6.5	—	25.0

Voltage at 25Z5 cathode—130 volts. Voltage across speaker field—30 volts. Voltage drop across ballast resistor (pins Nos. 3, 7)—49 volts. Voltage drop across pilot light section (pins Nos. 8 and 7)—4 volts.

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.

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 top of the chassis to left of variable condenser. Its trimmer is mounted on the trap.

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 section closest to dial is for the antenna coil.

I-f Transformer and Wave-Trap Alignment

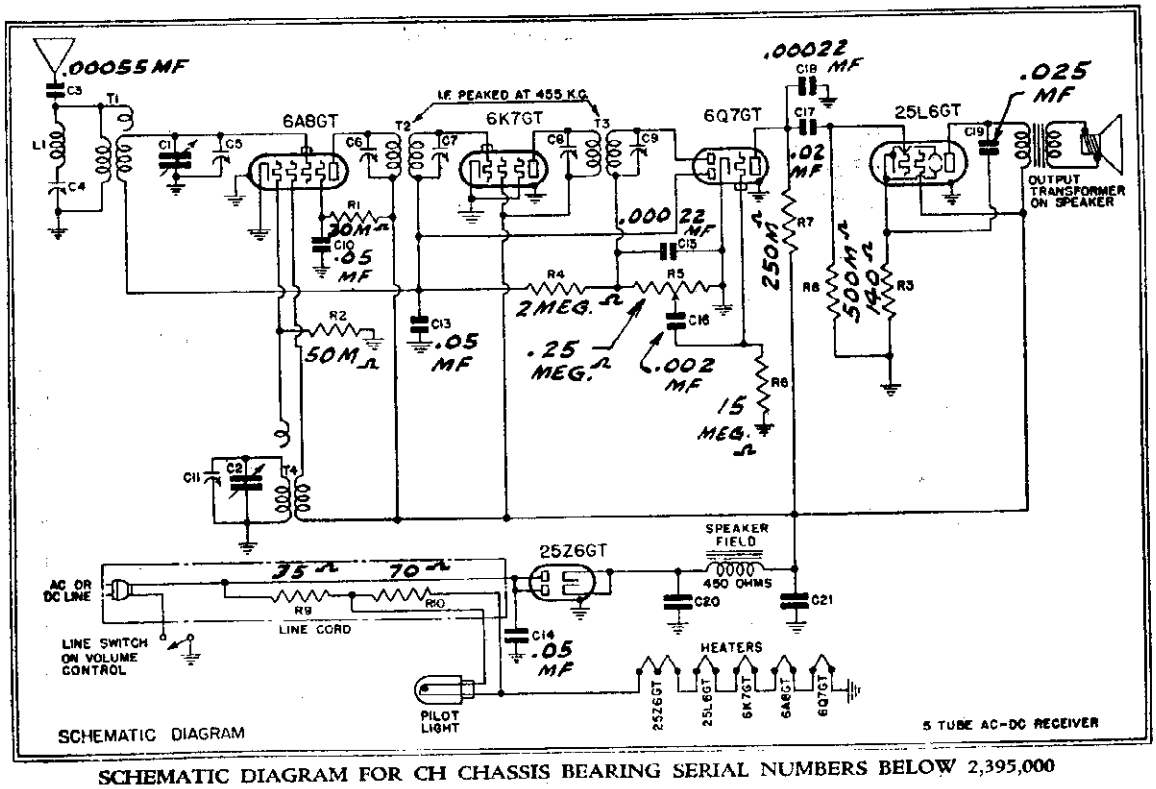
Turn the switch clockwise to the broadcast position and rotate the variable condenser to the minimum capacity position. Feed 456 kc to the grid cap of the 6A7 tube through a .02 mf condenser and adjust the four i-f trimmers for maximum response. Feed 456 kc to the antenna through a .0001 mf condenser and adjust the wave-trap trimmer for minimum response. (See General Notes, No. 7.)

R-f Alignment

With the wave-band switch (rear of chassis) in the broadcast position, clockwise, loosen indicator drive pulley set screw and set the dial indicator at 140. Feed 1400 kc through a .0001 mf condenser to the antenna lead and adjust first the oscillator trimmer (on left section of variable condenser) then the antenna trimmer (on right section of variable condenser) for maximum response. The police band is self-tracking and does not require any adjustment.

MODELS CH246,CH253,CH256,
Chassis CH
MODELS CL246,CL253,CL256,
Chassis CL

EMERSON RADIO & PHONOGRAPH CORP.



SCHEMATIC DIAGRAM FOR CH CHASSIS BEARING SERIAL NUMBERS BELOW 2,395,000

PRODUCTION CHANGES

1. **Chassis bearing** serial numbers below 2,395,000 differ from the above as follows:

T4	4XT-458	Oscillator coil. (See production change no. 2)
T2	4XT-434	Double-tuned 455 kc first i-f transformer
T3	4XT-435	Double-tuned 455 kc second i-f transformer
R4	KR-57	1 megohm ¼ watt carbon resistor
R9, R10	4XW-112	Resistance line cord with pilot light section (R9—150 ohms; R10—40 ohms)
C13	AC-6	0.1 mf, 200 volt tubular condenser
C20, C21	4HC-348B	Dual 20 mf, 150 volt dry electrolytic condenser
	4BL-94	Pilot light, 6.3 volt, .25 amp., Mazda No. 44
	4XS-324	4" dynamic speaker
	4XZ-811C	Dial drive shaft

2. **Chassis which use** oscillator coil 4XT-458 may use 6JT-467 or 6JT-467A as replacement. For correct lug connections for either of the three coils see illustration on next page.

3. **Condenser C12 is not used in CH chassis** which have the negative connected to the chassis.

4. Not used in CL above 2,656,950.

FOR ALL OTHER DATA SEE EMERSON PAGE 10-22, RIDER'S VOL.X

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (line switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given below.

FOR CH SERIAL NUMBERS BELOW 2,395,000:

Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
6A8	100	55	0	100	6.3
6K7	100	100	0	—	6.3
6Q7	43	—	0	—	6.3
25L6	92	100	5.5	—	25.0

Voltage at 25Z6 cathode—125 volts.

Voltage across speaker field—28 volts.

Voltage across pilot light—4 volts.

FOR CH SERIAL NUMBERS ABOVE 2,395,000 AND CL SERIAL NUMBERS BELOW 2,656,950:

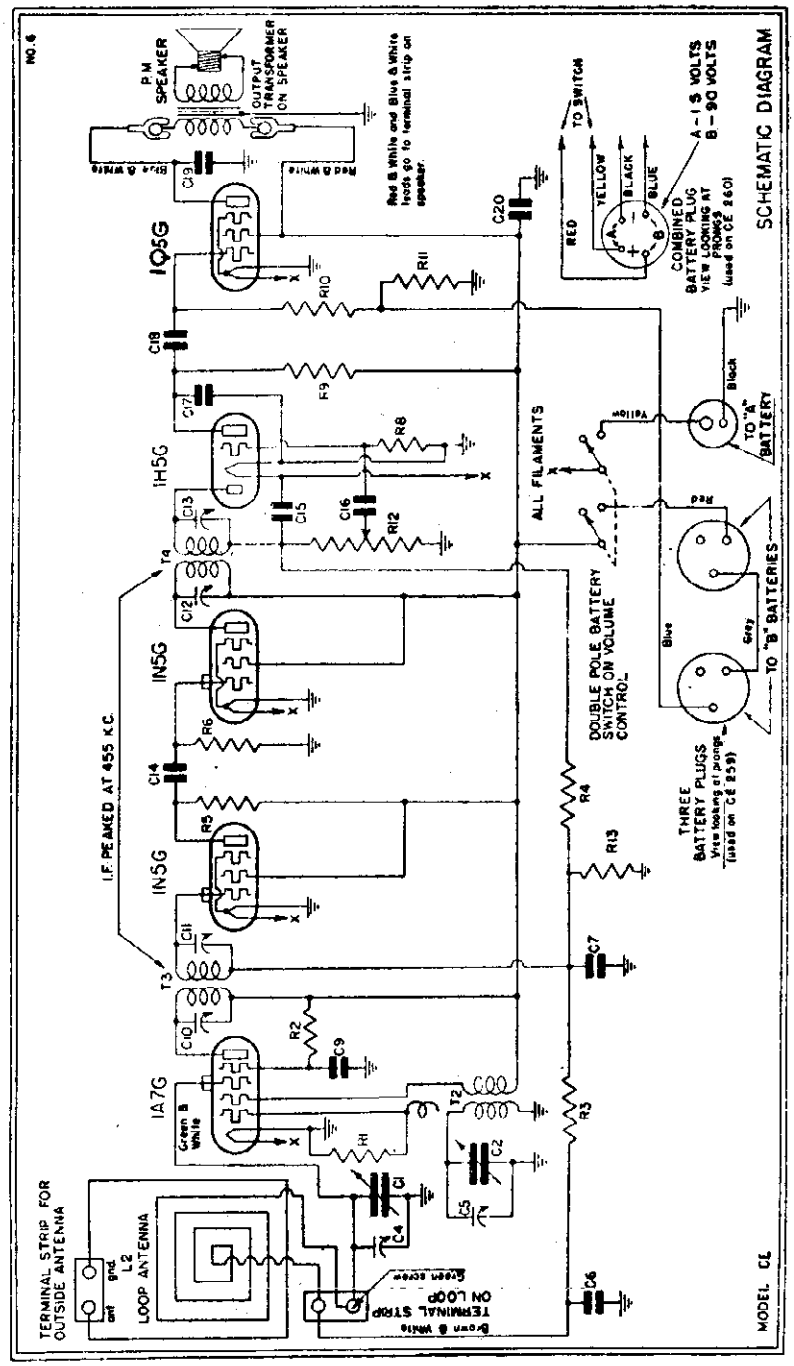
Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
12A8	94	50	0	94	12
12K7	94	94	0	—	12
12Q7	40	—	0	—	12
†35L6	87	94	5.2	—	35

‡Voltage at 35Z4 cathode—121 volts.
Voltage across speaker field—27 volts.
Voltage across pilot light section of ballast resistor (R9)—3.5.
Voltage drop across entire ballast resistor (R9 and R10)—13.5.

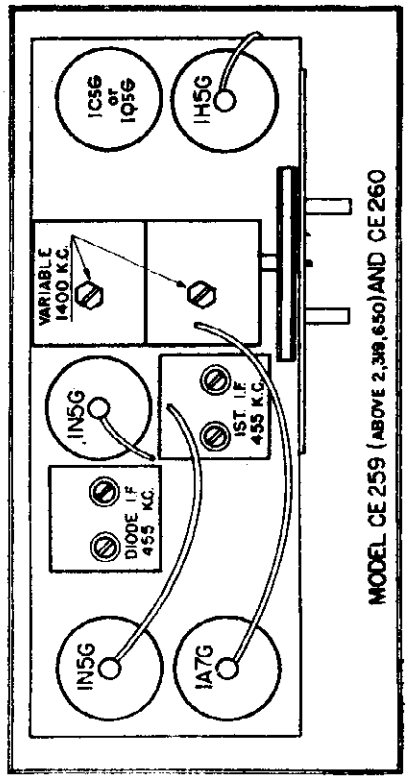
†Plate and screen voltages for 50L6 are 5% lower. Heater voltage—50 volts.
‡Voltage at 35Z5 cathode—115 volts.

EMERSON RADIO & PHONOGRAPH CORP.

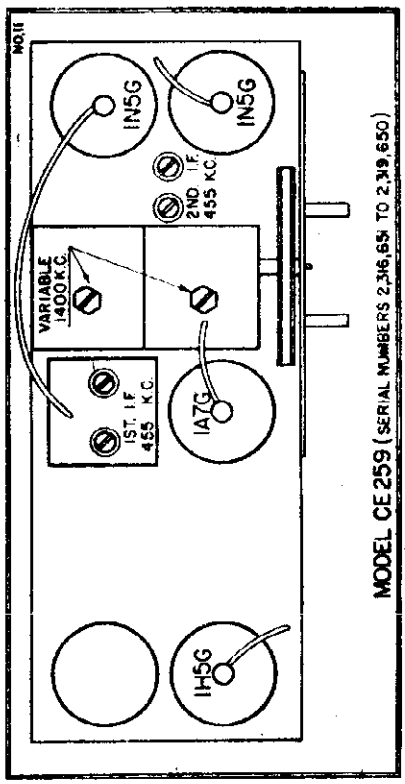
MODELS CE259, CE260, CE263, Chassis CE, Late



SCHEMATIC DIAGRAM FOR MODELS CE-259, CE-260 AND CE-263 (See Production Change No. 7)



MODEL CE 259 (ABOVE 2,339,650) AND CE 260



MODEL CE 259 (SERIAL NUMBERS 2,316,651 TO 2,339,650)

LOCATION OF TUBES AND TRIMMING CONDENSERS

MODELS CE-259, CE-260 & CE-263 (See Production Changes Nos. 3, 7)

MODELS CE259, CE260, CE263
Chassis CE, Late

EMERSON RADIO & PHONOGRAPH CORP.

REPLACEMENT PARTS LIST

When ordering replacement parts specify part numbers.

*Item	Part No.	DESCRIPTION
L2	6EW-146	Loop antenna assembly (for CE-259 only)
L2	6EW-152	Loop antenna assembly (for CE-260 only)
L2	6EW-157	Loop antenna assembly (for CE-263 only)
T2	6JT-467A	Oscillator coil (see production change no. 1c)
T3	6JT-466B	Double-tuned 455 kc first i-f transformer (see production change no. 1a)
T4	6MT-472A	Double-tuned 455 kc diode i-f transformer (see production change no. 1b)
R1	KR-53	50,000 ohm ¼ watt carbon resistor (see production change no. 5)
R2	ZZR-196	30,000 ohm ¼ watt carbon resistor (see production change no. 1f)
R3, R6	KR-54	100,000 ohm ¼ watt carbon resistor
R4, R8, R13	HR-42	2 megohm ¼ watt carbon resistor
R5	OR-73	25,000 ohm ¼ watt carbon resistor (see production change no. 7b)
R9, R10	KR-56	.5 megohm ¼ watt carbon resistor
R11	6ER-358	680 ohm ½ watt wire-wound resistor (see production change no. 7a)
R12	3HR-240B	Volume control 500,000 ohms with double pole line switch (for CE-259 and CE-263)
R12	3HR-240C	Volume control 500,000 ohms with double pole line switch (for CE-260)
C1, C2	4XC-391B	Two-gang variable condenser
†C4, C5		Trimmers, part of variable condenser (see production change no. 3)
C6, C7	BC-12	0.05 mf, 200 volt tubular condenser
C9, C18	LC-65	0.02 mf, 400 volt tubular condenser
†C10, C11, C12, C13		Trimmers, part of i-f transformer
C14	5AC-384	0.0002 mf, 600 volt tubular or mica condenser
C15, C17	4XC-394A	0.00022 mf mica condenser (see production change no. 4)
C16	KC-58	0.01 mf, 400 volt tubular condenser
C19	NNC-199	0.001 mf, 600 volt tubular condenser
C20	6EC-432	8 mf, 100 volt dry electrolytic condenser
	6ES-367A	5" permanent magnet dynamic speaker
	4XD-51A	Dial face (see production change no. 2)
	6ED-69	Indicator dial
	4MZ-588B	Dial pointer
	4XE-3	Dial crystal (for CE-259 and CE-260)
	4XE-3B	Dial crystal (for CE-263)
	5JZ-824	Drive cord spring
	4YZ-772	Dial drive cord
	6EW-135A	Battery cable (for CE-259)
	6EW-148	Battery cable (for CE-260)

*Item number locates the article on the schematic diagram.

†Not supplied separately.

PRODUCTION CHANGES

Chassis bearing serial numbers below 2,319,650 use:

(a) Double-tuned 455 kc first i-f transformer, part no. 4XT-434A

(b) Double-tuned 455 kc diode i-f transformer, part no. 4XT-435B

(c) Oscillator coil, part no. 4XT-433

(d) The low side of the volume control (R12) is connected to A plus instead of A minus (chassis) as shown in the schematic.

(e) Condenser C19 is connected from plate to B plus instead of from plate to ground as shown in the schematic.

(f) Resistor R2 is 50,000 ohms, part no. KR-53, instead of 30,000 ohms.

(g) Chassis using oscillator coil 4XT-433 have a 60 mmf condenser connected from oscillator grid to the grid terminal of the coil. Coil 6JT-467A has an extra capacity winding on the form which replaces this condenser.

Chassis bearing serial numbers below 2,408,049 use dial face, part no. 4XD-51

On Model CE-260 the antenna trimming condenser (C4) is mounted on the loop antenna frame instead of on the variable condenser.

In chassis bearing serial numbers above 2,319,650 condenser C15 is connected from the high side of the volume control to ground instead of to A plus as shown in the schematic.

Chassis bearing serial numbers below 2,439,541 use R1, 200,000 ohm ¼ watt carbon resistor.

Chassis bearing serial numbers below 2,440,834 use R5, 10,000 ohm ¼ watt carbon resistor.

Chassis bearing serial numbers below 2,593,855 use 1C5G output tube in same position on chassis as 1Q5G output tube and also have following changes:

(a) Resistor R11 was 740 ohm ½ watt wire-wound resistor.

(b) Resistor R5 was 10,000 ohm ¼ watt carbon resistor.

Chassis bearing serial numbers above 2,593,855 use a resistor 50,000 ohms in series with the high side of the volume control. This resistor is not shown on the schematic diagram.

EMERSON RADIO & PHONOGRAPH CORP.

MODELS CE259
CE260, CE263
Chassis CE, Lat

DESCRIPTION

TYPE: Single-band superheterodyne.

FREQUENCY RANGE:

540-1730 on early CE-259
530-1600 on all Models CE-260, CE-263 and later CE-259.

NUMBER OF TUBES: Five.

TYPE OF TUBES:

1—1A7G, oscillator-modulator
1—1N5G, 1st i-f amplifier
1—1N5G, 2nd i-f amplifier
1—1H5G, 2nd detector, a.v.c., a-f amplifier
†1—1C5G, pentode output, or, 1Q5G, beam power output (see production change no. 7).

POWER SUPPLY: A and B batteries.

VOLTAGE RATING:

1.5 volts A
90 volts B

CURRENT DRAIN:

.3 amps A at 1.5 volts
.01 amps B at 90 volts.

GENERAL NOTES

1. Batteries. The Models CE-259, CE-260 and CE-263 are designed to house the complete set of batteries within the cabinet.
2. The color coding of the i-f transformer leads is as follows:
   Grid—green — Plate—blue
   Grid return—black — B plus—red
3. The color coding of the battery cable is as follows:
   Red—B plus, 90 volts — Yellow—A plus, 1.5 volts
   Blue—B minus — Black—A minus.
4. If replacements are made in the r-f section of the circuit, the receiver should be carefully re-aligned.
5. Models CE-259, CE-260 and CE-263 have self-contained antennas and do not require additional antenna or ground connections. For permanent home installations of either model, however, if it is desired to improve reception of weak stations, an additional outdoor antenna should be used. For this purpose a terminal strip is provided in the cabinet for antenna and ground connections. (See diagram on last page.)
6. The self-contained loop antenna operates at maximum efficiency when its position is at right angles to the broadcasting source. It is important, therefore, once the station is tuned in, to rotate the cabinet back and forth through a quarter of a circle (90 degrees), leaving it at the position where the station is received with maximum volume.

BATTERY COMPLEMENT

Type Battery	No. Req.	Eveready Part No.	Ray-o-vac Part No.	Burgess Part No.
FOR MODEL CE-259 (Portable)				
1½ volt "A"	1	742 (plug-in type)	P-94A (plug-in type)	4FA-PI (plug-in type)
45 volt "B"	2	762 (plug-in type)	P-5303 (plug-in type)	B30-PI (plug-in type)
FOR MODEL CE-260				
Combined "A" and "B" Pack	1	748 (plug-in type)	AB82 (plug-in type)	
FOR MODEL CE-263 (Portable)				
1½ volt "A"	1	741 (plug-in type)	P-96A (plug-in type)	8F (plug-in type)
45 volt "B"	2	762 (plug-in type)	P-5303 (plug-in type)	B30-PI (plug-in type)

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed are from point indicated to chassis with volume control turned on full and no signal. The battery voltages for these readings were: "A" 1.5 volts, "B" 90 volts.

Tube	Plate	Screen	Osc. Plate	Fil.
1A7G	82	52	82	1.5
1N5G, 1st i-f	70	82	—	1.5
1N5G, 2nd i-f	82	82	—	1.5
1H5G	25	—	—	1.5
†1C5G or 1Q5G	77	82	—	1.5

Bias for the 1C5G or 1Q5G tube is obtained across the resister R11. The voltage drop across this resistor should be 7.8 volts with 1C5G or 7volts with 1Q5G (see production change no. 7.)

MODELS CE259, CE260, CE263
Chassis CE, Late

EMERSON RADIO & PHONOGRAPH CORP.

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 oscillator coil is located beneath the chassis. The trimmer for the oscillator coil is on the rear section of the variable condenser.

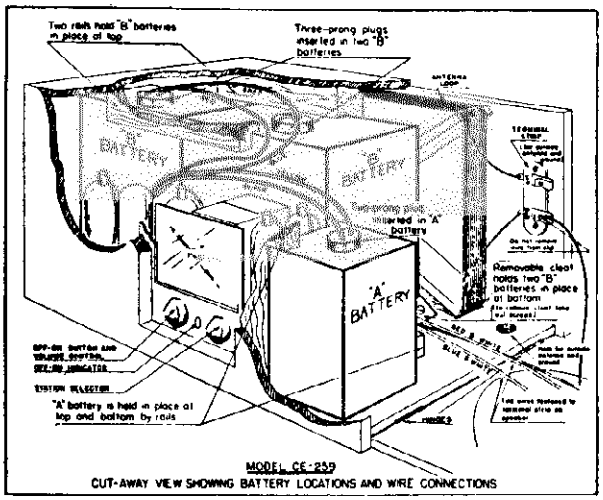
The loop antenna acts as the antenna coil. The trimmer for the loop, when provided, is on the front section of the variable condenser or on the loop frame. (See Production Change No. 3.)

I-f Alignment

Model CE-259 (below serial number 2,319,650). Swing variable condenser to maximum capacity position.

Model CE-259 (above serial number 2,319,650), CE-260 and CE-263. Swing the variable condenser to minimum capacity position.

Feed 455 kc to the grid of the 1A7G tube through a 0.01 mf condenser. Adjust the four i-f trimmers for maximum response.



MODEL CE-259
CUT-AWAY VIEW SHOWING BATTERY LOCATIONS AND WIRE CONNECTIONS

Battery Installation for Model CE-259

The diagram above illustrates the proper position of the batteries in the portable cabinet. To install and connect the batteries in this cabinet observe the following procedure:

1. Open the end side of the cabinet (side with speaker grille) by removing the two wood screws in the top corners of the panel. The panel is hinged at the bottom. Open the panel by pulling the small leather tab at the top edge.
2. A small wood cleat is fastened to the bottom of the cabinet directly below the two large wood rails. Remove this cleat by taking out the small wood screws.
3. The three-prong plugs on the battery cable from the receiver should be plugged into the two "B" batteries.
4. Slide the "B" batteries, one at a time, in an upright position between the two wood rails in the cabinet, as indicated in the diagram.
5. Replace the small wood cleat in front of the second battery and fasten it securely with the wood screws.
6. The small two-prong plug in the battery cable should be plugged into the "A" battery. Place the "A" battery in the front corner of the cabinet as shown in the diagram.
7. Be sure that all of the cable wires are free and clear of the chassis. Care should be taken also to keep the wires from jamming between the wood rails and the batteries.

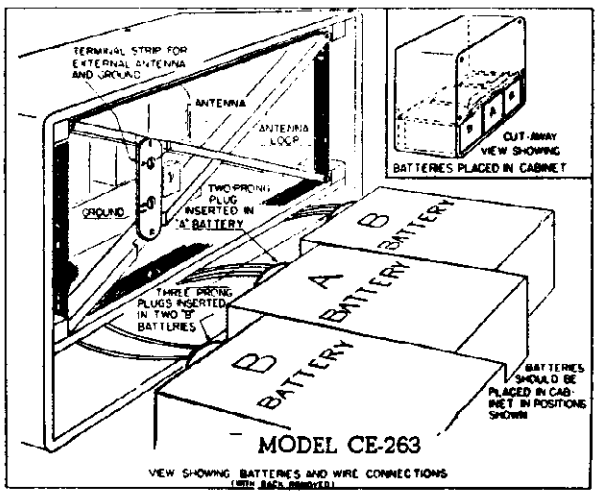
R-f Alignment

Set the dial pointer at 140. Set the signal generator at 1400 kc and feed its output into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from and parallel to the receiver loop antenna. Advance the output of the signal generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (on front section of variable condenser or on loop frame) then the antenna trimmer (on rear section of variable condenser) for maximum response.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance as follows. Align at 140. Set the pointer at 60 and feed 600 kc to the antenna lead. A portion of the outside turn of the loop may be swung to either side of the center to give maximum response. Realign at 140.

Battery Installation for Model CE-260

The cabinet for this model is designed to house completely the combined "A" and "B" pack. Place the battery pack in the cabinet at the rear of the receiver and insert the four-prong plug of the battery cable into the socket on the top of the battery.



MODEL CE-263
VIEW SHOWING BATTERIES AND WIRE CONNECTIONS

8. Close the end panel and replace the wood screws, fastening them securely.

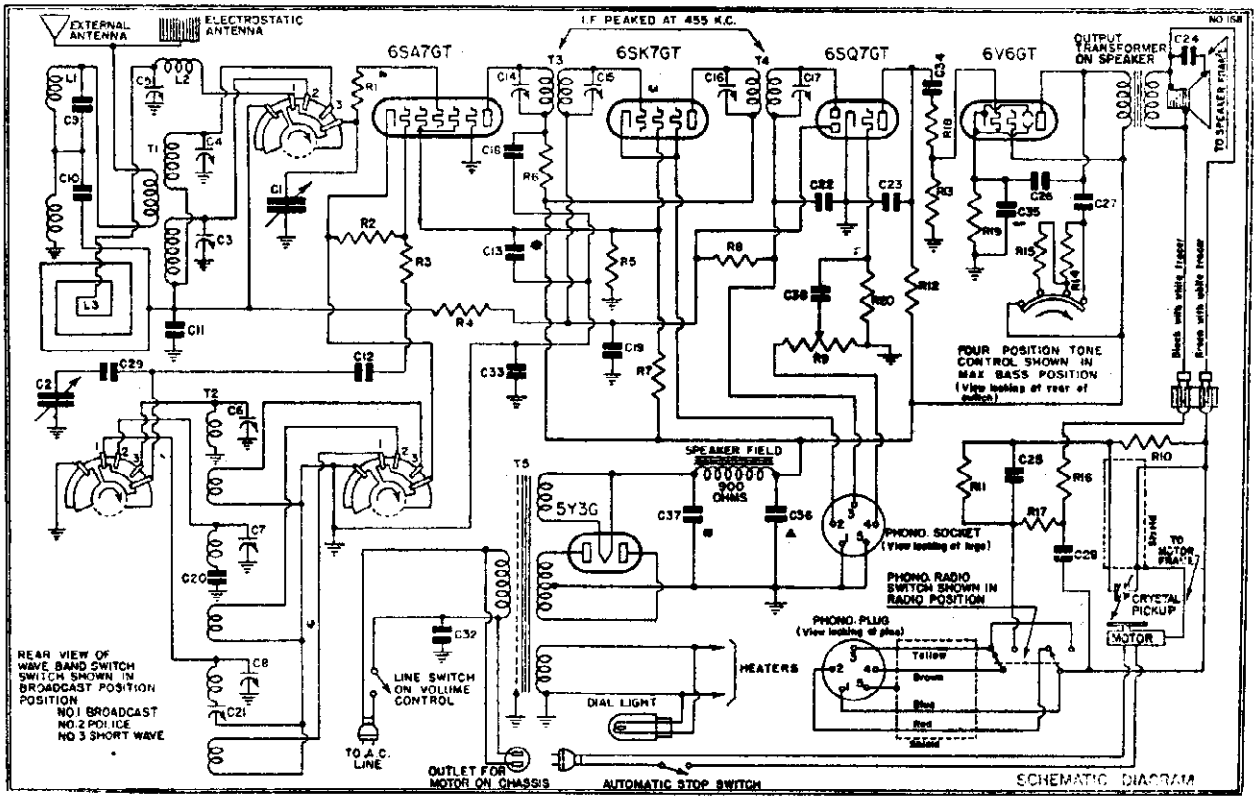
Battery Installation for Model CE-263

The cabinet for this model contains a shelf under the receiver for housing the batteries. The illustration above indicates the position of the batteries. To install and connect the batteries observe the following procedure:

1. Remove the back panel of the cabinet by taking out the wood screws.
2. Locate the battery cable on the bottom shelf of the cabinet.
3. With the batteries out of the cabinet insert the three-prong plugs on the battery cable into the two "B" batteries and the small two-prong plug into the "A" battery.
4. Place the batteries in the cabinet as indicated in the illustration. Note that the "A" battery is placed between the two "B" batteries. Also note that the plug end of the battery is up against the front panel of the cabinet.
5. Replace the back panel of the cabinet and fasten it in place with the wood screws.

EMERSON RADIO & PHONOGRAPH CORP.

MODEL FD396
Chassis FD



When ordering, specify part numbers. List price each, effective as of January 15, 1941. Subject to change without notice.

*Item No.	Part No.	DESCRIPTION	Price
L1, C9	8FT-573A	Antenna choke and 455 kc fixed wave-trap	$ .75
L2	7XT-564	Broadcast antenna loading coil	.25
L3	7XW-283	Broadcast antenna loop assembly	.70
T1	7XT-562	Police and short-wave antenna coil	.55
T2	7XT-563A	Three-band oscillator coil	1.45
T3	7QT-548D	Double-tuned 455 kc first i-f transformer	.90
T4	8ST-588B	Double-tuned 455 kc second i-f transformer	.95
T5	8DT-554	Power transformer	4.85
R1, R3	7XR-406	100 ohm ½ watt carbon resistor	.16
R2	LR-60	20,000 ohm ½ watt carbon resistor	.16
R4	KR-54	100,000 ohm ½ watt carbon resistor	.16
R5	3LR-265	40,000 ohm ½ watt carbon resistor	.16
R6	PR-79	1,000 ohm ½ watt carbon resistor	.16
R7	8DR-397	15,000 ohm 3 watt carbon resistor	.30
R8, R11	HR-42	2 megohm ½ watt carbon resistor	.16
R9	6GR-352	Volume control .25 meg. with line switch	.90
R10, R13, R17	KR-56	500,000 ohm ½ watt carbon resistor	.16
R12	KR-55	250,000 ohm ½ watt carbon resistor	.16
R14	4XR-334	2,500 ohm 1 watt carbon resistor	.16
R15	LR-64	5,000 ohm ½ watt carbon resistor	.16
R16	3BR-247	40,000 ohm ½ watt carbon resistor	.16
R18	KR-53	50,000 ohm ½ watt carbon resistor	.16
R19	8QR-421	240 ohm 1 watt wire-wound resistor	.16
R20	3RR-275	10 megohm ½ watt carbon resistor	.16
C1, C2	7AC-442	Two-gang variable condenser	2.90
C3, C4, C5	7XC-485	Triple trimmer strip for antenna circuits	.45
†C6, C7, C8		Trimmers, part of oscillator coil	
C9		0.001 mf condenser, part of 455 kc wave-trap	
C10, C33	KC-58	0.01 mf, 400 volt tubular condenser	.20
C11	2ZC-253	0.0025 mf mica condenser	.30
C12	5LC-410A	0.00011 mf mica condenser	.20
C13	EEC-132	.1 mf, 400 volt tubular condenser	.20
†C14, C15, C16, C17		Trimmers, part of i-f transformers	
C18, C27	LC-64	0.05 mf, 400 volt tubular condenser	.20
C21	2NC-231D	Single adjustable padding condenser. Range: 150-300 mmf	.30
C24	FC-29	0.02 mf, 200 volt tubular condenser	.20
C28	ZZC-211	0.03 mf, 200 volt tubular condenser	.20
C29	AAC-110	0.002 mf mica condenser	.20
C32	3LC-297A	0.01 mf, 400 volt tubular condenser	.20
C34	LC-65	0.02 mf, 400 volt tubular condenser	.20
C35, C36, C37	8DC-522	Multiple dry electrolytic condenser C35—20 mf, 25 volt; C36—15 mf, 350 volt; C37—15 mf, 400 volt	1.05
C38	3HC-274	0.002 mf, 600 volt tubular condenser	.20

DESCRIPTION

TYPE: Three-band superheterodyne.

FREQUENCY RANGES:

540-1750 kc.	(555-170 meters)
2300-7500 kc.	(130-40 meters)
6.9-22 mc.	(43.5-13.6 meters)

NUMBER OF TUBES: Five.

TYPE OF TUBES:

1—6SA7GT, pentagrid converter
1—6SK7GT, i-f amplifier
1—6SQ7GT, diode detector, audio amplifier and a.v.c.
1—6V6GT, power output
1—5Y3G, full-wave rectifier.

POWER SUPPLY: A.C. only.

VOLTAGE RATING: 105-125 volts.

POWER CONSUMPTION:

55 watts for the receiver.
75 watts for the combination.

GENERAL NOTES

1. The receiver should never be turned on with either the speaker plug or the 6V6GT tube out of their respective sockets, 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 will result.
3. The color coding of the i-f transformers is as follows:
   Grid—green — Plate—blue
   B plus—red — Grid return—black
4. The color coding of the power transformer is as follows:
   Primary—two black leads
   High-voltage secondary—two red leads
   High-voltage secondary center tap—red and yellow lead
   6.3 volt secondary—two green leads
   5 volt secondary—two yellow leads.
5. The adjustable padding condenser for the broadcast band is mounted on the top of the chassis, with the screw adjustment accessible in the top of the chassis. The police and short-wave bands have fixed padders, C20 and C29 on the schematic. When replacing these fixed padders be careful to use a condenser which has a capacity within 2% of the specified value, otherwise the short-wave coils may not track.
6. The phonograph motor is equipped with an automatic stop switch. To set this stop, with receiver switched off, push the motor start lever arm toward the rear (arm crosses under pickup near rear of cabinet). Then, with record in place on turntable, swing the vertical arm (which is at the left rear of the pickup) about its pivot so that the pickup bears against the arm when the needle reaches the spiral groove at the center of the record. This adjustment may have to be changed with different records.

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 volts, 60 cycles, a.c. All readings except B plus at rectifier, heaters, and cathode voltages were taken on 250 volt scale.

Tube	Plate	Screen	Cathode	Fil.
6SA7GT	250	85	0	6.3 ac.
6K7GT	250	85	0	6.3 ac.
6SQ7GT	125	—	0	6.3 ac.
6V6GT	235	250	0	6.3 ac.

ADJUSTMENTS

An oscillator with frequencies of 455, 600, 1600, 7500 and 20,000 kc should be used.

An output meter should be used across the voice coil or speaker output transformer for observing maximum response.

Use a dummy antenna for aligning the police and short-wave bands. A .0001 mf condenser in series with a 400 ohm carbon resistor may be used for the police band dummy antenna. For the short-wave band a 400 ohm carbon resistor may be used.

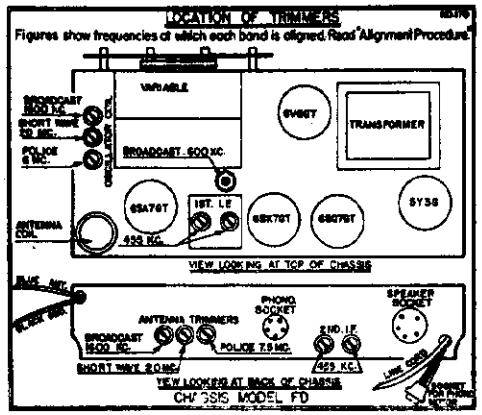
Always use as weak a test signal as possible during alignment.

The set's oscillator is higher in frequency than the signal on all three bands, 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 the 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. Loose screws are a sure source of noise, drifting, and microphonism.

In aligning 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 trimmers are being adjusted.



I-f Alignment

Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacity position and feed 455 kc through a 0.02 mf paper condenser, to the grid of the 6SA7 tube. The input may be fed to the stator lug of the front condenser section. Adjust the four i-f trimmers for maximum response.

Broadcast Alignment

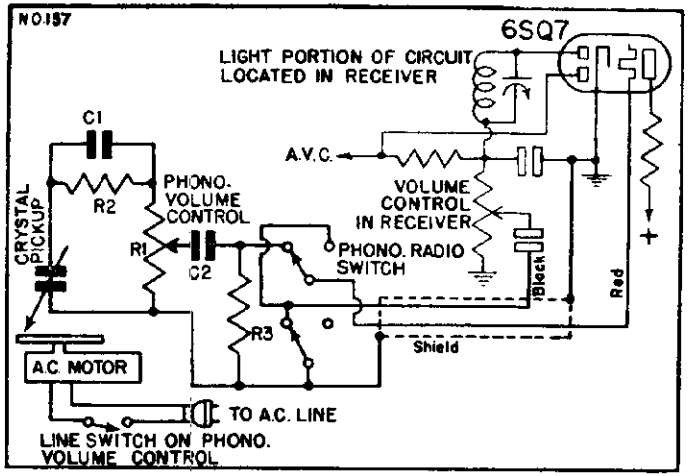
Rotate the wave-band switch to the broadcast (clockwise) position. Set the dial pointer at 160 and feed 1600 kc from the signal generator into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from and parallel to the receiver loop antenna and advance the output of the generator until a deflection is obtained on the output meter. Adjust first the oscillator coil trimmer then the antenna trimmer for maximum response. Reset the pointer at 60, feed 1600 kc and rock the variable condenser while adjusting the series padder for maximum response. Return to 1600 kc and check alignment. If readjustment is necessary return to 600 and repeat entire procedure.

Police Alignment

Set the wave-band switch at the police band (central) position and the pointer at 7.5. Feed 7500 kc to the antenna and adjust the oscillator trimmer for maximum response. Then adjust the antenna trimmer for maximum response. The police band padder is fixed and therefore requires no adjustment.

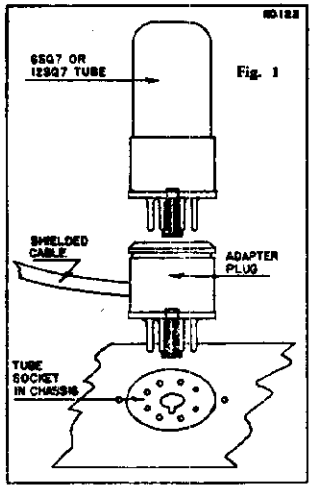
Short-Wave Alignment

Set the wave-band switch at the short-wave (counter-clockwise) position. Move the pointer to 20 and feed 20,000 kc to the antenna (using a 400 ohm dummy antenna) and adjust the short-wave oscillator trimmer for maximum response. If two peaks are obtained choose the minimum capacity peak. Then adjust the antenna coil trimmer for maximum response. If two peaks are obtained choose the maximum capacity peak.



FOR OTHER DATA SEE THAT PERTAINING TO MODEL EQ410, EMERSON PAGE 12-22

R1	Volume control, .5 megohms, with line switch	8CPM-64	Rim drive motor, 117 volt a.c.
R2	2 megohm ¼ watt carbon resistor	8CC-486A	Crystal pick-up
R3	15 megohm ¼ watt carbon resistor	TTS-111R	Phono-radio switch
C1	0.00011 mf mica condenser	6VG-24	Rubber needle cup
C2	0.002 mf, 600 volt tubular condenser	7MW-305	Phonograph connecting cable and adapter plug



—EO-388—S1 —EO-388—S2

GENERAL NOTES

1. This adapter may be used with any receiver which employs a 6SQ7, 6SQ7GT, 12SQ7 or 12SQ7GT tube for its first audio amplifier.
2. The motor used in the adapter is of the A.C. ONLY type and will be damaged if used on direct current.
3. The regular receiver volume control operates when the adapter switch is in the "radio" position.
4. The phonograph volume control and motor on-off switch are operated by the same knob.
5. The motor on-off switch does not switch the receiver on or off.
6. THIS RECORD PLAYER HAS BEEN DESIGNED TO OPERATE WITHOUT A GROUND. UNDER NO CIRCUMSTANCES SHOULD ANY GROUND (OR GROUND WIRE) BE PERMITTED TO COME IN CONTACT WITH ANY METAL PART OF THE COMBINATION.

MODEL: EO-388
Phonograph Adapter

CHASSIS MODEL: EO

MOTOR:
Alternating current type
Rim-drive.

PICK-UP: Crystal.

POWER CONSUMPTION: 20 watts.

VOLTAGE RATING: 105-125 volts.

OPERATION

To connect the record player to the Models DM-331, DP-332 or any other radio receiver equipped with a 6SQ7 or 12SQ7 second detector and first audio amplifier proceed as follows:

1. Remove the back from the cabinet (if cabinet is equipped with a back).
2. Locate and remove the 6SQ7 or 12SQ7 tube from its socket, inserting the prong end of the adapter (which comes attached to the 388 cabinet by a length of cable) into the socket from which the 6SQ7 or 12SQ7 tube has been removed. See Figure 1.
3. Insert the 6SQ7 or 12SQ7 tube into the top of the adapter plug. See Figure 1.
4. The back may then be replaced on the cabinet.

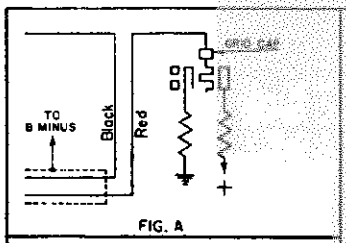
With the phono-radio switch in the adapter turned to the position marked "Radio," the receiver may be used in the ordinary manner. The receiver on-off switch and volume control must be operated to control the receiver.

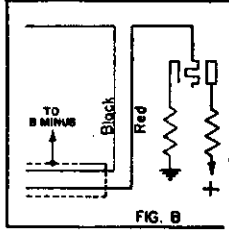
With the phono-radio switch in the adapter turned to the position marked "Phono" the phonograph may be operated. The phonograph volume is controlled by the same knob which switches the motor on and off. The radio receiver volume control will have no effect in "phono" position.

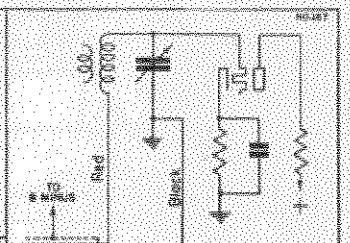
To turn the receiver off be sure to turn off both motor switch and receiver switch.

Receivers using 55, 75, 85, 6Q7, 12Q7, 6F5 and similar type tubes used as first audio amplifiers (see Fig. A).

1. Remove the adapter plug from the phonograph connecting cable.
2. Remove the control grid lead from the grid cap on the tube; connect the red wire emerging from the connecting cable to the grid cap of the tube; connect the black wire emerging from the connecting cable to the grid lead which originally connected to the grid cap.
3. The connecting cable shield must be connected to B— on the receiver chassis.







Receivers using single ended type tubes such as the 56, 76, 6J5, etc., as first audio amplifiers, in which the control grid is brought out at the tube base (see Fig. B).

1. Remove the adapter plug from the connecting cable.
2. Remove the grid lead from the control grid socket lug; connect the red wire emerging from the connecting cable to the grid socket lug; connect the black wire emerging from the connecting cable to the wire which originally connected to the control grid socket lug.
3. The connecting cable shield is connected to B— on the receiver chassis.

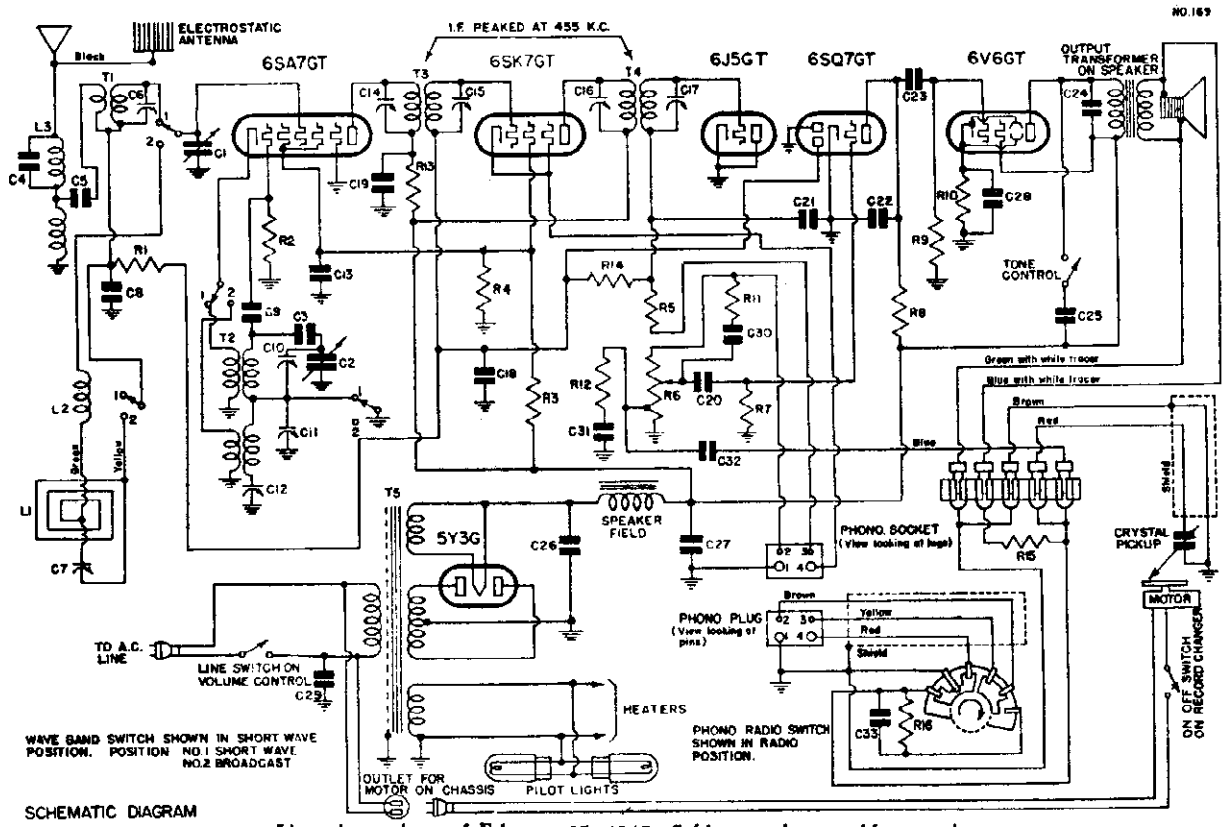
Receivers using a plate bend detector tube and having no first audio tube (see Fig. C).

1. Remove the adapter plug from the connecting cable.
2. Remove lead to the low end of the secondary on the detector coil; connect the red wire emerging from the connecting cable to the low end of the detector secondary; connect the black wire emerging from the connecting cable to the lead which originally connected to the secondary of the coil.
3. The connecting cable shield is connected to B— on the receiver chassis.

Note: This record player is not recommended for use with receivers using a grid leak detector and having only one audio stage.

MODEL FE-409, Chassis FE

EMERSON RADIO & PHONOGRAPH CORP.

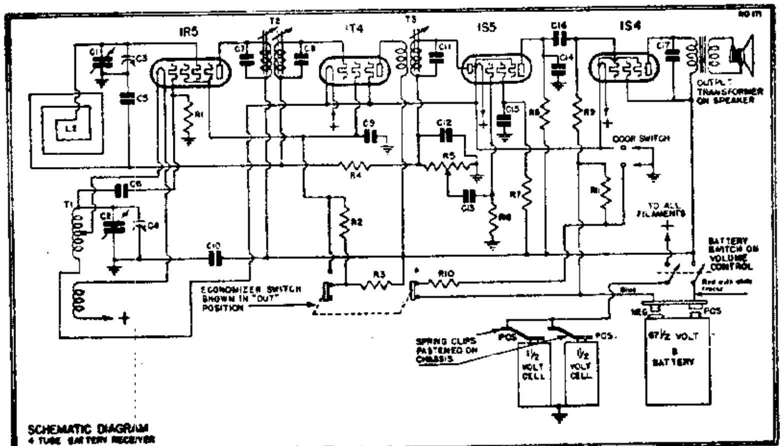


SCHEMATIC DIAGRAM

List price each as of February 15 1941. Subject to change without notice.

*Item No.	Part No.	REPLACEMENT PARTS LIST	Price
T1	8QT-576	Short-wave antenna coil	$ .45
T2	8QT-577	Two-band oscillator coil	.55
T3	7QT-548E	Double-tuned 455 kc first i-f transformer	.90
T4	7BT-550	Double-tuned 455 kc second i-f transformer	.80
T5	8QT-584	Power transformer	4.70
L1	8QW-286	Broadcast loop antenna	1.85
L2	8QT-578	Broadcast antenna loading coil	.25
L3	7RT-531A	Antenna choke and 455 kc wave-trap	.85
R1	KR-54	100,000 ohm ½ watt carbon resistor	.16
R2	LR-60	20,000 ohm ½ watt carbon resistor	.16
R3	8DR-397	15,000 ohm 3 watt carbon resistor	.30
R4	3BR-247	40,000 ohm ½ watt carbon resistor	.16
R5	OR-73	25,000 ohm ½ watt carbon resistor	.16
R6	8QR-420	Volume control .5 megohm with line switch	.90
R7	3RR-275	10 megohm ½ watt carbon resistor	.16
R8	KR-55	250,000 ohm ½ watt carbon resistor	.16
R9, R11	KR-56	500,000 ohm ½ watt carbon resistor	.16
R10	8QR-421	240 ohm 1 watt wire-wound resistor	.16
R12	LR-65	10,000 ohm ½ watt carbon resistor	.16
R13	PR-79	1,000 ohm ½ watt carbon resistor	.16
R14, R15	HR-42	2 megohm ½ watt carbon resistor	.16
R16	NNR-220	3 megohm ½ watt carbon resistor	.16
C1, C2	8QM 634	Six-button tuning unit with two-gang variable condenser	5.45
C4		0.0001 mf mica condenser—Part of L3	
C5	KC-58	0.01 mf, 400 volt tubular condenser	.20
C6		Trimmer, part of T1	
C7		Trimmer, part of L1	
C8	AAC-111	.003 mf mica condenser	.20
C9, C33	5LC-410A	.00011 mf mica condenser	.20
C10, C11	8QC-505	Dual oscillator trimming condenser	.30
C12	2NC-231A	Single adjustable padding condenser	.30
C13, C19	EEC-132	0.1 mf, 400 volt tubular condenser	.20
C14, C15, C16, C17		Trimmers, part of i-f transformers	
C18	BC-12	0.05 mf, 200 volt tubular condenser	.20
C20	3HC-274	0.002 mf, 600 volt tubular condenser	.20
C21, C22	5AC-384	0.0002 mf, 600 volt tubular condenser	.20
C23, C25	LC-65	0.02 mf, 400 volt tubular condenser	.20
C26, C27, C28	8QC-500	Multiple dry electrolytic condenser	1.05
		C26, 15 mf—400 volt; C27, 15 mf—350 volt; C28, 20 mf—25 volt.	
C29	3LC-297	0.01 mf, 400 volt tubular condenser	.20
C30	AAC-106A	0.00005 mf mica condenser	.20
C31	3PC-306	0.005 mf mica condenser	.20
C32	4VC-370A	0.00015 mf mica condenser	.20

EMERSON RADIO & PHONOGRAPH CORP.



VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed are from point indicated to chassis with volume control turned on full and no signal. The battery voltages for these readings were: "A" 1.5 volts, "B" 67.5 volts. All readings except filaments were taken on the 250 volt scale, with battery saver "out."

Tube	Plate	Screen	Fil.
1R5	57	60	1.5
1T4	57	60	1.5
1S5	*5	*3	1.5
1S4	55	60	1.5

Bias for the 1S4 tube is obtained across the resistor R11. The voltage drop across this resistor should be 7.5 volts with battery saver "out" or 9.4 volts with battery saver "in."

*The operating voltage of this tube cannot be measured because of the high resistor in the circuit.

ADJUSTMENTS

Location of Coils and Trimmer Adjustments

The first i-f transformer is located in the bottom outer edge of the chassis behind the lower flashlight cell. The brass screws which protrude from either end of the can are the core adjustment for trimming the transformer. The second i-f transformer is located between the 1T4 and 1S5 tubes. The single trimming core screw extends from the end of the can.

The oscillator coil is located inside the chassis, beside the variable condenser. Trimmer for the oscillator is located on the lower section of the variable condenser.

The loop antenna acts as the antenna coil. Trimmer for the loop is located on the upper section of the variable condenser.

I-f Alignment

Swing variable condenser to minimum capacity position.

Feed 455 kc to the grid of the 1R5 tube through a 0.01 mf condenser. Adjust the three i-f trimmer core screws for maximum response. (Clip the i-f input to the stator lug of the upper variable condenser section.)

R-f Alignment

Set the dial pointer at 150. Set the signal generator at 1500 kc and feed its output into a loop of wire about one foot in diameter. Hold this radiating loop about one foot away from and parallel to the receiver loop antenna. Advance the output of the generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (on lower section of variable condenser) then the antenna trimmer (on upper section of variable condenser) for maximum response.

BATTERY COMPLEMENT

The cabinet is designed to house the complete set of batteries. The battery complement should be as follows:

Type Battery	Number Required	Manufacturer's Part No.
1½ volt "A"	2	Standard "D" size (1 5/16" diameter) flashlight cell
67½ volt "B"	1	Eveready "Mini-max" No. 467

REPLACEMENT PARTS LIST

When ordering state part number. List price each as of February 15, 1941. (Subject to change without notice.)

*Item No.	Part No.	DESCRIPTION	PRICE
L2	7UW-296	Loop antenna	$ .85
T1	7UT-539A	Oscillator coil	.45
T2	7UT-540	Iron core double-tuned 455 kc first i-f transformer	1.90
T3	7UT-541	Iron core single-tuned 455 kc second i-f transformer	1.30
R1	KR-54	100,000 ohm ¼ watt carbon resistor	.16
R2	LR-64	5,000 ohm ⅜ watt carbon resistor	.16
R3	LR-65	10,000 ohm ⅜ watt carbon resistor	.16
R4	3RR-274	5 megohm ¼ watt carbon resistor	.16
R5	7UR-380	Volume control 1.5 megohm with double pole battery switch	.90
R6	3RR-275	10 megohm ⅜ watt carbon resistor	.16
R7, R9	NNR-220	3 megohm ⅜ watt carbon resistor	.16
R8	KR-57	1 megohm ⅜ watt carbon resistor	.16
R10	7UR-394	2200 ohm ⅜ watt carbon resistor	.16
R11	7UR-392	1800 ohm ⅜ watt carbon resistor	.16
C1, C2	7UC-469	Two-gang variable condenser	2.20
†C3, C4		Trimmers, part of variable condenser.	
C5, C9, C15	FC-29	0.02 mf, 200 volt tubular condenser	.20
C6, C12, C14	5LC-410A	0.00011 mf mica condenser	.20
†C7, C8, C11		Fixed trimming condensers, contained inside i-f cans.	
C10	7UC-476	10 mf, 100 volt dry electrolytic condenser	.50
C13	3HC-274	0.002 mf, 600 volt tubular condenser	.20
C16, C17	NNC-199	0.001 mf, 600 volt tubular condenser	.20

DESCRIPTION

TYPE: Single-band (battery operated) superheterodyne.

FREQUENCY RANGE: 540-1700 kc.

NUMBER OF TUBES: Four.

TYPE OF TUBES:
- 1—1R5, oscillator-modulator
- 1—1T4, i-f amplifier
- 1—1S5, 2nd detector, a.v.c., a-f amplifier
- 1—1S4, pentode output.

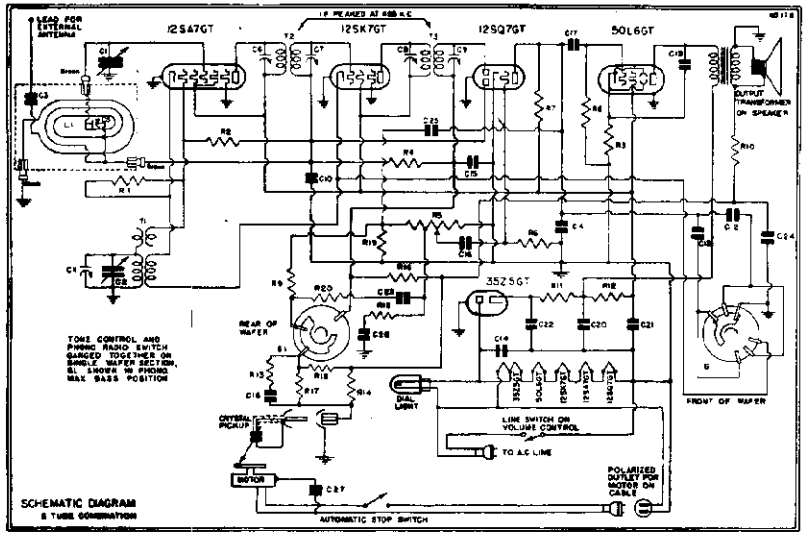
POWER SUPPLY: A and B batteries.

VOLTAGE RATING:
- "A" Battery—1.5 volts
- "B" Battery—67.5 volts.

CURRENT DRAIN:
- "A" Battery—0.25 amp.
- "B" Battery—0.0075 amp with Battery Saver "OUT"; 0.0055 amp with Battery Saver "IN"

GENERAL NOTES

1. The color coding of the i-f transformer leads is as follows:
   - Grid—green; Plate—blue
   - Grid return—black; B plus—red
2. The color coding of the battery cable is as follows: Red—B plus, 90 volts; Blue—B minus.
3. If replacements are made in the r-f section of the circuit, the receiver should be carefully re-aligned.
4. The self-contained loop antenna operates at maximum efficiency when its position is at right angles to the broadcasting source. It is important, therefore, once the station is tuned in, to rotate the cabinet back and forth through a quarter of a circle (90 degrees), leaving it at the position where the station is received with maximum volume.



SCHEMATIC DIAGRAM FOR MODEL FJ

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (line switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale.

Tube	Plate	Screen	Cathode	Fil.
12SA7GT	88	88	0	12
12SK7GT	88	88	0	12
12SQ7GT	30	—	0	12
50L6GT	100	88	5.3	50

Voltage at 35Z5 cathode—120 volts.

Voltage across pilot light—6.5 volts.

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. The color coding of the i-f transformer leads is as follows:

Grid—green	Plate—blue
Grid return—black	B plus—red

3. The receiver has a self-contained antenna and does not require additional antenna connections. For permanent home installations, however, if it is desired to improve reception of weak stations, an additional outdoor antenna should be used. For this purpose a lead has been brought out of the rear near the line cord.

4. The self-contained loop antenna has directional properties. It is important, therefore, once the station is tuned in, that the cabinet be rotated on its base back and forth through a quarter of a circle (90 degrees), and left at the position where the station is received with maximum volume.

DESCRIPTION

TYPE: Single-band superheterodyne and phonograph.

FREQUENCY RANGE: 540-1600 kc.

NUMBER OF TUBES: Five.

REPLACEMENT PARTS LIST

*Item	Part No.	DESCRIPTION
L1	9JW-343	Antenna loop assembly
T1	9JT-617	Oscillator coil
T2	8PT-586A	Double-tuned 455 kc first i-f transformer
T3	8PT-587	Double-tuned 455 kc second i-f transformer
R1	LR-60	20,000 ohm ¾ watt carbon resistor
R2, R5	4XR-327	15 megohm ¾ watt carbon resistor
R3	3FR-293	140 ohm ½ watt wire-wound resistor
R4	NNR-220	3 megohm ½ watt carbon resistor
R5	9JR-445	Volume control 2.5 meg., tapped at .5 meg.
R6	4XR-327	15 megohm ¾ watt carbon resistor
R7, R8	KR-56	500,000 ohm ¾ watt carbon resistor
R19, R20		
R9, R10	KR-53	50,000 ohm ¾ watt carbon resistor
R11	9JR-450	175 ohm 1 watt carbon resistor
R12	8JR-424	750 ohm 1 watt wire-wound resistor
R13, R15	KR-54	100,000 ohm ¾ watt carbon resistor
R14, R17	KR-57	1 megohm ¾ watt carbon resistor
R18		
R16	KR-55	250,000 ohm ¾ watt carbon resistor
C1, C2	9JC-532	Two-gang variable condenser
C3, C16	3HC-274	0.002 mf, 600 volt tubular condenser
C18		
C4	3RC-373	0.0004 mf, 500 volt tubular condenser
†C5, C11		Trimmers, part of variable condenser.
†C6, C7		Trimmers, part of i-f transformers.
C8, C9		
C10	AC-6	0.1 mf, 200 volt tubular condenser
C12	9JC-541	0.0006 mf, 600 volt tubular condenser
C13	9JC-542	0.0015 mf, 600 volt tubular condenser
C14	LC-64	0.05 mf, 400 volt tubular condenser
C15	5AC-384	0.0002 mf, 600 volt tubular condenser
C16, C18	3HC-274	0.002 mf, 600 volt tubular condenser
C17	LC-65	0.02 mf, 400 volt tubular condenser
C19	8WC-524	0.005 mf, 400 volt tubular condenser
C20, C21, C22	8JC-513	Multiple dry electrolytic condenser, 150 volt, C20—40 mf; C21, C22—20 mf.
C23	AC-7A	0.00025 mf mica condenser
C24	BC-12	0.05 mf, 200 volt tubular condenser
C25	4HC-395A	0.000026 mf mica condenser
C26	NNC-199	0.001 mf, 600 volt tubular condenser
C27	9JC-534	0.05 mf, 200 volt tubular condenser

TYPE OF TUBES:

1—12SA7GT, pentagrid oscillator-modulator

1—12SK7GT, first i-f amplifier

1—12SQ7GT, diode detector, a-f amplifier, a.v.c.

1—50L6GT, beam power output

1—35Z5GT, half-wave rectifier.

POWER SUPPLY: A.C. only.

VOLTAGE RATING: 105-125 volts.

POWER CONSUMPTION:

30 watts for the receiver.

20 watts for phono motor.

MODEL: FJ-412

CHASSIS MODEL: FJ

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 next to the 12SA7 tube. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted on top of the chassis next to the variable condenser. The trimmers are accessible through holes in the top of the can.

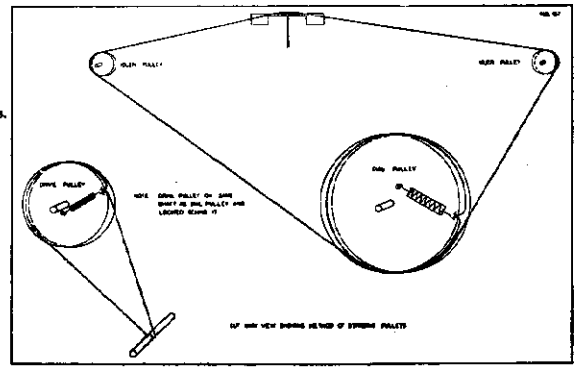
The trimmer for the oscillator coil is mounted on the front section of the variable condenser. The loop antenna trimmer is located on the loop assembly.

I-f Alignment

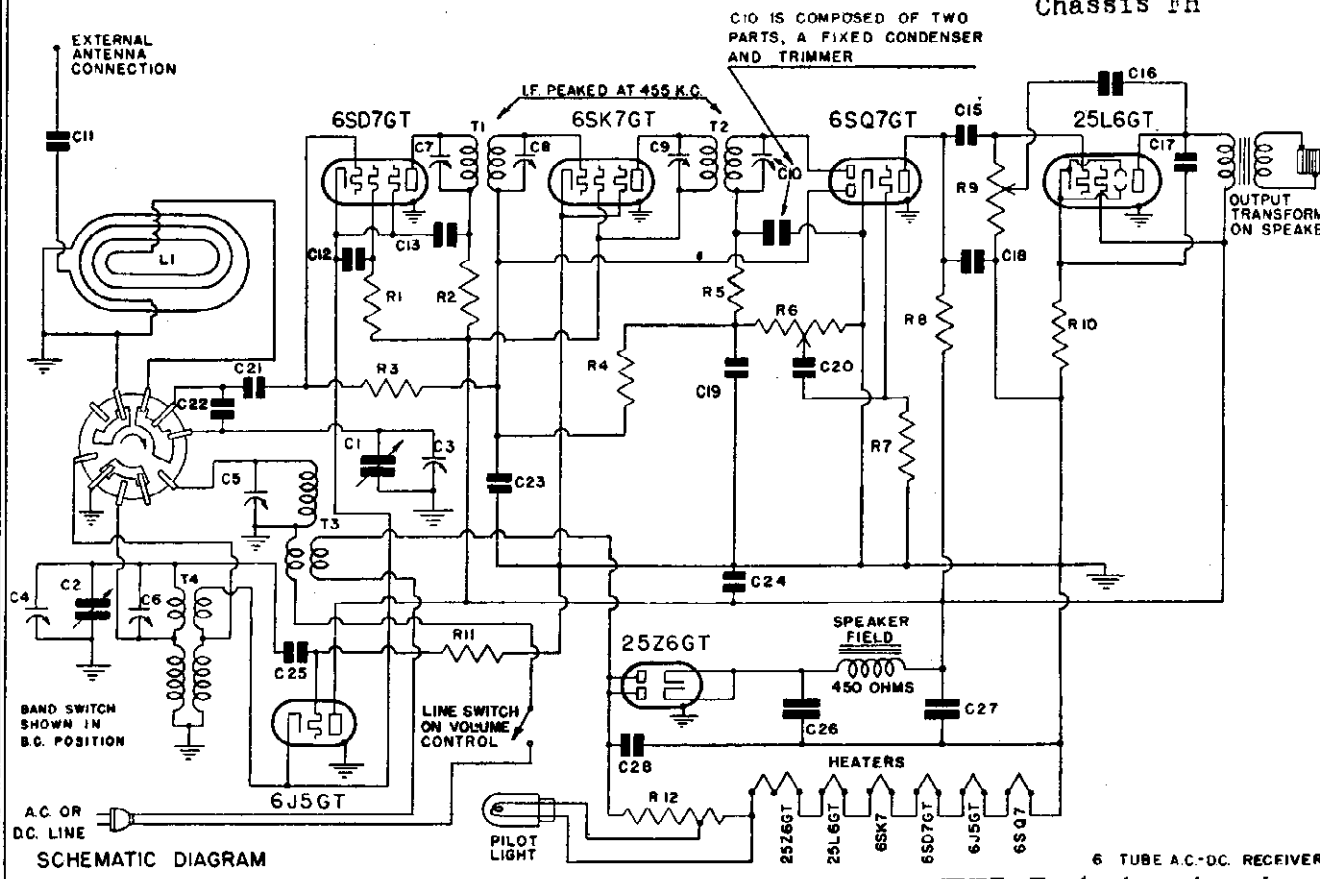
Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 12SA7GT tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response. The grid of the 12SA7GT tube may be reached by clipping the input lead to the stator lug of the antenna section.

R-f Alignment

Set the dial pointer at 140. Feed 1400 kc from the signal generator into a loop of wire about one foot in diameter. Hold this radiating loop about 12 inches away from and parallel to the receiver loop antenna. Advance the input to the loop until a satisfactory deflection is obtained on the output meter. Adjust first the oscillator trimmer then the antenna trimmer for maximum response. If the loop antenna has been replaced it may be necessary to retrack the loop inductance. With the dial set at 50 feed 600 kc to the antenna lead. A portion of the outside may be swung to either side of the center to give maximum response. Repeat the trimmer alignment at 140.



EMERSON RADIO & PHONOGRAPH CORP. MODELS FH413, FH44(Chassis FH



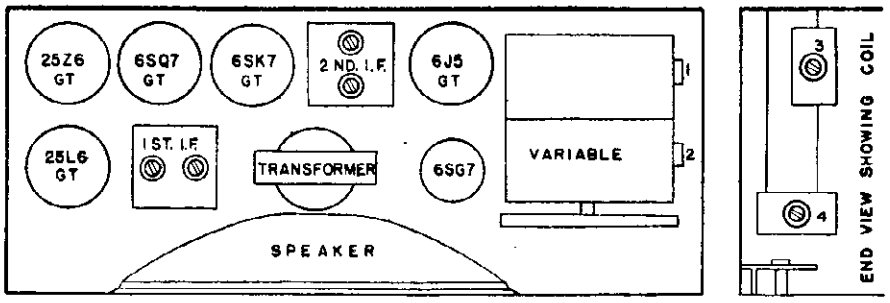
SCHEMATIC DIAGRAM

6 TUBE A.C.-D.C. RECEIVER

NO. 191

LOCATION OF TRIMMERS

FIGURES SHOW FREQUENCIES AT WHICH EACH BAND IS ALIGNED. READ "ALIGNMENT PROCEDURE"



1. BROADCAST OSCILLATOR TRIMMER 1600 K.C.
2. BROADCAST LOOP ANTENNA TRIMMER 1600 K.C.
3. SHORT WAVE OSCILLATOR TRIMMER 12 M.C.
4. SHORT WAVE ANTENNA TRIMMER 12 M.C.

TYPE: Two-band superheterodyne.

FREQUENCY RANGES:

540-1620 kc. (555-185 meters)
8.8-12.2 (16.3-24.5 meters)

POWER SUPPLY: A.C. or D.C.

VOLTAGE RATING: 105-125 vo

POWER CONSUMPTION: 30 wa

TYPE OF TUBES:

1—6SG7 or 6SD7
1—6J5, oscillator
1—6SK7, i-f amplifier
1—6SQ7, diode detector, a-f amplifier, a.v.c.
1—25L6, beam power output
1—25Z6, half-wave rectifier

Voltage at 25Z6 cathode—150 volt
Voltage across speaker field—32 vo
Voltage across pilot light—4.5 volts.

VOLTAGE ANALYSIS

Tube	Plate	Screen	Cathode	Fil.
6SG7 or 6SD7	92	63	0	6.3
6J5	102	—	0	6.3
6SK7	102	102	0	6.3
6SQ7	30	—	—	6.3
25L6	92	102	6.5	25

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower those given below.

REPLACEMENT PARTS LIST

When ordering, specify part numbers. List price each effective as of December 15, 1941. Subject to change without notice.

*Item	Part No.	DESCRIPTION	PRICE
L1	9HW-338	Loop antenna assembly (see production change no. 1a)	$ .65
T1	8CT-566B	Double-tuned 455 kc first i-f transformer	.85
T2	9HT-615	Double-tuned 455 kc second i-f transformer (see production change no. 1b)	1.15
T3	9HT-616	Short-wave antenna coil	.30
T4	9HT-614	Two-band oscillator coil	1.05
R1, R11	KR-53	50,000 ohm ½ watt carbon resistor	.16
R2	LR-64	5,000 ohm ½ watt carbon resistor	.16
R3, R4	NNR-220	3 megohm ½ watt carbon resistor	.16
R5		50,000 ohm ½ watt carbon resistor, part of T2.	
R6	9HR-441	Volume control: .5 megohm	.80
R7	3RR-275	10 megohm ½ watt carbon resistor	.16
R8	KR-56	500,000 ohm ½ watt carbon resistor	.16
R9	9HR-442	Tone control: 400,000 ohm	.60
R10	3FR-293	140 ohm ½ watt wire-wound resistor	.16
R12	9HR-443	Ballast resistor, 155 ohm	.50
C1, C2	9HC-530	Two-gang variable condenser	2.35
†C3, C4		Trimmers, part of variable condenser.	
†C5		Trimmer, part of T3.	
†C6		Trimmer, part of T4.	
†C7, C8, C9		Trimmers, part of i-f transformers.	
†C10		Trimmer and 0.0001 mf, mica condenser, part of T2.	
C11, C20	3HC-274	0.002 mf, 600 volt tubular condenser	.20
C12	FC-29	0.02 mf, 200 volt tubular condenser	.20
C13	BC-12	0.05 mf, 200 volt tubular condenser	.20
C15, C17	LC-65	0.02 mf, 400 volt tubular condenser	.20
C16, C18, C21	4XC-394A	0.00022 mf, mica condenser	.20
C28	LC-64	0.05 mf, 400 volt tubular condenser	.20
C19, C25	5LC-410A	0.00011 mf, mica condenser	.20
C22	9HC-531	0.00046 mf, mica condenser	.20
C23	AC-6	0.1 mf, 200 volt tubular condenser	.20
C24	KC-58	0.01 mf, 400 volt tubular condenser	.20
C26, C27	6JC-426R	Dual 20 mf, 150 volt dry electrolytic condenser	.90
	9HS-549	Dynamic speaker	4.35
	9HS-541	Dynamic speaker for Model 440	3.50
	9HS-542	Band switch	.80

*Item number locates the article on the schematic diagram.
†Not supplied separately.

PRODUCTION CHANGES

1. Chassis bearing serial numbers above 4,671,200 use:
   a—9HW-376 loop antenna ..... .65
   b—9HT-638 second i-f transformer 1.25

ADJUSTMENTS

An oscillator with frequencies of 455, 600, 1600 and 12,000 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.

I-f Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 6SD7 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response.

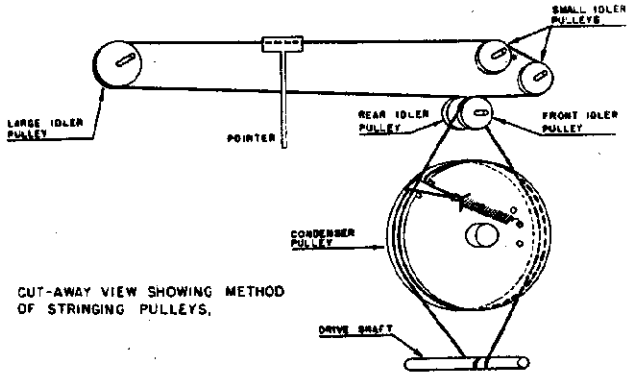
Note: The grid of the 6SD7 tube is the No. 4 pin.

R-f Alignment

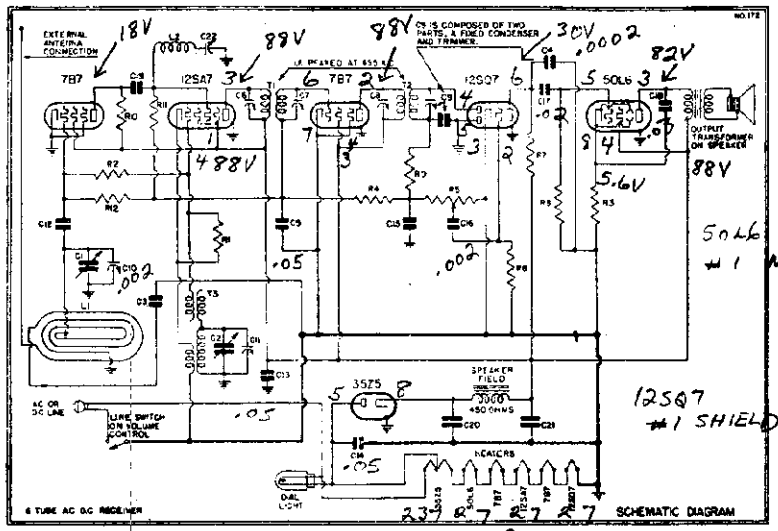
Rotate the wave-band switch counter-clockwise to the short-wave position. Set the dial pointer at 12 megacycles and using a 300 ohm carbon resistor as a dummy antenna feed 12 megacycles from the generator to the external antenna lead emerging from the rear of the chassis. Adjust first the short-wave oscillator trimmer and then the short-wave antenna trimmer for maximum response.

Rotate the wave-band switch clockwise to the broadcast position. Set the dial pointer at 160 and feed 1600 kc from the signal generator into a loop of wire bout 12 inches in diameter. Hold this radiating loop about 12 inches from the loop antenna and advance the signal generator until a deflection is obtained on the output meter. Adjust first the oscillator trimmer (rear section of the variable condenser) and then the antenna trimmer (front section of the variable condenser) for maximum response.

If the loop has been replaced it may be necessary to adjust the loop inductance as follows: Align at 1600. Set the pointer at 60 and feed 600 kc into the radiating loop. A portion of the outside turn of the loop may then be swung to either side of the center to give maximum response. Realign at 1600.



CUT-AWAY VIEW SHOWING METHOD OF STRINGING PULLEYS.



SCHEMATIC DIAGRAM FOR MODEL FL

TYPE: Single-band Superheterodyne.

FREQUENCY RANGE: 540-1630 kc.

NUMBER OF TUBES: Six.

TYPE OF TUBES:
1—7B7, r-f amplifier
1—12SA7, pentagrid oscillator-modulator
1—7B7, first i-f amplifier
1—12SQ7, diode detector, a-f amplifier, a.v.c.
1—50L6, beam power output
1—35Z5, half-wave rectifier.

POWER SUPPLY: A.C. or D.C.

VOLTAGE RATING: 105-125 volts.

POWER CONSUMPTION: 30 watts.

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 to the left of the variable condenser. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted on top of the chassis between the 7B7 tube and the speaker. The trimmers are accessible through holes in the top of the can.

The 455 kc wave-trap is located below the chassis deck.

The trimmers for the antenna and oscillator coils are located on the variable condenser. The trimmer on the front section is for the oscillator coil.

The oscillator coil is located underneath the chassis. The loop antenna acts as the antenna coil.

I-f and Wave-trap Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 12SA7 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response.

Feed 455 kc to the external antenna lead and adjust the wave-trap for minimum response.

Note: The grid of the 12SA7 tube is the No. 8 pin.

R-f Alignment

Set the dial pointer at 140. Set the signal generator at 1400 kc and feed its output into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from and parallel to the receiver loop antenna. Advance the output of the signal generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (on rear section of variable condenser) for maximum response.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance as follows. Align at 140. Set the pointer at 60 and feed 600 kc to the antenna lead. A portion of the outside turn of the loop may be swung to either side of the center to give maximum response. Realign at 140.

When ordering, specify part numbers. List price each effective as of March 1, 1941. Subject to change without notice.

*Item	Part No.	DESCRIPTION	PRICE
L1	9LW-344	Loop antenna assembly	$ .80
L2	9LT-619	455 kc wave-trap	.40
T1	7QT-548G	Double-tuned 455 kc first i-f transformer	.90
T2	9LT-618	Double-tuned 455 kc second i-f transformer	1.15
T3	8LT-570A	Oscillator coil	.40
R1	LR-60	20,000 ohm ¼ watt carbon resistor	.16
R2	3RR-275	10 megohm ⅛ watt carbon resistor	.16
R3	3FR-293	140 ohm 3/4 watt wire-wound resistor	.16
R4	NNR-220	3 megohm ½ watt carbon resistor	.16
R5	9LR-446	Volume control .5 megohm with line switch (see production change No. 1a)	.80
R6	4XR-327	15 megohm ½ watt carbon resistor	.16
R7, R8	KR-56	500,000 ohm ½ watt carbon resistor	.16
R9	KR-53	50,000 ohm ½ watt carbon resistor, part of T2	.16
R10	LR-65	10,000 ohm ¼ watt carbon resistor	.16
R11	OR-73	25,000 ohm ½ watt carbon resistor	.16
R12	KR-57	1 megohm ½ watt carbon resistor	.16
C1, C2	7BC-445E	Two-gang variable condenser	1.95
C3, C16	3HC-274	0.002 mf, 600 volt tubular condenser	.20
C4	5AC-384	0.0002 mf, 600 volt tubular condenser	.20
C5, C13	B12	0.05 mf, 200 volt tubular condenser	.20
C6, C7, C8		Trimmers, part of i-f transformers.	
C9		Trimmer and fixed condenser, part of T2.	
C10, C11		Trimmers, part of variable condenser.	
C12	4XC-394A	0.00022 mica condenser	.20
C14	LC-64	0.05 mf, 400 volt tubular condenser	.20
C15, C19	5LC-410A	0.00011 mica condenser	.20
C17	LC-63	0.02 mf, 400 volt tubular condenser	.20
C18	EC-23	0.03 mf, 400 volt tubular condenser	.20
C20, C21	6JC-426P	Dual 20 mf, 150 volt dry electrolytic condenser	.90
	7YS-476B	5" dynamic speaker	3.65

PRODUCTION CHANGES

1. Chassis bearing serial numbers below 4,540,900 use:
   (a) Volume control 7BR-363C ..... .85
   (b) Drive shaft 7BH-60D ..... .10

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (line switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given below.

Tube	Plate	Screen	Cathode	Fil.
7B7 (r-f)	18	88	0	5.5
12SA7	88	88	0	12.0
7B7	88	85	0	5.5
12SQ7	30	—	0	12.0
50L6	82	88	5.6	50.0

Voltage at 35Z5 cathode—120 volts.
Voltage across speaker field—82 volts.
Voltage across pilot light—4.5 volts.

The self-contained loop antenna operates at maximum efficiency when its position is at right angles to the broadcasting source. It is important, therefore, once the station is tuned in, to rotate the cabinet back and forth through a quarter of a circle (90 degrees), leaving it at the position where the station is received with maximum volume.

3. The color coding of the i-f transformer leads is as follows:

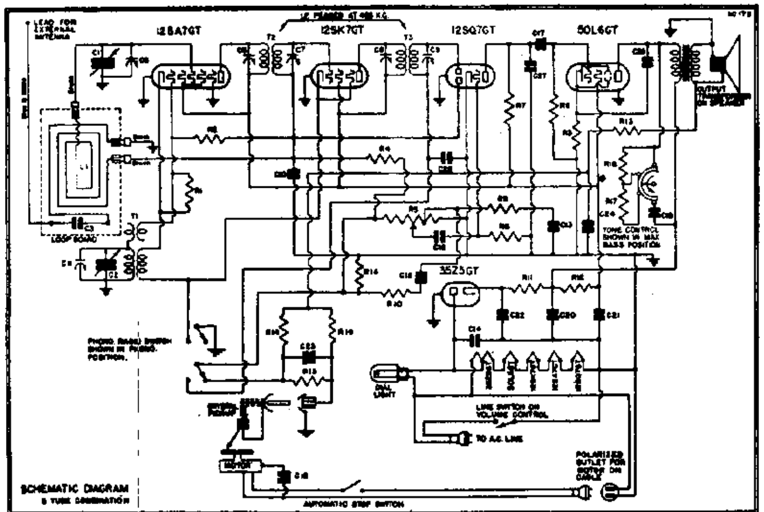
Grid—green	Plate—blue
Grid return—black	B plus—red

DIAL CORD REPLACEMENT

Draw the cord snugly around the condenser pulley and knot it, with no slack, near the notch in the pulley, after which the spring may be hooked to the cord and pulley. The dial face should bear against the fibre washer when finally assembled.

EMERSON RADIO & PHONOGRAPH CORP.

MODEL FO420, Chassis FO



SCHEMATIC DIAGRAM
5 TUBE COMBINATION

REPLACEMENT PARTS LIST

When ordering, specify part numbers. List price each, effective as of March 15, 1941. Subject to change without notice.

*Item No.	Part No.	DESCRIPTION	Price
L1	8SW-323A	Antenna loop assembly	$1.95
T1	8DT-572	Oscillator coil	.45
T2	7QT-348	Double-tuned 455 kc first i-f transformer	1.00
T3	8ST-588C	Double-tuned 455 kc second i-f transformer	.85
R1	LR-40	20,000 ohm ¼ watt carbon resistor	.16
R2, R6	4XR-327	15 megohm ¼ watt carbon resistor	.16
R3	3FR-293	140 ohm ½ watt wire-wound resistor	.16
R4	NNR-220	3 megohm ¼ watt carbon resistor	.16
R5	9OR-448	Volume control 2.5 megohm tapped at .5 megohm	.85
R7, R8, R18, R19	KR-36	500,000 ohm ¼ watt carbon resistor	.16
R9	KR-34	100,000 ohm ¼ watt carbon resistor	.16
R10, R14	KR-37	1 megohm ¼ watt carbon resistor	.16
R11	9JR-450	175 ohm 1 watt carbon resistor	.16
R12	8JR-424	750 ohm 1 watt wire-wound resistor	.16
R13	KR-33	50,000 ohm ¼ watt carbon resistor	.16
R15	HR-42	2 megohm ¼ watt carbon resistor	.16
R16	IR-43	1000 ohm ¼ watt carbon resistor	.16
R17	7UR-394	2200 ohm ¼ watt carbon resistor	.16
C1, C2	8SC-507A	Two-gang variable condenser	2.30
C3, C16	3HC-274	0.002 mf, 600 volt tubular condenser	.20
†C5, C11		Trimmers, part of variable condenser.	
†C6, C7, C8, C9		Trimmers, part of i-f transformers.	
C10	AC-6	0.1 mf, 200 volt tubular condenser	.20
C12	4XC-394A	0.00022 mf, mica condenser	.20
C13	NNC-199	0.001 mf, 600 volt tubular condenser	.20
C14	LC-44	0.05 mf, 400 volt tubular condenser	.20
C15	9JC-334	0.05 mf, 200 volt tubular condenser	.20
C17	LC-45	0.02 mf, 400 volt tubular condenser	.20
C18	3CC-302	0.15 mf, 200 volt tubular condenser	.20
C20, C21, C22	8JC-513A	Multiple dry electrolytic condenser, 150 volt. C20—40 mf; C21, C22—20 mf	1.50
C23	IIC-133A	0.000025 mf, mica condenser (see Production Change No. 1)	.20
C24	BC-12	0.05 mf, 200 volt tubular condenser	.20
C27, C28	5LC-418A	0.00011 mf; mica condenser	.20
C29	3PC-388	0.005 mf, 600 volt tubular condenser	.20

ADJUSTMENTS

An oscillator with frequencies of 455, 600 and 1500 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 located on top of the chassis deck. The trimmers are available through holes in top of the can.

The second i-f transformer is located on the rear wall underneath the chassis. The trimmers are available through holes in the rear chassis wall.

The loop antenna trimmer is mounted on the loop assembly. The oscillator trimmer is mounted on the front section of the variable condenser.

The oscillator coil is located underneath the chassis. The loop antenna acts as the antenna coil.

I-f Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 12SA7 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response.

Note: The grid of the 12SA7 tube is connected to the lower stator lug of the rear variable condenser section. Connection may be made with a test clip to the upper stator lug. This lug is easily identified by the connection of the green lead to the loop.

R-f Alignment

Set the dial pointer at 150. Set the signal generator at 1500 kc and feed its output into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from and parallel to the receiver loop antenna. Advance the output of the signal generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (on the loop assembly) for maximum response.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance as follows. Align at 150. Set the pointer at 60 and feed 600 kc to the antenna lead. A portion of the outside turn of the loop may be swung to either side of the center to give maximum response. Realign at 150.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (line switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale.

Tube	Plate	Screen	Cathode	Fil.
12SA7GT	90	90	0	12
12SK7GT	90	90	0	12
12SQ7GT	30	—	0	12
50L6GT	100	87	5.5	50

Voltage at 35Z5 cathode—115 volts.
Voltage across pilot light—4.5 volts.

FOR GENERAL INSTRUMENT 101 RECORD CHANGER DATA, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

DESCRIPTION

TYPE: Single-band superheterodyne and phonograph.

FREQUENCY RANGE: 540-1630 kc.

NUMBER OF TUBES: Five.

TYPE OF TUBES:
1—12SA7GT, pentagrid oscillator-modulator
1—12SK7GT, first i-f amplifier
1—12SQ7GT, diode detector, a-f amplifier, a.v.c.
1—50L6GT, beam power output
1—35Z5GT, half-wave rectifier.

POWER SUPPLY: A.C. only.

VOLTAGE RATING: 105-125 volts.

POWER CONSUMPTION:
30 watts for receiver.
20 watts for phono motor.

DIAL CORD REPLACEMENT

Use a turn and a half of cord, part number 7BZ-867A. Draw the cord snugly around the condenser pulley and knot it, with no slack, near the notch in the pulley, after which the spring may be hooked to the cord and pulley. The dial face should bear against the fibre washer when finally assembled.

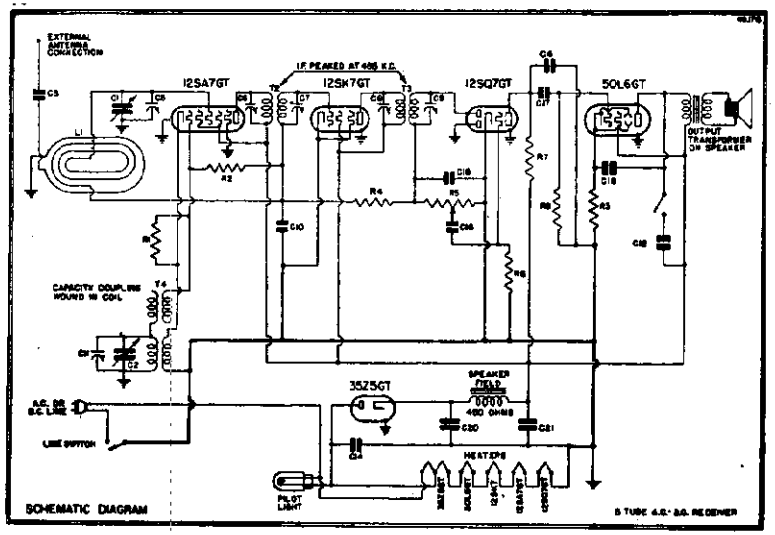
The color coding of the i-f transformer leads is as follows:

Grid—green, Plate—blue
Grid return—black, B plus—red

The receiver has a self-contained antenna and does not require additional antenna connections. For permanent home installations, however, if it is desired to improve reception of weak stations, an additional outdoor antenna should be used. For this purpose a lead has been brought out of the rear near the line cord.

The self-contained loop antenna has directional properties. It is recommended, therefore, once the station is tuned in, that the "Interceptor" knob (rear) be rotated back and forth, and left at the position where the desired station is received with maximum volume.

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 will result.



SCHEMATIC DIAGRAM FOR MODEL FP

REPLACEMENT PARTS LIST

*Item	Part No.	DESCRIPTION
L1	7BW-179	Loop antenna assembly
T4	9PT-620	Oscillator coil
T2	8CT-566B	Double-tuned 455 kc first i-f transformer
T3	9PT-621	Double-tuned 455 kc second i-f transformer
R1	1R-40	20,000 ohm ½ watt carbon resistor
R2, R6	4XR-327	15 megohm ½ watt carbon resistor
R3	3FR-295	140 ohm ½ watt wire-wound resistor
R4	1NR-220	3 megohm ½ watt carbon resistor
R5	9FR-447	Volume control .5 megohm
R7, R8	1R-56	500,000 ohm ½ watt carbon resistor
C1, C2	9PC-593	Two-gang variable condenser
C3, C16	3HC-274	0.002 mf, 600 volt tubular condenser
C4	5AC-584	0.0002 mf, 600 volt tubular condenser
†C5, C11		Trimmers, part of variable condenser.
†C6, C7, C8, C9		Trimmers, part of i-f transformers.
C10	AC-6	0.1 mf, 200 volt tubular condenser
C12	9PC-544	0.04 mf, 200 volt tubular condenser

MODELS: FP-421 and FP-422

CHASSIS MODEL: FP

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. In operating the receiver on d.c. it may be necessary to reverse the line plug for correct polarity.
3. The color coding of the i-f transformer leads is as follows:

Grid—green	Plate—blue
Grid return—black	B plus—red

4. The receiver has a self-contained antenna and does not require additional antenna connections. For permanent home installations, however, if it is desired to improve reception of weak stations, an additional outdoor antenna should be used. For this purpose a lead has been brought out of the rear near the line cord.
5. The self-contained loop antenna has directional properties. It is important, therefore, once the station is tuned in, that the cabinet be rotated on its base back and forth through a quarter of a circle (90 degrees), and left at the position where the station is received with maximum volume.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (line switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given below.

Tube	Plate	Screen	Cathode	Fil.
12SA7GT	88	88	0	12
12SK7GT	88	88	0	12
12SQ7GT	30	—	0	12
50L6GT	82	88	5.6	50

Voltage at 35Z5 cathode—120 volts.
Voltage across speaker field—32 volts.
Voltage across pilot light—4.5 volts.

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 next to the loop antenna. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted on top of the chassis next to the 50L6 tube. The trimmers are accessible through holes in the top of the can.

The trimmers for the antenna loop and the oscillator coil are located on the variable condenser. The front section is for the oscillator. The rear section is for the antenna loop. The oscillator coil is located beneath the chassis deck.

I-f Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 12SA7GT tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response. The grid of the 12SA7GT tube may be reached by clipping the input lead to the stator lug of the antenna section.

R-f Alignment

Set the dial pointer at 140. Feed 1400 kc from the signal generator into a loop of wire about one foot in diameter. Hold this radiating loop about 12 inches away from and parallel to the receiver loop antenna. Advance the input to the loop until a satisfactory deflection is obtained on the output meter. Adjust first the oscillator trimmer then the antenna trimmer for maximum response. If the loop antenna has been replaced it may be necessary to retrack the loop inductance. With the dial set at 60 feed 600 kc to the antenna lead. A portion of the outside may be swung to either side of the center to give maximum response. Repeat the trimmer alignment at 140.

TYPE: Single-band superheterodyne.

FREQUENCY RANGE: 540-1630 kc.

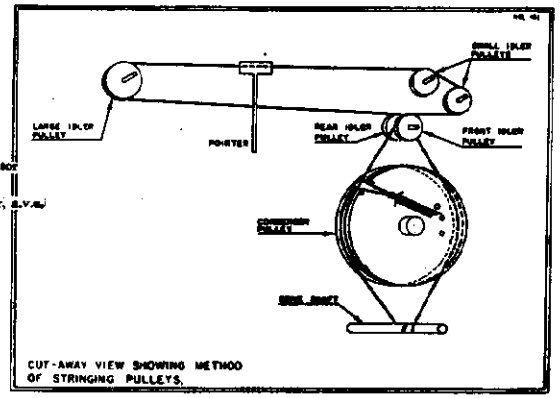
NUMBER OF TUBES: Five.

TYPE OF TUBES:
1—12SA7, pentagrid oscillator-modulator
1—12SK7, first i-f amplifier
1—12SQ7, diode detector, a-f amplifier, a.v.c.
1—50L6GT, beam power output
1—35Z5GT, half-wave rectifier.

POWER SUPPLY: A.C. or D.C.

VOLTAGE RATING: 105-125 volts.

POWER CONSUMPTION: 30 watts.



CUT-AWAY VIEW SHOWING METHOD OF STRINGING PULLEYS.

DESCRIPTION

TYPE: Single-band superheterodyne and phonograph.

FREQUENCY RANGE: 540-1600 kc.

NUMBER OF TUBES: Five.

TYPE OF TUBES:

1—12SA7, pentagrid oscillator-modulator
1—12SK7, first i-f amplifier
1—12SQ7, diode detector, a-f amplifier, a.v.c.
1—50L6, beam power output
1—35Z5GT, half-wave rectifier.

POWER SUPPLY: A.c. or d.c.

VOLTAGE RATING: 105-125 volts.

POWER CONSUMPTION: 30 watts for the receiver, 30 watts for the phono motor.

GENERAL NOTES

1. If replacements are made or the wiring disturbed in the r. section of the circuit, the receiver should be carefully re-aligned.

2. In operating the receiver on d.c. it may be necessary to reverse the line plug for correct polarity.

3. The color coding of the i-f transformer leads is as follows:

Grid—green	Plate—blue
Grid return—black	B plus—red

4. The receiver has a self-contained antenna and does not require additional antenna connections. For permanent home installations, however, if it is desired to improve reception of weak stations, an additional outdoor antenna should be used. For this purpose a lead has been brought out of the rear near the line cord.

5. The self-contained loop antenna operates at maximum efficiency when its position is at right angles to the broadcasting source. It is important, therefore, once the station is tuned in, to rotate the cabinet back and forth through a quarter of a circle (90 degrees), leaving it at the position where the station is received with maximum volume.

6. Before turning the phono motor on check the a.c.-d.c. switch underneath the turntable on the motor board, making sure that it is in a position corresponding to the power supply.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (line switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given below.

Tube	Plate	Screen	Cathode	Fil.
12SA7	88	88	0	12
12SK7	88	88	0	12
12SQ7	30	—	0	12
50L6	82	88	5.6	50

Voltage at 35Z5 cathode—120 volts.
Voltage across speaker field—32 volts.
Voltage across pilot light—6.3 volts.

ADJUSTMENTS

I-f Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 12SA7 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response.

Note: The grid of the 12SA7 tube is connected to the lower stator lug of the rear variable condenser section. Connection may be made with a test clip to the upper stator lug.

R-f Alignment

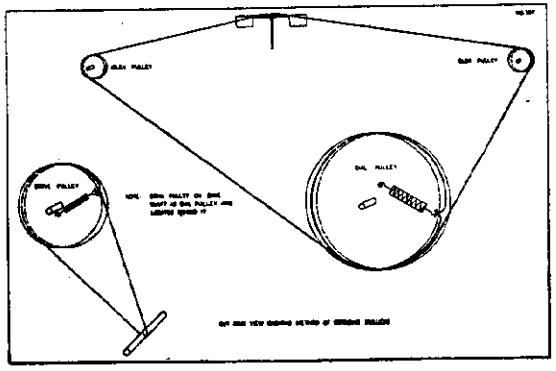
Set the dial pointer at 140. Set the signal generator at 1400 kc and feed its output into a loop of wire about 12 inches in diameter. Hold this reducing loop about 12 inches from and parallel to the receiver loop antenna. Advance the output of the signal generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (on rear section of variable condenser) for maximum response.

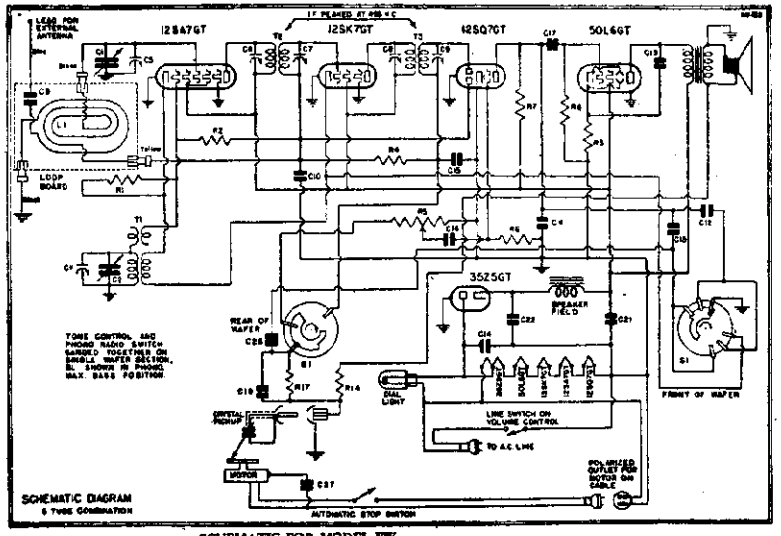
If the loop antenna has been replaced it may be necessary to adjust the loop inductance as follows: Align at 140. Set the pointer at 60 and feed 600 kc to the antenna lead. A portion of the outside turn of the loop may be turned to either side of the center to give MAXIMUM response. Realign at 140.

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.





SCHEMATIC FOR MODEL FW

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck next to the 12SA7 tube. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted on top of the chassis next to the 12SK7 tube. The trimmers are accessible through holes in the top of the can.

The trimmers for the antenna and oscillator coils are located on the variable condenser. The trimmer on the front section is for the oscillator coil.

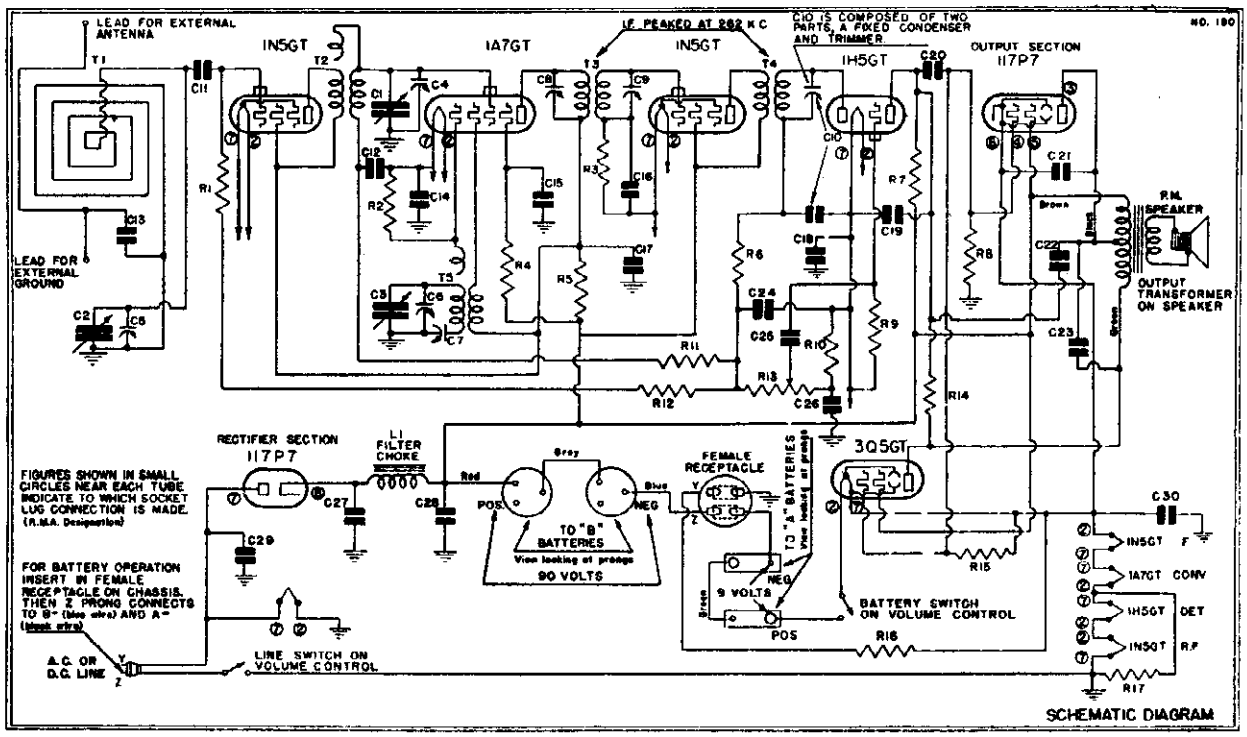
The oscillator coil is located underneath the chassis. The loop antenna acts as the antenna coil.

REPLACEMENT PARTS LIST

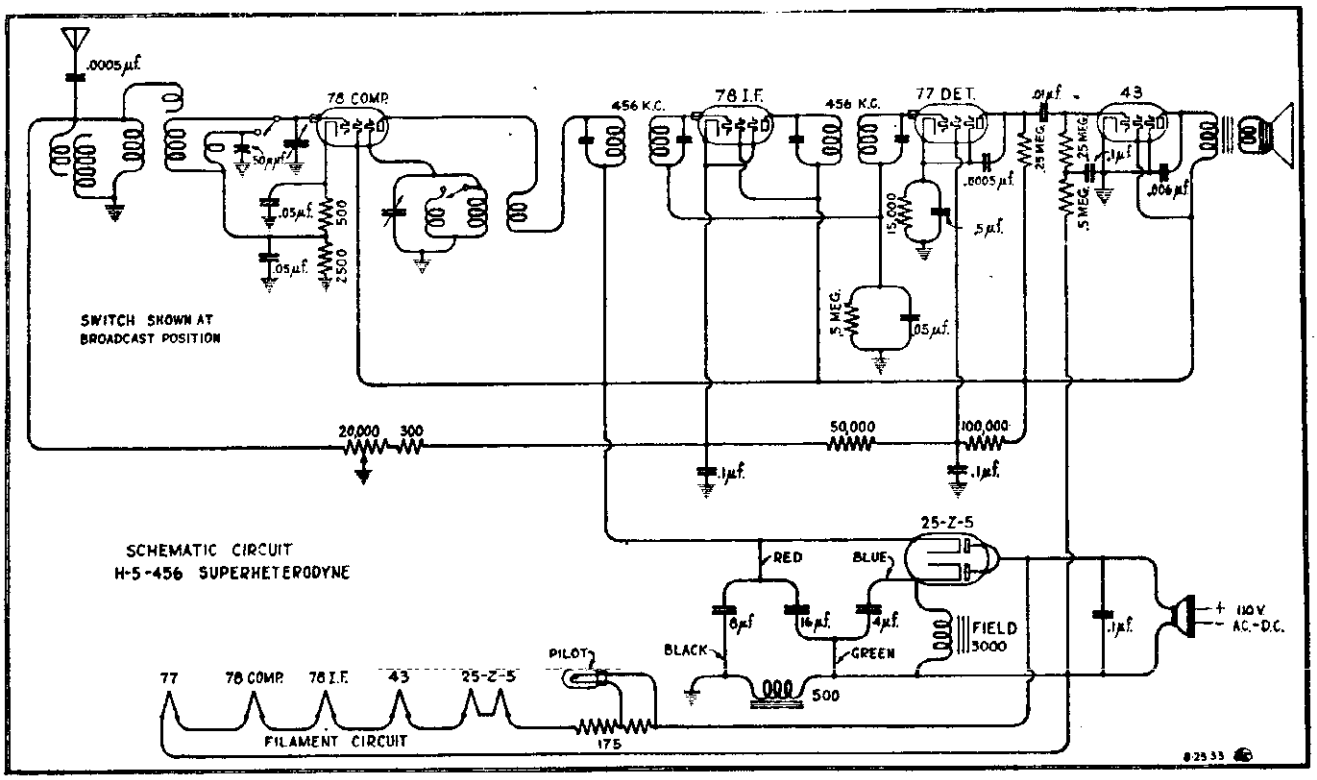
*Item	Part No.	DESCRIPTION
L1	9WW-362	Antenna loop assembly
T1	9JT-617	Oscillator coil
T2	8PT-586A	Double-tuned 455 kc first i-f transformer
T3	8PT-587	Double-tuned 455 kc second i-f transformer.
R1	LR-60	20,000 ohm ½ watt carbon resistor
R2, R6	4XR-327	15 megohm ¼ watt carbon resistor
R3	3FR-295	140 ohm ½ watt carbon resistor
R4, R17	NNR-220	3 megohm ½ watt carbon resistor
R5	9SR-452	Volume control, .5 megohm
R7, R8, R14	KR-56	500,000 ohm ½ watt carbon resistor
C1, C2	9SC-544	Two-gang variable condenser
C3, C16	3HC-274	0.002 mf, 600 volt tubular condenser
C4	3RC-373	0.0004 mf, 600 volt tubular condenser
†C5, C11		Trimmers, part of variable condenser
‡C6, C7, C8, C9		Trimmers, part of i-f transformers
C10	AC-6	0.1 mf, 200 volt tubular condenser
C12	9JC-541	0.0006 mf, 600 volt tubular condenser
C13	9JC-542	0.0015 mf, 600 volt tubular condenser
C14	LC-64	0.05 mf, 400 volt tubular condenser
C15	5AC-384	0.0002 mf, 600 volt tubular condenser
C17	LC-65	0.02 mf, 400 volt tubular condenser
C18	IC-47	0.0005 mf, mica condenser
C19	KC-58	0.01 mf, 400 volt tubular condenser
C21, C22	6JC-426S	Dual 20 mf, 150 volt dry electrolytic condenser
C26	4AC-395A	0.000026 mf mica condenser
C27	9JC-534	0.05 mf, 200 volt tubular condenser

EMERSON RADIO & PHONOGRAPH CORP.

MODEL FU427 FU428
Chassis FU
MODEL H-5 Universal
Compact



SCHEMATIC DIAGRAM FOR MODEL FU



Universal Compact

Five Tube Superheterodyne - - Short-and-Long Wave - - 75 to 550 Meters

Either A. C. or D. C. - - 110-120 Volts - - Adaptable for 220 Volts - - 25 to 60 Cycles

MODELS: FU-424, FU-427 and FU-428

CHASSIS MODEL: FU

REPLACEMENT PARTS LIST

*Item	Part No.	DESCRIPTION	PRICE
L1	7JT-524A	Filter choke	$ .85
T1	9UW-363	Antenna loop assembly	.80
T1	9UW-363A	Antenna loop assembly (Model 428)	.80
T2	9UT-627	Interstage coil	.40
T3	9UT-628	Double-tuned 262 kc first i-f transformer	1.10
T4	9UT-629	Single-tuned 262 kc second i-f transformer	.90
T5	9UT-526	Oscillator coil	.80
R1	HR-42	2 megohm ½ watt carbon resistor	.16
R2	LR-61	200,000 ohm ½ watt carbon resistor	.16
R3	3RR-274	5 megohm ½ watt carbon resistor	.16
R4	ZZE-196	30,000 ohm ½ watt carbon resistor	.16
R5	PR-79	1,000 ohm ½ watt carbon resistor	.16
R6		47,000 ohm ¼ watt carbon resistor (part of T4).	
R7, R8, R13	KR-56	500,000 ohm ½ watt carbon resistor	.16
R9	3RR-275	10 megohm ½ watt carbon resistor	.16
R10	BBR-113	4,000 ohm ½ watt carbon resistor	.16
R11, R12, R14, R15	NNR-220	3 megohm ½ watt carbon resistor	.16
R13	9UR-451	Volume control .5 megohm with double-pole switch	.90
R16	8AR-395	1,200 ohm ½ watt carbon resistor	.16
R17	3UR-282	860 ohm 3/8 watt wire-wound resistor	.16
C1, C2, C3	9UC-546	Three-gang variable condenser	3.35
†C4, C5, C6		Part of variable condenser.	
C7	2NC-231E	Padder condenser	.30
C8, C9, C10		Trimmers, part of i-f transformers.	
C11, C12, C16, C17	BC-12	0.05 mf, 200 volt tubular condenser	.20
C13, C23, C25	3HC-274	0.002 mf, 600 volt condenser	.20
C14, C18, C26	5AC-388	0.25 mf, 100 volt tubular condenser	.20
C15	FC-29	0.02 mf, 200 volt tubular condenser	.20
C16, C17	BC-12	0.05 mf, 200 volt tubular condenser	.20
C19	3RC-373	0.0004 mf, 600 volt tubular condenser	.20
C20	LC-65	0.02 mf, 400 volt tubular condenser	.20
C21	KC-58	0.01 mf, 400 volt tubular condenser	.20
C22	4XC-393A	0.00006 mf, mica condenser	.20
C24	5LC-410A	0.00011 mf, mica condenser	.20
C26	5AC-388	0.25 mf, 100 volt tubular condenser	.20
C27, C28	6JC-426T	Dual 20 mf, 150 volt dry electrolytic condenser	.90
C29	LC-64	0.05 mf, 400 volt tubular condenser	.20
C30	7FC-451	40 mf, 25 volt dry electrolytic condenser	.80
	9US-568	5" permanent magnet dynamic speaker (Model 424)	4.75
	7JS-443	6½" permanent magnet dynamic speaker (Model 428)	5.75
		DIAL PARTS	
	9LH-87A	Drive shaft and pulley	.10
	7BZ-867A	Drive cord	.02
	9CE-65	Dial crystal	.20
	9CD-127B	Dial pointer (Models 424, 427)	.15
	9CD-127N	Dial pointer (Model 428)	.15
	9UD-137T	Dial face	.35

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed are from point indicated to chassis with volume control turned on full and no signal. The battery voltages for these readings were: "A" 9.0 volts, "B" 90 volts.

Tube	Plate	Screen	Osc. Plate	Fil.
1A7GT	88	50	84	1.5
1N5GT, r-f	88	88	—	1.5
1N5GT	88	88	—	1.5
1H5GT	27	—	—	1.5
3Q5GT	85	86	—	3.0
117P7 (line operation only)	86	95	—	117

117P7 rectifier cathode (Pin No. 8); (line operation only)—130 volts.
117N7 may be substituted for the 117P7.

DESCRIPTION

TYPE: Universal (battery, a.c.-d.c.) superheterodyne.

FREQUENCY RANGE: 540-1630 kc.

NUMBER OF TUBES: Six.

TYPE OF TUBES:
1—1A7GT, oscillator-modulator
1—1N5GT, r-f amplifier
1—1N5GT, i-f amplifier
1—1H5GT, 2nd detector, a.v.c., a-f amplifier
1—3Q5GT, beam power output (battery operation)
1—117P7, beam power output and half-wave rectifier (line operation).

POWER SUPPLY: Battery, a.c. or d.c.

VOLTAGE RATING: (Line operation) 105-125 volts, a.c.-d.c.

POWER CONSUMPTION: (Line operation) 20 watts.

CURRENT DRAIN:
(Battery operation) "A" battery 0.05 amp.
"B" battery 0.01 amp.

GENERAL NOTES

1. The color coding of the i-f transformer leads is as follows:
   Grid—green Plate—blue
   Grid return—black B plus—red
2. The color coding of the battery cable is as follows:
   Red—B plus, 90 volts Yellow—A plus, 9 volts
   Blue—B minus Black—A minus
3. If replacements are made in the r-f section of the circuit, the receiver should be carefully re-aligned.
4. A.C.-D.C. Operation: In portable models open the small door at the back of the cabinet. It is important that this small door be left open while operating the receiver on either a.c. or d.c. power. Take out the line cord, removing the plug from its receptacle at the rear of the chassis. Insert the plug in the wall outlet. If the power supply is d.c. and the receiver does not operate at first, remove the plug from the wall outlet, turn it half way around and re-insert it in the outlet, thus obtaining the proper polarity.
5. Battery Operation: Important: Remove the line plug from the electrical outlet. Insert the plug into the receptacle at the rear of the receiver. This is important since the receiver will not operate from batteries with the plug out of the receptacle. The loose portion of the cord can then be coiled and placed in the cabinet.
6. The receiver has a self-contained antenna and normally does not require additional antenna or ground connection. For permanent home installations, however, in a location far removed from broadcasting stations, an additional outside antenna should be used. The outside antenna and ground connections should be made to the two leads at the rear of the cabinet. See the illustration on last page.
7. The self-contained loop antenna has directional properties. It is important, therefore, once the station is tuned in, that the cabinet be rotated on its base back and forth through a quarter of a circle (90 degrees), and left at the position where the station is received with maximum volume.

BATTERY COMPLEMENT

The cabinet is designed to house the complete set of batteries. The battery complement should be as follows:

Type Battery	Number Required	Eveready Part No.	Rayovac Part No.	Burgess Part No.
4½ volt "A"	2	746 (plug-in type)	P83A or EM-83 (plug-in type)	3G (plug-in type)
45 volt "B"	2	482 Minimax (plug-in type)	——	——

ADJUSTMENTS

An oscillator with frequencies of 262, 1400 and 600 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 oscillator coil is located beneath the chassis. The trimmer for the oscillator is on the middle section of the variable condenser.

The interstage coil is the shielded coil located beneath the chassis. Its trimmer is on the front section of the variable condenser.

The trimmer for the loop antenna is on the last section of the variable condenser (the section nearest the loop).

The i-f transformers are mounted on top of the chassis. The first i-f transformer is mounted next to the loop. The second i-f transformer is mounted next to the dial.

The series padder is located between the variable condenser and the shielded 1N5 tube.

I-f Alignment

Note: This receiver has an i-f frequency of 262 kc.

Swing variable condenser to minimum capacity position.

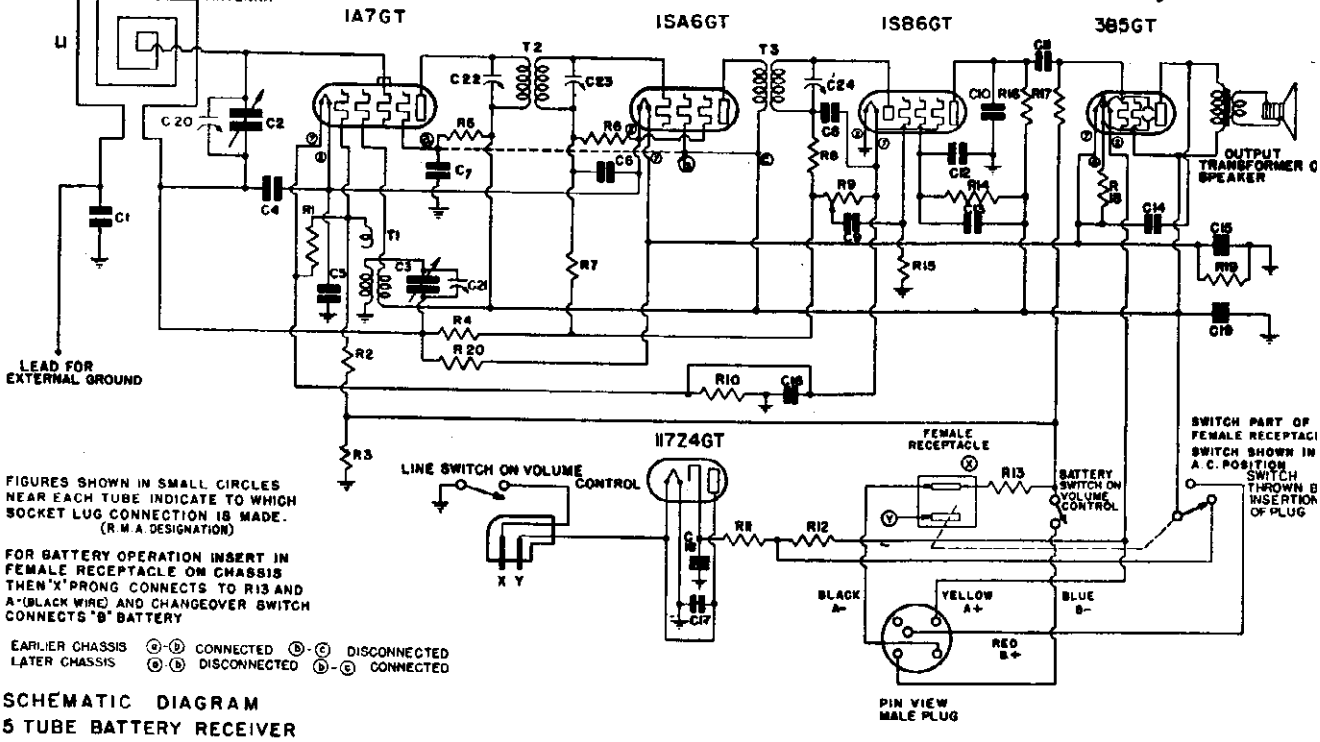
Feed 262 kc to the grid of the 1A7 tube through a 0.01 mf condenser. Adjust the three i-f trimmers for maximum response.

R-f Alignment

Set the dial pointer at 140. Feed 1400 kc from the signal generator into a loop of wire about one foot in diameter. Hold this radiating loop approximately one foot away from and parallel to the receiver loop and advance the output of the signal generator until a suitable deflection is obtained on the output meter. Adjust first the oscillator trimmer (middle section) then the interstage and loop trimmers for maximum response. Move dial pointer to 60 and feed 600 kc into the radiating loop and adjust the series padding condenser (while rocking the variable condenser back and forth) for maximum response. Realign at 1400 kc.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance. Align at 140. Set the dial at 60 and feed 600 kc to the radiating loop. A portion of the outside turn of the loop may then be swung to either side of the center to give maximum response. Realign at 140.

EMERSON RADIO & PHONOGRAPH CORP. MODELS FV426, FV433, Chassis F



SCHEMATIC DIAGRAM
5 TUBE BATTERY RECEIVER

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (line swit with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readi except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those gi below.

Tube	Plate	Screen	Osc. Plate	Fil.
1A7GT	69	46	69	1.4
1SA6GT	69	70	—	1.4
1SB6GT	9	5	—	1.4
3B5GT	67	69	—	2.5

Voltage at 117Z4GT cathode—125 volts

Voltage drop across R11, R12—117 volts

DESCRIPTION

TYPE: Universal (battery, a.c.-d.c.) superheterodyne.

FREQUENCY RANGE: 540-1600 kc.

NUMBER OF TUBES: Five.

TYPE OF TUBES:

1—1A7GT, oscillator-modulator
1—1SA6GT, i-f amplifier
1—1SB6GT, 2nd detector, a.v.c., a-f amplifier
1—3B5GT, beam power output (battery operation)
1—117Z4, half-wave rectifier (line operation).

POWER SUPPLY: Battery, a.c. or d.c.

VOLTAGE RATING: (Line operation) 105-125 volts, a.c.-d.c.

POWER CONSUMPTION: (Line operation) 13 watts.

CURRENT DRAIN:

(Battery operation) "A" battery .02 amp.
"B" battery 0.007 amp.

GENERAL NOTES

1. The color coding of the i-f transformer leads is as follows:

   Grid—green — Plate—blue
   Grid return—black — B plus—red

2. The color coding of the battery cable is as follows:

   Red—B plus, 67.5 volts — Yellow—A plus, 7.5 volts
   Blue—B minus — Black—A minus

3. If replacements are made in the r-f section of the circuit, the receiver should be carefully re-aligned.

4. Battery Operation: Important: Remove the line plug from the electrical outlet. Insert the plug into the receptacle a the bottom of the receiver. This is important since the re ceiver will not operate from batteries with the plug out of the receptacle. The loose portion of the cord can then be coiled and placed in the cabinet.

5. The receiver has a self-contained antenna and normally does not require additional antenna or ground connection. For permanent home installations, however, in a location far removed from broadcasting stations, an additional outside antenna should be used. The outside antenna and ground connections should be made to the two leads at the rear of the cabinet.

6. The self-contained loop antenna has directional properties It is important, therefore, once the station is tuned in, that the cabinet be rotated on its base back and forth through a quarter of a circle (90 degrees), and left at the position where the station is received with maximum volume.

MODELS FV426, FV433
Chassis FV

EMERSON RADIO & PHONOGRAPH CORP.

REPLACEMENT PARTS LIST

Specify part numbers when ordering. List price each, effective as of December 15, 1941. (Subject to change without notice.)

*Item	Part No.	DESCRIPTION	PRICE
L1	9VW-355	Loop antenna	$ .90
T1	9VT-360	Oscillator coil	.50
T2	9VT-668	Double-tuned 455 kc first i-f transformer	1.45
T3	9VT-632	Single-tuned 455 kc second i-f transformer	1.25
R1	10TR-485	220,000 ohm ¼ watt carbon resistor	.16
R2, R16	KR-57	1 megohm ¼ watt carbon resistor	.16
R3	9ZR-478	470,000 ohm ¼ watt carbon resistor	.16
R4, R6, R17	9ZR-480	3.3 megohm ¼ watt carbon resistor	.16
R5	9ZR-477	22,000 ohm ¼ watt carbon resistor	.16
R7, R20	3RR-275	10 megohm ¼ watt carbon resistor	.16
R8	10TR-486	47,000 ohm ¼ watt carbon resistor	.16
R9	9VR-453	Volume control with line switch 1.5 megohm	.90
R10	4CR-321	290 ohm ½ watt wire-wound molded resistor	.16
R11, R12	9VR-462	Candohm ballast resistor: R11—960 ohms, 3.5 watts; R12—1375 ohms, 3.6 watts	.40
R13	7VR-488	290 ohm ½ watt metallized filament, ceramic coated resistor	.16
R14, R15	10TR-487	4.7 megohm ¼ watt carbon resistor	.16
R18	3VR-271	510 ohm 1 watt wire-wound molded resistor	.16
R19	9VR-463	800 ohm 1 watt wire-wound molded resistor	.16
C1, C9, C11, C14	3HC-274	0.002 mf, 600 volt tubular condenser	.20
C2, C3	9VC-547	Two-gang variable condenser	2.90
C4, C16	AC-6	0.1 mf, 200 volt tubular condenser	.20
C5	5AC-388A	0.25 mf, 100 volt tubular condenser	.20
C6	KC-58	0.01 mf, 400 volt tubular condenser	.20
C7	9VC-566	5. mf, 100 volt dry electrolytic condenser	.50
C8	4XC-394A	0.0002 mf mica condenser	.20
C10	4XC-393A	0.00006 mf mica condenser	.20
C12	ZZC-211	0.03 mf, 200 volt tubular condenser	.20
C13	3VC-324	0.003 mf, 600 volt tubular condenser	.20
C15	9VC-560	40 mf, 40 volt dry electrolytic condenser	.55
C17	LC-64	0.05 mf, 400 volt tubular condenser	.20
C18, C19	8TC-529C	Dual 40 mf, 150 volt dry electrolytic condenser	1.00
†C20, C21		Trimmer condenser, part of variable condenser.	
†C22, C23, C24		Trimmer condenser, part of i-f transformers.	
	9VS-562	4" P.M. dynamic speaker	6.00

*Item number locates the article on the schematic diagram.

†Not supplied separately.

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck next to the variable condenser. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted on top of the chassis between the volume control and the speaker. The trimmer is accessible through a hole in the top of the can.

The trimmers for the antenna and oscillator coils are located on the variable condenser. The trimmer on the lower section is for the oscillator coil.

The oscillator coil is located underneath the chassis. The loop antenna acts as the antenna coil.

I-f Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 1A7GT tube through a .01 mf condenser and adjust the three i-f trimmers for maximum response.

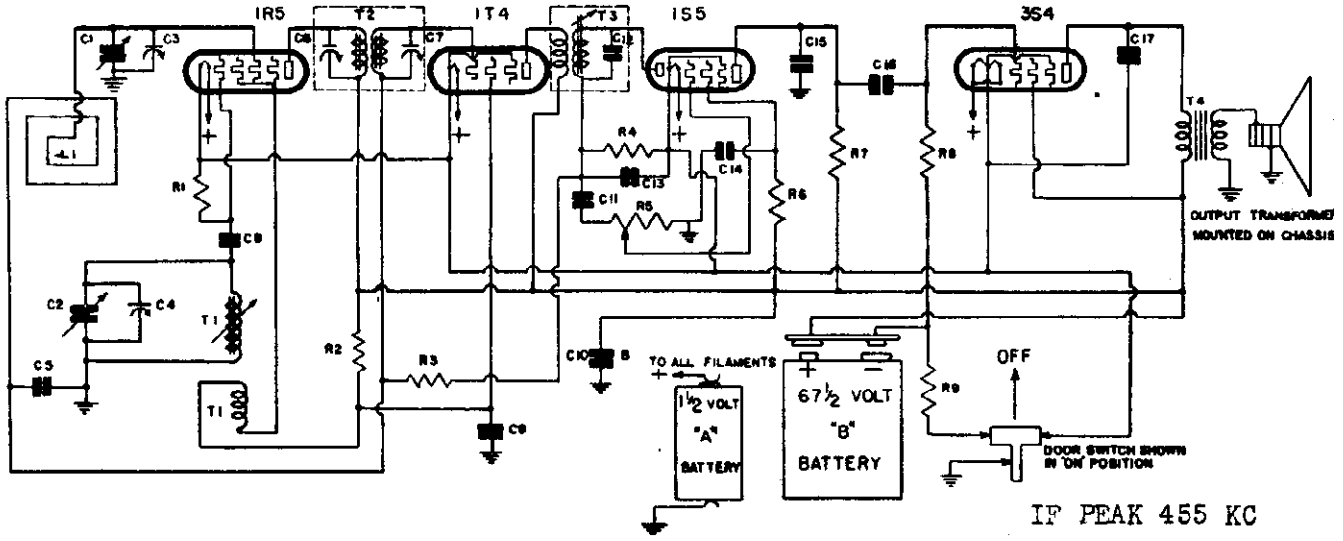
R-f Alignment

Set the dial pointer at 140. Set the signal generator at 1400 kc and feed its output into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from and parallel to the receiver loop antenna. Advance the output of the signal generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (on rear section of variable condenser) for maximum response.

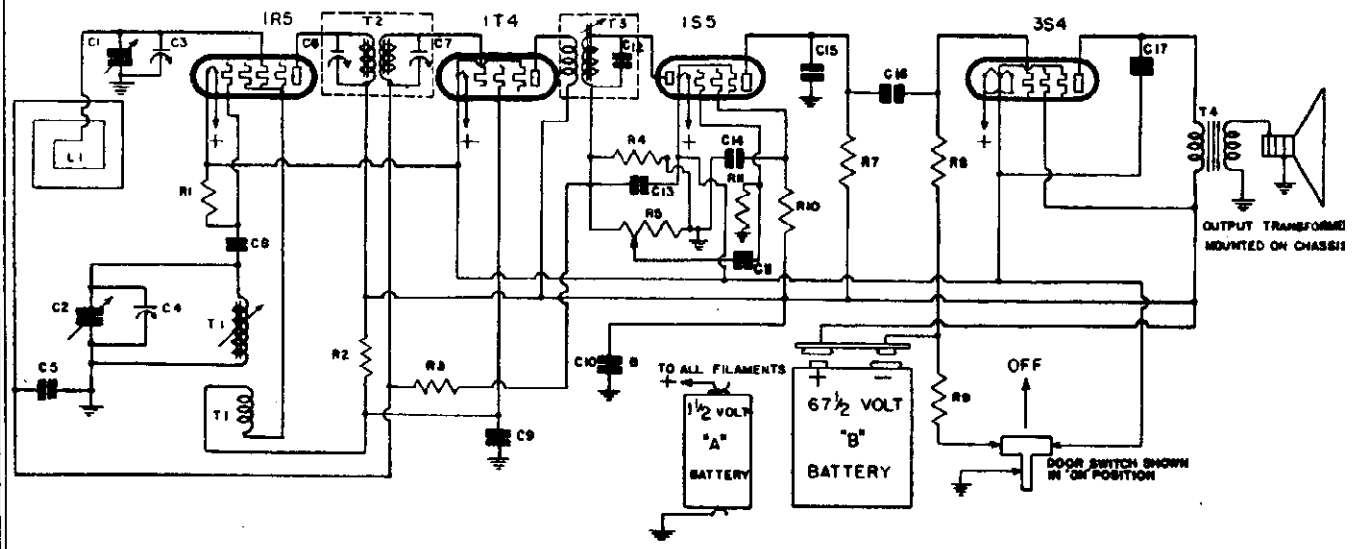
If the loop antenna has been replaced it may be necessary to adjust the loop inductance as follows: Align at 140. Set the pointer at 60 and feed 600 kc to the antenna lead. A portion of the outside turn of the loop may be swung to either side of the center to give maximum response. Realign at 140.

EMERSON RADIO & PHONOGRAPH CORP.

MODEL FR432
Chassis FR
Early, Late



FR SCHEMATIC DIAGRAM FOR CHASSIS BEARING SERIAL NUMBERS BELOW 4,818,700



FR SCHEMATIC DIAGRAM FOR CHASSIS BEARING SERIAL NUMBERS ABOVE 4,818,700

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed are from point indicated to chassis with volume contu turned on full and no signal. The battery voltages for these readings were: "A" 1.5 volts, "B" 67.5 volts. All readings except fi ments were taken on the 250 volt scale.

Tube	Plate	Screen	Fil.
1R5	57	35	1.5
1T4	57	35	1.5
1S5	*12	*3	1.5
3S4	55	60	1.5

Bias for the 3S4 tube is obtained across the resistor R9. The voltage drop across this resistor should be 7.5 volts.

*The operating voltage of this tube cannot be measured because of the high resistor in the circuit.

MODEL FR432, Chassis FR
Early, Late

EMERSON RADIO & PHONOGRAPH CORP.

REPLACEMENT PARTS LIST

When ordering state part number. List price each as of June 15, 1941. (Subject to change without notice.)

*Item	Part No.	DESCRIPTION	PRICE
L1	9RW-350A	Loop antenna	$ .60
T1	9RT-622	Oscillator coil	.75
T2	9RT-623	Double-tuned 455 kc first i-f transformer	1.70
T3	9RT-624	Single-tuned 455 kc second i-f transformer	1.40
T4	9RT-625	Output transformer	.90
R1	KR-54	100,000 ohm ¼ watt carbon resistor	.16
R2	KR-63	15,000 ohm ¼ watt carbon resistor	.16
R3, R6, R8	NNR-220	3 megohm ¼ watt carbon resistor	.16
R4, R7	KR-57	1 megohm ¼ watt carbon resistor	.16
R5	9RR-449	Volume control, 3 megohm	.65
R9	9RR-458	980 ohm ½ watt wire-wound resistor	.16
R10		5 megohm ¼ watt carbon resistor	.16
C1, C2	9RC-535G	Two-gang variable condenser	2.50
†C3, C4		Trimmers, part of variable condenser.	
C5, C9, C14	9RC-537	0.02 mf, 100 volt tubular condenser	.12
†C6, C7		Trimmers, part of first i-f transformer.	
C8	9RC-539	0.00005 mf, ceramic condenser	.20
C10	9RC-536	8 mfd, 100 volt dry electrolytic condenser	.50
C11, C17	9RC-552	0.003 mf, 150 volt tubular condenser	.12
†C12		Part of second i-f transformer.	
C13, C15	9RC-540	0.0001 mf, ceramic condenser	.20
C16	9RC-538	0.001 mf, 100 volt flat tubular condenser	.12
	9RS-553	Permanent magnet dynamic speaker	3.75

*Item number locates the article on the schematic diagram.

†Not supplied separately.

ADJUSTMENTS

An oscillator with frequencies of 455 and 1600 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 located next to the output transformer.

The trimmers are accessible through holes in top of the can.

The second i-f transformer is located between the 1T4 and 1S5 tubes. The single trimming core screw extends from the end of the can.

The oscillator coil is located next to the first i-f transformer. The trimmer for the oscillator is located on the smaller variable condenser section.

The 600 kc oscillator core adjustment is the brass screw protruding from the end of the oscillator coil.

The loop antenna acts as the antenna coil. Trimmer for the loop is located on the larger section of the variable condenser.

I-f Alignment

Swing variable condenser to minimum capacity position.

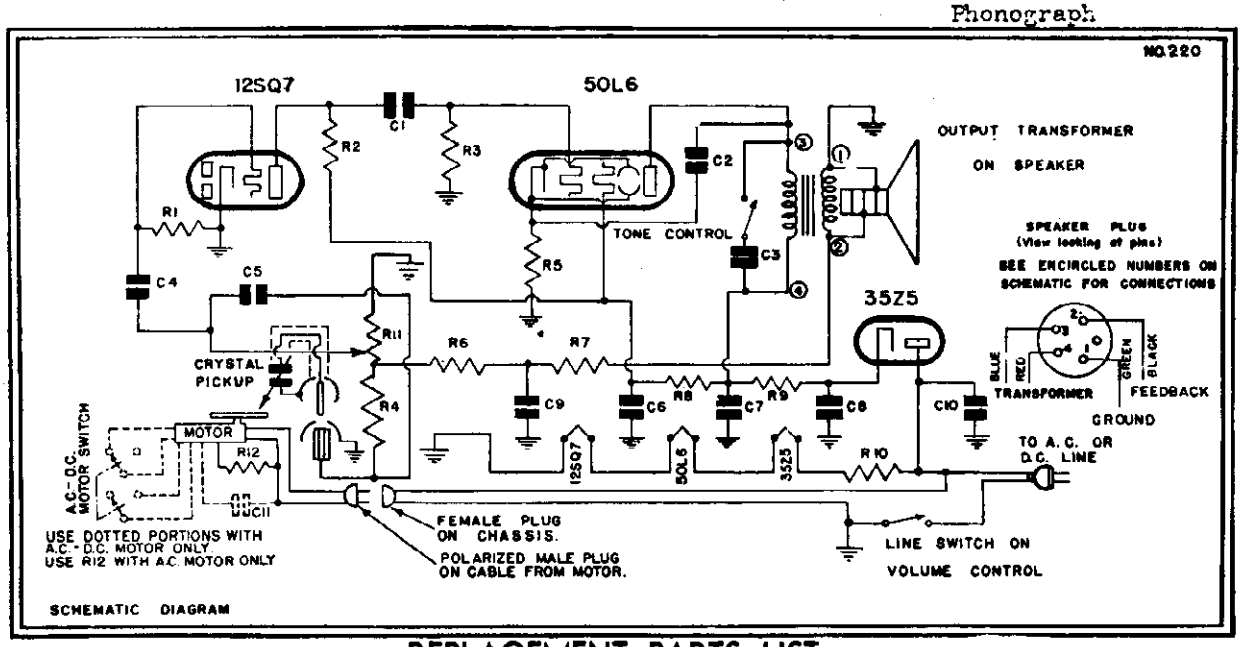
Feed 455 kc to the grid of the 1R5 tube through a 0.01 mf condenser. Adjust the three i-f trimmer screws for maximum response. (Clip the i-f input to the stator lug of the larger variable condenser section.)

R-f Alignment

Set the dial pointer at 160. Set the signal generator at 1600 kc and feed its output into a loop of wire about one foot in diameter. Hold this radiating loop about one foot away from and parallel to the receiver loop antenna. Advance the output of the generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (smaller section of variable condenser) then the antenna trimmer (larger section of variable condenser) for maximum response. Set the dial pointer at 60. Feed 600 kc and rock the variable condenser while adjusting the oscillator core adjustment for maximum response. Return to 1600 and check alignment. If readjustment is necessary return to 600 and repeat entire procedure.

EMERSON RADIO & PHONOGRAPH CORP.

MODELS FY434, Chas. FY
FY2-434, Chassis FY2
Phonograph



REPLACEMENT PARTS LIST

When ordering, specify part numbers. List price each effective as of Dec. 1, 1941. Subject to change without notice.

*Item	Part No.	DESCRIPTION	PRICE
R1	4XR-327	15 megohm ¼ watt carbon resistor	$ .16
R2, R3	KR-56	500,000 ohm ¼ watt carbon resistor	.16
R4, R6	KR-57	1 megohm ¼ watt carbon resistor	.16
R7	KR-53	50,000 ohm ¼ watt carbon resistor	.16
R8	KR-51	2,500 ohm ¼ watt carbon resistor	.16
R9	9JR-450	175 ohm 1 watt carbon resistor	.16
R10	9YR-460	133 ohm 3 watt wire-wound resistor	.25
R11	9YR-459	Volume control 2.5 megohm	.80
R12	KR-55	250,000 ohm ¼ watt carbon resistor (FY)	.16
C1, C2	LC-65	0.02 mf, 400 volt tubular condenser	.20
C3	BC-12	0.05 mf, 200 volt tubular condenser	.20
C4	3HC-274	0.002 mf, 600 volt tubular condenser	.20
C5	IC-51A	0.00001 mf, mica condenser	.20
C6, C7 C8	8JC-513B	Multiple dry electrolytic condenser, 150 volt; C6, C8—20 mf, C7—40 mf	.95
C9	FC-29	0.02 mf, 200 volt tubular condenser	.20
C10	LC-64	0.05 mf, 200 volt tubular condenser (FY2)	.20
C11	9JC-534	0.05 mf, 200 volt tubular condenser	.20

*Item number locates the article on the schematic diagram.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (line switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given below.

Tube	Plate	Screen	Cathode	Fil.
12SQ7GT	35	—	0	12
50L6GT	120	115	6.0	50

Voltage at 35Z5 cathode—135 volts.

TYPE OF TUBES:
1—12SQ7, first audio
1—50L6, beam power output
1—35Z5, half-wave rectifier.

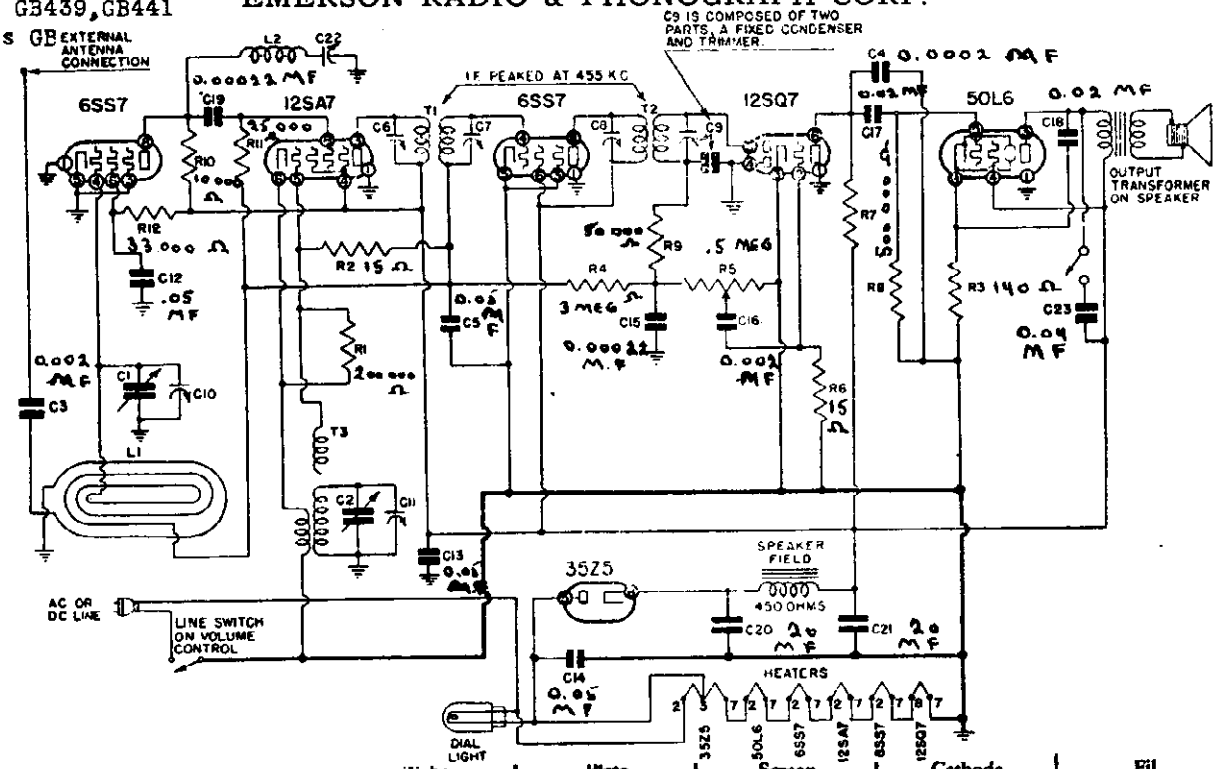
POWER CONSUMPTION:
45 watts (FY)
65 watts (FY2)

POWER SUPPLY:
a.c. (FY)
a.c.-d.c. (FY2)

VOLTAGE RATING: 105-125 volts.

MODELS GB439, GB441 — EMERSON RADIO & PHONOGRAPH CORP.

Chassis GB



VOLTAGE ANALYSIS

Voltage at 35Z5GT cathode—115 volts.

Tube	Plate	Screen	Cathode	Fil.
6SS7 (r-f)	50	57	0	6.0
12SA7	87	89	0	12.0
6SS7	88	89	0	6.0
12SQ7	30	—	0	12.0
50L6GT	82	89	5.3	50.0

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (line switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given below.

I-f and Wave-trap Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 12SA7 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response.

Feed 455 kc to the external antenna lead and adjust the wave-trap for minimum response.

Note: The grid of the 12SA7 tube is the No. 8 pin.

R-f Alignment

Set the dial pointer at 140. Set the signal generator at 1400 kc and feed its output into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from and parallel to the receiver loop antenna. Advance the output of the signal generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (on rear section of variable condenser) for maximum response.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance as follows. Align at 140. Set the pointer at 60 and feed 600 kc to the antenna lead. A portion of the outside turn of the loop may be swung to either side of the center to give maximum response. Realign at 140.

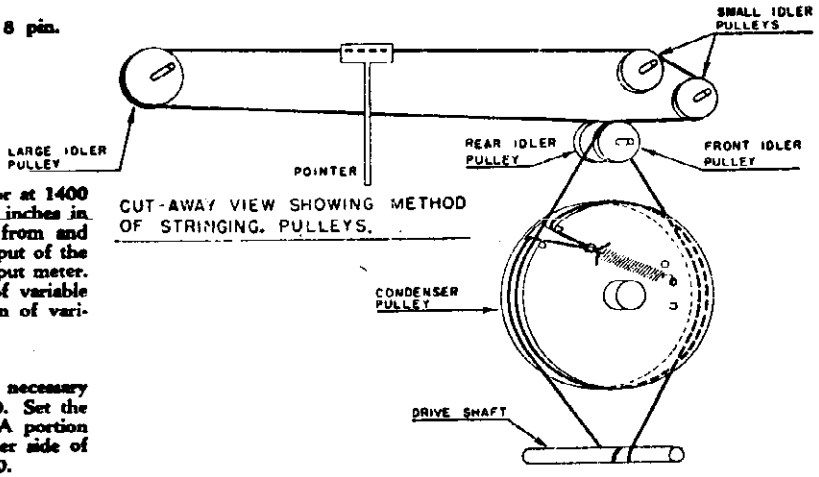
Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck next to the loop antenna. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted on top of the chassis between the 50L6 tube and the speaker. The trimmers are accessible through holes in the top of the can.

The trimmers for the antenna and oscillator coils are located on the variable condenser. The trimmer on the front section is for the oscillator coil.

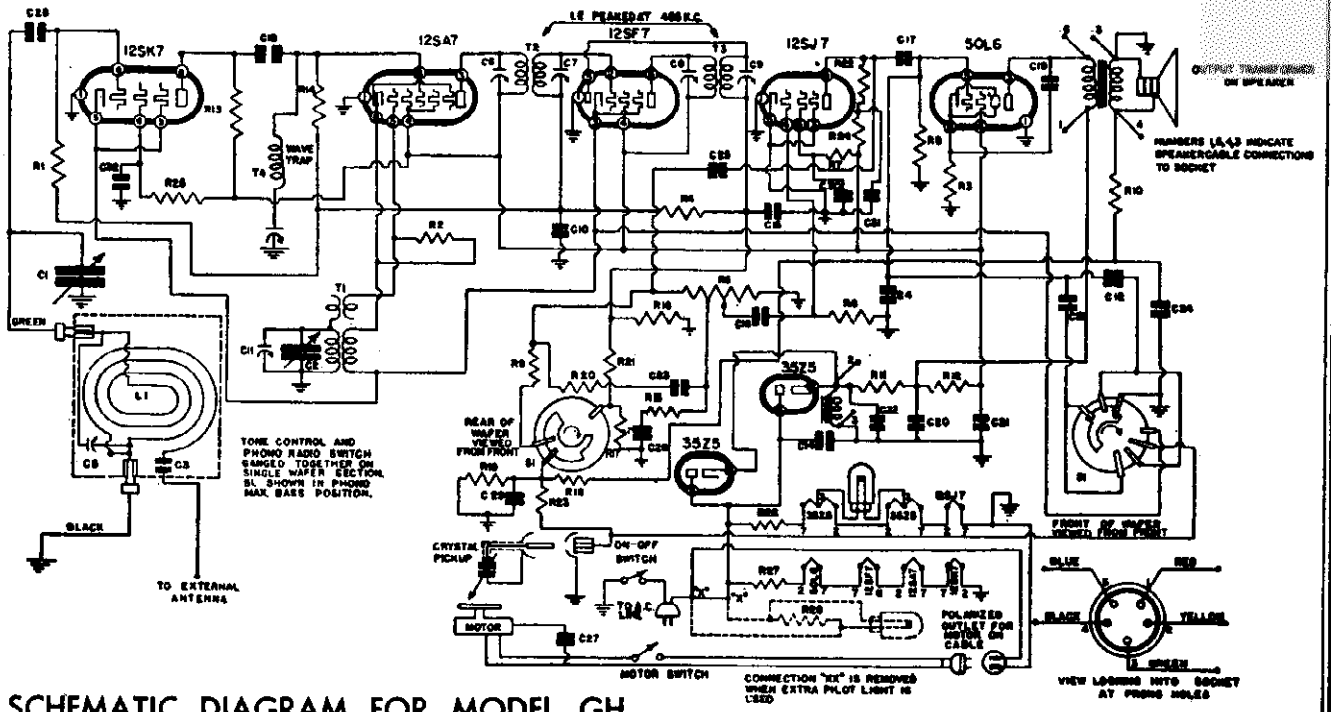
The oscillator coil is located underneath the chassis. The loop antenna acts as the antenna coil.



CUT-AWAY VIEW SHOWING METHOD OF STRINGING. PULLEYS.

EMERSON RADIO & PHONOGRAPH CORP.

MODELS GH437, GH447,
Chassis GH; GH2-447
Chassis GH2



SCHEMATIC DIAGRAM FOR MODEL GH

TYPE OF TUBES:

1—12SA7, pentagrid oscillator-modulator
1—12SK7, r-f amplifier
1—12SF7, diode detector, i-f amplifier, a.v.c.
1—12SJ7, a-f amplifier
1—50L6GT, beam power output
2—35Z5GT, half-wave rectifier.

POWER SUPPLY: a.c. only, 60 cycle (GH)
a.c.-d.c. (GH2)

VOLTAGE RATING: 105-125 volts.

POWER CONSUMPTION:

30 watts for the receiver.
20 watts for a.c. phono motor.
30 watts for a.c.-d.c. phono motor.

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 next to the 12SA7 tube. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted on top of the chassis next to the 50L6 tube. The trimmers are accessible through holes in the top of the can.

The trimmer for the oscillator coil is located on the variable condenser.

The antenna trimmer is mounted on the loop.

The oscillator coil is located underneath the chassis. The loop antenna acts as the antenna coil.

I-f and Wave-trap Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 12SA7 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response.

Feed 455 kc to the external antenna lead and adjust the wave-trap for minimum response.

Note: The grid of the 12SA7 tube is the No. 8 pin.

R-f Alignment

Set the dial pointer at 140. Set the signal generator at 1400 kc and feed its output into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from and parallel to the receiver loop antenna. Advance the output of the signal generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (on rear section of variable condenser) for maximum response.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance as follows: Align at 140. Set the pointer at 60 and feed 600 kc to the antenna lead. A portion of the outside turn of the loop may be swung to either side of the center to give maximum response. Realign at 140.

REPLACEMENT PARTS LIST

When ordering, specify part numbers. List price each, effective as of December 1, 1941. Subject to change without notice.

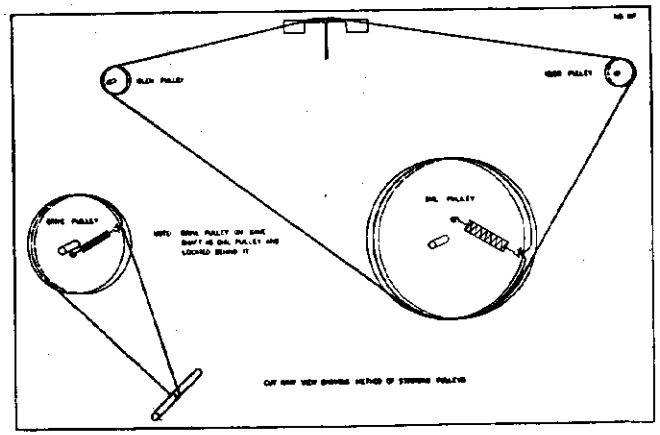
*Item	Part No.	DESCRIPTION	PRICE
L1	10HW-385	Loop antenna assembly	$1.45
T1	10HT-642	Oscillator coil	.60
T2	8LT-571	455 kc first i-f transformer	1.20
T3	10HT-655	455 kc second i-f transformer	1.20
T4	9LT-619	455 kc wave-trap	.65
R1, R7, R18, R19	KR-57	1 megohm ½ watt carbon resistor	.16
R2	LR-60	20,000 ohm ½ watt carbon resistor	.16
R3	3FR-293	140 ohm ½ watt wire-wound resistor	.16
R4	NNR-220	3 megohm ½ watt carbon resistor	.16
R5	9JR-445	Volume control 2.5 meg.	.90
R6	3RR-275	10 megohm ½ watt carbon resistor	.16
R8, R16, R17, R20	KR-56	500,000 ohm ½ watt carbon resistor	.16
R9, R10, R24	KR-53	50,000 ohm ½ watt carbon resistor	.16
R11	9JR-450	175 ohm 1 watt carbon resistor	.16
R12	8JR-424	750 ohm 1 watt wire-wound resistor	.16
R13	LR-65	10,000 ohm ½ watt carbon resistor	.16
R14	OR-73	25,000 ohm ½ watt carbon resistor	.16
R15, R23	KR-54	100,000 ohm ½ watt carbon resistor	.16
R21, R22	KR-55	100,000 ohm ½ watt carbon resistor	.16
R25	ZZR-196	30,000 ohm ½ watt carbon resistor	.16
R26, R27, R28	10HR-468	Ballast resistor: R26—233 ohm, 6 watt; R27—190 ohm, 5 watt; R28—250 ohm, 3 watt	.55
C1, C2	10HC-568	Two-gang variable condenser	3.35
C3, C16	3HC-274	0.002 mf, 600 volt tubular condenser	.20
C4	3RC-173	0.0004 mf, 600 volt tubular condenser	.20
†C5		Trimmer, part of loop assembly.	
†C6, C7, C8, C9		Trimmers, part of variable condenser.	
†C11		Trimmer, part of variable condenser.	
C10	AC-6	0.1 mf, 200 volt tubular condenser	.20
C12	9JC-541	0.0006 mf, 600 volt tubular condenser	.20
C13	9JC-542	0.0015 mf, 600 volt tubular condenser	.20
C14	LC-64	0.05 mf, 400 volt tubular condenser	.20
C15	5AC-384	0.0002 mf, 600 volt tubular condenser	.20
C17	LC-63	0.02 mf, 400 volt tubular condenser	.20
C18	5LC-410A	0.00011 mf, mica condenser	.20
C19	8WC-524	0.005 mf, 400 volt tubular condenser	.20
C20, C21, C22	10HC-569	Multiple dry electrolytic condenser: 150 volt; C20—20 mf; C21—80 mf; C22—40 mf	1.25
C23	AC-7A	0.00025 mf, mica condenser	.20
C24, C27, C30 C31, C32	BC-12	0.05 mf, 200 volt tubular condenser	.20
C25	4HC-395A	0.000026 mf, mica condenser	.20
C26	NNC-199	0.001 mf, 600 volt tubular condenser	.20
C28	4XC-394A	0.00022 mf, mica condenser	.20
C29	4VC-371A	0.0003 mf, mica condenser	.20
	10HS-592	6½" dynamic speaker (speaker field 3000 ohms)	7.10
	10HS-586	Phonoradio and tone control switch	.90
9JPM-89	9JPM-98	Phono motor (Model 437)	12.00
10HPM-101	10HPM-105	Phono motor (Model 447, single post)	12.00
10HPM-100	10HPM-106	Phono motor (Model 447)	11.25
10HPM-10V	10HPM-104	Phono motor (Model GH2-447)	39.00
	9JC-555	Crystal pickup (Model 437)	7.50
	10HC-592	Crystal pickup (Model 447, single post)	7.50
	10HC-593	Crystal pickup (Model 447)	8.15
	10HC-594	Crystal pickup (Model GH2-447)	6.60

*Item number locates the article on the schematic diagram.

†Not supplied separately.

Readings should be taken with a 1000 ohms-per-volt meter

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (line switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, A.C. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 D.C. will be given lower than those given below.



VOLTAGE ANALYSIS

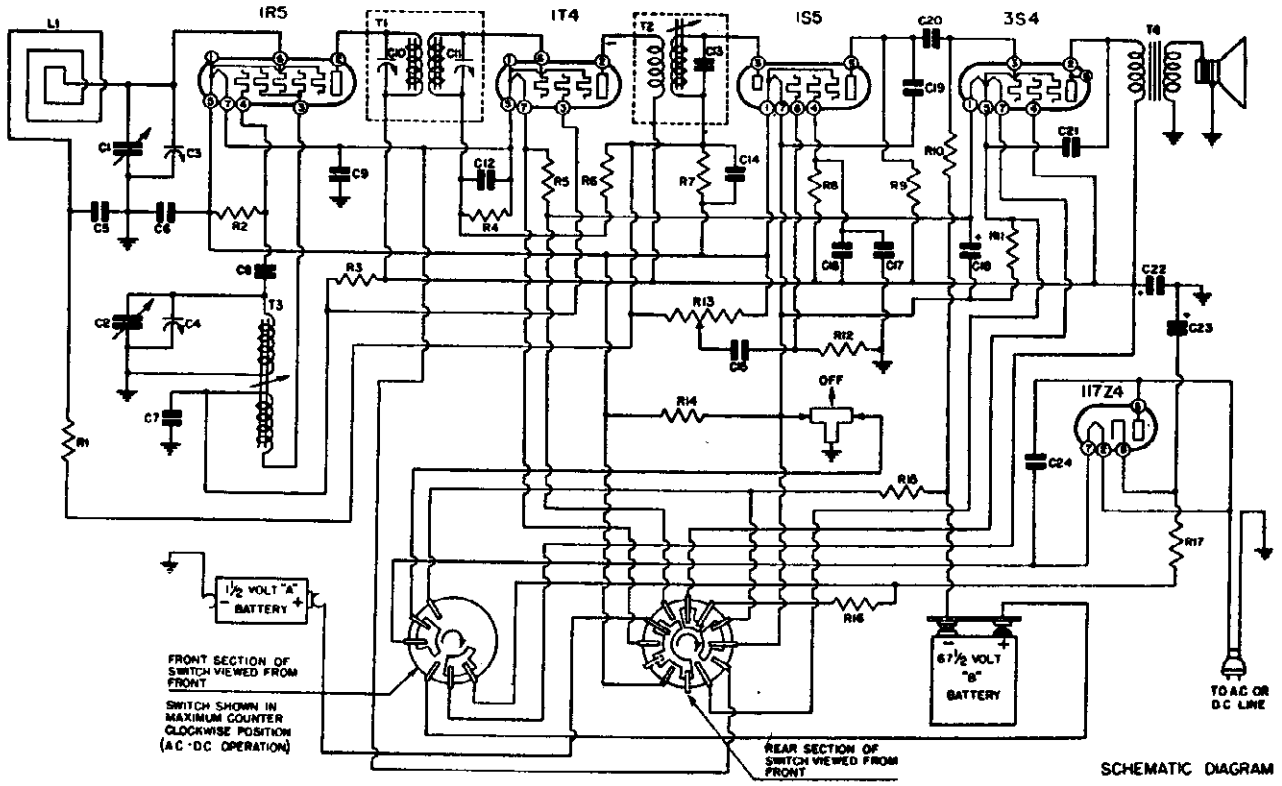
Tube	Plate	Screen	Cathode	Fil.
12SA7	88	88	0	12 a.c.
12SK7	48	46	0	12 a.c.
12SF7	89	89	0	12 a.c.
12SJ7	8	14	—	12 a.c.
50L6GT	108	89	5.1	50 a.c.

Voltage at 35Z5GT cathode—127 volts.

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (line switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower then those given below.

MODEL GC448
Chassis GC

EMERSON RADIO & PHONOGRAPH CORP.



SCHEMATIC DIAGRAM

ADJUSTMENTS

An oscillator with frequencies of 455 and 1600 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 located next to the output transformer.

The trimmers are accessible through holes in top of the can.

The second i-f transformer is located between the 1T4 and 1S5 tubes. The single trimming core screw extends from the end of the can.

The oscillator coil is located next to the first i-f transformer. The trimmer for the oscillator is located on the smaller variable condenser section.

The 600 kc oscillator core adjustment is the brass screw protruding from the end of the oscillator coil.

The loop antenna acts as the antenna coil. Trimmer for the loop is located on the larger section of the variable condenser.

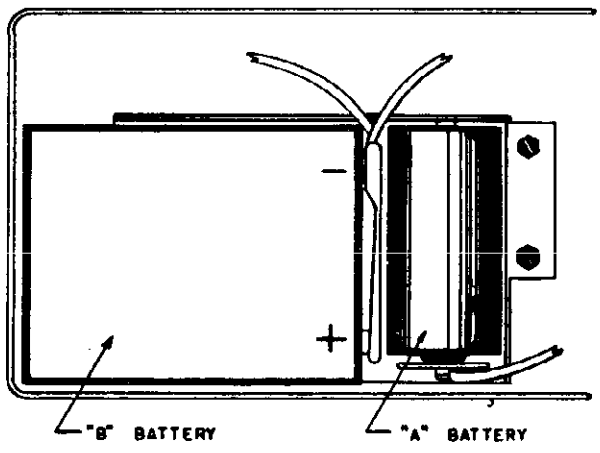
I-f Alignment

Rotate variable condenser to minimum capacity position.

Feed 455 kc to the grid of the 1R5 tube through a 0.01 mf condenser. Adjust the three i-f trimmer screws for maximum response. (Clip the i-f input to the stator lug of the larger variable condenser section.)

R-f Alignment

Set the dial pointer at 160. Set the signal generator at 1600 kc and feed its output into a loop of wire about one foot in diameter. Hold this radiating loop about one foot away from and parallel to the receiver loop antenna. Advance the output of the generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (smaller section of variable condenser) then the antenna trimmer (larger section of variable condenser) for maximum response. Set the dial pointer at 60. Feed 600 kc and rock the variable condenser while adjusting the oscillator core adjustment for maximum response. Return to 1600 and check alignment. If readjustment is necessary return to 600 and repeat entire procedure.



Place Batteries on Shelf, as Illustrated

SERVICE NOTES

MODEL: GC-448

CHASSIS MODEL: GC

GC-448

DESCRIPTION

TYPE: Universal (battery, a.c.-d.c.) superheterodyne.

FREQUENCY RANGE: 540-1600 kc.

NUMBER OF TUBES: Five.

TYPE OF TUBES:
1—1R5, oscillator-modulator
1—1T4, i-f amplifier
1—1S5, 2nd detector, a.v.c., a-f amplifier
1—3S4, pentode output
1—117Z4GT, half-wave rectifier.

POWER SUPPLY: Battery, a.c. or d.c

VOLTAGE RATING:
Line operation—105-125 volts, a.c.-d.c.
"A" Battery—1.5 volts.
"B" Battery—67.5 volts.

CURRENT DRAIN:
"A" Battery—0.25 amp.
"B" Battery—0.0075 amp.

GENERAL NOTES

1. The color coding of the i-f transformer leads is as follows:
   Grid—green — Plate—blue
   Grid return—black — B plus—red
2. The color coding of the battery cable is as follows:
   Red—B plus, 67½ volts White—B minus.
3. If replacements are made in the r-f section of the circuit, the receiver should be carefully re-aligned.
4. The receiver has a self-contained antenna and does not require additional antenna or ground connection.
5. The self-contained loop antenna operates at maximum efficiency when its position is at right angles to the broadcasting source. It is important, therefore, once the station is tuned in, rotate the cabinet back and forth through a quarter of a circle (90 degrees), leaving it at the position where the station is received with maximum volume.

BATTERY COMPLEMENT

The cabinet is designed to house the complete set of batteries. The battery complement should be as follows:

Type Battery	Number Required	Manufacturer's Part Number
1½ volt "A"	1	Standard "D" size (1 5/16" diameter) flashlight cell
67½ volt "B"	1	Eveready "Mini-max" No. 467

VOLTAGE ANALYSIS (Battery Operation)

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed are from point indicated to chassis with volume control turned on full and no signal. The battery voltages for these readings were: "A" 1.5 volts, "B" 67.5 volts. All readings except filaments were taken on the 250 volt scale.

Tube	Plate	Screen	Fil.
1R5	54	29	1.4
1T4	54	29	1.4
1S5	*4	—	1.4
3S4	51	54	1.4

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (line switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given below.

Tube	Plate	Screen	Fil.
1R5	72	39	1.4
1T4	72	39	1.4
1S5	*6	—	1.4
3S4	69	72	2.8

*The operating voltage of this tube cannot be measured because of the high resistor in the circuit. Voltage at 117Z4 cathode—125.

REPLACEMENT PARTS LIST

Specify part numbers when ordering. List price each, effective as of December 15, 1941. (Subject to change without notice.)

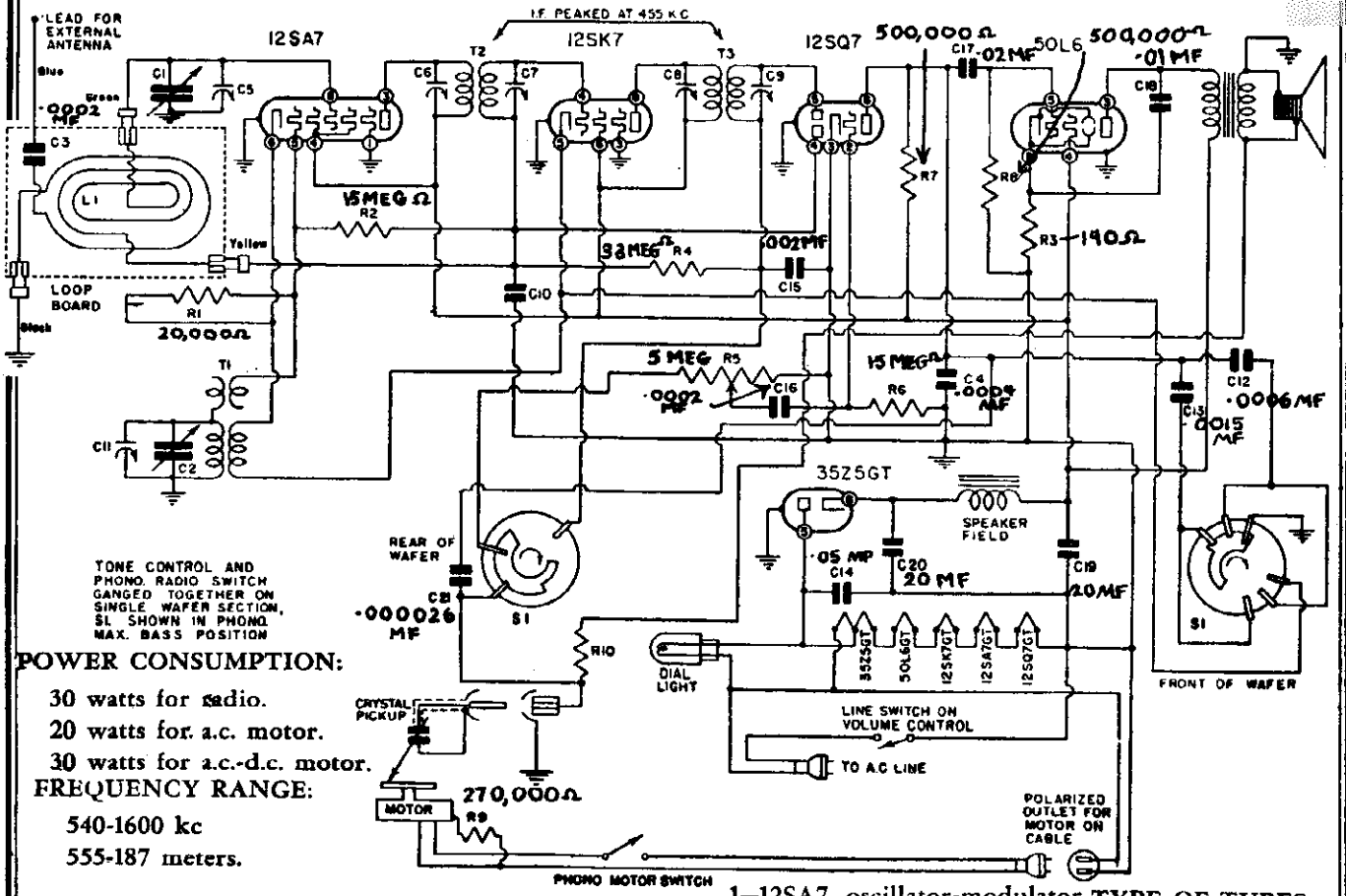
Part No.	*Item	DESCRIPTION	PRICE
9RW-350A	L1	Loop antenna	$ .65
9RT-623A	T1	Double-tuned 455 kc first i-f transformer	1.65
9RT-624	T2	Single-tuned 455 kc second i-f transformer	1.40
9RT-622	T3	Oscillator coil	.80
9RT-625A	T4	Output transformer	.75
NNR-220	R1, R10	3 megohm ½ watt carbon resistor	.16
KR-54	R2	100,000 ohm ½ watt carbon resistor	.16
KR-63	R3	15,000 ohm ½ watt carbon resistor	.16
4XR-327	R4, R6	15 megohm ½ watt carbon resistor	.16
3GR-300	R5	75 ohm ½ watt carbon resistor	.16
KR-57	R7, R9	1 megohm ½ watt carbon resistor	.16
3RR-274	R8	5 megohm ½ watt carbon resistor	.16
4XR-334	R11	2500 ohm 1 watt carbon resistor	.16
3RR-275	R12	10 megohm ½ watt carbon resistor	.16
9RR-449A	R13	Volume control 3. megohm	.65
10CR-466	R14	500 ohm 1 watt carbon resistor	.16
9RR-458	R15	900 ohm ½ watt wire-wound, moulded resistor	.16
10CR-464	R16	1500 ohm 5 watt wire-wound, ceramic insulated resistor	.25
10CR-465	R17	950 ohm 5 watt wire-wound, ceramic insulated resistor	.25
9RC-535G or 9RC-535A	C1, C2	Two-gang variable condenser	3.05
†C3, C4		Trimmer condenser on variable condenser.	
C5, C17	9RC-537	0.02 mf, 100 volt tubular condenser	.20
C6, C7, C9	5AC-388A	0.25 mf, 100 volt tubular condenser	.20
C8	9RC-539	0.00005 mf, ceramic condenser	.20
†C10, C11		Trimmer, part of i-f transformer.	
C12	10CC-563	0.01 mf, 100 volt tubular condenser	.20
†C13		Fixed condenser, part of i-f transformer.	
C14, C19	9RC-540	0.0001 mf, ceramic condenser	.20
C15	9RC-553	0.001 mf, 100 volt tubular condenser	.20
C16, C21	10CC-562	0.002 mf, 150 volt tubular condenser	.20
C18	9VC-560	40. mf, 40 volt dry electrolytic condenser	.45
C20	9RC-538	0.001 mf, 100 volt flat wound condenser	.12
C22, C23	6QC-437D	Dual dry electrolytic condenser: C22—40 mf, 150 volts; C23—20 mf, 150 volts	.75
C24	LC-44A	0.05 mf, 400 volt tubular condenser	.20
	10CS-577	3½" P.M. dynamic speaker	3.50
	10CS-578	Power change-over switch	1.05
	9RS-559A	Lid operated on-off switch	.35
	10CW-381	Line connector plug and cable assembly	.25
	10CW-380	Line cord and socket assembly	.60
	9RW-367	"B" battery cable	2.00
	9RK-18	Tuning wheel	.15
	9RK-19	Volume wheel	.15

*Item number locates the article on the schematic diagram.

†Not supplied separately.

EMERSON RADIO & PHONOGRAPH CORP.

MODELS GK450, Ch. GK; GK2-450, Chassis GK2



POWER CONSUMPTION:

30 watts for radio.
20 watts for a.c. motor.
30 watts for a.c.-d.c. motor.

FREQUENCY RANGE:

540-1600 kc
555-187 meters.

TYPE OF TUBES:

1—12SA7, oscillator-modulator
1—12SK7, i-f amplifier
1—12SQ7, diode detector, a-f amplifier and a.v.c.
1—50L6GT, beam power output
1—35Z5GT, half-wave rectifier

POWER SUPPY: a.c. only. 60 cycle. (GK)
a.c.-d.c. (GK2)

VOLTAGE RATING: 105-125 volts.

ADJUSTMENTS

R-f Alignment

Set the dial pointer at 140. Set the signal generator at 1400 kc and feed its output into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from and parallel to the receiver loop antenna. Advance the output of the signal generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (on rear section of variable condenser) for maximum response.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance as follows: Align at 140. Set the pointer at 60 and feed 600 kc to the antenna lead. A portion of the outside turn of the loop may be swung to either side of the center to give maximum response. Realign at 140.

I-f Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 12SA7 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response.

Note: The grid of the 12SA7 tube is connected to the lower stator lug of the rear variable condenser section. Connection may be made with a test clip to the upper stator lug.

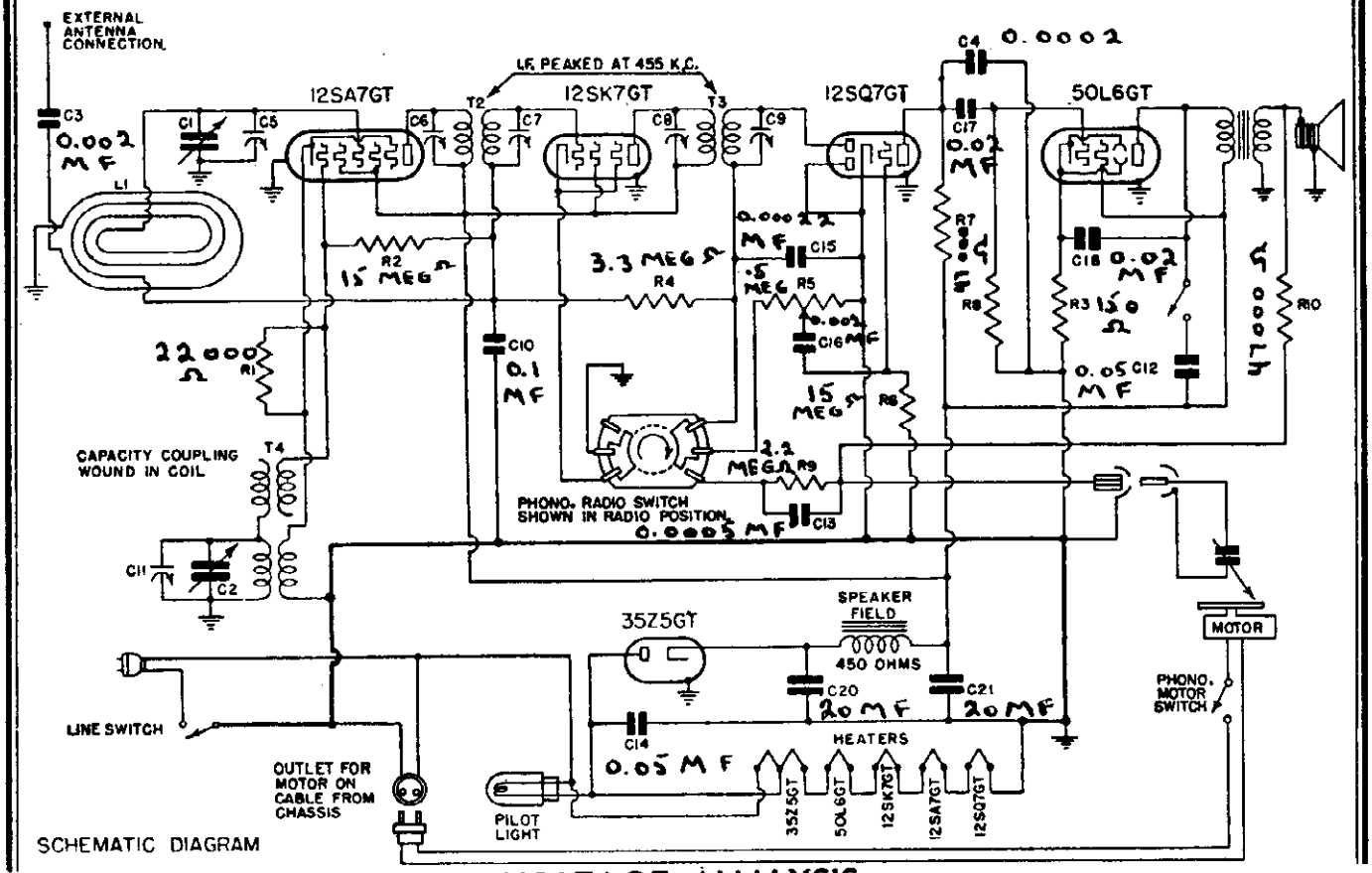
VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (line switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower then those given below.

Voltage at 35Z5GT cathode—118 volts.

Tube	Plate	Screen	Cathode	Fil.
12SA7	75	85	0	12 a.c.
12SK7	85	85	0	12 a.c.
12SQ7	25	—	0	12 a.c.
50L6GT	75	85	6.6	50 a.c.

MODEL FZ452, Chassis EMERSON RADIO & PHONOGRAPH CORP.



SCHEMATIC DIAGRAM

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (line switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale.

Tube	Plate	Screen	Cathode	Fil.
12SA7	88	88	0	12
12SK7	88	88	0	12
12SQ7	30	—	0	12
50L6	82	88	5.6	50

Voltage at 35Z5 cathode—120 volts.
Voltage across speaker field—32 volts.
Voltage across pilot light—4.5 volts.

I-f Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 12SA7 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response.

Note: The grid of the 12SA7 tube is connected to the stator lug of the rear variable condenser section. Connection may be made with a test clip.

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck to the right of the variable condenser. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted on top of the chassis between the variable condenser and the speaker. The trimmers are accessible through holes in the top of the can.

The trimmers for the antenna and oscillator coils are located on the variable condenser. The trimmer on the front section is for the oscillator coil.

The oscillator coil is located underneath the chassis. The loop antenna acts as the antenna coil.

R-f Alignment

Set the dial pointer at 140. Set the signal generator at 1400 kc and feed its output into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from and parallel to the receiver loop antenna. Advance the output of the signal generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (on rear section of variable condenser) for maximum response.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance as follows. Align at 140. Set the pointer at 60 and feed 600 kc to the radiating loop. A portion of the outside turn of the loop may be swung to either side of the center to give maximum response. Realign at 140.

TYPE OF TUBES:

1—12SA7, pentagrid oscillator-modulator
1—12SK7, first i-f amplifier
1—12SQ7, diode detector, a-f amplifier, a.v.c.
1—50L6, beam power output
1—35Z5, half-wave rectifier.

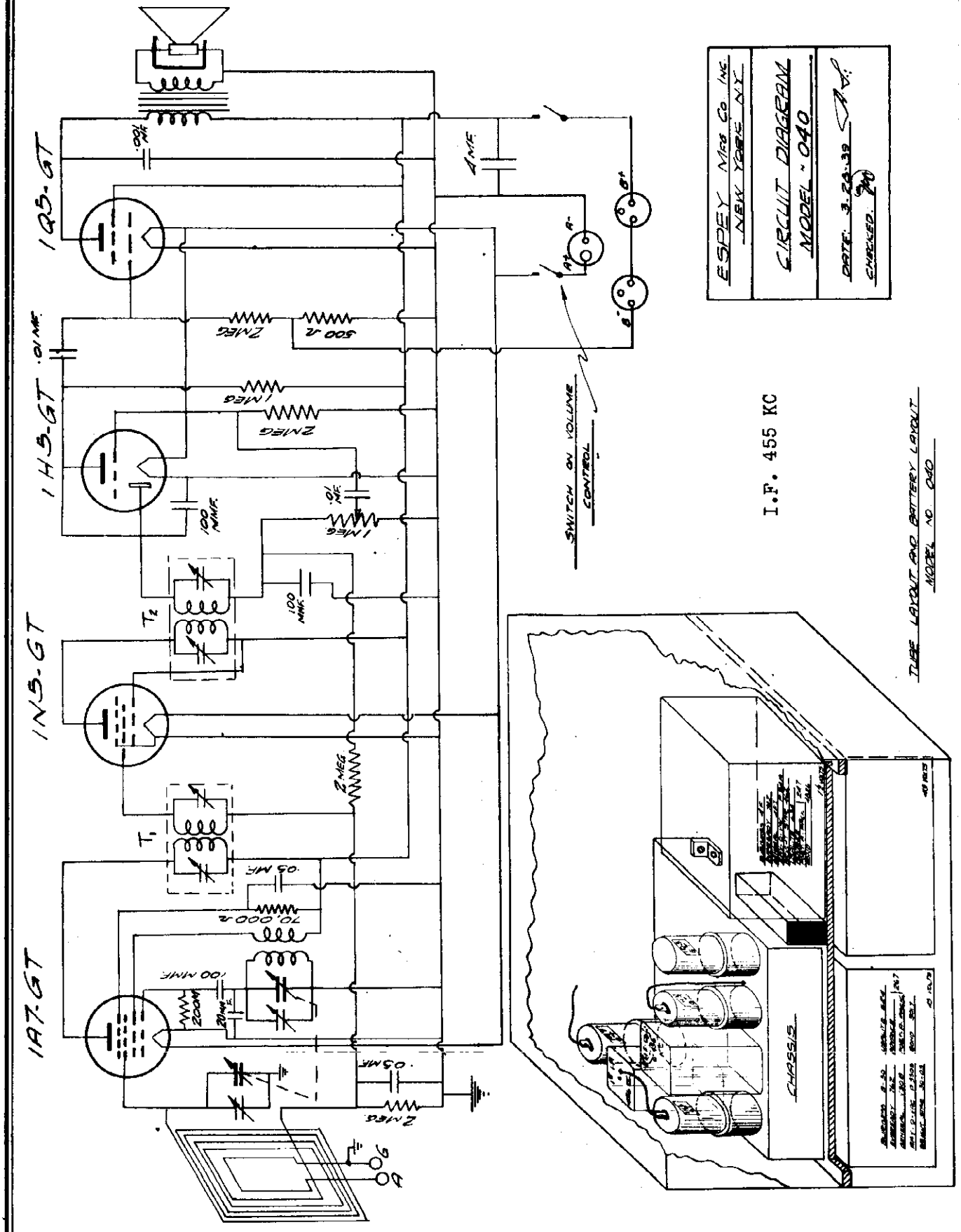
POWER SUPPLY: A.C. only.

VOLTAGE RATING: 105-125 volts.

POWER CONSUMPTION:

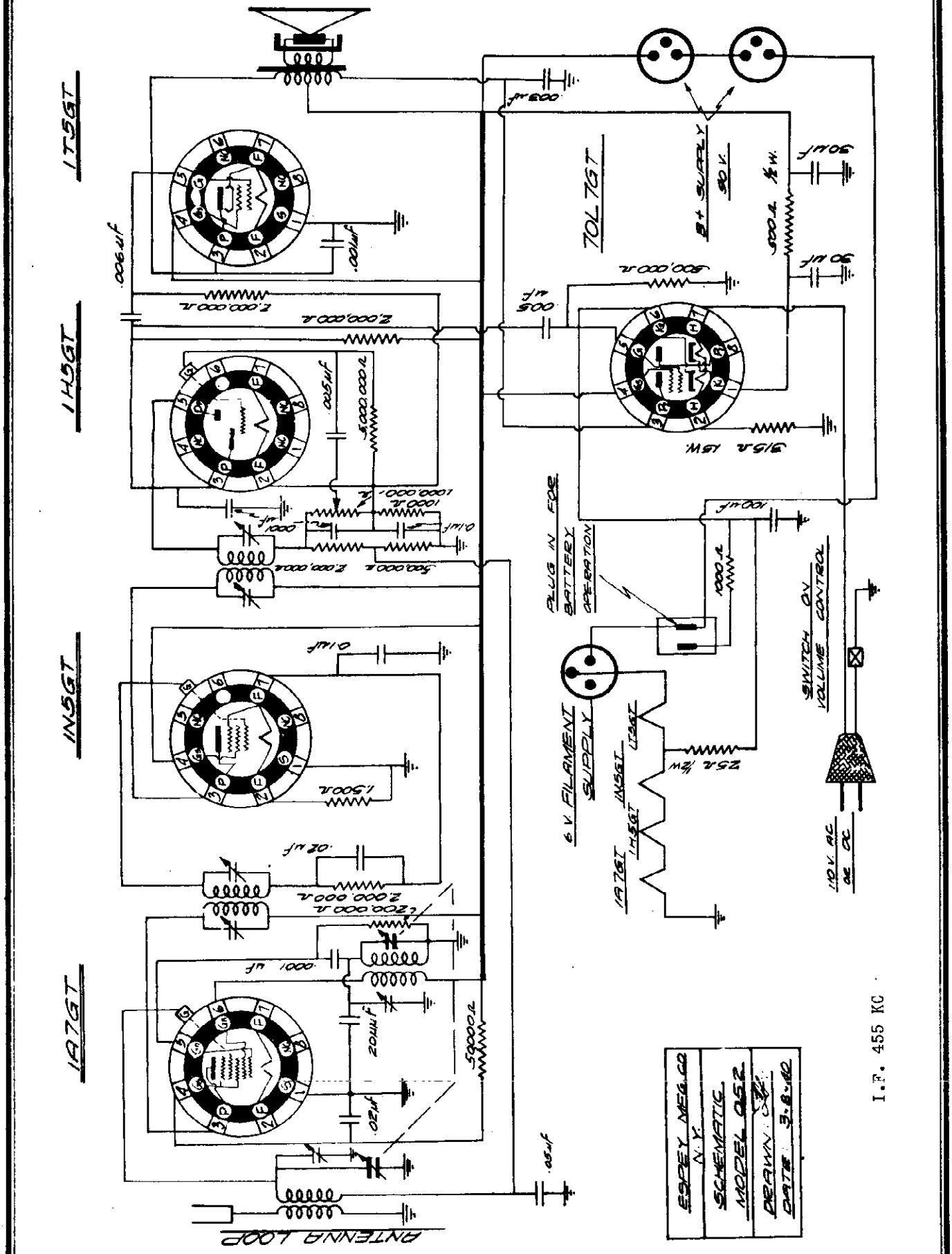
30 watts for receiver
15 watts for phono motor.

ESPEY MFG. CO., INC.

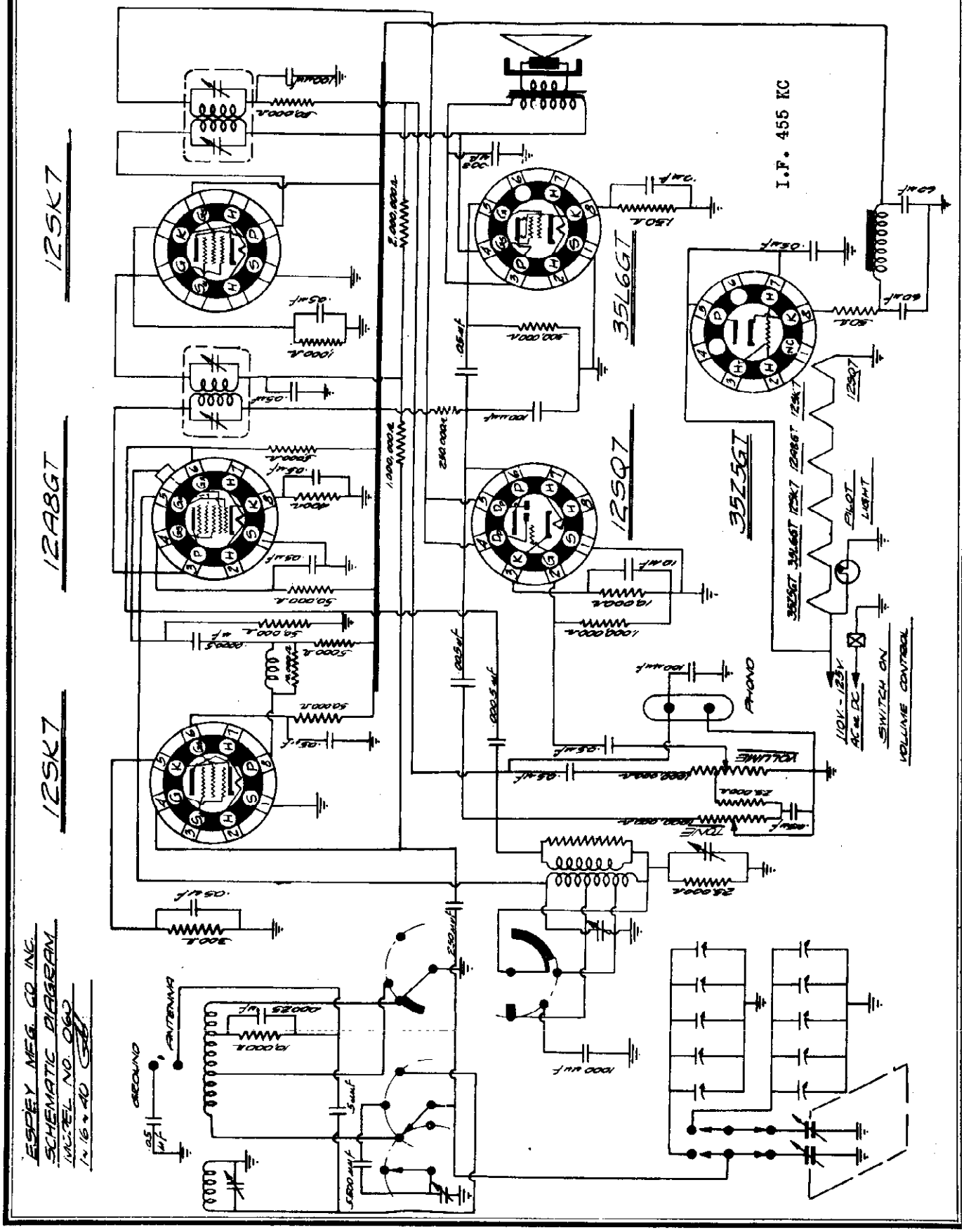


MODEL 052

ESPEY MFG. CO., INC.



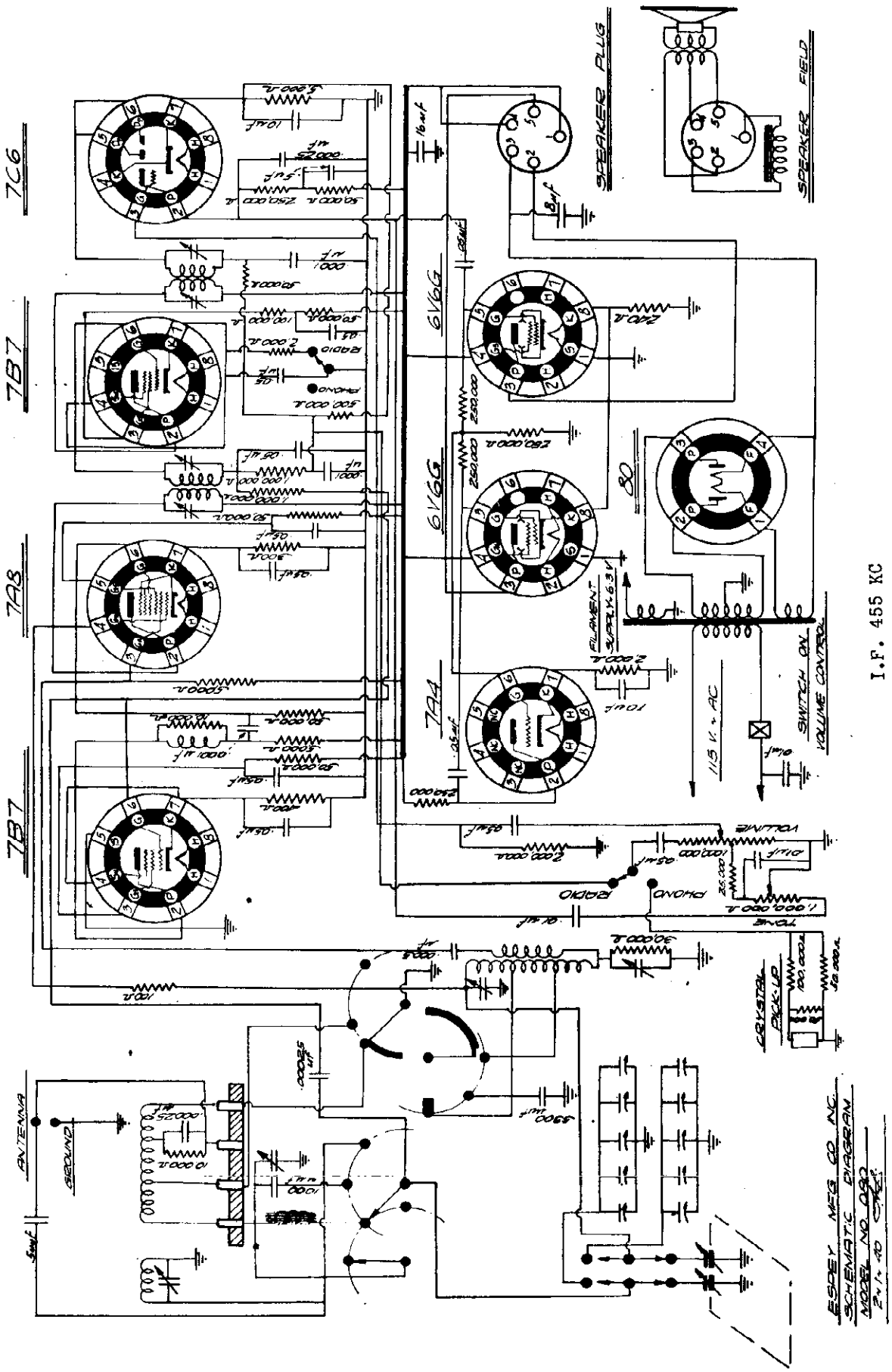
ESPEY MFG. CO., INC.



ESPEY MFG. CO. INC.
SCHEMATIC DIAGRAM
MODEL NO. 060
1936 - 40 SET

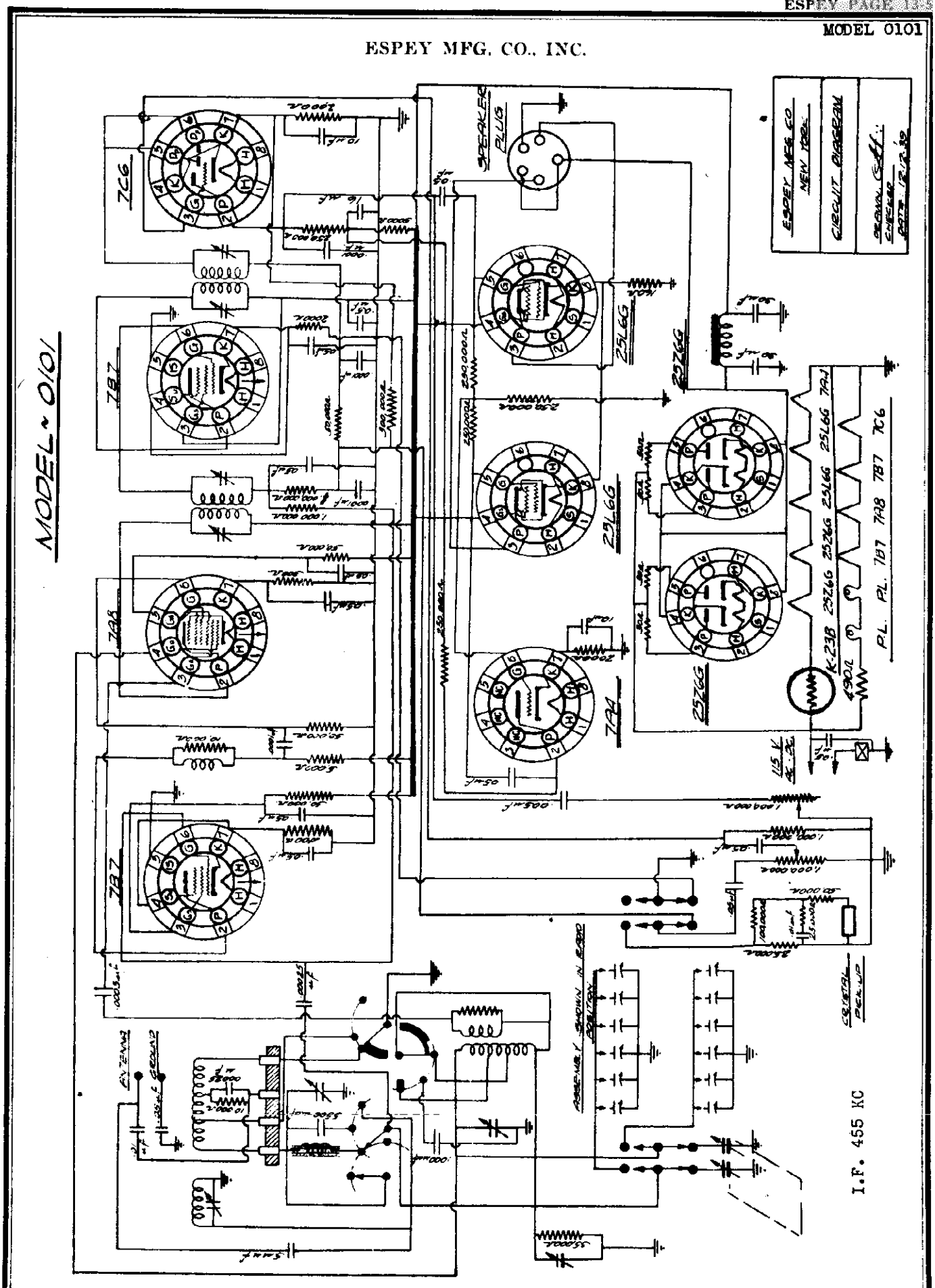
MODEL 080

ESPEY MFG. CO., INC.



MODEL 0101

ESPEY MFG. CO., INC.



MODEL 0102

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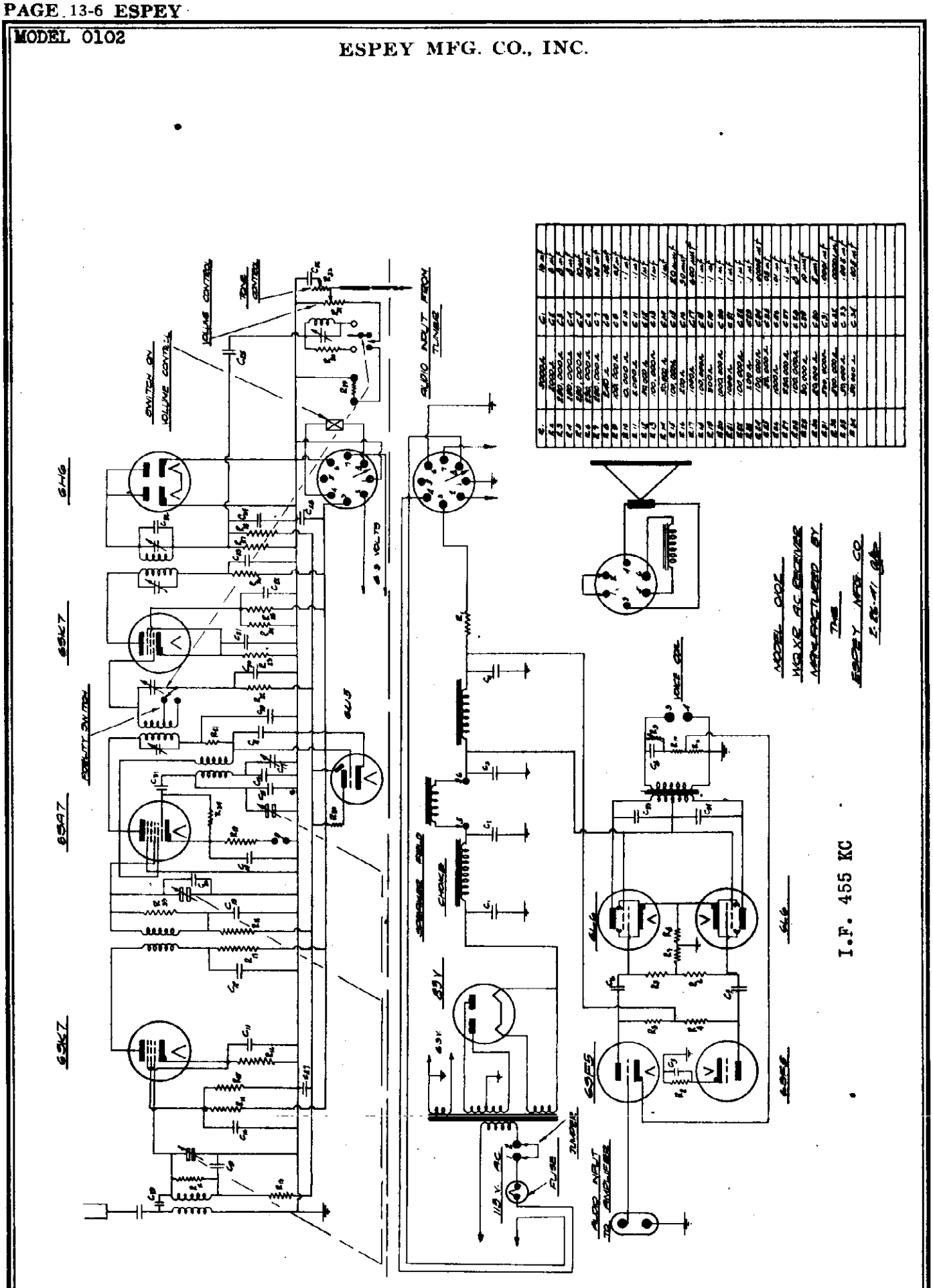
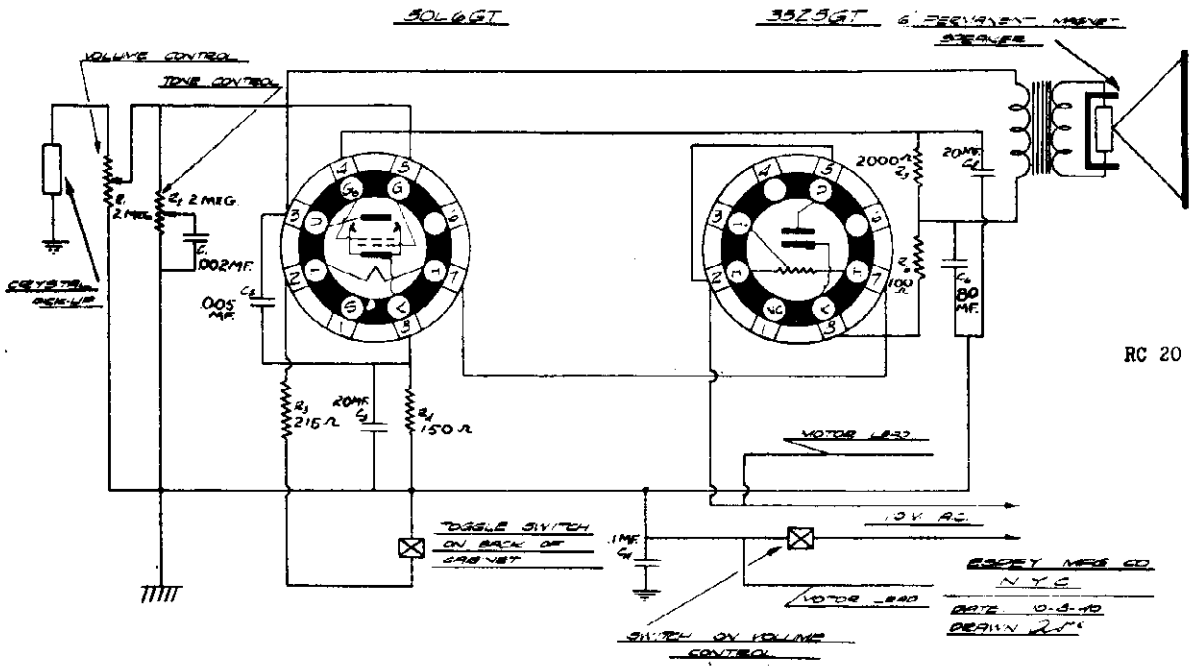
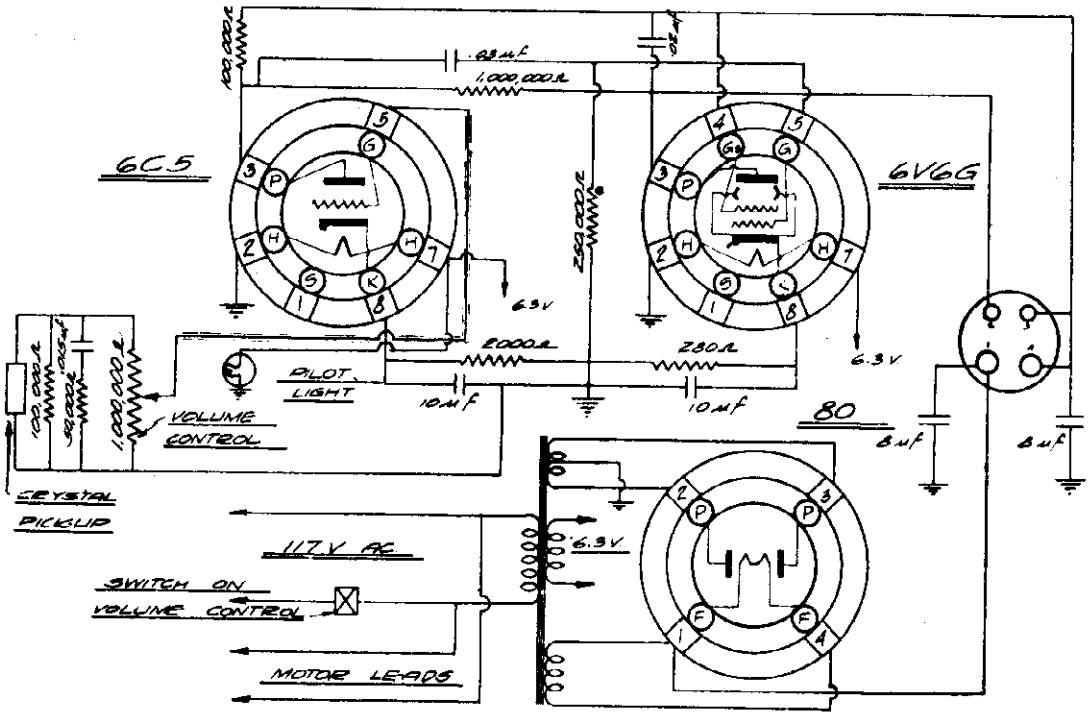


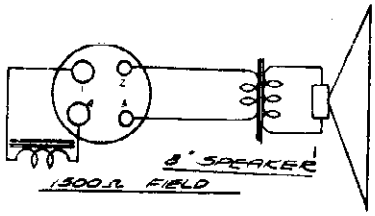
ESPEY MFG. CO., INC.



RC 20

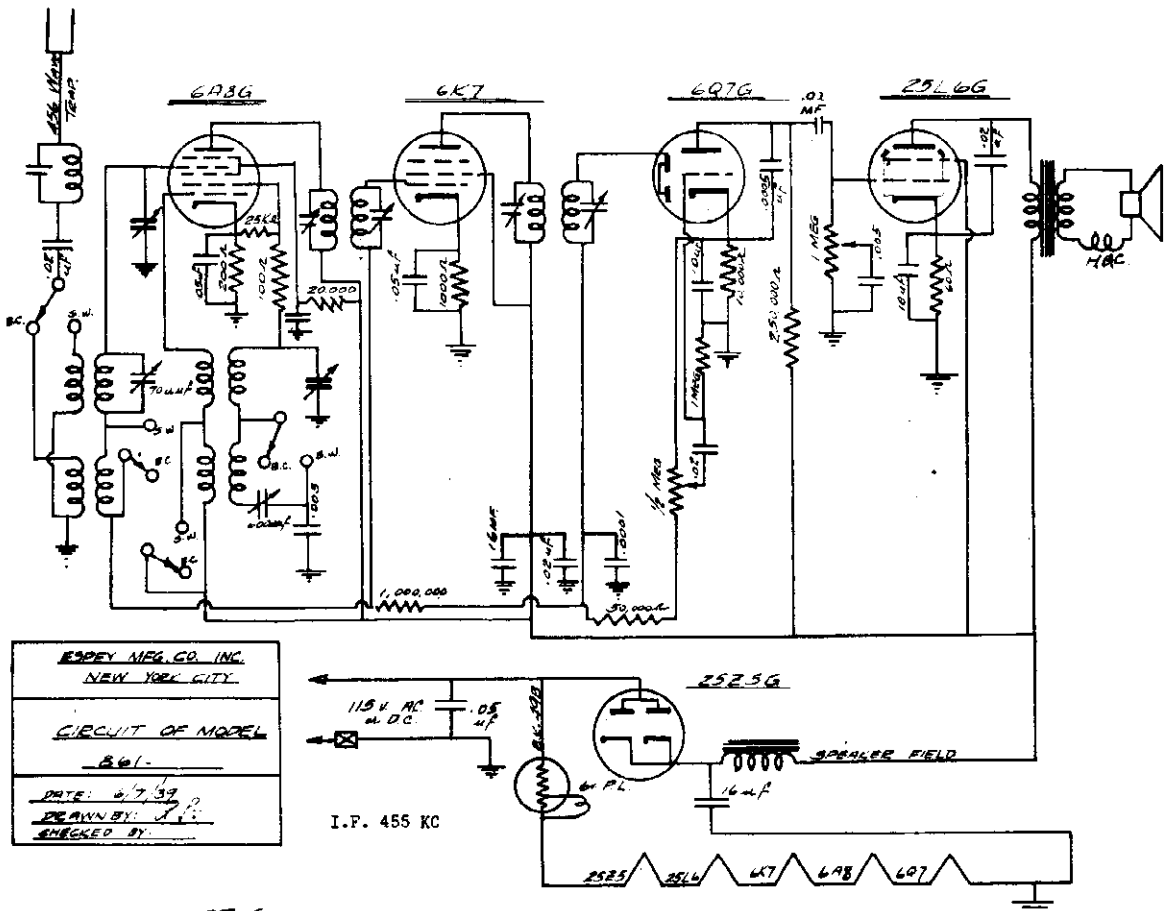


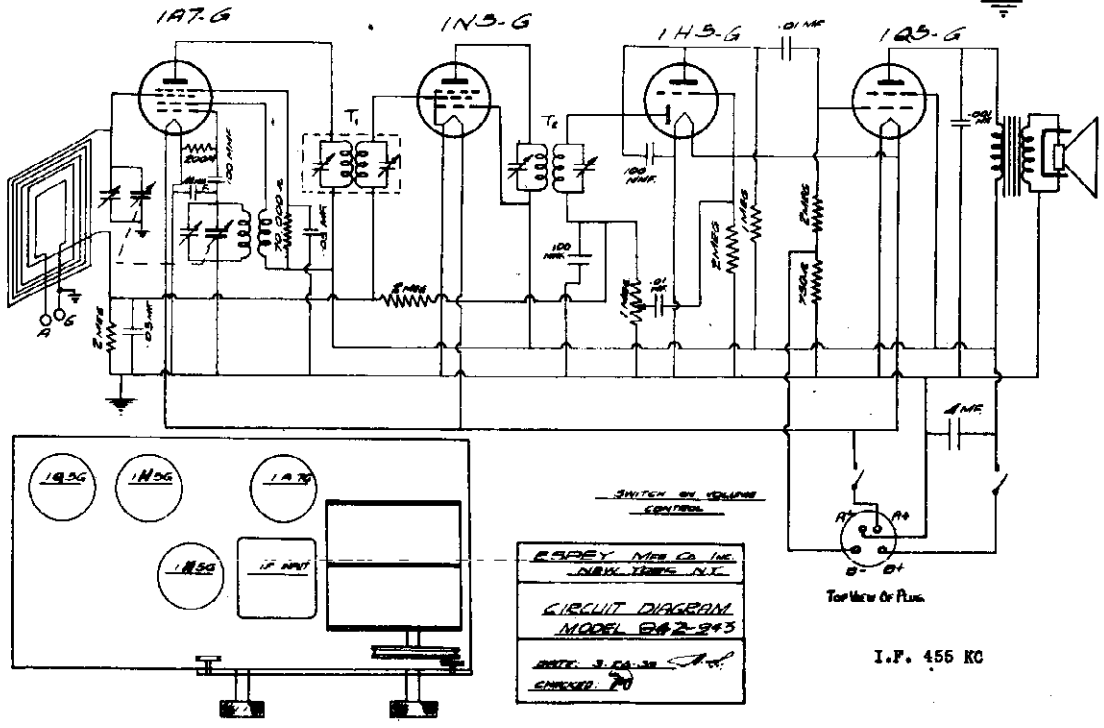
SCHEMATIC DIAGRAM
MODEL 030
ESPEY MFG CO INC
8-7-40



MODEL 861
MODELS 942,943

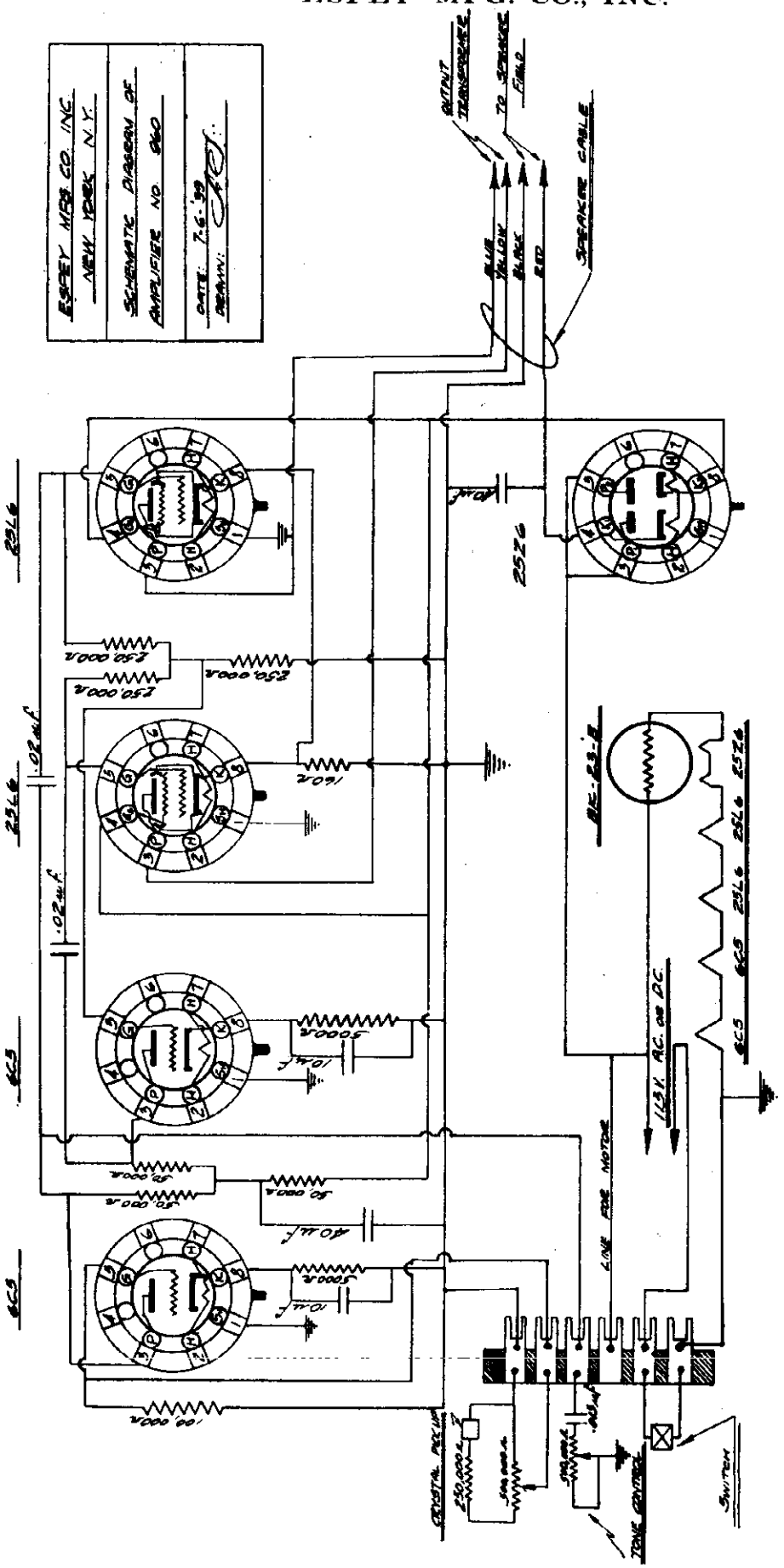
ESPEY MFG. CO., INC.





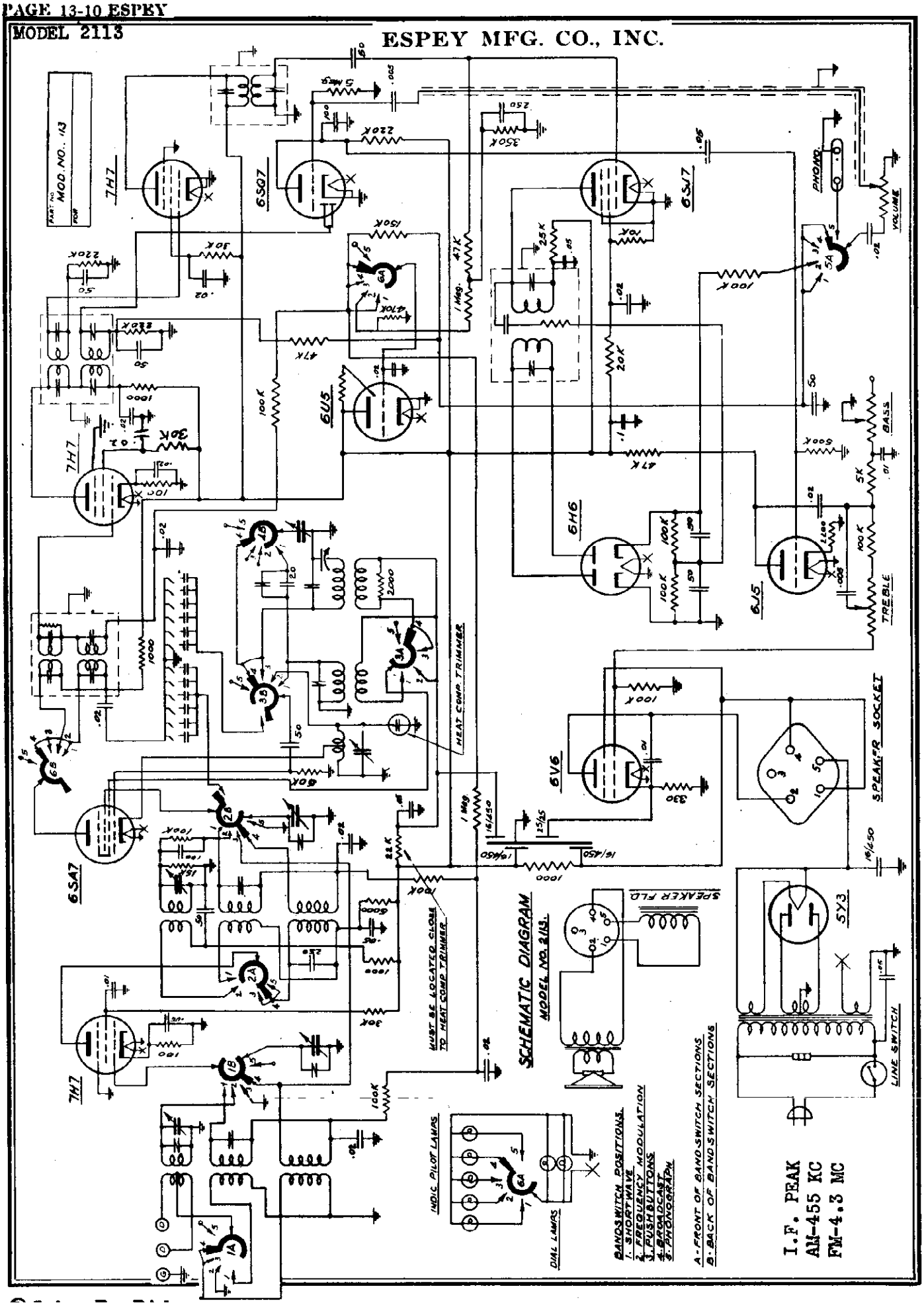
ESPEY MFG. CO., INC.

MODEL 960
Amplifier



MODEL 2113

ESPEY MFG. CO., INC.



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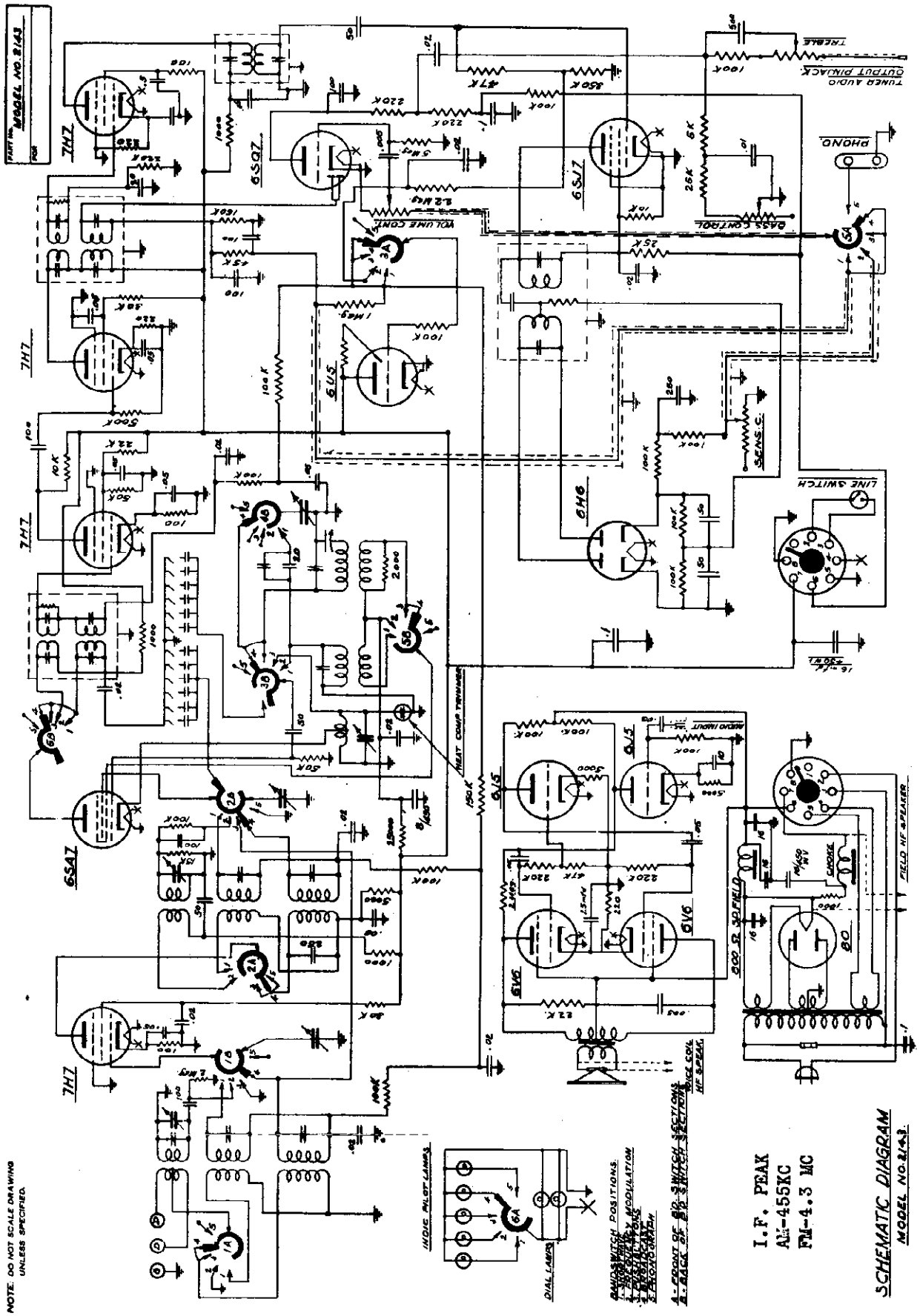
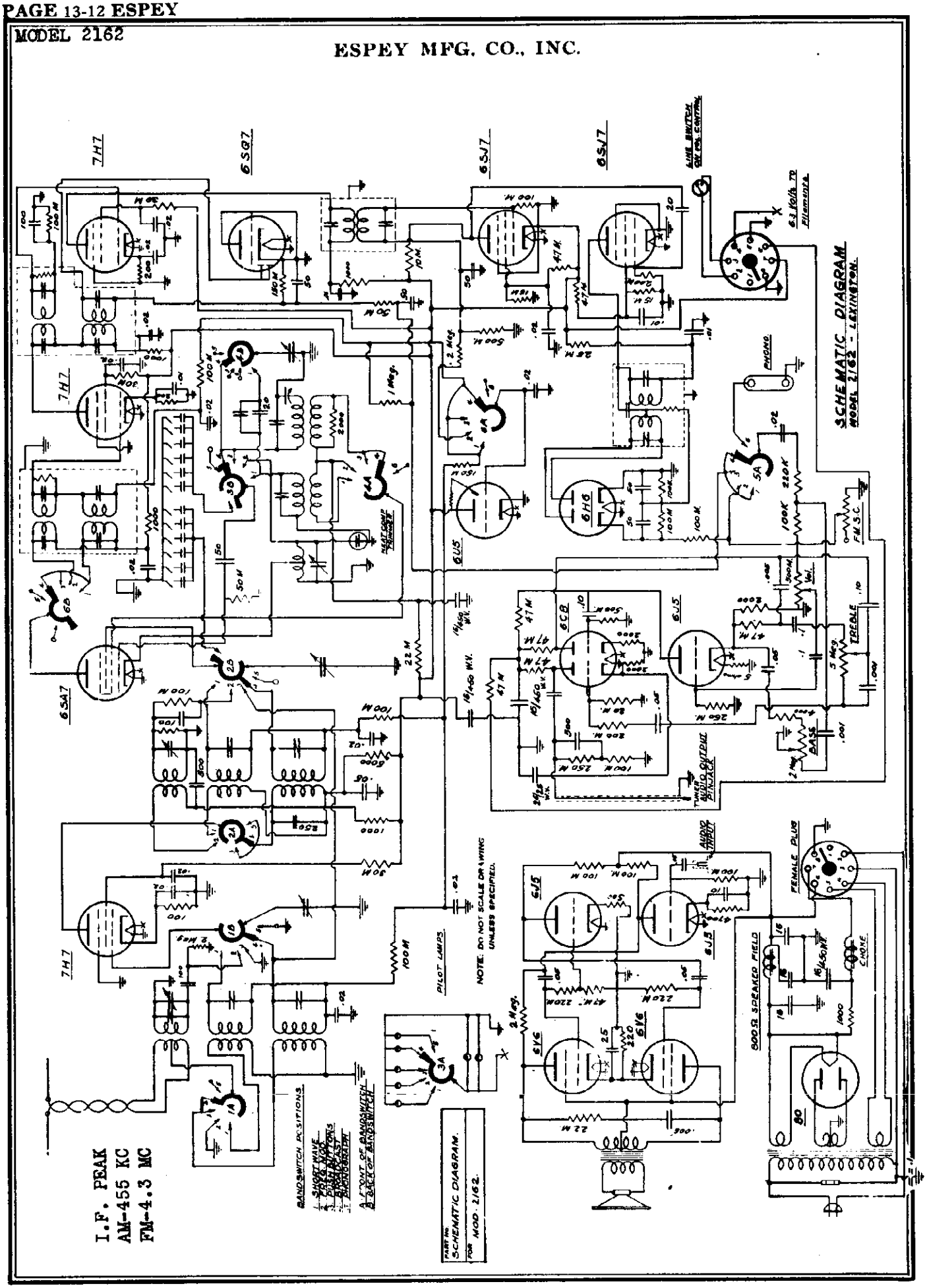
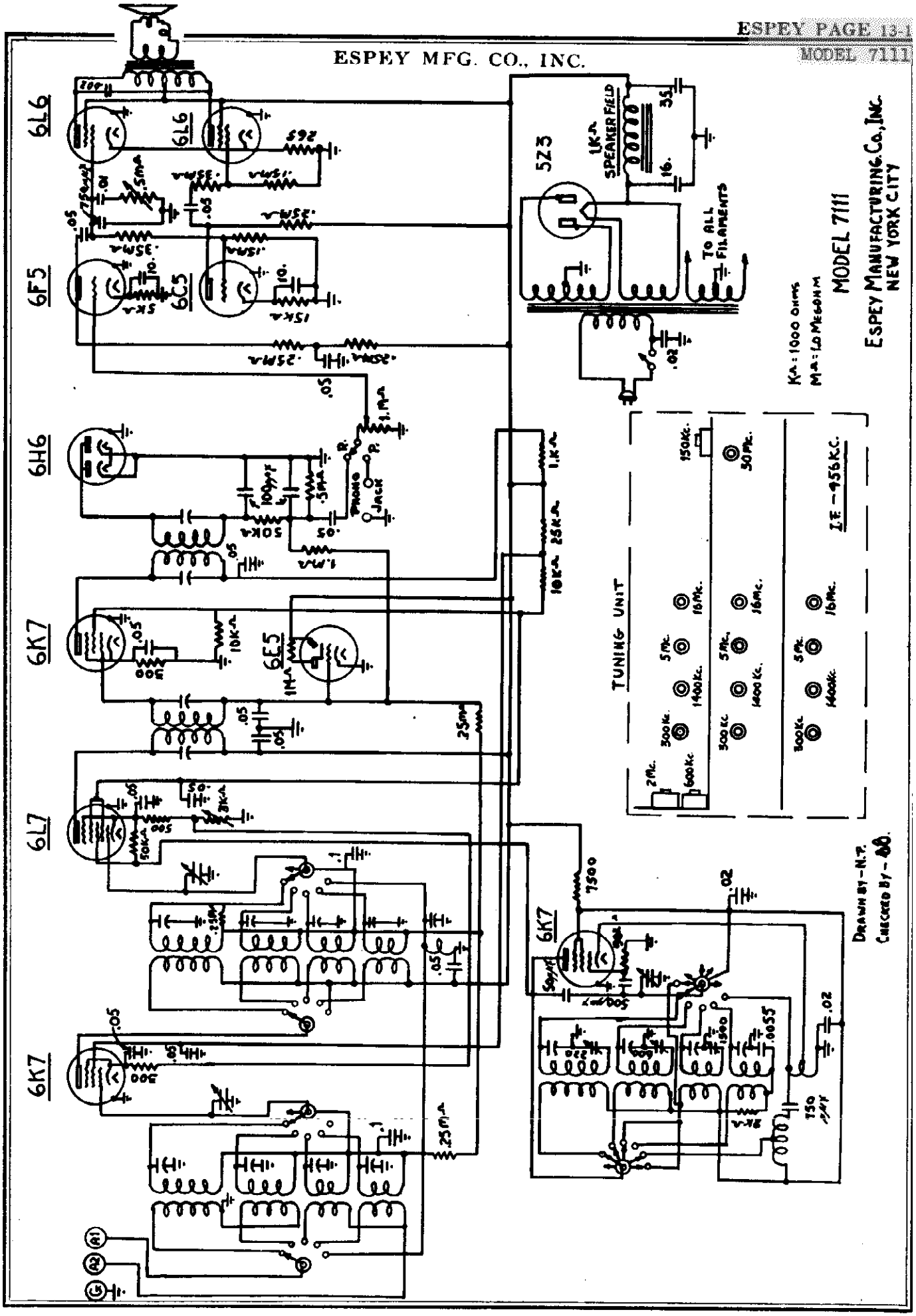


MODEL 2162

ESPEY MFG. CO., INC.

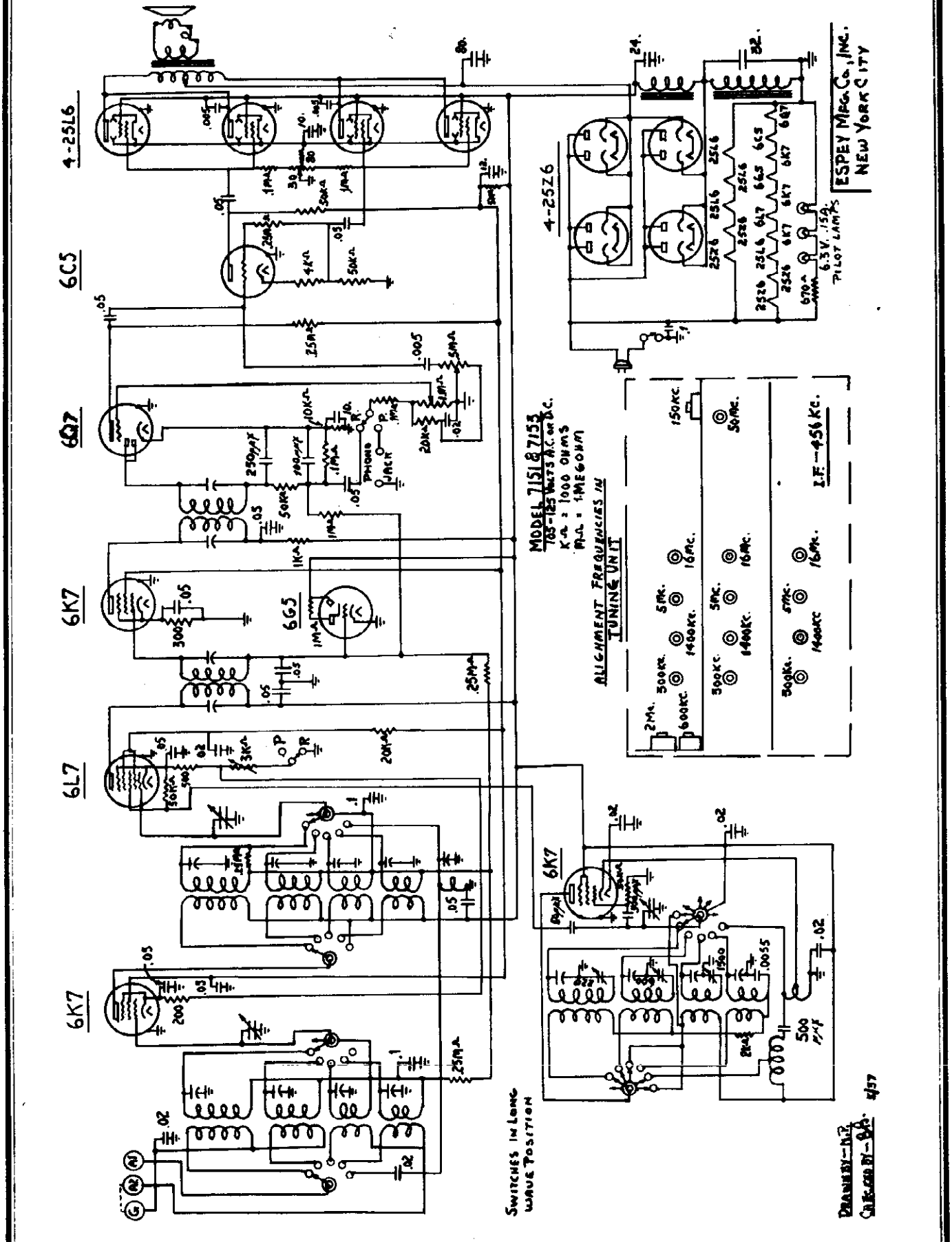


ESPEY MFG. CO., INC.



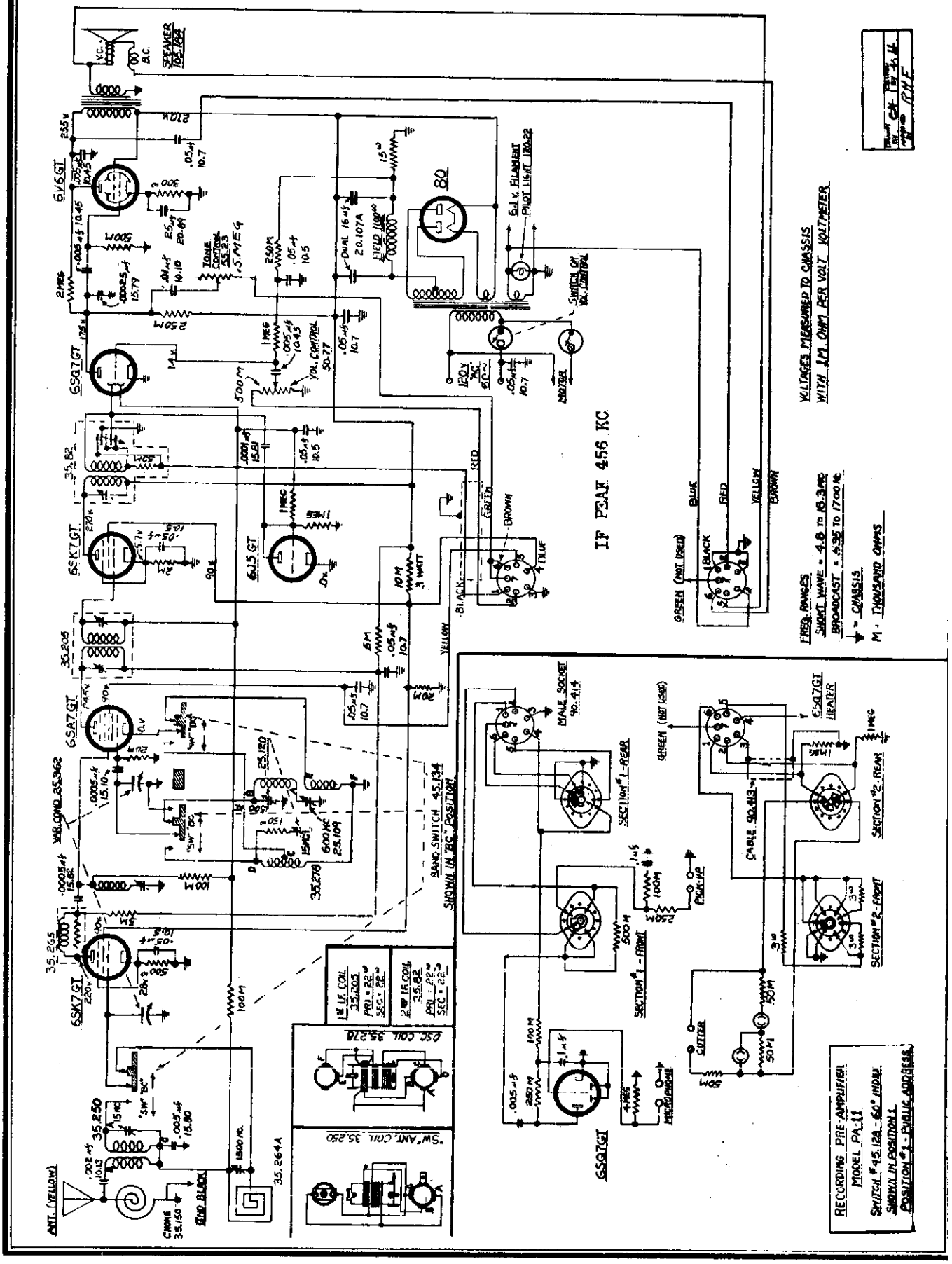
MODELS 7151, 7153

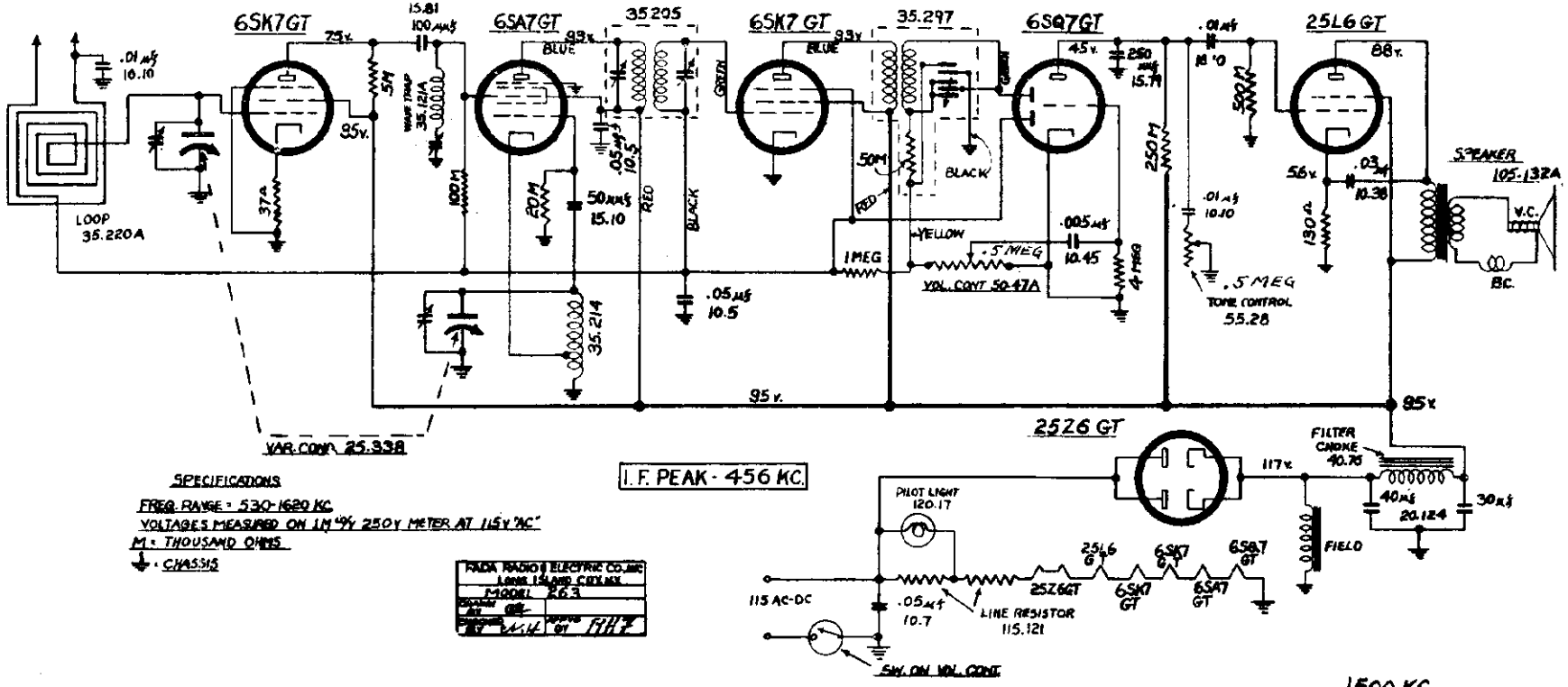
ESPEY MFG. CO., INC.



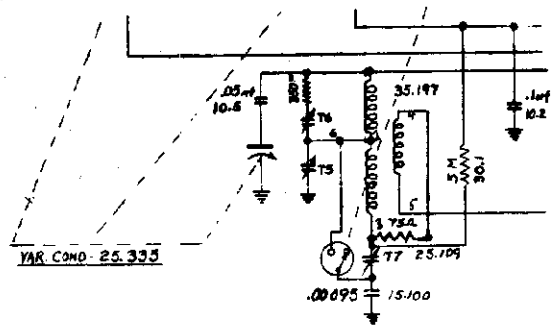
FADA RADIO & ELECTRIC CO.

MODEL PR-135



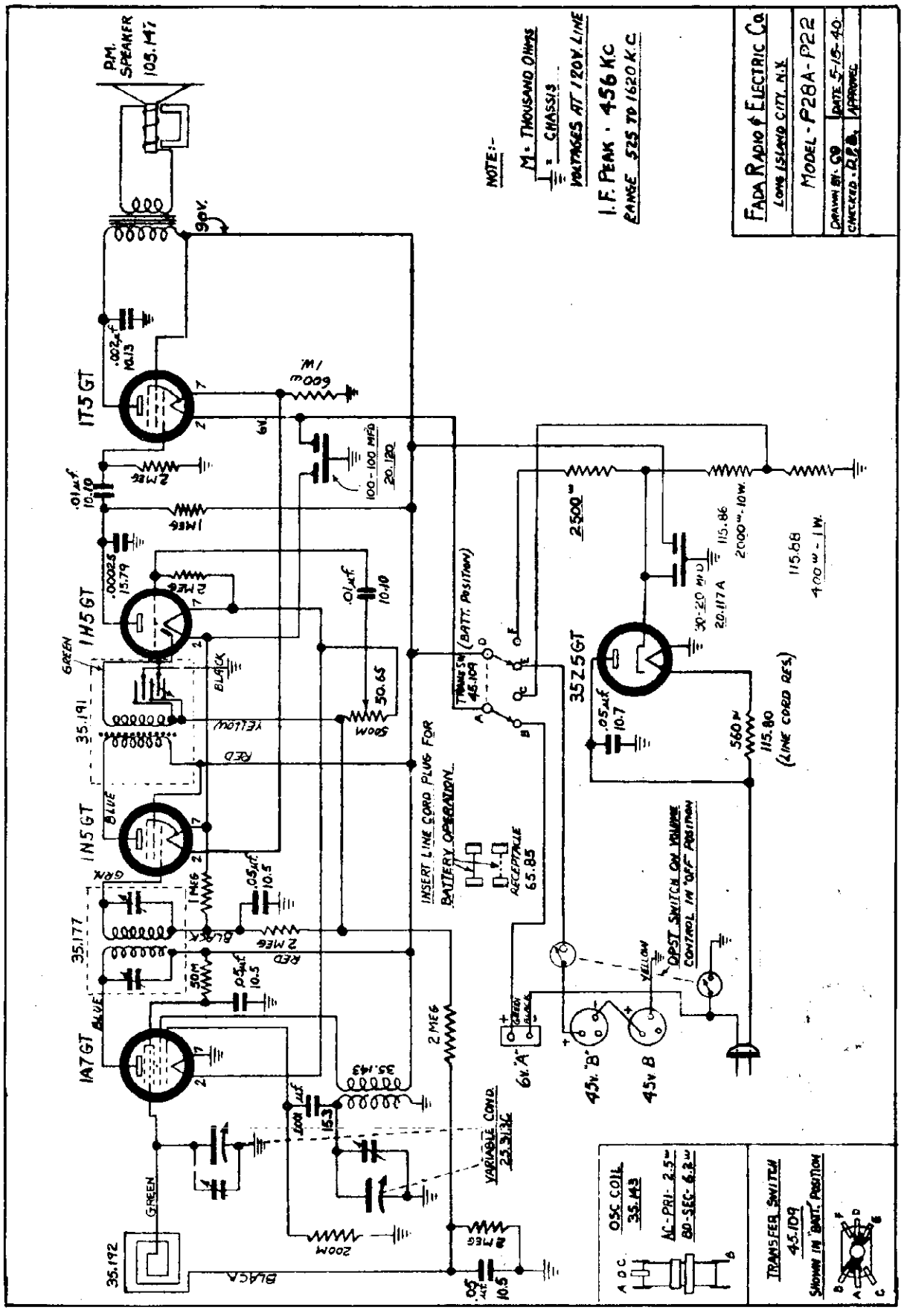


MODELS P24, PL72



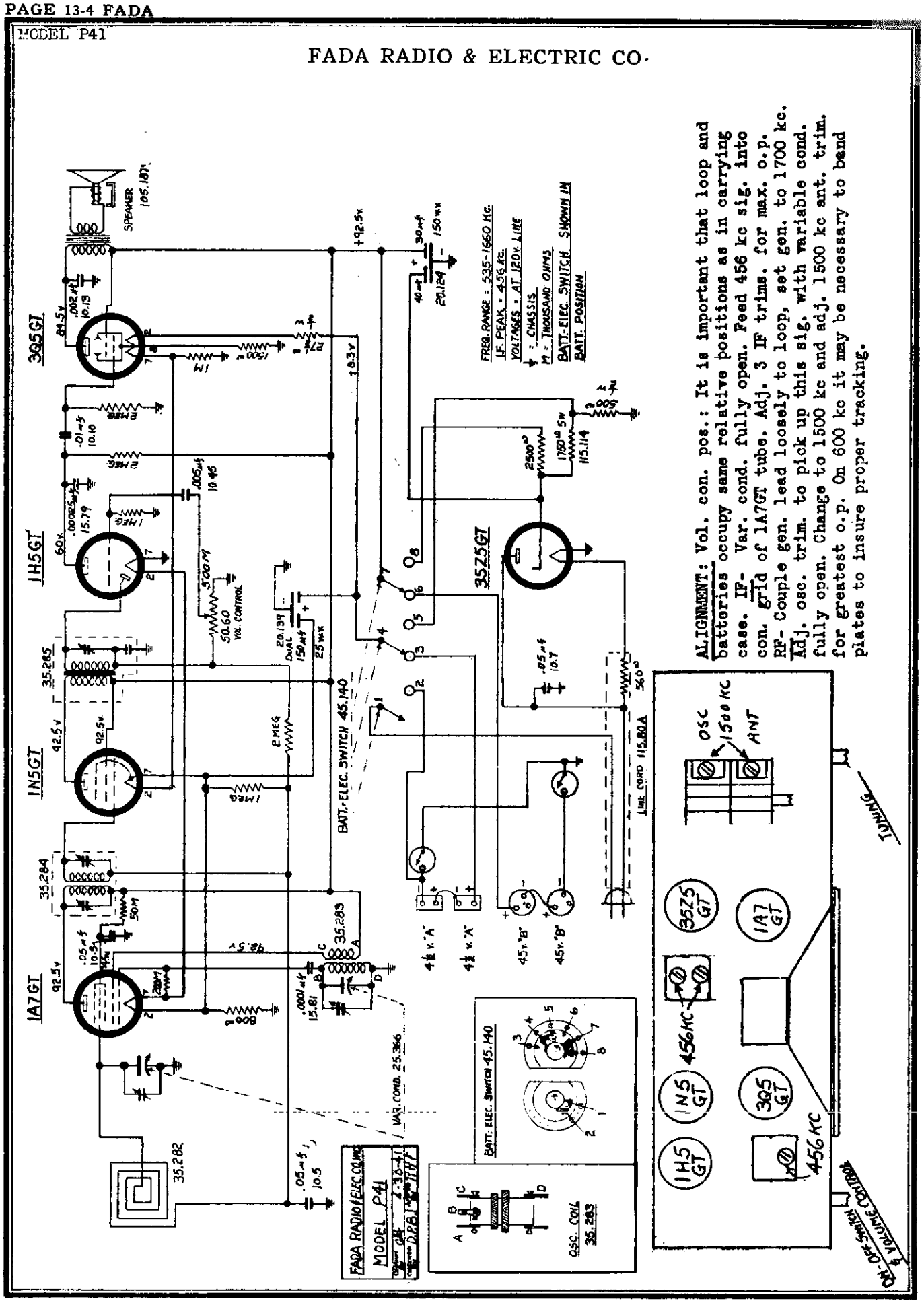
PARTIAL SCHEMATIC OF MODEL P24 Late and PL72
The 375-ohm resistor was added otherwise the circuit is the same as the Early Model P24 in Rider's Vol.XII, Fada page 12-2

FADA RADIO & ELECTRIC CO.



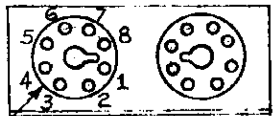
MODEL P41

FADA RADIO & ELECTRIC CO.

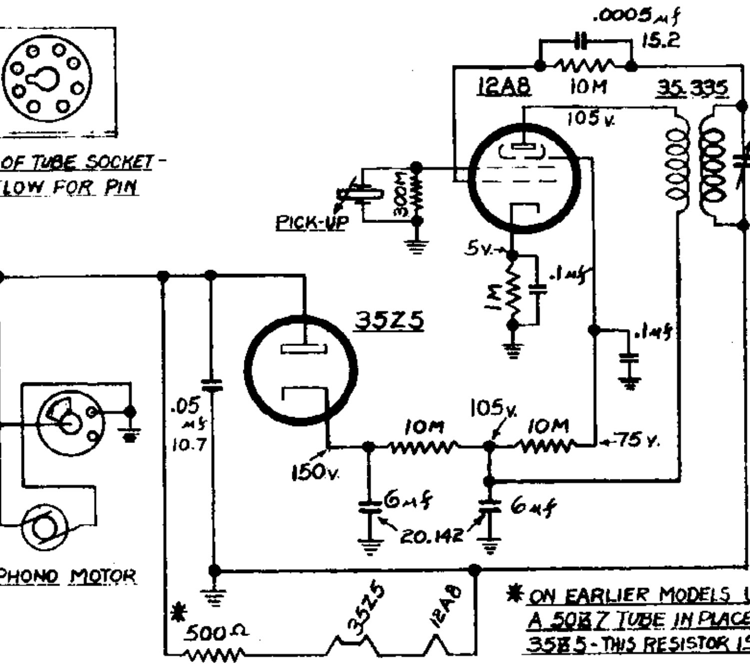


FADA RADIO & ELECTRIC CO.

MODELS WP-101, WP-10
MODELS AP-104, AP-10



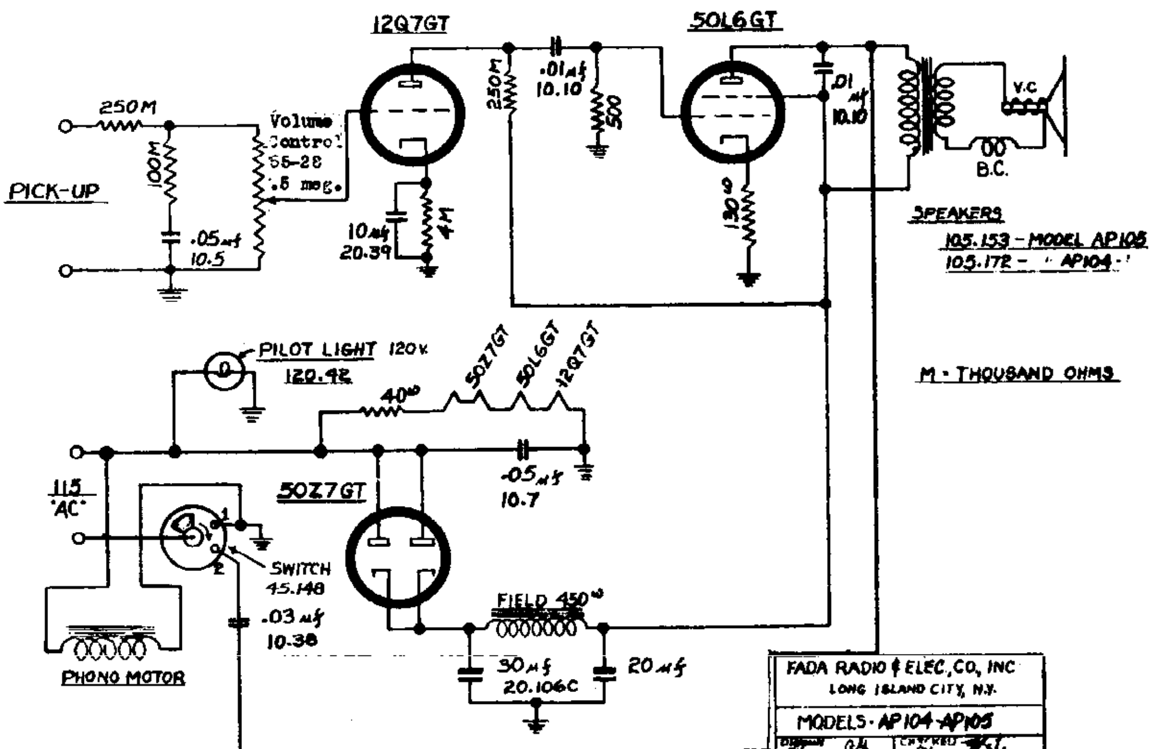
BOTTOM VIEW OF TUBE SOCKET - SEE TABLE BELOW FOR PIN CONNECTIONS



* ON EARLIER MODELS USING A 50Z7 TUBE IN PLACE OF 35Z5 - THIS RESISTOR IS 350Ω

TUBE	PIN CONNECTIONS 1	2	3	4	5	6	7	8
35Z5	NO CONNECT.	HEATER	HEATER TAP	NO CONNECT.	PLATE	NO CONNECT.	HEATER	CATHODE
50Z7	NO CONNECT.	HEATER	PLATE	CATHODE	PLATE	HEATER TAP	HEATER	CATHODE

FADA RADIO & ELEC. CO. INC.
LONG ISLAND CITY, N.Y.
MODELS - WP101 - WP102
DRAWN BY GH DATE 9-17-41
CHECKED BY G.J. APPROVED BY AHF



SPEAKERS
105.153 - MODEL AP105
105.172 - " AP104

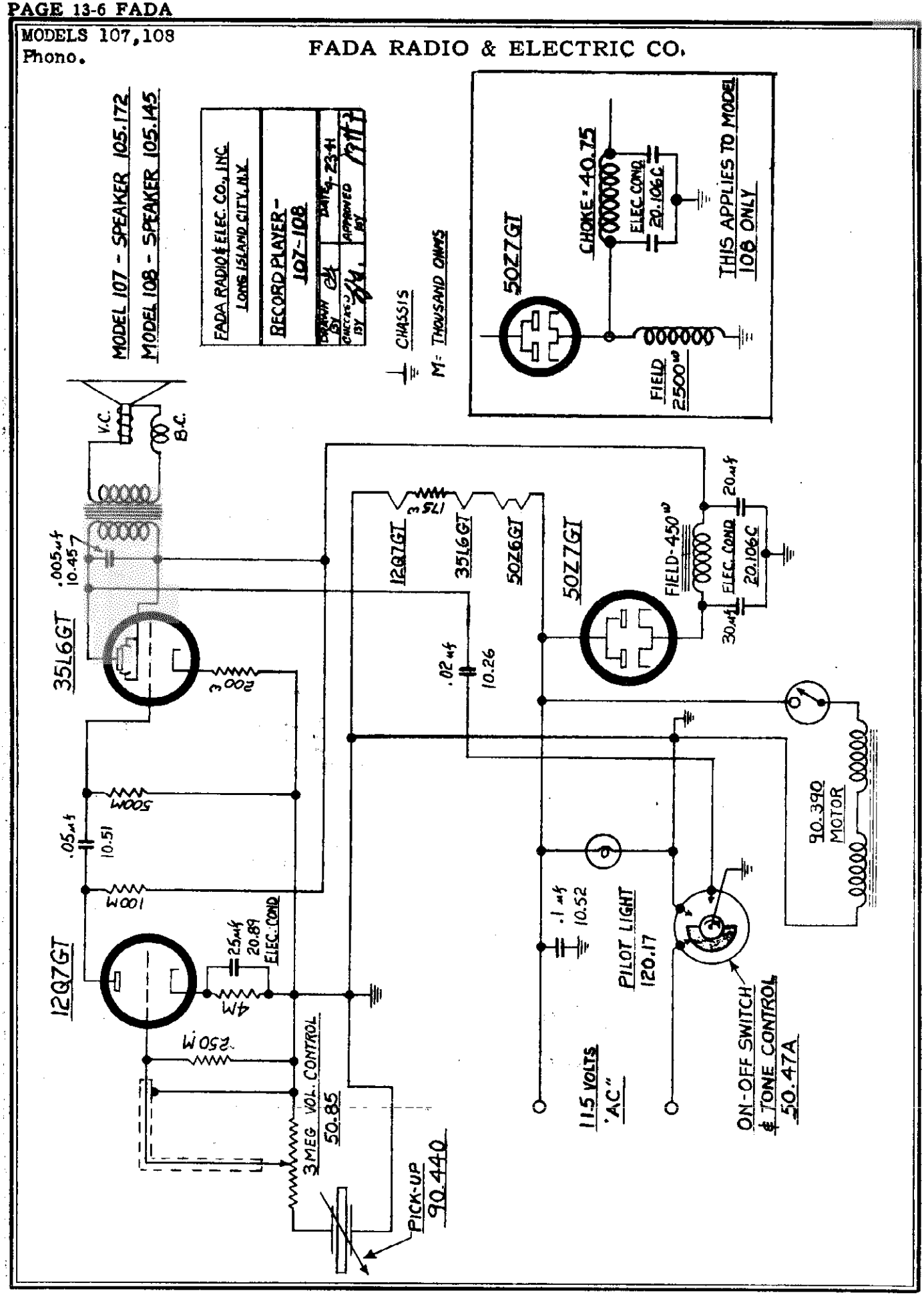
M - THOUSAND OHMS

FADA RADIO & ELEC. CO. INC.
LONG ISLAND CITY, N.Y.
MODELS - AP104 - AP105
DRAWN BY GH CHECKED BY
APPROVED BY AHF

SWITCH 45.148 SHOWN IN "OFF" POSITION
CONTACT 1 - MOTOR & UNIT "ON" - TREBLE TONE
" 1 & 2 - " " " " - BASS "

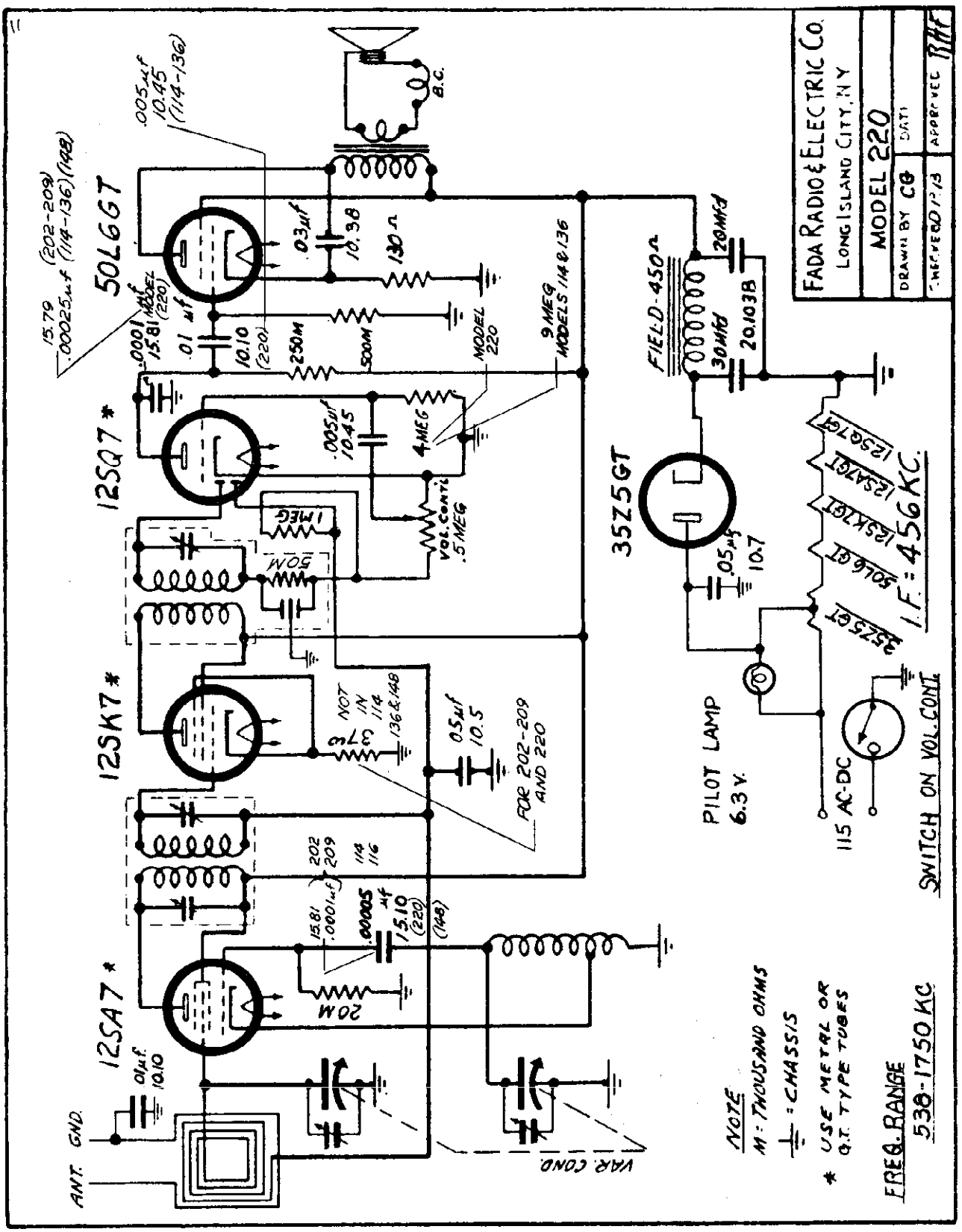
MODELS 107,108
Phono.

FADA RADIO & ELECTRIC CO.



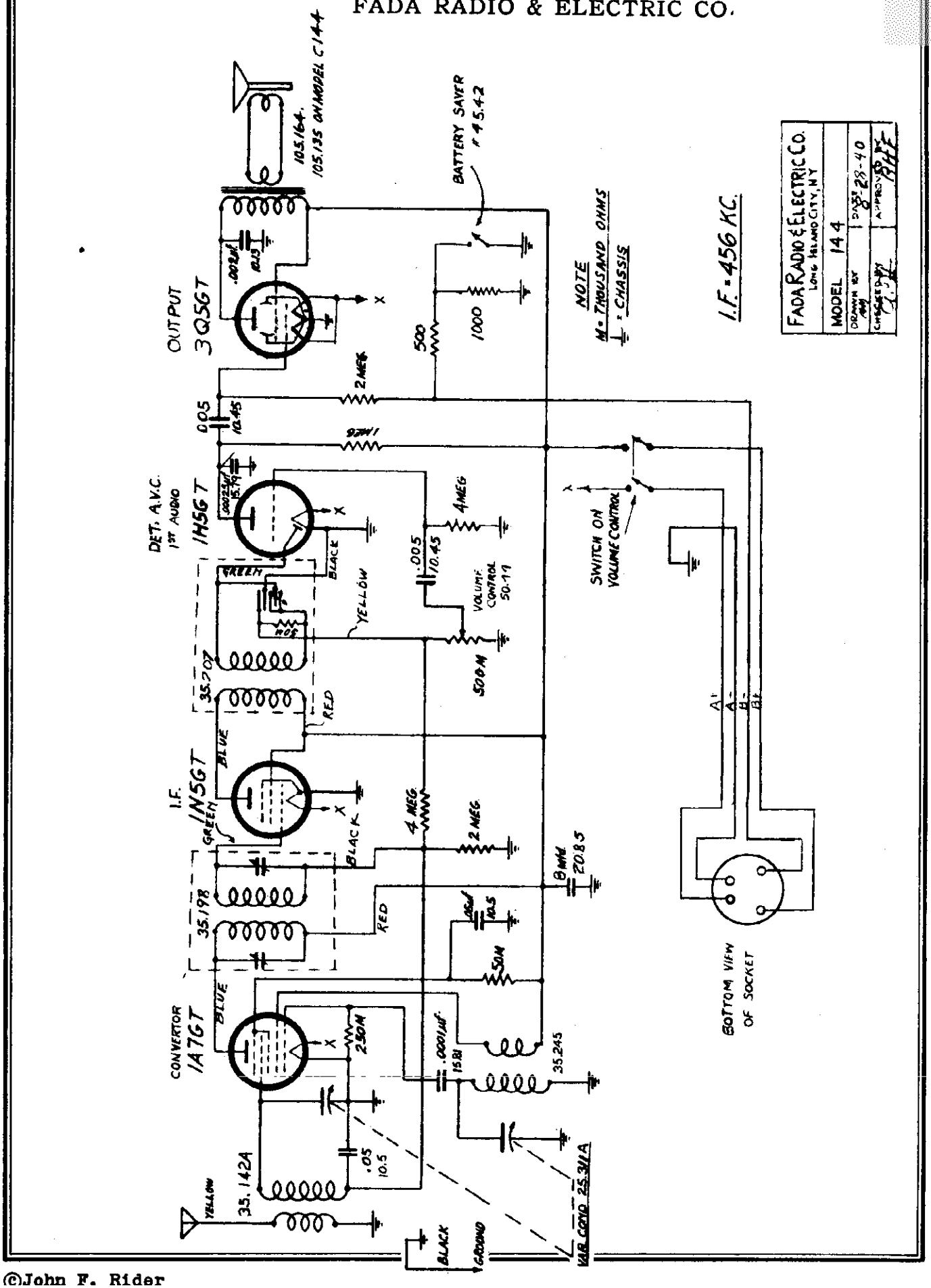
FADA RADIO & ELECTRIC CO.

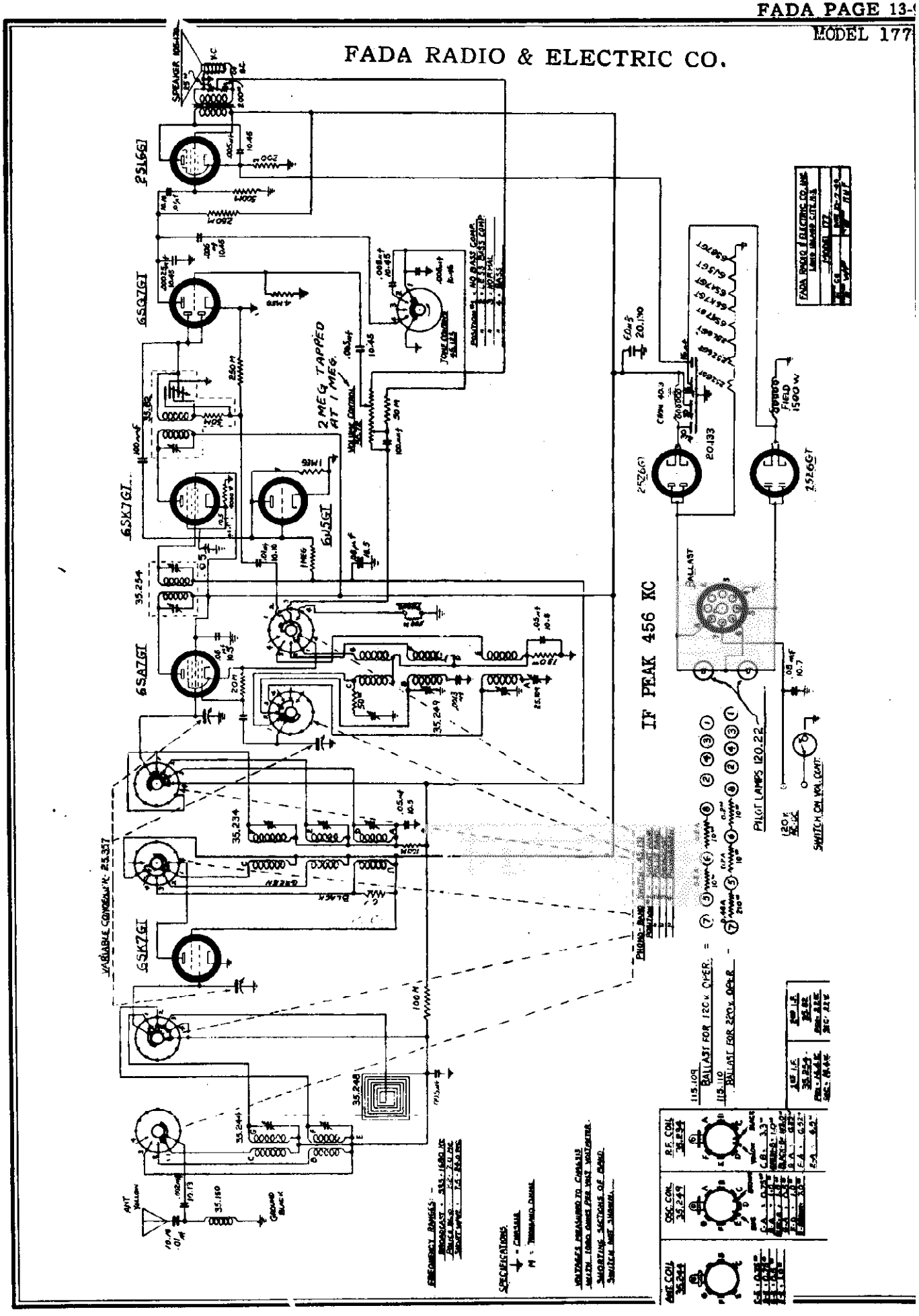
MODELS 114,136,148
202,209,220



MODEL 144

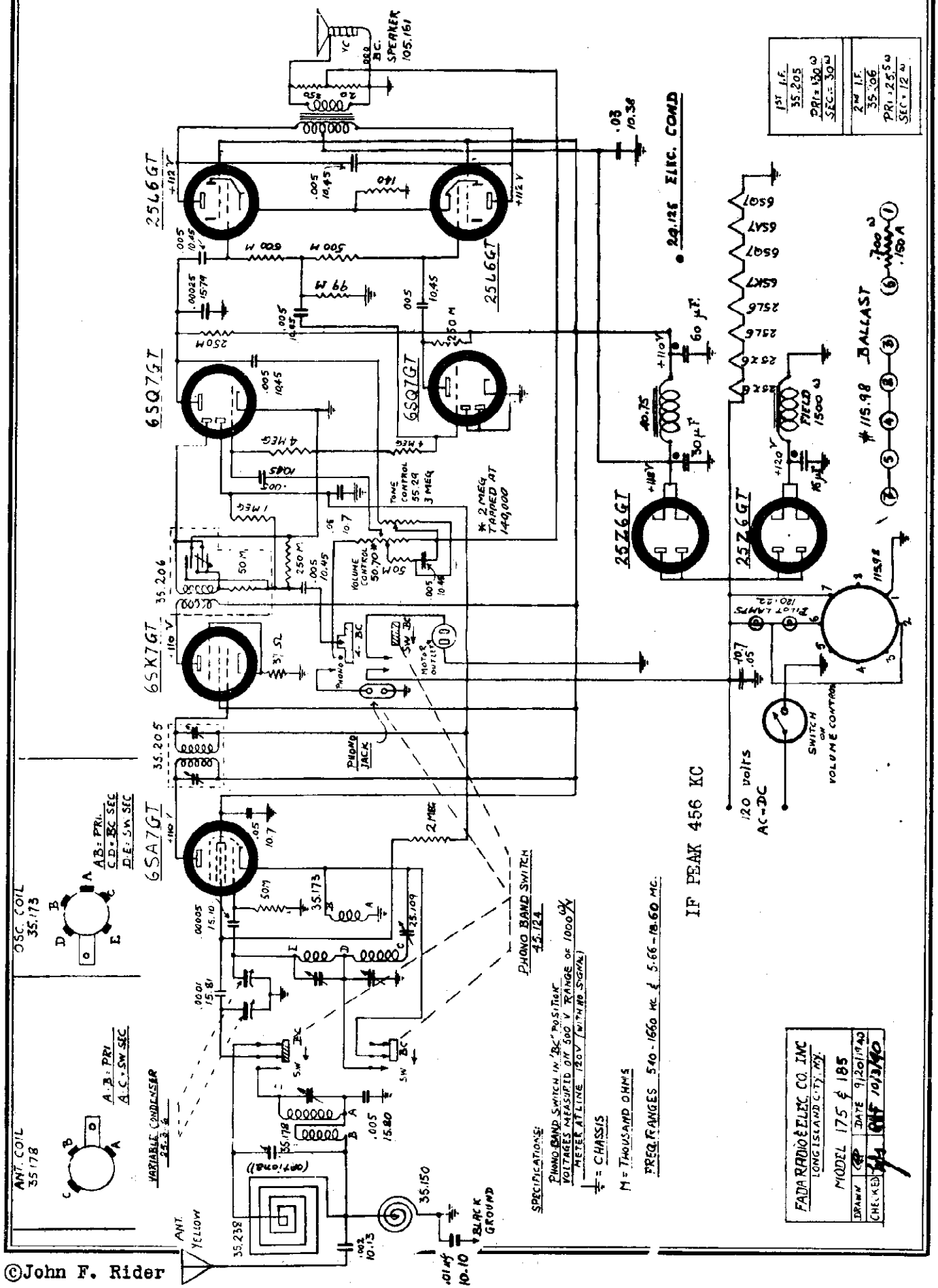
FADA RADIO & ELECTRIC CO.

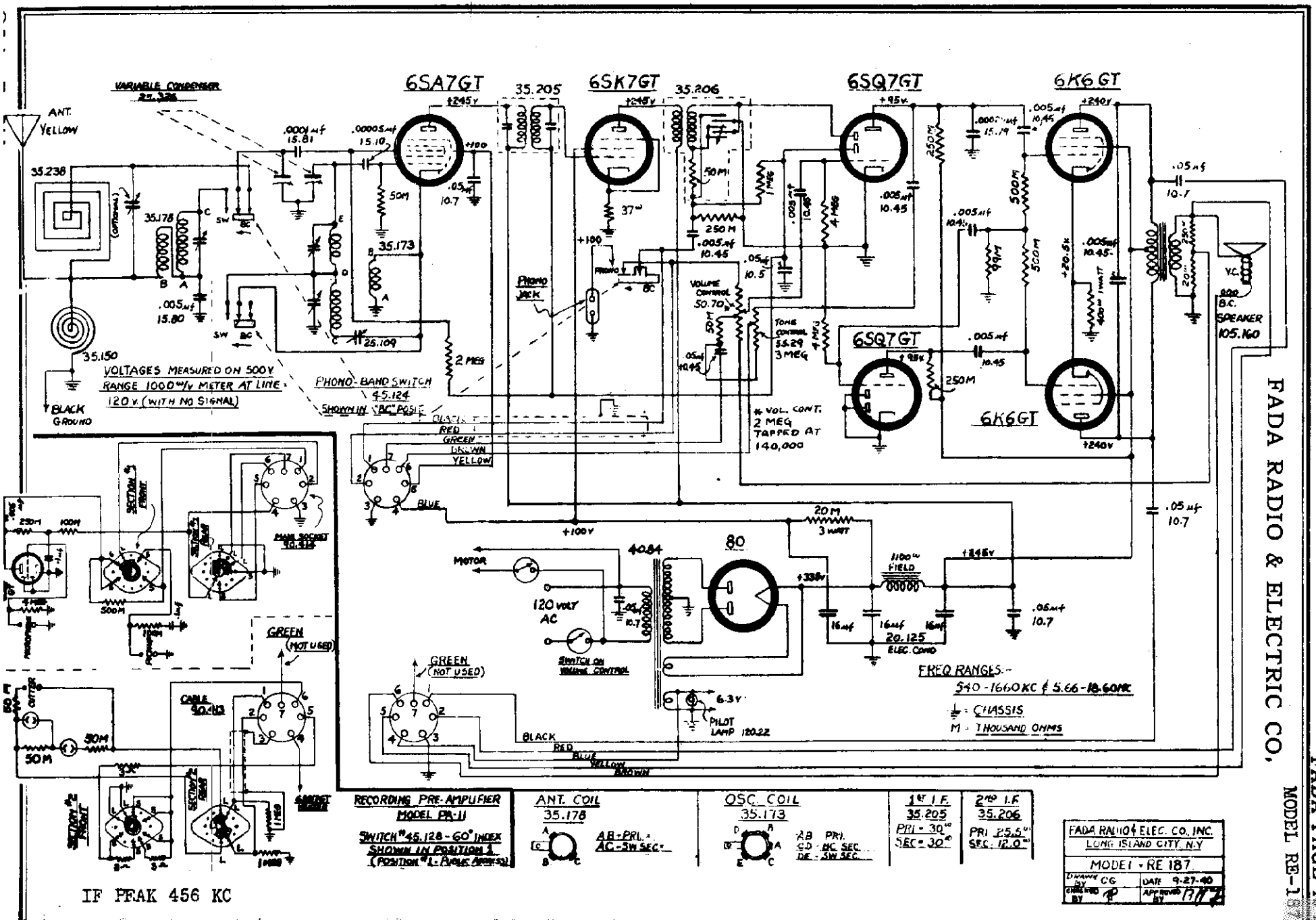



FADA RADIO & ELECTRIC CO.
MODEL 177
IF PEAK 456 KC
2 MEG TAPPED AT 1 MEG.
6SK7GT
6SA7GT
6SQ7GT
6V6GT
25Z6GT
25L6GT
35Z5GT
PILOT LAMPS 120.22
BALLAST FOR 120 V. OPER. 115.109
BALLAST FOR 220 V. OPER. 119.110
SWITCH ON VOL. CONT.
VARIABLE CONDENSER 25.357
SPECIFICATIONS

MODELS 175,185

FADA RADIO & ELECTRIC CO.



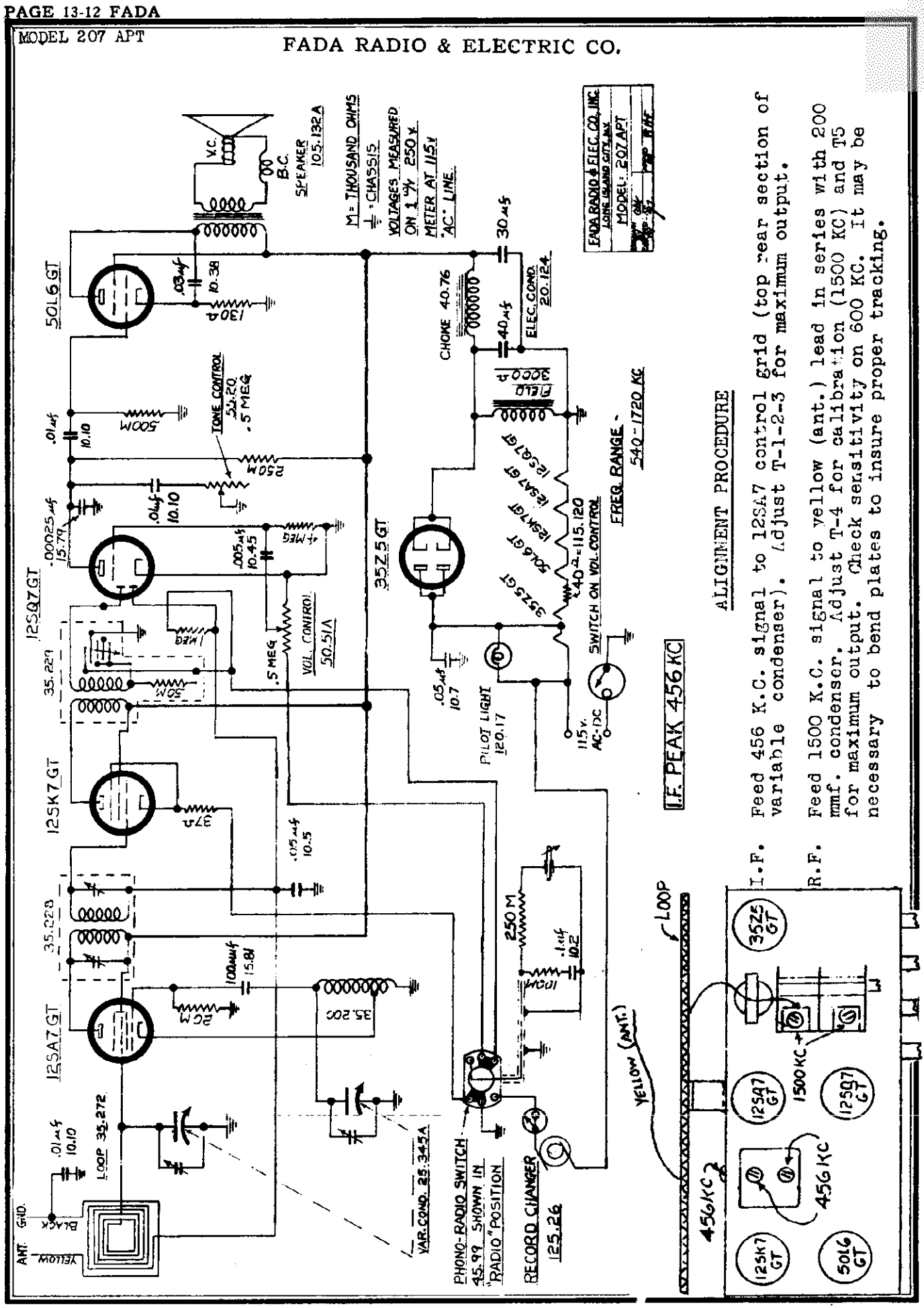


FADA RADIO & ELECTRIC CO.

MODEL RE-187

MODEL 207 APT

FADA RADIO & ELECTRIC CO.



FADA RADIO & ELEC. CO. INC. LONG ISLAND CITY, N.Y. MODEL 207 APT

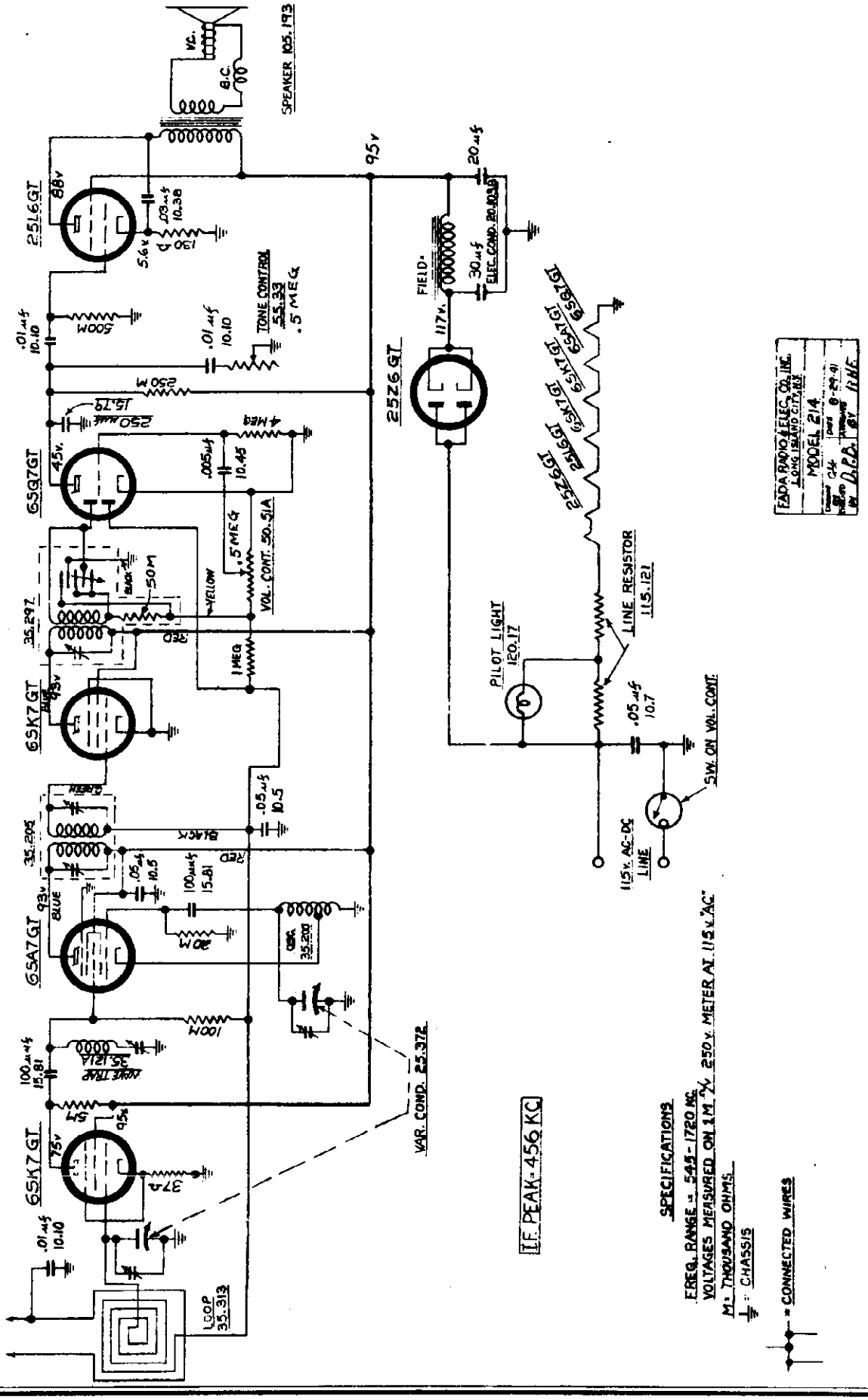
ALIGNMENT PROCEDURE

I.F. Feed 456 K.C. signal to 12SA7 control grid (top rear section of variable condenser). Adjust T-1-2-3 for maximum output.

R.F. Feed 1500 K.C. signal to yellow (ant.) lead in series with 200 mmf. condenser. Adjust T-4 for calibration (1500 KC) and T5 for maximum output. Check sensitivity on 600 KC. It may be necessary to bend plates to insure proper tracking.

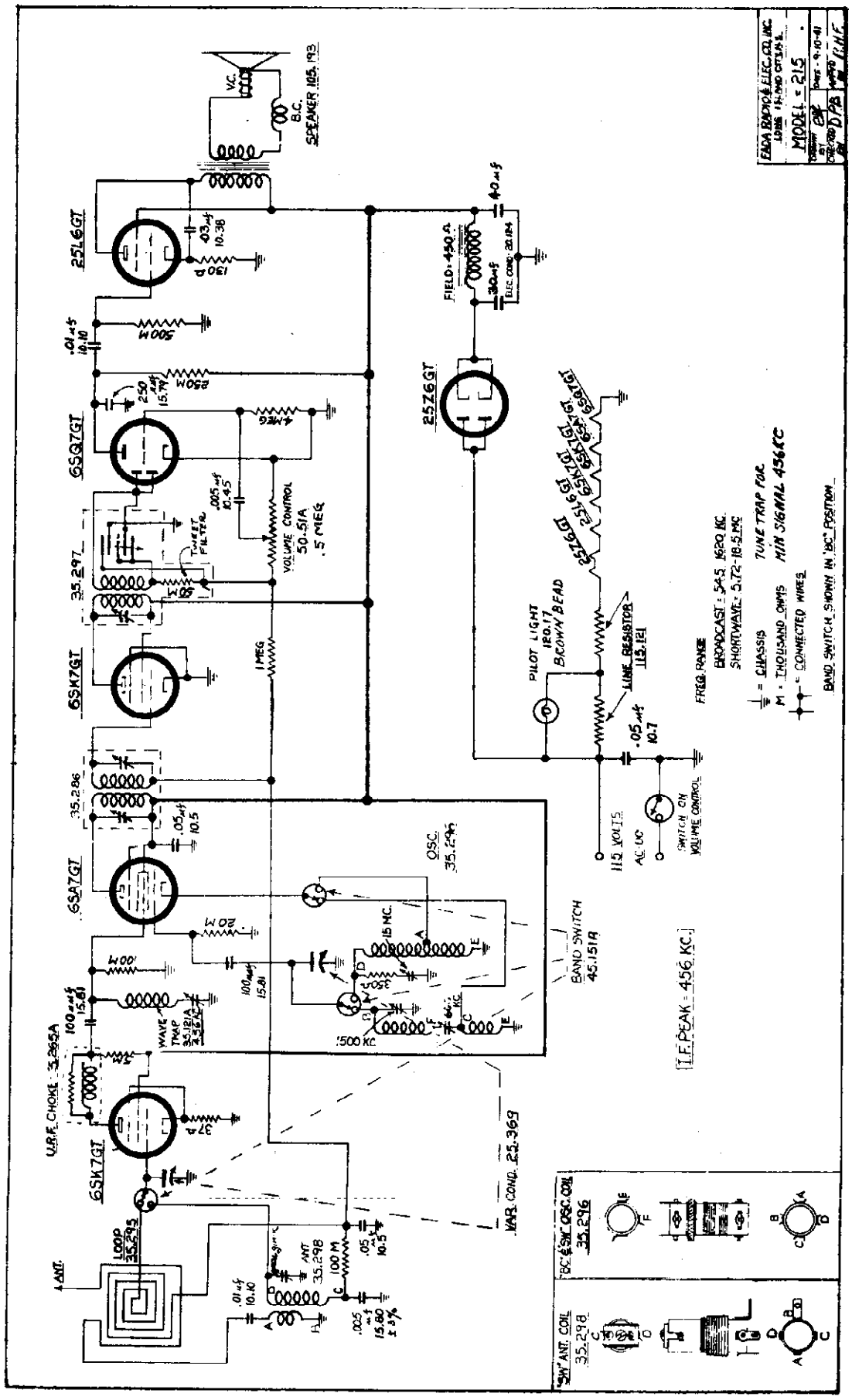
FADA RADIO & ELECTRIC CO.

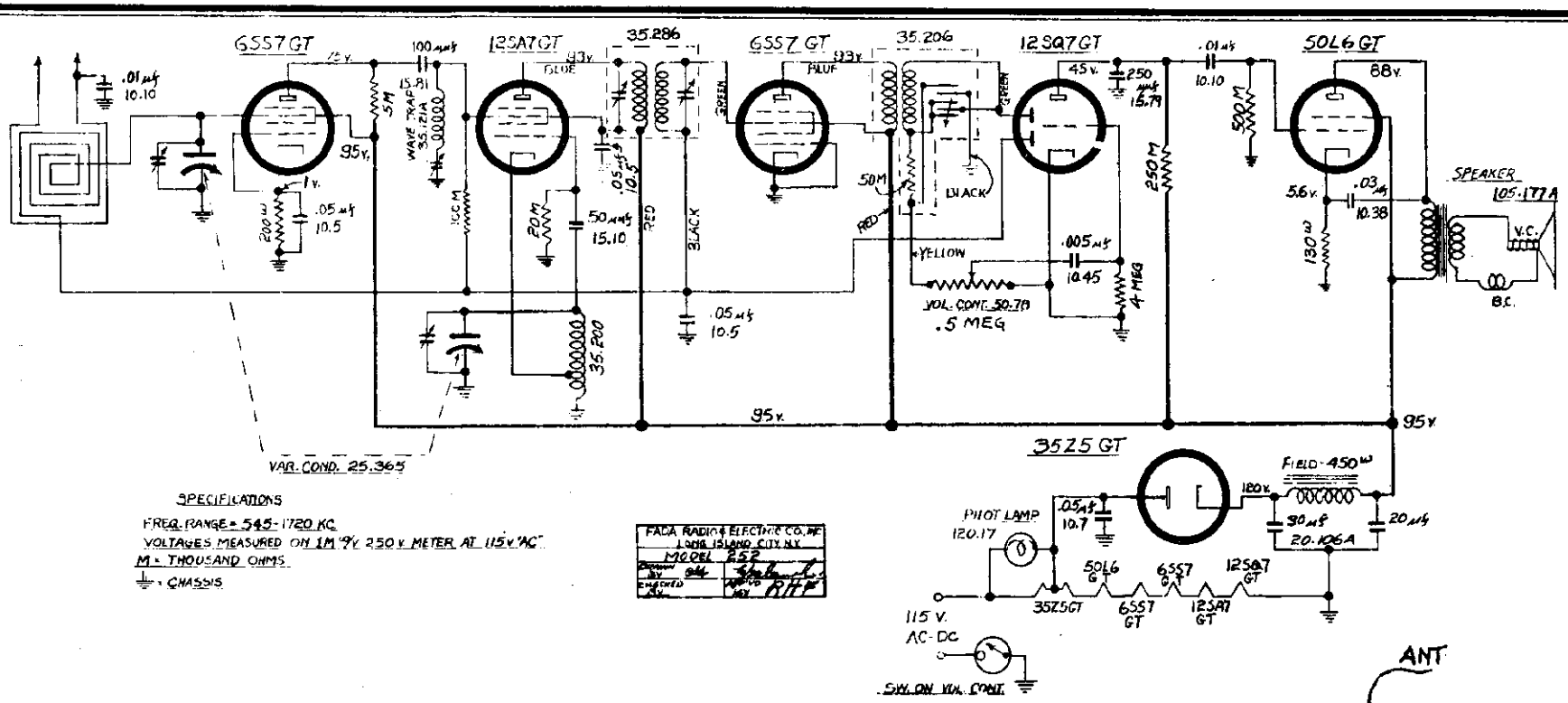
MODEL 21



MODEL 215

FADA RADIO & ELECTRIC CO.





SPECIFICATIONS

FREQ. RANGE = 545-1720 KC.
VOLTAGES MEASURED ON 1M 9V 250 V. METER AT 115 V. AC
M = THOUSAND OHMS
⏚ = CHASSIS

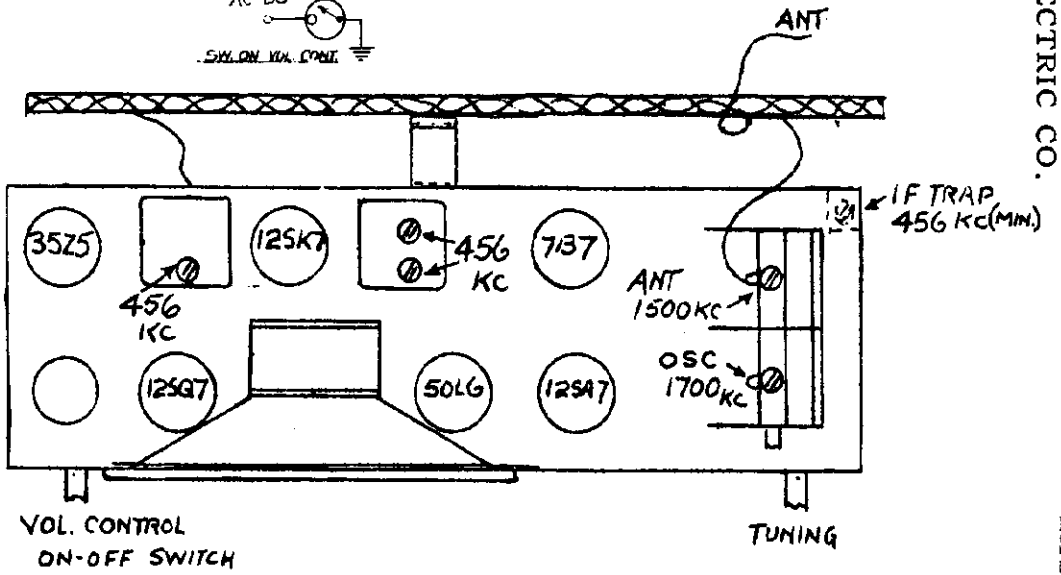
FADA RADIO & ELECTRIC CO. INC.
LONG ISLAND CITY, N.Y.
MODEL 252

ALIGNMENT: VOLUME CONTROL MAX. - SIG. GEN. OUTPUT AS LOW AS POSSIBLE.

IF- (1) Feed 456 kc, in series with .01 cond., to con. grid of RF tube - loop term. (rear sec. var. cond.). Adj. 3 IF trims. for max. (2) Adj. IF trap for min.

RF- (1) Feed 1700 kc sig. in series with 200 mmf. cond. to yellow ant. lead. Set osc. trim. cond. to pick up this frequency at approx. 1700 kc on dial. (2) Change to 1500 kc and adj. ant. trim. for max. (3) Check sensitivity on 600 kc.

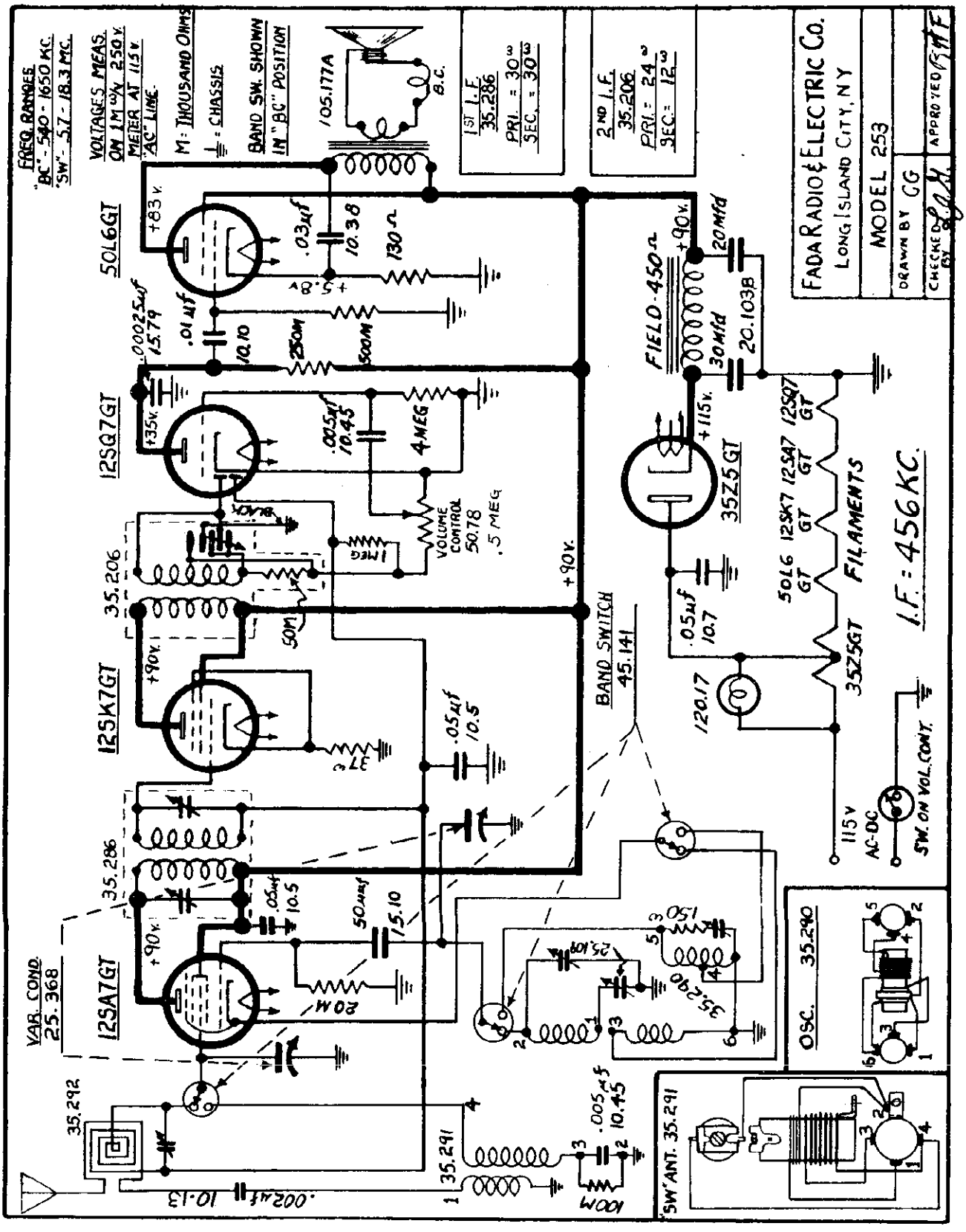
NOTE: On the early runs of this model, 6SS7 and 12SK7 tubes were employed in the RF and IF stages. In the event of 6SS7 failure, the 12SK7 may be substituted. The 40-ohm series resistor (black) in the heater circuit (not shown) can be removed if, due to low line voltage, the heat-up period is delayed. On the later runs, 7B7s were employed in place of the above.

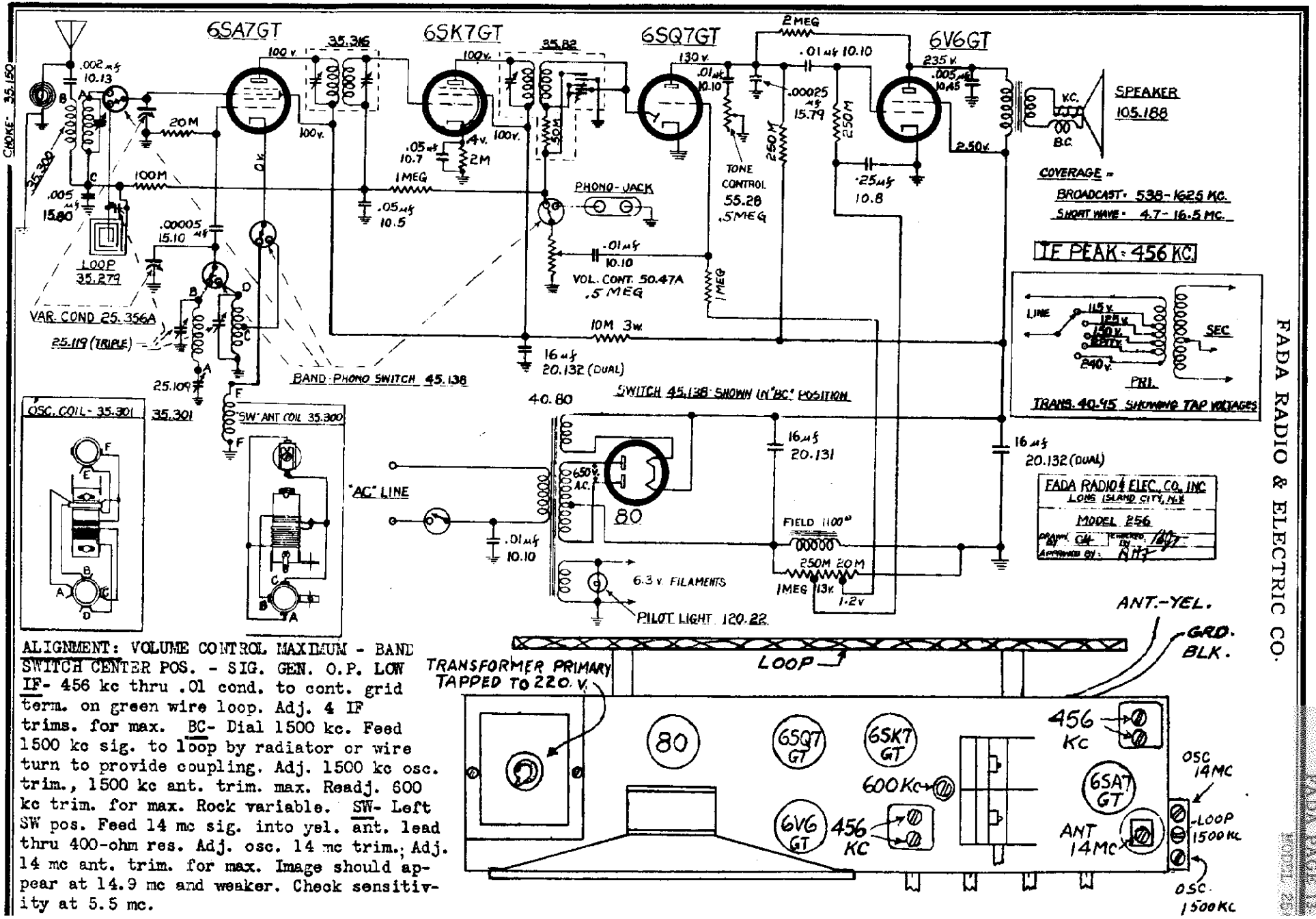


CHASSIS LAYOUT & TRIMMER LOCATIONS

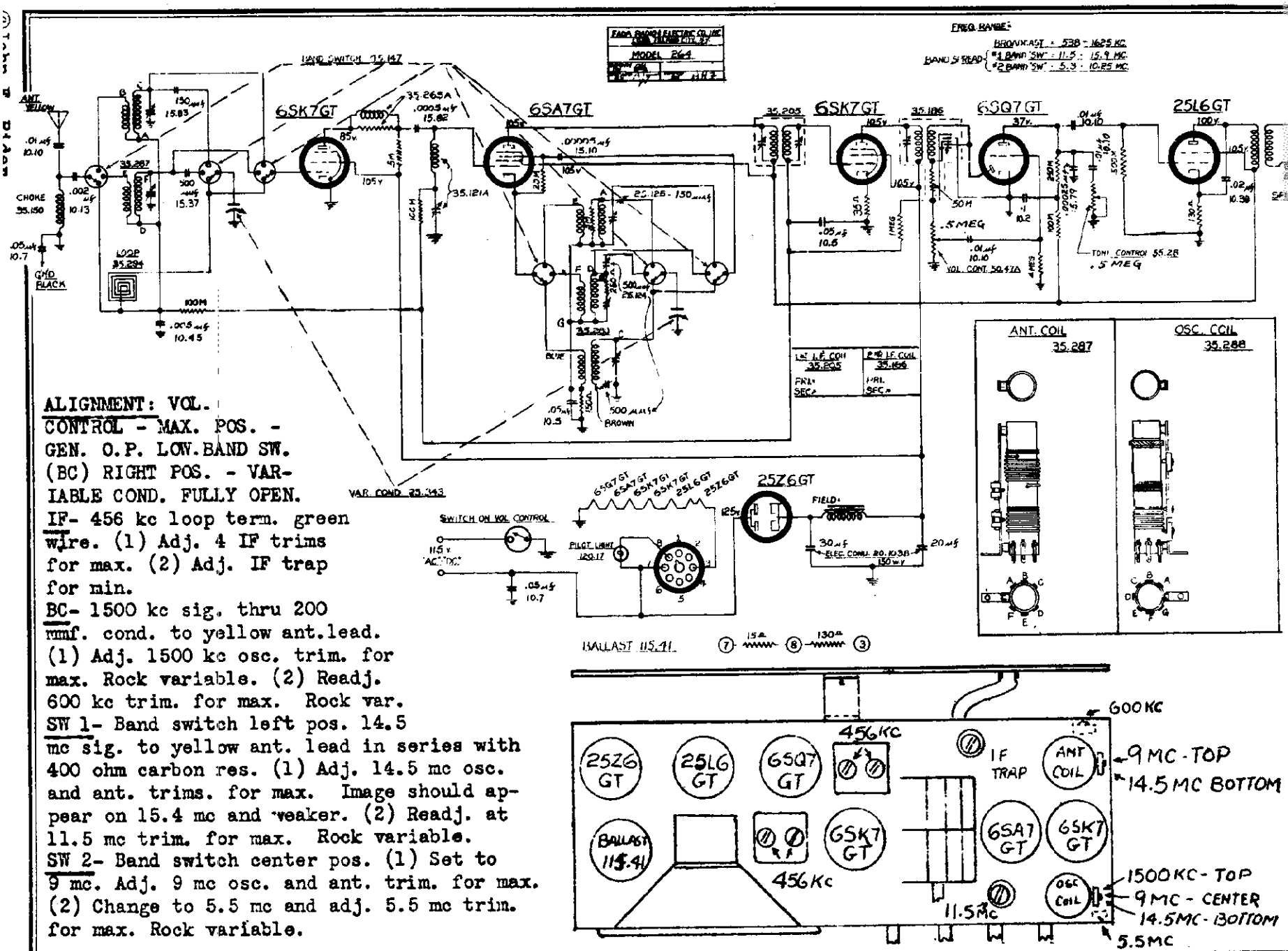
MODEL 253

FADA RADIO & ELECTRIC CO.





ALIGNMENT: VOLUME CONTROL MAXIMUM - BAND SWITCH CENTER POS. - SIG. GEN. O.P. LOW IF- 456 kc thru .01 cond. to cont. grid term. on green wire loop. Adj. 4 IF trims. for max. BC- Dial 1500 kc. Feed 1500 kc sig. to loop by radiator or wire turn to provide coupling. Adj. 1500 kc osc. trim., 1500 kc ant. trim. max. Readj. 600 kc trim. for max. Rock variable. SW- Left SW pos. Feed 14 mc sig. into yel. ant. lead thru 400-ohm res. Adj. osc. 14 mc trim.; Adj. 14 mc ant. trim. for max. Image should appear at 14.9 mc and weaker. Check sensitivity at 5.5 mc.



ALIGNMENT: VOL. CONTROL - MAX. POS. - GEN. O.P. LOW. BAND SW. (BC) RIGHT POS. - VARIABLE COND. FULLY OPEN.

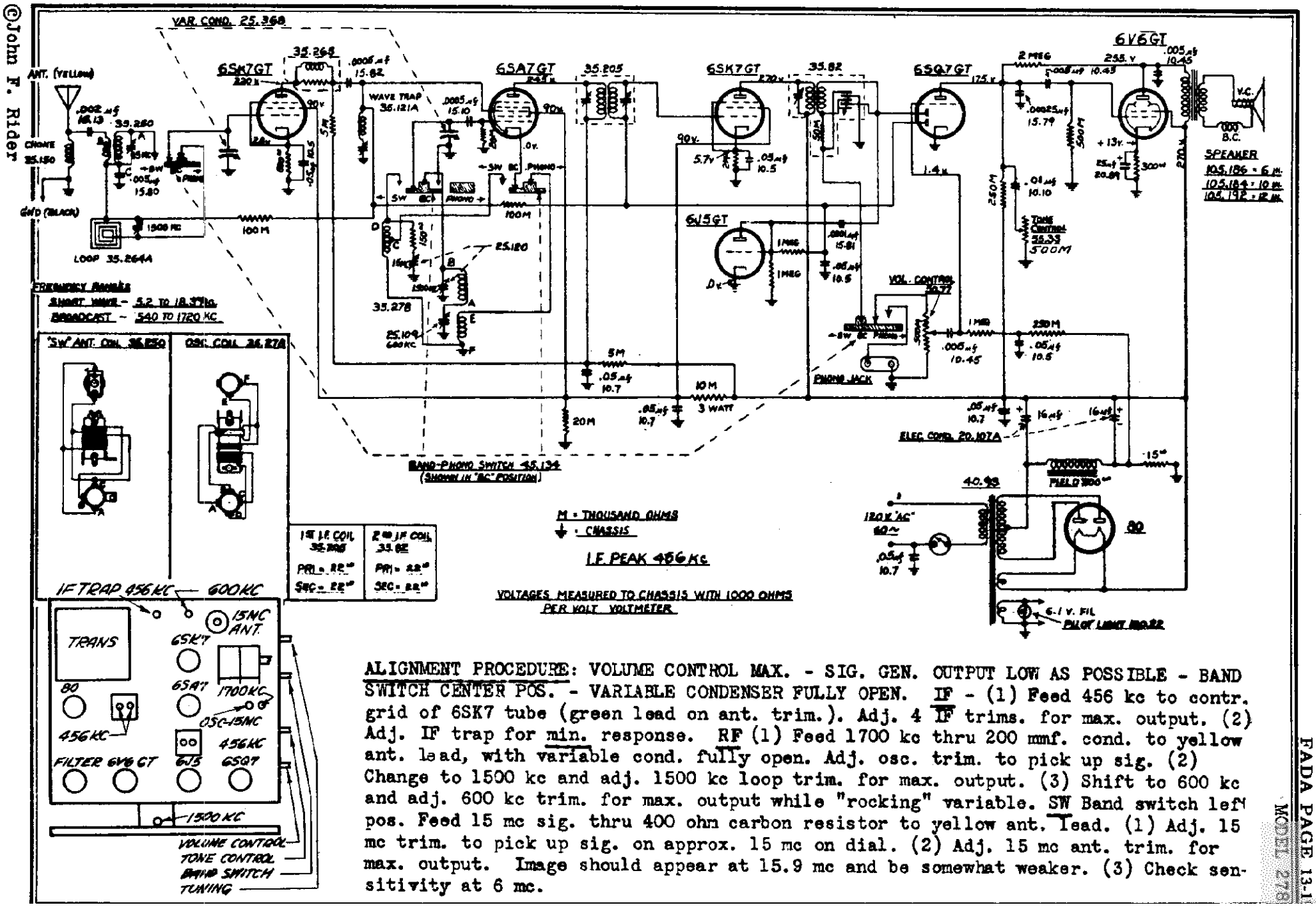
IF- 456 kc loop term. green wire. (1) Adj. 4 IF trims for max. (2) Adj. IF trap for min.

BC- 1500 kc sig. thru 200 mmf. cond. to yellow ant. lead. (1) Adj. 1500 kc osc. trim. for max. Rock variable. (2) Readj. 600 kc trim. for max. Rock var.

SW 1- Band switch left pos. 14.5 mc sig. to yellow ant. lead in series with 400 ohm carbon res. (1) Adj. 14.5 mc osc. and ant. trims. for max. Image should appear on 15.4 mc and weaker. (2) Readj. at 11.5 mc trim. for max. Rock variable.

SW 2- Band switch center pos. (1) Set to 9 mc. Adj. 9 mc osc. and ant. trim. for max. (2) Change to 5.5 mc and adj. 5.5 mc trim. for max. Rock variable.

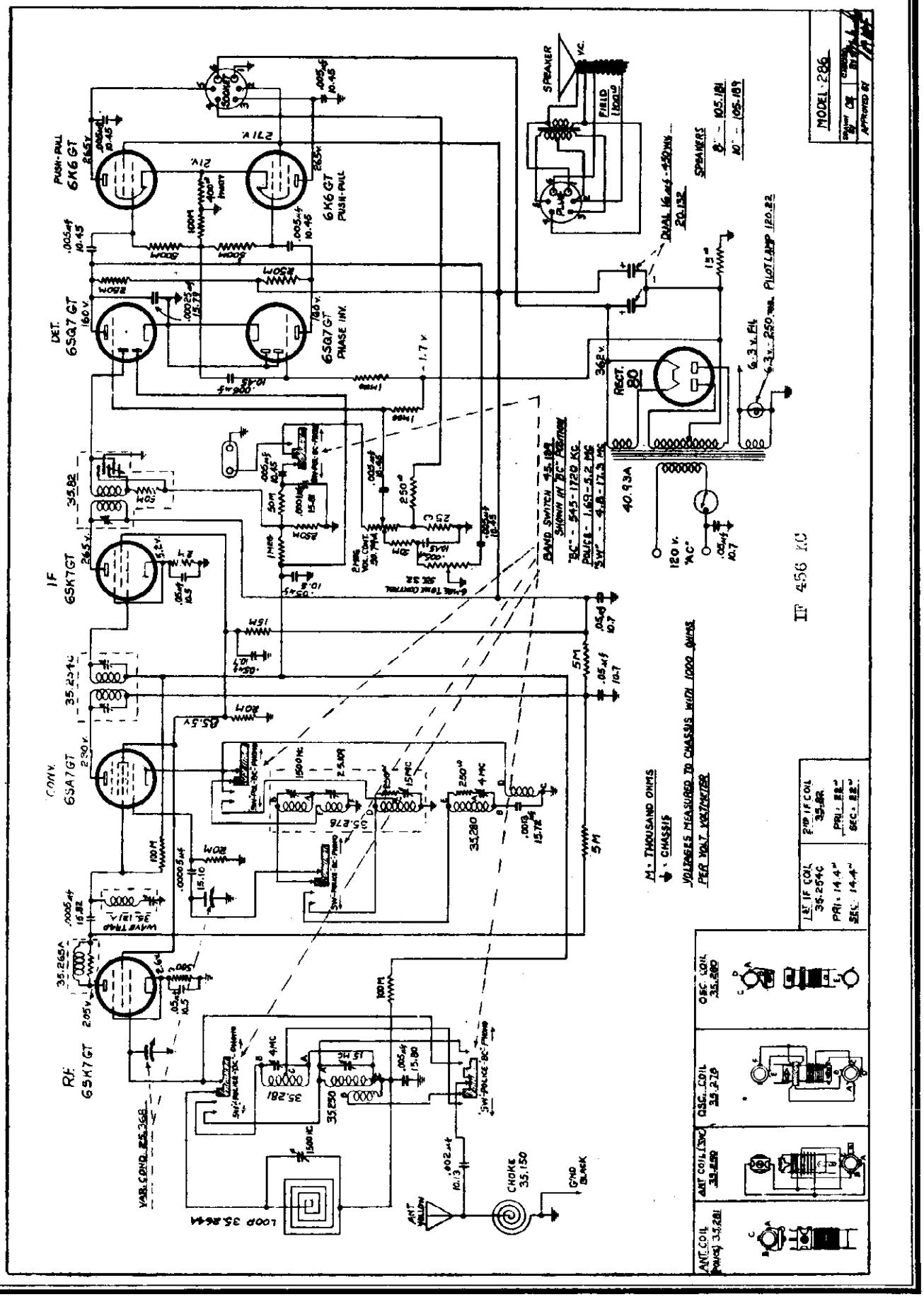
FADA RADIO & ELECTRIC CO.



ALIGNMENT PROCEDURE: VOLUME CONTROL MAX. - SIG. GEN. OUTPUT LOW AS POSSIBLE - BAND SWITCH CENTER POS. - VARIABLE CONDENSER FULLY OPEN. IF - (1) Feed 456 kc to contr. grid of 6SK7 tube (green lead on ant. trim.). Adj. 4 IF trims. for max. output. (2) Adj. IF trap for min. response. RF (1) Feed 1700 kc thru 200 mmf. cond. to yellow ant. lead, with variable cond. fully open. Adj. osc. trim. to pick up sig. (2) Change to 1500 kc and adj. 1500 kc loop trim. for max. output. (3) Shift to 600 kc and adj. 600 kc trim. for max. output while "rocking" variable. SW Band switch left pos. Feed 15 mc sig. thru 400 ohm carbon resistor to yellow ant. lead. (1) Adj. 15 mc trim. to pick up sig. on approx. 15 mc on dial. (2) Adj. 15 mc ant. trim. for max. output. Image should appear at 15.9 mc and be somewhat weaker. (3) Check sensitivity at 6 mc.

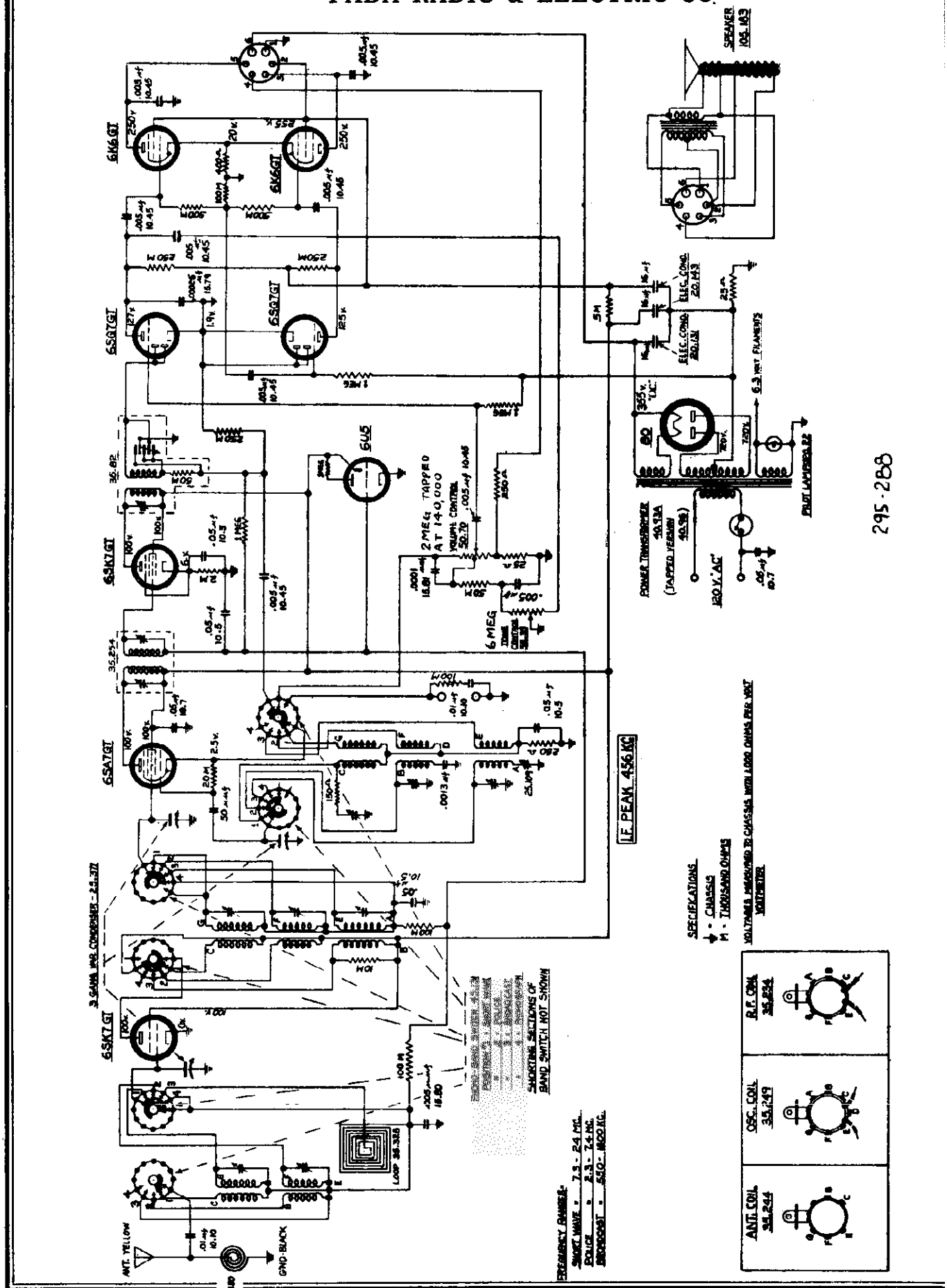
MODEL 286

FADA RADIO & ELECTRIC CO.

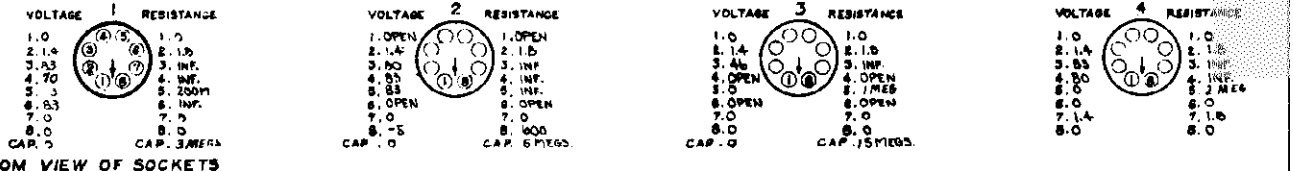


FADA RADIO & ELECTRIC CO.

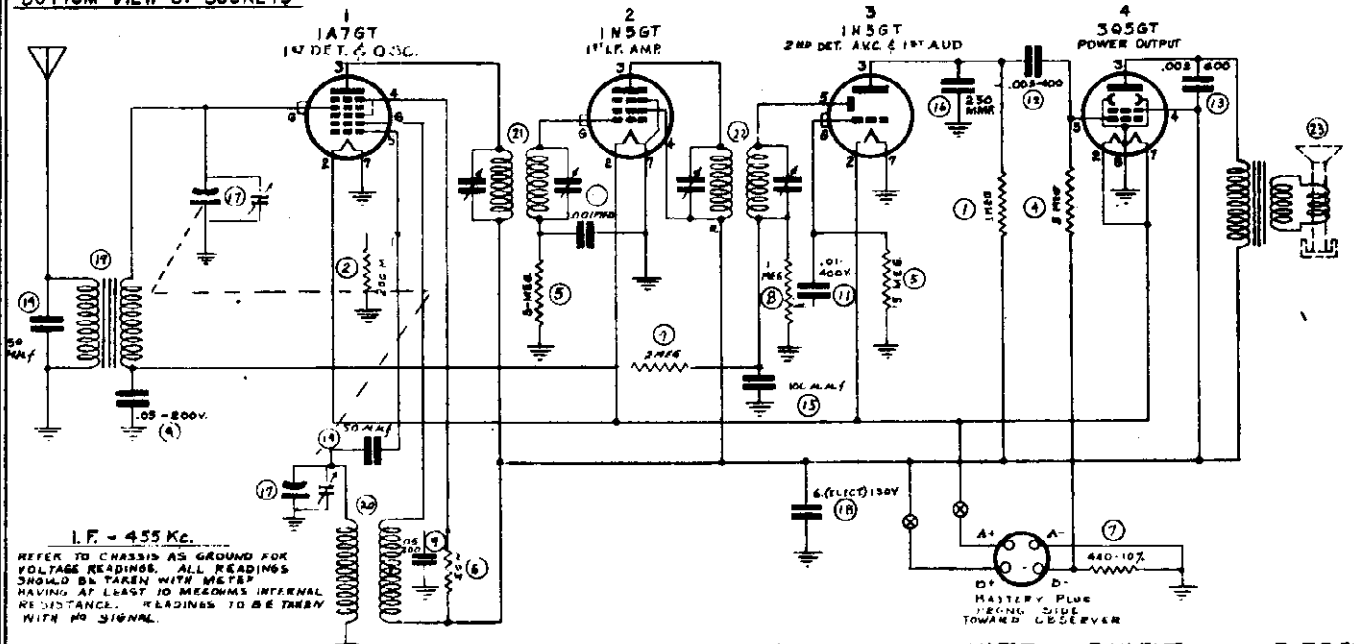
MODELS 288, 295

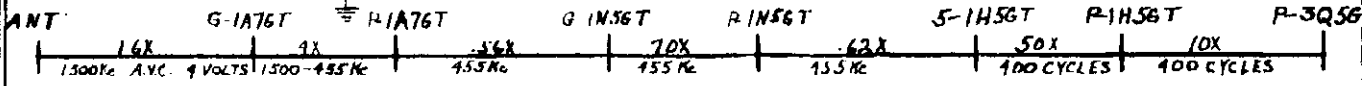


FARNSWORTH TELEV. & RADIO CORP.

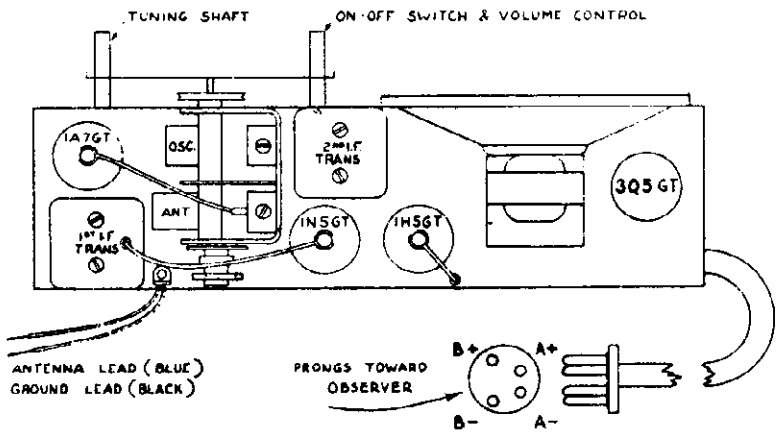


BOTTOM VIEW OF SOCKETS





MAX. A.V.C. VOLTAGE 5 — O.S.C. VOLTAGE 6.00 Kc. 9 V. 1500 Kc. 13 V — 98% VOLTAGE LOSS OUTPUT TRA



This receiver is a 4-tube battery operated receiver. An outside ant. may be connected to blue wire, and a ground to black wire.

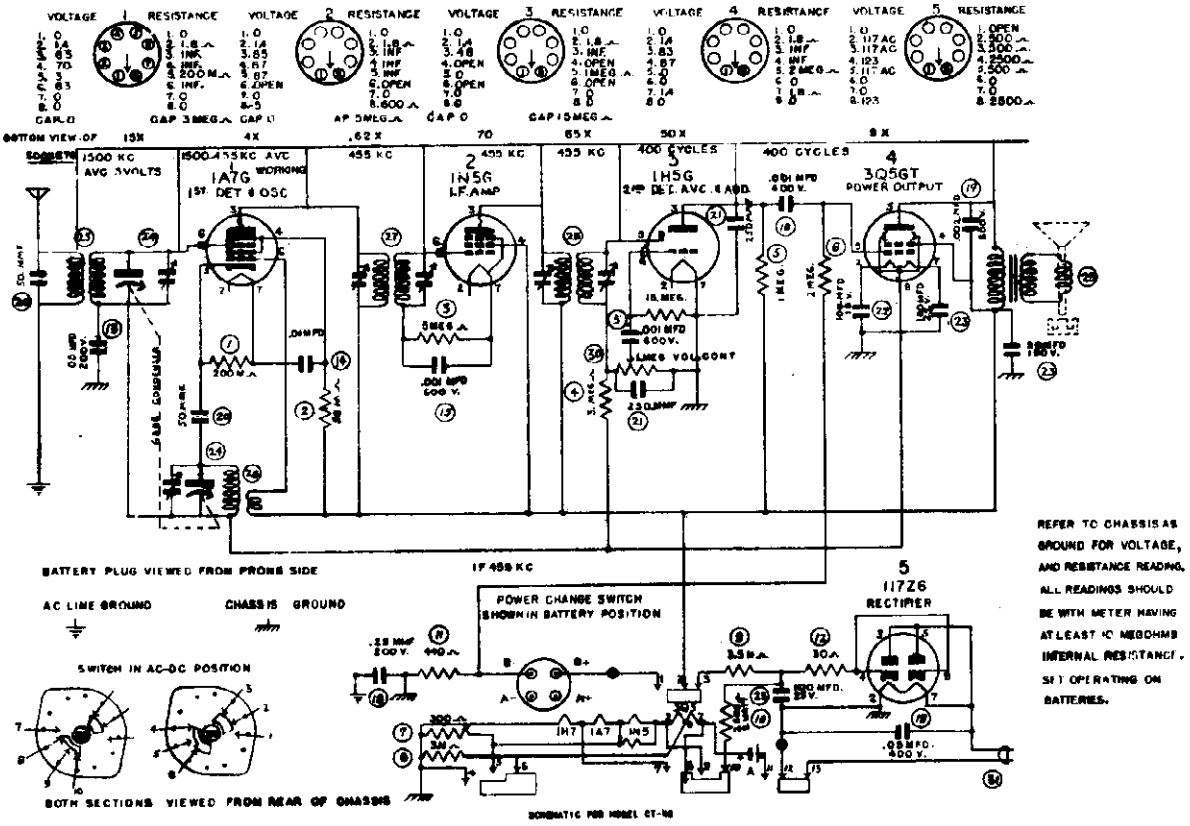
POWER SUPPLY: Either General 60B-6L or Burgess 6TA-60 can be used and will fit inside cabinet. Large unit as Burgess 17G-D60, Eveready 748, Ray-O-Vac AB-82, Bond 0528 or General 60DL-11L may be used, but will not fit inside cabinet. Battery drain-.2 amp., at 1½ v. and 9 ma., at 90 v.

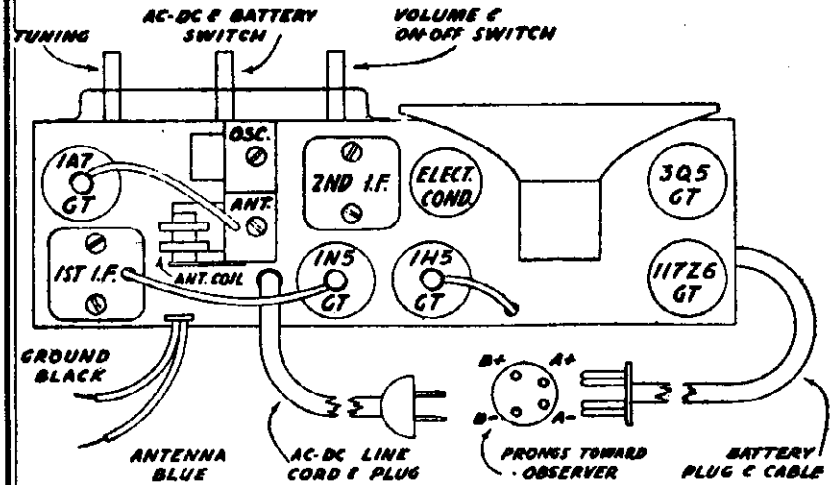
TABULATION FOR ALIGNMENT

STEPS	USE IN SERIES WITH GENERATOR	SET GENERATOR AT	SET GANG AT	ADJUST	LOCATED	TO OBTAIN
1.	CONNECT HIGH SIDE OF GENERATOR TO ANTENNA	455 Kc.	QUIET POINT	2ND I.F. TRIMMERS	TOP OF I.F. TRANS	MAXIMUM OUTPUT
				1ST I.F. TRIMMERS		
2.	250 M.M.F.	1730 Kc.	1730 Kc.	OSCILLATOR TRIMMER	SEE FIG	
3.	250 M.M.F.	1500 Kc.	1400 Kc. & ROCK GANG	ANTENNA TRIMMER		

MODEL CT-43

FARNSWORTH TELEV. & RADIO CORP.





ELEC. SPEC.: 5-tube AC-DC or 4-tube battery receiver. Outside ant. may be connected to blue wire, and ground to black wire. POWER SUPPLY: General 60B6L or Burgess 6TA-60 can be used and will fit inside cabinet. Large units as Burgess 17G-D60, Eveready 748, Ray-O-Vac AB-82, Bond 0528 or General 60DL-11L may be used, but will not fit inside cabinet. Battery drain is .2 amp., at 1½ volts and 9 ma., at 90 volts.

TABULATION FOR ALIGNMENT

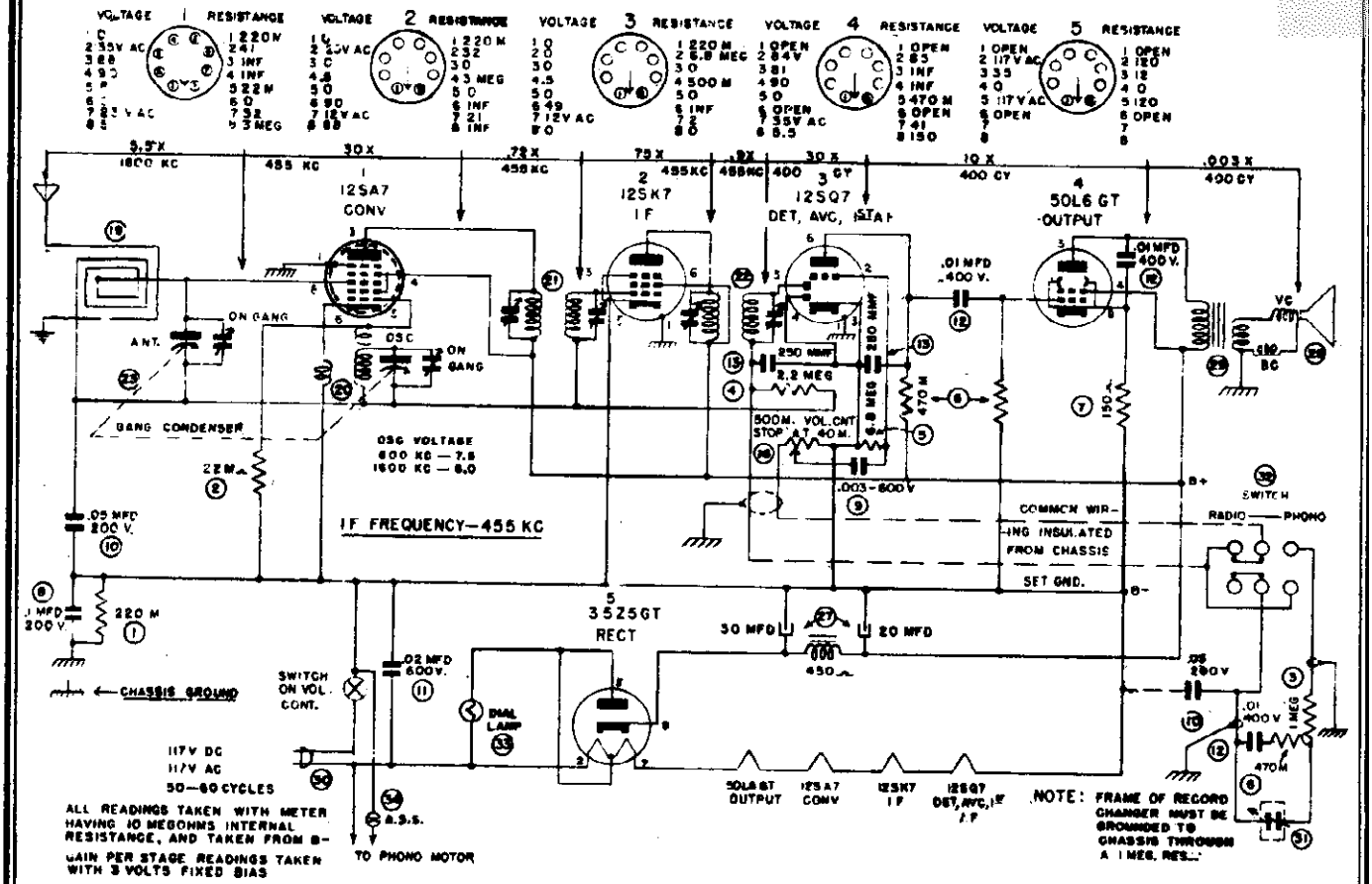
STEPS	USE IN SERIES WITH GENERATOR	SET GENERATOR AT	SET GANG AT	ADJUST	LOCATED	TO OBTAIN
1.	CONNECT HIGH SIDE OF GENERATOR TO ANTENNA	455 KC.	QUIET POINT	2ND I.F. TRIMMERS	TOP OF I.F. TRANS	MAXIMUM OUTPUT
				1ST I.F. TRIMMERS		
2.	250 M.M.F.	1730 KC.	1730 KC.	OSCILLATOR TRIMMER	SEE FIG.	
3.	250 M.M.F.	1500 KC.	1400 KC. & ROCK GANG	ANTENNA TRIMMER		

CT-54, CK-58,
Chassis C108-2

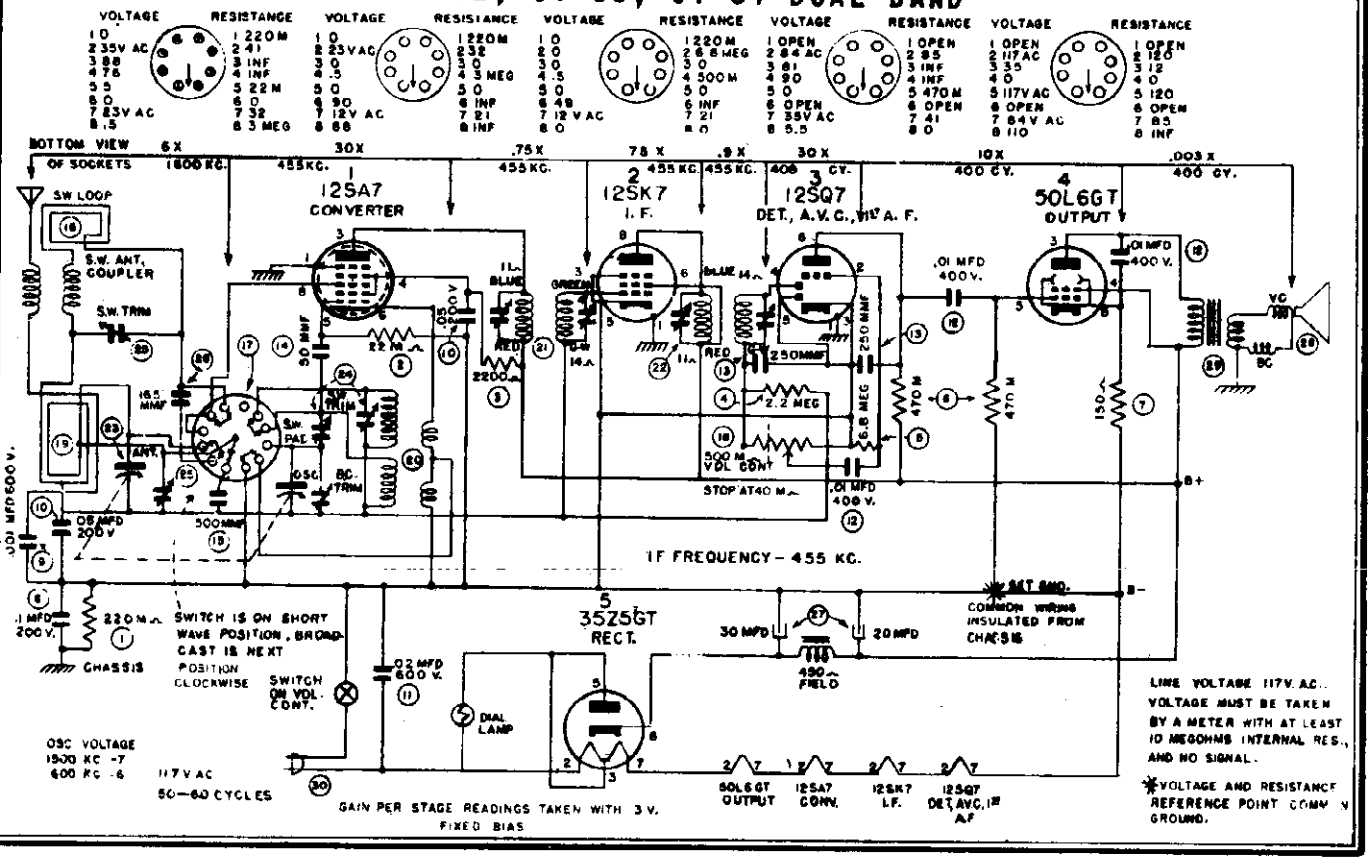
FARNSWORTH TELEV. & RADIO CORP

MODELS CT-50, CT-51,
Chassis C108-1;
CT-52, CT-53,
Chassis C109-1;

CT-50, CT-51, CK-58 SINGLE BAND



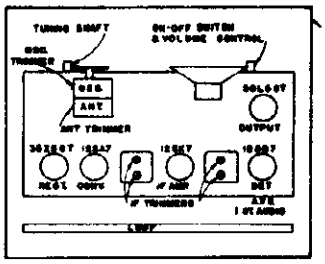
CT-52, CT-53, CT-54 DUAL BAND

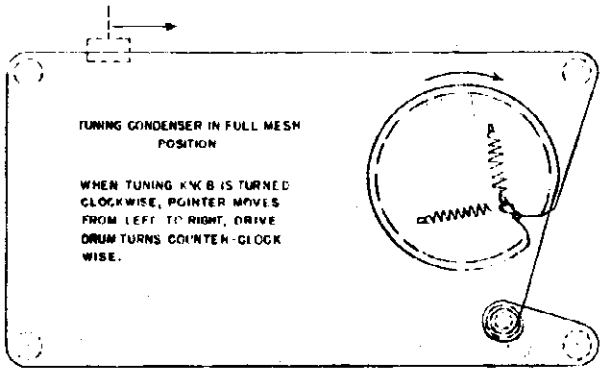


CHASSIS C108-1, C108-2, 109-1

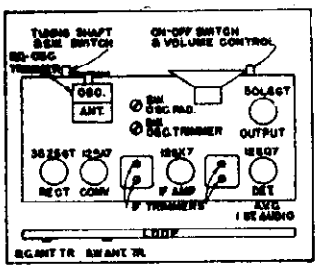
FARNSWORTH TELEV. & RADIO CORP.

SINGLE BAND TUBE LAYOUT





DUAL BAND TUBE LAYOUT



DIAL STRINGING

WHEN ALIGNING THE SHORT WAVE OSCILLATOR TIGHTEN THE ADJUSTING SCREW FOR MAXIMUM CAPACITY AND THEN LOOSEN IT UNTIL THE FIRST PEAK IS REACHED. DO NOT USE THE SIGNAL HEARD AT THE LOWER CAPACITY SETTING AS IN THIS RECEIVER THE OSCILLATOR WORKS AT A FREQUENCY LOWER THAN THE ONE THE R.F. IS TUNED TO. IF THE LOOP IS TUNED TO 9.0 MC THE OSCILLATOR IS TUNED TO 8,545 KC THAT IS SIGNAL FREQUENCY MINUS I.F. FREQUENCY, INSTEAD OF SIGNAL FREQUENCY PLUS I.F. FREQUENCY, OR 9,455 KC AS IS CUSTOMARY.

TABULATION FOR ALIGNMENT OF SIGNAL AND DUAL BAND RECEIVERS

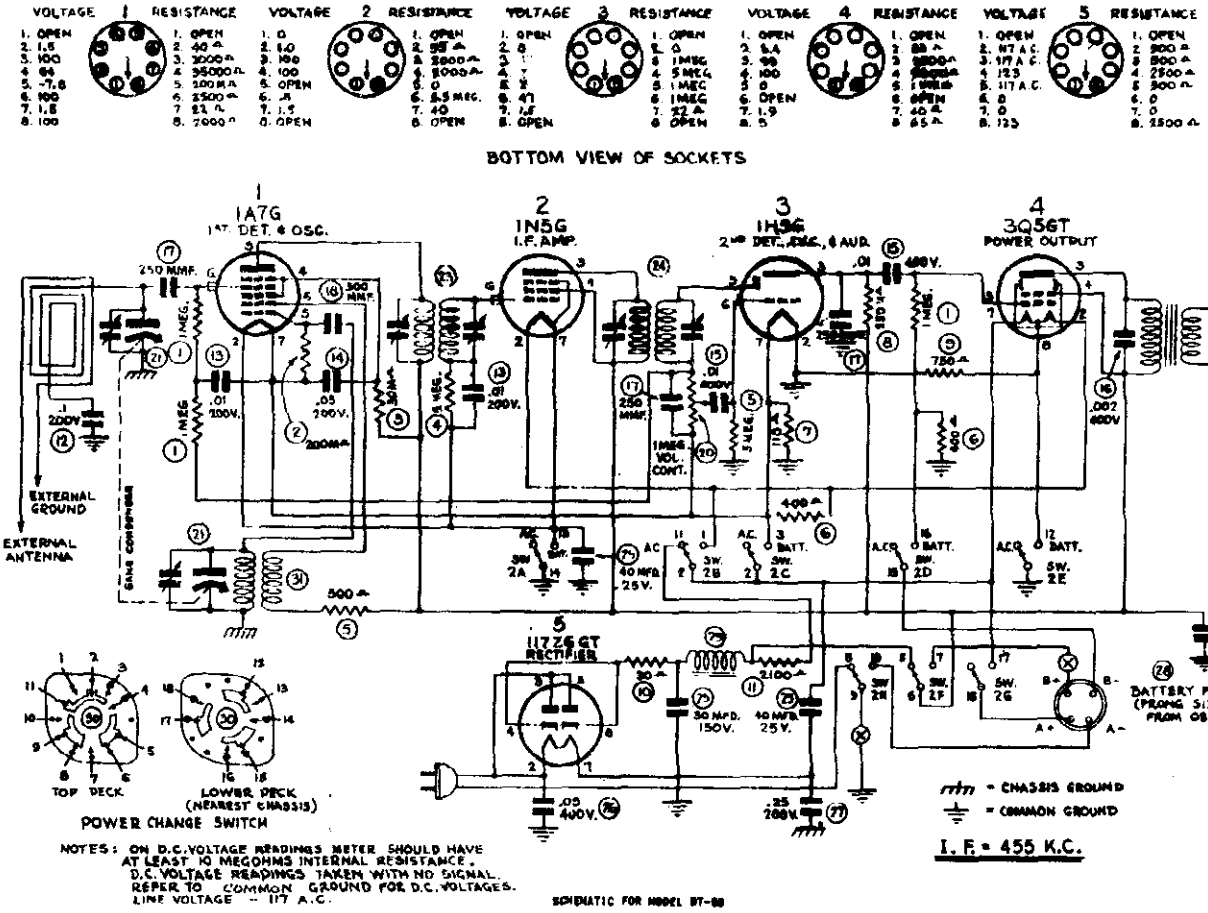
STEPS	DUMMY ANTENNA	SET GENERATOR AT	SET GANG AT	ADJUST	LOCATED	TO OBTAIN
1	SET VOLUME CONTROL FOR MAXIMUM OUTPUT					MAXIMUM OUTPUT
2	100 MMF	445 Kc	MINIMUM CAPACITY	2ND I.F. TRIMMERS	TOP OF I.F. TRANSFORMERS	
3				1ST I.F. TRIMMERS		
4		1720 Kc		B.C. OSC. TRIMMERS	ON TUNING CONDENSER	
5		1500 Kc	STRONGEST SIGNAL AND ROCK GANG	B.C. R.F. TRIMMER	*ON LOOP ANTENNA	
6	CHECK	1500 Kc, 1000 Kc AND 600 Kc				

SHORT WAVE BAND ALIGNMENT FOR CT-52, CT-53 AND CT-54 DUAL BAND RECEIVERS

7	400 OHMS	12.1 Mc	MINIMUM CAPACITY	S.W. OSC. TRIMMER	REAR OF CHASSIS	MAXIMUM OUTPUT
8		12.0 Mc	12.0	S.W. R.F. TRIMMER	ON LOOP ANTENNA	
9		9.4 Mc	9.4 Mc ROCK GANG FOR MAXIMUM SIGNAL	S.W. OSC. PADDER	FRONT OF CHASSIS	

*

FARNSWORTH TELEV. & RADIO CORP.



THIS SIX TUBE AC – DC OR FIVE TUBE BATTERY OPERATED PORTABLE RECEIVER HAS A BUIL IN LOOP ANTENNA. AN OUTSIDE ANTENNA MAY BE CONNECTED BY LOOSENING THE SCREW I THE LOWER RIGHT HAND CORNER OF THE BACK COVER. A GROUND SHOULD BE CONNECTED T THE SCREW IN THE LOWER LEFT HAND CORNER WHEN AN OUTSIDE ANTENNA IS USED.

ALIGNMENT

A SIGNAL GENERATOR CALIBRATED AT 455 Kc., 1400 Kc., AND 1730 Kc., IS NECESSARY PROPERLY ALIGN THIS RECEIVER. AFTER ALIGNING THE I.F. STAGES, REPLACE RECEIV IN CABINET AND FASTEN LOOP IN NORMAL POSITION BEFORE ALIGNING THE R.F. EN THROUGH THE OPENINGS IN THE END OF THE CABINET. THESE OPENINGS ARE CLOSED B SNAP FASTENERS. THE OSCILLATOR TRIMMER IS NEAREST THE FRONT PANEL AND THE LOC TRIMMER IS DIRECTLY BEHIND IT

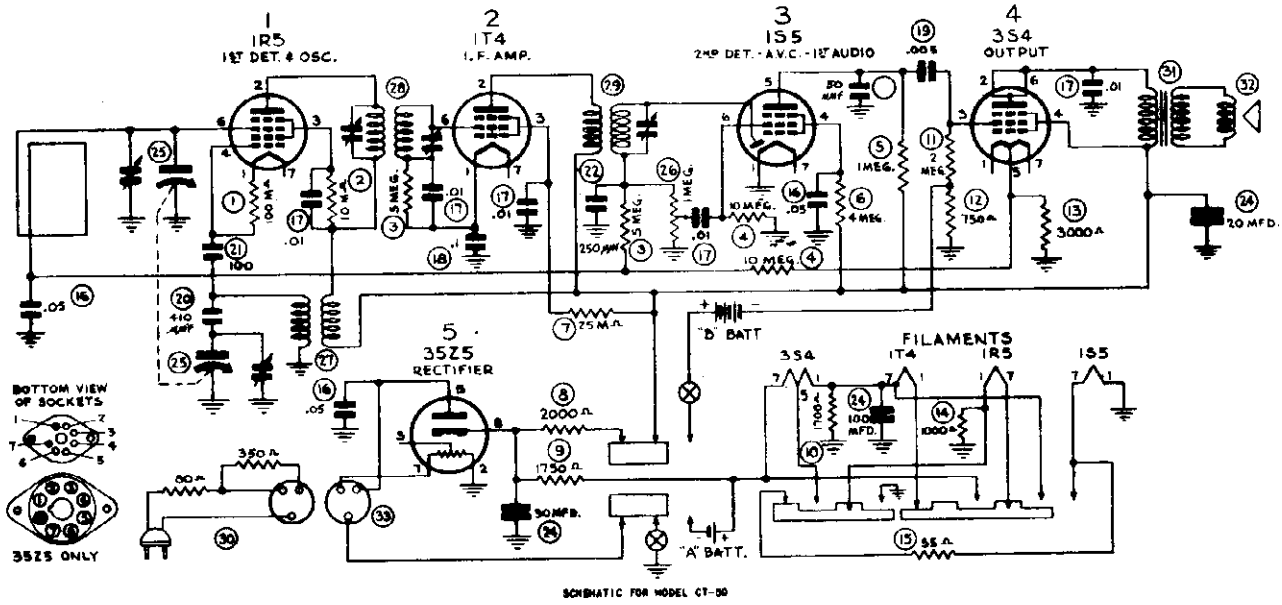
STEPS	USE IN SERIES WITH GENERATOR	SET GENERATOR AT	SET GANG AT	ADJUST	LOCATED	TO OBTAI
1.	.02MFD IN EACH LEAD CONNECT HIGH SIDE OF GENERATOR TO GRID CAP OF 1A7G TUBE	455 Kc.	QUIET POINT	2ND I.F. TRIMMERS 1ST I.F. TRIMMERS	TOP OF I.F. TRANS.	MAXIMUM OUTPUT
2.	LOOP**	1730 Kc.	MINIMUM	OSCILLATOR TRIMMER*	SEE NOTE BELOW	
3.	LOOP**	1400 Kc.	1400 Kc. & ROCK GANG	LOOP TRIMMER*		

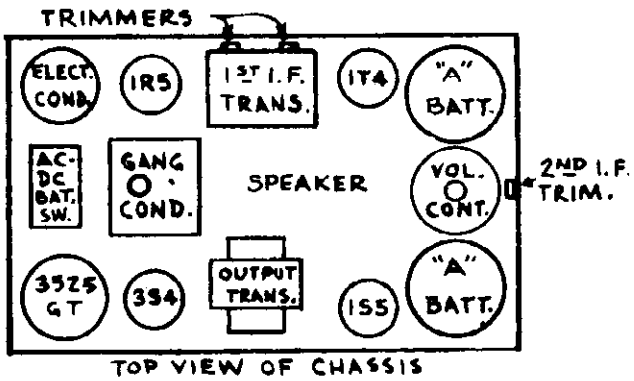
*SEE PRECEEDING PARAGRAPH FOR LOCATION OF TRIMMERS.

**LOOP TO CONSIST OF FIVE TO TEN TURNS OF INSULATED WIRE WOUND ON A THREE OR FOU INCH FORM TO BE CLOSELY COUPLED TO THE LOOP ANTENNA IN THE RECEIVER.

MODEL CT-59

FARNSWORTH TELEV. & RADIO CORP.





BATTERY

"A" BATTERIES

EVEREADY 950 — BURGESS NO. 2

FLASHLIGHT BATTERY OR SIZE D

TWO REQUIRED

REPLACE AFTER 25 HRS OF SERVICE

"B" BATTERY

EVEREADY 467 — BURGESS XX45

REPLACE AFTER 50 HRS OF SERVICE

WATTS	AT 117 VOLTS A.C.	25
VOLTAGE	A.C.	105–125

This five tube AC-DC or four tube battery operated portable receiver has a built in loop antenna.

ALIGNMENT

A signal generator calibrated at 455 Kc., 1400 Kc., and 1600 Kc., is necessary to properly align this receiver. After aligning the I.F. stages, replace receiver in cabinet and fasten loop in normal position before alighing the R.F. The oscillator trimmer is nearest the front panel on the gang and the loop trimmer is directly behind it on the gang. When aligning this receiver it should be operated on the self contained batteries.

TABULATION FOR ALIGNMENT

STEPS	USE IN SERIES WITH GENERATOR	SET GENERATOR AT	SET GANG AT	ADJUST	LOCATED	TO OBTAIN
1.	.02 MFD IN EACH LEAD CONNECT HIGH SIDE OF GENERATOR TO GRID OF 1R5 TUBE	455 Kc.	QUIET POINT	2ND I. F. TRIMMERS 1ST I.F. TRIMMERS	SEE FIG.	MAXIMUM OUTPUT
2.	LOOP **	1600 Kc.	MINIMUM	OSCILLATOR TRIMMER*	ON GANG COND.	
3.	LOOP**	1600 Kc.	1600 Kc. & ROCK GANG	LOOP TRIMMER*	ON GANG COND.	

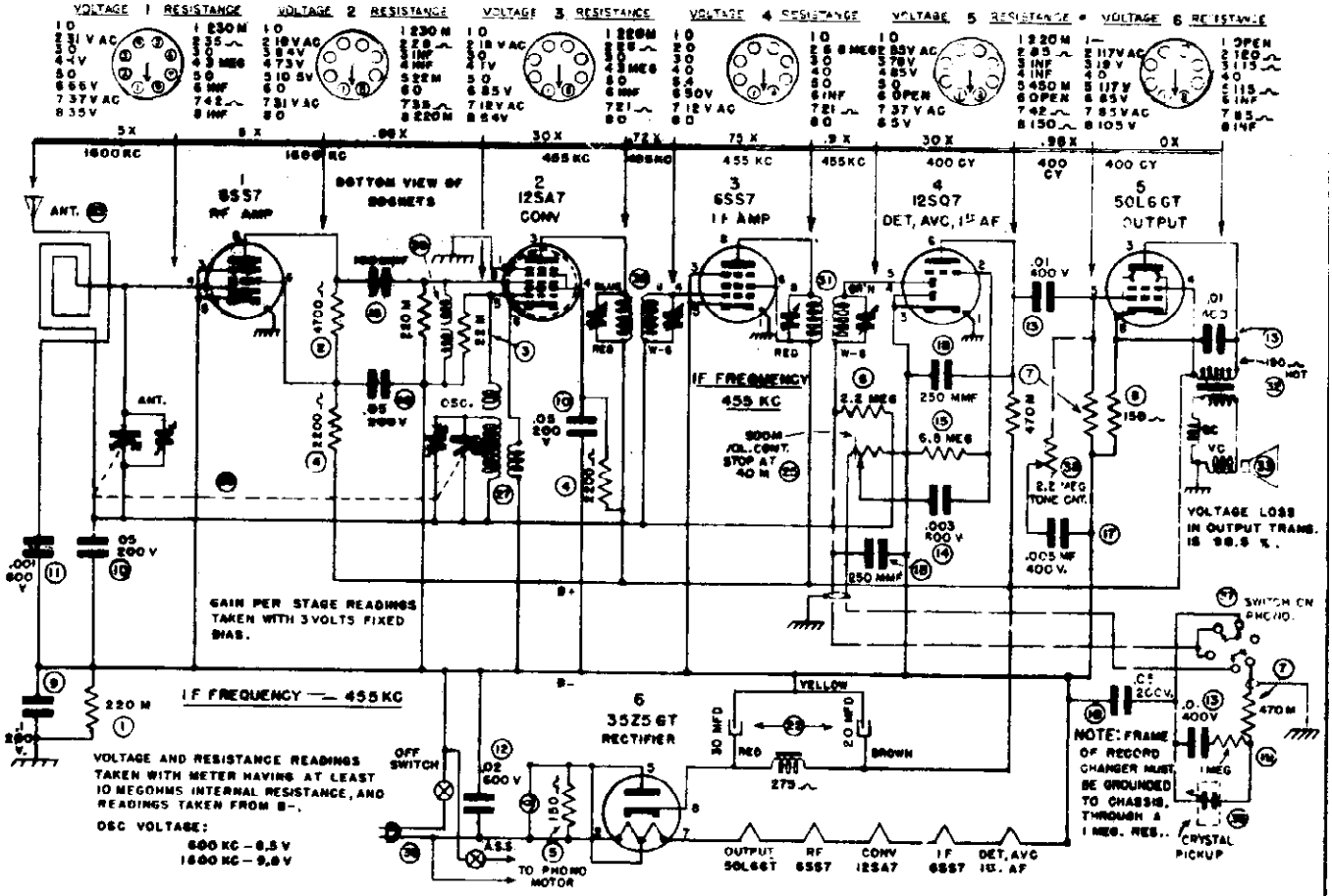
**LOOP TO CONSIST OF FIVE TO TEN TURNS OF INSULATED WIRE WOUND ON A THREE OR FOUR INCH FORM TO BE CLOSELY COUPLED TO THE LOOP ANTENNA IN THE RECEIVER.

CT-64, Chas. C110-2;
CK-66, Chas. C106-2

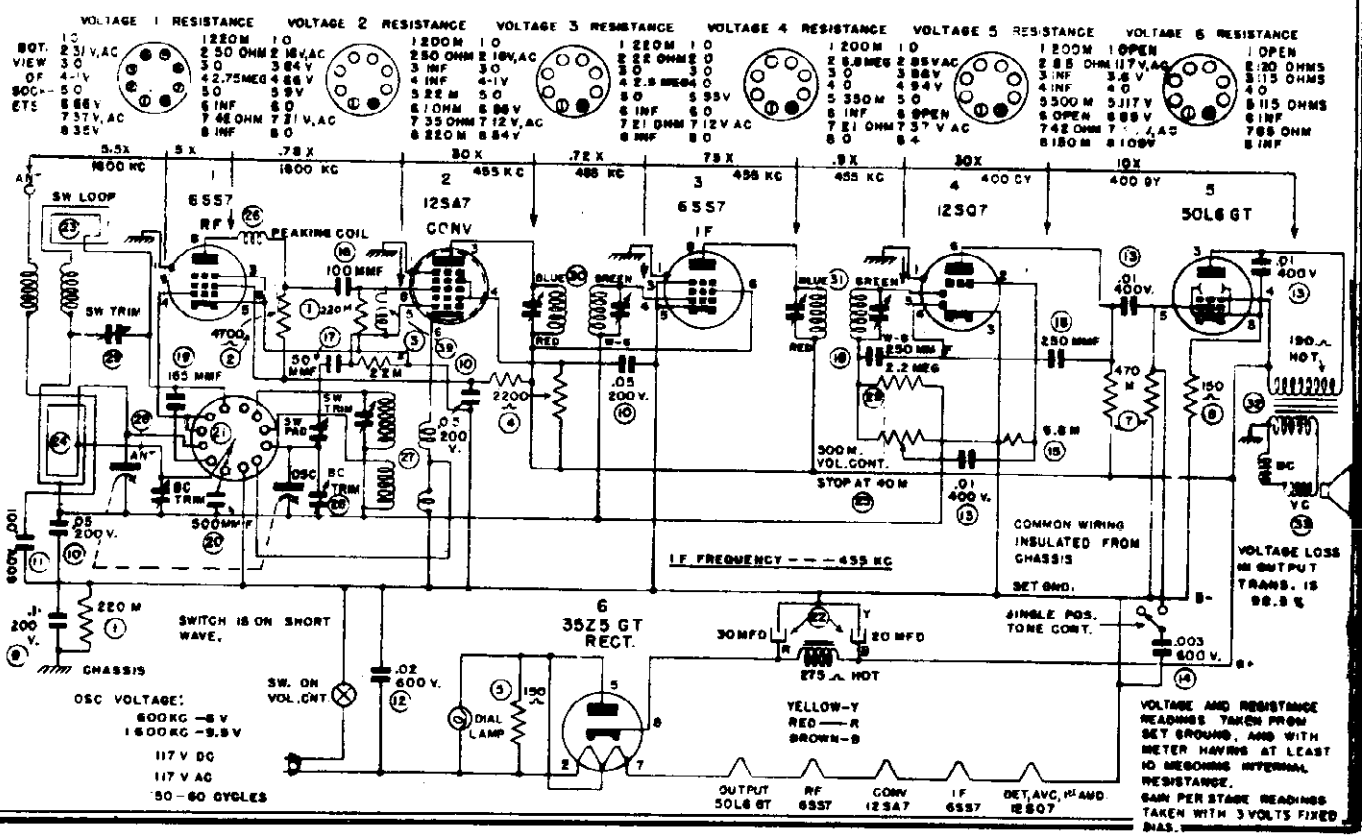
FARNSWORTH TELEV. & RADIO CORP.

CT-61 - CT-62 - CK-66 SINGLE BAND

MODELS CT-61, CT-62, Chassis C106-1;
CT-63, Chas. C110-1;



CT-63 - CT-64 - DUAL BAND

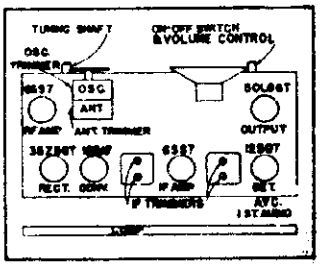


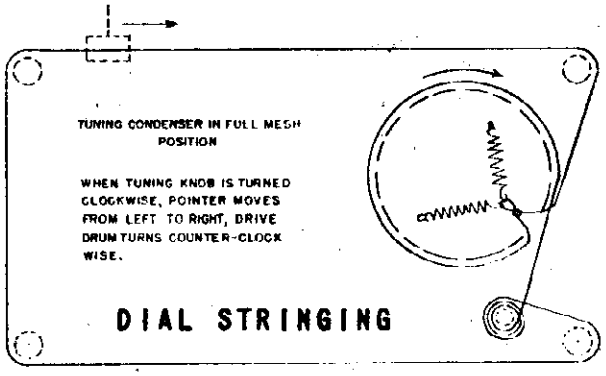
CHASSIS C106-1,C106-2.
C110-1,C110-2

FARNSWORTH TELEV. & RADIO CORP.

6SS7 – R.F. AMPLIFIER
12SA7 – CONVERTER AND OSCILLATOR
6SS7 – I.F. AMPLIFIER
12SQ7 – DET, A.V.C. AND AUDIO
50L6GT – OUTPUT
35Z5GT – RECTIFIER

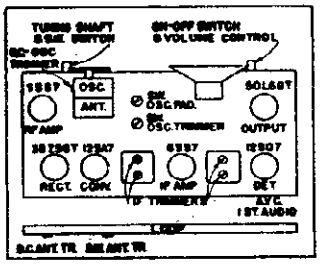
SINGLE BAND TUBE LAYOUT





DIAL STRINGING

DUAL BAND TUBE LAYOUT



WHEN ALIGNING THE SHORT WAVE OSCILLATOR TIGHTEN THE ADJUSTING SCREW FOR MAXIMUM CAPACITY AND THEN LOOSEN IT UNTIL THE FIRST PEAK IS REACHED. DO NOT USE THE SIGNAL HEARD AT THE LOWER CAPACITY SETTING AS IN THIS RECEIVER THE OSCIALLTOR WORKS AT A FREQUENCY LOWER THAN THE ONE THE R.F. IS TUNED TO. IF THE LOOP IS TUNED TO 9.0 MC THE OSCILLATOR IS TUNED TO 8,545 KC THAT IS SIGNAL FREQUENCY MINUS I.F. FREQUENCY, INSTEAD OF SIGNAL FREQUENCY PLUS I.F. FREQUENCY, OR 9,455 KC AS IS CUSTOMARY.

TABULATION FOR ALIGNMENT OF SINGLE AND DUAL BAND REVEIVERS

STEPS	DUMMY ANTENNA	SET GENERATOR AT	SET GANG AT	ADJUST	LOCATED	TO OBTAIN
1	SET VOLUME CONTROL FOR MAXIMUM OUTPUT					
2	100 MMF	455 Kc	MINIMUM CAPACITY	2ND I.F. TRIMMERS	TOP OF I.F. TRANSFORMERS	MAXIMUM OUTPUT
3				1ST I.F. TRIMMERS		
4		1720 Kc		B.C. OSC. TRIMMERS	ON TUNING CONDENSER	
5		1500 Kc	STRONGEST SIGNAL AND ROCK GANG	B.C. R.F. TRIMMERS	*ON LOOP ANTENNA	
6	CHECK	1500 Kc, 1000 Kc AND 600 Kc				

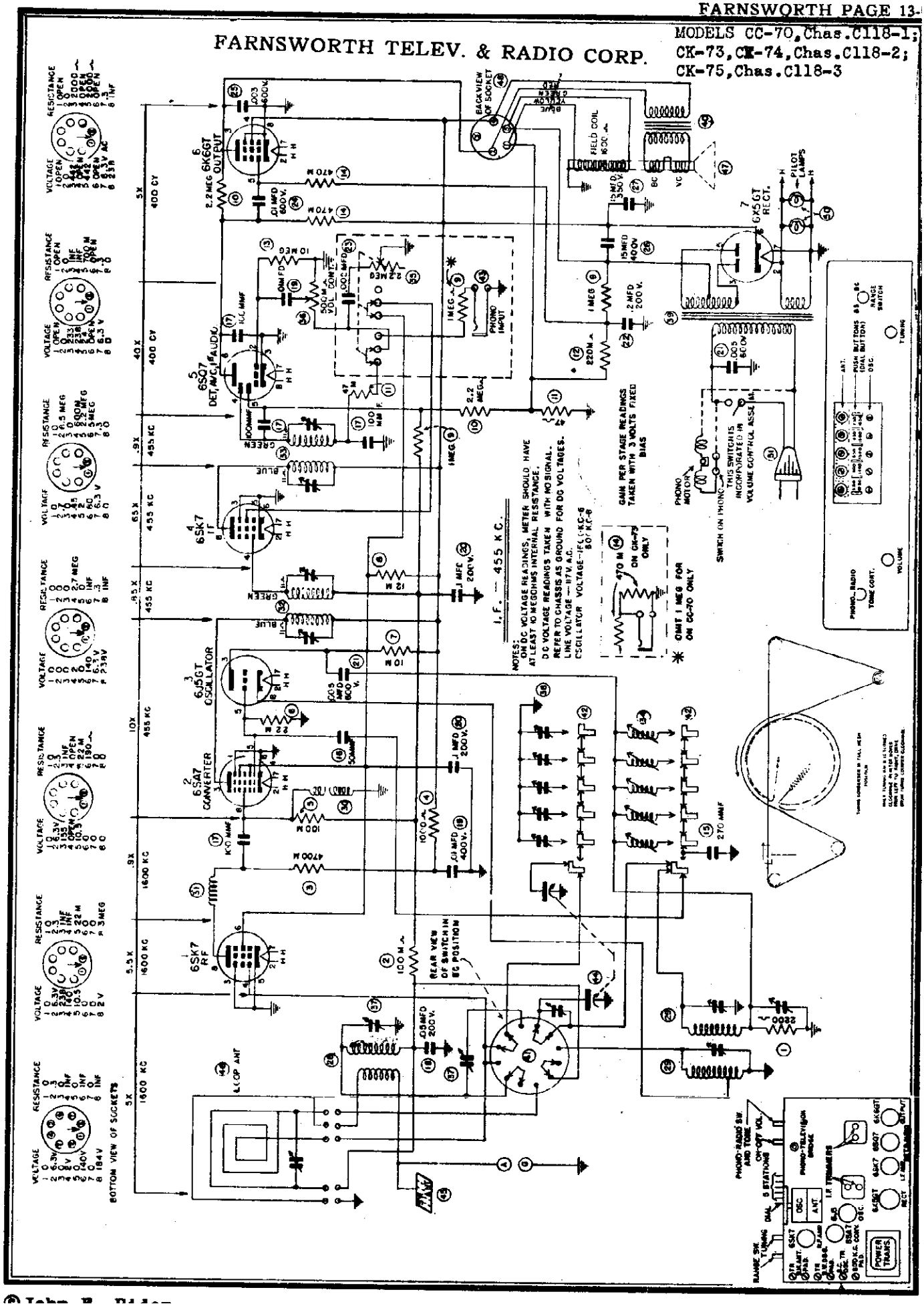
SHORT WAVE BAND ALIGNMENT FOR CT-63 AND CT-64 DUAL BAND RECEIVERS

7	400 OHMS	12.1 Mc	MINIMUM CAPACITY	S.W. OSC. TRIMMER	REAR OF CHASSIS	MAXIMUM OUTPUT
8		12 Mc	12 Mc	S.W. R.F. TRIMMER	ON LOOP ANTENNA	
9		9.4 Mc	9.4 Mc ROCK GANG FOR MAXIMUM SIGNAL	S.W. OSC. PADDER	FRONT OF CHASSIS	

* SEE CHASSIS LAYOUT ON FRONT PAGE.

FARNSWORTH TELEV. & RADIO CORP.

MODELS CC-70, Chas. C118-1;
CK-73, CK-74, Chas. C118-2;
CK-75, Chas. C118-3



CHASSIS C118-1,C118-2, C118-3

FARNSWORTH TELEV. & RADIO CORP.

WATTS AT 117 VOLTS A.C. CC MODEL 60, CK MODELS 80
VOLTAGE A.C. 105-125

PUSH BUTTON SET UP

TO PREVENT THE BUTTONS FROM BEING SET UP ON THE WRONG STATION A SIGNAL GENERATOR SHOULD BE USED.

ADJUST THE LOWER SCREW FIRST AS THIS IS THE OSCILLATOR, UNTIL THE SIGNAL IS HEARD MOST CLEARLY (SEE FIG.). THEN ADJUST THE TRIMMER SCREW DIRECTLY ABOVE THE OSCILLATOR FOR MAXIMUM VOLUME.

EQUIPMENT AND PROCEDURE FOR ALIGNMENT

WHEN ALIGNING THIS RECEIVER A SIGNAL GENERATOR CALLIBRATED AT 455 KC, 600 KC, 1500 KC, 1720 KC, 9.5 MC, 12 MC, AND 12.1 MC, ALSO AN OUTPUT INDICATOR ARE REQUIRED. ALL ADJUSTMENTS SHOULD BE MADE WITH THE VOLUME CONTROL SET FOR MAXIMUM VOLUME, KEEPING THE GENERATOR OUTPUT AS LOW AS POSSIBLE TO PREVENT A.V.C. ACTION AND FALSE READINGS. BEFORE RE-ALIGNING THE SET BE SURE ALL ADJUSTING SCREWS FOR THE IRON CORE OSCILLATOR COILS ARE FLUSH WITH OR INSIDE THE CHASSIS BASE.

CONNECT THE LOW SIDE OF THE SIGNAL GENERATOR TO THE TERMINAL MARKED G. (GROUND), AND THE HIGH SIDE OF THE GENERATOR TO THE TERMINAL MARKED A. (ANTENNA). (SEE FIG.A).

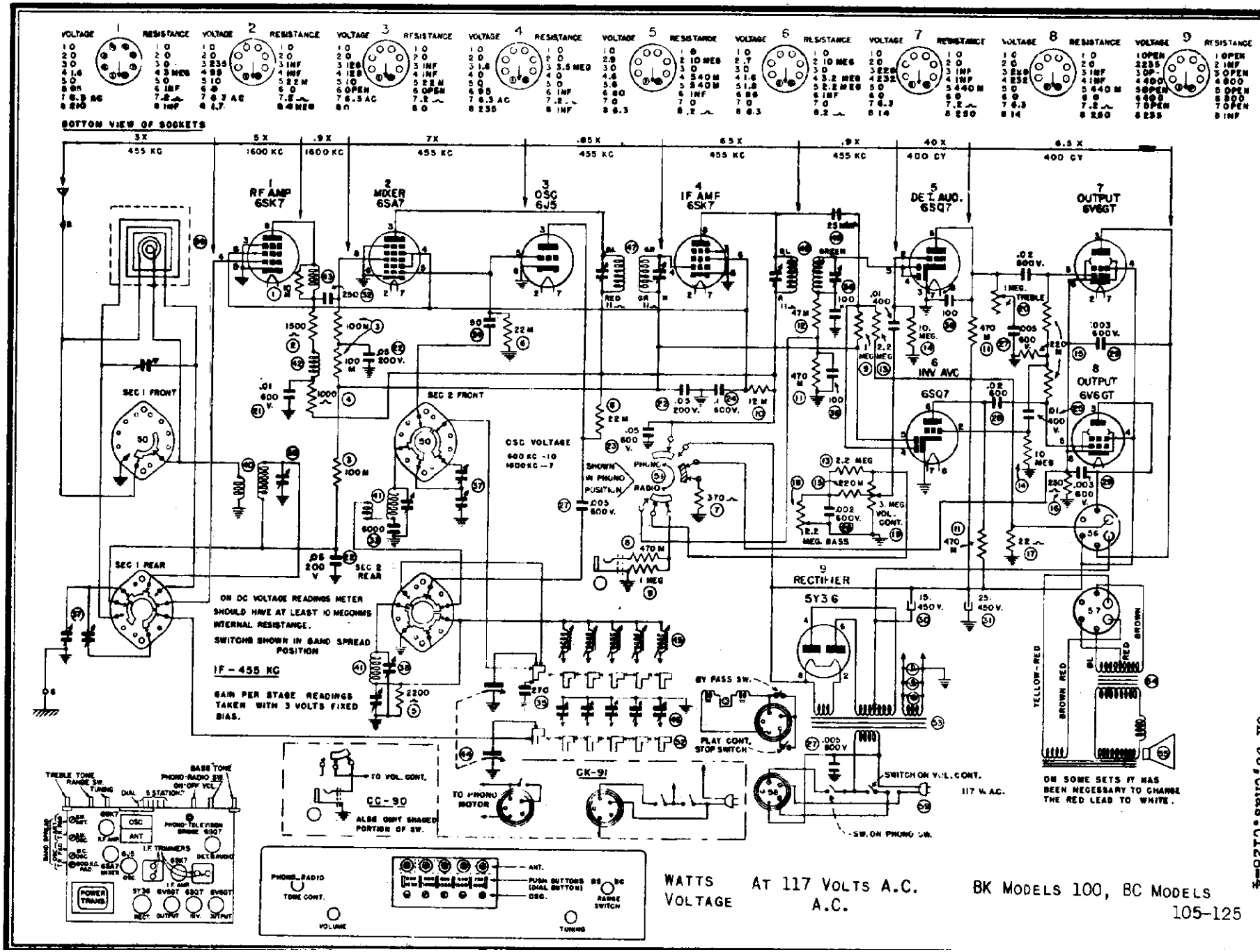
CAUTION—OFTEN TWO PEAKS ARE FOUND AT 12.1 MC. USE THE ONE FOUND AT THE MAXIMUM SETTING OF THE OSCILLATOR TRIMMER.

CAUTION—BE SURE AND REMOVE THE DIAL POINTER BEFORE REMOVING THE SET FROM THE CABINET.

STEPS	USE IN SERIES WITH ANTENNA	SET GENERATOR AT	SET GANG AT	ADJUST	LOCATED	TO OBTAIN
1.	SET VOLUME CONTROL AT MAXIMUM					
2.	250 MMFD.	455 KC.	NOTE A	2ND I.F. TRIMMERS	TOP 2ND I.F. TRAN.	MAXIMUM OUTPUT
3.				1ST I.F. TRIMMERS	TOP 1ST I.F. TRAN.	
4.		1720 MC.	1720	B.C. R.F. TRIMMER	SEE FIG.	
5.		1500 KC.	1500	B.C. R.F. TRIMMER	ON THE LOOP	
6.		600 KC.	600 KC. ROCK GANG	B.C. PADDER	SEE FIG.	
7.	RECHECK 1600 KC.					
8.	400 OHMS	12.1 MC.	12.1 MC.	S.W. OSC. TRIMMER		
9.		12.1 MC.	12.1 MC.	S.W. R.F. TRIMMER		
10.		9.5	9.5 MC. ROCK GANG	S.W. PADDER		

FARNSWORTH TELEV. & RADIO CORP.

MODELS CC-90, Ch. C128-1;
CK-91, Chas. C128-2;
CK-92, Chas. C128-3;
CK-93, Chas. C128-4



WATTS AT 117 VOLTS A.C.
VOLTAGE A.C.

BK MODELS 100, BC MODELS 105-125

CHASSIS C128-1,C128-2,
C128-3,C128-4

FARNSWORTH TELEV. & RADIO CORP.

PUSH BUTTON SET UP

TO PREVENT THE BUTTONS FROM BEING SET UP ON THE WRONG STATIONS A SIGNAL GENERATOR SHOULD BE USED.

THE BUTTON TO THE EXTREME RIGHT IS THE MANUAL TUNING BUTTON.

ADJUST THE LOWER SCREW (SEE FIG.) FIRST AS THIS IS THE OSCILLATOR; THEN ADJUST THE UPPER SCREW FOR MAXIMUM OUTPUT.

TABULATION FOR ALIGNMENT

STEPS	IN SERIES WITH ANTENNA	SET GENERATOR AT	SET GANG AT	ADJUST	LOCATED	TO OBTAIN
1	250 M.M.F.	455 Kc.	NOTE A	2ND I.F. TRIMMERS	TOP OF I.F. TRANS.	MAX. OUTPUT
2				1ST I.F. TRIMMERS		
3			PUSH STATION BUTTON	WAVE TRAP TRIMMER	SEE FIG.	MIN. OUTPUT
4		1720 Kc.	1720 Kc.	B.C. OSC. TRIMMER	SEE FIG.	MAXIMUM OUTPUT
5		1500 Kc.	1500 Kc.	B.C. ANT. TRIMMER		
6		600 Kc.	NOTE B	600 Kc. PAD		
7	RECHECK	1500 Kc.				
8	400 OHMS	18 Mc.	18 Mc.	S.W. OSC. TRIMMER *		
9		16 Mc.	16 Mc.	S.W. ANT TRIMMER **		
10	CHECK	6 Mc.				
11	400 OHMS	12 Mc.	12 Mc.	S.B. OSC. TRIMMER *		
12				S.B. ANT. TRIMMER **		
13		9.5 Mc.	9.5 Mc.	S.B. OSC. PADDER		
14				S.B. ANT. PADDER		
15	RECHECK	12 Mc.				

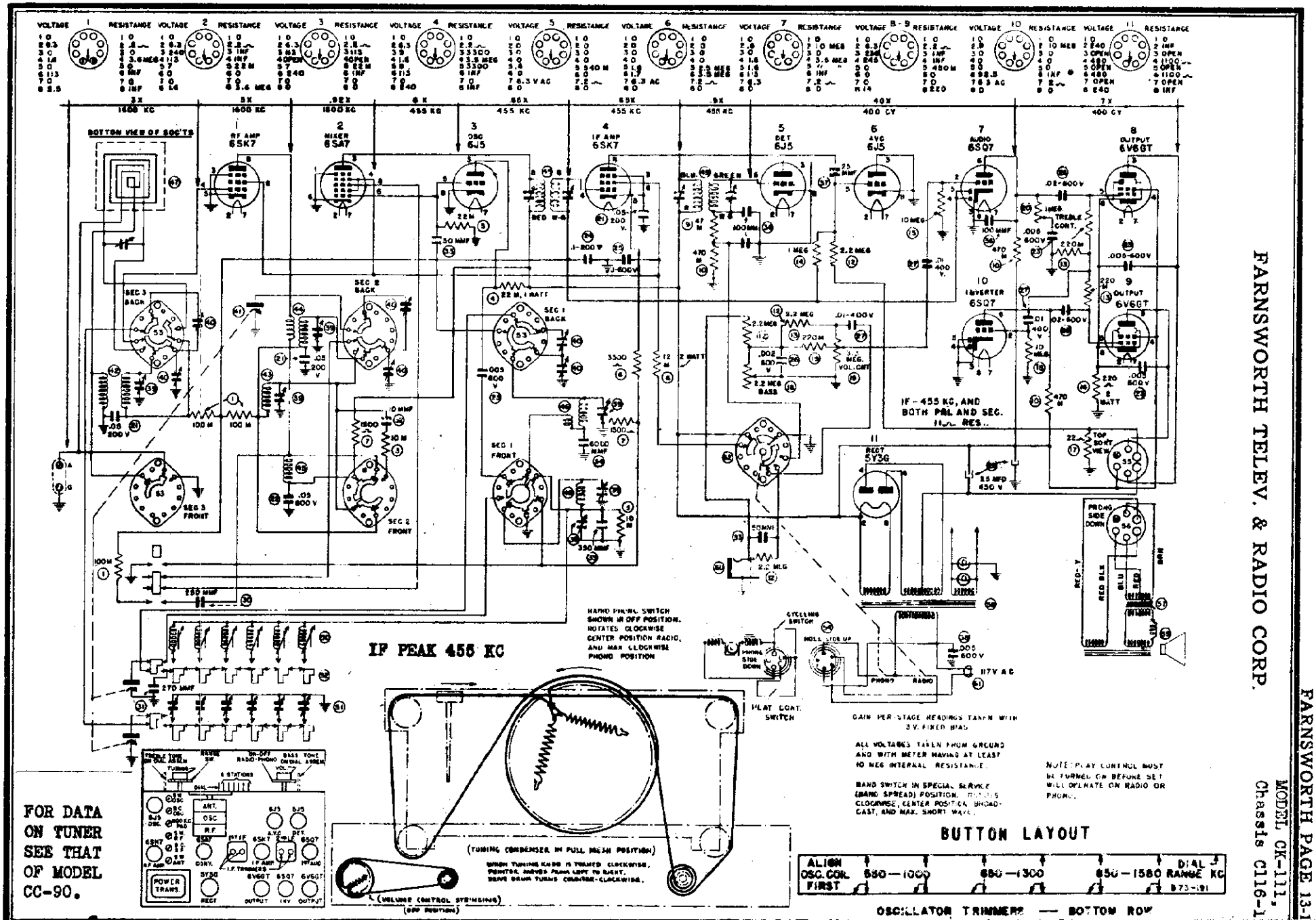
After pointer has been set on BC and calibrations checked, with range switch on Band Spread (Full CCW) set condenser so pointer is on 12 MC on "Foreign Spread Band." Set "Spread Band" Osc. trimmer for maximum output. Check for image on 11.1 Mc. (A weakened signal should be heard). Align antenna Band Spread trimmer for maximum signal. Turn condenser so pointer is on 9.5 Mc. adjust Spread Band Osc. padder for maximum signal. Check for image. (NO signal should be heard on 10.4 Mc). Align Antenna Band Spread padder for maximum signal. Go back to 12 Mc and repeat above. If much readjustment has to be made on trimmers, the padders must be checked again. Great care must be taken in adjusting Band Spread trimmers. Image must be checked. A fibre screwdriver must be used to adjust band spread.

*Tighten oscillator trimmer screw for maximum capacity, then unscrew until second peak is secured.
**Tighten R.F. trimmer screw for maximum capacity, then unscrew until first peak is secured.

NOTE A. Set gang at minimum.
NOTE B. Strongest signal and rock gang.

FARNSWORTH TELEV. & RADIO CORP.

MODEL CK-111,
Chassis C116-1



FOR DATA ON TUNER SEE THAT OF MODEL CC-90.

MODEL CK-111,
Chassis C116-1

FARNSWORTH TELEV. & RADIO CORP.

ALIGNMENT INSTRUCTIONS

AN OUTPUT METER AND A SIGNAL GENERATOR ARE REQUIRED FOR PROPER ALIGNMENT OF THESE SETS. THE OSCILLATOR SHOULD BE CALIBRATED AT THE FOLLOWING POINTS, 455 Kc, 600 Kc, 900 Kc, 1500 Kc, 1720 Kc, 9.5 Mc, 12 Mc, 16 Mc AND 18.1 Mc. ALWAYS KEEP THE OUTPUT OF THE SIGNAL GENERATOR AS LOW AS POSSIBLE TO PREVENT A.V.C. ACTION AND FALSE SETTINGS. CONNECT THE HIGH SIDE OF THE GENERATOR TO THE ANTENNA TERMINAL AND THE LOW SIDE OF IT TO THE GROUND TERMINAL MAKING CERTAIN JUMBER ON TERMINAL STRIP IS DISCONNECTED. BEFORE ALIGNING TIGHTEN WAVE TRAP TRIMMER SCREW.

TABULATION FOR ALIGNMENT

STEPS	IN SERIES WITH ANTENNA	SET GENERATOR AT	SET GANG AT	ADJUST	LOCATED	TO OBTAIN
1	250 M.M.F.	455 Kc.	Note A	2nd I.F. Trimmers	Top of I.F. Trans.	Max. Output
2				1st I.F. Trimmers		
3			Push Station Button	Wave Trap Trimmer	See Fig.	Min. Output
4		1720 Kc.	1720 Kc.	B.C. Osc. Trimmer	SEE FIG.	MAXIMUM OUTPUT
5		1500 Kc.	1500 Kc.	B.C. Mixer Trimmer		
6				B.C. Ant. Trimmer		
7		600 Kc.	Note B	600 Kc. Pad		
8	RECHECK	1400 Kc.				
9	400 Ohms	18 Mc.	18 Mc.	S.W. Osc. Trimmer *		
10		16 Mc.	16 Mc.	S.W. Mixer Trimmer **		
11				S.W. Ant. Trimmer **		
12	CHECK	6 Mc.				
13	400 Ohms	12 Mc.	12 Mc.	B.S. Osc. Trimmer *		
14				B.S. Mixer Trimmer **		
15				B.S. Ant. Trimmer **		
16		9.5 Mc.	9.5 Mc.	B.S. Osc. Padder		
17				B.S. Mixer Padder		
18				B.S. Ant. Padder		
19	RECHECK	12 Mc.				

AFTER POINTER HAS BEEN SET ON BC AND CALIBRATION CHECKED: WITH RANGE SWITCH ON BAND SPREAD (FULL CCW) SET CONDENSER SO POINTER IS ON 12 Mc ON "FOREIGN SPREAD BAND." SET "SPREAD BAND" OSC. TRIMMER FOR MAXIMUM OUTPUT. CHECK FOR IMAGE ON 11.1 Mc (A WEAK SIGNAL SHOULD BE HEARD). ALIGN RF AND ANTENNA BAND SPREAD TRIMMERS FOR MAXIMUM SIGNAL. TURN CONDENSER SO POINTER IS ON 9.5 Mc, ADJUST SPREAD BAND OSC. PADDER FOR MAXIMUM SIGNAL. CHECK FOR IMAGE. (NO SIGNAL SHOULD BE HEARD ON 10.4 Mc). ALIGN RF AND ANTENNA BAND SPREAD PADDER FOR MAXIMUM SIGNAL. GO BACK TO 12 Mc AND REPEAT ABOVE. IF SUCH READJUSTMENT HAS TO BE MADE ON TRIMMERS, THE PADDERS MUST BE CHECKED AGAIN. GREAT CARE MUST BE TAKEN IN ADJUSTING BAND SPREAD TRIMMERS. IMAGES MUST BE CHECKED. A FIBRE SCREWDRIVER MUST BE USED TO ADJUST BAND SPREAD.

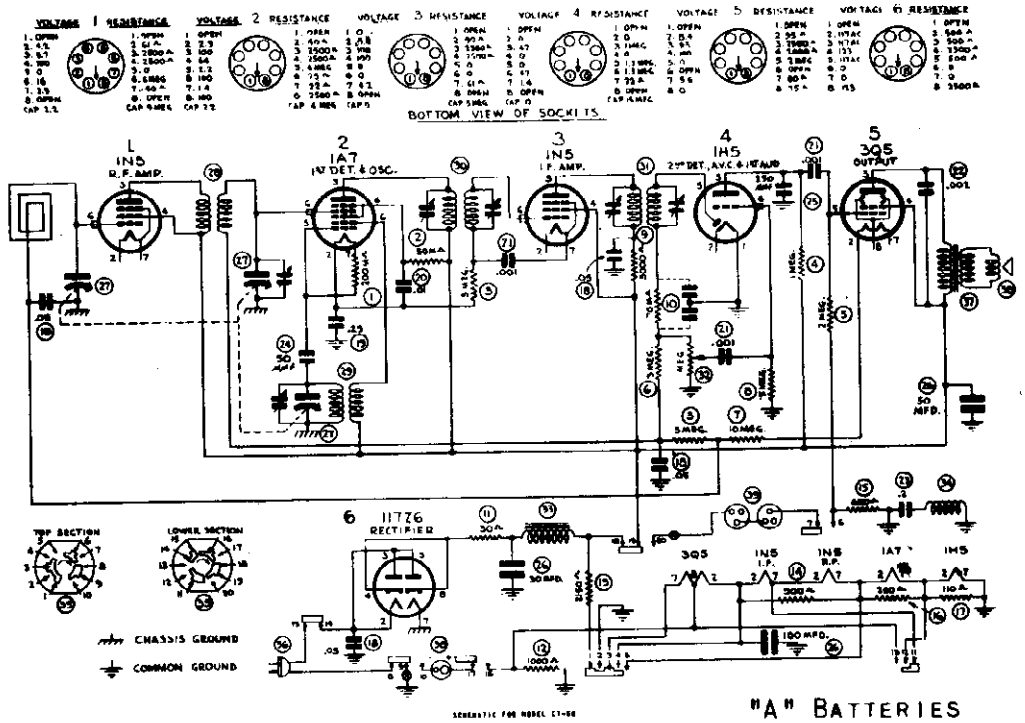
*TIGHTEN OSCILLATOR TRIMMER SCREW FOR MAXIMUM CAPACITY, THEN UNSCREW UNTIL SECOND PEAK IS SECURED.

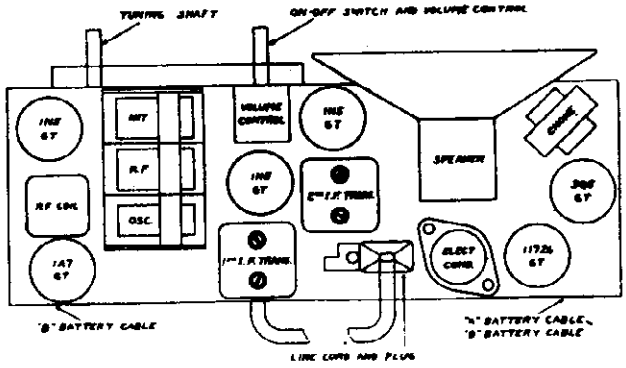
**TIGHTEN RF TRIMMER SCREW FOR MAXIMUM CAPACITY, THEN UNSCREW UNTIL FIRST PEAK IS SECURED.

NOTE A. SET GANG AT MINIMUM.
NOTE B. STRONGEST SIGNAL AND ROCK GANG.

MODEL CT-60

FARNSWORTH TELEV. & RADIO CORP.





"A" BATTERIES
1 BURGESS NO. 6F
1 EVEREADY NO. 745
1 RAY-O-VAC NO. P96A
1 BOND 4824
1 GENERAL 6F1

"B" BATTERIES
2 BURGESS NO. B30
2 EVEREADY NO. 482
2 RAY-O-VAC NO. 5303
2 BOND 3017
2 GENERAL V30B

WATTS	AT 117 VOLTS A.C.	25
VOLTAGE	A.C.	105-125

This six tube AC-DC or five tube battery operated portable receiver has a built in loop antenna. To connect an external antenna and ground remove the screws in the back of the cabinet then remove the back. The external antenna and ground may now be connected to the two wires at the top side of the cabinet. Try reversing the connections of the two wires to obtain best results.

ALIGNMENT

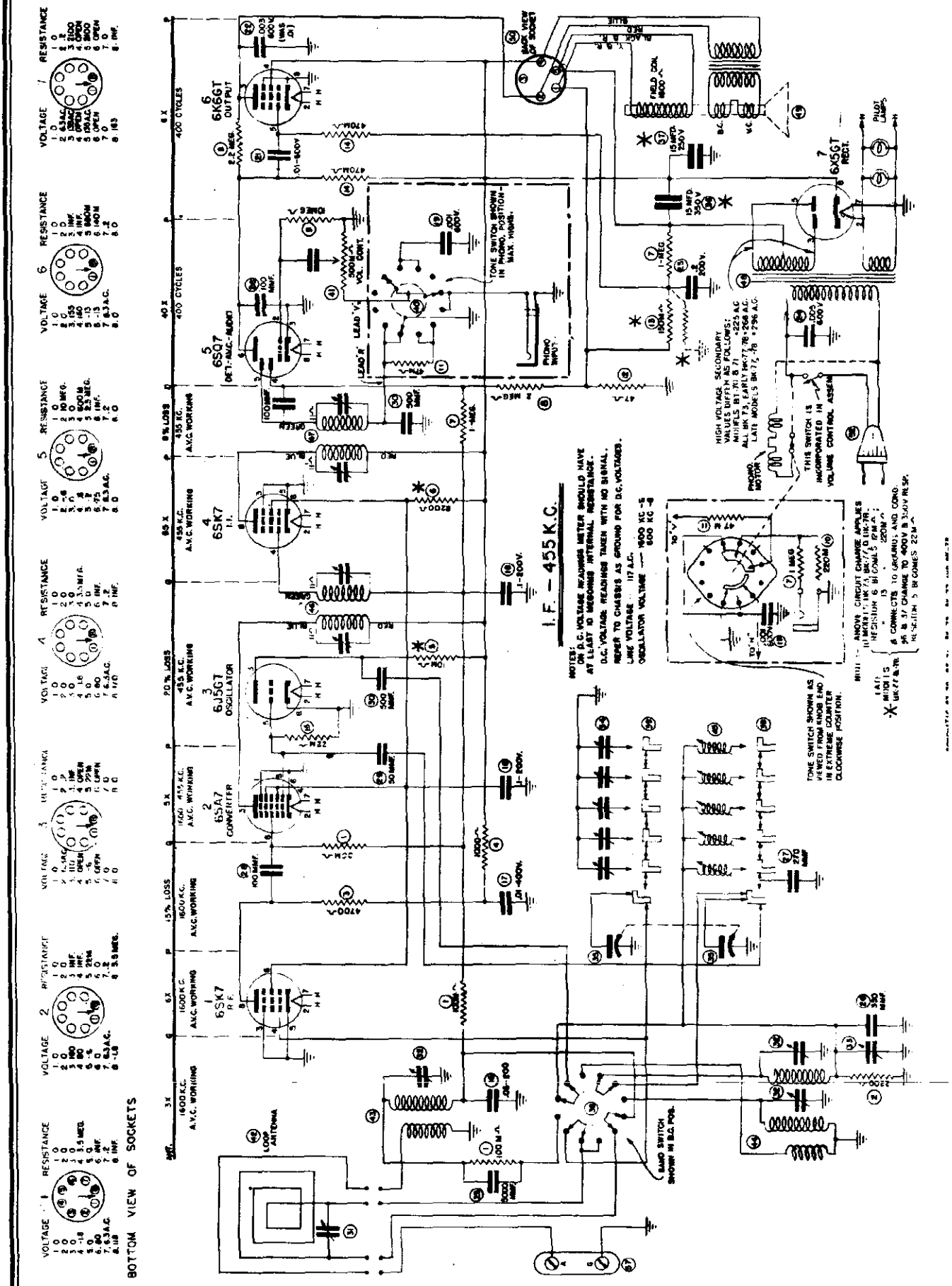
The alignment of this receiver requires the use of a signal generator that will cover the frequencies of 455, 1400 and 1600 Kc., and an output meter connected across the secondary of the output transformer. All alignments should be made with the set operating on the self-contained batteries.

TABULATION FOR ALIGNMENT

STEPS	USE IN SERIES WITH GENERATOR	SET GENERATOR AT	SET GANG AT	ADJUST	LOCATED	TO OBTAIN
1.	.02 MFD IN EACH LEAD CONNECT HIGH SIDE OF GENERATOR TO GRID CAP OF 1A7G TUBE	455 Kc.	QUIET POINT	2ND I.F. TRIMMERS	TOP OF I.F. TRANS.	MAXIMUM OUTPUT
				1ST I.F. TRIMMERS		
2.	HIGH SIDE TO GRID OF 1N5 R.F. TO BE THRU .02 MFD.	1600 Kc.	MINIMUM	OSCILLATOR TRIMMER	HOLE IN TOP OF R.F. COIL CAN	
3.	HIGH SIDE TO GRID OF 1N5 R.F. TO BE THRU .02 MFD.	1400 Kc.	1400 Kc. & ROCK GANG	R.F. TRIMMER	ON GANG SEE FIG.	

FARNSWORTH TELEV. & RADIO CORP.

MODELS BT70,BT
BK73,BK77,BK78



MODELS BT70,BT71, BK73,BK77,BK78 — MODELS BK84 - BK85,etc.

FARNSWORTH TELEV. & RADIO CORP.

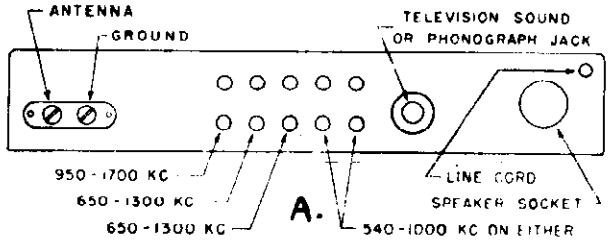
WHEN ALIGNING THIS RECEIVER A SIGNAL GENERATOR CALLIBRATED AT 455 Kc, 600 Kc, 1500 Kc, 1600 Kc, 6 Mc, 10 Mc, AND 18.1 Mc. ALSO AN OUTPUT INDICATOR ARE REQUIRED. ALL ADJUSTMENTS SHOULD BE MADE WITH THE VOLUME CONTROL SET FOR MAXIMUM VOLUME, KEEPING THE GENERATOR OUTPUT AS LOW AS POSSIBLE TO PREVENT A.V.C. ACTION AND FALSE READINGS. BEFORE RE-ALIGNING THE SET BE SURE ALL ADJUSTING SCREWS FOR THE IRON CORE OSCILLATOR COILS ARE FLUSH WITH OR INSIDE THE CHASSIS BASE.

CONNECT THE LOW SIDE OF THE SIGNAL GENERATOR TO THE TERMINAL MARKED G. (GROUND), AND THE HIGH SIDE OF THE GENERATOR TO THE TERMINAL MARKED A. (ANTENNA). (SEE FIG.A.)

CAUTION---OFTEN TWO PEAKS ARE FOUND AT 18 Mc. USE THE ONE FOUND AT THE MAXIMUM SETTING OF THE OSCILLATOR TRIMMER.

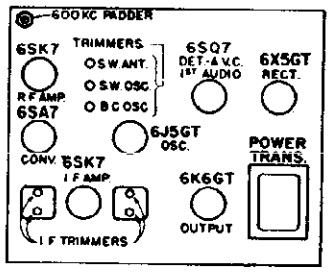
TABULATION FOR ALIGNMENT

STEPS	USE IN SERIES WITH ANTENNA	SET GENERATOR AT	SET GANG AT	ADJUST	LOCATED	TO OBTAIN
1.	SET VOLUME CONTROL AT MAXIMUM					
2.	250 MMFD.	455 Kc.	NOTE A	2ND I.F. TRIMNERS	TOP 2ND I.F. TRAN.	MAXIMUM OUTPUT
3.				1ST I.F. TRIMMERS	TOP 1ST I.F. TRAN.	
4.		1600 Kc.		B.C.R.F. TRIMMER	SEE FIG.	
5.		1500 Kc.	NOTE B	B.C.R.F. TRIMMER	ON THE LOOP	
6.		600 Kc.		B.C.	SEE FIG.	
7.	RECHECK 1600 Kc.					
8.	400 OHMS	18.1 Mc.	NOTE A	S.W. OSC. TRIMMER		
9.		16 Mc.	NOTE B	S.W.R.F. TRIMMER		
10.	CHECK SIGNAL AT 6 Mc. AND 10 Mc.	NOTE A. SET GANG AT MINIMUM NOTE B. STRONGEST SIGNAL AND ROCK GANG				



A.

B. CHASSIS LAYOUT

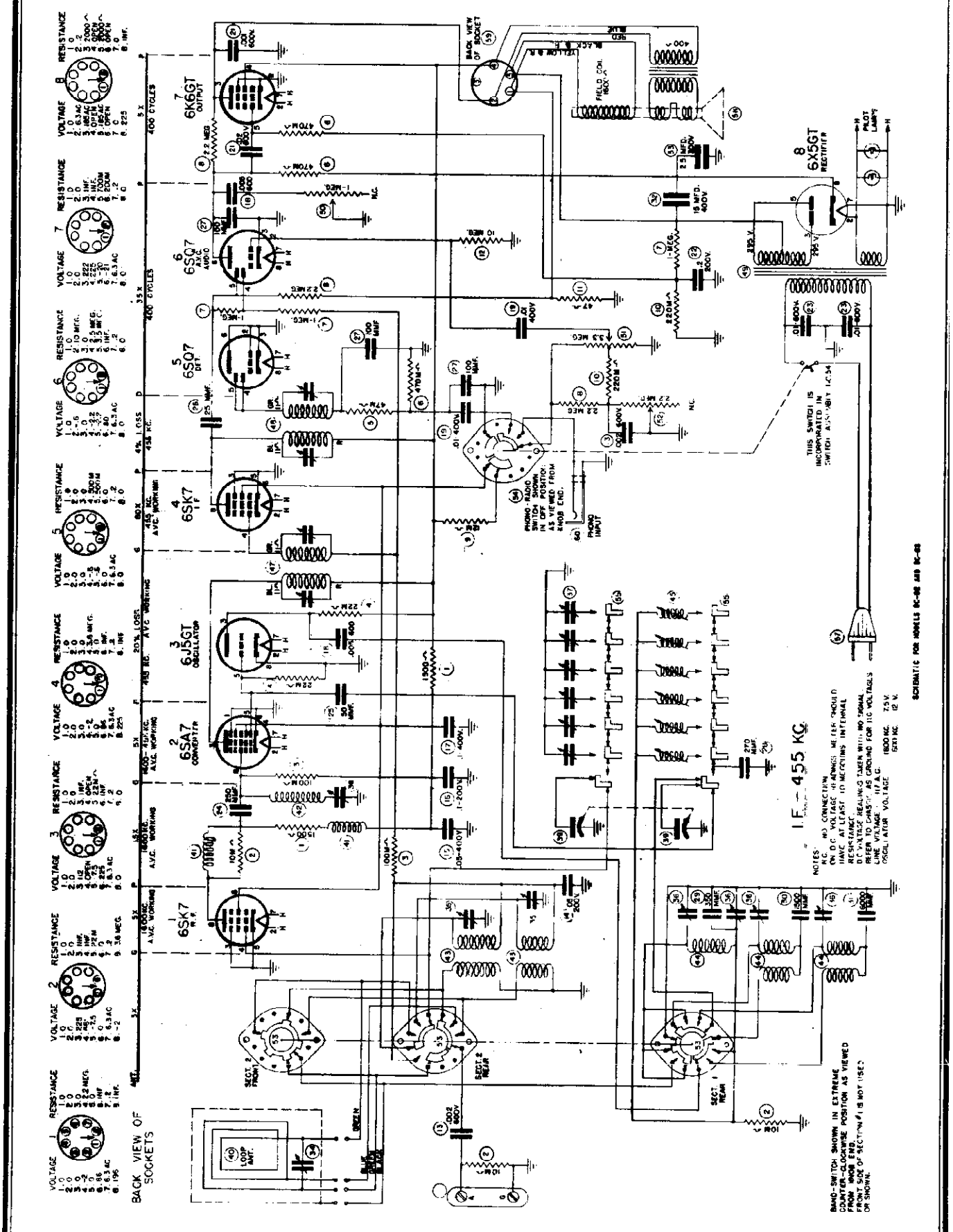


PUSH BUTTON SET UP

TO PREVENT THE BUTTONS FROM BEING SET UP ON THE WRONG STATION A SIGNAL GENERATOR SHOULD BE USED.

ADJUST THE LOWER SCREW FIRST AS THIS IS THE OSCILLATOR, UNTIL THE SIGNAL IS HEARD MOST CLEARLY (SEE FIG.). THEN ADJUST THE TRIMMER SCREW DIRECTLY ABOVE THE OSCILLATOR FOR MAXIMUM VOLUME.

FARNSWORTH TELEV. & RADIO CORP.



MODELS BC82, BC83

FARNSWORTH TELEV. & RADIO CORP.

ALIGNMENT INSTRUCTIONS

AN OUTPUT METER AND A SIGNAL GENERATOR ARE REQUIRED FOR PROPER ALIGNMENT OF THESE SETS. THE OSCILLATOR SHOULD BE CALIBRATED AT THE FOLLOWING POINTS, 455 Kc, 600 Kc, 900 Kc, 1500 Kc, 1600 Kc, 1.8 Mc, 5 Mc, 5.4 Mc, 6 Mc, 10 Mc, 16 MC AND 18.1 Mc.

TABULATION FOR ALIGNMENT

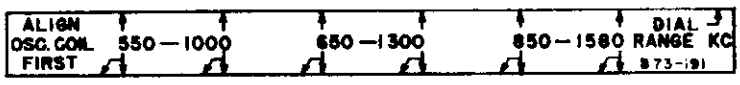
STEPS	IN SERIES WITH ANTENNA	SET GENERATOR AT	SET GANG AT	ADJUST	LOCATED	TO OBTAIN
1.	SET VOLUME AND TONE CONTROLS AT MAXIMUM					
2.	250 MMFD.	455 Kc.	NOTE A	2ND I.F. TRIMMERS	TOP OF I.F. TRANS.	MAX. OUTPUT
3.				1ST I.F. TRIMMERS		
4.				WAVE TRAP TRIMMER	REAR OF CHASSIS	MIN. OUTPUT
5.		1600 Kc.		Osc. B.C. TRIMMER	ON LOOP	MAXIMUM OUTPUT
6.		1500 Kc.	NOTE B	R.F. B.C. TRIMMER		
7.		600 Kc.		600 Kc. PAD	SEE FIG.	
8.	RECHECK 1500 Kc.					
9.	400 OHMS	5.4	NOTE A	Osc. POLICE TRIMMER*		
10.		5 Mc.	NOTE B	R.F. POLICE TRIMMER**		
11.	CHECK 1.8 Mc.					
12.	400 OHMS	18.1 Mc.	NOTE A	Osc. S.W. TRIMMER*		
13.		16 Mc.	NOTE B	R.F.S.W. TRIMMER**		
14.	CHECK 6 AND 10 Mc.					

*TIGHTEN OSCILLATOR TRIMMER SCREW FOR MAXIMUM CAPACITY, THEN UNSCREW UNTIL SECOND PEAK IS SECURED.

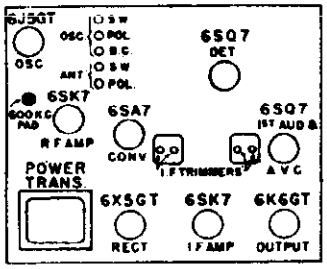
**TIGHTEN R.F. TRIMMER SCREW FOR MAXIMUM CAPACITY, THEN UNSCREW UNTIL FIRST PEAK IS SECURED.

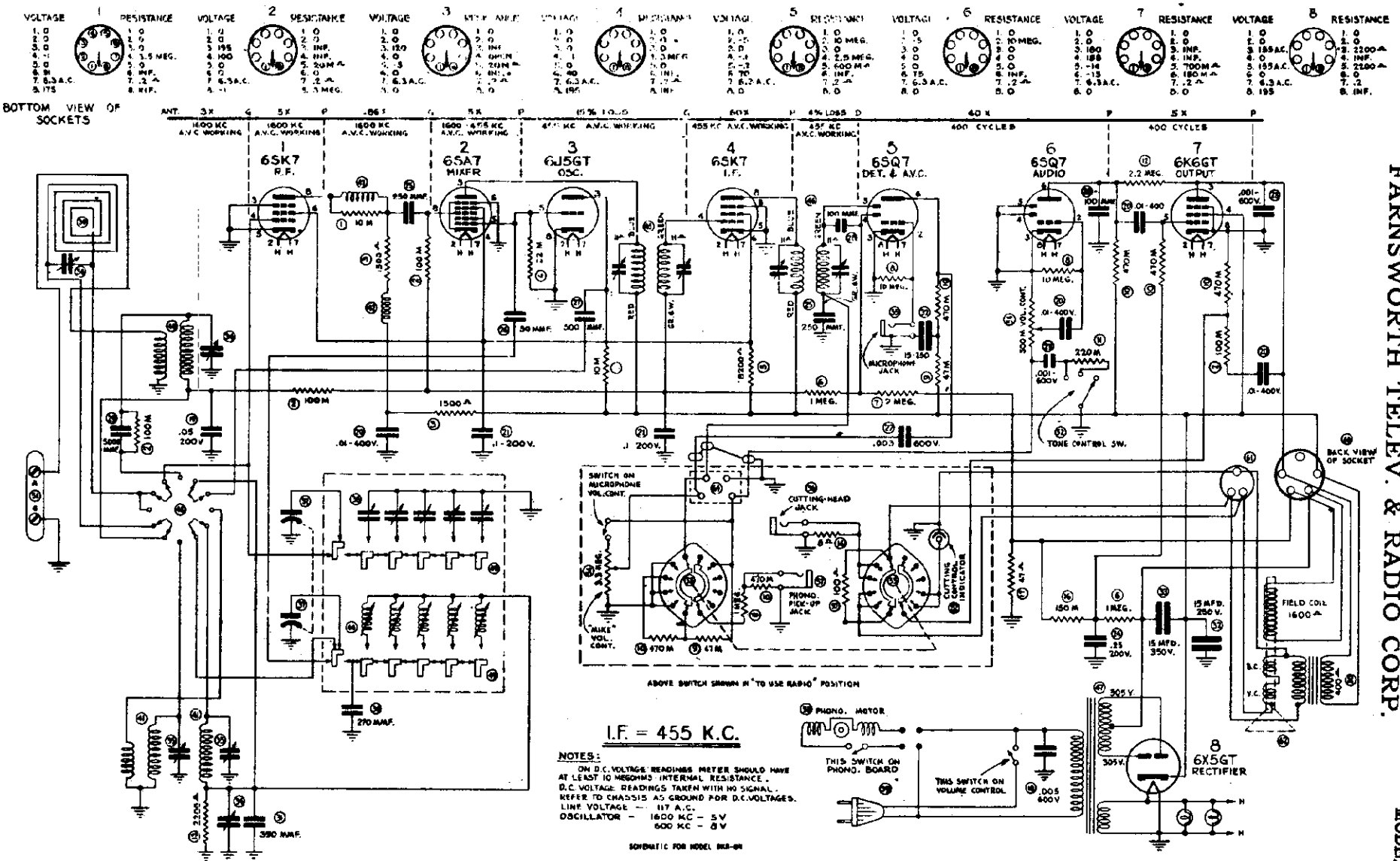
NOTE A. SET GANG AT MINIMUM.
NOTE B. STRONGEST SIGNAL AND ROCK GANG.

BUTTON LAYOUT



OSCILLATOR TRIMMERS — BOTTOM ROW



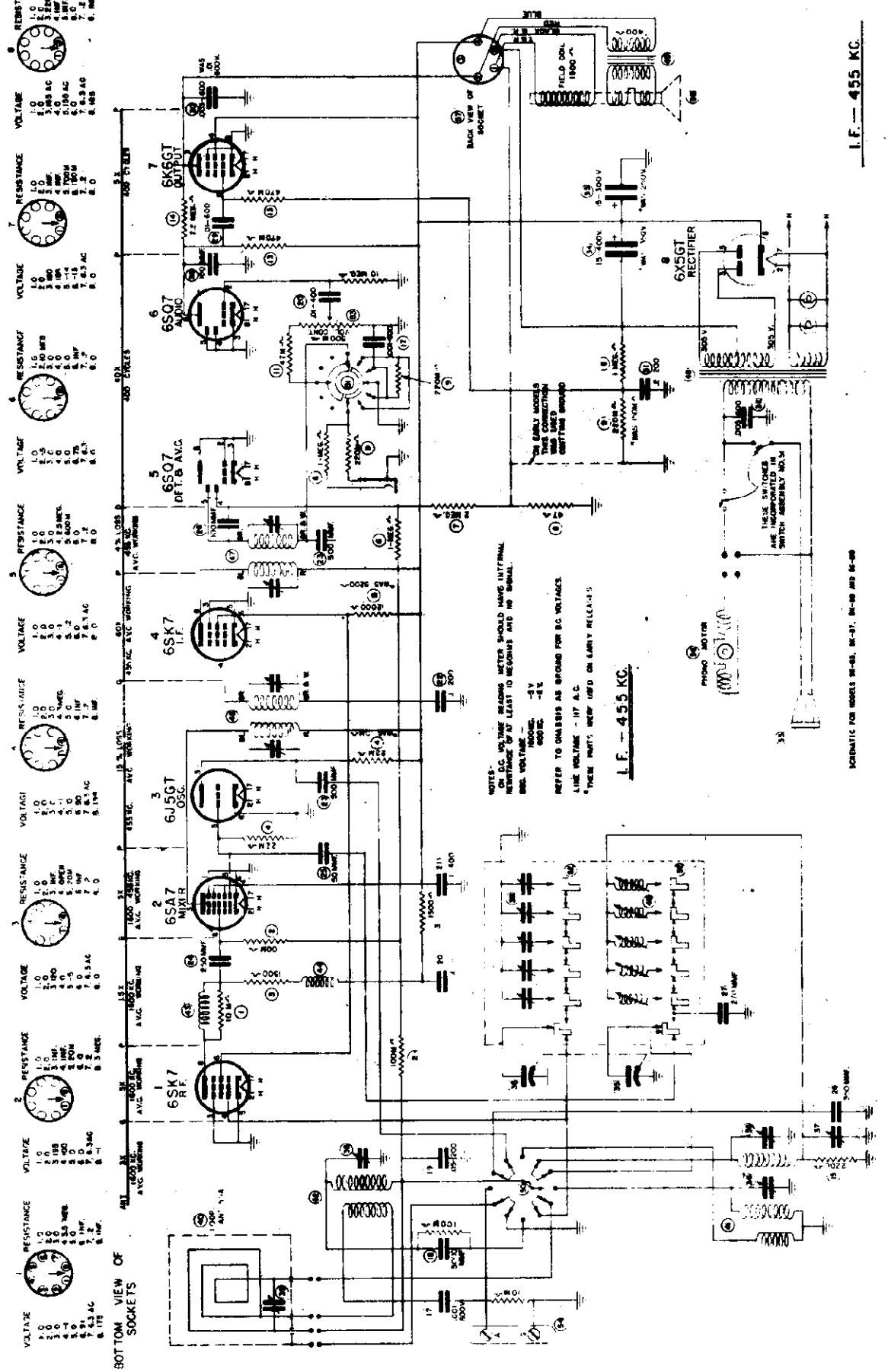


FOR GENERAL INDUSTRIES R-70 RECORD CHANGER SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

FOR OTHER DATA SEE INDEX

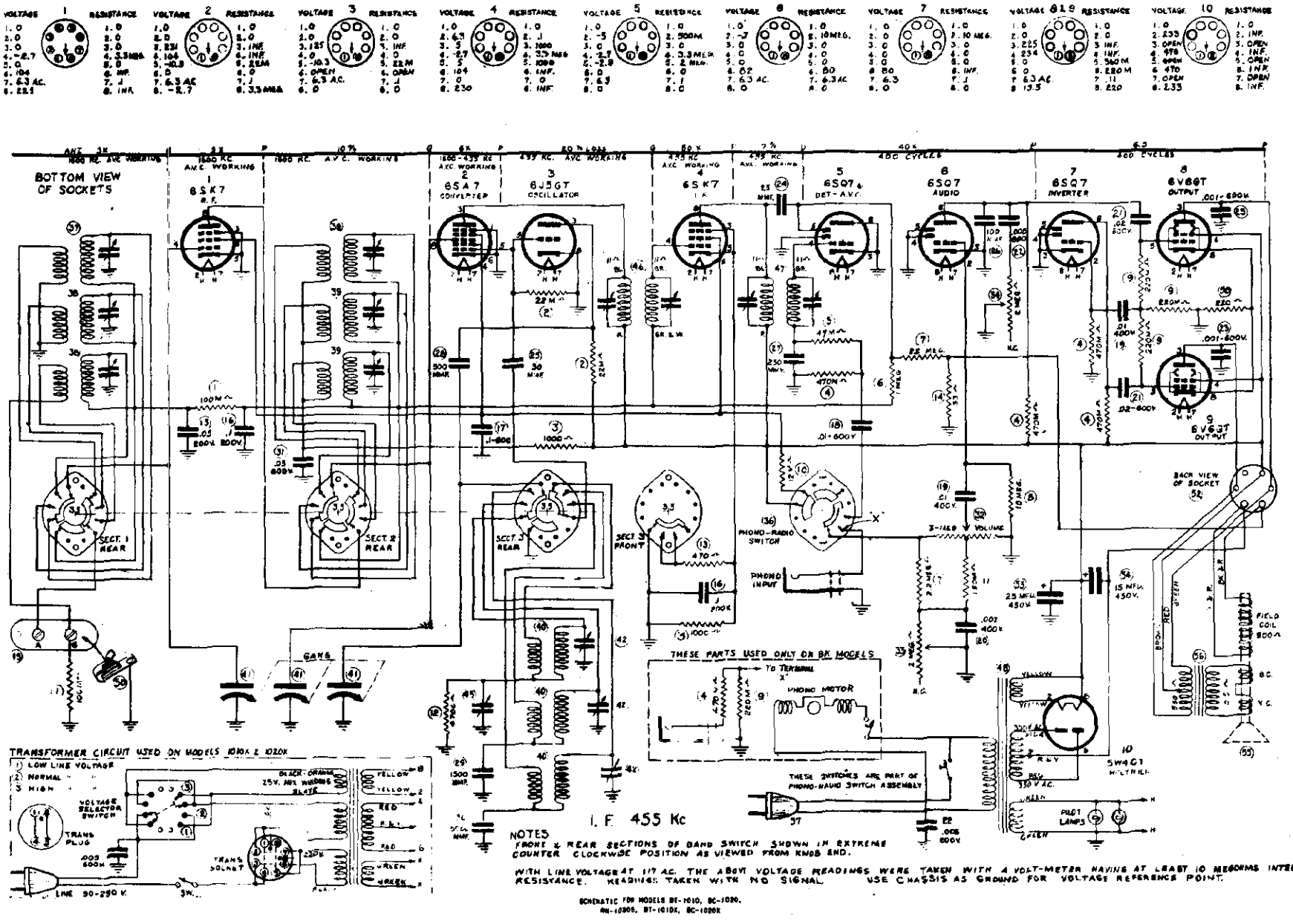
MODELS BK85, BK87, BK88, BK89

FARNSWORTH TELEV. & RADIO CORP.



FARNSWORTH TELEV. & RADIO CORP.

MODELS BT1010, BT1010X
BC1020, BC1020X, BK1030X



SCHEMATIC FOR MODELS BT-1010, BC-1020, BK-1030X, BT-1010X, BC-1020X

MODELS BT1010, BT1010X
BC1020, BC1020X, BK10305

FARNSWORTH TELEV. & RADIO CORP.

ALIGNMENT INSTRUCTIONS

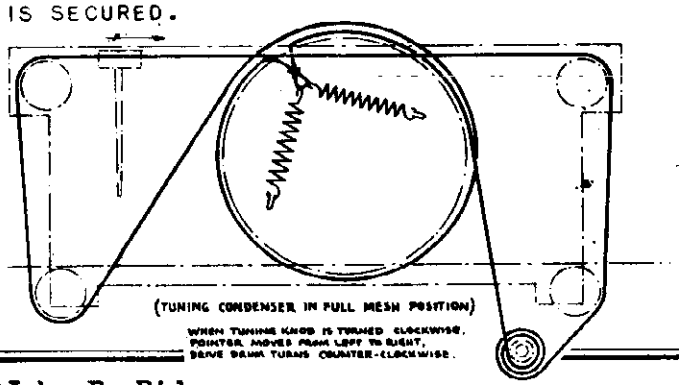
THE OSCILLATOR SHOULD BE CALIBRATED AT THE FOLLOWING POINTS, 455 Kc, 600 Kc, 1500 Kc, 1900 Kc, 6 Mc, 7 Mc, 6 Mc, 10 Mc, 20 Mc, AND 22 Mc.

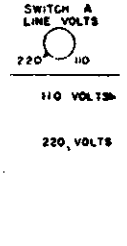
STEPS	IN SERIES WITH ANTENNA	SET GENERATOR AT	SET GANG AT	ADJUST	LOCATED	TO OBTAIN
1.	SET VOLUME AND TONE CONTROLS AT MAXIMUM					
2.	1 MFD. COND TO 6SA7 GRID (ON VAR. COND)	455 Kc.	NOTE A	2ND I.F. TRIMMERS	TOP OF I.F. TRANS.	MAX. OUTPUT
3.				1ST I.F. TRIMMERS		
4.	250 MMFD.	1900 Kc.		OSC. B.C. TRIMMER	SEE FIG.	MAXIMUM OUTPUT
5.		1500 Kc.		R.F. B.C. TRIMMER		
6.				ANT. B.C. TRIMMER		
7.		600 Kc.	NOTE B	600 Kc. PAD.		
8.	RECHECK 1500 Kc.					
9.	400 OHMS	7.0	NOTE A	OSC. TROPICAL TRIMMER*		
10.		6.0		R.F. TROPICAL TRIMMER**		
				ANT. TROPICAL TRIMMER**		
11.	RECHECK 6 Mc.					
12.	400 OHMS	22 Mc.	NOTE A	OSC. S.W. TRIMMER*		
13.		20 Mc.	NOTE B	R. F. S. W. TRIMMER**		
				ANT. S.W. TRIMMER**		
14.	RECHECK 20 Mc.					

NOTE A. SET GANG AT MINIMUM.
NOTE B. STRONGEST SIGNAL AND ROCK GANG.

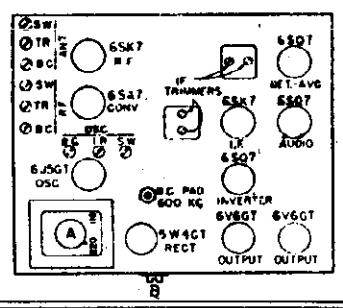
*TIGHTEN OSCILLATOR TRIMMER SCREW FOR MAXIMUM CAPACITY, THEN UNSCREW UNTIL SECOND PEAK IS SECURED.

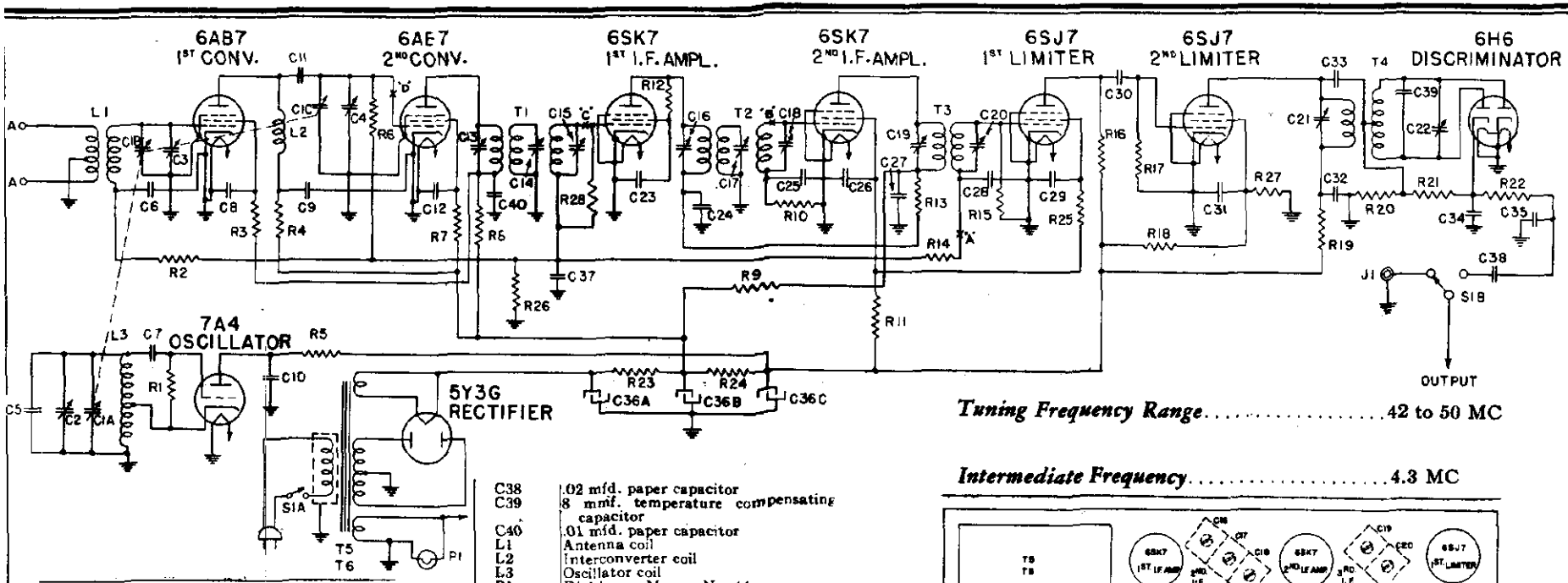
**TIGHTEN R.F. TRIMMER SCREW FOR MAXIMUM CAPACITY, THEN UNSCREW UNTIL FIRST PEAK IS SECURED.





CHASSIS LAYOUT





Tuning Frequency Range ..... 42 to 50 MC

Intermediate Frequency ..... 4.3 MC

Symbol	Description
C1a	Oscillator section of tuning condenser
C1b	1st converter section of tuning condenser
C1c	2nd converter section of tuning condenser
C2	5–24 mmf. oscillator air trimmer
C3	2–20 mmf. 1st converter trimmer
C4	2–20 mmf. 2nd converter trimmer
C5	40 mmf. temperature compensating capacitor
C6	470 mmf. mica capacitor
C7	50 mmf. temperature compensating capacitor
C8	470 mmf. mica capacitor
C9	470 mmf. mica capacitor
C10	470 mmf. mica capacitor
C11	470 mmf. mica capacitor
C12	.01 mfd. paper capacitor
C23	.01 mfd. paper capacitor
C24	.01 mfd. paper capacitor
C25	47 mmf. mica capacitor
C26	.01 mfd. paper capacitor
C27	.01 mfd. paper capacitor
C28	47 mmf. mica capacitor
C29	47 mmf. mica capacitor
C30	22 mmf. mica capacitor
C31	47 mmf. mica capacitor
C32	47 mmf. mica capacitor
C33	50 mmf. temperature compensating capacitor
C34	47 mmf. mica capacitor
C35	220 mmf. mica capacitor
C36a	15 mfd. dry electrolytic
C36b	30 mfd. dry electrolytic
C36c	10 mfd. dry electrolytic
C38	.02 mfd. paper capacitor
C39	8 mmf. temperature compensating capacitor
C40	.01 mfd. paper capacitor
L1	Antenna coil
L2	Interconverter coil
L3	Oscillator coil
P1	Dial lamp, MAZDA No. 44
R1	33,000 ohms carbon resistor
R2	3.3 megohms carbon resistor
R3	6800 ohms carbon resistor
R4	2200 ohms carbon resistor
R5	1000 ohms carbon resistor
R6	3.3 megohms carbon resistor
R7	12,000 ohms carbon resistor
R8	1000 ohms carbon resistor
R9	1000 ohms carbon resistor
R10	47,000 ohms carbon resistor
R11	15,000 ohms carbon resistor
R12	47,000 ohms carbon resistor
R13	2200 ohms carbon resistor
R14	2.2 megohms carbon resistor
R15	47,000 ohms carbon resistor
R16	10,000 ohms carbon resistor
R17	180,000 ohms carbon resistor
R18	68,000 ohms carbon resistor
R19	22,000 ohms carbon resistor
R20	100,000 ohms carbon resistor
R21	100,000 ohms carbon resistor
R22	100,000 ohms carbon resistor
R23	1200 ohms 7.4 W. wire wound resistor
R24	3300 ohms 1 W. carbon resistor
R25	47,000 ohms carbon resistor
R26	470,000 ohms carbon resistor
R27	47,000 ohms carbon resistor
R28	47,000 ohms carbon resistor
S1a	Power switch
S1b	FM-Phono switch
T1	1st I.F. transformer
T2	2nd I.F. transformer
T3	3rd I.F. transformer
T4	Discriminator I.F. transformer
T5	Power transformer for 50–60 cycles
T6	Power transformer for 25 cycles

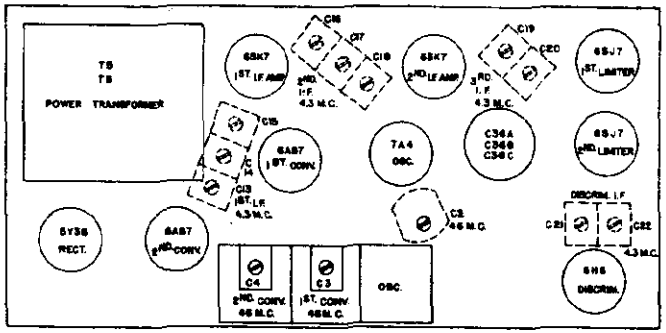


Fig. 1. Tube and Trimmer Location

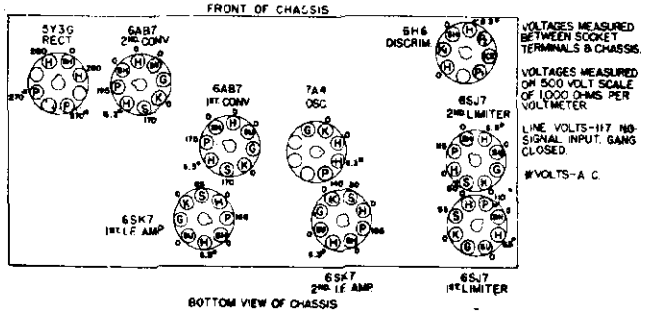


Fig. 2. Socket Voltages

GENERAL ELECTRIC CO.

Amplitude modulation, as the name implies, is a method of superimposing the audio frequencies on a constant amplitude radio frequency carrier so as to vary the carrier amplitude at the audio frequency rate. To illustrate: Suppose we amplitude-modulate a radio frequency carrier with a 400 cycle audio tone. When the audio tone is going through the positive portion of its cycle, its voltage will add to the carrier voltage. When the audio tone goes through the negative portion of its cycle, its voltage will subtract from the carrier voltage. The resultant voltage will be equal to the carrier voltage plus or minus the varying audio voltage and will swing from a maximum to a minimum and back to a maximum every 1/400 of a second. The frequency of the carrier remains fixed.

With frequency modulated signals the carrier amplitude remains fixed and the carrier frequency is varied—just the reverse of amplitude modulation. To illustrate: Suppose we frequency-modulate a 50 megacycle radio frequency carrier with a 400 cycle audio tone of one volt. The one volt audio tone, we shall assume, will vary the 50 megacycle carrier by 25 kilocycles. When the audio tone is going through the positive portion of its cycle, the carrier frequency will increase from 50 megacycles to 50 megacycles plus 25 kilocycles or 50.025 megacycles when the cycle is at a maximum. When the audio tone is going through the negative portion of its cycle, the carrier frequency will decrease from 50 megacycles to 50 megacycles minus 25 kilocycles or 49.975 megacycles when the cycle is at a minimum. The resultant carrier frequency will thus be varying back and forth between 49.975 and 50.025 megacycles at the rate of 400 times per second. Now if the voltage (volume) of the audio tone increases to two volts, the frequency swing will increase to 50 kilocycles above and below 50 megacycles. Thus, the audio tone is transmitted as the rate of the carrier frequency variations and audio volume is transmitted as the magnitude of the carrier frequency variations. It should be noted that the amplitude of the carrier remains constant during the modulation with audio.

Oscillator-Converter Circuit

If the full noise reducing properties of frequency modulation are to be realized the sensitivity of the Translator must be good enough to insure proper limiter operation. The gain through the intermediate frequency circuits is limited to that point beyond which lies instability. Hence, a considerable amount of gain must be realized through the R.F. amplifier and converter circuits in order to insure adequate receiver sensitivity.

To secure this required gain the double superheterodyne or cascade converter circuit is employed. It consists of two converter tubes, 6AB7's, and an oscillator tube, 7A4, with their associated circuits. The antenna circuit tunes the band from 42 to 50 MC. The circuit between the two converters tunes from 23.15 to 27.15 MC. The oscillator voltage is inductively coupled to the grid of the first converter tube. This produces by heterodyne action a signal to which the interconverter circuit is tuned. The first converter also conducts the oscillator signal through to the interconverter circuit. Accordingly, the oscillator signal heterodynes with the tuned signal in the interconverter circuit to produce an I.F. frequency of 4.3 MC at the output of the second converter.

To illustrate the action consider an FM signal of 42 MC to which the Translator is tuned. The oscillator frequency for this setting of the tuning control is 18.85 MC and it heterodynes in the 1st converter tube with the 42 MC signal to form 23.15 MC (42-18.85). This 23.15 MC signal, in turn, beats with oscillator signal in the 2nd converter to produce the 4.3 MC intermediate frequency.

Cascade Limiter Circuit

The limiter circuit consists of two resistance coupled 6SJ7 tubes in series. Each limiter operates at zero initial bias and low plate voltage. Both grid circuits are designed for self-biasing and the use of capacity-resistance networks provides enough time delay to retain the grid bias between signal peaks. The action of the limiter is such that as soon as a signal is applied to the grid of the tube the grid draws current. This grid current charges up the capacitor across the grid resistor and at the same time establishes a bias through current drain in the resistor. Between positive signal peaks the capacitor discharges through the resistor maintaining the grid bias. The circuit is so designed that negative signal swings are all beyond plate current cutoff and positive signal peaks are cut off by plate current saturation. The value of the 1st limiter capacity-resistance network is so chosen as to limit noise amplitudes. This arrangement leaves the 2nd limiter with the very much simplified task of reducing the remaining noise to the desired level.

Servicing

When servicing this Translator and especially when replacing parts care should be exercised to return all components including wiring to the original positions occupied. The positioning of parts and wiring is very critical. When replacing coils and I.F. transformers, maintain the lead lengths provided and use the same terminals to which the original coil or transformer was connected.

Stock No.	Description	List Price
*RB-008	BOARD—Terminal board (2 lug)	$0.10
*RB-060	BOARD—Antenna terminal board	.10
*RB-096	BOARD—Terminal board (3 lug)	.10
RB-1030	BOARD—Phono terminal jack	.10
*RC-039	CAPACITOR—.01 Mfd., 600 V. paper (C-12, 23, 24, 26, 27, 40)	.25
*RC-048	CAPACITOR—.02 Mfd., 600 V. paper (C-38)	.30
*RC-096	CAPACITOR—0.1 Mfd., 200 V. paper (C-37)	.30
*RC-216	CAPACITOR—47 Mmf. mica (C-25, 28, 29, 31, 32, 34)	.25
*RC-224	CAPACITOR—22 Mmf. mica (C-30)	.25
*RC-249	CAPACITOR—220 Mmf. mica (C-35)	.25
*RC-293	CAPACITOR—470 Mmf. mica (C-6, 8, 9, 10, 11)	.30
RC-322	CAPACITOR—40 Mmf. temperature compensating capacitor (C-5)	.30
RC-323	CAPACITOR—50 Mmf. temperature compensating capacitor (C-7, 33)	.25
RC-324	CAPACITOR—8 Mmf. temperature compensating capacitor (C-39)	.30
*RC-863	CORD—Power cord	.65
RC-5169	CAPACITOR—15 Mfd., 400 V.; 30 Mfd., 400 V.; 10 Mfd., 350 V. dry electrolytic (C-36a, 36b, 36c)	1.25
RC-6540	CAPACITOR—Air trimmer capacitor (C-2)	.95
RC-6541	CAPACITOR—2-20 Mmf. converter trimmers (C-3, 4)	.25
RC-7041	CONDENSER—Tuning condenser and station selector assembly (C-1a, 1b, 1c)	5.00
RC-8198	CABLE—Output connector cable and plug assembly	.55
RC-8199	CABLE—Condenser drive cable assembly	.10
RC-8526	CARD—Station tab card set	.15
RD-424	DRUM—Condenser drive drum assembly	.15
RE-096	ESCUTCHEON—Scale and escutcheon assembly	2.70
RG-306	GROMMET—Rubber grommet for protecting condenser leads (Pkg. 5)	.10
RK-091	KNOB—Control knob	.10
*RK-214	KEY—Left-hand station key	.10
*RK-222	KEY—All except left station keys	.15
RL-166	COIL—R.F. coil assembly (L-2)	.40
RL-952	LOCK—Cam lock (adjusting screw and lug) (Pkg. 10)	.10
RL-1010	COIL—Antenna and oscillator coil assembly (L1, L3)	.40
RM-514	MASK—Dial back plate mask	.05
*RP-145	PLUG—Radio chassis connector plug (Pkg. 5)	.25
*RP-154	PIN—Station key mounting pin (Pkg. 10)	.10
*RP-314	PULLEY—Pointer drive pulley and "C" washer	.15
RP-325	PULLEY—Drive cord wooden pulley (Pkg. 5)	.10
RP-1005	POINTER—Dial pointer	$0.10
RP-2003	PLATE—Dial scale backplate	.10
*RQ-1259	RESISTOR—1000 ohms, ½ W. carbon (R-5, 8, 9) (Pkg. 5)	.70
*RQ-1267	RESISTOR—2200 ohms, ½ W. carbon (R-4, 13) (Pkg. 5)	.70
*RQ-1279	RESISTOR—6800 ohms, ½ W. carbon (R-3) (Pkg. 5)	.70
*RQ-1283	RESISTOR—10,000 ohms, ½ W. carbon (R-16) (Pkg. 5)	.70
*RQ-1285	RESISTOR—12,000 ohms, ½ W. carbon (R-7) (Pkg. 5)	.70
*RQ-1287	RESISTOR—15,000 ohms, ½ W. carbon (R-11) (Pkg. 5)	.70
*RQ-1291	RESISTOR—22,000 ohms, ½ W. carbon (R-19) (Pkg. 5)	.70
*RQ-1295	RESISTOR—33,000 ohms, ½ W. carbon (R-1) (Pkg. 5)	.70
*RQ-1299	RESISTOR—47,000 ohms, ½ W. carbon (R-10, 12, 15, 25, 27) (Pkg. 5)	.70
*RQ-1303	RESISTOR—68,000 ohms, ½ W. carbon (R-18) (Pkg. 5)	.70
*RQ-1307	RESISTOR—100,000 ohms, ½ W. carbon (R-20, 21, 22) (Pkg. 5)	.70
*RQ-1313	RESISTOR—180,000 ohms, ½ W. carbon (R-17) (Pkg. 5)	.70
*RQ-1323	RESISTOR—470,000 ohms, ½ W. carbon (R-26) (Pkg. 5)	.70
*RQ-1339	RESISTOR—2.2 megohms, ½ W. carbon (R-14) (Pkg. 5)	.70
*RQ-1343	RESISTOR—3.3 megohms, ½ W. carbon (R-2, 6) (Pkg. 5)	.70
*RQ-1471	RESISTOR—3300 ohms, 1 W. carbon (R-24)	.20
RR-357	RESISTOR—1200 ohms, 7.4 W. wire wound (R-23)	.30
*RS-223	SOCKET—Octal tube socket (Pkg. 5)	.80
*RS-253	SOCKET—Electrolytic mounting socket	.10
*RS-265	SOCKET—Dial lamp socket assembly	.15
RS-296	SOCKET—7A4 tube socket	.25
RS-297	SOCKET—6H6 tube socket	.15
*RS-444	SPRING—Knob retaining spring (Pkg. 10)	.10
RS-624	SUPPORT—Power switch support	.25
RS-625	SUPPORT—Tuning shaft support	.40
RS-898	SCREW—Escutcheon mounting screw (Pkg. 10)	.10
RS-958	SPACER—Station key spacer on pin (Pkg. 3)	.05
RS-1813	SHIELD—Dial lamp shield (Pkg. 3)	.10
RS-3095	SWITCH—Power and FM-Phono switch (S-1)	1.00
RS-9019	SHAFT—Tuning shaft assembly	.15
RT-0813	TRANSFORMER—50-60 cycle power transformer (T-5)	3.10
RT-0815	TRANSFORMER—25 cycle power transformer (T-6)	7.80
RT-2007	TRANSFORMER—1st I.F. transformer (T-1)	1.55
RT-2008	TRANSFORMER—2nd I.F. transformer (T-2)	1.60
RT-2009	TRANSFORMER—3rd I.F. transformer (T-3)	1.30
RT-2010	TRANSFORMER—Discriminator transformer (T-4)	1.60
*RW-101	WASHER—Control shaft felt washer (Pkg. 10)	.05
RW-124	WASHER—Tuning shaft retaining washer (Pkg. 10)	.05
*RX-079	ASSEMBLY—Chassis mounting foot assembly	.40

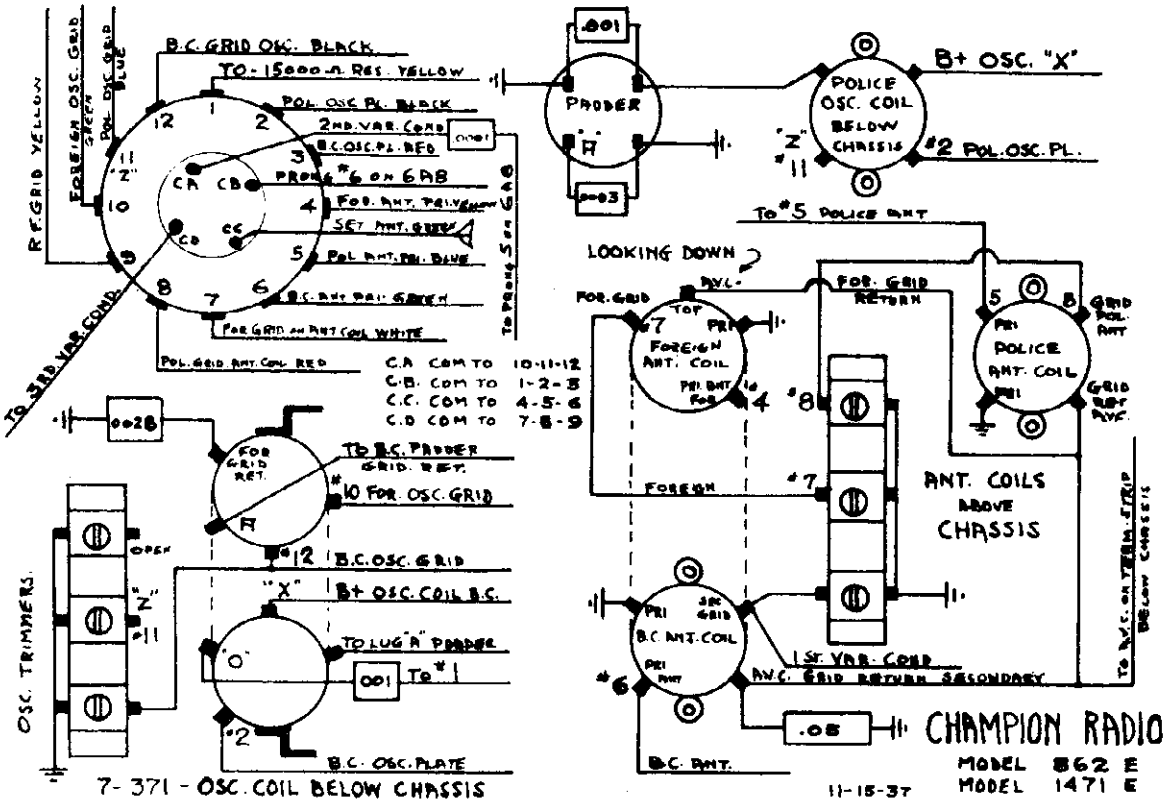
*Used on previous receivers.

(PRICES SUBJECT TO CHANGE WITHOUT NOTICE)

FERGUSON RADIO, INC.

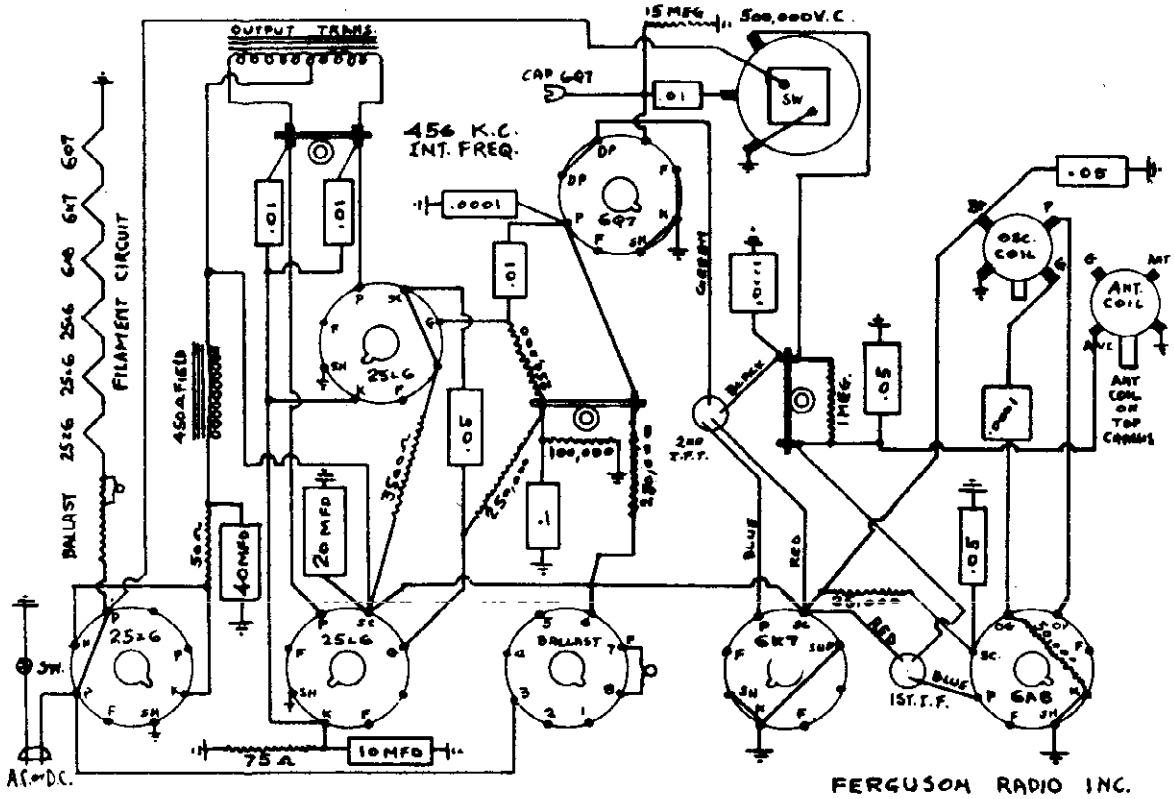
MODELS 862E, 1471
MODEL 7141AKS

3 GANG 3 BAND SUPERHETERODYNE DETAILS SHEET #2.



CHAMPION RADIO
MODEL 862 E
MODEL 1471 E
11-15-37

CHAMPION RADIO MODEL 7141 AKS

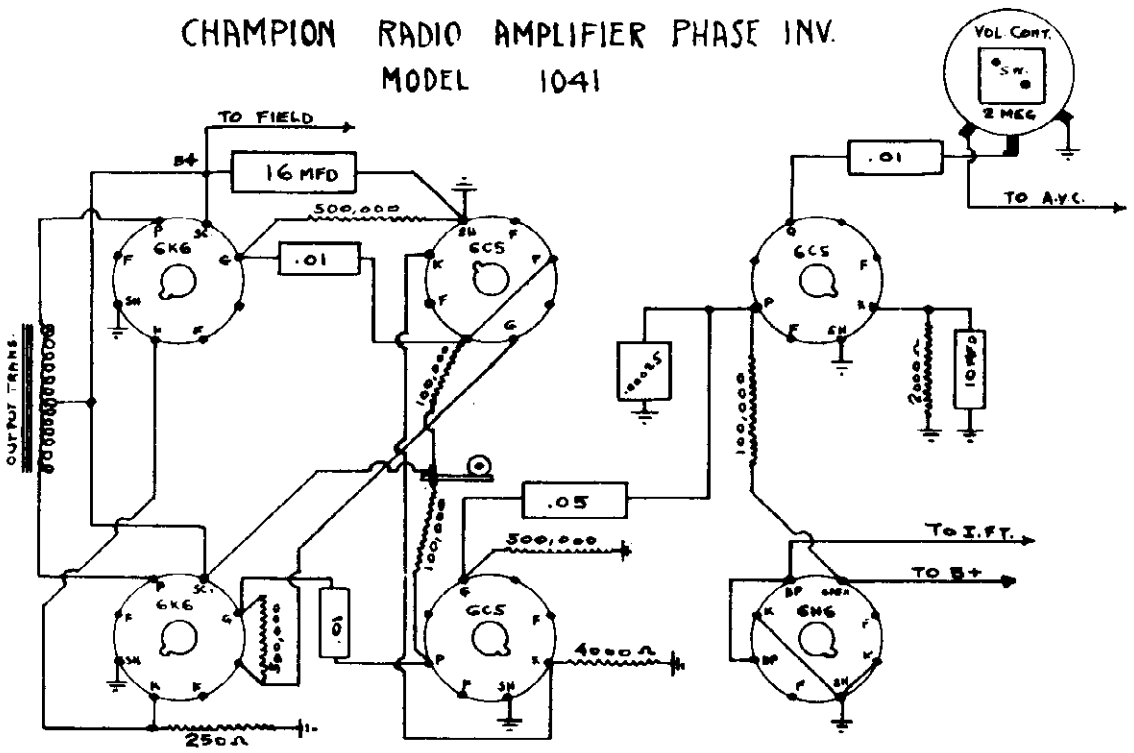


FERGUSON RADIO INC.

MODEL 1041
MODEL 7540 Ampl.

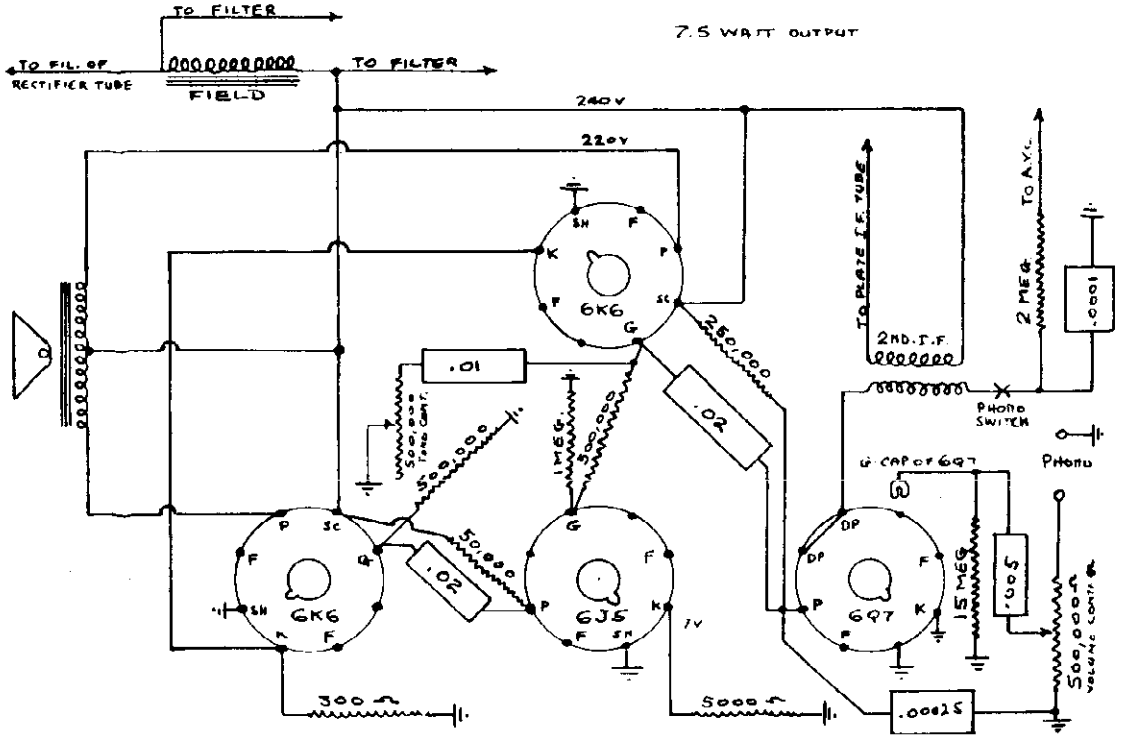
FERGUSON RADIO, INC.

CHAMPION RADIO AMPLIFIER PHASE INV.
MODEL 1041



FERGUSON RADIO INC.

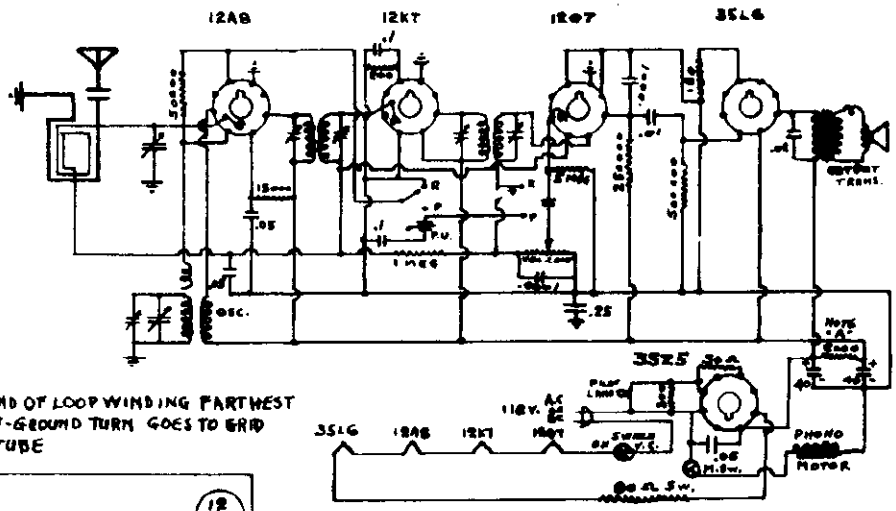
FERGUSON RADIO INC.
CHAMPION RADIO = MODEL 7540 P.P. AMPLIFIER USED WITH MODEL 6340 RADIO



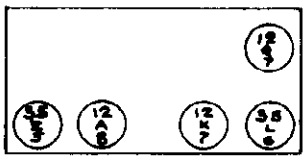
MODEL 5142 SOC
MODEL 5142 KF

FERGUSON RADIO, INC.

FERGUSON RADIO MODEL 5142 SOC.
456 K.C. I.F.



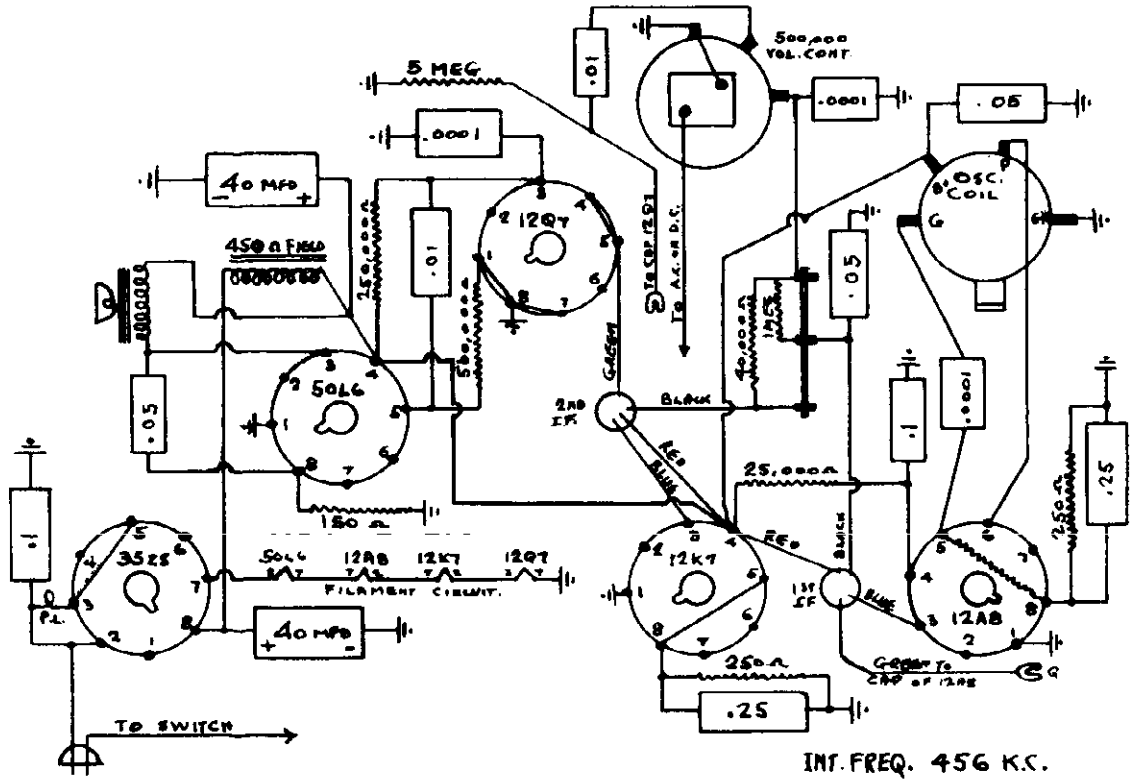
NOTE: THE END OF LOOP WINDING FARTHEST FROM ANT-GROUND TURN GOES TO GRID OF 12AB TUBE



TUBE LAYOUT

NOTE "A" ON SOME MODELS A DYNAMIC SPEAKER IS USED INSTEAD OF A P.M. AND 450 Ω FIELD IS USED IN PLACE OF 2000 Ω RES.

FERGUSON RADIO INC. MODEL 5142 KF



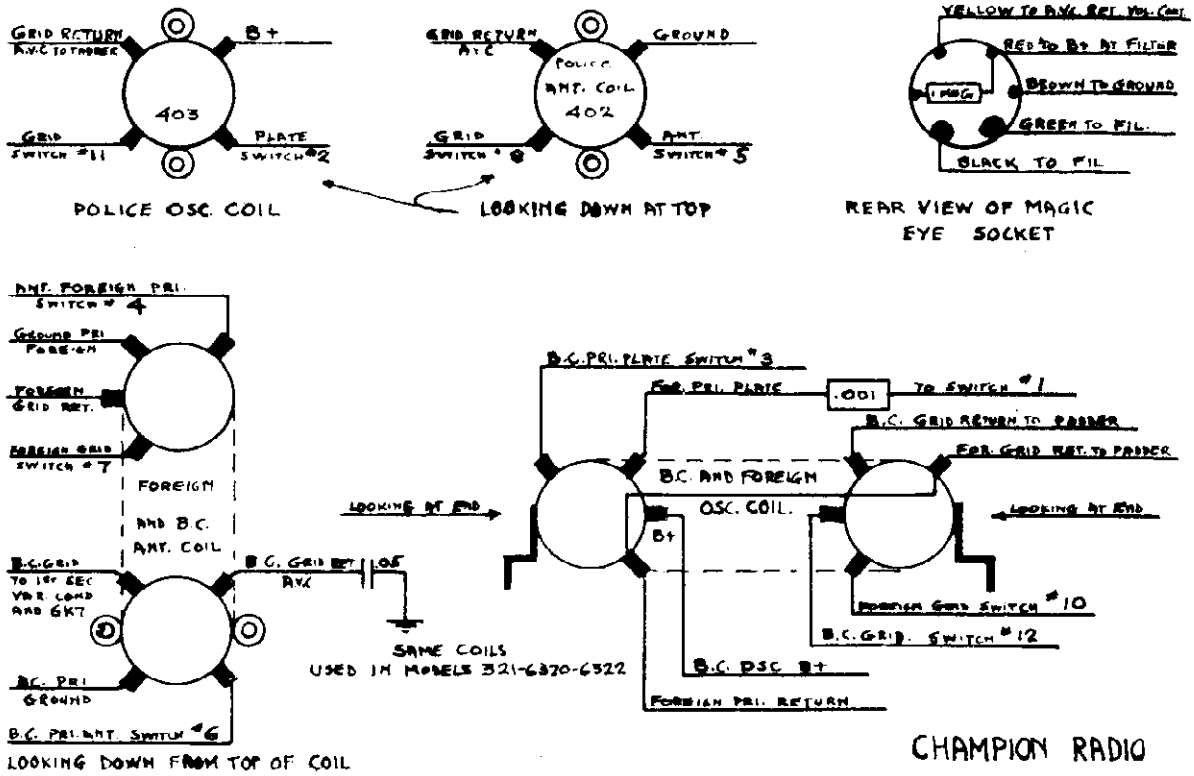
INT. FREQ. 456 K.C.

MODELS 6320, 6322

FERGUSON RADIO, INC.

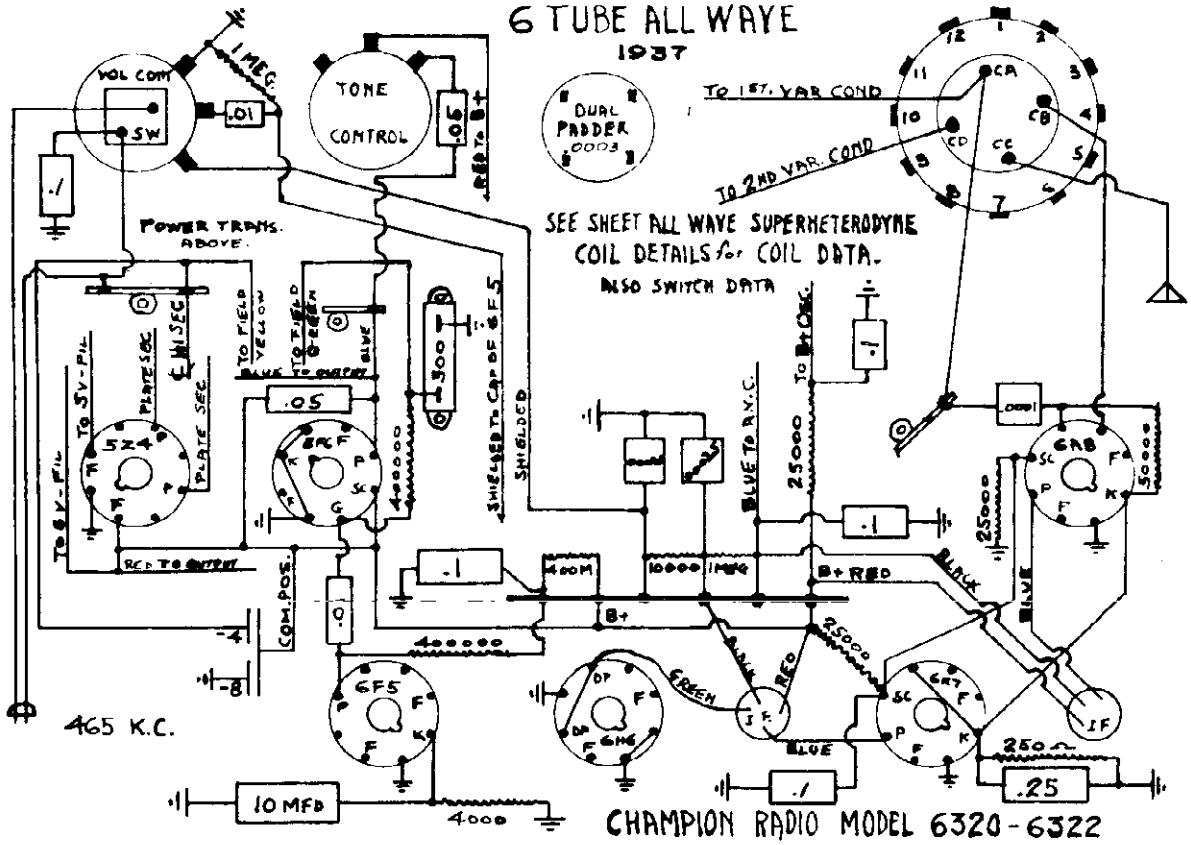
ALL WAVE SUPERHETERODYNE COIL DETAILS

1937 CHASSIS



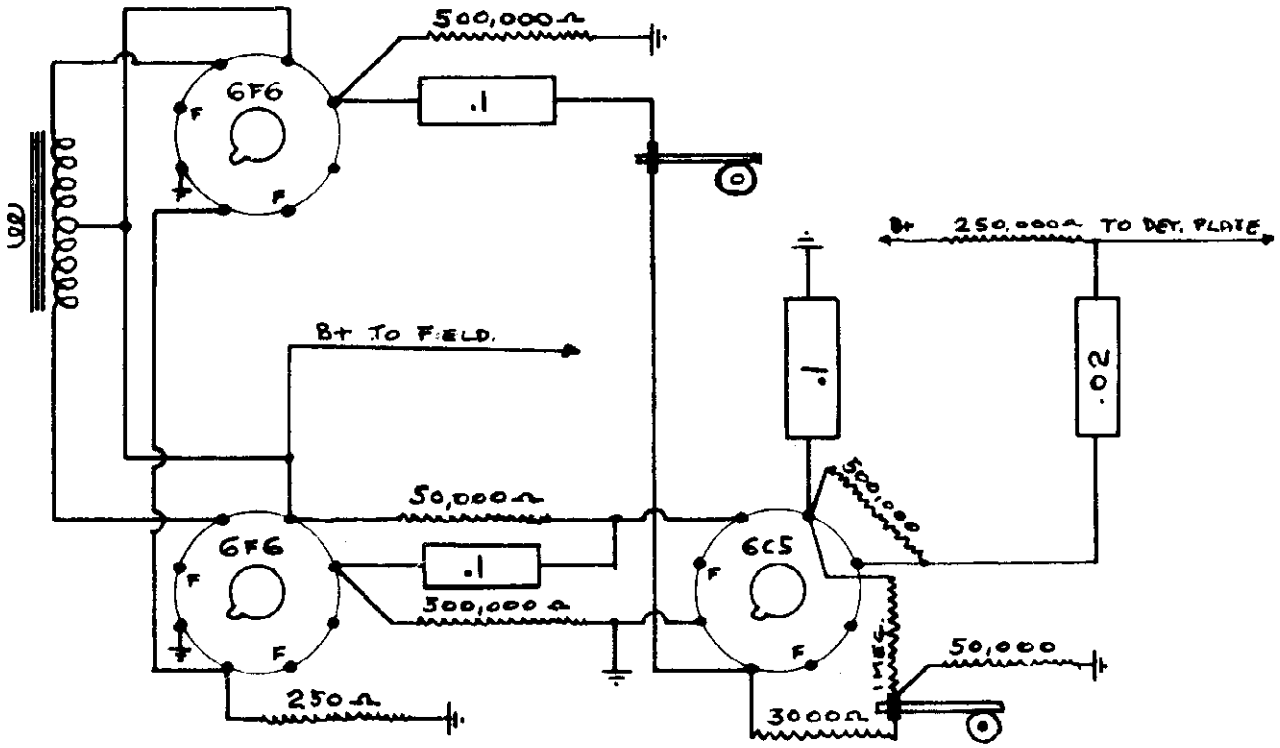
6 TUBE ALL WAVE

1937

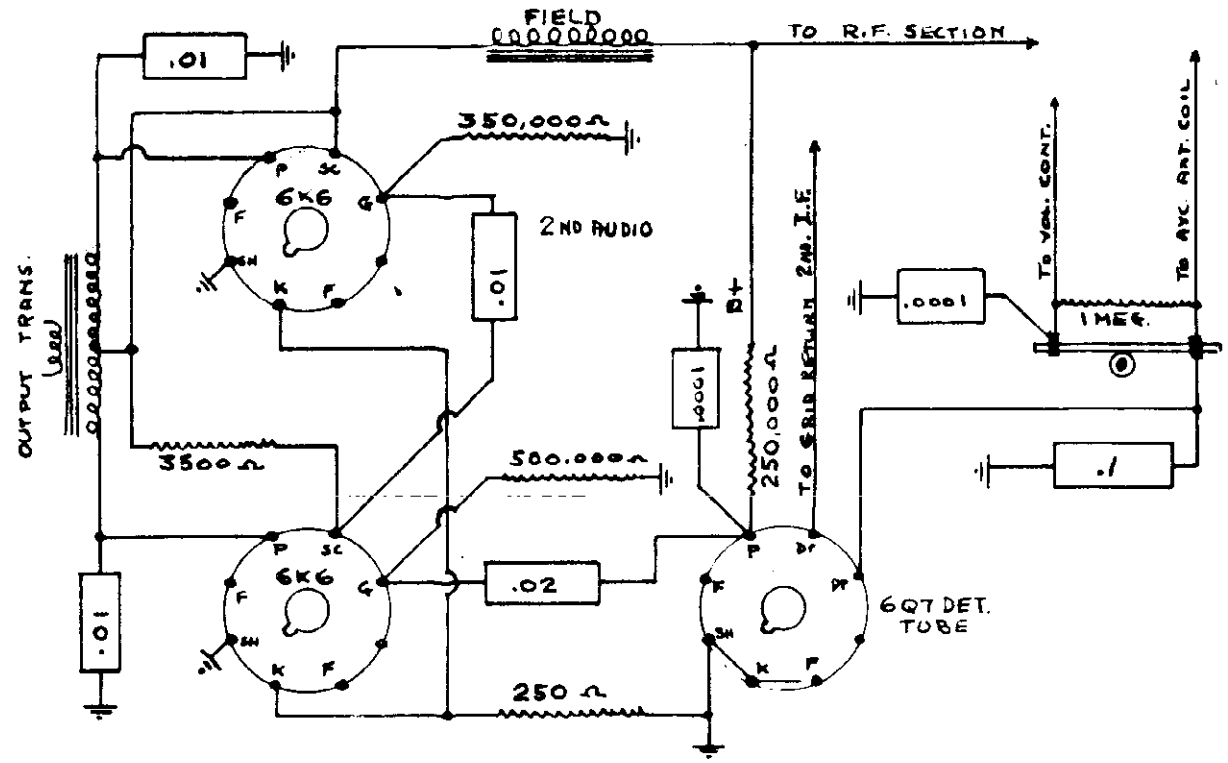


FERGUSON RADIO, INC.

3 TUBE AMPLIFIER
USED WITH CHAMPION 5 AND 6 TUBE TUNER



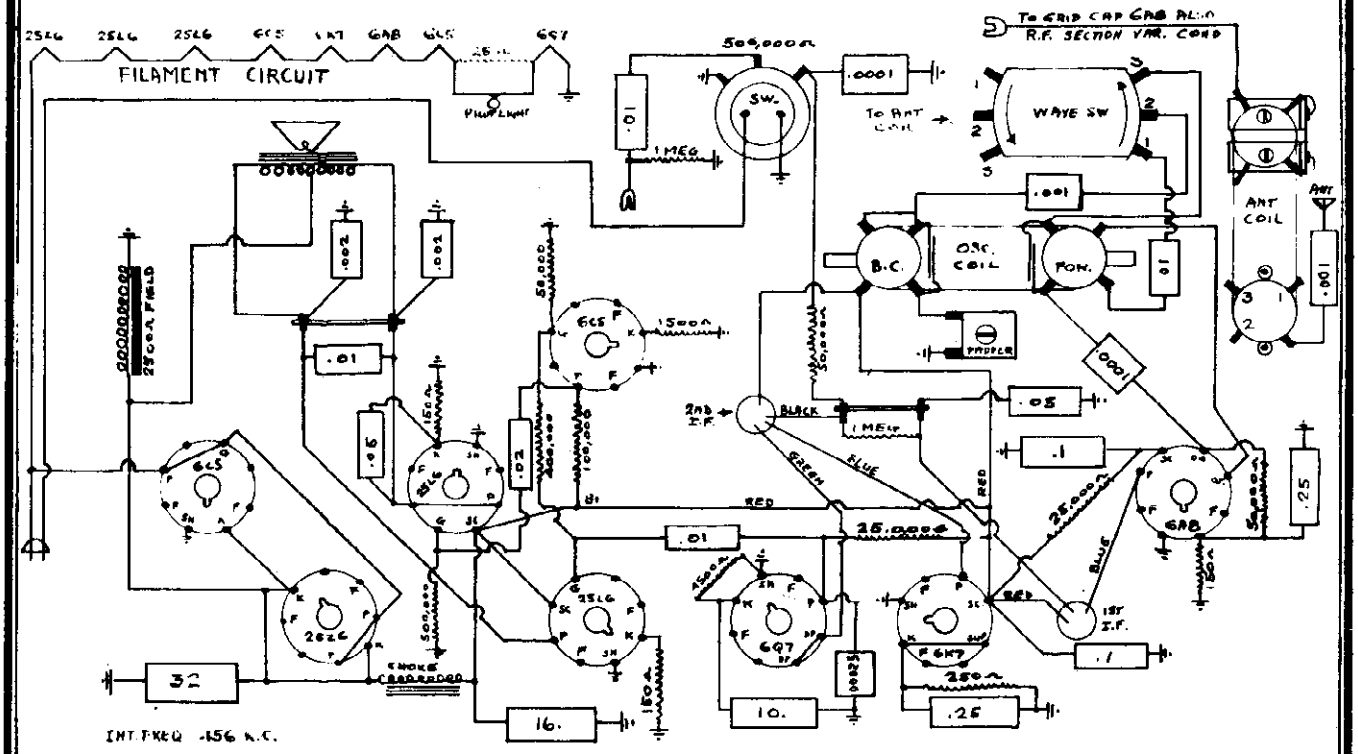
PUSH PULL AMPLIFIER USED ON MODEL 7140
BALANCE OF CIRCUIT SAME AS MODEL 6140 AK.



MODEL 7341 AKS
MODEL 8341M

FERGUSON RADIO. INC.

CHAMPION RADIO MODEL 8341 M



INT. FREQ. 456 K.C.

PRE B.C. AT 600 K.C.

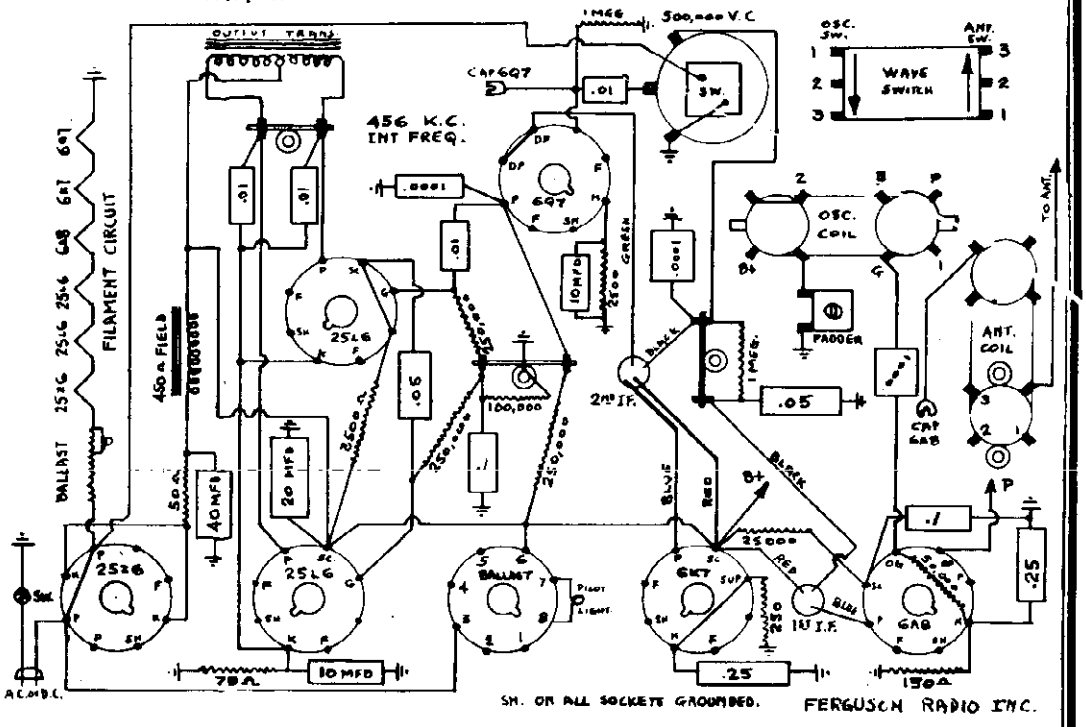
TRIM B.C. AT 1450 K.C.

TRIM FOR AT 15 M.C.

POLICE BAND NO ADJ.

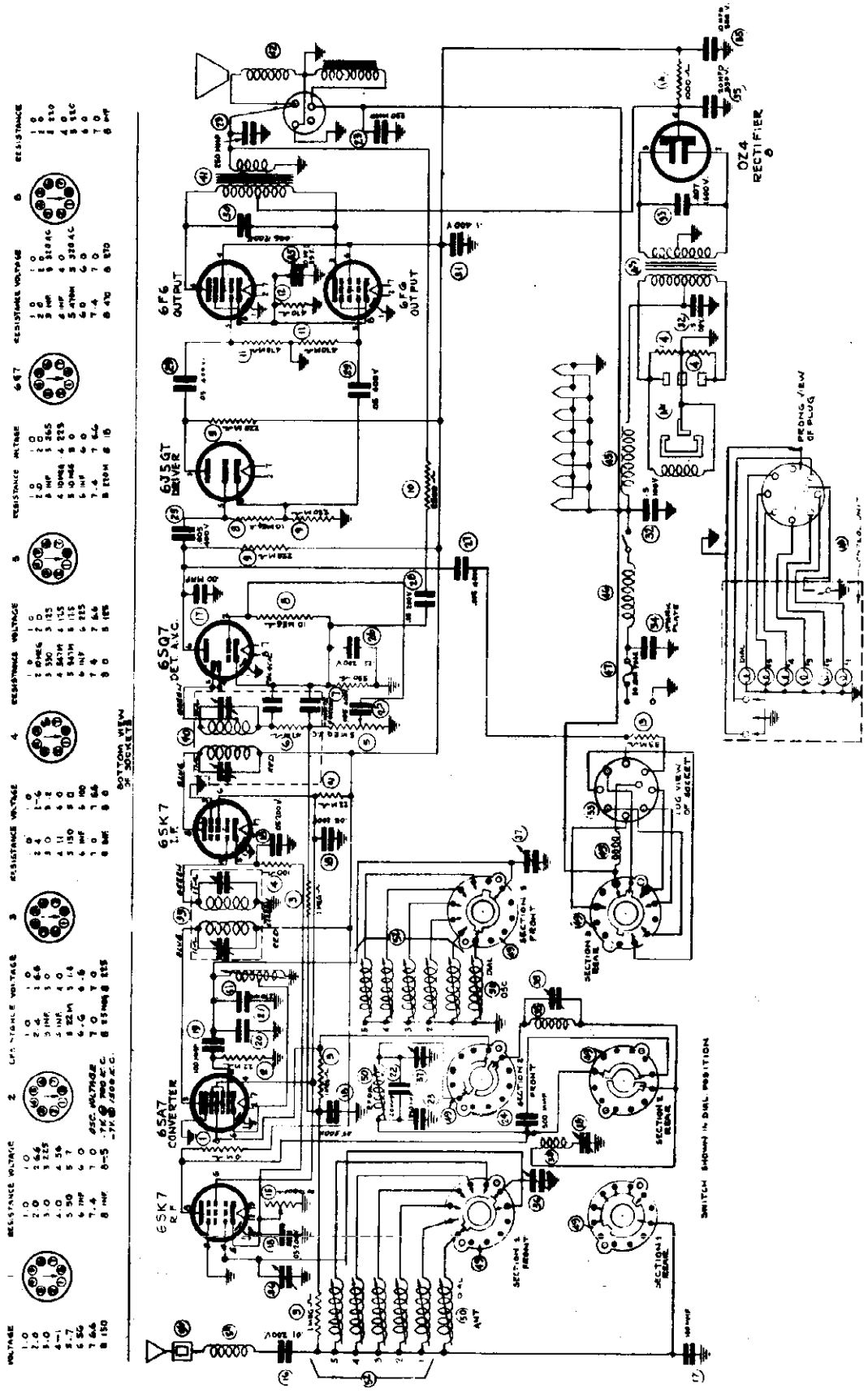
105 VOLT A.C. or D.C.

CHAMPION RADIO MODEL 7341 AKS.



SW. ON ALL SOCKETS GROUNDED. FERGUSON RADIO INC.

FIRESTONE TIRE & RUBBER CO.



MODEL S7350-1

FIRESTONE TIRE & RUBBER CO.

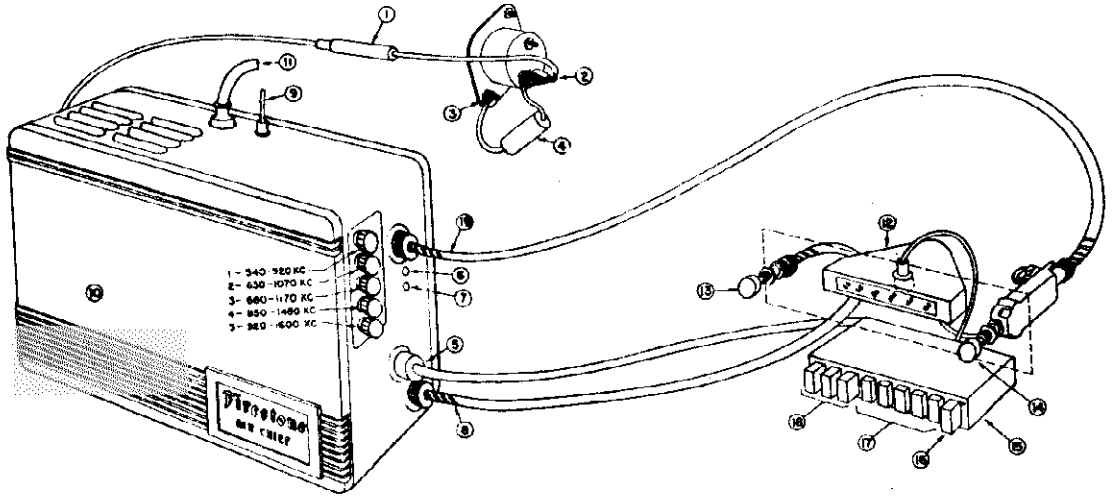


Figure 2

1. Fuse Container
2. Connection to Ammeter
3. Grounding of Ammeter Condenser
4. Ammeter Condenser
5. Push Button and Tone Control Cable
6. Hole for Antenna Matching Adjustment (Man.)
7. Hole for Antenna Matching Adjustment (P.B.)
8. Volume Control Cable
9. Antenna Lead-in Cable
10. Front Cover, Removable for Tube Replacement.
11. Speaker Cable
12. Manual Tuning Control
13. On-Off Switch and Volume Control Knob.
14. Station Selector Knob
15. Push Button Tuning Control
16. MONOMATIC TUNING BUTTON
17. Station Call Letter Indicator
18. TRIMATIC Tone Control Buttons
19. Station Selector Cable

ALIGNMENT PROCEDURE

SET DIAL TO	GENERATOR FREQUENCY	DUMMY ANTENNA	ADJUSTMENTS (IN ORDER SHOWN)	TRIMMER FUNCTION
540 kc	455 kc	.1 mfd.	T2, T1	IF
600 kc	455 kc	.1 mfd.	C14*	IF Wave Trap
Highest Frequency	1600 kc	.0001 mfd.	VC-2	Osc.
600 kc	600 kc	.0001 mfd.	C4	Shunt Coil
1400 kc	1400 kc	.0001 mfd.	VC-1	Transl. & Ant.

IMPORTANT ALIGNMENT NOTES

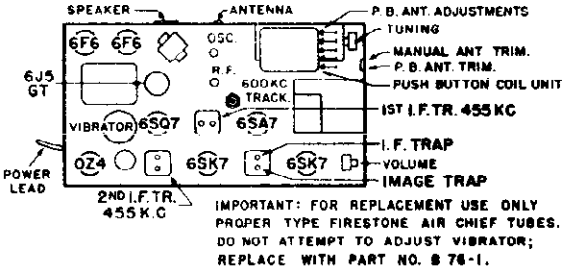
*The signal generator should be adjusted for high output and the trimmer should be adjusted for minimum response.

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 AVC of the receiver from interfering with accurate alignment, except as noted by (*) above.

To adjust image rejector, return set to button #5. Set generator to 1500 kc and adjust #5 button for maximum signal at 1500 kc. Then set generator to image frequency *(24100) and adjust image rejector for minimum signal use high generator output.

FIRESTONE AIR CHIEF STOCK NO. S-7350-1
CODE NO. F-PM-7
TUBE & VIBRATOR LOCATIONS



IMPORTANT: FOR REPLACEMENT USE ONLY PROPER TYPE FIRESTONE AIR CHIEF TUBES. DO NOT ATTEMPT TO ADJUST VIBRATOR; REPLACE WITH PART NO. S 76-1.

THE GENERATOR CHARGING RATE

Unless the car has an automatic voltage regulator, it is usually necessary to advance the generator charging rate to compensate for the additional drain of the radio. Under no conditions should the rate be increased beyond that specified by the manufacturer as the safe limit.

MODEL S7350-1 FIRESTONE TIRE & RUBBER CO. MODEL S7350-
MODEL S7399-

SETTING UP THE MONOMATIC TUNING MECHANISM:

Make a list of the five stations for which you desire Monomatic tuning. The stations chosen must be such that each will come within a different frequency range, as indicated by the following list. For example, it would not be possible to choose both a 550 kc station and a 600 kc station, since 600 kc does not come within the range of position #2. Arrange the stations, in order of their frequency; that is, the station of lowest frequency will be #1; of next higher frequency, #2, etc.

STATION	FREQUENCY RANGE
#1	540 to 920 kc
#2	630 to 1070 kc
#3	690 to 1170 kc
#4	850 to 1450 kc
#5	920 to 1570 kc

Operate the Monomatic button (marked "Push") until the dial becomes illuminated, indicating that the receiver is adjusted for Dial Tuning. Then tune your #1 station, using the Station Selector knob.

Operate the Monomatic button until the #1 station indicator (furtherest left of the station indicators) becomes illuminated.

Turn the knob, located on the side of the set, see Figure 2, which has the range 540-920 kc indicated below it, until the desired station is heard at maximum volume.

Return to Manual then tune in your #2 station on the dial, then operate the Monomatic button until the #2 indicator becomes illuminated. Then proceed to adjust the knob for this station in the same manner as just done for the #1 station.

Proceed in the same manner for the remaining stations on your list. Insert the proper call letter, cut from the sheets supplied, in the indicator button slots.

After setting button #5 the antenna should be matched by adjusting the screw marked P.B. Antenna Trimmer in Fig. 2, as #7. This screw is covered by a snap button. Slowly turn this screw until maximum volume is secured.

After this adjustment is made, it is recommended that all the buttons be re-cheeked for maximum response.

After this re-check is completed, it is necessary to adjust the manual antenna trimmer, see Fig. 2, #6. The adjusting screw for this is accessible after removing the snap button. Return the set to dial tuning, turn the manual tuning control until a station near 1400 kc is heard then adjust this screw for maximum volume.

Be sure to replace snap buttons after completing these adjustments.

TO SET UP THE BUTTONS FOR AUTOMATIC TUNING:

1. Turn the set on and allow it to operate at least fifteen minutes before attempting to set up the buttons.
2. Make a list of the frequencies of five nearby stations to which you wish to set up the buttons. Be sure to select the most powerful nearby stations, since weak signals will not give as satisfactory results.
3. Turn the set around so that the back of the set is facing you and remove the cabinet back.
4. Just behind the dial plate, when viewed from the rear, will be seen ten push button adjusting screws (see Fig. 1). These screws are used to tune in the stations that the buttons are to be set to.
5. Each of the push buttons can be made to tune in stations in a definite frequency range as shown in Fig. 1.

   Buttons No. 1 and 2 may be set up to any station which operates between 540 and 1000 KC. in frequency. Buttons No. 3 and 4 may be set up to stations operating between 750 and 1375 KC., while button No. 5 may be set up to stations operating between 980 and 1600 KC. ALWAYS TRY TO SELECT THE BUTTON WHICH CAN BE SET UP TO A STATION WHOSE FREQUENCY IS WELL WITHIN THE BUTTON'S OPERATING RANGE.
6. Turn the band switch to the "AM" position, push in the button labeled "MANUAL," then using the tuning knob (see Fig. 1) tune in the station you wish to set to button No. 1.

MODEL S7399-2

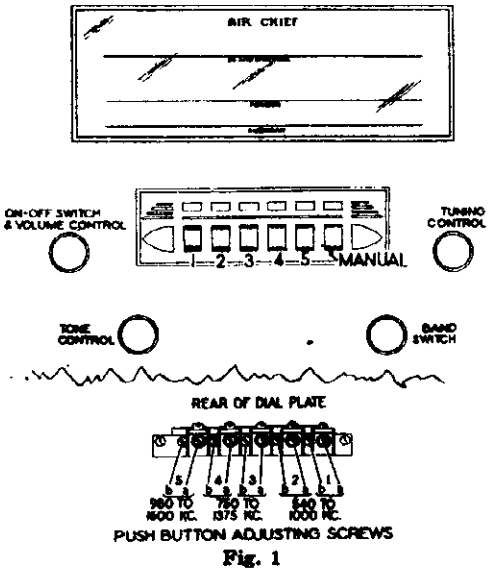


Fig. 1

7. Push in button No. 1 and using a screwdriver, turn adjusting screw No. 1a (the extreme right hand screw) until the station you had previously tuned in is again heard. If it is not heard, advance the volume control and adjust the screw again. Be sure to adjust screw No. 1a to the point where the program is heard with the deepest tone.
8. Insert the screwdriver in screw No. 1b (just to the left of, and behind, 1a) and turn it until the program is heard with the maximum volume. Check the setting of screw No. 1a, making sure it still is adjusted to give deepest tone.
9. The set-up for button No. 1 is now complete.
10. To set up the remaining buttons use the same procedure; push in the "MANUAL" button; tune in the station, using the tuning knob; push in the button to be set up; adjust its associated "a" adjusting screw until the station is tuned in (screw 2a for button No. 2, etc., see Fig. 1); the associated "b" screw is then adjusted for maximum volume.
11. Call letter tabs which may be used to label the buttons are provided with your radio. They fit in the small space above each push button.
12. To use push buttons at any time, turn the band switch to the "AM" position and push the proper button.

MODEL S7350-1
MODEL S7350-2

FIRESTONE TIRE & RUBBER CO.

S-7350-1

	PART NO.	NAME OF PART	LIST PRICE		PART NO.	NAME OF PART	LIST PRICE
1.	773-14	10 M. Ohms.	.15	29.	25-105	.05-400	.15
2.	773-16	22 M. Ohms.	.15	30.	25-110	.006-1200	.15
3.	773-24	1 Meg. Ohms.	.15	31.	25-103	.1-400 V.	.17
4.	773-4	100 Ohms.	.15	32.	25-118	.5-100 V.	.22
5.	78-42	.5 Meg. Ohms. Volume Control	.15	33.	25-109	.007-1600 V.	.17
6.	773-18	47 M. Ohms.	.15	34.	25-100	Spark Plate	.17
7.	773-7	330 Ohms.	.15	35.	25-99	Electrolitic	.95
8.	773-29	10 Meg. Ohms.	.15	36.	26-113	Trimmer	.28
9.	773-21	220 M. Ohms.	.15	37.	26-114	Trimmer Ass'y	.40
10.	773-11	2200 Ohms.	.15	38.	38-276	R.F. Coil Ass'y	1.40
11.	773-23	470 M. Ohms.	.15	39.	38-274	1st I.F. Ass'y	1.40
12.	77-125	470 Ohms. 1 Watt	.15	40.	38-275-	2nd I.F. Ass'y	1.65
13.	773-17	33 M. Ohms.	.15	41.	94-79	Output Trans.	1.35
14.	77-123	1000 Ohms. W.W. 1 Watt	.15	42.	11-163	Speaker & Cable Ass'y	4.50
15.	78-31	Sensitivity C.	.40	43.	94-78	Power Trans.	3.25
16.	25-112	.01 - 200 V.	.15	44.	76-1	Vibrator	2.55
17.	253-1	100 MMF	.15	45.	38-277	Vib. Choke	.51
18.	25-111	.05 - 200	.15	46.	38-278	A. Choke	.40
19.	25-106	100 MMF XM-262	.17	47.	48-7	Fuse 20 Amp.	.06
20.	25-117	Comp. Cap.	.28	48.	41-71	Control Unit	11.70
21.	258-1	270 MMF Sil. Mica Cap.	.28	49.	90-70	Switch & Stepper Ass'y	4.10
22.	25-121	20 MMF	.15	50.	38-273	Premeability Tuner	5.10
23.	253-2	250 MMF	.17	51.	38-280	Shunt Tracking Coil	.70
24.	253-3	500 MMF	.17	52.	38-272	P.B. Coil Ass'y	7.25
25.	25-116	.005 400 V.	.15	53.	80-136	Control Socket	.17
26.	25-114	.25 200 V.	.17	54.	38-279	Ant. Spark Chole	.34
27.	25-104	.005-400 V.	.15	55.	56-628	Ant. Cable Recp.	.15
28.	25-102	.05-200	.15				

S-7350-2

	PART NO.	NAME OF PART	LIST PRICE		PART NO.	NAME OF PART	LIST PRICE
1.	773-14	10 M Ohm.	.15	24.	25-110	.006 1200 V.	.17
2.	78-31	Sensitivity C.	.15	25.	25-109	.007-1600 V.	.17
3.	773-24	1 Meg.	.15	26.	25-118	.5-100 V.	.22
4.	773-16	22 M Ohm. 1/2 W.	.15	27.	25-100	Spark Plate	.17
5.	773-18	47 M Ohm.	.15	28.	25-121	20 MMF.	.15
6.	78-42	.5 Meg. Vol. Control	.95	29.	25-112	01-200 V.	.15
7.	773-29	10 Meg.	.15	30.	253-3	500 MMF.	.15
8.	773-21	220 M Ohm.	.15	31.	56-628	Antenna Cable Neck	.10
9.	773-23	470 M Ohm.	.15	32.	38-279	Antenna Spark Choke	.34
10.	773-7	330 Ohm.	.15	33.	38-273	Premeability Tuner	5.10
11.	77-123	1000 Ohm.	.15	34.	38-280	Shunt Tracking Coil	.70
12.	773-4	100 Ohm.	.15	35.	26-116	Trimmer Assembly	.40
13.	773-17	33 M Ohm.	.15	36.	26-115	Antenna Trimmer	.25
14.	77-69	22 M Ohm. 1 W.	.15	37.	38-274	1st I.F. Assembly	1.40
15.	25-111	.05 200 V.	.15	38.	38-275	2nd I.F. Assembly	1.40
16.	25-102	.05 200 V.	.15	39.	94-80	Output Transformer	1.20
17.	253-1	100 MMF.	.15	40.	11-164	Speaker & Cable	3.40
18.	25-104	.005-400 V.	.15	41.	94-78	Power Transformer	3.25
19.	25-116	.005-400 V.	.15	42.	76-1	Vibrator	2.55
20.	25-113	.01-400 V.	.15	43.	38-277	Vibrator Choke	.51
21.	25-119	.002-200 V.	.15	44.	38-278	A Choke	.40
22.	25-103	.1-400 V.	.17	45.	48-7	Fuse 20 Amp.	.10
23.	25-99	Electrolytic	.95	46.	25-124	Silver Mica Cond. 420 MMF.	.35

FIRESTONE TIRE & RUBBER CO.

IF PEAK 455 KC FOR PARTS LIST SEE INDEX

MODEL S7350-2

FIRESTONE TIRE & RUBBER CO.

ALIGNMENT PROCEDURE

PRELIMINARY

Output meter connections.....Across loud speaker voice coil
Connection of signal generator ground lead.....Receiver chassis
Connection of signal generator output lead.....Ant. Term
Dummy antenna value to be in series with generator output.....See chart below
Position of Volume Control.....Fully on
Position of Tone Control......"Speech"

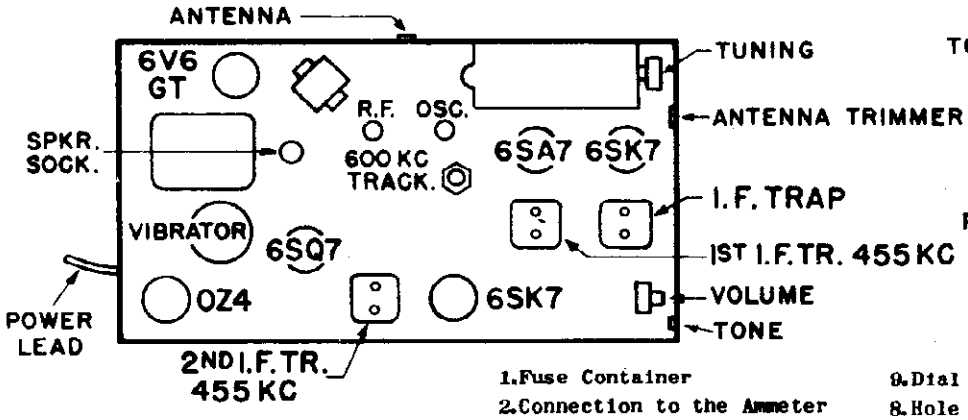
SET DIAL TO	GENERATOR FREQUENCY	DUMMY ANTENNA	ADJUSTMENTS (IN ORDER SHOWN)	TRIMMER FUNCTION
540 kc	455 kc	.1 mfd.	1st & 2nd I.F. TR.	I.F.
540 kc	455 kc	.1 mfd.	I.F. Wave Trap	I.F. Wave Trap
600 kc	600 kc	.0001 mfd.	600 kc Track	L.F. Pad
Highest Frequency	1600 kc	.0001 mfd.	Osc.	Osc.
600 kc	600 kc	.0001 mfd.	Antenna Tri.	Shunt Coil
1400 kc	1400 kc	.0001 mfd.	R.F.	Transl. & Ant.

IMPORTANT ALIGNMENT NOTES

The alignment procedure should be repeated in the original order, step by step to insure greater accuracy.

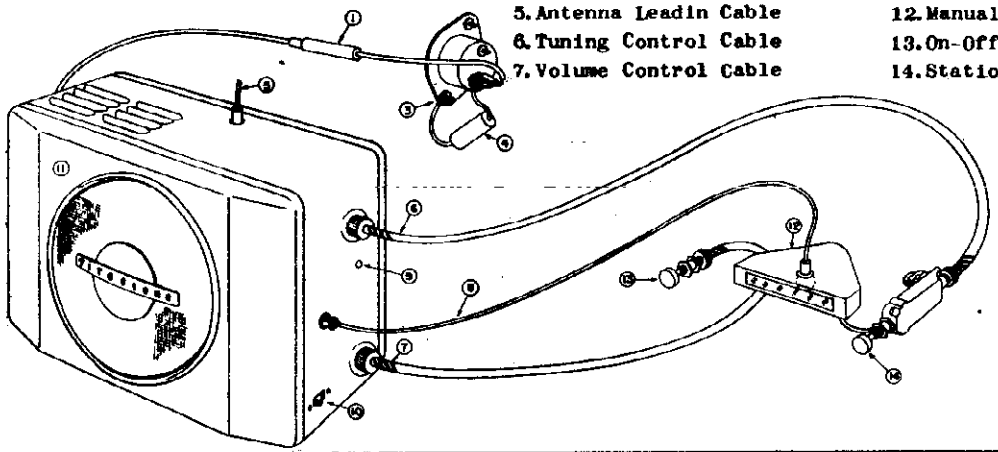
Always keep the output power from the generator at its lowest possible value to prevent AVC of the receiver from interfering with accurate alignment, except as noted by (*) above.

TUBE & VIBRATOR LOCATIONS

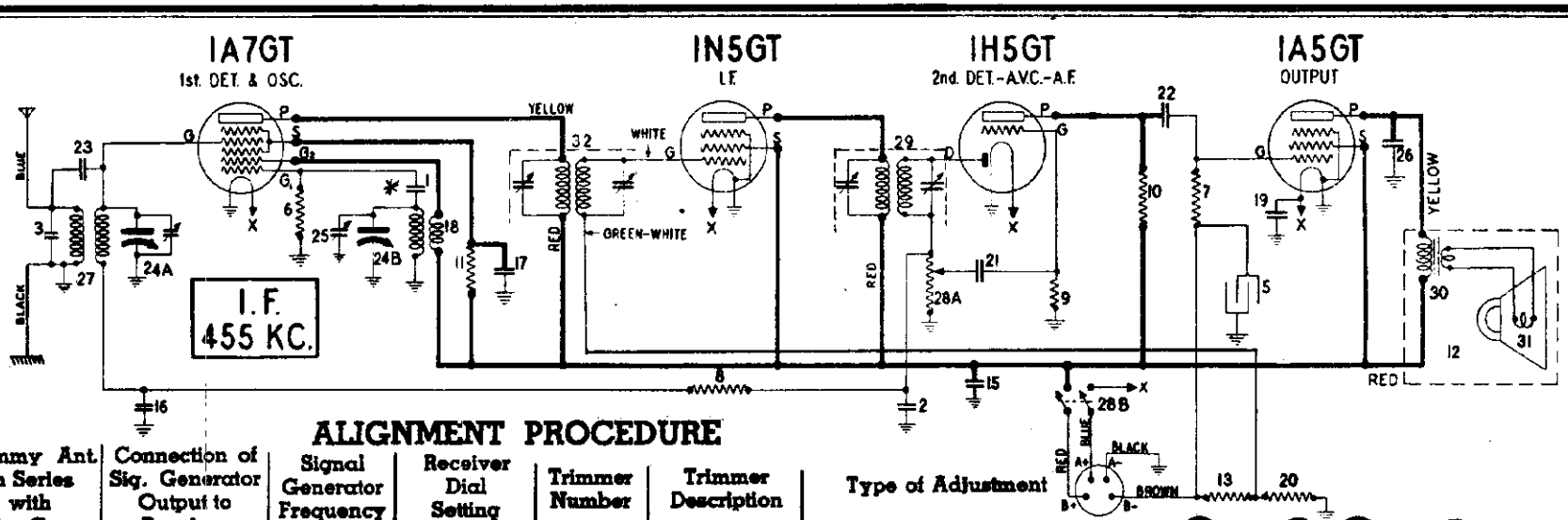


TO ADJUST VIBRATOR; DO NOT ATTEMPT REPLACE WITH PART NO. B 76-1.

CONNECTING THE RECEIVER

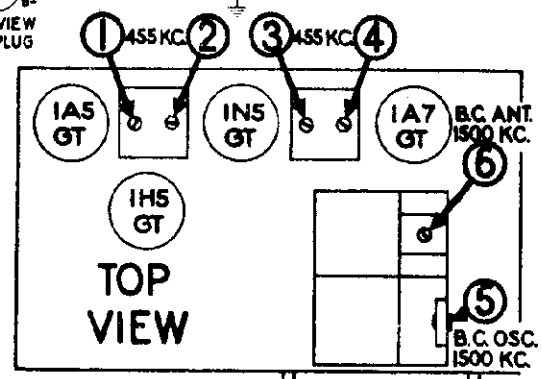


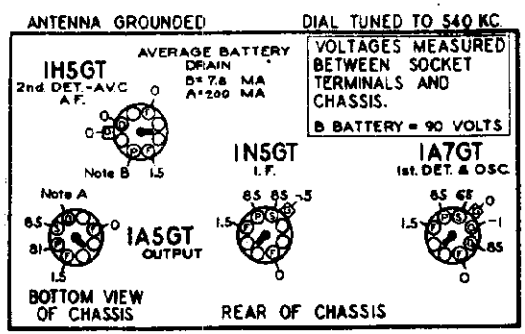
1. Fuse Container
2. Connection to the Ammeter
3. Grounding of the Ammeter
4. Ammeter Condenser
5. Antenna Leadin Cable
6. Tuning Control Cable
7. Volume Control Cable
8. Hole for Antenna Matching Adjustment
9. Dial Light Cable
10. Tone Control Switch
11. Front Cover
12. Manual Tuning Control
13. On-Off and Volume Control Knob
14. Station Selector Knob



ALIGNMENT PROCEDURE

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD Condenser	Control Grid of 1A7GT	455 KC	Any Point Where It Does Not Affect Signal	1-2	2nd I.F.	Adjust for maximum output. Then repeat adjustment.
				3-4	1st I.F.	
200 MMFD Condenser	Antenna Lead (Blue Wire)	1500 KC	1500 KC	5	Broadcast Oscillator (Shunt)	Adjust trimmer for maximum output.
200 MMFD. Condenser	Antenna Lead (Blue Wire)	1500 KC	Tune To 1500 KC Generator Signal	6	Broadcast Antenna	Adjust for maximum output.





SOCKET VOLTAGES

NOTE A: The bias for the control grid of the 1A5GT tube is -5 volts measured across resistors 13 & 20.

NOTE B: Due to the high resistance of plate resistor NO. 10 only a slight deflection will be obtained when

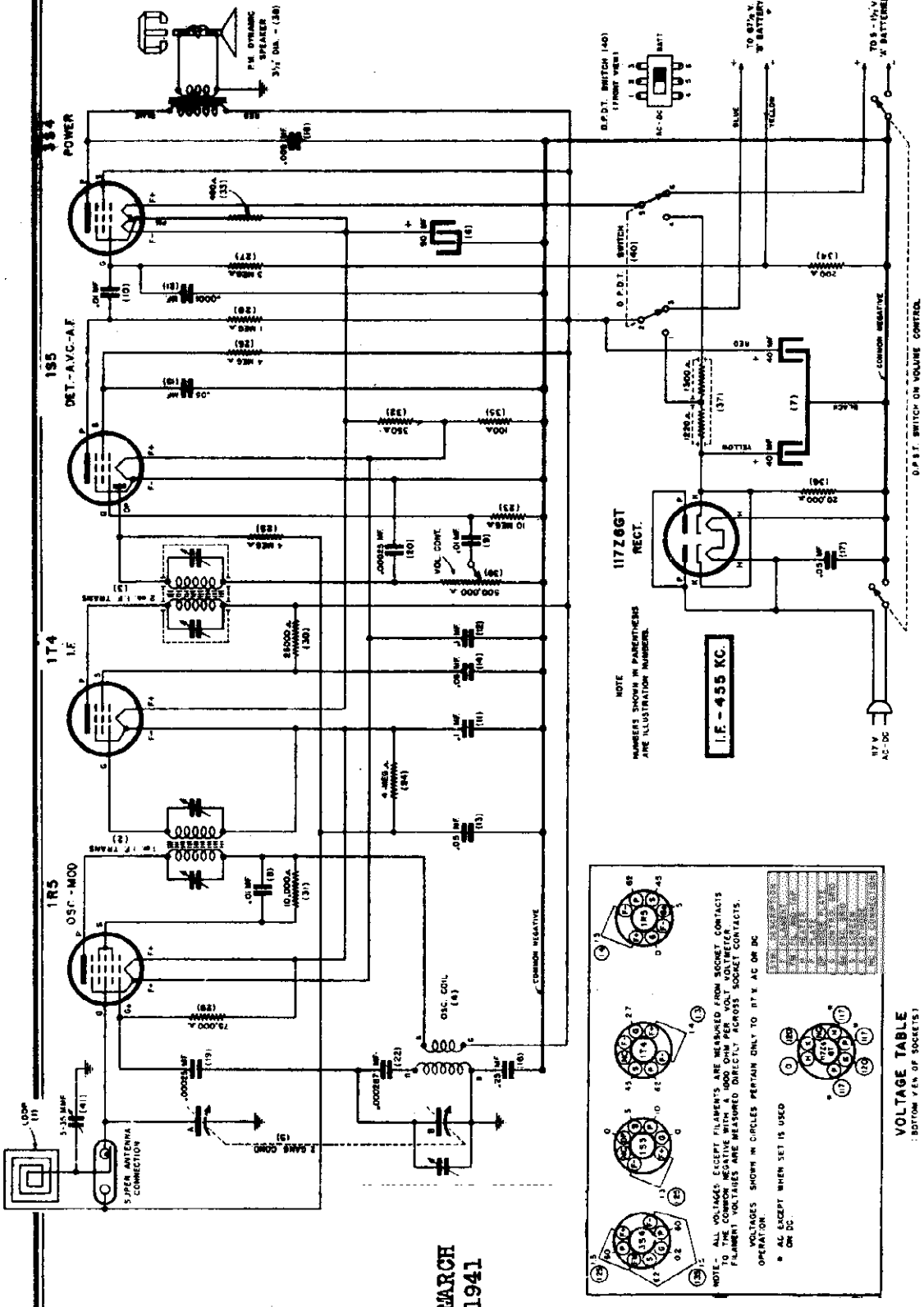
*No.1. In Model S7405-8, 260 mmf

TUBE LOCATIONS

1-----	85061	Condenser - mica 51 mmfd. ------	.17
2-----	83783	Condenser - mica 110 mmfd.------	.23
3-----	85061	Condenser - mica 51 mmfd.-------	.17
5-----	110377	Condenser - elect. 10 mfd. 35 V.	.92
6-----	110553	Resistor - carbon 220,000 ohms 1/4 watt----------	.14
7-----	110554	Resistor - carbon 1 meg. ½ watt	.14
8-9----	110560	Resistor - carbon 3.3 meg. ½ W.	.14
10----	110561	Resistor - carbon 680,000 ohms 1/4 watt----------	.14
11-----	112995	Resistor - carbon 15,000 ohms 1/4 watt----------	.14
12---R-	500886	Speaker - P.M. (6")----------	7.95
13-----	118078	Resistor - 560 ohms 1/4 watt----	.14
15-----	118206	Condenser - .25 mfd. 600 volt---	.40
16-17---	116819	Condenser - .05 mfd. 600 volt---	.23
18-----	117741	Coil - oscillator----------	.40
19-----	118206	Condenser - .25 mfd. 150 volt---	.40
20-----	118843	Resistor - carbon 47 ohms ½ W---	.14
21-----	119817	Condenser - .004 mfd. 600 volt--	.17
22-----	119193	Condenser - .01 mfd. 600 volt---	.17
23-----	119466	Capacitor - wire (2 mmfd.)------	.14
24A-24B-	501417	Condenser - tuning (with drum)---	4.00
25-----	501427	Condenser - trimmer----------	.30
26-----	119675	Condenser - .002 mfd. 600 volt--	.17
27-----	161323	Coil - antenna----------	1.15
28A-28B-	161325	Volume control ½ meg.with switch	1.75
29-----	161330	Transformer - 2nd I.F.----------	1.15
30---R-	500912	Transformer - output for R-500886 speaker----------	1.80
31---R-	500913	Cone & Voice coil for R-500886 speaker----------	1.80
32-----	161340	Transformer - 1st I.F.	1.25

MODEL S7397-1

FIRESTONE TIRE & RUBBER CO.



TEST OSCILLATOR

Set receiver dial to:	Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below:
Any point where no interfering signal is received.	Exactly 455 K. C.	0.2 Mfd. condenser	High side to lug on stator of gang condenser to which loop lead is connected.	Adjust each of the second I.F. transformer trimmers for maximum output, then adjust each of the first I.F. transformer trimmers for maximum output.
1 Exactly 1550 K.C.	Exactly 1550 K.C.	None	Use Small Loop to couple test oscillator to receiver loop.	Adjust 1550 K. C. oscillator trimmer for maximum output.
2 Approx. 1400 K.C.	Approx. 1400 K.C.	None	Use Small Loop to couple test oscillator to receiver loop.	While rocking gang condenser adjust 1400 K. C. loop trimmer for maximum output.

VOLTAGE TABLE
(BOTTOM VIEW OF SOCKETS)

NOTE:- ALL VOLTAGES EXCEPT FILAMENTS ARE MEASURED FROM SOCKET CONTACTS TO THE COMMON NEGATIVE WITH A 1000 OHM PER VOLT VOLTMETER. FILAMENT VOLTAGES ARE MEASURED DIRECTLY ACROSS SOCKET CONTACTS.

VOLTAGES SHOWN IN CIRCLES PERTAIN ONLY TO 117 V AC OR DC OPERATION.

* AC EXCEPT WHEN SET IS USED ON DC

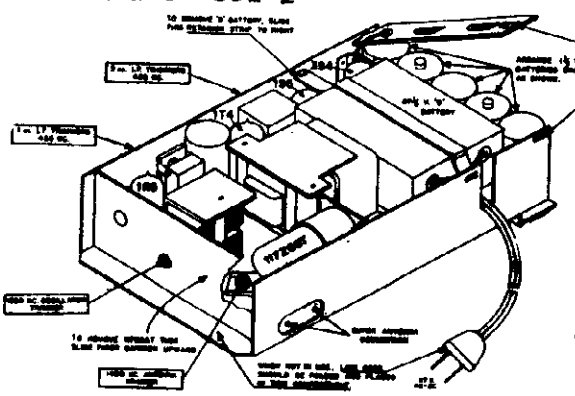
MARCH 1941

ALIGNMENT PROCEDURE

MODEL S7397-1
MODEL S7397-2(44

Model S-7391-1

FIRESTONE TIRE & RUBBER CO.



IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA AND BATTERIES IN THE SAM POSITION THEY WILL BE IN WHEN THE SET I IN THE CABINET. -- When adjusting 1550 kc oscillator trimmer and 1400 kc. antenna trimmer, do not connect test oscillator to loop. Couple test oscillator to receiver loop by: (a) Make a loop consisting of five to ten tur of No. 20 to 30 size wire wound on a three in form and attach across output of test oscilla tor, (b) Place test oscillator loop near set loop -- BE SURE THAT NEITHER MOVES WHILE ALIG ING.

ALIGNMENT PROCEDURE

Model S-7397-2

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibr incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one b make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment, check tuning dial adjustment by: turn gang condenser until plates touch maximum capacity (completely in mesh) at which point the dial indicator must be exactly even with the last line at the low frequency end of the calibration. If dial needle does not point exactly to last line move needle to correct position.

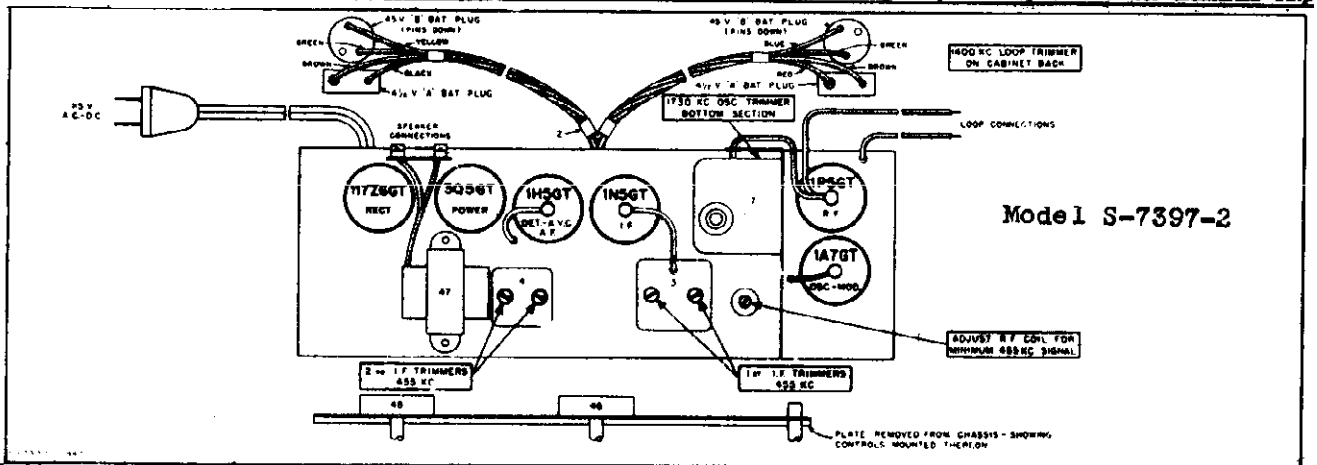
Use an accurately calibrated test oscillator with some type of output measuring device.

BEFORE ALIGNING, PLACE LOOP ANTENNA AND THE BATTERY IN THE SAME APPROXIMATE POSITION IN THE B OF CHASSIS THAT THEY WILL BE IN WHEN THE SET IS IN THE CABINET AND THE CABINET BACK CLOSED.

AS THE DIAL SCALE PARTIALLY COVERS THE I.F. TRIMMER, IT IS NECESSARY TO REMOVE DIAL SCALE FROM FR ON WHICH IT IS MOUNTED BY REMOVING THE STUDS THAT HOLD SCALE IN PLACE WHEN ALIGNING I.F. TRANSFORM

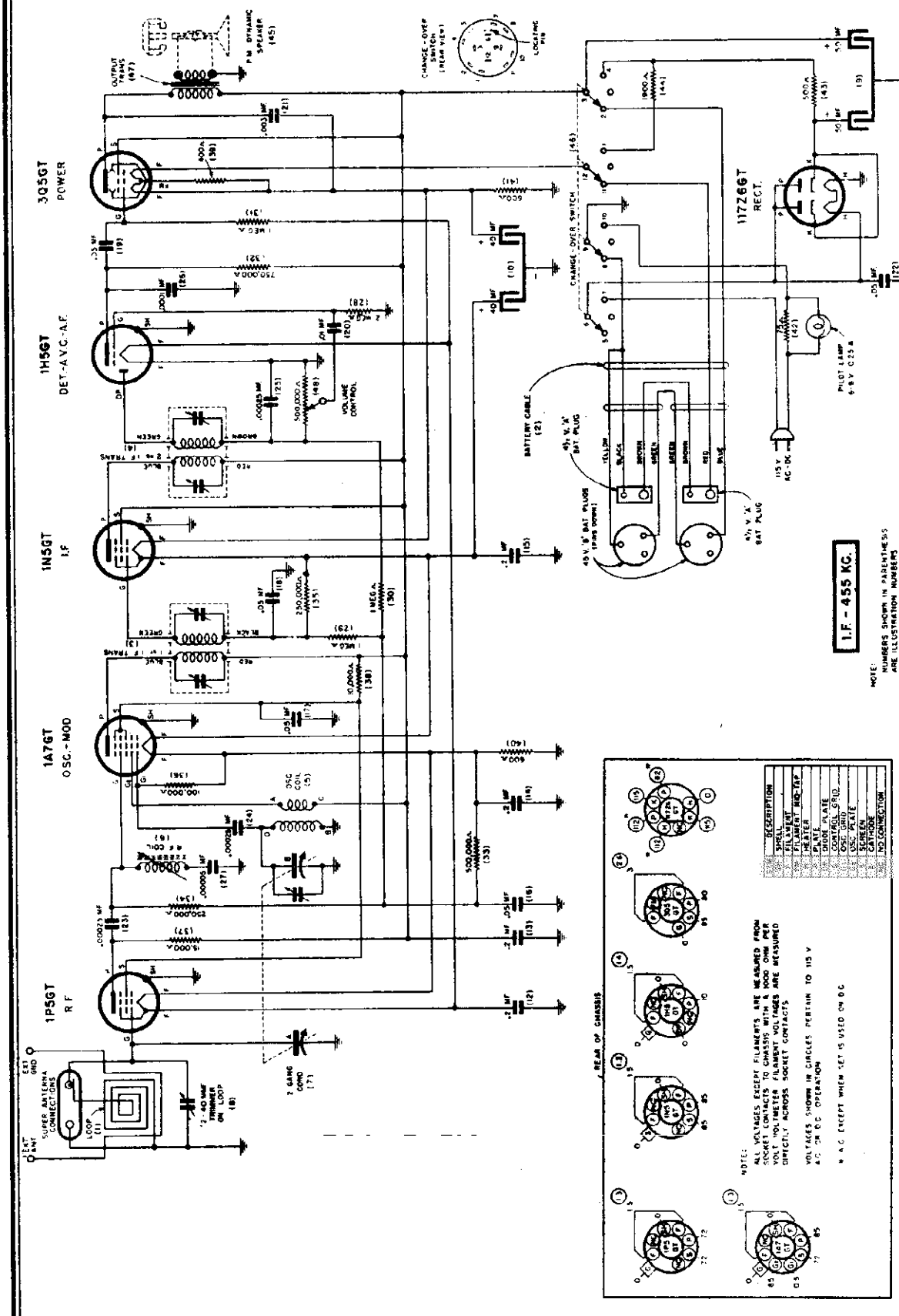
When adjusting 1600 kilocycle oscillator trimmer 600 K.C. padder, 455 K.C. R.F. trimmer and 1400 kilocycle antenna trimmer, do connect test oscillator to loop. Couple test oscillator to receiver loop by: (a) Make a loop consisting of five to ten turns of No. 20 t size wire wound on a three inch form and attach across output of test oscillator. (b) Place test oscillator loop near set loop—BE S THAT NEITHER MOVES WHILE ALIGNING.

Set receiver dial to:	TEST OSCILLATOR: Adjust test oscillator frequency to:	TEST OSCILLATOR: Use dummy antenna in series with output of test oscillator consisting of:	TEST OSCILLATOR: Attach output of test oscillator to:	Refer to parts layout diagram location of trimmers mentioned belo
Any point where no interfering signal is received.	Exactly 455 K.C.	0.2 Mfd. condenser	High side to grid cap of 1A7GT tube. Low side to frame of gang condenser.	Adjust each of the second I.F. transform trimmers for maximum output, then adj each of the first I.F. transformer trimm for maximum output.
1 Rotate gang condenser to Maximum Capacity	Exactly 455 K.C.	None	Use Small Loop to couple test oscillator to receiver loop.	Adjust R.F. coil for minimum 455 K. signal.
2 Exactly 1730 K.C.	Exactly 1730 K.C.	None	Use Small Loop to couple test Oscillator to receiver loop.	Adjust 1730 K.C. oscillator trimmer maximum output.
3 Approx. 1400 K.C.	Approx. 1400 K.C.	None	Use Small Loop to couple test Oscillator to receiver loop.	While rocking gang condenser adjust 1 K.C. loop trimmer for maximum outp



MODEL S7397-2(443)

FIRESTONE TIRE & RUBBER CO.

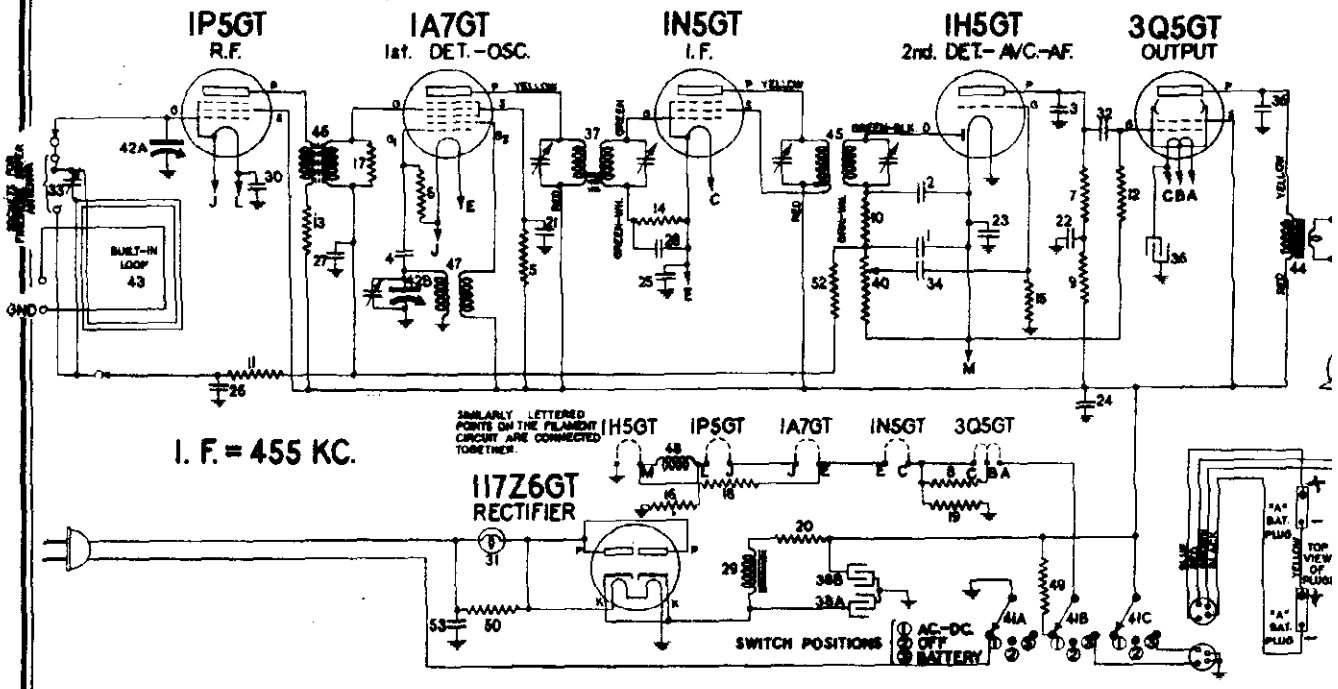


THIS RECEIVER CAN BE OPERATED EITHER WITH DRY BATTERIES OR FROM 110-120 VOLT DIRECT CURRENT OR 50-60 CYCLE ALTERNATING CURRENT. Thus the set may be operated on farms, in summer camps, hunting lodges, auto trailers, boats, or in any isolated districts where electric service is not available by using batteries. Where 110-120 volt direct current or 50-60 cycle alternating current is available, the radio may be operated direct from the electric lines without using the battery or making any change in the receiver.

When the Power Switch is in the AC-DC position the batteries are entirely disconnected and the set receives all its power from the AC or DC electric line.

FIRESTONE TIRE & RUBBER CO.

MODEL S739
Code A-377



FOR PARTS LIST SEE NEXT PAGE

WARNING: THE ADJUSTMENTS DESCRIBED ON THIS PAGE ARE TO BE MADE BY A QUAL SERVICE MAN ONLY. IF THESE ADJUSTMENTS ARE TAMPERED WITH BY ANYONE ELSE WARRANTY IS VOID.

ALIGNMENT PROCEDURE

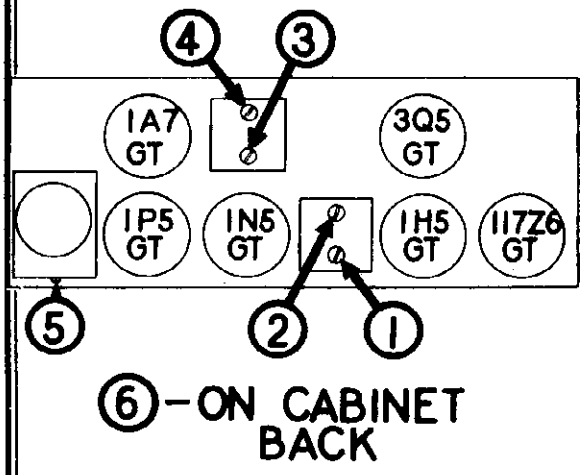
FOR ALIGNMENT an output meter and an accurately calibrated signal generator are required.

1. Connect the output meter across the voice coil or between the plate of the 3Q5GT output tube and gr through a 0.1 Mfd. condenser, depending on the type of meter. (The more sensitive type should be nected across the voice coil.)
2. Connect the ground lead of the signal generator through a .1 Mfd. condenser to the chassis.
3. Turn the volume control to the maximum volume position and keep it in this position while alig
4. With the gang condenser in full mesh, set the dial pointer to the low frequency end of the dial scal

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustmen
.1 MFD. Condenser	Control Grid of 1A7GT	455 KC	Any Point Where It Does Not Affect Signal	1-2	2nd I.F.	Adjust for maximum ou put. Then repeat adjus ment.
				3-4	1st I.F.	
200 MMFD. Condenser	Lead from sig. gen. placed near loop	1500 KC	1500 KC	5	Broadcast Oscillator (Shunt)	Adjust trimmer for ma imum output.
200 MMFD. Condenser	Lead from sig. gen. placed near loop	1500 KC	Tune To 1500 KC Generator Signal	6	Broadcast Antenna	Adjust for maximum ou put.

MODEL S7397-2
Code A-377

FIRESTONE TIRE & RUBBER CO.



INSTALLATION OF BATTERIES

BATTERIES USED

Quantity	Rating	Firestone Stock Number
2	4½ Volt "A"	E-1526-7
2	45 Volt "B"	E-1526-8

These batteries are placed on their sides in the bottom compartment of the cabinet as shown on page two of this booklet and on the label at the rear of the chassis. After plugging the four-pronged plug on the battery cable into the socket on the rear of the chassis, plug the two three-prong plugs on the battery cable into the sockets on the ends of the "B" batteries and the two two-prong plugs into the sockets on the ends of the "A" batteries. The four prong plug on the opposite end of the battery cable must be plugged into the socket on the rear of the chassis before connecting the batteries.

ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1-2-3	83783	Condenser—mica 110 mmfd.	$0.20
4	85061	Condenser—mica 51 mmfd.	.15
5	110552	Resistor—carbon 47,000 ohms ¼ watt	.12
6	110553	Resistor—carbon 220,000 ohms ¼ watt	.12
7	110554	Resistor—carbon 1 megohm ¼ watt	.12
8	110556	Resistor—carbon 330 ohm ¼ watt	.12
9	110559	Resistor—carbon 470,000 ohms ¼ watt	.12
10	110564	Resistor—carbon 100,000 ohms ¼ watt	.12
11-12	110570	Resistor—carbon 2.2 meg. ¼ watt	.15
13	110573	Resistor—carbon 2,200 ohms ¼ watt	.12
14-15	110580	Resistor—carbon 3.3 meg. ¼ watt	.12
16	112974	Resistor—carbon 220 ohm ¼ watt	.15
17	116052	Resistor—carbon 33,000 ohm 1/10 w.	.12
18-19	116080	Resistor—insulated 680 ohms ¼ watt	.15
20	116094	Resistor—220 ohms 2 watt w.w.	.20
21 to 23	116625	Condenser—.1 mfd. 600 volts	.25
24	118290	Condenser—.5 mfd. 150 volt	.50
25	116706	Condenser—.2 mfd. 600 volts	.35
26 to 28	116819	Condenser—.05 mfd. 600 volts	.20
29	117888	Filter choke	.85
30	118231	Condenser—.25 mfd. 150 volt	.32
31	118921	Lamp-dial (Mazda No. 47)	.15
32	119193	Condenser—.01 mfd. 600 volts	.15
33	119345	Condenser—trimmer (loop)	.20
34-35	119875	Condenser—.002 mfd. 600 volts	.15
36	161273	Condenser—electrolytic 50 mfd. 35 volt	.50
37	500759	Transformer—1st. I.F.	1.20
38A-38B	501213	Condenser—electrolytic { A—40 mfd. 150 volts / B—20 mfd. 150 volts }	1.20
39	R501350	Speaker—P.M. dynamic (5")	5.40
40	501353	Volume control—1 meg.	1.00
41A to 41C	501354	Switch—A.C.-D.C. & battery	1.30
42A-42B	501355	Condenser—variable tuning (with drum)	
43	501373	Loop antenna	1.80
44	501374	Transformer—output for speaker	1.80
45	501380	Transformer—2nd I.F.	1.60
46	501382	Coil—R.F.	.90
47	501383	Coil—oscillator	.80
48	501384	Choke coil	.35
49	501386	Resistor—1660 ohms 6 watts wire wound	.35
50	501390	Resistor—33 ohms 2 w. wire wound	.18
51	501445	Cone & V.C. for R-501350 speaker	1.50
52	110570	Resistor—carbon 2.2 meg. ¼ watt	.15
53	116819	Condenser—.05 mfd. 600 volts	.20

MISCELLANEOUS PARTS

Part Number	Description	List Price
501376	Battery cable—complete	$1.20
114955	Clamp for dial cord	.01
112745	Clip—coil mounting	.01
113019	Clip—dial scale retaining	.01
116948	Cord—dial drive (supplied in 6 ft. lengths)	Per doz. .10
114254	C-washer for tuning shaft	
501371	Dial scale	.60
501352	Jack—for external loop	.45
501360	Knob	.15
12349	Nut—8-32 for mounting speaker	Per C .45
500748	Plug—2 prong male for battery cable	.03
116398	Plug—3 prong male for battery cable	.06
500747	Plug—4 prong male for battery cable	.05
501348	Pointer—dial	.15
501349	Pointer—power knob	.15
501357	Screen—speaker	.65
83624	Screw-self tapping 8 x ¼	.01
117716	Shield—tube	.07
501347	Socket—dial lamp	.20
500681	Socket—4 prong (battery cable)	.10
116690	Socket—octal base	.12
89027	Washer—spring type for tuning shaft	.01
501361	Window—dial	.35

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

NOTE: The possession of this price list by any person is not to be construed as an offer to sell to him, nor anyone else, the goods listed herein at prices stated.

SOCKET VOLTAGES

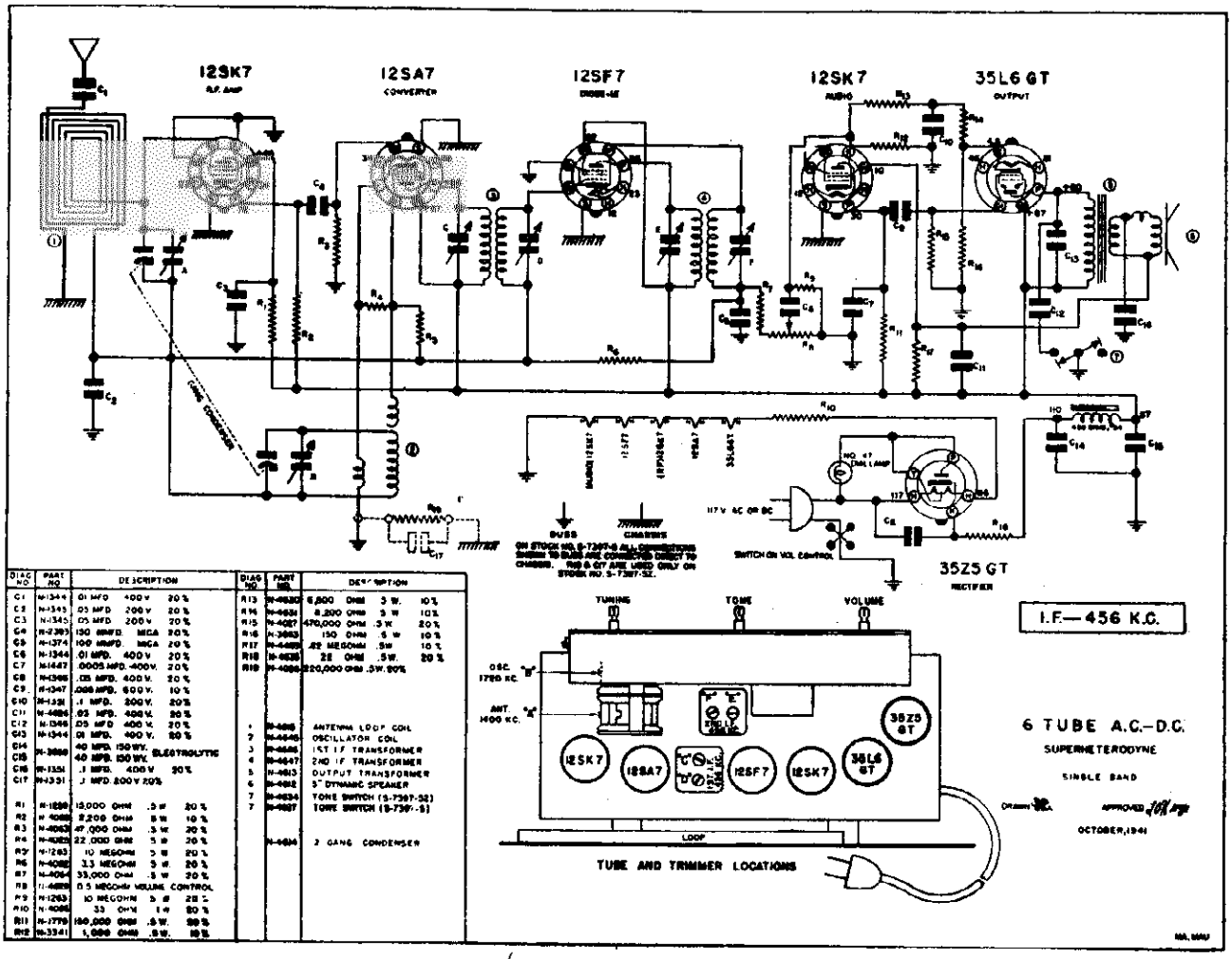
Line Voltage—117 Volts A.C. — No Sig. Input—Volume on Full

TUBE	FUNCTION	FIL.	K	G	G_1	G_2	S	P	D
1P5GT	R.F. Amp.	1.4	—	Note A	—	—	98	91	—
1A7GT	1st. Det.—Osc.	1.3	—	Note A	—2	98	58	98	—
1N5GT	I.F. Amp.	1.4	—	Note B	—	—	98	98	—
1H5GT	2nd. Det.—AVC. A.F.	1.4	—	0	—	—	—	13	Note A
3Q5GT	Output	1.4	—	Note A	—	—	98	94	—
117Z6GT	Rectifier	111 A.C.	121	VOLTAGE ON P_1 & P_2 = 111 VOLTS A.C.					

NOTE A: Voltage on these elements is 1.4 volts measured across filament of 1H5GT.
NOTE B: Voltage on the grid of the 1N5GT I.F. cannot be measured with a standard voltmeter. Use a voltmeter of 1,000 ohms per volt.

FIRESTONE TIRE & RUBBER CO.

Voltages shown on the circuit diagram are from socket terminals to ground buss. In measuring voltages use a voltmeter having a resistance of at least 1000 ohms per volt. Allowances should be made for variations in line voltage.



DIAG NO	PART NO	DESCRIPTION
C1	N-1344	.01 MFD 400 V 20%
C2	N-1345	.05 MFD 200 V 20%
C3	N-1345	.05 MFD 200 V 20%
C4	N-2387	150 MMFD MICA 20%
C5	N-1374	100 MMFD MICA 20%
C6	N-1344	.01 MFD. 400 V 20%
C7	N-1447	.0005 MFD. 400V. 20%
C8	N-1346	.125 MFD. 400 V. 20%
C9	N-1347	.008 MFD. 600 V. 10%
C10	N-1321	.1 MFD. 200 V. 20%
C11	N-4686	.05 MFD. 400 V. 20%
C12	N-1346	.125 MFD 400 V. 20%
C13	N-1344	.01 MFD. 400 V. 20%
C14		40 MFD. 150 WV.
C15	N-3088	40 MFD. 150 WV. ELECTROLYTIC
C16	W-1321	.1 MFD. 400 V 20%
C17	N-1321	.1 MFD. 200 V. 20%
R1	N-1288	10,000 OHM .5 W 20%
R2	N-4088	2,200 OHM .5 W 10%
R3	N-4063	47,000 OHM .5 W 20%
R4	N-4083	22,000 OHM .5 W 20%
R5	N-1283	10 MEGOHM .5 W 20%
R6	N-4082	3.3 MEGOHM .5 W 20%
R7	N-4064	33,000 OHM .5 W 20%
R8	N-4085	0.5 MEGOHM VOLUME CONTROL
R9	N-1283	10 MEGOHM .5 W 20%
R10	N-4066	33 OHM 1 W 20%
R11	N-1779	180,000 OHM .5 W 20%
R12	W-3341	1,000 OHM .5 W 10%
R13	N-4630	6,800 OHM .5 W. 10%
R14	N-4634	8,200 OHM .5 W 10%
R15	N-4087	470,000 OHM .5 W 20%
R16	N-3083	150 OHM .5 W 10%
R17	N-4088	.82 MEGOHM .5W 10%
R18	N-4638	22 OHM .5 W. 20%
R19	N-4086	220,000 OHM .5W 20%
1	N-4618	ANTENNA LOOP COIL
2	N-4646	OSCILLATOR COIL
3	N-4648	1ST I.F. TRANSFORMER
4	N-4647	2ND I.F. TRANSFORMER
5	N-4613	OUTPUT TRANSFORMER
6	N-4612	5" DYNAMIC SPEAKER
7	N-4634	TONE SWITCH (S-7397-S2)
7	N-4637	TONE SWITCH (S-7397-S1)
	N-4634	2 GANG CONDENSER

ALIGNMENT DATA AND SERVICING

Lack of sensitivity and poor tone quality may be due to any one or a combination of causes such as weak or defective tubes or speak open or grounded bias resistor, bypass condenser, etc. Never attempt to realign set until all other possible sources of trouble have be first thoroughly investigated and definitely proved not to be the cause.

NOTE: IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OUTP MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER AND THAT THE PROCEDURE BE CAREFULLY FOLLOWED, OTHE WISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT, THE TRIMMERS WILL BE REFERR TO BY THEIR FUNCTION AS INDICATED ON THE PARTS DIAGRAM.

ALIGNMENT PROCEDURE

GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 456, 600, 1400 and 1720 KC and an output meter to be connected across the primary and 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.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the broadcast band should be adjusted.

I. F. ALIGNMENT. With 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 (12SA7) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the ground buss, indicated in circuit diagram. Align all four I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT. Remove the chassis from the cabinet and set on a bench, taking care that no metal is near the loop. Do not make this setup on a metal bench.

Connect the test oscillator to the antenna of the set through a 200 mmfd. (.0002) condenser. With the gang condenser set at minimum capacity, set the test oscillator at 1720 KC, and adjust the oscillator (or 1720 KC trimmer) on gang condenser. Next—set the test oscillator at 1400 KC, and tune in the signal on the gang condenser. Adjust the antenna trimmer (or 1400 KC trimmer) for maximum signal. Next set the test oscillator at 600 KC, and tune in signal on condenser to check alignment of coils.

MODEL S7398-1
Beaumont

FIRESTONE TIRE & RUBBER CO.

ALIGNMENT PROCEDURE

Lack of sensitivity and poor tone quality may be due to any one or a combination of causes such as weak or defective tubes or speaker, open or grounded bias resistor, bypass condenser, etc. Never attempt to realign set until all other possible sources of trouble have been first thoroughly investigated and definitely proved not to be the cause.

NOTE: IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OUTPUT MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER AND THAT THE PROCEDURE BE CAREFULLY FOLLOWED, OTHERWISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT. THE TRIMMERS WILL BE REFERRED TO BY THEIR FUNCTION AS INDICATED ON THE PARTS DIAGRAM.

GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 456, 600, 1400 and 1720 KC and an output meter 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.

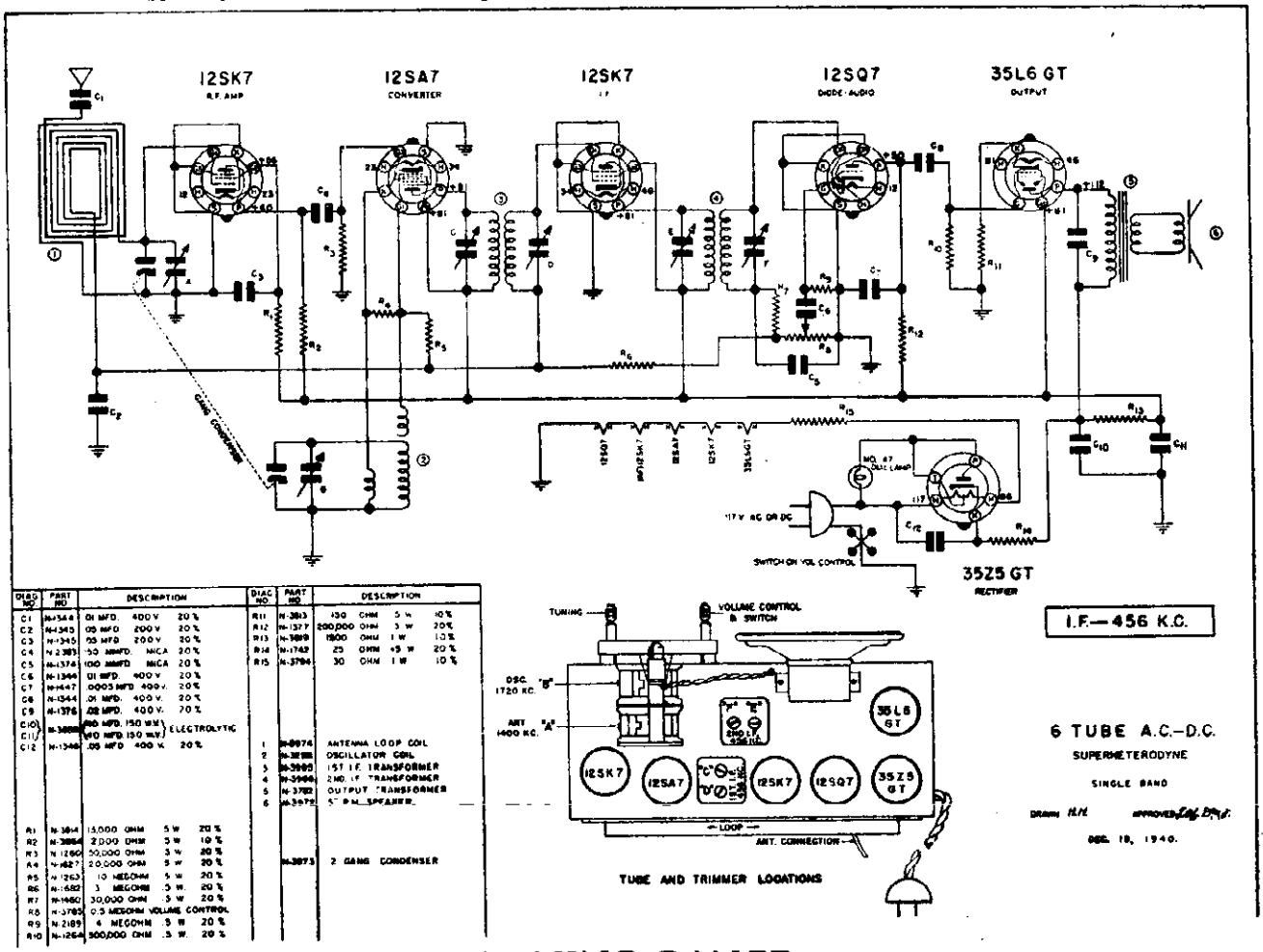
CORRECT ALIGNMENT PROCEDURE. The intermediate frequency (I.F.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the broadcast band should be adjusted.

I. F. ALIGNMENT. With 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 (12SA7) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the chassis ground. Align all four I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT. Remove the chassis from the cabinet and set on a bench, taking care that no metal is near the loop. Do not make this setup on a metal bench.

Connect the test oscillator to the antenna of the set through a 200 mmfd. (.0002) condenser. With the gang condenser set at minimum capacity, set the test oscillator at 1720 KC, and adjust the oscillator (or 1720 KC trimmer) on gang condenser. Next—set the test oscillator at 1400 KC, and tune in the signal on the gang condenser. Adjust the antenna trimmer (or 1400 KC trimmer) for maximum signal. Next set the test oscillator at 600 KC, and tune in signal on condenser to check alignment of coils.

Voltages shown on the circuit diagram are from socket terminals to chassis base. In measuring voltages use a voltmeter having a resistance of at least 1000 ohms per volt. Allowances should be made for variations in line voltage.



DIAG. NO.	PART NO.	DESCRIPTION
C1	N-3444	.01 MFD. 400 V. 20%
C2	N-3445	.05 MFD. 200 V. 20%
C3	N-3445	.05 MFD. 200 V. 20%
C4	N-2383	50 MMFD. MICA 20%
C5	N-1374	100 MMFD. MICA 20%
C6	N-1344	.01 MFD. 400 V. 20%
C7	N-1447	.0005 MFD. 400 V. 20%
C8	N-1344	.01 MFD. 400 V. 20%
C9	N-1376	.02 MFD. 400 V. 20%
C10	N-3888	40 MFD. 150 VOLT ELECTROLYTIC
C11		40 MFD. 150 VOLT
C12	N-1348	.05 MFD. 400 V. 20%
R1	N-3814	15,000 OHM 5 W. 20%
R2	N-3886	2,000 OHM 5 W. 10%
R3	N-1260	50,000 OHM 5 W. 20%
R4	N-1827	20,000 OHM 5 W. 20%
R5	N-1263	10 MEGOHM 5 W. 20%
R6	N-1682	3 MEGOHM .5 W. 20%
R7	N-1680	30,000 OHM .5 W. 20%
R8	N-3785	0.5 MEGOHM VOLUME CONTROL
R9	N-2189	4 MEGOHM .5 W. 20%
R10	N-1264	500,000 OHM .5 W. 20%
R11	N-3813	150 OHM 5 W. 10%
R12	N-1327	200,000 OHM .5 W. 20%
R13	N-3898	1500 OHM 1 W. 10%
R14	N-1743	25 OHM +5 W. 20%
R15	N-3796	30 OHM 1 W. 10%
1	N-3874	ANTENNA LOOP COIL
2	N-3898	OSCILLATOR COIL
3	N-3895	1ST I.F. TRANSFORMER
4	N-3896	2ND I.F. TRANSFORMER
5	N-3782	OUTPUT TRANSFORMER
6	N-3872	5" P.M. SPEAKER
	N-3873	2 GANG CONDENSER

TUBE AND TRIMMER LOCATIONS

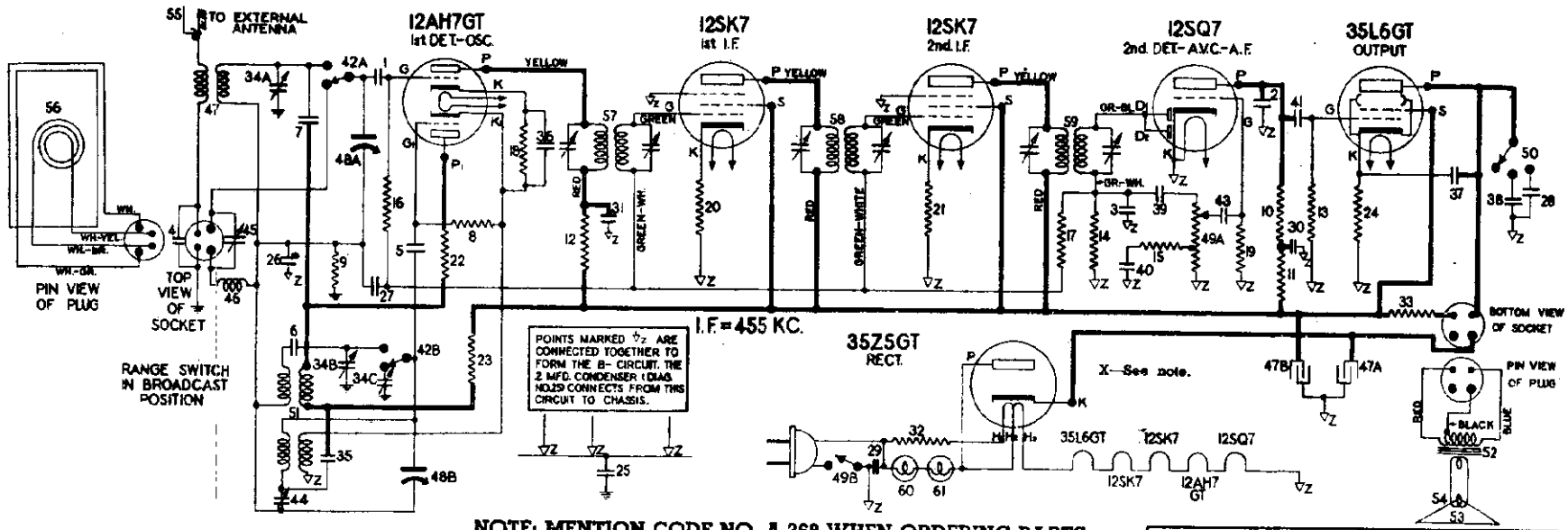
I.F.—456 K.C.

6 TUBE A.C.-D.C.
SUPERHETERODYNE
SINGLE BAND

Drawn H.H. Approved Engr. Dept.
DEC. 19, 1940.

TUNING RANGE

This receiver is designed to operate over the standard broadcast band which extends from 535 to 1720 Kilocycles (KC) (174 to 560 Meters) and includes the popular 1712 KC police channel.



NOTE: MENTION CODE NO. A-368 WHEN ORDERING PARTS.

NOTE—A 20 Ohm Resistor (1 Watt) is added at point X on all 25 Cycle Receivers. Part No. 117395, list price 16 cents.

ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1-2-3	83539	Condenser, Mica, 260 Mmfd.	$0.20
4-5	83783	Condenser, Mica, 110 Mmfd.	.20
6	88587	Condenser, Mica, .0042 Mfd.	.35
7	110510	Condenser, Wire 3 Mmfd.	.12
8	110552	Resistor, Carbon, 47,000 Ohms ¼ Watt	.12
9-10-11	110553	Resistor, Carbon, 220,000 Ohms ¼ Watt	.12
12	110557	Resistor, Carbon, 4700 Ohms ¼ Watt	.12
13-14	110559	Resistor, Carbon, 470,000 Ohms ¼ Watt	.12
15	110565	Resistor, Carbon, 22,000 Ohms ¼ Watt	.12
16-17	110570	Resistor, Carbon, 2.2 Meg. ¼ Watt	.15
18	110573	Resistor, Carbon, 2200 Ohms ¼ Watt	.12
19	110580	Resistor, Carbon, 3.3 Meg. ¼ Watt	.12
20-21-22	110590	Resistor, Carbon, 180 Ohms ¼ Watt	.12
23	112952	Resistor, Carbon, 3300 Ohms ¼ Watt	.10
24	116092	Resistor, 140 Ohms 1 Watt, W.W.	.14
25	115706	Condenser, .2 Mfd. 600 Volt	.35
26 to 31	116819	Condenser, .05 Mfd. 600 Volt	.20
32	117395	Resistor, 20 Ohm 1 Watt	.16
33	118835	Resistor, Insulated, 1500 Ohms 1 Watt	.15
34A-34B-34C	119174	Condenser, Trimmer 3 Section	.45
35-36-38-39	119193	Condenser, 01 Mfd. 600 Volt	.15
37-40	119414	Condenser, .02 Mfd. 600 Volt	.15
41	119417	Condenser, .006 Mfd. 600 Volt	.15
42A-42B	119534	Switch, Band	.80
43	119875	Condenser, .002 Mfd. 600 Volts	.15
44	119934	Condenser, Padder	.36
45	160449	Condenser, Trimmer	.18
46	500108	Coil, Compensating	.50
47	500249	Coil, Short Wave Antenna	.50
47A-47B	500256	Condenser Electrolytic A—40 Mfd. 150V. B—30 Mfd. 150V.	60 Cycle only 1.00
	500744	Condenser Electrolytic A—80 Mfd. B—20 Mfd.	25 Cycle only

Diagram Number	Part Number	Description	List Price
48A-48B	500311	Condenser, Tuning	$2.50
49A-49B	500315	Volume Control, 1 Meg. (with switch)	1.40
50	500316	Switch, Tone	.70
51	500322	Coil, Oscillator	1.00
52	M-500325	Transformer, Output for M-500351 Spkr.	1.70
53	M-500326	Cone & Voice Coil for M-500351 Spkr.	1 60
54	M-500351	Speaker, P.M. Dynamic (6")	4.80

Diagram Number	Part Number	Description	List Price
55	500368	Plate Antenna with clip	$0.42
56	500398	Loop Antenna & Cabinet Back	1.80
57	500452	Transformer, 1st I.F.	1.20
58	500455	Transformer, 2nd I.F.	1.20
59	500457	Transformer, 3rd I.F.	1.20
60-61	85298	Lamp—Dial 6 to 8 volt (Mazda 51)	.16

SOCKET VOLTAGES — ALL D.C. POTENTIAL MEASURED TO K ON THE 12SQ7 TUBE

NO SIGNAL CONDITION — DIAL TUNED TO 540 KC.

TUBE	FUNCTION	FIL. VOLTS	K	G	S	SU	P	D_1	D_2
12AH7GT*	1st DET.	11.0	3.5	0			63		
	OSC. (Elements marked.)		0	—5			62		
12SK7	1st I.F.	11.0	1.4	0	75	0	75		
12SK7	2nd I.F.	11.0	1.8	0	75	0	75		
12SQ7	2nd DET.—A.V.C.—A.F.	11.0	0	0			35	0	0
35L6GT	OUTPUT	30.0	4.0	0	75		90		
35Z5GT	RECTIFIER	31.0	100	Plate—105 A.C.					

*See trimmer chart for pin layout on 12AH7GT Tube.

Use a high resistance voltmeter of 1000 ohms per volt.

FIRESTONE TIRE & RUBBER CO.

MODEL S7398-3

FIRESTONE TIRE & RUBBER CO.

ALIGNMENT EQUIPMENT & PROCEDURE

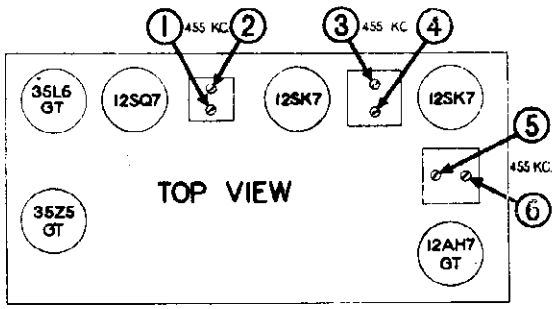
FOR ALIGNMENT: An output meter and an accurately calibrated signal generator are required.

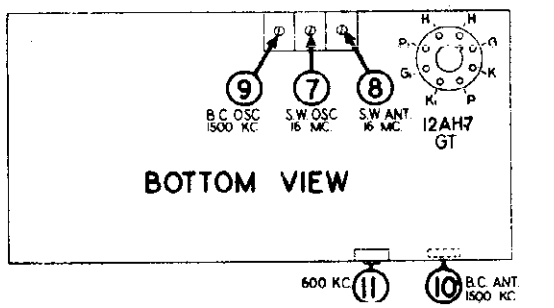
1. Connect the output meter across the voice coil or between the plate of the 35L6GT output tube and the cathode of the 12SQ7 through a .1 mfd. condenser. (The more sensitive type of meter should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to B— through a .25 mfd. condenser. If oscillation is encountered try dressing leads and changing point of connection to B—.
3. Volume control in maximum position. Weak signal input.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD. Condenser	Lug on Rear Section of Gang Cond.	455 KC	American	Any Point Where It Does Not Affect the Signal	1-2	3rd I.F.	Adjust for Maximum Output. Then repeat Adjustment.
					3-4	2nd I.F.	
					5-6	1st I.F.	
400 OHM Carbon Resistor	Antenna Terminal (Blue Wire)	16 MC	Foreign	16 MC	7	Foreign Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 15.1 MC. If Image does not appear, Realign at 16 MC, with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	Antenna Terminal (Blue Wire)	16 MC	Foreign	Tune to 16 MC Generator Signal	8	Foreign Antenna	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.
200 MMFD. Mica Condenser	Antenna Terminal (Blue Wire)	1500 KC	American	1500 KC	9	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.

Now replace the chassis and loop antenna in the cabinet before proceeding further.

200 MMFD. Mica Condenser	Antenna Terminal (Blue Wire)	1500 KC	American	Tune to 1500 KC Generator Signal	10	Broadcast Antenna	Adjust for Maximum Output.
200 MMFD. Mica Condenser	Antenna Terminal (Blue Wire)	600 KC	American	Tune to 600 KC Generator Signal	11	Broadcast Oscillator (Series)	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.



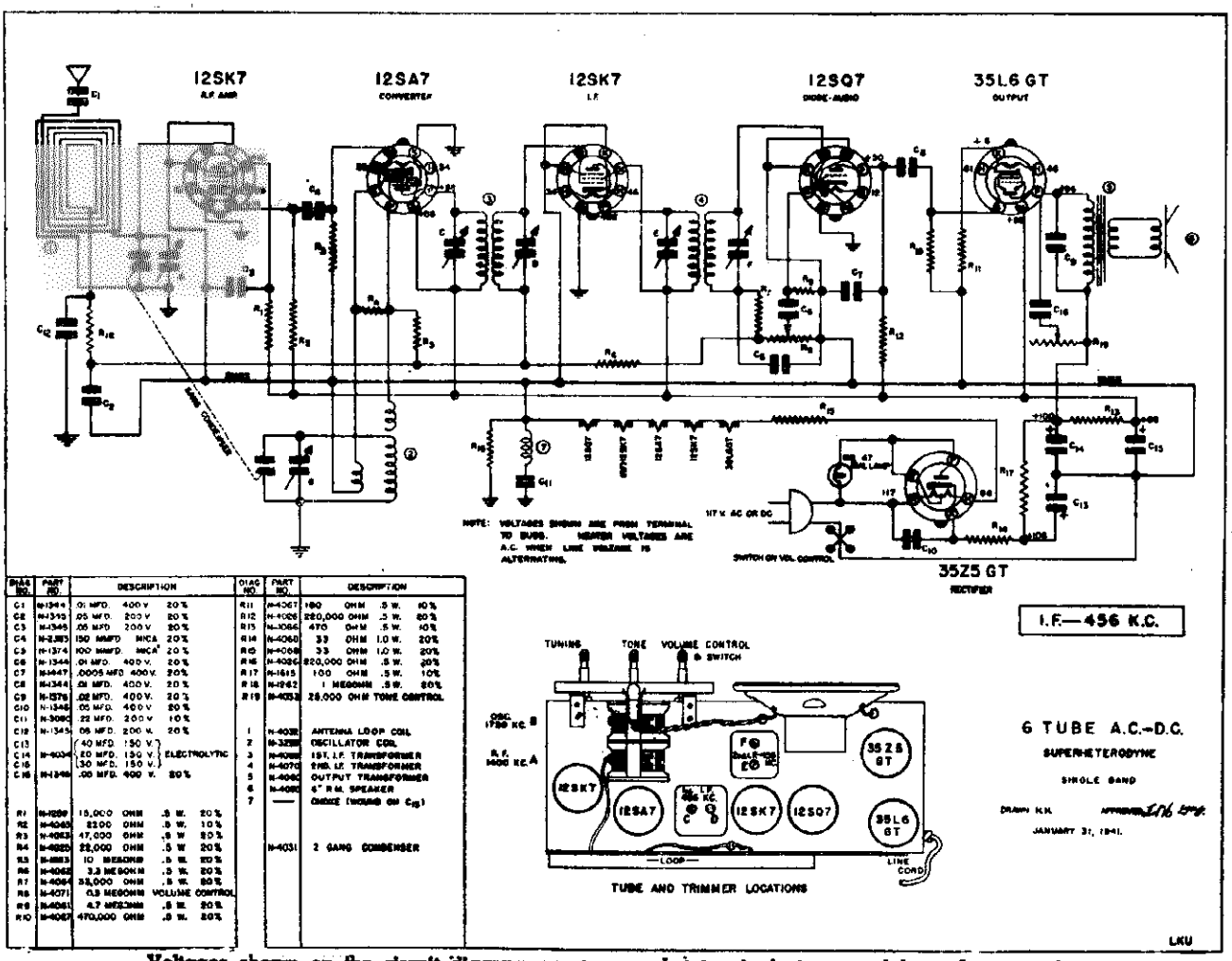


DIAL AND MISCELLANEOUS PARTS

Part Number	Description	List Price
116467	Base for Mtg. Electrolytic Cond.	$0.04
114955	Clamp, for dial cord	.01
112745	Clip, Coil mounting	.01
113019	Clip, Dial scale retaining	.01
117057	Cord, Drive supplied in 3' lengths	.15
500300	Dial scale	.48
500474	Escutcheon, Dial	1.90
119644	Knob, volume & tuning	.18
119746	Knob, band or tone	.18
85296	Lamp—Dial 6 to 8 volt (Mazda 51)	.16
110496	Plug, Speaker (4 Prong)	.12
500310	Pointer	.18
81145	Retaining Ring for tuning shaft	Per C .50
119587	Screw, No. 2 x 3/8 Phillips Round Hd.	.02
116793	Socket, for dial light	.40
500351	Socket, for loop antenna	.15
110501	Socket, 4 prong (for Spkr.)	.16
160392	Socket, Octal (Rectifier)	.12
116690	Socket, Octal Base	.12
111090	Spacer, Steel, Mtg. for gang	.02
119823	Spring, Dial cord tension	.06
119525	Tuning shaft	.10
111456	Washer, spring washer for tuning shaft	Per C .50

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

FIRESTONE TIRE & RUBBER CO.



DIAG NO.	PART NO.	DESCRIPTION
C1	M-1344	.01 MFD. 400 V. 20%
C2	M-1345	.05 MFD. 200 V. 20%
C3	M-1345	.05 MFD. 200 V. 20%
C4	M-2385	150 MMFD. MICA 20%
C5	M-1374	100 MMFD. MICA 20%
C6	M-1344	.01 MFD. 400 V. 20%
C7	M-1447	.0005 MFD. 400 V. 20%
C8	M-1344	.01 MFD. 400 V. 20%
C9	M-1376	.02 MFD. 400 V. 20%
C10	M-1345	.05 MFD. 400 V. 20%
C11	M-3080	.22 MFD. 200 V. 10%
C12	M-1345	.05 MFD. 200 V. 20%
C13		40 MFD. 150 V.
C14	M-4034	20 MFD. 150 V. ELECTROLYTIC
C15		30 MFD. 150 V.
C16	M-1348	.02 MFD. 400 V. 20%
R1	M-1039	15,000 OHM .5 W. 20%
R2	M-4065	2200 OHM .5 W. 10%
R3	M-4063	47,000 OHM .5 W. 20%
R4	M-4020	22,000 OHM .5 W. 20%
R5	M-4083	10 MEGOHM .5 W. 20%
R6	M-4062	3.3 MEGOHM .5 W. 20%
R7	M-4064	33,000 OHM .5 W. 20%
R8	M-4071	0.3 MEGOHM VOLUME CONTROL
R9	M-4061	4.7 MEGOHM .5 W. 20%
R10	M-4067	470,000 OHM .5 W. 20%
R11	M-4067	180 OHM .5 W. 10%
R12	M-4026	220,000 OHM .5 W. 20%
R13	M-1066	470 OHM .5 W. 10%
R14	M-4060	33 OHM 1.0 W. 20%
R15	M-4068	33 OHM 1.0 W. 20%
R16	M-4026	220,000 OHM .5 W. 20%
R17	M-1615	100 OHM .5 W. 10%
R18	M-1962	1 MEGOHM .5 W. 20%
R19	M-4052	25,000 OHM TONE CONTROL
1	M-4032	ANTENNA LOOP COIL
2	M-3258	OSCILLATOR COIL
3	M-4066	1ST. I.F. TRANSFORMER
4	M-4070	2ND. I.F. TRANSFORMER
5	M-4069	OUTPUT TRANSFORMER
6	M-4080	6" P.M. SPEAKER
7	——	CHOKE (WOUND ON C_{16})
	M-4031	2 GANG CONDENSER

Voltages shown on the circuit diagram are from socket terminals to ground buss. In measuring voltages use a voltmeter having a resistance of at least 1000 ohms per volt. Allowances should be made for variations in line voltage.

ALIGNMENT PROCEDURE

Lack of sensitivity and poor tone quality may be due to any one or a combination of causes such as weak or defective tubes or sp open or grounded bias resistor, bypass condenser, etc. Never attempt to realign set until all other possible sources of trouble have first thoroughly investigated and definitely proved not to be the cause.

NOTE: IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OU MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER AND THAT THE PROCEDURE BE CAREFULLY FOLLOWED, O WISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT. THE TRIMMERS WILL BE REFE TO BY THEIR FUNCTION AS INDICATED ON THE PARTS DIAGRAM.

GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 456, 600, 1400 and 1720 KC and an output meter 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.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the broadcast band should be adjusted.

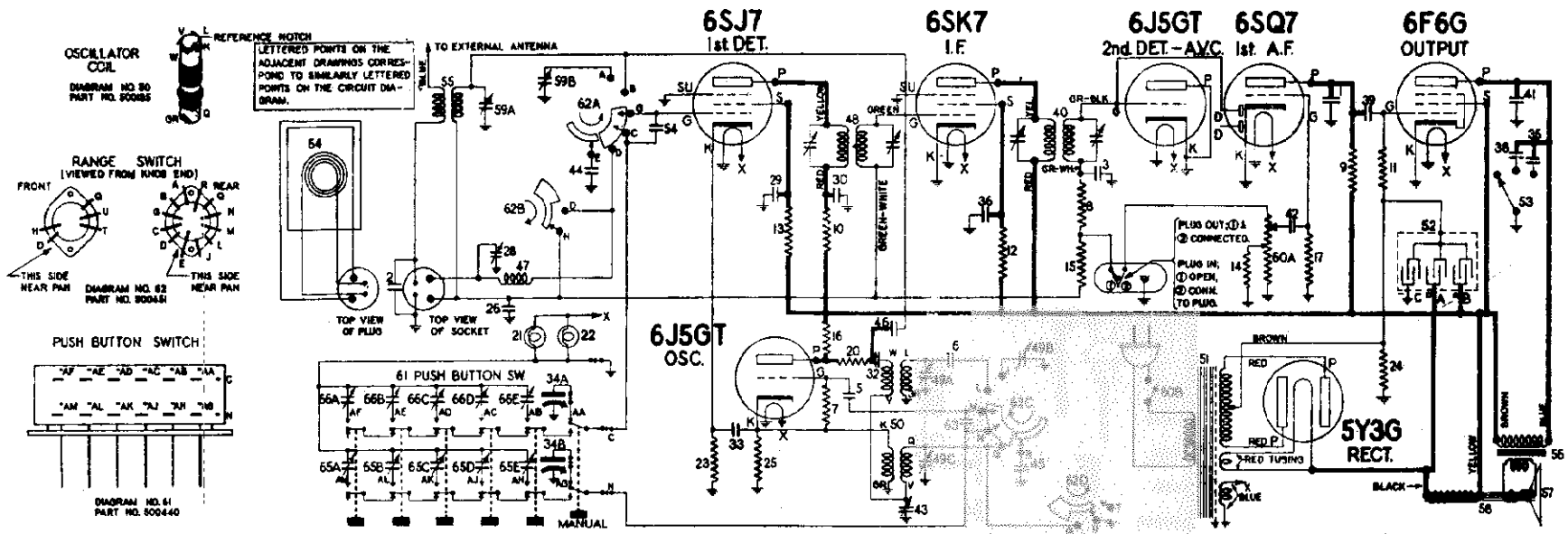
I. F. ALIGNMENT. With the gang condenser set at minimum, adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tube (12SA7) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the ground buss, indicated in circuit diagram. Align all four I.F trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT. Remove the chassis from the cabinet and set on a bench, taking care that no metal is near the loop. Do not make this setup on a metal bench.

Connect the test oscillator to the antenna of the set through a 200 mmfd. (.0002) condenser. With the gang condenser set at minimum capacity, set the test oscillator at 1720 KC, and adjust the oscillator (or 1720 KC trimmer) on gang condenser. Next—set the test oscillator at 1400 KC, and tune in the signal on the gang condenser. Adjust the antenna trimmer (or 1400 KC trimmer) for maximum signal. Next set the test oscillator at 600 KC, and tune in signal on condenser to check alignment of coils.

TUNING RANGE

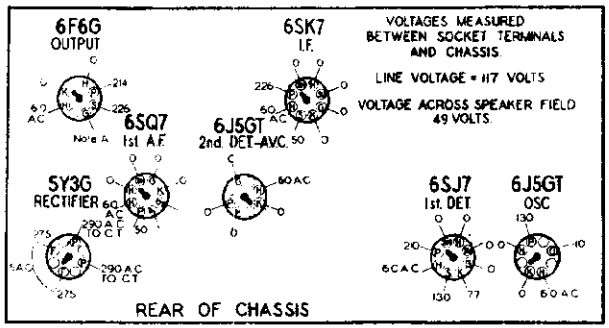
This receiver is designed to operate over the standard broadcast band which extends from 535 to 1720 Kilocycles (KC) (174 to 560 Met and includes the popular 1712 KC police channel.



NOTE: MENTION CODE No. A-370 WHEN ORDERING PARTS.

SOCKET VOLTAGES

Volume on Full with no Signal — Dial Tuned to 540 KC.



NOTE A: Grid voltage on the 6F6G output tube is —17 volts measured across resistor No. 24.

Use a high resistance voltmeter of 1000 ohms per volt.

ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1-2-3	83539	Condenser—mica 260 mmfd.	$0.20
5	85061	Condenser—mica 51 mmfd.	.15
6	88587	Condenser—mica .0042 mfd.	.35
7-8	110552	Resistor—carbon 47,000 ohms ¼ watt.	.12
9	110553	Resistor—carbon 220,000 ohms ¼ watt.	.12
10	110567	Resistor—carbon 4700 ohms ¼ watt.	.12
11	110559	Resistor—carbon 470,000 ohms ¼ watt.	.12
12-13	110564	Resistor—carbon 100,000 ohms ¼ watt.	.12
14	110565	Resistor—carbon 22,000 ohms ¼ watt.	.12
15	110570	Resistor—carbon 2.2 Meg. ¼ watt.	.15
16	110576	Resistor—carbon 10,000 ohms ½ watt.	.12
17	110580	Resistor—carbon 3.3 Meg. ¼ watt.	.12
18-19	110584	Resistor—carbon 330,000 ohms ¼ watt.	.12
20	110590	Resistor—carbon 180 ohms ¼ watt.	.12
21-22	110629	Dial Light Bulb—6.3 volt (Mazda No. 44)	.15
23	112952	Resistor—carbon 3300 ohms ¼ watt.	.10
24	117075	Resistor—300 ohm 1 watt w.w.	.16
25	116078	Resistor—560 ohms ¼ watt.	.12
26-27	116819	Condenser—.05 mfd. 600 volt.	.20
28	119132	Condenser—trimmer	.20
29 to 33	119193	Condenser—.01 mfd. 600 volt	.15
34A-34B	119291	Condenser—variable tuning	2.75
35-36-37	119414	Condenser—.02 mfd. 600 volt	.15
38	119416	Condenser—.008 mfd. 600 volt.	.15
39	119193	Condenser—.01 mfd. 600 volt.	.15
40	119024	Transformer—2nd I.F.	1.15
41	119417	Condenser—.006 mfd. 600 volt.	.15
42	119193	Condenser—.01 mfd. 600 volt.	.15
43	119934	Condenser—padder	$0.36
44-45	160646	Condenser—compensating, 100 mmfd.	.28
46	161315	Condenser—twisted wire—5 mmfd.	.16
47	500108	Coil—compensating	.50
48	500131	Transformer—1st I.F.	1.00
49A-49B-49C	500133	Condenser—three section trimmer	.50
50	500135	Coil—B.C. & S.W. Osc.	.75
51	500137	Transformer—power (60 cycles)	3.50
	500202	Transformer—power (25 cycles)	5.00
52	500201	Condenser—electrolytic A—20 mfd.—350 volt; B—10 mfd.—350 volt; C—20 mfd.—25 volt	1.35
53	500207	Switch—tone	.55
54	500212	Condenser—compensating 200 mmfd.	.35
55	500249	Coil—short wave antenna	.50
56	R-500710	Transformer—output for R-500426 Spkr.	1.35
57	R-500711	Cone & Voice Coil for R-500426 Spkr.	1.25
58	R-500426	Speaker, dynamic (6").	4.80
59A-59B	500438	Condenser—trimmer two section	.35
60A-60B	500439	Volume Control—1 Meg. (with switch).	1.40
61	500440	Switch—push button	2.25
62A to 62D	500451	Switch—band	1.51
63	500484	Condenser—compensating, 215 mmfd.	.38
64	500490	Loop antenna & cabinet back	1.90
65A to 65E	500553	Trimmers—push button (top bank).	1.10
66A to 66E	500554	Trimmers—push button (bottom bank).	1.10

INTERMEDIATE FREQUENCY 455 KC

FIRESTONE TIRE & RUBBER CO.

ALIGNMENT EQUIPMENT & PROCEDURE

THIS RECEIVER MAY BE ALIGNED IN THE CABINET WITH LOOP CONNECTED

1. Connect the output meter across the voice coil or from the plate of the 6F6G output tube to chassis through a .1 mfd. condense
2. Connect the ground lead of the signal generator to the receiver chassis.
3. Make sure that the wires coming from the chassis and push button switch are connected as shown in the figure below.
4. Push in the "manual" button and keep it pushed in. Check the pointer to see that it is correctly set to 540 KC. with gang in full mesh
5. Turn the volume control to the maximum volume position, and the tone control to the "speech" position.
6. FOLLOW THE ORDER OF ALIGNMENT INDICATED BELOW

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD Condenser	Lug on Outer Section of Gang Cond.	455 KC	Broadcast	Any Point Where It Does Not Affect the Signal	1-2 3-4	2nd I.F. 1st I.F.	Adjust for Maximum Output. Then r peat Adjustment.
400 OHM Carbon Resistor	Blue Lead from Chassis	16 MC	Foreign	16 MC	5	Foreign Oscillator	Adjust for Maximum Output. Check to se if Proper Peak was Obtained by Tunin in Image at Approx. 15.1 MC. If Imag does not appear, Realign at 16 MC, wit Trimmer Screw farther out. Recheck Imag
400 OHM Carbon Resistor	Blue Lead from Chassis	16 MC	Foreign	Tune to 16 MC Generator Signal	6	Foreign Antenna	Adjust for Maximum Output. Try Increase Output by Detuning Trimmer an Retuning Receiver Dial until Maximu Output is Obtained.
400 OHM Carbon Resistor	Blue Lead from Chassis	11.5 MC	Intermediate	11.5 MC	7	Spread Band Oscillator	Adjust for Maximum Output. Check to se if Proper Peak was Obtained by Tunin in Image at Approx. 10.6 MC. If Imag does not appear, Realign at 11.5 MC, wit Trimmer Screw farther out. Recheck Imag
400 OHM Carbon Resistor	Blue Lead from Chassis	11.5 MC	Intermediate	Tune to 11.5 MC Generator Signal	8	Spread Band Antenna	Adjust for Maximum Output.
No Connection	Place Lead from Signal Gen. Near Loop	1500 KC	Broadcast	1500 KC	9	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.

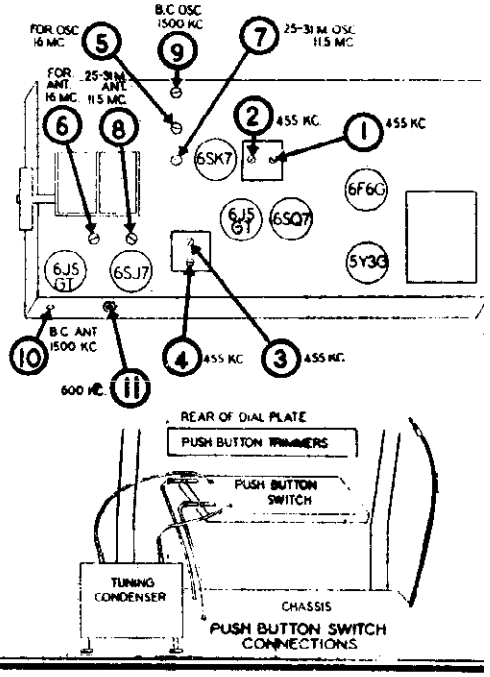
NOW PLACE THE CABINET BACK AND LOOP ANTENNA INTO POSITION AT THE BACK OF THE CABINET.

No Connection	Place Lead from Signal Gen. Near Loop	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	10	Broadcast Antenna	Adjust for Maximum Output.
No Connection	Place Lead from Signal Gen. Near Loop	600 KC	Broadcast	Tune to 600 KC Generator Signal	11	Broadcast Oscillator (Series)	Adjust for Maximum Output. Try Increase Output by Detuning Trimmer an Retuning Receiver Dial until Maximu Output is Obtained.

MISCELLANEOUS PARTS

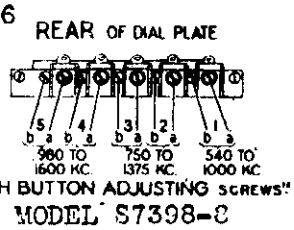
Part Number	Description	List Price
116467	Base for mounting electrolytic condenser	
83552	Bolt—chassis mounting No. 10 7/8	$ .04
114955	Clamp- for dial cord	.03
112745	Clip- coil mounting	.01
117057	Cord drive supplied in 3' lengths	.01
500436	Dial background	.15
500400	Dial scale	.14
113402	Drum—dial cord drive	3.00
500427	Knob -tone & range	.56
500406	Knob -tuning & volume	.16
12349	Nut—8-32 for mounting gang	.16
119911	Phono—terminal strip Per C	.45
500445	Pointer	.16
500405	Pushbutton	.20
81145	Retaining ring for tuning shaft	.12
83624	Screw—self tapping 8 x 1/4 Per C	.50
85827	Set screw—8-32 square head	.01
500411	Shaft—tuning	.02
111090	Spacer—steel mounting for gang	.30
113177	Spring—dial cord tension	.02
500051	Socket for loop antenna	.09
119791	Socket—octal	.15
114876	Socket—octal (rectifier)	.12
114878	Socket—octal with special ground	.15
117315	Tabs—station call letter	.15
111456	Washer—spring washer for tuning shaft	.55

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE 5Q

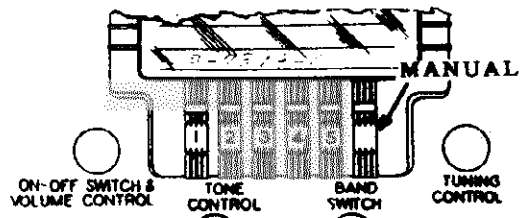


MODEL S7398-8
MODEL S7399-1
MODEL S7400-6

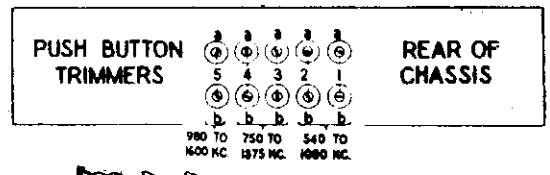
FIRESTONE TIRE & RUBBER CO.



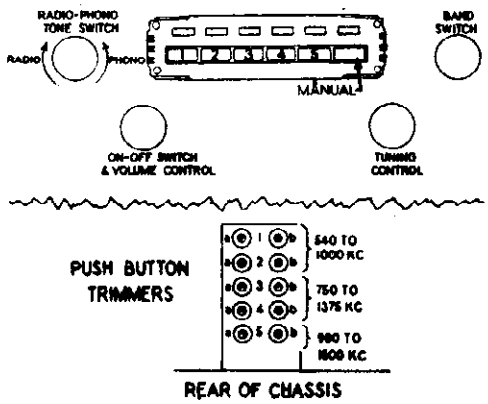
PUSH BUTTON ADJUSTING SCREWS
MODEL S7398-8



MODEL S7399-1




MODEL S7400-6



TO SET UP THE BUTTONS FOR AUTOMATIC TUNING: FOR ALL MODELS

1. Turn the set on and allow it to operate at least fifteen minutes before attempting to set up the buttons.
2. Make a list of the frequencies of five nearby stations to which you wish to set up the buttons. Be sure to select the most powerful nearby stations, since weak signals will not give as satisfactory results.
3. Turn the set around so that the back of the set is facing you. Through the ten holes in the back of the chassis will be seen ten adjusting screws. (See Fig. 1). These screws are used to tune in the stations that the buttons are to be set to.
4. Each of the push buttons can be made to tune in sfations in a definite frequency range as shown in Fig. 1. It is imperative that in setting up the buttons you select stations whose frequency is in the indicated range of that button. ALWAYS TRY TO SELECT THE BUTTON WHICH CAN BE SET UP TO A STATION WHOSE FREQUENCY IS WELL WITHIN THE BUTTON'S OPERATING RANGE.
5. Turn the band switch to the "AM" position, push in the button labeled "MANUAL," then using the tuning knob (see Fig. 1) tune in the station you wish to set to button No. 1.
6. Push in button No. 1 and using a screwdriver turn adjusting screw No. 1a (the top one) until the station you had previouslv tuned in is again heard. If it is not heard, advance the volume control and adjust the screw again. Be sure to adjust screw No. 1a to the point where the program is heard with the deepest tone.
7. Insert the screwdriver in adjusting screw No. 1b (the one below 1a) and turn it until the program is heard with the deepest tone. Now again check the setting of screw No. 1a, making sure it is adjusted to give the deepest tone.
8. The set-up for button No. 1 is now complete.
9. To set up the remaining buttons use the same procedure; push in the "MANUAL" button; tune in the station, using the tuning knob; push in the button to be set up; adjust its associated "a" adjusting screw until the station is tuned in (screw 2a for button No. 2, etc., see Fig. 1); the associated "b" screw is then adjusted for deepest tone as before.
10. Call letter tabs which may be used to label the buttons are provided with your radio. They fit in the small space above each push button.
11. To use push button at any time, turn the band switch to the "AM" position and push the proper button.

Voltage S-7399-1 only

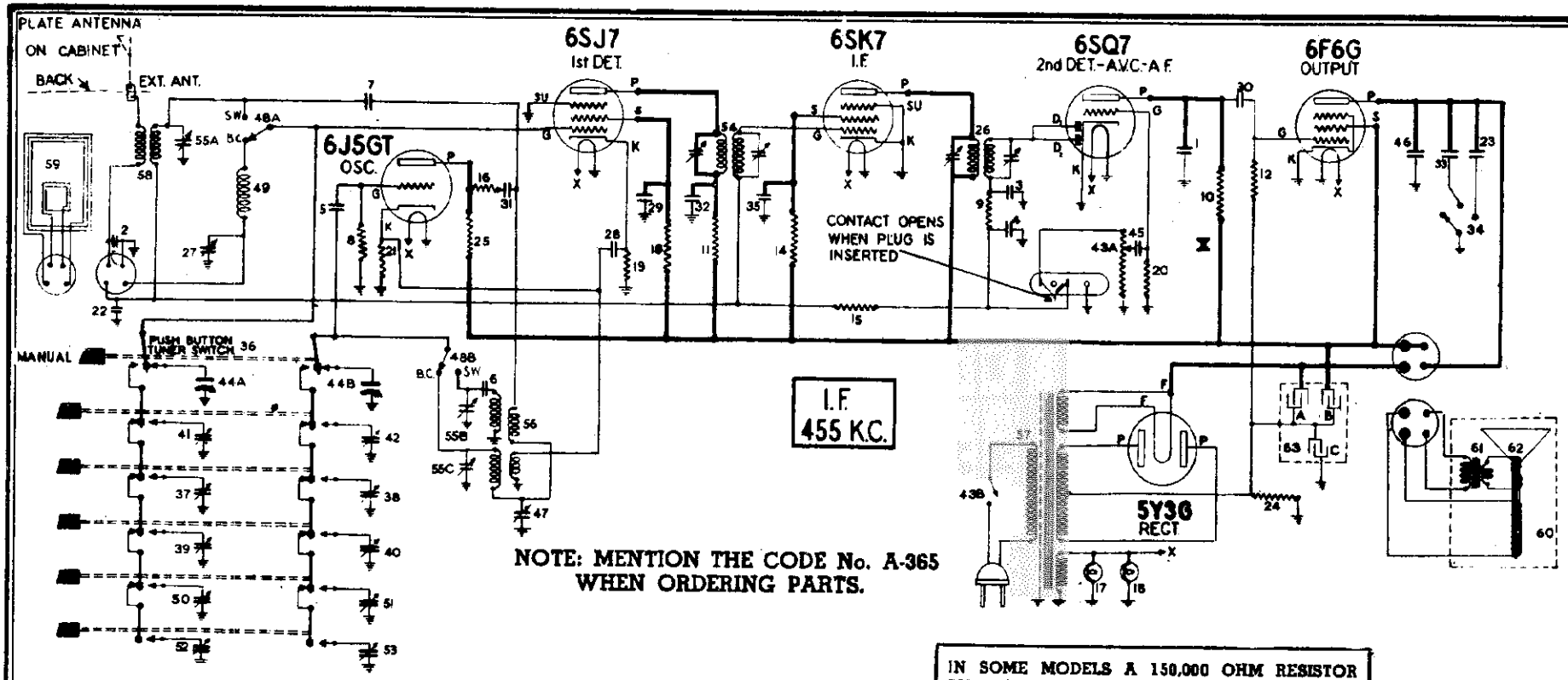
SOCKET VOLTAGES — ALL D.C. POTENTIAL MEASURED TO CHASSIS

NO SIGNAL CONDITION — DIAL TUNED TO 540 KC.

TUBE	FUNCTION	H	K	G	S	SU	P	D_1	D_2
6SJ7	1st DET.	6.0 A.C.	.5	O	160	0	225		
6J5GT	OSC.	6.0 A.C.	0	—5			150		
6SK7	I.F.	6.0 A.C.	0	O	62	0	230		
6SQ7	2nd DET. — A.V.C. & A.F.	6.0 A.C.	0	O			92	0	0
6F6G	OUTPUT	6.0 A.C.	0	Note A	230		215		
5Y3G	RECTIFIER	5.0 A.C.					Plates 350 V.A.C to C.T.		

NOTE A: The bias for this grid is —15 volts measured across resistor No. 24.

Use a high resistance voltmeter of at least 1000 ohms per volt.



NOTE: MENTION THE CODE No. A-365 WHEN ORDERING PARTS.

IN SOME MODELS A 150,000 OHM RESISTOR BYPASSED TO GROUND BY A .05 MFD. CONDENSER HAS BEEN INSERTED AT POINT "X."

Diagram Number	Part Number	Description	List Price
1	83539	Condenser—mica 260 mmfd.	$0.20
2-3-4	83783	Condenser—mica 110 mmfd.	.20
5	85061	Condenser—mica 51 mmfd.	.15
6	88587	Condenser—mica .0042 mfd.	.35
7	110510	Condenser—wire 3 mmfd.	.12
8-9	110552	Resistor—carbon 47,000 ohms ¼ watt	.12
10	110553	Resistor—carbon 220,000 ohms ¼ watt	.12
11	110557	Resistor—carbon 4,700 ohms ¼ watt	.12
12	110559	Resistor—carbon 470,000 ohms ¼ watt	.12
13-14	110564	Resistor—carbon 100,000 ohms ¼ watt	.12
15	110570	Resistor—carbon 2.2 meg. ¼ watt	.15
16	110590	Resistor—carbon 180 ohms ¼ watt	.12
17-18	110629	Dial light bulb—6.3 volt	.15
19	112952	Resistor—carbon 3,300 ohms ¼ watt	.10
20	112975	Resistor—carbon 10 meg. ¼ watt	.12
21	116078	Resistor—560 ohms ¼ watt	.12
22-23	116819	Condenser—.05 mfd. 600 volt	.20
24	117075	Resistor—300 ohm 1 watt W.W.	.16
25	118805	Resistor—carbon 10,000 ohms 1 watt	.12
26	119024	Transformer—2nd I.F.	1.15
27	119132	Condenser—trimmer	.20
28 to 33	119193	Condenser—.01 mfd. 600 volt	.15
34	119289	Switch-tone	.60
35	119414	Condenser—.02 mfd. 600 volt	.15
36	119603	Push Button Switch	2.30
37 to 40	119663	Condenser—Push Button trimmer (750-1375 KC.)	.24
41-42	119664	Condenser—Push Button trimmers (980-1600 KC.)	.24
43A-43B	119779	Volume control—½ meg. (with switch)	1.25
44A-44B	119812	Gang condenser	2.05
45-46	119817	Condenser—.004 mfd. 600 volt	.15

ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
47	119934	Condenser—padder	$0.36
48A-48B	500057	Switch—band	1.20
49	500108	Coil—compensator	.50
50 to 53	500127	Condenser—Push button trimmer (540-1000 KC)	.24
54	500131	Transformer—1st I.F.	1.00
55A-55B-55C	500133	Condenser—three section trimmer	.50
56	500135	Coil—B.C. & S.W. Osc.	.75
57	500137	Transformer—power (60 cycles)	3.50
	500202	Transformer—power (25 cycles)	5.60

Diagram Number	Part Number	Description	List Price
58	500147	Coil—short wave antenna	$0.55
59	500179	Loop antenna	2.40
60	M-500180	Speaker—dynamic (8")	6.50
61	M-500194	Transformer—output for M-500180 speaker	1.75
62	M-500195	Cone & Voice coil for M-500180 speaker	1.70
63A-63C	500201	Condenser—electrolytic	1.35

A=20 mfd.—350 V.
B=10 mfd.—350 V.
C=20 mfd.— 25 V.

MODEL S7399-1

FIRESTONE TIRE & RUBBER CO.

ALIGNMENT EQUIPMENT & PROCEDURE

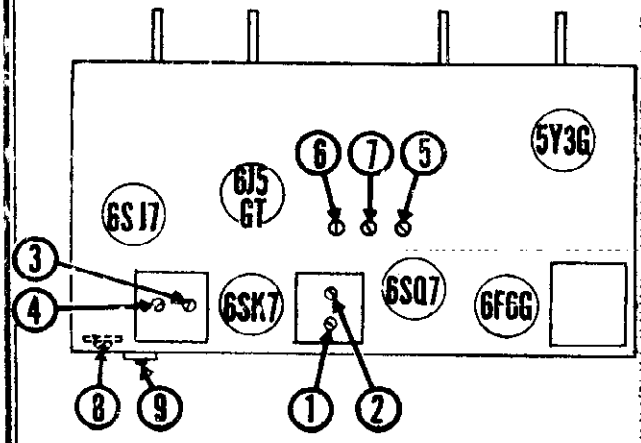
NOTE: THIS SET MAY BE COMPLETELY ALIGNED WITHOUT REMOVING FROM THE CABINET.

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator are required.

1. **Connect the loop as indicated in the circuit diagram and keep it in the circuit at all times.**
2. **Connect the output meter across the voice coil or from the plate of the 6F6G output tube to chassis through a .1 mfd. condenser. Connect the ground lead of the signal generator to the receiver chassis.**
3. **Turn volume control to the maximum position and keep it in this position throughout alignment procedure.**
4. **Push the MANUAL button in and keep it pushed in.**

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output To Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD. Condenser	Rear Lug of Gang Condenser	455 KC	Broadcast	Any Point Where It Does Not Affect The Signal	1-2 3-4	2nd I. F. 1st I. F.	Adjust for maximum output. Then repeat adjustment.
400 OHM Carbon Resistor	External Antenna Terminal Blue Wire	16 MC	Foreign	16 MC	5	Foreign Oscillator (Shunt)	Adjust for maximum output. Check to see if proper peak was obtained by tuning in image at approx. 15.1 MC. If image does not appear realign at 16 MC. with trimmer screw farther out. Recheck image.
400 OHM Carbon Resistor	External Antenna Terminal Blue Wire	16 MC	Foreign	Tune to 16 MC. Generator Signal	6	Foreign Antenna	Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained.
200 MMFD. Mica Condenser	External Antenna Terminal Blue Wire	1500 KC	Broadcast	1500 KC	7	Broadcast Oscillator (Shunt)	Adjust for maximum output.
200 MMFD. Mica Condenser	External Antenna Terminal Blue Wire	1500 KC	Broadcast	Tune To 1500 KC Generator Signal	8	Broadcast Antenna	Adjust for maximum output.
200 MMFD. Mica Condenser	External Antenna Terminal Blue Wire	600 KC	Broadcast	Tune To 600 KC Generator Signal	9	Broadcast Oscillator (Series Pad)	Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained.

TRIMMER LOCATIONS



DIAL AND MISCELLANEOUS PARTS

Part Number	Description	List Price
116467	Base for mtg. electrolytic condenser	$0.04
500181	Cabinet back complete	1.50
119559	Clamp—dial scale	.08
114955	Clamp—for dial cord	.01
112745	Clip—coil mounting	.01
117057	Cord—drive (supplied in 3' lengths)	.15
500139	Dial scale	.35
119782	Dial background	.06
500167	Escutcheon—dial	.85
119644	Knob—push on	.18
119746	Knob—range	.16
116584	Plug (rubber)	.02
119781	Pointer	.14
119911	Phono-terminal strip	.16
119654	Push button	.06
81145	Retaining ring for tuning shaft	Per C .50
114914	Screw—special head for mtg. escutcheon	Per Dz. .15
119778	Shaft—tuning	.10
110501	Socket—4 prong (for spkr.)	.16
111008	Socket—dial lamp	.12
114878	Socket—octal—with special ground	.15
119791	Socket—octal	.12
114876	Socket—octal (rectifier)	.15
500051	Socket for loop antenna	.15
119823	Spring dial cord tension	.08
119739	Station call tabs	.48
111456	Washer—spring washer	Per C .50

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

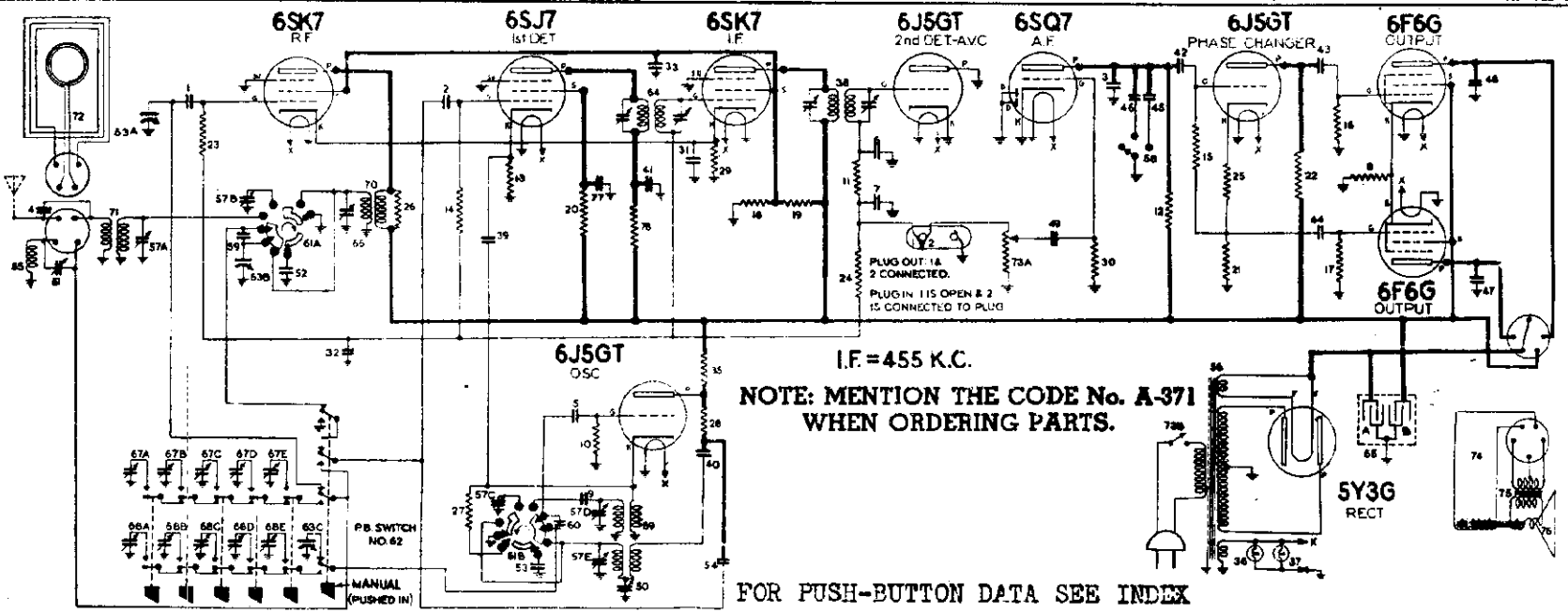


Diagram Number	Part Number	Description	List Price
1-2-3	83539	Condenser—mica 250 mmfd.	$0.20
4-5	83783	Condenser—mica 110 mmfd.	.20
6-7	85061	Condenser—mica 51 mmfd.	.15
8	89462	Resistor—W.W. 270 ohms 1 watt	.15
9	89997	Condenser—mica .0042 mfd.	.35
10-11	110552	Resistor—carbon 47,000 ohms ¼ watt.	.12
12	110553	Resistor—carbon 220,000 ohms ¼ watt	.12
13	110557	Resistor—carbon 4700 ohms ¼ watt	.12
14 to 17	110559	Resistor—carbon 470,000 ohms ¼ watt	.12
18-19	110561	Resistor—carbon 15,000 ohms 2 watts.	.30
20	110564	Resistor—carbon 100,000 ohms ¼ watt	.12
21-22	110565	Resistor—carbon 22,000 ohms ¼ watt.	.12
23-24	110570	Resistor—carbon 2.2 meg. ¼ watt	.15
25	110573	Resistor—carbon 2,200 ohms ¼ watt	.12
26	110588	Resistor—carbon 6800 ohms ¼ watt	.12
27-28	110590	Resistor—carbon 180 ohms ¼ watt	.12
29	112994	Resistor—carbon 220 ohms ¼ watt	.16
30	116050	Resistor—insulated 10 meg. ¼ watt	.12
31	116625	Condenser—.1 mfd. 600 volt	.25
32-33-34	116819	Condenser—.05 mfd. 600 volt	.20
35	118805	Resistor—carbon 10,000 ohms 1 watt	.12
36-37	118921	Lamp-Dial (Mazda No. 47)	.15
38	119024	Transformer—2nd I.F.	1.15
39-40-41	119193	Condenser—.01 mfd. 600 volt	.15
42-43-44	119414	Condenser—.02 mfd. 600 volt	.15
45	119416	Condenser—.008 mfd. 600 volt	.15
46-47-48	119817	Condenser—.004 mfd. 600 volt	.15
49	119875	Condenser—.002 mfd. 600 volt	.15
50	119934	Condenser—padder	.36
51	160449	Condenser—trimmer (Loop)	.18
52-53	160646	Condenser—compensating 100 mmfd.	.28
54	161315	Condenser—twisted wire 5 mmfd.	.16
55	500108	Coil—compensating	.50
56	500116	Transformer—power (60 cycles)	6.50
	160780	Transformer—power (25 cycles)	8.00
57A to 57E	500168	Condenser—trimmer (5 section)	.65
58	500207	Switch—tone	.55
59-60	500484	Condenser—compensating 215 mmfd.	.38
61A-61B	500794	Switch—band	1.80
62	500795	Switch—push button	2.90
63A to 63C	500796	Condenser—variable tuning	3.50
64	500801	Transformer—1st I.F.	1.20
65	500807	Condenser—electrolytic, A-20 mfd.—400 volt / B-15 mfd.—400 volt	1.30
66	500842	Condenser—trimmer	.20
67A to 67E	500860	Condenser—push but. trimmers (top bank)	1.10
68A to 68E	500861	Condenser—push but. trimrs. (botm. bank)	1.10
69	500865	Coil—oscillator (B.C. & S.W.)	1.20
70	500866	Coil—broadcast R.F.	.80
71	500867	Coil—short wave antenna	.78
72	500868	Loop antenna	1.60
73A-73B	500877	Volume control—½ meg (with switch)	1.25
74	M-500880	Speaker—dynamic (12") with transformer	11.00
75	M-501309	Transformer—output for M-500880 spkr.	1.80
76	M-501310	Cone & voice coil for M-500880 spkr.	1.80
77	119193	Condenser—.01 mfd. 600 volt	.15
78	110588	Resistor—carbon 6800 ohms ¼ watt	.12

ELECTRICAL PARTS

SOCKET VOLTAGES—ALL D.C. POTENTIAL MEASURED TO CHASSIS

NO SIGNAL CONDITION — DIAL TUNED TO 540 K.C.

TUBE	FUNCTION	H	K	G	S	SU	P	D_1	D_2
6SK7	R.F.	6.0 A.C.	3	0	85	0	210		
6SJ7	1st Det.	6.0 A.C.		0	150	0	190		
6J5GT	Osc.	6.0 A.C.		—3			140		
6SK7	I.F.	6.0 A.C.	3	0	85	0	210		
6J5GT	2nd Det A.V.C.	6.0 A.C.		0			0		
6SQ7	A.F.	6.0 A.C.		0			75	0	0
6J5GT	Phase Changer	6.0 A.C.	38	*0			160		
(2) 6F6G	Output	6.0 A.C.	16	0	210		310		
5Y3G	Rectifier	5.0 A.C.					Plates 370 V.A.C. to C.T.		

Use a high resistance voltmeter of at least 1000 ohms per volt. *to K

MODEL S7399-2

FIRESTONE TIRE & RUBBER CO

ALIGNMENT EQUIPMENT & PROCEDURE

THIS RECEIVER MAY BE ALIGNED IN THE CABINET WITH LOOP CONNECTED

1. Connect the output meter across the voice coil or from plate to plate of the 6F6G output tubes.
2. Connect the ground lead of the signal generator to the receiver chassis.
3. Push in the "manual" button and keep it pushed in. Check the pointer to see that it is correctly set to 540 KC. with gang in full mesh.
4. Turn the volume control to the maximum volume position, and the tone control to the "speech" position.
5. FOLLOW THE ORDER OF ALIGNMENT INDICATED BELOW.

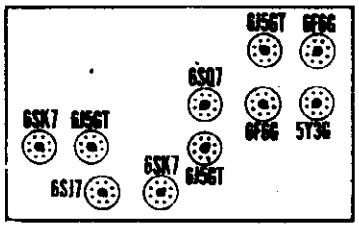
Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD Condenser	Lug on Middle Section of Gang Cond.	455 KC	American	Any Point Where It Does Not Affect the Signal	1-2 3-4	2nd I.F. 1st I.F.	Adjust for Maximum Output. Then repeat Adjustment.
400 OHM Carbon Resistor	Blue Lead from Chassis	16 MC	Foreign	16 MC	5	Foreign Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 15.1 MC. If Image does not appear, Realign at 16 MC, with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	Blue Lead from Chassis	16 MC	Foreign	Tune to 16 MC Generator Signal	6	Foreign Antenna	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.
400 OHM Carbon Resistor	Blue Lead from Chassis	11.5 MC	25-31 M.	11.5 MC	7	Spread Band Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 10.6 MC. If Image does not appear, Realign at 11.5 MC, with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	Blue Lead from Chassis	11.5 MC	25-31 M.	Tune to 11.5 MC Generator Signal	8	Spread Band Antenna	Adjust for Maximum Output.
No Connection	Place Lead from Signal Gen. Near Loop	1500 KC	American	1500 KC	9	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
No Connection	Place Lead from Signal Gen. Near Loop	1500 KC	American	Tune to 1500 KC Generator Signal	10	Broadcast Detector	Adjust for Maximum Output.
No Connection	Place Lead from Signal Gen. Near Loop	600 KC	American	Tune to 600 KC Generator Signal	11	Broadcast Oscillator (Series)	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.
No Connection	Place Lead from Signal Gen. Near Loop	1500 KC	American	Tune to 1500 KC Generator Signal	12	Broadcast Antenna	Adjust for Maximum Output.

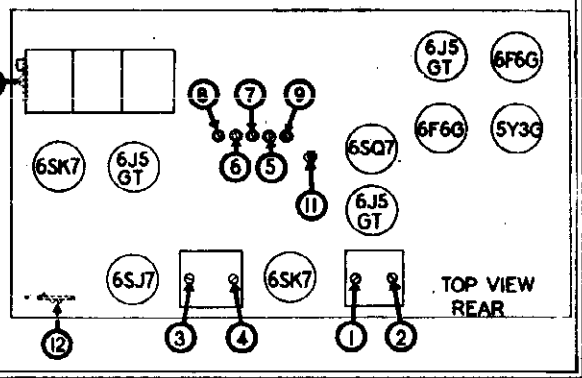
MISCELLANEOUS PARTS

Part Number	Description	List Price
116584	Bumper plug (rubber)	$0.02
500883	Cabinet back	.80
114955	Clamp—for dial cord	.01
112745	Clip—coil mounting	.01
117057	Cord—drive (supplied in 3 ft. lengths)	.15
500800	Dial scale	1.90
113402	Drum—dial cord drive	.55
500500	Escutcheon—push button	1.10
160193	Knob—Volume & Tuning	.18
161366	Knob—Band & Tone	.18
119911	Phono—terminal strip	.16
500858	Pointer	.18
500405	Push button	.12
81145	Retaining ring for tuning shaft	Per C .50
114914	Screw—special head for mtg escutcheon	per Dz. .15
85827	Set screw—8-32 square head for drive drum	.02
500411	Shaft—tuning	.30
119791	Socket—octal	.12
114876	Socket—octal (rectifier)	.15
114878	Socket—octal, with spec. ground	.15
500051	Socket for loop antenna	.15
160026	Socket—condenser mtg.	.04
117704	Socket - for speaker, 5 prong	.13
113177	Spring—dial cord tension	.09
114041	Tabs—station call letters	.35
111456	Washer—spring washer for tuning shaft	Per C .50

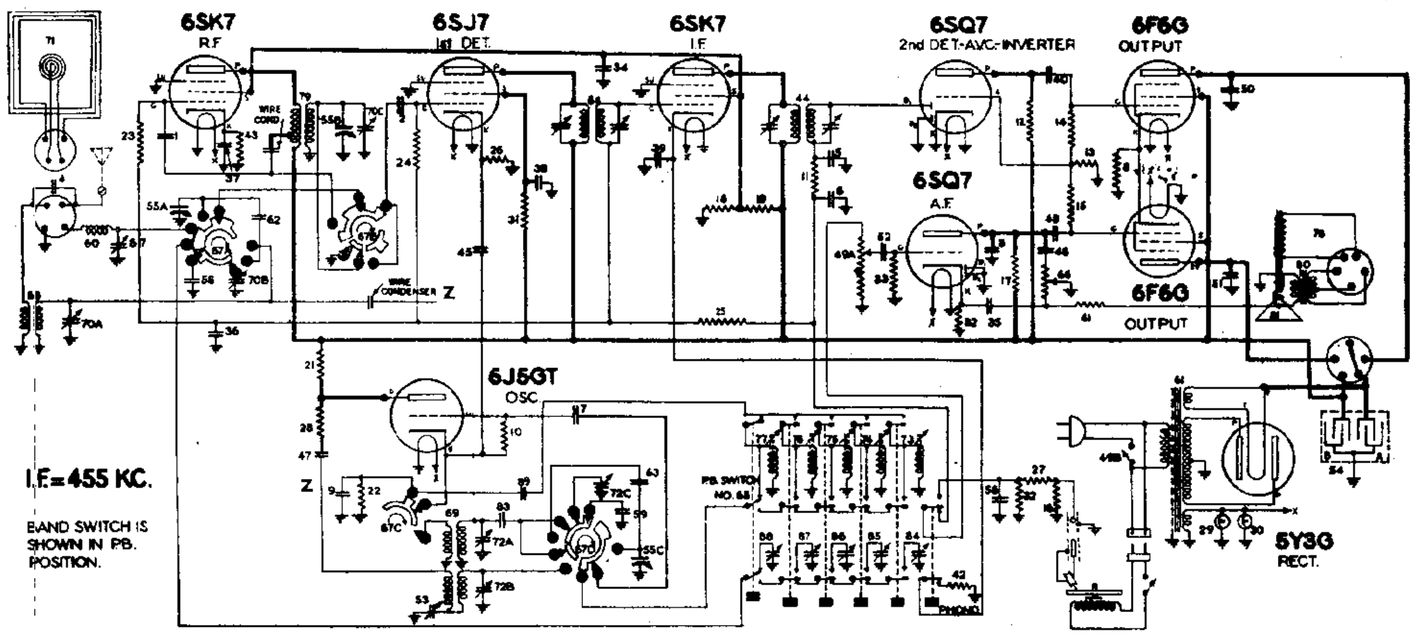
ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

TUBE LOCATIONS





FIRESTONE TIRE & RUBBER CO.



"Z" POINTS CONNECT TOGETHER.

I.F.=455 KC.

BAND SWITCH IS SHOWN IN P.B. POSITION.

NOTE: Mention Code No. A-372 when ordering parts.

Diagram Number	Part Number	Description	List Price
1-2-3	83539	Condenser—mica 260 mmfd.	$0.20
4-5-6	83783	Condenser—mica 110 mmfd.	.20
7	85061	Condenser—mica 51 mmfd.	.15
8	88462	Resistor—wire wound 270 ohms 1 watt	.15
9	89114	Condenser—800 mmfd.	.20
10-11	110552	Resistor—carbon 47,000 ohms ¼ watt	.12
12 to 15	110553	Resistor—carbon 220,000 ohms ¼ watt	.12
16	110554	Resistor—carbon 1 megohm ¼ watt	.12
17	110559	Resistor—carbon 470,000 ohms ¼ watt	.12
18-19	110561	Resistor—carbon 15,000 ohms 2 watts	.30
21-22	110569	Resistor—carbon 10,000 ohms ¼ watt	.12
23-24-25	110570	Resistor—carbon 2.2 meg. ¼ watt	.15
27	110584	Resistor—carbon 330,000 ohms ¼ watt	.12
28	110590	Resistor—carbon 180 ohms ¼ watt	.12
29-30	110629	Dial Light Bulb—6.3 volt (Mazda No. 44)	.15
31-32	112962	Resistor—Carbon 150,000 ohms ¼ watt	.12
33	112975	Resistor—carbon 10 meg. ¼ watt	.12
34-35	116625	Condenser—.1 mfd. 600 volt	.25
36 to 40	116819	Condenser—.05 mfd. 600 volt	.20
41	118805	Resistor—carbon 10,000 ohms 1 watt	.12
42-43	118827	Resistor—carbon 270 ohms ¼ watt	.10
44	119024	Transformer—2nd I.F.	1.15
45-46-47	119193	Condenser—.01 mfd. 600 volt	.15
48	119414	Condenser—.02 mfd. 600 volt	.15
49A-49B	119602	Volume Control—1 meg. (with switch)	1.25
50-51	119817	Condenser—.004 mfd. 600 volt	.15
52	119875	Condenser—.002 mfd. 600 volt	.15
53	119934	Condenser—padder	.36
54	160008	Condenser—electrolytic {A-30 mfd. 450 volt / B-15 mfd. 450 volt}	1.50
55A to 55C	160373	Condenser—variable tuning	3.20
56	160430	Condenser—.001 mfd. 600 volt	.15
57	160449	Condenser—trimmer (loop)	.18
58-59	160646	Condenser—compensating 100 mmfd.	.28

ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
60	500108	Coil—compensating	$0.50
61	500118	Transformer—power (60 cycle)	6.50
	160780	Transformer—power (25 cycle)	8.00
62	500212	Condenser—compensating 200 mmfd.	.35
63	500484	Condenser—compensating 215 mmfd.	.38
64	500801	Transformer—1st I.F.	1.20
65	500927	Switch—push button	2.80
66	500929	Tone Control—5 meg.	1.85
67A to 67D	500930	Switch—band	1.85
68	501024	Coil—S.W. antenna	.55
69	501025	Coil—oscillator (B.C. & S.W.)	1.00
70A to 70C	501026	Condenser—trimmer (3 Sect.)	.55
71	501034	Loop Antenna—complete	1.80
72A to 72C	501095	Condenser—trimmer (3 Section)	.60
73	501147	Coil—push button (low freq.)	$0.85
74-75	501148	Coil—push button (med. freq.)	.85
76-77	501149	Coil—push button (high freq.)	.85
78	M-501245	Speaker—dynamic 12"	12.50
79	501297	Coil—B.C. det.	.90
80	M-501304	Transformer—output for M-501245 spkr.	1.95
81	M-501305	Cone & Voice Coil for M-501245 speaker	1.95
82	116078	Resistor—carbon 560 ohms ¼ watt	.12
83	88587	Condenser—mica .0042 mfd.	.35
84	500127	Condenser—P.B. trimmer (low freq.)	.24
85-86	119663	Condenser—P.B. trimmer (med. freq.)	.24
87-88	119664	Condenser—P.B. trimmer (high freq.)	.24
89	111575	Condenser—mica 220 mmfd.	.20
	500725	Crystal Cartridge	6.00

SOCKET VOLTAGES—ALL D.C. POTENTIAL MEASURED TO CHASSIS

NO SIGNAL CONDITION — DIAL TUNED TO 540 KC.

TUBE	FUNCTION	H	K	G	S	SU	P	D_1	D_2
6SK7	R.F.	6.0 A.C.	2	0	72	0	190		
6SJ7	1st Det.	6.0 A.C.	5	0	100	0	190		
6J5GT	Osc.	6.0 A.C.	0	—3			140		
6SK7	I.F.	6.0 A.C.	2	0	72	0	190		
6SQ7	2nd Det.—A.V.C. Inverter	6.0 A.C.	0	0			50	0	0
6SQ7	A.F.	6.0 A.C.	2	0			50	0	0
2 (6F6G)	Output	6.0 A.C.	12	0	190		290		
5Y3G	Rectifier	5.0 A.C.					Plates 350 V.A.C. to C.T.		

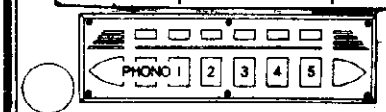
Use a high resistance voltmeter of at least 1000 ohms per volt.

MODEL S7400-2
Air Chief

FIRESTONE TIRE & RUBBER CO.

1. Connect the output meter across the voice coil or from plate to plate of the 8F8G output tubes.
2. Connect the ground lead of the signal generator to the receiver chassis.
3. Turn the volume control to the maximum volume position, and the tone control to the high position.
4. FOLLOW THE ORDER OF ALIGNMENT INDICATED BELOW.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD Condenser	Lug on Middle Section of Gang Cond.	455 KC	Broadcast	Any Point Where It Does Not Affect the Signal	1-2	2nd I.F.	Adjust for Maximum Output. Then repeat Adjustment.
					3-4	1st I.F.	
400 OHM Carbon Resistor	Blue Lead from Chassis	16 MC	Foreign	16 MC	5	Foreign Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 15.1 MC. If Image does not appear, Realign at 16 MC, with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	Blue Lead from Chassis	16 MC	Foreign	Tune to 16 MC Generator Signal	6	Foreign Antenna	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.
400 OHM Carbon Resistor	Blue Lead from Chassis	11.5 MC	25-31M	11.5 MC	7	Spread Band Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 10.6 Mc. If Image does not appear, Realign at 11.5 MC, with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	Blue Lead from Chassis	11.5 MC	25-31M	Tune to 11.5 MC Generator Signal	8	Spread Band Antenna	Adjust for Maximum Output.
No Connection	Place Lead from Signal Gen. Near Loop	1500 KC	Broadcast	1500 KC	9	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
NOW PLACE THE CHASSIS AND LOOP ANTENNA INTO THE SAME RELATIVE POSITION AS WHEN IN THE CABINET.							
No Connection	Place Lead from Signal Gen. Near Loop	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	10	Broadcast Detector	Adjust for Maximum Output.
No Connection	Place Lead from Signal Gen. Near Loop	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	11	Broadcast Antenna	Adjust for Maximum Output.
No Connection	Place Lead from Signal Gen. Near Loop	600 KC	Broadcast	Tune to 600 KC Generator Signal	12	Broadcast Oscillator (Series)	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.



PUSH BUTTON TUNER

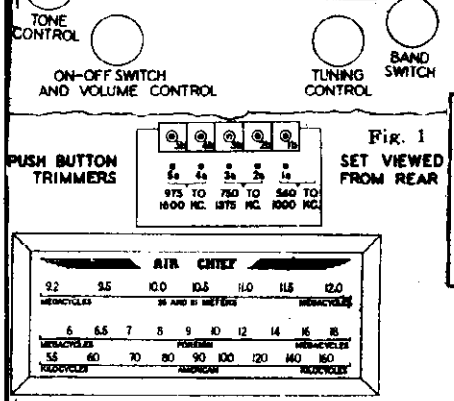
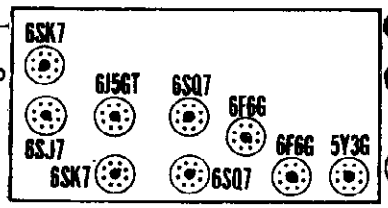
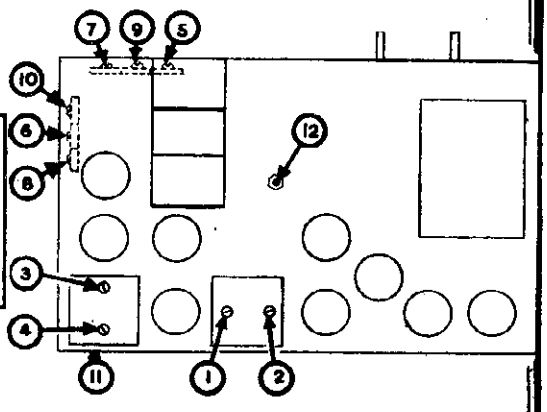


Fig. 1 SET VIEWED FROM REAR

TUBE LOCATIONS





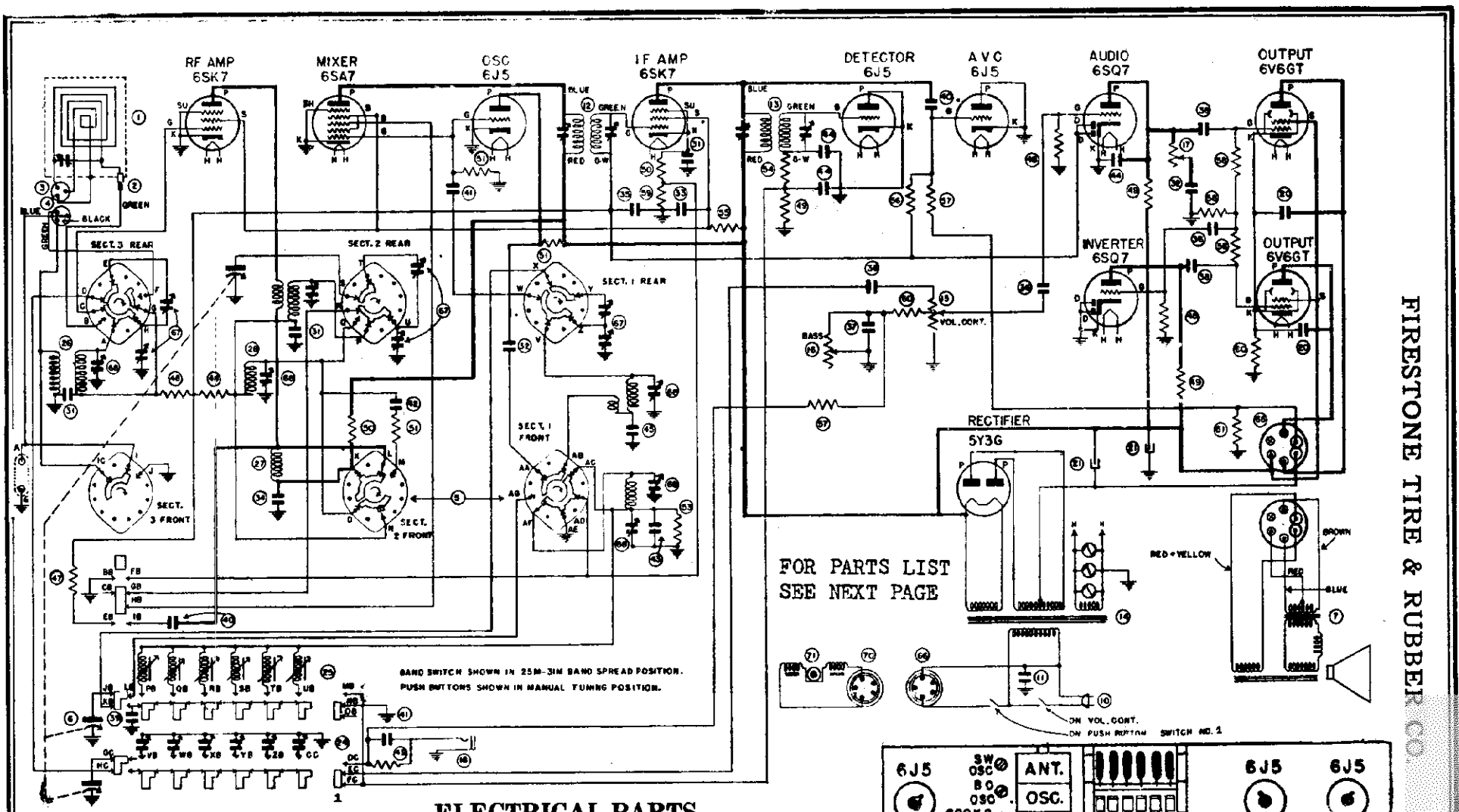
Turn the BAND SWITCH to the "AM" position, then using the tuning knob (see Fig. 1) tune in the station you wish to set to button No. 1.

Turn the Band Switch to the "AUT" position and push in button No. 1. Using a screwdriver turn adjusting screw No. 1a until the station you had previously tuned in is again heard. If it is not heard, advance the volume control and adjust the screw again. Be sure to adjust screw No. 1a to the point where the program is heard with the deepest tone.

Insert the screwdriver in adjusting screw No. 1b and turn it until the program is heard with maximum volume. Now again check the setting of screw No. 1a making sure it is adjusted to give the deepest tone.

The set-up for button No. 1 is now complete.

To set up the remaining buttons use the same procedure; turn the Band Switch to the "AM" position, tune in the station using the tuning knob; turn the Band Switch to the "AUT" position; push in the button to be set up; adjust its associated "a" adjusting screw until the station is tuned in (screw "2a" for button No. 2, etc., see Fig. 1); the associated "b" screw is then adjusted for maximum volume as before.



ELECTRICAL PARTS

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

FOR FARNSWORTH CAPEHART P-2 RECORD CHANGER, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

Part No.	Diagram No.	Description	List Price
38-386	1	Loop Antenna	6.10
26-31	2	Loop Trimmer & Jack	.15
8011-1	3	3 Prong Loop Socket	.15
809-1	4	3 Prong Plug for Loop	.15
90-107	5	Band Switch	2.35
26-159	6	Gang Condenser	4.25

MODEL S7400-3

FIRESTONE TIRE & RUBBER CO.

ELECTRICAL PARTS

Part No.	Diagram No.	Description	List Price
38-364	26	S. W. Antenna Coil	.60
38-367	27	Plate Choke	.60
38-362	28	B. C. Mixer Coil	.60
38-363		S. W. Mixer Coil	.60
38-365	30	B. C. & S. W. Osc. Coil, includ. con.	1.25
256-1	31	.05 Mfd 200V Condenser	.15
255-1	32	.005 Mfd. 400V Condenser	.15
25-34	33	0.1 Mfd. 400V Condenser	.20
255-2	34	.05 Mfd. 400V Condenser	.20
256-2	35	0.1 Mfd 200V Condenser	.15
255-1	36	.01 Mfd 400V Condenser	.15
255-4	37	.002 Mfd 400V Condenser	.15
255-3	38	.02 Mfd. 400V Condenser	.15
258-1	39	270 Mmf Silver Mica Condenser	.25
253-2	40	250 Mmf. Mica Condenser	.15
253-5	41	50 Mmf. Mica Condenser	.15
25-49	42	10 Mmf. Mica Condenser	.15
258-2	43	350 Mmf Silver Mica Condenser	.30
253-1	44	100 Mmf. Mica Condenser	.15
2514-1	45	6000 Mmf. Mica Condenser	.40
773-19	47	Carbon Resistor 100,000 Ohms	.15
773-39	48	Carbon Resistor 10 Meg. Ohms	.15
773-23	49	Carbon Resistor 470,000 Ohms	.15
773-10	50	Carbon Resistor 1,500 Ohms	.15
773-16	51	Carbon Resistor 22,000 Ohms. 1 Watt	.15
773-14	53	Carbon Resistor 10,000 Ohms	.15
773-18	54	Carbon Resistor 47,000 Ohms	15
77-155	55	Carbon Resistor 12,000 Ohms. 2 Watt	.15
773-24	56	Carbon Resistor 1 Meg. Ohms	.15
773-25	57	Carbon Resistor 2.2 Meg. Ohms	.15
773-21	58	Carbon Resistor 220,000 Ohms	.15
773-10	59	Carbon Resistor 3,300 Ohms	.15
77-61	60	220 Ohms. W. W. 2W. Resistor	.20
774-3	61	22 Ohms. W. W. ½W. Resistors	.15
804-2	65	Speaker Socket	.10
22-131	66	Plug & Wire Assby.	.60
26-162	67	Dual Trimmer Strip	.40
26-161	68	6 Gang Trimmer Strip	.80
80-28	70	Male Plug Phono Motor	.15
44-27	71	60 Cycle Motor	.70

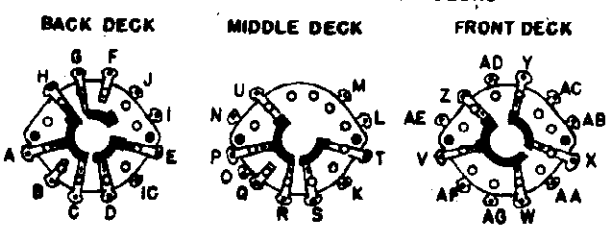
A.V.C. Coupling Condenser 40 is 25 Mmf. Part number 253-4 ..... .15

A.V.C. Isolating Resistors for 6SK7 & 6SA7 marked 48 should be 47 100,000 Ohms.

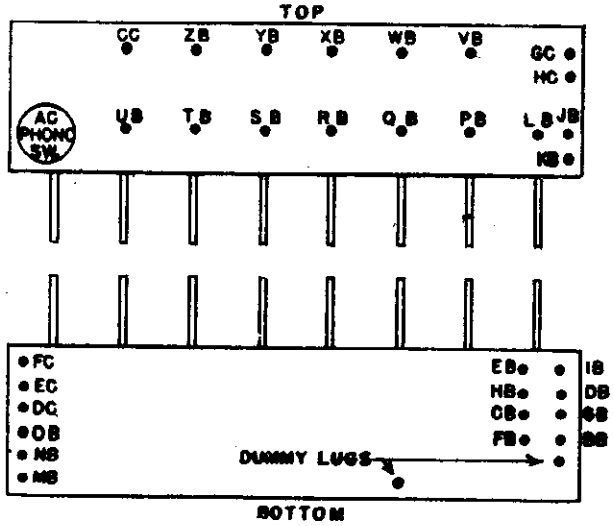
Bass Boost Resistor marked 60 should be 58 220,000 Ohms

27-118	10	Line Cord and Plug	.55
25-81	11	Line Buffer	.20
36-158	12	1st I. F. Transformer	1.60
38-160	13	2nd I. F. Transformer	1.60
944-1	14	60 Cycle Transformer	5.75
78-17	15	Volume Control	.80
78-53	16	Bass Control	.75
78-54	17	Treble Control	.75
805-1	18	Phono Jack	.15
80-33		A-G Terminal Strip	.15
255-1	20	.01 Mfd. 400V Condenser	.15
2511-1	21	25 Mfd.—450 Volt Electrolytic	.75
90-34		Push Button Switch	3.50
26-46	24	Trimmer Strip (Push Button)	1.15

BACK VIEW OF RANGE SWITCH DECKS



PUSH BUTTON TUNER SWITCH



LETTERS ON TERMINALS OF SWITCHES SHOWN ABOVE CORRESPOND TO SIMILARLY LETTERED TERMINALS ON THE SWITCHES SHOWN IN THE CIRCUIT DIAGRAM.

SOCKET VOLTAGES—ALL D.C. VOLTAGES MEASURED TO CHASSIS

ANTENNA GROUNDED — DIAL TUNED TO 540 K.C.

TUBE	FUNCTION	H	K	G	G_1	S	SU	P	D_1	D_2
6SK7	R.F.	6.3	0	Note A		105		235		
6SA7	Mixer	6.3	0	Note A		105		255		
6J5	Oscilator	6.3	0					130		
6SK7	I.F.	6.3	8.5	Note A		105		255		
6J5	Detector	6.3	0					0		
6J5	A. V. C.	6.3	0	Note A				0		
6SQ7	1st Audio	6.3	0					62	Note A	Note A
6SQ7	Inverter	6.3	0					62	0	0
6V6GT	Audio	6.3	15			255		240		
6V6GT	Audio	6.3	15			255		240		
5Y3G	Rectifier	5					350 A.C.			

NOTE A: Due to the high resistance in the circuit, only very slight deflections of the voltmeter will be obtained.

A Firestone "Powerscope" is built into this receiver and under normal conditions will give satisfactory reception. In locations remote from broadcasting stations, or where poor receiving conditions exist, it may be necessary to use an outside antenna. This antenna may be a single wire from 35 feet to 75 feet long, including the lead-in wire, erected as high as possible and as far from electric light wires (or other sources of noise) as possible. When an antenna is used a good ground should also be used. The antenna wire is connected to the screw marked "Ant." and the ground to the terminal, marked "Gnd." located at the rear of the chassis.

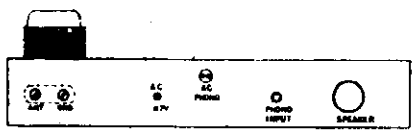


Fig. 1

The "Powerscope" in these instruments is rotatable and may be turned by means of the right hand knob on the panel. A stop is provided to prevent the "Powerscope" from turning too far. This knob should be used to adjust the "Powerscope" towards the station, or that direction which gives the best reception, i. e., loudest signals with least interference. In some locations it may be found that stations can only be received with the "Powerscope" in one position. This is a local condition and may be due to local shielding.

FIRESTONE TIRE & RUBBER CO.

FOR TUNER DATA SEE MODEL S7400-4

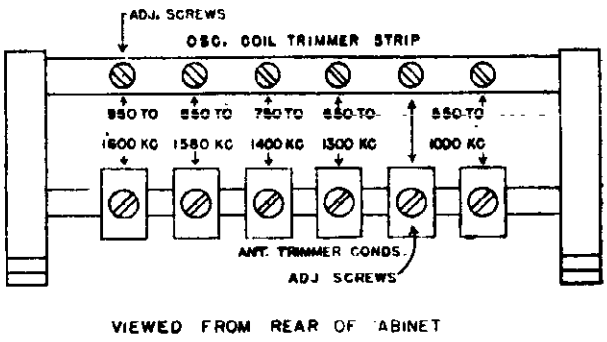
ALIGNMENT PROCEDURE

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator are required.

1. **Connect the output meter across the voice coil or across the plates of the 6F6G output tubes depending on the type of meter. (The more sensitive type should be connected across the voice coil.)**
2. **Connect the ground lead of the signal generator to the receiver chassis or to the "G" terminal at the back of the chassis.**
3. **Turn the volume control to within 15° of the maximum volume position and keep it in this position throughout the alignment procedure**
4. **Push in the "Manual" button and keep it pushed in. Check the pointer to see that it is correctly set.**

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Description	Type of Adjustment
.1 MFD Condenser	Lug on Rear Section of Gang. Cond.	455 KC	Broadcast	Any Point Where It Does Not Affect the Signal	2nd I.F. 1st I.F.	Adjust for Maximum Output. Then Repeat Adjustment.
250 MMF.	"Ant." Terminal	1600 KC	Broadcast	1600 KC	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
250 MMF.	"Ant." Terminal	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	Broadcast R.F. Loop Trimmer	Adjust for Maximum Output.
250 MMF.	"Ant." Terminal	600 KC	Broadcast	Tune to 600 KC Generator Signal	600 KC Padder	Adjust for Maximum Output. Try to Increase Output by Rocking the Gang until Maximum Output is Obtained.
400 OHM Carbon Resistor	"Ant." Terminal	18.1 MC	Foreign	18.1 MC	Shortwave Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 17.2 MC. If Image does not appear, Realign at 18.1 MC, with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	"Ant." Terminal	16 MC	Foreign	Tune to 16 MC Generator Signal	Shortwave Antenna Shortwave R.F.	Adjust for Maximum Output. Try to Increase Output by Rocking the Gang until Maximum Output is Obtained.
400 OHM. Carbon Resistor	"Ant." Terminal	9.5 MC	25M-31M	9.5 MC	Band Spread* Oscillator Pad	Adjust for Maximum Output. To check for Correct Alignment Tune Generator to 10.4 MC. If Image comes in alignment is correct.
400 OHM. Carbon Resistor	"Ant." Terminal	9.5 MC	25M-31M	9.5 MC	Band Spread* R. F. Pad.	Adjust for Maximum Output.
400 OHM. Carbon Resistor	"Ant." Terminal	9.5 MC	25M-31M	9.5 MC	Band Spread* Ant. Pad	Adjust for Maximum Output.
400 OHM. Carbon Resistor	"Ant." Terminal	12 MC	25M-31M	12 MC	Band Spread* Osc. Trimmer	Adjust for Maximum Output. To Check for Correct Alignment Tune Generator to 12.9 MC. If Image Comes In Alignment is Correct.
400 OHM. Carbon Resistor	"Ant." Terminal	12 MC	25M-31M	12 MC	Band Spread* R.F. Trimmer.	Adjust For Maximum Output.
400 OHM. Carbon Resistor	"Ant." Terminal	12 MC	25M-31M	12 MC	Band Spread* Ant. Trimmer	Adjust For Maximum Output.

*BAND SPREAD CONDENSERS MOUNTED UNDERNEATH CHASSIS PAN. SEE ILLUSTRATION BELOW.



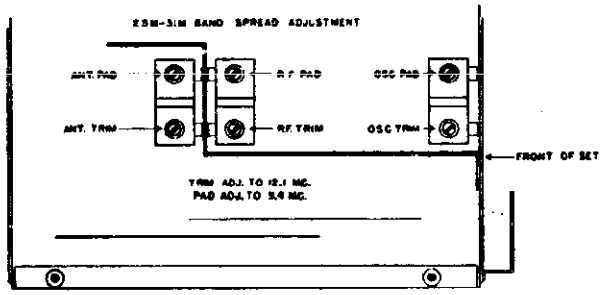
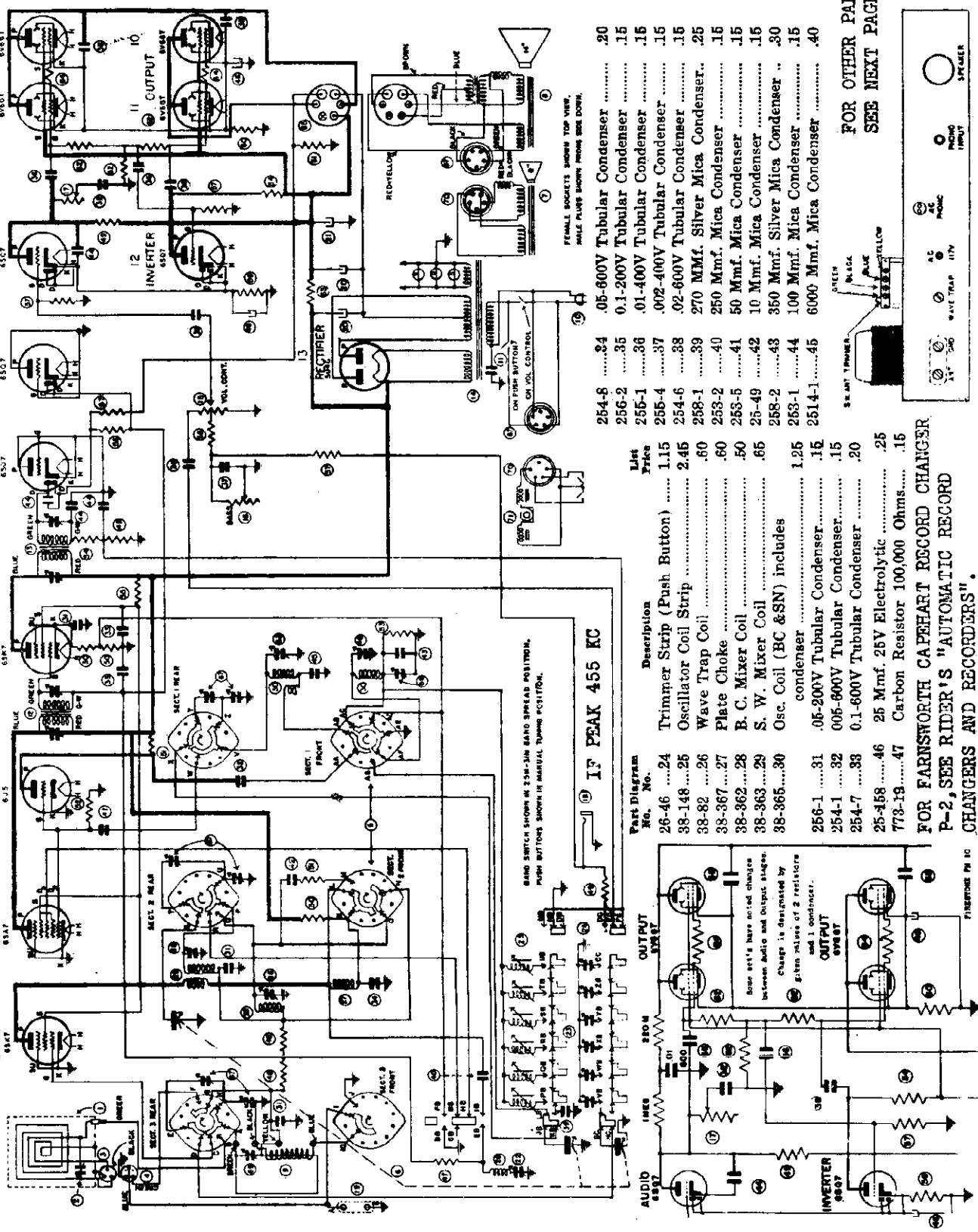


Fig. 3

MODELS S7400-4, S7400-5

FIRESTONE TIRE & RUBBER CO.



Part Diagram No.	No.	Description	List Price
26-46	...24	Trimmer Strip (Push Button)	..... 1.15
38-148	...25	Oscillator Coil Strip	..... 2.45
38-82	...26	Wave Trap Coil	..... .60
38-367	...27	Plate Choke	..... .60
38-362	...28	B. C. Mixer Coil	..... .50
38-363	...29	S. W. Mixer Coil	..... .65
38-365	...30	Osc. Coil (BC &SW) includes condenser	..... 1.25
256-1	...31	.05-200V Tubular Condenser	..... .15
254-1	...32	005-600V Tubular Condenser	..... .15
254-7	...33	0.1-600V Tubular Condenser	..... .20
25-458	...46	25 Mmf. 25V Electrolytic	..... .25
773-19	...47	Carbon Resistor 100,000 Ohms	..... .15
254-8	...34	.05-600V Tubular Condenser	..... .20
256-2	...35	0.1-200V Tubular Condenser	..... .15
256-1	...36	.01-400V Tubular Condenser	..... .15
256-4	...37	.002-400V Tubular Condenser	..... .15
254-6	...38	.02-600V Tubular Condenser	..... .15
258-1	...39	270 MMf. Silver Mica Condenser	.. .25
253-2	...40	250 Mmf. Mica Condenser	..... .15
253-5	...41	50 Mmf. Mica Condenser	..... .15
25-49	...42	10 Mmf. Mica Condenser	..... .15
258-2	...43	350 Mmf. Silver Mica Condenser	.. .30
253-1	...44	100 Mmf. Mica Condenser	..... .15
2514-1	...45	6000 Mmf. Mica Condenser	..... .40

FOR FARNSWORTH CAPEHART RECORD CHANGER P-2, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

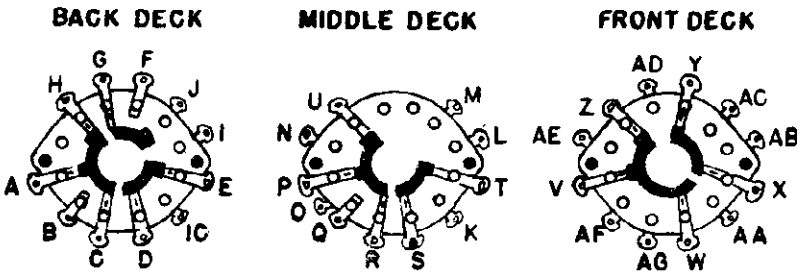
FIRESTONE TIRE & RUBBER CO. MODELS S7400-4, S7400-5

PARTS LIST CONT.

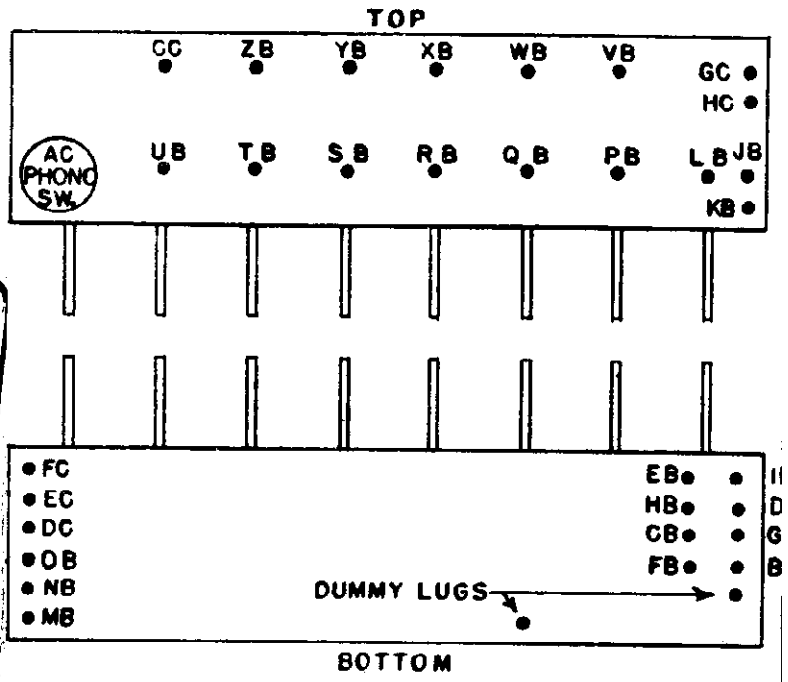
771-19	48	Carbon Resistor 100,000 Ohms.	.15
773-23	49	Carbon Resistor 470,000 Ohms.	.15
773-10	50	Carbon Resistor 1,500 Ohms.	.15
773-16	51	Carbon Resistor 22,000 Ohms.	.15
77-156	52	Carbon Resistor 22,000 Ohms.	.15
771-14	53	Carbon Resistor 10,000 Ohms.	.15
773-18	54	Carbon Resistor 47,000 Ohms.	.15
77-155	55	Carbon Resistor 12,000 Ohms.	.15
773-24	56	Carbon Resistor 1 Meg. Ohms.	.15
773-25	57	Carbon Resistor 2.2 Meg. Ohms.	.15
773-21	58	Carbon Resistor 220,000 Ohms.	.15
773-12	59	Carbon Resistor 3,300 Ohms.	.15
77-153	60	150W. W. W. 4 Watt Resistor	.25
77-152	61	15W. W. W. ½ Watt Resistor	.15
773-20	62	150M Ohm. Carbon Resistor	.15
77-64	63	100 Ohm. 4 Watt W. W. Resistor	.15
773-6	64	220 Ohm. Carbon Resistor	.15
804-2	65	Speaker Socket 6 Prong	.10
22-131	66	Plug & Wire Assby.	.60
26-162	67	Dual Trimmer Strip	.40

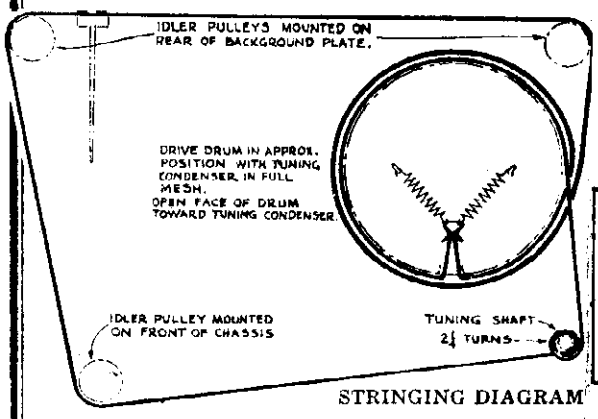
LETTERS ON TERMINAL OF SWITCHES SHOWN TO THE RIGHT, CORRESPOND TO SIMILARLY LETTERED TERMINALS ON THE SWITCHES SHOWN IN THE CIRCUIT DIAGRAM.

BACK VIEW OF RANGE SWITCH DECKS



PUSH BUTTON TUNER SWITCH





STRINGING DIAGRAM

SOCKET VOLTAGES—ALL D.C. VOLTAGES MEASURED TO CHASSIS

ANTENNA GROUNDED — DIAL TUNED TO 540 K.C.

TUBE	FUNCTION	H	K	G	G_1	S	SU	P	D_1	D_2
6SK7	R.F.	6.3 A.C.	0	Note A		105	0	250		
6SA7	Mixer	6.3 A.C.	0	Note A	Note A	105	0	255		
6J5	Oscillator	6.3 A.C.	0					125		
6SK7	I. F.	6.3 A.C.	7.4			105	7.4	255		
6SQ7	Detector	6.3 A.C.	0						Note A	Note A
6SQ7	A.V.C.	6.3 A.C.		0				0	Note A	Note A
6SQ7	1st Audio	6.3 A.C.	1	0				105	1	1
6SQ7	Inverter	6.3 A.C.	1	0				105	1	1
6V6GT	Audio	6.3 A.C.	18			255		250		
6V6GT	Audio	6.3 A.C.	18			255		250		
6V6GT	Audio	6.3 A.C.	18			255		250		
6V6GT	Audio	6.3 A.C.	18			255		250		
5U4G	Rectifier	5 A.C.					350 A.C.			

NOTE A: Due to the high resistance in the circuit, only very slight deflections of the voltmeter will be obtained.

PUSH BUTTON ADJUSTMENT

Directly back of dial assembly are 6 screws. The right hand pair connect with left hand button looking from front. (1)Make list of 6 stations in order of freqs. (2)Press "Manual" button, tune in lowest freq. station. (3)Press button selected for station. (4) Adj. upper brass screw until station is heard clearly. (5)Adj. lower screw in same pair for maximum volume.

MODELS S7400-4, S7400-5

FIRESTONE TIRE & RUBBER CO.

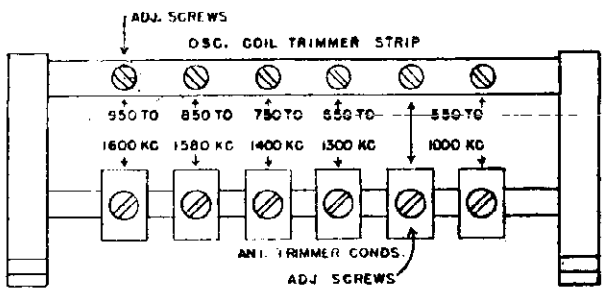
ALIGNMENT PROCEDURE

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator are required.

1. **Connect the output meter across the voice coil or across the plates of the 6V6GT output tubes depending on the type of meter. (The more sensitive type should be connected across the voice coil.)**
2. **Connect the ground lead of the signal generator to the receiver chassis or to the "G" terminal at the back of the chassis.**
3. **Turn the volume control to within 15° of the maximum volume position and keep it in this position throughout the alignment procedure.**
4. **Push in the "Manual" button and keep it pushed in. Check the pointer to see that it is correctly set.**

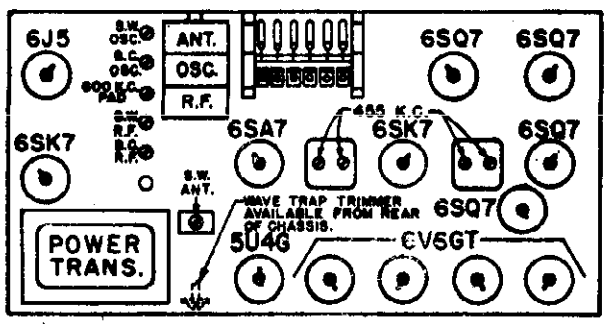
Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Description	Type of Adjustment
.1 MFD Condenser	Lug on Rear Section of Gang. Cond.	455 KC	Broadcast	Any Point Where It Does Not Affect the Signal	2nd I.F.	Adjust for Maximum output.
					1st I.F.	Adjust for Maximum Output. Tighten screw next to 6SA7. Adjust other screw for maximum output. Adjust screw next to 6SA7 for maximum output. Do not touch the other screw again.
250 MMF.	"Ant." Terminal	455 KC	Push in No. 6 Button	Any Point Where It Does Not Affect the Signal	Wave Trap	Adjust for MINIMUM Output. Using a Strong Signal from Generator.
250 MMF.	"Ant." Terminal	1600 KC	Broadcast	1600 KC	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
250 MMF.	"Ant." Terminal	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	Broadcast R.F.	Adjust for Maximum Output.
					Loop Trimmer	
250 MMF.	"Ant." Terminal	600 KC	Broadcast	Tune to 600 KC Generator Signal	600 KC Padder	Adjust for Maximum Output. Try to Increase Output by Rocking the Gang until Maximum Output is Obtained.
400 OHM Carbon Resistor	"Ant." Terminal	18.1 MC	Foreign	18.1 MC	Shortwave Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 17.2 MC. If Image does not appear, Realign at 18.1 MC, with Trimmer Screw Farther out. Recheck Image.
400 OHM Carbon Resistor	"Ant." Terminal	16 MC	Foreign	Tune to 16 MC Generator Signal	Shortwave Antenna	Adjust for Maximum Output.
					Shortwave R.F.	Try to Increase Output by Rocking the Gang until Maximum Output is Obtained.
400 OHM Carbon Resistor	"Ant." Terminal	9.5 MC	25M-31M	9.5 M.C	Band Spread* Oscillator Pad	Adjust for Maximum Output. To check for Correct Alignment Tune Generator to 10.4 MC. If Image comes in alignment is correct.
400 OHM Carbon Resistor	"Ant." Terminal	9.5 MC	25M-31M	9.5 M.C	Band Spread* R. F. Pad	Adjust for Maximum Output.
400 OHM Carbon Resistor	"Ant." Terminal	9.5 MC	25M-31M	9.5 M.C	Band Spread* Ant. Pad	Adjust for Maximum Output.
400 OHM Carbon Resistor	"Ant." Terminal	12 MC	25M-31M	12 MC	Band Spread* Osc. Trimmer	Adjust for Maximum Output. To Check for Correct Alignment Tune Generator to 12.9 MC. If Image Comes in Alignment is Correct.
400 OHM Carbon Resistor	"Ant." Terminal	12 MC	25M-31M	12 MC	Band Spread* R.F. Trimmer.	Adjust For Maximum Output.
400 OHM Carbon Resistor	"Ant." Terminal	12 MC	25M-31M	12 MC	Band Spread* Ant. Trimmer	Adjust For Maximum Output.

*BAND SPREAD CONDENSERS MOUNTED UNDERNEATH CHASSIS PAN. SEE ILLUSTRATION BELOW.

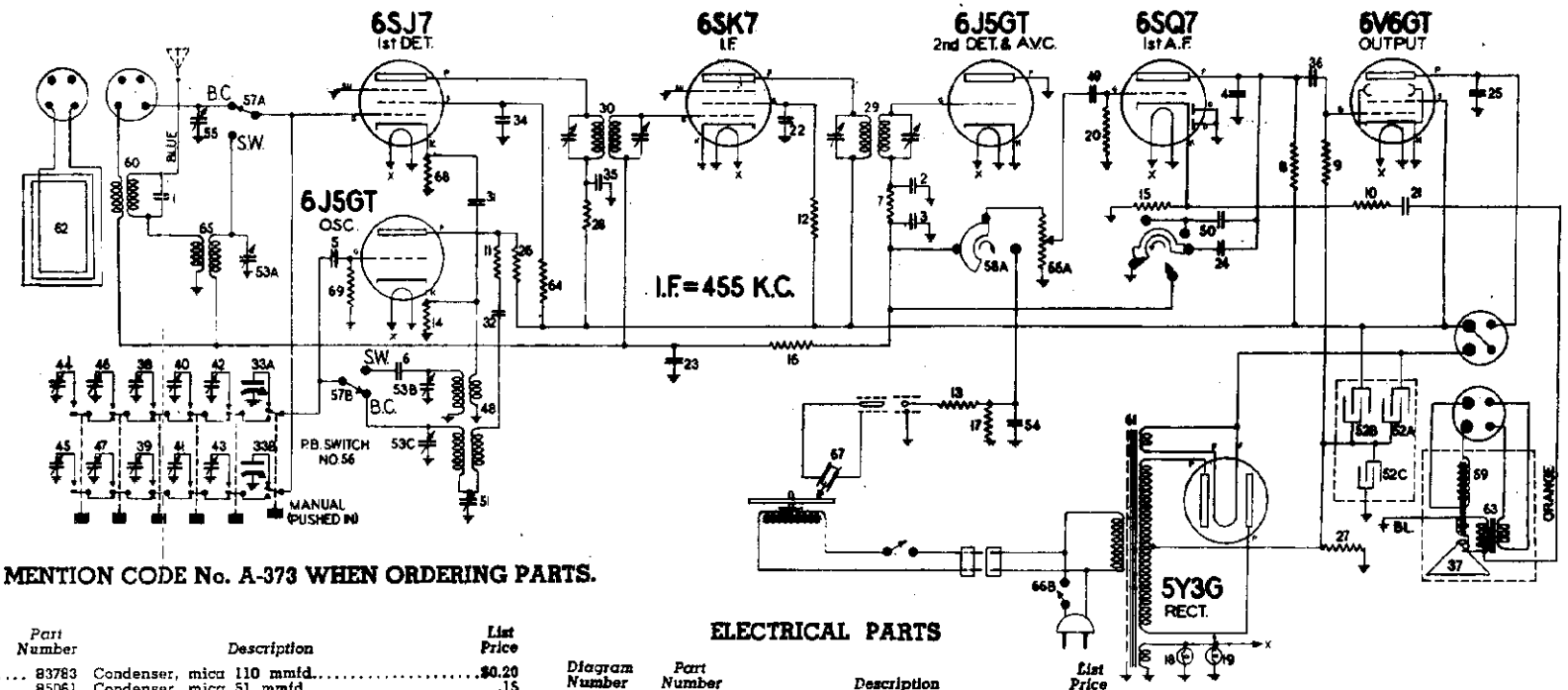


VIEWED FROM REAR OF CABINET

Push Button Adjustment



B C ANT TRIMMER IS IN LOOP ANT



NOTE: MENTION CODE No. A-373 WHEN ORDERING PARTS.

Diagram Number	Part Number	Description	List Price
1 to 4	83783	Condenser, mica 110 mmfd.	$0.20
5	85061	Condenser, mica 51 mmfd.	.15
6	88587	Condenser, mica .0042 mfd.	.35
7	110552	Resistor—carbon 47,000 ohms ¼ watt	.12
8-9	110553	Resistor—carbon 220,000 ohms ¼ watt	.12
10	118816	Resistor—carbon 6800 ohms ¼ watt	.12
11	110590	Resistor—carbon 180 ohms ¼ watt	.12
12-13	110564	Resistor—carbon 100,000 ohms ¼ watt	.12
14-15	116078	Resistor, carbon 560 ohms ¼ watt	.12
16	110570	Resistor—carbon 2.2 meg. ¼ watt	.15
17	110584	Resistor—carbon 330,000 ohms ¼ watt	.12
18-19	112636	Lamp—dial (Mazda No. 44 frosted)	.25
20	112975	Resistor—carbon 10 meg. ¼ watt	.12
21	116625	Condenser—.1 mfd. 600 volt	.25
22	119414	Condenser—.02 mfd., 600 volt	.15
23	116819	Condenser—.05 mfd. 600 volt	.20
24	119416	Condenser—.008 mfd., 600 volt	.15
25	119417	Condenser, .006 mfd., 600 volt	.15
26	118805	Resistor—carbon 10,000 ohms 1 watt	.12
27	113812	Resistor—180 ohms 1 watt W.W.	.12
28	110557	Resistor—carbon 4700 ohms ¼ watt	.12
29	119024	Transformer—2nd I.F.	1.15
30	500801	Transformer—1st I.F.	1.20
31-32	119193	Condenser—.01 mfd. 600 volt	.15
33A-33B	119291	Condenser—variable tuning	2.75
34-35-36	119414	Condenser—.02 mfd. 600 volt	.15
37	M-500969	Cone & Voice coil for M-500948 speaker	2.00
38 to 41	119663	Condenser—push button trimmer (med. freq.)	.24
42-43	119664	Condenser—push button trimmer (high freq.)	.24
44 to 47	119753	Condenser—push button trimmer (low freq.)	.24
48	500248	Coil—oscillator	1.00
49-50	119875	Condenser—.002 mfd. 600 volt	.15
51	119934	Condenser—padder	.38

FOR PUSH-BUTTON DATA SEE INDEX

ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
52	160174	Condenser—electrolytic Section A—20 mfd. 400 volt Section B—15 mfd. 400 volt Section C—10 mfd. 25 volt	$1.30
53A to 53C	160415	Condenser—trimmer (3 section)	.48
54	160430	Condenser—.001 mfd. 600 volt	.15
55	160449	Condenser—trimmer	.18
56	500056	Switch—push button	2.60
57A-57B	500057	Switch—Band	1.20
58A-58B	501028	Switch—Radio-Phono tone	1.25
59	M-500948	Speaker—Dynamic (10")	7.65
60	500255	Coil—compensating	1.05
61	500116	Transformer—power (50-60 cycle)	$6.50
	160780	Transformer—power (25 cycle)	8.00
62	500939	Loop antenna complete	1.65
63	M-500968	Transformer—output for M-500948 speaker	2.00
64	112962	Resistor—carbon 150,000 ohms ¼ watt	.12
65	500147	Coil—short wave antenna	.55
66A-66B	501027	Volume control—1 meg. (with switch)	1.25
67	161289	Crystal cartridge	5.00
68	112952	Resistor—carbon 3300 ohms ¼ watt	.10
69	110552	Resistor—carbon 47,000 ohms ¼ watt	.12

SOCKET VOLTAGES—ALL D.C. POTENTIAL MEASURED TO CHASSIS

NO SIGNAL CONDITION — DIAL TUNED TO 540 KC.

TUBE	FUNCTION	H	K	G	S	SU	P	D_1	D_2
6SJ7	1st Det.	6.0 A.C.	9.0	0	105	0	220		
6J5GT	Osc.	6.0 A.C.	0	—3			165		
6SK7	I.F.	6.0 A.C.	0	0	46	0	230		
6J5GT	2nd Det.—A.V.C.	6.0 A.C.	0	0			0		
6SQ7	1st A.F.	6.0 A.C.	1	0			75	0	0
6V6GT	Output	6.0 A.C.	0	Note A	230		220		
5Y3G	Rectifier	5.0 A.C.					Plates 350 V.A.C. to C.T.		

NOTE A: The 6V6GT grid bias voltage is —13.5 volts measured across resistor No. 27. Use a high resistance voltmeter of at least 1000 ohms per volt.

MODEL S7400-6

FIRESTONE TIRE & RUBBER CO.

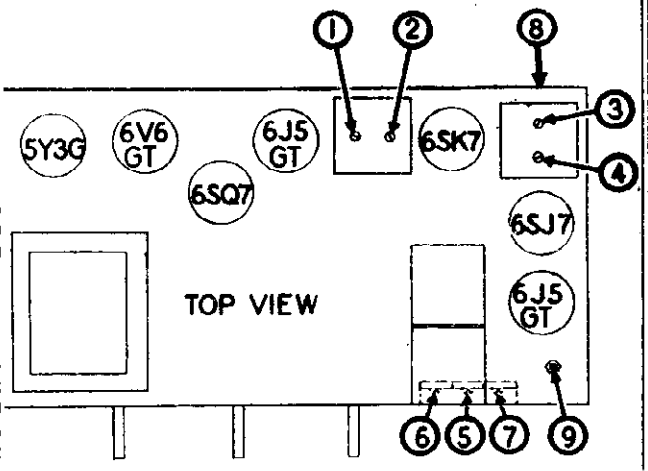
ALIGNMENT EQUIPMENT & PROCEDURE

1. Connect the output meter across the voice coil or from plate of the 6V6GT output tube to chassis through a .1 mfd. condenser. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the receiver chassis.
3. Turn the RADIO-PHONO TONE SWITCH to the extreme clockwise position.
4. Turn the volume control to the maximum position and keep it in this position throughout the alignment procedure.
5. Push in the "Manual" button and keep it pushed in. Check the pointer to see that it is correctly set to 540 KC. with gang in full mesh.
6. The loop must be connected as indicated in circuit diagram at all times.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD. Condenser	Lug on rear Section of Gang Cond.	455 KC	American	Any Point Where It Does Not Affect the Signal	1-2	2nd I.F.	Adjust for Maximum Output. Then repeat Adjustment.
					3-4	1st I.F.	
400 OHM Carbon Resistor	Antenna Terminal (Blue Wire)	16 MC	Foreign	16 MC	5	Foreign Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 15.1 MC. If Image does not appear, Realign at 16 MC, with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	Antenna Terminal (Blue Wire)	16 MC	Foreign	Tune to 16 MC Generator Signal	6	Foreign Antenna	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.
200 MMFD. Mica Condenser	Antenna Terminal (Blue Wire)	1500 KC	American	1500 KC	7	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
Now replace the chassis and loop antenna in the cabinet before proceeding further.							
200 MMFD. Mica Condenser	Antenna Terminal (Blue Wire)	1500 KC	American	Tune to 1500 KC Generator Signal	8	Broadcast Antenna	Adjust for Maximum Output.
200 MMFD. Mica Condenser	Antenna Terminal (Blue Wire)	600 KC	American	Tune to 600 KC Generator Signal	9	Broadcast Oscillator (Series)	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.

MISCELLANEOUS PARTS

Part Number	Description	List Price
500936	Cabinet Back	$ .50
160395	Cable, Motor	.48
117493	Cable, Pickup	.40
114955	Clamp, for Dial Cord	.01
112745	Clip, Coil Mounting	.01
117057	Cord, Drive (Supplied in 3 ft. Lengths)	.15
500100	Dial Scale	1.00
117029	Drive Drum & Bushing	.50
500110	Escutcheon, Dial (with Glass)	1.30
500111	Escutcheon, Push Button	.40
119644	Knob, Volume & Tuning	.18
119746	Knob, Band or Tone	.16
160269	Pointer	.18
500112	Push Button	.12
81145	Retaining Ring for Tuning Shaft	Per C .50
114914	Screw Special Head for Mtg. Escutcheon	Per Doz. .15
85827	Set Screw, 8-32 Square Head	.02
500051	Socket for Loop Antenna	.15
160039	Socket, Phono	.08
110501	Socket, 4 Prong (for Speaker)	.16
119791	Socket, Octal	.12
114876	Socket, Octal (Rectifier)	.15
114878	Socket, Octal with Special Ground	.15
116467	Socket, Condenser Mtg.	.04
111090	Spacer, steel, Mtg. for Gang	.02
113177	Spring, Dial Cord Tension	.09
117315	Tabs, Station Call Letters	.55
118606	Tuning Shaft	.18
111456	Washer, Spring Washer for Tuning Shaft	Per C .50



FOR GENERAL INDUSTRIES 201 RECORD CHANGER, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

FIRESTONE TIRE & RUBBER CO.

MODEL S7401-
Lumitone

ALIGNMENT PROCEDURE

Lack of sensitivity and poor tone quality may be due to any one or a combination of causes such as weak or defective tubes or speal open or grounded bias resistor, bypass condenser, etc. Never attempt to realign set until all other possible sources of trouble have b first thoroughly investigated and definitely proved not to be the cause.

NOTE: IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OUTI MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER AND THAT THE PROCEDURE BE CAREFULLY FOLLOWED, OTH WISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT. THE TRIMMERS WILL BE REFERI TO BY THEIR FUNCTION AS INDICATED ON THE PARTS DIAGRAM.

GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 456, 600, 1400 and 1720 KC and an output meter 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.

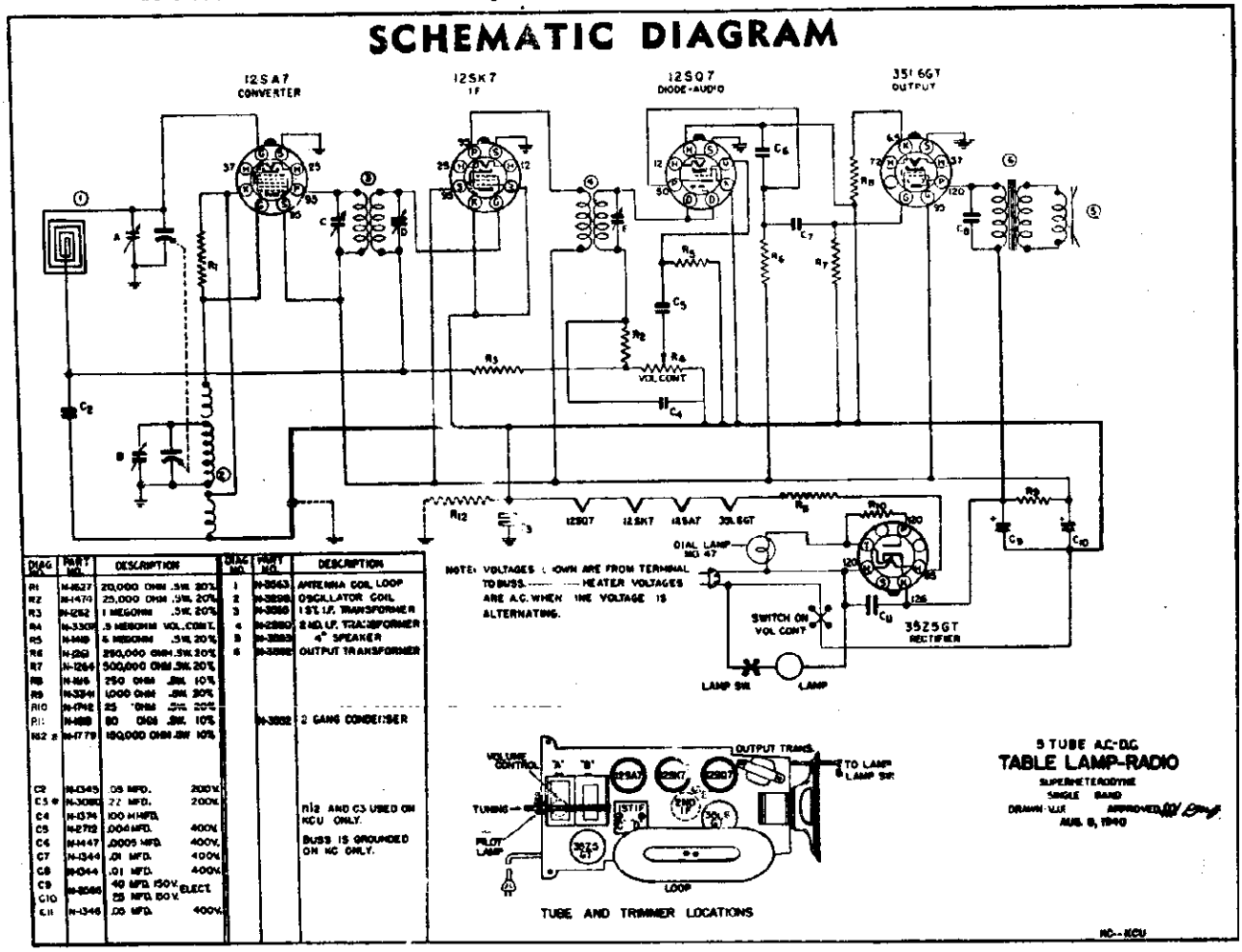
CORRECT ALIGNMENT PROCEDURE. Remove the chassis from the cabinet and set on a bench taking care that no iron or other metal is near the loop. (See section on replacement of tubes). Do not make this setup on a metal bench. The intermediate frequency (I.F.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the broadcast band should be adjusted.

I. F. ALIGNMENT. With the gang condenser set at minimum, ac just the test oscillator to 456 KC and connect the output to the gri of the first detector tube (12SA7) through a .05 or .1 mfd. cor denser. The ground on the test oscillator should be connected t the chassis ground. Align all three I.F. trimmers to peak or max mum reading on the output meter.

BROADCAST BAND ALIGNMENT. Connect the test oscillator to loop transmitter and couple to the loop antenna on the receive With the gang condenser set at minimum capacity, set the test osci lator at 1720 K.C. and adjust the oscillator (or 1720 KC trimmer) o gang condenser. Next—set the test oscillator at 1400 KC, an tune in the signal on the gang condenser. Adjust the antenn trimmer (or 1400 KC trimmer) for maximum signal. Next set the te oscillator at 600 KC, and tune in signal on condenser to chec alignment of coils.

Voltages shown on the circuit diagram are from socket terminals to chassis base. In measuring voltages use a voltmeter having a resistance of at least 1000 ohms per volt. Allowances should be made for variations in line voltage.

SCHEMATIC DIAGRAM



NOTE: VOLTAGES SHOWN ARE FROM TERMINAL TO BUSS. ——— HEATER VOLTAGES ARE A.C. WHEN THE VOLTAGE IS ALTERNATING.

DIAG SYM	PART NO.	DESCRIPTION
R1	N-1627	20,000 OHM .5W. 20%
R2	N-1470	25,000 OHM .5W. 20%
R3	N-1262	1 MEGOHM .5W. 20%
R4	N-3309	.5 MEGOHM VOL. CONT.
R5	N-1419	6 MEGOHM .5W. 20%
R6	N-1261	250,000 OHM .5W. 20%
R7	N-1264	500,000 OHM .5W. 20%
R8	N-1415	250 OHM .5W. 10%
R9	N-3314	1,000 OHM .5W. 20%
R10	N-1742	25 OHM .5W. 20%
R11	N-1418	80 OHM .5W. 10%
R12 & R13	N-1779	180,000 OHM .5W. 10%
C2	N-1345	.05 MFD. 200V.
C3 & C5	N-3082	.22 MFD. 200V.
C4	N-1376	100 M.M.FD.
C5	N-2712	.004 MFD. 400V.
C6	N-1447	.0005 MFD. 400V.
C7	N-1344	.01 MFD. 400V.
C8	N-1344	.01 MFD. 400V.
C9	N-2066	40 MFD. 150V. ELECT.
C10		25 MFD. 50V.
C11	N-1346	.05 MFD. 400V.

DIAG NO.	PART NO.	DESCRIPTION
1	N-2563	ANTENNA COIL LOOP
2	N-3268	OSCILLATOR COIL
3	N-3266	1ST I.F. TRANSFORMER
4	N-2280	2ND I.F. TRANSFORMER
5	N-3283	4" SPEAKER
6	N-3286	OUTPUT TRANSFORMER
	N-3032	2 GANG CONDENSER

R12 AND C3 USED ON KCU ONLY.

BUSS IS GROUNDED ON KC ONLY.

KC--KCU

This new Radio-Lamp of yours incorporates the latest developments and refinements that radio engineers have devised. In order to realize the advantages to the fullest extent you must thoroughly understand its operation and use. Therefore it is important that you read the following pages carefully. PLEASE READ THESE INSTRUCTIONS ALL THE WAY THROUGH BEFORE ATTEMPTING TO USE THE RECEIVER.

ASSEMBLY OF LAMP. Screw the small shade on the lamp socket and screw the lamp bulb in the socket. Then place the large shade on the small shade and the assembly is complete.

TYPE OF LAMP BULB REQUIRED. The lamp is designed to use a three light bulb. This type of bulb will give three intensities of light and comes in two sizes. For normal illumination use the 30, 70 and 100 watt size with a medium base. For better illumination use the 50, 100 and 150 watt size with a medium base. Standard 60 or 100 watt bulbs can be used successfully in the lamp, but only one intensity of light will be obtained.

TUBES USED. Five tubes are used. Their type numbers and locations are shown on the tube location diagram inside the base of the lamp. Before attempting to replace tubes see the section on ***replacement of tubes.***

ANTENNA AND GROUND. This radio lamp has a self contained loop antenna and requires no external antenna or ground. On weak stations the signal can be improved by rotating the lamp slightly.

POWER SUPPLY. This receiver is designed to operate on any alternating current supply (AC) ranging from 110 to 120 volts, 50 to 60 cycles; or on any direct current supply (DC) ranging from 110 to 120 volts.

SPECIAL INSTRUCTIONS FOR DC OPERATION. When operating from a DC (direct current) power supply, it may be necessary to reverse the power cord plug in the wall socket before the receiver will function, due to the polarity condition of a direct current supply. If the receiver fails to perform after being turned on one minute, simply reverse the power plug.

TUNING DIAL. (Station Selector)—Rotate the dial in the base of the lamp slowly over a narrow range of the dial at a point where the desired station is located, until the station is received with maximum volume; then readjust the volume control to the proper level. **Never** use the station selector to adjust volume as this practice results in distorted tone quality and deficient bass response. The Volume Control **only** is to be used for this purpose. For maximum clarity the indicator knob should be adjusted to the center of the area covered by the station being tuned.

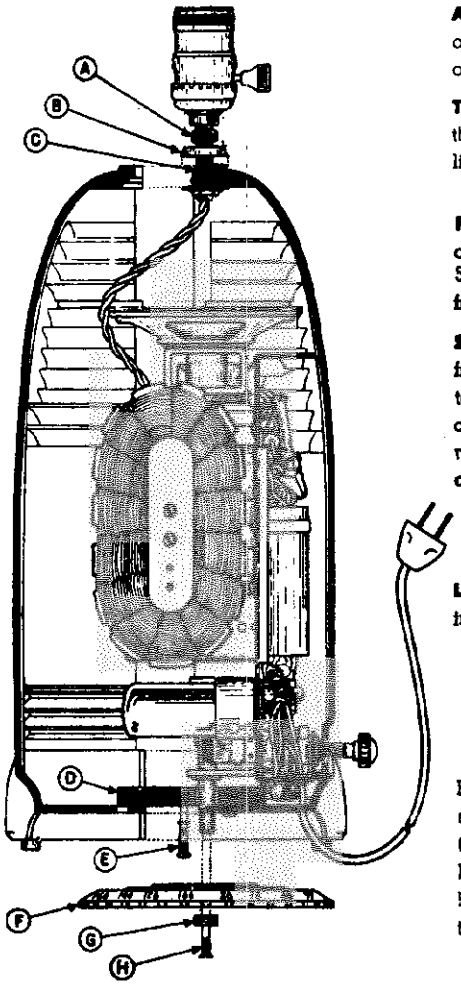


FIGURE 1.

CONTROLS AND OPERATION

LAMP SWITCH. The switch located in lamp socket must be turned in a clockwise direction to secure the three intensities of light if a three light bulb is used. If a standard single light bulb is used only one intensity of light will be obtained.

REPLACEMENT OF TUBES

(See Figure 1)

Remove the shades and lamp bulb to prevent damage. Next loosen screw H and slip off washer G and the dial F. Next unscrew E and the screw next to it. (These screws have red heads). At the top of lamp just below the lamp socket, will be found nut A which must be loosened sufficiently to allow collar B to be moved high enough to allow the two halves of the lamp base to be separated.

If tubes are removed from their sockets for test or replacement purposes, make certain that each tube is placed in its proper socket. (See tube layout diagram in the base of the lamp).

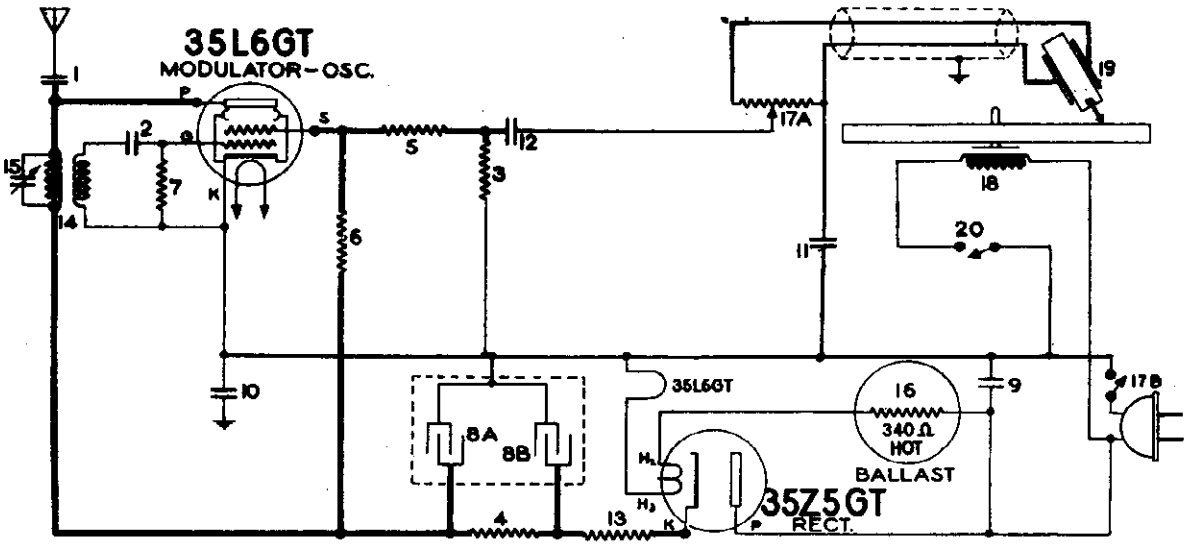
Failure to replace the tubes in their proper sockets may result in damage to the tube, or the receiver, or both.

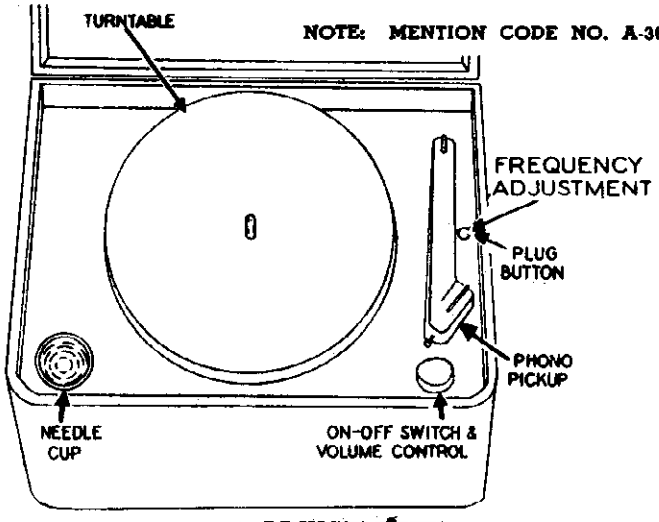
TUNING RANGE

This receiver is designed to operate over the standard broadcast band which extends from 535 to 1720 Kilocycles (KC) (174 to 560 Meters) and includes the popular 1712 KC police channel.

MODEL S7401-6 Phono

FIRESTONE TIRE & RUBBER CO.





NOTE: MENTION CODE NO. A-367 WHEN ORDERING PARTS

ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1	83539	Condenser—mica, 260 mmfd.	$0.20
2	83783	Condenser—mica, 110 mmfd.	.20
3	110559	Resistor—carbon 470,000 ohms ¼ watt.	.12
4	110569	Resistor—carbon 10,000 ohms ¼ watt.	.12
5	110578	Resistor carbon 68,000 ohms ¼ watt.	.12
6	110580	Resistor—carbon 3.3 meg. ¼ watt.	.12
7	116051	Resistor—insulated 33,000 ohms ¼ watt.	.15
8A-8B	116470	Condenser—electrolytic 20-20 mfd. 150 volt.	.95
9-10	116625	Condenser—.1 mfd. 600 volt.	.25
11-12	116819	Condenser—.05 mfd. 600 volt.	.20
13	118823	Resistor—1000 ohms 1 watt Wire Wound.	.15
14	160499	Coil oscillator	.26
15	160501	Condenser—tuning	.22
16	160540	Ballast tube	.60
17A-17B	160576	Volume control—250,000 ohms with switch.	1.45
18	160603	Motor—less turntable	5.65
19	160617	Crystal cartridge	4.50
20	160693	Switch—On-Off	.42

ADJUSTMENTS

Set the receiver that is to be used with this record player to some frequency between 540 and 750 KC. Choose a frequency that is clear and free from interfering stations. Keep in mind the fact that strong signals may be present at night where there are no signals in the daytime. Remove the plug near the volume control on top of the record player. Using an insulated screwdriver turn the screw, located beneath this plug, until the signal from the record player is heard in the receiver. This will be heard as a reduction in noise as the signal comes in tune with the receiver. If a record is being played, the music or sound from it may be tuned in. If it is desired to change the frequency, set the receiver to the new frequency and turn the screw until the signal is heard. Turning the adjusting screw clockwise increases the frequency and turning it counter-clockwise lowers the frequency.

When the record player is located at some distance from the receiver, or under conditions when the signal from it is too weak, the coil of wire from the record player should be uncoiled enough to give a satisfactory signal. Under no conditions should more wire be uncoiled than is necessary for a reasonably strong signal in the receiver.

HOWLS OR SQUEALS

Howls or squeals from this unit may be caused by the following:

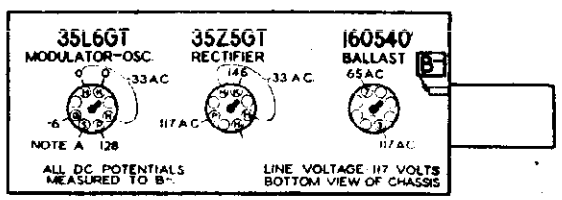
1. Interference caused by choosing a frequency which is not clear. To remedy, change the record player frequency to one where there is no interference.
2. Too weak a signal permitting interference from a weak station. To remedy, uncoil some of the wire from the coil under the record player, or move the record player nearer the set.
3. Too strong a signal permitting vibration from the speaker to cause microphonics. (The record player and receiver are in this case usually very close together.) To remedy, place the record player on another support or mount it on sponge rubber. Coiling up the wire coming from the chassis may help if the signal is too strong.

MISCELLANEOUS PARTS

Part Number	Description	List Price
146467	Base for mtg. electrolytic condenser.	$0.04
112798	Clip—for mtg. oscillator coil	.01
160617	Crystal cartridge	4.50
161104	Idler wheel with rubber rim	1.00
160219	Knob—push on	.06
160033	Needle cup	.08
113463	Rubber bushing—motor mtg.	.03
119791	Socket—8 prong	.12
114876	Socket—octal base (for rectifier)	.15
161105	Turntable—9"	2.00

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

SOCKET VOLTAGES



NOTE A: Voltage on the screen of the 35L6GT cannot be measured with the ordinary voltmeter because of the high resistance of resistor No. 6.
Use a voltmeter of at least 1000 ohms per volt.

MODEL S7402-5
Commentator

FIRESTONE TIRE & RUBBER CO.

TUNING RANGE

This receiver is designed to operate over the standard broadcast band which extends from 535 to 1720 Kilocycles (KC) (174 to 560 Meters) and includes the popular 1712 KC police channel.

Lack of sensitivity and poor tone quality may be due to any one or a combination of causes such as weak or defective tubes or speaker, open or grounded bias resistor, bypass condenser, etc. Never attempt to realign set until all other possible sources of trouble have been first thoroughly investigated and definitely proved not to be the cause.

NOTE: IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OUTPUT MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER AND THAT THE PROCEDURE BE CAREFULLY FOLLOWED, OTHERWISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT. THE TRIMMERS WILL BE REFERRED TO BY THEIR FUNCTION AS INDICATED ON THE PARTS DIAGRAM.

ALIGNMENT PROCEDURE

GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 456, 600, 1400 and 1720 KC and an output meter 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.

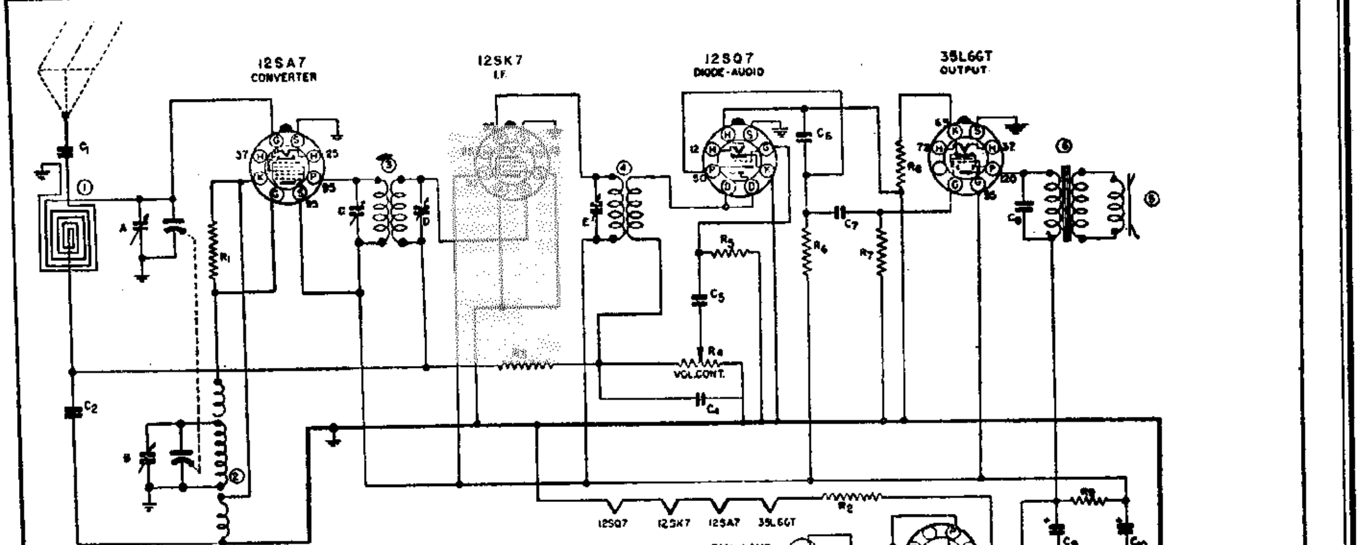
CORRECT ALIGNMENT PROCEDURE. The intermediate frequency (I.F.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the broadcast band should be adjusted.

I. F. ALIGNMENT. With 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 (12SA7) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the chassis ground. Align all three I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT. Remove chassis, and loop antenna from cabinet and set them up on the bench so that they occupy exactly the same respective positions on the bench as they did in the cabinet. Care should be taken to have no iron or other metal near the loop. Do not make this set-up on a metal bench.

Connect the test oscillator to the antenna of the set through a 100 mmfd. (.0001) condenser. With the gang condenser set at minimum capacity, set the test oscillator at 1720 KC, and adjust the oscillator (or 1720 KC trimmer) on gang condenser. Next—set the test oscillator at 1400 KC, and tune in the signal on the gang condenser. Adjust the antenna trimmer (or 1400 KC trimmer) for maximum signal. Next set the test oscillator at 600 KC, and tune in signal on condenser to check alignment of coils.

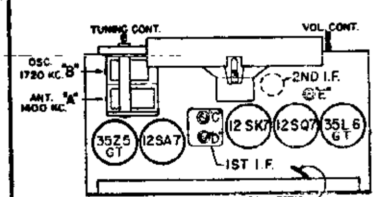
Voltages shown on the circuit diagram are from socket terminals to chassis base. In measuring voltages use a voltmeter having a resistance of at least 1000 ohms per volt. Allowances should be made for variations in line voltage.



I.F. 456 KC.

DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
R1	N-627	20,000 OHM .5W. 20%	1	N-3875	ANTENNA COIL LOOP
R2	N-618	80 OHM .5W. 10%	2	N-3298	OSCILLATOR COIL
R3	N-1262	1 MEGOHM .5W. 20%	3	N-3876	1ST. I.F. TRANSFORMER
R4	N-3877	.5 MEGOHM VOL.CONT.	4	N-3754	2ND. I.F. TRANSFORMER
R5	N-1419	6 MEGOHM .5W. 20%	5	N-3873	4" SPEAKER
R6	N-1261	250,000 OHM .5W. 20%	6	N-3899	OUTPUT TRANSFORMER
R7	N-1264	500,000 OHM .5W. 20%			
R8	N-3756	200 OHM .5W. 10%			
R9	N-3341	1,000 OHM .5W. 20%			
R10	N-1742	25 OHM .5W. 20%			
				N-3874	2 GANG CONDENSER
C1	N-1344	.01 MFD. 400V.			
C2	N-1345	.05 MFD. 200V.			
C3	N-1346	.05 MFD 400V.			
C4	N-1374	100 MMFD.			
C5	N-2712	.004 MFD 400V.			
C6	N-1447	.0005 MFD. 400V.			
C7	N-1344	.01 MFD. 400V.			
C8	N-076	.02 MFD. 400V.			
C9	N-3302	35 MFD. 150V. ELECT			
C10	N-3302	30 MFD. 150V. ELECT			

NOTE VOLTAGES SHOWN ARE FROM TERMINAL TO GROUND ------- HEATER VOLTAGES ARE A.C. WHEN LINE VOLTAGE IS ALTERNATING.



TUBE AND TRIMMER LOCATIONS

5 TUBE AC-DC

SUPERHETERODYNE
SINGLE BAND
DRAWN N.N. APPROVED [signature]
NOV. 25, 1940.

LM

MODEL S7402–
Mercury

FIRESTONE TIRE & RUBBER CO.

TUNING RANGE

This receiver is designed to operate over the standard broadcast band which extends from 535 to 1720 Kilocycles (KC) (174 to 560 Met and includes the popular 1712 KC police channel.

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GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 456, 600, 1400 and 1720 KC and an output meter 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.

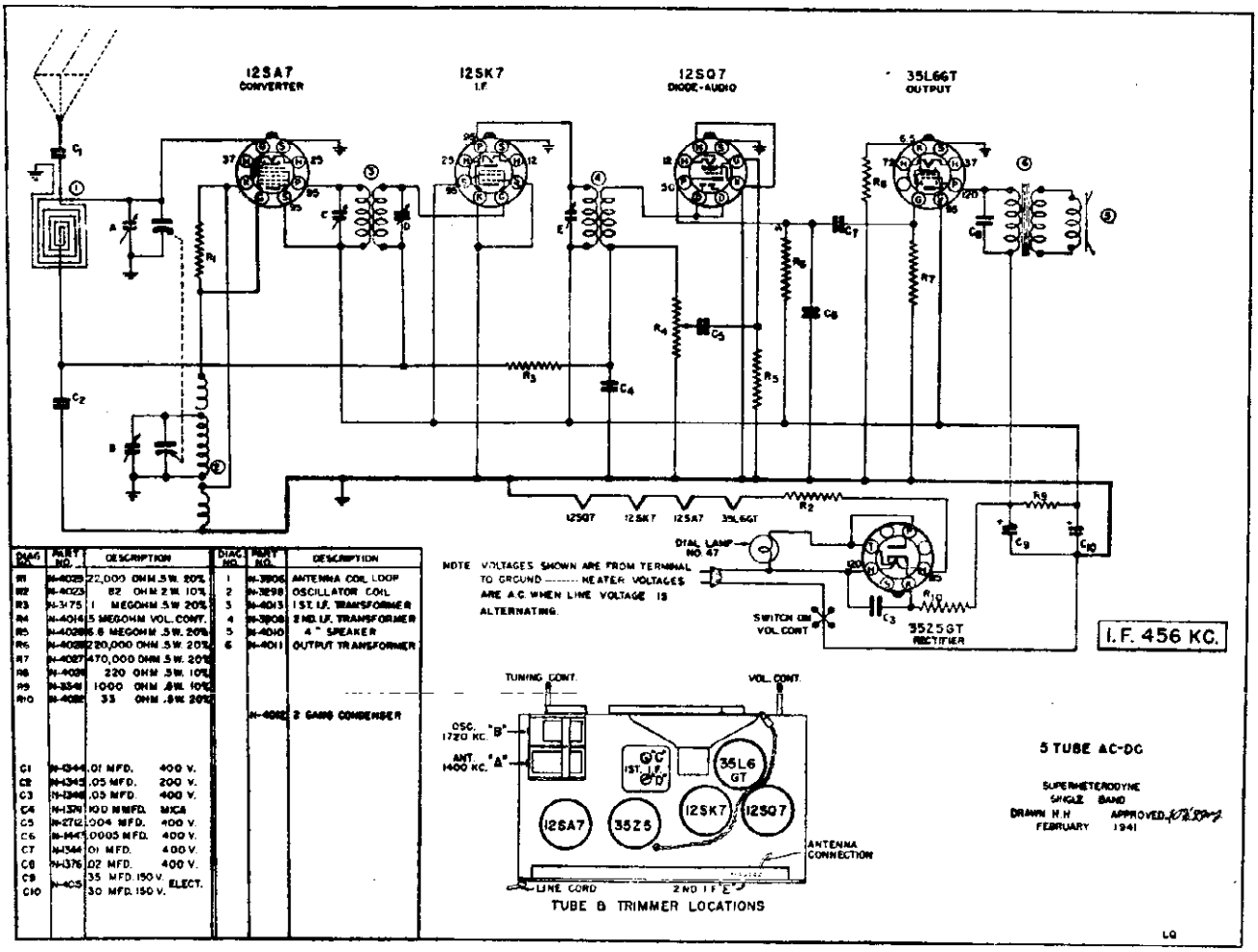
CORRECT ALIGNMENT PROCEDURE. The intermediate frequency (I.F.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the broadcast band should be adjusted.

I. F. ALIGNMENT. With 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 (12SA7) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the chassis ground. Align all three I.F. trimmers to peak or maxi mum reading on the output meter.

BROADCAST BAND ALIGNMENT. Remove chassis, and, loo antenna from cabinet and set them up on the bench so that they occupy exactly the same respective positions on the bench as they did in the cabinet. Care should be taken to have no iron or othe metal near the loop. Do not make this set-up on a metal bench.

Connect the test oscillator to the antenna of the set through a 100 mmfd. (.0001) condenser. With the gang condenser set at minimum capacity, set the test oscillator at 1720 KC, and adjus the oscillator (or 1720 KC trimmer) on gang condenser. Next—se the test oscillator at 1400 KC, and tune in the signal on the gang condenser. Adjust the antenna trimmer (or 1400 KC trimmer) fo maximum signal. Next set the test oscillator at 600 KC, and tune in signal on condenser to check alignment of coils.

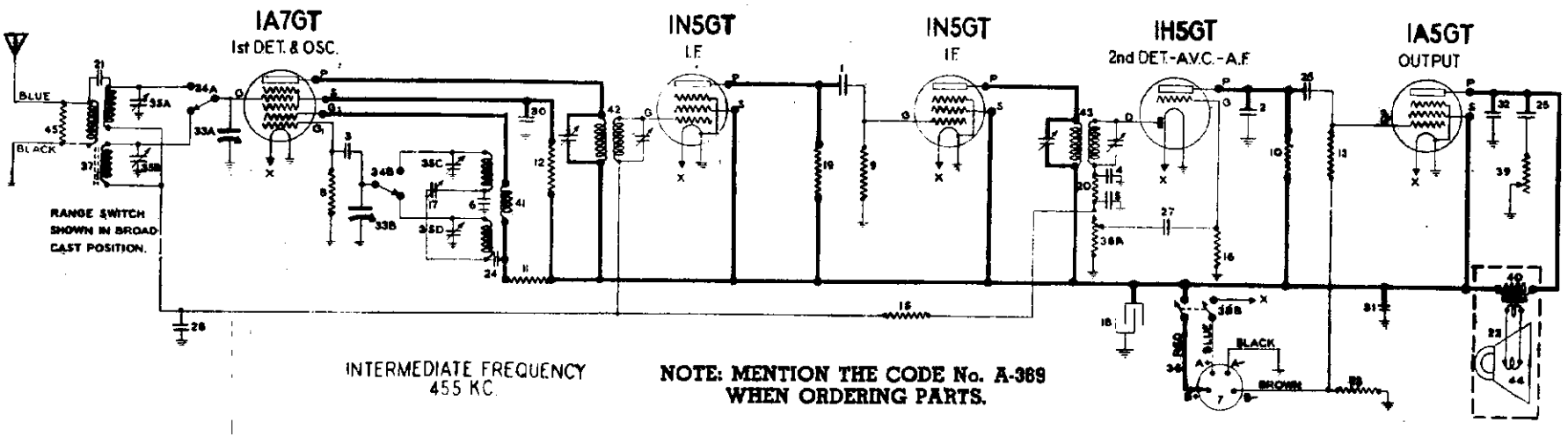
Voltages shown on the circuit diagram are from socket terminals to chassis base. In measuring voltages use a voltmeter having a resistance of at least 1000 ohms per volt. Allowances should be made for variations in line voltage.



DIAG. NO.	PART NO.	DESCRIPTION
R1	N-4023	22,000 OHM .5 W. 20%
R2	N-4023	82 OHM 2 W. 10%
R3	N-3175	1 MEGOHM .5 W. 20%
R4	N-4014	.5 MEGOHM VOL. CONT.
R5	N-4038	.6 MEGOHM .5 W. 20%
R6	N-4038	220,000 OHM .5 W. 20%
R7	N-4027	470,000 OHM .5 W. 20%
R8	N-4028	220 OHM .5 W. 10%
R9	N-3348	1000 OHM .5 W. 10%
R10	N-4032	33 OHM .5 W. 20%
C1	N-1344	.01 MFD. 400 V.
C2	N-1343	.05 MFD. 200 V.
C3	N-1346	.03 MFD. 400 V.
C4	N-1376	900 MMFD. MICA
C5	N-2712	.004 MFD. 400 V.
C6	N-1447	.0005 MFD. 400 V.
C7	N-1344	.01 MFD. 400 V.
C8	N-1376	.02 MFD. 400 V.
C9	N-4015	35 MFD. 150 V. ELECT.
C10		30 MFD. 150 V.

DIAG. NO.	PART NO.	DESCRIPTION
1	N-3806	ANTENNA COIL LOOP
2	N-3898	OSCILLATOR COIL
3	N-4013	1ST I.F. TRANSFORMER
4	N-3908	2ND I.F. TRANSFORMER
5	N-4040	4" SPEAKER
6	N-4011	OUTPUT TRANSFORMER
	N-4032	2 GANG CONDENSER

LQ



INTERMEDIATE FREQUENCY
455 KC.

NOTE: MENTION THE CODE No. A-389 WHEN ORDERING PARTS.

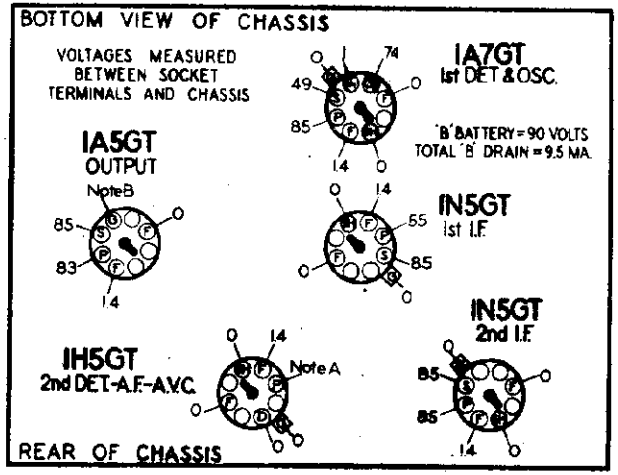
ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1	83539	Condenser—mica, 260 mmfd.	$0.20
2	83783	Condenser—mica, 110 mmfd.	.20
3-4-5	85081	Condenser—mica, 51 mmfd.	.15
6	88587	Condenser—mica, .0042 mfd.	.35
7	88631	Plug—4 prong, male	.06
8	110553	Resistor—carbon, 220,000 ohms, ¼ watt	.12
9	110580	Resistor—carbon, 3.3 meg. ¼ watt	.12
10	110554	Resistor—carbon 1 megohm ¼ watt	.12
11	110557	Resistor—carbon, 4,700 ohms, ¼ watt	.12
12	110568	Resistor—carbon, 33,000 ohms, ¼ watt	.12
13	110570	Resistor—carbon, 2.2 meg., ¼ watt	.15
15-16	110580	Resistor—carbon, 3.3 meg., ¼ watt	.12
17	112799	Condenser—padder	.30
18	112898	Condenser—electrolytic 16 mfd., 150 volt	.50
19	116063	Resistor—carbon, 10,000 ohms, ¼ watt	.12
20	110565	Resistor—carbon, 22,000 ohms, ¼ watt.	.12
21	114969	Condenser—mica, 15 mmfd.	.12
22	M-500350	Speaker—P.M. (8")	6.30
23	116078	Resistor—580 ohms, ¼ watt	$0.12
24-25-26	119193	Condenser—.01 mfd., 600 volt	.15
27	119617	Condenser—.004 mfd., 600 volt	.15
28 to 30	116819	Condenser—.05 mfd., 600 volt	.20
31	116625	Condenser—.1 mfd., 600 volt	.25
32	119875	Condenser—.002 mfd., 600 volt	.15
33A-33B	500358	Condenser—tuning (with drum)	3.50
34A-34B	119859	Range switch	.65
35A-35D	119536	Condenser—trimmer (4 sections)	.60
36	119537	Battery cable	.40
37	119541	Coil—antenna	1.25
38	500356	Volume control—1 meg. (with switch)	1.40
39A-39B	500357	Tone control—100,000 ohms	.90
40	M-500354	Transformer—output for M-500350 speaker	1.70
41	119669	Coil—oscillator	.75
42	119720	Transformer—1st I.F.	1.25
43	119673	Transformer—2nd I.F.	1.25
44	M-119750	Cone and voice coil for M-500350 speaker	1.60
45	116063	Resistor—carbon, 10,000 ohms, ¼ watt	.12

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

SOCKET VOLTAGES

ANTENNA GROUNDED — **DIAL TUNED TO 540 KC.**



Note A: Only a small voltage will be measured at the plate of the 1H5GT when using a voltmeter having a resistance of 1000 ohms per volt.

Note B: The bias on the 1A5GT grid is —8 volts measured across resistor No. 23.

MISCELLANEOUS PARTS LIST IS ON OTHER SIDE

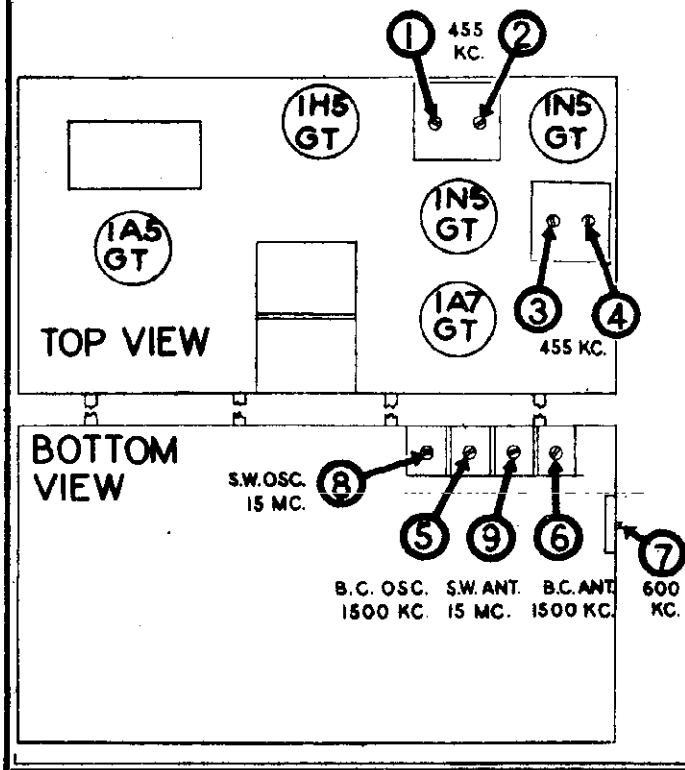
FIRESTONE TIRE & RUBBER CO.

ALIGNMENT PROCEDURE

FOR ALIGNMENT an output meter and an accurately calibrated signal generator are required.

1. **Connect the output meter across the voice coil or between the plate of the 1A5GT output tube and gro through a 0.1 Mfd. condenser, depending on the type of meter. (The more sensitive type should be nected across the voice coil.)**
2. **Connect the ground lead of the signal generator to the black ground wire or the chassis.**
3. **Turn the volume control to the maximum volume position and keep it in this position while aligning.**
4. **With the gang condenser in full mesh, set the dial pointer to the low frequency edge of the dial scale.**

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output To Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD. Condenser	Control Grid of 1A7GT	455 KC	Broadcast	Any Point Where It Does Not Affect The Signal	1-2	2nd I. F.	Adjust for maximum output Then repeat adjustment.
					3-4	1st I. F.	
200 MMFD. Mica Condenser	Antenna Lead (Blue Wire)	1500 KC	Broadcast	1500 KC	5	Broadcast Oscillator (Shunt)	Adust for maximum output
200 MMFD. Mica Condenser	Antenna Lead (Blue Wire)	1500 KC	Broadcast	Tune To 1500 KC Generator Signal	6	Broadcast Antenna	Adjust for maximum output
200 MMFD. Mica Condenser	Antenna Lead (Blue Wire)	600 KC	Broadcast	Tune To 600 KC Generator Signal	7	Broadcast Oscillator (Series Pad)	Adjust for maximum output Try to increase output by de tuning trimmer and retuning receiver dial until maximum output is obtained.
400 OHM Carbon Resistor	Antenna Lead (Blue Wire)	15 MC	Foreign	15 MC	8	Foreign Oscillator (Shunt)	Adjust for maximum output. Check to see if proper peak was obtained by tuning in image at approx. 14.1 MC. If image does not appear realign at 15 MC, with trimmer screw farther out. Recheck image.
400 OHM Carbon Resistor	Antenna Lead (Blue Wire)	15 MC	eign	15 MC	9	Foreign Antenna	Adjust for maximum output. Try to increase output by de tuning trimmer and retuning receiver dial until maximum output is obtained.

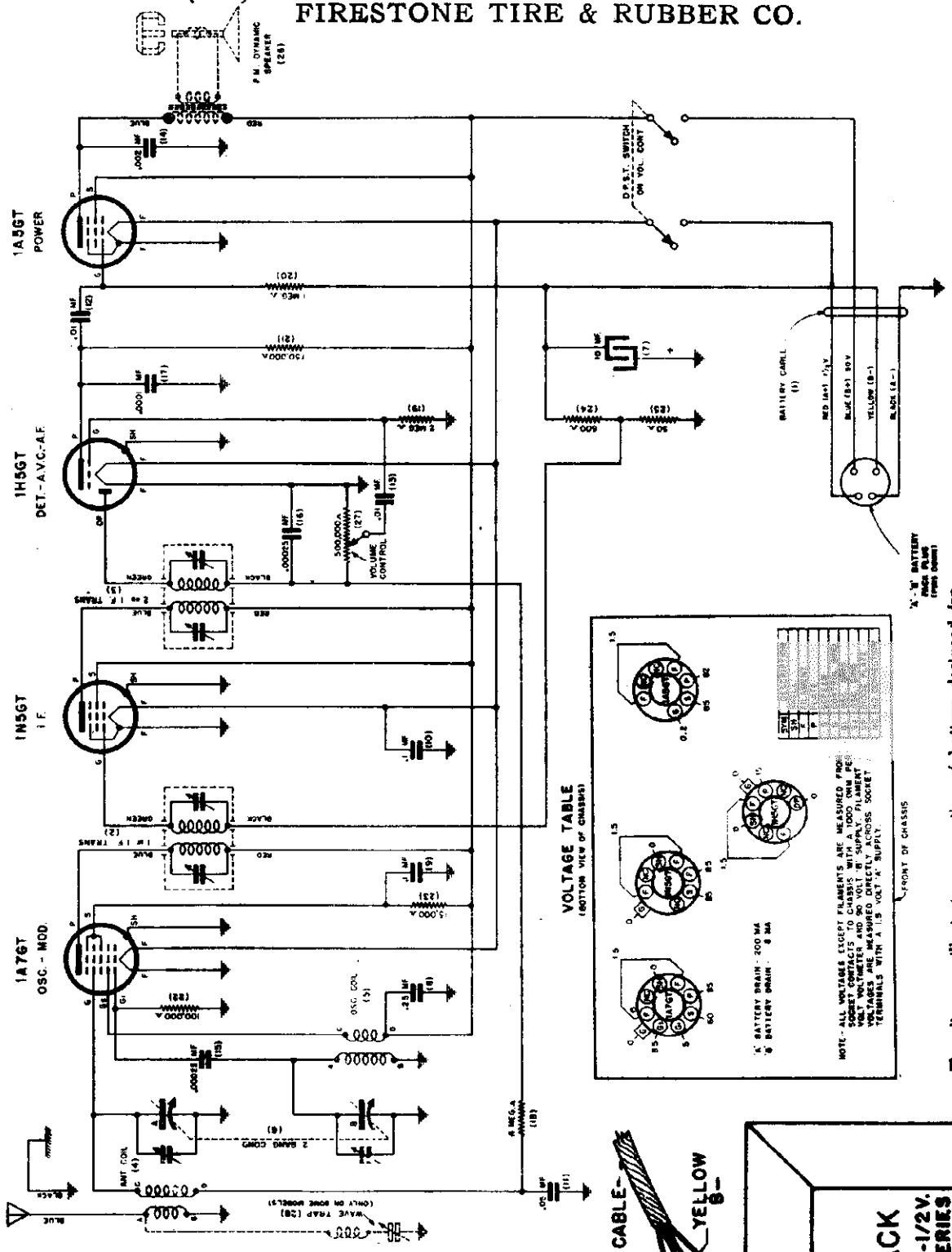


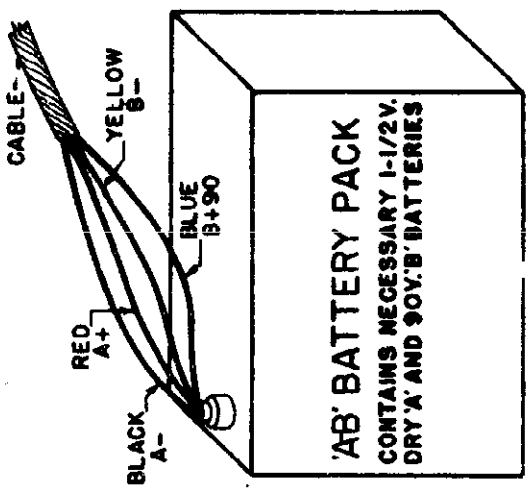
MISCELLANEOUS PARTS

Part Number	Description	List Price
500368	Cabinet back	$0.7(
114955	Clamp, for Dial Cord	.0
112745	Clip, Coil Mounting	.0
117057	Cord, Drive supplied in 3 Ft. Lengths	.1
500359	Dial Scale	.5(
500395	Escutcheon—Dial	1.5(
119644	Knob, (Unmarked)	.1(
119746	Knob, Band	.1(
500382	Lever, for on-off indicator	.1
88631	Plug, 4 prong male for battery cable	.0
160436	Pointer	.1(
81145	Retaining Ring, for tuning shaft Per C	.5
114914	Screw, Special Head for Mtg. Escutcheon Per Doz.	.1
85827	Set Screw, 8-32 Sq. Head for Ind. Lever	.0
500354	Shaft, tuning	.1
116592	Shield, Tube	.1(
119791	Socket, Octal	.1
111090	Spacer, Steel Mtg. for gang	.0
114968	Spring, Dial cord tension	.0
117157	Spring, for On-Off indicator	.0
111456	Washer, Spring washer for tuning shaft Per C	.5

MODEL S7405-8 (445)

FIRESTONE TIRE & RUBBER CO.





SHOWING PLUG INSERTED IN RECEPTACLE ON TOP OF "AB" BATTERY PACK

The diagram illustrates connection of battery designed for use with your Model S-7405-8 Firestone Radio. Before attempting to install battery TURN ON-OFF SWITCH TO "OFF" POSITION.

BATTERY LIFE depends on the number of hours per day the set is operated, and the quality of the battery used. Firestone battery stock No. E-1527-7 is built of the finest material and is especially designed for best operation of your radio. When used on an average of two to three hours per day it will provide approximately 750-1000 hours' service.

AERIAL

USE A GOOD AERIAL—RECEPTION WILL BE POOR IF THE RADIO IS OPERATED WITHOUT AN AERIAL OR WITH A POOR ONE—WITH A GOOD AERIAL GOOD RESULTS CAN BE EXPECTED. AS THE BEST AERIAL TO USE DEPENDS ON THE LOCATION, SURROUNDING OBJECTS, ETC., BE SURE TO:

1. Always use the best possible aerial. Remember an outdoor aerial erected as high as possible is the best one to use. If it is impractical to use an outdoor aerial, erect one in the attic or around the picture moulding.
2. A 35 to 100 foot aerial should be ample for most locations. While in shielded locations and in remote districts a longer aerial may have to be used, always keep the aerial as short as possible consistent with satisfactory reception.
3. Insulate aerial from its supports by glass or porcelain insulators, and keep lead-in wire away from buildings, etc., with stand-off insulators.
4. Use insulated window lead-in strip to bring aerial lead-in into house.
5. Use an approved lightning arrester.
6. Connect aerial lead-in to blue lead coming out rear of chassis.
7. Attach a good ground to the black lead coming out at rear of chassis. A cold water pipe, steam radiator, or an iron rod driven two to four feet in moist ground will provide a good ground.

ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.

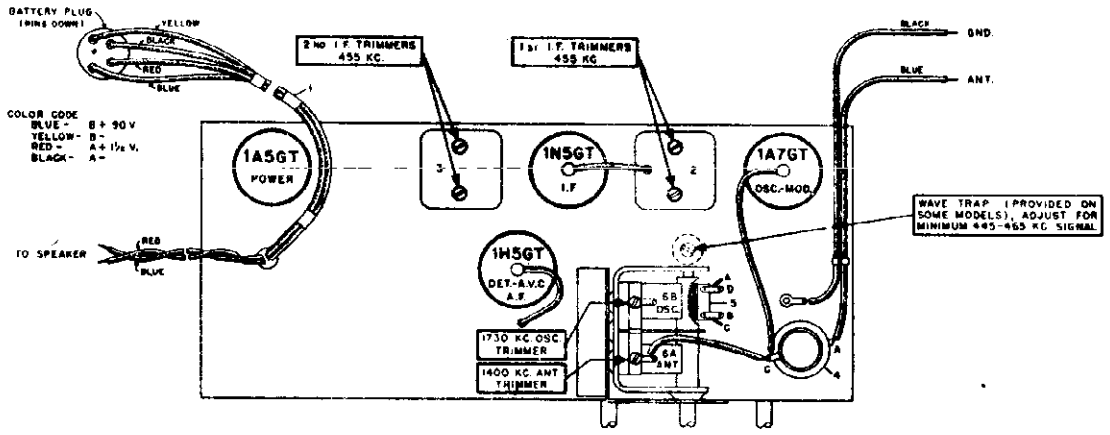
Before starting alignment:

(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to the last line move to correct position.

(b) Use an accurately calibrated test oscillator with some type of output measuring device.

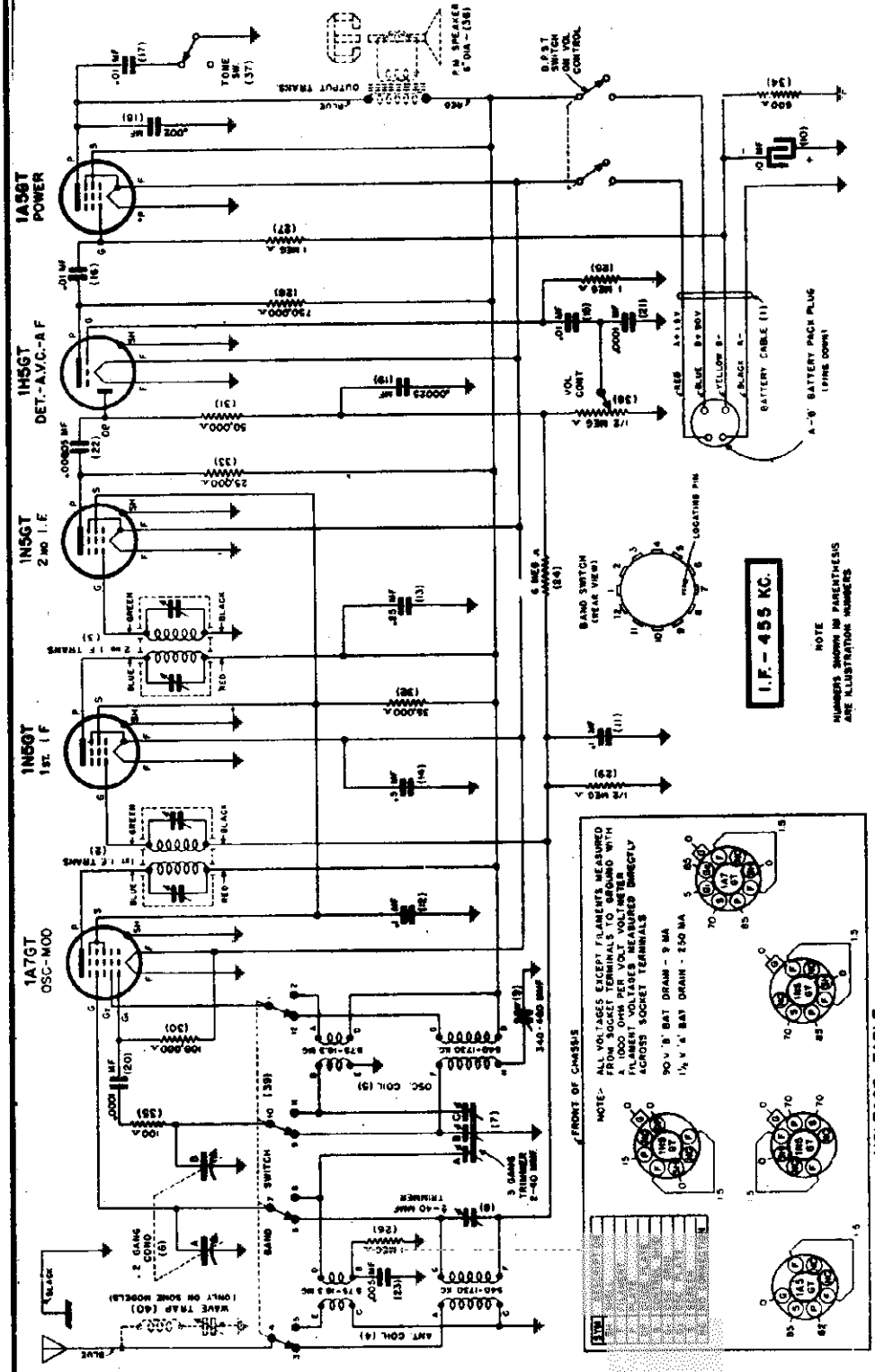
(c) Have ground lead of test oscillator attached to chassis.

Set receiver dial to:	TEST OSCILLATOR			Refer to parts layout diagram for location of trimmers mentioned below
	Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	
I.F. Any point where no interfering signal is received	455 K. C.	.02 MFD condenser	High side to grid terminal of 1A7GT tube DO NOT REMOVE CAP.	Adjust each of the second I. F. transformer trimmers for maximum output—then adjust each of the first I. F. trimmers for maximum output.
(1) Exactly 1730 K. C.	Exactly 1730 K. C.	.00025 MFD condenser	Receiver blue antenna lead	Adjust 1730 K. C. oscillator trimmer for maximum output.
(2) Approx. 1400 K. C.	Exactly 1400 K. C.	.00025 MFD condenser	Receiver blue antenna lead	While rocking gang condenser adjust 1400 K. C. antenna trimmer for maximum output.



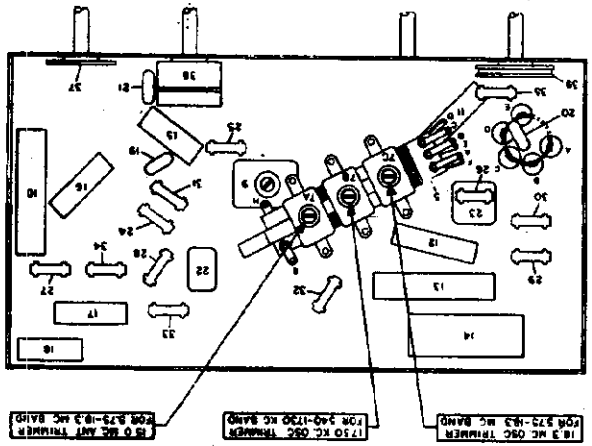
MODEL S7405-9

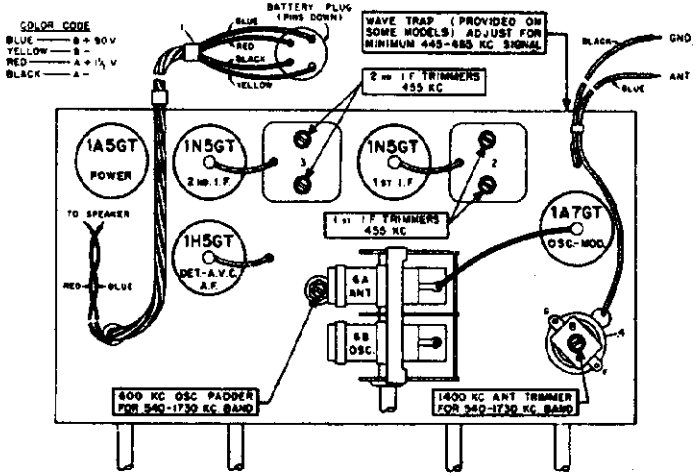
FIRESTONE TIRE & RUBBER CO.



Illus. No.	Part No.	Name	Description	List Price
1	13068	Cable	Battery with 4 Prong Plug	$0.40
2	13301	Coil	First I.F. Transformer	.90
3	13301	Coil	Second I.F. Transformer	.90
4	12319	Coil	Antenna	.80
5	12320	Coil	Oscillator	.55
6	12321	Condenser	Tuning (2 Gang) with Pulley	1.65
7	3762	Condenser	Trimmer (3 Gang)	.47
8	1587	Condenser	Trimmer 3-35 MMF	.21
9	3287	Condenser	Padding Total Range 200-600 MMF. Working Range 380-460 MMF	.45
10	1693	Condenser	Tubular Dry Elec. (10 Mfd. 25 V. D.C. Working)	.75
11	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20
12	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20
13	9032	Condenser	Tubular .25 Mfd. 200 Volt	.23
14	2131	Condenser	Tubular .5 Mfd. 200 Volt (Shielded)	.55
15	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
16	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
17	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
18	10762	Condenser	Tubular .002 Mfd. 400 Volt	.18
19	9458	Condenser	Mica .00025 Mfd. + or — 20%	.21
20	7934	Condenser	Mica .0001 Mfd. + or — 20%	.21
21	7934	Condenser	Mica .0001 Mfd. + or — 20%	.21
22	1544	Condenser	Mica .00005 Mfd.	.21
23	10892	Condenser	Mica .005 Mfd. + or — 3%	.30
24	2333	Resistor	Carbon 6 Meg Ohm 1/3 Watt	.19
25	7998	Resistor	Carbon 1 Meg Ohm 1/3 Watt	.19

Illus. No.	Part No.	Part Name	Description	List Price
26	7998	Resistor	Carbon 1 Meg Ohm ⅓ Watt	.19
27	7998	Resistor	Carbon 1 Meg Ohm ⅓ Watt	.19
28	2673	Resistor	Carbon 750,000 Ohm ⅓ Watt	.19
29	6984	Resistor	Carbon 500,000 Ohm ⅓ Watt	.19
30	8000	Resistor	Carbon 100,000 Ohm ⅓ Watt	.19
31	6879	Resistor	Carbon 50,000 Ohm ⅓ Watt	.19
32	1618	Resistor	Carbon 35,000 Ohm ⅓ Watt	.19
33	8907	Resistor	Carbon 25,000 Ohm ⅓ Watt	.19
34	1552	Resistor	Carbon 600 Ohm ⅓ Watt	.19
35	2431	Resistor	Carbon 100 Ohm ⅓ Watt	.19
36	13304	Speaker	6" P.M.	4.25
37	12322	Switch	Tone Control (S.P.S.T.)	.40
38	12297	Volume Control	(With D.P.S.T. Switch)	.80
39	12134	Switch	Band Selector	.65
40	11540	Wave Trap	(Optional)	.50





ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment: (a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of dial calibration. If dial needle does not point exactly to last line move to correct position.

(b) Use an accurately calibrated test oscillator with some type of output measuring device.

(c) Have ground lead of test oscillator attached to chassis.

Place band switch for operation on:	Set receiver dial to:		TEST OSCILLATOR: Adjust test oscillator frequency to:	TEST OSCILLATOR: Use dummy antenna in series with output of test oscillator consisting of:	TEST OSCILLATOR: Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below:
I. F. alignment use any band position.	Any point where no interfering signal is received.		455 K.C.	.02 MFD. condenser	High side to grid terminal of 1A7G tube. DO NOT REMOVE CAP	Adjust each of the second I. F. transformer trimmers for maximum output—then adjust each of the first I. F. trimmers for maximum output.
1730 to 540 K.C Band	1	Exactly 1730 K.C.	Exactly 1730 K.C.	.00025 MFD. condenser	High side to Receiver blue antenna lead	Adjust 1730 K.C. oscillator trimmer for maximum output.
	2	Exactly 1400 K.C.	Approx. 1400 K.C.	.00025 MFD. condenser	High side to Receiver blue antenna lead	While rocking gang condenser adjust 1400 K.C. antenna trimmer for maximum output.
	3	Approx. 600 K.C.	Approx. 600 K.C.	.00025 MFD. condenser	High side to Receiver blue antenna lead	While rocking gang gang condenser adjust 600 K.C. oscillator padder for maximum output.
5.75 to 18.3 M.C. Band	1	Exactly 18.3 M.C.	Exactly 18.3 M.C.	400 Ohm carbon resistor	High side to Blue Antenna Lead	Adjust 18.3 M.C. oscillator trimmer for maximum output—be sure to use proper peak. If more than one peak is noticed, back off trimmer to minimum capacity, then screw down trimmer (add capacity) until the second peak—which is the proper one to use is tuned in.
	2	Approx.	Approx.		High side to Blue Ant.	While rocking gang condenser adjust 17 M.C. antenna trimmer for

MODEL S7422-9

FIRESTONE TIRE & RUBBER CO.

Lack of sensitivity and poor tone quality may be due to any one or a combination of causes such as weak or defective tubes or speaker, open or grounded bias resistor, bypass condenser, etc. Never attempt to realign set until all other possible sources of trouble have been first thoroughly investigated and definitely proved not to be the cause.

NOTE: IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OUTPUT MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER AND THAT THE PROCEDURE BE CAREFULLY FOLLOWED, OTHERWISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT. THE TRIMMERS WILL BE REFERRED TO BY THEIR FUNCTION AS INDICATED ON THE PARTS DIAGRAM.

ALIGNMENT PROCEDURE

GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 456, 600, 1400 and 1720 KC and an output meter 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.

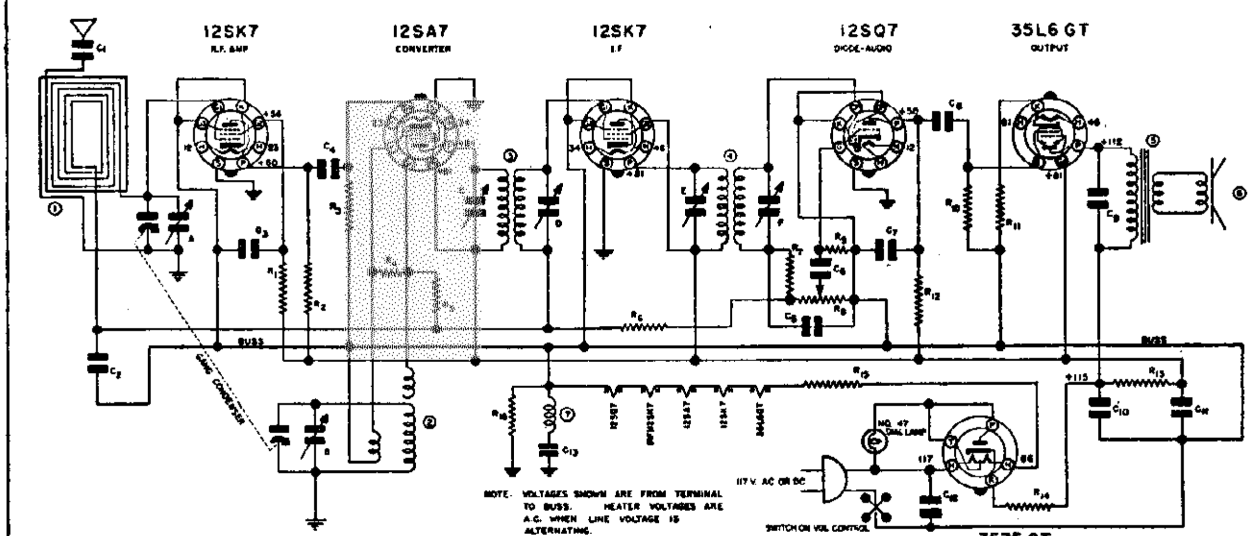
CORRECT ALIGNMENT PROCEDURE. The intermediate frequency (I.F.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the broadcast band should be adjusted.

I. F. ALIGNMENT. With 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 (12SA7) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the ground buss, indicated in circuit diagram. Align all four I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT. Remove the chassis from the cabinet and set on a bench, taking care that no metal is near the loop. Do not make this setup on a metal bench.

Connect the test oscillator to the antenna of the set through a 200 mmfd. (.0002) condenser. With the gang condenser set at minimum capacity, set the test oscillator at 1720 KC, and adjust the oscillator (or 1720 KC trimmer) on gang condenser. Next—set the test oscillator at 1400 KC, and tune in the signal on the gang condenser. Adjust the antenna trimmer (or 1400 KC trimmer) for maximum signal. Next set the test oscillator at 600 KC, and tune in signal on condenser to check alignment of coils.

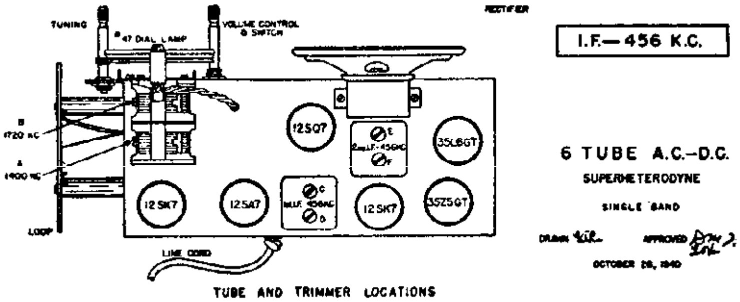
Voltages shown on the circuit diagram are from socket terminals to chassis base. In measuring voltages use a voltmeter having a resistance of at least 1000 ohms per volt. Allowances should be made for variations in line voltage.



NOTE- VOLTAGES SHOWN ARE FROM TERMINAL TO BUSS. HEATER VOLTAGES ARE A.C. WHEN LINE VOLTAGE IS ALTERNATING.

DIAG NO	PART NO	DESCRIPTION
C1	N-1344	.01 MFD 400 V 20%
C2	N-1345	.05 MFD. 200 V 20%
C3	N-1345	.05 MFD. 200 V 20%
C4	N-2383	150 MMFD MICA 20%
C5	N-1374	100 MMFD MICA 20%
C6	N-1344	.01 MFD. 400 V 20%
C7	N-1447	.0005 MFD 400 V. 20%
C8	N-1344	.01 MFD. 400 V. 20%
C9	N-1376	.02 MFD. 400 V. 20%
C10, C11	N-3658	40 MFD. 150 WV / 40 MFD 150 WV ELECTROLYTIC
C12	N-1346	.05 MFD 400 V. 20%
C13	N-3080	.22 MFD. 200 V. 10%
R1	N-3814	15,000 OHM .5 W. 20%
R2	N-3793	4,050 OHM .5 W. 10%
R3	N-1260	50,000 OHM .5 W. 20%
R4	N-1627	20,000 OHM .5 W. 20%
R5	N-1263	10 MEGOHM .5 W. 20%
R6	N-1418	3.5 MEGOHM .5 W. 20%
R7	N-1480	30,000 OHM .5 W. 20%
R8	N-3785	0.5 MEGOHM VOLUME CONTROL
R9	N-2.89	4 MEGOHM .5 W. 20%
R10	N-1264	500,000 OHM .5 W. 20%

DIAG NO.	PART NO	DESCRIPTION
R11	N-3813	150 OHM .5 W. 10%
R12	N-1377	200,000 OHM .5 W. 20%
R13	N-3819	1200 OHM 1 W. 10%
R14	N-1742	25 OHM .5 W. 20%
R15	N-3794	30 OHM 1 W. 10%
R16	N-1377	200,000 OHM .5 W. 20%
1	N-3784	ANTENNA LOOP COIL
2	N-3290	OSCILLATOR COIL
3	N-3816	1ST. I.F. TRANSFORMER
4	N-3804	2ND. I.F. TRANSFORMER
5	N-3782	OUTPUT TRANSFORMER
6	N-3781	5" P.M. SPEAKER
7	—	CHOKE (WOUND ON C_{13})
	N-3783	2 GANG CONDENSER



TUBE AND TRIMMER LOCATIONS

I.F.—456 K.C.

6 TUBE A.C.-D.C.
SUPERHETERODYNE
SINGLE BAND

OCTOBER 28, 1940

MODELS S7425-6(Late)
S7425-9

FIRESTONE TIRE & RUBBER CO.

ALIGNMENT PROCEDURE

FOR OTHER DATA SEE FIRESTONE PAGE 11-24 IN RIDER'S VOL.XI

ALIGNMENT: An output meter and an accurately calibrated signal generator are required.

Connect the output meter across the voice coil or, using a .1 mfd. condenser in series, connect as follows:

MODEL S-7425-9: Between the 35L6GT plate and B— terminal shown on voltage chart.

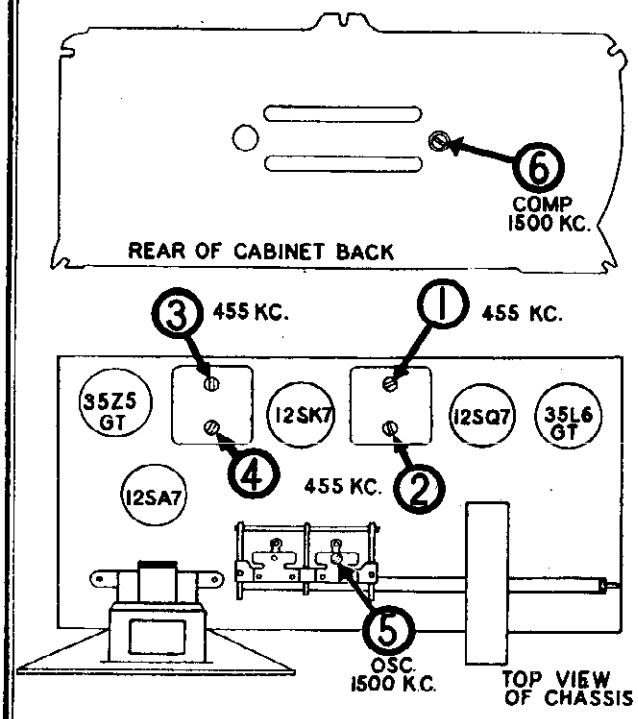
MODEL S-7425-6: Between the 35L6GT plate and chassis.

Connect the ground lead of the signal generator to the chassis of the receiver through a .25 mfd. condenser and keep it connect in this manner throughout the entire alignment procedure. Failure to do this may have serious results as one side of the pow line may be grounded in the signal generator. If oscillation or hum occurs in the model S-7425-9, connect the ground lead of t signal generator through a .25 condenser to B— as shown on the Voltage Chart.

TO CALIBRATE THE DIAL:—Remove the chassis from the cabinet and set it on a flat surface (insulated from ground). With t gang in full mesh, the last dial division (just below 55) on the low frequency end, should be exactly 4⅜ inches above the tal surface. If this is not the case, release the set screw in the collar which connects the gang condenser shaft with the tuni unit, and holding the gang in full mesh, turn the dial until the last division is exactly 4⅜ inches above the table surface. N re-tighten the set screw in the collar. The 4⅜ inch division on the ruler (when measured vertically from table surface), is to used as the dial indicator for all calibrations and alignment.

Dummy Ant. in Series with Signal Generator	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD. Condenser	Green wire of Loop (Loop must be connected)	455 KC	Any point where it does not affect the signal	1-2	2nd I.F.	Adjust for maximum output Then repeat adjustment.
				3-4	1st I.F.	
200 MMFD. Mica Condenser	"Ant." Terminal	1500 KC	1500 KC	5	Broadcast Oscillator (Shunt)	Adjust trimmer to bring in signal.
200 MMFD. Mica Condenser	"Ant." Terminal	1500 KC	Tune to 1500 KC Generator Signal	6	Broadcast Antenna (Shunt)	Adjust for maximum output

Now remove the output meter and signal generator connections and replace the set in the cabinet. Replace the cabinet back and MAKE SURE THAT THE GREEN WIRE GOES TO THE UPPER RECEPTACLE OF THE LOOP AND THE GREEN-WHITE WIRE TO THE LOWER RECEPTACLE. Place the antenna lead from the signal generator near the back of the cabinet and turn the output up until the 1500 KC signal is weakly heard. Adjust trimmer No. 6 for maximum output by ear.



MISCELLANEOUS PARTS

Part Number	Description	List Price
117231	Back—cabinet, for S-7425-6	$0.20
117865	Back—cabinet, for S-7425-9	.20
117211	Cabinet	3.60
112745	Clip—coil mounting	.0
113558	Clutch spring—for tuner (on cam shaft)	.0
113504	Collar coupling (between tuner unit and gang cond. shaft)	.0
113560	Dial Scale—celluloid strip	.2
113592	Felt Pad (cabinet feet ivory) 3/16"	.0
113549	Felt Strip—(white) behind push button levers	.0
113572	Key—for push button (right hand)	.2
113557	Key—for push button tuner (left hand)	.2
113531	Knob—tuning (ivory)	.3
113574	Knob—volume (ivory)	.1
113500	Mechanical tuner unit—less tenite tips for push buttons	3.9
116689	Pad—for push button levers	.0
83624	Screw—self tapping 8 x ¼"	.0
85827	Set Screw—8/32 Square head	.0
113538	Screw—for tuning knob (chrome head)	.1
113636	Screw—No. 8 x ¾" chassis mtg.	.0
113699	Screw—No. 8 x 1" for chassis mtg.	.0
113542	Socket—dial lamp—insulated	.1
116690	Socket (octal base) (small)	.1
113559	Spring—for key return	.0
113550	Tabs—station call letter	.2
113529	Tip—for push button (ivory)	.0
114132	Window for dial	.1

MODEL S7427-7

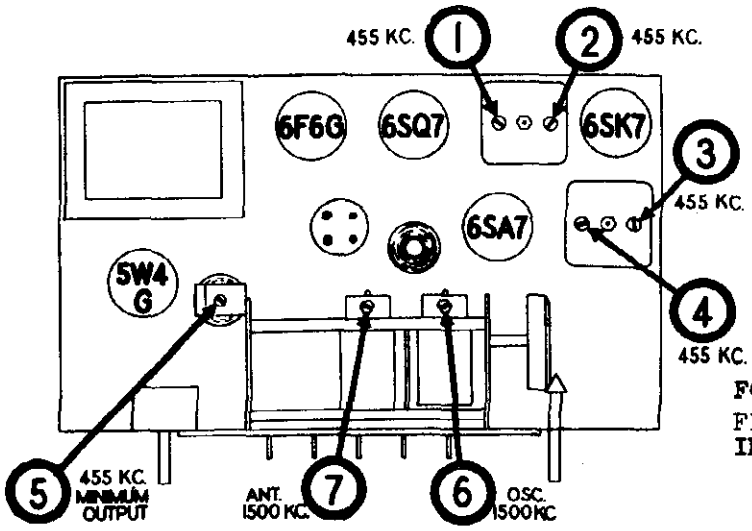
FIRESTONE TIRE & RUBBER CO.

ALIGNMENT EQUIPMENT & PROCEDURE

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator with a tuning range from 456 KC to 1500 KC are required.

1. Connect the output meter across the voice coil or between the plate of the 6F6-G output tube and ground, depending on the type of meter. (The more sensitive type should be connected across the voice coil).
2. Connect the ground lead of the signal generator to the "G" terminal or the chassis.
3. Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure.
4. Remove the connector from between the "A" and "X" terminals on the antenna strip.

DUMMY ANT. IN SERIES WITH SIG. GEN.	CONNECTION OF SIG. GENERATOR OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
.1 MFD CONDENSER	LEFT LUG ON GANG COND.	455 KC	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1-2	2nd I.F.	ADJUST FOR MAXIMUM OUTPUT THEN REPEAT ADJUSTMENT.
				3-4	1st I.F.	
200 MMFD. MICA CONDENSER	"A" TERMINAL	455 KC	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	5	WAVE TRAP	ADJUST FOR MINIMUM OUTPUT USING A STRONG GENERATOR SIGNAL.
200 MMFD. MICA CONDENSER	"A" TERMINAL	1500 KC	1500 KC	6	BROADCAST OSCILLATOR (Shunt)	ADJUST FOR MAXIMUM OUTPUT.
200 MMFD. MICA CONDENSER	"A" TERMINAL	1500 KC	TUNE TO 1500 KC GENERATOR SIGNAL	7	BROADCAST ANTENNA (Shunt)	ADJUST FOR MAXIMUM OUTPUT.

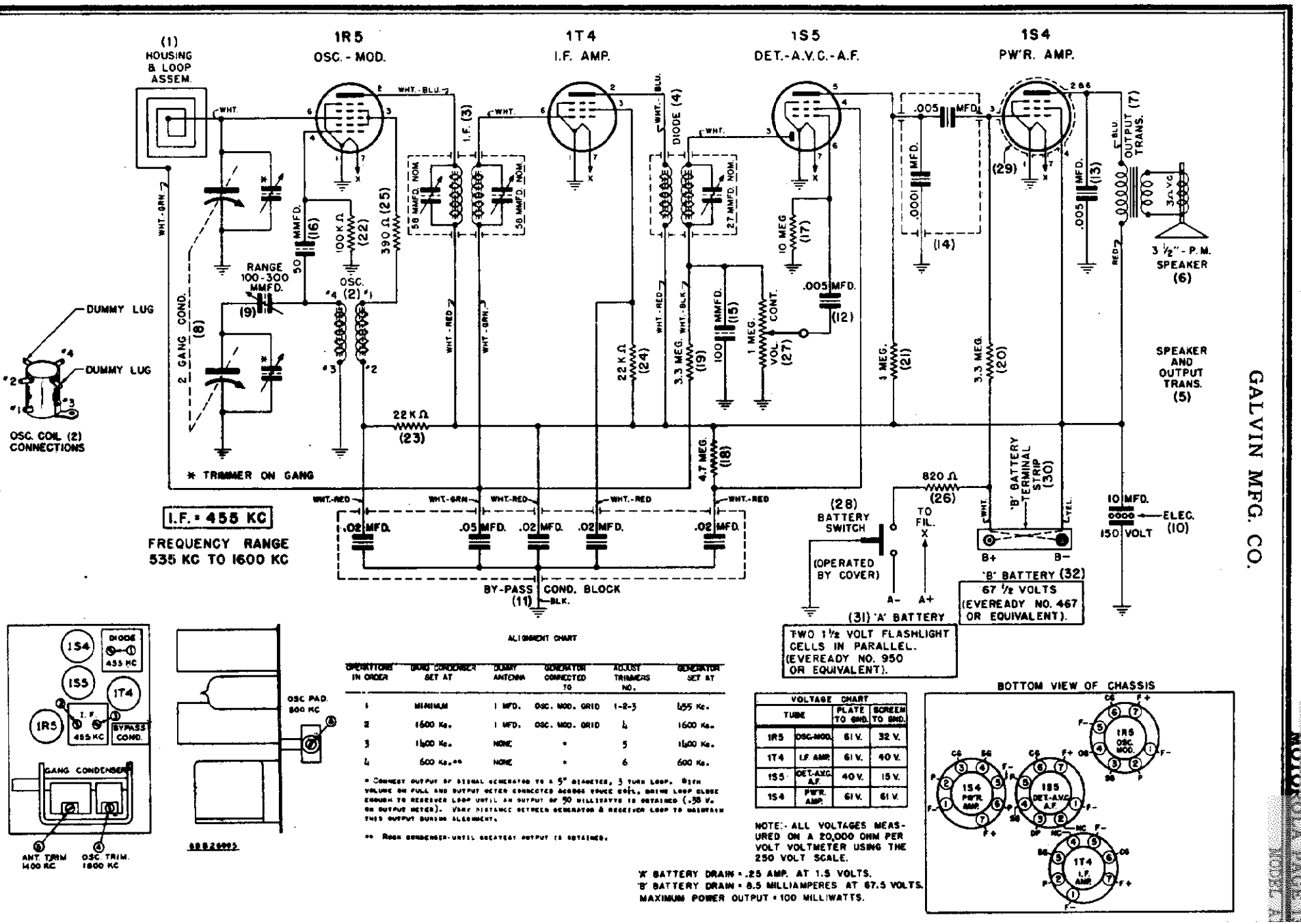


FOR OTHER DATA SEE FIRESTONE PAGE 11-39 IN RIDER'S VOL.XI

HOW TO SET UP AND USE THE PUSH BUTTON TUNER

To set up the push buttons, proceed as follows:

1. Turn on the set and allow it to operate for at least one-quarter hour before attempting to set up the push buttons. Be sure that the set is connected to an antenna system before starting.
2. Select the five stations to which the buttons are to be set. Be sure to select nearby, powerful stations, since weak signals will generally give better results when tuned in manually. Any button may be set to any desired station.
3. Grasp the tuning knob and push it in (the movement is slight, about 1/8 inch) so that the drive pinion engages the condenser drive gear and the set may be tuned manually.
4. Tune in the station to which you wish to set the particular button. Be sure to tune in the station correctly by TUNING TO THE POINT WHERE THE PROGRAM IS HEARD WITH THE LEAST HISS OR DISTORTION.
5. Grasp the push button being set up, and turn it to the left (counter-clockwise) about one whole turn.
6. Push this button all the way in, and then release it. Now turn it to the right (clockwise) until reasonably tight. This completes the set-up operation.
7. Set up the remaining four buttons in a similar manner.
8. Label each button with the call letters of the stations you have selected, using the call letter tabs packed with your receiver. Paste the call letter tab in the recess above the push button.
9. To use your push button tuner, push in the button labelled with the call letters of the desired station. Be sure to push the button all the way in.



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ALIGNMENT CHART

OPERATIONS IN ORDER	GANG CONDENSER SET AT	DUMMY ANTENNA	GENERATOR CONNECTED TO	ADJUST TRIMMERS NO.	GENERATOR SET AT
1	MAXIMUM	1 MFD.	OSC. MOD. GRID	1-2-3	455 Kc.
2	1600 Kc.	1 MFD.	OSC. MOD. GRID	4	1600 Kc.
3	1400 Kc.	NONE	*	5	1400 Kc.
4	600 Kc.**	NONE	*	6	600 Kc.

* Connect output of signal generator to a 5" diameter, 3 turn loop. With volume on full and output meter connected across voice coil, bring loop close enough to receiver loop until an output of 50 milliwatts is obtained (.58 V. on output meter). Vary distance between generator & receiver loop to maintain this output during alignment.

** Rock condenser until greatest output is obtained.

VOLTAGE CHART			
TUBE		PLATE TO GND.	SCREEN TO GND.
1R5	OSC-MOD.	61 V.	32 V.
1T4	I.F. AMP.	61 V.	40 V.
1S5	DET-AVC A.F.	40 V.	15 V.
1S4	PWR. AMP.	61 V.	61 V.

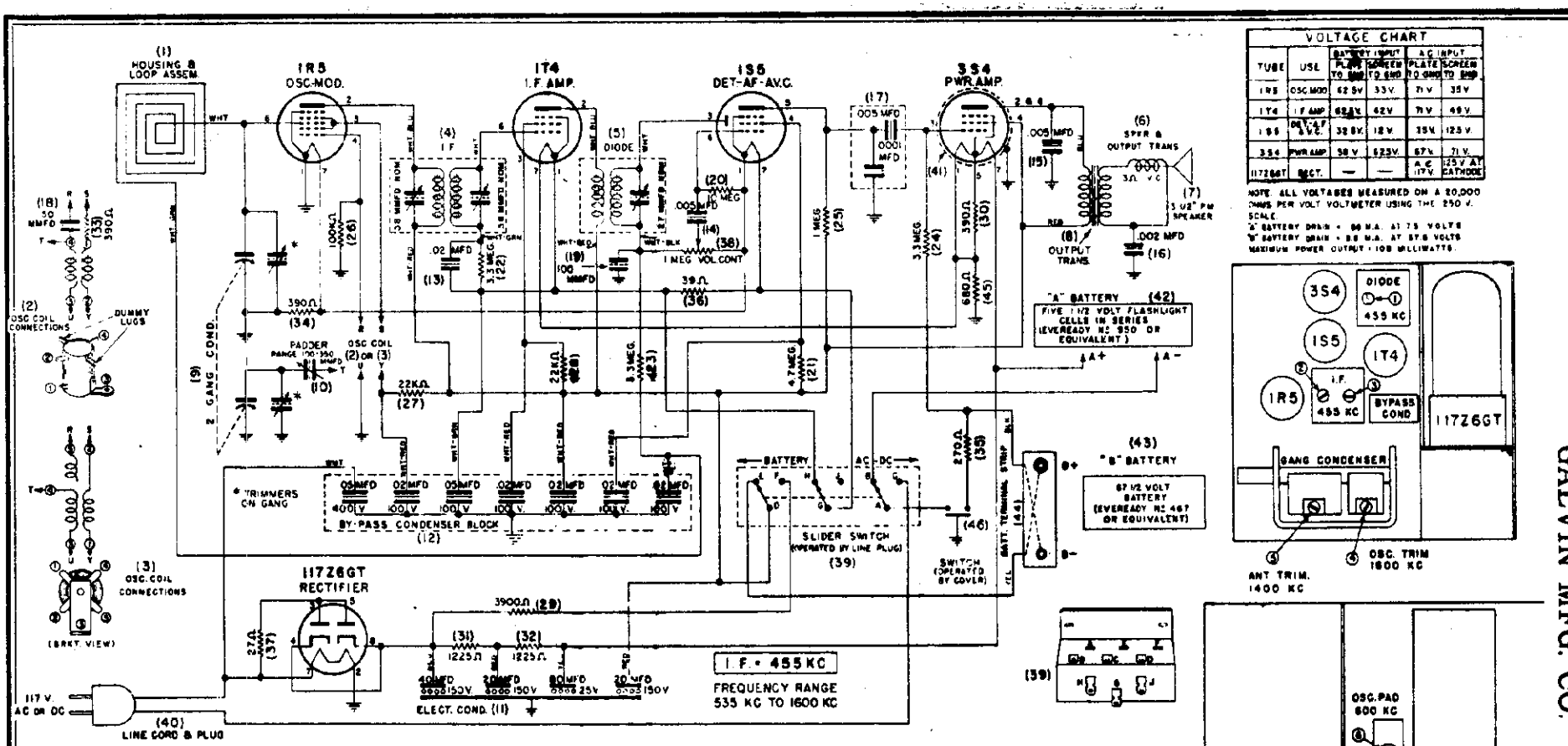
NOTE:- ALL VOLTAGES MEASURED ON A 20,000 OHM PER VOLT VOLTMETER USING THE 250 VOLT SCALE.

'A' BATTERY DRAIN = .25 AMP. AT 1.5 VOLTS.
'B' BATTERY DRAIN = 8.5 MILLIAMPERES AT 67.5 VOLTS.
MAXIMUM POWER OUTPUT = 100 MILLIWATTS.

BOTTOM VIEW OF CHASSIS

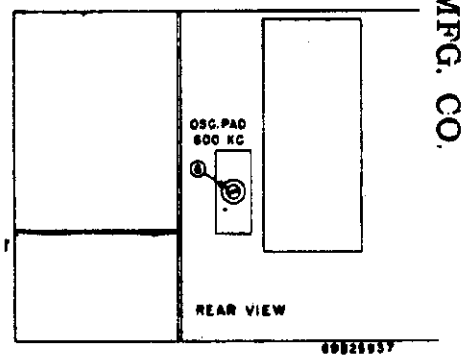
GALVIN MFG. CO.

MOTOROLA PAGE 1 MODEL A



VOLTAGE CHART					
TUBE	USE	BATTERY INPUT PLATE TO GND	BATTERY INPUT SCREEN TO GND	A.C. INPUT PLATE TO GND	A.C. INPUT SCREEN TO GND
1R5	OSC-MOD	62.5V	33V	71V	35V
1T4	I.F. AMP	62.5V	62V	71V	69V
1S5	DET-A.F. A.V.C.	32.5V	12V	35V	12.5V
3S4	PWR. AMP	58 V	62.5V	67V	71 V.
117Z6GT	RECT.	—	—	A.C. 117V.	125 V. AT CATHODE

NOTE: ALL VOLTAGES MEASURED ON A 20,000 OHMS PER VOLT VOLTMETER USING THE 250 V. SCALE.
"A" BATTERY DRAIN = 86 M.A. AT 7.5 VOLTS
"B" BATTERY DRAIN = 8.8 M.A. AT 67.5 VOLTS
MAXIMUM POWER OUTPUT = 100 MILLIWATTS.

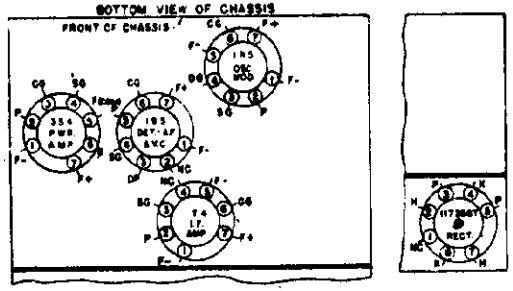


ALIGNMENT CHART

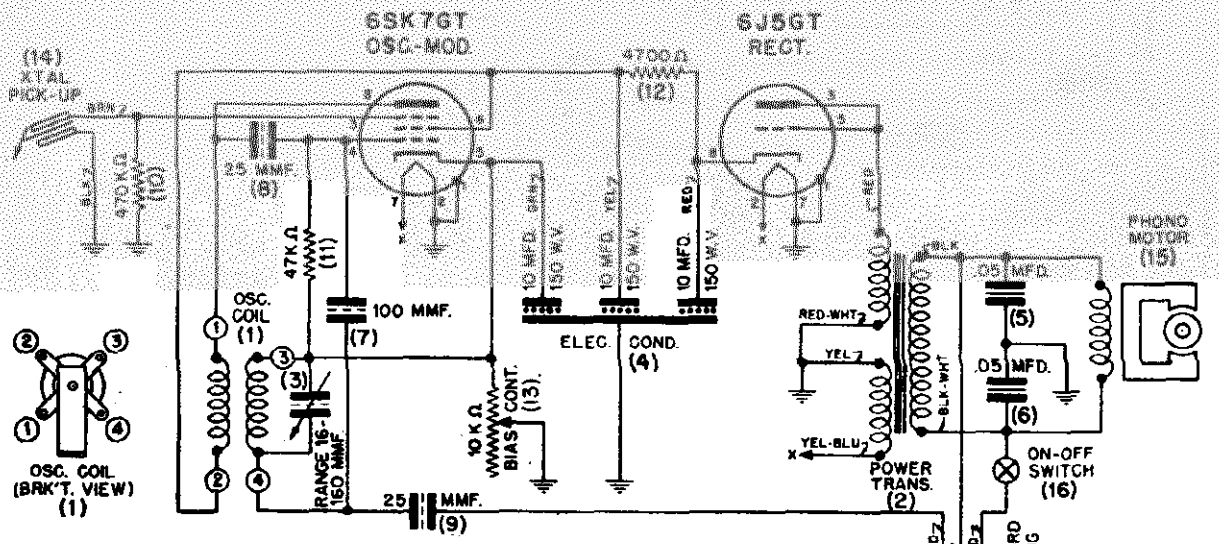
* Connect output of signal generator to a 5" diameter, 3 turn loop. With volume on full and output meter connected across voice coil, bring loop close enough to receiver loop until an output of 50 milliwatts is obtained (.38 V. on output meter). Vary distance between generator & receiver loop to maintain this output during alignment.

** Rock condenser until greatest output is obtained.

OPERATIONS IN ORDER	GANG CONDENSER SET AT	DUMMY ANTENNA	GENERATOR CONNECTED TO	ADJUST TRIMMERS NO.	GENERATOR SET AT
1	MINIMUM	1 MFD.	OSC. MOD. GRID	1-2-3	455 KC.
2	1600 KC.	1 MFD.	OSC. MOD. GRID	4	1600 KC.
3	1400 KC.	NONE	*	5	1400 KC.
4	600 KC.**	NONE	*	6	600 KC.



GALVIN MFG. CO.

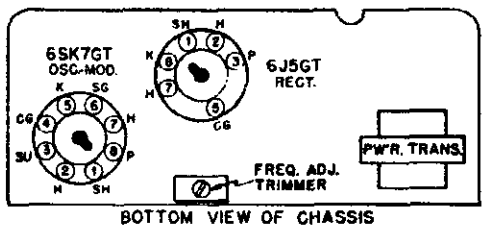


FREQUENCY RANGE
1250 KC TO 1750 KC

VOLTAGE CHART - 117 V. AC INPUT				
TUBE		PLATE TO GND.	SCREEN TO GND.	CATH. TO GND.
6SK7GT	OSC.-MOD.	75 V.	75 V.	0-40 V.
6J5GT	RECT.	AC	—	195 V.

NOTE:- ALL VOLTAGES MEASURED WITH A 1,000 OHM PER VOLT VOLTMETER.

* VARIES WITH SETTING OF BIAS CONTROL



BOTTOM VIEW OF CHASSIS

MODEL 22B

MODEL 22B
FOR ADDITIONAL DATA
SEE INDEX

POINTER AND

GANG DRIVE CORD

RESTRINGING

INSTRUCTIONS

MODEL 60XW3

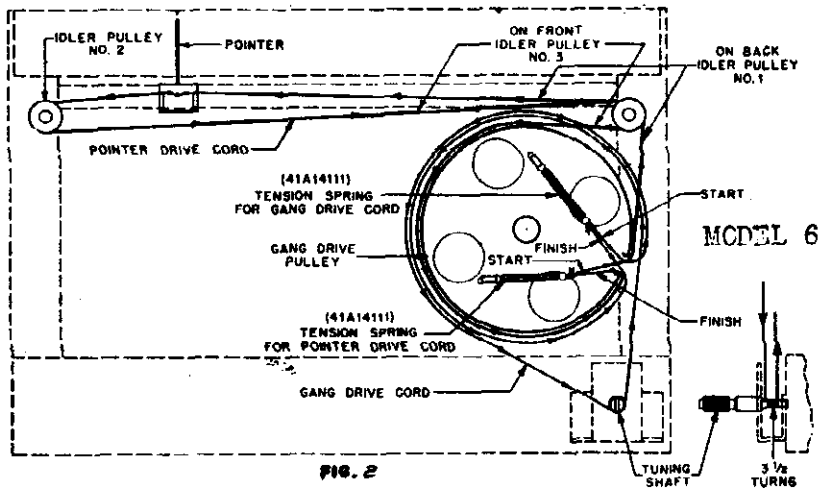


FIG. 2

MODEL 60X

GANG DRIVE CORD

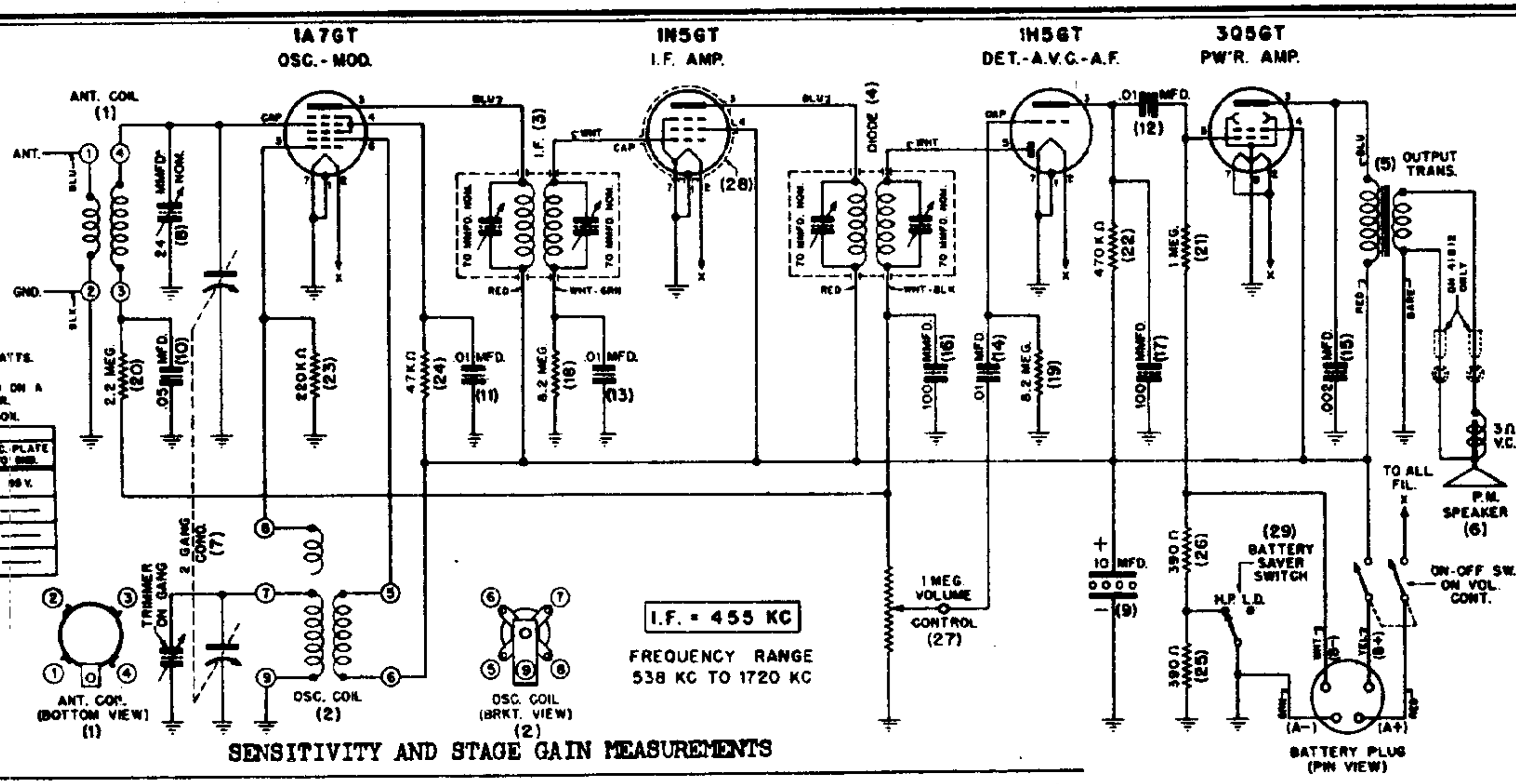
1. Remove the chassis from cabinet.
2. Remove broken string.
3. Turn gang to fully meshed position.
4. Cut a 35" length of 30 lb. silk fish cord.
5. Tie one end of cord to tension spring (Part No. 41A14111).
6. Hook other end of spring to gang drive pulley as shown in Fig. 2.
7. Pass cord through slot in gang drive pulley and wind, in a counter-clockwise direction, around and down to tuning shaft.
8. Wind cord 3-1/2 turns counter-clockwise around tuning sha exactly as shown in Fig. 2.
9. Route cord up and wind one full turn around gang drive pulley, a counter clockwise direction, to slot.
10. Pass cord through slot and tie cord to spring.
NOTE: *Before tying cord, adjust length so that spring will exe a light pull on cord.*
11. Place a drop of shellac on cord knot.

POINTER DRIVE CORD

1. Remove the chassis from cabinet.
2. Remove broken string.
3. Turn gang to fully meshed position.
4. Cut a 40" length of 30 lb. silk fish cord.
5. Tie one end of cord to tension spring (Part No. 41A14111).
6. Hook other end of spring to gang drive pulley as shown in Fig. 2.
7. Pass cord through slot in gang drive pulley and route cord upward to idler pulley No. 1 (Back pulley).
8. Route cord in a counter-clockwise direction around idler pulley No. 1 and across chassis to idler pulley No. 2.
9. Continue in a counter-clockwise direction around idler pulley No. 2 and back across chassis to idler pulley No. 3 (Front Pulle
10. Continue in a clockwise direction around idler pulley No. 3 in a counter-clockwise direction around gang drive pulley to sl
11. Pass cord through slot and tie to spring.
NOTE: *Before tying cord, adjust length so that spring will ex a light pull on cord.*
12. Replace pointer on cord. To calibrate, tune in a station of k frequency and adjust pointer on cord to indicate station frequer Fasten to cord with a drop of shellac.
13. Place a drop of shellac on cord knot.

MODELS 41B11, 41B12

GALVIN MFG. CO.



'A' DRAIN - .25 AMP.
'B' DRAIN IN 'L.D.' POSITION - 8 MA
'B' DRAIN IN 'H.P.' POSITION - 12 MA
MAX. PW'R. OUTPUT = 300 MILLIWATTS.

NOTE: - ALL VOLTAGES MEASURED ON A 1,000 OHM PER VOLT VOLTMETER.
BATT. SAVER SW. IN 'H.P.' POSITION.

VOLTAGE CHART				
TUBE		PLATE TO GND.	SCREEN TO GND.	OSC. PLATE TO GND.
1A7GT	OSC-MOD	88 V.	40 V.	90 V.
1N5GT	I.F. AMP.	85 V.	85 V.	———
1H5GT	DET.-A.V.C. A.F.	38 V.	———	———
3Q5GT	PW'R. AMP.	80 V.	85 V.	———

BATTERY PACK 1-1/2 V. 'A' & 90 V. 'B' (30)

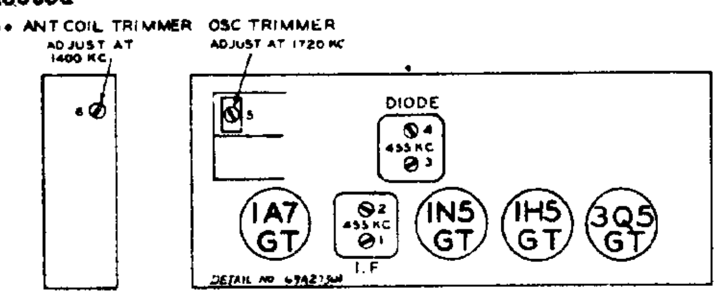
SENSITIVITY AND STAGE GAIN MEASUREMENTS

Average Microvolt Input *	Generator Set At	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
3600	455	I.F. Grid	.1 Mfd.	.5 Meg	.38
105	455	Mod. Grid	.1 Mfd.	.5 Meg	.38
120	600	Mod. Grid	.1 Mfd.	.5 Meg	.38
22	600	Ant. Terminal	200 Mmf.	None	.38

Volume Control Set at Maximum
* .05 Watts = .38 Volts

** Output Meter Connected Across Voice Coil.

Operations In Order	Gang Condenser Set At	Dummy Antenna	Generator Connected To	Adjust Trimmers No.	Generator Set At
1	Minimum	.1Mfd	OSC-Mod	1-2-3-4	455K.C.
2	1720K.C.	.1Mfd	OSC-Mod	5	1720K.C.
3	1400K.C.	200Mmf	Ant. Lead.	6	1400K.C.



MODEL 51 F 11

ALIGNMENT CHART

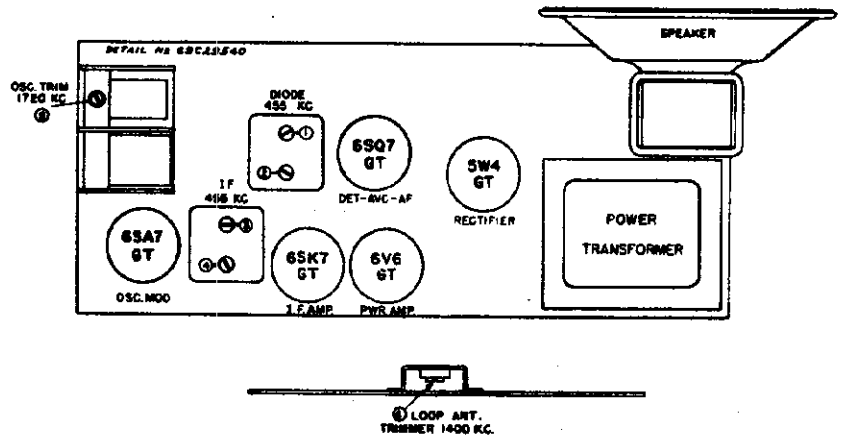
Operations In Order	Gang Condenser Set At	Dummy Antenna	Generator Connected to	Adjust Trimmers No.	Generator Set At
1	1720 K.C.	.1 Mfd.	Osc.Mod.Grid	1-2-3-4	455 K.C.
2	1720 K.C.	200 Mmf	Ext.Ant. Connection	5	1720 K.C.
3	1400 K.C.	200 Mmf	Ext.Ant. Connection	6	1400 K.C.

SENSITIVITY AND STAGE GAIN MEASUREMENTS

Average Microvolt Input *	Generator Set At	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
1750	456 K.C.	I.F. Grid	.1 Mfd	.5 Meg.	.38
22	455 K.C.	Mod. Grid	.1 Mfd	.5 Meg.	.38
36	600 K.C.	Mod. Grid	.1 Mfd	.5 Meg.	.38
3	600 K.C.	Ant.Terminal	200 Mmf	None	.38

Volume Control Set at Maximum
* .05 Watts = .38 Volts

Tone Control Set at High Position.
** Output meter connected across voice coil.



TUBE & TRIMMER LAYOUT

CHASSIS Nº M-184 MODEL Nº 51F11

MODEL 61 F 21

ALIGNMENT CHART

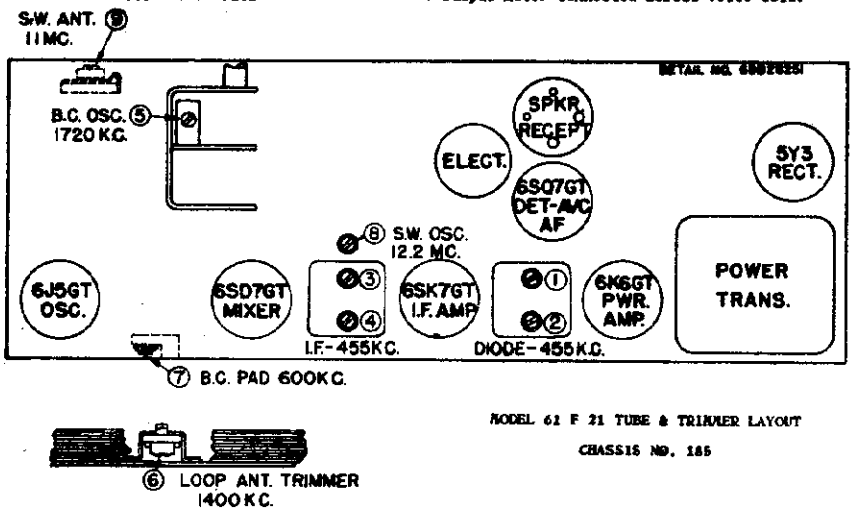
Operations In Order	Gang Condenser Set At	Dummy Antenna	Band Switch Set At	Generator Connected To	Adjust Trimmers No.	Generator Set At
1	1720 K.C.	.1 Mf.	B.C.	Mixer Grid	1-2-3-4	455 K.C.
2	1720 K.C.	200 Mmf.	B.C.	Ext.Ant. Connection	5	1720 K.C.
3	1400 K.C.	200 Mmf.	B.C.	Ext.Ant. Connection	6	1400 K.C.
4	600 K.C.	200 Mmf.	B.C.	Ext.Ant. Connection	7	600 K.C.
5	12.2 M.C.	400 Ohms	S.W.	Ext.Ant. Connection	8	12.2 M.C.
6	11.0 M.C.	400 Ohms	S.W.	Ext.Ant. Connection	9	11.0 M.C.

SENSITIVITY AND STAGE GAIN MEASUREMENTS

Average Microvolt Input *	Generator Set At	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
2100	456 K.C.	I.F. Grid	.1 Mfd.	.5 Meg.	.38
10	455 K.C.	Mixer Grid	.1 Mfd.	.5 Meg.	.38
12	600 K.C.	Mixer Grid	.1 Mfd.	.5 Meg.	.38
11	600 K.C.	Ant.Terminal	200 Mmf.	None	.38

Volume Control Set at Maximum
* .05 Watts = .38 Volts

Tone Control Set At High Position.
** Output meter connected across voice coil.



MODEL 61 F 21 TUBE & TRIMMER LAYOUT

CHASSIS NO. 185

GALVIN MFG. CO.

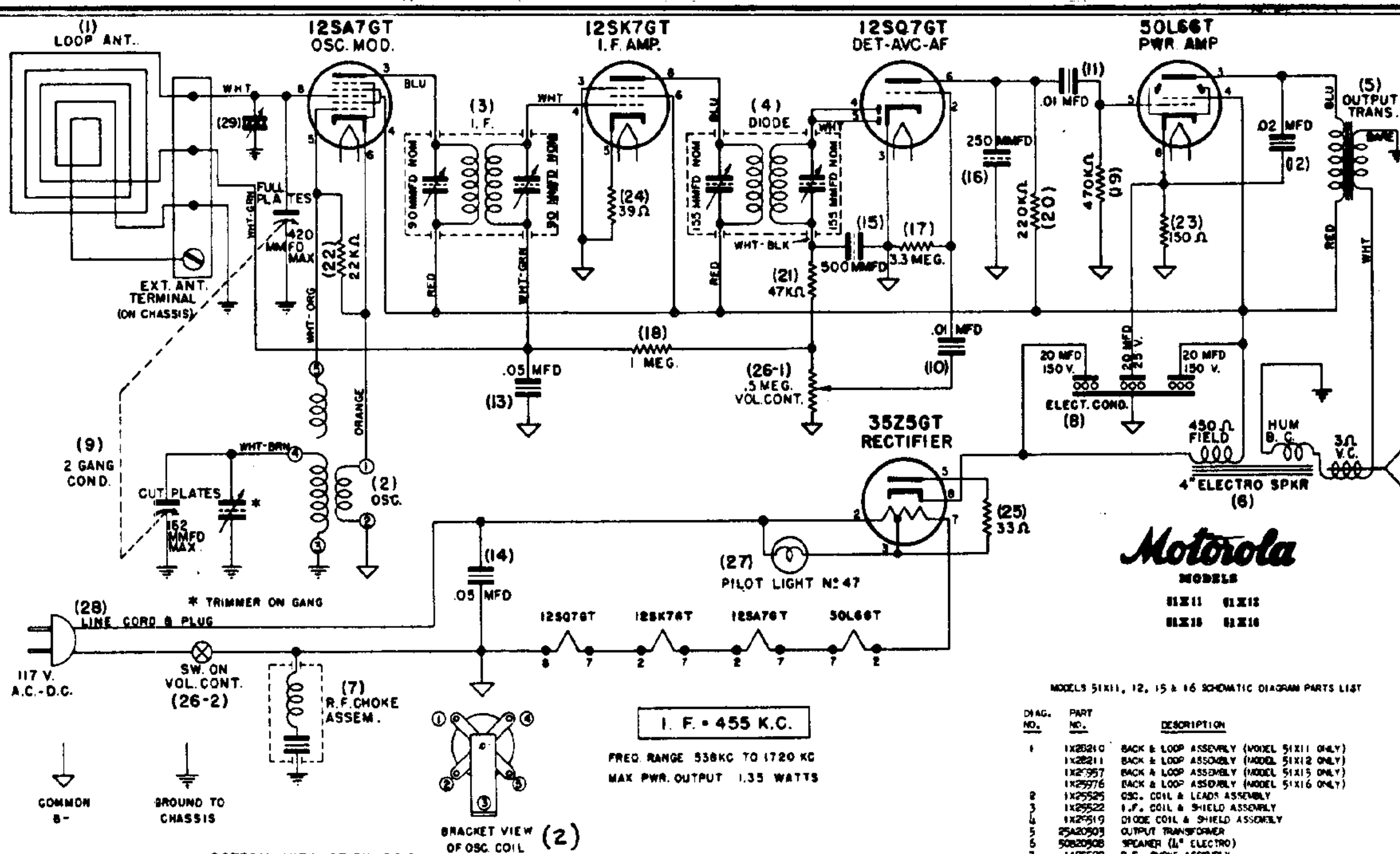
MOTOROLA PAGE

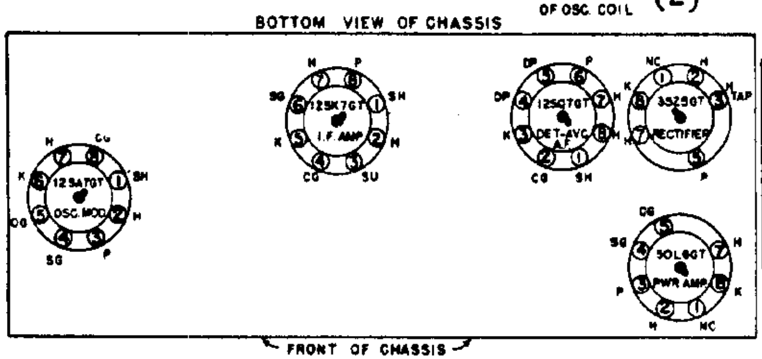
MODEL 51F

MODEL 61F

MODELS 51X11, 51X12, 51X15, 51X16

GALVIN MFG. CO.





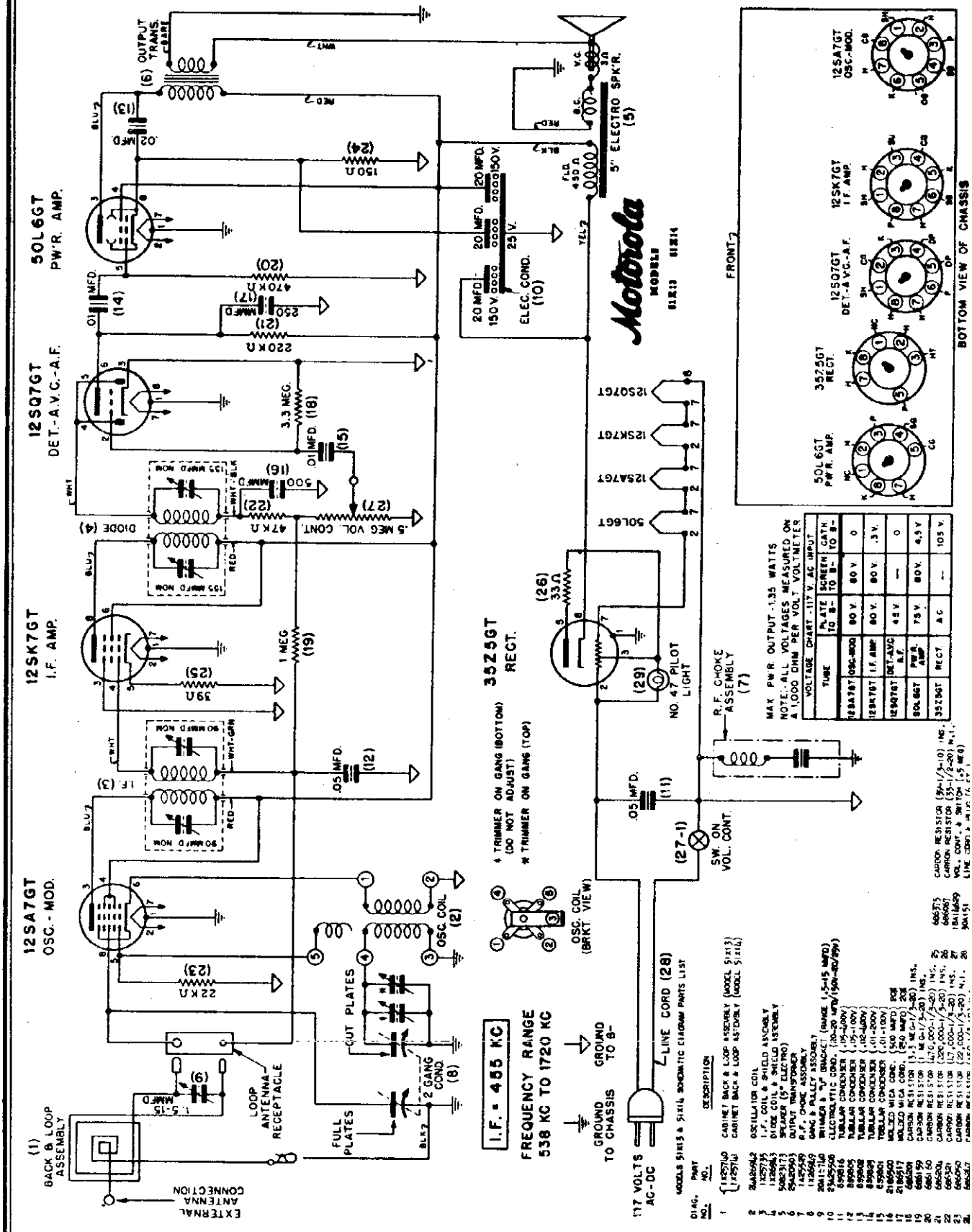
VOLTAGE CHART				
TUBE		PLATE TO B-	SCREEN TO B-	CATH. TO B-
12SA7GT	OSC. MOD.	80 V.	80 V.	0
12SK7GT	I.F. AMP.	80 V.	80 V.	.5 V.
12SQ7GT	DET. AVC-AF	48 V.	—	0
50L6GT	PWR. AMP.	75 V.	80 V.	5.5 V.
35Z5GT	RECT.	A.C.	—	105 V.

NOTE: ALL VOLTAGES MEASURED ON A 1000 OHMS PER VOLT VOLTMETER
INPUT: 117 V. A.C.

MODELS 51X11, 12, 15 & 16 SCHEMATIC DIAGRAM PARTS LIST

DIAG. NO.	PART NO.	DESCRIPTION
1	1X20210	BACK & LOOP ASSEMBLY (MODEL 51X11 ONLY)
	1X20211	BACK & LOOP ASSEMBLY (MODEL 51X12 ONLY)
	1X25957	BACK & LOOP ASSEMBLY (MODEL 51X15 ONLY)
	1X25976	BACK & LOOP ASSEMBLY (MODEL 51X16 ONLY)
2	1X25525	OSC. COIL & LEADS ASSEMBLY
3	1X25522	I.F. COIL & SHIELD ASSEMBLY
4	1X25519	DIODE COIL & SHIELD ASSEMBLY
5	25A20503	OUTPUT TRANSFORMER
6	50B20508	SPEAKER (4" ELECTRO)
7	1A25529	R.F. CHOKE ASSEMBLY
8	23A25508	ELECT. COND. & STRAP (20-20/150V & 20/25V)
9	1X25584	GANG & PULLEY ASSEMBLY (2 GANG)
10	8S9801	TUBULAR CONDENSER (.01-100V)
11	8S9825	TUBULAR CONDENSER (.01-200V)
12	8S9802	TUBULAR CONDENSER (.02-400V)
13	8S9805	TUBULAR CONDENSER (.05-100V)
14	8S9816	TUBULAR CONDENSER (.05-400V)
15	21B6500	MOLDED MICA CONDENSER (500 MMFD) 20%
16	21B6517	MOLDED MICA CONDENSER (250 MMFD) 20%
17	6S6201	CARBON RESISTOR (3.3 MEG-1/3-20) INS.
18	6S6159	CARBON RESISTOR (1 MEG-1/3-20) INS.
19	6S6160	CARBON RESISTOR (470,000-1/3-20) INS.
20	6S6204	CARBON RESISTOR (220,000-1/3-20) INS.
21	6S6321	CARBON RESISTOR (47,000-1/3-20) INS.
22	6S6212	CARBON RESISTOR (22,000-1/3-20) INS.
23	6S6247	CARBON RESISTOR (150-1/3-10) N.I.
24	6S6375	CARBON RESISTOR (39-1/3-10) INS.
25	6S6067	CARBON RESISTOR (33-1/2-20) N.I.
26	18A14629	VOL. CONTROL & SWITCH (.5 MEG)
27	65X11854	BULB (6.3V-.15AMP TUB. BAY) #47
28	30A151	LINE CORD & PLUG (6 FT.)
29	20A25194	TRIMMER CONDENSER (7 MMFD NOM.)

GALVIN MFG. CO.



MODELS 51X11 to 51X16
MODEL 62T2

GALVIN MFG. CO.

MODEL 62T2 ALIGNMENT CHART

Operations In Order	Gang Condenser Set At	Dummy Antenna	Band Switch Set At	Generator Connected to	Adjust Trimmers No.	Generator Set At
1	Minimum 1720 K.C.	.1 Mfd.	B.C.	Osc-Mod.Grid	1-2-3-4	455 K.C.
2	Minimum 1720 K.C.	.1 Mfd.	B.C.	Osc-Mod.Grid	5	1720 K.C.
3	538 K.C.	.1 Mfd.	B.C.	Osc-Mod.Grid	6	538 K.C.
4	1400 K.C.	200 Mmf.	B.C.	External Antenna Terminal	7	1400 K.C.
5	18 M.C.	.1 Mfd.	S.W.	Osc-Mod.Grid	8	18 M.C.
6	16 M.C.	400 Ohms	S.W.	External Antenna Terminal	9	16 M.C.
7	1400 K.C.	200 Mmf.	B.C.	External Antenna Terminal	10	1400 K.C.

Volume Control Set at Maximum.

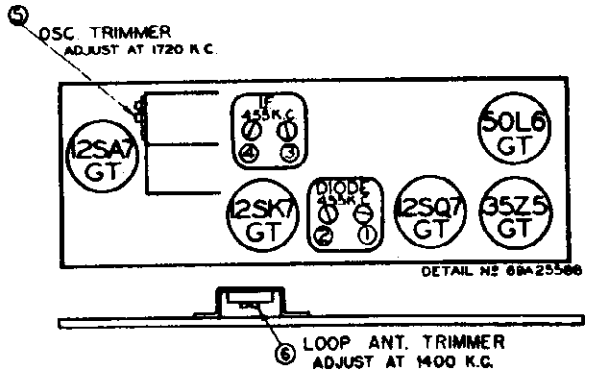
SENSITIVITY AND STAGE GAIN MEASUREMENTS

Average Microvolt Input *	Generator Set At	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
2500	455	I.F. Grid	.1.Mfd.	.5 Meg	.38
35	455	Mod. Grid	.1 Mfd.	.5 Meg	.38
40	600	Mod. Grid	.1 Mfd.	.5 Meg	.38
4	600	R.F. Grid	.1 Mfd.	.5 Meg	.38
3	600	Ant. Terminal	200 Mmf.	None	.38

Volume Control Set at Maximum.
* .05 Watts .38 Volts.

Tone Control set in treble position.
** Output meter connected across voice coil.

MODELS
51X11 51X14
51X12 51X15
51X13 51X16



ALIGNMENT CHART

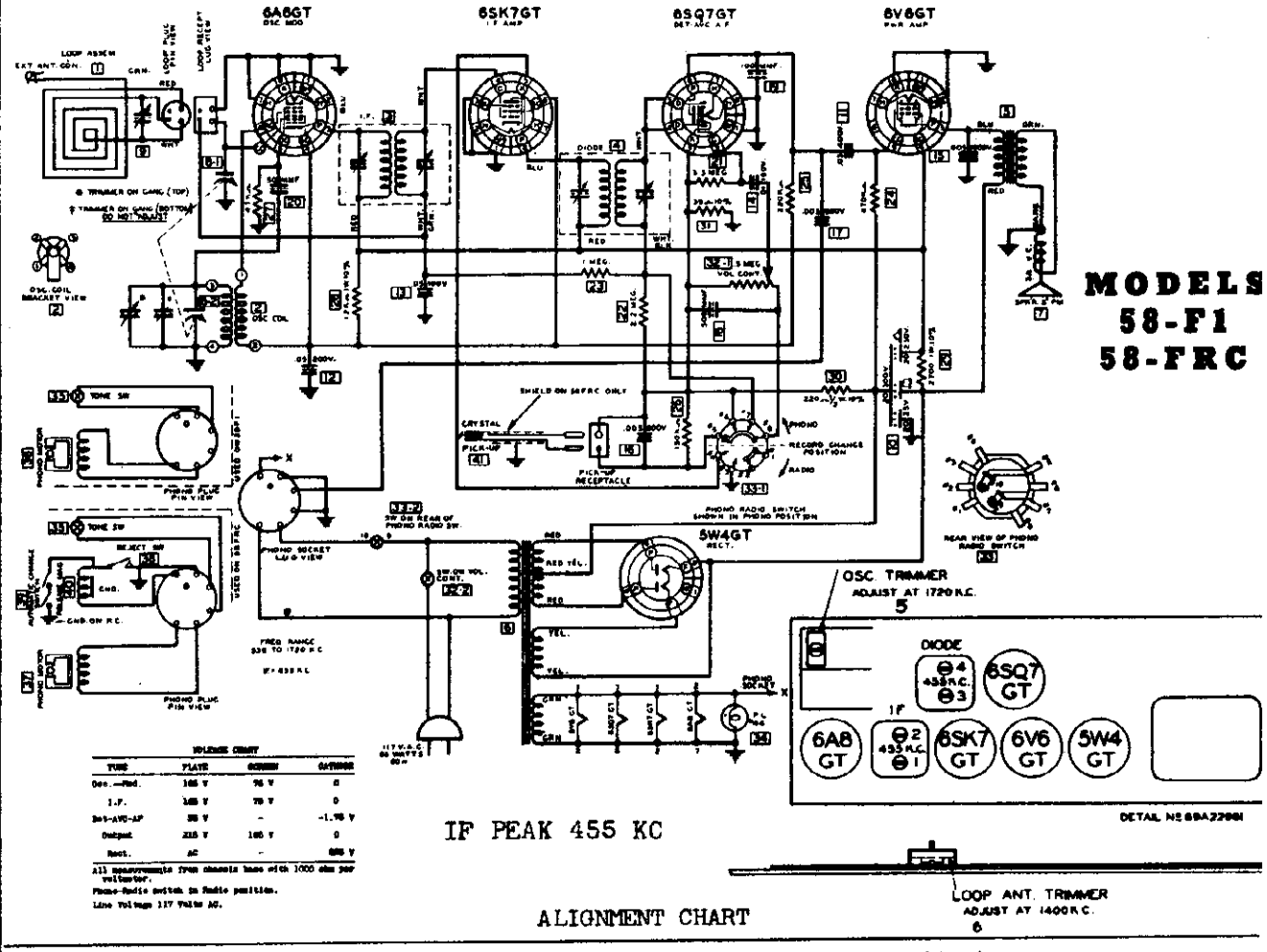
Operations In Order	Gang Condenser Set At	Dummy Antenna	Generator Connected To	Adjust Trimmers No.	Generator Set At
1	Minimum	.1 Mfd.	Osc.Mod.Grid	1-2-3-4	455 K.C.
2	1720 K.C.	.1 Mfd.	Osc.Mod.Grid	5	1720 K.C.
3	1400 K.C.	400 Ohms	External Antenna Terminal	6	1400 K.C.

SENSITIVITY AND STAGE GAIN MEASUREMENTS

Average Microvolt Input *	Generator Set At	Generator Feeder Connected To	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
2600	455	I.F. Grid	.1 Mfd.	.5 Meg.	.38
25	455	Mod. Grid	.1 Mfd.	.5 Meg.	.38
30	600	Mod. Grid	.1 Mfd.	.5 Meg.	.38
5	600	Ant.Terminal	400 Ohms	None	.38

Volume Control Set at Maximum
** Output meter connected across voice coil.
* .05 Watts = .38 Volts

GALVIN MFG. CO.



MODELS
58-F1
58-FRC

ALIGNMENT CHART

Operations In Order	Gang Condenser Set At	Dummy Antenna	Generator Connected To	Adjust Trimmers No.	Generator Set At
1	Minimum 1720 K.C.	400 Ohms	Osc.-Mod. Grid	1-2-3-4	455 K.C.
2	Minimum 1720 K.C.	400 Ohms	External Antenna Terminal	5	1720 K.C.
3	1400 K.C.	400 Ohms	External Antenna Terminal	6	1400 K.C.

Volume Control Set at Maximum.

SENSITIVITY AND STAGE GAIN MEASUREMENTS

Average Microvolt Input *	Generator Set At	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
1750	455	I.F. Grid	.1 Mfd.	.5 Meg	.38
22	455	Mod. Grid	.1 Mfd.	.5 Meg	.38
30	600	Mod. Grid	.1 Mfd.	.5 Meg	.38
3	600	Ant. Terminal	400 Ohms	None	.38

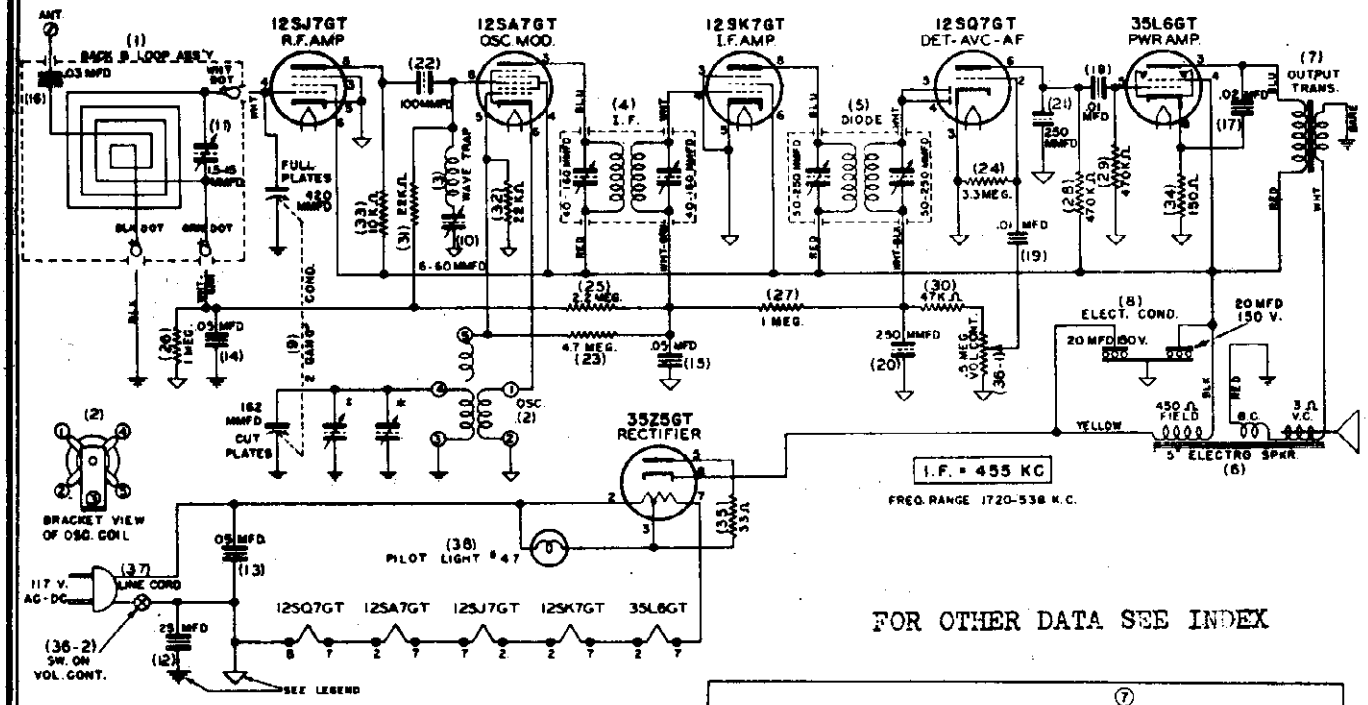
Volume Control Set at Maximum
* .05 Watts = .38 Volts

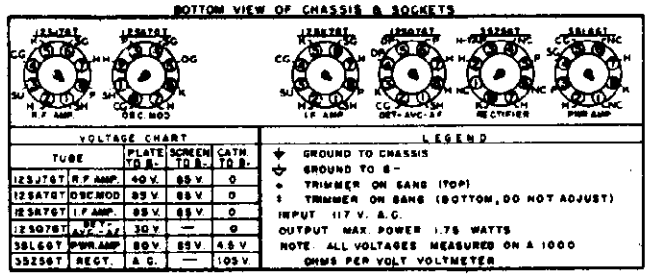
** Output Meter Connected Across Voice Coil.

FOR SERVICE INFORMATION AND PARTS PRICE LIST ON THE AUTOMATIC RECORD CHANGER AND PHONOGRAPH SECTION, REFER TO FORM S-8-E.

MODEL 60XW3

GALVIN MFG. CO.



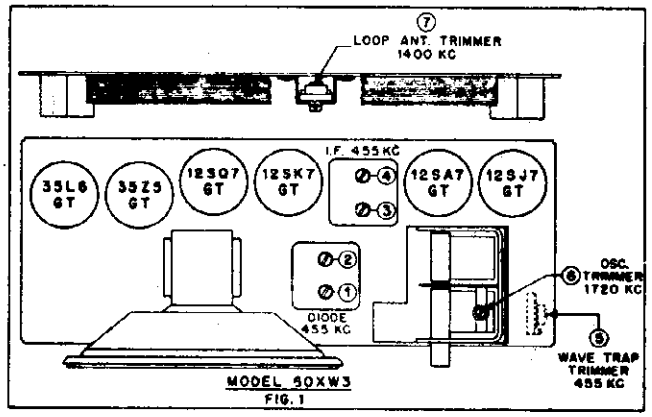


TUBE		PLATE TO B-	SCREEN TO B-	CATH. TO B-
12SJ7GT	R.F. AMP.	90 V.	85 V.	0
12SA7GT	OSC.MOD.	85 V.	85 V.	0
12SK7GT	I.F. AMP.	85 V.	85 V.	0
12SQ7GT	DET.-AVC.-AF	30 V.	—	0
35L6GT	PWR.AMP.	80 V.	85 V.	4.5 V.
35Z5GT	RECT.	A.C.	—	105 V.

LEGEND

- GROUND TO CHASSIS
- GROUND TO B-
- TRIMMER ON GANG (TOP)
- TRIMMER ON GANG (BOTTOM, DO NOT ADJUST)

INPUT 117 V. A.C.
OUTPUT MAX. POWER 1.75 WATTS
NOTE ALL VOLTAGES MEASURED ON A 1000 OHMS PER VOLT VOLTMETER



ALIGNMENT CHART

MODEL 60XW3

OPERATIONS IN ORDER	GANG CONDENSER SET AT	DUMMY ANTENNA	GENERATOR CONNECTED TO	ADJUST TRIMMERS NO	GENERATOR SET AT
1	Minimum	.1 MFD	R.F. Grid	1-2-3-4	455 KC.
2	Minimum	.1 MFD	R.F. Grid	5*	455 KC.
3	1720 KC.	.1 MFD	R.F. Grid	6	1720 KC.
4	1400 KC.	200 MMFD.	Ant. Terminal	7	1400 KC.

Adjust for Minimum Response (I.F. Wave Trap) See Fig. 1.

SENSITIVITY AND STAGE GAIN MEASUREMENTS

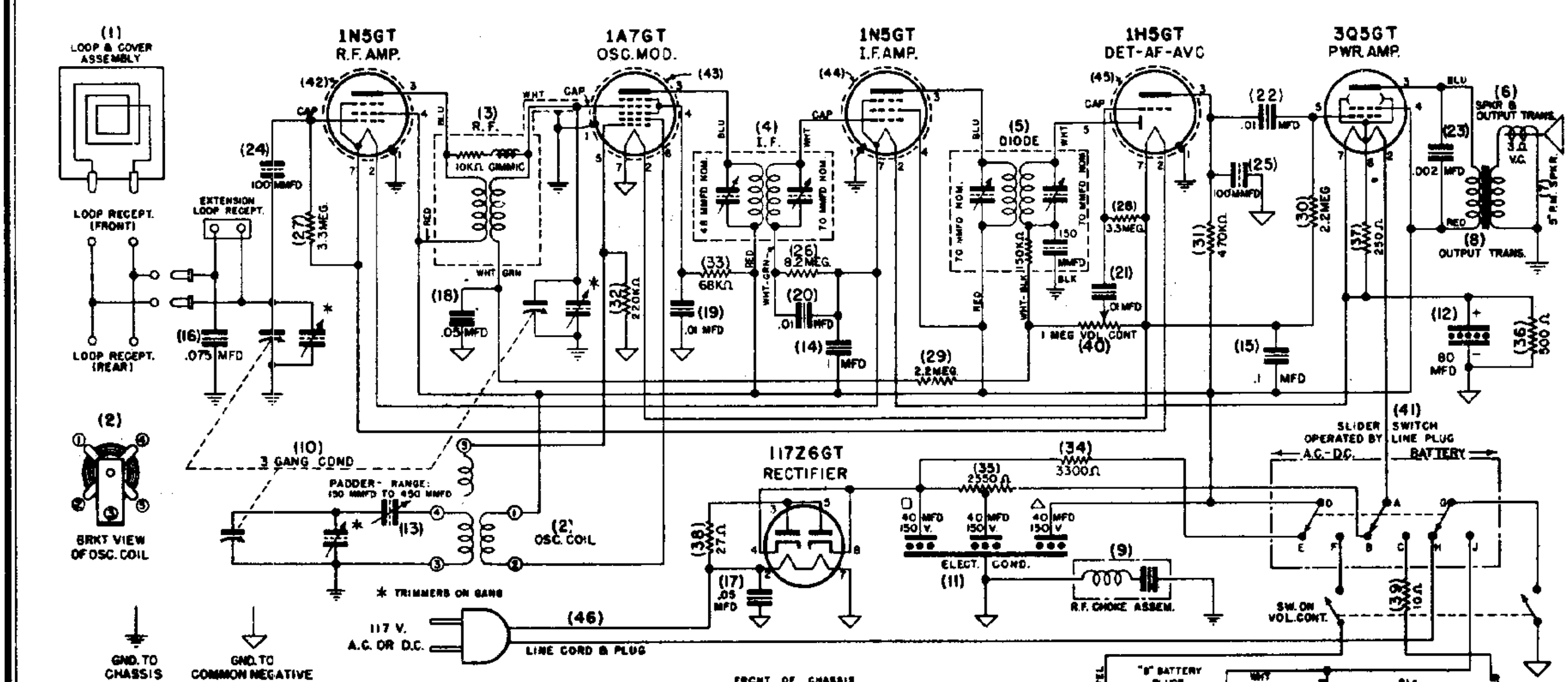
AVERAGE MICROVOLT INPUT	GENERATOR SET AT	GENERATOR FEEDER CONNECTED TO	DUMMY ANTENNA CAPACITY	LEAK RESISTANCE	OUTPUT METER READING **
4750	455 K.C.	I.F. Grid	.1 Mfd.	.5 Meg.	.38
110	455 K.C.	Mod. Grid	.1 Mfd.	.5 Meg.	.38
55	600 K.C.	Mod. Grid	.1 Mfd.	.5 Meg.	.38
7	600 K.C.	R.F. Grid	.1 Mfd.	.5 Meg.	.38
6	600 K.C.	Ant. Terminal	200 Mmfd.	None	.38

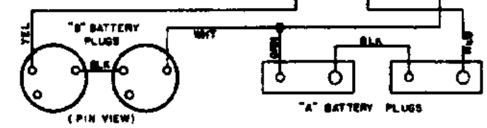
Volume Control set at Maximum

* *1 Watt=.38 Volts*

** *Output meter connected across voice coil.*

GALVIN MFG. CO.





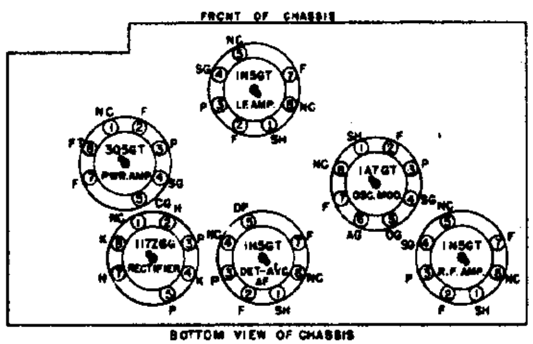
GND. TO CHASSIS

GND. TO COMMON NEGATIVE

I.F. = 455 KC

FREQUENCY RANGE
535 KC TO 1600 KC

FOR OTHER DATA
SEE INDEX

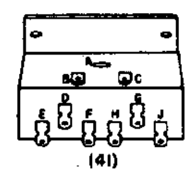


"B" BATTERY
45 VOLT BATTERY (2 REQUIRED) (EVEREADY No 482 OR EQUIVALENT) (48)

"A" BATTERY
4 1/2 VOLT BATTERY (2 REQUIRED) (EVEREADY No 746 OR EQUIVALENT) (47)

VOLTAGE CHART			
TUBE	PLATE TO B-	SCREEN TO B-	OSC. PLATE TO B-
1N5GT RF. AMP.	85V.	85V.	—
1A7GT OSC. MOD.	85V.	40V.	85V.
1N5GT I.F. AMP.	85V.	85V.	—
1H5GT DET-AF-AVC	30V.	—	—
3Q5 PWR-AMP.	80V.	85V.	—
117Z6G RECT.	LINE VOLTAGE (117V.)	—	125V. AT CATH.

NOTE: ALL VOLTAGES MEASURED ON A 1000 OHMS PER VOLT VOLTMETER, 117V. A.C. OR BATTERY INPUT.
MAX. PWR. OUTPUT 300 MILLIWATTS.



CURRENT DRAIN	A.C.	BATT
"A"	49 MA	49 MA
"B"	14 MA	14.5 MA

Motorola
62L11
62L12

SCHEMATIC DIAGRAM PARTS LIST

DIAG. NO.	PART NO.	DESCRIPTION
1	24A27467	FRONT COVER & LOOP (MODEL 61L12)
	24A29916	FRONT COVER & LOOP (MODEL 61L11)
2	24A29996	OSCILLATOR COIL
3	1A25906	R.F. COIL & SHIELD ASSEMBLY
4	1A25904	I.F. COIL & SHIELD ASSEMBLY
5	1A25902	DIODE COIL & SHIELD ASSEMBLY
6	50A25891	SPEAKER & OUTPUT TRANSFORMER
7		50A25892 SPEAKER (5" P.M.) ONLY
8		25A25895 OUTPUT TRANSFORMER ONLY
9	1A25935	R.F. CHOKE ASSEMBLY
10	19A25923	VARIABLE CONDENSER (3 GANG)
11	23A25889	ELECT. CONDENSER (40-40-40 MFD/150V)
12	23A25888	ELECT. CONDENSER & STRAP (80 MFD-25V)
13	20A25899	PADDER CONDENSER (RANGE 150 MMFD TO 450 MMFD)
14	8A9806	TUBULAR CONDENSER (.1-200V)
15	8A9806	TUBULAR CONDENSER (.1-200V)
16	8A25599	TUBULAR CONDENSER (.075-200V)
17	8A9826	TUBULAR CONDENSER (.05-400V)
18	8A9805	TUBULAR CONDENSER (.05-100V)
19	8A9825	TUBULAR CONDENSER (.01-200V)
20	8A25999	TUBULAR CONDENSER (.01-100V)
21	8A9801	TUBULAR CONDENSER (.01-100V)
22	8A9801	TUBULAR CONDENSER (.01-100V)
23	8A9824	TUBULAR CONDENSER (.002-400V)
24	21B6511	MOLDED MICA COND. (100 MMFD) 20%
25	21B6511	MOLDED MICA COND. (100 MMFD) 20%
26	6B6310	CARBON RESISTOR (8.2 MEG-1/3-20) INS.
27	6B6201	CARBON RESISTOR (3.3 MEG-1/3-20) INS.
28	6B6201	[illegible] INS.
29	6B6202	[illegible] INS.
30	6B6202	[illegible] INS.
31	6B6160	[illegible] INS.
32	6B6349	[illegible] INS.
33	6B6256	[illegible] INS.
34	6B6034	[illegible] S.I.
35	17A25877	[illegible]

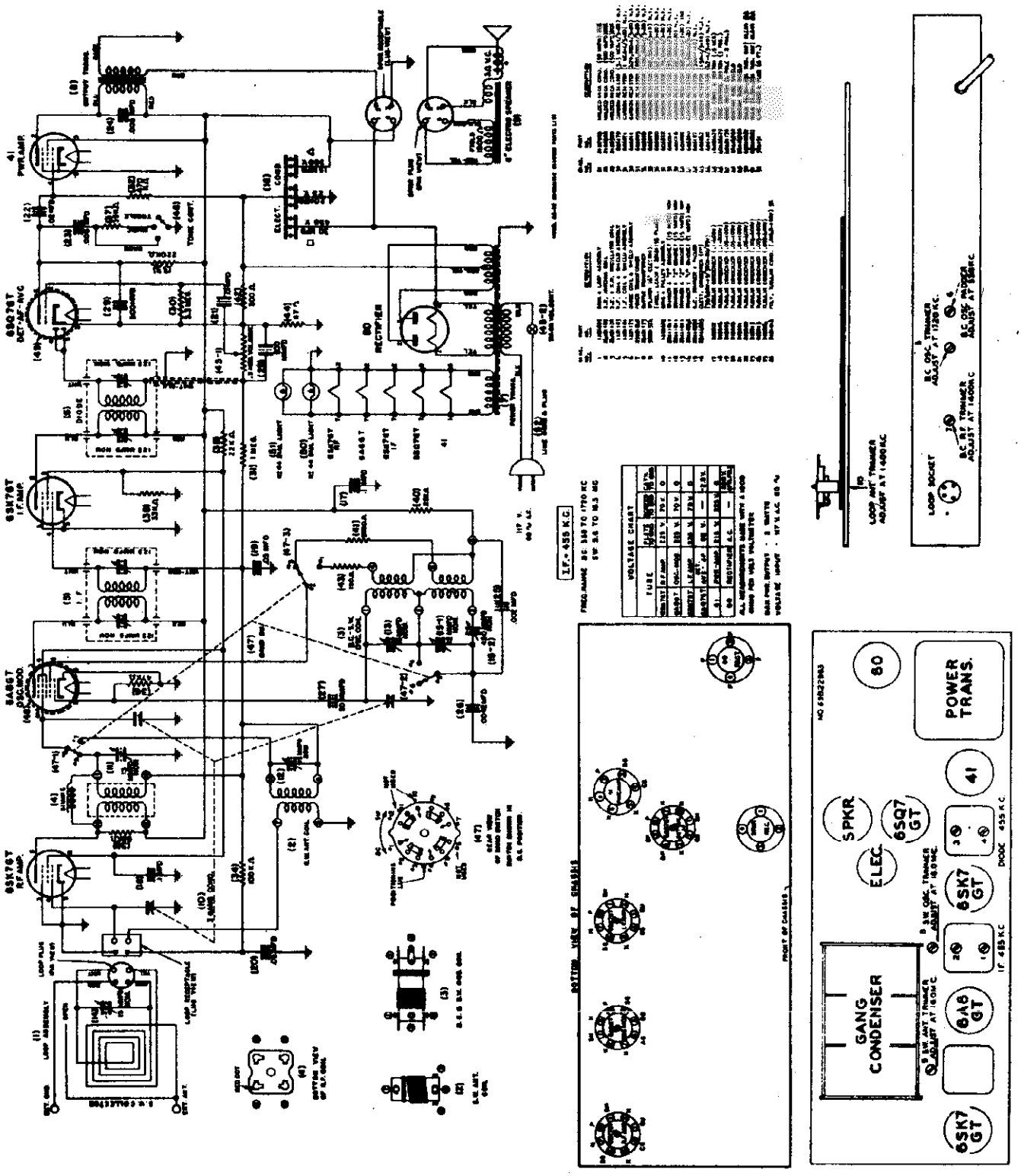
CHANGES INDICATED

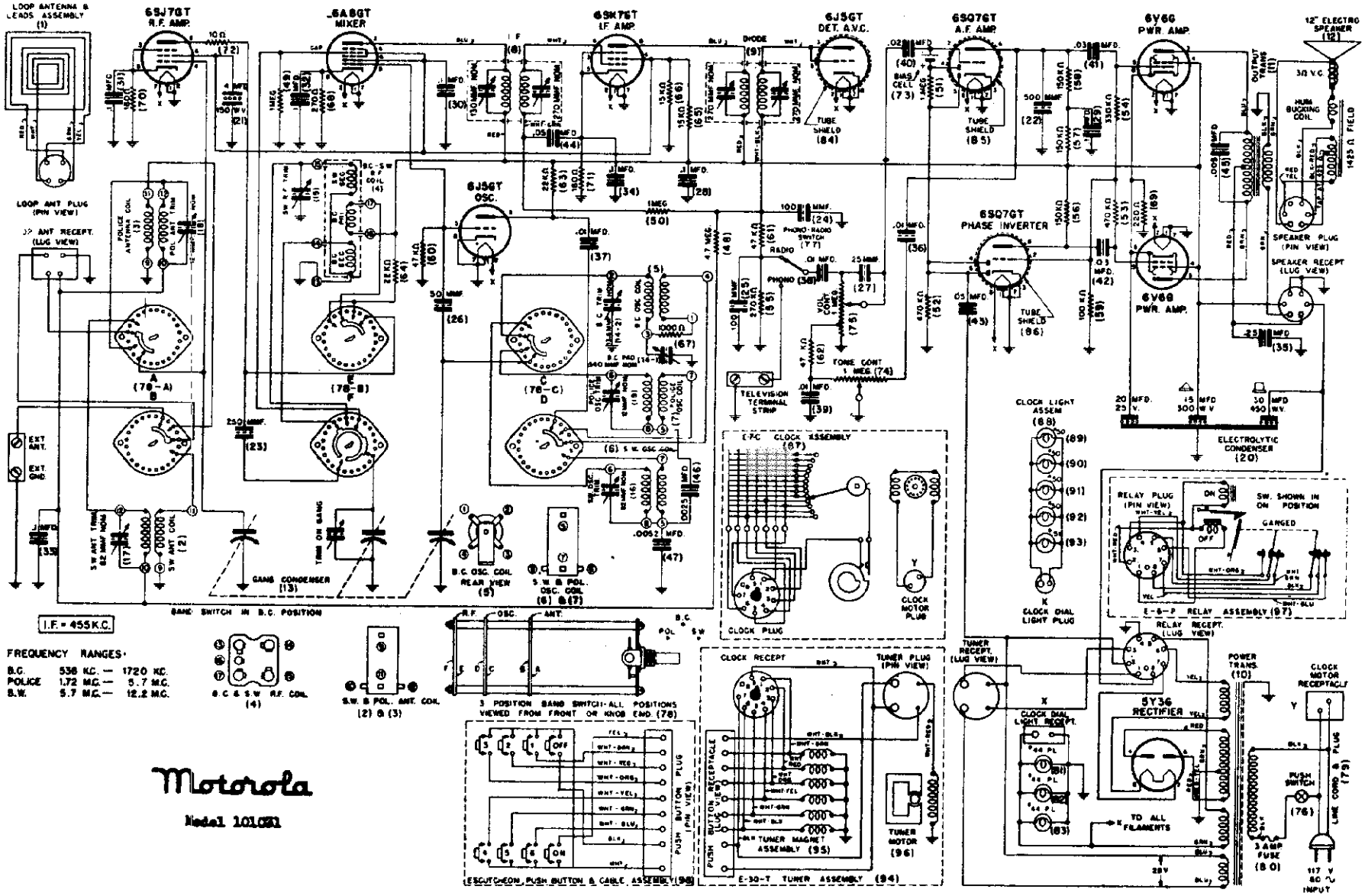
DIAG. NO.	PART NO.	DESCRIPTION
36	6B6461	CARBON RESISTOR (500-1/3-10) INS.
37	6B6404	CARBON RESISTOR (250-1/3-10) INS.
38	6B6242	CARBON RESISTOR (27-1/2-10) S.I.
39	6B6418	CARBON RESISTOR (10-1/3-10) INS.
40	18A25882	VOL. CONTROL & SWITCH (1 MEG)
41	40A27114	SLIDER SWITCH & BRACKET
42	26A14760	TUBE SHIELD (BANTAM)
43	26A14760	TUBE SHIELD (BANTAM)
44	26A14760	TUBE SHIELD (BANTAM)
45	26A14760	TUBE SHIELD (BANTAM)
46	30B20529	LINE CORD & PLUG (6FT.)
47	16B20579	"A" BATTERY (4-1/2 VOLT) (2 REQUIRED) (EVEREADY #746 OR EQUIVALENT)
48	16B16684	"B" BATTERY (45 VOLT) (2 REQUIRED) (EVEREADY #482 OR EQUIVALENT)

MODEL 62T2

GALVIN MFG. CO.

FOR OTHER DATA SEE INDEX





Motorola

Model 101C21

MOTOROLA PAGE 1
MODEL 101C

MODEL 101C31

ALIGNMENT CHART

OPERATIONS IN ORDER	GANG CONDENSER SET AT	DUMMY ANTENNA	BAND SWITCH SET AT	GENERATOR CONNECTED TO	ADJUST TRIMMERS NO.	GENERATOR SET AT
1	MINIMUM 1720 K.C.	.1 Mfd.	B. C	Osc. Mod. Grid.	1-2-3-4	455 K. C.
2	1720 K. C.	.1 Mfd.	B. C	Osc. Mod. Grid.	5	1720 K. C.
3	538 K. C.	.1 Mfd.	B. C	Osc. Mod. Grid.	6	538 K. C.
4	1400 K. C.	400 Ohms	B. C	External Antenna Terminal	7	1400 K. C.
5	5.7 MC.	.1 Mfd.	POI	Osc. Mod. Grid.	8	5.7 M. C.
6	4.1 M. C.	400 Ohms	POI	External Antenna Terminal	9	4.1 M. C.
7	12.2 M. C.	.1 Mfd.	S W	Osc. Mod. Grid.	10	12.2 M. C.
8	11.0 M. C.	400 Ohms	S W	External Antenna Terminal	11	11.0 M. C.
9	11.0 M. C.	400 Ohms	S W	External Antenna Terminal	12	11.0 M. C.

Volume Control set at Maximum Tone Control set in Treble Position.

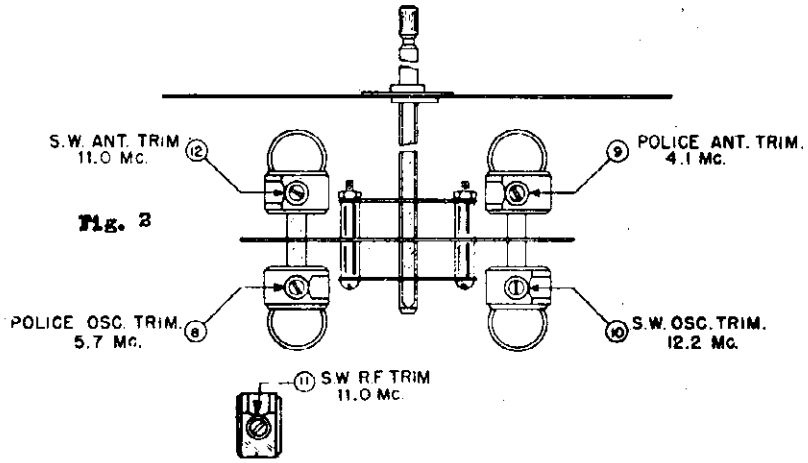


Fig. 2

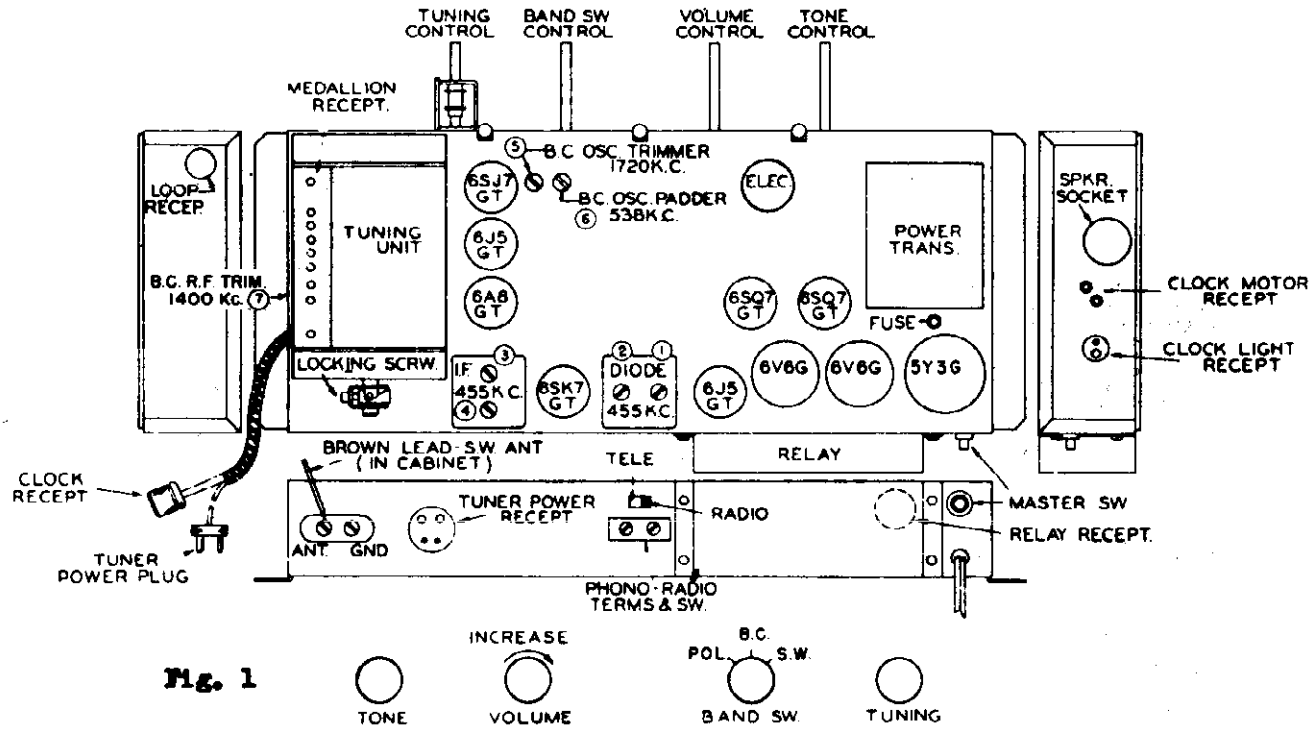


Fig. 1

Code No.	Part No.	Description

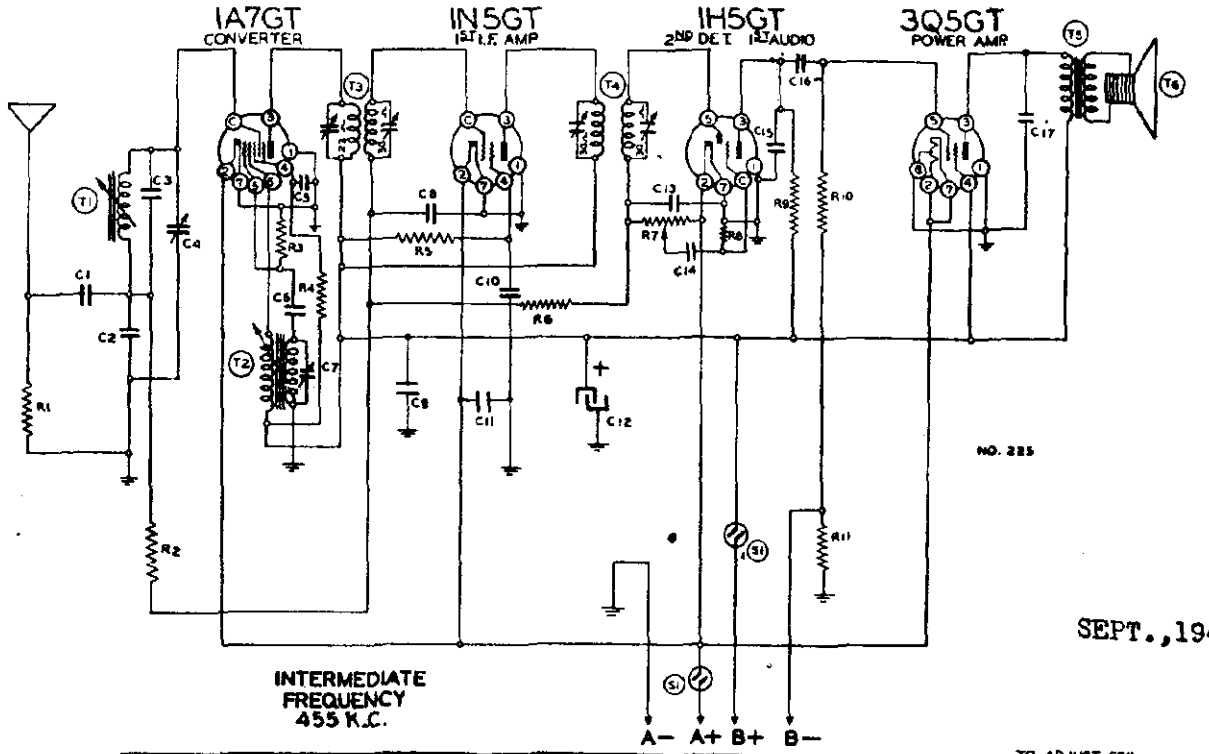
RESISTORS

R1	13017	10M ohm—⅓ w.
R2	1304	3 megohm—⅓ w.
R3	1309	200M ohm—⅓ w.
R4	130194	35M ohm—⅓ w.
R5	13094	50M ohm—⅓ w.
R6	1304	3 megohm—⅓ w.
R7	101250	1 megohm—Volume control and switch ½ w.
R8	130257	5 megohm—⅓ w.
R9	13019	1 megohm—⅓ w.
R10	130146	2 megohm—⅓ w.
R11	13079	400 ohm—⅓ w.

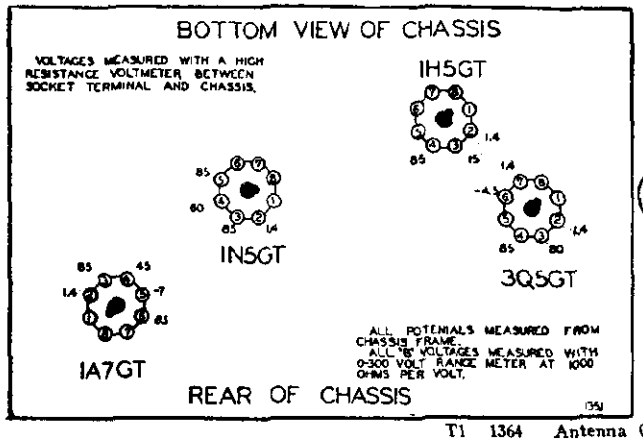
CONDENSERS

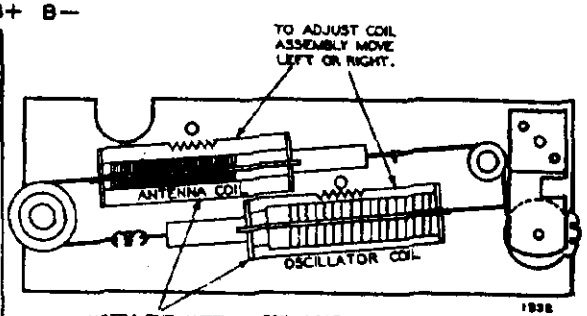
C1	12936	.0003 mica
C2	100112	.001 x 200 v.
C3	129177	.000045—Ceramicon
C4	124165	Antenna trimmer
C5	1009	.05 x 200 v.—Condenser
C6	12912	.00025 mica
C7	124165	Oscillator trimmer
C8	1009	.05 x 200 v. Condenser
C9	1006	.25 x 200 v. Condenser
C10	10020	.1 x 200 v.
C11	10017	.5 x 120 v.
C12	119117B	10 mfd. x 150 v. lytic
C13	1295	.0001 mica
C14	10012	.003 x 600 v. Condenser
C15	1295	.0001 mica
C16	10026	.02 x 400 v. Condenser
C17	1007	.005 x 600 v.

C4 and C7 are in same unit.



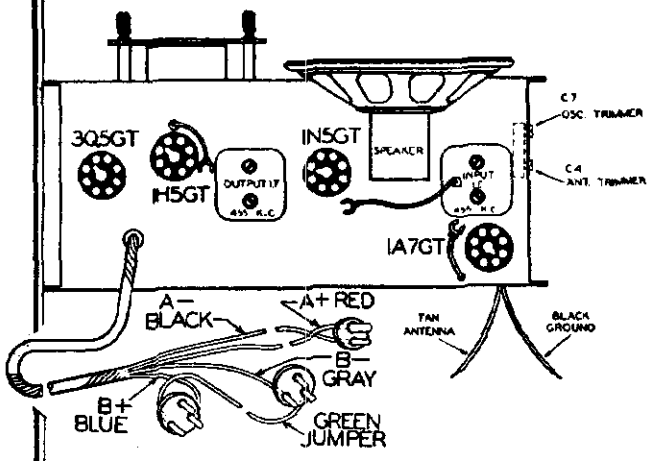
SEPT.,1941





NOTE: THE ANTENNA COIL ASSEMBLY IS MADE SO THAT IT IS MOVABLE LEFT OR RIGHT. WHEN MAKING THE ADJUSTMENT AS GIVEN IN THE ALIGNMENT PROCEDURE MOVE COIL ASSEMBLY VERY SLOWLY

COIL ASSEMBLY VIEW



PARTS

T1	1364	Antenna Coil Permeability tuning assem.
T2	1364	Oscillator Coil Complete.
T3	108202	Input I. F. Coil 455 kc.
T4	108153B	Output I. F. Coil 455 kc.
T5	10591B	Output transformer
T6	114215R	6" P.M. speaker

ALIGNMENT PROCEDURE

MODELS C4B15,C4B16

The following equipment is required for aligning.

- Dummy antenna. 1 mfd. and 200 mmf.
- Volume control—Maximum all adjustments.
- Connect ground lead of radio chassis to ground post of signal generator.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Iron Cores (Dial Setting)	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
455 Kc. I. F.	455 Kc.	.1 MFD.	Connect to Grid of 1A7	Iron Cores All the way out	Two trimmers on top of output I. F. can	Output I. F.	maximum output
	455 Kc.	.1 MFD.	Connect to Grid of 1A7	Iron Cores All the way out	Two trimmers on top of input I. F. can	Input I. F.	maximum output
BROAD-CAST BAND	1700 Kc.	.1 MFD.	Connect to Grid of 1A7	Iron Cores All the way out	Trimmer (C7) (See chassis view)	Oscillator	maximum output
	1700 Kc.	200 MMF.	Connect to Antenna Clip	Iron Cores All the way out	Trimmer (C4) (See chassis view)	Antenna	maximum output
	1400 Kc.	200 MMF.	Connect to Antenna Clip	Turn Dial to 1400 Kc.	Adjust position of antenna coil (See coil assembly view)	Antenna Coil Adjustment	maximum output (See Note "A")
	1700 Kc.	200 MMF.	Connect to Antenna Clip	Turn Dial to 1700 Kc.	Adjust trimmer (C4) (See chassis view)	Antenna	Check for tracking (See Note "B")

NOTE "A"—The antenna coil assembly is made so that it is movable. When making the adjustment as given in the alignment procedure move the coil assembly very slowly. It can be moved by hand or by pivoting one edge of the blade of a screwdriver in the hole and engaging the blade in the gear teeth of the coil form.

NOTE "B"—After the antenna coil has been tracked at 1400 Kc. it is necessary to check the antenna trimmer (C4) adjustment again at 1700 Kc. If no appreciable change in trimmer adjustment is made the coil is in track, if the trimmer requires considerable change it will be necessary to again adjust the position of the antenna coil at 1400 Kc. These two adjustments should be tried several times until no change of trimmer adjustment is required at 1700 Kc.

ALIGNMENT PROCEDURE

MODEL C640

IMPORTANT:—See alignment instructions

- Volume control—Maximum all adjustments.
- Connect B - of radio chassis to ground post of signal generator through .1 Mfd. condenser.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning:

- An all wave signal generator.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 Mfd.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Grid of 12SA7	Rotor full open (Plates out of mesh)	Four Trimmers on Top (See Fig. 1)	Output and Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1600 Kc.	.1 MFD.	Grid of 12SA7	Rotor full open (Plates out of mesh)	Trimmer bottom of rear section of gang. (See bottom of radio)	Broadcast Oscillator	Adjust to maximum output
	1400 Kc.	See Note "A"		Set dial at 1400 Kc.	Trimmer bottom of front section of gang. (See bottom of radio)	Broadcast Antenna	Adjust to maximum output

NOTE "A" Lay the output lead from the generator in back of the loop antenna. Turn up the output of the generator, picking up the energy in the loop antenna without any electrical connection from the generator.

FREQUENCY RANGE
540 to 1600 K.C.

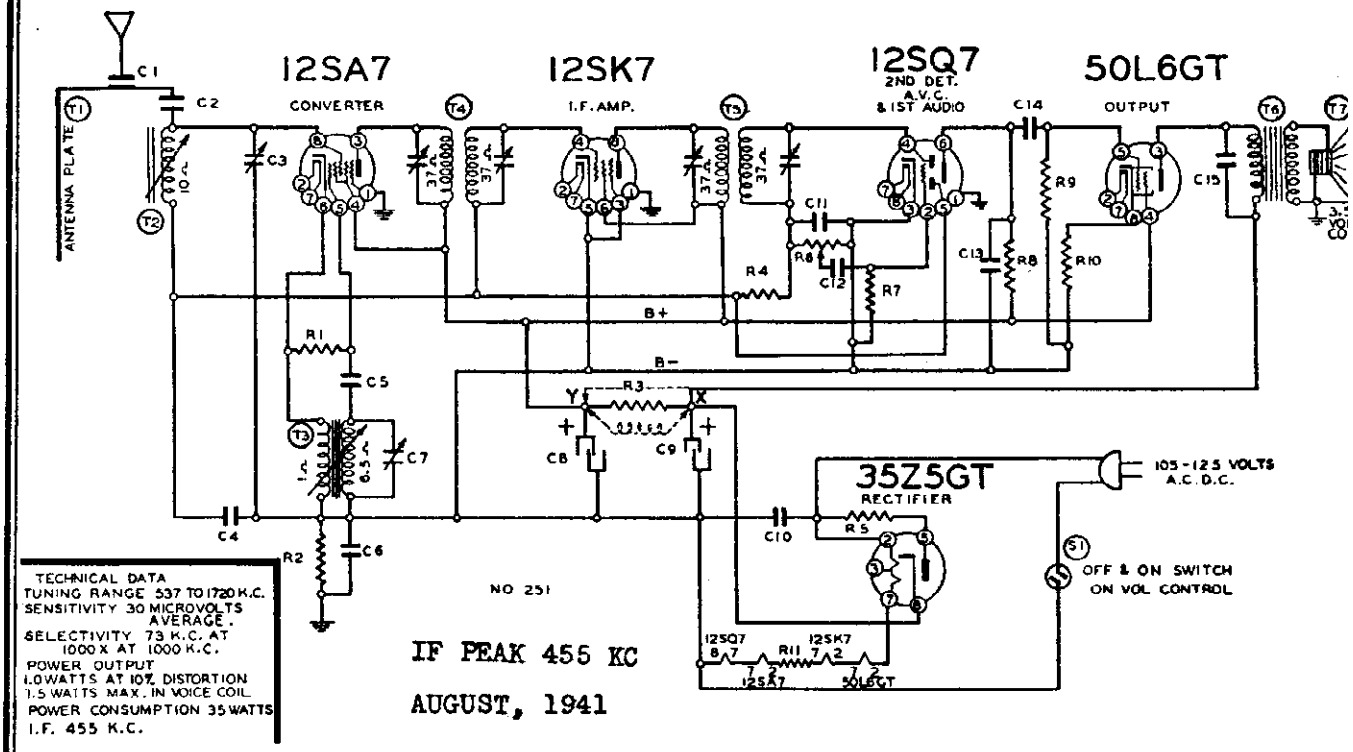
Power Consumption.....35 Watts

Power Output.....1 Watt Undistorted, 1.5 Watts Maximum

Intermediate Frequency.....455 K.C.

FOR SCHEMATIC AND OTHER DATA SEE RIDER'S VOL.XII

GAMBLE-SKOGMO, INC.



On sets which use an electro-dynamic speaker 114260, R3 is replaced by the speaker field and the B+ lead for output transformer is connected to point Y.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Replacement Parts List

Part No.	Schematic Diagram Reference	Description	No. Used In Set	Selling Price Each
		CONDENSERS		
1009	C4	.05 x 200 Volt Tubular Condenser	1	.25
10011	C14, C15	.01 x 400 Volt Tubular Condenser	2	.25
10013	C10	.05 x 400 Volt Tubular Condenser	1	.25
10025	C12	.002 x 600 Volt Tubular Condenser	1	.25
10091	C6	.15 x 400 Volt Tubular Condenser	1	.25
11992	C8, C9	Electrolytic Filter Condenser. 50 to 60 Cycles. 20 Mfd. x 150 V.; 40 Mfd. x 150 V.	1	1.50
11993	C8, C9	Electrolytic Filter Condenser. 25 Cycles 40 Mfd. x 150 V.; 60 Mfd x 150 V.		1.75
124137	C3, C7	Ant. and Osc. Dual Trimmer Condenser	1	.35
129114	C2	.0003 Mica Type Condenser—20%	1	.25
12939	C5	.00005 Mica Type Condenser—20%	1	.25
12912	C11	.00025 Mica Type Condenser—20%	1	.25
1292	C13	.0005 Mica Type Condenser—20%	1	.25
		RESISTORS		
101272	R6, S1	Volume Control and Switch (500M Ohms)	1	1.00
130176	R1	20M Ohm—½ Watt Resistor—10%	1	.20
130293	R11	30 Ohm—1 Watt Resistor—20%	1	.20
130100	R2, R8	150M Ohm—½ Watt Resistor—20%	2	.20
130240	R5	30 Ohm—½ Watt Resistor—10%	1	.20
1304	R4	3 Megohm—½ Watt Resistor—20%	1	.20
130257	R7	5 Megohm—½ Watt Resistor—25%	1	.20
13011	R9	250M Ohm—½ Watt Resistor—20%	1	.20
130166	R10	150 Ohm—½ Watt Resistor—10%	1	.20
130287	R3	1200 Ohm—1 Watt Resistor—10% Used only when P. M. Dynamic Speaker is used.	1	.20
114268	T7			
114260	T7			
105139	T6			
108157H	T4			
1081570	T5			
13618	T2, T3			
128657-36				
128657-9				
115779-18	T1			
115779-9	T1			
131193				
131356				
10798E				
121171				
1121010				
1121008				
13143				
1121006				
1209				
120184				
128523-17				
128523-8				

SPEAKER

Four Inch P.M. Dynamic Speaker (Less Output Transformer).	1	2.5
or		
Four Inch Electrodynamic Speaker. (Less Output Transformer).	1	2.5
Output Transformer for Either Speaker	1	1.0

COILS

Input I.F. Coil Complete in Can	1	1.0
Output I.F. Coil Complete in Can	1	1.0
Ant. and Osc. Coil Permeability Tuning Unit Complete—Ready to Mount	1	3.5

MISCELLANEOUS

Bakelite Cabinet—Walnut	1	2.0
Bakelite Cabinet—Ivory Color	1	3.0
Antenna Plate—Walnut Color	1	.1
Antenna Plate—Ivory Color	1	.2
Snap-in Rivets to Fasten Ant. Plate	2	.0
Snap-in Rivets to Fasten Ant. Plate	2	.0
Line Cord and Plug	1	.5
Eight Prong Octal Wafer Socket	5	.1

DIAL AND TUNING PARTS

Dial Scale	1	.4
Crystal for Dial Scale	1	.1
Snap-in Rivets to Fasten Crystal	2	.0
Pointer	1	.1
String for Dial	Yd.	.1
Coiled Tension Spring for Dial String	1	.0
Knob—Walnut	2	.1
Knob—Ivory	2	.1

MODEL C5D14

GAMBLE-SKOGMO, INC.

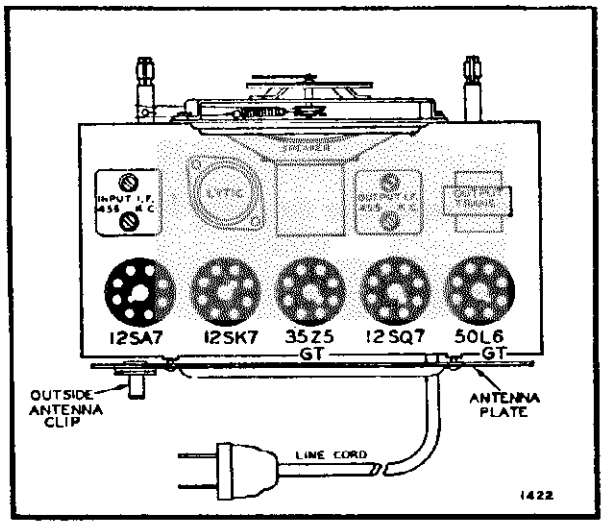
ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect B— of radio chassis to ground post of signal generator through .1 Mfd. condenser.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Iron Cores (Dial Setting)	Adjust Trimmers to Maximum (in Order Shown)
I. F.	455 Kc.	.1 MFD.	Connect to Metal Antenna Backplate	Iron Cores All the way out	Two trimmers on top of output I. F. can
	455 Kc.	.1 MFD.	Connect to Metal Antenna Backplate	Iron Cores All the way out	Two trimmers on top of input I. F. can
BROAD-CAST BAND	1720 Kc.	.1 MFD.	Connect to Metal Antenna Backplate	Iron Cores All the way out	Osc. Trimmer (C7) (See voltage chart)
	1720 Kc.	200 MMF.	Connect to Outside Antenna Clip	Iron Cores All the way out	Ant. Trimmer (C3) (See voltage chart)
	1400 Kc.	200 MMF.	Connect to Outside Antenna Clip	Turn Dial to 1400 Kc.	Adjust position of antenna coil (See coil assembly view)
	1720 Kc.	200 MMF.	Connect to Outside Antenna Clip	Turn Dial to 1720 Kc.	Adjust trimmer (C3) (See voltage chart)

NOTE "A"—The antenna coil assembly is made so that it is movable. When making the adjustment as given in the alignment procedure move the coil assembly very slowly. It can be moved by hand or by pivoting one edge of the blade of a screwdriver in the hole and engaging the blade in the gear teeth of the coil form.

NOTE "B"—After the antenna coil has been tracked at 1400 Kc. it is necessary to check the antenna trimmer (C3) adjustment again at 1720 Kc. If no appreciable change in trimmer adjustment is made the coil is in track. If the trimmer requires considerable change it will be necessary to again adjust the position of the antenna coil at 1400 Kc. These two adjustments should be tried several times until no change of trimmer adjustment is required at 1720 Kc.

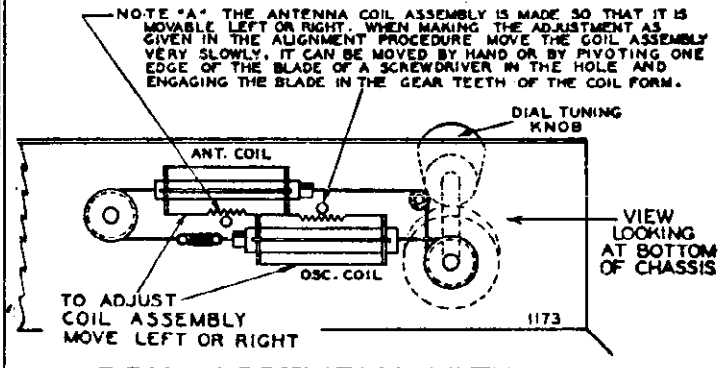


CHASSIS VIEW, showing tube location and the outside antenna clip.

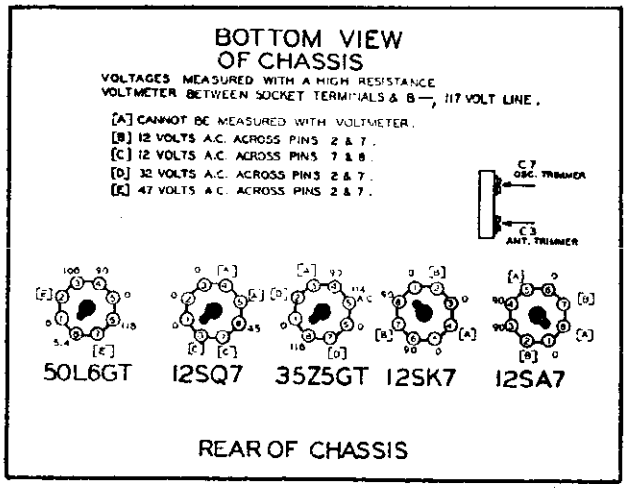
Antenna

This radio is designed to pick up strong local stations without requiring an outside antenna. For best results, however, an outside antenna approximately 50 to 75 feet long including lead-in is recommended. It should be erected as high as possible and as far from surrounding objects as practical. For minimum interference it should be at right angles to street car lines, incoming power lines and other electrical apparatus which may be in the vicinity. A ground is not required.

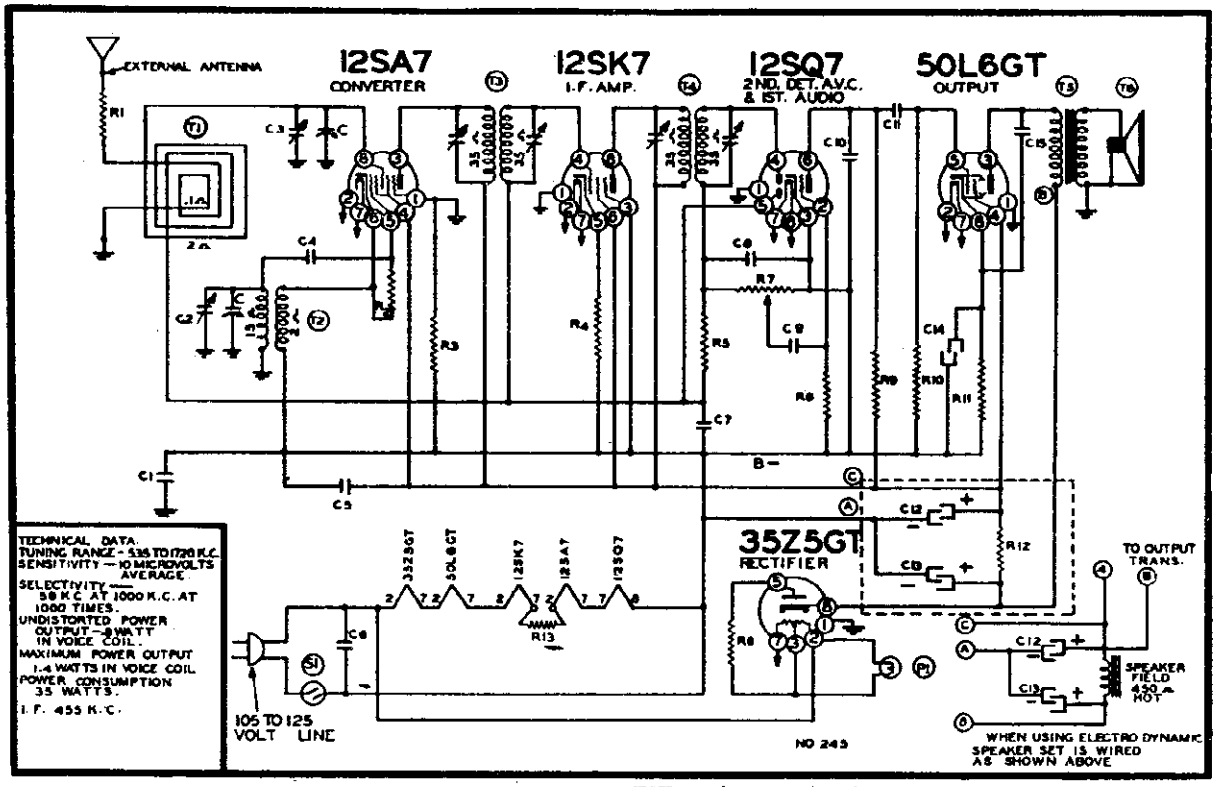
Periodic inspection of the antenna system is recommended to be sure that all connections are clean and tight, and that the antenna is well insulated from the ground at all points.



COIL ASSEMBLY VIEW



GAMBLE-SKOGMO, INC.

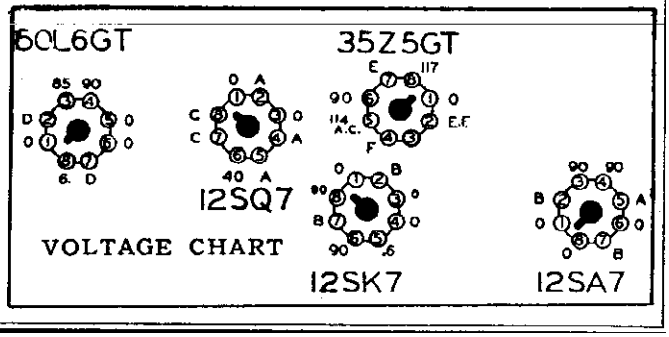


A - CANNOT BE MEASURED WITH VOLTMETER
B - 12 VOLTS A C ACROSS PINS 2-7
C - 12 VOLTS A C ACROSS PINS 7-8
D - 48 VOLTS A C ACROSS PINS 2-7
E - 225 VOLTS A C ACROSS PINS 2-7
F - 117 VOLTS A C ACROSS PINS 2-4

Part No.	Schematic Diagram Reference	Description	No. Used In Set	Selling Price Each
CONDENSERS				
102151	C, C2	Two Gang Variable Condenser with Osc. Trimmer Condenser	1	2.50
1001	C6	.1 x 400 Volt Tubular Condenser	1	.25
1009	C5, C7	.05 x 200 Volt Tubular Condenser	2	.25
10025	C9	.002 x 600 Volt Tubular Condenser	1	.25
10091	C1	.15 x 400 Volt Tubular Condenser	1	.25
100106	C11	.004 x 600 Volt Tubular Condenser	1	.25
10026	C15	.02 x 400 Volt Tubular Condenser	1	.25
119134	C12, C13, C14	Electrolytic Filter Condenser, 25 to 60 Cycles. 20 Mfd. x 150 V.; 40 Mfd. x 150 V.; 40 Mfd. x 25 V.	1	1.25
124180	C3	Antenna Trimmer	1	.55
12921	C4	.0002 Mica Type Condenser—20%	1	.25
1295	C8	.0001 Mica Type Condenser—20%	1	.25
12912	C10	.00025 Mica Type Condenser—20%	1	.25
RESISTORS				
101265	R7, S1	Volume Control and Switch (1 Megohm)	1	1.00
13094	R2	50M Ohm—½ Watt Resistor—10%	1	.20
130215	R6	25 Ohm—½ Watt Resistor—10%	1	.20
1309	R3	200M Ohm—½ Watt Resistor—20%	1	.20
13097	R4	200 Ohm—½ Watt Resistor—10%	1	.20
1304	R5	3 Megohm—½ Watt Resistor—20%	1	.20
130257	R8	5 Megohm—½ Watt Resistor—25%	1	.20
1303	R9	500M Ohm—½ Watt Resistor—20%	1	.20
13037	R10	750M Ohm—½ Watt Resistor—20%	1	.20
130166	R11	150 Ohm—½ Watt Resistor—10%	1	.20
130287	R12	1200 Ohm—1 Watt Resistor—10%	1	.20
130293	R13	30 Ohm—1 Watt Resistor—10%	1	.20
13026	R1	1M Ohm—½ Watt Resistor—10%	1	.20
COILS				
108140N	T3	Input I.F. Coil Complete in Can	1	1.00
108141G	T4	Output I.F. Coil Complete in Can	1	1.00
110187	T2	Oscillator Coil	1	.50
111258	T1	Loop Antenna (Specify Color)	1	1.25
128730		Cardboard Back Only (Specify Color)	1	.10
SPEAKER				
114251	T6	Five Inch P.M. Dynamic Speaker Less Output Transformer	1	3.50
		or		
114258	T6	Five Inch Electro Dynamic Speaker Less Output Transformer	1	3.50
105108D	T5	Output Transformer	1	1.00
DIAL AND TUNING PARTS				
107249	P1	6-8 Volt Pilot Lite Bulb, Type T-47	1	.10
107389B		Socket Assembly for Dial Light	1	.10
1121000		Dial Scale	1	1.75
112998		Diffuser for Dial	1	.10
131211		Snap-in Rivets to Fasten Dial Scale	2	.01
112999		Pointer	1	.10
120145		Coiled Tension Spring for Dial String	1	.05
1209		String for Dial	Yard	.15
117919		Tuning Shaft	1	.10
128686-37		Knob—Walnut—"Volume"	1	.20
128687-37		Knob—Walnut—"Tuning"	1	.20
128686-8		Knob—Ivory—"Volume"	1	.20
128687-8		Knob—Ivory—"Tuning"	1	.20

BOTTOM VIEW OF CHASSIS

ALL VOLTAGES MEASURED BETWEEN SOCKET PIN & B-, WITH A 1000 OHMS PER VOLT VOLTMETER. 117 VOLT LINE.



MODEL 534

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect — B of radio chassis to ground post of signal generator through .1 Mfd. condenser.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- 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 Mfd., and 200 Mmf.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (In Order Shown)	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Grid of 12SK7 I. F. Tube	Rotor full open (Plates out of mesh)	Two trimmers on top (See Top View)	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 12SA7	Rotor full open (Plates out of mesh)	Two trimmers on top (See Top View)	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1650 Kc.	.1 MFD.	Grid of 12SA7	Rotor full open (Plates out of mesh)	Trimmer—Bottom of gang (See Top View)	Oscillator	Adjust to maximum output
	1400 Kc.		(See Note "A" and "B")	Set dial at 1400 Kc.	Trimmer—Bottom of gang (See Top View)	Antenna	(See Note "A") Adjust to maximum output

Loop aerial should be connected when aligning receiver.

NOTE "A"—Mount the chassis and the loop antenna in the cabinet, connect the loop antenna to the chassis. Adjust the antenna trimmer through hole in bottom of cabinet.

NOTE "B"—Lay the output lead from the signal generator in back of the loop antenna. Turn up the output of the generator, picking up the energy in the loop antenna without any electrical connection from the signal generator.

MODEL C5D15

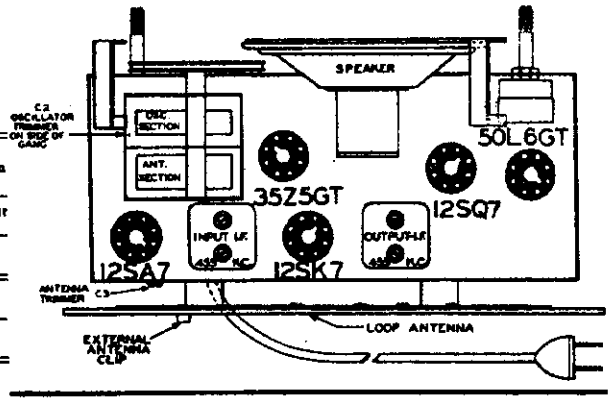
ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect B— to ground post of signal generator.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted to Maximum (In Order Shown)
I. F.	455 Kc.	.1 MFD.	Grid of 12SK7 I. F. Tube	Rotor full open (Plates out of mesh)	Two trimmers on top of Output (See Chassis View)
	455 Kc.	.1 MFD.	Grid of 12SA7	Rotor full open (Plates out of mesh)	Two trimmers on top of Input (See Chassis View)
BROAD-CAST BAND	1720 Kc.	.1 MFD.	Grid of 12SA7	Rotor full open (Plates out of mesh)	Oscillator Trimmer on gang (See Chassis View)
	1400 Kc.		(See Note "A")	Set dial at 1400 Kc.	Antenna Trimmer C3 (See Chassis View)

Loop aerial should be connected when aligning receiver.

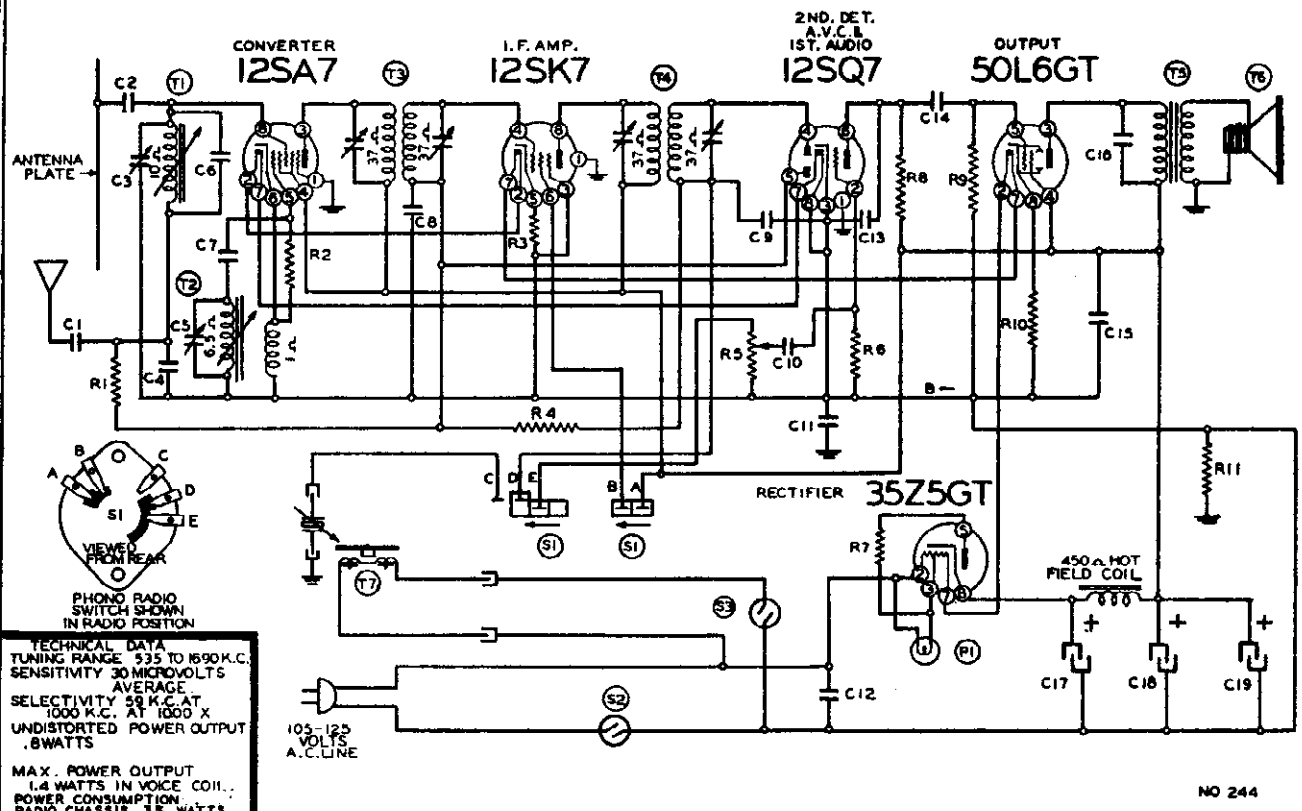
NOTE "A"—Lay the output lead from the signal generator in back of the loop antenna. Turn up the output of the generator, picking up the energy in the loop antenna without any electrical connection from the signal generator.



CHASSIS VIEW showing tube location.

NOTE: External Antenna Clip at back of chassis.

GAMBLE-SKOGMO, INC.



FOR OAK RECORD CHANGER SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

Replacement Parts List

Part No.	Schematic Diagram Reference	Description	No. Used In Set	Selling Price Each
CONDENSERS				
1009	C8, C15	.05 x 200 Volt Tubular Condenser	2	.25
100119	C11	.1 x 400 Volt Tubular Condenser	1	.25
10025	C10	.002 x 600 Volt Tubular Condenser	1	.25
10019	C14	.006 x 600 Volt Tubular Condenser	1	.25
10011	C16	.01 x 400 Volt Tubular Condenser	1	.25
1001	C12	.1 x 400 Volt Tubular Condenser	1	.25
11994	C17, C18, C19	Electrolytic Filter Condenser. 50 to 60 Cycles. 40 Mfd. x 150 V.; 20 Mfd. x 150 V.; 20 Mfd. x 150 V.	1	1.50
11995	C17, C18, C19	Electrolytic Filter Condenser. 25 Cycles. 60 Mfd. x 150 V.; 40 Mfd. x 150 V.; 40 Mfd. x 150 V.		2.00
124136	C3, C5	Ant. and Osc. Dual Trimmer Condenser	1	.35
129114	C2	.0003 Mica Type Condenser—20%	1	.25
1295	C1, C7, C9	.0001 Mica Type Condenser—20	3	.25
129162	C4	.0008 Mica Type Condenser—10%	1	.25
12912	C13	.00025 Mica Type Condenser—20%	1	.25
129183	C6	.00005 Ceramicon Condenser—10%	1	.35
RESISTORS				
101266	R5, S2	Volume Control and Switch (500M Ohms)	1	1.00
1309	R1, R11	200M Ohm—½ Watt Resistor—20%	2	.20
130176	R2	20M Ohm—½ Watt Resistor—10%	1	.20
130168	R3	100 Ohm—½ Watt Resistor—10%	1	.20
1304	R4	3 Megohm—½ Watt Resistor—20%	1	.20
13011	R8	250M Ohm—½ Watt Resistor—20%	1	.20
130257	R6	5 Megohm—½ Watt Resistor—25%	1	.20
130215	R7	25 Ohm—½ Watt Resistor—10%	1	.20
13037	R9	750M Ohm—½ Watt Resistor—20%	1	.20
130293	R12	30 Ohm—1 Watt Resistor—20%	1	.20
		Following Resistors Used Only When P.M. Dynamic Speaker is Used:		
130166	R10	150 Ohm—½ Watt Resistor—10%	1	.20
13097		200 Ohm—½ Watt Resistor—10%	1	.20
130287		1200 Ohm—1 Watt Resistor—10%	1	.20

COILS

108140L T3	Input I.F. Coil Complete in Can	1	1.00
108145E T4	Output I.F. Coil Complete in Can	1	1.00
13616 T1, T2	Ant. and Osc. Coil Permeability Unit Complete Ready to Mount	1	3.75

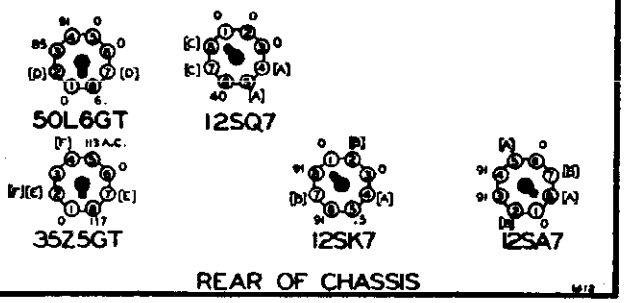
SPEAKER

114257 T6	Five Inch Electrodynamic Speaker (Less Output Transformer)	1	3.50
	OR		
114198B T6	Five Inch P.M. Dynamic Speaker (Less Output Transformer)	1	3.50
105108C T5	Output Transformer for Speaker	1	1.00

BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH A HIGH RESISTANCE VOLTMETER BETWEEN SOCKET TERMINALS & 'B' MINUS.
PHONO-RADIO SWITCH TO BE IN RADIO POSITION.
VOLUME CONTROL AT MINIMUM & NO SIGNAL.
117 VOLT LINE.

[A] - CANNOT BE MEASURED WITH VOLTMETER.
[B] - 11 VOLTS A.C. ACROSS PINS 2 & 7.
[C] - 11 VOLTS A.C. ACROSS PINS 7 & 8.
[D] - 47 VOLTS A.C. ACROSS PINS 2 & 7.
[E] - 34 VOLTS A.C. ACROSS PINS 2 & 7.
[F] - 117 VOLTS A.C. ACROSS PINS 2 & 4.



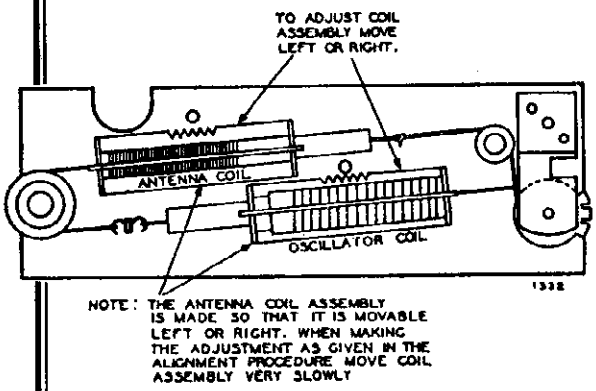
REAR OF CHASSIS

VOLTAGE CHART

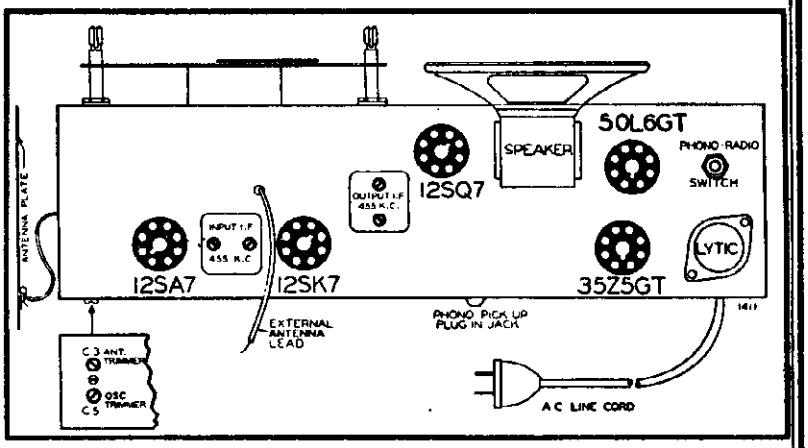
MODEL C5D16

GAMBLE-SKOGMO, INC.

POWER SUPPLY— Unless your radio is marked otherwise, it must be operated from 105 to 125 volts, 60 cycle A.C. If in doubt, phone your electric light company. Receivers of this same model which are for use on special voltages are marked accordingly. Reversing the plug may reduce station hum.



COIL ASSEMBLY VIEW



CHASSIS VIEW—Showing tube location and type. Note External Antenna Lead at back of chassis.

Antenna

This radio is designed to pick up strong local stations without requiring an outside antenna. **For best results, however,** an outside antenna approximately 50 to 75 feet long including lead-in is recommended. It should be erected as high as possible and as far from surrounding objects as practical. For minimum interference it should be at right angles to street car lines, incoming power lines and other electrical apparatus which may be in the vicinity. **A ground is not required.**

Periodic inspection of the antenna system is recommended to be sure that all connections are clean and tight, and that the antenna is well insulated from the ground at all points.

ALIGNMENT PROCEDURE

- Connect B— of radio chassis to ground post of signal generator through .1 Mfd. condenser.
- Volume control—Maximum all adjustments.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Iron Cores (Dial Setting)	Trimmers Adjusted to Maximum (in Order Shown)
I. F.	455 Kc.	.1 MFD.	Connect to Antenna Plate	Iron Cores All the way out	Two trimmers on top of output I.F. (See Chassis View)
	455 Kc.	.1 MFD.	Connect to Antenna Plate	Iron Cores All the way out	Two trimmers on top of input I.F. (See Chassis View)
BROAD-CAST BAND	1690 Kc.	.1 MFD.	Connect to Antenna Plate	Iron Cores All the way out	Oscillator trimmer (C5) (See Chassis View)
	1690 Kc.	200 MMF.	Connect to Antenna Plate	Iron Cores All the way out	Antenna trimmer (C3) (See Chassis View)
	1400 Kc.	200 MMF.	Connect to Antenna Plate	Turn Dial to 1400 Kc.	Adjust position of antenna coil right or left. (See Note "A")
	1690 Kc.	200 MMF.	Connect to Antenna Plate	Turn Dial to 1690 Kc.	Adjust antenna trimmer (C3) (See Chassis View) (See Note "B")

NOTE "A"—The antenna coil assembly is made so that it is movable right or left. When making the adjustment as given in the alignment procedure move the coil assembly very slowly. It can be moved by hand or by pivoting one edge of the blade of a screwdriver in the hole and engaging the blade in the gear teeth of the coil form.

NOTE "B"—After the antenna coil has been tracked at 1400 Kc. it is necessary to check the antenna trimmer (C3) adjustment again at 1690 Kc. If no appreciable change in trimmer adjustment is made the coil is in track, if the trimmer requires considerable change it will be necessary to again adjust the position of the antenna coil at 1400 Kc. These two adjustments should be tried several times until no change of trimmer adjustment is required at 1690 Kc.

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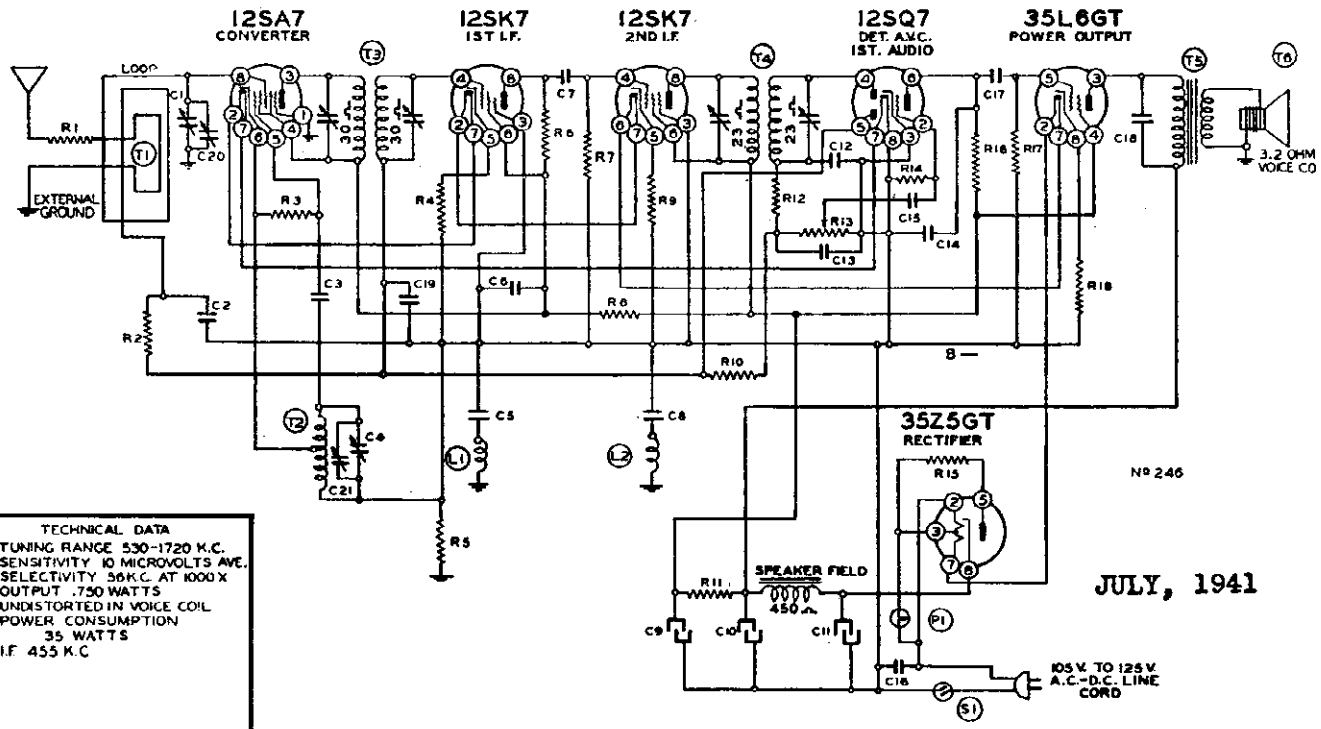


TECHNICAL DATA
TUNING RANGE 530-1720 K.C.
SENSITIVITY 10 MICROVOLTS AVE.
SELECTIVITY 36K.C. AT 1000 X
OUTPUT .750 WATTS
UNDISTORTED IN VOICE COIL
POWER CONSUMPTION
35 WATTS
I.F. 455 K.C.

JULY, 1941

Replacement Parts List

In ordering parts refer to model number on chassis label.

Use Only Genuine Factory Replacement Parts.

Part No.	Schematic Diagram Reference	Description	No. Used In Set	Selling Price Each
CONDENSERS				
102153	C1, C4, C20, C21	Two Gang Condenser Complete with Tuner Assembly and Ant. and Osc. Trimmers	1	6.00
10026	C8, C17, C18	.02 x 400 Volt Tubular Condenser	3	.25
10025	C15	.002 x 600 Volt Tubular Condenser	1	.25
1009	C2, C19	.05 x 200 Volt Tubular Condenser	2	.25
10020	C6	.1 x 200 Volt Tubular Condenser	1	.25
100110	C5	.2 x 400 Volt Tubular Condenser	1	.25
1001	C16	.1 x 400 Volt Tubular Condenser	1	.25
119135	C9, C10, C11	Electrolytic Filter Condenser, 20 Mfd. x 150 V.; 20 Mfd. x 150 V.; 40 Mfd. x 150 V.	1	1.25
1295	C3, C7, C12, C13, C14	.0001 Mica Type Condenser—20%	5	.25
RESISTORS				
101274	R13, S1	Volume Control and Switch (1 Megohm)	1	1.00
13082	R6	10M Ohm—½ Watt Resistor—10%	1	.20
1304	R10	3 Megohm—½ Watt Resistor—20%	1	.20
13021	R3	20M Ohm—½ Watt Resistor—20%	1	.20
130166	R18	150 Ohm—½ Watt Resistor—10%	1	.20
13097	R11	200 Ohm—1 Watt Resistor—10%	1	.20
130215	R15	25 Ohm—½ Watt Resistor—10%	1	.20
13019	R17	1 Megohm—½ Watt Resistor—20%	1	.20
130257	R14	5 Megohm—½ Watt Resistor—25%	1	.20
13020	R12	100M Ohm—½ Watt Resistor—20%	1	.20
1309	R16	200M Ohm—½ Watt Resistor—20%	1	.20
130168	R4	100 Ohm—½ Watt Resistor—10%	1	.20
1303	R7	500M Ohm—½ Watt Resistor—20%	1	.20
13097	R9	200 Ohm—½ Watt Resistor—10%	1	.20
130345	R1, R8	1M Ohm —½ Watt Resistor—10%	1	.20
130100	R2, R5	150M Ohm—½ Watt Resistor—20%	2	.20
COILS				
108148P	T3	Input I. F. Coil Complete in Can	1	1.00
108145G	T4	Output I. F. Coil Complete in Can	1	1.00
110146	T2	Oscillator Coil	1	.75
111260	T1	Loop Antenna Assembly—Specify Color	1	1.25
105140	L1	I. F. Filter Choke	1	.05
105141	L2	Filter Choke	1	.05
SPEAKER				
114263	T6	4 x 6 Inch Oval Electrodynamic Speaker (Less Output Transformer)	1	3.50
105106B	T5	Output Transformer for Speaker	1	1.00

Part No.	Schematic Diagram Reference	Description	No. Used In Set	Selling Price Each
MISCELLANEOUS				
107249	P1	6-8 Volt Pilot Lite Bulb, Type T-47	1	.10
107389		Socket Assembly for Pilot Lite	1	.10
10798		Line Cord and Plug	1	.50
121210		8 Prong Molded Octal Sockets	6	.15
128659-36		Bakelite Cabinet—Walnut	1	3.75
128659-9		Bakelite Cabinet—Ivory Color	1	5.00
134123		Rubber Bumpers for Bottom of Cabinet	4	.03
131356		Snap-in Buttons to Fasten Back	4	.01
128740		Back for Cabinet—Brown	1	.10
128740B		Back for Cabinet—Ivory Color	1	.10
DIAL AND TUNING PARTS				
1121012		Dial Scale	1	.90
112998		Diffuser	1	.10
131211		Snap-in Rivets to Fasten Dial	2	.01
1121013		Pointer	1	.15
120377		Coiled Tension Spring for Dial String	2	.03
120214		String for Dial	Per Yd.	.15
120424		Spring—On Tuning Shaft	1	.03
1209		String for Tuning Shaft	Per Yd.	.15
117922		Tuning Shaft	1	.10
128699-18		Pushbuttons—Left—Walnut	3	.10
128700-18		Pushbuttons—Right—Walnut	3	.10
128699-9		Pushbuttons—Left—Ivory	3	.10
128700-9		Pushbuttons—Right—Ivory	3	.10
131383		Screw Driver	1	.10
128523-17		Knob Walnut	2	.10
128523-8		Knob—Ivory	2	.10
112973		Set of Station Call Letters	1	.15
112979		Set of Tabs for Call Letters	1	.10

All prices quoted are list and are subject to the usual trade discounts.

Shipments are F. O. B. our factory. When remitting in advance, please include postage. Prices subject to change without notice.

WE CANNOT SUPPLY SPEAKER CONES OR FIELDS SEPARATELY, WE CAN REPLACE OR REPAIR A DAMAGED SPEAKER FOR $2.75 IF IT IS RETURNED TO OUR FACTORY, TRANSPORTATION CHARGES PREPAID.

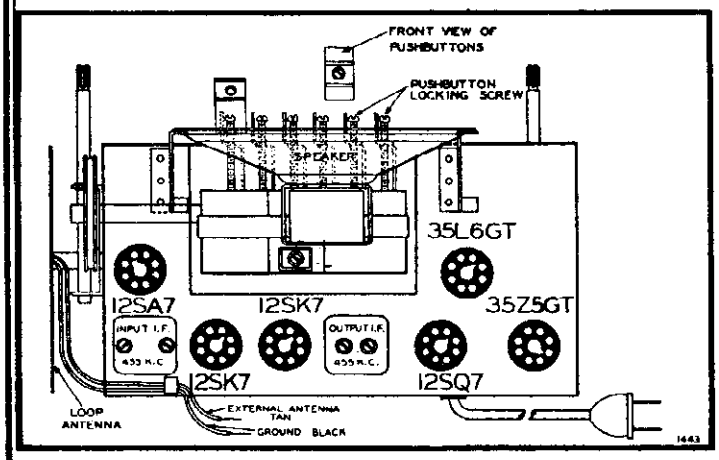
GAMBLE-SKOGMO, INC.

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect B— of radio chassis to ground post of signal generator through .1 Mfd. condenser.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted to Maximum
I. F.	455 Kc.	.1 MFD.	Grid of 12SK7 2nd I. F.	Rotor full open (Plates out of mesh)	Two trimmers on top of Output I. F.
	455 Kc.	.1 MFD.	Grid of 12SA7 Converter	Rotor full open (Plates out of mesh)	Two trimmers on top of Input I. F.
BROAD-CAST BAND	1720 Kc.	.1 mmf.	Grid of 12SA7	Rotor full open (Plates out of mesh)	Osc. trimmer C21 See voltage chart view
	1400 Kc.	200 mmf.	External Antenna and B—	Set Dial at 1400 K. C.	Ant. trimmer C20 See voltage chart view

The loop antenna should be connected to the radio and in its proper position when making all adjustments.



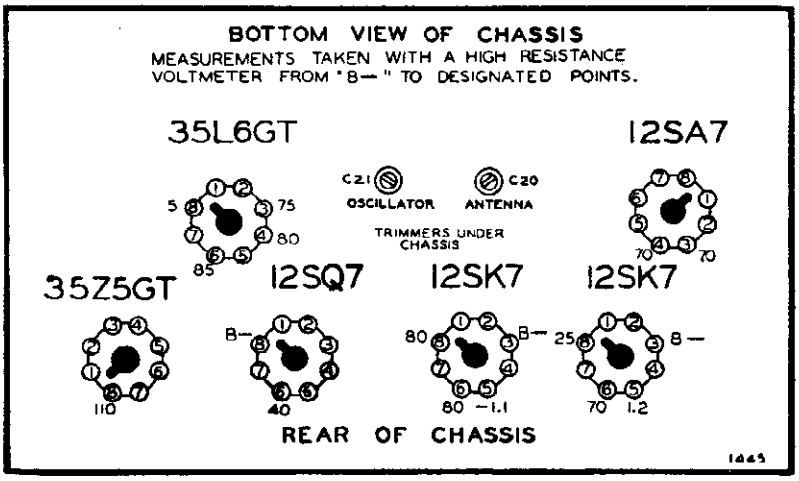
Chassis View, Showing Tube Location and the External Antenna and Ground Leads

Setting the Pushbuttons

Make a list of your 6 favorite stations—push out the call letters of these stations from the call letter sheets supplied. Next insert a long slim screw driver into the hole in front of one of the pushbuttons and unscrew the pushbutton locking screw (to the left) several turns. Now with the screw driver still engaged in the locking screw slot push it all the way in. Hold it in this position and tune in the station you want with the tuning knob. Now tighten up the pushbutton locking screw by turning it to the right. Tighten firmly. Continue setting each button in the same way. When you have set your stations insert the call letter of each station in the front of the proper button and put one of the celluloid tabs over the station call letter.

To change stations simply repeat the above procedure.

If you are unable to set a station on any particular button it is probably because the pushbutton locking screw has not been unloosened (turned to the left).



VOLTAGE CHART

Unless your radio is marked otherwise, it must be operated from 105 to 125 volts, 50 to 60 cycle, or the same D. C. Voltage. If in doubt, phone your electric light company. Receivers of this same model which are for use on special voltages are marked accordingly. When using your radio on A. C., reversing the plug may reduce station hum. If set does not operate in one minute on direct current reverse the plug.

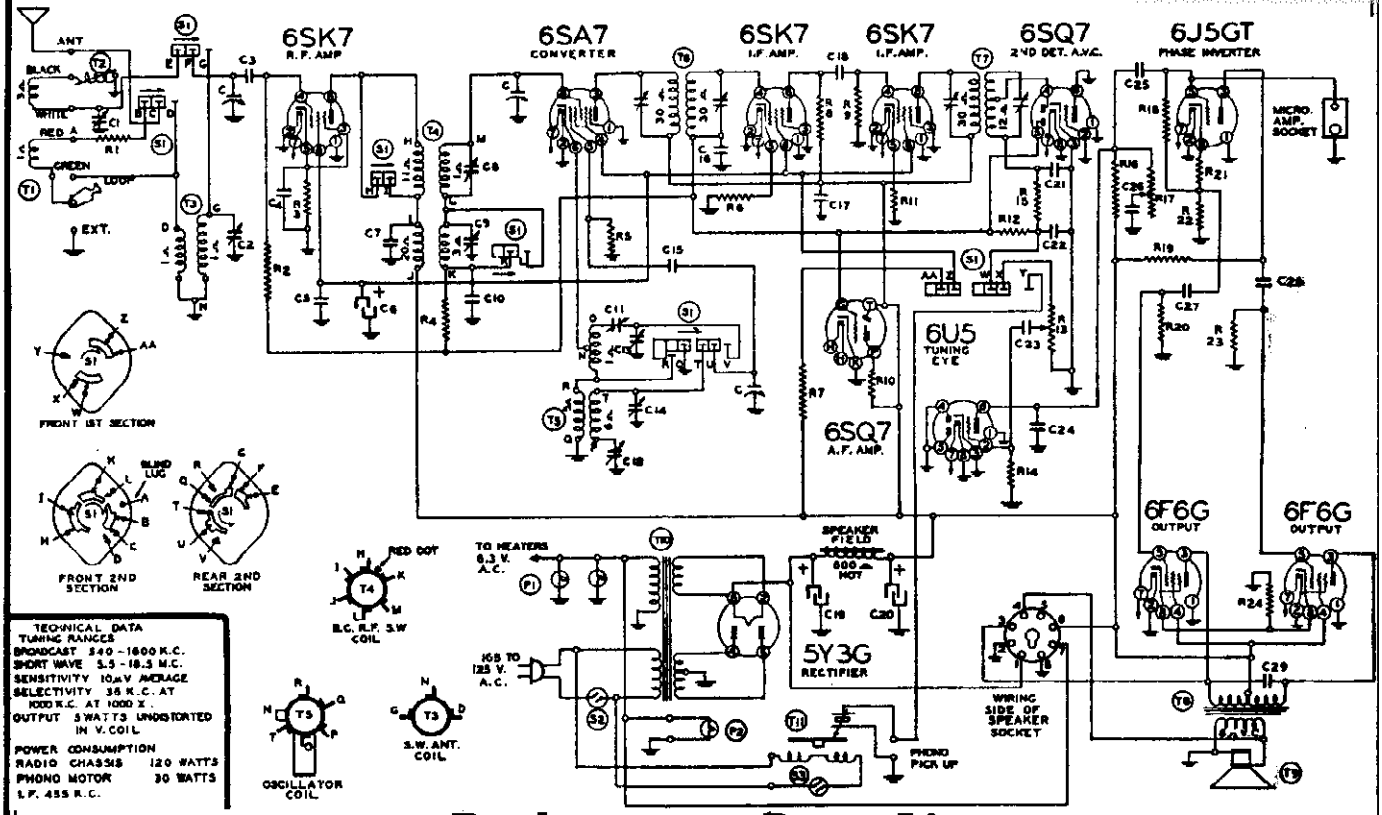
Antenna

This radio is designed to pick up strong local stations without requiring an outside antenna. The built-in aerial may be somewhat directional therefore try the radio in several positions.

For best results, however, an outside antenna approximately 50 to 75 feet long including lead-in is recommended. It should be erected as high as possible and as far from surrounding objects as practical. For minimum interference it should be at right angles to street car lines, incoming power lines and other electrical apparatus which may be in the vicinity. A ground is advisable. A good ground will often reduce noise. The ground wire should be connected with a clamp to a well cleaned water pipe or to a piece of pipe driven several feet into damp earth.

Periodic inspection of the antenna and ground system is recommended to be sure that all connections are clean and tight, and that the antenna is well insulated from the ground at all points.

GAMBLE-SKOGMO, INC.



TECHNICAL DATA
TUNING RANGES
BROADCAST 540 - 1600 K.C.
SHORT WAVE 5.5 - 18.5 M.C.
SENSITIVITY 10μV AVERAGE
SELECTIVITY 35 K.C. AT 1000 K.C. AT 1000 K.
OUTPUT 5 WATTS UNDISTORTED IN V. COIL
POWER CONSUMPTION
RADIO CHASSIS 120 WATTS
PHONO MOTOR 30 WATTS
I.F. 455 K.C.

Replacement Parts List

In ordering parts or writing refer to the model number

Part No.	Schematic Diagram Reference	Description	No. Used In Set	Price Each
		CONDENSERS		
102152	C	Three Gang Variable Condenser	1	4.00
10020	C4	.1 x 200 Volt Tubular Condenser	1	.25
10026	C10, C16, C25	.02 x 400 Volt Tubular Condenser	3	.25
10025	C23	.002 x 600 Volt Tubular Condenser	1	.25
1009	C27	.05 x 200 Volt Tubular Condenser	1	.25
10013	C28	.05 x 400 Volt Tubular Condenser	1	.25
10011	C26	.01 x 400 Volt Tubular Condenser	1	.25
10071	C29	.004 x 600 Volt Tubular Condenser	1	.25
100117	C5, C17	.25 x 400 Volt Tubular Condenser	2	.35
119124	C6, C19, C20	Electrolytic Filter Condenser—10 Mfd. x 350 V.; 25 Mfd. x 450 V.; 25 Mfd. x 450 V.	1	1.50
124180	C2	S.W. Antenna Trimmer	1	.55
124179	C8, C9	S.W. and B.C. R.F. Trimmer—Dual	1	.45
124181	C13, C14	S.W. and B.C. Osc. Trimmer—Dual	1	.40
124182	C1	B.C. Antenna Trimmer	1	.20
129157	C12	.000525 Compression Cond.—B.C. Pad	1	.35
1292	C3, C18	.0005 Mica Type Condenser—20%	2	.25
129160	C7	.0004 Mica Type Condenser—20%	1	.35
12939	C15	.00005 Mica Type Condenser—20%	1	.25
1295	C21, C22	.0001 Mica Type Condenser—2%	2	.25
129156	C11	.0024 Compression Mica Condenser	1	.50
12912	C24	.00025 Mica Type Condenser—20%	1	.25
		RESISTORS		
101270	R13, S2	Volume Control and Switch (500M Ohms)	1	1.25
101271	R17	Tone Control (1 Megohm)	1	.90
13019	R2, R18	1 Megohm—½ Watt Resistor—20%	2	.20
1305	R4	300M Ohm—½ Watt Resistor—20%	1	.20
130208	R5	40M Ohm—½ Watt Resistor—20%	1	.20
13054	R6, R11	500 Ohm—½ Watt Resistor—20%	2	.20
130263	R8	12M Ohm—½ Watt Resistor—20%	1	.20
13020	R9, R19, R22	100M Ohm—½ Watt Resistor—20%	3	.20
130304	R7	12M Ohm—2 Watt Resistor—10%	1	.20
13012	R15	50M Ohm—½ Watt Resistor—20%	1	.20
130170	R12	3 Megohm—½ Watt Resistor—25%	1	.20
130225	R14	15 Megohm—½ Watt Resistor—30%	1	.20
13043	R21	2500 Ohm—½ Watt Resistor—20%	1	.20
1303	R20, R23	500M Ohm—½ Watt Resistor—20%	2	.20
13011	R16	250M Ohm—½ Watt Resistor—20%	1	.20
130311	R24	300 Ohm—1 Watt Resistor—20%	1	.20
13099	R3	300 Ohm—½ Watt Resistor—20%	1	.20
13024	R1	400 Ohm—½ Watt Resistor—20%	1	.20
	R10	1 Megohm—In Eye Socket	1	.20
		COILS		
108169J	T6	Input I. F. Coil Complete in Can	1	1.00
108130C	T7	Output I.F. Coil Complete in Can	1	1.25
10957	T4	B.C.—S.W. R.F. Coil Complete in Can	1	1.25
110149	T5	B.C.—S.W. Oscillator Coil	1	.75
111176	T3	S.W. Antenna Coil	1	.50
111153	T2	Loop Adjusting Coil With Iron Slug	1	.50
111257	T1	Loop Antenna Assembly	1	2.00
		SPEAKER		
114261B	T9	Ten Inch Electrodynamic Speaker (Less Output Transformer)	1	6.00
		TRANSFORMERS		
10554F	T8	Output Transformer for Speaker	1	1.50
104202C	T10	Power Transformer, 50 to 60 Cycles 105-125 Volt Primary	1	4.50
104203C		Power Transformer 25 to 60 Cycles 105-125 Volt Primary		
		BANDSWITCH		
125179	S1	Band Switch Complete	1	1.50
		MISCELLANEOUS		
107266		Line Cord and Plug	1	.50
13489		Rubber Cushions to Float Chassis	4	.10
121308		Eight Prong Octal Molded Socket for Speaker	1	.15
121210		Eight Prong Octal Molded Socket	10	.15
107169		Socket and Cable Assembly for Tuning Eye	1	.75
10794	P1	6-8 Volt Pilot Lite Bulb Type T-44	2	.10
107395		Socket Assembly for Pilot Lite	2	.10
11757A		Bracket for Tuning Eye	1	.15
11757B		Clamp for Tuning Eye	1	.15
11757C		Wing Bolt for Above	1	.05
		DIAL AND TUNING PARTS		
1121014		Dial Scale	1	.60
131211		Snap-in Rivets to Fasten Dial Scale		.01
112935-B		Escutcheon and Crystal for Dial	1	1.50
112934B		Pointer	1	.15
128573 F-31		Knob—"Volume"	1	.20
128573C-31		Knob—"Tuning"	1	.20
128573E-31		Knob—"Tone"	1	.20
128572-31		Knob—"Band"	1	.20
117918		Tuning Shaft	1	.10
112826		Pulley with Bushing	1	.25
1209		String for Dial	Yd.	.15
120197		Coiled Tension Spring for Dial String	1	.05

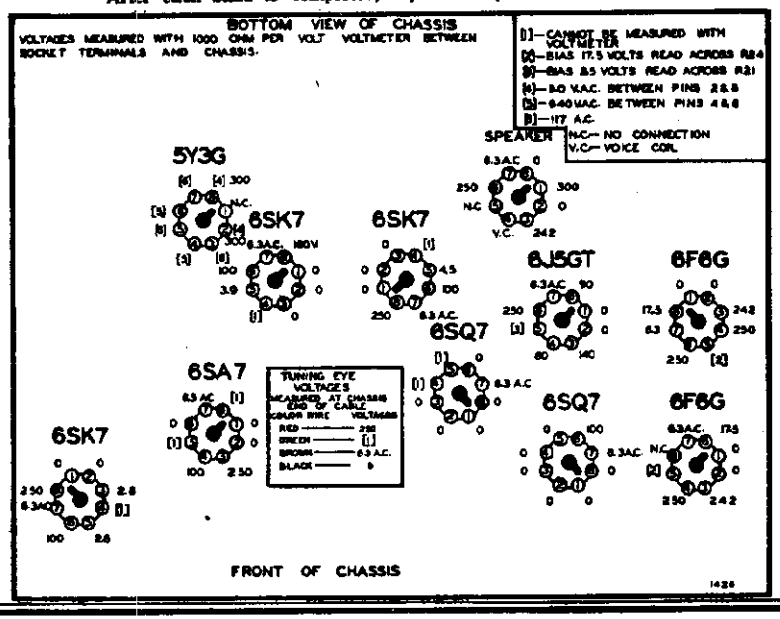
Alignment Procedure

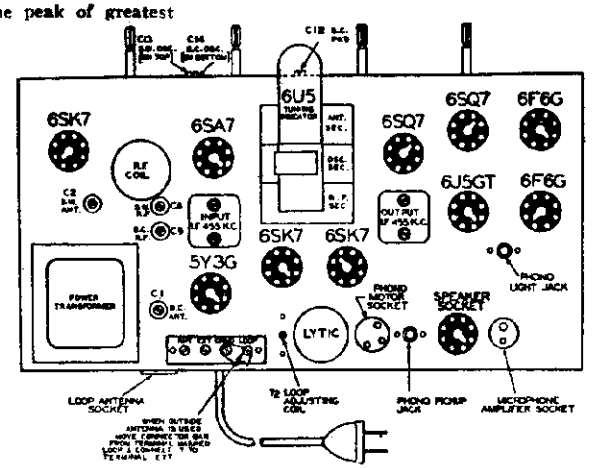
- Volume control—Maximum all adjustments.
- Connect dummy antenna value in series with generator output lead.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connect on to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted to Maximum (in Order Shown)
I. F.	455 Kc.	.1 MFD.	Grid of 6SK7 I. F.	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top Output I. F.
	455 Kc.	.1 MFD.	Grid of 6SA7 Mixer	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top Input I. F.
SHORT WAVE BAND	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	C13, S.W. Osc.
	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	C8, S.W. R.F., C2 S.W. Antenna
	6 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 6 Mc.	C11 S.W. Osc. Series Pad See Note "A"
BROAD-CAST BAND	1580 Kc.	200 mmf.	Grid of 6SK7 R. F. Tube	Broadcast	Rotor full open (Plates out of mesh)	C14 B.C. Osc.
	540 Kc.	200 mmf.	Grid of 6SK7 R. F. Tube	Broadcast	Set Dial at 540 Kc. (Plates in Mesh)	C12 B.C. Osc. Series Pad
	1400 Kc.	200 mmf.	Grid of 6SK7 R. F. Tube	Broadcast	Set Dial at 1400 Kc.	C9 B.C. R.F.
LOOP ALIGN-MENT	1400 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 1400 Kc.	C1 B.C. Ant.
	600 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 600 Kc.	T2 Iron Core Tracking Coil

NOTE "A"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

After each band is completed, repeat the procedure as a final check.





CHASSIS VIEW ANTENNA AND GROUND TERMINALS

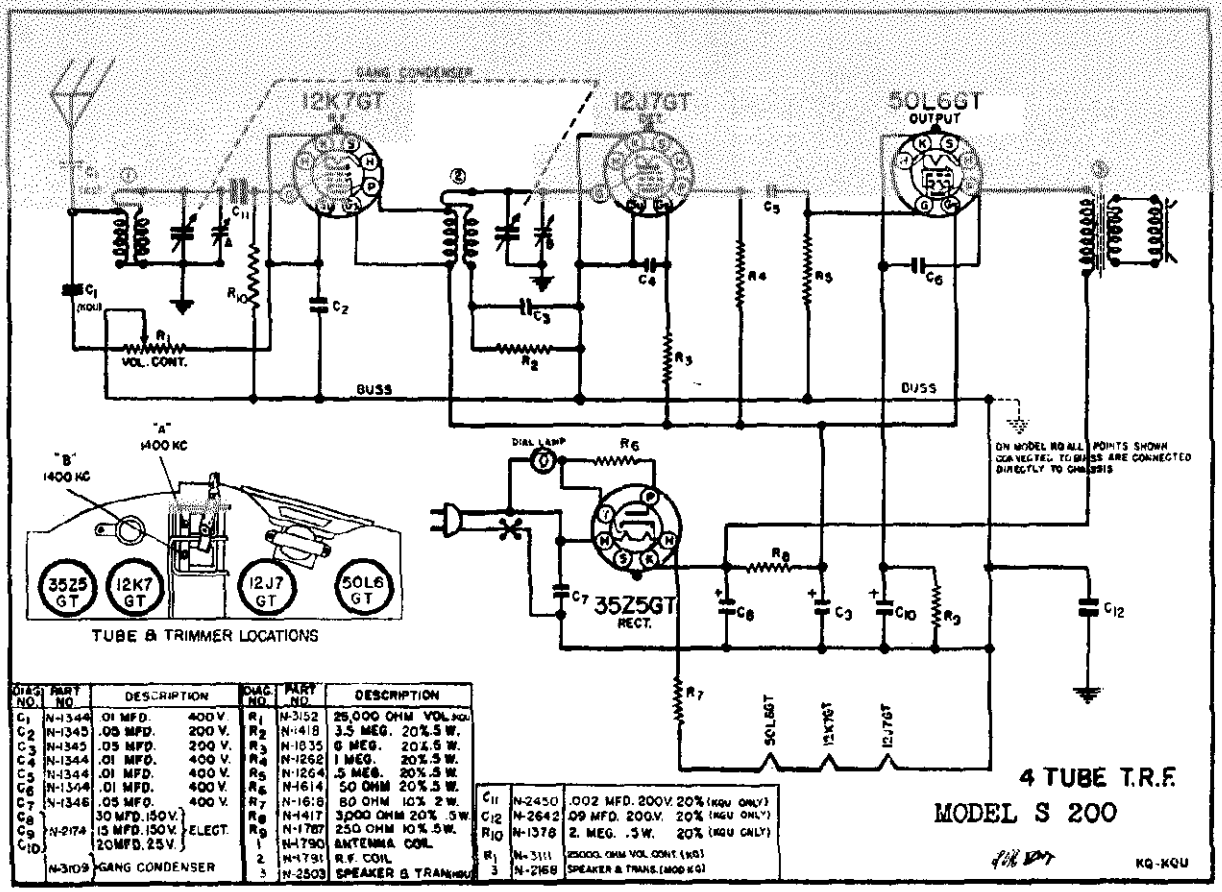
When using an external antenna and ground, move the metal strap (connector bar) from terminal marked LOOP and connect it to terminal marked EXT.

The antenna and ground wires should then be connected to the terminals marked "Ant."—"Gnd."

OCTOBER, 1941

FOR DATA ON THE OAK RECORD CHANGER, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

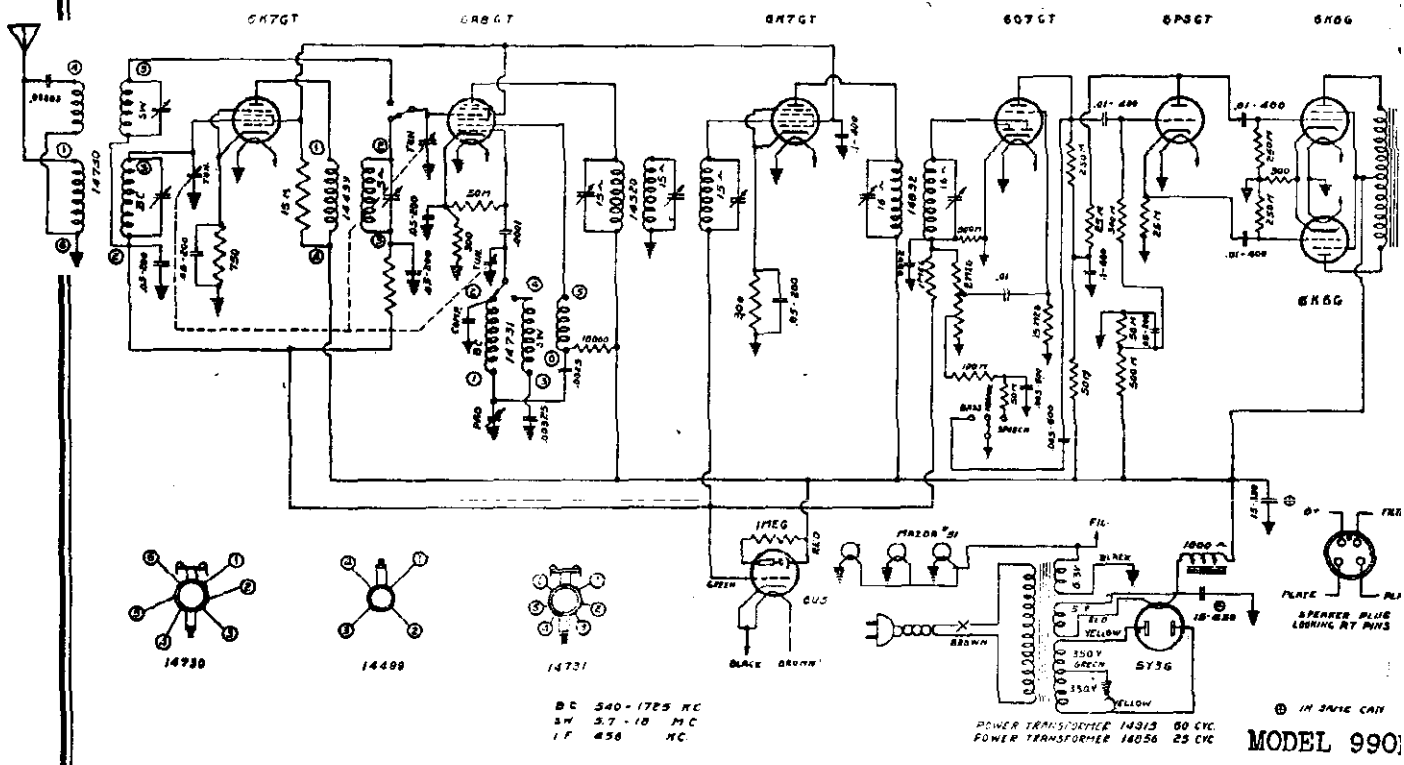
GAMBLE-SKOGMO, INC.



DIAG. NO.	PART NO.	DESCRIPTION	
C_1	N-1344	.01 MFD.	400 V.
C_2	N-1345	.05 MFD.	200 V.
C_3	N-1345	.05 MFD.	200 V.
C_4	N-1344	.01 MFD.	400 V.
C_5	N-1344	.01 MFD.	400 V.
C_6	N-1344	.01 MFD.	400 V.
C_7	N-1346	.05 MFD.	400 V.
C_8	N-2174	30 MFD. 150 V.	ELECT.
C_9		15 MFD. 150 V.	
C_{10}		20 MFD. 25 V.	
	N-3109	GANG CONDENSER	

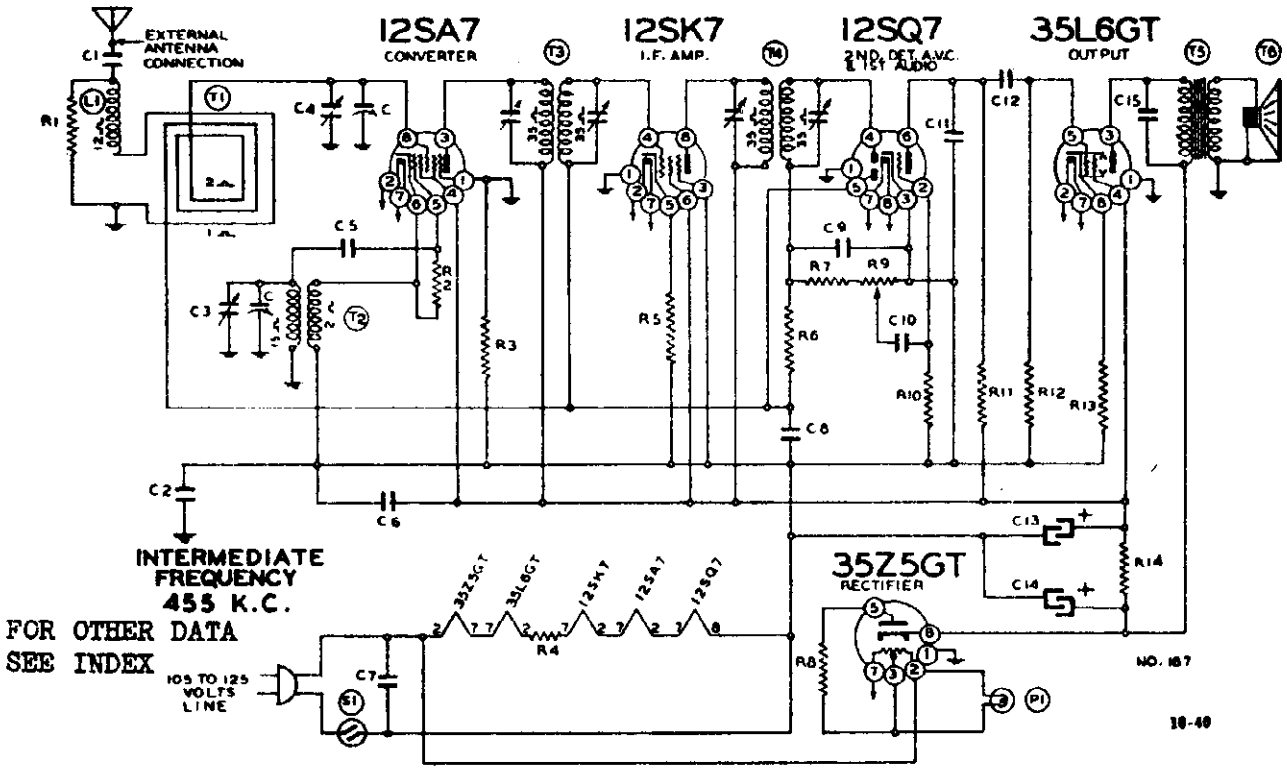
DIAG. NO.	PART NO.	DESCRIPTION
R_1	N-3152	25,000 OHM VOL. CONT.
R_2	N-1418	3.5 MEG. 20% .5 W.
R_3	N-1835	6 MEG. 20% .5 W.
R_4	N-1262	1 MEG. 20% .5 W.
R_5	N-1264	.5 MEG. 20% .5 W.
R_6	N-1614	50 OHM 20% .5 W.
R_7	N-1618	80 OHM 10% 2 W.
R_8	N-1417	3,000 OHM 20% .5 W.
R_9	N-1787	250 OHM 10% .5 W.
1	N-1790	ANTENNA COIL
2	N-1791	R.F. COIL
3	N-2503	SPEAKER & TRANSF.

C_{11}	N-2450	.002 MFD. 200 V. 20% (KQU ONLY)
C_{12}	N-2642	.09 MFD. 200 V. 20% (KQU ONLY)
R_{10}	N-1378	2. MEG. .5 W. 20% (KQU ONLY)
R_1	N-3111	25000 OHM VOL. CONT. (KQ)
3	N-2168	SPEAKER & TRANS. (MOD KQ)



MODEL 534

GAMBLE-SKOGMO, INC.



Replacement Parts List

CONDENSERS

C	102132	2 gang variable condenser
C1	10011	.01 x 400 v.
C2	10091	.15 x 400 v.
C3		Oscillator trimmer on gang
C4		Antenna trimmer on gang
C5	12921	.0002 mfd. mica
C6	1009	.05 x 200 v.
C7	1001	.1 x 400 v.
C8	1009	.05 x 200 v.
C9	1295	.0001 mfd. mica
C10	10025	.002 x 600 v.
C11	12912	.00025 mfd. mica
C12	100106	.004 x 600 v.
C13	11992	20 mfd. lytic x 150 w. v.
C14	11992	40 mfd. lytic x 150 w. v.
C15	10026	.02 x 400 v.

C13 and C14 are in same unit

PARTS

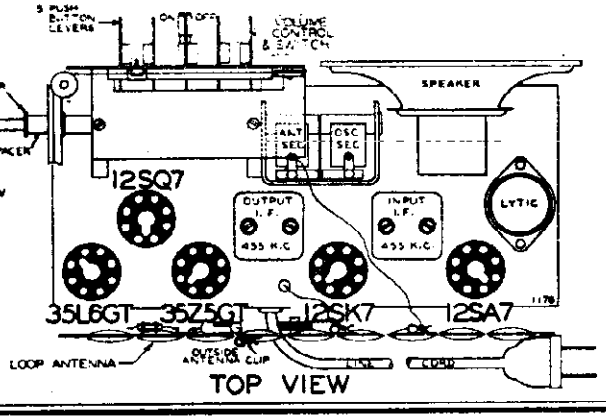
T1	111182	Loop antenna—complete assembly
T2	110145	Oscillator coil
T3	108140I	Input I. F.—455 kc.
T4	108141D	Output I. F.—455 kc.
T5	105104	Output Transformer
T6	114201	5" P. M. Speaker
L1	12311	Loading coil
S1		On-off switch on volume control
P1	107249	Pilot light bulb T47

RESISTORS

R1	130314	2200 ohm—½ w.
R2	13094	50M ohm—½ w.
R3	1309	200M ohm—½ w.
R4	130315	75 ohm—1½ w.
R5	130203	40 ohm—½ w.
R6	1304	3 megohm—½ w.
R7	1301	25M ohm—½ w.
R8	130215	25 ohm—½ w.
R9	101198	1 megohm volume control
R10	130257	5 megohm—½ w.
R11	1303	500M ohm—½ w.
R12	1303	500M ohm—½ w.
R13	130166	150 ohm—½ w.
R14	130287	1200 ohm—1 w.

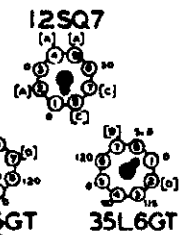
COILS

108140-I	T3	Input I.F. Coil in Can—455 K.C. 1 1.00
108141-D	T4	Output I.F. Coil in Can—455 K.C. 1 1.00
110145	T2	Oscillator Coil ..... 1 .50
111182	T1	Loop Antenna Assembly Complete with Back (Specify Color) 1 1.50



BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS & B+ WITH A LINE VOLTAGE OF 117 V. VOLUME CONTROL AT MINIMUM.
(a) CANNOT BE MEASURED WITH VOLTMETER.
(b) 12 VOLTS A.C. MEASURED ACROSS PINS 2 & 7.
(c) 12 VOLTS A.C. MEASURED ACROSS PINS 7 & 8.
(d) 24 VOLTS A.C. MEASURED ACROSS PINS 2 & 7.



REAR OF CHASSIS

Setting the Automatic Pushbuttons

Make a list of your 5 favorite stations. Push out the call letters of these stations from the call letter sheets supplied. Insert a call letter in the front of each pushbutton.

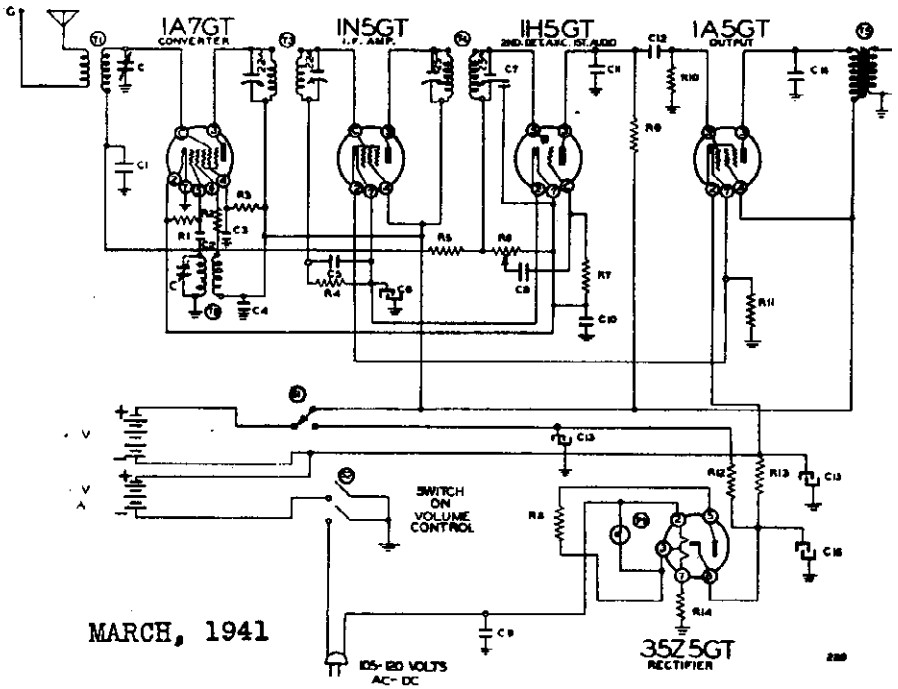
Press one of the buttons all the way down and hold it FIRMLY. Now tune in the station you want with the tuning knob. Tune back and forth until the station is clear, then release the button. **NOTE: If the tuning knob turns quite hard when the button is held down firmly (loosen the reset lock screw several turns with a screwdriver or coin (quarter).**

Continue, setting each of the remaining pushbuttons in the same way. Now turn the tuning knob all the way to the right and tighten the reset lock screw. This screw prevents the pushbuttons from slipping off the stations you have set. To change stations loosen lock screw and proceed as above.

GAMBLE-SKOGMO, INC.

TECHNICAL DATA

A – CURRENT 58 MA.
B – CURRENT 8 MA.
TUNING RANGE 538 KC. TO 1600 KC.
SENSITIVITY 75 MICROVOLTS AVE.
SELECTIVITY AT 1000KC = 48 K.C. AT 1000 X SIGNAL
OUTPUT 180 MW UNDISTORED 3 OHM VOICE COIL
I.F. 455 K.C.



MARCH, 1941

Code No.	Part No.	Description

RESISTORS

R1	1309	200M ohm—⅓ w.
R2	130193	3M ohm—⅓ w.
R3	130305	65M ohm—⅓ w.
R4	130225	15 megohm—⅓ w.
R5	1304	3 megohm—⅓ w.
R6	101252	1 megohm—Volume control
R7	130223	10 megohm—⅓ w.
R8	130197	20 ohm—⅓ w.
R9	13019	1 megohm—⅓ w.
R10	1304	3 megohm—⅓ w.
R11	130345	1M ohm—⅓ w.
R12	130129	2500 ohm—⅓ w.
R13	130344	1975 ohm—6 watt
R14	130343	545 ohm—14 watt

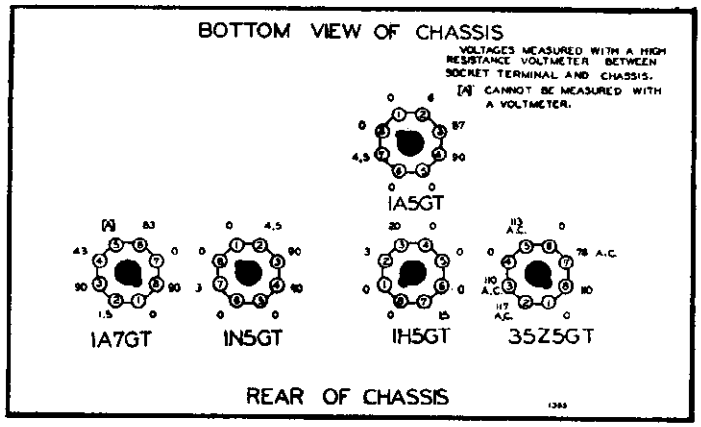
CONDENSERS

C	102141	Gang condenser
C1	1009	.05 x 200 v. condenser
C2	1295	.0001 mica
C3	100128	.05 x 120 v. condenser
C4	100135	.25 x 120 v. condenser
C5	100127	.01 x 120 v. condenser
C6	119123	20.0 mfd.—50 w. v. Lytic
C7		Approximately 100 mfd. in I.F. can
C8	100134	.006 x 120 v. condenser
C9	10013	.05 x 400 v. condenser
C10	100133	.1 x 120 v. condenser
C11	1295	.0001 mica
C12	100127	.01 x 120 v. condenser
C13	119123	40.0 mfd.—150 w. v. Lytic
C14	10025	.002 x 600 v. condenser
C15	119123	200.0 mfd.—10 w. v. Lytic
C16	119123	40.0 mfd.—150 w. v. Lytic

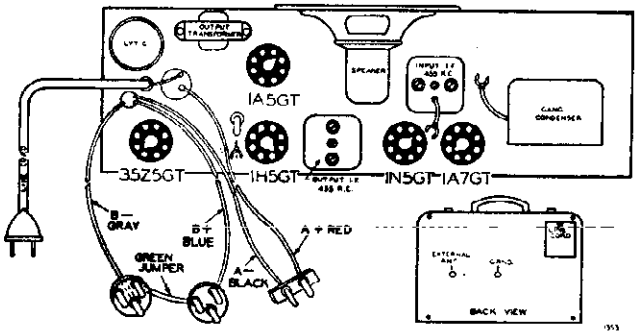
C6, C13, C15 and C16 are in one unit

PARTS

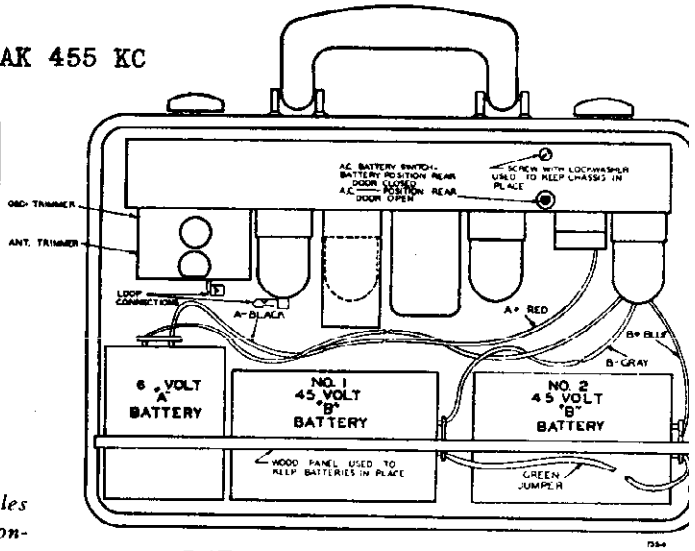
T1	111241	Loop antenna assembly
T2	110179	Oscillator coil
T3	108201	Input I. F. coil
T4	108200	Output I. F. coil
T5	105127	Output transformer
T6	114240	Speaker 5" P.M.
S1	125153	A. C. Battery switch
S2	101252	Switch on Volume control
P1	107362	Pilot Lite bulb—T47



IF PEAK 455 KC



CHASSIS VIEW showing tube location and battery cables —INSET back view, shows external ant. and ground connections.



BATTERY CONNECTIONS—When replacing batteries connect cables as shown above.

ALIGNMENT PROCEDURE MODEL C590

The following equipment is required for aligning.

- Dummy antenna .1 mfd. and 200 mmf.
- Volume control—Maximum all adjustments.
- Connect ground lead of radio chassis to ground post of signal generator.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Iron Cores (Dial Setting)	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
455 Kc. I. F.	455 Kc.	.1 MFD.	Connect to Grid of 1A7	Rotor full open (Plates out of mesh)	Trimmers on top of I. F. cans	Output and input I. F.	maximum output (See Note "A")
BROAD-CAST BAND	1600 Kc.	.1 MFD.	Connect to Grid of 1A7	Rotor full open (Plates out of mesh)	Trimmer on gang (See chassis view)	Oscillator	maximum output (See Note "A")
	1400 Kc.	200 MMF.	Connect to Antenna Clip	Set dial at 1400 Kc.	Trimmer on gang (See chassis view)	Antenna	maximum output (See Note "B")

NOTE "A"—The loop antenna need not be connected to the radio when making these adjustments, but a 1. Meg. Resistor must be substituted across the loop clips. The ground of the signal generator is connected to the chassis and the other lead from the signal generator in series with .1 MFD. dummy to the grid of the 1A7GT tube.

NOTE "B"—This adjustment should be made with the ground lead of the signal generator connected to the external ground terminal. The other lead of the signal generator is connected in series with a 200 Mmf. dummy to the external antenna terminal.

ALIGNMENT PROCEDURE MODEL 642

IMPORTANT:—See alignment instructions

- Volume control—Maximum all adjustments.
- Connect B - of radio chassis to ground post of signal generator through .1 Mfd. condenser.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning:

- An all wave signal generator.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 Mfd.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Grid of 12SA7	Rotor full open (Plates out of mesh)	Four Trimmers on Top (See Fig. 1)	Output and Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1600 Kc.	.1 MFD.	Grid of 12SA7	Rotor full open (Plates out of mesh)	Trimmer rear section of gang.	Broadcast Oscillator	Adjust to maximum output
	1400 Kc.	See Note "A"		Set dial at 1400 Kc.	Trimmer front section of gang	Broadcast Antenna	Adjust to maximum output

NOTE "A" Lay the output lead from the generator in back of the loop antenna. Turn up the output of the generator, picking up the energy in the loop antenna without any electrical connection from the generator.

POWER SUPPLY:

Caution:—This radio, unless otherwise marked, must be operated from 105-115 volts, A. C. (50/60 cycles) or D. C. supply only. If you are in doubt as to the voltage rating of the power supply, consult your local power company before inserting plug. Do not insert plug unless all tubes are in their proper sockets.

Receivers of this model which are to be used on voltages other than 105-115 volts A. C. (50/60 cycle), or 105-115 volts D. C. are so marked. The power consumption of this receiver is 35 watts.

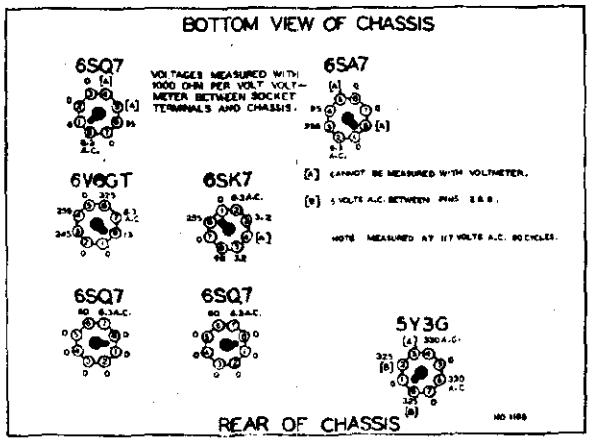
FREQUENCY RANGE
535 to 1600 K.C.

Power Consumption—35 Watts

Power Output—1 Watt Undistorted, 1.5 Watts Maximum

Intermediate Frequency—455 K.C.

FOR DATA ON GENERAL INDUSTRIES R70 RECORD CHANGER, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".



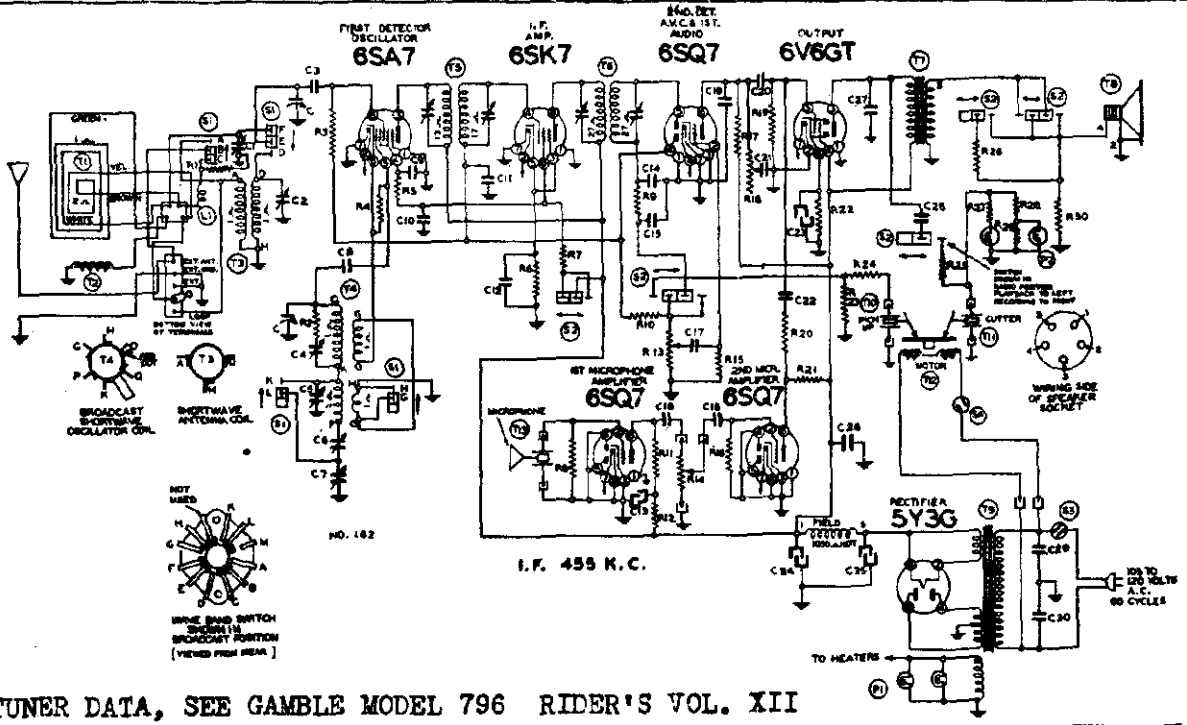


FIG. 6

FOR TUNER DATA, SEE GAMBLE MODEL 796 RIDER'S VOL. XII

Circuit Diagram Ref. No.	Part No.	Description
		RESISTORS
R1	13018	4M ohm—⅓ w.
R2	130197	20 ohm—⅓ w.
R3	1304	3 megohm—⅓ w.
R4	130236	30M ohm—⅓ w.
R5	13092	1M ohm—⅓ w.
R6	13083	300 ohm—⅓ w.
R7	130313	20M ohm—1½ watt
R8	130257	5 megohm—½ w.
R9	13012	50M ohm—⅓ w.
R10	1304	3 megohm—⅓ w.
R11	1303	500M ohm—⅓ w.
R12	13012	50M ohm—⅓ w.
R13	101215	1 megohm volume control
R14	101219	1 megohm microphone control
R15	130223	10 megohm—⅓ w.
R16	130223	10 megohm—⅓ w.
R17	13011	250M ohm—⅓ w.
R18	101216	1 megohm tone control
R19	1303	500M ohm—⅓ w.
R20	13020	100M ohm—⅓ w.
R21	1303	500M ohm—⅓ w.
R22	130227	250 ohm—1 watt
R23	13019	1 megohm—⅓ w.
R24	1303	500M ohm—⅓ w.
R25	130194	35M ohm—¼ w.
R26	130166	150 ohm—⅓ w.
R27	1309	200M ohm—⅓ w.

Circuit Diagram Ref. No.	Part No.	Description
		CONDENSERS
C	102131	2 gang variable condenser
C1	124117	B.C. Antenna Trimmer
C2	124116	S.W. Antenna Trimmer
C3	1292	.0005 mica
C4	124112	S.W. Oscillator Trimmer
C5	124112	B.C. Oscillator Trimmer
C6	124134	B.C. Series Pad
C7	124134	S.W. Series Pad
C8	12991	.00015 mica
C9	10013	.05 x 400 v.
C10	1001	.1 x 400 v.
C11	1009	.05 x 200 v.
C12	1009	.05 x 200 v.
C13	11967	8 mfd. lytic
C14	129161	.0001 mica
C15	129161	.0001 mica
C16	10026	.02 x 400 volts
C17	10071	.004 x 600 v.
C18	10025	.002 x 600 v.
C19	1292	.0005 mica
C20	10013	.05 x 400 v.
C21	10019	.006 x 600 v.
C22	10013	.05 x 400 v.
C23	119110	40 mfd. lytic
C24	119110	20 mfd. lytic

Circuit Diagram Ref. No.	Part No.	Description
C28	10024	.25 x 400 v.
C29	10061	.02 x 600 v.
C30	10061	.02 x 600 v.
C4 and C5 in same unit—C6 and C7 in same unit C14 and C15 are in same unit C23, C24 and C25 are in same unit		
		PARTS
T1	111165E	Loop Antenna Assembly
T2	111153	Loop Adjustable Coil
T3	111163	S.W. Antenna Coil
T4	110190	B.C. & S.W. Oscillator Coil
T5	108162B	Input I.F. Coil—455 kc.
T6	108132D	Output I.F. Coil—455 kc.
T7	105109	Output Transformer
T8	114195	10" Dynamic Speaker
T9	104209	Power Transformer
T10	104210	Pickup arm
T11	104210	Record cutter arm
T12	104210	Phono Motor
T13	114196	Microphone Complete
L1	1239	R.F. Choke coil
S1	125114	Wave Band Switch
S2	125115	Radio Recording Switch
S3		On-off switch on Volume Control

ALIGNMENT PROCEDURE

IMPORTANT: See Aligning Instructions.

- Volume control—Maximum all adjustments.
- Connect radio ground to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minute.

The following equipment is requ[illegible] for aligning:

- An all wave signal generat[illegible] 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 400 ohms.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Grid of 6SK7 I. F.	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 3)	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 6SA7 Mixer	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 3)	Input I. F.	Adjust to maximum output
SHORT WAVE BAND (See Note A)	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C4 (See Fig. 4)	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C2 (See Fig. 4)	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 6 Mc.	Trimmer C7 (See Fig. 4)	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "C")
BROAD-CAST BAND (See Note A)	1570 Kc.	200 mmf.	Grid of 6SA7	Broadcast	Rotor full open (Plates out of mesh)	Trimmer C5 (See Fig. 4)	Broadcast oscillator	Adjust to maximum output
	532 Kc.	200 mmf.	Grid of 6SA7	Broadcast	Set Dial at 532 K. C.	Trimmer C6 (See Fig. 4)	Broadcast oscillator series pad	Adjust to maximum output
LOOP ALIGN-MENT (See Note B)	1400 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 1400 Kc.	Trimmer C1 (See Fig. 5)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 600 Kc.	Trimmer T2 (See Fig. 5)	Iron Core Tracking Coil	Adjust to maximum output

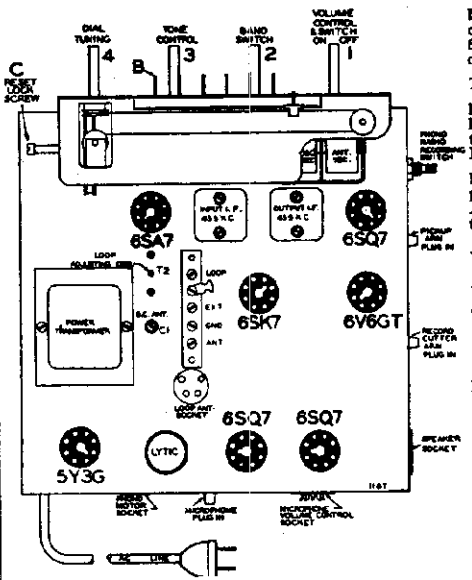


FIG. 3—TOP VIEW

NOTE "A"—The signal generator is connected to the "ANT." and "GND." terminals on the rear of the chassis when aligning the **Short Wave Band** and to the grid of the 6SA7 tube and ground terminal when setting the **Broadcast Band** oscillator end frequencies, (1570 and 532 K. C.).

The loop antenna need not be connected to the radio when making these adjustments.

NOTE "B"—Loop alignment is made with the chassis mounted in the cabinet and the loop antenna connected. The signal generator is connected to the "ANT." and "GND." terminals and the jumper on the terminal board connected to "EXT." terminal. (See Fig. 3).

NOTE "C"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained. Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each band is completed, repeat the procedure as a final check.

BAND SWITCH	BAND	FREQUENCY RANGE
Extreme Right Rotation	Short Wave	5.4 to 18.3 MC.
Center Position	Broadcast	532 to 1570 KC.

Power Consumption (Radio Chassis only, less Phono Motor)..... 50 Watts

Power Output..... 3.6 Watts Undistorted, 5.4 Watts Maximum

Intermediate Frequency..... 455 K.C.

POWER SUPPLY:

Caution:—This radio, unless otherwise marked, must be operated from 105-125 volts, 60 cycle A.C. supply only. If you are in doubt as to the voltage and frequency rating of the power supply, consult your local power company before inserting plug. Do not insert plug unless all tubes and speaker plug are in their proper sockets.

Receivers of this model which are to be used on voltages or frequencies other than 105-125 volts, 60 cycles are so marked. The power consumption of this receiver is 60 watts. **UNDER NO CIRCUMSTANCES remove the chassis from the cabinet without first removing plug from light socket.**

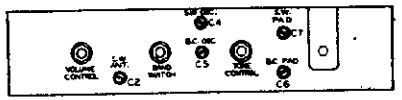


FIG. 4

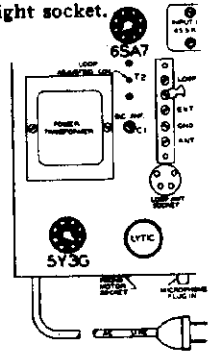


FIG. 5—TOP VIEW

BAND	DIAL SCALE	FREQUENCY RANGE
Broadcast	Upper	532 to 1570 KC. (Kilocycles)
Short Wave	Lower	5.4 to 18.3 MC. (Megacycles)

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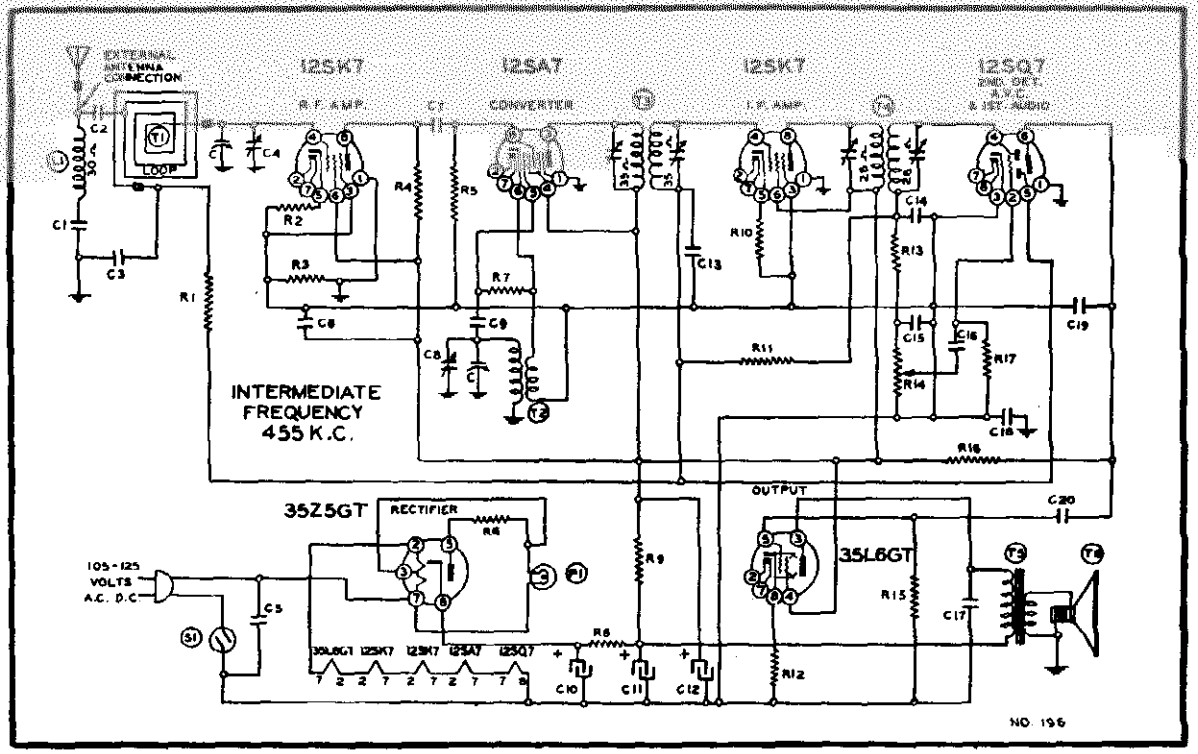
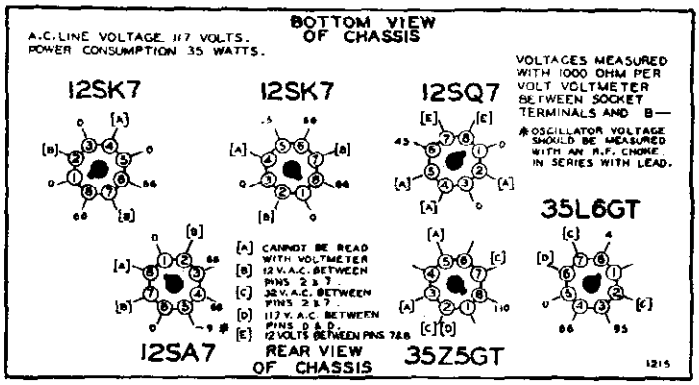
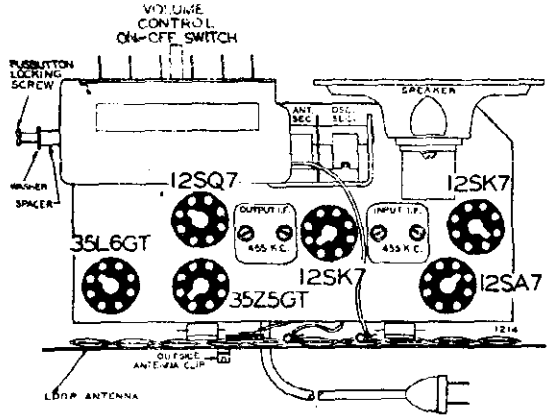


NOVEMBER, 1940



FOR TUNER DATA SEE INDEX



R17	130257	5 megohm—⅓ w.

CONDENSERS

C	102116	2 gang variable condenser
C1	10011	.01 x 400 v.
C2	129132	.000125 mica
C3	10026	.02 x 400 v.
C4		B.C. Antenna Trimmer
C5	1001	.1 x 400 v.
C6	1006	.25 x 200 v.
C7	1295	.0001 mica
C8		B.C. Oscillator Trimmer
C9	1295	.0001 mica
C10	11994	40 mfd.—150 w.v. lytic
C11	11994	20 mfd.—150 w.v. lytic
C12	11994	20 mfd.—150 w.v. lytic
C13	1009	.05 x 200 v.
C14	1295	.0001 mica

Code No.	Part No.	Description

RESISTORS

R1	130100	150M ohm—⅓ w.
R2	130168	100 ohm—⅓ w.
R3	130100	150M ohm—⅓ w.
R4	130218	5M ohm—⅓ w.
R5	13020	100M ohm—⅓ w.
R6	130215	25 ohm—½ w.
R7	13094	50M ohm—⅓ w.
R8	130296	200 ohm—1 w.
R9	130287	1200 ohm—1 w.
R10	130248	40 ohm—⅓ w.
R11	1304	3 megohm—⅓ w.
R12	130166	150 ohm—⅓ w.
R13	13012	50M ohm—⅓ w.
R14	101193	1 megohm volume control
R15	1303	500M ohm—⅓ w.
R16	1309	200M ohm—⅓ w.

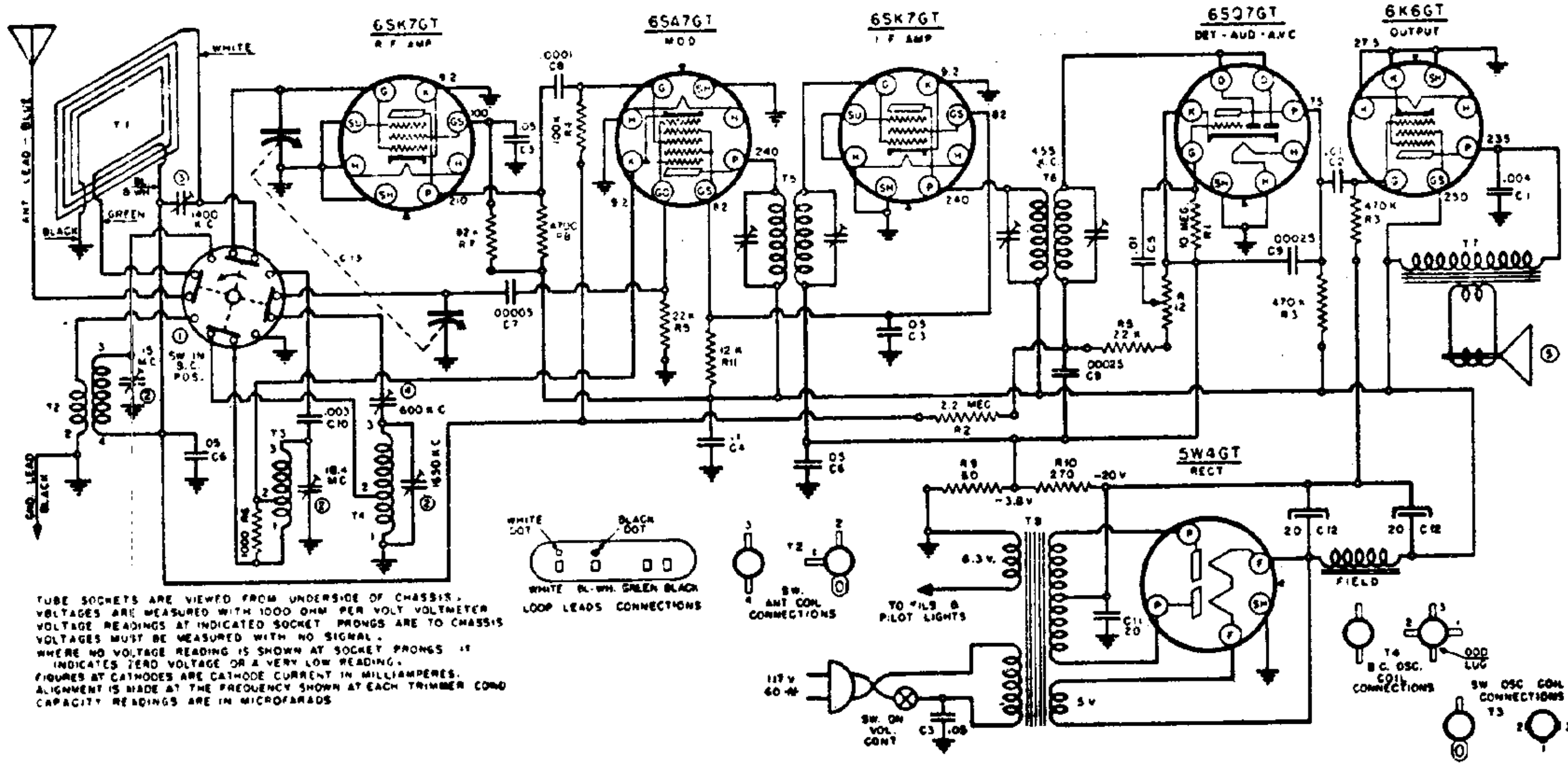
C15	12939	.00005 mica
C16	10025	.002 x 600 v.
C17	10026	.02 x 400 v.
C18	100110	.2 x 400 v.
C19	1295	.0001 mica
C20	100106	.001 x 600 v.

C10, C11 and C12 are in same unit

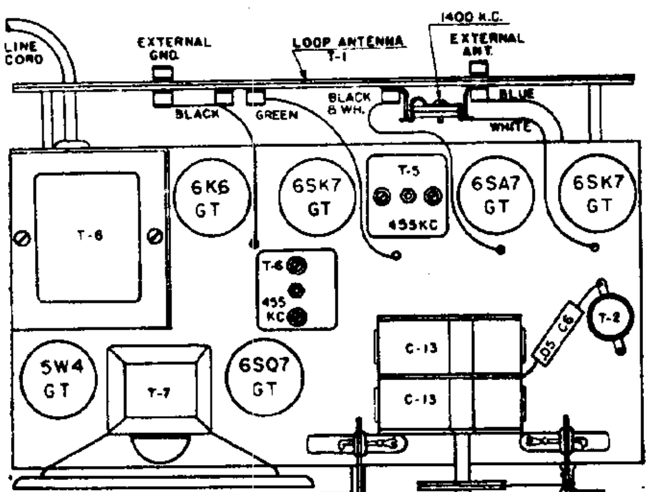
PARTS

T1	111145	Loop Antenna Assembly
T2	110128	Oscillator Coil
T3	108140G	Input I.F. Coil—465 kc.
T4	108145C	Output I.F. Coil—465 kc.
T5	10595B	Output Transformer
T6	114174	5" P.M. Speaker
L1	1237	Loading Coil
S1		On-off switch on volume control
P1	107249	Pilot light T47

MODEL 906



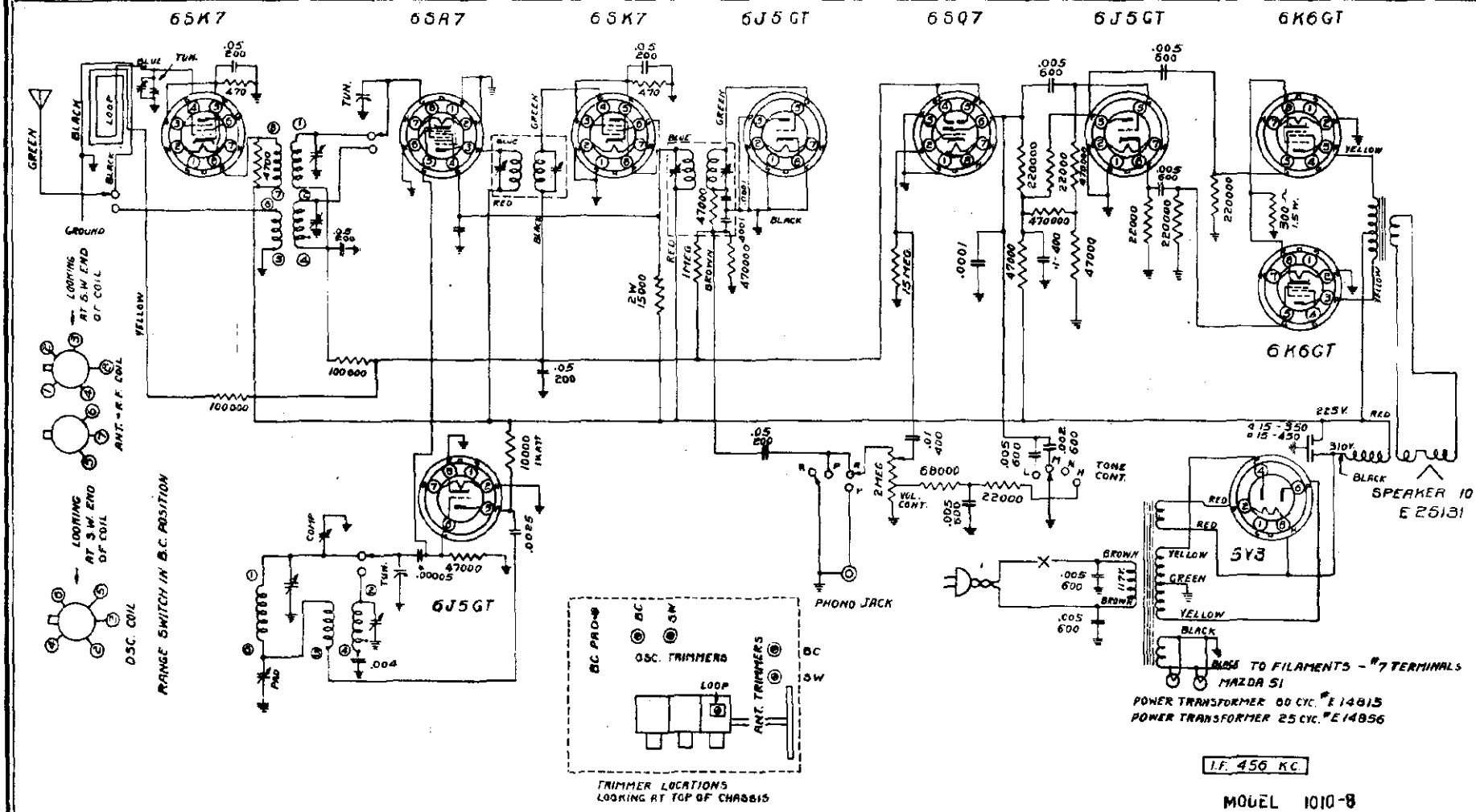
TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONGS IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
ALIGNMENT IS MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER COND
CAPACITY READINGS ARE IN MICROFARADS



CODE	PART NO.	DESCRIPTION
R 1	60 195	10 MEGOHM 1/4 WATT RESISTOR
R 2	60-179	2.2 " " "
R 3	60 178	470K OHM " "
R 4	60 186	100K " " "
R 5	60 185	22K " " "
R 6	60-217	1000 " " "
R 7	60-494	82K " 1/2 WATT "
R 8	60-282	4700 " " "
R 9	60-182	80 " " "
R 10	60-245	270 " 1 WATT "
R 11	60-645	12K " 2 WATT "
R 12	24 146	900K " VOLUME CONTROL (WITH SW.)

CODE	PART NO	DESCRIPTION D-61
T 1	82-19	LOOP ANTENNA
T 2	10 357	S W ANTENNA COIL
T 3	10 320	S W OSCILLATOR COIL
T 4	10-326	B C " "
T 5	10-358	1ST. I.F. TRANSFORMER
T 6	10-312	2ND. " "
T 7		OUTPUT TRANSFORMER (ON SPKR
T 8	80 195	POWER TRANSFORMER
1	89 145	BAND SWITCH
2	20-127	TRIMMER BLOCK
3	20 129	TRIMMER (ON LOOP)
4	20 130	PADDING CONDENSER
5	29 300	5" DYNAMIC SPEAKER

CODE	PART NO	DESCRIPTION
C 1	1651	.004 MFD 600 V TUBULAR COND
C 2	16-119	.01 " 400 V " "
C 3	1607	.05 " " " "
C 4	16-116	.1 " " " "
C 5	16 121	.01 " 200 V " "
C 6	1822	.05 " " " "
C 7	1503	.00005 " MICA CONDENSER
C 8	1501	.0001 " " "
C 9	1504	.00025 " " "
C 10	15-118	.003 " " "
C 11	18-243	20 MFD. 25 W V ELECTROLYTIC
C 12	18-256	20 X 20 MFD 450 W V. ELECTROLYTIC
C 13	19-180	2 GANG VARIABLE CONDENSER



GAMBLE-SKOGMO, INC.

MODEL 1010-8
CIRCUIT DIAGRAM E 25143

Watts input at 117 V. line 80. Watts output 3.0 Undistorted 4.5 Maximum.
Selectivity at 1000 times signal 34 kc band width Intermediate frequency 456 kc.
Tuning Ranges: Broadcast 540 to 1725 kc Short-wave 6.0 to 18.0 mc
Sensitivity: Broadcast 5 to 6 Microvolts Short-wave 20 to 45 Microvolts
I.F. 456kc at 6SA7 grid (Stator of center section of variable condenser) 65 to 75 Microvolts.
Tube Functions: 6SK7 R.F. Amplifier, 6SA7 first detector, 6J5GT Oscillator, 6SK7 I.F. Amplifier, 6J5GT Diode Detector, 6SQ7 First Audio Amplifier, 6J5GT Phase Inverter, 2-6K6GT Power Output and 5Y3G Rectifier.

MODEL 1010B
MODEL 1070A

The following equipment is needed for aligning this receiver:
Model 1010 B Signal generator covering Broadcast and short-wave bands, output meter, screw driver, dummy antennas of 200 MMF - 400 Ohms and .1MFD
The receiver and generator should be allowed to warm up for a few minutes. The volume control should be set at maximum and the sensitivities given are for .5 watt output.
The following chart gives connections and operations in their order for proper alignment of this receiver. The trimmer locations will be found on the circuit diagram.

	Generator Frequency	Connection at Radio	Dummy Antenna	Range Switch	Dial Setting	Trimmers to Tune	Approx. Sensitivity
	I.F. 456 K.C.	6SA7 Grid Center Stator of Var. Cond.	.1 MFD.	B.C.	H.F.End	I.F.Trimmers to Max.	65-75 M.W.
	B.C. 1725 K.C.	Antenna	200 MMF.	"	H.F.End Limit of Travel	B. C. Oscillator	
Issue A August, 1940 Serial No. 100001 up	1400 K. C.	"	"	"	1400 K.C. See Note "A"	B.C. Ant. & Loop Tune to Max.	5-6 M.W.
	600 K. C.	"	"	"	Rock Rotor	Padder	5-6 M.W.
	S.W. 15.2 M.C.	"	400 Ohm	S.W.	15.2 M.C.	S.W.Osc. & Ant. to Max.	40 M.W.
	6.0 M.C.	"	"	"	6.0 M.C.	Check	20 M.W.

Note "A" - If the pointer is not at 1400 kc with a 1400 kc signal it may be loosened from the dial cord and moved to correct the calibration. This should be checked across the band to arrive at the optimum condition.

Note "B" - Care should be taken not to align on the image frequency. This may be checked by rotating the dial of the signal generator. Another signal should be heard at dial frequency plus 912 kc. This signal should be checked carefully on the short wave band, making sure the lowest frequency signal agrees with the dial setting in frequency and that it is the strongest of the two.

SPECIFICATIONS 1070-A

Watts input at 117 V. line: 52 Watts output: 1.7 Undistorted 2.7 Maximum
Selectivity at 1000 times signal — 34kc band width Intermediate frequency 456kc
Speaker 6½" Electrodynamic, 1100 ohm field
Tuning Ranges:

Broadcast Band	540 to 1725 kc	25 Meter Band	10.8 to 12.1 mc
31 Meter Band	9.3 to 9.81 mc	19 Meter Band	14.9 to 15.5 mc

Sensitivity: For .5 watt output:

Broadcast Band	3 to 5 Microvolts	25 Meter Band	25 to 30 "
31 Meter Band	20 to 25 "	19 Meter Band	40 to 50 "

I. F. 456kc at 6SA7 grid (Stator of middle section of variable condenser) 65 to 70 Microvolts.
Tube Functions: 6SK7—R. F., 6SA7 first detector, 6J5GT oscillator, 6SK7 I. F. amplifier, 6SQ7 diode detector and first audio amplifier, 6K6GT power output tube, 5Y3G rectifier.

Generator Frequency	Connection at Radio	Dummy Antenna	Range Switch Setting	Dial Setting	Trimmers to Tune	Approx. Sensitivity .5 Watt O. P.
I. F. 456 k.c.	Center Stator of Var. Cond.	.1 Mfd.	B. C.	H. F. End	I. F. Trans. Tune to Max.	65 to 75 Mv.
B. C. 1725 k.c.	Ant.	200 Mmf.	B. C.	H. F. Limit of Travel	B. C. Osc.	—
1400 k.c.	"	"	"	1400— See Note "A"	B. C. Ant. " " Loop Tune to Max.	3-5 Mv.
600 k.c.	"	"	"	600— Rock Rotor	Padder	3-5 Mv.
31 M. Band 9.6 m.c.	"	400 Ohms.	31 M.	9.6 m. c.	31 M. Osc. 31 M. Ant. Tune to Max.	20-25 Mv.
25 M. Band 11.6 m.c.	"	"	25 M.	11.6 m. c.	25 M. Osc. 25 M. Ant. Tune to Max.	25-30 Mv.
19 M. Band 15.2 m.c.	"	"	19 M.	15.2 m. c.	19 M. Osc. 19 M. Ant. Tune to Max.	40-50 Mv.

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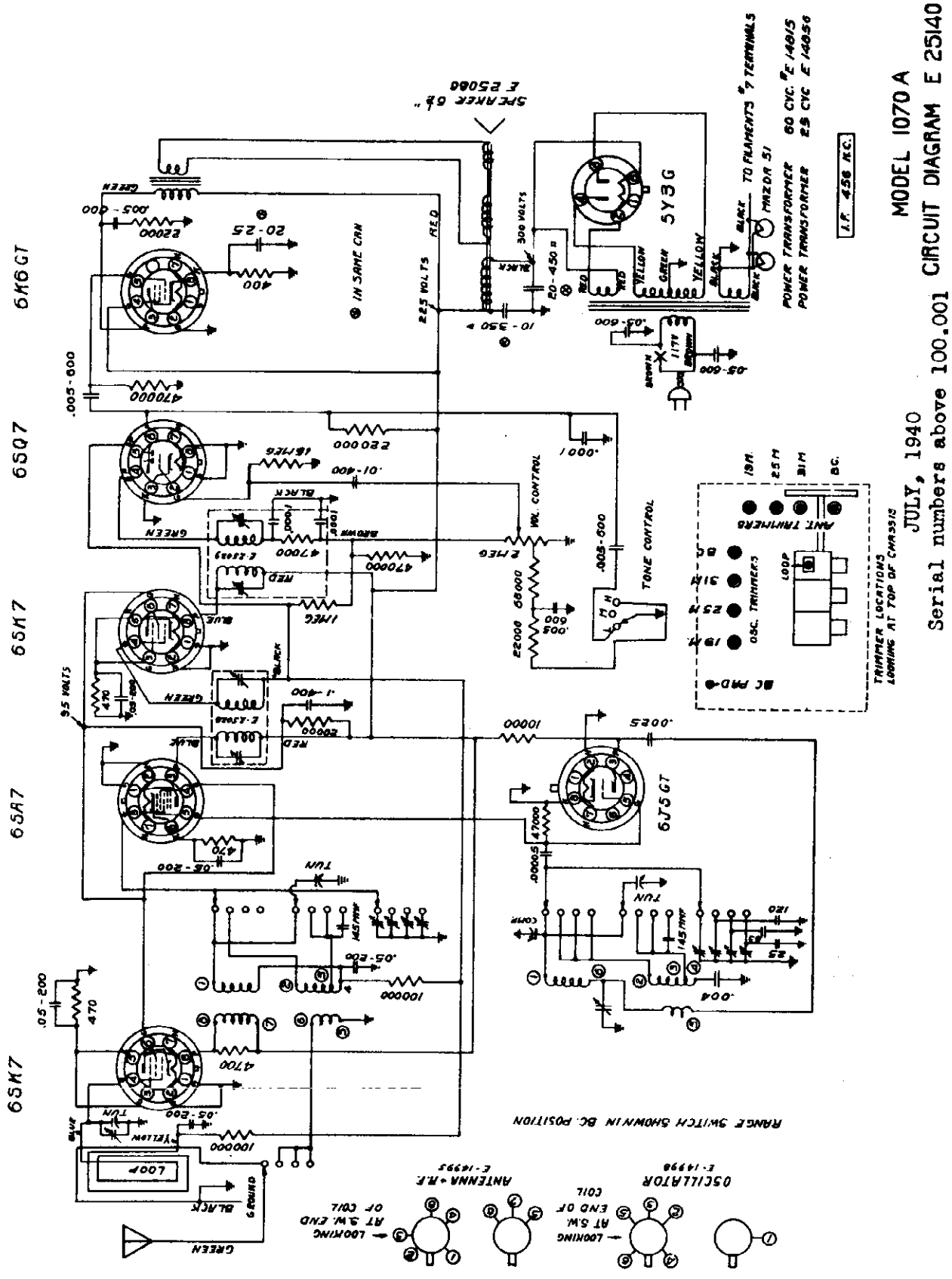
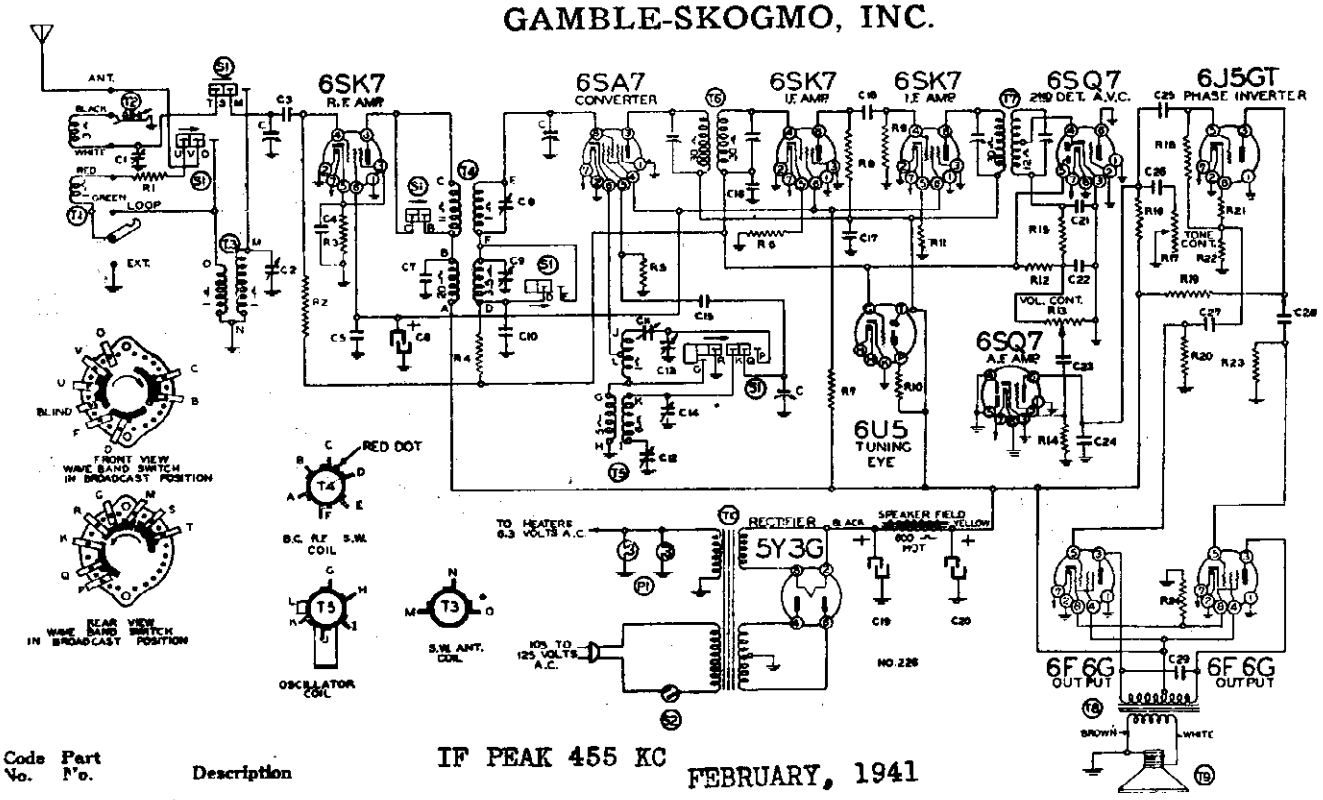


MODEL C1131

GAMBLE-SKOGMO, INC.



Code No. | Part No. | Description

IF PEAK 455 KC

FEBRUARY, 1941

RESISTORS

R1	13024	400 ohms—½ w.
R2	13019	1 megohm—½ w.
R3	13099	300 ohms—½ w.
R4	1305	300M ohm—½ w.
R5	130208	40M ohm—½ w.
R6	13054	500 ohm—½ w.
R7	130304	12M ohm—2 w.
R8	130263	12M ohm—½ w.
R9	13020	100M ohm—½ w.
R10		1 megohm—in eye socket
R11	13054	500 ohm—½ w.
R12	130170	3 megohm—½ w.
R13	101214	Volume control (500M ohm)
R14	130225	15 megohm—½ w.
R15	13012	50M ohm—½ w.
R16	13011	250M ohm—½ w.
R17	101213	Tone control (1 megohm)
R18	13019	1 megohm—½ w.
R19	13020	100M ohm—½ w.
R20	1303	500M ohm—½ w.
R21	13043	2500 ohm—½ w.
R22	13020	100M ohm—½ w.
R23	1303	500M ohm—½ w.
R24	130311	300 ohm—1 w.

CONDENSERS

C	102129	Three gang variable condenser
C1	124132	B.C. antenna trimmer
C2	124117	S.W. antenna trimmer
C3	1292	.0005 mica
C4	10020	.1 x 200 v.
C5	100117	.25 x 400 v.
C6	119124	10 mfd. lytic—350 w. v.
C7	129160	.0004 mica
C8	124131	S.W. R.F. trimmer
C9	124131	B.C. R.F. trimmers
C10	10026	.02 x 400 v.
C11	129156	.0024 compression S.W. pad
C12	129157	.000525 compression B.C. pad
C13	124130	S.W. oscillator trimmer
C14	124130	B.C. oscillator trimmer
C15	12939	.00005 mica
C16	10026	.02 x 400 v.
C17	100117	.25 x 400 v.
C18	1292	.0005 mica
C19	119124	25 mfd. lytic—450 w. v.
C20	119124	25 mfd. lytic—450 w. v.
C21	1295	.0001 mica
C22	1295	.0001 mica
C23	10025	.002 x 600 v.
C24	12912	.00025 mica
C25	10026	.02 x 400 v.
C26	10011	.01 x 400 v.
C27	1009	.05 x 200 v.
C28	10012	.05 x 400 v.
C29	10071	.004 x 600 v.

PARTS

T1	111240	Loop antenna assembly
T2	111153	Loop adjustable coil
T3	111176	S.W. antenna coil
T4	10957	B.C. S.W.—R.F. coil
T5	110149	B.C. S.W. oscillator coil
T6	108169I	Input I.F. 465 kc.
T7	108130D	Output I.F. 465 kc.
T8	10554B	Output transformer
T9	114192B	10" dynamic speaker (600 ohm field)
T10	104202	Power transformer
S1	125111	Wave band switch
S2		On-off switch on volume control
P1	10794	(2) pilot light bulbs T-44

C6, C19 and C20 in one unit

C8 and C9 in one unit

C13 and C14 in one unit

TECHNICAL DATA

Power Consumption - - - - - - 120 Watts

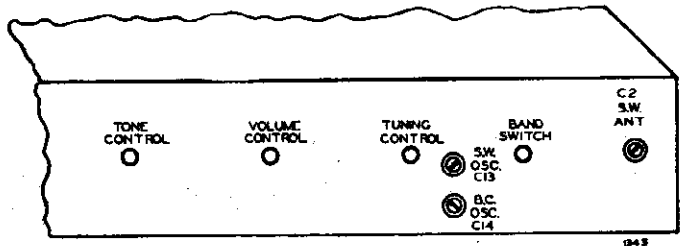
Power Output - - - - - 5 Watts Undistorted

Sensitivity for 500 Milliwatt Output: 6 Microvolts Average

Selectivity - 36 KC Broad at 1000 Times Signal at 1000 KC

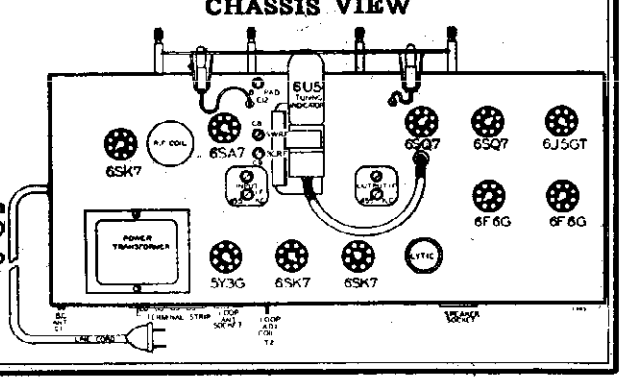
Tuning Frequency Range Broadcast Band - 540 to 1580 KC

Short Wave Band - - 5.5 to 18.5 MC



TRIMMER VIEW—FRONT OF CHASSIS

CHASSIS VIEW



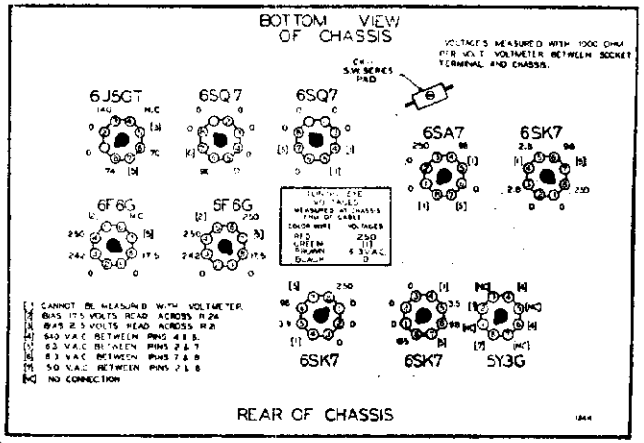
ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio ground to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.

The following equipment is required for aligning.

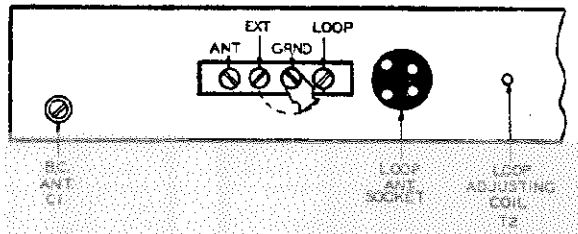
- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Dummy antennas—.1 mf., 200 mmf., 400 ohms.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (In Order Shown)	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Grid of 6SK7 I. F.	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 6SA7 Mixer	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top	Input I. F.	Adjust to maximum output
SHORT WAVE BAND (See Note A)	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C13	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmers C8, C2	Short Wave R. F. and S. W. Antenna	Adjust to maximum output
	6 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 6 Mc.	Trimmer C11 (See voltage chart)	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "C")
BROAD-CAST BAND (See Note A)	1580 Kc.	200 mmf.	Grid of 6SK7 R. F. Tube	Broadcast	Rotor full open (Plates out of mesh)	Trimmer C14	Broadcast oscillator	Adjust to maximum output
	540 Kc.	200 mmf.	Grid of 6SK7 R. F. Tube	Broadcast	Set Dial at 540 Kc. (Plates in Mesh)	Trimmer C12	Broadcast oscillator series pad	Adjust to maximum output
	1400 Kc.	200 mmf.	Grid of 6SK7 R. F. Tube	Broadcast	Set Dial at 1400 Kc.	Trimmer C9	Broadcast R. F.	Adjust to maximum output
LOOP ALIGN-MENT (See Note B)	1400 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 1400 Kc.	Trimmer C1	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 600 Kc.	Trimmer T2	Iron Core Tracking Coil	Adjust to maximum output



ANT. & GROUND TERMINALS—When using an external antenna and ground, move the metal strap shown above and fasten it under the screw marked "Ext."

The antenna and ground wires should then be connected to the terminals marked "Ant." — "Grnd."



IMPORTANT—Loosen the screws which hold the chassis to the cabinet and pull out the shipping strips under the chassis—The chassis will then rest on its rubber cushions.

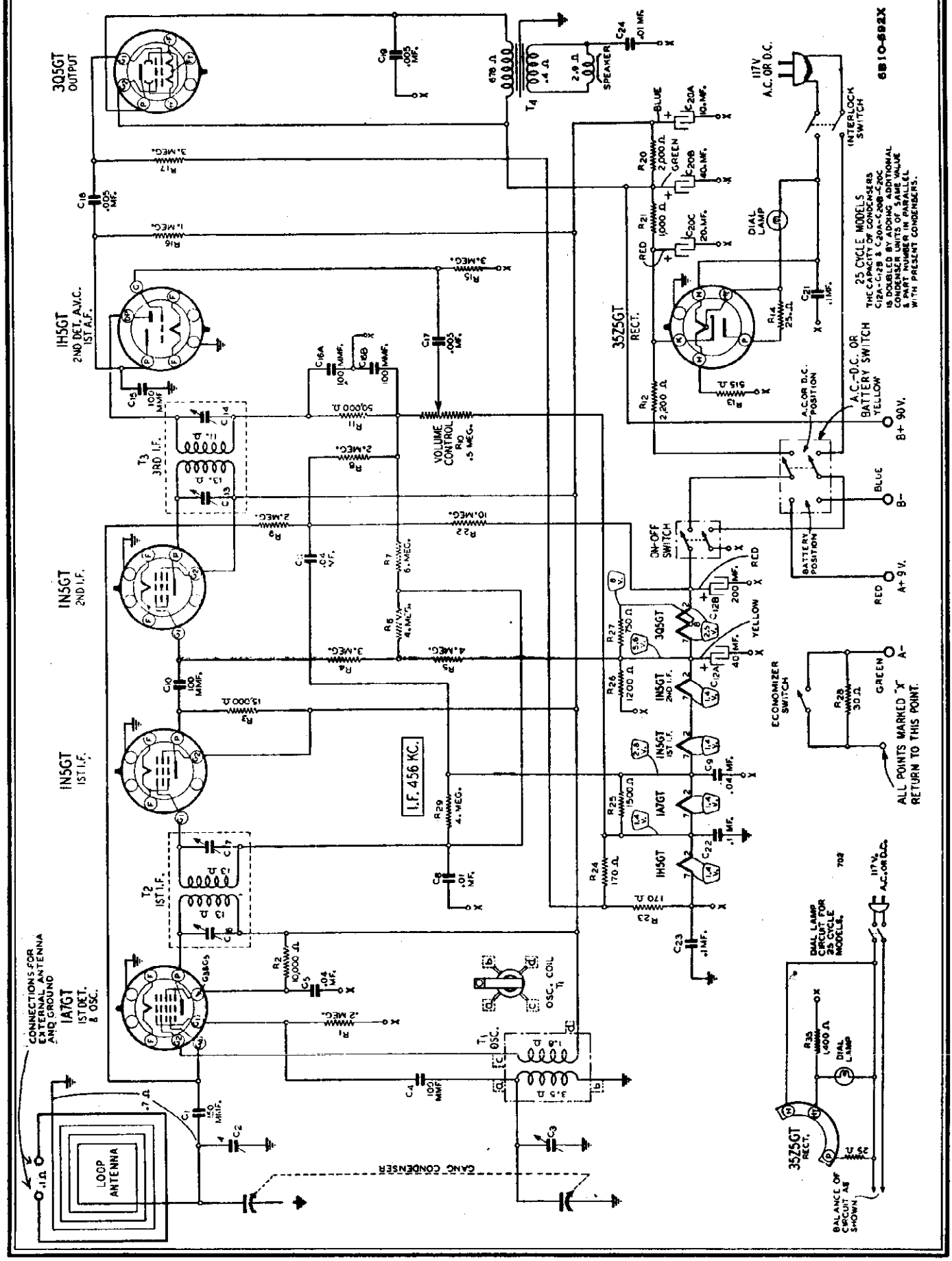
POWER SUPPLY—Unless your radio is marked otherwise, it must be operated from 105 to 125 volts, 50 to 60 cycle A.C. current. If in doubt, phone your electric light company. Receivers of this same model which are for use on special voltages are marked accordingly. When using your radio on A.C. current, reversing the plug may reduce station hum.

GAMBLE-SKOGMO, INC.

GAMBLE-SKOGMO
MODEL 611

MODEL 3006

GAMBLE-SKOGMO, INC.



GAMBLE-SKOGMO, INC.

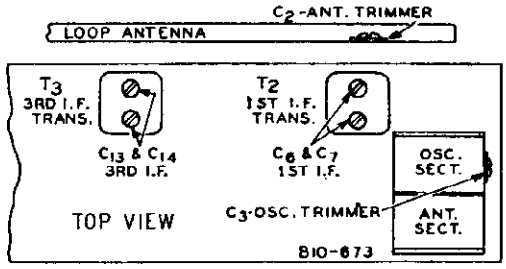
ALIGNMENT PROCEDURE

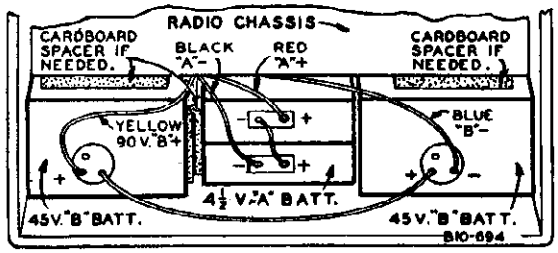
Volume Control—Maximum All Adjustments.

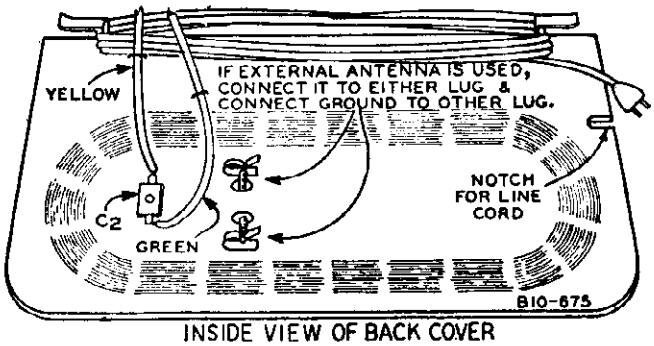
Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning:
A Signal Generator which will provide an accurate calibrated signal at the test frequencies as listed.
Output Indicating Meter—Non-Metallic Screwdriver
Dummy Antennas—.1 mf., 200 mmf.

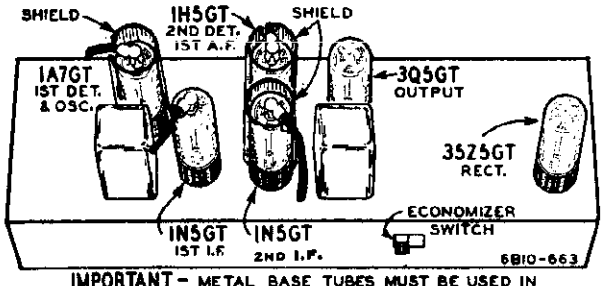
SIGNAL GENERATOR FREQUENCY SETTING	ANTENNA CONNECTION	GROUND CONNECTION	DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration below)
456 KC	External Antenna Clip on Loop	External Ground Clip on Loop	.1 mf.	Turn Rotor to full open	1st I.F. (C6) & (C7) 3rd I.F. (C13) & (C14)
1600 KC	External Antenna Clip	External Ground Clip	.1 mf.	Turn Rotor to full open	Oscillator (C3)
1400 KC	External Antenna Clip See Note A	External Ground Clip	200 mmf.	Turn Rotor to max. output	Antenna (C2)







INSIDE VIEW OF BACK COVER



IMPORTANT - METAL BASE TUBES MUST BE USED IN THOSE SOCKETS AT WHICH SHIELDS ARE SHOWN.

SPECIFICATIONS

Input Voltages and Currents—Battery Operation
"A" Batteries..... 9 Volts—50 Ma.
"B" Batteries.....90 Volts—11.5 Ma.

Power Consumption (At 117 volts AC Supply) 28 Watts

Power Output
Battery Operation - - - - 150 Mw Undistorted, 350 Mw Maximum
AC Operation - - - - - 200 Mw Undistorted, 400 Mw Maximum

Selectivity - 50 KC Broad at 1000 Times Signal

Intermediate Frequency - - - - - - 456 KC

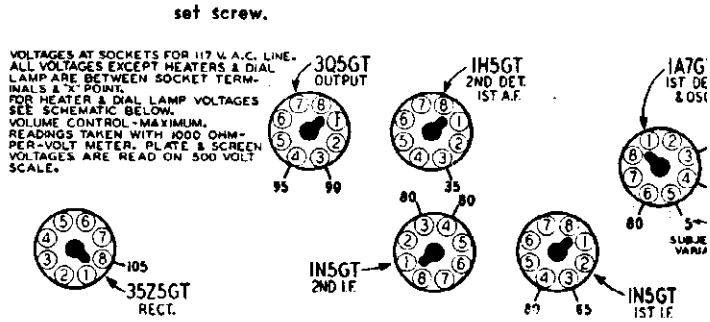
Speaker - - - - - - - - - 6" P.M. Dynamic

Tuning Frequency Range - - 540 to 1600 KC

Sensitivity (For 05 Watt Output)
External Antenna - - - 10 Microvolts Average

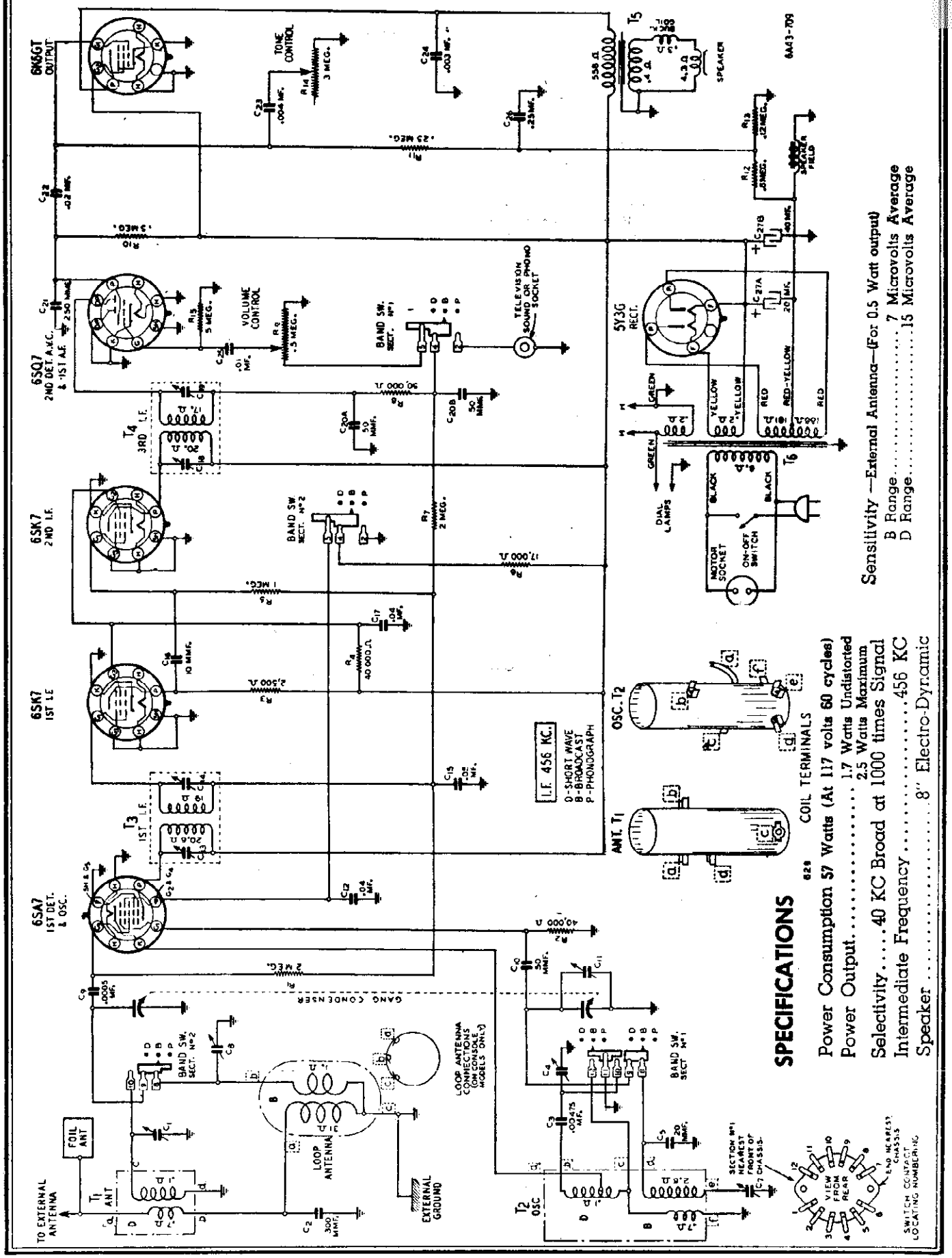
NOTE A—Re-assemble chassis in cabinet. Close back on cabinet.

CALIBRATION—To obtain dial scale calibration, tune in an 800 KC signal. The pointer should be at the 800 KC mark on the dial. If it is not, loosen pointer set screw and set the pointer at the 800 KC mark. Retighten set screw.



MODEL 3058

GAMBLE-SKOGMO, INC.



SPECIFICATIONS

628 COIL TERMINALS

Power Consumption 57 Watts (At 117 volts 60 cycles)
Power Output..... 1.7 Watts Undistorted
2.5 Watts Maximum
Selectivity.....40 KC Broad at 1000 times Signal
Intermediate Frequency.....456 KC
Speaker .....8" Electro-Dynamic

Sensitivity —External Antenna—(For 0.5 Watt output)
B Range.....7 Microvolts Average
D Range.....15 Microvolts Average

GAMBLE-SKOGMO, INC.

ALIGNMENT PROCEDURE

Volume Control—Maximum 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.

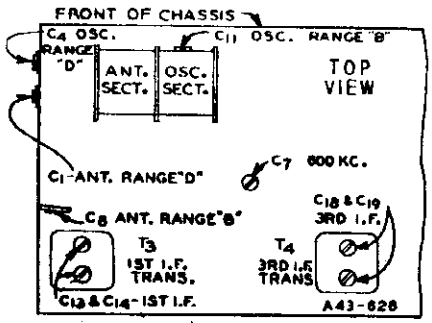
The following equipment is required for aligning:

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., 100 mmf., and 400 ohms.

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
Console Model—It is not necessary to remove chassis from cabinet. Merely remove chassis mounting screws so that chassis may be turned to reach oscillator trimmer on gang condenser.					
I.F.					
456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C13) & (C14) 3rd I.F. (C18) & (C19)
RANGE B					
1600 KC	External Antenna Clip or Lead	100 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C11)
1400 KC	External Antenna Clip or Lead	100 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC—See Note A	Ant. Range B (C8)
600 KC	External Antenna Clip or Lead See Note B	100 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C7) Rock Rotor—See Note C
RANGE D					
18,300 KC	External Antenna Clip or Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C4)
17,000 KC	External Antenna Clip or Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C1) Rock Rotor—See Note C
LOOP RANGE B					
1400 KC	External Antenna Clip or Lead See Note D	100 mmf.	B Range	Turn Rotor to Max. Output	Ant. Range B (C8)



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—If the pointer is not at 1400 KC on the dial, remove pointer from drive cord. Tune in a 1400 KC signal. Set pointer at the 1400 KC mark on the dial scale. Attach pointer to drive cord.

NOTE B—(Table Model) By means of wooden blocks, stand the loop aerial assembly upright exactly 4 inches from the back of the chassis.

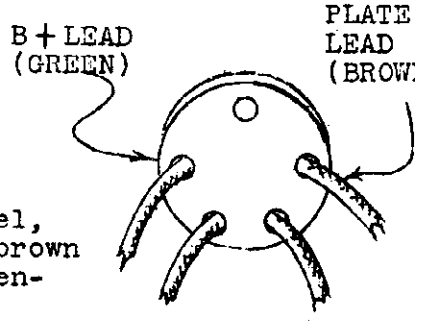
NOTE C—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

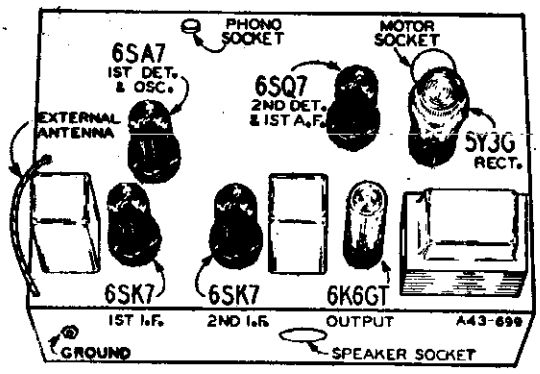
NOTE D—(Table Model) Re-assemble chassis in cabinet. Replace back on cabinet. Connect ground post of signal generator to external ground clip on loop antenna (Table Model) or ground screw on chassis (Console Model).

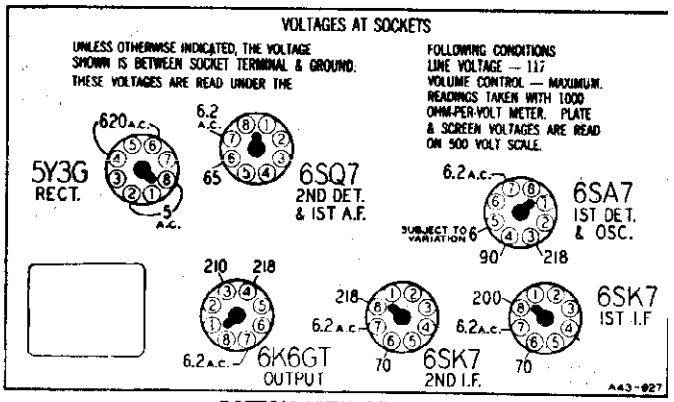
CAUTION—When aligning the short w band, be sure NOT to adjust at the im frequency. This can be checked as foll Let us say the signal generator is set 15,000 KC. The signal will then be heard 15,000 on the dial of the radio. The im signal, which is much weaker, will be heard 15,000 less 912 KC, or 14,088 KC on the d It may be necessary to increase the in signal to hear the image.

In a few cases in the first shipments of this model, some of the speakers had reversed green lead and brown lead connections at the speaker plug. If hum is encountered, check these connections.

The illustrations below show the correct connections for the green (B+) and brown (plate) speaker leads.



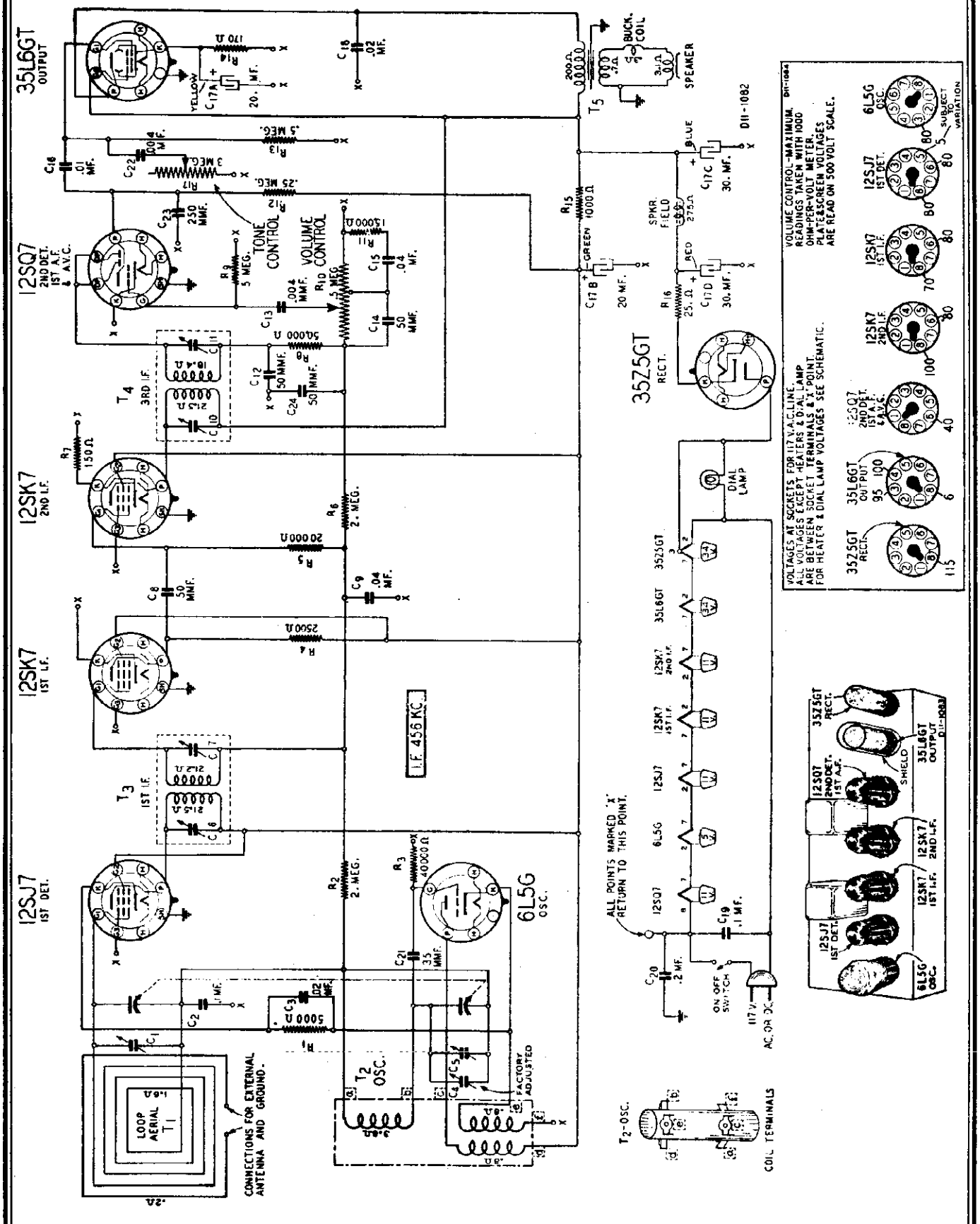




BOTTOM VIEW OF CHASSIS

MODEL 3128, Late

GAMBLE-SKOGMO, INC.



GAMBLE-SKOGMO, INC.

MODEL 3128, Late
MODEL 4132

MODEL 4132 ALIGNMENT PROCEDURE

Volume Control—Maximum 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.

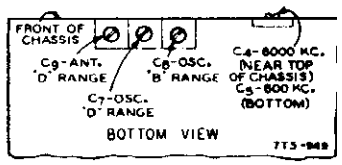
The following equipment is required for aligning:
An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter—Non-Metallic Screwdriver.
Dummy Antennas—.1 mf., 200 mmf., and 400 ohms.

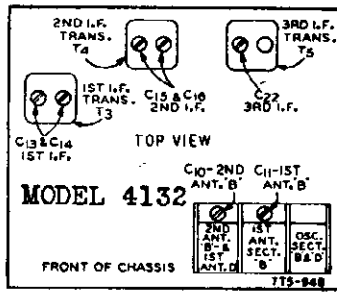
	SIGNAL GENERATOR FREQUENCY SETTING	CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I. F.	456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C13) & (C14) 2nd I.F. (C15) & (C16) 3rd I.F. (C22)
RANGE B	1610 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C8)
	1500 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1500 KC— See Note A	1st Ant. Range B (C11) 2nd Ant. Range B (C10)
	600 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C5) Rock Rotor—See Note B
RANGE D	18,300 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C7)
	16,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C9) Rock Rotor—See Note B
	6000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	6000 KC (C4) Rock Rotor—See Note B

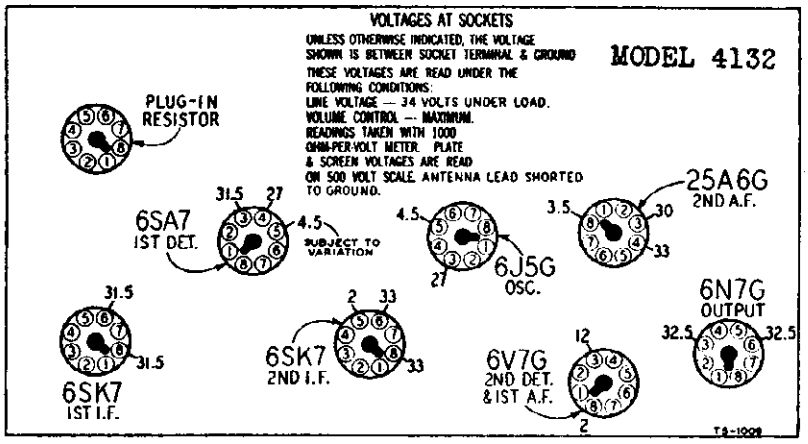
After each range is completed, repeat the procedure as a final check.

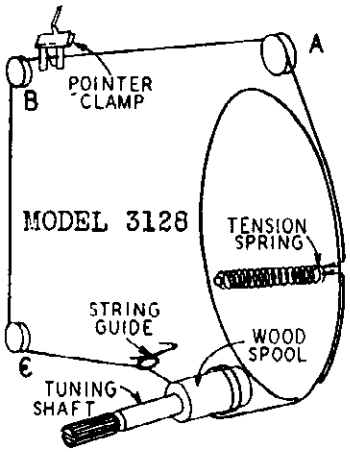
NOTE A—If the pointer is not at 1500 KC on the dial, remove pointer from drive cord. Set pointer at the 1500 KC mark on the dial scale. Attach pointer to drive cord.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.





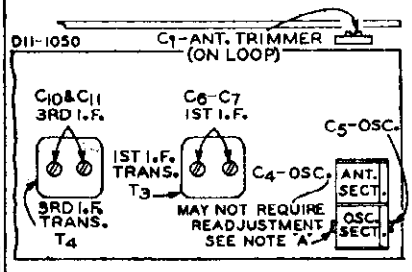




DRIVE CORD REPLACEMENT

Turn gang condenser to full open position. Using a new drive cord 50" in length, attach one end to tension spring. Fasten other end of tension spring to hook on drive pulley. Pass cord through slot in pulley rim and around idler pulleys A, B and C as shown. Pass cord through string guide.

Wind 2 turns counter-clockwise (from front of chassis) around tuning shaft spool. Turns should progress away from chassis—See illustration. Wind 1¼ turns counter-clockwise (from front of chassis) around drive pulley. This turn should be on the left side of the pulley rim (from gang end of chassis). Continue cord through slot in pulley rim. Stretch tension spring and tie free end of cord to spring.



MODEL 3128 ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.
Allow Chassis and Signal Generator to "Heat-Up" for several minutes.
The equipment in column at right is required for aligning:

Signal Generator which will provide an accurate calibrated signal at test frequencies as listed
Output Indicating Meter; Non-Metallic Screwdrive
Dummy Antennas—.1 mf., 200 mmf.

SIGNAL GENERATOR FREQUENCY SETTING	ANTENNA CONNECTION	GROUND CONNECTION	DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMER TO MAXIMUM (See Trimmer Illustration)
I.F. 456 KC	Signal Grid of 1st Det. Connect at Stator of Large Gang Section.	Point "X" 12SQ7— 1st A.F. Prong No. 3	.1 n.f.	Turn Rotor to Full Open	1st I.F. (C6) & (C7) 3rd I.F. (C10) & (C11
1610 KC	Signal Grid of 1st Det.	Point "X"	.1 mf.	Turn Rotor to Full Open	Oscillator (C8) See Note A
1400 KC	External Antenna Clip	Point "X"	200 mmf.	Turn Rotor to Max. Output Set Indicator to 1400 KC— See Note B	Antenna (C1)

SPECIFICATIONS

Power Consumption ..... 28 Watts (At 117 volts AC Supply)
Power Output ..... .75 Watt Undistorted 1.3 Watts Maximum
Selectivity...49 KC Broad at 1000 times Signal
Intermediate Frequency.....456 KC
Speaker .....5" Electro-Dynamic
Tuning Frequency Range 528 to 1610 KC
Sensitivity (For .05 watt output)—External Ant. 9 Microvolts Average

MODEL 3128

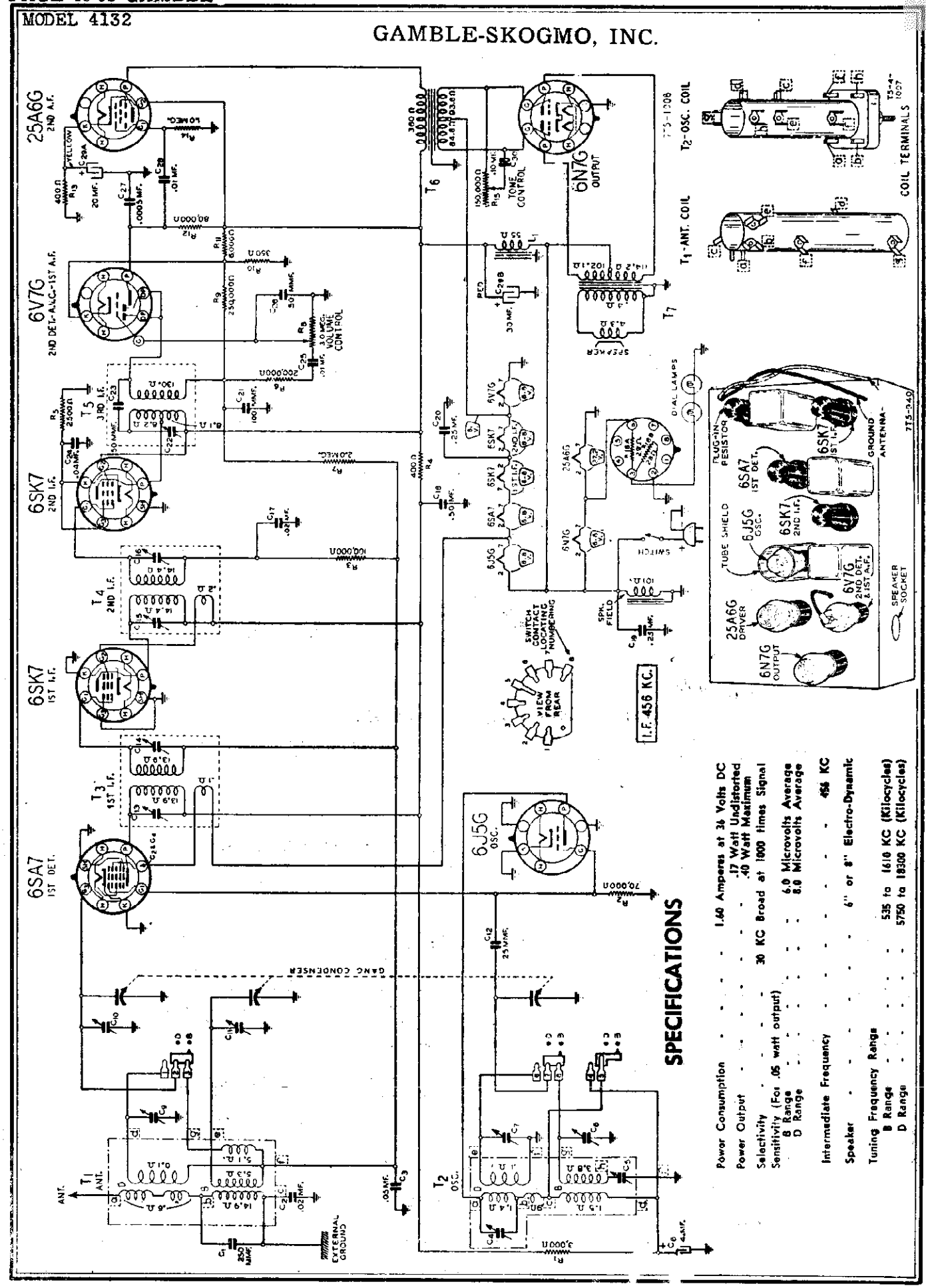
After each range is completed, repeat the procedure as a final check.

NOTE A—Adjust Oscillator (C5) trimmer on gang condenser. Oscillator (C4) auxiliary trimmer on other side of gang is adjusted at factory and ordinarily need not be readjusted in the field.

NOTE B—If the pointer is not at 1400 KC on the dial, set pointer at this mark on the dial scale.

MODEL 4132

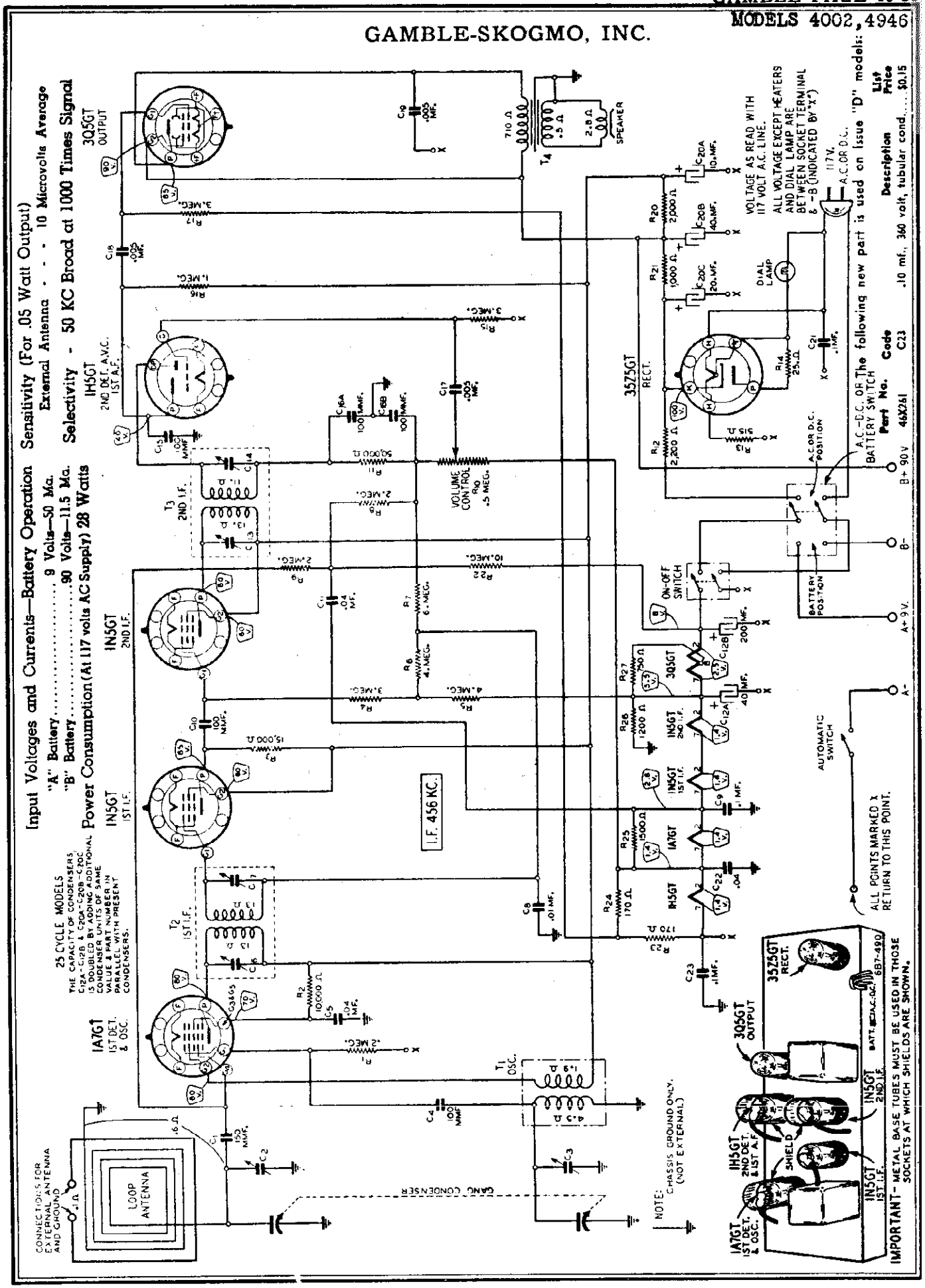
GAMBLE-SKOGMO, INC.



SPECIFICATIONS

Power Consumption	1.60 Amperes at 36 Volts DC
Power Output	.17 Watt Undistorted
	.40 Watt Maximum
Selectivity	30 KC Broad at 1000 times Signal
Sensitivity (For .05 watt output)	
B Range	6.0 Microvolts Average
D Range	8.0 Microvolts Average
Intermediate Frequency	456 KC
Speaker	6" or 8" Electro-Dynamic
Tuning Frequency Range	
B Range	535 to 1610 KC (Kilocycles)
D Range	5750 to 18300 KC (Kilocycles)

GAMBLE-SKOGMO, INC.



Removing Chassis from Cabinet

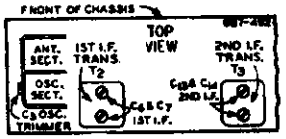
Take out the 2 screws, one at each side on the outside of the cabinet. Grasp the chassis shelf at each rear corner and edge it away from the cabinet front until the chassis shelf and chassis slide easily out of the cabinet.

To remove the shelf from the chassis, take out the bolt and the 2 screws at the bottom of the shelf.

Using Radio Without Batteries—The radio may be used without batteries when it is operated on AC-DC. If this is done, tape the prongs of the battery plugs to prevent them from accidentally touching each other, and place the plugs and cables in the battery compartment.

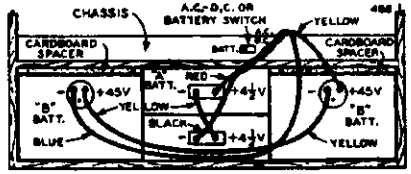
NOTE A—Chassis must be in cabinet. Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. The back of the cabinet must be in place. Place radio approximately 3 feet from loop so as to pick up signal. Radio should not be in proximity to any metal (metal bench, etc.).

CALIBRATION (For models with pointer in front of dial scale)—To obtain dial scale calibration, tune in on 800 KC signal. The pointer should be at the 800 KC mark on the dial. If it is not, hold the pulley at the back of the dial and loosen the pointer screw. Set the pointer at the 800 KC mark. Hold the pointer and retighten the pointer screw.



Two 4½ Volt "A" batteries—Portable Size 4" x 1⅜" x 4⅝" High

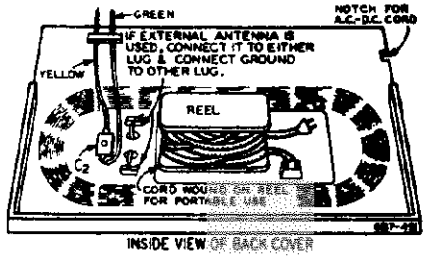
Two 45 Volt "B" batteries—Portable Size 4⅛" x 2½" x 5⅜" High



Caution

The metal chassis is connected to one side of the line through a .10 mfd. condenser. Both AC and DC power lines are generally grounded on one side. If the side of the line not connected to the metal chassis through this condenser is grounded and the metal chassis comes in contact with an external ground, this condenser will be connected across the line and there will be an increase in hum.

Therefore, in any service work on the chassis, keep it on a wood or other insulated surface to avoid contacts with ground. The person working on the set should avoid getting in contact with any ground.



INSIDE VIEW OF BACK COVER

ALIGNMENT PROCEDURE

Volume Control—Maximum 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:

A Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

Output Indicating Meter—Non-Metallic Screwdriver.

Dummy Antenna—.1 mf.

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration below and Illustration of Back—Page 1)
455 KC	Signal Grid of 1st Det. (Top Cap)	.1 mf.	Turn Rotor to full open	1st I.F. (C8) & (C7) 2nd I.F. (C13) & (C14)
1600 KC	Signal Grid of 1st Det.	.1 mf.	Turn Rotor to full open	Oscillator (C3)
1500 KC	None—See Note A		Turn Rotor to max. output	Antenna (C2)

Section 6B7

CHANGES MADE FOR ISSUE "B" November 28,1939

To satisfy Underwriter's requirements, the chassis issue will become "B" when several changes in the routing of wires and the arrangement of parts in the chassis have been made.

Chassis with these changes have had the 6 lug terminal strip 4A98 removed.

PROLONGING TUBE LIFE
CHANGES FOR ISSUE "C" Jan. 9, 1940

To compensate for variations in tube characteristics as well as high line voltages, the following changes have been made in the filament series circuit to reduce the voltages across the tube filaments and to prolong tube life.

Resistor R12, which is in series with the filament series, has been changed from 1950 ohms to 2200 ohms.

There was unequal emission from the 2 sections of the filament of the 3Q5GT output tube. This caused unequal voltages across the 2 sections of the filament and shortened the tube life. There is now a 750 ohm resistor (R27) across one section which equalizes the currents through both portions.

The four 1½ volt tube filaments were shunted with 1200 ohms - Resistors R19 - 800 ohms and R18 400 ohms (See old schematic). The connecting point between these 2 resistors established the grid (bias) voltage for the output tube. These 4 tubes are now shunted by one 1200 ohm Resistor R26.

The 1A7GT 1st Detector Filament is now shunted with a 1500 ohm resistor - R25.

The 1H5GT 2nd Detector Filament is now shunted with 340 ohms - Resistors R24 and R23 in series. The connecting point between these 2 resistors establishes the grid (bias) voltage for the output tube.

CHANGES MADE FOR ISSUE "D" March 11, 1940

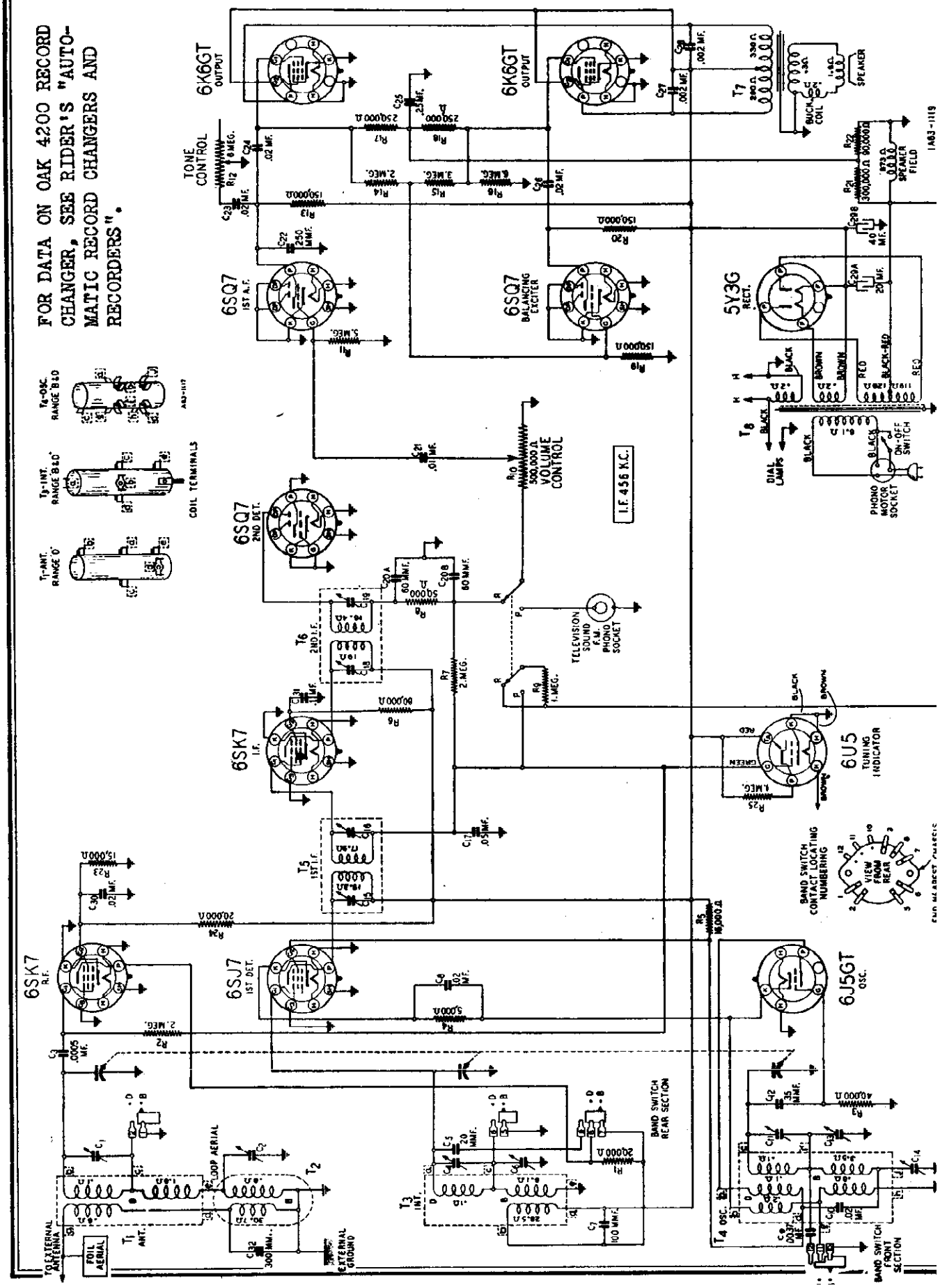
To satisfy additional Underwriters requirements, the chassis has been isolated from the AC-DC line except for a connection through a .1 mf. condenser - See schematic On these models the battery wires are held by a clamp located under the chassis shelf. On previous issues this clamp was above the shelf. The battery compartment cardboard fillers have been made smaller to clear the above mentioned clamp.

On chassis with the above changes incorporated, the issue letter becomes "D."

All voltages on this issue chassis except the heaters and dial lamp are measured between socket terminal and B- (indicated by "X") - See schematic

GAMBLE-SKOGMO, INC.

FOR DATA ON OAK 4200 RECORD CHANGER, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".



MODEL 4164

GAMBLE-SKOGMO, INC.

SPECIFICATIONS

Power Consumption - 85 Watts (At 117 volts 60 cycles)
105 Watts (Phonograph Operating)

Power Output - - - - - - - - 4 Watts Undistorted
5.5 Watts Maximum

Selectivity - - - 35 KC Broad at 1000 times Signal

Intermediate Frequency - - - - - - - - - - 456 KC

Speaker - - - - - - - 8", 10" or 12" Electro-Dynamic

Tuning Frequency Range

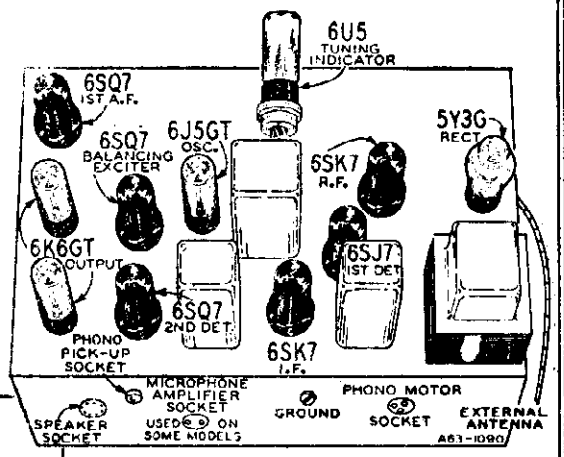
B Range - - - - - - - - - 535 to 1610 KC

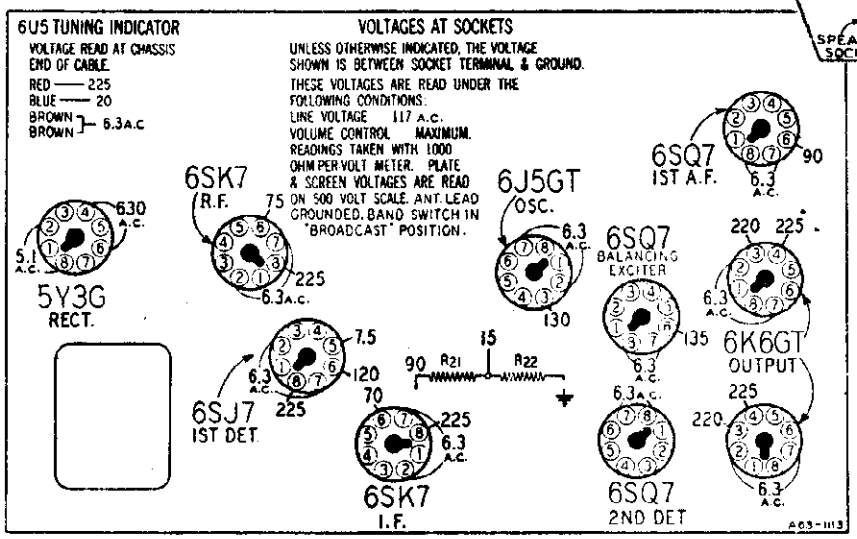
D Range - - - - - - - - - 5.35 to 18.3 MC

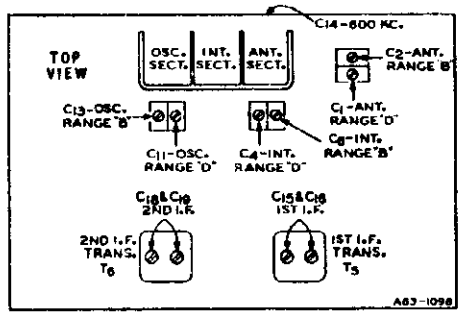
Sensitivity—External Antenna—(For 0.5 Watt output)

B Range - - - - - - - 2.0 Microvolts Average

D Range - - - - - - - 4.0 Microvolts Average







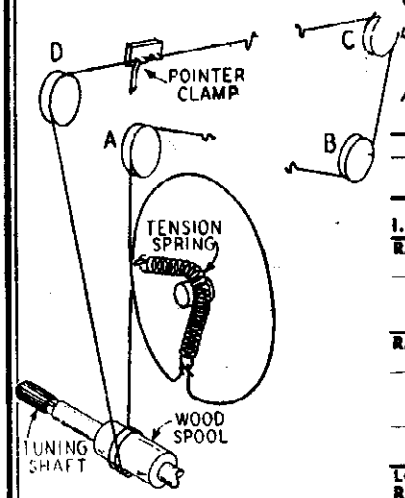
NOTE A—If the pointer is not at 1400 KC on the dial, remove pointer from drive cord. Set pointer at the 1400 KC mark on the dial scale. Attach pointer to drive cord.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

DRIVE CORD REPLACEMENT

Turn gang condenser to open position. Use new drive cord 55" in length.

Secure one end of tension spring to hook on drive pulley. Bend spring around drive pulley shaft—see illustration. Pass cord through slot in pulley rim. Wind cord ¼ turn clockwise (from drive pulley end of chassis) around drive pulley. Pass cord around idler pulleys A, B, C and D as in illustration. Then wind cord 2½ turns clockwise (from front of chassis) around tuning shaft spool. These turns should progress away from chassis. Pass cord over top of drive pulley for ¾ turn clockwise (from drive pulley end of chassis) and through slot in pulley rim. Fasten cord to tension spring—see illustration.



ALIGNMENT PROCEDURE

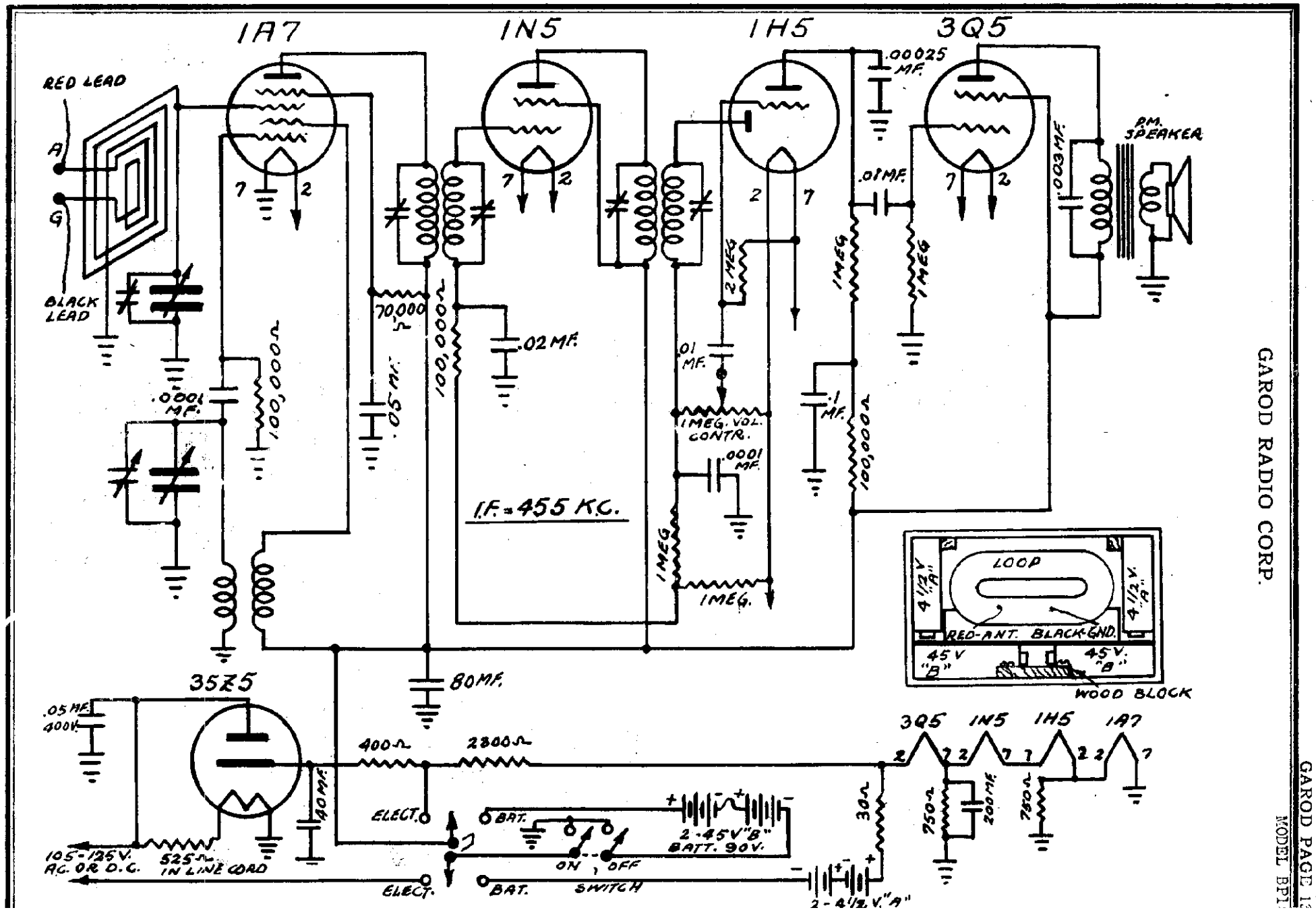
Volume Control—Maximum All Adjustments.

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., 100 mmf., and 400 ohms.

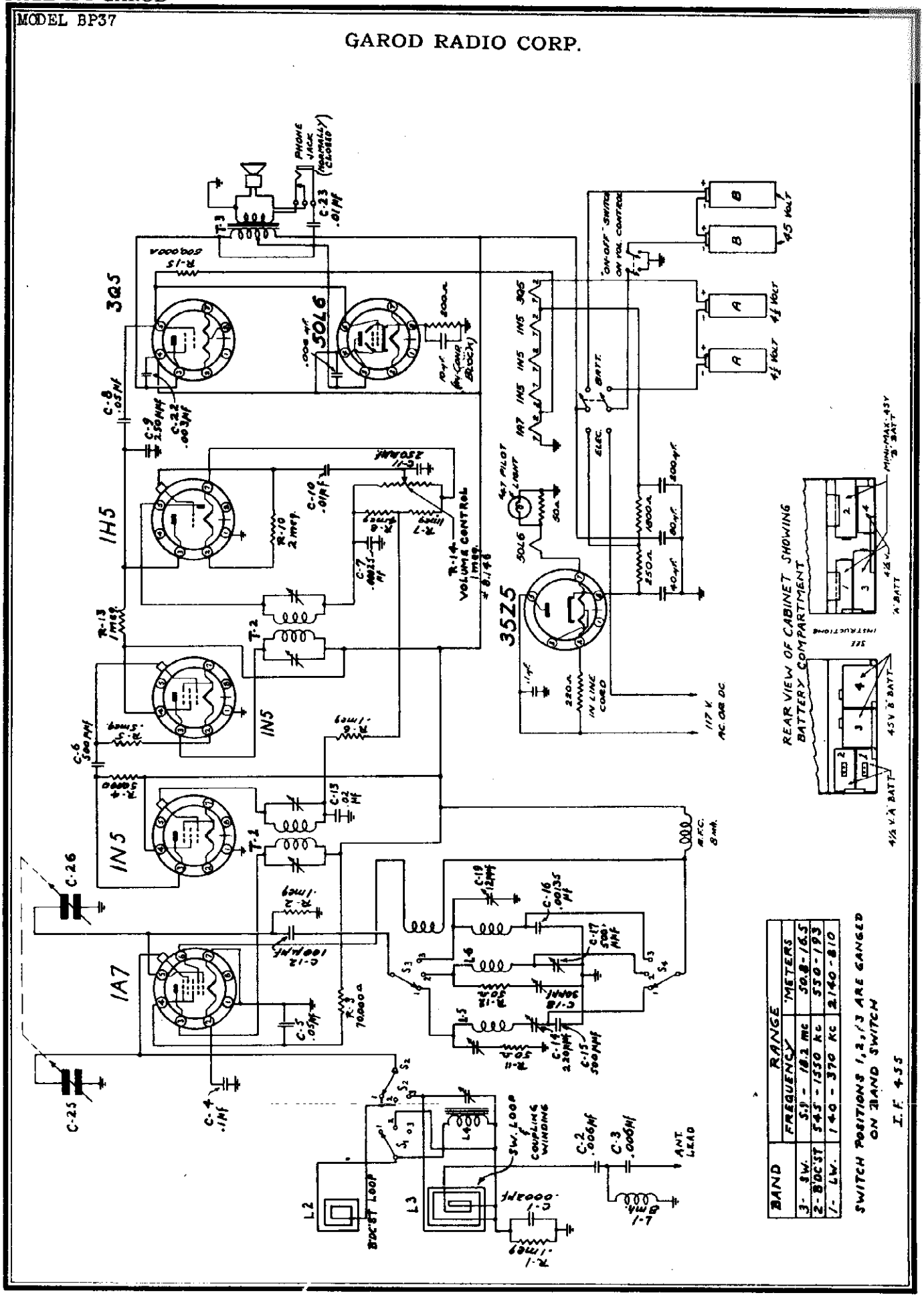
	SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I.F.	456 KC	Signal Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C15) & (C16) 2nd I.F. (C18) & (C19)
RANGE D	18,300 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C14)
	17,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C1) Int. Range D (C4) Rock Rotor—See Note B
RANGE B	1610 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C13)
	1400 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC— See Note A	Ant. Range B (C2) Int. Range B (C6)
	600 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C14) Rock Rotor—See Note B
LOOP RANGE B	1400 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output	Ant. Range B (C2)



GAROD RADIO CORP.

MODEL BP37

GAROD RADIO CORP.

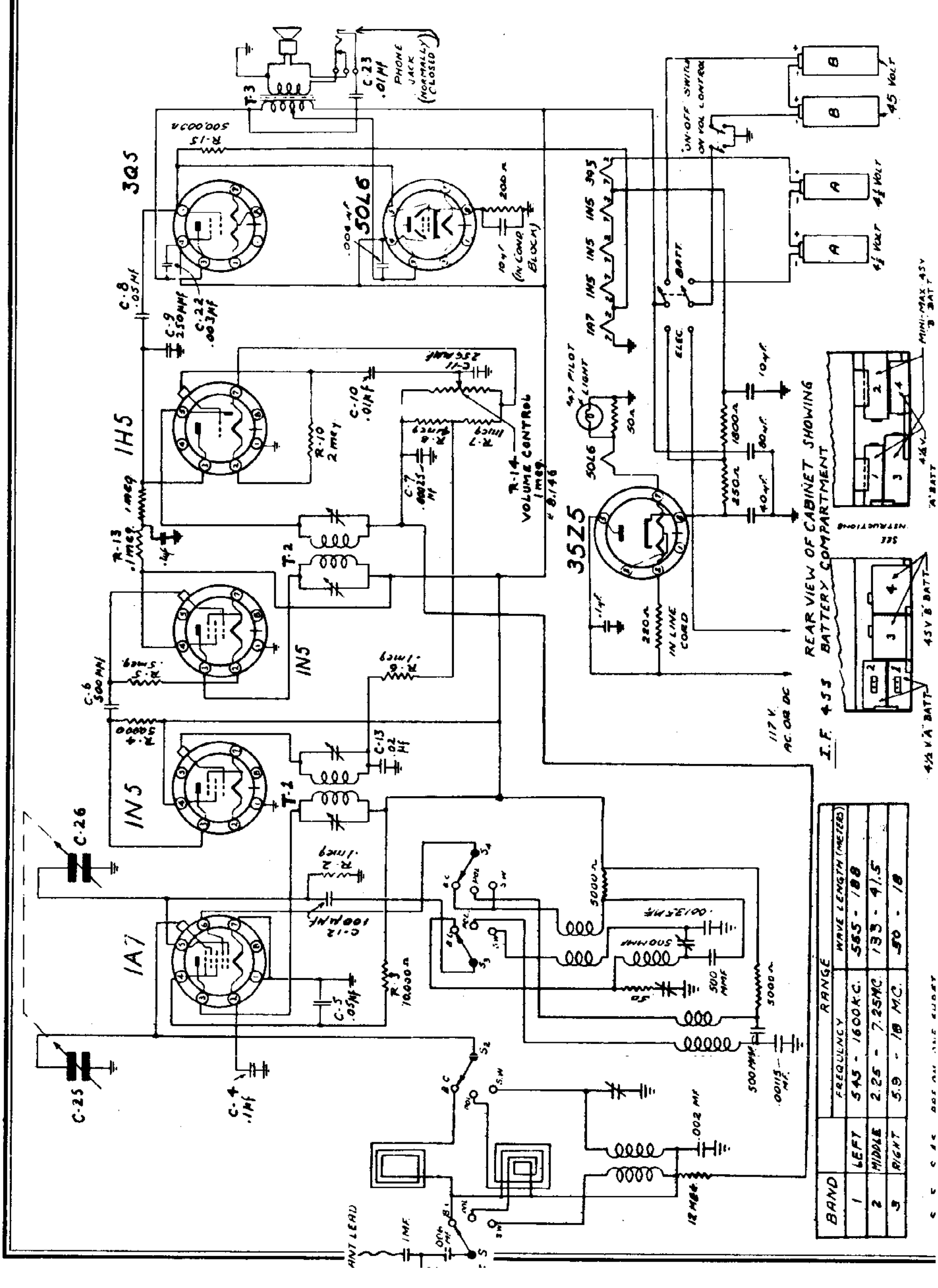


BAND	RANGE	
	FREQUENCY	METERS
1- S.W.	5.9 - 18.2 mc	50.8 - 16.5
2- B'CST	545 - 1550 kc	550 - 193
3- L.W.	140 - 370 Kc	2140 - 810

SWITCH POSITIONS 1, 2, & 3 ARE GANGED ON BAND SWITCH

I.F. 455

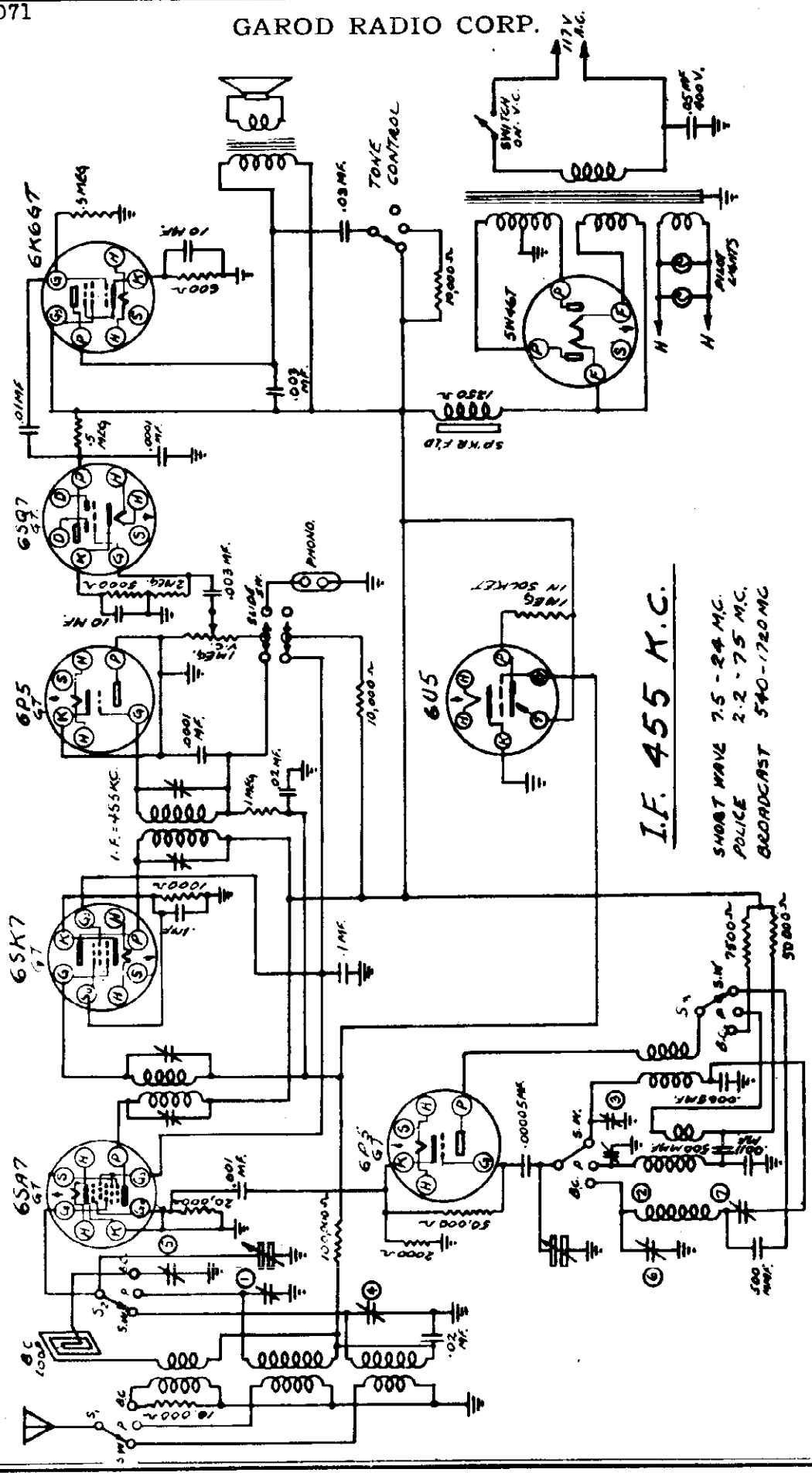
GAROD RADIO CORP.

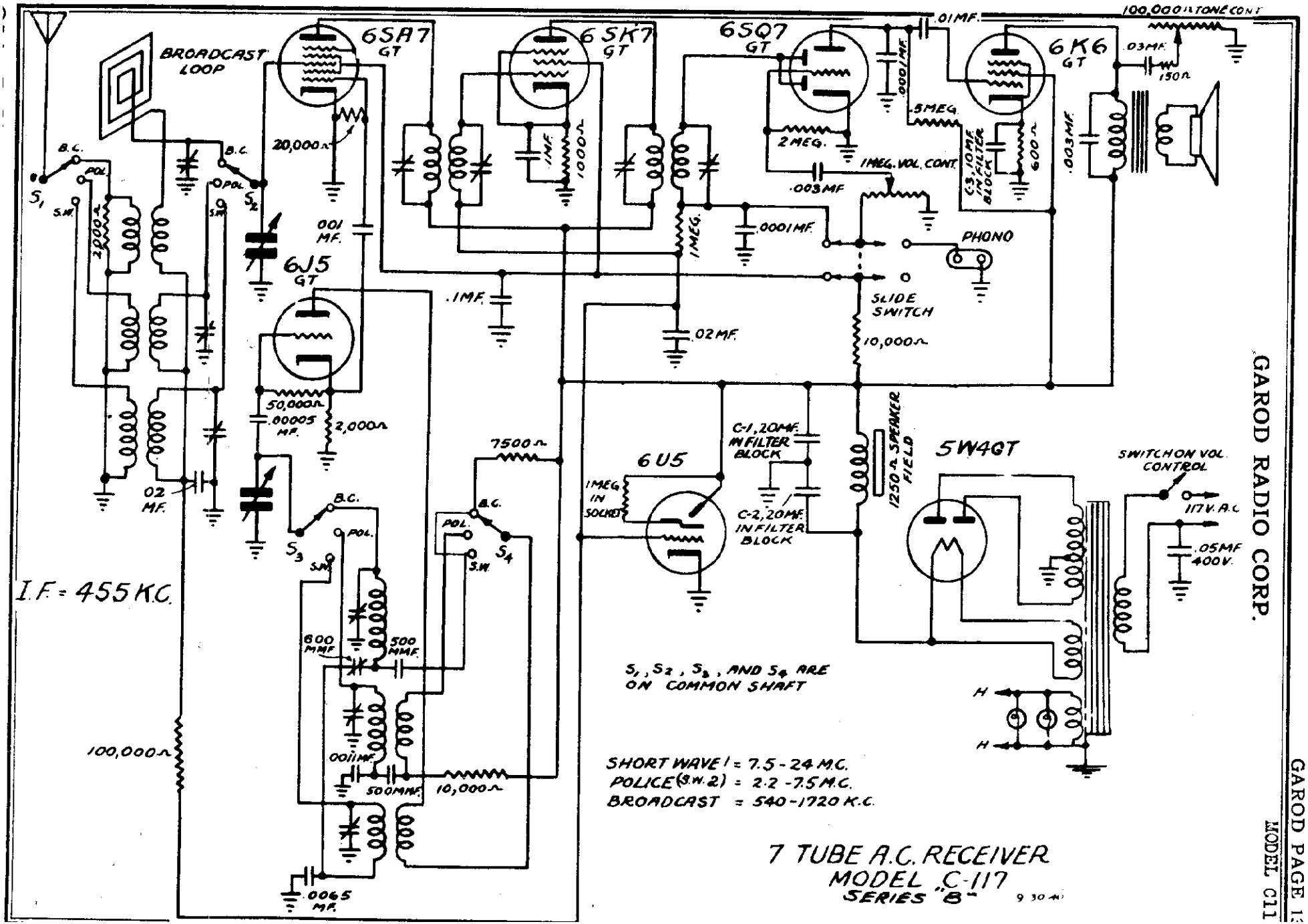


BAND		RANGE: FREQUENCY	WAVE LENGTH (METERS)
1	LEFT	545 - 1600 K.C.	585 - 188
2	MIDDLE	2.25 - 7.25 MC.	133 - 41.5
3	RIGHT	5.9 - 18 M.C.	50 - 18

MODEL D71

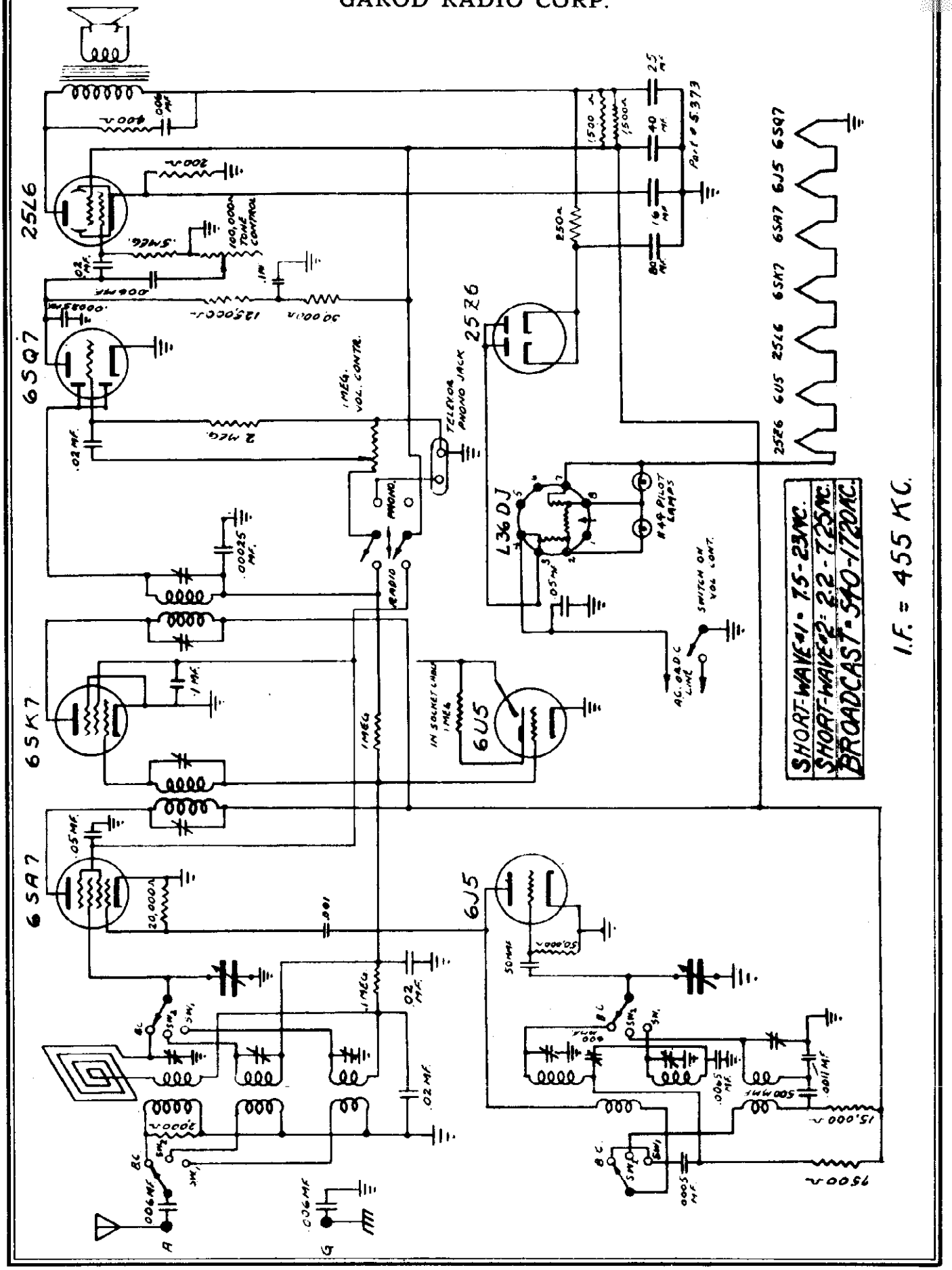
GAROD RADIO CORP.



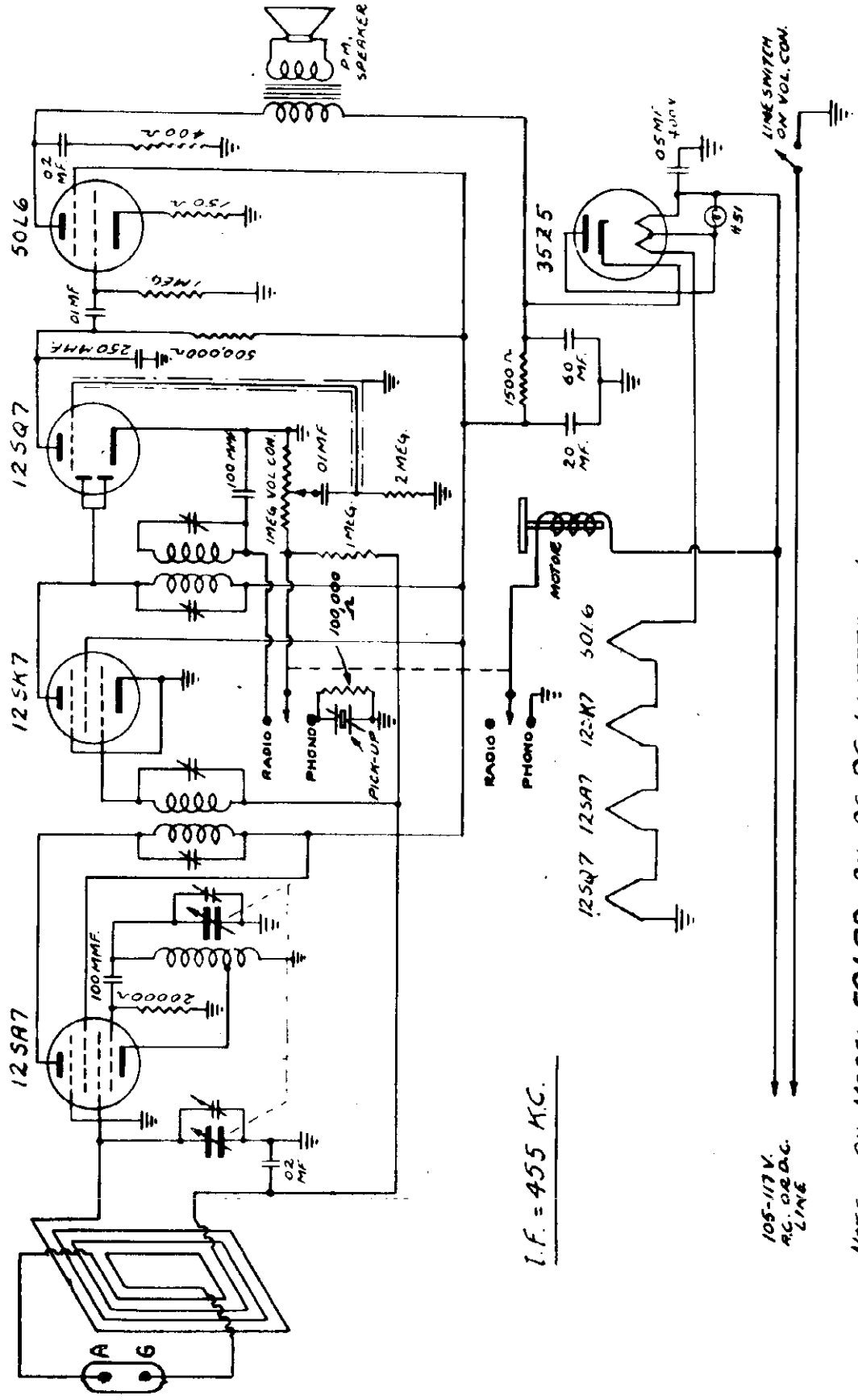

BROADCAST LOOP
6SA7 GT
6SK7 GT
6SQ7 GT
6K6 GT
6J5 GT
6U5
5W4GT
S1
S2
S3
S4
B.C.
POL.
S.W.
20,000Ω
2000Ω
001 MF.
.02 MF.
50,000Ω
.00005 MF.
2,000Ω
7500Ω
800 MMF.
500 MMF.
.0011MF.
500MMF.
10,000Ω
100,000Ω
.0065 MF.
.1MF.
1000Ω
1MEG.
.0001MF.
.02MF.
10,000Ω
.01MF.
.001MF.
.5MEG.
2MEG.
1MEG. VOL. CONT.
.003MF
C-3, 10MF IN FILTER BLOCK
600Ω
100,000Ω TONE CONT.
.03MF.
150Ω
.003MF.
PHONO
SLIDE SWITCH
1MEG IN SOCKET
C-1, 20MF. IN FILTER BLOCK
C-2, 20MF. IN FILTER BLOCK
1250Ω SPEAKER FIELD
SWITCH ON VOL. CONTROL
117V. A.C.
.05MF 400V.
H
H
I.F. = 455 K.C.
S1, S2, S3, AND S4 ARE ON COMMON SHAFT
SHORT WAVE I = 7.5 - 24 M.C.
POLICE (S.W. 2) = 2.2 - 7.5 M.C.
BROADCAST = 540 - 1720 K.C.
7 TUBE A.C. RECEIVER
MODEL "C-117
SERIES "B"
9 30 A.M.
GAROD RADIO CORP.
GAROD PAGE 13
MODEL C11

MODELS 'C118, 328

GAROD RADIO CORP.



GAROD RADIO CORP.



MODEL HM-3 MODEL JM-3

Electrical Specifications

Rating "A"—115–125 volts, 60 cycles, 20 watts.

Rating "V"—115–125 volts, 50 cycles, 20 watts.

Rating "C"—115–125 volts, 25 cycles, 20 watts.

MODEL JM-4

Electrical Specifications

Rating "A6"—115–125 volts, 60 cycles, 20 watts.
Rating "A5"—115–125 volts, 50 cycles, 20 watts.

INFORMATION

When connecting this record player to an a-c/d-c receiver insert a .25 mfd. 400 V. paper capacitor between the black lead of the record player and the chassis ground, and a .005 or .01 mfd., 400 V. paper capacitor between the green lead of the record player and the circuit tapped in the radio.

Radio Receiver Connections

There are several different methods which may be used to connect the record player to the radio receiver depending upon the provisions incorporated in the radio for handling phonograph connections and upon the type of installation desired. Several methods are outlined below for superheterodyne receivers.

The process of changing from radio reception to record-player operation and vice versa requires either the manual insertion of the record-player leads in the radio circuit each time the process is performed or the use of a switch to automatically perform the operation. The convenience of a switching arrangement will so far outweigh the labor involved in manual operation that the slight additional cost of a switch will pass unnoticed.

There follow several general methods of installation which should not be assumed to be comprehensive or all-conclusive.

Method No. 1.—(For radios equipped with phono pin-jack terminals.) The Model HM-3 is equipped with a plug for connecting to radios equipped with a phono pin jack. The green lead of the record player is connected to the pin terminal and the black lead to the shield of the plug. Some radio models automatically switch to record-player operation when the plug is inserted in the terminal; other models require pushing or rotating a switch incorporated on the radio control panel.

Method No. 2.—(For radios equipped with phono terminals.) Consult the instruction pamphlet which was supplied with your radio to determine which phono terminals are for connections to the record player. There may be three or four terminals, depending upon the type of radio. Determine which terminal is connected to the high side of the volume control. For radio operation, there will be a link connection between this volume-control terminal and the radio diode load terminal. On a three-terminal board, the remaining terminal will be chassis ground. On a four-terminal board, one of the remaining terminals will be chassis ground and the other a diode return.

Using manual insertion of the record player into the radio circuits, it is only necessary to remove the link from between the diode load and volume-control terminals and reinsert it between the diode load and chassis ground terminals (on a three-terminal board), or between diode load and diode return (on a four-terminal board). The green lead on the record player is then connected to the volume control terminal and the black lead to the chassis ground terminal. To return to radio operation, merely remove the link and reinsert between the diode load and volume-control terminals.

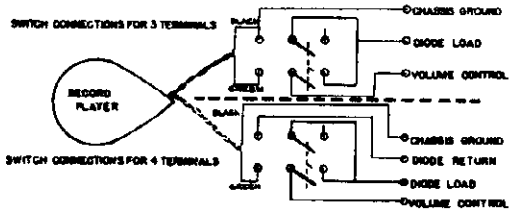
It may not be necessary to disconnect the record-player leads when returning to radio operation depending upon the circuit design in your radio receiver. If the tone quality and volume are impaired when the record player remains connected, then it will be necessary to remove the record-player leads from the radio terminals each time you turn from record-player performance to radio reception.

Using switch operation requires the use of a double-pole double-throw toggle or rotary switch. The general method of connection is as shown in Fig. 1.

The record player can remain permanently connected when using this method of switch connection.

Some late radio models have the switch already incorporated in the push-button assembly.

Method No. 3.—(For radios not equipped with phono or pin-jack terminals but on which phono terminals are to be located.) First, pull the radio power-cord plug out of the power-supply socket; then remove the radio receiver chassis from the cabinet to allow access to the high side of the volume control. Unsolder the lead from the high side of the volume control and solder it on to one lead of a two-conductor shielded pair. Solder the other conductor of the shielded pair to the high side of the volume control. This shielded pair should be long enough to extend to the outside rear of the radio chassis. Solder the shields to the chassis. Procure a three-terminal board and mount it on the shelf of the cabinet at the rear of the chassis. Connect the shield to one outside terminal and the new volume-control conductor to the other outside terminal, leaving the center terminal for the remaining conductor. Connect the record player to the two outside terminals. When record-player operation is desired, interconnect the center terminal and the shield terminal. When radio operation is desired, interconnect the center terminal and the volume-control terminal. It may be necessary, depending upon the circuit in your radio receiver, to remove the record-player leads from the terminals each time radio reception is to be enjoyed. Tone and volume performance will indicate connection requirements. A switch may be inserted to perform the change-over operations by connecting as shown in Fig. 1. (Read descriptive material pertaining to Fig. 1.)



Method No. 4.—Some radio models will permit satisfactory record-player operation with the green lead of the record player connected to grid of the first audio tube and the black lead connected to the chassis ground. This method, however, requires tuning the radio to a dead spot on the band and may, in addition, require shorting the antenna to ground. NOTE.—Do not remove radio grid lead from the first audio tube.

The above instructions apply to the Models JM-3 and JM-4 as well as to Model HM-3.

See Index for Parts Lists of these Models. Note that two different motor assemblies have been used.

GENERAL ELECTRIC CO.

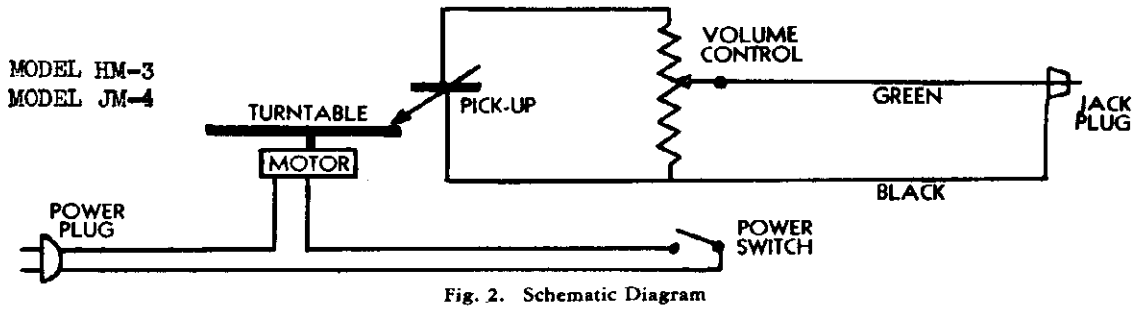


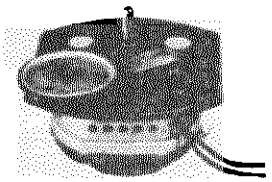
Fig. 2. Schematic Diagram

REPLACEMENT PARTS LIST
Model JM-4

Stock No.	Description	List Price
	CHASSIS ASSEMBLY	
RB-944	BOTTOM COVER—Cabinet bottom cover	$0.30
*RC-2002	CLAMP—Crystal clamp	.10
RC-2017	CATCH—Tone arm catch for securing to rest	.10
RC-8174	CORD—Power cord	.40
*RF-016	FOOT—Rubber foot for cabinet (Pkg. 3)	.05
*RH-114	HAIRPIN COTTER—Swivel retaining cotter	.10
*RK-063	KNOB—Power switch and volume control knob	.10
RN-007	NUT—Speed nut for mounting motor assembly (Pkg. 3)	.10
RN-008	NUT—Power switch clamping nut (Pkg. 5)	.10
*RN-102	NEEDLE CUP—Rubber needle cup	.10
*RP-145	PLUG—Phono plug (Pkg. 5)	.25
*RP-506	PICK-UP—Crystal pick-up	4.75
*RP-801	POST—Tone arm swivel post	.15
*RR-940	REST—Tone arm rest	.15
*RS-888	SCREW—Needle clamping screw	.10
RS-896	SCREW—Crystal clamp and catch screw (Pkg. 5)	.05
*RS-938	SWIVEL—Tone arm swivel assembly	.15
*RT-912	TONE ARM—Crystal tone arm	.65
RV-073	VOLUME CONTROL—Volume control and power switch	.70
*RW-114	WEIGHT—Tone arm weight	.05

MOTOR TURNTABLE ASSEMBLY MODEL NO. 2

RM-133	MOTOR—60-cycle motor assembly complete	6.25
RP-165	PLATE—Main plate and turntable shaft bearing assembly	.90
RP-166	PLATE—Motor mounting plate	.30
RP-167	PLATE—Rubber-edged-wheel movable plate and bearing assembly	.70
RP-316	PULLEY—60-cycle drive pulley and oil throw washer (Pkg.2)	.25
RS-493	SPRING—Movable plate tension spring (Pkg. 2)	.10
RS-943	SPINDLE—Turntable spindle and cotter	.20
RS-953	SPACERS—Rotor spacers between bearings (Pkg. 5)	.15
RT-924	TURNTABLE—8-inch brown flocked turntable	1.60
RW-912	WHEEL—Rubber-edged wheel, washer, oil felt and cotter	1.00
RX-073	ASSEMBLY—Rotor bearing brackets, felts, bearing assembly	.35
RX-074	ASSEMBLY—Motor plate mounting bushing, washers and screws	$0.15
RX-075	ASSEMBLY—Motor field and winding assembly	2.00
RX-076	ASSEMBLY—Movable-plate-guide spacer, washer screw assembly (Pkg. 5)	.10
RX-077	ASSEMBLY—Propeller, cotter, washer assembly	.15
RX-078	ASSEMBLY—Rotor assembly	1.35



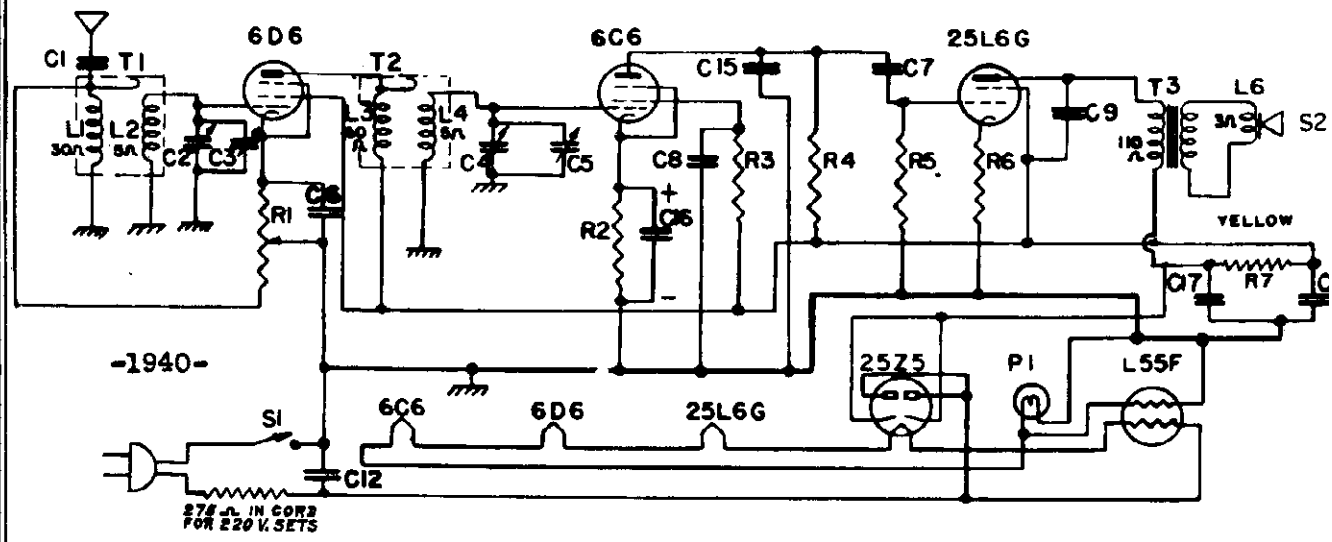
MOTOR TURNTABLE ASSEMBLY MODEL NO. 3

RB-184	BRACKET—Turntable drive wheel bracket assembly	.15
RB-185	BRACKET—Lower motor bearing bracket assembly complete	.40
RF-502	FIELD—60-cycle field stator assembly complete	3.60
RF-503	FIELD—50-cycle field stator assembly complete	3.60
RP-504	FRAME—Upper motor frame assembly	.60
RM-139	MOTOR—60-cycle motor assembly complete less turntable	6.00
RM-140	MOTOR—50-cycle motor assembly complete less turntable	6.40
RP-164	PLATE—Motor mounting plate and bearing assembly	.90
RP-311	PULLEY—60-cycle motor pulley and setscrew	.20
RP-312	PULLEY—50-cycle motor pulley and setscrew	.25
RR-406	ROTOR—Rotor complete	1.55
RS-4008	SPRING—Turntable drive tension spring (Pkg. 2)	.05
RS-875	SETSCREW—Motor pulley setscrew (Pkg. 12)	.25
RS-932	SPINDLE—Turntable spindle and cotter	.30
RT-923	TURNTABLE—8-inch brown flocked turntable	1.60
RW-909	WHEEL—Rubber-edged drive wheel	.50
RX-065	ASSEMBLY—Turntable drive wheel bracket mounting washer, screw and nut assembly (Pkg. 5)	.20
RX-066	ASSEMBLY—Lower bearing bracket screw and nut assembly (Pkg. 3)	.05
RX-067	ASSEMBLY—Motor mounting screw, washer and grommet assembly (Pkg. 3)	.25
RX-068	ASSEMBLY—Drive wheel oil retainer, cotter and thrust washer assembly (Pkg. 5)	.10

*Used on previous receivers. (Prices subject to change without notice)

GENERAL ELECTRIC CO.

MODELS GDE-41A, GDE-41
MODELS FE-82, FE-87



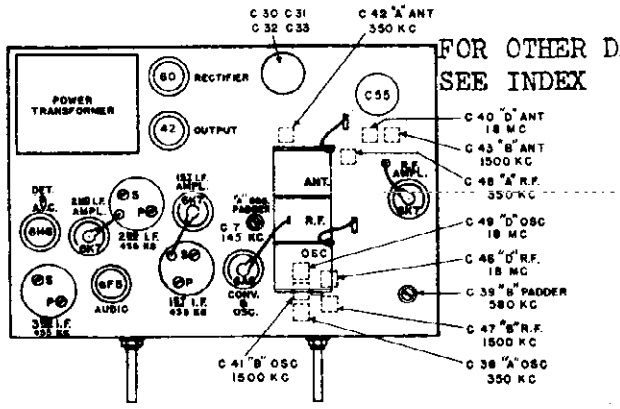
Symbol	Description	Symbol	Description	Symbol	Description
C-1	.01 Mfd. Paper Capacitor	C-16	10 Mfd. Dry Electrolytic	R-4, 5	1.0 Megohm Carbon Resistor
C-2,3,4,5	Tuning Condenser and Trimmers	C-17	30 Mfd. Dry Electrolytic	R-6	150 Ohm Carbon Resistor
C-6	.05 Mfd. Paper Capacitor	C-18	20 Mfd. Dry Electrolytic	R-7	5700 Ohm Carbon Resistor
C-7, 8	.01 Mfd. Paper Capacitor	R-1	25,000 Ohm Volume Control	T-1	Antenna Transformer
C-9	.02 Mfd. Paper Capacitor	R-2	35,000 Ohm Carbon Resistor	T-2	R.F. Transformer
C-12	.05 Mfd. Paper Capacitor	R-3	3.0 Megohm Carbon Resistor	T-3	Output Transformer
C-15	100 Mmf. Mica Capacitor				

POWER CONSUMPTION GDE-41A 48 WATTS, GDE-41V 90 WATTS

SOCKET VOLTAGES

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" Rating A.C. or D.C.	"V" Rating A.C. or D.C.	"A" Rating A.C. or D.C.	"V" Rating A.C. or D.C.	"A" Rating A.C. or D.C.	"V" Rating A.C. or D.C.	"A" Rating A.C. or D.C.	"V" Rating A.C. or D.C.	"A" Rating A.C. or D.C.	"V" Rating A.C. or D.C.
6D6	112	104	112	104	15	14.5	0.8	0.75	6.2	6.3
6C6	33*	28*	28	26	2.1	2.0	.05	.05	6.2	6.3
25L6G	126	118	112	104	7.9	7.8	44	43	25.5	26
25Z5	....	....			135	130	48	47	24	24

Line Voltage "A" rating—115. Line Voltage "V" rating—220.
No signal input—Dial pointer at 540.—Volume control at minimum.
* Measured on 250-volt scale.



CHASSIS LAYOUT-FE-82, FE-87

FOR OTHER DATA SEE INDEX

Tuning Frequency Range

Band "B" ..... 540–1800 kc.
Alignment Frequency ..... 1500 kc.

ALIGNMENT

Connect the high side of the signal generator through a 250 mmf. condenser to the antenna lead. The low side of the signal generator output should be connected to the receiver chassis through a .05 mfd. condenser. Connect a suitable output meter across the voice coil leads; then proceed as follows:

1. With gang condenser plates completely closed, the dial pointer should coincide with the horizontal dial line.

2. Tune receiver to the 1500 kc. point on the dial; then align trimmers (C-3 and C-5) on the gang condenser at 1500 kc. for a maximum output meter reading.

Precaution—One side of the power supply is connected to the chassis—Do not connect chassis to any external ground.

GENERAL ELECTRIC CO.

ALIGNMENT PROCEDURE

Alignment Frequencies

I.F.....455 KC R.F.....1500 and 580 KC
The location of all trimmers is shown in Fig. 1.

I.F. Alignment

Connect an output meter across the voice coil. Turn the volume control to maximum. Set test oscillator to 455 KC and keep the oscillator output as low as a readable meter reading will permit.

Apply signal to the grid of the 6SK7GT through a .05 mfd. capacitor and align the 2nd I.F. transformer. Repeat the procedure, applying the 455 KC signal to the control grid of the 6SA7GT and aligning the 1st I.F. transformer. Finish by over-all adjustments.

R.F. Alignment

With gang condenser plates completely closed, set dial pointer to the first mark at the left end of the scale. Apply a 1500-KC signal either through a standard I.R.E. dummy to the antenna terminal or through an additional loop connected to the generator output which can be magnetically coupled to the receiver Beam-a-Scope. Align (C-2) at 1500 KC and peak (C-1) for maximum output. Peak (C-3) on 580 KC while rocking the gang condenser. Retrim at 1500 KC.

Special Service Information

The following data will be very useful to servicemen equipped with vacuum-tube voltmeters or similar voltage-measuring instruments.

(1) Stage Gains
Antenna Post to Converter Grid—6 at 1000 KC‡
Converter Grid to 6SK7GT Grid—30 at 455 KC‡
6SK7GT Grid to 6Q7GT Det. Plate—100 at 455 KC‡

(2) Audio Gains
.06 volts, 400 cycles signal across volume control with control set to maximum will give approximately ½-watt speaker output.

(3) DC voltage developed across oscillator grid resistor (R-1) averages 12 volts.

‡ Variations of +10, −20% permissible.

FOR OTHER DATA IN VOL. XII SEE INDEX

ALIGNMENT PROCEDURE

I.F. ALIGNMENT WITH OSCILLOSCOPE

Band Switch Setting	Input Freq.	Point of Input	Dummy Antenna	Trimmer	Comments
1. Band "D"	455 K.C. Sweep	I.F. Grid	.05 Mfd. or Larger	2nd I.F. Sec. (Bottom of Shield Can) 2nd I.F. Pri. (Top of Shield Can)	Gang condenser plates closed—connect audio input of oscilloscope to ground and to the junction of R-10 and R-12. Adjust trimmers in order mentioned for a single symmetrical curve of maximum amplitude. The resulting curve with input at converter grid is shown in Fig. 3.
2. Band "D"	455 K.C. Sweep	Converter Grid	.05 Mfd. or Larger	1st I.F. Sec. (Top of Shield Can) 1st I.F. Pri. (Bottom of Shield Can)	

I.F. ALIGNMENT WITH OUTPUT METER

1. Band "D"	455 K.C. with Modulation	I.F. Grid	.05 Mfd. or Larger	2nd I.F. Sec. (Bottom of Shield Can) 2nd I.F. Pri. (Top of Shield Can)	Gang condenser plates closed—connect output meter across voice coil—keep signal low and volume control on as far as possible. Adjust all trimmers for maximum output.
2. Band "D"	455 K.C. with Modulation	Converter Grid	.05 Mfd. or Larger	1st I.F. Sec. (Top of Shield Can) 1st I.F. Pri. (Bottom of Shield Can)	

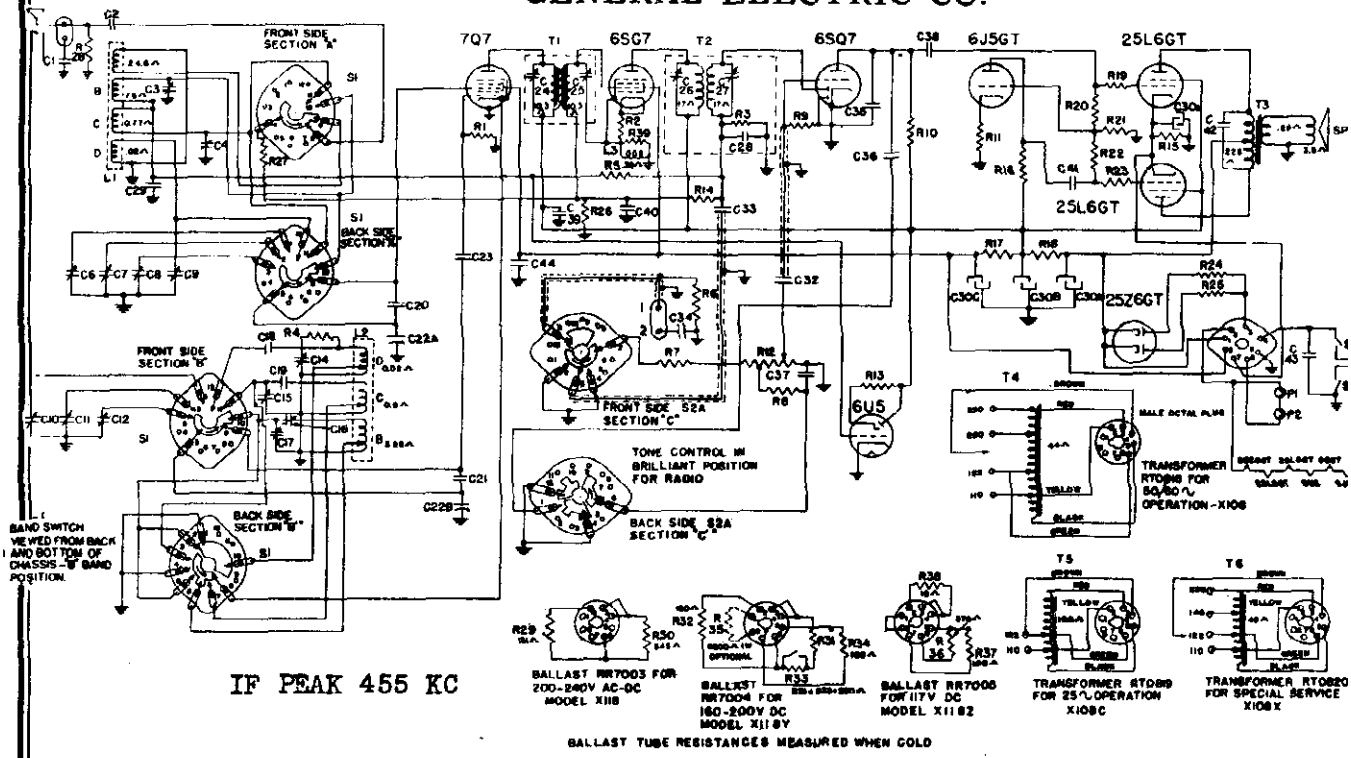
R.F. ALIGNMENT
Models HE-74 and HE-740

1. Band "B"	.....	.....	.....	.....	Close gang condenser plates. Adjust pointer to first line at left end of tuning scale.
2. Band "D"	21 M.C. with Modulation	Antenna Post	I.R.E.	Osc. (C-9) R.F. (C-6) Ant. (C-3)	Connect output meter across voice coil—peak trimmers for maximum output. The image of any "D" band signal should be heard 910 K.C. below the input signal. Example: 18 M.C. image is at 17.09 M.C. Peak (C-6) while rocking the gang condenser.
3. Band "C"	6 M.C. with Modulation	Antenna Post	I.R.E.	Osc. (C-10) R.F. (C-7) Ant. (C-4)	Peak trimmers for maximum output using a low input signal. Peak (C-7) while rocking the gang condenser. Image—910 K.C. below signal.
4. Band "B"	1500 K.C. with Modulation	Antenna Post	I.R.E.	Osc. (C-11) R.F. (C-8) Ant. (C-5)	Peak trimmers for maximum output with a low input signal.
5. Band "B"	580 K.C. with Modulation	Antenna Post	I.R.E.	Osc. padder (C-12)	Adjust padder for maximum output in the vicinity of 580 K.C. while rocking the gang condenser.
6. Band "B"	Repeat Operation 4				

FOR OTHER DATA IN RIDER'S VOL. XII SEE INDEX

GENERAL ELECTRIC CO.

MODELS X108, X1



IF PEAK 455 KC

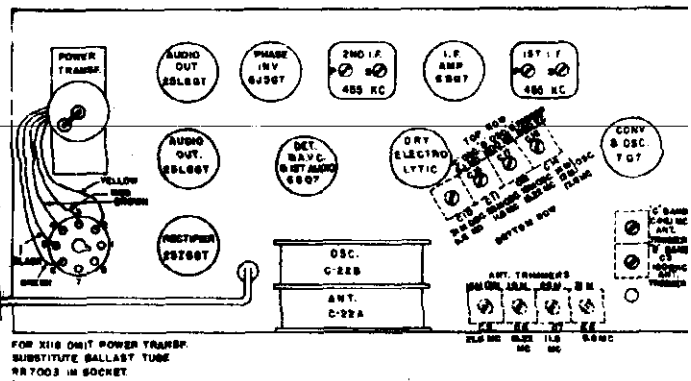
BALLAST TUBE RESISTANCES MEASURED WHEN COLD

RADIO REPLACEMENT PARTS LIST

Our Cat. No.	Symbol	Description	List Price
*RC-039	C1	CAPACITOR—.01 mfd., 600 v. paper	$0.25
*RC-009	C2	CAPACITOR—.001 mfd., 600 v. paper	.30
RC-6554	C3, 4	CAPACITOR—"B" and "C" Antenna trimmer	.35
RT-883	C6, 7, 8, 9	TRIMMER—Antenna trimmer strip	.70
RT-884	C10, 11, 12, 14, 15, 16, 17	TRIMMER STRIP—Oscillator trimmer strip	1.25
*RC-396	C-18	CAPACITOR—5600 mmf., mica	.45
*RC-347	C-19	CAPACITOR—1800 mmf., mica	.35
RC-325	C-20, 21	CAPACITOR—45 mmf., compensating capacitor	.40
RC-7062	C-22a, 22b	CONDENSER—2 gang tuning condenser	1.10
RC-326	C-23	CAPACITOR—40 mmf., compensating capacitor	.25
*RC-072	C-29	CAPACITOR—.05 mfd., 200 v., paper	.25
RC-5197	C-30a	CAPACITOR—20 mfd., 250 v, dry electrolytic	1.40
	C-30b	CAPACITOR—40 mfd., 250 v, dry electrolytic	
	C-30c	CAPACITOR—20 mfd., 250 v, dry electrolytic	
	C-30d	CAPACITOR—20 mfd., 25 v, dry electrolytic	
*RC-039	C-32	CAPACITOR—.01 mfd., 600 v, paper	.25
*RC-048	C-33	CAPACITOR—.02 mfd, 600 v, paper	.30
*RC-130	C-34	CAPACITOR—.2 mfd., 400 v, paper	.30
*RC-249	C-35	CAPACITOR—220 mmf. mica	.25
*RC-049	C-36	CAPACITOR—.004 mfd., 600 v, paper	.35
*RC-023	C-37	CAPACITOR—.005 mfd, 600 v, paper	.25
*RC-060	C-38	CAPACITOR—.03 mfd., 600 v, paper	.25
*RC-092	C-39	CAPACITOR—.05 mfd., 600 v, paper	.30
*RC-072	C-40	CAPACITOR—.05 mfd., 200 v, paper	.25
*RC-060	C-41	CAPACITOR—.03 mfd, 600 v, paper	.25
*RC-039	C-42	CAPACITOR—.01 mfd., 600 v, paper	
*RC-117	C-43	CAPACITOR—.02 mfd., 600 v, AC	
*RC-092	C-44	CAPACITOR—.05 mfd., 600 v, paper	
*RQ-1295	R-1	RESISTOR—33,000 ohm, ½ W., carbon	
*RQ-1235	R-2	RESISTOR—100 ohm, ½ W., carbon	
*RQ-1321	R-3	RESISTOR—390,000 ohm, ½ W., carbon	
*RQ-1219	R-4	RESISTOR—22 ohm, ½ W., carbon	
*RQ-1339	R-5	RESISTOR—2.2 megohm, ½ W., carbon	
*RQ-1323	R-6	RESISTOR—470,000 ohm, ½ W., carbon	
*RQ-1299	R-7	RESISTOR—47,000 ohm, ½ W., carbon	
*RQ-1305	R-8	RESISTOR—82,000 ohm, ½ W., carbon	
*RQ-1355	R-9	RESISTOR—10 megohm, ½ W., carbon	
*RQ-1323	R-10	RESISTOR—470,000 ohm, ½ W., carbon	

Our Cat. No.	Symbol	Description	List Price
*RQ-1271	R-11	RESISTOR—3,300 ohm, ½ W., carbon	$0.70
RV-136	R-12	VOLUME CONTROL—2 meg. volume control	.95
*RQ-1331	R-13	RESISTOR—1 megohm, ½ W., carbon	.70
*RQ-1347	R-14	RESISTOR—4.7 meg., ½ W., carbon	.70
*RQ-642	R-15	RESISTOR—220 ohm, 2 W., carbon	.20
*RQ-1303	R-16	RESISTOR—68,000 ohm, ½ W., carbon	.70
*RQ-1473	R-17	RESISTOR—3,900 ohm, 1 W., carbon	.20
*RQ-669	R-18	RESISTOR—2700 ohm, 2 W., carbon	.20
*RQ-1259	R-19	RESISTOR—1000 ohm, ½ W., carbon	.70
*RQ-1311	R-20	RESISTOR—150,000 ohm, ½ W., carbon	.70
*RQ-1301	R-21	RESISTOR—56,000 ohm, ½ W., carbon	.70
*RQ-1317	R-22	RESISTOR—270,000 ohm, ½ W, carbon	.70
*RQ-1239	R-23	RESISTOR—1,000 ohm, ½ W, carbon	.70
*RQ-641	R-24 25	RESISTOR—180 ohm, 2 W., carbon	.30
*RQ-1345	R-26	RESISTOR—3.9 meg., ½ W., carbon	.70
*RQ-1325	R-27	RESISTOR—560,000 ohm, ½ W. carbon	.70
RR-7003	R-28, 29	RESISTOR—200-240 volt ballast	1.90
RR-7004	R-31-34	RESISTOR—160-200 volt ballast	
*RQ-1481	R-35	RESISTOR—8200 ohm, 1 W., carbon	.20
RR-7005	R-36-38	RESISTOR—117 v. DC ballast	
*RQ-1211	R-39	RESISTOR—10 ohm, ½ W., carbon	.70
RS-3127	S-1	SWITCH—Band change switch	1.25
RS-3128	S-2A, 2B	SWITCH—Tone control and power switch	1.45
RL-1016	L-1	COIL—Antenna coil (all bands)	1.10
RL-2064	L-2	COIL—Oscillator coil (all bands)	1.10
RL-371	L-3	COIL—I.F. Neutralizing coil	.25
RT-3007	T-1	TRANSFORMER—1st IF transformer	1.15
RT-3008	T-2	TRANSFORMER—2nd IF transformer	1.15
RT-4014	T-3	TRANSFORMER—Output transformer	1.55

* Used on previous receivers.



FOR OTHER DATA SEE INDEX

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

GENERAL ELECTRIC CO.

TONE CONTROL SWITCH CONNECTIONS

Position in Use	Section "C'" Back Side	Section "C" Front Side
Radio-Brilliant	Open	3-7
Radio-Bass	1-12	3-7
Radio-Treble	4-6	3-7
Radio-Mellow	1-12 4-6	3-7
Phono-Brilliant	Open	7-11 2-3
Phono-Bass	1-12	7-11 2-3
Phono-Treble	4-6	7-11 2-3
Phono-Mellow	1-12 4-6	7-11 3-4

SPECIAL SERVICE INFORMATION

The following information will be very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

NOTE—Connection to converter grid must be made directly to tube grid and not to gang condenser on spread bands.

(1) Stage gains

(a) Antenna Post to Converter Grid, three 400 ohms and 200 mmfd. in series, at

Stand.	1000 KC....5.4	31 M.....9.6 MC....1.8
SW1	4000 KC....3.7	25 M....11.8 MC....1.6
SW2	18000 KC....1.1	19 M....15.22 MC...1.4
		16-13 M....17.8 MC....1.0

BAND CHANGE AND TONE CONTROL SWITCHING

The following charts show the switch points connected for any one position of either the wave change or tone control switches. The numbers shown in each box indicate the switch points connected together in the section of the switch for each position of the switch. As for example: the numbers 5-9-10 indicate these switch points are all connected together for this particular position of the switch.

BAND SWITCH CONNECTIONS

Band in Use	Section "A" Front side	Section "A'" Back Side	Section "B" Front Side	Section "B'" Back Side
BC	4-8-9	5-9-10	5-9-10	1-10 6-8
SW1	4-8-10	5-9-11	5-9-11	1-2-10 7-8
SW2	4-8-11	5-9-12	5-9-12	1-2-3 8-10
31 METER	8-11	9-12-1	9-12-1	1-2-3-4 8-10
25 METER	8-11	9-12-2	9-12-2	1-2-3-4-5 8-10
19 METER	8-11	9-12-3	9-12-3	2-3-4-5-6 8-10
16 and 13 METER	8-11	9-12	9-12	3-4-5-6-7 8-10

Tubes

Converter-Oscillator.....GE-7Q7
IF Amplifier.....GE-6SG7
Detector, AVC, 1st Audio.....GE-6SQ7
Phase Inverter.....GE-6J5GT
Power Output.....(2) GE-25L6GT
Rectifier.....GE-25Z6GT
Tuning Indicator.....GE-6U5
Pilot Lamps.....(2) MAZDA No. 44

(b) RF on Converter Grid to IF on 6SG7 grid at

Stand.	1000 KC.....61	31 M.....9.6 MC.....65
SW1	4000 KC.....63	25 M....11.8 MC.....68
SW2	18000 KC.....71	19 M....15.22 MC....71
		16-13 M....17.8 MC.....71

(c) IF on Converter Grid to IF on 6SG7 grid at 455 KC—85

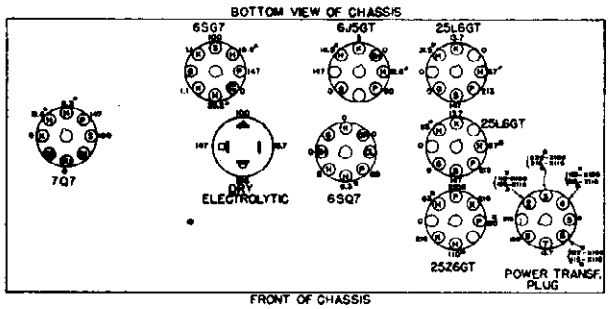
(d) IF Grid to diode plate at 455 KC—160

(2) Voltage across the diode load to give ½-watt speaker output at 400 cycles—.046 V.

(3) DC voltage developed across oscillator grid resistor (R1) at

Stand.	1000 KC.8.3 V.	31 M.....4.4 V.
SW1	4000 KC.7.7 V.	25 M.....4.8 V.
SW2	18000 KC.5.0 V.	19 M.....4.4 V.
		16-13 M.....3.7 V.

Variations of ±20% permissible. All measurements taken with R-26 shorted across.



VOLTAGES INDICATED BY ASTERISK (*) ARE AC VOLTAGES. VOLTAGES READ WITH 1000 OHMS/VOLT METER ON 250-VOLT SCALE

CONVERSION FOR SPECIAL LINE VOLTAGES

The Models X-108 and X-118 can be converted for operation on the following line voltages. In all cases where the power transformer is replaced with a ballast resistor, the power transformer must be removed from the chassis as the radiant heat from the ballast resistor is likely to injure the transformer insulation. When operated with these special resistors and lower power supplies than 220 volts, the audio power output and socket voltages will be reduced.

220 Volts AC/DC—(Range 200-240 Volts)

Remove transformer from chassis of X-108, insert ballast tube resistor RR-7003, and change label to read X-118.

180 Volts DC—(Range 160-200 volts)

Remove transformer from chassis of X-108 or ballast RR-7003 from X-118; insert the ballast tube resistor RR-7004 and change the label on the receiver so that it reads Model X-118Y.

NOTE—The 8200 ohm, 1 watt resistor (R-35) shown in dotted lines for the RR-7004 ballast tube schematic is not a part of the ballast tube. In order to increase the sensitivity and power output of this receiver when operating in this voltage range, this resistor may be installed externally across the terminals 1 and 8 of the ballast tube socket.

117 Volts DC—(Range 105-129 Volts)

Remove transformer from chassis of X-108 or ballast RR-7003 from X-118; insert the ballast tube resistor RR-7005 and change the label on the receiver so that it reads Model X-118Z.

NOTE—The power output on this receiver can be raised if the resistors R-18, R-24 and R-25 are shorted across.

Two other transformers are available for AC operation. The transformer T5 can be substituted in the Model X-108 receiver for operation on 25-cycle circuits. Remark the label so that it reads Model X-108C. The special duty transformer T6 can be used in the Model X-108 receiver for operation on 50/60 cycle circuits where a 145-volt tap is required. Remark the label on the receiver so that it reads Model X-108X.

The cold resistance of all ballast tubes is shown directly on the schematic diagram, Fig. 2.

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	220	95	....	6.0	6.3
6A8	Oscillator	150	....	....	10	6.3
	Converter	220	90			
6J5-G	A.F.C. Control	150	....	6.1	3.5	6.3
6K7	1st I.F. Amplifier	236	92	....	7.0	6.3
6K7	2nd I.F. Amplifier	225	102	3.0	8.6	6.3
6J5-G	Audio	130	....	5.5	1.3	6.3
6L6-G	Output	280	234	13.5	57	6.3
5Z3	Rectifier	600/330 RMS	....	360 d-c	110	5.0

A-C line voltage—120 volts with fuse clipped in the 125-volt tap—no signal input—1000 ohms per-volt-meter—dial pointer at 530 kc. on broadcast band.

GENERAL INFORMATION

The Model F-109 is a three-band a-c operated receiver employing ten General Electric Pretested Tubes in a superheterodyne circuit. This receiver incorporates automatic "Touch Tuning" with thirteen station buttons, electric finger-tip dial drive control, R.F. amplifier, two stages of I.F. amplification, four-point tone control and other features of design as described in the following paragraphs. The phonograph equipment is designed to play records on one side automatically.

Receiver Operation

The antenna transformer T-6 used in conjunction with a 6K7 tube and the R.F. transformer T-4 are the essential elements of the R.F. amplifier. After the conversion to 465 kc. by means of the combination oscillator converter tube 6A8, the signal is amplified by the I.F. amplifier which consists of three tuned transformers and two 6K7 tubes. The primary and secondary coils of these transformers are carefully adjusted midway between the points of critical and overcoupling so as to give the I.F. amplifier a broadened band width with a subsequent better fidelity of the received program.

The output of the I.F. amplifier is applied to a 6H6 diode rectifier, which is a combination detector, automatic volume control, and bias source for the automatic frequency control tube. A detailed explanation of the A.F.C. will be found in a following paragraph. A second 6H6 diode is used to supply minimum bias to all tubes controlled by the avc. One of the plates (16) of this diode supplies initial bias to the R.F. stage, while the other plate (17) supplies the 6A8 converter and 1st I.F. amplifier with the proper bias. Since the cathodes of the 6H6 are connected to a 2.8-volt point on the bleeder resistance R-35, this allows the avc controlled tubes to have a constant −2.8-volt bias with no signal input. This bias will remain constant until the point at which the avc voltage developed, becomes greater than this −2.8 volts, at which time the bias on these tubes will then be dependent upon the avc developed by the strength of the carrier. When operating in the "B" band, the minimum bias is automatically raised on the 6A8 converter and 6K7 1st I.F. tubes by means of a section of the wave change switch (S-1, terminal 4). This places R-31 in parallel with R-32 and the lower section of the bleeder resistance (R-5), which increases the fixed bias source applied to this avc controlled circuit through a section of the 6H6 diode. This reduces between station noise considerably on the "B" band but does not effect a reduction of sensitivity when a station carrier is tuned in.

Volume is controlled by the variable potentiometer (R-34) in the grid circuit of the 6J5-G audio amplifier tube. The output of the 6J5-G is resistance coupled to the 6L6-G Beam Power Output tube which gives ample undistorted power output to a 12-inch dynamic speaker.

TONE CONTROL

Negative feed back is used to control the quality and tone of reproduction. The frequency response of the audio circuit is varied by the tone control switch and its associated network as follows:

In the "normal" position, voltage from the voice coil is fed back through R-23, R-2, and C-49 to a tap on the volume control. C-31 serves to inject high frequencies into a tap higher up on the volume control. This arrangement gives an extended high frequency response, holds down the "boom" caused by pentode output and speaker resonance, and at the same time improves the quality and response to an extended range of both high and low frequencies.

In the "bass" position, the high frequency input to the audio system is limited by the addition of C-41 across the volume control and its coupling condenser; and, also, by the omission of the high frequency injector capacitor C-31. This permits the true reproduction of a wide range of low frequencies without the "boom" at speaker resonance.

In the "foreign" position R-2 and C-49 are shorted out of the network used for "bass." This permits more degeneration of the lower frequencies, and provides a tone range most suited for foreign reception. This position may be used to reduce noise and also to reduce bass on programs which predominate in low frequency tones.

C-41 is removed from the circuit in the "speech" position, R-2 and C-49 are shorted out leaving only R-23 in the circuit thus allowing flat degeneration of all frequencies. This arrangement has been found to give the best response for programs predominating in speech.

COIL SYSTEM

The coils for the three bands are wound a single form. The antenna transformer is designated as T-6, the R.F. transformer as T-4 and the oscillator transformer is marked T-3. All contacts on the band switch are numbered in Fig. 10 and Fig. 11 to facilitate tracing the coil circuits.

The band switch connects the coils to operate as follows:

Ant.	Primary	Secondary	Remarks
"B"	L-6	L-4 & L-5	
"C"	L-3	L-4	L-5 shorted
"D"	L-2 & L-3	L-1	L-4 & L-5 shorted
RF			
"B"	L-13	L-11 & L-12	
"C"	L-10	L-11	L-12 shorted
"D"	L-9 & L-10	L-8	L-11 & L-12 shorted
Osc.			
"B"	L-19	L-18	
"C"	L-17	L-16	Connects C-30 across L-18
"D"	L-15	L-14	Connects C-30 across L-16

On "D" band contact No. 9 is used to provide a ground for the General Electric noise reducing antenna systems, KV-300 and FT-40.

RESISTANCE MEASUREMENTS

No.	Resis. to Ground	Tube	Socket Prong
6	3 megs.	RF Grid	Cap
7	2.8 megs.	6A8 Conv.	Cap
8	2.8 megs.	1st IF Grid	Cap
9	3 ohms	2nd IF Grid	Cap
10	340,000 ohms	Diode Plate	Prong 3 AFC sw. closed
11	340,000 ohms	Diode Plate	Prong 5 AFC sw. closed
12	Grounded	Diode Cath.	Prong 4
13	1 meg. AFC sw. open 47,000 ohms AFC sw. closed	Diode Cath.	Prong 8
14	0-2 megs. vol.con.	1st Audio Grid	" 5
15	100,000 ohms	6L6 Grid	Prong 5
16	2.5 megs.	Diode Plate	Prong 3
17	2.7 megs.	Diode Plate	Prong 5
18	10,000 ohms	Diode Cath.	Prong 8
19	27 ohms	Diode Cath.	Prong 4
20	2.2 ohms pin on cantactor (Corresponding button pressed)		

GENERAL ELECTRIC CO.

AUTOMATIC FREQUENCY CONTROL

The Automatic Frequency Control used in this receiver shifts the oscillator frequency so that the correct intermediate frequency is very closely produced even when the receiver is mistuned several kilocycles.

The essential elements are the discriminator transformer T-9, the twin diode 6H6 with its balanced discriminator network, and the 6J5-G control tube connected across the broadcast oscillator plate coil.

The discriminator transformer is designed to deliver (when properly tuned to 465 kc.) equal voltages to each section of the 6H6 when the receiver is correctly tuned to give an I.F. frequency of 465 kc. Under this condition the voltage drop across R-21 is equal and opposite to the voltage across the total resistance of R-19, R-22 and R-17; thus no discriminator voltage is produced to control the 6J5-G tube.

However, if the signal frequency is increased above 465 kc., unequal voltages are applied to the diodes and the voltage over R-21 is greater than the voltage over the combined resistance of R-19, R-22 and R-17. The difference of these two voltages is positive and is applied to the 6J5-G control tube.

When the signal frequency is decreased below 465 kc., the result is less voltage over R-21 and a greater voltage over the combined resistances R-19, R-22 and R-17. The difference of these two voltages, as applied to the 6J5-G control tube, is negative.

Thus three conditions arise:

On resonance:	no discriminator voltage developed
Above 465 kc.:	a positive control voltage
Below 465 kc.:	a negative control voltage

The 6J5-G A.F.C. control tube has a combination of self and fixed bias, the latter being the result of the current supplied through R-8 to the cathode resistor R-4. The R.F. voltage applied to the control grid of the 6J5-G is obtained from the drop across the C-6 series padder and C-30. The vector sum of these two voltages is applied to the phase shifting network C-25 and R-3 and, in turn, to the control grid. This phase shifting network causes the control tube to appear as a reactance in parallel with the oscillator coil. The value of the apparent reactance depends upon the control voltage produced by the discriminator.

When the set is mistuned above the incoming signal, the converter output is above the 465 kc. required. A positive discriminator voltage is produced as explained above. This causes the 6J5-G tube to act as more capacitive reactance and thus lower the oscillator frequency; this gives a lower converter output frequency, approximately 465 kc.

When the set is mistuned below the incoming signal, the converter output is below the 465 kc. required. A negative discriminator voltage is produced as explained above. This causes the 6J5-G to act as less capacitive reactance thus increasing the oscillator frequency. This in turn gives a higher converter output frequency, approximately 465 kc.

A decided A.F.C. action is apparent on short waves. The discriminator voltage is produced in the same manner as above. However, the action of the 6J5-G tube is different. The 6A8 oscillator plate voltage and 6J5-G plate voltage are supplied through the same resistor (R-5). A positive discriminator voltage allows the 6J5-G plate current to increase, thus reducing the 6A8 oscillator plate voltage. This causes a lower oscillator frequency with the resultant lower converter output frequency, approximately 465 kc.

With a negative discriminator voltage the 6J5-G plate current is less, thus increasing the 6A8 oscillator plate voltage. This causes a higher oscillator frequency with the resultant higher converter output frequency, approximately 465 kc.

DIAL MECHANISM

(A) Manual drive leather-faced bevel gear
(B) Beveled idler gear
(C) Tuning shaft gear
(D) Volume control drive cord pulley
(E) Band switch drive cord pulley
(F) Tone control drive cord pulley
(G) Belt driven spiral rod drive pulley
(1) Spiral drive rod rider
(2) Pointer slider guide rod
(3) Tuning pointer spiral drive rod
(4) Motor belt
(5) Spiral rod bracket with bearing
(6) Motor shaft collar
(7) Clutch tension spring
(8) Pulley dog
(9) Motor shaft collar
(10) Tone control pointer
(11) Tone control cord pulley stud
(12) Band switch indicator
(13) Band switch indicator cord pulley stud
(14) Long dial drive cord
(15) Dial scale pointer
(16) Volume control pointer
(19) Short dial drive cord
(20) Stationary spring support
(23) Relay armature extension
(24) Armature back stop

} Fig. 7

Tuning mechanism diagram (Fig. 1) is self-explanatory. The tuning condenser drive cord can be easily replaced without removing *any* part of the chassis while all dial indicating control cords are made readily accessible for servicing by merely removing the seven small screws holding the dial reflector assembly.

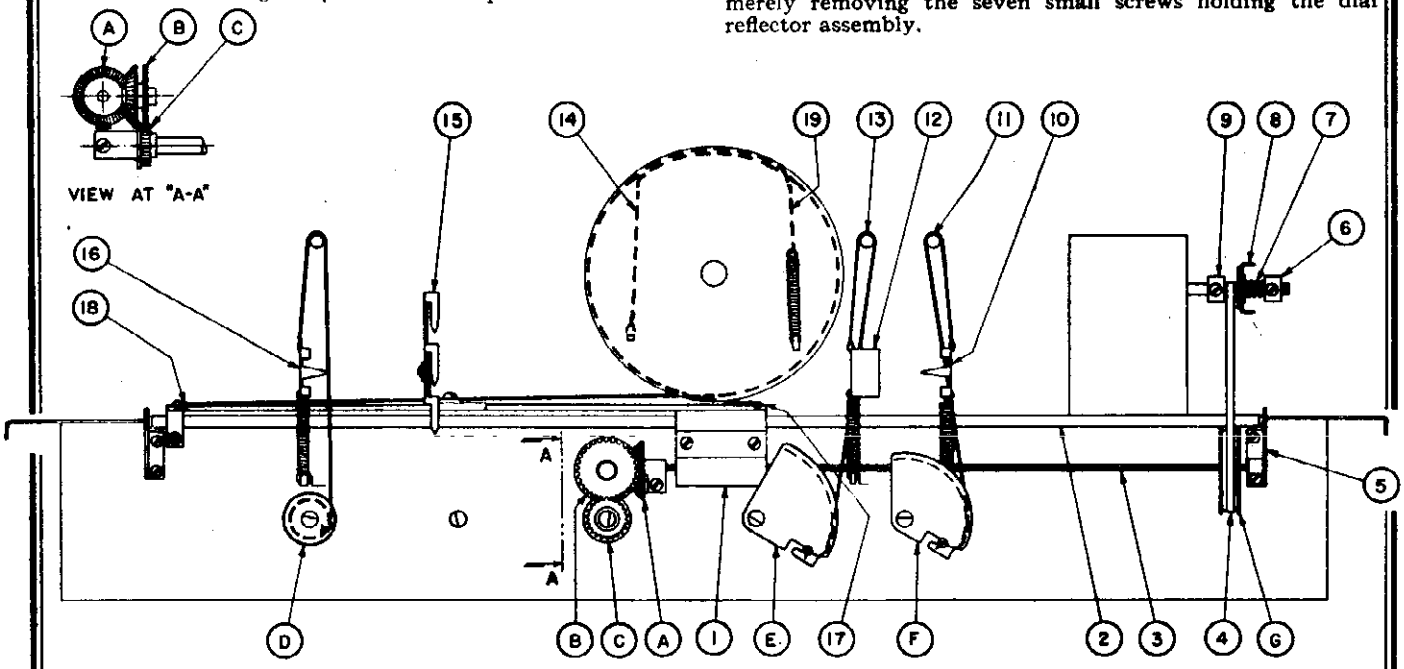


Fig. 1. Dial Mechanism

RELAY ADJUSTMENTS

The following adjustments should be made with relay assembled on the motor bracket, Fig. 7.

(1) Make sure contacts are adjusted to open in correct sequence: center contacts (motor) first, contacts farthest from armature (AFC) second, contacts nearest armature (silent tuning) last. *It is very important that the silent tuning switch open last.*

(2) Adjust backstop (24) so that the armature snaps closed when the relay coil is energized with 4.5 volts A.C. The backstop must make a positive contact with the back of the armature in the open position; otherwise sluggish operation of the relay will result which will cause the motor drive to skip buttons. If the relay will not close at 4.5 volts and still maintain proper travel and sequence, weaken the spring on the rear of the armature plate by bending the stationary spring support (20).

(3) Loosen the setscrew on the motor shaft collar nearest motor (9) and adjust collar so that the pulley dog (8) misses the relay armature extension by .001 in. (relay not energized). All contacts must be closed when the relay armature touches the end of the motor dog; if the motor contacts open in this position the armature will chatter.

(4) Spring adjustment (7) on slip clutch should be just tight enough so as not to allow slippage of motor when driving the dial mechanism. Loosen setscrew on outside shaft collar (6) and screw the collar on the shaft to tighten slip clutch.

(5) The pole piece of the relay coil is divided in two semicircles. The relay armature should only touch the pole segments toward the motor shaft. There should be a .001 in. clearance between the back segment (21) and the armature when closed; otherwise a buzzing will be heard. Sometimes a front pole segment that is not perfectly flat will cause the same trouble. File off the offending bump.

(6) Backstop setting should be such that the distance (22) is 26/32 in. with the relay closed and 29/32 in. with the relay open.

(7) Spacing between relay contact points when open should be .015 to .018 inches for contact No. 1 and .008 to .010 inches for contact No. 2 and No. 3.

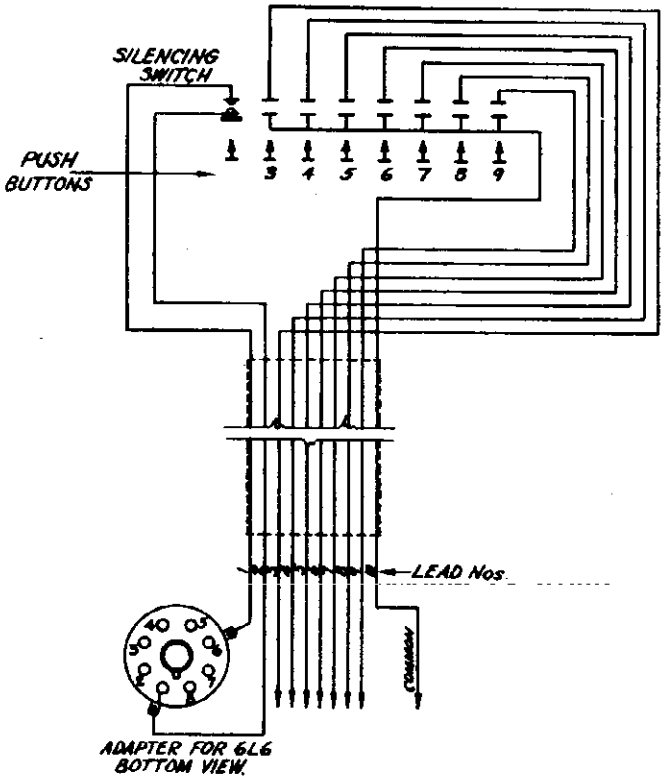


Fig. 6. Schematic of Remote Control

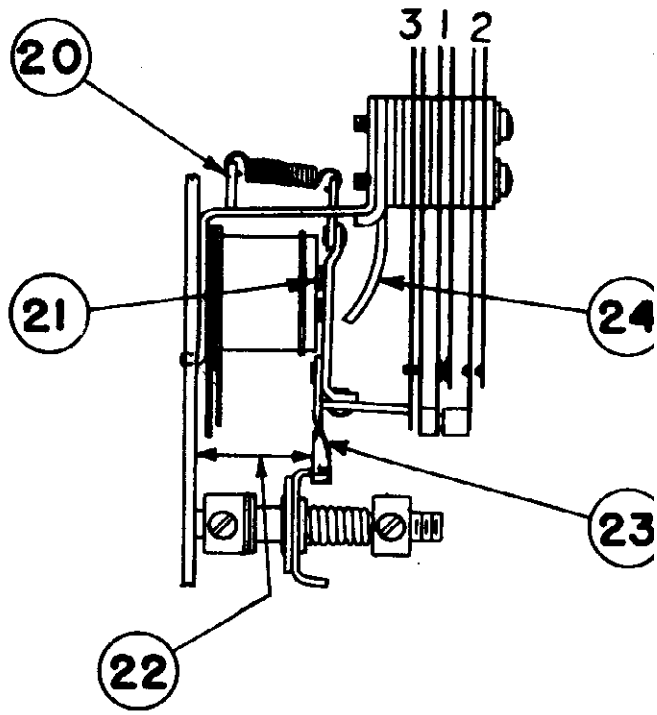


Fig. 7. Relay

INCORRECT OPERATION AND SUGGESTED REMEDIES

Skipping of Stations

(a) "Touch Tuning" button leads not making good co tact to adjustable contact pins. Clean contacts and re-inse

(b) Sliding contactor blade either covered by thin pie of bakelite or dirty. Carefully run fine file over top of slidi contactor, making sure not to leave any sharp corners. Slidi contactor should have a small amount of vaseline on bevel surface to prevent chattering.

(c) Nipple too sharp on adjustable contacts will cau sliding contactor blade to jump across. Smooth off with fi sandpaper.

(d) Relay armature out of adjustment causing sluggis operation of relay switch. See paragraph 2 under Relay A justments.

(e) Excessive side play in sliding contactor. Loosen the se screw on the back of the sliding contactor and slide hold together. Final adjustment should allow sliding contactor t rock freely.

(f) Not enough tension on sliding contactor arm. Loose collar on shaft in rear of contact segment and move slidin contactor arm towards the contact segment; then tighte collar on shaft.

(g) If the contacts at the rear of the "Touch Tuning" button assembly shafts do not close or make good contac the motor will continue to scan the dial without stoppin at the desired station.

(h) Contact segment may be bent out of shape. Thi should be perpendicular to chassis deck and parallel t rear chassis apron in order to allow the contactor arm t wipe the adjustable contacts evenly.

No Action When Station Button Is Pressed

(a) Relay remains energized and audio continues t function—push button escutcheon grounded. Be sure dia and push button escutcheons are insulated from each othe or from the control shafts.

(b) "Off" switch contacts do not close.

(c) If set does not tune automatically unless scan buttor is also depressed, contacts No. 6, Fig. 5, require close spacing.

(d) Open or shorted motor capacitor—Characterized by motor armature humming but no torque. Replace 100 mfd. capacitor C58.

MODEL F-109

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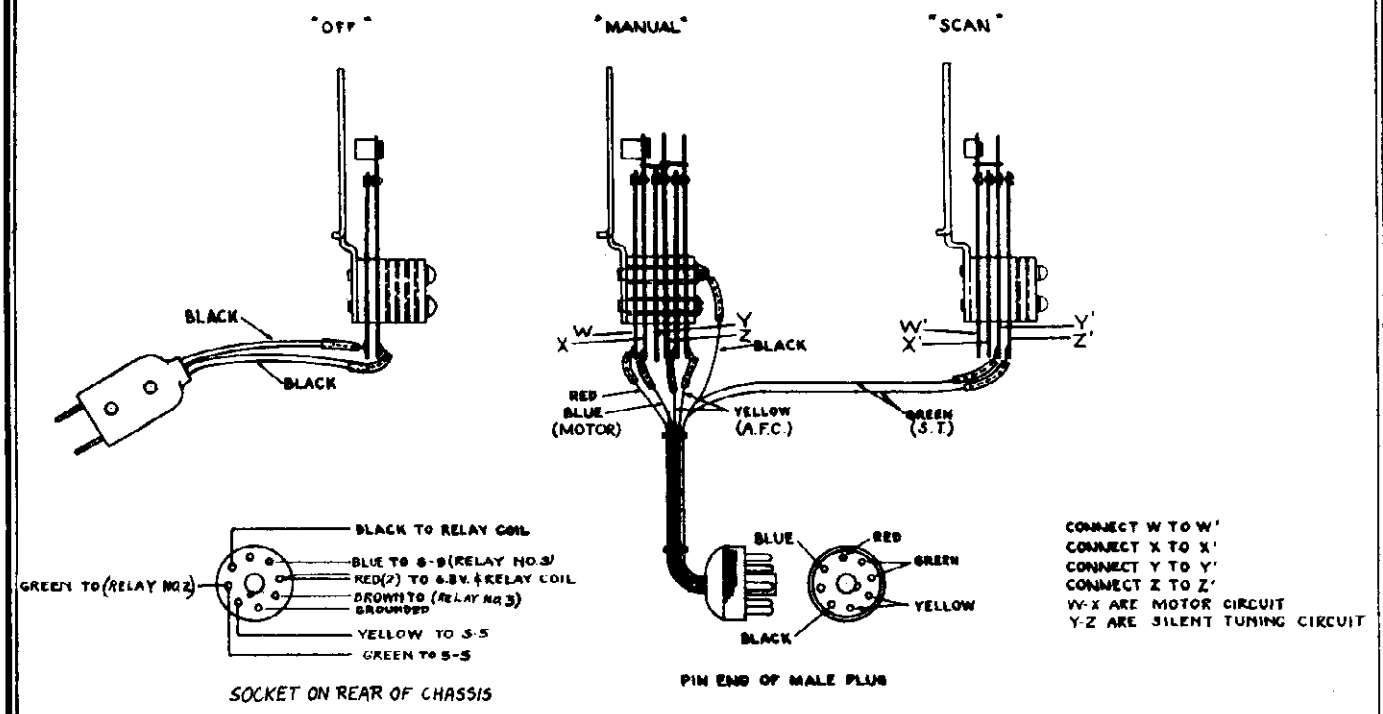


Fig. 8. Wiring Diagram of "Off," "Manual" and "Scan"

(e) Open or shorted coil in motor—Characterized by no torque or low torque in one direction. Replace motor or repair coil.

(f) Drive mechanism bound, or too tight for motor to drive.

(g) Not enough friction in slip pulley—The friction of the slip pulley is adjusted by tightening the collar on the end of the motor shaft. Care should be exercised that the setscrew does not hit the relay armature.

(h) Belt slippage—The tension of the belt may be increased by raising the motor on the relay bracket. If the belt still slips, reverse belt and use other surface or use belt dressing.

Noise in Audio Output While "Touch Tuning"

(a) Improper sequence—If the relay switch contacts open in improper sequence, audio output will be available too soon, and the break in the motor switch will be heard in the speaker. Correct as described in (1) under Relay Adjustments.

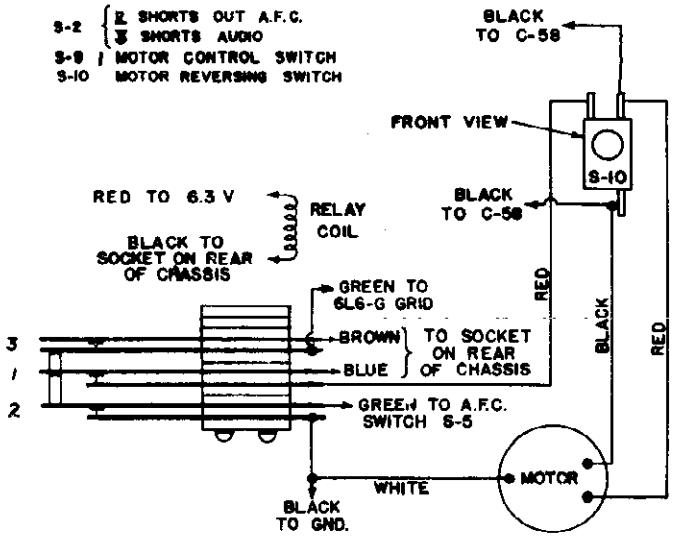


Fig. 9. Motor Relay Wiring Diagram

(b) Dressing of silent tuning lead—Early production receivers had silencing lead from 6L6 grid run to connector socket on rear apron, up to "Push Button" switch, and return through socket connector to the relay switch where the ground wires of AFC, motor and silent tuning contacts were connected together and grounded to chassis. Reconnect as follows: Ground A.F.C. and motor contacts to a point of the chassis directly underneath the motor. The green grid lead from the 6L6 should be rewired over the top of the chassis deck to the silencing contact, Fig. 9, of the relay switch; the lead from the other relay silencing contact should be connected to a prong of the connector plug, Fig. 8, from this point, connection is made to the silencing portion of the "Touch Tuning" switch, and a return to ground from this point is made through the connector plug to the chassis near the connector plug socket.

(c) Noise through filter circuit—The "blurp" in the speaker on early production due to the sudden application of audio may be reduced by placing a .05 mfd., 600-volt capacitor (RC-092) across the output filter capacitor (C-61).

Miscellaneous Adjustments

(a) When a "Touch Tuning" button will not remain in a locked position, it usually indicates that the springs at each end of the latch bar are not in proper adjustment. They should exert an equal pull on each end.

(b) The fork on the tuning condenser should be adjusted so that the motor reversing switch clicks over when the pointer approximately reaches the 540 and 1620 kc. markings on the dial scale. With the pointer at the extreme end of calibrations when tuning manually, the reversing switch lever should be set so there is not more than 1/16 in. nor less than 1/32 in. clearance between the lever and the switch trigger after the switch has snapped.

(c) The motor and relay mounting plate should rest parallel to the chassis deck. Do not adjust the spring tension foot; raise or lower motor on bracket, as required. Make sure that there is no electrical connection between the motor frame and the chassis.

(d) The "Off" switch on the "Touch Tuning" assembly should stay closed for at least one-half the movement of the key, opening only on the final click. If firm contact does not exist between the points, vibration of the set may cause an intermittent noise.

(e) The silent tuning contacts of the "Manual" and "Scan" switches should open last to permit quiet operation.

GENERAL ELECTRIC CO.

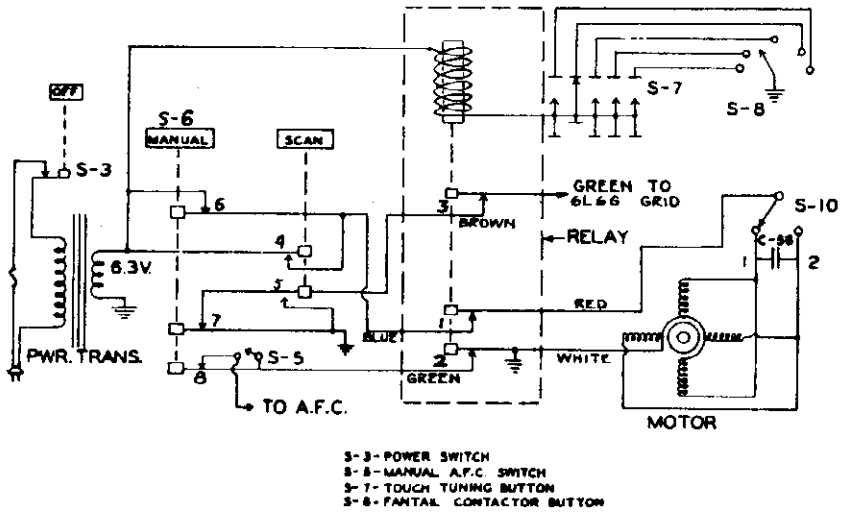


Fig. 5. Schematic of "Touch Tuning" System

TOUCH TUNING

General Electric "Touch Tuning" consists of three essential units; the push-button assembly of sixteen buttons, used by the operator for control; the motor and relay assembly, operating in conjunction with the buttons to provide fast and accurate tuning; and the contact segment with its sliding contactor and adjustable contacts enabling selection of thirteen different stations to be tuned automatically.

Of the sixteen push-buttons, thirteen are used for station selection. The other buttons are used for "Manual" control (No. 8), "Scanning" (No. 15 and) "Off" (No. 16). Depression of any button except No. 15 will lock the depressed button and release any other that may be in the circuit. Thus the selection of any station button or of "Manual" will release the "Off" switch turning the set on.

The tuning motor is operated as a capacitor type squirrel-cage induction motor, with capacitor. C-58 as the phase-shifting device. By tracing the motor circuit it will be seen that C-58 is in series with one set of poles when the motor reversing the switch is in position shown in Fig. 5. When the switch S-10 is reversed the capacitor C-58 is in series with the opposite set of poles. This causes the motor field to rotate in the opposite direction with the resultant change in motor rotation.

The motor power is supplied from the tube heater circuit through "Manual" switch (contact No. 6), Fig. 5, the relay (contact No. 1) and the motor reversing switch (S-10) with the chassis as common return. It will continue to run until the sliding contactor (S-8) contacts the stud on the contact segment which is connected to the button in the circuit. When this contact is made, the relay field coil is energized, causing the relay to open the motor circuit (contact No. 1). At the same time the relay arm also engages the motor clutch, causing instantaneous stopping of tuning mechanism travel. Depression of another station button causes another similar cycle.

Pressing the "Manual" button (S-6) releases any depressed button. Thus S-7 is opened and the relay field coil can not be energized. Contact No. 6 opens the motor circuit. Contacts No. 7 and No. 8 remove the ground from the grid of the 6L6-G and from the A.F.C. circuit respectively.

With the receiver set for "Manual" operation, depression of the "Scan" button closes the motor circuit by the shunting of contact No. 6 on the "Manual" switch allowing continuous motor operation and dial travel. As the motor drives to the dial limits on either end, S-10 is automatically thrown, causing reversal of motor rotation.

During periods of motor operation, either for automatic station selection or for scanning, the grid of the 6L6-G is shorted to ground. This "silent tuning," accomplished by relay contact No. 3, in the former case or scan button contact (No. 5) in the latter, avoids reception of unwanted stations or inter-station noise when tuning automatically or by means of the "Scan" button.

The use of automatic frequency control on "Manual" made optional by the A.F.C. switch (S-5). When any one the thirteen "Touch Tuning" buttons is depressed, circu is made through contact No. 8 on S-6 and is completed throu relay contact No. 2, thus removing A.F.C. while the mot is in operation. When the station is reached the relay ope contact No. 2, thus removing the ground on the A.F.C. ci cuit. *The A.F.C. is automatically turned on when "Tou Tuning" is being used.*

REMOTE CONTROL

There are ten leads in the "Remote Touch Tuning Contro cable. These leads serve the following functions:

The No. 1 and No. 2 leads are connected to the octal ba adapter and serve to connect the silencing button to th output tube.

The No. 3 to No. 9 leads correspond to the button numbe and with the No. 10 lead, provide the selection of statio from the remote control unit. These leads are to be connecte to pins on the contact segment on the rear of the chassis.

Remove the least desirable station's letters from or of the "Touch Tuning" buttons of the receiver and insert th "Remote" tab. Note the number of this button as marke on the escutcheon.

Remove from a pin on the contact segment on the r ceiver, the lead which bears this number, and connect it t the No. 10 lead from the remote control cable, Fig. 6.

(The pin on the contact segment from which this lead wa removed is left vacant.)

Now note the number of a receiver push button whic bears the same call letters as a remote unit button. Remov the lead with this number from the pin on the contact seg ment. Connect to this pin the lead from the remote cabl which corresponds to the above-mentioned remote un button. Fasten the lead with a hex nut and tighten lightl with a pair of pliers or small wrench. Now re-connect th original lead to the pin. Proceed in the same manner unt the seven remote button leads are connected.

Remove the 6L6G tube and place in the 6L6G tube socke the adapter which is connected to leads No. 1 and No. 2 Insert the 6L6G tube in this adapter.

When the "Remote Touch Tuning Control" unit is con nected, as explained above, the action is identical with tha of the regular station selection circuit. The remote butto unit is in series with the "Remote" button lead on the re ceiver through lead No. 10 of the remote unit cable. The rela field coil circuit is completed through the set "Remote" button (S-7); the common (No. 10) lead; the depressed con trol button; its lead to a pin on the contact segment, and t ground through the sliding contactor. *The "Silent" butto must be in the released position when operating the receiver fro either the remote control unit or from the receiver controls other wise no audio output will be obtained.*

MODELS FE-112, FE-116, FE-119

GENERAL ELECTRIC CO.

ALIGNMENT PROCEDURE

I.F. Alignment with Oscilloscope

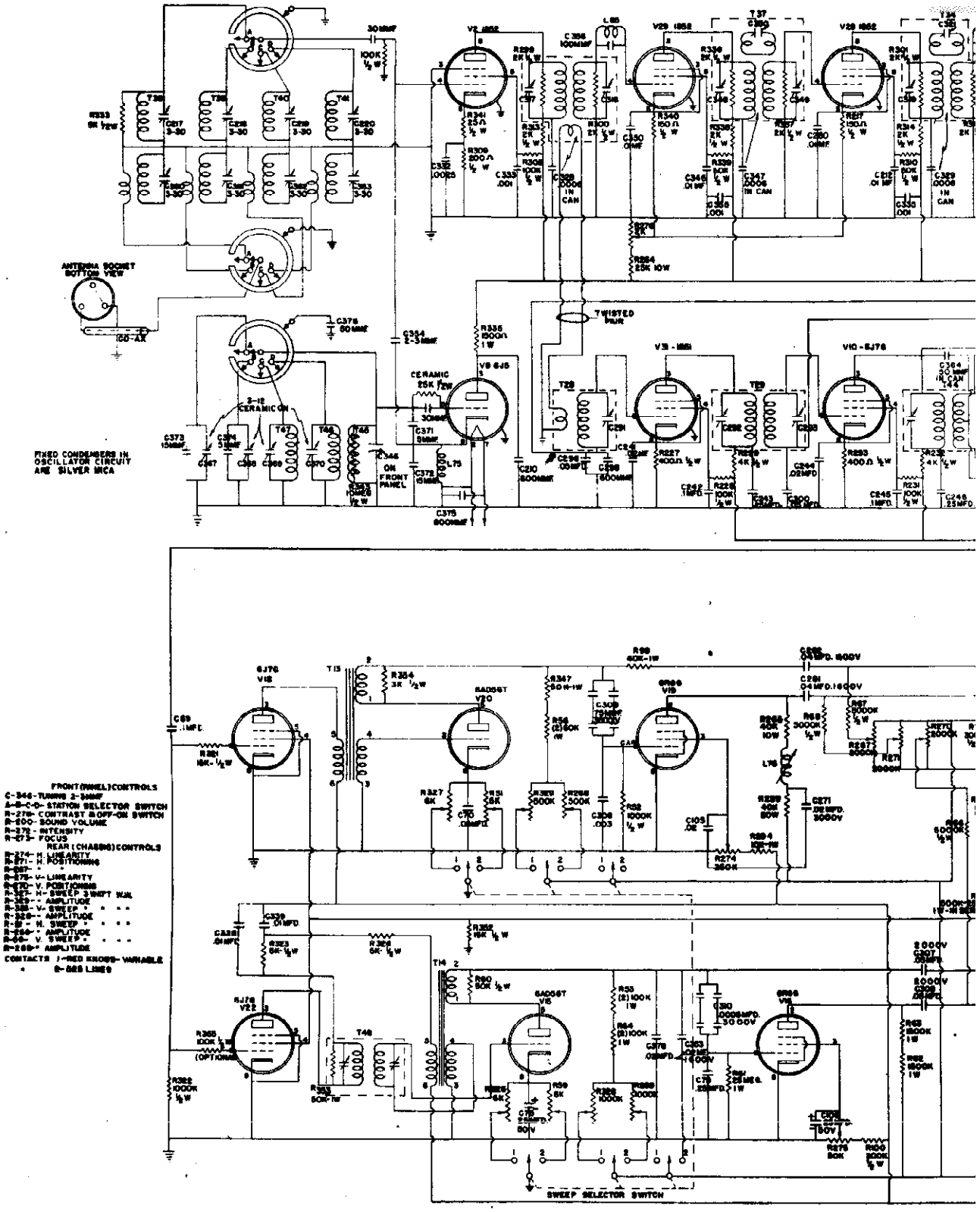
Band Switch Setting	Input Frequency	Point of Input	Dummy Ant.	Trimmer	Remarks
1. Band "B	455 kc. Sweep	2nd I.F. Grid	.05 Mfd.	3rd I.F. Sec. (C-30) Pri. (C-29)	Gang condenser plates wide open—connect vertical input of oscilloscope to ground and the junction of R-18 and R-36 and 3rd I.F. transformer. Adjust 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	455 kc. Sweep	1st I.F. Grid	.05 Mfd.	2nd I.F. Sec. (C-28) Pri. (C-27)	
3. Band "B	455 kc. Sweep	Converter Grid	.05 Mfd.	1st. I.F. Sec. (C-26) Pri. (C-25)	
4. Band "B	455 kc. Sweep	Antenna Post	250 Mmf. 400 ohms	Wave trap Trimmer C-31	Adjust trimmer for minimum amplitude.

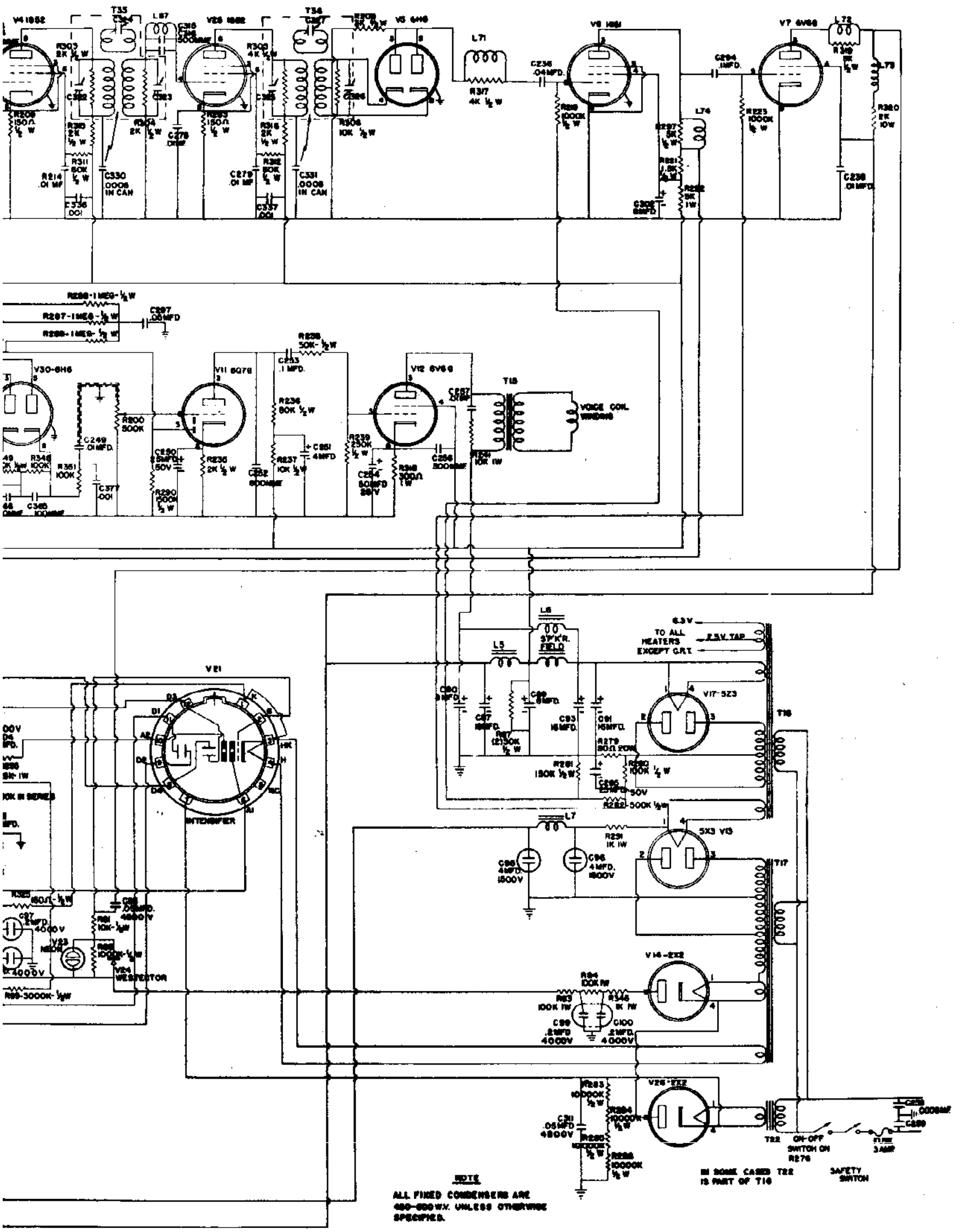
I.F. Alignment with Output Meter

1. Band "B	455 kc. with Modulation	2nd I.F. Grid	.05 Mfd.	3rd. I.F. Sec. (C-30) Pri. (C-29)	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	455 kc. with Modulation	1st I.F Grid	.05 Mfd.	2nd I.F. Sec. (C-28) Pri. (C-27)	
3. Band "B	455 kc. with Modulation	Converter Grid	.05 Mfd.	1st I.F. Sec. (C-26) Pri. (C-27)	
4. Band "B	455 kc. with Modulation	Antenna Post	250 Mmf. 400 ohms	Wave trap Trimmer C-31	Adjust trimmer for minimum output.

R.F. Alignment

1. Band "B					Close gang plates. Adjust pointer to first mark at left end of tuning scale.
2. Band "A	350 kc. with Modulation	Antenna Post	250 Mmf. 400 ohms	Osc. (C-14) R.F. (C-8) Ant. (C-23)	Connect output meter across voice coil. Set tone control to "Bass" position. Volume control maximum. Adjust trimmers for maximum output with a low input signal.
3. Band "A	145 kc with Modulation	Antenna Post	250 Mmf. 400 ohms	Osc. Padder (C-18)	Adjust padder for maximum output in the vicinity of 145 kc. while rocking the gang condenser.
4. Band "A	Repeat operation 2				
5. Band "B	1500 kc. with Modulation	Antenna Post	250 Mmf. 400 ohms	Osc. (C-13) R.F. (C-7) Ant. (C-22)	Adjust trimmers for maximum output with a low input signal.
6. Band "B	580 kc. with Modulation	Antenna Post	250 Mmf. 400 ohms	Osc. Padder (C-17)	Adjust padder for maximum output in the vicinity of 580 kc. while rocking the gang condenser.
7. Band "B	Repeat operation 4				
8. Band "D-1"	12 Mc. with Modulation	Antenna Post	250 Mmf. 400 ohms	Osc. (C-16) R.F. (C-10) Ant. (C-4)	Peak C-10 for maximum output while rocking the gang. Peak C-4 for maximum output. The image of any signal on "D-1" band should be heard 910 kc. below the input signal when osc. trimmer C-16 is set properly. Example: 12 Mc. image is at 11.09 Mc.
9. Band "D-2"	15 Mc. with Modulation	Antenna Post	250 Mmf. 400 ohms	Osc. (C-19) R.F. (C-11) Ant. (C-5)	Set these padders for maximum output. The image of any signal on "D-2" band should be heard 910 kc. above the input signal. Example: 21 Mc. image is at 21.91 Mc.
10. Band "D-2"	21 Mc. with Modulation	Antenna Post	250 Mmf. 400 ohms	Osc. (C-15) R.F. (C-9) Ant. (C-3)	Peak C-9 for maximum output while rocking the gang condenser peak C-3 for maximum output.
11. Band "D-2"	Repeat operation 8				
12. Band "D-2"	Repeat operation 9				FOR OTHER DATA SEE INDEX


FIXED CONDENSERS IN OSCILLATOR CIRCUIT ARE SILVER MICA
FRONT (PANEL) CONTROLS
C-346- TUNING 2-34MMF
A-B-C-D- STATION SELECTOR SWITCH
R-278- CONTRAST & OFF-ON SWITCH
R-600- SOUND VOLUME
R-272- INTENSITY
R-273- FOCUS
REAR (CHASSIS) CONTROLS
R-274- H. LINEARITY
R-271- H. POSITIONING
R-267- "
R-275- V. LINEARITY
R-270- V. POSITIONING
R-265- H. SWEEP SHIFT MAN.
R-269- " AMPLITUDE
R-268- V. SWEEP " "
R-280- " AMPLITUDE
R-59 - H. SWEEP " "
R-266- " AMPLITUDE
R-60- V. SWEEP " "
R-288- " AMPLITUDE
CONTACTS F-RED KNOBS- VARIABLE
" B-BLK KNOBS
ANTENNA SOCKET BOTTOM VIEW
SWEEP SELECTOR SWITCH


V4 1852
T35
L67
V25 1852
T36
V5 6H6
L71
R317 4K ½ W
C236 .04MFD.
V6 1851
C294 .1MFD.
V7 6V6G
L72
L73
L74
R320 2K 10W
C238 .01MFD.
C330 .0006 IN CAN
C331 .0006 IN CAN
R288-1MEG-½W
R287-1MEG-½W
R286-1MEG-½W
C297 .05MFD
V30-6H6
V11 6Q7G
V12 6V6G
T15
VOICE COIL WINDING
R200 500K
R236 50K ½W
R239 250K ½W
C256 500MMF
V21
INTENSIFIER
L6 SP'K'R. FIELD
L5
6.3V
TO ALL HEATERS EXCEPT C.R.T.
2.5V. TAP
V17-5Z3
T16
L7
5X3 V13
T17
V14-2X2
V24 WESTECTOR
V23 NEON
V26-2X2
T22
ON-OFF SWITCH ON R276
SAFETY SWITCH
IN SOME CASES T22 IS PART OF T16
NOTE
ALL FIXED CONDENSERS ARE 400-600 W.V. UNLESS OTHERWISE SPECIFIED.

ALIGNMENT AND PRODUCTION TESTING OF TELEVISION RECEIVERS.

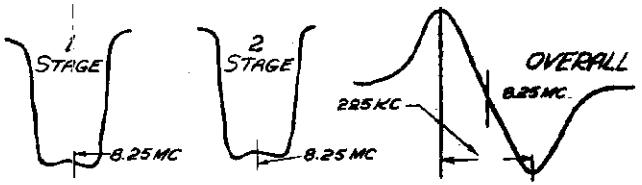
1. AUDIO CIRCUITS

Operation of the audio frequency amplifier may be checked by touching the grid of the 6Q7 and noting hum pickup in the speaker. The first video IFT should be adjusted roughly as it affects the sound I.F. characteristic.

Next, the I.F. amplifier should be aligned, using an oscillograph connected to the screen of the 2nd I.F. tube (screen by pass removed) and a wobbulator connected to the proper points to indicate the desired characteristic. The 2nd I.F.T. should be adjusted first with the wobbulator connected to the grid of the first I.F. tube (1851), and then the first I.F.T. adjusted with the wobbulator connected to the converter grid. Next the 6J7 screen by pass should be put back, the oscillograph shifted to the diode output at the first audio coupling condenser, the .001 de-emphasis condenser opened, and the discriminator transformer adjusted.

The output of the wobbulator should be of the order of 5000 microvolts which may be obtained from the RCA wobbulator using the low tap with a 10 ohm resistor shunting it to ground. A Ferris signal generator may be used as a marker connecting it to the wobbulator output (low tap) through a 100 ohm resistor.

The appearance of the characteristics are indicated by the sketches below. The exact shape of these curves will vary somewhat with individual receivers.

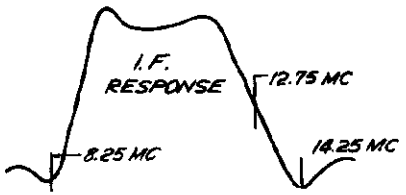


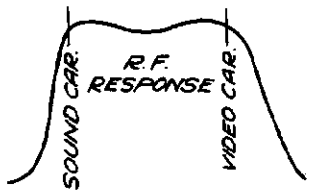
A check on alignment should be made using a Ferris signal generator with about 5000 microvolts output. Tuning the signal generator through the band two equal peaks (± 10%) and a null point should be observed. The null point should be at 8.25 mc (± 15 Kc).

Sensitivity should then be checked using the Ferris signal generator connected to the converter grid, and the oscillograph connected to the plate of the 6V6G audio output tube. The input for an average output for the two peaks of 50 V. p. to p. (1" direct on 168) should be from 30 to 100 microvolts. (At this low input the two peaks may not be exactly equal due to the fact that signal level affects the I.F. tuning to some extent.)

2. VIDEO I.F. CIRCUITS

An oscillograph is attached to the 6H6 video detector load. An I.F. wobbulator is connected successively to the last I.F. stage, next to the last, and so on, back to the mixer grid with adjustment of the corresponding I.F. transformer at each step. In this alignment the overall curve is approximately that shown below. This sketch is illustrative of several receivers but the exact amount of dip is somewhat variable and the final adjustment generally involves use of an actual test pattern received by R.F. It is desirable that the video I.F. alignment shall have the 6db attenuation at the carrier to provide successful reception of the single side band transmission. 4 of the 5 picture I.F. transformers are triple tuned while the first I.F. transformer is a double tuned unit. When tuning the video I.F. transformer in the plate of the mixer tube, the R.F. circuits should be disconnected from the grid of the mixer before attaching the I.F. signal wobbulator to this grid so as to insure flat input.





The trap to reject the adjacent channel picture carrier and the traps to reject the associated sound carrier are all pretuned and need no further adjustment. These traps are tuned in manufacture using a Q-meter.

3. R.F. CIRCUITS

The R.F. circuits are aligned by using an input wobbulator having relatively high voltage of the order of 1 volt covering the channels as follows:

1	50-56 Mc
2	60-66 Mc
4	78-84 Mc
6	96-102 Mc

To determine the characteristic of those R.F. circuits independent of I.F. response, an oscillograph is connected with its grounded terminal to the B plus supply (using care not to touch the oscillograph) and with its vertical input amplifier connected to the mixer screen. In this way the mixer screen response represents quite adequately the band pass characteristics of the R.F. circuits. This high level wobbulator is applied to the antenna terminals, following which the R.F. antenna coil and the mixer grid coil are tuned with the corresponding condensers for each band. The response curve for each band is represented by the sketch above, showing the response for one of the bands which is typical of all of them. The higher channels are somewhat broader than this. During this alignment the oscillator tube has been removed.

Alignment of the oscillator itself is made by using a signal generator tuned to the carrier frequency for the sound channel. Then the oscillator trimmers are adjusted for each of the 4 channels mentioned above so that the sound carrier is received as indicated by the loud speaker. To insure that the oscillator is tuned above the desired carrier the signal generator is then tuned to the picture carrier and a check of received signal is made through the video channel. Another check is to see that the minimum capacity of the oscillator trimmer is used where it is possible to get 2 oscillator frequencies which pass a sound signal. This adjustment of the oscillator is made with the front knob trimmer set at ½ capacitance. A final sensitivity measurement is now made using the signal generator on the carrier frequencies for sight and sound for all 4 channels.

The picture sensitivity should be approximately 200 microvolts input signal on all channels to yield 15 volts peak to peak at the final video 6V6 amplifier plate, using an oscillograph for measurement and using a signal generator with 30%amodulation. 4

Sound Rejection

While an attenuation ratio of 100 at the sound carrier was sufficient with A.M. sound, it is not adequate with F.M. sound. The signal generator should be tuned through the sound band which is 150 Kc (± 75 Kc) and the attenuation ratio should be at least 100 throughout this band at R.F.

Adjacent Channel Sound Rejection

Previously rejection ratios of 1000 to 1 at R.F. was attained, measurements should be made by tuning through the band as above and the ratio should be over 500 throughout the band.

The sound sensitivity at R.F. should be approximately the same as at I.F.

4. VIDEO AND SWEEP CIRCUITS

This alignment of the video amplifier and the sweep circuits can be made either with an over-the-air test pattern or with a test pattern from a coaxial line. When an over-the-air transmission is used the signal is applied to the antenna terminals.

However, when a coaxial line signal is used, it is necssary to observe the precaution of a suitable input network for applying the signal to the grid of the 1851 first video amplifier tube. This tube has a fixed bias within the set to which its grid lead is returned and its cathode is grounded. It is therefore desirable to insert a coupling condenser of at least 0.1 ufd from the coaxial line and supply a grid leak from the 1851 grid lead of at least ½ megohm between the 1851 grid cap and the lead wire from beneath the chassis which would otherwise normally be connected to the 1851. In this way the proper fixed bias is still applied to this tube.

After alignment has been made as outlined above there are certain tests and precautions that should be followed closely in order to eliminate the possibility of shipping either defective receivers or those that are not up to standard in efficiency and quality. A co-ax line carrying a composite video signal to be used for checking video amplifier and sync circuits should be monitored to make sure that Horizontal Blanking is no more than 16% and front porch comprises 2% of total. Vertical Blanking should be from 7 to 8%.

The 1851 tube and 6V6 tube of the 2 stage video frequency amplifier have their frequency constants such that the overall response to the cathode-ray tube grid is essentially flat from 30 cps to 3½ megacycles with a gradual drop to approximately 4½ megacycles at which time the response is down to about 30%. This original design was checked with the video frequency wobbulator and it has been found unnecessary to check each receiver individually except for general observation of a test pattern which is adequate to show up any actual mistake in the circuit wiring of the peaking coils, etc.

The sweep circuits are tested to determine the adequacy of amplitude and frequency range. Linearity adjustment is made with the two linearity controls on the sweep deck. In case these adjustments do not cover a sufficient range additional small capacitances are placed in parallel with the bottom condenser of the potential divider which feeds the grid of the sweep amplifier tube. This added condenser is actually placed from grid to ground of the sweep amplifier tube. In this way the ratio of signal from the oscillator to the signal from the amplifier will be controlled, thus correcting the linearity so that an overall linear sawtooth is produced by combination of a sweep oscillator output which is exponential and a sweep amplifier output which by its grid characteristic produces a reverse curvature.

After linearity has been adjusted the horizontal amplitude control should have at least one inch additional amplitude available. The vertical amplitude control should have several inches of additional amplitude available.

The black sweep control knobs, which are connected by turning the sweep selector switch on the front panel counterclockwise (to position 2), should be checked to insure that the vertical frequency range includes 30 and 60 fields per second with adequate overlap, and that the horizontal frequency range includes 8000 and 15,750 lines per second with adequate overlap.

The black knobs should be set up at the standard 525 lines 30 frames.

The red sweep control knobs, which are connected by turning the sweep selector switch clockwise (to position 1) should be capable of being adjusted to the following color combinations:

(a) CBS color pictures use 375 lines per frame at 60 frames per second which requires a horizontal scanning rate of 22,500 lines per second, and a vertical scanning rate of 120 field scans per second.

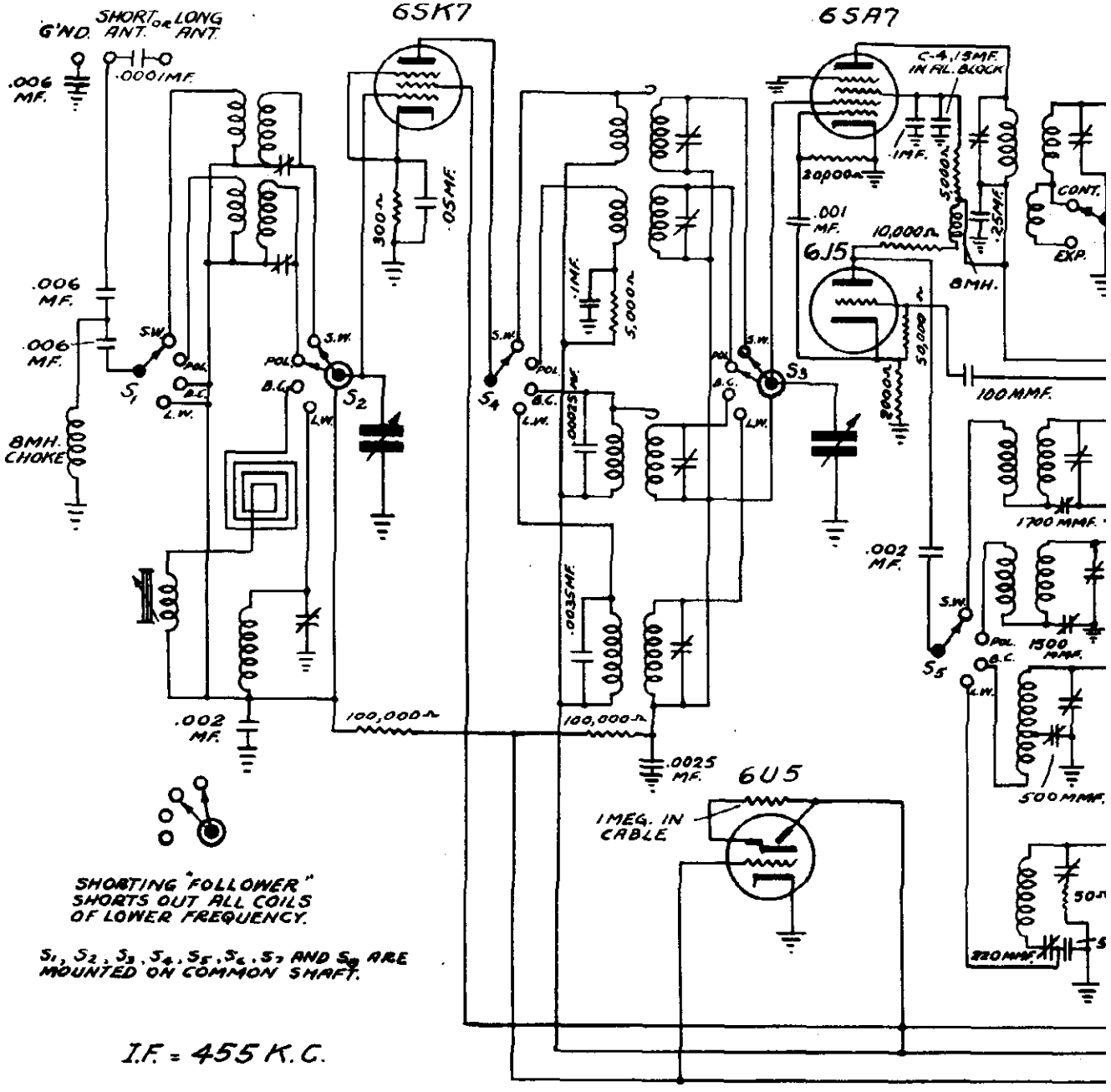
(b) NBC has transmitted color with 441 lines per frame and 60 frames per second, requiring 26.460 scanning lines per second, and 120 vertical fields per second.

The Du Mont sync transformer should be adjusted as follows:

A Du Mont picture signal should be applied to the 1851 first video grid in accordance with the previous instructions, or received over the air. A diode rectifier with its output connected to an oscillograph should be very loosely coupled to the grid of the horizontal oscillator (green lead on Du Mont sync transformer). This may be done by clipping a battery clip around an insulated portion of the green lead. The oscillograph sweep should be synchronized to the 60 cycle power line, the beam of the CRT should be cut off, and the sweep oscillator tubes of the television receiver removed. The Du Mont sync transformer should then be adjusted for maximum amplitude of the envelope of the H.F. burst pulse as indicated on the oscillograph.

The test pattern should be clean and crisp with no signs of any breakdown visible. Breakdown will cause intermittent black lines which jump back and forth vertically or horizontally tear out similar to that produced by noise, which is particularly noticeable at the black circle of the test pattern.

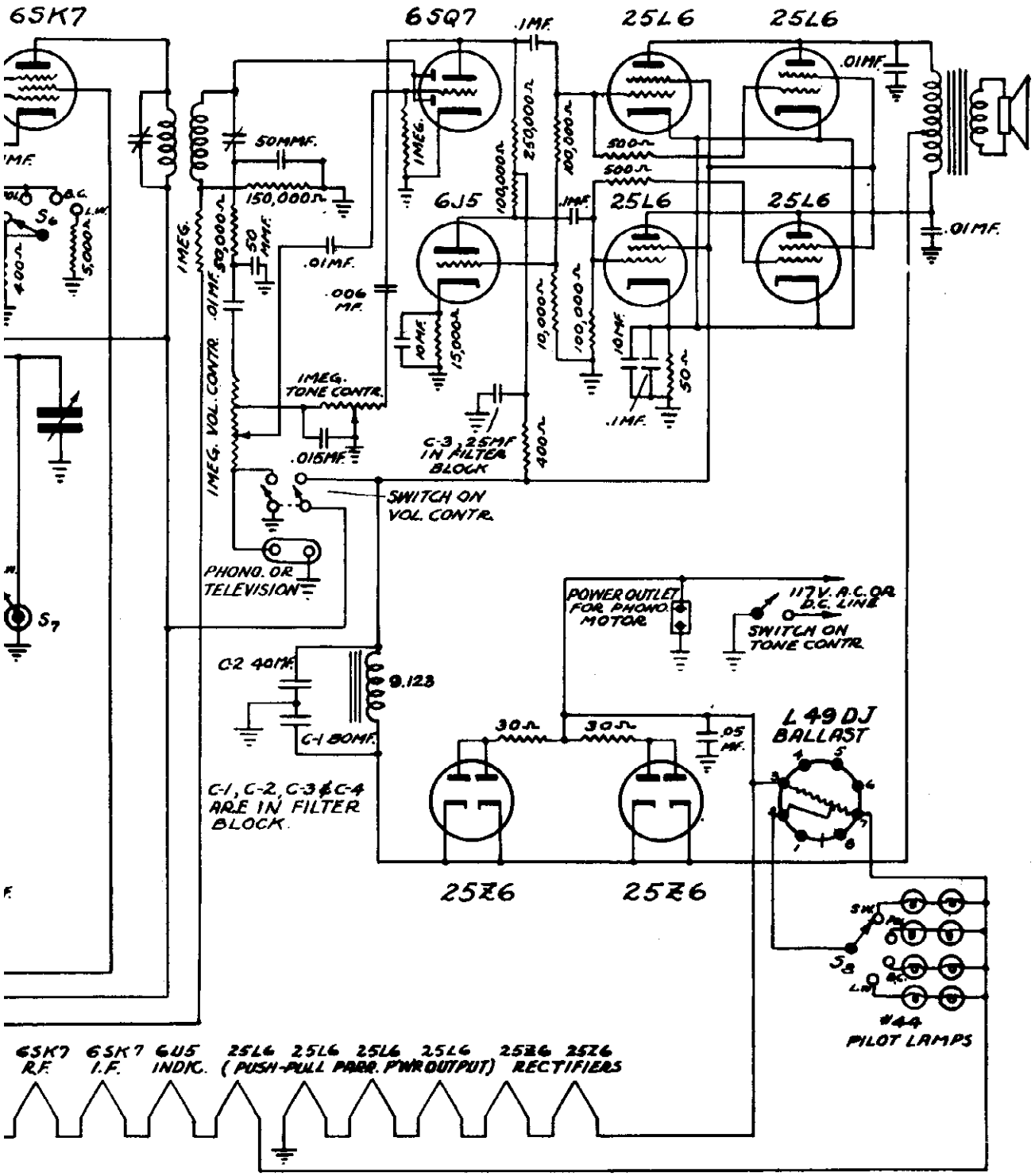
Very often faulty coupling condensers in the deflection circuits will cause this trouble and tapping them with an insulated rod will help locate the faulty part.



BAND	RANGE	
	FREQUENCY	WAVE LENGTH
SHORT WAVE	22.5 MC. - 7.2 M.C.	13 - 41.75 METERS
POLICE	7.4 MC. - 2.3 MC.	40.5 - 128 METERS
BROADCAST	545 - 1620 KILOCYCLES	550 - 185 METERS
LONG WAVE	140 - 370 KILOCYCLES	2140 - 813 METERS

IO CORP.

MODELS C124,1444,1454,1464
1474,4014



13 TUBE A.C., D.C. RECEIVER

This model is a 13-tube (plus ballast) 4-band radio receiver.It is for operation on 105 to 125 volts, DC or AC (50 to 60 cycles).

The frequency coverage is as follows:

Long Wave Band.	142 to 375 Kilocycles.
Broadcast Band.	543 to 1600 Kilocycles.
First Short Wave.	2.35 to 7.6 Megacycles.
Second " "	7.2 to 22.5 Megacycles.

The controls on this receiver are as follows: (from left to right)

(1) Band Switch
(2) Band Expansion (High Fidelity)
(3) Volume & Phono Switch
(4) Tone Control & Line Switch
(5) Tuning.

All packing should be removed before attempting to set up the receiver. The tubes should be examined to make sure that they are mounted firmly in their sockets, as they may be jarred loose in shipment.

ANTENNA - A highly selective loop antenna is included in the cabinet of this receiver. By turning the cabinet slightly,maximum volume with a minimum of noise may be had.Where conditions do not permit placement of the receiver in a position for best reception,it may be desirable to connect a short antenna to the binding post marked "A" which is located on the Loop Antenna. Where reception from greater distances is desired, it is necessary to install a well-insulated outdoor antenna about 50 feet long.

BROADCAST BAND: The dummy antenna for this band should consist of a 250 mmfd condenser only. The signal generator is set at 1620 kc, the band switch set at broadcast position. The variable condsnser should be opened so that the plates are entirely out of mesh. The oscillator trimmer is then adjusted for maximum response on that frequency(1620KC).Set the signal generator at 1400kc and tune the receiver until a response is indicated.The dial pointer should coincide with the 1400 kc mark on the dial. Now adjust the interstage trimmer for maximum output.The signal generator is then set at 600 kc and the receiver tuned until a response is indicated. The padder condenser is then adjusted for maximum gain while the tuning gang condenser is rocked slightly to the left and right. The Antenna loading coil is now set for a maximum.This is located on top of the chassis behind the gang condenser. The 1400 kc adjustment should then be rechecked.

LONG WAVE BAND: The band selector switch is set in position for operation on the long wave band. The receiver and generator are both tuned to 300 kc and the oscillator trimmer is adjusted for maximum response.The antenna and first detector trimmers are adjusted in the order named for maximum output.

The signal generator is then set at 150 kc and the signal is tuned in.The long wave padder condenser is adjusted for maximum response while the gang tuning condenser is rocked slightly to the left and right. The 300 kc adjustment should then be rechecked.

Realignment of this receiver should not be attempted unless all other possible causes of faulty operation have been thoroughly investigated. An accurately calibrated signal generator which will cover the necessary wave-bands and an output meter for indicating the effect of adjustments are required.

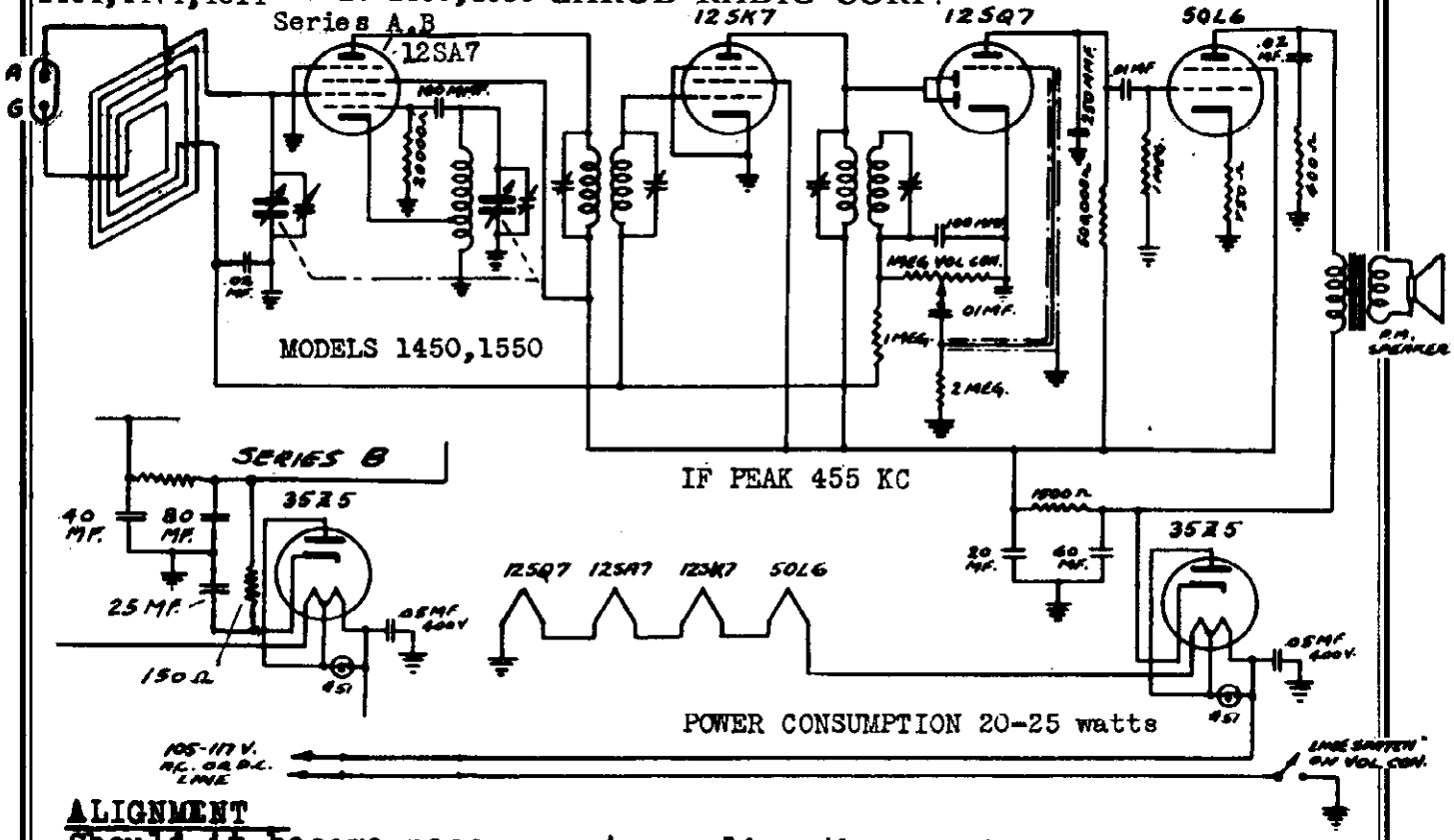
It is important to remember that in receivers of this kind which are equipped with automatic volume control,it is necessary to use the minimum possible signal from the signal generator; otherwise the A.V.C. action will tend to nullify the variations in output as the trimmers are adjusted.

I.F. ADJUSTMENT: The signal generator is set at 455 kc and is connected through a .5 mmfd condenser to the grid of the first detector (6SA7). This connection may be made to the stator lug on the middle section of the variable condenser With the band switch set on "Broadcast", the Band Expansion Switch in the Selective position (left), the pointer set at about 600 kc and the receiver volume control at its maximum position,the I.F.trimmers are adjusted for maximum output. These trimmers may be found on top of the I.F. transformer shield cans.

SECOND SHORT WAVE BAND: Turn the dial control knob so that the condenser plates are entirely out of mesh. Set the band switch to the second or higher frequency short wave band. The signal generator should be connected to the short-antenna binding post through the dummy antenna consisting of a 250 mmfd mica condenser and a 400 OHM non-inductive resistor. The oscillator trimmer condenser should be opened to minimum capacity and the signal generator then set to 22.5 megacycles. The oscillator trimmer is then increased in capacity until maximum response is obtained. Two responses are possible and it is important that the high frequency response (oscillator trimmer low capacity)be used. The signal generator is then set to 19MC and the variable condenser turned until a response is obtained. The pointer should coincide with the 19MC mark on the dial. The antenna preselector and first detector trimmers are then adjusted.in the order named, for maximum output.The variable condenser should be rocked slightly during this last adjustment. The signal generator is now set at 8.mc and the signal tuned in on the dial. The padder for this band is adjusted for maximum reading of the output meter while the generator tuning condenser is rocked slightly to right and left. The high frequency adjustment should then be rechecked.

FIRST SHORT WAVE BAND: The band selector switch is set in position for operation on the first short wave (second from left). The variable condenser is opened so that the plates are completely unmeshed and the oscillator trimmer is opened to minimum capacity. The signal generator is set to 7.6 mc and the oscillator trimmer condenser is increased in capacity until a response is heard. Two responses are possible and it is important that the higher frequency response(oscillator trimmer low capacity) be used. Set the signal generator at 7 mc and turn the tuning control until a response is indicated on the output meter. The pointer should now coincide with the 7 mc marker on the dial. The antenna preselector and first detector trimmers are then adjusted in the order named for maximum output. After high frequency adjustments have been made, set the signal generator at 2.5 mc and turn the variable gang condenser until a response is observed. Adjust the padding condenser for this band for maximum gain while rocking the tuning condenser slightly to the right and the left. The higher frequency adjustment should then be rechecked.

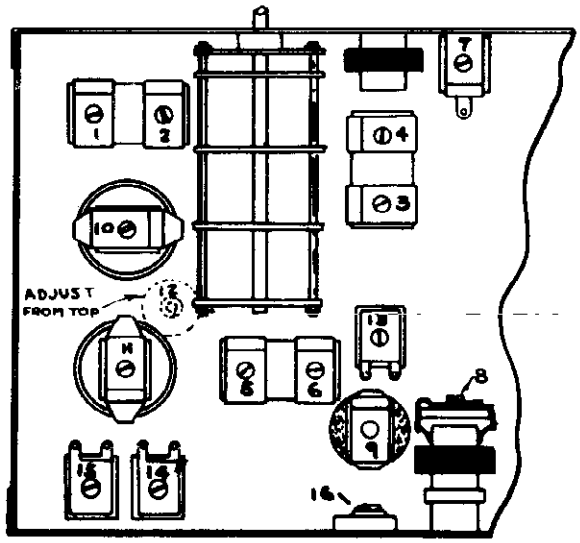
MODELS C124,1444,1454,
1464,1474,4014 MODELS 1450,1550 GAROD RADIO CORP.



ALIGNMENT

Should it become necessary to realign the receiver at any time, proceed in the usual manner by first adjusting the I.F. transformers, for maximum output as indicated by an output meter connected across the voice coil. Then turn the dial to 1500 KC. Set the signal generator (or 1500KC local station) to this frequency and tune in the signal by means of the oscillator trimmer on the variable condenser, (Front section). Then adjust the antenna trimmer for maximum output. No other adjustments are necessary.

C124, 4014, 1444
1454, 1464, 1474



BOTTOM VIEW OF CHASSIS SHOWING LOCATION OF TRIMMERS & PADDERS

NUMBER (SEE DIAGRAM)	ALIGNMENT CHART FUNCTION	ALIGNMENT FREQUENCY
1	2ND. S.W. ANT. TRIMMER	19 M.C.
2	1ST. S.W. ANT.	7 M.C.
3	2ND. S.W. INTER. (1ST. DET.)	19 M.C.
4	1ST. S.W. " "	7M.C.
5	2ND. S.W. OSC	22.5M.C.
6	1ST. S.W. "	7.6M.C.
7	L.W. ANT.	300K.C.
8	L.W. INTER (1ST. DET.)	300K.C.
9	L.W. OSC.	300K.C.
10	B.C. INTER. (1ST. DET.)	1400K.C.
11	B.C. OSC	1620K.C.
12	B.C. LOOP PADDER	600K.C.
13	2ND. S.W. "	8 M.C.
14	1ST. S.W. "	2.5M.C.
15	B.C. "	600K.C.
16	L.W. "	150K.C.
	I.F. FREQUENCY	455K.C.

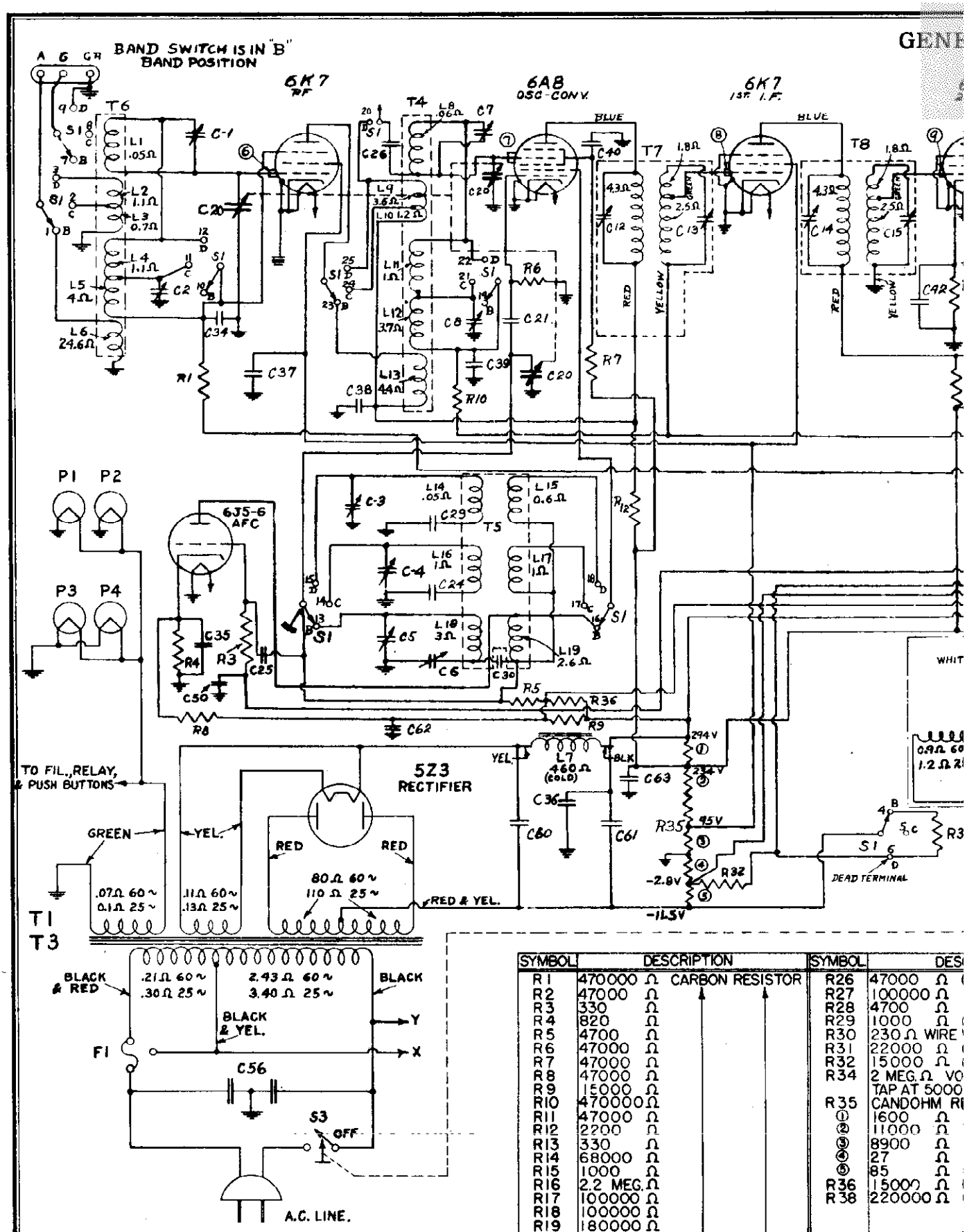
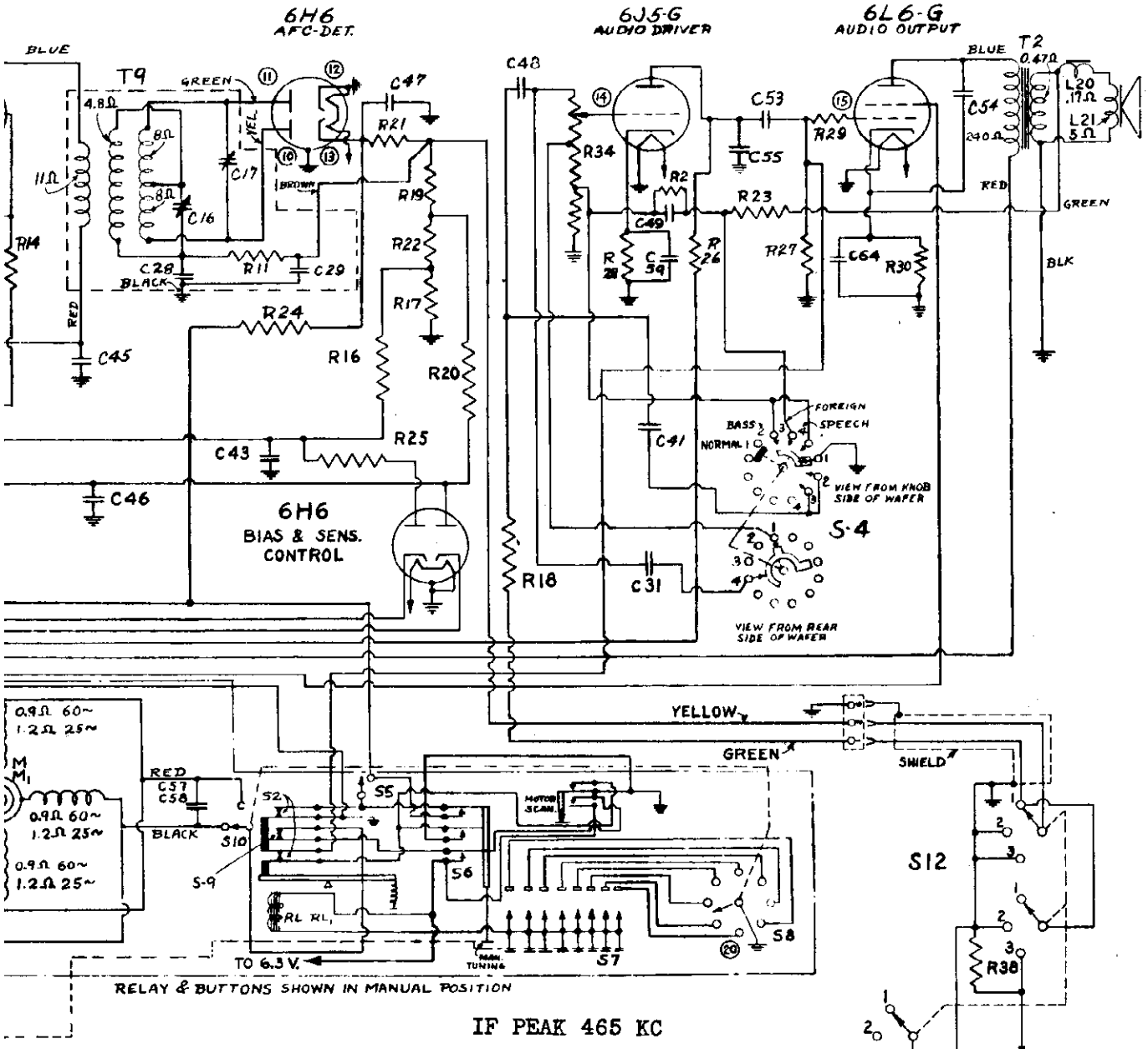


Fig. 10. Schematic Diagram

SYMBOL	DESCRIPTION	SYMBOL	DES
R1	470000 Ω CARBON RESISTOR	R26	47000 Ω
R2	47000 Ω	R27	100000 Ω
R3	330 Ω	R28	4700 Ω
R4	820 Ω	R29	1000 Ω
R5	4700 Ω	R30	230 Ω WIRE
R6	47000 Ω	R31	22000 Ω
R7	47000 Ω	R32	15000 Ω
R8	47000 Ω	R34	2 MEG. Ω VO
R9	15000 Ω		TAP AT 5000
R10	470000 Ω	R35	CANDOHM RI
R11	47000 Ω	①	1600 Ω
R12	2200 Ω	②	11000 Ω
R13	330 Ω	③	8900 Ω
R14	68000 Ω	④	27 Ω
R15	1000 Ω	⑤	85 Ω
R16	2.2 MEG. Ω	R36	15000 Ω
R17	100000 Ω	R38	220000 Ω
R18	100000 Ω		
R19	180000 Ω		
R20	2.2 MEG. Ω	C1	5-40 MMF
R21	510000 Ω	C2	5-40 MMF
R22	220000 Ω	C3	5-30 MMF
R23	2200 Ω	C4	5-30 MMF
R24	47000 Ω	C5	5-40 MMF
R25	100000 Ω CARBON RESISTOR	C6	175-350 MMF

L ELECTRIC CO.



IF PEAK 465 KC

ION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
ON RESISTOR	C7	2-20 MMF. "D" R.F. TRIM.	C41	.00075 MFD. PAPER CAPACITOR
	C8	2-20 MMF. "B" R.F.	C42	.1 MFD.
ON	C12	330 MMF OPER. 1ST. I.F. PRI.	C43	.05 MFD.
D	C13	1ST. I.F. SEC.	C44	.05 MFD.
ON	C14	2ND I.F. PRI.	C45	.1 MFD.
ON RESISTOR	C15	330 2ND. I.F. SEC.	C46	.05 MFD.
ITROL	C16	280 3RD. I.F. PRI.	C47	.1 MFD.
500000 Ω	C17	41.5 MMF. OPER. 3RD. I.F. SEC. TRIM.	C48	.005 MFD.
OR	C20	10-450 MMF. TUNING CAPACITOR	C49	.1 MFD.
	C21	50 MMF. MICA	C50	.05 MFD.
	C23	3600 MMF.	C53	.05 MFD.
	C24	1300 MMF.	C54	.01 MFD.
	C25	250 MMF.	C55	.001 MFD. PAPER
	C26	20 MMF.	C56	.01-.01 MFD. LINE
	C28	150 MMF.	C57	2300 MFD. DRY ELC. 25~
ON RESISTOR	C29	150 MMF.	C58	1000 MFD. DRY 50-60~
ON RESISTOR	C30	750 MMF.	C59	10 MFD. DRY
	C31	35 MMF. MICA	C60	16 MFD. WET
	C34	.05 MFD. PAPER	C61	30 MFD. WET
TRIMMER	C35	.1 MFD.	C62	4 MFD. DRY
	C36	.05 MFD.	C63	10 MFD. DRY
	C37	.25 MFD.	C64	25 MFD. DRY ELC. CAPACITOR
	C38	.1 MFD.		
	C39	.05 MFD.		
D. TRIMMER	C40	.05 MFD. PAPER CAPACITOR		

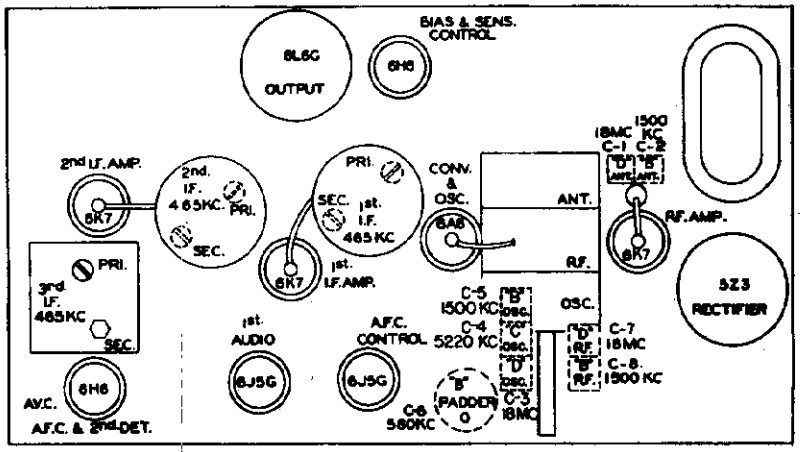


Fig. 2. Chassis Layout and Trimmer Location

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 an AC voltmeter with a scale reading of 3 to 5 volts. A cathode ray oscilloscope is preferred for I.F. alignment.
3. A screw-driver type alignment tool.

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. The grid lead should not be removed from the tube to which the input signal is applied when aligning the I.F. as this would remove the grid bias from the tube.

Automatic Frequency Control Adjustments

After I.F. alignment is completed with output meter and without disturbing the generator setting, remove the signal generator lead from the grid of the 6A8 converter. Apply the 465 kc. signal, to the 6A8 grid capacitively through the insulation of the grid lead.

Tune in a weak broadcast station at about 1000 kc. and, with the A.F.C. switch "off," tune the receiver carefully for "Zero" beat between this carrier and the 465 kc. generator signal. Throw the A.F.C. switch on and adjust the 3rd I.F. secondary trimmer (C-17) to zero beat. This adjustment is very critical and must be made with great care. When the alignment is correctly done, there will be no appreciable difference in the beat note with the A.F.C. switch "on" or "off."

Another method of A.F.C. adjustment after I.F. alignment with an output meter is to connect a low range voltmeter between the cathodes of the 6H6 discriminator. Leave the signal generator connected to the 6A8 grid and without disturbing its setting adjust C-17. It will be noticed that the meter reads plus when C-17 is tuned off resonance on one side and negative when tuned on the opposite side of resonance. The correct adjustment of C-17 is between these positions, when the voltmeter reads zero.

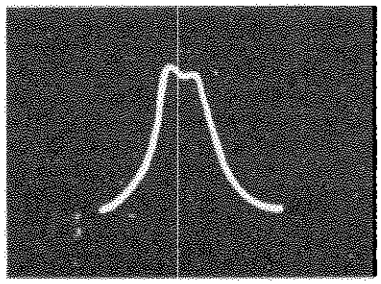


Fig. 3. Over-all I.F. Curve

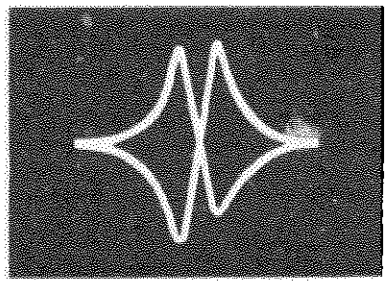


Fig. 4. AFC Adjustment Curve

Tuning Frequency Range

Band "B"	540–1680 kc.
Band "C"	1500–5500 kc.
Band "D"	5400–18,000 kc.

Intermediate Frequency ..... 455 kc.

Electrical Power Output

Undistorted	5½ watts
Maximum	10 watts

Tuning Control Drive Ratio Manual 90–1

Tone Control ..... 4-point control

Loud-speaker—Electrodynamic

Cone diameter	12-inch
Voice coil impedance	6.5 ohm at 400 cycles

ALIGNMENT PROCEDURE

I.F. Alignment with Oscilloscope

Band Switch Setting	Input Frequency	Point of Input	Dummy Ant.	Trimmer (See Fig. 9)	Remarks
1. Band "B"	465 kc. Sweep	2nd I.F. Grid	.05 Mfd.	3rd I.F. Pri. (C-16)	A.F.C. switch "off"—Condenser gang at minimum capacity—vertical input ground and the junction of R-18, R-19, R-21 and brown lead from the 3rd I.F. trans. Adjust trimmers in order listed for a single curve of maximum amplitude. The resulting curve with input at converter grid is shown in Fig. 3.
2. Band "B"	465 kc. Sweep	1st I.F. Grid	.05 Mfd.	2nd I.F. Sec. (C-15) Pri. (C-14)	
3. Band "B"	465 kc. Sweep	Converter Grid	.05 Mfd.	1st I.F. Sec. (C-13) Pri. (C-13)	
4. Band "B"	465 kc. Sweep	Converter Grid	.05 Mfd.	3rd I.F. Sec. (C-17)	Disconnect one end of C-47—Turn A.F.C. switch "on"—Vertical input of oscilloscope to ground and discriminator cathode; prong No. 8 on 6H6.—Adjust trimmer for cross on horizontal axis. Fig. 4.

I.F. Alignment with Output Meter

1. Band "B"	465 kc. Modulated	2nd I.F. Grid	.05 Mfd.	3rd I.F. Pri. (C-16)	A.F.C. switch "off"—Condenser gang at minimum capacity—output meter connected across the voice coil—volume control at maximum—input as low as practical. Adjust all trimmers in order listed for maximum output. Do not attempt an over-all re-alignment once a stage alignment has been completed.
2. Band "B"	465 kc. Modulated	1st I.F. Grid	.05 Mfd.	2nd I.F. Sec. (C-15) Pri. (C-14)	
3. Band "B"	465 kc. Modulated	Converter Grid	.05 Mfd.	1st I.F. Sec. (C-13) Pri. (C-13)	
4. Band "B"	.....	.....	.....	3rd I.F. Sec. (C-17)	See paragraph on A.F.C. adjustment.

R.F. Alignment

1. Band "B"					Turn A.F.C. switch "off"—Set dial pointer to first line at left-hand end of dial scale with condenser gang fully meshed.
2. Band "D"	18 mc. Modulated	Antenna post	250 Mmf. 400 ohms	Osc. (C-3) R.F. (C-7) Ant. (C-1)	Connect output meter across voice coil—Turn tone control to bass. D band image should be 990 kc. below input signal when oscillator trimmer. (C-3) is peaked properly. Example: 15 mc.—image 14.07 mc. Peak C-7 and C-1 while rocking gang condenser.
3. Band "C"	5220 kc. Modulated	Antenna post	250 Mmf. 400 ohms	Osc. (C-4)	Adjust trimmer for greatest output with dial pointer at 5,220 kc.
4. Band "B"	1500 kc. Modulated	Antenna post	250 Mmf. 400 Ohms	Osc. (C-5) R.F. (C-8) Ant. (C-2)	Adjust trimmers, in order listed, for greatest output at 1500 kc.
5. Band "B"	580 kc. Modulated	Antenna post	250 Mmf. 400 Ohms	Osc. padder (C-6)	Adjust padder for maximum output in vicinity of 580 kc. while rocking gang condenser.
6. Band "B"	Repeat operation No. 4				

Electrical Specifications

Rating Label	Power Supply (Volts)	Frequency (Cycles)	Power Consumption (Watts)
A6	110–120 (120–130)*	60	175
A5	110–120 (120–130)*	50	175
C2	110–120 (120–130)*	25	180

* The receivers, as shipped from the factory, have the fuse clipped to the 120–130-volt tap of the transformer, marked 125 on the fuse board. If the normal voltage of your power supply is always below 115 volts, the fuse should be removed from this tap and placed in the lower voltage clip marked 115.

Tubes

RF Amplifier	6K7 Triple-grid, super control amplifier
Oscillator and Converter	6A8 Pentagrid Converter
1st I.F. Amplifier	6K7 Triple-grid, super control amplifier
2nd I.F. Amplifier	6K7 Triple-grid, super control amplifier
AFC Discriminator and Detector	6H6 Twin diode
Bias and Sensitivity Control	6H6 Twin diode
AFC Control	6J5-G Detector amplifier triode
1st Audio	6J5-G Detector amplifier triode
Audio Output	6L6-G Beam power amplifier
Rectifier	5Z3 Full wave rectifier
Dial lamps	MAZDA No. 46—6.3 volt, 0.35 amps.

GENERAL ELECTRIC CO.

FOR "IMPROVED" GENERAL INSTRUMENT MODEL L RECORD CHANGER
SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS."

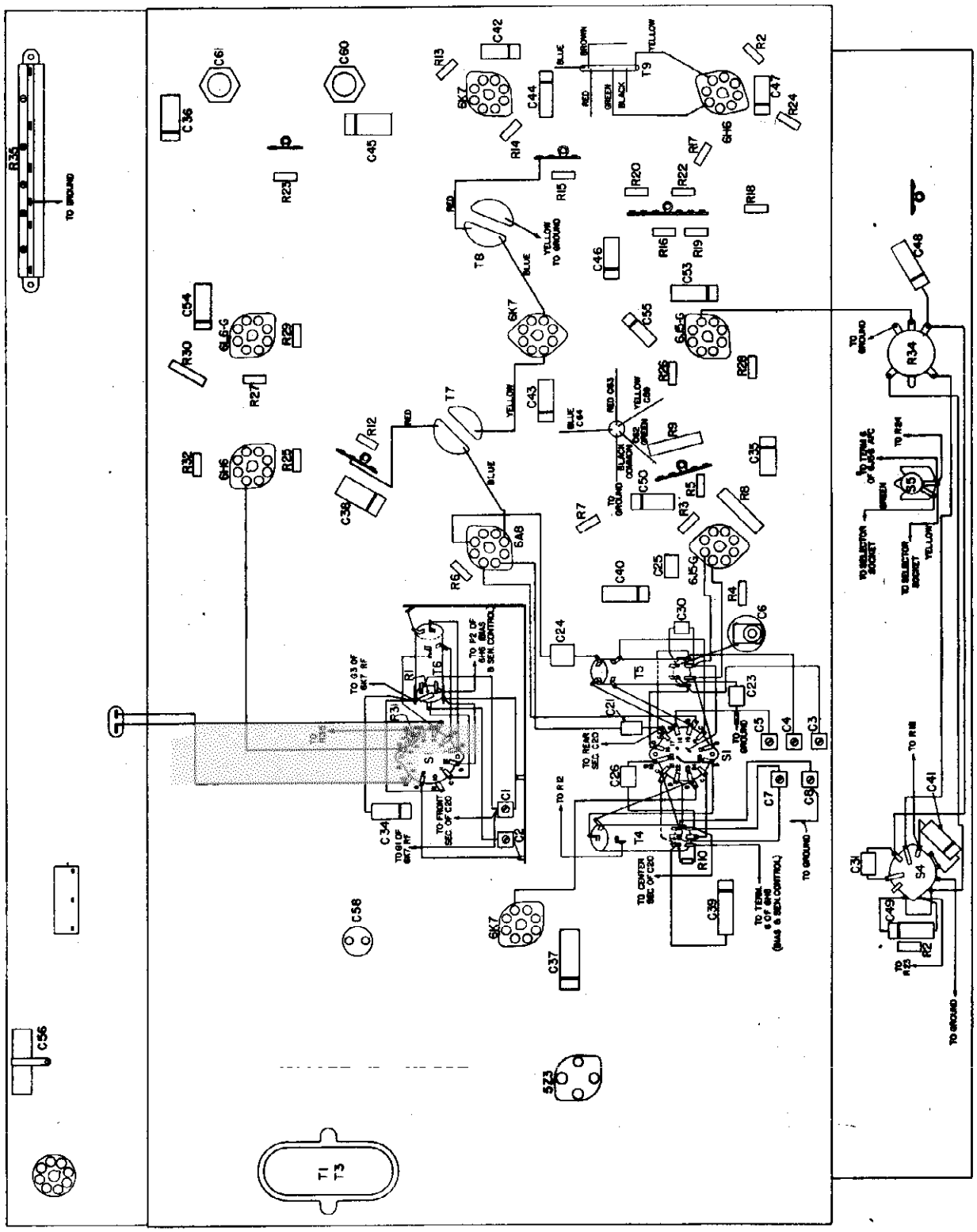


Fig. 11. Chassis Parts Layout

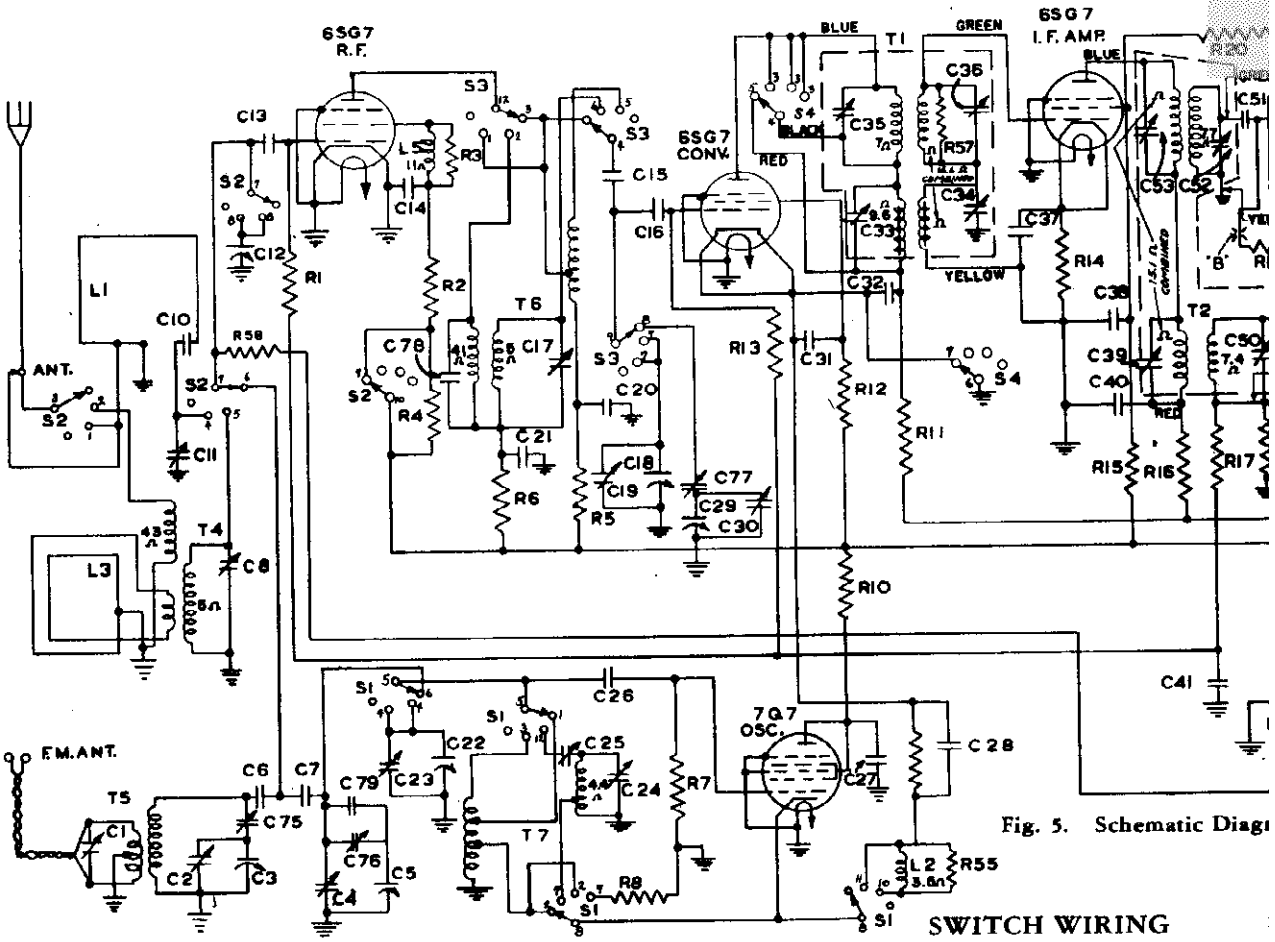


Fig. 5. Schematic Diagr

SWITCH WIRING

The band switch terminals
Switch Wiring Diagram, Fig.
the corresponding numbered p
Diagram, Fig. 5. Switch section
as S1, section 2 is represente
Schematic Diagram, Fig. 5.

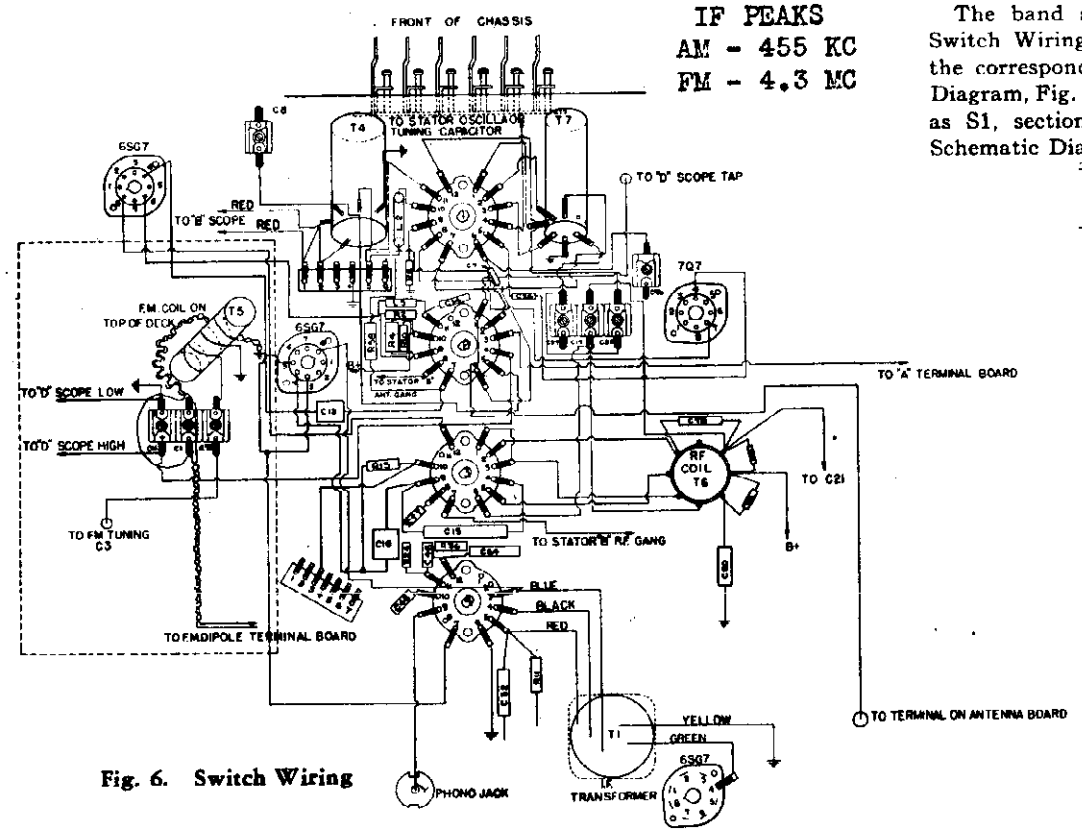
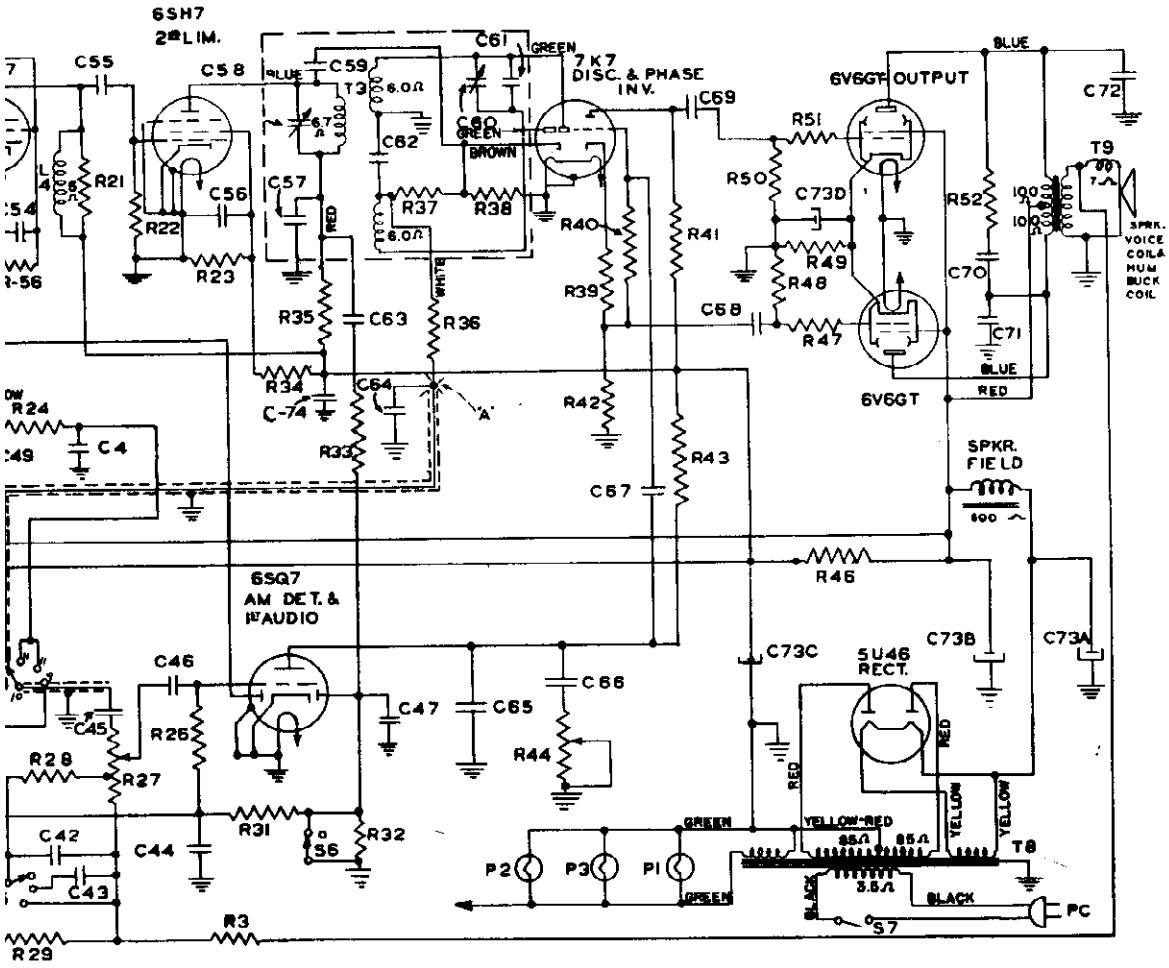


Fig. 6. Switch Wiring

Symbol	
C-1	"F
C-2	"F
C-3	"F
C-4	"F
C-5	"F
C-6	47
C-7	10
C-8	"B
C-10	300
C-11	"S
C-12	"A
C-13	220
C-14	.02
C-15	.05
C-16	47
C-17	"B
C-18	"A
C-19	"D
C-20	360
C-21	.05
C-22	"A
C-23	"D
C-24	"B
C-25	560
C-26	65
C-27	.08
C-28	.00
C-29	"F
C-30	"F
C-31, -32	.02
C-37, -38	.05
C-40	.02
C-41	.05
C-42	.00
C-43, -44, -45	.01
C-46	.00
C-47, -48, -49	10

.ECTRIC CO.

MODELS LF-115, LF-116, LFC-1118, LFC-1128, LFC-1228



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Description
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mica capacitor

Symbol	Description
C-51	33 mmf., mica capacitor
C-54	47 mmf., mica capacitor
C-55	22 mmf., mica capacitor
C-56	.02 mfd., paper capacitor
C-57, -59	47 mmf., mica capacitor
C-61	8 mmf., compensating capacitor
C-62	220 mmf., mica capacitor
C-63	.01 mfd., paper capacitor
C-64	220 mmf., mica capacitor
C-65	100 mmf., mica capacitor
C-66	.01 mfd., paper capacitor
C-67, -68, -69	.05 mfd., paper capacitor
C-70	.005 mfd., paper capacitor
C-71, -72	.002 mfd., paper capacitor
C-73a	30 mfd., dry electrolytic
C-73b	15 mfd., dry electrolytic
C-73c	10 mfd., dry electrolytic
C-73d	20 mfd., dry electrolytic
C-74	.05 mfd., paper capacitor
C-75	"FM" RF padder
C-76	"FM" Oscillator padder
C-77	"FM" Converter padder
C-78	270 mmf., mica capacitor
C-79	65 mmf., compensating capacitor
R-1	1.5 megohm, carbon resistor
R-2	3,900 ohm, carbon resistor
R-3	100,000 ohm, carbon resistor
R-4	33,000 ohm, carbon resistor
R-5, -6	2,200 ohm, carbon resistor
R-7	33,000 ohm, carbon resistor
R-8	330 ohm, carbon resistor
R-9	1,200 ohm, carbon resistor
R-10	10,000 ohm, carbon resistor
R-11	2,200 ohm, carbon resistor
R-12	22,000 ohm, carbon resistor
R-13	1.5 megohm, carbon resistor
R-14	330 ohm, carbon resistor
R-15	15,000 ohm, carbon resistor
R-16	2,200 ohm, carbon resistor
R-17	2.2 megohm, carbon resistor
R-18	150,000 ohm, carbon resistor
R-19	100,000 ohm, carbon resistor
R-20	220,000 ohm, carbon resistor
R-21	8,200 ohm, carbon resistor
R-22	180,000 ohm, carbon resistor
R-23, -24	47,000 ohm, carbon resistor
R-26	6.8 megohm, carbon resistor
R-27	2 megohm, volume control
R-28	68,000 ohm, carbon resistor
R-29	22 ohm, carbon resistor
R-30	470 ohm, carbon resistor
R-31	2.2 megohm, carbon resistor
R-32	1.0 megohm, carbon resistor
R-33	10,000 ohm, carbon resistor
R-34	68,000 ohm, carbon resistor
R-35	22,000 ohm, carbon resistor
R-36	68,000 ohm, carbon resistor
R-37, -38	100,000 ohm, carbon resistor
R-39	3,300 ohm, carbon resistor
R-40	470,000 ohm, carbon resistor
R-41, -42	82,000 ohm, carbon resistor
R-43	220,000 ohm, carbon resistor
R-44	0.5 megohm treble-tone control
R-46	2,500 ohm, wire wound resistor
R-47	1,000 ohm, carbon resistor
R-48	220,000 ohm, carbon resistor
R-49	270 ohm, carbon resistor
R-50	220,000 ohm, carbon resistor
R-51	1,000 ohm, carbon resistor
R-52	8,200 ohm, carbon resistor
R-55	100,000 ohm, carbon resistor
R-56	47,000 ohm, carbon resistor
R-57	220,000 ohm, carbon resistor
R-58	820,000 ohm, carbon resistor
S-1, -2, -3, -4	Band switch
S-5	Bass tone switch
S-6	Squelch switch
S-7	Power switch (combined R-44)
T-1	1st IF transformer
T-2	2nd IF transformer
T-3	Discriminator IF transformer
T-4	"BC" Band antenna transformer
T-5	"FM" band antenna transformer
T-6	"BC," "SW" and "FM" converter transformer
T-7	"BC," "SW" and "FM" oscillator transformer
T-8	Power transformer
T-9	Output transformer
L-1	"SW" Beam-a-Scope
L-2	Cathode choke
L-3	"BC" Beam-a-Scope
L-4	Limiter plate choke
L-5	Screen choke

GENERAL ELECTRIC CO.

MODELS LF-115, LF-116
LFC-1118
LFC1128
LFC-1228

SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS" FOR DATA COVERING THE RECORD CHANGERS INCORPORATED IN THE FOLLOWING G.E. COMBINATIONS:

MODEL LFC-1118 HAS THE RCA RP-162 RECORD CHANGER
MODEL LFC-1128 " " " RP-158 " "
MODEL LFC-1228 " " " RP-160 " "

GENERAL INFORMATION

Models LF-115 and LF-116 are combination AM and FM superheterodyne receivers using eleven tubes. The LF-116 differs from the LF-115 by the use of a special 10-inch speaker and an enclosed and lined tone chamber which provide superior acoustic qualities.

The Model LFC-1118 uses the Model LF-115 AM and FM chassis in conjunction with an automatic record changer.

The Model LFC-1228 is a de luxe phonograph and A-FM receiver using the LF-115 chassis and the 10-inch speaker and padded sound chamber as used in Model LF-116 receiver. The

The Model LFC-1128 is very similar to the Model LFC-1118 phono combination except for the automatic record player.

A detailed description of the FM portion of these receivers is given in the following paragraphs.

Oscillator-converter Circuit

The first 6SG7 tube acts as a conventional RF amplifier when operating in the Short-wave or Broadcast bands. However, in order to obtain optimum gain, the above tube becomes the first converter of a double or cascade converter system when operating in the FM band.

This cascade converter system consists of the two 6SG converter tubes and an oscillator tube 7Q7 with the associated circuits. The tuning condensers for the two con verters and oscillator are low capacity sections and gange together as usual. The antenna tuning circuit consisting o T5 and C3 tunes the FM band from 42 to 50 megacycles; th second converter tuned circuit consisting of a portion of T6 an C29 tunes from 23.15 to 27.15 megacycles; while the oscillato tuned circuit consisting of C5 and a portion of T7 tunes fro 18.85 to 22.85 megacycles. The oscillator voltage is capacit coupled to the grid of the first converter tube through C- This produces, by heterodyne action, a signal to which th plate circuit of this first converter is tuned. The firs converter tube also provides a gain of unity for the oscillato frequency. Accordingly, oscillator voltage is also applie to the grid of the second 6SG7 converter tube which produce in its plate circuit the IF frequency of 4.3 megacycles.

To illustrate the action consider an FM signal of 42 MC to which the receiver is tuned. The oscillator frequency fo this setting of the tuning control is 18.85 MC and it hetero dynes in the 1st converter tube with the 42 MC signal t

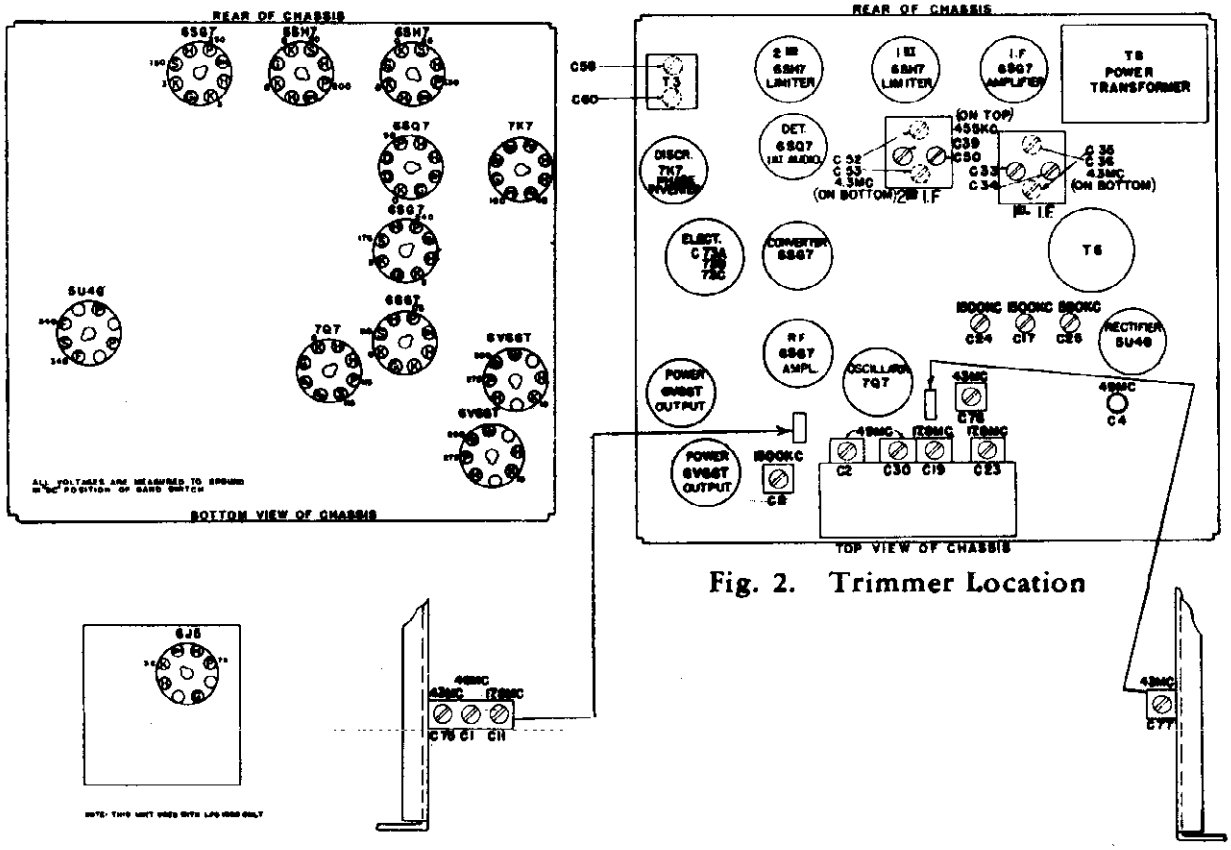


Fig. 2. Trimmer Location

form 23.15 MC (42–18.85). The 23.15 MC signal, in turn, beats with oscillator signal in the 2nd converter to produce the 4.3 MC intermediate frequency.

IF Amplifier

The IF amplifier operates as a dual amplifier in that it will operate either at the 455 KC required for the Broadcast and SW bands or at 4.3 MC required for the FM band, without the need of switching transformers except at the primary of the 1st IF. When the IF is operating at 455 KC, the primary and secondary coils of the 4.3 MC section of T1 and T2 are such a low impedance that they can be considered as shorted across; while when operating at 4.3 MC, the primary and secondary trimmers of the 455 KC section of T1 and T2 are such a low impedance that they effectively short out this portion of the transformer. Thus the frequency at which the IF is operating is applied across the proper section of the dual transformers and is amplified by the IF tubes.

Cascade Limiter Circuit

The limiter circuit consists of two resistance coupled 6SH7 tubes in series. Each limiter operates at zero initial bias and low screen voltage. Both grid circuits are designed for self-biasing and the use of capacity-resistance networks provides enough time delay to retain the grid bias between signal peaks. The action of the limiter is such that as soon as a signal is applied to the grid of the tube the grid draws current. This grid current charges up the capacitor across the grid resistor and at the same time establishes a bias through current drain in the resistor. The circuit is so designed that negative signal swings are all beyond plate current cutoff and positive signal peaks are cut off by plate current saturation. The value of the 1st limiter capacity-resistance network is so chosen as to limit noise amplitudes This arrangement leaves the 2nd limiter with the very much simplified task of reducing the remaining noise to the desired level.

FM Station Silencer

This circuit operates on amplitude modulated signals to produce squelch or quieting of the audio amplifier. Since the noise limiter circuits only operate when an FM carrier is present, noise between stations will ride through with undiminished amplitude. This amplitude modulation appears in the last noise limiter plate circuit and develops a voltage across R35. This voltage is rectified by one diode of the 6SQ7 tube and then applied to the 1st audio grid circuit of this tube provided the switch S6 is open. This rectified DC voltage is sufficient to completely bias off this audio tube so that no signal is passed. When a sufficiently strong FM signal is received so that the noise limiters operate with satisfactory signal strength, the noise or amplitude signal is reduced so low that the proper bias is restored to the 6SQ7 audio amplifier and the audio signal is then passed through to the output and phase inverter circuits. This squelch voltage can be manually removed by closing switch S6 so that weak FM stations that have considerable noise present can be received if desired.

FM CHANNEL ALIGNMENT

Due to good stability of components and the wide band characteristics of the IF amplifier circuits, alignment should be unnecessary under normal conditions. However, if alignment is necessary, the procedure is given in table form on page 3 with the location of all trimmers shown in Fig. 2.

IF Alignment

It is preferable to align the IF amplifier by means of a cathode ray oscilloscope and a 4.3 megacycle signal generator with a superimposed 200 KC sweep frequency. Many signal generators and mechanical frequency wobblers are available wherein the above requirements are fulfilled. As for example: G-E Model TMV-97-C Test Oscillator used in conjunction with the G-E Frequency Modulator TMV-128A will give a sufficient sweep of 200 KC when operated in the "Hi" position in conjunction with the 3100–6800 KC band of the Test Oscillator. When the Frequency Modulator is added to the Test Oscillator, the Test Oscillator calibration no longer is accurate, thus making necessary a recalibration. The following procedure may be followed. With a factory aligned receiver where the IF alignment can be assumed to be accurate, connect the above equipment to show the IF selectivity curve as described in Table I. When the two curves are brought together (by tuning Test Oscillator rather than receiver IF trimmers) so that they coincide, take the reading of the signal generator as being the proper point for 4.3 MC with 200 KC sweep alignment. As a further check on the accuracy, another signal generator where the 4.3 MC calibration is accurately known can be coupled to the same point of input as the Test Oscillator and Modulator are coupled and then when the 2nd single frequency generator (4.3 MC) is turned ON, a beat note should be observed at the peak of the resonance curve on the oscilloscope. If this beat note is not at the peak retune the Test Oscillator-Modulator until it does appear at this point.

Where the above equipment is not available, satisfactory alignment can be accomplished by using the equipment and procedure given in Table II. This makes use of an unmodulated RF signal of 4.3 MC and a high resistance (20,000 ohm per volt) voltmeter. The calibration of the signal generator must be accurately known.

A dummy antenna of 50 mmf. or less should be used in series with the signal generator input to the receiver when all IF alignments are made.

RF Alignment

Make all Frequency Modulation RF alignments with the chassis in the cabinet. The alignment procedure is given in Table III on page 3. The image signal should be below 46 MC when the oscillator is properly set.

AM CHANNEL ALIGNMENT

The Amplitude Modulation Channel of the receiver is aligned by following the procedure as outlined in Table IV. All IF alignment may be made with the chassis either installed in or removed from the cabinet. The RF alignment, however, must be made with the chassis and loop antennas securely fastened into their respective places in the cabinet as their relative position in respect to each other affects the alignment. The RF signal should be capacity coupled to the loop antennas by placing a two-foot wire for an antenna on the test-oscillator output post (high side). Keeping this antenna two feet or more from the receiver loops will generally insure freedom from too much coupling.

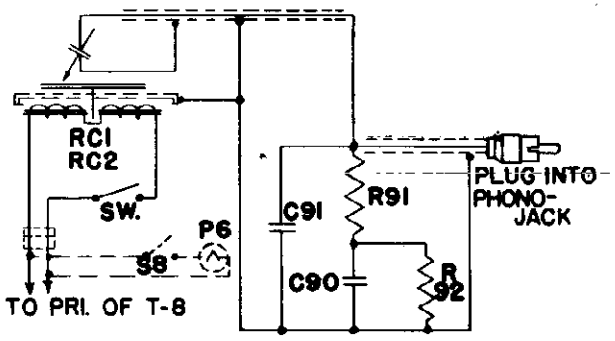


Fig. 9. **Phono Compensation Circuit (Models LFC-1118 and LFC-1128)**

Symbol	Description
C90	.0025 mfd. paper capacitor
C91	180 mmf. mica capacitor
R91	130,000 ohm carbon resistor
R92	430,000 ohm carbon resistor
S8	Compartment lamp switch
P6	Compartment lamp

GENERAL ELECTRIC CO

MODELS LF-115, LF-116, LFC-1216
LFC-1128, LFC-1228

Table I IF ALIGNMENT WITH OSCILLOSCOPE—"FM" CHANNEL

Step	Input Signal Connected to	Input Frequency	Band and Pointer Setting	Trimmer Adjustment	Comments
1	6SG7 converter grid in series with 22 mmf.	4.3 MC & ±200 KC Sweep	"FM" Band 42 MC	C52 C53	Connect high side of oscilloscope in series with 470,00 ohm resistor to R19 at point "B." Connect low side t chassis ground. Peak trimmers for resultant curv shown in Fig. 3.
2	6SG7 converter grid in series with 22 mmf.	4.3 KC & ±200 KC Sweep	"FM" Band 42 MC	C35 C36	
3	Repeat Step 1				
4	Repeat Step 2				
5	6SG7 converter grid in series with 22 mmf.	4.3 MC & ±200 KC Sweep	"FM" Band 42 MC	C60 C58	Connect high side of oscilloscope in series with 470,00 ohm resistor to R36, point "A." Connect low side t chassis ground. Peak trimmers for resultant curve show in Fig. 4. C60 is aligned when curve crosses midway i vertical plane. Proper alignment of C58 gives straighte sides to curve near crossover point.

Table II IF ALIGNMENT WITH METER—"FM" CHANNEL

Step	Input Signal Connected to	Input Frequency	Band and Pointer Setting	Trimmer Adjustment	Comments
1	6SG7 converter grid in series with 22 mmf.	Unmodulated 4.3 MC signal	"FM" Band 42 MC	C52 C53 C35 C36	Connect the 10-volt scale of a 20,000 ohm per vo voltmeter in series with a 470,000 ohm resistor betwee point "B" and ground. Peak all trimmers for maximu output using just enough input signal to give a satisfa tory output reading.
2	Repeat Step 1				
3	6SG7 converter grid in series with 22 mmf.	Unmodulated 4.3 MC signal	"FM" Band 42 MC	C60 C58	Connect the 10-volt scale of a 20,000 ohm per vo voltmeter in series with a 470,000-ohm resistor betwee points "A" and ground. *With C60 purposely detune* peak C58 for maximum meter reading. Align C60 fo the 0 voltage point where the meter reading change from a positive to negative value. Use as low a signa input as necessary to give a satisfactory meter readin

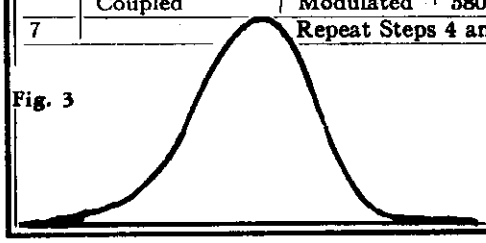
Table III RF ALIGNMENT—"FM" CHANNEL

Step	Input Signal Connected to	Input Frequency	Band and Pointer Setting	Trimmer Adjustment	Comments
1	Direct to "FM" Antenna Post	Unmodulated 49 MC signal	"FM" Band 49 MC	C4 (Osc.)	Connect the 10-volt range of a 20,000 ohm per vo voltmeter in series with a 470,000-ohm resistor to poin "B." The other side of the voltmeter lead connects t chassis ground. Peak trimmers for maximum mete reading using just enough signal input to give sati factory meter reading.
2	Direct to "FM" Antenna Post	Unmodulated 49 MC Signal	"FM" Band 49 MC	C2 C30	
3	Direct to "FM" Antenna Post	Unmodulated 43 MC Signal	"FM" Band 43 MC	C76 (Osc.)	
4	Direct to "FM" Antenna Post	Unmodulated 43 MC Signal	"FM" Band 43 MC	C75 C77	
5	Direct to "FM" Antenna Post	Unmodulated 46 MC Signal	"FM" Band 46 MC	C1	
6	Repeat Step 1				
7	Repeat Step 2				

Table IV IF, "BC," and "SW" ALIGNMENT—"AM" CHANNEL

Step	Input Signal Connected to	Input Frequency	Band and Pointer Setting	Trimmer Adjustment	Comments
1	6SG7 converter grid in series with .05 mfd.	455 KC Modulated	"BC" Band 550 KC	C50 C39 C34 C33	Connect 5.0-volt AC voltmeter across the voice co of the speaker. Peak all trimmers for maximum ou put. All RF alignments must be made with the chass in the cabinet.
2	Capacity Coupled	17.8 MC Modulated	"SW" Band 17.8 MC	C23*	*When aligning the SW oscillator trimmer, use maximu capacity peak. The image frequency should appear a 18,710 KC.
3	Capacity Coupled	17.8 MC Modulated	"SW" Band 17.8 MC	C19** C11	**Rock gang condenser when making alignment.
4	Capacity Coupled	1500 KC Modulated	"BC" Band 1500 KC	C24	
5	Capacity Coupled	1500 KC Modulated	"BC" Band 1500 KC	C17 C8	
6	Capacity Coupled	580 KC Modulated	"BC" Band 580 KC	C25**	
7	Repeat Steps 4 and 5				

Fig. 3



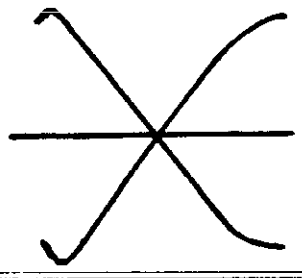


Fig. 4

MODELS LF-115, LF-116, LFC-1118, LFC-1128, LFC-1228

Tuning Frequency Range

"BC" Band	550–1700 KC
"SW" Band	5.8–18.0 MC
"FM" Band	42–50 MC

Intermediate Frequency

FM Channel	4.3 MC
AM Channel	455 KC

Electrical Power Output

Undistorted	10 watts
Maximum	12 watts

Loud-speaker—Electrodynamic

Over-all Dimensions (inches)

Model	LF-115	LF-116	LFC-1118	LFC-1128	LFC-1228
Height	40¼	41	37	35½	36½
Width	31	31	32½	35	35½
Depth	15¼	15½	16⅝	16⅝	16⅝

SERVICE HINTS

Replacement of Components

When servicing the FM portion of this receiver and especially when replacing parts, care should be exercised to return all components including wiring to the original position occupied in the chassis. The positioning of parts and wiring is very critical. When replacing coils or IF transformers, maintain the lead lengths provided and use the same terminals to which the original coil or transformer was connected.

Pointer Focusing

The focusing of the pointer on the dial scale is accomplished by increasing or decreasing the pointer distance from the dial scale. This is a rather critical adjustment and can be varied enough by loosening the mounting bolts and moving the chassis either back or forward in the cabinet until properly focused and then tightening mounting bolts.

Rotor Balance Spring

On the right-hand side of the tuning condenser assembly is a wire bracket from which a spring is suspended that connects to the drive drum of the tuning condenser. The proper adjustment of this spring counterbalances the weight of the condenser drive assembly and prevents backlash. For chassis mounted horizontally, as in Models LFC-1118, LFC-1128 and LFC-1228, the spring must be in the rear notch of wire bracket. For the Model LF-115 which has a 20° slope mounting, the spring is fastened in the center notch of the bracket while on LF-116 mounting (30° slope) the spring is in the bracket notch nearest front of chassis.

Loudspeaker - Electrodynamic

Model	LF-115	LF-116
Cone Diameter	12-inch	10-inch
Voice Coil Impedance (400 cycles)	7.8	8.4 ohms
Field Resistance	600 ohms	600 ohms

Model	LFC-1118, LFC-1128	LFC-1228
Cone Diameter	12-inch	10-inch
Voice Coil Impedance (400 cycles)	7.8	8.4 ohms
Field Resistance	600 ohms	600 ohms

Electrical Rating

Rating	Power Supply (Volts)	Frequency (Cycles per Second)	Power Consumption (Watts)
	(Models LF-115, LF-116)		
A	105–125	50–60	115
C	105–125	25	120
	(Models LFC-1118, LFC-1128, LFC-1228)		
	105–125	60	130

Drive Control Stringing

When replacing a drive cord, the stringing is accomplished as shown in Fig. 7. Before soldering the cord to the two drums as shown, check the pointer location as being at the last mark on the left-hand end of the scale when the gang condenser plates are completely closed; then solder.

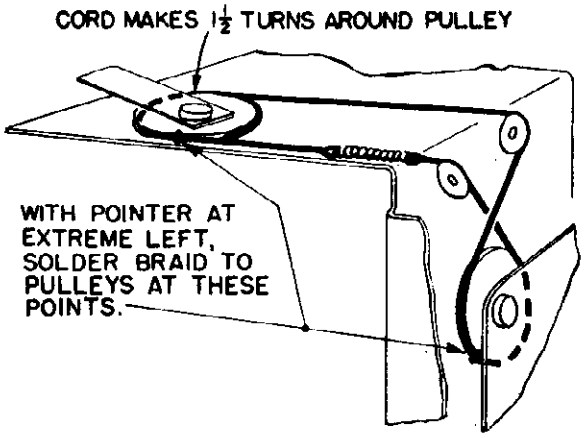


Fig. 7. Drive Cord Stringing

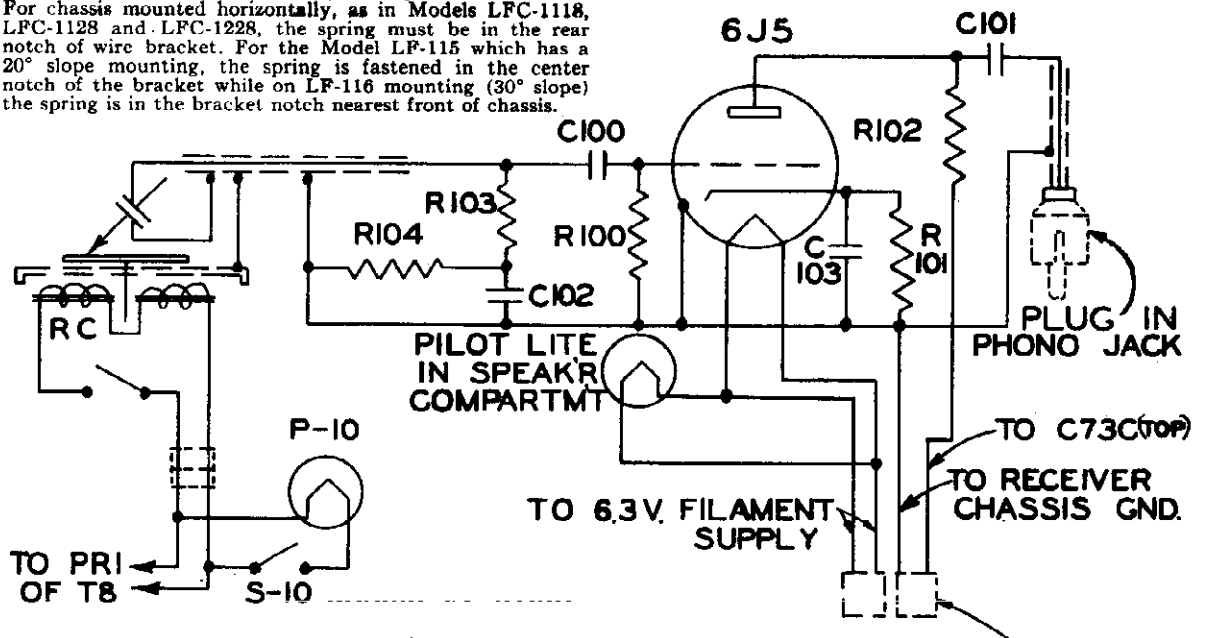
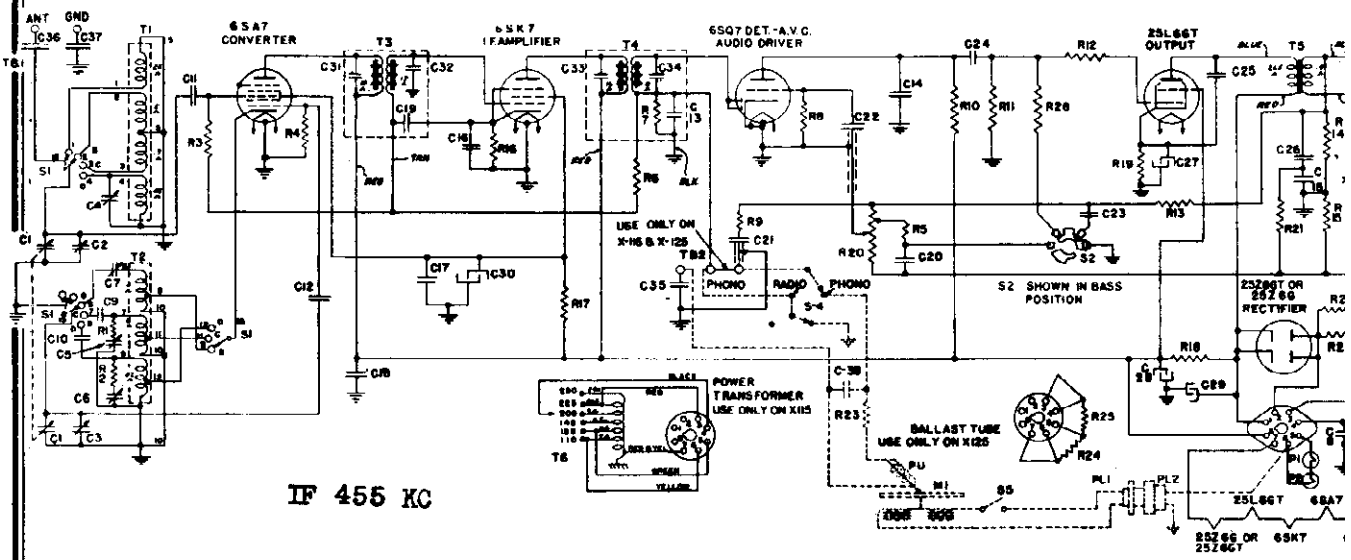


Fig. 8. Phono Pre-amplifier (Model LFC-1228 only)

Symbol	Description	Symbol	Description
C100, 101	.005 mfd., paper capacitor	R102	220,000 ohm carbon resistor
C102	.01 mfd., paper capacitor	R103	33,000 ohm carbon resistor
C103	14 mfd. electrolytic cap.	R104	220,000 ohm carbon resistor
R100	1.0 megohm carbon resistor	S10	Compartment lamp switch
R101	8,200 ohm carbon resistor	P10	Compartment lamp

GENERAL ELECTRIC CO.



NOTE—PARTS AND WIRING SHOWN DOTTED FOR MODEL X-145 ONLY

Symbol	Description	Symbol	Description	Symbol	Description
C1, 2, 3	Tuning condenser and trimmers	C29	40 mfd 300 V dry electrolytic	R18	3,300 ohm carbon resistor
C4	3–30 mmf "SW2" ant. trimmer	C30	20 mfd. 250 V dry electrolytic	R19	220 ohm carbon resistor
C5	3–30 mmf "SW1" osc. trimmer	C35	.25 mfd paper capacitor	R20, S3	2.0 megohm volume control
C6	3–30 mmf "SW2" osc. trimmer	C36, 37, 38	.01 mfd paper capacitor	R21	220 ohm carbon resistor
C7	435–535 mmf "BC" padder	R1	330 ohm carbon resistor	R22	330 ohm carbon resistor
C8	.02 mfd paper capacitor	R2	39 ohm carbon resistor	R23	15,000 ohm carbon resistor
C9	1800 mmf mica capacitor	R3	680,000 ohm carbon resistor	R24, 25	Ballast resistor RR-783
C10	5600 mmf mica capacitor	R4	22,000 ohm carbon resistor	R26	390,000 ohm carbon resistor
C11	470 mmf mica capacitor	R5	180,000 ohm carbon resistor	R27	330 ohm carbon resistor
C12	47 mmf mica capacitor	R6	2.2 megohm carbon resistor	T1	Antenna transformer
C13	100 mmf mica capacitor	R7	330,000 ohm carbon resistor	T2	Oscillator transformer
C14	220 mmf mica capacitor	R8	4.7 megohm carbon resistor	T3	1st IF transformer
C15–C19	.05 mfd paper capacitor	R9	47,000 ohm carbon resistor	T4	2nd IF transformer
C20, 21	.002 mfd paper capacitor	R10	330,000 ohm carbon resistor	T5	Output transformer
C22	.02 mfd paper capacitor	R11	470,000 ohm carbon resistor	T6	Power transformer
C23	.0015 mfd paper capacitor	R12	1,000 ohm carbon resistor	S1	Band switch
C24	.05 mfd paper capacitor	R13	5.6 megohm carbon resistor	S2	Tone control switch
C25	.008 mfd paper capacitor	R14	1,500 ohm carbon resistor	S3	Power switch on R20
C26	.1 mfd paper capacitor	R15	270 ohm carbon resistor	S4	Phono-Radio switch
C27	20 mfd 25 V. dry electrolytic	R16	330 ohm carbon resistor	S5	Automatic stop switch
C28	50 mfd. 250 V. dry electrolytic	R17	3,900 ohm carbon resistor		

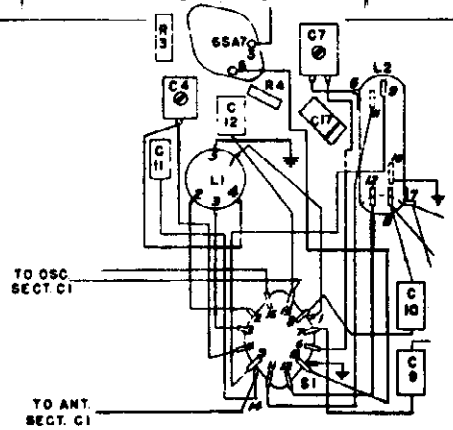


Fig. 5. Switch Wiring

MAGNETIC PICKUP (MODEL X-145)

To Replace Pickup Coil

Service operations which may be necessary on the pickup unit can be carried out by carefully observing the following disassembly procedure:

1. The cover is removed from the pickup head by removing the wax from the hole immediately to the rear of the needle holder. This will expose the slotted end of the cover screw which can be backed out with a small screwdriver. *Extreme care should be exercised so as not to burr or break the slot.*

2. Remove the magnet by placing an iron bar (keeper) approximately the same cross-section area, above the armature block assembly so that the magnet can be slid upon the keeper without breaking the magnetic circuit. The magnet is held in place by a spring at the elbow of the magnet. If the magnetic circuit is broken the magnetism may be permanently impaired.

3. The rubber damping blocks are held in a frame which fastens to the two armature blocks by means of setscrews. Remove the screws, rubber blocks and holder.

4. Unsolder the two leads from the pickup coil which fasten to the terminal board at the top of the magnet.

5. Remove the armature blocks from the back plate of the pickup by removing the two large head screws which hold them in place. The coil, armature and blocks can now be removed and a new coil substituted. Before removing the assembly, it is advisable to measure the distance across the face of the assembled armature and blocks and when you replace this assembly the same dimension should be maintained.

To assemble the unit, the reverse procedure should be followed. To maintain the correct assembled dimension of the coil, armature, and blocks; loosely fasten the assembly to the back plate by the screws, then clamp the assembly in a vise to the desired dimension, and tighten screws. Next assemble the rubber damping block and frame to the armature block. When tightening the assembly the armature vane is centered between the armature block pole pieces by the damping block; then tighten the two screws. The coil leads are soldered to the terminal strip being careful not to break or burn off the leads with too hot an iron. Replace the magnet (without breaking magnetic circuit), cover, and cover screw. Seal the cover screw with a bit of wax.

MODELS X-115, X-125
X-145

GENERAL ELECTRIC CO.

PHONOGRAPH OR TELEVISION SOUND CONNECTION

Fig. 1 shows a simple method for connecting a crystal or high impedance magnetic pick-up into the receiver circuit of the Models X-115 and X-125. The phono switch is a double-pole, double-throw type with a phono motor power switch attached such as General Electric Stock No. RS-366. This should be mounted in close proximity to the rear chassis terminal board. It is important that the pick-up leads be shielded with copper braid to prevent hum interference. Connect the shield braid to the chassis ground.

When making the connections in Fig. 1, remove the jumper between terminals 1 and 2.

A television sound channel or FM converter may be connected in place of the pick-up.

When the connections are made as shown the regular radio volume and tone controls control the external unit the same as when operating the radio.

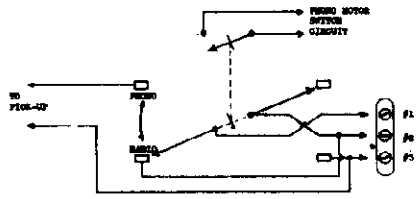


Fig. 1. Pick-up Connections

SPECIAL SERVICE INFORMATION

The following information will be very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

(1) Stage gains.
- (a) Antenna Post to Converter Grid at
  - 1000 KC 4.0
  - 4000 KC 3.2
  - 18,000 KC 2.4
- (b) R.F. on Converter Grid to I.F. on 6SK7 Grid at
  - 1000 KC 36
  - 4000 KC 30
  - 18,000 KC 28
- (c) I.F. on Converter Grid to I.F. on 6SK7 Grid at 455 KC 55

(2) Voltage across the diode load to give ½-watt speaker output at 400 cycles ..... .07 volts.

(3) DC voltage developed across oscillator grid resistor (R4) at
- 1000 KC 8.6
- 4000 KC 9.7
- 18,000 KC 7.7

Variations of +10, −20% are permissible.

ALIGNMENT PROCEDURE

The alignment procedure, shown in table form, is made with the chassis removed from the cabinet.

Since the dial scale and pointer are not a part of the main chassis, it is necessary to use the special alignment scale glued to the back side of the pulley frame adjacent to the pointer cord and make a temporary pointer. To make the pointer, close the gang condenser plates, then with paper clip or drop of paint mark point on cord which is in line with last thin line on right side of scale (viewed from rear of chassis). The selected edge of the paper clip or the drop of paint then will serve as a pointer for performing the R.F. alignment.

Output meter alignment is preferable and the meter may be connected across the voice coil leads, then turn volume control partially up. Keep the signal input as low as possible to avoid AVC action.

I.F. transformers are double, permeability-tuned with adjusting shafts at top and bottom of shield cans.

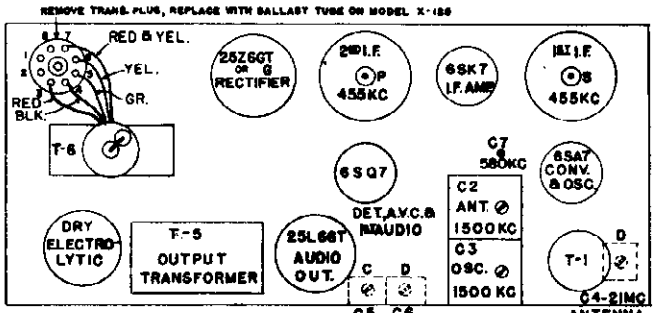


Fig. 2. Trimmer Location

ALIGNMENT CHART

Step	Test-Osc. Connect to	Test-Osc. Setting	Pointer Setting	Tune Trimmer for Max. Output
1	6SK7 IF grid in series with .05 mfd.	455 KC	"BC" Band 550 KC	2nd IF trans. inductors
2	6SA7 Conv. grid in series with .05 mfd.	455 KC	"BC" Band 550 KC	1st IF trans. inductors
3	Ant. post in series with 200 mmf and 400 ohms	580 KC	"BC" Band 580 KC	C7**
4	Ant. post in series with 200 mmf and 400 ohms	1500 KC	"BC" Band 1500 KC	(C3) osc. (C2) ant.
5	REPEAT STEP NO. 3			
6	Ant. post in series with 200 mmf and 400 ohms	6.0 MC	"SW1" Band 6.0 MC	(C5) osc.**
7	Ant. post in series with 200 mmf and 400 ohms	21.0 MC	"SW2" Band 21 MC	(C6) osc.* (C4) ant.**

* Use minimum capacity peak.
** Rock gang condenser for optimum peak.

PHONO MOTOR FREQUENCY CONVERSION (MODEL X-145)

The Model X-145 can be operated from either a 50- or 60-cycle source of power by a slight alteration in the phono motor.

The phono motor leaves the factory for operation on 50 cycles. To convert to 60-cycle operation, it is merely necessary to remove the conversion spring from the rotor drive pulley, shown in Fig. 3. This can be easily accomplished by grasping the end of the spring with a pair of pointed pliers and pulling, using an unwinding motion to aid in loosening.

If at any time the motor is desired to be reconverted for 50-cycle operation, a new conversion spring, Stock No. RS-4037, may be put on the motor drive pulley by hand in the following manner. Hold the conversion spring in the right hand with the extension on the top side, then hook spring over the edge of drive pulley pressing down over same with a twisting effort in the direction to unwind or enlarge the inside diameter of the spring. The rotor should be held stationary during this procedure with fingers of left hand. After completely seating the spring over the pulley, the extension which is provided to facilitate assembly should be sprung out away from pulley sufficiently so that it may be clipped off, allowing no protrusion to remain.

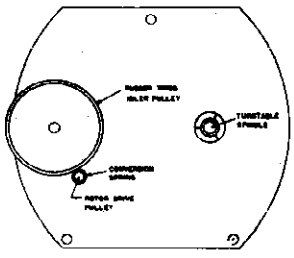


Fig. 3

GENERAL ELECTRIC CO.

MODELS X-115, X-12
X-145
MODEL X-127

MODEL X-127
BAND SWITCH CONNECTIONS

Band in Use	Section "A" Front Side	Section "A1" Back Side	Section "B" Front Side	Section "B1" Back Side
BC	4-8-9	5-9-10	5-9-10	1-10 6-8
SW1	4-8-10	5-9-11	5-9-11	1-2-10 7-8
SW2	4-8-11	5-9-12	5-9-12	1-2-3 8-10
31 METER	8-11	9-12-1	9-12-1	1-2-3-4 8-10
25 METER	8-11	9-12-2	9-12-2	1-2-3-4-5 8-10
19 METER	8-11	9-12-3	9-12-3	2-3-4-5-6 8-10
16 and 13 METER	8-11	9-12	9-12	3-4-5-6-7 8-10

MODEL X-127
TONE CONTROL SWITCH CONNECTIONS

Position in Use	Section "C1" Back Side	Section "C" Front Side
Radio-Brilliant	Open	3-7
Radio-Bass	1-12	3-7
Radio-Treble	4-6	3-7
Radio-Mellow	1-12 4-6	3-7
Phono-Brilliant	Open	7-11 2-3
Phono-Bass	1-12	7-11 2-3
Phono-Treble	4-6	7-11 2-3
Phono-Mellow	1-12 4-6	7-11 3-4

CONVERSION FOR SPECIAL LINE VOLTAGES MODELS X-115, X-125 X-145

The Models X-115 and X-125 can be converted for operation on the following line voltages. In all cases where the power transformer is replaced with a ballast resistor, the power transformer must be removed from the chassis as the radiant heat from the ballast resistor is likely to injure the transformer insulation. When operated with these special resistors and lower power supplies than 220 volts the audio power output and socket voltages will be reduced.

220 Volts AC/DC—(Range 200-240 volts)

Remove transformer from chassis of X-115 and substitute ballast resistor RR-783 in socket previously occupied by transformer plug. Change label so that it reads Model X-125.

115 Volts DC—(range 105-129 volts)

Remove transformer from chassis of X-115 or ballast RR-783 from X-125; insert the ballast tube resistor RR-785 and change label so that it reads Model X-125Z.

180 Volts DC (range 145-215 volts)

Remove transformer from chassis of X-115 or ballast RR-783 from X-125; insert the ballast tube resistor RR-784 and change the label on the receiver so that it reads Model X-125Y.

Loud-speaker

The voice coil is accurately and permanently centered at the factory and should seldom give trouble. In case a voice coil needs recentering, it will be necessary to replace the entire cone and voice coil assembly. Assembly instructions accompany each replacement cone.

NOTE: In no case should the magnet be removed from the assembly position as it will lose magnetism.

Electrical Rating

Model	Rating	Power Supply: Voltage Tap	Power Supply: Voltage Range	Frequency Cycles AC	Power Consumption (Watts)
X-115	V	110 125	103-117 118-133	50-60	65
X-145	V	145 200 225 250	134-156 188-212 213-237 238-262	50-60	80
X-125			200-240 AC or DC	25-100	100

MODELS X-115, X-125, X-145

Tuning Frequency Range

Band "BC" ..... 540-1600 KC
Band "SW1" ..... 2200-7000 KC
Band "SW2" ..... 7000-22000 KC

Electrical Power Output

Undistorted ..... 2.7 watts
Maximum ..... 5.0 watts

Loud-speaker—PM Dynamic

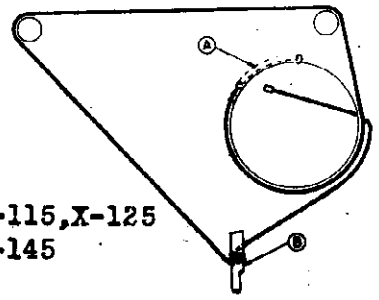
Cone Diameter ..... 6½ inches
Voice Coil Impedance (400 cycles) ..... 3.5 ohms

Phonograph Mechanism

Type Mechanism ..... Manual
Type Pick-up ..... Magnetic
Turntable Speed ..... 78 RPM

Tubes

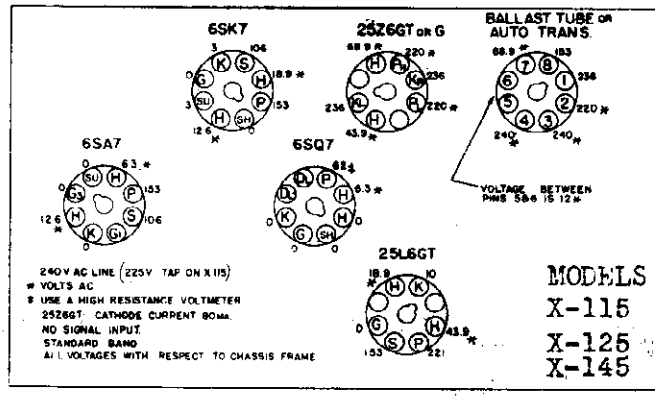
Converter-Oscillator GE-6SA7
IF Amplifier GE-6SK7
Detector, Audio, AVC GE-6SQ7
Power Output GE-25L6GT
Rectifier ..... GE-25Z6G or GT
Dial Lamp ..... (2) MAZDA No. 4



MODELS X-115, X-125
X-145

Fig. 7. Drive Arrangement

REAR OF CHASSIS



MODELS
X-115
X-125
X-145

BOTTOM VIEW OF CHASSIS

MODEL X-127

GENERAL ELECTRIC CO.

REPLACEMENT PARTS LIST

Our Cat. No.	Symbol	Description	List Price
*RC-039	C-1	CAPACITOR—.01 mfd., 600-V paper	$0.25
*RC-009	C-2	CAPACITOR—.001 mfd. 600-V paper	.30
*RC-6554	C-3, 4	CAPACITOR—"B" and "C antenna trimmer	.35
*RC-092	C-5	CAPACITOR—.05 mfd. 600-V	.30
*RT-883	C-6, 7, 8, 9	TRIMMER—Antenna trimmer strip	.70
*RT-884	C-10, 11, 12, 14, 15, 16, 17	TRIMMER STRIP—Oscillator trimmer strip	1.25
*RC-396	C-18	CAPACITOR—5600 mmf., mica	.45
*RC-347	C-19	CAPACITOR—1800 mmf., mica	.35
*RC-325	C-20, 21	CAPACITOR—45 mmf., compensating cap.	.40
*RC-7062	C-22a, 22b	CONDENSER—2 gang tuning condenser	1.10
*RC-326	C-23	CAPACITOR—40 mmf., compensating cap.	.25
*RC-252	C-28	CAPACITOR—200 mmf., mica	.30
*RC-072	C-29	CAPACITOR—.05 mfd., 200-V paper	.25
*RC-5132	C-30a	CAPACITOR—40 mfd., 300-V dry, electrolytic	2.10
	C-30b	CAPACITOR—50 mfd., 250-V dry electrolytic	
	C-30c	CAPACITOR—20 mfd., 250-V dry electrolytic	
	C-30d	CAPACITOR—20 mfd., 25-V dry electrolytic	
*RC-039	C-32	CAPACITOR—.01 mfd., 600-V paper	.25
*RC-048	C-33	CAPACITOR—.02 mfd., 600 V paper	.30
*RC-092	C-34	CAPACITOR—.05 mfd., 600 V paper	.30
*RC-249	C-35	CAPACITOR—220 mmf., mica	.25
*RC-049	C-36	CAPACITOR—.004 mfd., 600-V paper	.35
*RC-023	C-37	CAPACITOR—.005 mfd., 600-V paper	.25
*RC-060	C-38	CAPACITOR—.03 mfd., 600-V paper	.25
*RC-092	C-39	CAPACITOR—.05 mfd., 600-V paper	.30
*RC-072	C-40	CAPACITOR—.05 mfd., 200-V paper	.25
*RC-060	C-41	CAPACITOR—.03 mfd., 600-V paper	.25
*RC-055	C-42	CAPACITOR—.003 mfd. 600-V paper	.25
*RC-104	C-43	CAPACITOR—.1 mfd. 600-V paper	.30
*RC-092	C-44	CAPACITOR—.05 mfd. 600-V paper	.30
*RC-263	C-45	CAPACITOR—270 mmf. mica	.25
RC-124	C-46	CAPACITOR—.0055 mfd. 1500 V paper	.25
*RC-156A	C-47, 48	CAPACITOR—0.5 mfd. 120 V paper	.45
*RC-095	C-49	CAPACITOR—.05 mfd. 200 V paper	.20
*RC-293	C-50	CAPACITOR—470 mmf., mica	.30

Our Cat. No.	Symbol	Description	List Price
*RQ-1295	R-1	RESISTOR—33,000 ohm ½ watt carbon	$0.70–5
*RQ-1235	R-2	RESISTOR—100 ohm ½ watt carbon	.70–5
*RQ-1321	R-3	RESISTOR—390,000 ohm ½ watt carbon	.70–5
*RQ-1219	R-4	RESISTOR—22 ohm ½ watt carbon	.70–5
*RQ-1339	R-5	RESISTOR—2.2 megohm ½ watt carbon	.70–5
*RQ-1323	R-6	RESISTOR—470,000 ohm ½ watt carbon	.70–5
*RQ-1299	R-7	RESISTOR—47,000 ohm ½ watt carbon	.70–5
*RQ-1305	R-8	RESISTOR—82,000 ohm ½ watt carbon	.70–5
*RQ-1355	R-9	RESISTOR—10 megohm ½ watt carbon	.70–5
*RQ-1323	R-10	RESISTOR—470,000 ohm ½ watt carbon	.70–5
*RQ-1275	R-11	RESISTOR—4,700 ohm ½ watt carbon	.70–5
*RV-136	R-12	VOLUME CONTROL—2 meg. volume control	.95
*RQ-1331	R-13	RESISTOR—1 megohm ½ watt carbon	.70–5
*RQ-1347	R-14	RESISTOR—4.7 meg. ½ watt carbon	.70–5
*RQ-1257	R-15	RESISTOR—820 ohm ½ watt carbon	.70–5
*RQ-1323	R-16	RESISTOR—470,000 ohm ½ watt carbon	.70–5
*RQ-1483	R-17	RESISTOR—10,000 ohm, 1 watt carbon	.20
*RQ-1235	R-18	RESISTOR—100 ohm ½ watt carbon	.70–5
*RQ-1259	R-19	RESISTOR—1000 ohm ½ watt carbon	.70–5
*RQ-1317	R-20	RESISTOR—270,000 ohm ½ watt carbon	.70–5
*RQ-1293	R-21	RESISTOR—27,000 ohm ½ watt carbon	.70–5
*RQ-1323	R-22	RESISTOR—470,000 ohm ½ watt carbon	.70–5
*RQ-1259	R-23	RESISTOR—1000 ohm ½ watt carbon	.70–5
*RQ-1251	R-24	RESISTOR—470 ohm ½ watt carbon	.70–5
*RQ-1347	R-26	RESISTOR—4.7 meg. ½ watt carbon	.70–5
*RQ-1325	R-27	RESISTOR—560,000 ohm ½ watt carbon	.70–5
*RQ-1261	R-28	RESISTOR—1,200 ohm ½ watt carbon	.70–5
*RQ-1295	R-29	RESISTOR—33,000 ohm ½ watt carbon	.70–5
*RQ-1211	R-30	RESISTOR—10 ohm ½ watt carbon	.70–5
*RL-1016	L-1	ANTENNA COIL—Antenna coil	1.10
*RL-2064	L-2	COIL—Oscillator coil	1.10
*RL-371	L-3	COIL—I.F. Neutralizing coil	.25
RL-376	L-4	CHOKE—RF Choke	.50
RL-377	L-5	CHOKE—B + and RF Choke	.25
*RS-3127	S-1	SWITCH—Band change switch	1.25
*RS-3128	S-2a, 2b	SWITCH—Tone control and power switch	1.45
RS-3145	S-3	SWITCH—Current saver switch	.45
RS-1082	SPKR	SPEAKER—9" oval speaker	4.20
*RT-3007	T-1	TRANSFORMER—First IF transformer	1.15
*RT-3008	T-2	TRANSFORMER—Second IF transformer	1.15
RT-4021	T-3	TRANSFORMER—Output transformer	1.55
RT-0822	T-4	TRANSFORMER—Power transformer	3.45
RV-205	V	VIBRATOR—6-volt vibrator, power supply	3.80

* Used on previous receivers.

Prices subject to change without notice

ALIGNMENT PROCEDURE

There are two 17.8 reference points on the paper scale on the rear of the dial reflector plate. The one towards the lower frequency end of the dial is the proper one to use for the 16-meter spread-band alignment; while the other is used for a reference point on the SW2 band.

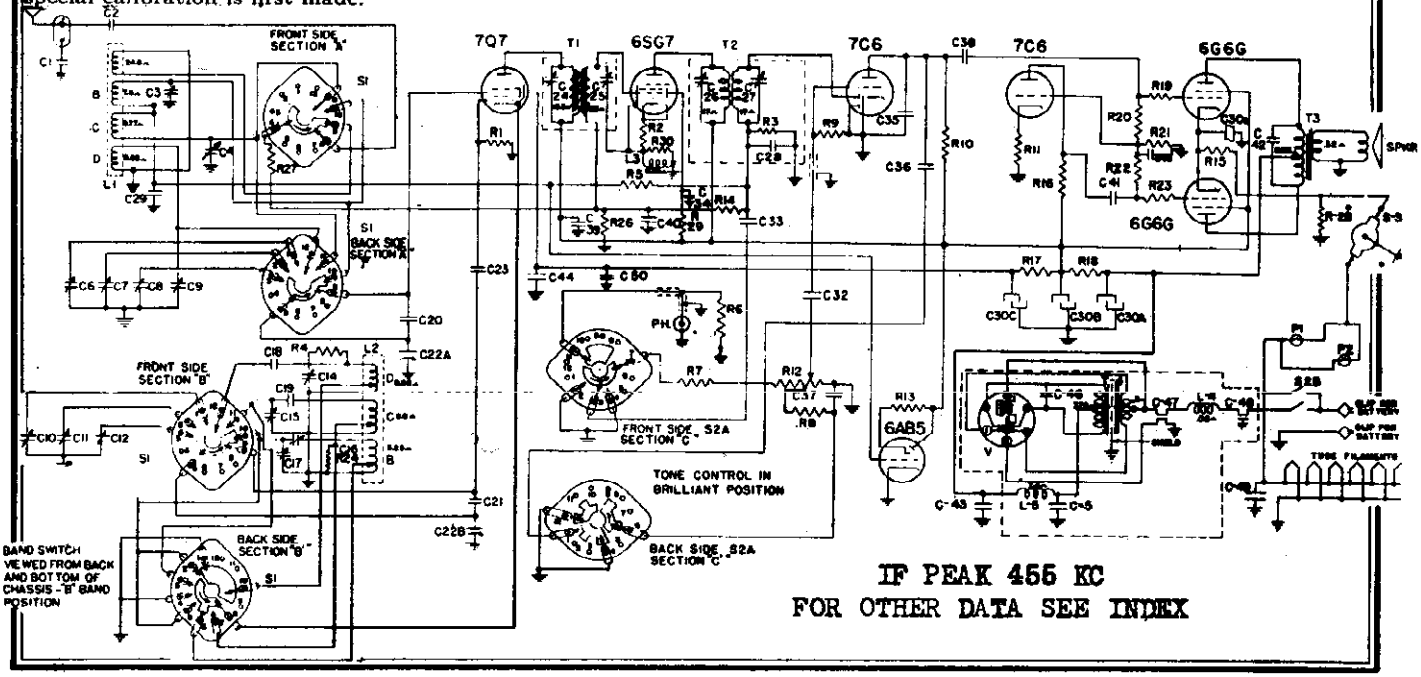
The SW2 band does not require alignment. This band is taken care of when the 16-meter spread band is aligned.

Spread-band Alignment

Since accuracy in frequency calibration is very essential for proper alignment of the spread bands, it is impractical to use the standard test oscillator for this purpose unless a special calibration is first made.

The actual reception of short-wave stations of known frequency in the band to be checked is probably the most satisfactory method for determining the proper setting of the oscillator trimmers in these bands. The oscillator trimmer should be adjusted so that the station appears at the correct position on the dial. RF alignment can be made with the test oscillator.

The calibration of the test oscillator may be checked by zero beating the test oscillator with a short-wave station of known frequency. By taking several of these calibration points, it will afford a calibration of a high degree of accuracy in case you wish to use the test oscillator for alignment in these bands.



IF PEAK 455 KC

FOR OTHER DATA SEE INDEX

GENERAL ELECTRIC CO.

SPECIAL SERVICE INFORMATION

The following information will be very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

NOTE—Connection to converter grid must be made directly to tube grid and not to gang condenser on spread bands.

(1) Stage gains

(a) Antenna Post to Converter Grid, through 400 ohms and 200 mmfd. in series, at

Stand.	1000 KC...5.4	31 M.....9.6 MC....1.8
SW-1	4000 KC...3.7	25 M....11.8 MC....1.6
SW-2	18000 KC...1.1	19 M....15.22 MC...1.4
		16–13 M....17.8 MC....1.0

(b) RF on Converter Grid to IF on 6SG7 grid at

Stand.	1000 KC...61	31 M.....9.6 MC....65
SW-1	4000 KC...63	25 M....11.8 MC....68
SW-2	18000 KC...71	19 M....15.22 MC....71
		16–13 M....17.8 MC....71

(c) IF on Converter Grid to IF on 6SG7 grid at 455 KC—85

(d) IF Grid to diode plate at 455 KC—160

(2) Voltage across the diode load to give ½-watt speaker output at 400 cycles—.08 V.

(3) DC voltage developed across oscillator grid resistor (R1) at

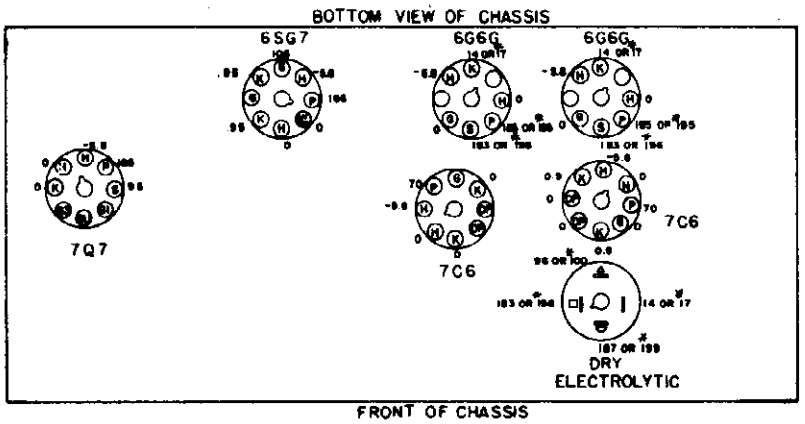
Stand.	1000 KC.8.3 V.	31 M.....4.4 V.
SW1	4000 KC.7.7 V.	25 M.....4.8 V.
SW2	18000 KC.5.0 V.	19 M.....4.4 V.
		16–13 M.....3.7 V.

Variations of ±20% permissible. All measurements taken with R-26 shorted across.

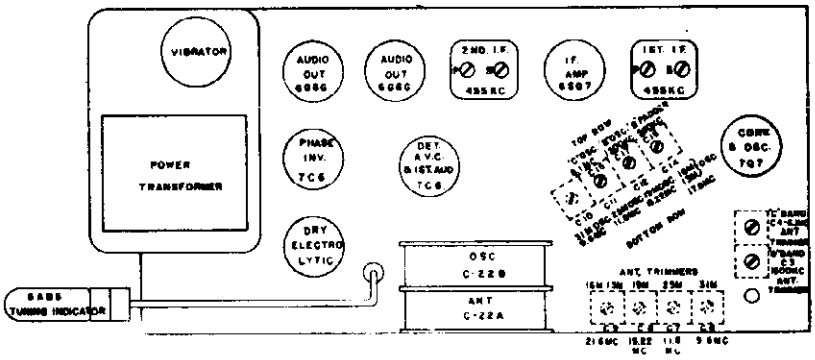
ALIGNMENT CHART

Step	Test Osc. Connected to	Test-osc. Setting	Band and Pointer Setting	Tune Trimm for Max. Output
1	6SG7 I.F. grid in series with .05 mfd. cap.	455 KC	"BC" BAND 550 KC	C26 and C2
2	7Q7 CONV. grid in series with .05 mfd. cap.	455 KC	"BC" BAND 550 KC	C24 and C2
3	ANT. POST in series with 200 mmf. and 400 ohms	580 KC	"BC" BAND 580 KC	C16**
4	ANT. POST in series with 200 mmf. and 400 ohms	1500 KC	"BC" BAND 1500 KC	C17 (osc.) C3 (ant.)
5	REPEAT STEP 3			
6	ANT. POST in series with 200 mmf. and 400 ohms	6.1 MC	"SW-1"BAND 6.1 MC	C15 (osc.) C4 (ant.)
7	ANT. POST in series with 200 mmf. and 400 ohms	17.8 MC	16 METER 17.8 MC	C14* (osc.)
8	ANT. POST in series with 200 mmf. and 400 ohms	21.6 MC	16 METER 21.6 MC	C9*** (ant.)
9	ANT. POST in series with 200 mmf. and 400 ohms	15.22 MC	19 METER 15.22 MC	C10* (osc.) C6*** (ant.)
10	ANT. POST in series with 200 mmf. and 400 ohms	11.8 MC	25 METER 11.8 MC	C11* (osc.) C7*** (ant.)
11	ANT. POST in series with 200 mmf. and 400 ohms	9.6 MC	31 METER 9.6 MC	C12* (osc.) C8*** (ant.)

*Use minimum capacity peak if two are obtainable.
**Rock gang condenser for optimum peak.
***Use maximum capacity peak if two are obtainable.



VOLTAGES READ WITH 1000 OHMS VOLT VOLTMETER ON 250VOLT SCALE
BATTERY SAVER SWITCH IN NORMAL POSITION
6.0 VOLTS AT BATTERY



MODELS X-156, X-166

GENERAL ELECTRIC CO.

SPECIAL SERVICE INFORMATION

The following information will be very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

NOTE—Connection to converter grid must be made directly to tube grid and not to gang condenser on spread bands.

(1) Stage gains

(a) Antenna Post to Converter Grid, through 400 ohms and 200 mmfd. in series, at

Stand.	1000 KC	5.4	31 M	9.6 MC	1.8
SW1	4000 KC	3.7	25 M	11.8 MC	1.6
SW2	18000 KC	1.1	19 M	15.22 MC	1.4
			16–13 M	17.8 MC	1.0

(b) RF on Converter Grid to IF on 6SG7 grid at

Stand.	1000 KC	61	31 M	9.6 MC	65
SW1	4000 KC	63	25 M	11.8 MC	68
SW2	18000 KC	71	19 M	15.22 MC	71
			16–13 M	17.8 MC	71

(c) IF on Converter Grid to IF on 6SG7 grid at 455 KC—85

(d) IF Grid to diode plate at 455 KC—160

(2) Voltage across the diode load to give ½-watt speaker output at 400 cycles—.046 V.

(3) DC voltage developed across oscillator grid resistor (R1) at

Stand.	1000 KC	8.3 V.	31 M	4.4 V.
SW1	4000 KC	7.7 V.	25 M	4.8 V.
SW2	18000 KC	5.0 V.	19 M	4.4 V.
			16–13 M	3.7 V.

Variations of ±20% permissible. All measurements taken with R-26 shorted across.

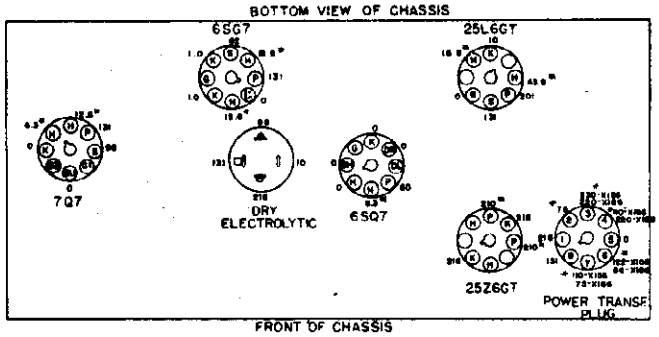


Fig. 3 Socket Voltages

Electrical Rating

Model	Rating	Power Supply: Tap	Power Supply: Voltage Range	Frequency Cycles AC	Power Consumption (Watts)
	C	110 125	103–117 117–133	25–60	60
X-156	V	110 125 200 230	103–117 117–133 185–215 215–250	50–60	60
X-166			200–240 V AC or DC	25–100	100

Tuning Frequency Range

"BC" Band.....540–1700 KC
"SW1" Band.....2.2–6.8 MC
"SW2" Band.....6.8–21.0 MC
31 Meter Band.....9.36–9.8 MC
25 Meter Band.....11.6–12.5 MC
19 Meter Band.....14.9–17.3 MC
16 and 13 Meter Band.....17.7–22.2 MC

Electrical Power Output

Undistorted with proper voltage at tap on power transformer—3 watts.
Maximum with proper voltage at tap on power transformer - 5 watts.

Loud-speaker—DM Dynamic

Cone Diameter.....6½ inches
Voice Coil Impedance (400 cycles).....3.5 ohms

Tubes

Converter-Oscillator.....GE-7Q7
IF Amplifier.....GE-6SG7
Detector, AVC, 1st Audio.....GE-6SQ7
Power Output.....GE-25L6GT
Rectifier.....GE-25Z6GT
Tuning Indicator.....GE-6U5
Pilot Lamps.....(2) MAZDA No. 44

Power Supply

The Model X-156 is equipped with a plug-in type power supply which permits practically instantaneous conversion to DC operation. Simply remove the power transformer and replace with a plug-in type ballast resistor. Refer to the data given under "Conversion for Special Line Voltages."

The power transformer in the Model X-156 is provided with four voltage taps. Instant tap switching is made by a simple pin plug and jack device. For correct operation, measure the power supply voltage. Note which voltage range covers this voltage (see Electrical Specifications) and using the corresponding tap, insert the plug in the jack.

CONVERSION FOR SPECIAL LINE VOLTAGES

The Models X-156 and X-166 can be converted for operation on the following line voltages. In all cases where the power transformer is replaced with a ballast resistor, the power transformer must be removed from the chassis as the radiant heat from the ballast resistor is likely to injure the transformer insulation. When operated with these special resistors and lower power supplies than 220 volts, the audio power output and socket voltages will be reduced.

220 Volts AC/DC—(Range 200-240 Volts)

Remove transformer from chassis of X-156, insert ballast tube resistor RR-7007, and change label to read X-166.

180 Volts DC—(Range 160-200 Volts)

Remove transformer from chassis of X-156 or ballast RR-7007 from X-166; insert the ballast tube resistor RR-7008 and change the label on the receiver so that it reads Model X-166Y.

Miscellaneous

The transformer T5 can be substituted in the Model X-156 receiver for operation on 25-cycle circuits. Remark the label so that it reads Model X-156C.

The cold resistance of all ballast tubes is shown directly on the schematic diagram, Fig. 2.

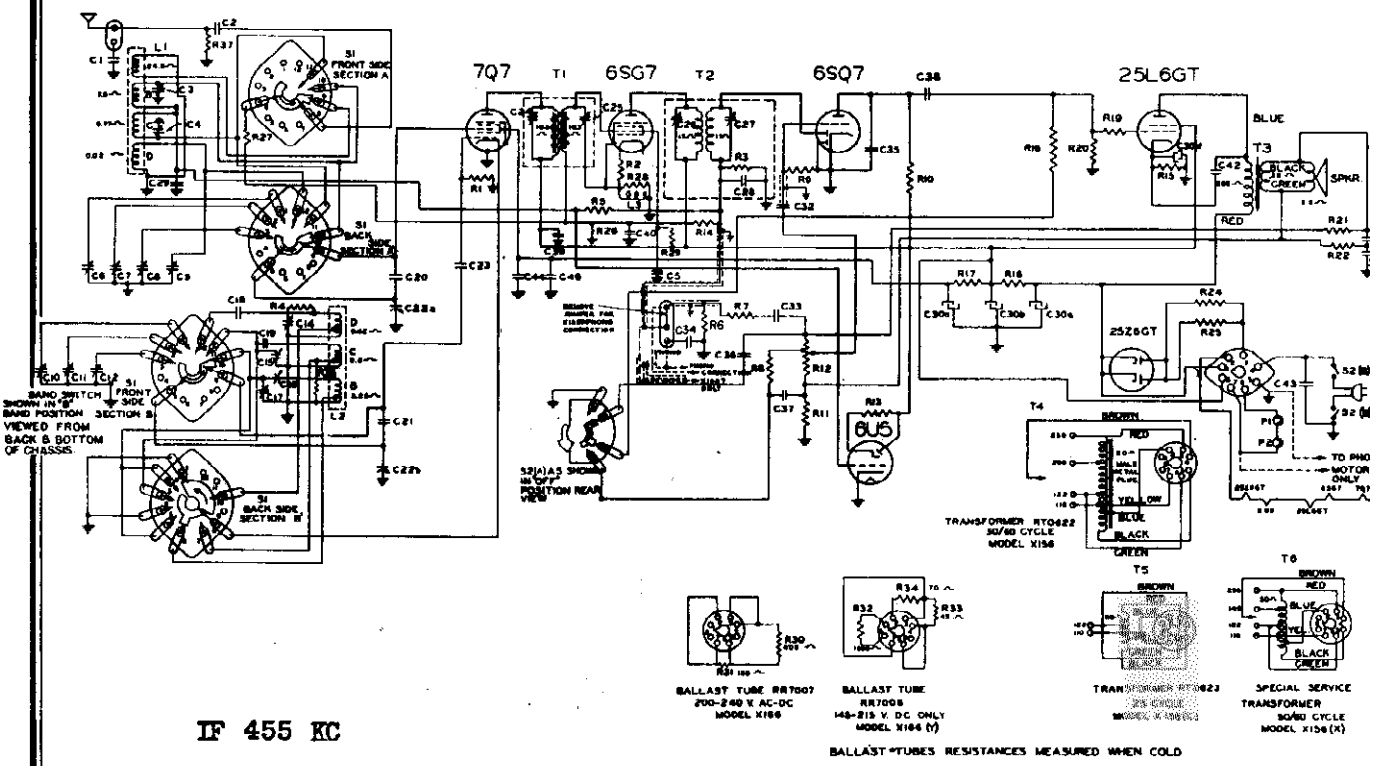


Fig. 2 Schematic Diagram

RADIO REPLACEMENT PARTS LIST

MODELS X-156 AND X-166

Stock No.	Symbol	Description	List Price
*RC-039	C-1	CAPACITOR—.01 mfd., 600-V paper	$0.25
*RC-009	C-2	CAPACITOR—.001 mfd., 600-V paper	.30
*RC-6554	C-3, 4	CAPACITOR—"B" and "C" antenna trimmer	.35
*RC-092	C-5	CAPACITOR—.05 mfd. 600-V	.30
*RT-883	C-6, 7, 8 & 9	TRIMMER—Antenna trimmer strip	.70
*RT-884	C-10, 11, 12, 14, 15, 16, 17	TRIMMER STRIP—Oscillator trimmer strip	1.25
*RC-396	C-18	CAPACITOR—5600 mmf., mica	.45
*RC-347	C-19	CAPACITOR—1800 mmf., mica	.35
*RC-325	C-20, 21	CAPACITOR—45 mmf., compensating capacitor	.40
*RC-7062	C-22a, 22b	CONDENSER—2-gang tuning condenser	1.10
*RC-326	C-23	CAPACITOR—40 mmf., compensating capacitor	.25
*RC-072	C-29	CAPACITOR—.05 mfd., 200-V paper	.25
*RC-5132	C-30a	CAPACITOR—40 mfd., 300-V dry electrolytic	2.10
	C-30b	CAPACITOR—50 mfd., 250-V dry electrolytic	
	C-30c	CAPACITOR—20 mfd., 250-V dry electrolytic	
	C-30d	CAPACITOR—20 mfd., 25-V dry electrolytic	
*RC-039	C-32	CAPACITOR—.01 mfd., 600-V paper	.25
*RC-023	C-33	CAPACITOR—.005 mfd., 600-V paper	.25
*RC-130	C-34	CAPACITOR—.2 mfd., 400-V paper	.30
*RC-249	C-35	CAPACITOR—220 mmf., mica	.25
*RC-006	C-36	CAPACITOR—.0015 mfd., 600-V paper	.25
*RC-016	C-37	CAPACITOR—.002 mfd. 600 V paper	.25
*RC-092	C-38, 39	CAPACITOR—.05 mfd 600-V paper	.30
*RC-072	C-40	CAPACITOR—.05 mfd. 200-V paper	.25
*RC-096	C-41	CAPACITOR—.1 mfd. 200 V paper	.30
*RC-031	C-42	CAPACITOR—.008 mfd. 1600-V paper	.25
*RC-117	C-43	CAPACITOR—.02 mfd. 600 V.—AC	.30
*RC-092	C-44	CAPACITOR—.05 mfd., 600-V paper	.30
*RC-095	C-45	CAPACITOR—.05 mfd. 200-V paper	.20
*RC-293	C-46	CAPACITOR—470 mmf., mica	.30
*RQ-1295	R-1	RESISTOR—33,000 ohm, ½-W carbon	.70-5
*RQ-1235	R-2	RESISTOR—100 ohm, ½-W carbon	.70-5
*RQ-1321	R-3	RESISTOR—390,000 ohm, ½-W carbon	.70-5
*RQ-1219	R-4	RESISTOR—22 ohm, ½-W carbon	.70-5
*RQ-1339	R-5	RESISTOR—2.2 megohm, ½-W carbon	.70-5
*RQ-1323	R-6	RESISTOR—470,000 ohm, ½-W carbon	.70-5
*RQ-1299	R-7	RESISTOR—47,000 ohm, ½ W carbon	$0.70-
*RQ-1313	R-8	RESISTOR—180,000 ohm, ½ W carbon	.70-
*RQ-1355	R-9	RESISTOR—10 megohm, ½-W carbon	.70-
*RQ-1321	R-10	RESISTOR—330,000 ohm, ½-W carbon	.70-
*RQ-1245	R-11	RESISTOR—270 ohm, ½-W carbon	.70-
RV-140	R-12	VOL. CONTROL—2 meg. volume control	.95
*RQ-1331	R-13	RESISTOR—1 megohm, ½-W carbon	.70-
*RQ-1347	R-14	RESISTOR—4.7 meg., ½-W. carbon	.70-
*RQ-1433	R-15	RESISTOR—180 ohm 1-W carbon	.20
*RQ-1321	R-16	RESISTOR—390,000 ohm, ½-W carbon	.70-
*RQ-1473	R-17	RESISTOR—3,900 ohm, 1-W carbon	.20
*RQ-670	R-18	RESISTOR—3,300 ohm, 2-W carbon	.35
*RQ-1259	R-19	RESISTOR—1,000 ohm, ½-W carbon	.70-
*RQ-1323	R-20	RESISTOR—470,000 ohm, ½-W carbon	.70-
*RQ-1353	R-21	RESISTOR—8.2 megohm, ½-W carbon	.70-
*RQ-1243	R-22	RESISTOR—220 ohm, ½-W carbon	.70-
*RQ-1263	R-23	RESISTOR—1,500 ohm, ½-W carbon	.70-
*RQ-646	R-24	RESISTOR—330 ohm, 2-W carbon	.20
*RQ-643	R-25	RESISTOR—270 ohm, 2-W carbon	.30
*RQ-1345	R-26	RESISTOR—3.9 meg., ½-W carbon	.70-
*RQ-1331	R-27	RESISTOR—1 megohm, ½-W-carbon	.70-
*RQ-1211	R-28	RESISTOR—10 ohm, ½-W carbon	.70-
*RQ-1291	R-29	RESISTOR—22,000 ohm ½-W carbon	.70-
RR-7007	R-30, 31	RESISTOR—200-240 volt ballast	2.0
RR-7008	R-32, 33, 34	RESISTOR—145-215-volt ballast	3.0
*RQ-1307	R-37	RESISTOR—100,000 ohm, ½-W carbon	.70-
*RQ-1251	R-38	RESISTOR—470 ohm, ½-W carbon	.70-
RS-3143	S-1	SWITCH—Band change switch	1.40
RS-3114	S2a, 2b	SWITCH—Tone control and power switch	1.45
*RL-1016	L-1	COIL—Antenna coil (all bands)	1.10
*RL-2064	L-2	COIL—Oscillator coil (all bands)	1.10
*RL-371	L-2	COIL—IF neutralizing coil	.25
RL-380	L-3	COIL—IF neutralizing coil (used with chassis stamped Rev. 1 only)	.25
*RT-3007	T-1	TRANSFORMER—1st I.F. transformer	1.15
*RT-3008	T-2	TRANSFORMER—2nd I.F. transformer	1.15
RT-4020	T-3	TRANSFORMER—Output transformer	1.30
RT-0622	T-4	TRANSFORMER—50/60 cycle power transformer (Model X-156)	4.20
RT-0623	T-5	TRANSFORMER—25-cycle power transformer (Model X-156C)	4.75
*RS-1061		SPEAKER—6½" P.M. speaker	2.70

* Used on previous receivers.

Prices subject to change without notice

MODELS X-156, X-166

GENERAL ELECTRIC CO.

PRODUCTION CHANGE

During the production of these receivers, the Type 6SG7 tube was altered so that its suppressor grid element which formerly was connected directly to the shield, now connects to the cathode element of the tube instead.

Due to circuit usage, this new type will cause oscillation if used in a chassis that was designed for the early style tube, and vice versa, without first changing the neutralizing coil, L-3. The early type 6SG7 tube mut be used with neutralizing coil RL-371; while the late production tube must be used in conjunction with neutralizing coil RL-380.

For identification, the early production 6SG7 has either a X marked on the tube or tube carton while the late production tube is unmarked except for the tube symbol. All chassis with the new neutralizing coils (RL-380) and new production 6SG7 tubes are serial numbered 8750 and over and are stamped as REV. 1.

The schematic diagram, Fig. 2, illustrates the connections to the earlier type 6SG7 tube.

PHONOGRAPH INSTALLATION

This receiver is provided with a phonograph terminal board on the rear of the back cover of the receiver for the connection of a record player. The following connection procedure should be observed.

1. Remove the link from terminals 1 and 2, and replace it between terminals 2 and 3.
2. Connect the record player to terminals 1 and 3. If the record player does not have a high-impedance pick-up a matching transformer may have to be used. It is very important that the high side pick-up lead has a shield to prevent hum interference. This shield should be connected to terminal No. 3 and the high side pick-up lead to terminal No. 1.

If, on operating the record player, external radio signals leak through, turn the tuning control to a position where no radio signals would be received. Complete silencing of the external radio signals can be obtained by grounding the antenna terminal while operating the record player.

If, in operating the record player, there is appreciable hum interference, reverse the record player phono motor power cord plug in the power supply outlet.

Alignment Procedure

The alignment procedure shown in table form is made either with the chassis in or removed from the cabinet.

If the chassis is removed from the cabinet to make the RF alignment, the dial which is fastened to the cabinet cannot be used for calibration reference. Use must be made, therefore, of the paper scale fastened on the rear of the dial reflector plate. With the gang condenser completely closed, one of the edges of the pointer rider should be lined up with the first marking to the right of the scale on the rear of the dial reflector plate. This can be accomplished by sliding the pointer on the cord until it does. The selected edge of the pointer rider may now serve as a pointer for the RF alignment. There are two 17.8 reference points on the paper scale on the rear of the dial reflector plate. The one towards the lower frequency end of the dial is the proper one to use for the 16-meter spread-band alignment; while the other is used for a reference point on the SW2 band.

The SW2 band does not require alignment. This band is taken care of when the 16 meter spread-band is aligned.

Spread-band Alignment

Since accuracy in frequency calibration is very essential for proper alignment of the spread-bands, it is impractical to use the standard test oscillator for this purpose unless a special calibration is first made.

The actual reception of short-wave stations of known frequency in the band to be checked is probably the most satisfactory method of determining the proper setting of the oscillator trimmers in these bands. The oscillator trimmer should be adjusted so that the station appears at the correct position on the dial. R.F. alignment can be made with the test oscillator.

The calibration of the test oscillator may be checked by zero beating the test oscillator with a short-wave station of known frequency. By taking several of these calibration points, it will afford a calibration of a high degree of accuracy in case you wish to use the test oscillator for alignment in these bands.

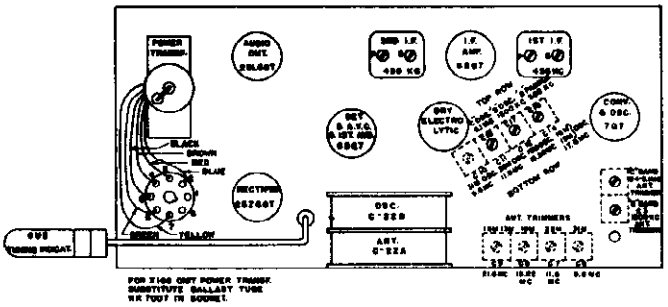


Fig. 1. Trimmer Location

ALIGNMENT CHART

Step	Test Osc. Connected to	Test-osc. Setting	Band and Pointer Setting	Tune Trimmer for Max. Output
1	6SG7 I.F. grid in series with .05 mfd. cap.	455 KC	"BC" BAND 550 KC	C26 and C27
2	7Q7 CONV. grid in series with .05 mfd. cap	455 KC	"BC" BAND 550 KC	C24 and C25
3	ANT. POST in series with 200 mmf. and 400 ohms	580 KC	"BC" BAND 580 KC	C16**
4	ANT. POST in series with 200 mmf and 400 ohms	1500KC	"BC" BAND 1500 KC	C17 (osc.) C3 (ant.)
5	REPEAT STEP 3			
6	ANT. POST in series with 200 mmf. and 400 ohms	6.1 MC	"SW-1" BAND 6.1 MC	C15 (osc.) C4 (ant.)
7	ANT. POST in series with 200 mmf. and 400 ohms	17.8 MC	16 METER 17.8 MC	C14* (osc.)
8	ANT. POST in series with 200 mmf. and 400 ohms	21.6 MC	16 METER 21.6 MC	C9*** (ant.)
9	ANT. POST in series with 200 mmf. and 400 ohms	15.22 MC	19 METER 15.22 MC	C10* (osc.) C6*** (ant.)
10	ANT POST in series with 200 mmf. and 400 ohms	11.8 MC	25 METER 11.8 MC	C11* (osc.) C7*** (ant.)
11	ANT POST in series with 200 mmf. and 400 ohms	9.6 MC	31 METER 9.6 MC	C12* (osc.) C8*** (ant.)

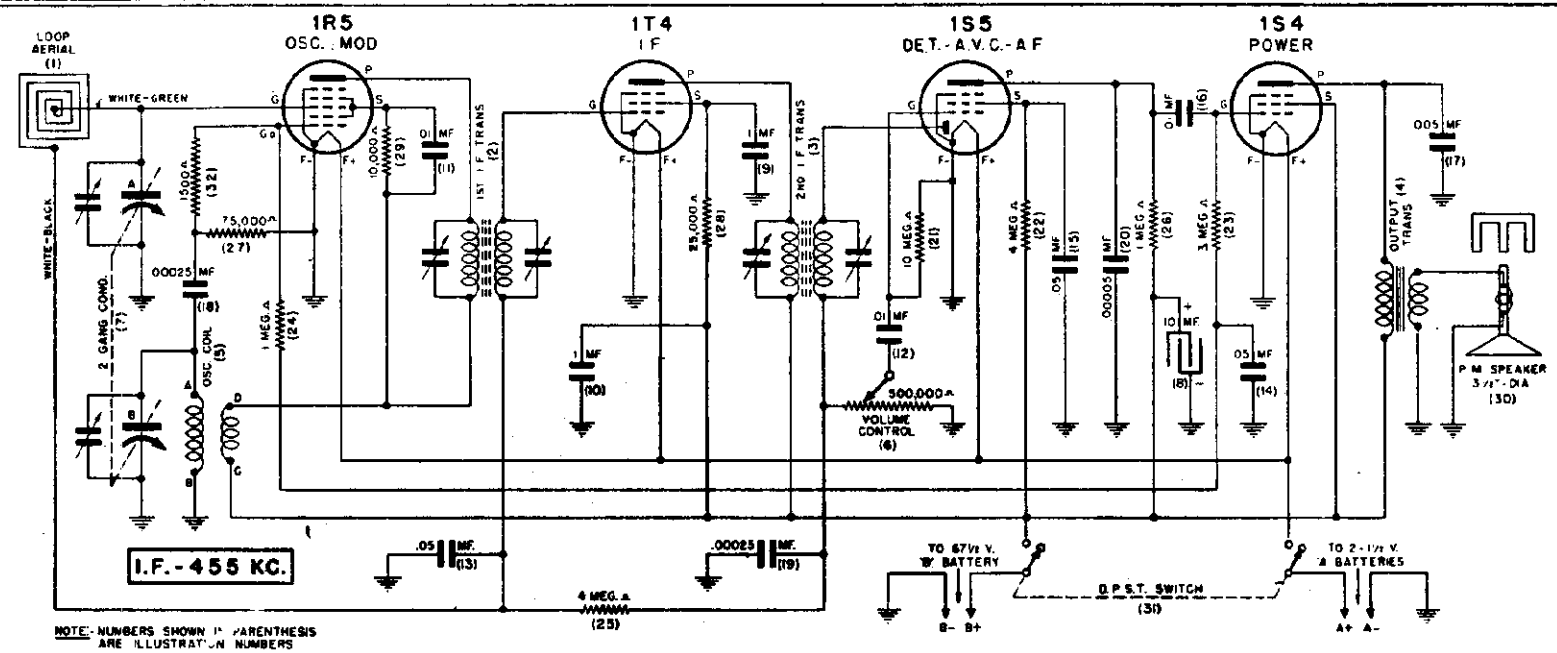
*Use minimum capacity peak if two are obtainable.
**Rock gang condenser for optimum peak.
***Use maximum capacity peak if two are obtainable.

BAND CHANGE SWITCHING

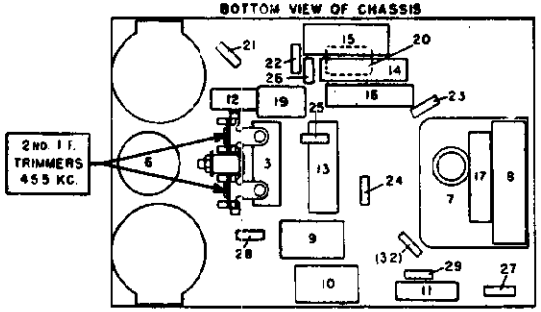
The following charts show the switch points connected for any one position of the wave change switch. The numbers shown in each box indicate the switch points connected together in the section of the switch for each position of the switch. As for example: the numbers 5–9–10 indicate these switch points are all connected together for this particular position of the switch.

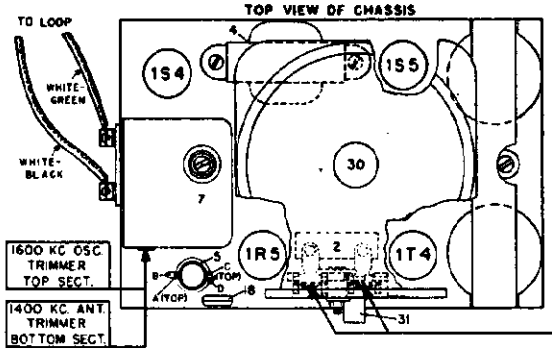
BAND SWITCH CONNECTIONS

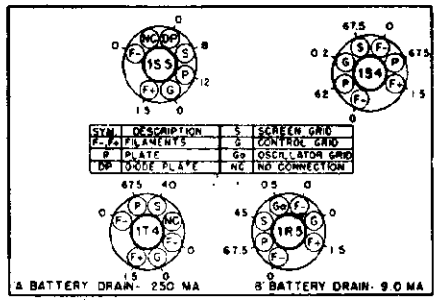
Band in Use	Section "A" Front Side	Section "A" Back Side	Section "B" Front Side	Section "B" Back Side
BC	4–8–9	5–9–10	5–9–10	1–10 6–8
SW1	4–8–10	5–9–11	5–9–11	1–2–10 7–8
SW2	4–8–11	5–9–12	5–9–12	1–2–3 8–10
31 METER	8–11	9–12–1	9–12–1	1–2–3–4 8–10
25 METER	8–11	9–12–2	9–12–2	1–2–3–4–5 8–10
19 METER	8–11	9–12–3	9 12 3	2–3–4–5–6 8–10
16 and 13 METER	8–11	9–12	9–12	3–4–5–6–7 8–10



NOTE-NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS







(BOTTOM VIEW OF CHASSIS)
ABOVE VOLTAGES ARE MEASURED FROM SOCKET TERMINALS TO CHASSIS, DIAL AT 1000 KC. & NO SIGNAL

PART NO.-227

Tuning Control Drive Ratio	6:1
Battery Specification	2-1½ Volt "A" Eveready No. 950 or Equivalent 1-67½ Volt "B" Eveready No. 467 or Equivalent
Intermediate Frequency	455 K.C.
Tuning Frequency Range	540-1600 K.C.
Maximum Power Output	175 Milliwatts
Loud Speaker	Cone Diameter—3 Inches
Voice Coil Impedance	(400 Cycles) 3.5 Ohms

Tubes: Converter-Oscillator 1R5, I.F. 1T4, Detector A.V.C. 1S5, Power Output 1S4.

ALIGNMENT PROCEDURE

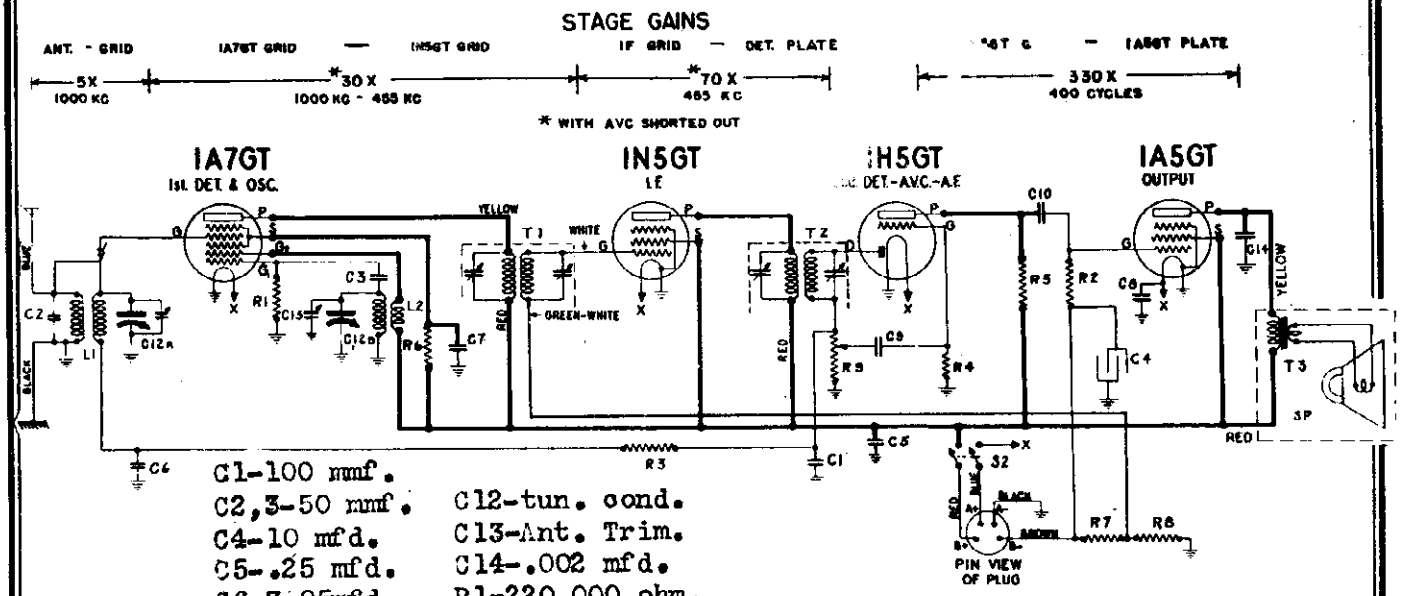
Alignment Frequencies I.F. .....455 K.C.
R.F. .....1600 & 1400 K.C.

I.F. Alignment Connect an output meter across the voice coil. Rotate the volume to maximum. Set test oscillator to 455 K.C. and apply signal to lug on stator of gang condenser to which loop is connected through a .05 Mfd. capacitor. Align the second I.F. transformer trimmers, next adjust the first I.F. transformer trimmers. Keep test oscillator output as low as a readable meter reading will permit.

R.F. Alignment Couple test oscillator output to loop in case cover. Adjust test oscillator and receiver dial to exactly 1600 K.C. Peak 1600 K.C. oscillator trimmer for maximum output. Change test oscillator signal and receiver dial to approximately 1400 K.C. Then while rocking gang condenser trim 1400 K.C. antenna trimmer for

MODEL LB-424

GENERAL ELECTRIC CO.

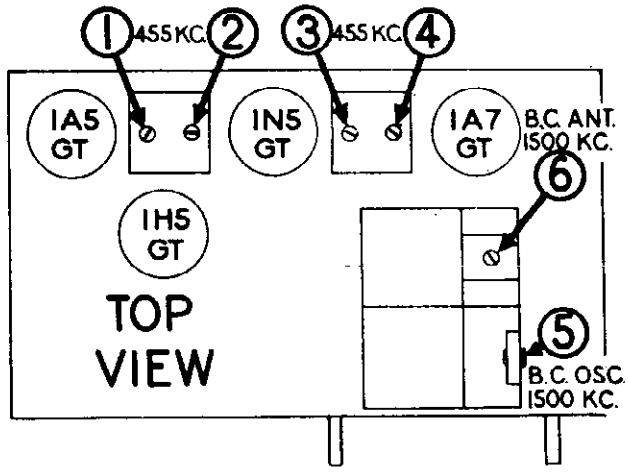


C1-100 mmf.
C2,3-50 mmf.
C4-10 mfd.
C5-.25 mfd.
C6,7-.05mfd.
C8-.25 mfd.
C9-.004 mfd.
C10-.01 mfd.
C12-tun. cond.
C13-Ant. Trim.
C14-.002 mfd.
R1-220,000 ohm.
R2-1 megohm.
R3,4-3.3 megohm.
R5-680,000 ohm.
R6-15,000 ohm.
R7-560 ohm.
R8-47 ohm.
RV143S-Vol. Cont.
L1-Ant. Coil
L2-Osc. Coil
T1-1st IF Trans.
T2-2nd. IF Trans.
T3-Out.Spk. Trans.
SP-6in. PM Spk.

REPLACEMENT PARTS LIST

Stock Number	Description	List Price
	ELECTRICAL PARTS	
*RC-235	CAPACITOR—100 mmf., mica	$0.25
*RC-206	CAPACITOR—50 mmf., mica	.35
*RC-5105	CAPACITOR—10 mfd., 35 V, electrolytic	.60
*RC-148	CAPACITOR—.25 mfd., 600 V, paper	.35
*RC-092	CAPACITOR—.05 mfd., 600 V, paper	.30
*RC-136	CAPACITOR—.25 mfd., 200 V, paper	.30
*RC-025	CAPACITOR—.004 mfd., 600 V, paper	.20
*RC-039	CAPACITOR—.01 mfd., 600 V, paper	.25
RC-7068-S	CONDENSER—Tuning condenser (with drum)	3.30
RC-6561-S	CAPACITOR—Antenna trimmer	.20
*RC-016	CAPACITOR—.002 mfd., 600 V, paper	.25
*RQ-1315	RESISTOR—220,000 ohm, ½-W carbon	.70-5
*RQ-1331	RESISTOR—1 megohm, ½-W carbon	.70-5
*RQ-1343	RESISTOR—3.3 megohm, ½-W carbon	.70-5
*RQ-1327	RESISTOR—680,000 ohm, ½-W carbon	.70-5
*RQ-1287	RESISTOR—15,000 ohm, ½-W carbon	.70-5
*RQ-1253	RESISTOR—560 ohm, ½-W carbon	.70-5
*RQ-1227	RESISTOR—47 ohm, ½-W carbon	.70-5
RV-143-S	VOLUME CONTROL—Volume control and power switch	1.45
RL-169-S	COIL—Antenna coil	$1.20
RL-2079-S	COIL—Oscillator coil	.45
RT-3023-S	TRANSFORMER—1st IF transformer	1.20
RT-3026-S	TRANSFORMER—2nd IF transformer	1.20
RT-4027-S	TRANSFORMER—Output speaker transformer	1.80
RS-1091-S	SPEAKER—6-inch PM speaker	8.75

Prices Subject to Change without Notice.



Electrical Specifications

1. Battery Power Supply
   1.5 Volt "A" supply, 90 volts "B" supply. Eveready No. 748, Burgess No. 17G-D60 or equivalent.
2. Battery drain
   "A" Supply—approximately .2 amp.
   "B" supply—approximately 7.8 ma.

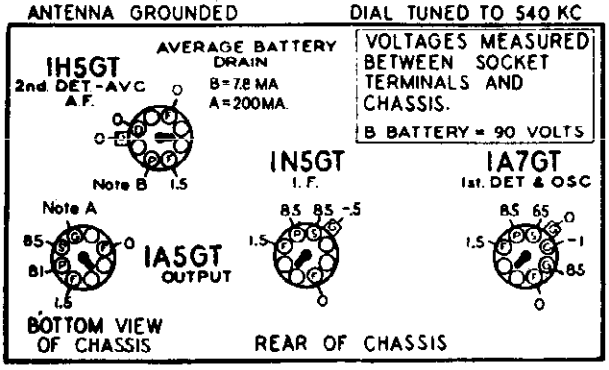
Alignment Frequencies

IF . . . . . 455 KC
RF . . . . . 1500 KC
The location of all trimmers is shown in Fig. 2.

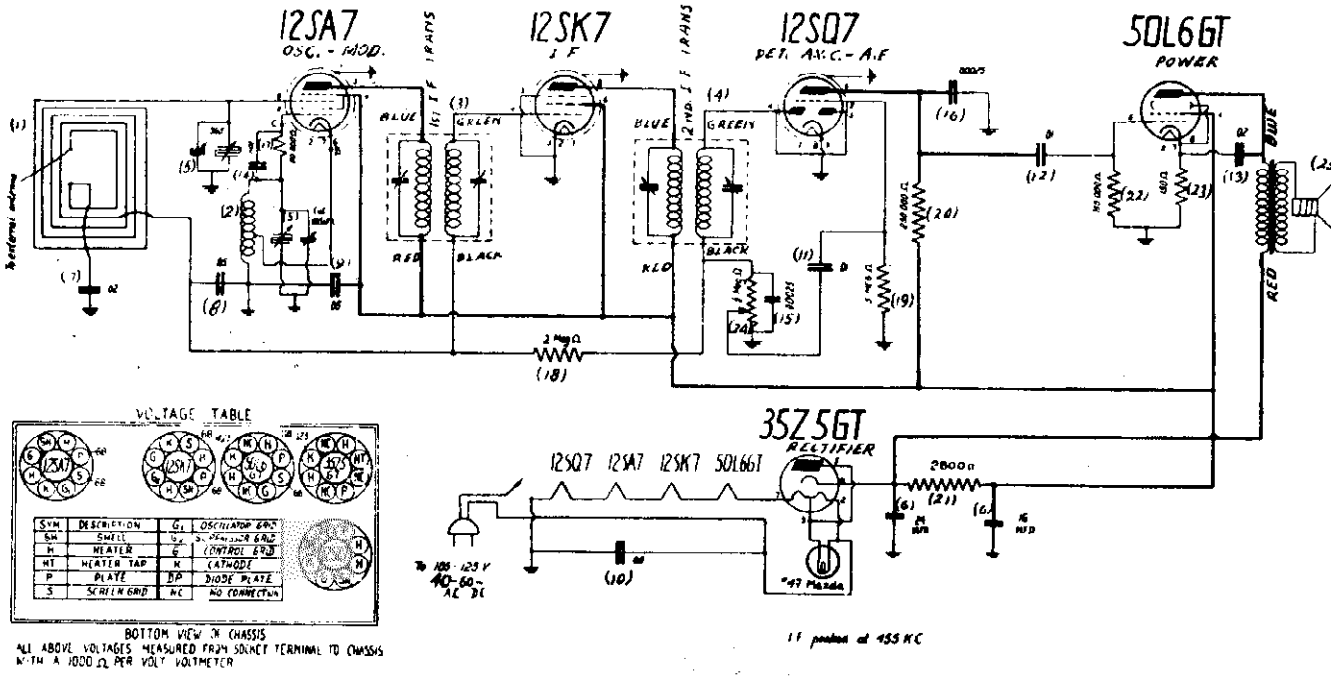
Alignment Procedure

Connect an output meter across the speaker voice coil. Turn volume control to maximum and in all cases keep test-oscillator output as low as a readable output meter reading will permit. Proceed with alignment as given in the following table.

Step	Connect Test-osc. to	Test-osc. Setting	Pointer Setting	Adjust Trimmers for Max. Output
1	1A7GT conv. grid in series with .05 mfd.	455 KC	540 KC	1, 2, 3 and 4
2	Antenna lead (blue)	1500 KC	1500 KC	5
3	Antenna lead (blue)	1500 KC	1500 KC	6



GENERAL ELECTRIC CO.



SERVICE INFORMATION

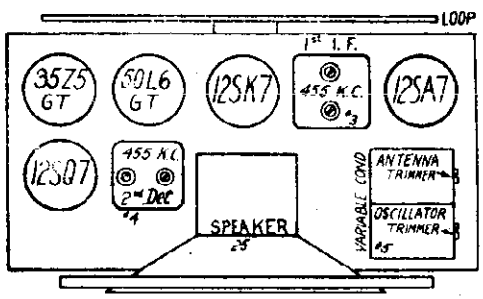
Voltages—Line 117 Volts AC—Power Consumption 27 Watts. Volume Control maximum. Meter 1000 ohms per volt, 250 volt scale.

Plate (3) of 12SA7 tube to common ground	68 volts
Screen (4) of 12SA7 tube to common ground	68 volts
Plate (8) of 12SK7 tube to common ground	68 volts
Screen (6) of 12SK7 tube to common ground	68 volts
Plate (3) of 50L6GT tube to common ground	118 volts
Screen (4) of 50L6GT tube to common ground	68 volts
Cathode (8) of 50L6GT tube to common ground	4.25 volts
Cathode (8) of 35Z5GT tube to common ground	125 volts
Heater (2) and (7) of 12SA7 tube	12.4 volts AC
Heater (2) and (7) of 12SK7 tube	12.4 volts AC
Heater (7) and (8) of 12SQ7 tube	12.4 volts AC
Heater (2) and (7) of 50L6GT tube	48 volts AC
Heater (2) and (7) of 35Z5GT tube	34 volts AC

SERVICE NOTES

Turning Control Drive Ratio	6½:1
Power Consumption	30 watts
Intermediate Frequency	455 K.C.
Tuning Frequency Range	540 1700 K.C.
Maximum Power Output	1.25 watts
Loud Speaker	Cone Diameter 4 inches
Voice Coil Impedance	(at 400 cycles) 3 ohms

Tubes: Converter-Oscillator 12SA7, I. F. 12SK7, Detector, A. V. C. 12SQ7, Power Output 50L6GT, Rectifier 35Z5GT.



ALIGNMENT PROCEDURE

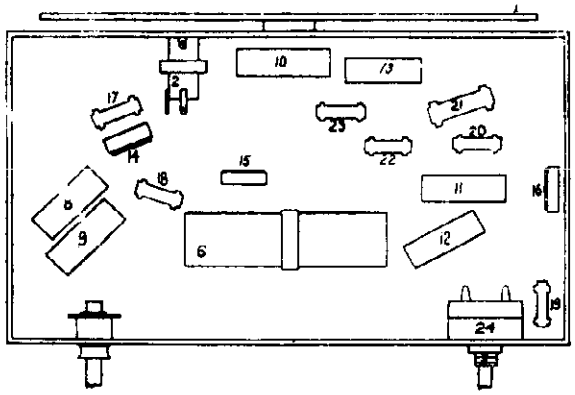
Alignment Frequencies I.F. ..... 455 K.C.
R.F. ..... 1700 & 1400 K.C.

I.F. Alignment

Connect an output meter across the voice coil. Rotate the volume control to maximum. Set test oscillator to 455 kilocycles and apply signal to control grid of 12SA7 tube through a .05 mfd. capacitor. Align the second I.F. transformer trimmers, next adjust the first I.F. transformer trimmers. Keep the test oscillator output to a level that will give a good meter reading.

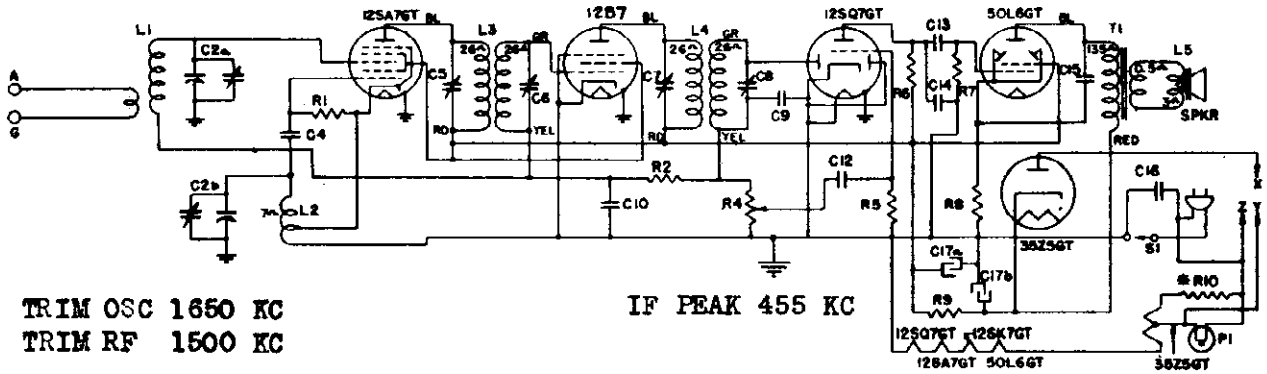
R.F. Alignment

Attach high side of test oscillator to flexible lead extending from rear of chassis through a .00025 mfd. condenser. Connect the low side to the receiver chassis. Adjust the test oscillator and receiver to 1700 kilocycles. Peak 1700 kilocycles oscillator trimmer for maximum output. Change test oscillator signal and receiver dial to approximately 1400 kilocycles. Then while rocking gang condenser, trim 1400 kilocycles antenna trimmer for maximum output.



MODEL J-512

GENERAL ELECTRIC CO.



TRIM OSC 1650 KC
TRIM RF 1500 KC

IF PEAK 455 KC

"A" rated receivers have "X" connected to "Y" and R-10 is shorted out
"C" rated receivers have "X" connected to "Z"

-1940-

Parts Description List

Sym.	Description	Sym.	Description	Sym.	Description
C-2a	Antenna Section Tuning Condenser	C-13	.005 mfd. paper capacitor	P-1	Dial lamp, MAZDA No. 47
C-2b	Oscillator Section Tuning Condenser	C-14	330 mmf. mica capacitor	R-1	33,000 ohms carbon resistor
C-4	47 mmf. mica capacitor	C-15	.01 mfd. paper capacitor	R-2	2.2 megohms carbon resistor
C-5	60–140 mmf. I.F. trimmer	C-16	.05 mfd. paper capacitor	R-4	0.5 megohm volume control
C-6	60–140 mmf. I.F. trimmer	C-17a	30 mfd. 150 V. dry electrolytic	R-5	4.7 megohms carbon resistor
C-7	60–140 mmf. I.F. trimmer	C-17b	40 mfd. 150 V. dry electrolytic	R-6	470,000 ohms carbon resistor
C-8	60–140 mmf. I.F. trimmer	L-1	Beam-a-Scope	R-7	470,000 ohms carbon resistor
C-9	470 mmf. mica capacitor	L-2	Oscillator coil	R-8	150 ohms carbon resistor
C-10	.05 mfd. paper capacitor	L-3	1st I.F. transformer	R-9	1200 ohms 1 W. carbon resistor
C-12	.005 mfd. paper capacitor	L-4	2nd I.F. transformer	R-10	13 ohms carbon resistor ±5%

Electrical Specifications

Rating	Power Supply (Volts)	Frequency (Cycles on AC)	Power Consumption (Watts)
A	115—AC or DC	40–60	30
C	115—AC or DC	25	30

Special Service Information

The following information will be found very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

(1) Stage Gains — Gain

Antenna to 12SA7GT grid...3 to 3.5 at 1000 KC‡
12SA7GT grid to 12B7 grid..50 at 455 KC ‡
12B7 grid to 12SQ7GT detector plate.....50 at 455 KC ‡

Gains shown in the first two stages do not contain the conversion gain which amounts to 1.1 at 1000 KC.

(2) 0.15 volt, 400 cycle signal across the volume control will give ½ watt speaker output. (Volume control turned to maximum.)

(3) Average DC voltage developed across oscillator grid leak.....15 volts

‡ Variations of +10%, −20% permissible.

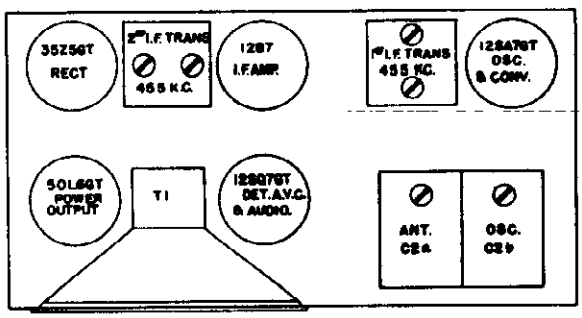


Fig. 1. Trimmer Location

ALIGNMENT CONVENTIONAL
SEE SPECIAL SECTION VOL. VIII

Intermediate Frequency.....455 KC

Electrical Power Output (117-line volts)

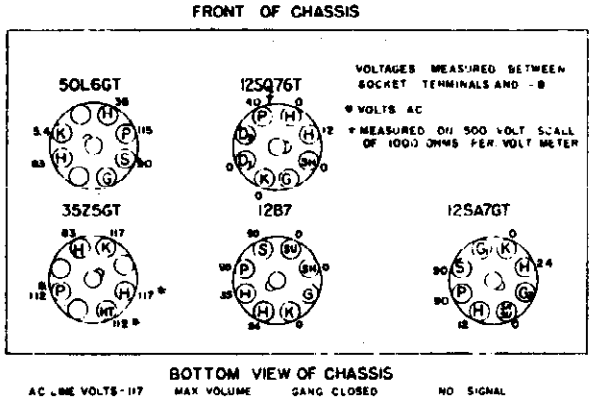
Undistorted.....1.3 watts
Maximum.....1.9 watts

Loud-speaker—"Alnico" Magnetic Dynamic

Outside Cone Diameter.....4 inches
Voice Coil Impedance (400 cycles).....3.5 ohms

Tubes

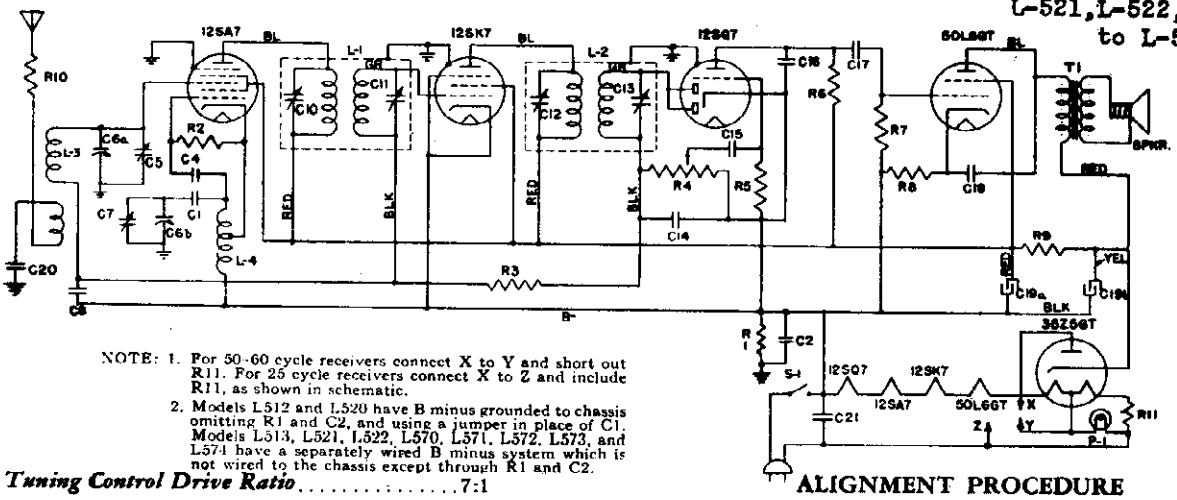
Converter-Oscillator.....GE-12SA7GT
I.F. Amplifier.....GE-12B7
Det., Aud., AVC.....GE-12SQ7GT
Power Output.....GE-50L6GT
Rectifier.....GE-35Z5GT



Socket Voltages

GENERAL ELECTRIC CO.

MODELS L-512, L-513, L-52(
L-521, L-522, L-57(
to L-574 in



NOTE: 1. For 50-60 cycle receivers connect X to Y and short out R11. For 25 cycle receivers connect X to Z and include R11, as shown in schematic.

2. Models L512 and L520 have B minus grounded to chassis omitting R1 and C2, and using a jumper in place of C1. Models L513, L521, L522, L570, L571, L572, L573, and L574 have a separately wired B minus system which is not wired to the chassis except through R1 and C2.

Tuning Control Drive Ratio 7:1

Electrical Specifications

Rating A-6....105-117 volts, 50-60 cycles or 105-117 volts D-C; 30 watts

Rating C-2....105-117 volts, 25 cycles or 105-117 volts D-C; 30 watts

Tuning Frequency Range ..... 550–1720 KC

Intermediate Frequency ..... 455 KC

Maximum Power Output ..... 1.5 watts

Loud-speaker—PM Dynamic

Outside Cone Diameter ..... 4 inches
Voice Coil Impedance (400 Cycles) ..... 3.5 ohms

Tubes

Converter and Oscillator GE-12SA7
I.F. Amplifier GE-12SK7
Detector, AVC, Audio GE-12SQ7
Power Output GE-50L6GT
Rectifier GE-35Z5GT
Dial Lamp ..... MAZDA No.47

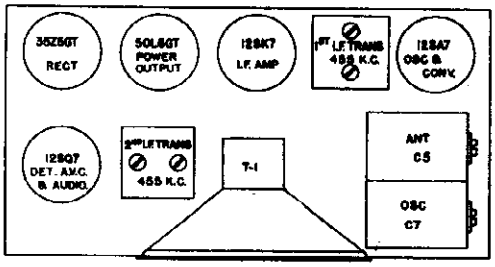


Fig. 1. Tube and Trimmer Location

ALIGNMENT PROCEDURE

Alignment Frequencies

I.F. ..... 455 KC
R.F. ..... 1500 KC

The location of all trimmers is shown in Fig. 1.

I.F. Alignment

Connect an output meter across the voice coil. Turn the volume control to maximum. Set test oscillator to 455 KC and keep the oscillator output as low as a readable meter reading will permit.

Apply signal to the converter grid through a .05 mfd. capacitor and align progressively the trimmers in the 2nd and 1st I.F. transformer cans.

R.F. Alignment

Close the gang condenser by rotating the tuning control. Slide the pointer along the cord until it lines up with the first dial marking on the left. Now rotate the tuning control until the pointer is over the 1500 KC dial mark. Apply a 1500 KC signal to the receiver by means of a standard loop antenna. Align the oscillator trimmer (C-7) to bring in the signal and peak the signal by adjusting the antenna trimmer (C-5). (See Fig. 1 for trimmer locations.)

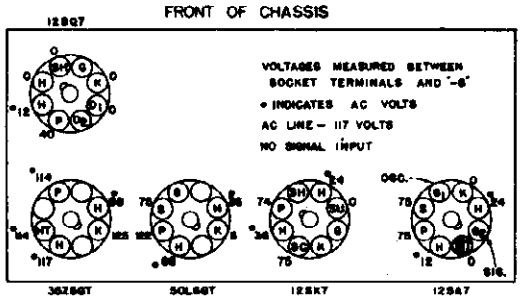


Fig. 2. Socket Voltages

REPLACEMENT PARTS LIST

Stock No.	Symbol	Description	List Price
*RC-072	C-1	CAPACITOR—.05 mfd. 200-V paper	$0.25
*RC-130	C-2	CAPACITOR—0.2 mfd. 400-V paper	.30
*RC-235	C-4	CAPACITOR—100 mmf. mica	.25
*RC-7039	C-6a, b	CONDENSER—Tuning condenser (includes trimmers C-5, C-7)	1.70
*RC-072	C-8	CAPACITOR—.05 mfd., 200-V. paper	.25
*RC-274	C-14	CAPACITOR—330 mmf. mica	.30
*RC-023	C-15	CAPACITOR—.005 mfd. 600 V. paper	.25
*RC-274	C-16	CAPACITOR—330 mmf. mica	.30
*RC-039	C-17	CAPACITOR—.01 mfd., 600 V. paper	.25
*RC-048	C-18	CAPACITOR—.02 mfd., 600 V. paper	.30
*RC-5174	C-19a	CAPACITOR—20 mfd., 150 V. dry electrolytic	.60
	C19-b	CAPACITOR—30 mfd. 150 V. dry electrolytic	
*RC-039	C-20	CAPACITOR—.01 mfd., 600 V. paper	.25
*RC-092	C-21	CAPACITOR—.05 mfd., 600 V. paper	.30
*RQ-1319	R-1	RESISTOR—330,000 ohms, ½ W. carbon	.70-5
*RQ-1291	R-2	RESISTOR—22,000 ohms, ½ W. carbon	.70-5
*RQ-1339	R-3	RESISTOR—2.2 megohms, ½ W. carbon	.70-5
*RV-108	R-4, S-1	VOL. CONTROL—0.5 megohm volume control and power switch	.95
*RQ-1347	R-5	RESISTOR—4.7 megohms, ½ W. carbon	.70-5
*RQ-1317	R-6	RESISTOR—270,000 ohms, ½ W. carbon	.70-5
*RQ-1323	R-7	RESISTOR—470,000 ohms, ½ W. carbon	.70-5
*RQ-1239	R-8	RESISTOR—150 ohms, ½ W. carbon	.70-5
*RQ-1469	R-9	RESISTOR—2700 ohms, 1 W. carbon	.20
*RQ-1255	R-10	RESISTOR—680 ohm, ½ W. carbon	.70-5
*RQ-1214	R-11	RESISTOR—13 ohms, ¼ W. carbon	.70-5

Precaution

If the signal generator is AC operated, use an isolating transformer between the power supply and the radio receiver power input. The use of an isolating capacitor is not recommended as AC current through the capacitor will introduce hum modulation and/or create the possibility of a burned-out signal generator attenuator.

Special Service Information

The following information will be very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

(1) Stage Gains*
Antenna Post to Converter Grid....3.0 at 1000 KC
I.F. on Converter Grid to I.F. on I.F. Amplifier Grid....60 at 455 KC
I.F. Amplifier Grid to Diode Plate...45 at 455 KC

(2) 0.20-volt, 400-cycle signal across the volume control will give ½-watt speaker output.* (Volume control turned to maximum.)

(3) Average DC voltage developed across oscillator grid leak....6 volts

* Variations of ±20% permissible. All readings obtained with enough signal input to give ½-watt speaker output.

GENERAL ELECTRIC CO.

To Charge Battery

The battery is charged by merely plugging the receiver power cord in the rated AC power outlet and turning the selector switch to "charge." Frequent check should be taken of the charge indicator and when all indicator balls are visible, the battery is fully charged. Charging the battery after all indicator balls are visible will not harm the battery except that it will evaporate the water faster. A completely discharged battery will be restored usually within 20 to 30 hours.

When operating the receiver from the AC house current, the battery is being charged at a slow rate. Thus if you wish to operate the receiver at the same time that you are charging even a fully discharged battery, plug the power cord in the AC receptacle and turn the power selector switch to the AC position. Prolonged and repeated operation on this position will assure that the battery is always maintained in a nearly fully charged condition.

Battery Operating Instructions

1. Add distilled or tap water in the filter cap at sufficiently frequent intervals to keep liquid level at indicator mark as viewed through opening in a battery case. DO NOT OVERFILL. The battery is available by removing the thumb screw on the left side of the battery case and removing the cover of the case. If any water is spilled in receiver when filling battery, remove with absorbent tissue.

Tap or drinking water is satisfactory as long as it does not contain large quantities of iron or chlorine dissolved in it.

2. If battery is discharged (only one or two indicators showing), water should be added to the level line before starting the recharge.

3. A fully charged battery will operate the radio in "Battery" position about 15 hours before recharging is required. Whenever possible, it is best not to allow the battery to become discharged to the extent that all three indicators disappear.

However, if all three indicators have sunk, the battery should be recharged immediately or within 24 hours.

4. A battery will continually discharge at a slow rate even when not in use. For this reason, monthly checks should be made of the charge condition and the battery placed on charge when necessary. This will prevent damage to the battery such as freezing during cold weather.

BATTERY INSTALLATION

The following instructions should be carefully followed in installing battery:

1. Remove battery from packing carton.
2. If needed, add water to bring liquid level to indicator mark on battery container. Do not overfill.
3. Remove back cover from radio, also battery case cover. The latter is removed by taking out the thumb screw and pulling the left side of the cover away from the battery case.
4. Turn battery with ball indicators faced to left, and then connect the two black leads with spade terminals onto the extreme right or negative (−) terminal of the battery. Note that the leads when connected to the terminal come away from the terminal on the side of battery toward you.
5. Turn battery so that the indicators face the front, then slide the battery part way into the case. Connect the two yellow leads with the spade terminals to the front or positive (+) terminal of the battery. The leads when connected will come away from the terminal on the right-hand side of the battery.
6. Connect the rubber vent tube over the vent located in middle of battery.
7. Slide battery as far as it will go into battery case.
8. Replace battery case cover.
9. Place battery on charge, if necessary, as described in a previous paragraph, until all three indicators are showing in the opening in the case cover.

Charger Characteristics

A ¼-ampere fuse is used in series with the primary of the charger transformer. If the battery, after being placed on charge, does not show any signs of becoming charged after a reasonable length of time, the fuse should be checked. Replace only with a ¼-amp GE Cat. No. 2548 fuse or its equivalent.

If one or more of the copper oxide discs of the rectifier unit are defective, the charger will not operate properly. To test the rectifier unit operation, proceed as follows: Remove the two black leads from the negative terminal of the battery and connect a DC ammeter which will read two amperes, in series with these leads to the negative terminal of the battery. Plug the power cord into an AC supply and turn the power selector switch to the "Charge" position. With the AC line voltage at 117 volts, the average charging current should read about 1.35 amperes at 2.1 volts battery. If line voltage is greater or battery voltage is lower than 2.1 volts the charging current will be greater. If the current is much less than this value at the rated line of 117 volts, one or more of the copper oxide discs may be defective.

To check individual discs, the following tests are suggested. In the conducting direction, the rectifier disc should pass 0.5 ampere or more when ½ volt is impressed across the disc. Note: The copper oxide rectifier disc conducts when the positive potential is applied to the copper oxide surface. The copper oxide is a dark blue coating and is plated with nickel to afford a good surface contact to the oxide. If a DC ammeter is not available for measuring currents as high as 0.5 ampere, the circuit shown in Fig. 2 can be used for this check. This method requires that the resistance of 2.75 ohms be made fairly accurate and is placed in series with the rectifier disc and placed across the two volt storage battery. The voltage should always read 0.5 volt or less; if the voltage exceeds 0.5 volt across the disc in this circuit, it indicates a defective disc.

The reverse current flow is as important as the above test and is made as follows: Reverse the battery polarity in the above test circuit and place a milliammeter that will read 10 milliamps in series with a lead to one of the battery terminals. This reverse current should not exceed 2½ milliamperes at the applied voltage of 2.0 volts. If the current is considerably above this value the disc should be discarded. Precaution—A suitable meter fuse should be used in series with the milliammeter to prevent damage to the meter in case the disc under test is shorted. A rough check, if a milliammeter is not available, is to measure the resistance of the disc in the non-conducting direction on the low-resistance tap (1½ volt) of the ohmmeter. The resistance should measure at least 750 ohms.

BATTERY INFORMATION

The receiver uses a 2-volt Willard Radio Battery No. 20-2 or equivalent. It has a twenty ampere-hour capacity and should be cared for in the same manner as any other storage battery.

Charge Indicator

The degree of charge of the battery can be determined by removing the back cover of the radio and referring to the charge ball indicator visible through the hole in the metal battery case.

If the battery is fully charged, three indicator balls will be visible at the surface of the liquid in the battery. When the battery discharges, these ball indicators will sink and disappear in the following order:

1. Green indicator sinks when approximately 10 per cent of battery capacity has been discharged.
2. White ball sinks when 50 per cent capacity has been discharged.
3. The red ball sinks when battery is 90 per cent discharged.

On charge, the balls rise or float in the reverse order and the charge is complete and may be stopped when all three balls appear in the opening.

GENERAL ELECTRIC CO.

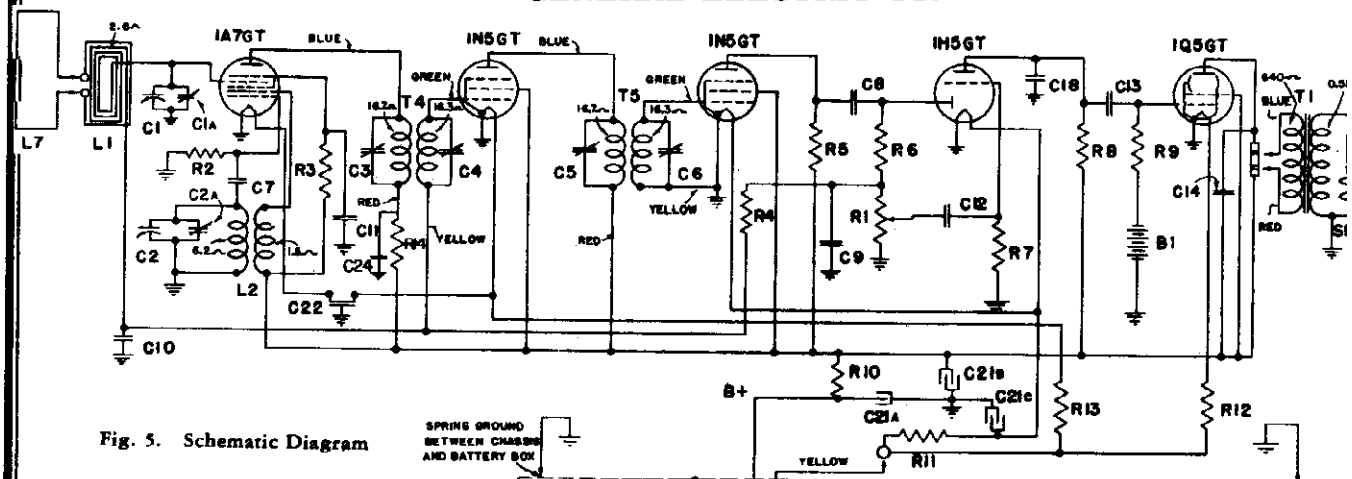


Fig. 5. Schematic Diagram

POWER SELECTOR SWITCH OPERATION

POSITION	CONTACTS CONNECTED
"OFF"	ALL CONTACTS OPEN
"BATTERY"	#1 to #2; #4 to #5; #7* to #8
"AC"	#1 to #2 to #3; #4 to #5; #8 to #9
"CHARGE"	#2 to #3; #8 to #9

* #7 terminal is not connected to circuit

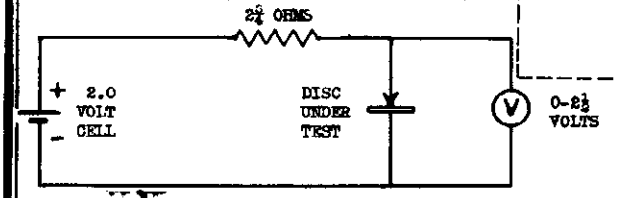


Fig. 2. Charger Disc Test

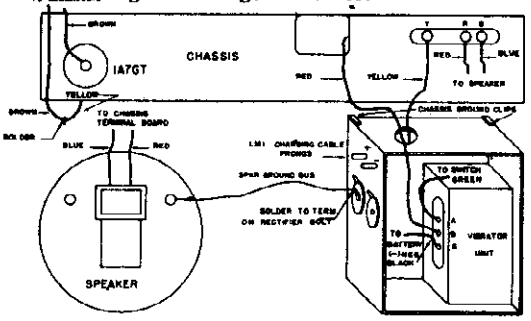


Fig. 3. Assembly Wiring

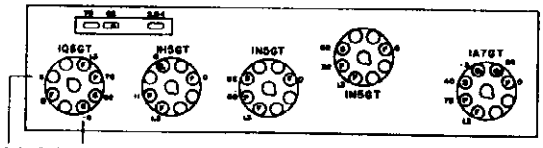


Fig. 1. Socket Voltage Diagram

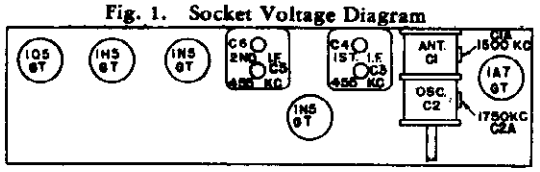


Fig. 4. Trimmer Location

Prices subject to change without notice.

Stock No.	Symbol	Description	List Price
RC-7054	C-1, 2	CONDENSER—Tuning condenser and trimmers	$1.55
*RC-216	C-7	CAPACITOR—47 mmf, mica	.25
*RC-235	C-8, 9	CAPACITOR—100 mmf., mica	.25
*RC-072	C-10	CAPACITOR—.05 Mfd., 200 V. paper	.25
*RC-096	C-11	CAPACITOR—0.1 Mfd., 200 V. paper	.30
*RC-023	C-12, 13	CAPACITOR—.005 Mfd., 600 V. paper	.25
*RC-039	C-14	CAPACITOR—.01 Mfd., 600 V. paper	.25
*RC-096	C-15	CAPACITOR—0.1 Mfd., 200 V. paper	.30
*RC-072	C-16	CAPACITOR—.05 Mfd., 200 V. paper	.25
*RC-027	C-17	CAPACITOR—.006 Mfd., 100 V. paper	.30
*RC-235	C-18	CAPACITOR—100 mmf., mica	.25
*RC-156A	C-19, 20	CAPACITOR—0.5 Mfd., 120 V.	.45
RC-5189	C-21A, 21B	CAPACITOR—15 Mfd., 150 V. dry electrolytic	.75
	C-21C	CAPACITOR—1200 Mfd., 2 V. dry electrolytic	
*RC-156A	C-22	CAPACITOR—0.5 Mfd., 120 V. paper	.45
*RC-092	C-23	CAPACITOR—.05 Mfd., 600 V. paper	.30
RV-125	R-1	VOLUME CONTROL—0.5 megohm volume control	.95
*RQ-1315	R-2	RESISTOR—220,000 ohm, ½ W. carbon	.70—5
*RQ-1299	R-3	RESISTOR—47,000 ohm, ½ W. carbon	.70—5
*RQ-1339	R-4	RESISTOR—2.2 megohm, ½ W. carbon	.70—5
*RQ-1293	R-5	RESISTOR—27,000 ohm, ½ W. carbon	.70—5
*RQ-1299	R-6	RESISTOR—47,000 ohm, ½ W. carbon	.70—5
*RQ-1347	R-7	RESISTOR—4.7 megohm, ½ W. carbon	.70—5
*RQ-1331	R-8	RESISTOR—1.0 megohm, ½ W. carbon	$0.70—5
*RQ-1339	R-9	RESISTOR—2.2 megohm, ½ W. carbon	.70—5
*RQ-1259	R-10	RESISTOR—1,000 ohm, ½ W. carbon	.70—5
RQ-1208	R-11, 12, 13	RESISTOR—8.2 ohm, ½ W. carbon	.70—5
RC-2056	B-1	CELL—5.0 V. bias cell assembly	.55
RL-568	L-1	BEAM-A-SCOPE—Loop antenna assembly (inside cover)	.90
RL-2055	L-2	COIL—Oscillator coil	.30
RL-367	L-5	CHOKE—B choke	.20
RL-366	L-6	CHOKE—Vibrator choke	.55
RL-567	L-7	BEAM-A-SCOPE—External loop antenna	.45
RL-365	L-8	CHOKE—Filament supply choke	.20
RS-3115	SW1	SWITCH—Power selector switch	.70
RT-4010	T-1	TRANSFORMER—Output transformer	.90
RT-0525	T-2	VIBRATOR—Vibrator power transformer	1.80
RT-0524	T-3	TRANSFORMER—50-60 cycle rectifier step-down transformer	1.20
RT-0527	T-3	TRANSFORMER—25 cycle rectifier step-down transformer	
RT-393	T-4	TRANSFORMER—1st I.F. transformer	.90
RT-392	T-5	TRANSFORMER—2nd I.F. transformer	.90
RV-204	V-1	VIBRATOR—Power supply synchronous vibrator	3.60
RR-802	X-1	RECTIFIER—Copper oxide rectifier	.25
RS-1066	Spkr	SPEAKER—PM speaker	4.60

GENERAL ELECTRIC CO.

ALIGNMENT PROCEDURE

Alignment Frequencies

I.F. ..... 455 KC

R.F. ..... 1500 KC

The location of all trimmers is shown in Fig. 4.

I.F. Alignment

Connect an output meter across the voice coil. Turn volume control to maximum. Set test oscillator to 455 KC and keep the oscillator output as low as a readable meter reading will permit.

Apply signal to 1A7GT converter grid through .05 Mfd. capacitor and align progressively the trimmers in the 2nd and 1st I.F. transformer cans.

R.F. Alignment

Adjust the signal generator to 1750 KC and loosely couple a wire from the output terminal of the signal generator so that the receiver loop will pick up the signal. Set the gang condenser to minimum capacity and adjust the oscillator trimmer (C2A) to receive the signal. After this has been done set the signal generator to 1500 KC and tune the receiver until this signal is tuned in. Adjust the R.F. trimmer (1A) for maximum output. In case of bent plates in the condenser, set the signal generator and the receiver to 600 KC and bend plates into the position for maximum output.

Tubes

Converter-Oscillator	GE-1A7GT
1st I.F. Amplifier	GE-1N5GT
2nd I.F. Amplifier	GE-1N5GT
Detector & 1st Audio	GE-1H5GT
Power Output	GE-1Q5GT

SPECIFICATIONS

Physical Dimensions

Height	13 inches
Width	13 inches
Depth	4¾ inches
Weight (with Battery)	16 pounds

Special Service Information

The following service information will be very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

(1) Stage Gains

1A7GT grid to 1st IF grid	40 at 1,000 KC
1A7GT grid to 1st IF grid	57 at 455 KC
1st IF grid to 2nd IF grid	95 at 455 KC
2nd IF grid to 1H5GT diode plate	8.5 at 455 KC

(2) Audio Gain

0.08 volts, 400 cycle signal across volume control with control set at maximum, will give approximately 50 milliwatts speaker output.

(3) DC voltage developed across oscillator grid resistor (R2) averages 6.5 volts at 1,000 KC.

Variations of 20 per cent permissible. All readings obtained are with AVC shorted to chassis ground.

Electrical Rating

Charging from AC line:
110–125 volts AC. ..... 50–60 cycles ..... 6 watts
110–125 volts AC. ..... 25–60 cycles .... 10 watts

Charging from storage battery (using LM-1 Charging Cable):
6.3 volts DC. ..... 1.4 amperes

Receiver power consumption:
2.1 volts DC. ..... 1.3 amperes ..... 2.7 watts

Receiver battery requirement:
Willard 2.0 volts No. 20-2 or equivalent rechargeable battery.

Fuse: G-E No. 2548 ¼-ampere rating.

Tuning Frequency Range

Broadcast Band ..... 550–1750 KC

Electrical Power Output

Maximum ..... 225 milliwatts

Loudspeaker—PM Dynamic

Cone Diameter ..... 5 inches
Voice Coil Impedance ..... 3.5 ohms (400 cycles)

GENERAL INFORMATION

Power Supply

All power necessary for the operation of the receiver is supplied by the 2-volt built-in rechargeable battery. The tube filaments are heated directly by the two volts from the battery while the necessary high voltage for the screen and plates of the tubes is furnished by a synchronous vibrator used in conjunction with a step-up power transformer and its associated filter circuit. The synchronous vibrator operates on the two volts from the battery.

Provision has been made to charge the battery directly from the house current without removing the battery from the receiver circuit. Two charging positions are provided on the four-position power selector switch. The "Charge" position of this switch allows the battery to be charged at the rate of approximately 1.35 amperes from the house current during the period that the receiver is not being operated. The "AC" position of the switch allows the receiver to be operated at the same time that the battery is being charged. Under this condition, however, it takes a considerably longer period for a partially discharged battery to be fully restored due to the fact that current is taken from the battery to operate the receiver.

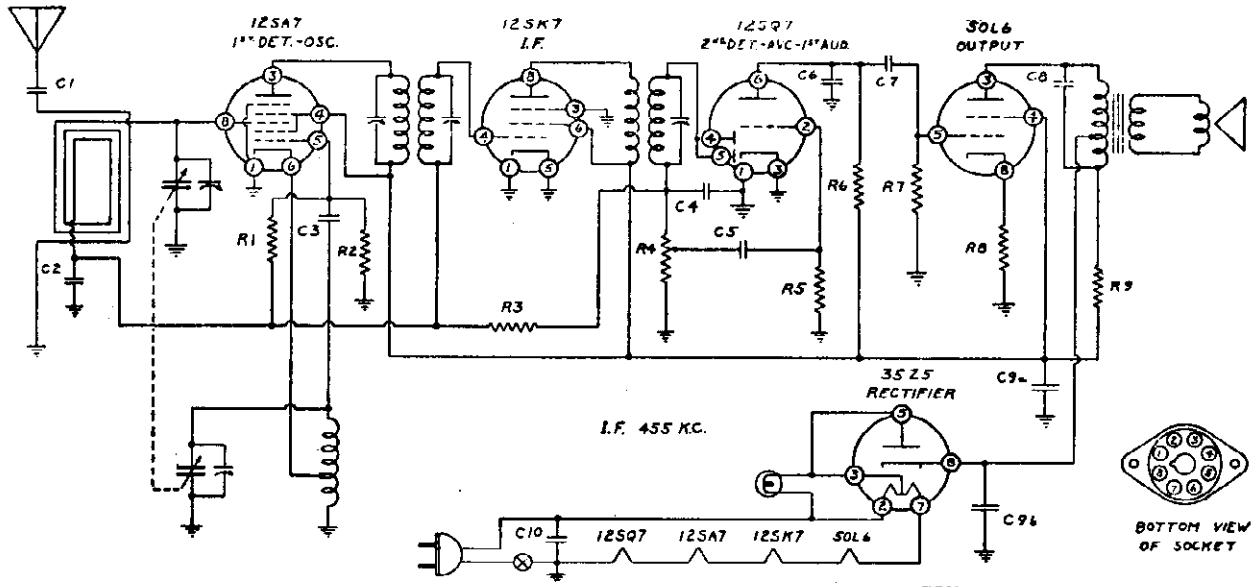
The battery charging unit consists of a step-down transformer which converts the house current to approximately 5.5 volts on 50–60 cycle models; on 25–60 cycle models the voltage is 6.6 volts. This low voltage is then applied to a copper oxide rectifier in a full wave rectifier circuit which supplies the battery with a DC charging current.

A charging cable, Stock LM-1, is available, which provides a convenient means of charging the radio battery from an automobile or 6-volt storage battery. The cable plug is inserted over the two prongs on the left side of the metal battery case and the plug and socket on the other end of the cable is provided with terminals for connection to a 6-volt supply. Full installation instructions are provided with each cable.

Before the receiver chassis can be removed from the cabinet, it is necessary to first remove the battery-vibrator case. The battery case is held in place by four screws available from the bottom of the cabinet. The radio chassis is held by two Phillips head screws located on the control panel. Fig. 3 shows the various connectors used to interconnect the units.

GENERAL ELECTRIC CO.

MODEL LCP-59



RESISTORS

No.	Ohms	Watts	No.	Ohms	Watts
R1	10,000,000	½	R6	250,000	½
R2	25,000	½	R7	500,000	½
R3	2,000,000	½	R8	150-10%	½
R4	500,000	V.C.	R9	1,000	½
R5	5,000,000	½			

CONDENSERS

No.	Capacity (Mfd.)	Volts	No.	Capacity (Mfd.)	Volts
C1	.001	600	C7	.01	400
C2	.05	200	C8	.02	400
C3	.00005	Mica	C9a	50. Elect.	150
C4	.00025	Mica	C9b	30. Elect.	150
C5	.005	600	C10	.05	400
C6	.0005	Mica			

Part No.	Part Name	Description	Price List
*RB-641R	Button	Snap button for back cover (Pkg. 6)	$ .10
*RB-642R	Button	Snap button for dial scale	.05
*RB-956R	Back	Cardboard back cover	.20
*RC-009	Capacitor	.001 Mfd., 600 V. paper (C-1)	.30
*RC-023	Capacitor	.005 Mfd., 600 V. paper (C-5)	.25
*RC-047	Capacitor	.01 Mfd., 400 V. paper (C-7)	.20
*RC-048	Capacitor	.02 Mfd., 600 V. paper (C-8)	.30
*RC-072	Capacitor	.05 Mfd., 200 V. paper (C-2)	.25
*RC-092	Capacitor	.05 Mfd., 600 V. paper (C-10)	.30
*RC-216	Capacitor	50 Mmf. Mica (C-3)	.25
*RC-259	Capacitor	250 Mmf. Mica (C-4)	.30
*RC-296	Capacitor	500 Mmf. Mica (C-6)	.25
RC-5184R	Capacitor	30 Mfd., 50 Mfd., 150 Volt Electrolytic (C-9A), (C-9B)	1.50
*RC-7046R	Condenser	2-gang tuning condenser	2.30
*RC-863	Cord	Power line cord	.65
RD-194R	Dial	Dial scale	.40
*RH-905R	Handle	Cabinet handle	.35
*RK-1013R	Knob	Control knob	.15
RL-562R	Antenna	Loop antenna assembly	1.75
RL-2051R	Coil	Oscillator coil	.40
RP-1015R	Pointer	Dial pointer	.15
*RQ-1239	Resistor	150-ohm, ½ W. carbon (R-8) (Pkg. 5)	.70
*RQ-1259	Resistor	1,000-ohm, ½ W. carbon (R-9) (Pkg. 5)	.70
*RQ-1292	Resistor	25,000-ohm, ½ W. carbon (R-2) (Pkg. 5)	.70
*RQ-1317	Resistor	250,000-ohm, ½ W. carbon (R-6) (Pkg. 5)	.70
*RQ-1324	Resistor	500,000-ohm, ½ W. carbon (R-7) (Pkg. 5)	.70
*RQ-1339	Resistor	2.0 megohm, ½ W. carbon (R-3) (Pkg. 5)	.70
*RQ-1348	Resistor	5.0 megohm, ½ W. carbon (R-5) (Pkg. 5)	.70
*RQ-1355	Resistor	10.0 megohm, ½ W. carbon (R-1) (Pkg. 5)	.70
*RS-299R	Socket	Pilot lamp socket	.30
*RS-486R	Spring	Dial drive cord spring	.05
RS-1062R	Speaker	5" PM speaker	3.20
RT-4007R	Transformer	Output transformer	1.00
*RS-252	Socket	Tube socket	.15
*RS-9018R	Screws	Chassis mounting screws (Pkg. 6)	.10
*RS-9020R	Shaft	Drive Shaft	.10
*RT-380R	Transformer	1st I. F. transformer	1.15
*RT-381R	Transformer	2nd I. F. transformer	.80
*RV-113R	Volume Control	0.5 megohm volume control (R-4)	.95
RW-058R	Window	Dial window	.35
*RW-129R	Washer	Horseshoe drive shaft washer	.05
RW-132R	Washer	Spring drive shaft washer	.05
RZ-203R	Cabinet	Model LCP-596 cabinet	4.20

* Used on previous receivers.

(PRICES SUBJECT TO CHANGE WITHOUT NOTICE)

General Data

The alignment of this receiver requires the use of a signal generator that will cover the frequencies of 455, 600, 1400 and 1730 K.C., and an output meter 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 signal generator output as low as possible, to prevent the AVC from operating and giving false readings.

I.F. Alignment

Adjust the signal generator to 455 K.C. and connect the output to the grid of the first detector tube (12SA7) through a .05 or .1 mfd. condenser. Connect ground of signal generator to chassis ground through a .1 mfd. condenser. Align all I.F. trimmers to peak or maximum reading on the output meter.

Broadcast Band Alignment

Adjust the signal generator to 1730 K.C. and connect the output to the antenna lead, through a .0002 mfd. mica condenser. Set the gang condenser to minimum capacity and adjust the oscillator trimmer to receive this signal. After this has been carefully done, the next step is to set the signal generator to 1400 K.C. and after tuning in the signal adjust the B.C. antenna trimmer to peak. In case of bent plates, set the signal generator and the receiver to 600 K.C. and bend the plates into the position for maximum output.

Voltages—Line 117 Volts AC—Power Consumption 30 Watts. Volume Control maximum. Meter 1000 ohms per volt, 150 volt scale.

Plate (3) of 12SA7 tube to common ground..... 93 volts
Screen (4) of 12SA7 tube to common ground..... 95 volts
Plate (8) of 12SK7 tube to common ground..... 93 volts
Screen (6) of 12SK7 tube to common ground..... 95 volts
Plate (3) of 50L6 tube to common ground.....118 volts
Screen (4) of 50L6 tube to common ground..... 95 volts
Cathode (8) of 50L6 tube to common ground..... 5.5 volts
Cathode (8) of 35Z5 tube to common ground....122 volts

Speaker—5" PM Type
Voice coil impedance at 400 cycles..... 3.8 ohms

Oscillator Coil

Looking at the connection end in a clockwise direction starting at the chassis the terminals are No. 1, end of winding; No. 2, start of winding; No. 3, tap.
No. 2 and No. 1—Resistance 4.9 ohms.
No. 3 and No. 1—Resistance 4.3 ohms.

First I.F. Transformer

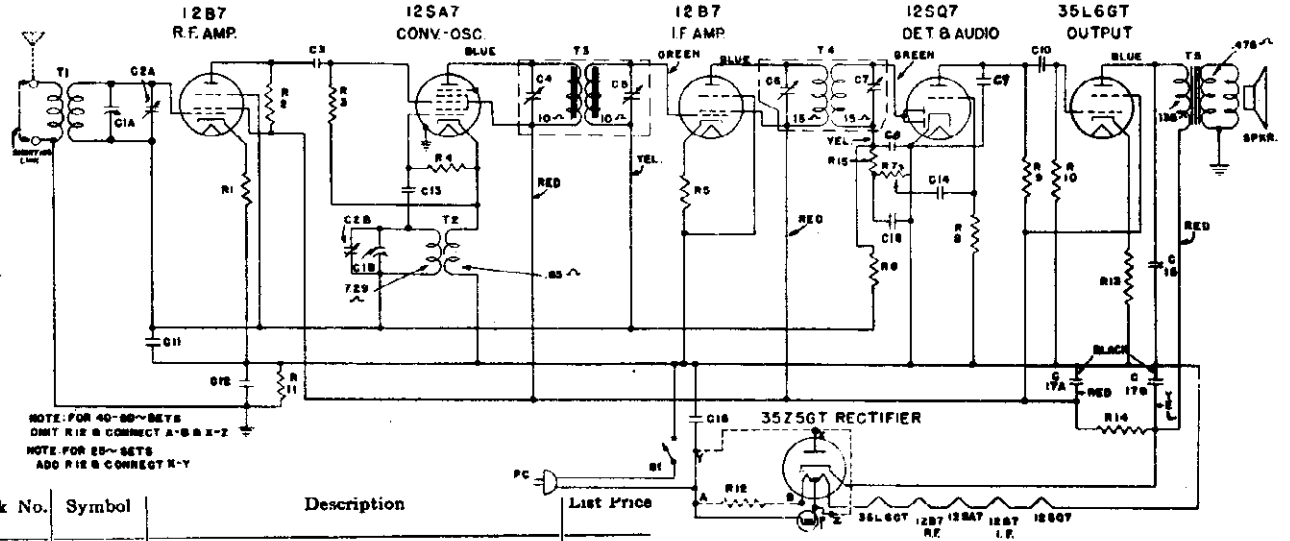
Primary—Blue, plate, red, B+—Resistance 20.4 ohms.
Secondary—White, grid; Black, AVC—Resistance 20.3 ohms.

Second I.F. Transformer

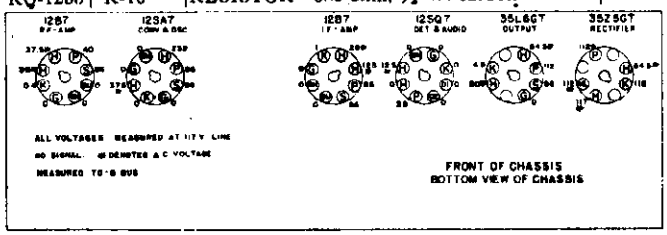
Primary—Blue, plate; red B+—Resistance 22.2 ohms.
Secondary—White, diode; Black, AVC—Resistance 22.1 ohms.

MODELS L-600, L-601, L-610, L-611

GENERAL ELECTRIC CO.



Stock No.	Symbol	Description	List Price
*RC-7049	C-1a, 1b, 2a, 2b	CONDENSER—Tuning condenser	$1.70
*RC-235	C-3	CAPACITOR—100 Mmf., mica	.25
*RC-242	C-8	CAPACITOR—150 Mmf., mica	.25
*RC-274	C-9	CAPACITOR—330 Mmf., mica	.30
*RC-039	C-10	CAPACITOR—.01 Mfd., 600 V. paper	.25
*RC-072	C-11	CAPACITOR—.05 Mfd., 200 V. paper	.25
*RC-104	C-12	CAPACITOR—0.1 Mfd., 600 V. paper	.30
*RC-216	C-13	CAPACITOR—47 Mmf., mica	.25
*RC-023	C-14	CAPACITOR—.005 Mfd., 600 V. paper	.25
*RC-048	C-15	CAPACITOR—.02 Mfd., 600 V. paper	.25
*RC-092	C-16	CAPACITOR—.05 Mfd., 600 V. paper	.30
*RC-5183	C-17a, 17b	CAPACITOR—50 Mfd., 60 Mfd., electrolytic	.80
*RC-235	C-18	CAPACITOR—100 Mmf., mica	.25
*RQ-1227	R-1	RESISTOR—47 ohm, ½ W. carbon	.70—5
*RQ-1275	R-2	RESISTOR—4700 ohm, ½ W. carbon	.70—5
*RQ-1299	R-3	RESISTOR—47,000 ohm, ½ W. carbon	.70—5
*RQ-1295	R-4	RESISTOR—33,000 ohm, ½ W. carbon	.70—5
*RQ-1235	R-5	RESISTOR—100 ohm, ½ W. carbon	.70—5
*RQ-1339	R-6	RESISTOR—2.2 megohm, ½ W. carbon	.70—5
*RV-120	R-7, S-1	VOLUME CONTROL—0.5 megohm, combined with power switch	1.45
*RQ-1349	R-8	RESISTOR—5.6 megohm, ½ W. carbon	.70—5
*RQ-1323	R-9, 10, 11	RESISTOR—470,000 ohm, ½ W. carbon	.70—5
*RQ-1213	R-12	RESISTOR—12 ohm, ½ W. carbon	.70—5
*RQ-1239	R-13	RESISTOR—150 ohm, ½ W. carbon	.70—5
*RQ-651	R-14	RESISTOR—1000 ohm, 2 W. carbon	.20
*RQ-1299	R-15	RESISTOR—47,000 ohm, ½ W. carbon	.70—5
*RQ-1255	R-16	RESISTOR—680 ohm, ½ W. carbon	.70—5



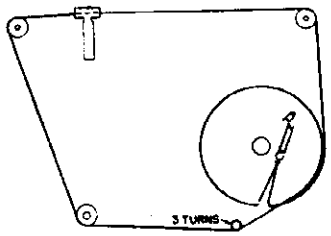
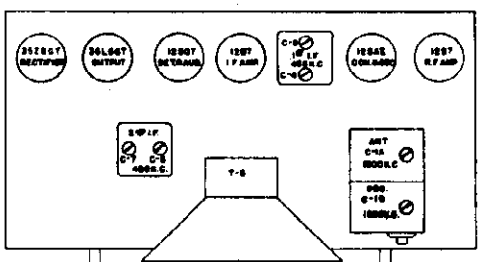


Fig. 1. Dial Stringing Diagram



Electrical Power Output (117 line volts)

Undistorted . . . . . 1.0 watts
Maximum . . . . . 1.5 watts

ALIGNMENT PROCEDURE

Alignment Frequencies

RF . . . . . 1500 KC
IF . . . . . 455 KC

The chassis must be removed from the cabinet to make the following alignment. The location of all trimmers is shown in Fig. 2.

IF Alignment

Connect an output meter across the voice coil. Turn the volume control to maximum. Set test oscillator to 455 KC and keep the oscillator output as low as a readable meter reading will permit.

Apply signal to the 12SA7 converter grid through a .05 mfd. capacitor and align progressively the trimmers in the 2nd and 1st IF transformers.

RF Alignment

When making the following alignment the loop antenna must be bolted to the chassis by the screw and spacer mounting. The RF signal should be capacity coupled to the receiver loop by placing a two-foot piece of wire for an antenna on the test oscillator output post (high side). Keeping this antenna two feet or more from the receiver loop will generally insure freedom from too much coupling. Metal objects such as meters, tools, etc., should not be placed in close proximity to the loop when making this alignment.

With the gang condenser plates completely closed, the pointer should line up with the first mark on the left of the scale. Set the signal generator to 1500 KC. Align (C-1b) to the signal while the pointer is on the 1500 KC mark. Peak (C-1a) for maximum output.

Special Service Information

The following information will be very useful to servicemen equipped with vacuum tube voltmeters or similar voltage measuring instruments.

(1) Stage Gains
Antenna post to RF grid—3.8 at 1000 KC
RF grid to converter grid—6.0 at 1000 KC
Converter grid to IF grid—46 at 455 KC
IF grid to 12SQ7 diode plate—75 at 455 KC

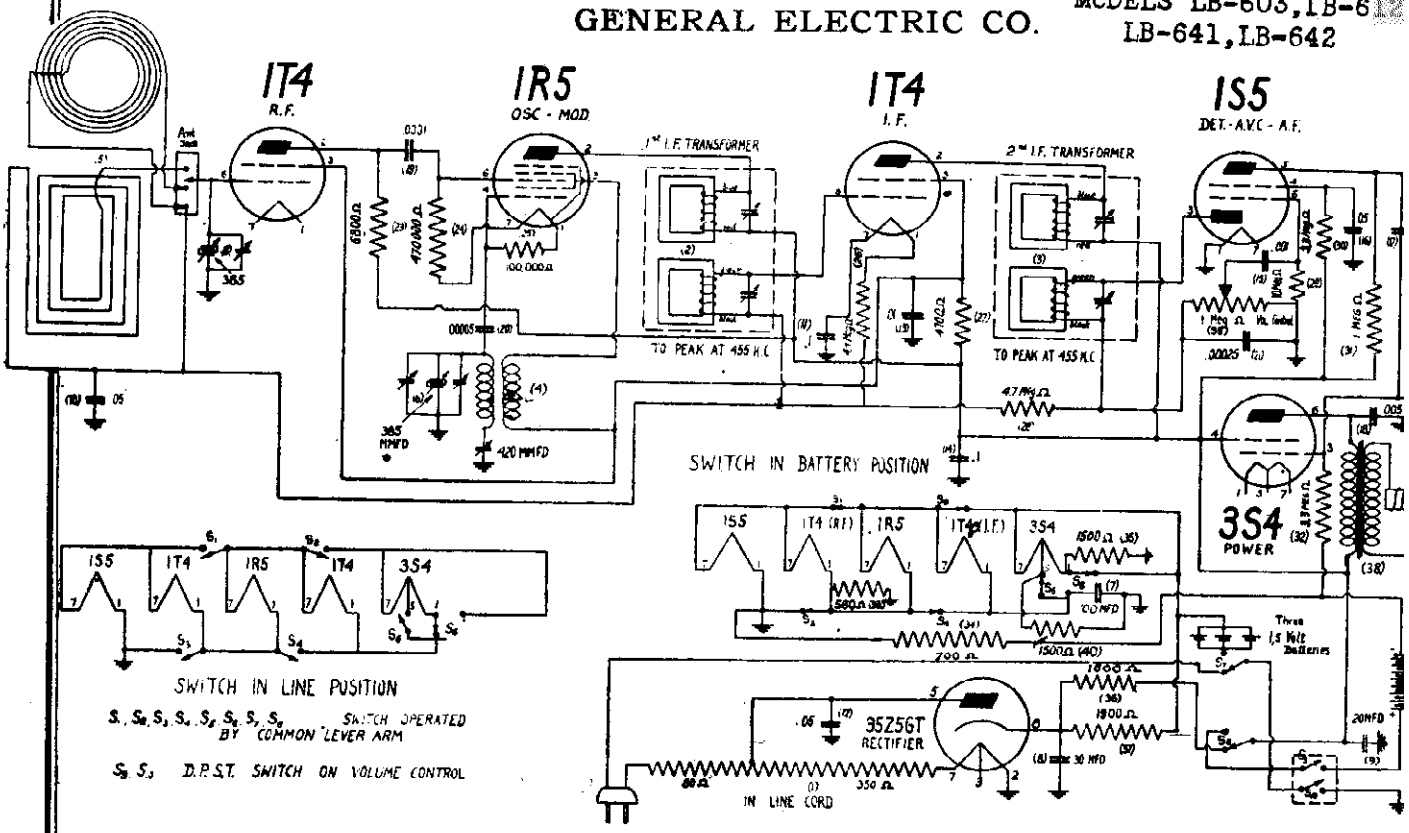
(2) Audio Gain
.14 volts, 400 cycles signal across volume control with control set at maximum, will give approximately ½-watt speaker output.

(3) DC voltage developed across oscillator grid resistor (R4) averages 10.0 volts at 1000 KC.
Variations of ±20% permissible. All readings obtained with enough signal input to give ½-watt speaker output.

(PRICES SUBJECT TO CHANGE WITHOUT NOTICE)

GENERAL ELECTRIC CO.

MODELS LB-603, LB-612
LB-641, LB-642



SERVICE NOTES

Battery Specifications.....Three Eveready No. 950, Burgess No. 2 or equivalent. One Eveready No. 467 Burgess No. XX45 or equivalent.

Intermediate Frequency .....455 K.C.
Tuning Frequency range .....540-1700 K.C.
Maximum Power Output .....150 Milliwatts
Loud Speaker .....Cone Diameter-4 inches
Voice Coil Impedance .....(400 cycles) 3½ ohms
Tubes: R. F. 1T4, Converter-Oscillator 1R5, I. F. 1T4, Detector, A. V. C. 1S5, Power Output 3S4, Rectifier 35Z5GT

ALIGNMENT PROCEDURE

Alignment Frequencies R. F. ..... 600-1500-1700 K. C.
I. F. .....455 K. C.

I. F. Alignment

Connect an output meter across the voice coil. Rotate the volume control to maximum. Set test oscillator to 455 kilocycles and apply signal to control grid of 1T4 R. F. tube through a .05 mfd. capacitor. Align the second I. F. transformer trimmers, next adjust the first I. F. trimmers. Keep the test output to a level that will give a good meter reading.

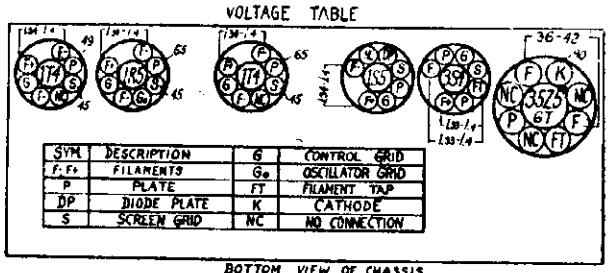
R. F. Alignment

Place a one turn loop not closer than six inches from the receiver Beam-a-Scope which is located in the front cover. Apply a 1700 kilocycles signal to the coupling loop. Adjust the receiver to 1700 kilocycles by turning the variable condenser until it is in the extreme clockwise position. Align the oscillator trimmer (C-1A). Set the signal generator to 1500 kilocycles. Turn the receiver tuning condenser until the generator signal is picked up. Peak (C-1B) for maximum output. Change the test signal to 600 kilocycles and turn the condenser until signal is heard. Peak (C-2) while rocking the gang variable.

The Beam-a-Scope leads should be dressed the same after the components are mounted in the cabinet as during alignment.

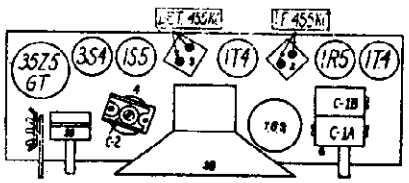
2. The batteries are easily installed or replaced. When the back of the cabinet is opened, the battery compartment is accessible. Place the dry cell batteries on the right side with brass terminal toward the outside. Snap the red lead terminal to the positive (+) terminal of the "B" battery. The blue lead should be snapped to the negative (-) terminal. Place the "B" battery on the left side of the compartment with the terminals toward the center. The sketch inside the cabinet will be found an aid in connecting the batteries properly.

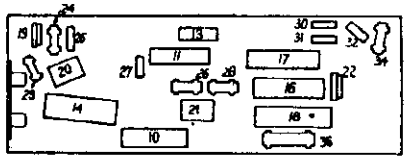
VOLTAGE TABLE



SYM.	DESCRIPTION	G	CONTROL GRID
F-F+	FILAMENTS	G_o	OSCILLATOR GRID
P	PLATE	FT	FILAMENT TAP
DP	DIODE PLATE	K	CATHODE
S	SCREEN GRID	NC	NO CONNECTION

BOTTOM VIEW OF CHASSIS
ALL FILAMENT VOLTAGES MEASURED ACROSS SOCKET TERMINALS, OTHER VOLTAGES MEASURED FROM SOCKET TERMINAL TO GROUND WITH A 1000 Ω PER VOLT VOLTMETER

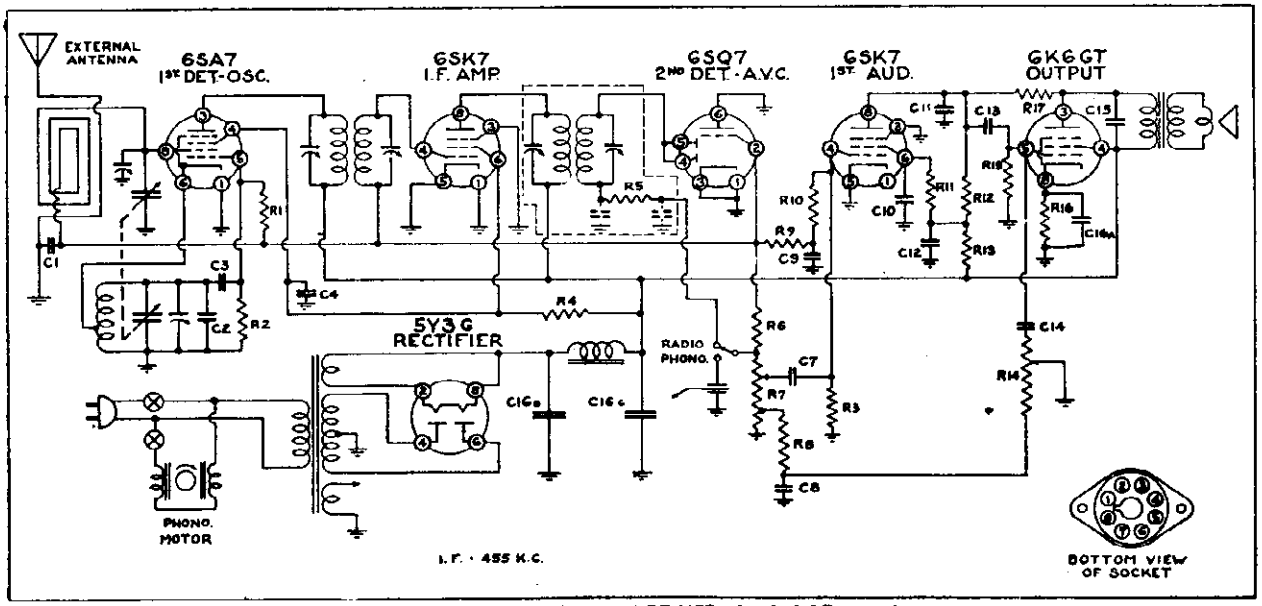




BOTTOM VIEW OF CHASSIS
PARTS 12 15 29 33 35 40 LOCATED ON TOP OF CHASSIS

MODEL LC-608

GENERAL ELECTRIC CO.



C5 and C6 are an integral part of RT-397R, the 2nd I.F. transformer.

No.	Ohms	Watts	No.	Ohms	Watts
	RESISTORS				
R1	10,000,000	½	R10	5,000,000	½
R2	20,000	½	R11	1,000,000	½
R3	5,000,000	½	R12	250,000	½
R4	15,000—10%	2	R13	50,000	½
R5	70,000	½	R14	500,000	T.C.
R6	2,000,000	½	R15	500,000	½
R7	500,000	V.C.	R16	800—10%	½
R8	20,000	½	R17	3,000,000	½
R9	1,000,000	½			

No.	Capacity (Mfd.)	Volts	No.	Capacity (Mfd.)	Volts
	CONDENSERS				
C1	.05	200	C10	.05	400
C2	.000025—10%	Mica	C11	.00025	Mica
C3	.00005	Mica	C12	.1	400
C4	.05	400	C13	.01	400
C5	.0001	Mica	C14	.005	600
C6	.0001	Mica	C15	.002	600
C7	.01	400	C16a	20.	25
C8	.02	200	C16b	20.	350
C9	.05	200	C16c	20.	350

ALIGNMENT DATA

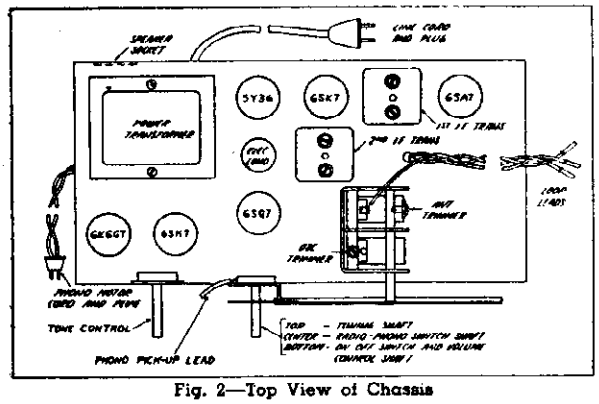


Fig. 2—Top View of Chassis

For Radio Products RC-50 Record Changer see Riders "Automatic Record Changers and Recorders."

The alignment of this receiver requires the use of a signal generator that will cover the frequencies of 455, 600, 1400 and 1630 kc., and an output meter to be connected across the primary or secondary of the output transformer. All alignments should be made with the volume control in the maximum position, to prevent the AVC from operating and giving false readings.

I.F. ALIGNMENT

Adjust the signal generator to 455KC and connect the output to the grid of the first detector tube (6SA7) through a .05 or .1 mfd. condenser. Align all I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT

Adjust the signal generator to 1630 KC. and connect the output to a shielded loop radiator and place this loop about two feet from the loop antenna. If no loop radiator is available the output of the signal generator should be connected to the blue lead extending from the loop antenna through a .0002 mfd. mica condenser. Set the gang condenser to minimum capacity and adjust the oscillator trimmer (See Fig. 2) to receive this signal. After this has been carefully done, the next step is to set the signal generator to 1400 K.C. and after tuning in the signal adjust the antenna trimmer to peak. This is all that is necessary for the alignment unless the plates of the gang condenser have been bent out of shape. In case of bent plates, set the signal generator and the receiver to 600 K.C. and bend the plates into the position for maximum sensitivity over the tuning range.

SERVICE INFORMATION

Speaker (RS-1068R) 6½" P.M. Type.
D.C. voice coil **resistance**.....2.8 ohms
Voice coil impedance at 400 cycles.....3.1 ohms
Oscillator Coil (RL-2058R)
Looking at the connection end in a clockwise direction starting at the chassis the terminals are: No. 1, end of winding; No. 2, start of winding; No. 3, tap.
No. 1 and No. 2—**Resistance**.....4.5 ohms
No. 1 and No. 3—**Resistance**.....4.05 ohms
No. 2 and No. 3—**Resistance**.....45 ohm

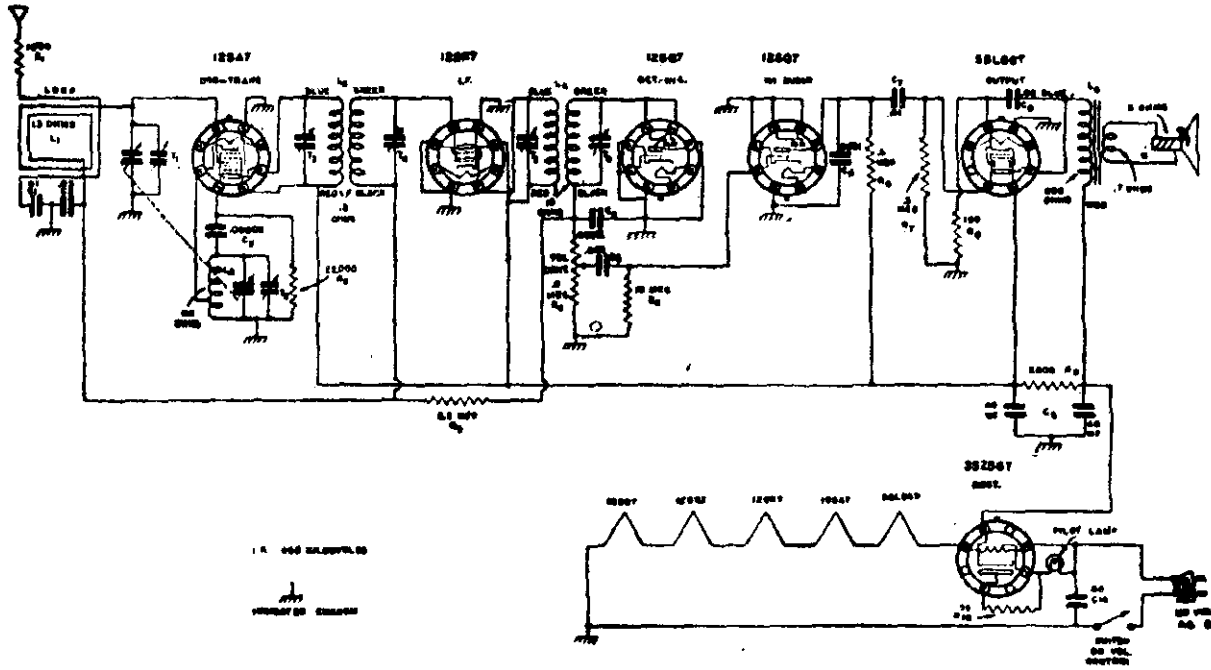
First I.F. Transformer (RT-396R)
Primary—Blue, plate; red, B+
Resistance.....18.2 ohms
Secondary—White, grid; black, AVC
Resistance.....15.1 ohms
Second I.F. Transformer (RT-397R)
Primary—Blue, plate; red, B+
Resistance.....20.9 ohms
Secondary—White, diode; black, AVC
Resistance.....17.4 ohms

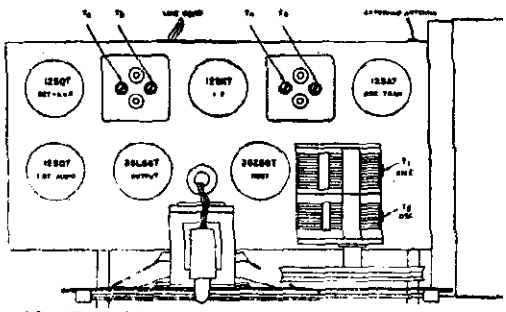
VOLTAGE CHART

All voltages measured with a 1,000 ohm per volt meter on the 300 volt scale. Line voltage 117 volts A.C. Volume control maximum and no signal tuned in. Power consumption 75 watts.

6SA7 TUBE	Volts
Plate (3) to ground	255
Screen (4) to ground	93
6SK7 (I. F.) TUBE	**Volts**
Plate (8) to ground	255
Screen (6) to ground	93
6K6G TUBE	
Plate (3) to ground	240
Screen (4) to ground	258
Cathode (8) to ground	18
5Y3G TUBE	
Filament (8) to ground	266

GENERAL ELECTRIC CO.





Intermediate Frequency	455 K.C.
Tuning Frequency Range	540-1720 K.C.
Audio, Power Output (Beam Power)	1.7 Watts
P. M. Speaker	Cone Diameter—4 Inches
Voice Coil Impedance (400 cycles)	3.5 Ohms

OPERATING VOLTAGES (Approximately)

(Measured with respect to chassis at 117 Volt Line)

TUBES		SCREEN VOLTS	PLATE VOLTS
12SA7	Converter Oscillator	75	75
12SK7	I-F	75	75
12SQ7	Detector - A. V. C.	—	—
12SQ7	1st Audio	—	30*
35L6GT	Output	75	108
35Z5GT	Rectifier	Voltage at Anode .115	

* 300 Volt Range of 1000 Ohm-per-Volt Meter

ALIGNMENT PROCEDURE

Alignment Frequencies:

I. F.	455 K.C.
R. F.	1500 K.C.

I. F. Alignment

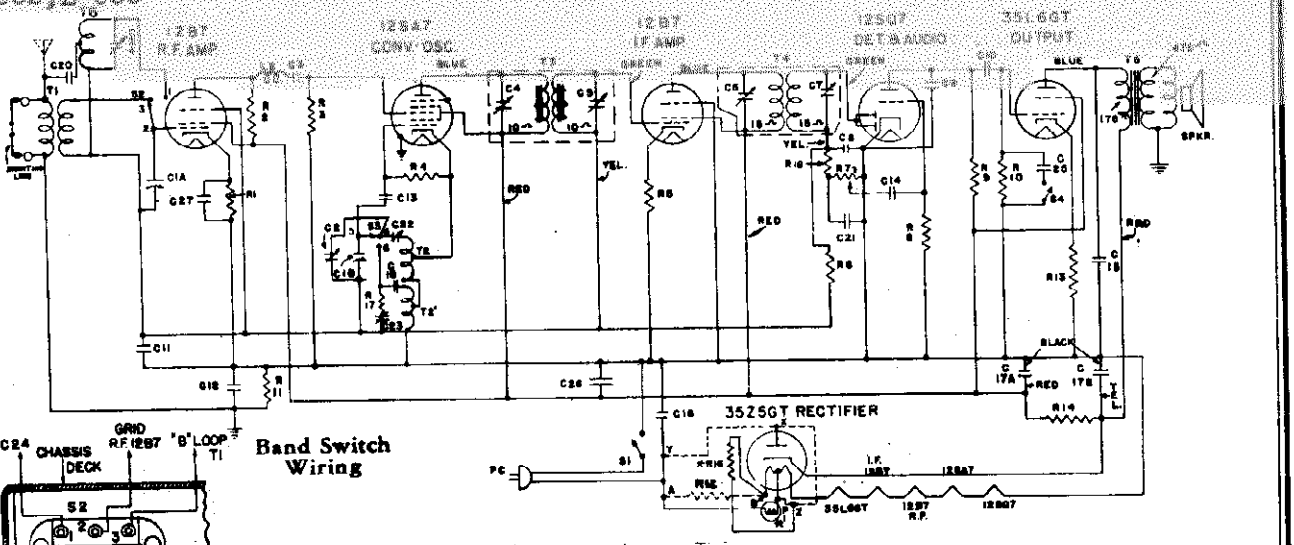
Connect an output meter across the voice coil. Rotate the volume to maximum. Set test oscillator to 455 K.C. and apply signal to lug on stator of gang condenser to which loop is connected through a .05 Mfd. capacitor. Align the second I. F. transformer trimmers, next adjust the first I. F. transformer trimmers. Keep test oscillator output as low as a readable-meter reading will permit.

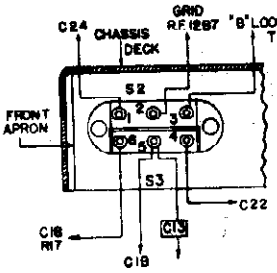
R. F. Alignment

Set the dial pointer and generator at 1500 K.C. I a wire from the output terminal of the generator, hav it come near the receiver. However, no metallic conn tion is made between the signal generator and receiver.

Peak the oscillator trimmer for maximum output then the antenna trimmer.

If the variable condenser plates have become b or damaged, it may be necessary to adjust them tracking, at 600 K.C. The oscillator plates are adjus first, then the antenna plates are adjusted for maxim output at 600 K.C.





Band Switch Wiring

On 40–60 cycle receivers, omit R12 and connect A–B & X–Z.
On 25-cycle receivers, add R12 and connect X–Y.
R16 used only when No. 47 pilot lamp is used.

IF PEAK 455 KC

ALIGNMENT CHART

Step	Connect Test-Osc. to	Test-Osc. Setting	Pointer Setting	Adjust Trimmers for Max. Output
1	12B7 IF Grid in series with .05 mfd.	455 KC	"BC" Band 550 KC	C6 & C7
2	6SA7 Conv. grid in series with .05 mfd.	455 KC	"BC" Band 550 KC	C4 & C5
3	Capacity Coupled	580 KC	"BC" Band 580 KC	C22**
4	Capacity Coupled	1500 KC	"BC" Band 1500 KC	C2** (Osc.)
5	REPEAT STEP 3			
6	Capacity Coupled	18 MC	"SW" Band 18 MC	C23* (Osc.)
7	Capacity Coupled	18 MC	"SW" Band 18 MC	C24** (Ant.)

* Use minimum capacity peak.
** Rock gang condenser when making alignment.

Special Service Information

(1) Stage gains

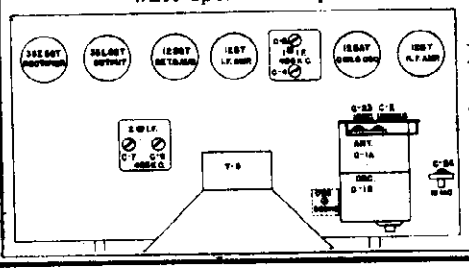
Antenna post to RF grid—3.0 at 1000 KC
RF grid to converter grid—6.0 at 1000 KC
Converter grid to IF grid—50 at 455 KC
IF grid to 12SQ7 diode plate—75 at 455 KC

(2) Audio gains

.14 volts, 400 cycles signal across volume control with control set to maximum will give approximately ½-watt speaker output.

(3) DC voltage developed across oscillator grid resistor (R4) averages 9.0 volts at 1000 KC or 8.0 volts at 10,000 KC.

* Variations of ±20% permissible. All readings obtained with enough signal input to give ½-watt speaker output.



PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Electrical Power Output (117 line volts)

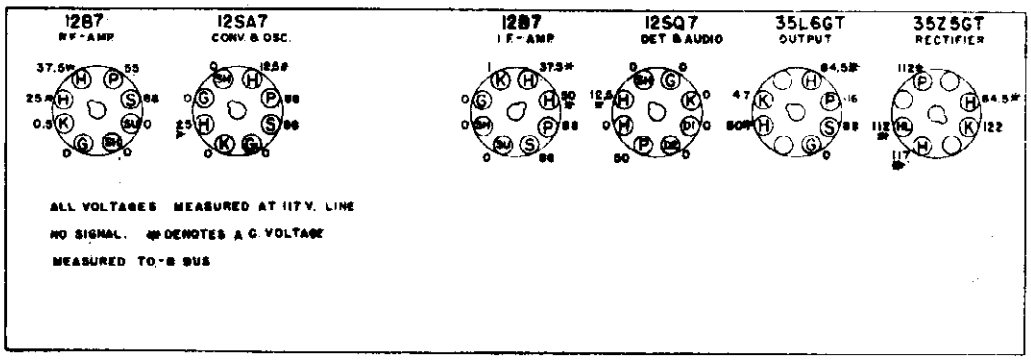
Undistorted.....1.1 watts
Maximum.....1.6 watts

Loud-speaker—PM Dynamic

Outside Cone Diameter.....5 inches
Voice Coil Impedance (400 cycles)...3.5 ohms

REPLACEMENT PARTS LIST

Stock No.	Symbol	Description	List Price
*RC-7050	C1a, 1b	CONDENSER—Tuning condenser	$1.95
*RC-6547	C2	CAPACITOR—"BC" and "SW" Osc. trimmer assembly	.30
*RC-235	C3	CAPACITOR—100 mmf., mica	.25
*RC-274	C8	CAPACITOR—330 mmf., mica	.30
*RC-242	C9	CAPACITOR—150 mmf., mica	.25
*RC-039	C10	CAPACITOR—.01 mfd., 600 V paper	.25
*RC-072	C11	CAPACITOR—.05 mfd. 200 V paper	.25
*RC-104	C12	CAPACITOR—0.1 mfd. 600 V paper	.30
*RC-216	C13	CAPACITOR—47 mmf. mica	.25
*RC-023	C14	CAPACITOR—.005 mfd. 600 V paper	.25
*RC-039	C15	CAPACITOR—.01 mfd. 600 V. paper	.25
*RC-092	C16	CAPACITOR—.05 mfd. 600 V. paper	.30
*RC-5183	C17a, 17b	CAPACITOR—50 mfd. 60 mfd. 150 V. Electrolytic	.80
*RC-391	C18	CAPACITOR—4300 mmf. mica	.35
*RC-209	C20	CAPACITOR—39 mmf. mica	.25
*RC-235	C21	CAPACITOR—100 mmf. mica	.25
*RC-6548	C22	CAPACITOR—"B" padder	.35
*RC-6547	C23	CAPACITOR—"SW" and "BC" Osc. Trimmer Assembly	.30
*RC-6546	C24	CAPACITOR—"SW" band ant. trimmer	.20
*RC-053	C25	CAPACITOR—.0032 mfd 600 V. paper	.25
*RC-039	C-26, 27	CAPACITOR—.01 mfd. 600-V paper	.25
*RQ-1227	R-1	RESISTOR—47 ohm, ½-W. carbon	.70–5
*RQ-1275	R-2	RESISTOR—4700 ohm, ½-W carbon	.70–5
*RQ-1299	R-3	RESISTOR—47,000 ohm, ½-W carbon	.70–5
*RQ-1295	R-4	RESISTOR—33,000 ohm, ½-W carbon	.70–5
*RQ-1235	R-5	RESISTOR—100 ohm, ½-W carbon	.70–5
*RQ-1339	R-6	RESISTOR—2.2 megohm, ½-W carbon	.70–5
*RV-120	R-7, S-1	VOL. CONTROL—0.5 megohm with power switch (Models L-621, 624, 632, 633)	1.45
RV-131	R-7, S-1	VOL. CONTROL—0.5 megohm with power switch (Model L-613 only)	1.45
*RQ-1349	R-8	RESISTOR—5.6 megohm, ½-W. carbon	.70–5
*RQ-1315	R-9	RESISTOR—220,000 ohm, ½-W carbon	.70–5
*RQ-1323	R-10, 11	RESISTOR—470,000 ohm ½-W carbon	.70–5
*RQ-1213	R-12	RESISTOR—12 ohm, ½-W. carbon	.70–5
*RQ-1239	R-13	RESISTOR—150 ohm, ½-W. carbon	.70–5
*RQ-651	R-14	RESISTOR—1000 ohm, 2-W. carbon	.20
*RQ-1255	R-16	RESISTOR—680 ohm, ½-W. carbon	.70–5
*RQ-1231	R-17	RESISTOR—68 ohm, ½-W. carbon	.70–5
*RQ-1299	R-18	RESISTOR—47,000 ohm, ½-W. carbon	.70–5
*RL-1012	L-2	COIL—R.F. Choke coil	.20



FRONT OF CHASSIS
BOTTOM VIEW OF CHASSIS

G.E. Models L-613, L-621, L-624, L-632, L-633.

GENERAL INFORMATION

Two different types of record changers were used during the production of the Model LC-619 phonograph combination.

The Model LRP-170 record changer is identified by the single record post and the eccentric turntable spindle, whereas the LRP-162 changers make use of a two-post record holder. Different pickup compensation is used for the two changers as noted at the bottom of the schematic diagram and the change in value of resistors, R12 and R16, as given in the replacement parts list.

Special Service Information

The following data are taken with a vacuum tube voltmeter or similar voltage measuring device.

(1) Stage Gains
Antenna Post to RF Grid — 5 at 1000 KC
RF Grid to Converter Grid — 5 at 1000 KC

(2) Audio Gains
.14 volts, 400 cycles signal across volume control with control set to maximum will give approximately ½-watt speaker output.

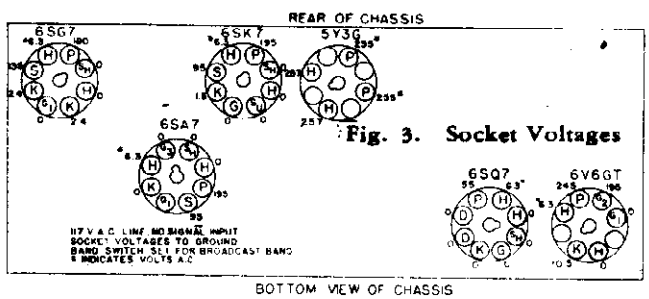
(3) DC voltage developed across oscillator grid resistor R4 averages 10 volts at 1000 KC or 8.0 volts at 10,000 KC.

Variations of ±20% permissible. All readings taken with AVC shorted out.

ALIGNMENT PROCEDURE

The location of trimmers is shown in Fig. 4. All oscillator and RF trimmers are accessible through a slot through the back cover of the cabinet.

The alignment procedure is given in table form. All IF alignments may be made with the chassis removed from the cabinet. However, the RF alignments are made with the chassis and loop antennas securely fastened in the cabinet, as the relative position of the loop antenna with respect to the chassis materially affects it. The RF signal should be capacity coupled by placing a two-foot wire for an antenna on the test-oscillator output post (high side). Keeping this antenna two feet or more from the receiver loop will generally insure freedom from too much coupling. Metal objects such as meters, tools, etc., should not be placed on top of the receiver cabinet.



BOTTOM VIEW OF CHASSIS

Fig. 3. Socket Voltages

Model LC 619 ALIGNMENT CHART

Step	Connect Test-Osc. to	Test-Osc. Setting	Pointer Setting	Adjust Trimmers for Maximum Output
1	6SK7 IF Grid in series with .05 mfd.	455 KC	"BC" Band 550 KC	C6 & C7
2	6SA7 Conv. grid in series with .05 mfd.	455 KC	"BC" Band 550 KC	C4 & C5
3	Repeat Step 1			
4	Capacity Coupled	580 KC	"BC" Band 580 KC	C22**
5	Capacity Coupled	1500 KC	"BC" Band 1500 KC	C2** (Osc.)
6	Repeat Step 4			
7	Capacity Coupled	18 MC	"SW" Band 18 MC	C23* (Osc.)
8	Capacity Coupled	18 MC	"SW" Band 18 MC	C24** (Ant.)

* Use minimum capacity peak.
** Rock gang condenser when making alignment.

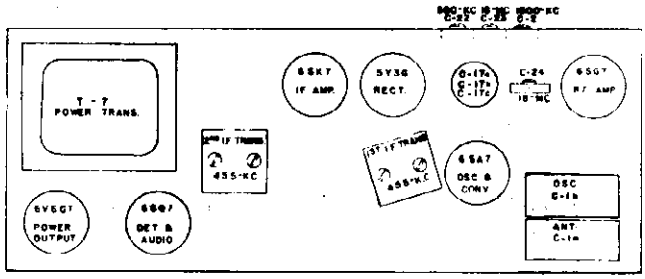


Fig. 4. Trimmer Location

Electrical Rating

Rating "A6"—110-125 volts, 60 cycles, 80 watts.
Rating "A5"—110-125 volts, 50 cycles, 80 watts.

Tuning Frequency Range

"BC" Band ..... 540–1720 KC
"SW" Band ..... 5.3–18.0 MC

Intermediate Frequency ..... 455 KC

Electrical Power Output

Undistorted ..... 2.5 watts
Maximum ..... 4.5 watts

Loud-speaker—PM Dynamic

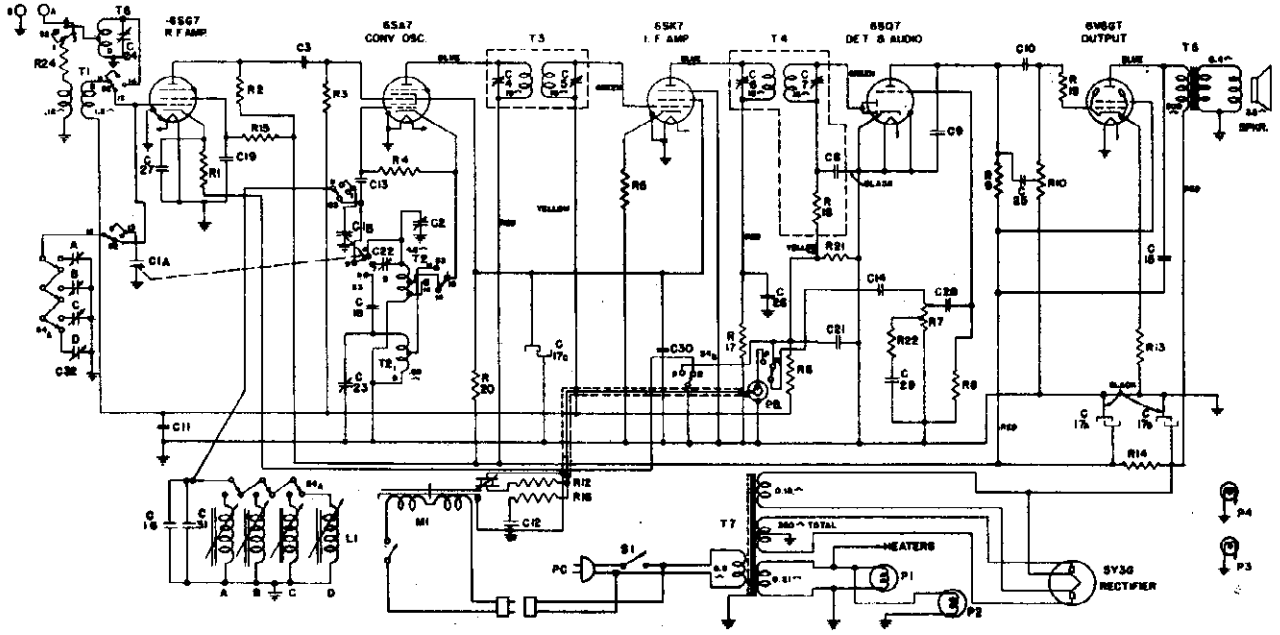
Outside Cone diameter ..... 12 inches
Voice Coil Impedance (400 cycles) ..... 3.5 ohms

Phonograph Mechanism

Type changer ..... Models LRP-162 or LRP-17
Type pickup ..... Crystal
Turntable speed ..... 78 Rpm

GENERAL ELECTRIC CO.

For Modified General Industries 201 Record Changer or RCA RP-162 Record Changer see Riders "Automatic Record Changers, and Recorders.



NOTE—C12 IS OMITTED WHEN RECORD CHANGER RP-162 IS USED

Fig. 1. Schematic Diagram

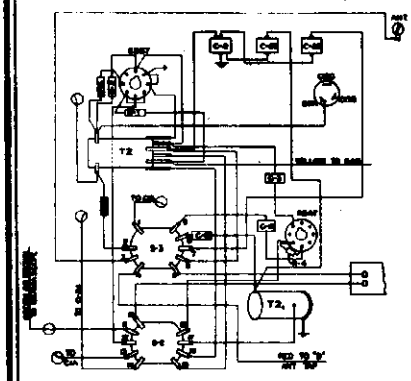


Fig. 2. Switch Wiring

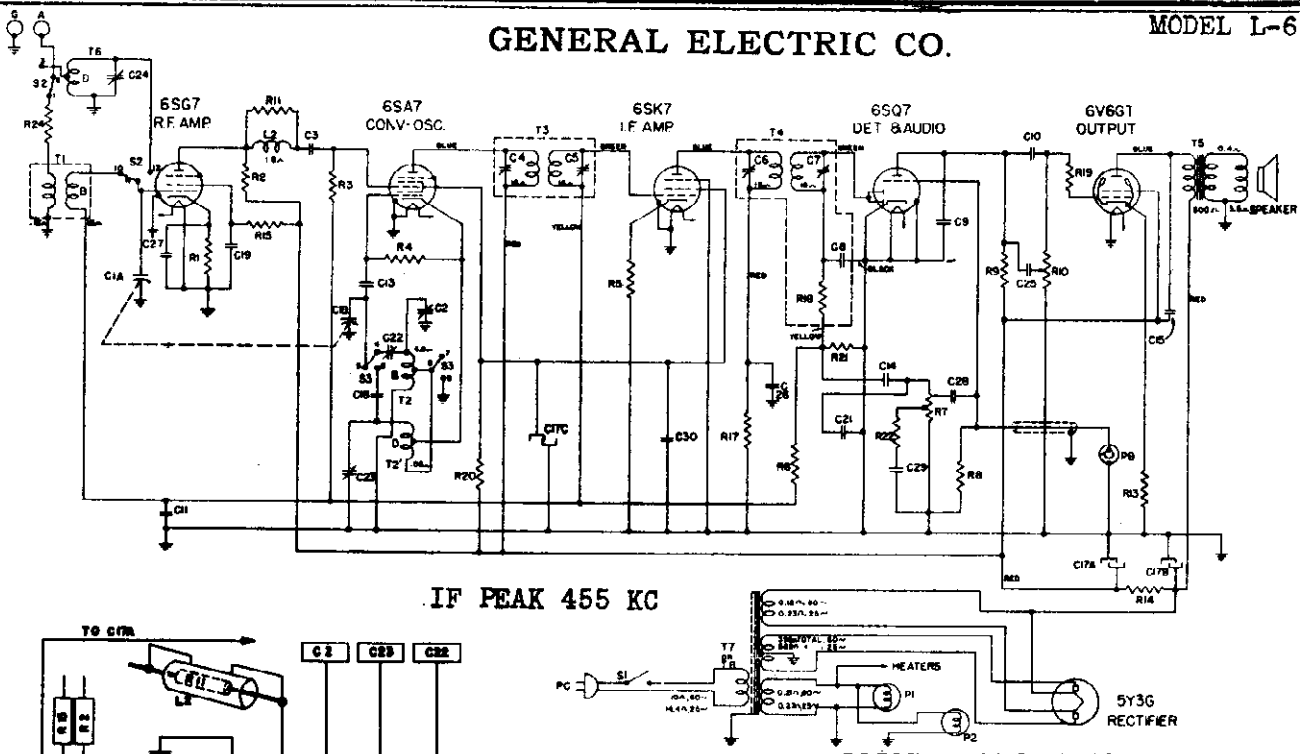
RADIO REPLACEMENT PARTS LIST

Our Cat. Number	Symbol	Description	List Price
*RC-7061	C1a, C1b	CONDENSER—2 gang tuning condenser	$2.00
*RC-6552	C-2	CAPACITOR—"B" band trimmer (Part of C22, 23)	.55
*RC-235	C-3	CAPACITOR—100 mmf., mica	.25
*RC-252	C-8	CAPACITOR—200 mmf., mica	.30
*RC-242	C-9	CAPACITOR—150 mmf., mica	.25
*RC-048	C-10	CAPACITOR—.02 mfd. 600-V paper	.30
*RC-072	C-11	CAPACITOR—.05 mfd. 200-V paper	.25
*RC-011	C-12	CAPACITOR—.002 mfd. 600-V paper (Used with Model LRP-170 record player only)	.25
*RC-216	C-13	CAPACITOR—47 mmf., mica	.25
*RC-023	C-14	CAPACITOR—.005 mfd. 600-V paper	.25
*RC-055	C-15	CAPACITOR—.003 mfd. 600-V paper	.25
*RC-329	C-16	CAPACITOR—150 mmf., compensating capacitor	.25
*RC-5201	C-17a	CAPACITOR—30 mfd. 250-V dry electrolytic	.95
	C-17b	CAPACITOR—30 mfd. 300 volt dry electrolytic	
	C-17c	CAPACITOR—10 mfd. 250 volt dry electrolytic	
*RC-390	C-18	CAPACITOR—3900 mmf. mica	.35
*RC-039	C-19	CAPACITOR—.01 mfd. 600-V paper	.25
*RC-235	C-21	CAPACITOR—100 mmf., mica	.25
*RC-6552	C-22	CAPACITOR—"B" padder (Part of C2, 23)	.55
*RC-6552	C-23	CAPACITOR—"D" Osc. trimmer (Part of C2, 22)	.55
*RC-6553	C-24	CAPACITOR—"D" antenna trimmer	$0.25
*RC-023	C-25	CAPACITOR—.005 mfd. 600-V paper	.25
*RC-039	C-26, 27, 28	CAPACITOR—.01 mfd. 600-V paper	.25
*RC-049	C-29	CAPACITOR—.0042 mfd. 600-V paper	.35
*RC-039	C-30	CAPACITOR—.01 mfd. 600-V paper	.25
*RC-305	C-31	CAPACITOR—600 mmf., silvered mica	.25
*RT-885	C-32a, b, c, d	TRIMMER STRIP—Push button trimmer strip	.70
*RQ-1247	R-1	RESISTOR—330 ohm, ½-W carbon	.70-5
*RQ-1271	R-2	RESISTOR—3300 ohm, ½-W carbon	.70-5
*RQ-1299	R-3	RESISTOR—47,000 ohm, ½-W carbon	.70-5
*RQ-1291	R-4	RESISTOR—22,000 ohm, ½-W carbon	.70-5
*RQ-1239	R-5	RESISTOR—150 ohm, ½-W carbon	.70-5
*RQ-1339	R-6	RESISTOR—2.2 megohm, ½-W carbon	.70-5
*RV-135	R-7	VOL. CONTROL—2 meg. volume control	.95
*RQ-1355	R-8	RESISTOR—10 megohm, ½-W carbon	.70-5
*RQ-1323	R-9	RESISTOR—470,000 ohm, ½-W carbon	.70-5
*RT-722	R-10, S1	TONE CONTROL—0.5 meg. tone control	1.45
*RQ-1299	R-12	RESISTOR—47,000 ohm, ½-W carbon (Used only with Model LRP-170 record player)	.70-5
*RQ-1315	R-12	RESISTOR—220,000 ohm, ½-W carbon (Used only with Model LRP-162 record player)	.70-5
*RQ-1247	R-13	RESISTOR—330 ohm, ½-W carbon	.70-5
*RQ-665	R-14	RESISTOR—1800 ohm, 2-W carbon	.20
*RQ-1293	R-15	RESISTOR—27,000 ohm, ½-W carbon	.70-5
*RQ-1299	R-16	RESISTOR—47,000 ohm, ½-W carbon (Used only with Model LRP-170 record player)	.70-5
*RQ-1313	R-16	RESISTOR—180,000 ohm, ½-W carbon (Used only with Model LRP-162 record player)	.70-5
*RQ-1259	R-17	RESISTOR—1000 ohm, ½-W carbon	.70-5
*RQ-1299	R-18	RESISTOR—47,000 ohm, ½-W carbon	.70-5
*RQ-1259	R-19	RESISTOR—1000 ohm, ½-W carbon	.70-5
*RQ-653	R-20	RESISTOR—10,000 ohm, 2-W carbon	.35
*RQ-1323	R-21	RESISTOR—470,000 ohm, ½-W carbon	.70-5
*RQ-1303	R-22	RESISTOR—68,000 ohm, ½-W carbon	.70-5
*RQ-1259	R-24	RESISTOR—1000 ohm, ½-W carbon	.70-5
*RL-9530	L1-a, b, c, and d	COIL—Push button coil assembly	.65
RS-3142	S-2, S-3	SWITCH—Band switch	1.10
*RS-3130	S4a, 4b	SWITCH—Touch tuning switch	4.00
RL-591	T-1	BEAM-A-SCOPE—"B" band loop	1.20
RL-2073	T-2	COIL—"B" band oscillator coil	.50
RL-2074	T-2'	COIL—"D" band oscillator coil	.30
*RT-3005	T-3	TRANSFORMER—1st IF transformer	.90
RT-3010	T-4	TRANSFORMER—2nd IF transformer	1.20
*RT-4013	T-5	TRANSFORMER—Output transformer	1.25
RL-592	T-6	BEAM-A-SCOPE—"D" band loop	.50
*RT-0621	T-7	TRANSFORMER—50 or 60 cycle power transformer	4.25
*RS-1081	SPKR	SPEAKER—12 inch PM speaker	5.50

Prices subject to change without notice.

* Used on previous receivers.

GENERAL ELECTRIC CO.



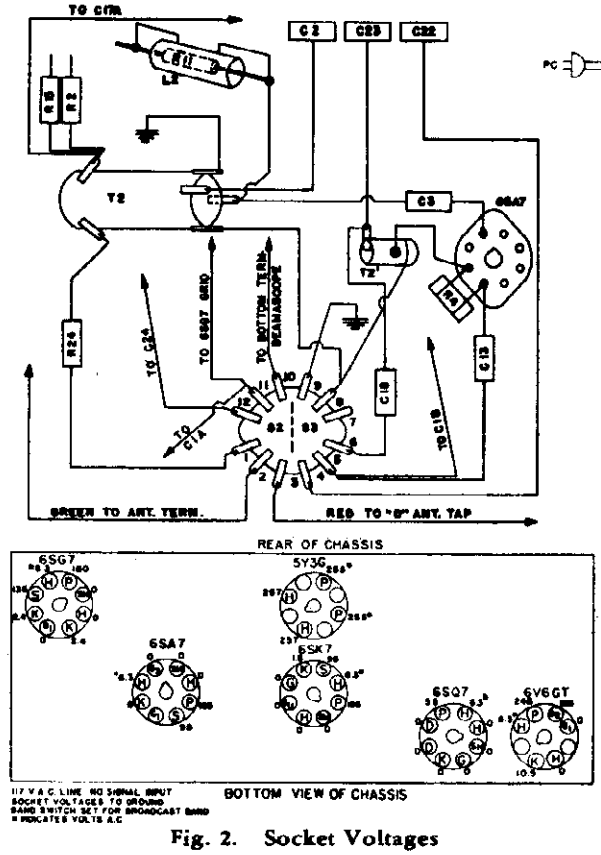


Fig. 2. Socket Voltages

ALIGNMENT CHART

Step	Connect Test-Osc. to	Test-Osc. Setting	Pointer Setting	Adjust Trimmers for Maximum Output
1	6SK7 IF Grid in series with .05 mfd.	455 KC	"BC" Band 550 KC	C6 & C7
2	6SA7 Conv. grid in series with .05 mfd.	455 KC	"BC" Band 550 KC	C4 & C5
3	Capacity Coupled	580 KC	"BC" Band 580 KC	C22**
4	Capacity Coupled	1500 KC	"BC" Band 1500 KC	C2** (Osc.)
5	Repeat Step 3			
6	Capacity Coupled	18 MC	"SW" Band 18 MC	C23* (Osc.)
7	Capacity Coupled	18 MC	"SW" Band 18 MC	C24** (Ant.)

* Use minimum capacity peak.
** Rock gang condenser when making alignment.

ALIGNMENT PROCEDURE

The location of trimmers is shown in Fig. 1. All oscillator and RF trimmers are accessible through a slot through the back cover of the cabinet.

The alignment procedure is given in table form. All IF alignments may be made with the chassis removed from the cabinet. However, the RF alignments are made with the chassis and loop antennas securely fastened in the cabinet as the relative position of the loop antenna with respect to the chassis materially affects it. The RF signal should be capacity coupled by placing a two-foot wire for an antenna on the test-oscillator output post (high side). Keeping this antenna two feet or more from the receiver loop will generally insure freedom from too much coupling. Metal objects such as meters, tools, etc., should not be placed on top of the receiver cabinet.

Special Service Information

The following data are taken with a vacuum tube voltmeter similar voltage measuring device.

(1) Stage Gains

Antenna Post to RF Grid	5 at 1000 KC
RF Grid to Converter Grid	5 at 1000 KC
Converter Grid to IF Grid	40 at 1000 KC
Converter Grid to IF Grid	60 at 455 KC
IF Grid to 6SQ7 diode plates	90 at 455 KC

(2) Audio Gains
.14 volts, 400 cycles signal across volume control with control set to maximum will give approximately ½-watt speaker output.

(3) DC voltage developed across oscillator grid resistor R4 averages 10 volts at 1000 KC or 8.0 volts at 10,000 KC.

Variations of ±20% permissible. All readings taken with AVC shorted out.

GENERAL ELECTRIC CO.

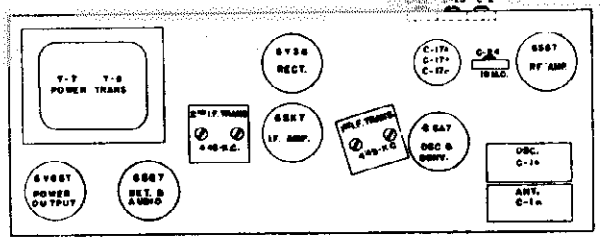


Fig. 1. Trimmer Location

Electrical Power Output

Undistorted.....2.5 watts
Maximum.....4.5 watts

Loudspeaker—PM Dynamic

Outside Cone Diameter.....5 inches
Voice Coil Impedance (400 cycles).....3.5 ohms

REPLACEMENT PARTS LIST MODEL L-630

Our Stock No.	Symbol	Description	List Price
RC-7061	C1A, 1B	CONDENSER—Tuning condenser	$2.00
RC-6552	C2	CAPACITOR—"B" osc. trimmer strip (Combined with C22, 23)	.55
*RC-235	C3	CAPACITOR—100 mmf., mica	.25
*RC-252	C8	CAPACITOR—200 mmf., mica	.30
*RC-242	C9	CAPACITOR—150 mmf., mica	.25
*RC-048	C10	CAPACITOR—.02 mfd., 600 V, paper	.30
*RC-072	C11	CAPACITOR—.05 mfd., 200 V, paper	.25
*RC-216	C13	CAPACITOR—47 mmf., mica	.25
*RC-023	C14	CAPACITOR—.005 mfd., 600 V, paper	.25
*RC-055	C15	CAPACITOR—.003 mfd., 600 V, paper	.25
*RC-5164	C17a, 17b, 17c	CAPACITOR—15 mfd., 250 V, 30 mfd., 300 V., 10 mfd., 250 V, dry electrolytic	1.00
*RC-390	C18	CAPACITOR—3900 mmf., mica	.35
*RC-039	C19	CAPACITOR—.01 mfd., 600 V, paper	.25
*RC-235	C21	CAPACITOR—100 mmf., mica	.25
RC-6552	C-22	CAPACITOR—"B" band padder (Combined with C2, 23)	.55
RC-6552	C-23	CAPACITOR—"D" osc. trimmer (Combined with C2, 22)	.55
RC-6553	C-24	CAPACITOR—"D" antenna trimmer	.15
*RC-023	C25	CAPACITOR—.005 mfd., 600 V, paper	.25
*RC-092	C26	CAPACITOR—.05 mfd., 600 V, paper	.30
*RC-047	C27, 28	CAPACITOR—.01 mfd., 400 V, paper	.20
*RC-017	C29	CAPACITOR—.0042 mfd., 600 V, paper	.25
*RC-039	C30	CAPACITOR—.01 mfd., 600 V, paper	.25
*RQ-1247	R1	RESISTOR—330 ohm, ½-W, carbon	.70-5
*RQ-1271	R-2	RESISTOR—3300 ohm, ½-W, carbon	.70-5
*RQ-1299	R-3	RESISTOR—47,000 ohm, ½-W, carbon	.70-5
*RQ-1291	R-4	RESISTOR—22,000 ohm, ½-W, carbon	.70-5
*RQ-1239	R-5	RESISTOR—150 ohm, ½-W, carbon	.70-5
*RQ-1339	R-6	RESISTOR—2.2 megohm, ½-W, carbon	.70-5
RV-135	R-7	VOLUME CONTROL—2 meg. volume control	.95
*RQ-1347	R-8	RESISTOR—4.7 megohms, ½-W., carbon	.70-5
*RQ-1323	R-9	RESISTOR—470,000 ohm, ½-W., carbon	.70-5
RT-722	R-10, S-1	TONE CONTROL—0.5 meg. control and power switch	$1.45
*RQ-1283	R-11	RESISTOR—10,000 ohm, ½-W., carbon	.70-5
*RQ-1247	R-13	RESISTOR—330 ohm, ½-W., carbon	.70-5
*RQ-665	R-14	RESISTOR—1800 ohm, 2-W., carbon	.20
*RQ-1293	R-15	RESISTOR—27,000 ohm, ½-W., carbon	.70-5
*RQ-1259	R-17	RESISTOR—1000 ohm, ½-W., carbon	.70-5
*RQ-1299	R-18	RESISTOR—47,000 ohm, ½-W. carbon	.70-5
*RQ-1259	R-19	RESISTOR—1000 ohm, ½-W., carbon	.70-5
*RQ-683	R-20	RESISTOR—10,000 ohm, 2-W., carbon	.35
*RQ-1323	R-21	RESISTOR—470,000 ohm, ½-W., carbon	.70-5
*RQ-1308	R-22	RESISTOR—100,000 ohm, ½-W., carbon	.70-5
*RQ-1251	R-24	RESISTOR—470 ohm, ½-W., carbon	.70-5
RL-370	L-2	CHOKE—R.F. interstage choke	.30
RL-577	T-1	BEAM-A-SCOPE—"B" band loop and cabinet back assembly	1.60
RL-2062	T-2	COIL—Osc. coil band "B"	.35
RL-2063	T-2i	COIL—Osc. coil "D" band	.30
RT-3005	T-3	TRANSFORMER—1st I.F. transformer	.90
RT-3006	T-4	TRANSFORMER—2nd I.F. transformer	1.15
RT-4013	T-5	TRANSFORMER—Output transformer	2.25
RL-578	T-6	BEAM-A-SCOPE—"D" band loop	.60
RT-0619	T-7	TRANSFORMER—60 cycle power transformer	4.00
RT-0620	T-8	TRANSFORMER—25 cycle power transformer	6.80
RS-3126	S-2, S-3	SWITCH—Band change switch	.70
RS-1071	SPKR.	SPEAKER—5-in. PM speaker	2.25

*Used on previous receivers.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

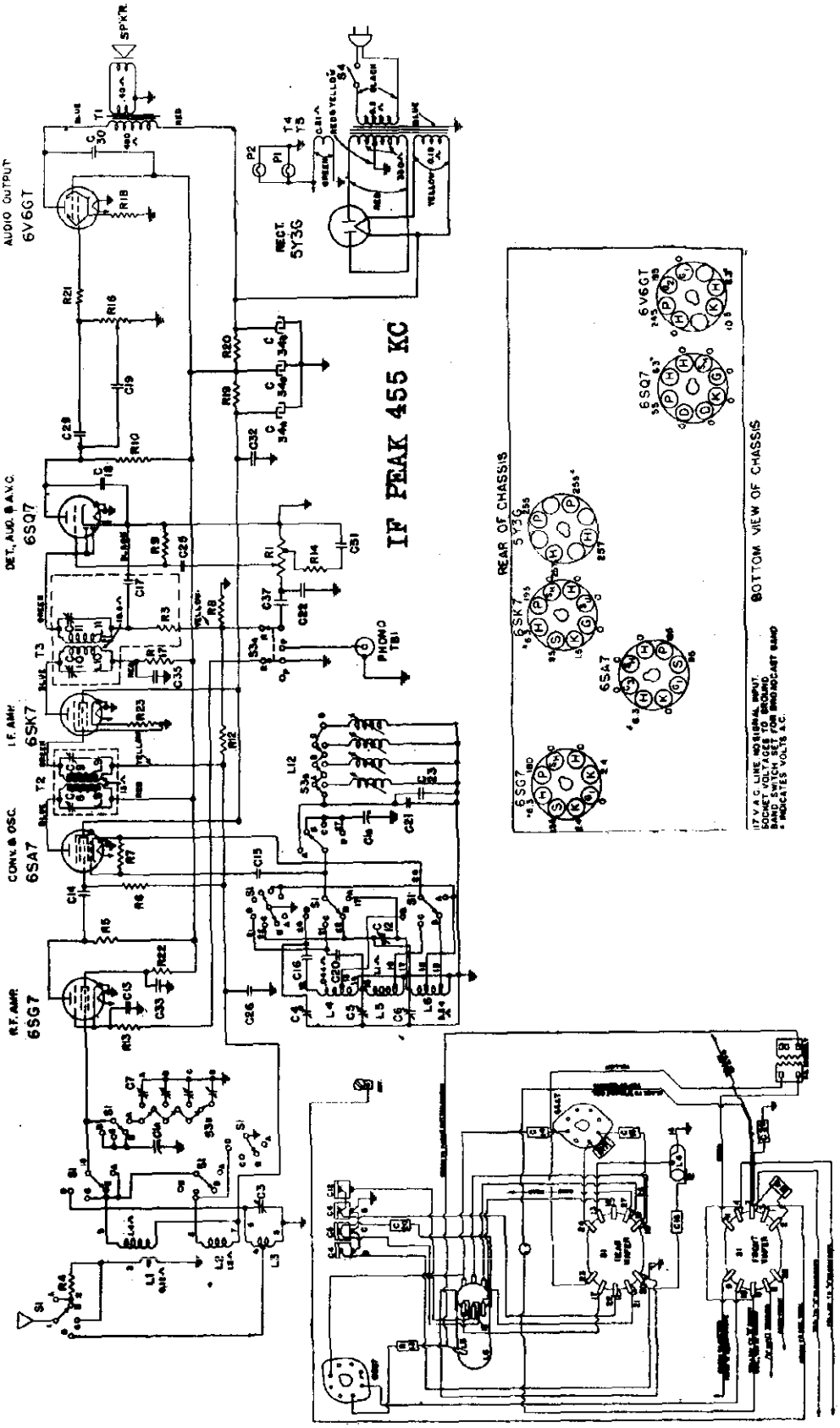
REPLACEMENT PARTS LIST—MODEL LC-648

Our Cat. No.	Symbol	Description	List Price
*RC-7061	C-1a, 1b	CONDENSER—Tuning condenser	$2.00
RT-891	C-2	TRIMMER STRIP—"B" Osc. Trimmer strip (combined with C-16, 22)	.55
*RC-235	C-3	CAPACITOR—100 mmf. mica	.25
*RC-252	C-8	CAPACITOR—200 mmf. mica	.30
*RC-242	C-9	CAPACITOR—150 mmf. mica	.25
*RC-048	C-10	CAPACITOR—.02 mfd. 600 V paper	.30
*RC-072	C-11	CAPACITOR—.05 mfd. 200 V paper	.25
*RC-011	C-12	CAPACITOR—.002 mfd. 600 V paper (Used only with RLP-170 record player)	.25
*RC-216	C-13	CAPACITOR—47 mmf., mica	.25
*RC-023	C-14	CAPACITOR—.005 mfd. 600 V paper	.25
*RC-055	C-15	CAPACITOR—.003 mfd. 600 V paper	.25
RT-891	C-16	TRIMMER STRIP—Ant. trimmer (Part of C-2, 22)	.55
RC-5201	C17a, 17b, 17C	CAPACITOR—30 mfd. 250 V, 30 mfd. 300 V., 10 mfd. 250 V. dry electrolytic	.95
*RC-039	C-19	CAPACITOR—.01 mfd. 600 V paper	.25
*RC-235	C-21	CAPACITOR—100 mmf., mica	.25
RT-891	C-22	TRIMMER STRIP—"B" Band padder (Combined with C 2, C-16)	.55
*RC-023	C-25	CAPACITOR—.005 mfd. 600 V paper	.25
*RC-047	C-26, 27 28	CAPACITOR—.01 mfd. 400 V paper	.20
*RC-017	C-29	CAPACITOR—.0042 mfd. 600 V paper	.25
*RQ-1247	R-1	RESISTOR—330 ohm, ½-W carbon	.70-5
*RQ-1271	R-2	RESISTOR—3300 ohm, ½-W carbon	.70-5
*RQ-1299	R-3	RESISTOR—47,000 ohm, ½-W carbon	.70-5
*RQ-1291	R-4	RESISTOR—22,000 ohm, ½-W carbon	.70-5
*RQ-1239	R-5	RESISTOR—150 ohm, ½-W carbon	.70-5
*RQ-1339	R-6	RESISTOR—2.2 megohm, ½-W carbon	.70-5
*RV-135	R-7	VOL.CONTROL—2 meg. volume control	.95
*RQ-1355	R-8	RESISTOR—10.0 megohm, ½-W carbon	.70-5
*RQ-1323	R-9	RESISTOR—470,000 ohm, ½-W carbon	.70-5
*RT-722	R-10, S1	TONE CONTROL—0.5 meg. control and power switch	1.45
*RQ-1299	R-11, 12	RESISTOR—47,000 ohm, ½-W carbon (Used only with record player LRP-170)	.70-5
*RQ-1313	R-11	RESISTOR—180,000 ohm, ½-W carbon (Used only with record player LRP-162)	.70-5
*RQ-1315	R-12	RESISTOR—220,000 ohm, ½-W carbon (Used only with record player LRP-162)	.70-5
*RQ-1247	R-13	RESISTOR—330 ohm, ½-W carbon	.70-5
*RQ-665	R-14	RESISTOR—1800 ohm, 2-W carbon	.20
*RQ-1293	R-15	RESISTOR—27,000 ohm, ½-W carbon	.70-5
*RQ-1259	R-17	RESISTOR—1000 ohm, ½-W carbon	.70-5
*RQ-1299	R-18	RESISTOR—47,000 ohm, ½-W carbon	.70-5
*RQ-1259	R-19	RESISTOR—1000 ohm, ½-W carbon	.70-5
*RQ-683	R-20	RESISTOR—10,000 ohm, 2-W carbon	.35
*RQ-1323	R-21	RESISTOR—470,000 ohm, ½-W carbon	.70-5
*RQ-1303	R-22	RESISTOR—68,000 ohm ½-W carbon	$0.70-5
*RQ-1259	R-24	RESISTOR—1000 ohm, ½-W carbon	.70-5
RL-590	T-1	BEAM-A-SCOPE—Built-in loop antenna	1.25
RL-2072	T-2	COIL—Osc. coil, Band "B"	.30
*RT-3005	T-3	TRANSFORMER—1st IF transformer	.90
*RT-3006	T-4	TRANSFORMER—2nd IF transformer	1.15
*RT-4013	T-5	TRANSFORMER—Output transformer	1.25
RT-0621	T-7	TRANSFORMER—60-cycle power transformer	4.25
RS-3141	S-3	SWITCH—Phono-radio switch	.55
RS 1081	SPKR	SPEAKER—12-in. PM-speaker	5.50

MISCELLANEOUS PARTS

*RB-009	BOARD—Single lug terminal board	.15
*RB-013	BOARD—Two lug terminal board	.10
*RB-026	BOARD—Antenna terminal board	.10
*RB-093	BOARD—Six lug terminal board	.10
*RB-636	BEZEL—Pilot lamp bezel	.15
*RB-1030	BOARD—Phono-jack board	.10
*RB-1046	BOARD—3-lug terminal board	.10
*RC-865	CORD—Power cord	.45
*RC-1989	CUSHION—Tuning condenser mtg. cushion	.05-5
*RC-2015	CLAMP—Dial scale clamp	.10-5
*RC-9009	CONE—Speaker cone	.95
RD-774	DIAL—Dial scale assembly	.80
RG-448	GRILLE CLOTH—Cabinet grille cloth	1.20
*RL-916	LAMP—Mazda No. 44 pilot lamp	1.50-10
*RK-091	KNOB—Vol. or tuning control knob	.10
*RK-092	KNOB—Tone or phono-radio knob	.10
RP-1031	POINTER—Dial pointer assembly	.25
*RS-238	SOCKET—Octal tube socket	.15
*RS-257	SOCKET—Electrolytic mtg. socket	.05
*RS-266	SOCKET—Dial lamp socket	.15
*RS-292	SOCKET—Pilot lamp socket, (bottom of cabinet)	.25
*RS-298	SOCKET—Phono compartment lamp socket	.20
*RS-444	SPRING—Volume or tuning knob spring	.10-10
*RS-463	SPRING—Drive cord tension spring	.10-5
*RS-511	SPACER—Tuning condenser mounting spacer	.15-10
*RS-4012	SPRING—Tone or phono knob spring	.10-10
*RS-9042	SHAFT—Tuning shaft and clip	.10
*RT-959	TERMINAL—Speaker and loop lead terminal	.05-5
RW-061	WINDOW—Phono-compartment lamp window	.15
*RW-101	WASHER—Felt washer for knobs	.05-10

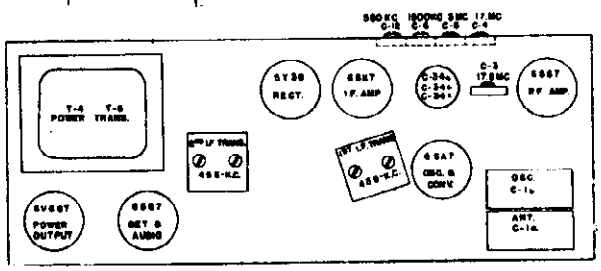
GENERAL ELECTRIC CO.



MODEL L-640

GENERAL ELECTRIC CO.

Our Cat. No	Symbol	Description	List Price
RC-7061	C1a, C1b	CONDENSER—2-gang tuning condenser	$2.00
RC-6553	C-3	CAPACITOR—1.8-20 mmf., "D" band trimmer	.25
RC-6555	C4, 5, 6	CAPACITOR STRIP—"B" "C" and "D" osc. trimmers	.65
RT-885	C7a, b, c, d	TRIMMER STRIP—Push button trimmer strip	.70
RC-6555	C-12	CAPACITOR—"B" padder (Part of C4, 5, 6)	.70
*RC-039	C-13	CAPACITOR—.01 mfd., 600 V. paper	.25
*RC-235	C-14	CAPACITOR—100 mmf., mica	.25
*RC-216	C-15	CAPACITOR—47 mmf., mica	.25
*RC-393	C-16	CAPACITOR—4700 mmf., mica	.50
*RC-242	C-18	CAPACITOR—150 mmf., mica	.25
*RC-023	C-19	CAPACITOR—.005 mfd., 600 V. paper	.25
*RC-349	C-20	CAPACITOR—2000 mmf., mica	.30
RC-305	C-21	CAPACITOR—600 mmf., silvered mica	.25
*RC-235	C-22	CAPACITOR—100 mmf., mica	.25
RC-329	C-23	CAPACITOR—150 mmf., temp comp. cap.	.25
*RC-039	C-25	CAPACITOR—.01 mfd. 600 V. paper	.25
*RC-072	C-26	CAPACITOR—.05 mfd. 200 V. paper	.25
*RC-048	C-29	CAPACITOR—.02 mfd. 600 V. paper	.30
*RC-055	C-30	CAPACITOR—.003 mfd. 600 V. paper	.25
*RC-049	C-31	CAPACITOR—.004 mfd., 600 V. paper	.35
*RC-039	C-32, 33	CAPACITOR—.01 mfd., 600 V. paper	.25
	C-34A	CAPACITOR—10 mfd., 250 V. dry electrolytic	
*RC-5164	C-34B	CAPACITOR—15 mfd., 250 V. dry electrolytic	1.00
	C-34C	CAPACITOR—30 mfd., 300 V. dry electrolytic	
*RC-039	C-35	CAPACITOR—.01 mfd., 600 V. paper	.25
*RC-023	C-37	CAPACITOR—.005 mfd., 600 V. paper	.25
*RV-135	R-1	VOLUME CONTROL—2 meg. volume control	.95
*RQ-1299	R-3	RESISTOR—47,000 ohm, ½-W. carbon	.70–5
*RQ-1251	R-4	RESISTOR—470 ohm, ½-W. carbon	.70–5
*RQ-1275	R-5	RESISTOR—4,700 ohm, ½-W. carbon	.70–5
*RQ-1299	R-6	RESISTOR—47,000 ohm, ½-W. carbon	.70–5
*RQ-1291	R-7	RESISTOR—22,000 ohm, ½-W. carbon	.70–5
*RQ-1323	R-8	RESISTOR—470,000 ohm, ½-W. carbon	.70–5
*RQ-1355	R-9	RESISTOR—10 megohm, ½-W. carbon	.70–5
*RQ-1331	R-10	RESISTOR—1 megohm, ½-W. carbon	.70–5
*RQ-1339	R-12	RESISTOR—2.2 megohm, ½-W. carbon	$0.70–5
*RQ-1247	R-13	RESISTOR—330 ohm, ½-W. carbon	.70–5
*RQ-1308	R-14	RESISTOR—100,000 ohm, ½-W. carbon	.70–5
*RT-722	R-16, S-4	TONE CONTROL—.5 megohm tone control and power switch	1.45
*RQ-1267	R-17	RESISTOR—2200 ohm, ½-W. carbon	.70–5
*RQ-1247	R-18	RESISTOR—330 ohm, ½-W. carbon	.70–5
*RQ-633	R-19	RESISTOR—10,000 ohm, 2-W. carbon	.35
*RQ-665	R-20	RESISTOR—1,800 ohm, 2-W. carbon	.20
*RQ-1259	R-21	RESISTOR—1,000 ohm, ½-W. carbon	.70–5
*RQ-1293	R-22	RESISTOR—27,000 ohm, ½-W. carbon	.70–5
*RQ-1239	R-23	RESISTOR—150 ohm, ½-W. carbon	.70–5
RL-579	L-1	BEAM-A-SCOPE—"B" Band loop and cabinet back assembly	1.60
RL-167	L-2	COIL—"C" band R.F. coil	.25
*RL-578	L-3	BEAM-A-SCOPE—"D" band loop assembly	.60
RL-2065	L-4	COIL—"D" band oscillator coil	.25
RL-2066	L5, 6	COIL—"B" and "C" band osc. coil	.85
RL-9530	L12a, b, c, d	COIL—Push button coil assembly	.85
RS-2129	S-1	SWITCH—Band change switch	1.30
RS-3130	S-3a, b	SWITCH—Push button switch	4.00
*RT-4013	T-1	TRANSFORMER—Output transformer	1.25
RT-3009	T-2	TRANSFORMER—1st I.F. transformer	1.20
RT-3010	T-3	TRANSFORMER—2nd I.F. transformer	1.20
*RT-0619	T-4	TRANSFORMER—60-cycle power transformer	4.00
*RT-0620	T-5	TRANSFORMER—25-cycle power transformer	6.80
RS-1073	SPKR	SPEAKER—5-inch PM speaker	2.40



*Used on previous receivers.

Tuning Frequency Range

"BC" Band.....550–1720 KC
"SW-1" Band.....1.7–5.2 MC
"SW2" Band.....5.2–18.1 MC

Intermediate Frequency.....455 KC

Electrical Power Output

Undistorted.....2.7 watts
Maximum.....4.6 watts

ALIGNMENT CHART

Step	Connect Test-Osc. to	Test-Osc. Setting	Pointer Setting	Adjust Trimmers for Maximum Output
1	6SK7 IF Grid in series with .05 mfd.	455 KC	"BC" Band 550 KC	C10 & C11
2	6SA7 Conv. grid in series with .05 mfd	455 KC	"BC" Band 550 KC	C8 & C9
3	Capacity Coupled	580 KC	"BC" Band 580 KC	C12**
4	Capacity Coupled	1500 KC	"BC" Band 1500 KC	C6** (Osc.)
5	Repeat Step 3			
6	Capacity Coupled	5 MC	"SW1" Band	C5 (Osc.)
7	Capacity Coupled	18 MC	"SW2" Band	C4* (Osc.)
8	Capacity Coupled	18 MC	"SW2" Band	C3** (Ant.)

Some production receivers have C-30 connected from the 6V6GT plate to chassis ground. Late production receivers have C-30 connected as shown in the schematic diagram.

ALIGNMENT PROCEDURE

The location of trimmers is shown in Fig. 1. All oscillator and RF trimmers are accessible through a slot through the back cover of the cabinet.

The alignment procedure is given in table form. All IF alignments may be made with the chassis removed from the cabinet. However, the RF alignments are made with the chassis and loop antennas securely fastened in the cabinet, as the relative position of the loop antenna with respect to the chassis materially affects it. The RF signal should be capacity coupled by placing a two-foot wire for an antenna on the test-oscillator output post (high side). Keeping this antenna two feet or more from the receiver loop will generally insure freedom from too much coupling. Metal objects such as meters, tools, etc., should not be placed on top of the receiver cabinet.

*Use minimum capacity peak.
**Rock gang condenser when making alignment.

Special Service Information

The following data are taken with a vacuum tube voltmeter or similar voltage measuring device.

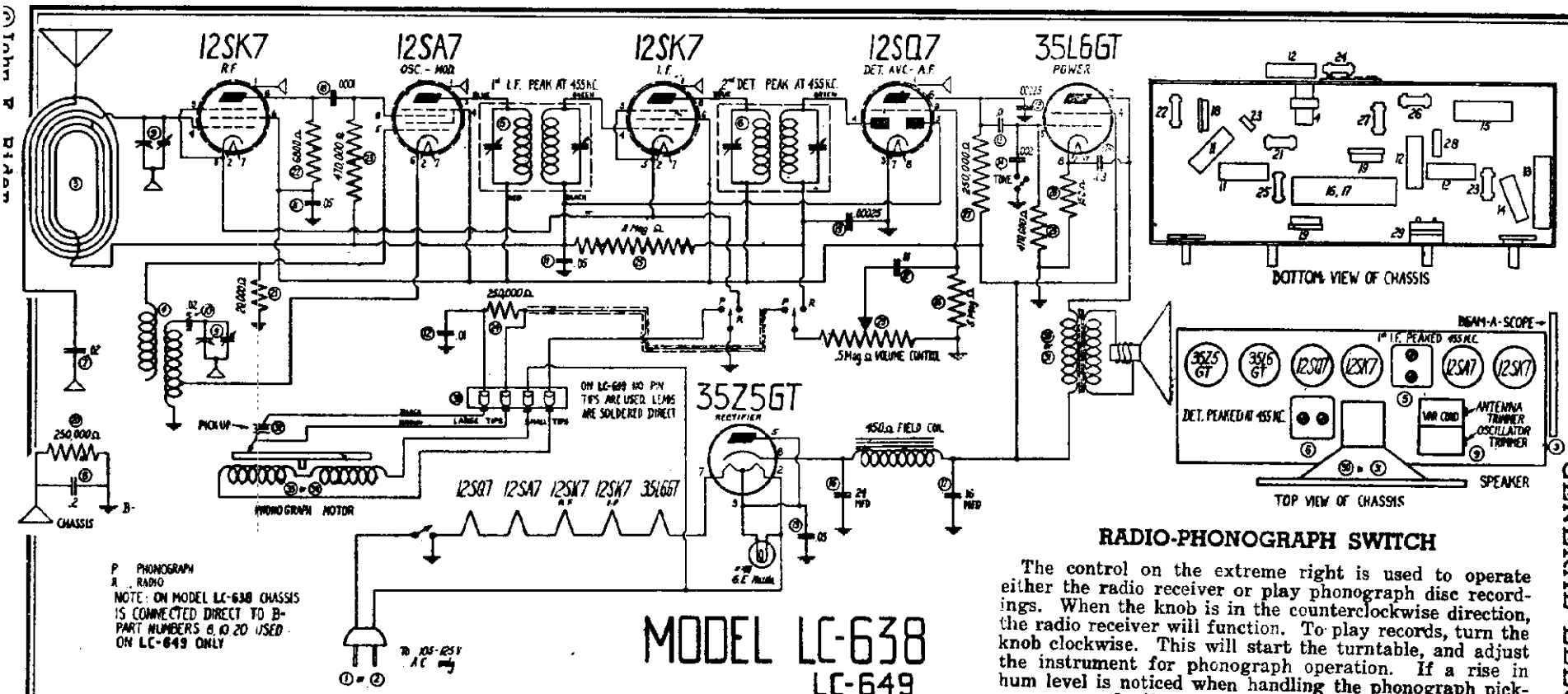
(1) Stage Gains

Antenna Post to RF Grid	6.5 at 1000 KC
RF Grid to Converter Grid	7.0 at 1000 KC
Converter Grid to IF Grid	45 at 1000 KC
Converter Grid to IF Grid	63 at 455 KC
IF Grid to 6SQ7 diode plates	70 at 455 KC

(2) Audio Gains
.14 volts, 400 cycles signal across volume control with control set to maximum will give approximately ½-watt speaker output.

(3) DC voltage developed across oscillator grid resistor R7 averages 10 volts at 1000 KC or 8.0 volts, at 10,000 KC.

Variations of ±20% permissible. All readings taken with AVC shorted out.



MODEL LC-638
LC-649

RADIO-PHONOGRAPH SWITCH

The control on the extreme right is used to operate either the radio receiver or play phonograph disc recordings. When the knob is in the counterclockwise direction, the radio receiver will function. To play records, turn the knob clockwise. This will start the turntable, and adjust the instrument for phonograph operation. If a rise in hum level is noticed when handling the phonograph pickup, reverse the line cord plug in the electric outlet.

ALIGNMENT PROCEDURE

Alignment Frequencies I. F. .....455 K. C.
R. F. .....1700 & 1400 K. C.

I. F. Alignment

Connect an output meter across the voice coil. Rotate the volume control to maximum. Set test oscillator to 455 kilocycles and apply signal to control grid of 12SK7 R. F. through a .05 mfd. capacitor. Align the second I. F. transformer trimmers, next adjust the first I. F. transformer trimmers. Keep the test oscillator output to a level that will give a good meter reading.

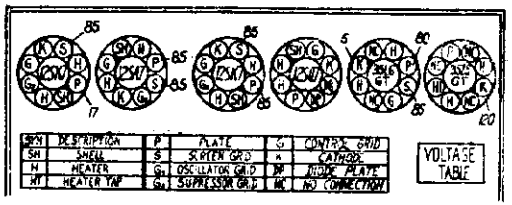
R. F. Alignment

Attach high side of test oscillator to flexible lead extending from rear of chassis through a .00025 mfd. condenser. Connect the low side to the receiver chassis. Adjust the test oscillator and receiver to 1700 kilocycles. Peak 1700 kilocycles oscillator trimmer for maximum output. Change test oscillator signal and receiver dial to approximately 1400 kilocycles. Then while rocking gang condenser, trim 1400 kilocycles antenna trimmer for maximum output.

SERVICE INFORMATION

Voltages—Line 117 Volts AC—Power Consumption 40 Watts including Phonograph Motor. Volume Control maximum. Meter 1000 ohms per volt, 250 volt scale.

Plate (8) of 12SK7 R. F. tube to common ground	17 volts
Screen (6) of 12SK7 R. F. tube to common ground	85 volts
Plate (3) of 12SA7 tube to common ground	85 volts
Screen (4) of 12SA7 tube to common ground	85 volts
Plate (8) of 12SK7 I. F. tube to common ground	85 volts
Screen (6) of 12SK7 I. F. tube to common ground	85 volts
Plate (3) of 35L6GT tube to common ground	80 volts
Screen (4) 35L6GT tube to common ground	85 volts
Cathode (8) of 35L6GT tube to common gronud	5.0 volts
Cathode (8) of 35Z5GT tube to common ground	120 volts
heater (2) and (7) of 12SA7 tube	12.4 volts AC
Heater (2) and (7) of 12SK7 R. F. tube	12.4 volts AC
Heater (2) and (7) of 12SK7 I. F. tube	12.4 volts AC
Heater (2) and (7) of 12SQ7 tube	12.4 volts AC
Heater (2) and (7) of 35L6GT tube	35.0 volts AC
Heater (2) and (7) of 35Z5GT tube	35.0 volts AC

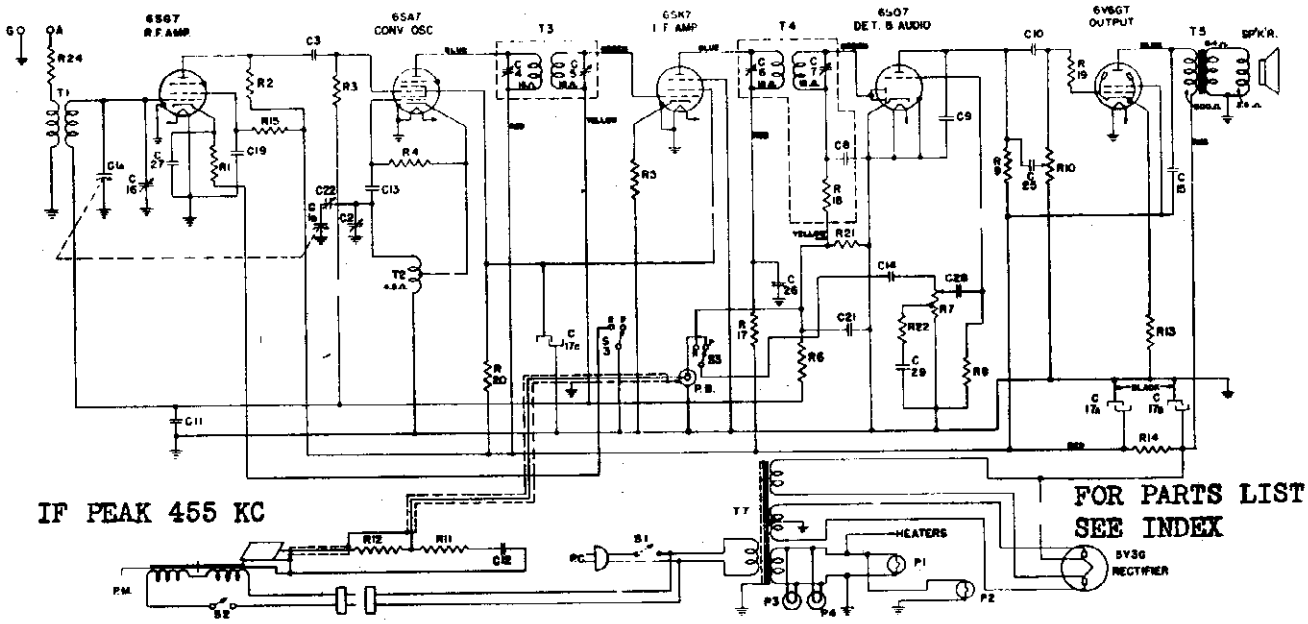


BOTTOM VIEW OF CHASSIS

All above voltages measured from socket terminal to chassis with a 1000 Ω per volt voltmeter.

MODEL LC-648

GENERAL ELECTRIC CO.



Electrical Rating

Rating "A6"—110–125 volts, 60 cycles, 80 watts.
Rating "A5"—110–125 volts, 50 cycles, 80 watts.

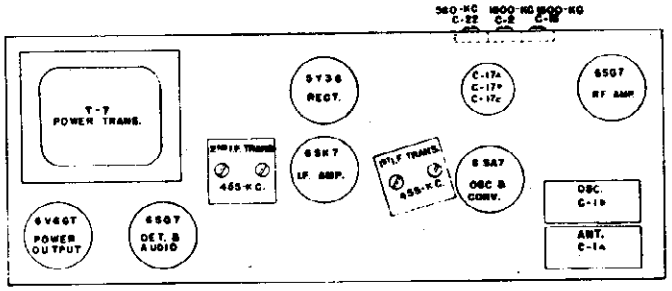
Electrical Power Output

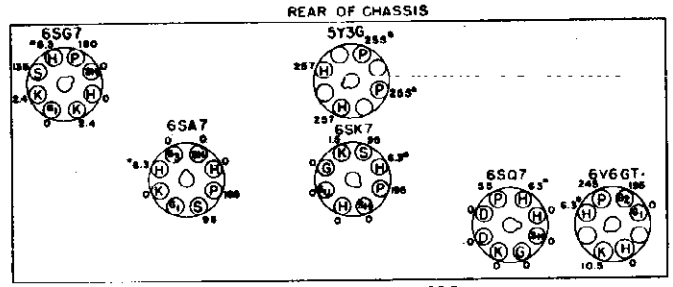
Undistorted.....2.5 watts
Maximum.....4.5 watts

ALIGNMENT PROCEDURE

The location of trimmers is shown in Fig. 1. All oscillator and RF trimmers are accessible through a slot through the back cover of the cabinet.

The alignment procedure is given in table form. All IF alignments may be made with the chassis removed from the cabinet. However, the RF alignments are made with the chassis and loop antennas securely fastened in the cabinet, as the relative position of the loop antenna with respect to the chassis materially affects it. The RF signal should be capacity-coupled by placing a two-foot wire for an antenna on the test-oscillator output post (high side). Keeping this antenna two feet or more from the receiver loop will generally insure freedom from too much coupling. Metal objects such as meters, tools, etc., should not be placed near the receiver loop.





117 V A.C. LINE NO SIGNAL INPUT
SOCKET VOLTAGES TO GROUND
BAND SWITCH SET FOR BROADCAST BAND
# INDICATES VOLTS A.C.

ALIGNMENT CHART

Step	Connect Test-Osc. to	Test-Osc. Setting	Pointer Setting	Adjust Trimmers for Maximum Output
1	6SK7 IF Grid in series with .05 mfd.	455 KC	"BC" Band 550 KC	C6 & C7
2	6SA7 Conv. grid in series with .05 mfd.	455 KC	"BC" Band 550 KC	C4 & C5
3	Repeat step 1.			
4	Capacity Coupled	580 KC	"BC" Band 580 KC	C22*
5	Capacity Coupled	1500 KC	"BC" Band 1500 KC	C2 (Osc.)
6	Capacity Coupled	1500 KC	"B" Band 1500 KC	C16 (RP)
7	Repeat step 4.			

* Rock gang condenser when making alignment.

Special Service Information

The following data are taken with a vacuum tube voltmeter or similar voltage measuring device.

(1) Stage Gains

Antenna Post to RF Grid	5 at 1000 KC
RF Grid to Converter Grid	5 at 1000 KC
Converter Grid to IF Grid	40 at 1000 KC
Converter Grid to IF Grid	60 at 455 KC
IF Grid to 6SQ7 diode plates	90 at 455 KC

(2) Audio Gains
.14 volts, 400 cycles signal across volume control with control set to maximum will give approximately ½-watt speaker output.

(3) DC voltage developed across oscillator grid resistor R4 averages 10 volts at 1000 KC.

Variations of ±20% permissible. All readings taken with AVC shorted out.

FOR RCA RP-162 or G.E. LRP-170 RECORD CHANGERS, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

GENERAL ELECTRIC CO.

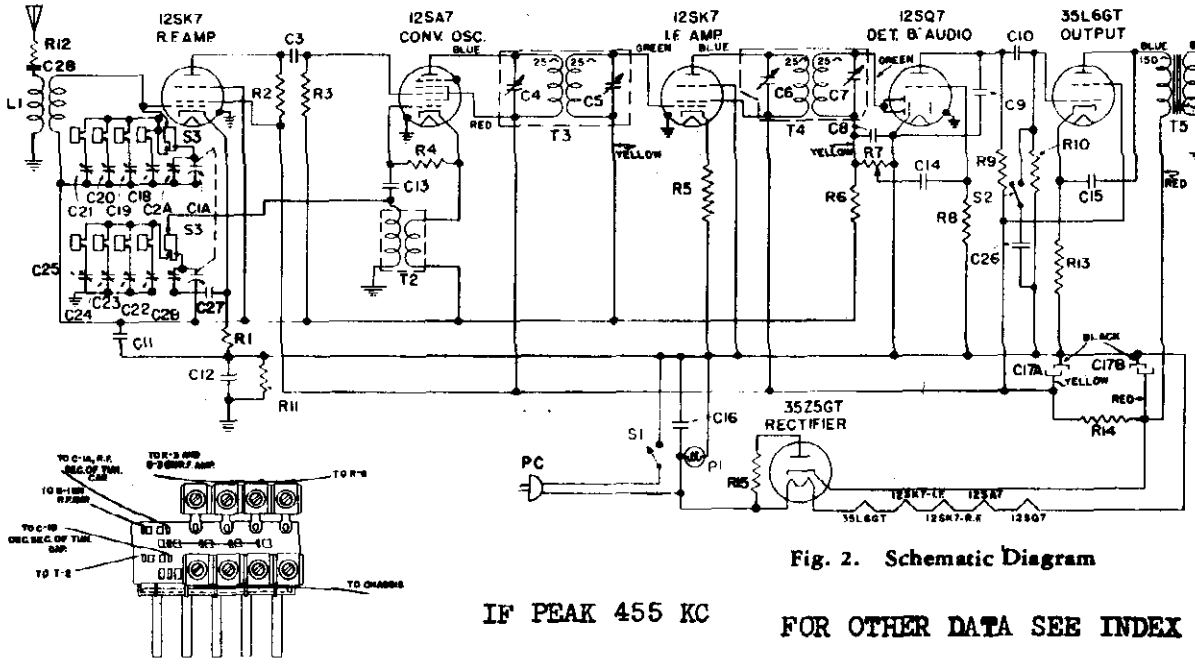


Fig. 2. Schematic Diagram

Selector Switch Wiring

IF PEAK 455 KC

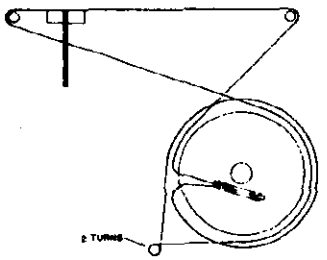
FOR OTHER DATA SEE INDEX

REPLACEMENT PARTS LIST

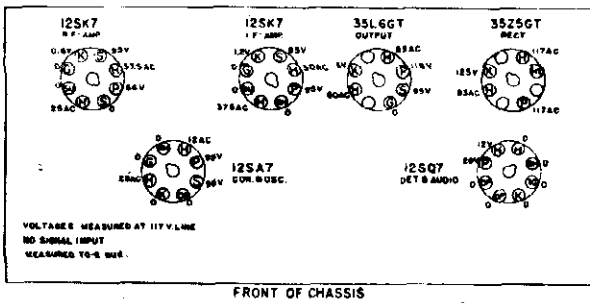
Cat. No.	Symbol	Description	List Price
RC-7059	C1A, 1B	CONDENSER—Tuning condenser (with trimmers 2A, 2B mounted)	$2.05
*RC-235	C3	CAPACITOR—100 mmf. mica	.25
*RC-274	C8	CAPACITOR—330 mmf., mica	.30
*RC-242	C9	CAPACITOR—150 mmf., mica	.25
*RC-039	C10	CAPACITOR—.01 mfd., 600 V., paper	.25
*RC-072	C11	CAPACITOR—.05 mfd., 200 V., paper	.25
*RC-092	C12	CAPACITOR—.05 mfd., 600 V., paper	.30
*RC-216	C13	CAPACITOR—47 mmf., mica	.25
*RC-039	C14	CAPACITOR—.01 mfd., 600 V., paper	.25
*RC-048	C15	CAPACITOR—.02 mfd., 600 V., paper	.30
*RC-092	C16	CAPACITOR—.05 mfd., 600 V., paper	.30
RC-5194	C17A	CAPACITOR—60 mfd., 150 V., dry electrolytic	.70
	C17B	CAPACITOR—50 mfd., 150 V., dry electrolytic	
*RT-881	C18–C21	TRIMMER STRIP—Station key adjustments (RF section)	.70
*RT-882	C22–C25	TRIMMER STRIP—Station key adjustments (Osc. section)	.60
*RC-016	C26	CAPACITOR—.002 mfd., 600 V. paper	.25
*RC-048	C27	CAPACITOR—.02 mfd., 600 V., paper	.30
*RC-039	C28	CAPACITOR—.01 mfd., 600 V., paper	.25
*RQ-1231	R1	RESISTOR—68 ohm, ½-W carbon	.70–5
*RQ-1279	R2	RESISTOR—6800 ohm, ½-W carbon	.70–5
*RQ-1299	R3	RESISTOR—47,000 ohm, ½-W carbon	.70–5
*RQ-1295	R4	RESISTOR—33,000 ohm, ½-W carbon	.70–5
*RQ-1227	R5	RESISTOR—47 ohm, ½-W carbon	.70–5
*RQ-1339	R6	RESISTOR—2.2 meg., ½-W carbon	.70–5
*RV-123	R7, S1	VOLUME CONTROL—0.5 meg. control and power switch (Model L-652)	1.45
RV-132	R7, S1	VOLUME CONTROL—0.5 meg. control and power switch (Model L-650)	1.45
*RQ-1349	R8	RESISTOR—5.6 meg., ½-W carbon	.70–5
*RQ-1323	R9, 10, 11	RESISTOR—470,000 ohm, ½-W carbon	.70–5
*RQ-1259	R12	RESISTOR—1000 ohm, ½-W, carbon	.70–5
*RQ-1239	R13	RESISTOR—150 ohm, ½-W, carbon	.70–5
*RQ-651	R14	RESISTOR—1000 ohm, 2-W carbon	.20
*RQ-1227	R15	RESISTOR—47 ohm, 2-watt carbon	.70-5
*RS-3108	S2	SWITCH—Tone control switch	.20
*RS-3114	S3	SWITCH—Automatic tuning switch (less trimmers) (Model L-652 only)	1.25
RS-3125	S3	SWITCH—Automatic tuning switch (less trimmers) (Model L-650)	1.25
RL-575	L1	BEAM-A-SCOPE—Cabinet back and loop assembly (Model L-650 only)	1.00
RL-576	L1	BEAM-A-SCOPE—Cabinet back and loop assembly (Model L-652 only)	1.00
*RL-2053	T2	COIL—Oscillator coil and clip	.35
RT-3002	T3	TRANSFORMER—1st I.F. transformer	.80
RT-3003	T4	TRANSFORMER—2nd I.F. transformer	.80
*RT-4008	T5	TRANSFORMER—Output transformer	.70

*Used on previous receivers.

(Prices Subject to Change without Notice)



Dial Stringing Diagram



FRONT OF CHASSIS
BOTTOM VIEW OF CHASSIS

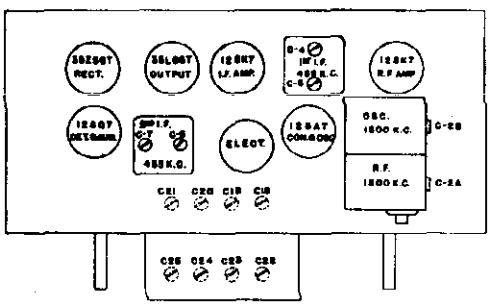


Fig. 1. Trimmer Location

MODELS L-650,L-652
MODELS X-108,X-118

GENERAL ELECTRIC CO.

MODELS L-650,L-652

Alignment Frequencies

RF ..... 1500 KC
IF ..... 455 KC

The chassis must be removed from the cabinet as described above to make the following alignments. The locations of all trimmers are shown in Fig. 1.

IF Alignment

Connect an output meter across the voice coil. Turn the volume control to maximum. Set test oscillator to 455 KC and keep the oscillator output as low as a readable meter reading will permit.

Apply signal to the 12SA7 converter grid through a .05 mfd. capacitor and align progressively the trimmers in the 2nd and 1st IF transformers.

RF Alignment

When making the following alignment the loop antenna must be bolted to the chassis by the two mounting screws. Since the glass dial scale is fastened to the cabinet, it cannot be used for reference during the alignment of the chassis outside the cabinet. Use must be made therefore of the four calibration marks at the bottom flange of the dial scale reflector plate (immediately below end of dial scale pointer). These marks referring from left to right are as follows: Reference point, 580 KC, 1000 KC, and 1500 KC.

The RF signal should be capacity coupled to the receiver loop by placing a two foot piece of wire for an antenna on the test oscillator output post (high side). Keeping this antenna two feet or more from the receiver loop will generally insure freedom from too much coupling. Metal objects such as meters, tools, etc. should not be placed in close proximity to the loop when making the alignment.

With the gang condenser plates completely closed, the end of the pointer should line up with the first mark to the left of the dial reflector plate. If it doesn't the pointer can be moved on the dial cord until it does. Set the signal generator to 1500 KC. Set pointer to the 1500 KC mark (extreme right flange mark) and align (C2B) to the signal. Peak (C2A) for maximum output.

Special Service Information

The following information will be useful to servicemen equipped with vacuum tube voltmeters or similar voltage measuring instruments. When making the Stage Gain measurements in (1), the AVC bus should be shorted to B—.

(1) Stage Gains
Antenna post to converter grid.....26 at 1000 KC
RF grid to converter grid.....5.6 at 1000 KC
Converter grid to IF grid.....25 at 455 KC
IF grid to 12SQ7 diode plate.....53 at 455 KC

(2) Audio Gain
0.14 volts, 400 cycle signal across volume control with control set at maximum, will give approximately ½-watt speaker output.

(3) DC voltage developed across oscillator grid resistor (R4) averages 5.0 volts at 1000 KC.

Variations of 20 per cent permissible. All readings obtained with enough signal input to give ½-watt speaker output.

Alignment Procedure MODELS X-108,X-118

The alignment procedure shown in table form is made either with the chassis in or removed from the cabinet.

If the chassis is removed from the cabinet to make the RF alignment, the dial which is fastened to the cabinet cannot be used for calibration reference. Use must be made, therefore, of the paper scale fastened on the rear of the dial reflector plate. With the gang condenser completely closed, one of the edges of the pointer rider should be lined up with the first marking to the right of the scale on the rear of the dial reflector plate. This can be accomplished by sliding the pointer on the cord until it does. The selected edge of the pointer rider may now serve as a pointer for the RF alignment. There are two 17.8 reference points on the paper scale on the rear of the dial reflector plate. The one towards the lower frequency end of the dial is the proper one to use for the 16-meter spread-band alignment; while the other is used for a reference point on the SW2 band.

The SW2 band does not require alignment. This band is taken care of when the 16 meter spread-band is aligned.

Since accuracy in frequency calibration is very essential for proper alignment of the spread-bands, it is impractical to use the standard test oscillator for this purpose unless a special calibration is first made.

The actual reception of short-wave stations of known frequency in the band to be checked is probably the most satisfactory method or determining the proper setting of the oscillator trimmers in these bands. The oscillator trimmer should be adjusted so that the station appears at the correct position on the dial. R.F. alignment can be made with the test oscillator.

The calibration of the test oscillator may be checked by zero beating the test oscillator with a short-wave station of known frequency. By taking several of these calibration points, it will afford a calibration of a high degree of accuracy in case you wish to use the test oscillator for alignment in these bands.

ALIGNMENT CHART MODELS X-108,X-118

Step	Test Osc. Connected to	Test-osc. Setting	Band and Pointer Setting	Tune Trimmer for Max. Output
1	6SG7 I.F. grid in series with .05 mfd. cap.	455 KC	"BC" BAND 550 KC	C26 and C27
2	7Q7 CONV. grid in series with .05 mfd. cap.	455 KC	"BC" BAND 550 KC	C24 and C25
3	ANT. POST in series with 200 mmf. and 400 ohms	580 KC	"BC" BAND 580 KC	C16**
4	ANT. POST in series with 200 mmf and 400 ohms	1500 KC	"BC" BAND 1500 KC	C17 (osc.) C3 (ant.)
5	REPEAT STEP 3			
6	ANT. POST in series with 200 mmf. and 400 ohms	6.1 MC	"SW-1" BAND 6.1 MC	C15 (osc.) C4 (ant.)
7	ANT. POST in series with 200 mmf. and 400 ohms	17.8 MC	16 METER 17.8 MC	C14* (osc.)
8	ANT. POST in series with 200 mmf. and 400 ohms	21.6 MC	16 METER 21.6 MC	C9*** (ant.)
9	ANT. POST in series with 200 mmf. and 400 ohms	15.22 MC	19 METER 15.22 MC	C10* (osc.) C6*** (ant.)
10	ANT. POST in series with 200 mmf. and 400 ohms	11.8 MC	25 METER 11.8 MC	C11* (osc.) C7*** (ant.)
11	ANT. POST in series with 200 mmf. and 400 ohms	9.6 MC	31 METER 9.6 MC	C12* (osc.) C8*** (ant.)

*Use minimum capacity peak if two are obtainable.
**Rock gang condenser for optimum peak.
***Use maximum capacity peak if two are obtainable.

Electrical Rating

Model	Rating	Power Supply Tap	Power Supply Voltage Range	Frequency Cycles AC	Power Consumption (Watts)
	C	110	103–117	25–60	70
		125	117–133		
X-108	V	110	103–117		
		125	117–133		
		200	185–215	50–60	70
		230	215–250		
X-118			200–240V AC or DC	25–100	100

Tuning Frequency Range

"BC" Band.....540–1700 KC
"SW1" Band.....2.2–6.8 MC
"SW2" Band.....6.8–21.0 MC
31 Meter Band.....9.36–9.8 MC
25 Meter Band.....11.6–12.5 MC
19 Meter Band.....14.9–17.3 MC
16 and 13 Meter Band.....17.7–22.2 MC

Electrical Power Output

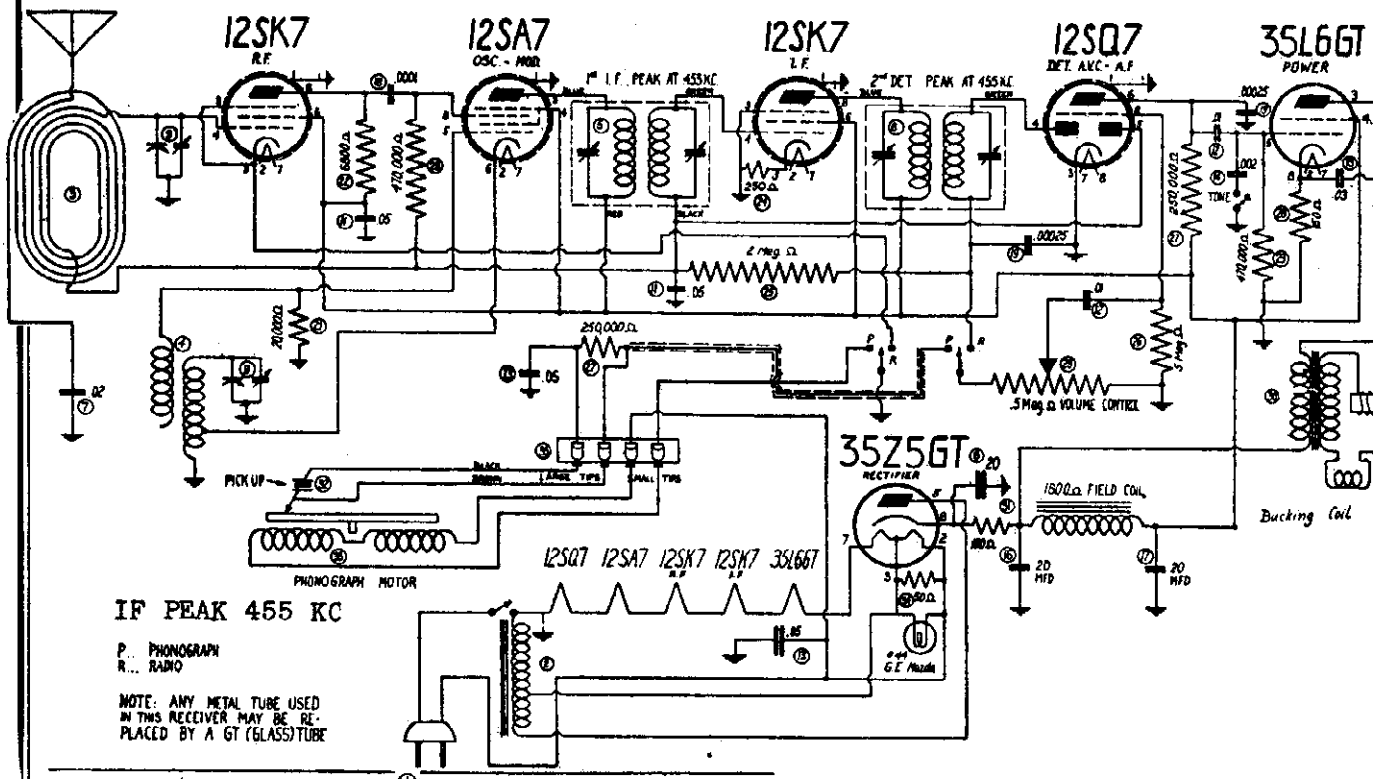
Undistorted with proper voltage at tap on power transformer—6 watts.

Maximum with proper voltage at tap on power transformer—6.5 watts.

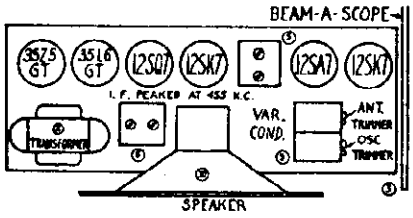
Loud-speaker—PM Dynamic

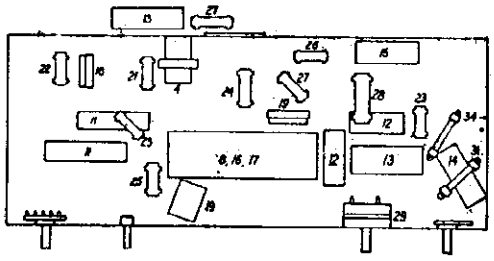
Cone Diameter.....8 inches
Voice Coil Impedance (400 cycles).....3.5 ohms

GENERAL ELECTRIC CO.

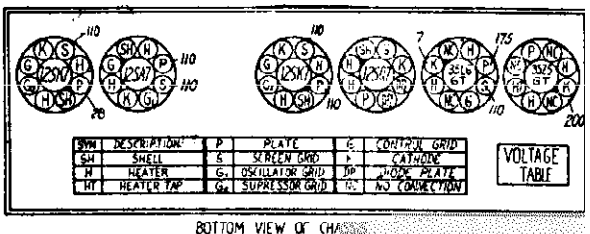


Part No.	Symbol		Description	Price List
RT-0625-W	2	Transformer	Auto Transformer	$3.00
*RT-367-W	5	Transformer	1st I. F. Transformer	1.10
*RT-3016-W	6	Transformer	2nd Detector	1.10
*RL-585-W	3	Beamascope		1.10
*RL-2069-W	4	Coil	Oscillator	.50
*RC-7036-W	9	Condenser	Tuning (2 gang) & drive pulley	2.50
RC5202W	8,16,17	Condenser	20+20+20 mfd. 250 v.	2.00
*RC-039	12	Condenser	Tubular .01 md. 400v	.25
*RC-048	7	Condenser	Tubular .02 mfd. 400v	.30
*RC-072	11	Condenser	Tubular .05 mfd. 200v	.25
*RC-092	13	Condenser	Tubular .05 mfd. 400v	.30
*RC-060	15	Condenser	Tubular .03 mfd. 400v	.25
*RC-011	14	Condenser	Tubular .002 mfd. 400v	.25
*RC-259	19	Condenser	Mica 250 mmfd.	.30
*RC-235	18	Condenser	Mica 100 mmfd.	.25
*RV-138-W	29		Volume Control & Switch	1.25
*RQ-1239	28	Resistor	Carbon 150 Ohm ¼ W. (Pkg.5)	.70
*RQ-1316-W	27	Resistor	" 250,000 Ohm ¼ W. (Pkg.5)	.70
*RQ-1339	25	Resistor	" 2 Meg. Ohm ¼ W. (Pkg.5)	.70
*RQ-1348	26	Resistor	" 5 Meg. Ohm ¼ W. (Pkg.5)	.70
*RQ-1291	21	Resistor	" 20,000 Ohm ¼ W. (Pkg.5)	.70
*RQ-1323	23	Resistor	" 470,000 Ohm ¼ W. (Pkg.5)	.70
*RQ-1279	22	Resistor	" 6,800 Ohm ¼ W. (Pkg.5)	.70
RQ-1245	24	Resistor	" 250 Ohm ¼ W. (Pkg.5)	.70
RR-7011-W	34	Resistor	Wire Wound 50 Ohm	.50
RR-7012-W	31	Resistor	Wire Wound 150 Ohm	.60
*RC-865	1		Line Cord	.45
RB-978-W			Cabinet Back Cover	.30
RX-110-W			Dial Frame & Pulley Assembly	1.00
RD-777-W			Glass Dial Scale	1.30
RS-1083-W	30		5" Electro-Dynamic with Trans.	5.00
*RS-238		Tube Socket	8 Prong Octal 1 5/16"	.15
*RS-2018-W			Pilot Lamp Socket	.35
*RK-1043-W			Knob (walnut) Pkg. 2	.40
*RK-1064-W			Knob (walnut with white dot)	.25
*RS-3133-W		Switch	Tone Control Switch	.50
*RS-3134-W		Switch	Phonograph Switch	1.00
RP-1033-W		Pointer	Dial Pointer	.35
*RC-8062-W			Drive Spring & Cord	.25
*RF-208-W			Fastener for Cabinet back cover	.10
RT-4022-W			Output Transformer for Speaker	2.50
RC-9056-W			Cone for Speaker	1.75
*RC-2065-W	35	Contact strip for motor & pickup pin tips		.25





BOTTOM VIEW OF CHASSIS



BOTTOM VIEW OF CHASSIS

ALL ABOVE VOLTAGES MEASURED FROM SOCKET TERMINAL TO CHASSIS WITH A 1000 Ω PER VOLT VOLTMETER

FOR OTHER DATA SEE INDEX

MODEL LC-658
MODEL L-678

GENERAL ELECTRIC CO.

SPECIFICATIONS MODEL L-678

Over-all Dimensions

Height ..... 9 1/8 inches
Width ..... 16 5/16 inches
Depth ..... 11 1/8 inches

Electrical Rating

A-6 Rating ..... 115 volts, 60 cycles AC, 75 watts
A-5 Rating ..... 115 volts, 50 cycles AC, 75 watts

Tuning Frequency Range ..... 550–1600 KC.

Intermediate Frequency ..... 455 KC.

Electrical Power Output

Undistorted ..... 2.0 watts
Maximum ..... 2.5 watts

Loud-speaker—PM Dynamic

Outside cone diameter ..... 6.5 inches
Voice coil impedance (400 cycles) ..... 3.5 ohms

Phonograph Mechanism

Type mechanism ..... Manual
Type pick-up ..... Crystal
Turntable speed ..... 78 R.P.M.

Tubes

Converter-oscillator GE-6SA7GT
I.F. Amplifier GE-6SK7GT
Det., A.V.C., 1st Audio GE-6Q7GT
2nd Audio GE-6J5GT
Power output GE-25L6GT
Rectifier GE-25Z6GT
Dial lamp ..... Mazda No. 44

TO SET-UP PUSH BUTTONS

1. Make a list of stations desired on push buttons and arrange in order, from low to highest frequency; insert tabs of the call letters of the stations in the keys in the order listed.
2. Allow the receiver to run five minutes before making the following adjustments. Manually tune in first station, lift key upward and loosen adjusting bolt. Hold the tuning control to the exact tune position and with a screwdriver push in the adjusting bolt as far as it will go, then tighten the adjusting bolt.
3. Adjust for each of the five remaining stations in a similar manner.

MODEL LC-658

SERVICE NOTES

Tuning Control Drive Ratio 12:1
Power Consumption (with phono) ..... 68 watts
Power Consumption (radio only) ..... 46 watts
Intermediate Frequency ..... 455 K.C.
Tuning Frequency Range ..... 540-1700 K.C
Maximum Power Output ..... 3 watts
Loud Speaker ..... Cone diameter—6 inches
Voice Coil Impedance ..... (at 400 Cycles) 3 ohms
Tubes: R. F. amplifier 12SK7 Converter—Oscillator 12SA7, I. F. 12SK7, Detector, A. V. C. 12SQ7, Power Output 35L6GT, Rectifier 35Z5GT.

SERVICE INFORMATION

Voltages—Line 117 Volts AC—Power Consumption 68 Watts including Phonograph Motor. Volume Control maximum. Meter 1000 ohms per volt, 250 volt scale.

Plate (8) of 12SK7 R. F. tube to common ground	28 volts
Screen (6) of 12SK7 R.F. tube to common ground	110 volts
Plate (3) of 12SA7 tube to common ground	110 volts
Screen (4) of 12SA7 tube to common ground	110 volts
Plate (8) of 12SK7 I. F. tube to common ground	110 volts
Screen (6) of 12SK7 I.F. tube to common ground	110 volts
Plate (3) of 35L6GT tube to common ground	175 volts
Screen (4) of 35L6GT tube to common ground	110 volts
Cathode (8) of 35L6GT tube to common ground	7 volts
Cathode (8) of 35Z5GT tube to common ground	200 volts
Heater (2) and (7) of 12SA7 tube	12.6 volts AC
Heater (2) and (7) of 12SK7 R. F. tube	12.6 volts AC
Heater (2) and (7) of 12SK7 I. F. tube	12.6 volts AC
Heater (2) and (7) of 12SQ7 tube	12.6 volts AC
Heater* (2) and (7) of 35L6GT tube	35 volts AC
Heater (2) and (7) of 35Z5GT tube	33 volts AC

MODEL L-678

ALIGNMENT PROCEDURE

Alignment Frequencies

I.F. ..... 455 KC R.F. ..... 1500 and 580 KC
The location of all trimmers is shown in Fig. 1.

I.F. Alignment

Connect an output meter across the voice coil. Turn the volume control to maximum. Set test oscillator to 455 KC and keep the oscillator output as low as a readable meter reading will permit.

Apply signal to the grid of the 6SK7GT through a .05-mfd. capacitor and align the 2nd IF transformer. Repeat the procedure, applying the 455-Kc signal to the control grid of the 6SA7GT and aligning the 1st I.F. transformer. Finish by over-all adjustments.

R.F. Alignment

With gang condenser plates completely closed, set dial pointer to the first mark at the left end of the scale. Apply a 1500-Kc signal either through a standard I.R.E. dummy to the antenna terminal or through an additional loop connected to the generator output which can be magnetically coupled to the receiver Beam-a-Scope. Align (C-2) at 1500 KC and peak (C-1) for maximum output. Peak (C-3) on 580 KC while rocking the gang condenser. Retrim at 1500 KC.

Precaution

If the signal generator is AC operated, use an isolating transformer between the power supply and the radio receiver power input. The use of an isolating capacitor is not recommended as AC current through the capacitor will introduce hum modulation and/or create the possibility of a burned out signal generator attenuator.

Special Service Information

The following data will be very useful to servicemen equipped with vacuum tube voltmeters or similar voltage measuring instruments.

(1) Stage Gains*
Antenna post to 6SA7GT grid ..... 4 at 1000 KC
6SA7GT grid to 6SK7GT grid ..... 30 at 455 KC
6SK7GT grid to 6Q7GT det. plate ..... 100 at 455 KC

(2) Audio Gains
.06 volts, 400 cycles signal across volume control with control set to maximum will give approximately ½ watt speaker output.

(3) DC voltage developed across oscillator grid resistor (R-1) averages 12 volts.

* Variations of +10%, −20% permissible.

Loud-speaker

The voice coil is accurately and permanently centered at the factory and should seldom give trouble. In case a voice coil needs recentering it will be necessary to replace the entire cone and voice-coil assembly.

NOTE.—In no case should the magnet be removed from the assembled position without remagnetizing after replacing it.

MODEL LC-658

ALIGNMENT PROCEDURE

Alignment Frequencies I. F. ..... 455 K.C.
R. F. ..... 1700 & 1400 K.C.

I. F. Alignment

Connect an output meter across the voice coil. Rotate the volume control to maximum. Set test oscillator to 455 kilocycles and apply signal to control grid of 12SK7 R. F. through a .05 mfd. capacitor. Align the second I. F. transformer trimmers, next adjust the first I. F. transformer trimmers. Keep the test oscillator output to a level that will give a good meter reading.

R. F. Alignment

Attach high side of test oscillator to flexible lead extending from rear of chassis through a .00025 mfd. condenser. Connect the low side to the receiver chassis. Adjust the test oscillator and receiver to 1700 kilocycles. Peak 1700 kilocycles oscillator trimmer for maximum output. Change test oscillator signal and receiver dial to approximately 1400 kilocycles. Then adjust 1400 kilocycles antenna trimmer for maximum output.

FOR OTHER DATA SEE INDEX

GENERAL ELECTRIC CO.

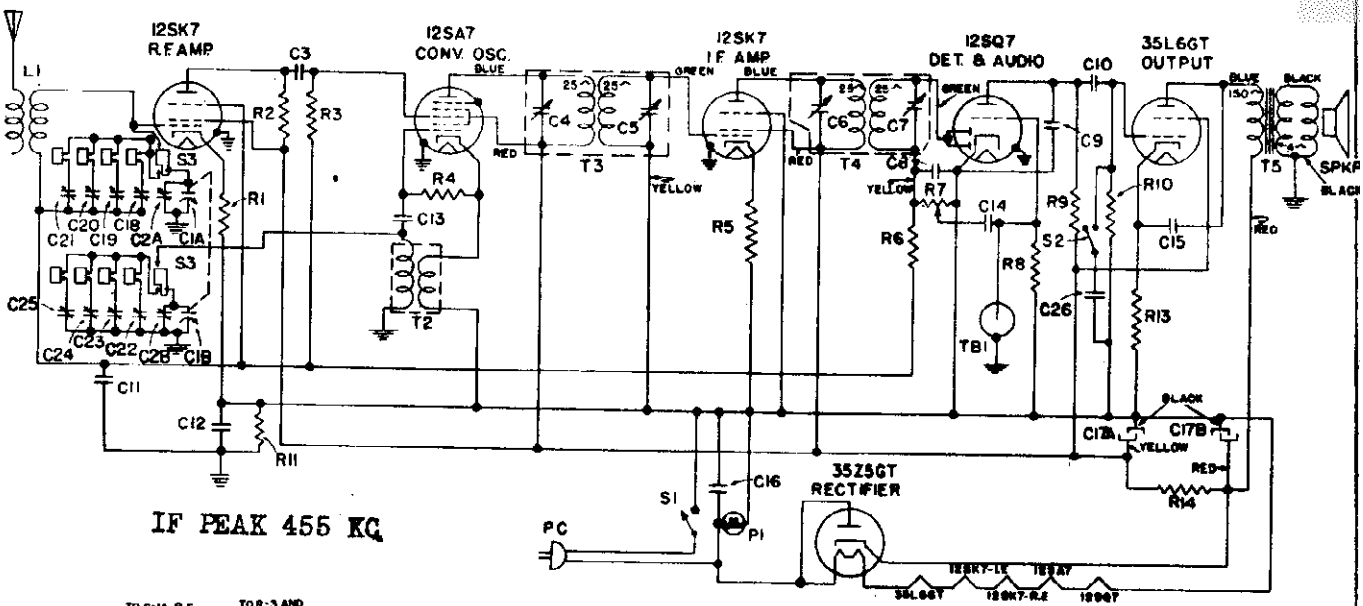
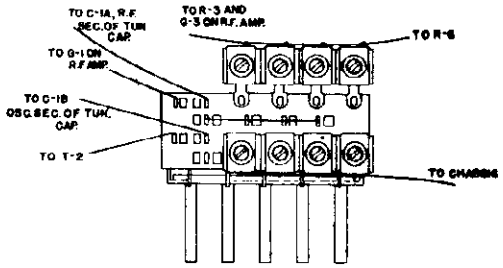


Fig. 2. Schematic Diagram



Selector Switch Wiring

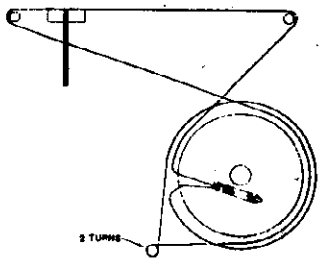


Fig. 3. Dial Stringing Diagram

Part No.	Symbol	Description	List Price
RC-7052	C1A, 1B	CONDENSER—Tuning Condenser (with trimmers 2A, 2B mounted)	$1.60
*RC-235	C3	CAPACITOR—100 Mmf., mica	.25
*RC-274	C8	CAPACITOR—330 Mmf., mica	.30
*RC-242	C9	CAPACITOR—150 Mmf., mica	.25
*RC-039	C10	CAPACITOR—.01 Mfd., 600 V. paper	.25
*RC-072	C11	CAPACITOR—.05 Mfd., 200 V. paper	.25
*RC-130	C12	CAPACITOR—0.2 Mfd., 400 V. paper	.30
*RC-216	C13	CAPACITOR—47 Mmf., mica	.25
*RC-039	C14, 15	CAPACITOR—.01 Mfd., 600 V. paper	.25
*RC-092	C16	CAPACITOR—.05 Mfd., 600 V. paper	.30
RC-5187	C17A	CAPACITOR—40 Mfd., 150 V. dry electrolytic	.60
	C17B	CAPACITOR—30 Mfd., 150 V. dry electrolytic	
RT-881	C18-C21	TRIMMER STRIP—Station key adjustments (R.F. section)	.70
RT-882	C22-C25	TRIMMER STRIP—Station key adjustments (Osc. section)	.60
*RC-016	C26	CAPACITOR—.002 Mfd., 600 V. paper	.25
*RQ-1219	R1	RESISTOR—22 ohm, ½ W. carbon	.70-5
*RQ-1281	R2	RESISTOR—8200 ohm, ½ W. carbon	.70-5
*RQ-1299	R3	RESISTOR—47,000 ohm, ½ W. carbon	.70-5
*RQ-1295	R4	RESISTOR—33,000 ohm, ½ W. carbon	.70-5
*RQ-1239	R5	RESISTOR—150 ohm, ½ W. carbon	.70-5
*RQ-1339	R6	RESISTOR—2.2 megohms, ½ W. carbon	.70-5
RV-123	R7, S1	VOLUME CONTROL—0.5 megohm control and power switch	1.45
*RQ-1349	R8	RESISTOR—5.6 megohm, ½ W. carbon	.70-5
*RQ-1323	R9, 10, 11	RESISTOR—470,000 ohm, ½ W. carbon	.70-5
*RQ-1239	R13	RESISTOR—150 ohm, ½ W. carbon	.70-5
*RQ-661	R14	RESISTOR—1,000 ohm, 2 W. carbon	.20
*RS-3108	S2	SWITCH—Tone control switch	.20
RS-3114	S3	SWITCH—Automatic tuning switch (less trimmers)	1.25
RL-565	L1	BEAM-A-SCOPE—Loop antenna and cabinet back assembly	.90
RL-2053	T2	COIL—Oscillator coil and clip	.35
RT-388	T3	TRANSFORMER—1st I.F. transformer	$0.65
RT-389	T4	TRANSFORMER—2nd I.F. transformer	.65
RT-4008	T5	TRANSFORMER—Output transformer	.70
RS-1064	Spkr.	SPEAKER—5-inch P.M. speaker	2.10

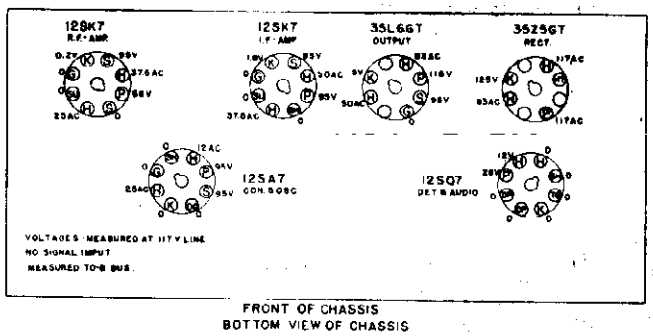


Fig. 4. Socket Voltages

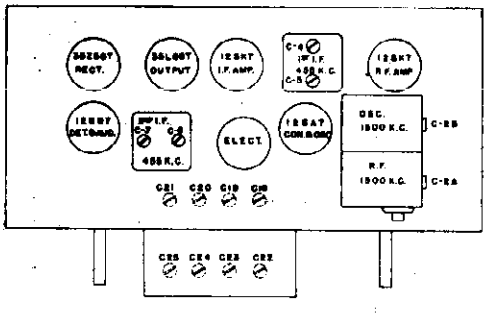


Fig. 1. Trimmer Location

MODEL L-660

MODELS J-644, J-644W, J-654, J-654W

GENERAL ELECTRIC CO.

MODEL 660

ALIGNMENT PROCEDURE

Alignment Frequencies

RF ..... 1500 KC
IF ..... 455 KC

The chassis must be removed from the cabinet as described above to make the following alignments. The locations of all trimmers is shown in Fig. 1.

IF Alignment

Connect an output meter across the voice coil. Turn the volume control to maximum. Set test oscillator to 455 KC and keep the oscillator output as low as a readable meter reading will permit.

Apply signal to the 12SA7 converter grid through a .05 mfd. capacitor and align progressively the trimmers in the 2nd and 1st IF transformers.

RF Alignment

When making the following alignment the loop antenna must be bolted to the chassis by the two mounting screws. Since the glass dial scale is fastened to the cabinet, it cannot be used for reference during the alignment of the chassis outside the cabinet. Use must be made therefore of the four calibration marks at the botton flange of the dial scale reflector plate (immediately below end of dial scale pointer). These marks referring from left to right are as follows: Reference point, 580 KC, 1000 KC, and 1500 KC.

The RF signal should be capacity coupled to the receiver loop by placing a two foot piece of wire for an antenna on the test oscillator output post (high side). Keeping this antenna two feet or more from the receiver loop will generally insure freedom from too much coupling. Metal objects such as meters, tools, etc. should not be placed in close proximity to the loop when making the alignment.

With the gang condenser plates completely closed, the end of the pointer should line up with the first mark to the left of the dial reflector plate. If it doesn't the pointer can be moved on the dial cord until it does. Set the signal generator to 1500 KC. Set pointer to the 1500 KC mark (extreme right flange mark) and align (C2B) to the signal. Peak (C2A) for maximum output.

Loudspeaker—PM DYNAMIC

Outside cone diameter ..... 5 inches
Voice coil impedance (400 cycles) ..... 3.5 ohms

SPECIFICATIONS

Over-all Dimensions:

Height ..... 8 5/16 inches
Width ..... 13 inches
Depth ..... 8 inches

Electrical Rating

105–125 volts AC/DC, 50–60 cycles AC.

Tuning Frequency Range ..... 550–1720 KC

Intermediate Frequency ..... 455 KC

Electrical Power Output (117 volts)

Undistorted ..... 1.1 watts
Maximum ..... 1.6 watts

GENERAL INFORMATION

Station Key Adjustments

The station key adjustments are located on the bottom of the cabinet through the slots designated as "Osc." and "RF." The extreme left trimmer in rows "Osc." and "RF" are corresponding adjustments for the first or extreme left station key. The second set of adjustment trimmers are for the No. 2 or second key from left; correspondingly the remaining sets of trimmers are for the station keys No. 3 and No. 4. All receivers to run for 15 minutes before making the following adjustments.

1. List desired station on key, then manually tune in station desired for this key.
2. Push in station key to be set-up, to its depressed position.
3. Adjust its corresponding "Osc." adjustment for the station signal which you tuned manually above and which is listed for the key. Peak adjustment for clearest reception.
4. Adjust corresponding "RF" adjustment for maximum signal strength.
5. Proceed in like manner for adjustment of remaining keys.

NOTE.—Clockwise rotation of adjustment screws lowers the frequency.

Special Service Information

The following information will be useful to servicemen equipped with vacuum tube voltmeters or similar voltage measuring instruments. When making the Stage Gain measurements in (1), the AVC bus should be shorted to B –.

(1) Stage Gains
Antenna post to converter grid ..... 3.8 at 1000 KC
Converter grid to IF grid ..... 30 at 455 KC
IF grid to 12SQ7 diode plate ..... 53 at 455 KC

(2) Audio Gain
0.14 volts, 400 cycle signal across volume control with control set at maximum, will give approximately ½-watt speaker output.

(3) DC voltage developed across oscillator grid resistor (R4) averages 5.0 volts at 1000 KC.

Variations of 20 per cent permissible. All readings obtained with enough signal input to give ½-watt speaker output.

J644, J644W, J654, J654W

These receivers incorporate the following features: Single-ended tubes, automatic volume control, built-in antenna, dynapower speaker and beam power output.

ALIGNMENT PROCEDURE

Alignment Frequencies

I.F. ..... 455 KC
R.F. ..... 1650 and 1500 KC

The location of all trimmers is shown in Fig. 1.

I.F. Alignment

Connect an output meter across the voice coil. Turn the volume control to maximum. Set test oscillator to 455 KC and keep the oscillator output as low as a readable meter reading will permit.

Apply signal to the converter grid through a .05 mfd. capacitor and align progressively the trimmers in the 2nd and 1st I.F. transformer cans.

R.F. Alignment

To insert the R.F. signal use either a standard I.R.E. dummy antenna between the signal generator and the receiver antenna post, or loop-couple the generator signal to the receiver Beam-a-Scope. A distance of two feet between generator loop and receiver Beam-a-Scope will insure freedom from over-coupling. When using an I.R.E. dummy antenna for R.F. alignment, do not connect the signal generator ground to the receiver chassis

With the gang condenser wide open, align oscillator trimmer (C-3b) to 1650 KC. Change generator signal to 1500 KC, tune receiver to the signal and peak antenna trimmer (C-3a) for maximum output.

Precaution

If the signal generator is AC operated use an isolating transformer between the power supply and the radio receiver power input. The use of an isolating capacitor is not recommended as AC current through the capacitor will introduce hum modulation and/or create the possibility of a burned-out signal generator attenuator.

Special Service Information

The following information will be very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

(1) Stage Gains — Gain*
Antenna Post to Converter Grid ..... 4.0 at 1000 KC
I.F. on Converter Grid to I.F. on I.F. Amplifier Grid ..... 35 at 455 KC
I.F. Amplifier Grid to Diode Plate ..... 60 at 455 KC

(2) 0.05-volt, 400-cycle signal across the volume control will give ½-watt speaker output.* (Volume control turned to maximum.)

(3) Average RF voltage developed from oscillator cathode to B – ..... 1.5 volts

* Variations of ± 20% permissible. All readings obtained with enough signal input to give ½-watt speaker output.

GENERAL ELECTRIC CO.

MODELS LB-700, LB-70
LB-702, LB-703

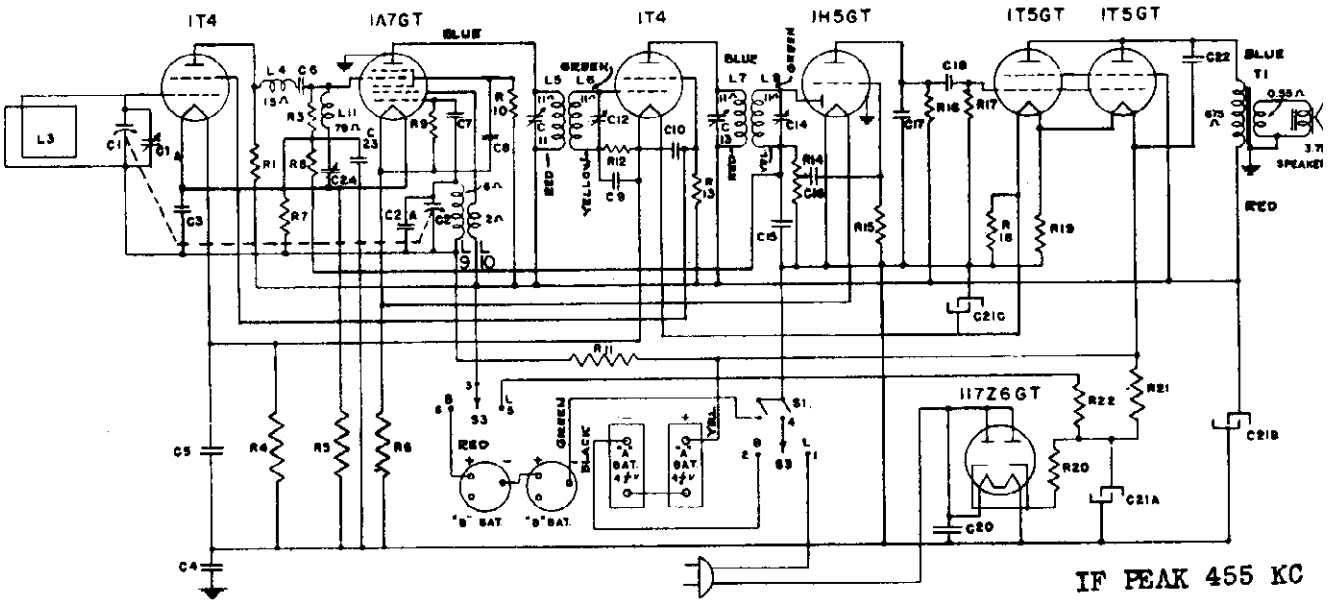


Fig. 2. Schematic Diagram Models LB-700 and LB-702

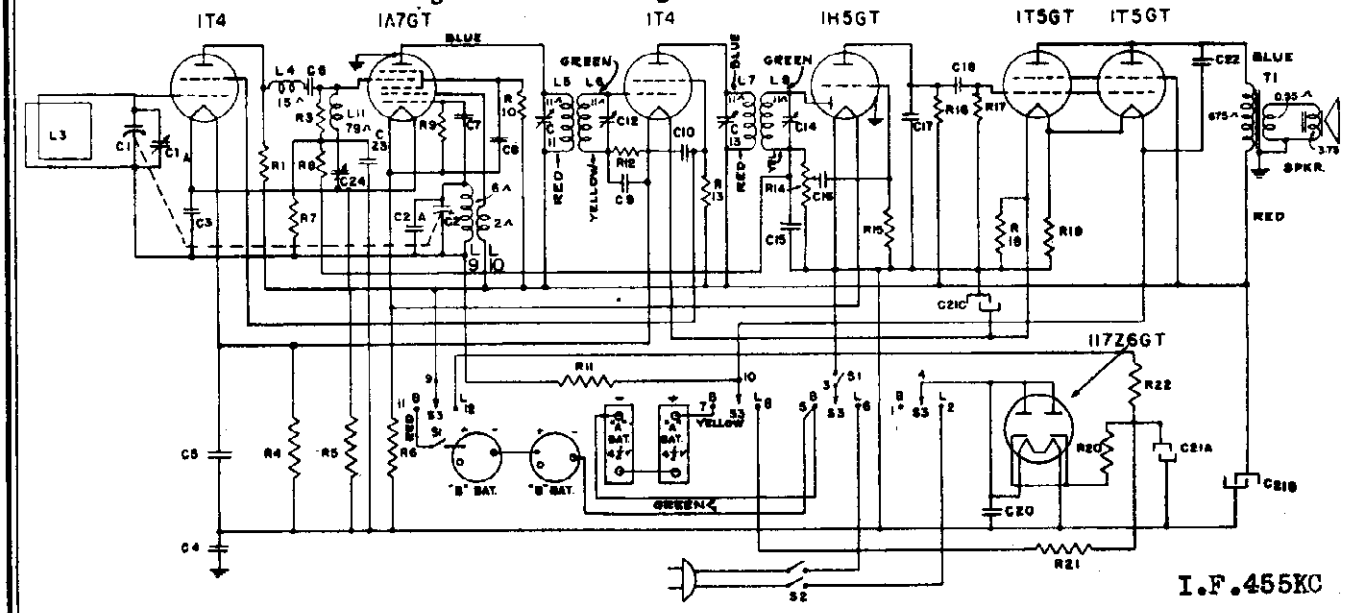


Fig. 3. Schematic Diagram Models LB-701 and LB-703

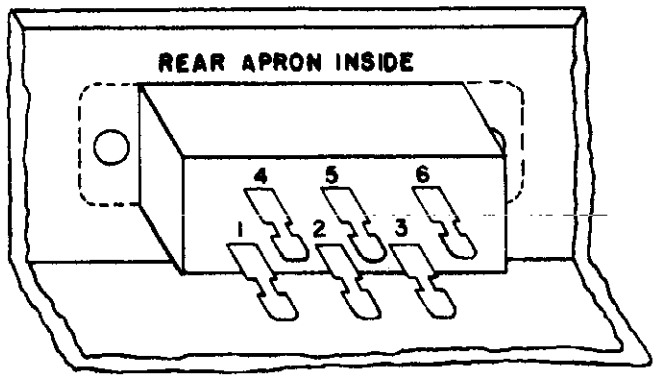


Fig. 4. Switch Wiring
Models LB-700 and LB-702

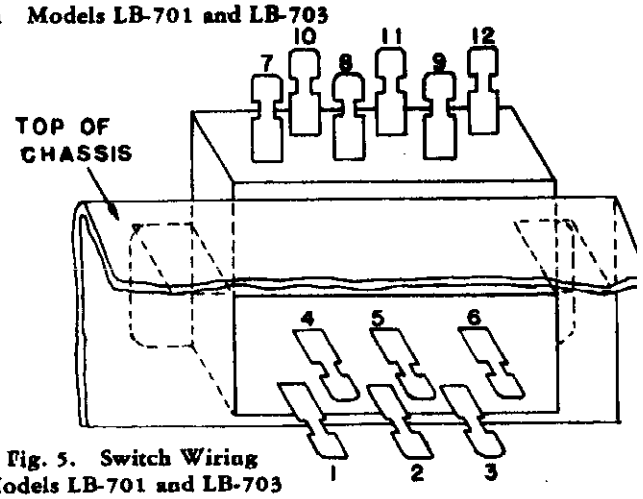


Fig. 5. Switch Wiring
Models LB-701 and LB-703

MODELS LB-700, LB701,
LB-702, LB-703

GENERAL ELECTRIC CO.

Stock No.	Symbol	Description	List Price
RC-7058	C-1, 1A, C2 and C2A	CONDENSER—Tuning condenser & trimmers	$1.80
*RC-071	C-3	CAPACITOR—.05 mfd., 120 V paper	.25
*RC-092	C-4	CAPACITOR—.05 mfd., 600 V paper	.30
*RC-130	C-5	CAPACITOR—.2 mfd., 200 V paper	.30
*RC-293	C-6	CAPACITOR—470 mmf., mica	.30
*RC-216	C-7	CAPACITOR—47 mmf., mica	.25
*RC-107	C-8-9-10	CAPACITOR—.1 mfd., 120 V paper	.25
*RC-249	C-15	CAPACITOR—220 mmf. mica	.25
*RC-023	C-16	CAPACITOR—.005 mfd., 600 V paper	.25
*RC-235	C-17	CAPACITOR—100 mmf., mica	.25
*RC-039	C-18	CAPACITOR—.01 mfd., 600 V, paper	.25
*RC-092	C-20	CAPACITOR—.05 mfd., 600 V, paper	.30
RC-5196	C-21A	CAPACITOR—40 mfd., 150 V, electrolytic	.60
RC-5193	C-21B, C	CAPACITOR -60 mfd., 150 V.; 100 mfd., 15 V, electrolytic	.80
*RC-039	C-22	CAPACITOR—.01 mfd., 600 V, paper	.25
*RC-071	C-23	CAPACITOR—.05 mfd., 120 V, paper	.25
*RC-672	C-24	CAPACITOR—5-35 mmf., trimmer	.15
*RQ-1287	R-1	RESISTOR—15,000 ohm, ½ W. carbon	.70-5
*RQ-1323	R-3	RESISTOR—470,000 ohm, ½ W. carbon	.70-5
*RQ-1263	R-4	RESISTOR—1,500 ohm, ½ W. carbon	.70-5
*RQ-1259	R-5	RESISTOR—1,000 ohm, ½ W. carbon	.70-5
*RQ-1253	R-6	RESISTOR—560 ohm ½ W. carbon	.70-5
*RQ-1341	R-7	RESISTOR—2.7 megohms, ½ W. carbon	.70-5
*RQ-1339	R-8	RESISTOR—2.2 megohms, ½ W. carbon	.70-5
*RQ-1315	R-9	RESISTOR—220,000 ohm, ½ W. carbon	.70-5
*RQ-1299	R-10	RESISTOR—47,000 ohm, ½ W. carbon	.70-5
*RQ-1355	R-11	RESISTOR—10 megohm, ½ W. carbon	.70-5
*RQ-1323	R-12	RESISTOR—470,000 ohm, ½ W. carbon	$0.70-5
*RQ-1295	R-13	RESISTOR—30,000 ohm, ½ W. carbon	.70-5
RV-130	R-14, S-1	VOLUME CONTROL—1.0 meg. vol. control & power switch (Models LB702, LB703)	1.45
RV-134	R14, S-1	VOLUME CONTROL—1.0 meg. vol. control and power switch (Models LB700, LB701)	1.45
*RQ-1349	R-15	RESISTOR—5.6 megohm, ½ W. carbon	.70-5
*RQ-1331	R-16, 17	RESISTOR—1.0 megohm, ½ W carbon	.70-5
*RQ-1257	R-18	RESISTOR—820 ohm, ½ W. carbon	.70-5
*RQ-1261	R-19	RESISTOR—1200 ohm, ½ W. carbon	.70-5
RQ-621	R-20	RESISTOR—91 ohm, 2 watt	.20
RR-366	R-21	RESISTOR—2200 ohm, 7 watt "wire-wound"	.30
*RQ-1261	R-22	RESISTOR—1200 ohm, ½ watt, carbon	.70-5

Electrical Rating

1. AC or DC Power Supply
   105–125 volts, 25–60 cycles on AC, 25 watts
2. Battery Power Supply
   9 volt "A" Supply
   90 volt "B" Supply

Loudspeaker—"Alnico" Magnet Dynamic

Outside Cone Diameter.....5 inches
Voice Coil Impedance (400 cycles).....3.5 ohms

Maximum Power Output.....440 milliwatts

Special Service Information

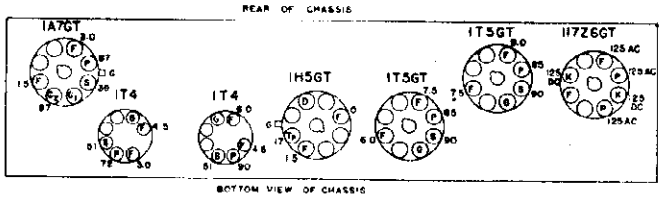
The following information will be very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available:

(1) Stage Gains
RF Grid to Converter Grid .....5.0 to 1000 KC
Converter Grid to 1F Grid .....40 at 1000 KC
Converter Grid to 1F Grid .....50 at 455 KC
1F Grid to 1H5GT diode plate .....90 at 455 KC

(2) 0.07 volts, 400 cycle signal across the volume control will give 50 milliwatts speaker output. With volume control set at maximum.

(3) Average DC voltage developed across the oscillator grid resistor (R9)—10 volts

Variations of ±20 o/o permissible. All readings are obtained with the AVC shorted out.



Line-Battery Switch Wiring

Figures 4 and 5 show the line-battery switch for the Models LB700-LB702 and LB701-LB703 respectively. The switch terminals are numbered from 1-6 and 1-12 to facilitate the tracing of the circuit when referring to the schematic diagram in changing or servicing a switch.

ALIGNMENT PROCEDURE

Alignment Frequencies

IF–455 KC.....RF–1750 and 1500 KC

General Alignment Notes

The chassis must be removed from the carrying case in order to perform the alignment of the IF, wavetrap and oscillator trimmers. For alignment of the RF trimmer, the chassis should be assembled in the cabinet. Special care must be exercised in making alignments outside the cabinet so as to place the batteries, Beam-a-Scope and chassis in the same relative positions with respect to one another as these components occupy in the cabinet; otherwise alignment will not be satisfactory.

IF Alignment

Connect an output meter across the voice coil of speaker and rotate volume control to maximum. Tighten wave trap trimmer (C24), then loosen this trimmer screw about two turns. Set test oscillator to 455 KC and capacity couple this test oscillator signal to the loop antenna. This can be done by using a three foot piece of wire connected to the high side of the signal generator and bring this wire to within a foot or two of the receiver loop antenna. Keep oscillator signal as low as a readable meter reading will permit and align all IF trimmers (C14, 13, 12, 11) for maximum output.

Wave Trap Alignment

With test oscillator set at 455 KC and with same input as described under "IF Alignment," adjust wave trap trimmer (C24) for a minimum output-meter reading.

RF Alignment

Adjust test oscillator to 1750 KC and loosely couple a wire from the output terminal of the signal generator so that the receiver loop will pick up the signal. Set the gang condenser to minimum capacity and adjust the oscillator trimmer (C2A) to receive the signal. After this has been done return the chassis to the cabinet, replace the back cover and set test oscillator to 1500 KC. Tune the receiver until this signal is heard, then with a thin insulated screw driver, peak the RF trimmer C1A for maximum output. This trimmer is available through the hole in the side of the cabinet.

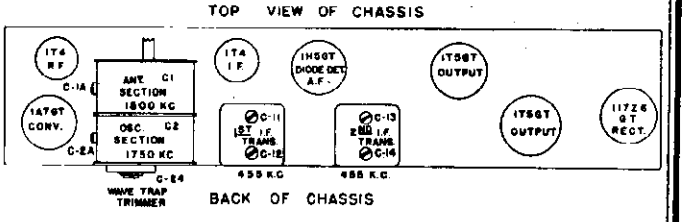
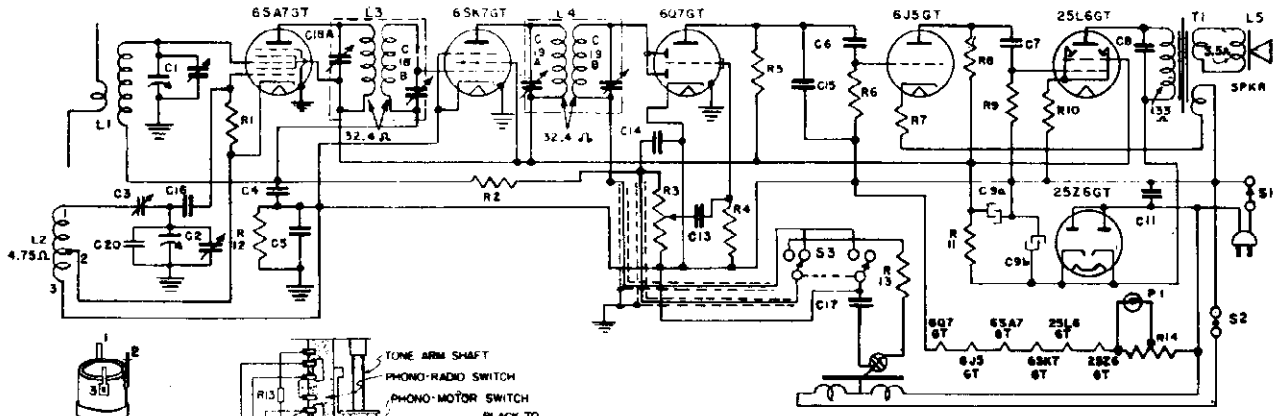
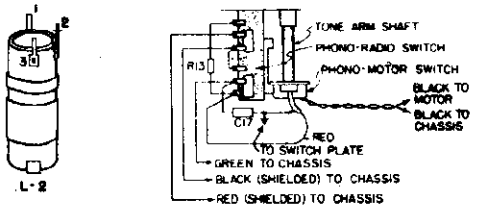


Fig. 1. Trimmer Location

GENERAL ELECTRIC CO.

MODEL L-678

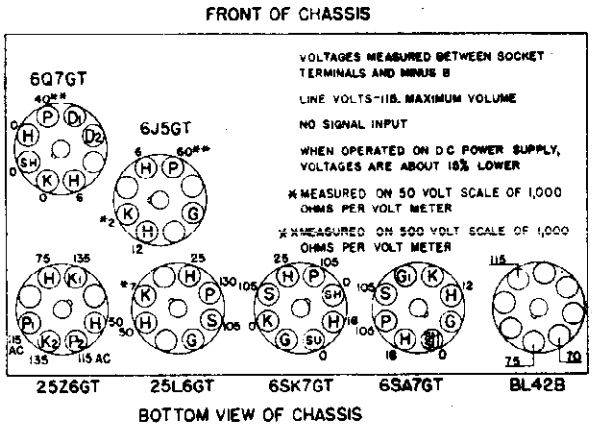


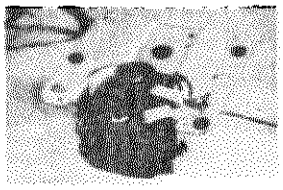


IF PEAK 455 KC

Stock No	Symbol	Description	List Price
*RC-7017	C-1, -2	CONDENSER—Tuning Condenser	$5.80
*RC-6515	C-3	CAPACITOR—Oscillator padder	.30
*RC-072	C-4	CAPACITOR—.05 Mfd., 200 V. paper	.25
*RC-130	C-5	CAPACITOR—0.2 Mfd., 400 V. paper	.30
*RC-023	C-6, 7	CAPACITOR—.005 Mfd., 600 V. paper	.25
*RC-039	C-8	CAPACITOR—.01 Mfd., 600 V. paper	.25
*RC-5145	C-9a	CAPACITOR—30 Mfd., 150 V.	.75
*RC-5145	C-9b	CAPACITOR—50 Mfd., 150 V.	
*RC-092	C-11	CAPACITOR—.05 Mfd., 600 V. paper	.30
*RC-060	C-13	CAPACITOR—.03 Mfd., 600 V. paper	.25
*RC-293	C-14	CAPACITOR—470 Mmf., mica	.30
*RC-250	C-15	CAPACITOR—220 Mmf., mica	.25
*RC-216	C-16	CAPACITOR—47 Mmf., mica	.25
*RC-104	C-17	CAPACITOR—0.1 Mfd., 400 V. paper	.30
*RC-226	C-20	CAPACITOR—10 Mmf., mica	.25
*RQ-1295	R-1	CAPACITOR—33,000 ohms, ½ W. carbon	.70-5
*RQ-1339	R-2	RESISTOR—2.2 megohm, ½ W. carbon	.70-5
RV-119	R-3, S-1	VOLUME CONTROL—0.5 megohm potentiometer	1.45
*RQ-1365	R-4	RESISTOR—15 megohm, ½ W. carbon	.70-5
*RQ-1323	R-5	RESISTOR—470,000 ohms, ½ W. carbon	.70-5
*RQ-1331	R-6	RESISTOR—1.0 megohm, ½ W. carbon	.70-5
*RQ-1271	R-7	RESISTOR—3,300 ohms, ½ W. carbon	.70-5
*RQ-1297	R-8	RESISTOR—39,000 ohms, ½ W. carbon	.70-5
*RQ-1323	R-9	RESISTOR—470,000 ohms, ½ W. carbon	.70-5
*RQ-1239	R-10	RESISTOR—150 ohms, ½ W. carbon	.70-5
*RQ-1459	R-11	RESISTOR—1,000 ohms, 1 W. carbon	.20
*RQ-1323	R-12	RESISTOR—470,000 ohms, ½ W. carbon	.70-5
*RQ-1307	R-13	RESISTOR—100,000 ohms, ½ W. carbon	.70-5
*RR-773	R-14	RESISTOR—BL42B Ballast resistor	.40
*RL-528	L-1	LOOP—Built-in antenna and back cover assembly	1.00
*RL-2016	L-2	COIL—Oscillator coil	.25
*RT-341	L-3	TRANSFORMER—1st I.F. transformer	.80
*RT-342	L-4	TRANSFORMER—2nd I.F. transformer	.80
*RT-475	T-1	TRANSFORMER—Output transformer	1.00

FOR OTHER DATA SEE INDEX





MOTOR ASSEMBLY
MODEL 1 (60-cycle only)

*RB-187	BRACKET—Rubber-edged drive wheel bracket assembly	$0.20
*RB-188	BRACKET—Rubber edged idler wheel bracket assembly	.20
*RB-627	BUSHING—Motor mtg. rubber bushing	.20-5
*RC-5146	CAPACITOR—Motor capacitor	1.00
*RH-112	HAIRPIN COTTER—Rubber wheel hairpin cotter	.10-10
*RM-129	MOTOR—60-cycle motor complete	4.50
*RP-157	PLATE—Motor mounting plate and spindle bearing assembly	.90
*RS-471	SPRING—Idler wheel bracket tension spring	.30-5
*RS-934	SPINDLE—Turntable spindle and snap ring	.30
*RT-916	TURNTABLE—8-inch flocked turntable	1.60
*RW-910	WHEEL—Rubber-edged wheel	.35

MOTOR ASSEMBLY—MODEL 2
(60-cycle and 50-cycle)

*RM-133	MOTOR—60-cycle motor assembly complete	$4.75
RM-152	MOTOR—50-cycle motor assembly complete	5.25
*RP-165	PLATE—Main plate and turntable shaft bearing assembly	1.00
*RP-166	PLATE—Motor mounting plate	.35
*RP-167	PLATE—Rubber-edged wheel movable plate and bearing assembly	.80
*RP-316	PULLEY—60-cycle drive pulley	.15
RP-333	PULLEY—50-cycle drive pulley	.35-2
*RS-493	SPRING—Movable plate tension spring	.10
*RS-943	SPINDLE—Turntable spindle and cotter	.25
*RS-953	SPACERS—Rotor spacers between bearings	.15-5
*RT-924	TURNTABLE—8-inch turntable	1.50
*RW-912	WHEEL—Rubber-edged wheel, washer, oil felt and cotter	1.50

(PRICES SUBJECT TO CHANGE WITHOUT NOTICE)

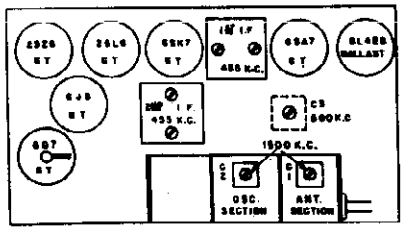


Fig. 1. Trimmer Location

MODELS HE-74, HE-74L,
HE-740, HE-740L

GENERAL ELECTRIC CO.

REPLACEMENT PARTS LIST

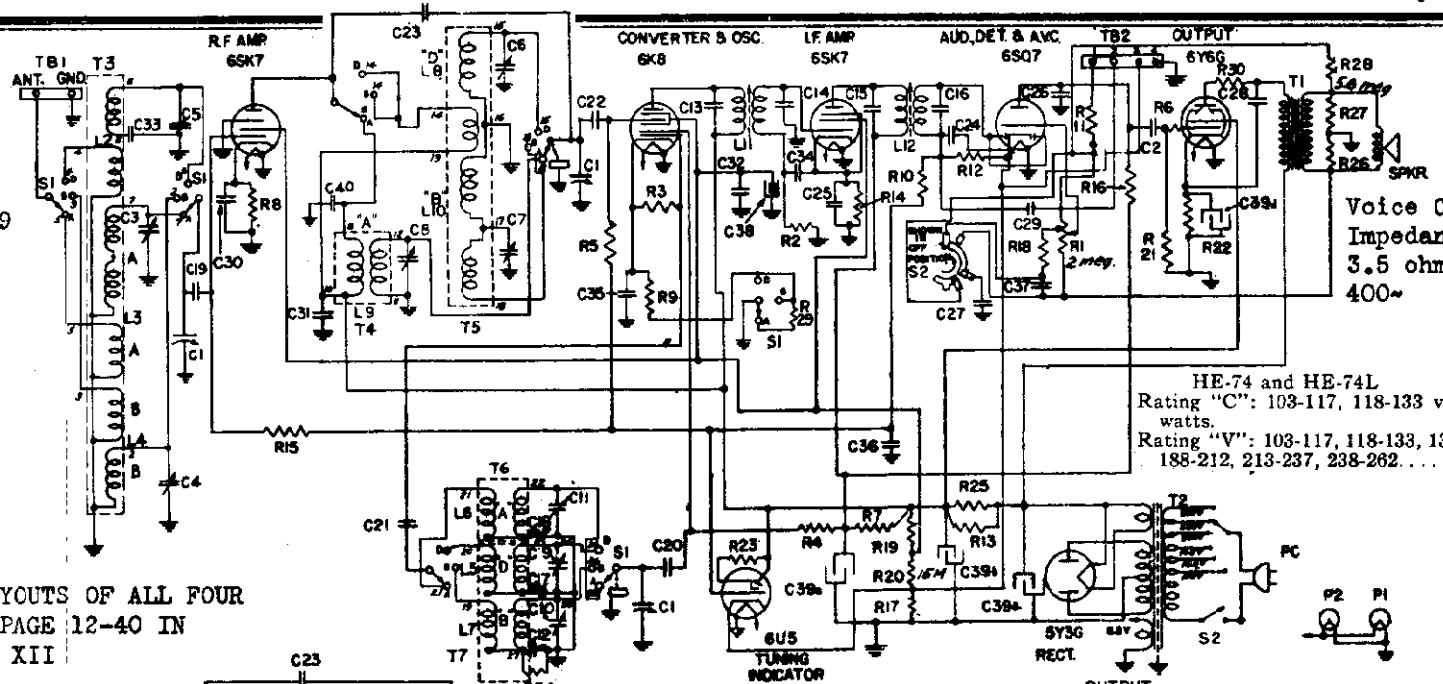
Models HE-74, HE-74L, HE-740, and HE-740L

Stock No.	Description	List Price
*RB-095	BOARD—Terminal board (2 lugs)	$0.10
RB-911	BACK COVER—Cabinet back cover (Model HE-740, 740L)	.30
RB-1002	BOARD—Ant-Gnd. terminal board (Model HE-74, 74L)	.10
RB-1004	BOARD—Terminal board (2 lugs and mounting post)	.10
RB-1005	BOARD—Terminal board (4 lugs)	.10
RB-1006	BOARD—Terminal board (5 lugs)	.10
RB-1007	BOARD—Terminal board (3 lugs) (Model HE-74, 740)	.10
RB-1011	BOARD—Ant-Gnd. terminal board (Model HE-740, 740L)	.10
RB-1012	BOARD—Phono-terminal board	.15
RB-1023	BOARD—Terminal board (5 lugs) (Model HE-74L, 740L)	.10
RC-004	CAPACITOR—.00075 mfd. 600 V. paper (C-27)	.25
*RC-011	CAPACITOR—.002 mfd. 600 V. paper (C 29)	.25
RC-039	CAPACITOR—.01 mfd. 600 V. paper (C-40, 41)	.25
*RC-054	CAPACITOR—.03 mfd. 1500 V. paper (C-28)	.35
*RC-055	CAPACITOR—.003 mfd. 600 V. paper (C-37)	.25
RC-056	CAPACITOR—.006 mfd. 600 V. paper (C-33)	.25
RC-072	CAPACITOR—.05 mfd. 200 V. paper (C-30, 34, 35, 36)	.25
RC-074	CAPACITOR—.05 mfd. 600 V. AC line (C-43)	.40
RC-090	CAPACITOR—.04 mfd. 600 V. paper (C-25)	.30
*RC-092	CAPACITOR—.05 mfd. 600 V. paper (C-2, 31, 32)	.30
RC-148	CAPACITOR—.25 mfd. 600 V. paper (C-42)	.35
*RC-206	CAPACITOR—50 mmf. mica (C-21)	.35
RC-231	CAPACITOR—10 mmf. mica (C-23)	.25
RC-235	CAPACITOR—100 mmf. mica (C-24)	.25
*RC-250	CAPACITOR—220 mmf. mica (C-26)	.25
RC-293	CAPACITOR—470 mmf. mica (C-19, 20, 22)	.30
*RC-348	CAPACITOR—1600 mmf. mica (C-18)	.35
*RC-359	CAPACITOR—2800 mmf. mica (C-17)	.50
*RC-676	CAPACITOR—300-650 mmf. "B" band padder (C-12)	.35
*RC-684	CAPACITOR—5-40 mmf. 3-30 mmf. 2-20 mmf. "D," "C," "B" band antenna trimmer assembly (C-3, 4, 5)	.45
*RC-685	CAPACITOR—3-30 mmf. 3-30 mmf. 3-30 mmf. "D," "C," "B" band R.F. trimmer assembly (C-6, 7, 8)	.45
*RC-686	CAPACITOR—3-30 mmf. 3-30 mmf. 5-45 mmf. "D," "C," "B" band oscillator trimmer assembly (C-9, 10, 11)	.45
*RC-863	CORD—Power cord (Model HE-74, 74L)	.65
*RC-1981	CLAMP—Tuning indicator clamp	.10
*RC-5100	CAPACITOR—8 mfd. 250 V. dry electrolytic (C-38)	.50
RC-5130	CAPACITOR—40 mfd. 350 V.; 20 mfd. 300 V.; 20 mfd. 300 V.; 20 mfd. 25 V.; dry electrolytic (C39a, 39b, 39c, 39d) (Model HE-74, 74L)	2.10
RC-5132	CAPACITOR—40 mfd. 300 V.; 50 mfd. 250 V.; 20 mfd. 250 V.; 20 mfd. 25 V.; dry electrolytic (C-39a, 39b, 39c, 39d) (Model HE-740, 740L)	2.10
RC-6518	CAPACITOR—75-175 mmf. "A" band padder	.25
RC-7010	CONDENSER—Tuning condenser (C-1)	4.95
RC-8085	CABLE—Tuning indicator cable assembly (Model HE-740, 740L)	.50
RC-8118	CABLE—Tuning indicator cable assembly (Model HE-74, 74L)	$0.50
RC-8126	CORD—Power cord (Model HE-740, 740L)	.40
RD-106	DIAL—Dial scale (Model HE-74, 740)	1.15
RD-118	DIAL—Dial scale (Model HE-74L, 740L)	1.35
RE-054	ESCUTCHEON—Dial scale escutcheon	1.90
RE-055	ESCUTCHEON—Tuning indicator escutcheon	.20
*RF-012	FOOT—Mounting foot assembly	.40
*RG-016	GRID CLIP—Grid clip for metal tube (Pkg. 5)	.10
RK-045	KNOB—Control knobs (Pkg. 5) (Model HE-740, 740L)	.60
RK-047	KNOB—Control knobs (Model HE-74, 74L) (Pkg. 5)	.40
RL-082	COIL—Ant. coil, band "D," "C" and "B" (L-2, 3, 4) (HE-74, 740)	1.50
RL-091	COIL—Ant. coil, band "D," "A" and "B" (L-2, 3, 4) (Model HE-74L, 740L)	2.50
RL-157	COIL—RF coil, band "D" and "B" (L8, 10) (Model HE-74, 740)	1.00
RL-158	COIL—RF coil, band "C" (L-9) (HE-74, 740)	.60
RL-160	COIL—RF coil, band "D" and "B" (L8, 10) (Model HE-74L, 740L)	1.00
RL-161	COIL—RF coil, band "A" (L-9) (Model HE-74L, 740L)	1.15
RL-284	COIL—Osc. coil, band "D" and "B" (L-5, 7) (Model HE-74, 740)	.85
RL-285	COIL—Osc. coil, band "C" (L-6) (Model HE-74, 740)	.50
RL-298	COIL—Osc. coil, band "D" & "B" (L-5, 7) (Model HE-74L, 740L)	.90
RL-299	COIL—Osc. coil, band "A" (L-6) (Model HE-74L, 740L)	.75
RQ-642	RESISTOR—220 ohms, 2-W. carbon (R-22)	.20
RQ-669	RESISTOR—2700 ohms, 2-W. carbon (R-19)	.20
RQ-672	RESISTOR—3900 ohms, 2-W. carbon (R-13, 25)	.20
*RQ-1219	RESISTOR—22 ohms, ½-W. carbon (R-26) (Pkg. 5)	.70
*RQ-1235	RESISTOR—100 ohms, ½-W. carbon (R-27) (Pkg. 5)	.70
*RQ-1239	RESISTOR—150 ohms, ½-W. carbon (R-17) (Pkg. 5)	.70
*RQ-1243	RESISTOR—220 ohms, ½-W. carbon (R-9) (Pkg. 5)	.70
*RQ-1247	RESISTOR—330 ohms, ½-W. carbon (R-14) (Pkg. 5)	.70
*RQ-1253	RESISTOR—560 ohms, ½-W. carbon (R-8) (Pkg. 5)	.70
*RQ-1259	RESISTOR—1000 ohms, ½-W. carbon (R-6, 7) (Pkg. 5)	.70
*RQ-1277	RESISTOR—5600 ohms, ½-W. carbon (R-24) (Pkg. 5)	.70
*RQ-1287	RESISTOR—15,000 ohms, ½-W. carbon (R-4) (Pkg. 5)	.70
*RQ-1295	RESISTOR—33,000 ohms, ½-W. carbon (R-3) (Pkg. 5)	.70
*RQ-1299	RESISTOR—47,000 ohms, ½-W. carbon (R-11) (Pkg. 5)	.70
*RQ-1315	RESISTOR—220,000 ohms, ½-W. carbon (R-18) (Pkg. 5)	.70
*RQ-1319	RESISTOR—330,000 ohms, ½-W. carbon (R-2, 12, 16) (Pkg. 5)	.70
*RQ-1323	RESISTOR—470,000 ohms, ½-W. carbon (R-21) (Pkg. 5)	.70
*RQ-1325	RESISTOR—560,000 ohms, ½-W. carbon (R-5, 15) (Pkg. 5)	.70
*RQ-1339	RESISTOR—2.2 meg. ½-W. carbon (R-10) (Pkg. 5)	.70

*Used on previous receivers.

(Prices subject to change without notice)

Model HE-74L
Similar to
HE-74, see
GE page 12-39
except for
wave bands.

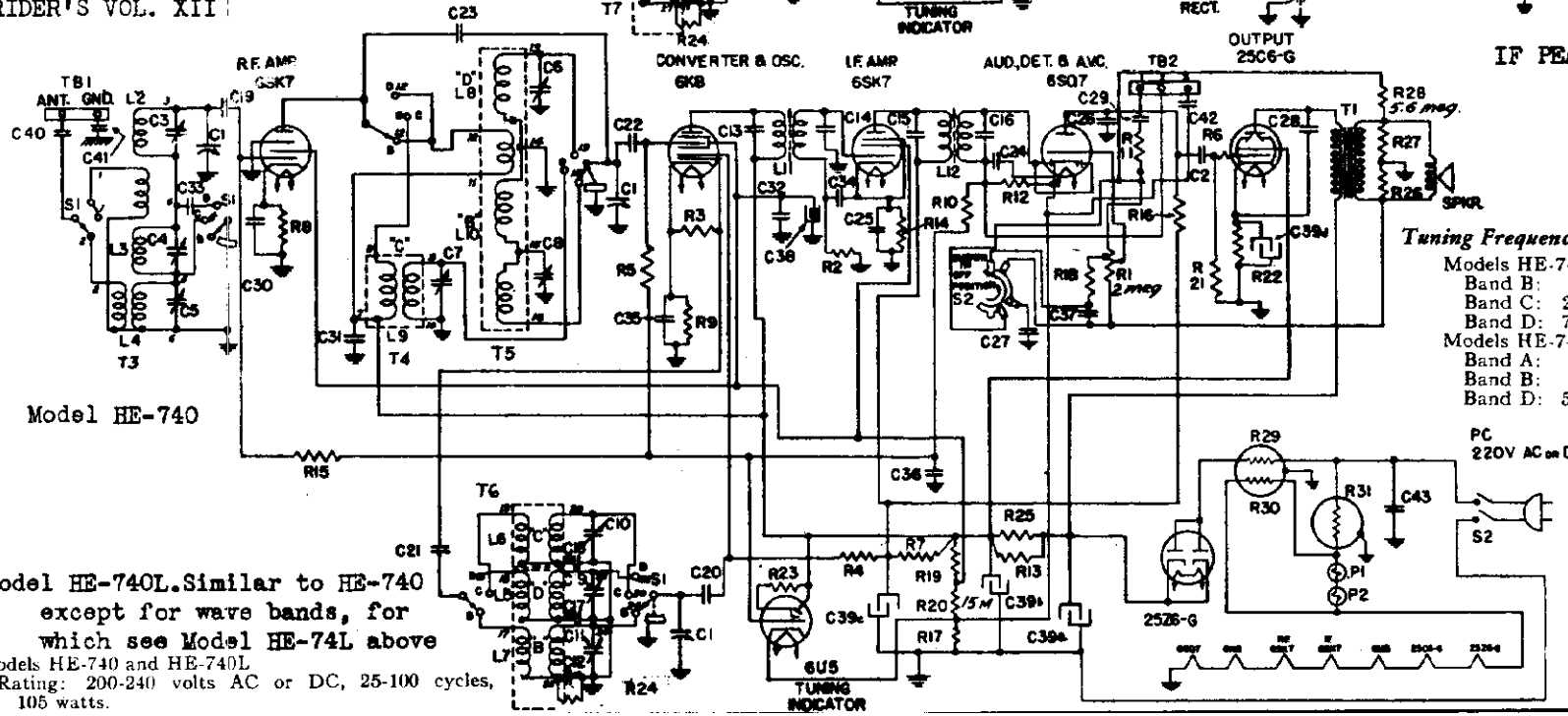


Voice Coil
Impedance
3.5 ohms at
400~

HE-74 and HE-74L
Rating "C": 103-117, 118-133 volts, 25-60 cycles, 85 watts.
Rating "V": 103-117, 118-133, 134-155, 188-212, 213-237, 238-262..... { volts, 50-60 cycles, 85 watts.

FOR PARTS LAYOUTS OF ALL FOUR
MODELS, SEE PAGE 12-40 IN
RIDER'S VOL. XII

IF PEAK 455 KC



Model HE-740

Tuning Frequency Range

Models HE-74 and HE-740
Band B: 540–1600 K.C.
Band C: 2200–7000 K.C.
Band D: 7000–22,000 K.C.
Models HE-74L and HE-740L
Band A: 140–400 K.C.
Band B: 540–1600 K.C.
Band D: 5700–18,000 K.C.

BALLAST
TUBES
K13J287
K13J58

Model HE-740L. Similar to HE-740 except for wave bands, for which see Model HE-74L above

Models HE-740 and HE-740L
Rating: 200-240 volts AC or DC, 25-100 cycles, 105 watts.

MODEL L-740

GENERAL ELECTRIC CO.

SPECIFICATIONS

Over-all Dimensions

Height ..... 11⅝ inches
Width ..... 17 inches
Depth ..... 11 inches

Electrical Rating

"A" rating, 110–125 volts, 50–60 cycles, 70 watts.
"C" rating, 110–125 volts, 25 cycles, 70 watts.

Tuning Frequency Range

"BC" Band ..... 550–1720 KC
"SW1" Band ..... 1.7–5.2 MC
"SW2" Band ..... 5.2–18.1 MC

Intermediate Frequency ..... 455 KC

Electrical Power Output

Undistorted ..... 3.5 watts
Maximum ..... 5.5 watts

Loud-speaker—PM Dynamic

Outside Cone Diameter ..... 6½ inch
Voice Coil Impedance ..... 3.5 ohms

Tubes

RF Amplifier GE-6SG7
Converter, Oscillator GE-6SA7
IF Amplifier, Detector, AVC. GE-6SF7
Audio Amplifier, Phase Inverter GE-6SC7
Power Output. ..... (2) GE-6K6GT
Rectifier GE-5W4GT
Dial Lamps ..... (2) MAZDA No. 44

ALIGNMENT CHART

Step	Connect Test-Osc. to	Test-Osc. Setting	Pointer Setting	Adjust Trimmers for Maximum Output
1	6SF7 IF Grid in series with .05 mfd.	455 KC	"BC" Band 550 KC	C17 & C16
2	6SA7 Conv. grid in series with .05 mfd.	455 KC	"BC" Band 550 KC	C14 & C13
3	Capacity Coupled	580 KC	"BC" Band 580 KC	C11**
4	Capacity Coupled	1500 KC	"BC" Band 1500 KC	C8** (Osc.)
5	Repeat Step 3			
6	Capacity Coupled	5 MC	"SW1" Band	C7** (Osc.)
7	Capacity Coupled	18 MC	"SW2" Band 18 MC	C6* (Osc.)
8	Capacity Coupled	18 MC	"SW2" Band 18 MC	C1** (Ant.)

*Use minimum capacity peak.
**Rock gang condenser when making alignment.

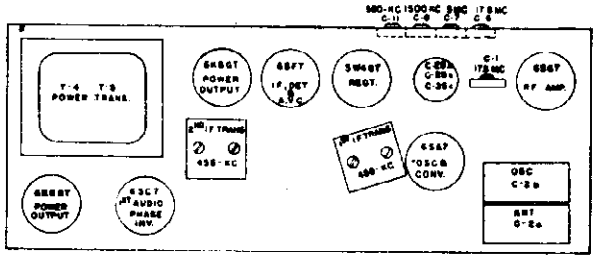


Fig. 1. Trimmer Location

ALIGNMENT PROCEDURE

The location of trimmers is shown in Fig. 1. All oscillator and RF trimmers are accessible through a slot through the back cover of the cabinet.

The alignment procedure is given in table form. All IF alignments may be made with the chassis removed from the cabinet. However, the RF alignments are made with the chassis and loop antennas securely fastened in the cabinet, as the relative position of the loop antenna with respect to the chassis materially affects it. The RF signal should be capacity coupled by placing a two-foot wire for an antenna on the test-oscillator output post (high side). Keeping this antenna two feet or more from the receiver loop will generally insure freedom from too much coupling. Metal objects such as meters, tools, etc., should not be placed on top of the receiver cabinet.

Special Service Information

The following data are taken with a vacuum tube voltmeter or similar voltage measuring device.

(1) Stage Gains

Antenna Post to RF Grid	6.5 at 1000 KC
RF Grid to Converter Grid	10 at 1000 KC
Converter Grid to IF Grid	45 at 1000 KC
Converter Grid to IF Grid	60 at 455 KC
IF Grid to 6SF7 diode plates	110 at 455 KC

(2) Audio Gains
.16 volts, 400 cycles signal across volume control with control set to maximum will give approximately ½-watt speaker output.

(3) DC voltage developed across oscillator grid resistor R4 averages 10 volts at 1000 KC or 8.0 volts at 10,000 KC.

Variations of ±20% permissible. All readings taken with −1½-volt fixed bias on AVC bus.

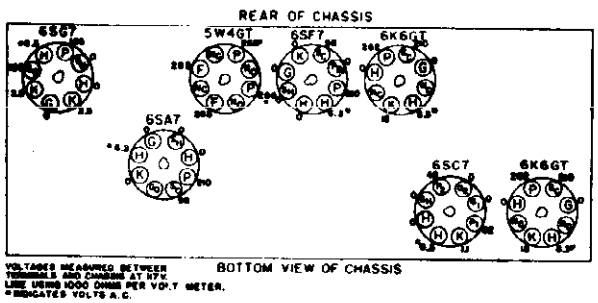
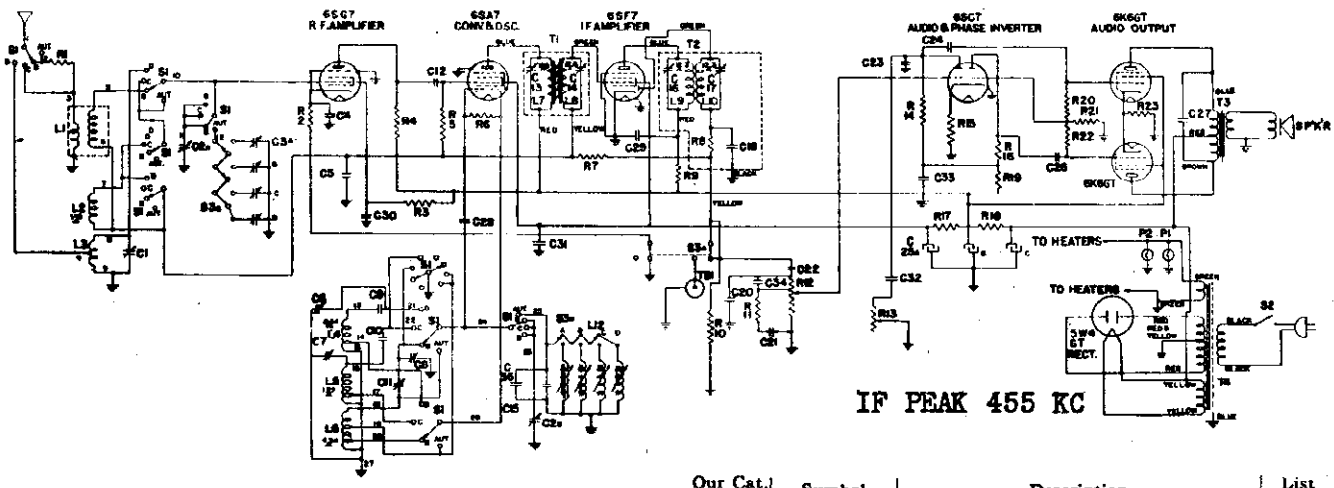
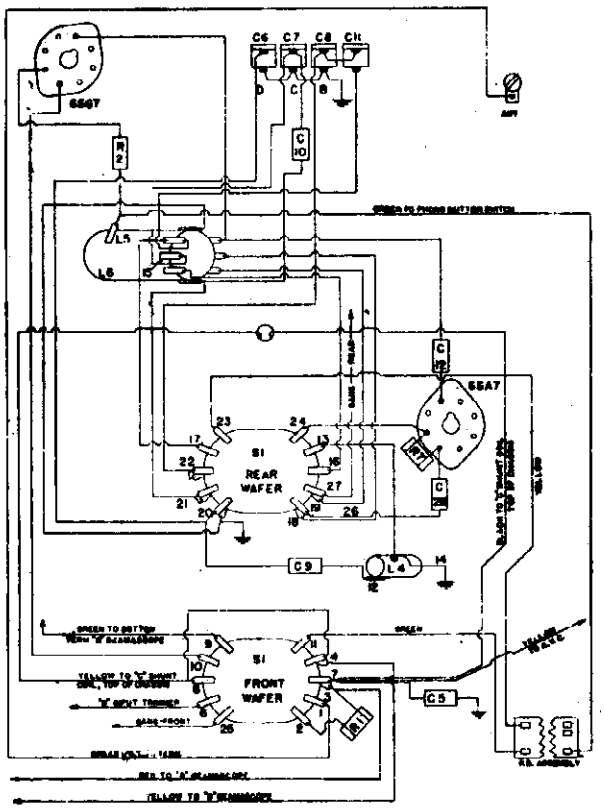


Fig. 2. Socket Voltages

MODEL L-740

GENERAL ELECTRIC CO.





Our Cat. Number	Symbol	Description	List Price
RC-6553	C-1	CAPACITOR L8 20 mmf., "D" band trimmer	$0.25
RC-7061	C-2a, C-2b	CONDENSER—2 gang condenser	2.00
RT-885	C-3a, b, c, and d	TRIMMER STRIP—Push button trimmer strip	.70
*RC-039	C-4	CAPACITOR—.01 mfd. 600 volt paper	.25
*RC-072	C-5	CAPACITOR—.05 mfd. 200 volt paper	.25
RC-6555	C-6, 7, 8	CAPACITOR STRIP—"B," "C" and "D" osc. trimmers	.70
*RC-393	C-9	CAPACITOR—4700 mmf., mica	.50
*RC-349	C-10	CAPACITOR—2000 mmf., mica	.30
RC-6555	C-11	CAPACITOR—"B" padder (part of C-4, -5, -6)	.65

Our Cat. Number	Symbol	Description	List Price
*RC-235	C-12	CAPACITOR—100 mmf., mica	.25
RC-305	C-15	CAPACITOR—600 mmf., silvered mica	.25
*RC-252	C-18	CAPACITOR—200 mmf., mica	.30
*RC-235	C-20	CAPACITOR—100 mmf., mica	.25
*RC-049	C-21	CAPACITOR—.004 mfd., 600 V, paper	.35
*RC-023	C-22	CAPACITOR—.005 mfd., 600 V, paper	.25
*RC-249	C-23	CAPACITOR—220 mmf., mica, 500 V	.25
*RC-048	C-24	CAPACITOR—.02 mfd., 600 V, paper	.30
RC-5198	C-25a	CAPACITOR—10 mfd., 250 V, dry electrolytic	1.10
	C-25b	CAPACITOR—15 mfd., 300 V, dry electrolytic	
	C-25c	CAPACITOR—30 mfd., 350 V, dry electrolytic	
*RC-048	C-26	CAPACITOR—.02 mfd. 600 V, paper	.30
*RC-011	C-27	CAPACITOR—.002 mfd. 600 V, paper	.25
*RC-216	C-28	CAPACITOR—47 mmf., mica	.25
*RC-039	C-29, 30, 31	CAPACITOR—.01 mfd. 600 V, paper	.25
*RC-023	C-32	CAPACITOR—.005 mfd. 600 V, paper	.25
*RC-104	C-33	CAPACITOR—0.1 mfd. 600 V, paper	.30
*RC-216	C-34	CAPACITOR—47 mmf., mica	.25
*RC-329	C-35	CAPACITOR—150 mmf, compensating cap	.25
*RQ-1251	R-1	RESISTOR—470 ohm, ½-W. carbon	.70-5
*RQ-1243	R-2	RESISTOR—220 ohm, ½-W. carbon	.70-5
*RQ-1275	R-5	RESISTOR—4700 ohm, ½-W. carbon	.70-5
*RQ-1299	R-6	RESISTOR—47,000 ohm, ½-W. carbon	.70-5
*RQ-1291	R-7	RESISTOR—22,000 ohm, ½-W. carbon	.70-5
*RQ-1339	R-8	RESISTOR—2.2 megohm, ½-W. carbon	.70-5
*RQ-1299	R-10	RESISTOR—47,000 ohm, ½-W. carbon	.70-5
*RQ-1308	R-11	RESISTOR—100,000 ohm, ½-W. carbon	$0.70-5
*RV-135	R-12	VOLUME CONTROL—2 meg. volume control	.95
*RQ-1323	R-14	RESISTOR—470,000 ohm, ½-W. carbon	.70-5
*RQ-1273	R-15	RESISTOR—3900 ohm, ½-W. carbon	.70-5
*RQ-1331	R-16	RESISTOR—1 megohm, ½-W. carbon	.70-5
*RQ-683	R-17	RESISTOR—10,000 ohm 2-W. carbon	.35
*RR-357	R-18	RESISTOR—12,000 ohm, 7.4 watt, W. W.	.30
*RQ-1293	R-19	RESISTOR—27,000 ohm, ½-W. carbon	.70-5
*RQ-1319	R-20	RESISTOR—330,000 ohm, ½-W. carbon	.70-5
*RQ-1308	R-21	RESISTOR—100,000 ohm, ½-W. carbon	.70-5
*RQ-1319	R-22	RESISTOR—330,000 ohm, ½-W. carbon	.70-5
*RQ-1451	R-25	RESISTOR—470 ohm, 1-W. carbon	.20
*RQ-1323	R-26	RESISTOR—470,000 ohm, ½-Watt carbon	.70-5
*RQ-1269	R-27	RESISTOR—2600 ohm, ½-Watt carbon	.70-5
RT-723	R-28, S-2	TONE CONTROL—2 megohm tone control and power switch	1.45
*RQ-1308	R-29	RESISTOR—100,000 ohm, ½-W. carbon	.70-5
RL-580	L-1	BEAM-A-SCOPE—"B" band loop and cabinet back assembly	1.60
*RL-167	L-2	COIL—"C" band R.F. coil	.25
RL-581	L-3	BEAM-A-SCOPE—"D" band loop assembly	.60
*RL-2065	L-4	COIL—"D" band oscillator coil	.25
*RL-2066	L-5, -6	COIL—"B" and "C" band osc. coil	.85
*RL-9530	L-12a, b, c, and d	COIL—Push button coil assembly	.85
*RS-3129	S-1	SWITCH—Band change switch	1.30
*RS-3130	S-3a, b	SWITCH—Push button switch	4.00
RT-3011	T-1	TRANSFORMER—1st I.F. transformer	1.20
RT-3012	T-2	TRANSFORMER—2nd I.F. transformer	1.20
RT-4015	T-3	TRANSFORMER—Speaker output transformer	1.40
RT-0724	T-4	TRANSFORMER—50/60 cycle power transformer	4.15
RT-0725	T-5	TRANSFORMER—25-cycle power transformer	9.90
*RS-1012	SPKR	SPEAKER—6½ in. P.M. speaker	3.25

* Used on previous receivers.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

MODEL LC-758

GENERAL ELECTRIC CO.

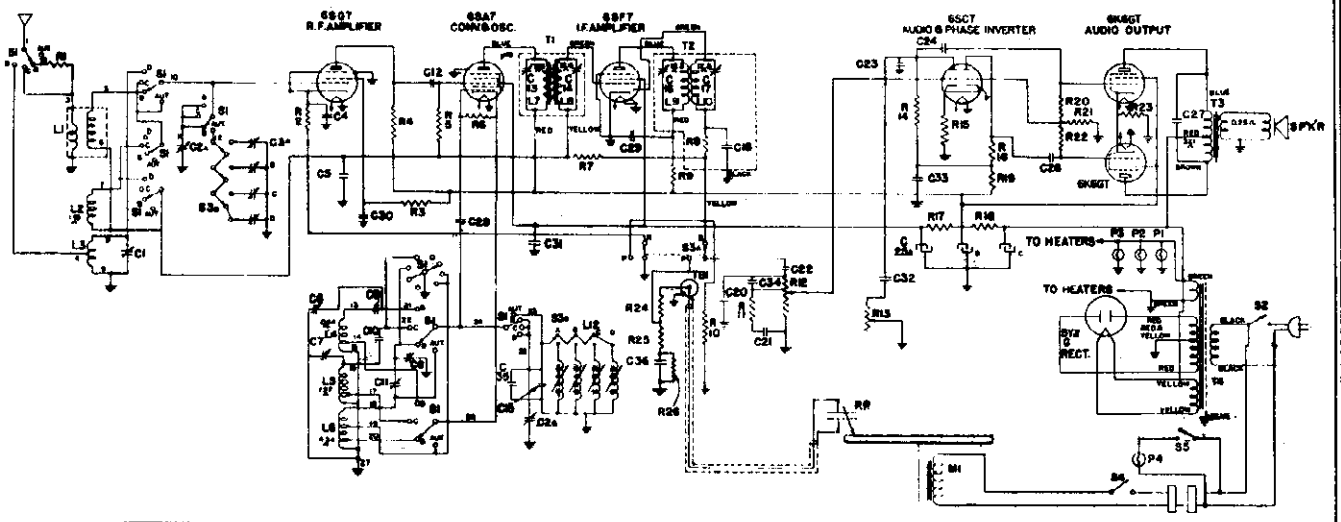


Fig. 1. Schematic Diagram

I.F. 455KC

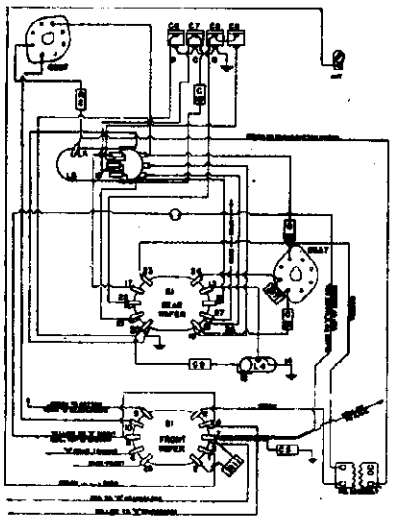


Fig. 2. Switch Wiring

RADIO REPLACEMENT PARTS LIST

Our Cat. Number	Symbol	Description	List Price
*RC-6537	C-1	CAPACITOR—1.8-20 mmf. "D" band trimmer	$0.25
*RC-7061	C-2a, 2b	CONDENSER—2-gang tuning condenser	2.00
*RT-885	C-3a, b, c, d	TRIMMER STRIP—Push button trimmer strip	.70
*RC-039	C-4	CAPACITOR—.01 mfd., 600 V paper	.25
*RC-072	C-5	CAPACITOR—.05 mfd., 200 V paper	.25
*RC-6555	C-6, 7, 8	CAPACITOR STRIP—"B," "C" and "D" osc. trimmers	.65
*RC-393	C-9	CAPACITOR—4700 mmf., mica	.50
*RC-349	C-10	CAPACITOR—2000 mmf., mica	.30
*RC-6555	C-11	CAPACITOR—"B" padder (Part of C6, 7, 8)	.65
*RC-235	C-12	CAPACITOR—100 mmf., mica	.25
*RC-305	C-15	CAPACITOR—600 mmf., silvered mica	.25
*RC-252	C-18	CAPACITOR—200 mmf., mica	.30
*RC-235	C-20	CAPACITOR—100 mmf., mica	.25
*RC-049	C-21	CAPACITOR—.0042 mfd., 600 V paper	.35
*RC-023	C-22	CAPACITOR—.005 mfd., 600 V paper	.25
*RC-249	C-23	CAPACITOR—220 mmf., mica	.25
*RC-048	C-24	CAPACITOR—.02 mfd., 600 V paper	.30

RADIO REPLACEMENT PARTS LIST

Our Cat. Number	Symbol	Description	List Price
RC-5199	C-25a	CAPACITOR—10 mfd., 350 V dry electrolytic	$1.30
	C-25b	CAPACITOR—15 mfd., 400 V dry electrolytic	
	C-25c	CAPACITOR—30 mfd., 450 V dry electrolytic	
*RC-048	C-26	CAPACITOR—.02 mfd., 600 V paper	.30
*RC-191	C-27	CAPACITOR—.002 mfd., 1000 V paper	.35
*RC-216	C-28	CAPACITOR—47 mmf., mica	.25
*RC-039	C-29, 30, 31	CAPACITOR—.01 mfd., 600 V paper	.25
*RC-023	C-32	CAPACITOR—.005 mfd., 600 V paper	.25
*RC-104	C-33	CAPACITOR—0.1 mfd., 600 V paper	.30
*RC-235	C-34	CAPACITOR—100 mmf., mica	.25
*RC-329	C-35	CAPACITOR—150 mmf. compensating	.25
*RC-016	C-36	CAPACITOR—.002 mfd., 600 V paper	.25
*RQ-1259	R-1	RESISTOR—1000 ohm, ½-W carbon	.70-5
*RQ-1243	R-2	RESISTOR—220 ohm, ½-W carbon	.70-5
*RQ-1299	R-3	RESISTOR—47,000 ohm, ½-W carbon	.70-5
*RQ-1275	R-4	RESISTOR—4700 ohm, ½-W carbon	.70-5
*RQ-1299	R-5	RESISTOR—47,000 ohm, ½-W carbon	.70-5
*RQ-1291	R-6	RESISTOR—22,000 ohm, ½-W carbon	.70-5
*RQ-1339	R-7	RESISTOR—2.2 megohm, ½-W carbon	.70-5
*RQ-1299	R-8	RESISTOR—47,000 ohm, ½-W carbon	.70-5
*RQ-1269	R-9	RESISTOR—2700 ohm, ½-W carbon	.70-5
*RQ-1323	R-10	RESISTOR—470,000 ohm, ½-W carbon	.70-5
*RQ-1303	R-11	RESISTOR—68,000 ohm, ½-W carbon	.70-5
*RV-135	R-12	VOL. CONTROL—2 meg. volume control	.95
RT-723	R-13, S-2	TONE CONTROL—2 meg. tone control	1.45
*RQ-1323	R-14	RESISTOR—470,000 ohm, ½-W carbon	.70-5
*RQ-1273	R-15	RESISTOR—3,900 ohm, ½-W carbon	.70-5
*RQ-1331	R-16	RESISTOR—1 megohm, ½-W carbon	.70-5
*RQ-687	R-17	RESISTOR—15,000 ohm, 2-W carbon	.35
*RR-357	R-18	RESISTOR—1,200 ohm, 5.6 watt, w.w.	.30
*RQ-1308	R-19	RESISTOR—100,000 ohm, ½-W carbon	.70-5
*RQ-1319	R-20	RESISTOR—330,000 ohm, ½-W carbon	.70-5
*RQ-1308	R-21	RESISTOR—100,000 ohm, ½-W carbon	.70-5
*RQ-1319	R-22	RESISTOR—330,000 ohm, ½-W carbon	.70-5
*RQ-646	R-23	RESISTOR—330 ohm, 2-W carbon	.20
*RQ-1315	R-24, 25, 26	RESISTOR—220,000 ohm, ½-W carbon	.70-5
RL-586	L-1	BEAM-A-SCOPE—"B" band loop	2.75
*RL-167	L-2	COIL—"C" band R.F. coil	.25
RL-587	L-3	BEAM-A-SCOPE—"D" band loop assembly	.55
*RL-2065	L-4	COIL—"D" band oscillator coil	.25
RL-2070	L-5-6	COIL—"B" and "C" band oscillator coil	.80
*RL-9530	L-12a, b, c, d	COIL—Push-button coil assembly	.85
*RS-3129	S-1	SWITCH—Band change switch	1.30
*RS-3130	S-3a, b	SWITCH—Push-button switch	4.00
RS-3137	S-5	SWITCH—PHONO compartment lamp switch	.40
RT-3017	T-1	TRANSFORMER—1st IF transformer	1.20

* Used on previous receivers.

Prices subject to change without notice.

GENERAL ELECTRIC CO.

SPECIFICATIONS

Over-all Dimensions

Height ..... 36 inches
Width ..... 34 ½ inches
Depth ..... 16 ¾ inches

Electrical Rating

Rating "A6"—110–125 volts, 60 cycles, 85 watts
Rating "A5"—110–125 volts, 50 cycles, 85 watts

Tuning Frequency Range

"BC" Band ..... 550–1720 KC
"SW1" Band ..... 1.7–5.2 MC
"SW2" Band ..... 5.2–18.1 MC

Intermediate Frequency ..... 455 KC

For RCA RP 158 Record Changer, see Rider's "Automatic Record Changers and Recorders".

ALIGNMENT CHART

Step	Connect Test-Osc. to	Test-Osc. Setting	Pointer Setting	Adjust Trimmers for Maximum Output
1	6SF7 IF Grid in series with .05 mfd.	455 KC	"BC" Band 550 KC	C17 & C16
2	6SA7 Conv. grid in series with .05 mfd.	455 KC	"BC" Band 550 KC	C14 & C13
3	Capacity Coupled	580 KC	"BC" Band 580 KC	C11**
4	Capacity Coupled	1500 KC	"BC" Band 1500 KC	C8** (Osc.)
5	Repeat Step 3			
6	Capacity Coupled	5 MC	"SW1" Band	C7** (Osc.)
7	Capacity Coupled	17.8 MC	"SW2" Band 18 MC	C6* (Osc.)
8	Capacity Coupled	17.8 MC	"SW2" Band 18 MC	C1** (Ant.)

* Use minimum capacity peak.
** Rock gang condenser when making alignment.

Special Service Information

The following data are taken with a vacuum tube voltmeter or similar voltage measuring device.

(1) Stage Gains

Antenna Post to RF Grid	6.5 at 1000 KC
RF Grid to Converter Grid	10 at 1000 KC
Converter Grid to IF Grid	45 at 1000 KC
Converter Grid to IF Grid	60 at 455 KC
IF Grid to 6SF7 diode plates	110 at 455 KC

(2) Audio Gains
.16 volts, 400 cycles signal across volume control with control set to maximum will give approximately ½-watt speaker output.

(3) DC voltage developed across oscillator grid resistor R4 averages 10 volts at 1000 KC or 8.0 volts at 10,000 KC.

Variations of ±20% permissible. All readings taken with minus 1½-volt fixed bias on AVC bus.

Electrical Power Output

Undistorted ..... 8.5 watts
Maximum ..... 14 watts

Loud-speaker—PM Dynamic

Outside Cone Diameter ..... 12 inches
Voice Coil Impedance (400 cycles) ..... 3.5 ohms

Phonograph Mechanism

Type Changer ..... Model LRP-158 or LRP-170
Type Pickup ..... Crystal
Turntable Speed ..... 78 RPM

Tubes

RF Amplifier GE-6SG7
Converter-Oscillator GE-6SA7
IF Amplifier, AVC, Detector GE-6SF7
Audio Amplifier, Phase Inverter GE-6SC7
Audio Output ..... (2) GE-6K6GT
Rectifier GE-5Y3G
Dial Lamps ..... (2) Mazda No. 44

ALIGNMENT PROCEDURE

The location of trimmers is shown in Fig. 4. All oscillator and RF trimmers are accessible through a slot through the back cover of the cabinet.

The alignment procedure is given in table form. All IF alignments may be made with the chassis removed from the cabinet. However, the RF alignments are made with the chassis and loop antennas securely fastened in the cabinet, as the relative position of the loop antenna with respect to the chassis materially affects it. The RF signal should be capacity coupled by placing a two-foot wire for an antenna on the test-oscillator output post (high side). Keeping this antenna two feet or more from the receiver loop will generally insure freedom from too much coupling. Metal objects such as meters, tools, etc., should not be placed on top of the receiver cabinet.

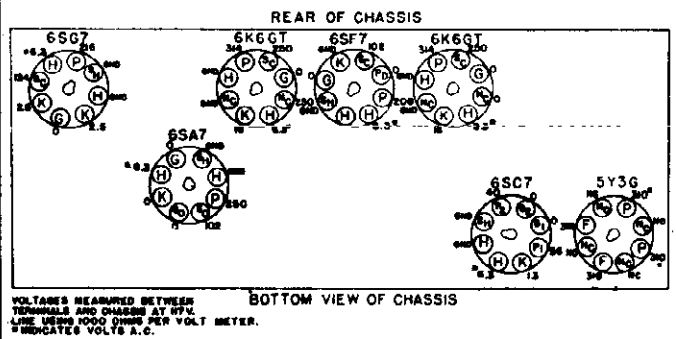


Fig. 3. Socket Voltages

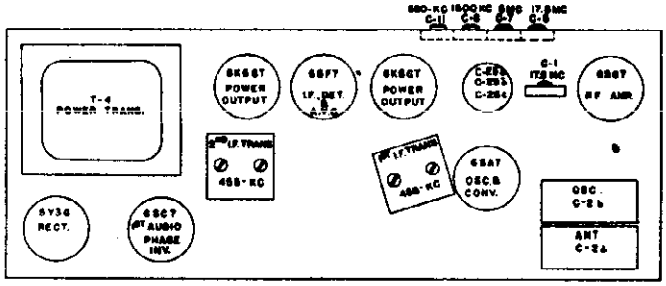
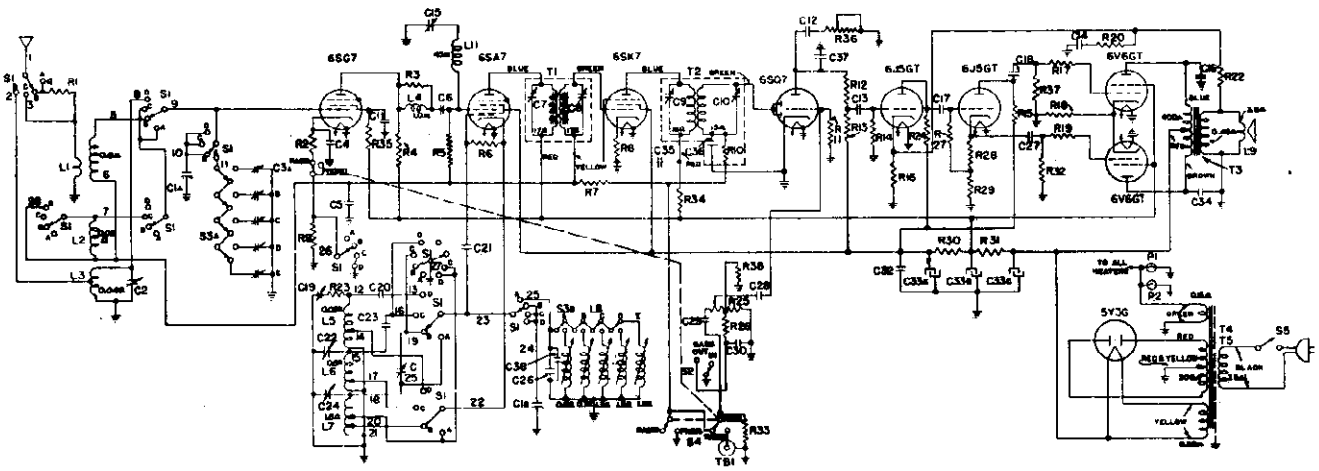


Fig. 4. Trimmer Location

MODEL L-915

GENERAL ELECTRIC CO.



RADIO REPLACEMENT PARTS LIST

Our Cat. Number	Symbol	Description	List Price
*RC-5165	C-33a	CAPACITOR—10 mfd. 300-V. dry electrolytic.	
	C-33b	CAPACITOR—15 mfd. 300-V. dry electrolytic	$1.10
	C-33c	CAPACITOR—300 mfd. 350-V dry electrolytic	
*RC-191	C-34	CAPACITOR—.002 mfd. 1000-V paper.	.35
*RC-039	C-35	CAPACITOR—.01 mfd. 600-V paper.	.25
*RC-252	C-36	CAPACITOR—200 mmf., mica	.30
*RC-249	C-37	CAPACITOR—220 mmf., mica	.25
RC-327	C-38	CAPACITOR—82 mmf., compensating cap.	.25
*RQ-1259	R-1	RESISTOR—1000 ohm ½-W carbon	.70-5
*RQ-1243	R-2	RESISTOR—220 ohm ½-W carbon	.70-5
*RQ-1283	R-3	RESISTOR—10,000 ohm ½-W carbon	.70-5
*RQ-1275	R-4	RESISTOR—4700 ohm ½-W carbon	.70-5
*RQ-1299	R-5	RESISTOR—47,000 ohm ½-W carbon	.70-5
*RQ-1291	R-6	RESISTOR—22,000 ohm ½-W carbon	.70-5
*RQ-1339	R-7	RESISTOR—2.2 megohms ½-W carbon	.70-5
*RQ-1239	R-8	RESISTOR—150 ohm ½-W carbon	.70-5
*RQ-1251	R-9	RESISTOR—470 ohm ½-W carbon	.70-5
*RQ-1299	R-10	RESISTOR—47,000 ohm ½-W carbon	.70-5
*RQ-1355	R-11	RESISTOR—10 megohm ½-W carbon	.70-5
*RQ-1308	R-12	RESISTOR—100,000 ohm ½-W carbon	.70-5
*RQ-1317	R-13	RESISTOR—270,000 ohm ½-W carbon	.70-5
*RQ-1323	R-14	RESISTOR—470,000 ohm ½-W carbon	.70-5
*RQ-1295	R-15	RESISTOR—33,000 ohm ½-W carbon	.70-5
*RQ-1283	R-16	RESISTOR—10,000 ohm ½-W carbon	.70-5
*RQ-1259	R-17	RESISTOR—1000 ohm ½-W carbon	.70-5
*RQ-1433	R-18	RESISTOR—180 ohm 1-W carbon	.20
*RQ-1259	R-19	RESISTOR—1000 ohm ½-W carbon	.70-5
*RQ-1265	R-20	RESISTOR—1800 ohm ½-W carbon	.70-5
*RQ-1283	R-22	RESISTOR—10,000 ohm ½-W carbon	.70-5
*RQ-1221	R-23	RESISTOR—27 ohm ½-W carbon	.70-5
*RQ-1309	R-24	RESISTOR—120,000 ohm ½-W carbon	.70-5
RV-137	R-25	VOLUME CONTROL—2 meg. volume control	.95
*RQ-1311	R-26	RESISTOR—150,000 ohm ½-W carbon	.70-5
*RQ-1323	R-27	RESISTOR—470,000 ohm ½-W carbon	.70-5
*RQ-1269	R-28	RESISTOR—2700 ohm ½-W carbon	.70-5
*RQ-1295	R-29	RESISTOR—30,000 ohm ½-W carbon	.70-5
*RQ-673	R-30	RESISTOR—8200 ohm 2-W carbon	.20
*RQ-765	R-31	RESISTOR—1800 ohm 3-W carbon	.20
*RQ-1323	R-32	RESISTOR—470,000 ohm ½-W carbon	.70-5
*RQ-1315	R-33	RESISTOR—220,000 ohm ½-W carbon	.70-5
*RQ-1259	R-34	RESISTOR—1000 ohm ½-W carbon	.70-5
*RQ-1293	R-35	RESISTOR—27,000 ohm ½-W carbon	.70-5
RT-724	R-36, S5	TONE CONTROL—Treble tone control and power switch	1.45
*RQ-1323	R-37, 38	RESISTOR—470,000 ohm ½-W carbon	.70-5
RL-582	L-1	BEAM-A-SCOPE—"B" band loop assembly	3.25
RL-1017	L-2	COIL—"C" band antenna coil	.20
RL-583	L-3	BEAM-A-SCOPE—"D" band loop assembly	.45
RL-372	L-4	CHOKE—RF interstage choke	.20
RL-2067	L5, 6, 7	COIL—"D," "C" and "B" bands osc. coil	1.05
*RL-9528	L-8a, b, c, d, e	COIL—Station selector trimmer coil assembly	4.80
RS-3131	S-1	SWITCH—Band change switch	1.35
*RS-3108	S-2	SWITCH—Bass-tone control switch	.20

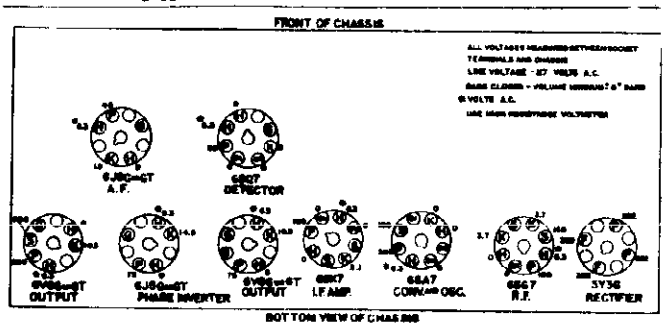
Prices subject to change without notice.

RADIO REPLACEMENT PARTS LIST

Our Cat. Number	Symbol	Description	List Price
RC-7063	C1a, 1b	CONDENSER—Tuning condenser	$2.00
*RC-6537	C2	CAPACITOR—"D" band trimmer	.25
RT-886	C-3 a, b, c, d, e	TRIMMER STRIP—Station selector trimmer strip	.95
*RC-072	C-4	CAPACITOR—.05 mfd. 200 V paper.	.25
*RC-096	C-5	CAPACITOR—0.1 mfd. 200-V paper.	.30
*RC-235	C-6	CAPACITOR—100 mmf. mica	.25
*RC-048	C-11	CAPACITOR—.02 mfd. 600-V paper	.30
*RC-023	C-12	CAPACITOR—.005 mfd. 600-V paper.	.25
*RC-048	C-13, 14	CAPACITOR—.02 mfd. 600-V paper	.30
*RC-191	C-16	CAPACITOR—.002 mfd. 1000-V paper.	.35
*RC-060	C-17, 18	CAPACITOR—.03 mfd. 600-V paper.	.25
RT-887	C-19	TRIMMER STRIP—"D" band osc. trimmer. (Part of C-22, 24)	.40
*RC-396	C-20	CAPACITOR—5600 mmf., mica	.45
*RC-216	C-21	CAPACITOR—47 mmf. mica	.25
RT-887	C-22	TRIMMER STRIP—"C" band osc. trimmer. (Part of C-19, 24)	.40
*RC-349	C-23	CAPACITOR—2000 mmf., mica	.30
RT-887	C-24	TRIMMER STRIP—"B" band osc. trimmer. (Part of C-19, 22)	.40
RC-6556	C-25	CAPACITOR—"B" band padder	.30
*RC-304	C-26	CAPACITOR—720 mmf., silvered mica	.30
*RC-060	C-27	CAPACITOR—.03 mfd. 600-V paper	.25
*RC-048	C-28	CAPACITOR—.02 mfd. 600-V paper.	.30
*RC-023	C-29	CAPACITOR—.005 mfd. 600-V paper.	.25
*RC-011	C-30	CAPACITOR—.002 mfd. 600-V paper.	.25
*RC-039	C-32	CAPACITOR—.01 mfd. 600-V paper.	.25

* Used on previous receivers.

Our Cat. Number	Symbol	Description	List Price
RS-3132	S-3a, b, and c	SWITCH—Push button switch (switch only)	$1.80
RT-3013	T-1	TRANSFORMER—1st I.F. transformer	1.20
RT-3014	T-2	TRANSFORMER—2nd I.F. transformer	1.25
*RT-485	T-3	TRANSFORMER—Output transformer.	1.10
*RT-0813	T-4	TRANSFORMER—50-60 cycle power transformer.	3.10
*RT-0815	T-5	TRANSFORMER—25-cycle power transformer	7.80
RS-1075	L-9	SPEAKER—14 inch dynapower speaker.	5.30
RM-409	L-11, C-15	WAVE TRAP—Wave-trap assembly	.50



Loud-speaker-PM Dynamic

Outside Cone Diameter ..... 14 inches
Voice Coil Impedance (400 cycles) ..... 3.5 ohms

Electrical Rating

Rating "A"—110-125 volts AC, 50-60 cycles, 90 watts
Rating "C"—110-125 volts AC, 25 cycles, 90 watts

MODEL L-915
MODELS L-915W, L-916

GENERAL ELECTRIC CO.

Stock No.	Symbol	Description	List Price
*RQ-1323	R-37, 38	RESISTOR—470,000 ohm ½-W carbon	$0.70-5
*RL-582	L-1	BEAM-A-SCOPE—"B" band loop assembly	3.25
*RL-1017	L-2	COIL—"C" band antenna coil	.20
*RL-583	L-3	BEAM-A-SCOPE—"D" band loop assembly	.45
*RL-372	L-4	CHOKE—RF interstage choke	.20
*RL-2067	L-5-6-7	COIL—"D" "C" and "B" bands oscillator coil	1.05
*RL-9528	L-8a, b, c, d, e	COIL—Station selector trimmer coil assembly	4.80
*RS-3131	S-1	SWITCH—Band change switch	1.35
*RS-3108	S-2	SWITCH—Bass-tone control switch	.20
*RS-3132	S-3a, b, and c	SWITCH—Push button switch (switch only)	1.80
*RT 3013	T-1	TRANSFORMER—1st I.F. transformer	1.20
*RT-3014	T-2	TRANSFORMER—2nd I.F. transformer	1.25
RT-4023	T-3	TRANSFORMER—Output transformer	1.50
RT-0911	T-4	TRANSFORMER—50-60 cycle power transformer	5.25
RS-1085	L-10	SPEAKER—14 inch dynamic speaker	6.50
RW-409	L-11 C-15	WAVE TRAP—Wave trap assembly	.50

MISCELLANEOUS PARTS

*RB-026	BOARD—Antenna terminal board	$0.10
*RB-094	BOARD—7 lug terminal board	.10
*RB-096	BOARD—3 lug terminal board	.10
*RB-1030	BOARD—Phono terminal board	.10
*RB-1046	BOARD—3 lug terminal board	.10
*RC-863	CORD—Power cord	.75
*RC-1987	CLAMP—Oscillator coil clamp	.05-2
*RC-2015	CLAMP—Dial scale mtg. clamp	.10-5
*RC-2021	CORE—Station coil tuning core	.10

* Used on previous receivers.

Cabinet Dimensions

	L915W	L916
Height	40 in.	40 in.
Width	29¼ in.	29¼ in.
Depth	13⅞ in.	14⅛ in.

Electrical Rating

Rating "A"—110-125 volts, a-c, 50-60 cycles, 100 watts.
Rating "C"—110-125 volts, a-c, 25 cycles, 100 watts.

Tuning Frequency Range

"BC" Band.....550-1700 KC
"SW1" Band.....1.7-5.5 MC
"SW2" Band.....5.5.-18.0 MC

Intermediate Frequency.....455 KC

Electrical Power Output

Undistorted.....6 watts
Maximum.....9 watts

Loudspeaker—Electrodynamic

Outside cone diameter.....14 inches
Voice coil impedance (400 cycles).....5.0 ohms

Tubes

RF Amplifier.....GE-6SG7
Converter-Oscillator.....GE-6SA7
IF Amplifier.....GE-6SK7
Detector, AVC & 1st Audio.....GE-6SQ7
2nd Audio.....GE-6J5GT
Phase Inverter.....GE-6J5GT
Power Output.....(2) GE-6V6GT
Rectifier.....GE-5Y3G
Pilot Lamp.....(2) MAZDA No. 44

GENERAL INFORMATION

Models L915W and L916 are electrically identical and only vary in cabinet and dial scale treatment.

In Model L915W, electrodynamic speaker RS1092 (marked K33J371) was substituted for a portion of the production in place of the speaker listed in the parts list (marked K-33J365). Since this substitute speaker has a field coil resistance of 400 ohms instead of 500 ohms as shown on the schematic diagram, a 100 ohm resistor, RQ621, is added in series with the speaker field coil to maintain proper socket

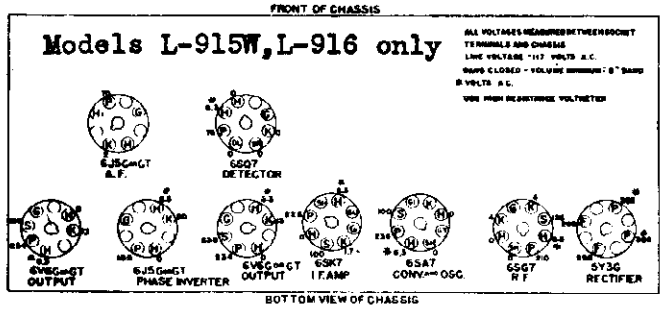


Fig. 3. Socket Voltages

voltages whenever this substitute speaker is used. When replacing the cone for either speaker, use Stock No. RC9045.

ALIGNMENT PROCEDURE

The location of all trimmers is shown in Fig. 4. All oscillator and RF trimmers are accessible from the back of the receiver.

The alignment procedure is given in table form. All IF alignment may be made with the chassis removed from the cabinet. However, the RF alignments are made with the chassis and loop antennas securely bolted in the cabinet, as the relative position of the loop antennas with respect to the chassis materially affects the alignment. The RF signal should be capacity coupled by placing a two-foot wire for an antenna on the test oscillator output post (high side). Keeping this antenna two feet or more from the receiver loop will generally assure freedom from too much coupling.

ALIGNMENT CHART

Step	Connect Test-Osc. To	Test Osc. Setting	Pointer Setting	Adjust Trimmers for Maximum Output
1	6SK7 IF grid in series with .05 mfd.	455 KC	"BC" Band 550 KC	C10 & C9
2	6SA7 converter grid in series with .05 mfd.	455 KC	"BC" Band 550 KC	C8 & C7
3	6SG7 RF grid in series with .05 mfd.	455 KC	"BC" Band 550 KC	C15***
4	Capacity Coupled	580 KC	"BC" Band 580 KC	C25**
5	Capacity Coupled	1500 KC	"BC" Band 1500 KC	C24** (Osc.)
6	Repeat Step 4			
7	Capacity Coupled	5 MC	"SW1" Band 5.0 MC	C22** (Osc.)
8	Capacity Coupled	18 MC	"SW2" Band 18.0 MC	C19* (Osc.)
9	Capacity Coupled	18 MC	"SW2" Band 18.0 MC	C2** (Ant.)

* Use minimum capacity peak.
** Rock gang condenser when making alignment.
*** Peak for minimum output.

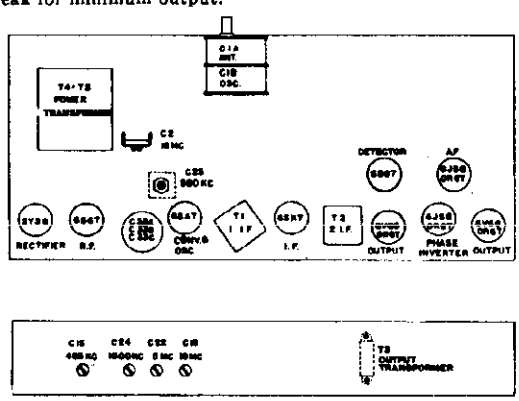


Fig. 4. Trimmer Location

GENERAL ELECTRIC CO.

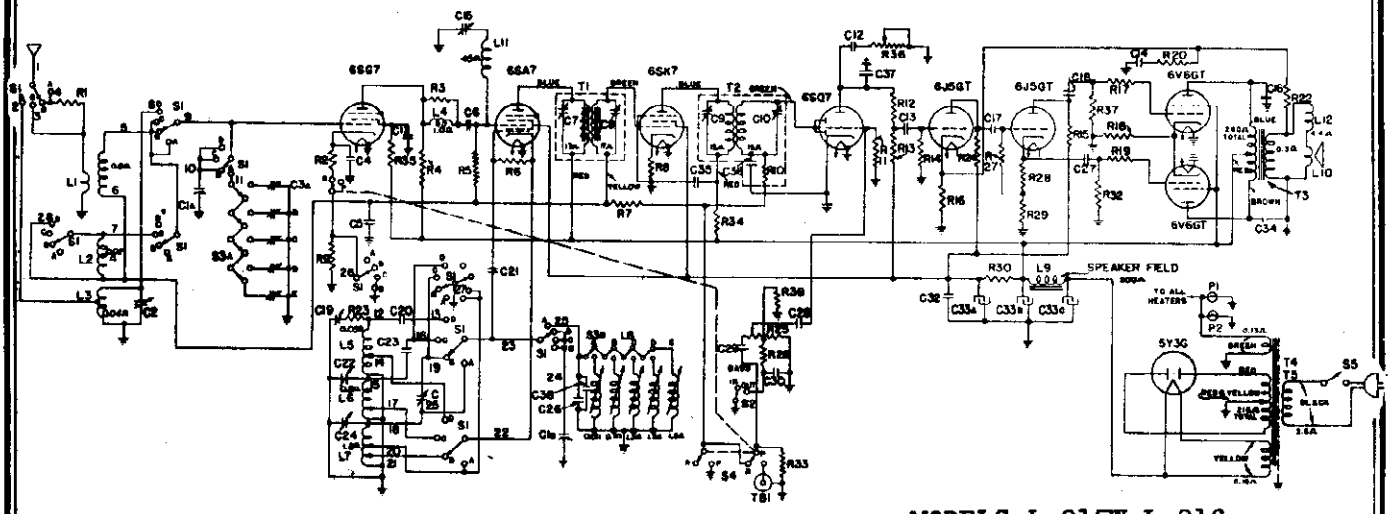


Fig. 1. Schematic Diagram MODELS L-915W, L-916

IF 455 K.C.

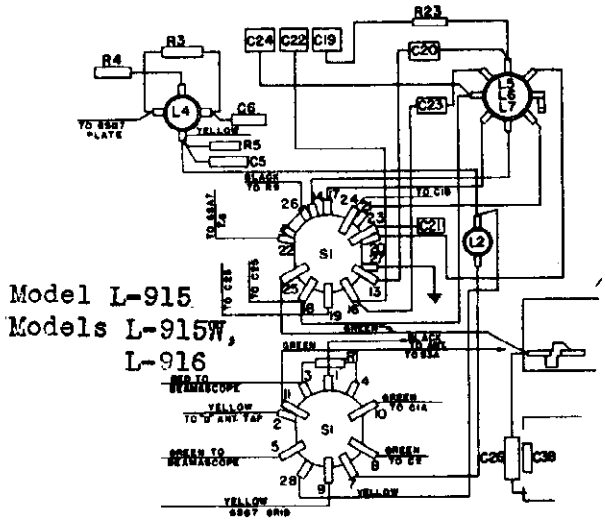


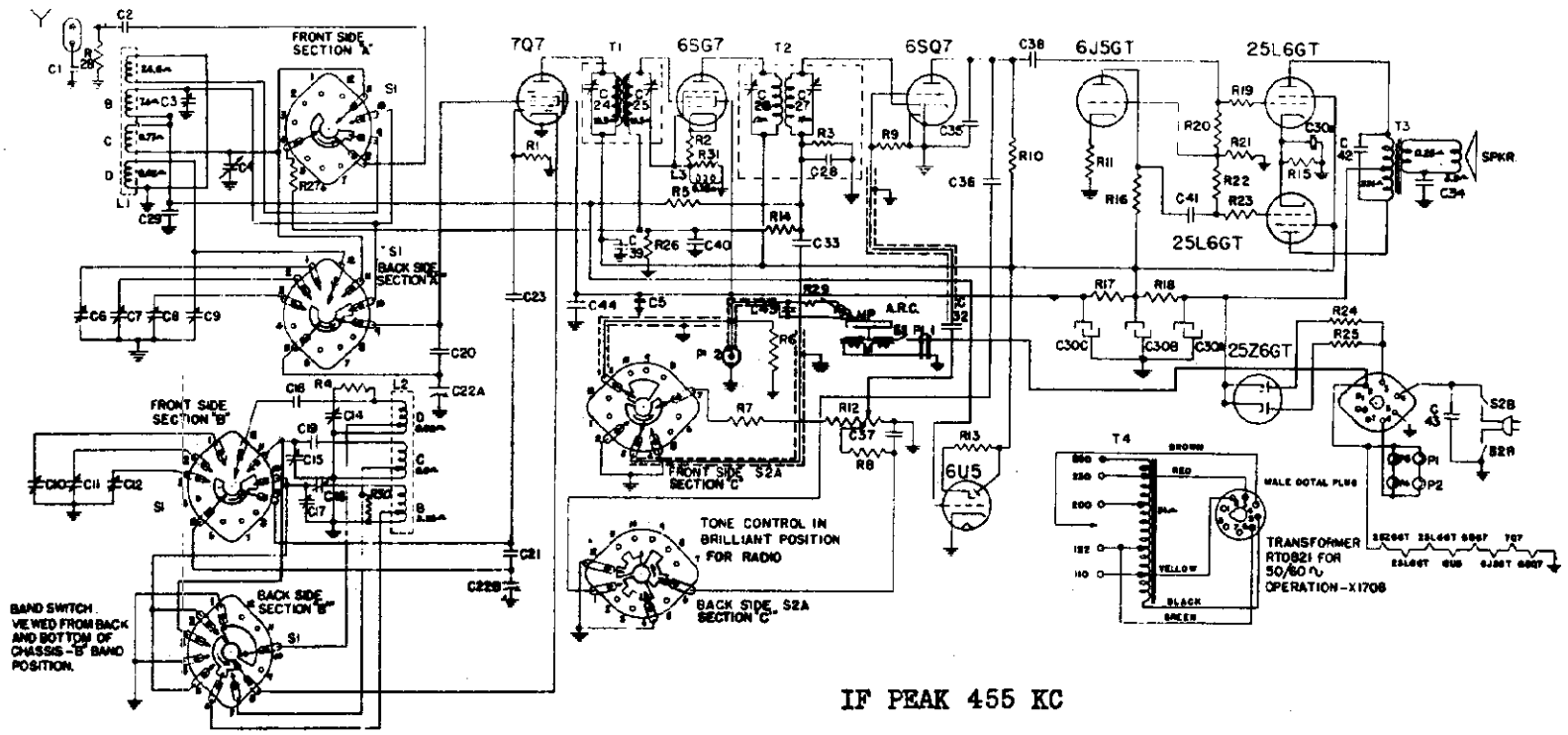
Fig. 2. Switch Wiring

Stock No.	Symbol	Description	List Price
*RC-7063	C1a, 1b	CONDENSER—Tuning condenser	$2.00
*RC-6537	C2	CAPACITOR—"D" band trimmer	.25
*RT-886	C-3a, b, c, d, e	TRIMMER STRIP—Station selector trimmer strip	.95
*RC-092	C-4	CAPACITOR—.05 mfd. 600V paper	.30
*RC-096	C-5	CAPACITOR—0.1 mfd. 200-V paper	.30
*RC-235	C-6	CAPACITOR—100 mmf. mica	.25
*RC-048	C-11	CAPACITOR—.02 mfd. 600-V paper	.30
*RC-023	C-12	CAPACITOR—.005 mfd. 600-V paper	.25
*RC-048	C-13, 14	CAPACITOR—.02 mfd. 600-V paper	.30
*RC-191	C-16	CAPACITOR—.002 mfd. 1000-V paper	.35
*RC-060	C-17, 18	CAPACITOR—.03 mfd. 600-V paper	.25
*RT-887	C-19	TRIMMER STRIP—"D" band osc. trimmer (Part of C-22, 24)	.40
*RC-396	C-20	CAPACITOR—5600 mmf., mica	.45
*RC-216	C-21	CAPACITOR—47 mmf. mica	.25
*RT-887	C-22	TRIMMER STRIP—"C" band osc. trimmer (Part of C-19, 24)	.40
*RC-349	C-23	CAPACITOR—2000 mmf., mica	.30
*RT-887	C-24	TRIMMER STRIP—"B" band osc. trimmer (Part of C-19, 22)	.40
*RC-6556	C-25	CAPACITOR—"B" band padder	.30
*RC-304	C-26	CAPACITOR—720 mmf., silvered mica	.30
*RC-060	C-27	CAPACITOR—.03 mfd. 600-V paper	.25
*RC-048	C-28	CAPACITOR—.02 mfd. 600-V paper	.30

* Used on previous receivers.

Stock No.	Symbol	Description	List Price
*RC-023	C-29	CAPACITOR—.005 mfd. 600-V paper	$0.25
*RC-011	C-30	CAPACITOR—.002 mfd. 600-V paper	.25
*RC-039	C-32	CAPACITOR—.01 mfd. 600-V paper	.25
RC-5204	C-33a	CAPACITOR—10 mfd. 300 V dry electrolytic	1.30
	C-33b	CAPACITOR—15 mfd. 400 V dry electrolytic	
	C-33c	CAPACITOR—15 mfd. 400 V dry electrolytic	
*RC-191	C-34	CAPACITOR—.002 mfd. 1000-V paper	.35
*RC-039	C-35	CAPACITOR—.01 mfd. 600-V paper	.25
*RC-252	C-36	CAPACITOR—200 mmf., mica	.30
*RC-249	C-37	CAPACITOR—220 mmf., mica	.25
*RC-327	C-38	CAPACITOR—82 mmf., compensating cap.	.25
*RQ-1259	R-1	RESISTOR—1000 ohm ½-W carbon	.70-5
*RQ-1243	R-2	RESISTOR—220 ohm ½-W carbon	.70-5
*RQ-1283	R-3	RESISTOR—10,000 ohm ½-W carbon	.70-5
*RQ-1275	R-4	RESISTOR—4700 ohm ½-W carbon	.70-5
*RQ-1299	R-5	RESISTOR—47,000 ohm ½-W carbon	.70-5
*RQ-1291	R-6	RESISTOR—22,000 ohm ½-W carbon	.70-5
*RQ-1339	R-7	RESISTOR—2.2 megohms ½-W carbon	.70-5
*RQ-1239	R-8	RESISTOR—150 ohm ½-W carbon	.70-5
*RQ-1251	R-9	RESISTOR—470 ohm ½-W carbon	.70-5
*RQ-1299	R-10	RESISTOR—47,000 ohm ½-W carbon	.70-5
*RQ-1355	R-11	RESISTOR—10 megohm ½-W carbon	.70-5
*RQ-1308	R-12	RESISTOR—100,000 ohm ½-W carbon	.70-5
*RQ-1317	R-13	RESISTOR—270,000 ohm ½-W carbon	.70-5
*RQ-1323	R-14	RESISTOR—470,000 ohm ½-W carbon	.70-5
*RQ-1295	R-15	RESISTOR—33,000 ohm ½-W carbon	.70-5
*RQ-1283	R-16	RESISTOR—10,000 ohm ½-W carbon	.70-5
*RQ-1259	R-17	RESISTOR—1000 ohm ½-W carbon	.70-5
*RQ-1435	R-18	RESISTOR—200 ohm 1-W carbon	.15
*RQ-1259	R-19	RESISTOR—1000 ohm ½-W carbon	.70-5
*RQ-1265	R-20	RESISTOR—1800 ohm ½-W carbon	.70-5
*RQ-1283	R-22	RESISTOR—10,000 ohm ½-W carbon	.70-5
*RQ-1221	R-23	RESISTOR—27 ohm ½-W carbon	.70-5
*RQ-1309	R-24	RESISTOR—120,000 ohm ½-W carbon	.70-5
*RV-137	R-25	VOLUME CONTROL—2 meg. volume control	.95
*RQ-1311	R-26	RESISTOR—150,000 ohm ½-W carbon	.70-5
*RQ-1323	R-27	RESISTOR—470,000 ohm ½-W carbon	.70-5
*RQ-1269	R-28	RESISTOR—2700 ohm, ½-W carbon	.70-5
*RQ-1295	R-29	RESISTOR—30,000 ohm, ½-W carbon	.70-5
*RQ-685	R-30	RESISTOR—12,000 ohm 2-W carbon	.25
*RQ-1323	R-32	RESISTOR—470,000 ohm ½-W carbon	.70-5
*RQ-1315	R-33	RESISTOR—220,000 ohm ½-W carbon	.70-5
*RQ-1259	R-34	RESISTOR—1000 ohm ½-W carbon	.70-5
*RQ-1299	R-35	RESISTOR—47,000 ohm ½-W carbon	.70-5
*RT-724	R-36, S5	TONE CONTROL—Treble tone control and power switch	1.45

Prices subject to change without notice.



IF PEAK 455 KC

ELECTRICAL PARTS DESCRIPTION

Symbol	Description	Symbol	Description	Symbol	Description	Symbol	Description
	CAPACITORS	C30c	20 mfd. 250 V dry electrolytic	R3	390,000 ohm, ½-W carbon	R26	3.9 meg, ½-W carbon
C1	.01 mfd. 400 V paper	C30d	20 mfd. 25 V dry electrolytic	R4	22 ohm, ½-W carbon	R27	560,000 ohm, ½-W carbon
C2	.001 mfd. 600 V paper	C32	.01 mfd. 200 V paper	R5	2.2 megohm, ½-W carbon	R28	100,000 ohm, ½-W carbon
C3, 4	"B" and "C" antenna trimmer	C33	.02 mfd. 200 V paper	R6	470,000 ohm, ½-W carbon	R29	15,000 ohm, ½-W carbon
C6, 7, 8, 9	Antenna trimmer strip	C34	.05 mfd. 200 V paper	R7	47,000 ohm, ½-W carbon	R30	470 ohm, ½-W carbon
C10, 11, 12, 14, 15, 16, 17	Oscillator trimmer strip	C35	220 mmf. mica	R8	82,000 ohm, ½-W carbon		
C18	5600 mmf., mica	C36	.004 mfd. 600 V paper	R9	10 megohm, ½-W carbon		**MISCELLANEOUS**
C19	1800 mmf., mica	C37	.005 mfd. 200 V paper	R10	470,000 ohm, ½-W carbon		
C20, 21	45 mmf., compensating capacitor	C38	.03 mfd. 600 V paper	R11	3300 ohm, ½-W carbon	PL-2	Male phono plug
C22a, 22b	2-gang tuning condenser	C39	.05 mfd. 200 V paper	R12	2 meg. volume control	PL-1	Phono motor connector
C23	40 mmf., compensating capacitor	C40	.05 mfd. 200 V paper	R13	1 megohm, ½-W carbon	S1	Band change switch
C29	.05 mfd. 200 V paper	C41	.03 mfd. 600 V paper	R14	4.7 meg., ½-W carbon	S2a, 2b	Tone control and power switch
C30a	40 mfd. 300 V dry electrolytic	C42	.005 mfd. 600 V paper	R15	220 ohm, 2-W carbon	L1	Antenna coil (all bands)
C30b	50 mfd. 250 V dry electrolytic	C43	.02 mfd. 600 V AC	R16	68,000 ohm, ½-W carbon	L2	Oscillator coil (all bands)
		C44	.05 mfd. 400 V paper	R17	3900 ohm, 1-W carbon	L3	I.F. neutralizing coil
		C45	.01 mfd. 400 V paper	R18	2700 ohm, 2-W carbon	T1	1st I.F. transformer
			RESISTORS	R19	1000 ohm, ½-W carbon	T2	2nd I.F. transformer
		R1	33,000 ohm, ½-W carbon	R20	150,000 ohm, ½-W carbon	T3	Output transformer
		R2	100 ohm, ½-W carbon	R21	56,000 ohm, ½-W carbon	T4	50/60-cycle power transformer
				R22	270,000 ohm, ½-W carbon	SPKR	12-inch PM speaker
				R23	1000 ohm, ½-W carbon		
				R24, 25	220 ohm, 2-W carbon		

Fig. 3. Schematic Wiring Diagram

MODEL X-1708

GENERAL ELECTRIC CO.

FOR OAK RECORD CHANGER DATA SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

Power Requirements

Power Supply		Frequency Cycles AC	Power Consumption (Watts)
Tap	Voltage Range		
110	103–117	50–60	90
125	117–133		
200	185–215		
230	215–240		
250	240–260		

The power transformer is provided with five voltage taps. Instant tap switching is made by a simple pin plug and jack device. For correct operation, measure the power supply voltage, note which voltage range covers this voltage and using the corresponding tap, insert the plug in the jack.

SPECIAL SERVICE INFORMATION

The following information will be very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

NOTE—Connection to converter grid must be made directly to tube grid and not to gang condenser on spread bands.

(1) Stage gains

(a) Antenna Post to Converter Grid, through 400 ohms and 200 mmfd. in series, at

Stand.	1000 KC.....5.4	31 M...9.6 MC....1.8
SW1	4000 KC.....3.7	25 M...11.8 MC....1.6
SW2	18000 KC.....1.1	19 M...15.22 MC...1.4
		16–13 M...17.8 MC....1.0

(b) RF on Converter Grid to IF on 6SG7 grid at

Stand.	1000 KC....61	31 M.... 9.6 MC...65
SW1	4000 KC....63	25 M.....11.8 MC....68
SW2	18000 KC....71	19 M.....15.22 MC...71
		16–13 M.....17.8 MC....71

(c) IF on Converter Grid to IF on 6SG7 grid at 455 KC—85

(d) IF Grid to diode plate at 455 KC—160

(2) Voltage across the diode load to give ½-watt speaker output at 400 cycles—.046 V.

(3) DC voltage developed across oscillator grid resistor (R1) at

Stand.	1000 KC..8.3 V.	31 M.....4.4 V.
SW1	4000 KC..7.7 V.	25 M.....4.8 V.
SW2	18000 KC..5.0 V.	19 M.....4.4 V.
		16–13 M.....3.7 V.

Variations of ±20% permissible. All measurements taken with R-26 shorted across.

Electrical Power Output

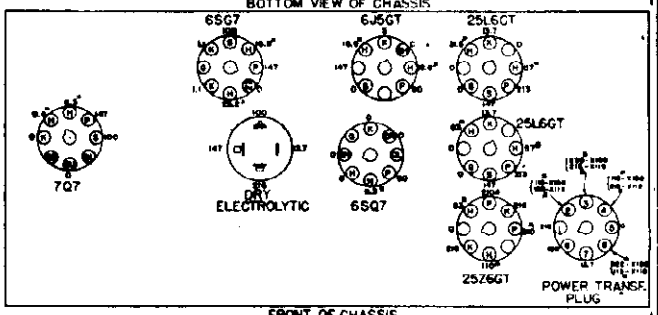
Undistorted with proper voltage at tap on power transformer—6 watts.

Maximum with proper voltage at tap on power transformer—6.5 watts.

Loud-speaker

The voice coil is accurately and permanently centered at the factory and should seldom give trouble. In case a voice coil needs recentering, it will be necessary to replace the entire cone and voice coil assembly. In no case should you attempt to move the magnet in the assembly.

SOCKET VOLTAGES



Voltages indicated by asterisk (*) are AC voltages
DC voltages measured between socket terminals and chassis
Voltages measured on 1000 ohms/volt meter on 500 volt scale
Gang closed, no signal input
Band switch turned to standard broadcast band

Fig. 2

Loud-speaker—PM Dynamic

Cone Diameter.....12 inches

Voice Coil Impedance (400 cycles).....3.5 onms

Tubes

Converter-Oscillator	GE-7Q7
IF Amplifier	GE-6SG7
Detector, AVC, 1st Audio	GE-6SQ7
Phase Inverter	GE-6J5GT
Power Output	(2)GE-25L6GT
Rectifier	GE-25Z6GT
Tuning Indicator	GE-6U5
Pilot Lamps	(2) MAZDA No. 44

GENERAL INFORMATION

The Model X-1708 is a seven-band receiver employing eight tubes in a superheterodyne circuit. Four of these bands are spread bands which allow taking the most important portions of the "SW2" band and expanding them for ease in tuning the short-wave stations.

It is designed for operation on 50 or 60 cycle AC sources ranging from 103 to 260 volts. See ***Power Requirements.***

Automatic Record Changer

The record changer will automatically play seven 12-inch or eight 10-inch records at one loading. It is shipped for operation on a 110-volt 50-cycle power supply but can be converted for use on a 110-volt 60-cycle power supply by changing the motor spindle bushing. The 60-cycle bushing is slightly smaller in diameter than the 50-cycle bushing, and is tied to the underside of the record changer frame. To replace, unscrew the setscrew on the motor spindle bushing (which drives the turntable drive wheel), and replace with the bushing for 60-cycle operation. Be sure the setscrew matches with the depression on the motor shaft, and is securely tightened. When properly installed, the top of the bushing should be just a fraction below the top of the motor shaft.

NOTE: Regardless of choice of tap on the power transformer, the phonograph motor is fed 110 volts.

GENERAL ELECTRIC CO.

Alignment Procedure

The alignment procedure shown in table form is made either with the chassis in or removed from the cabinet.

If the chassis is removed from the cabinet to make the RF alignment, the dial which is fastened to the cabinet cannot be used for calibration reference. Use must be made, therefore, of the paper scale fastened on the rear of the dial reflector plate. With the gang condenser completely closed, one of the edges of the pointer rider should be lined up with the first marking to the right of the scale on the rear of the dial reflector plate. This can be accomplished by sliding the pointer on the cord until it does. The selected edge of the pointer rider may now serve as a pointer for the RF alignment. There are two 17.8 reference points on the paper scale on the rear of the dial reflector plate. The one towards the lower frequency end of the dial is the proper one to use for the 16-meter spread-band alignment; while the other is used for a reference point on the SW2 band.

The SW2 band does not require alignment. This band is taken care of when the 16-meter spread-band is aligned.

Spread-band Alignment

Since accuracy in frequency calibration is very essential for proper alignment of the spread bands, it is impractical to use the standard test oscillator for this purpose unless a special calibration is first made.

The actual reception of short-wave stations of known frequency in the band to be checked is probably the most satisfactory method for determining the proper setting of the oscillator trimmers in these bands. The oscillator trimmer should be adjusted so that the station appears at the correct position on the dial. RF alignment can be made with the test oscillator.

The calibration of the test oscillator may be checked by zero beating the test oscillator with a short-wave station of known frequency. By taking several of these calibration points, it will afford a calibration of a high degree of accuracy in case you wish to use the test oscillator for alignment in these bands.

ALIGNMENT CHART

Step	Test Osc. Connected to	Test-osc. Setting	Band and Pointer Setting	Tune Trimmer for Max. Output
1	6SG7 I.F. grid in series with .05 mfd. cap.	455 KC	"BC" BAND 550 KC	C26 and C27
2	7Q7 CONV. grid in series with .05 mfd. cap.	455 KC	"BC" BAND 550 KC	C24 and C25
3	ANT. POST in series with 200 mmf. and 400 ohms	580 KC	"BC" BAND 580 KC	C16**
4	ANT. POST in series with 200 mmf. and 400 ohms	1500 KC	"BC" BAND 1500 KC	C17 (osc.) C3 (ant.)
5	R E P E A T		S T E P	3
6	ANT. POST in series with 200 mmf. and 400 ohms	6.1 MC	"SW1" BAND 6.1 MC	C15 (osc.) C4 (ant.)
7	ANT. POST in series with 200 mmf. and 400 ohms	17.8 MC	16 METER 17.8 MC	C14* (osc.)
8	ANT. POST in series with 200 mmf. and 400 ohms	21.6 MC	16 METER 21.6 MC	C9*** (ant.)
9	ANT. POST in series with 200 mmf. and 400 ohms	15.22 MC	19 METER 15.22 MC	C10* (osc.) C6*** (ant.)
10	ANT. POST in series with 200 mmf. and 400 ohms	11.8 MC	25 METER 11.8 MC	C11* (osc.) C7*** (ant.)
11	ANT. POST in series with 200 mmf. and 400 ohms	9.6 MC	31 METER 9.6 MC	C12* (osc.) C8*** (ant.)

* Use minimum capacity peak if two are obtainable.
** Rock gang condenser for optimum peak.
*** Use maximum capacity peak if two are obtainable.

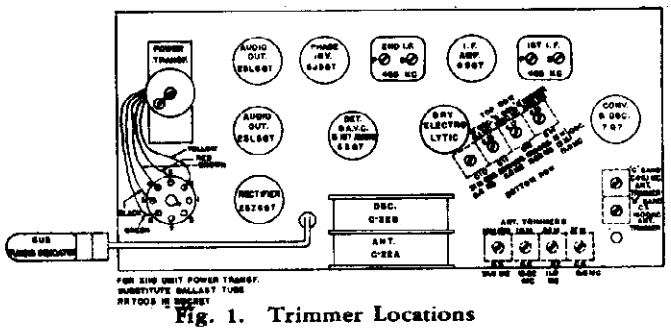


Fig. 1. Trimmer Locations

BAND CHANGE AND TONE CONTROL SWITCHING

The following charts show the switch points connected for any one position of either the wave change or tone control switches. The numbers shown in each box indicate the switch points connected together in the section of the switch for each position of the switch. As for example: the numbers 5–9–10 indicate these switch points are all connected together for this particular position of the switch.

BAND SWITCH CONNECTIONS

Band in Use	Section "A" Front Side	Section "A" Back Side	Section "B" Front Side	Section "B" Back Side
BC	4–8–9	5–9–10	5–9–10	1–10 6–8
SW1	4–8–10	5–9–11	5–9–11	1–2–10 7–8
SW2	4–8–11	5–9–12	5–9–12	1–2–3 8–10
31 METER	8–11	9–12–1	9–12–1	1–2–3–4 8–10
25 METER	8–11	9–12–2	9–12–2	1–2–3–4–5 8–10
19 METER	8–11	9–12–3	9–12–3	2–3–4–5–6 8–10
16 and 13 METER	8–11	9–12	9–12	3–4–5–6–7 8–10

TONE CONTROL SWITCH CONNECTIONS

Position in Use	Section "C" Back Side	Section "C" Front Side
Radio-Brilliant	Open	3–7
Radio-Bass	1–12	3–7
Radio-Treble	4–6	3–7
Radio-Mellow	1–12 4–6	3–7
Phono-Brilliant	Open	7–11 2–3
Phono-Bass	1–12	7–11 2–3
Phono-Treble	4–6	7–11 2–3
Phono-Mellow	1–12 4–6	7–11 3–4

Intermediate Frequency ..... 455 KC

Tuning Frequency Range

"BC" Band ..... 540–1700 KC
"SW1" Band ..... 2.2–6.8 MC
"SW2" Band ..... 6.8–21.0 MC
31 Meter Band ..... 9.36–9.8 MC
25 Meter Band ..... 11.6–12.5 MC
19 Meter Band ..... 14.9–17.3 MC
16 and 13 Meter Band ..... 17.7–22.2 MC

GENERAL ELECTRIC CO.

MODEL JFM-90

Rating	Power Supply (Volts)	Frequency (Cycles Per Second)	Power Consumption (Watts)
A6	105–125	50–60	65
C2	105–125	25	65

ALIGNMENT PROCEDURE

Equipment

In order to perform the necessary alignment operations on this Translator the following equipment is recommended:

(1) A good signal generator capable of giving a 46 MC signal with adjustable output voltage.
(2) A wide band signal generator covering 4.3 MC with a sweep circuit of plus or minus 200 KC.
(3) A cathode ray oscilloscope.
(4) A 0–100 microammeter.

I.F. Alignment

Alignment of the I.F. transformers must be performed stage by stage and no over-all adjustments should be made after completing the stage by stage adjustments.

Connect the high side of the oscilloscope input through a 470,000 ohm carbon resistor to point "A" on the 1st limiter 6SJ7 load circuit. The ground side of the oscilloscope input connects to the chassis. Progressively apply a wide band signal generator output of 4.3 MC to points "B," "C" and "D" of the 2nd I.F., 1st I.F. and 2nd converter grids. Use a .05 mfd. capacitor between the generator output and points "B" and "C." Use a 22 mmf. capacitor between the generator output and point "D." Connect the ground lead of the wide band signal generator output to the chassis at the same point to which the oscilloscope ground is connected. Align the primary and secondary I.F. transformer trimmers for maximum vertical deflection of the oscilloscope curve. The third circuit trimmers (C14 and C17) of the 1st and 2nd I.F. transformers should be adjusted to give maximum broadness to the peak of the oscilloscope curve consistent with maximum vertical deflection. The I.F. curve should not be broadened beyond that point where the vertical deflection of the oscilloscope curve is reduced.

Discriminator Alignment

Remove the oscilloscope input connections from the limiter load and connect the high lead directly to the audio output. Connect the ground lead to the chassis using the same point to which the generator ground is connected. Apply the wide band generator signal of 4.3 MC through a 22 mmf. capacitor to point "D" on the 2nd converter grid. Adjust the discriminator transformer (T4) primary trimmer (C21) for maximum vertical deflection on the oscilloscope. Align the secondary trimmer (C22) for center crossover of the two curves. Retrim the primary trimmer (C21) for straight crossover lines if necessary.

R.F. Alignment

Connect a 0–100 microammeter in series with a 470,000 ohm resistor between chassis and point "A" on the load circuit of the 1st limiter tube, 6SJ7. The resistor should be between the meter and point "A." Apply a 46 MC generator signal to the antenna input terminals of the Translator. Set dial pointer to 46 MC and align oscillator trimmer (C2). The image signal should be below 46 MC when the oscillator is properly set. Peak the converter trimmers (C3 and C4) for maximum output.

NOTE. If oscillations develop in the I.F. circuits during alignment it is probably due to the generator and oscilloscope ground connections. Be sure these ground connections are made to the same point on the chassis. Changing ground points will generally assist in eliminating instability.

MODEL LC-648W

GENERAL INFORMATION

Two different types of record changers were used during the production of the Model LC648W phonograph combination.

The Model LRP-170 record changer is identified by the single record post and the eccentric turntable spindle, whereas the LRP-162 changers make use of a two-post record holder. Different pickup compensation is used for the two changers as noted at the bottom of the schematic diagram and the change in value of resistors R-11 and R-12 as given in the parts list.

ALIGNMENT PROCEDURE

The location of trimmers is shown in Fig. 1. All oscillator and RF trimmers are accessible through a slot through the back cover of the cabinet.

The alignment procedure is given in table form. All IF alignments may be made with the chassis removed from the cabinet. However, the RF alignments are made with the chassis and loop antennas securely fastened in the cabinet, as the relative position of the loop antenna with respect to the chassis materially affects it. The RF signal should be capacity-coupled by placing a two-foot wire for an antenna on the test-oscillator output post (high side). Keeping this antenna two feet or more from the receiver loop will generally insure freedom from too much coupling. Metal objects such as meters, tools, etc., should not be placed near the receiver loop.

ALIGNMENT CHART

Step	Connect Test-Osc. to	Test-Osc. Setting	Pointer Setting	Adjust Trimmers for Maximum Output
1	6SK7 IF Grid in series with .05 mfd.	455 KC	"BC" Band 550 KC	C6 & C7
2	6SA7 Conv. grid in series with .05 mfd.	455 KC	"BC" Band 550 KC	C4 & C5
3	With input on 6SA7 conv., repeat step 1.			
4	Capacity Coupled	580 KC	"BC" Band 580 KC	C22*
5	Capacity Coupled	1500 KC	"BC" Band 1500 KC	C2 (Osc.)
6	Capacity Coupled	1500 KC	"B" Band 1500 KC	C16 (RF)
7	Repeat step 4.			

* Rock gang condenser when making alignment.

Special Service Information

The following data are taken with a vacuum tube voltmeter or similar voltage measuring device.

(1) Stage Gains

Antenna Post to RF Grid	5 at 1000 KC
RF Grid to Converter Grid	5 at 1000 KC
Converter Grid to IF Grid	40 at 1000 KC
Converter Grid to IF Grid	60 at 455 KC
IF Grid to 6SQ7 diode plates	90 at 455 KC

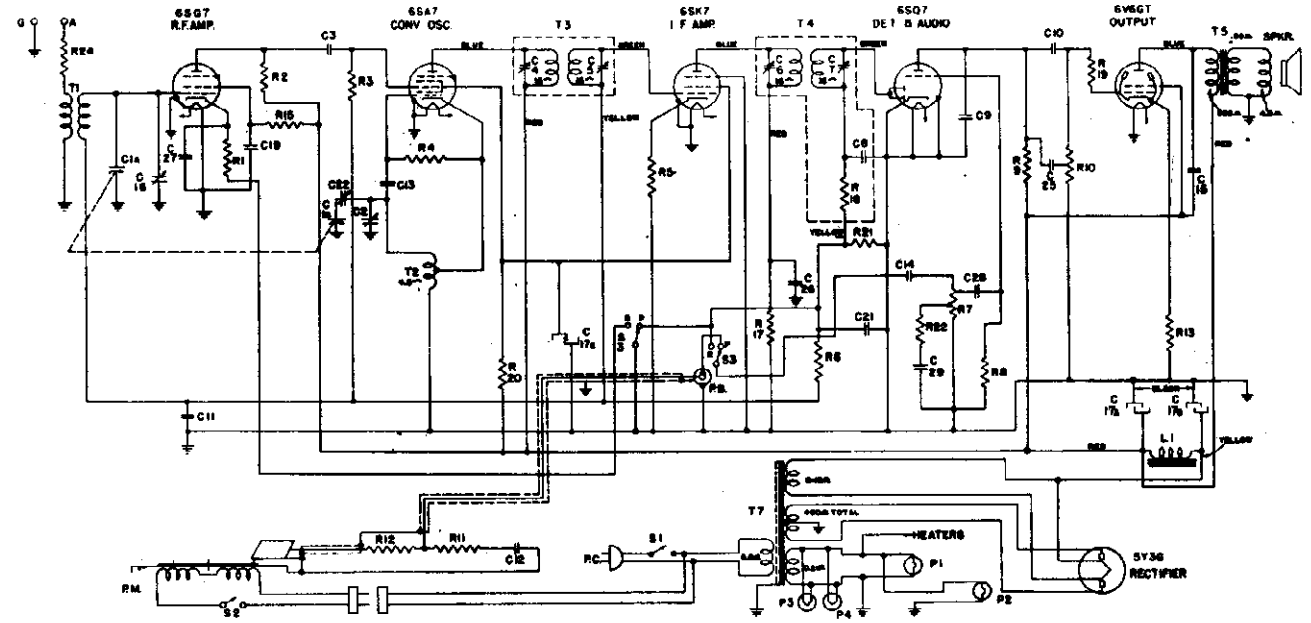
(2) Audio Gains
.14 volts, 400 cycles signal across volume control with control set to maximum will give approximately ½-watt speaker output.

(3) DC voltage developed across oscillator grid resistor R4 averages 10 volts at 1000 KC.

Variations of ±20% permissible. All readings taken with AVC shorted out.

MODEL LC648W

GENERAL ELECTRIC CO.



FOR G.E. LRP-162 and LRP-170 RECORD CHANGERS, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS"

Our Cat. No.	Symbol	Description	List Price
*RC-7061	C-1a, 1b	CONDENSER—Tuning condenser	$2.00
RT-891	C-2	TRIMMER STRIP—"B" Osc. Trimmer strip (combined with C-16, 22)	.55
*RC-235	C-3	CAPACITOR—100 mmf. mica	.25
*RC-252	C-8	CAPACITOR—200 mmf. mica	.30
*RC-242	C-9	CAPACITOR—150 mmf. mica	.25
*RC-048	C-10	CAPACITOR—.02 mfd. 600 V paper	.30
*RC-072	C-11	CAPACITOR—.05 mfd. 200 V paper	.25
*RC-011	C-12	CAPACITOR—.002 mfd. 600 V paper (Used only with RLP-170 record player)	.25
*RC-216	C-13	CAPACITOR—47 mmf., mica	.25
*RC-023	C-14	CAPACITOR—.005 mfd. 600 V paper	.25
*RC-055	C-15	CAPACITOR—.003 mfd. 600 V paper	.25
*RT-891	C-16	TRIMMER STRIP—Ant. trimmer (Part of C-2, 22)	.55
RC-5212	C17a, 17b, 17c	CAPACITOR—10-15-10 mfd., electrolytic	1.10
*RC-039	C-19	CAPACITOR—.01 mfd. 600 V paper	.25
*RC-235	C-21	CAPACITOR—100 mmf., mica	.25
*RT-891	C-22	TRIMMER STRIP—"B" Band padder (Combined with C 2, C-16)	.55
*RC-023	C-25	CAPACITOR—.005 mfd. 600 V paper	.25
*RC-047	C-26, 27, 28	CAPACITOR—.01 mfd. 400 V paper	.20
*RC-017	C-29	CAPACITOR—.0042 mfd. 600 V paper	.25
*RQ-1247	R-1	RESISTOR—330 ohm, ½-W carbon	.70-5
*RQ-1271	R-2	RESISTOR—3300 ohm, ½-W carbon	.70-5
*RQ-1299	R-3	RESISTOR—47,000 ohm, ½-W carbon	.70-5
*RQ-1291	R-4	RESISTOR—22,000 ohm, ½-W carbon	.70-5
*RQ-1239	R-5	RESISTOR—150 ohm, ½-W carbon	.70-5
*RQ-1339	R-6	RESISTOR—2.2 megohm, ½-W carbon	.70-5
*RV-135	R-7	VOL. CONTROL—2 meg. volume control	.95
*RQ-1355	R-8	RESISTOR—10.0 megohm, ½-W carbon	.70-5
*RQ-1323	R-9	RESISTOR—470,000 ohm, ½-W carbon	.70-5
*RT-722	R-10, S1	TONE CONTROL—0.5 meg. control and power switch	1.45
*RQ-1299	R-11, 12	RESISTOR—47,000 ohm, ½-W carbon (Used only with record player LRP-170)	.70-5
*RQ-1313	R-11	RESISTOR—180,000 ohm, ½-W carbon (Used only with record player LRP-162)	.70-5
*RQ-1315	R-12	RESISTOR—220,000 ohm, ½-W carbon (Used only with record player LRP-162)	.70-5
*RQ-1247	R-13	RESISTOR—330 ohm, ½-W carbon	.70-5
*RQ-1299	R-15	RESISTOR—47,000 ohm, ½-W carbon	.70-5
*RQ-1259	R-17	RESISTOR—1000 ohm, ½-W carbon	.70-5
*RQ-1299	R-18	RESISTOR—47,000 ohm, ½-W carbon	.70-5
*RQ-1259	R-19	RESISTOR—1000 ohm, ½-W carbon	.70-5
*RQ-687	R-20	RESISTOR—15,000 ohm, 2-W carbon	.35
*RQ-1323	R-21	RESISTOR—470,000 ohm, ½-W carbon	.70-5
*RQ-1303	R-22	RESISTOR—88,000 ohm ½-W carbon	.70-5
*RQ-1259	R-24	RESISTOR—1000 ohm, ½-W carbon	$0.70-5
*RL-590	T-1	BEAM-A-SCOPE—Built-in loop antenna	1.25
*RL-2072	T-2	COIL—Osc. coil, Band "B"	.30
*RT-3005	T-3	TRANSFORMER—1st IF transformer	.90
*RT-3006	T-4	TRANSFORMER—2nd IF transformer	1.15
RT-4033	T-5	TRANSFORMER—Output transformer	1.25
RT-0629	T-7	TRANSFORMER—60-cycle power transformer	5.05
*RS-3141	S-3	SWITCH—Phono-radio switch	.55
RS-1096	SPKR	SPEAKER—12-in. EM speaker	8.05

* Used on previous receiver. Prices subject to change without notice

Electrical Rating

Rating "A6"—110–125 volts, 60 cycles, 80 watts.
Rating "A5"—110–125 volts, 50 cycles, 80 watts.

Tuning Frequency Range

"BC" Band ..... 540–1720 KC

Intermediate Frequency ..... 455 KC

Electrical Power Output

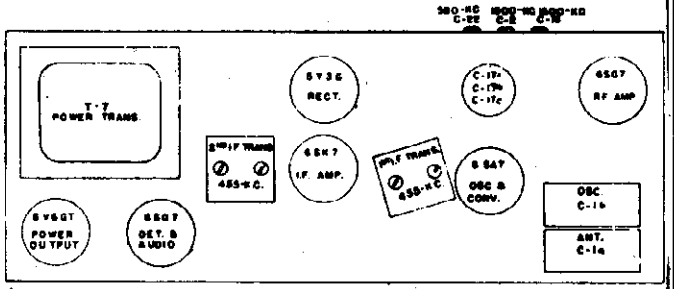
Undistorted ..... 2.5 watts
Maximum ..... 4.5 watts

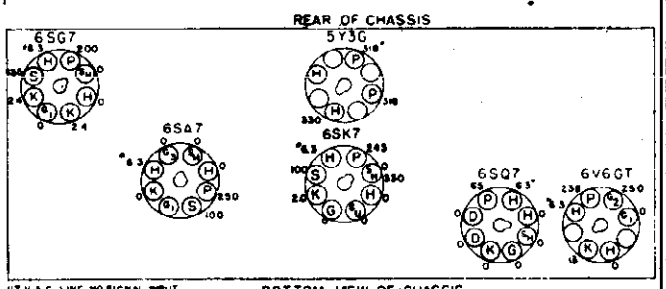
Loudspeaker—EM Dynamic

Outside cone diameter ..... 12 inches
Voice coil impedance (400 cycles) ..... 5.0 ohms

Phonograph Mechanism

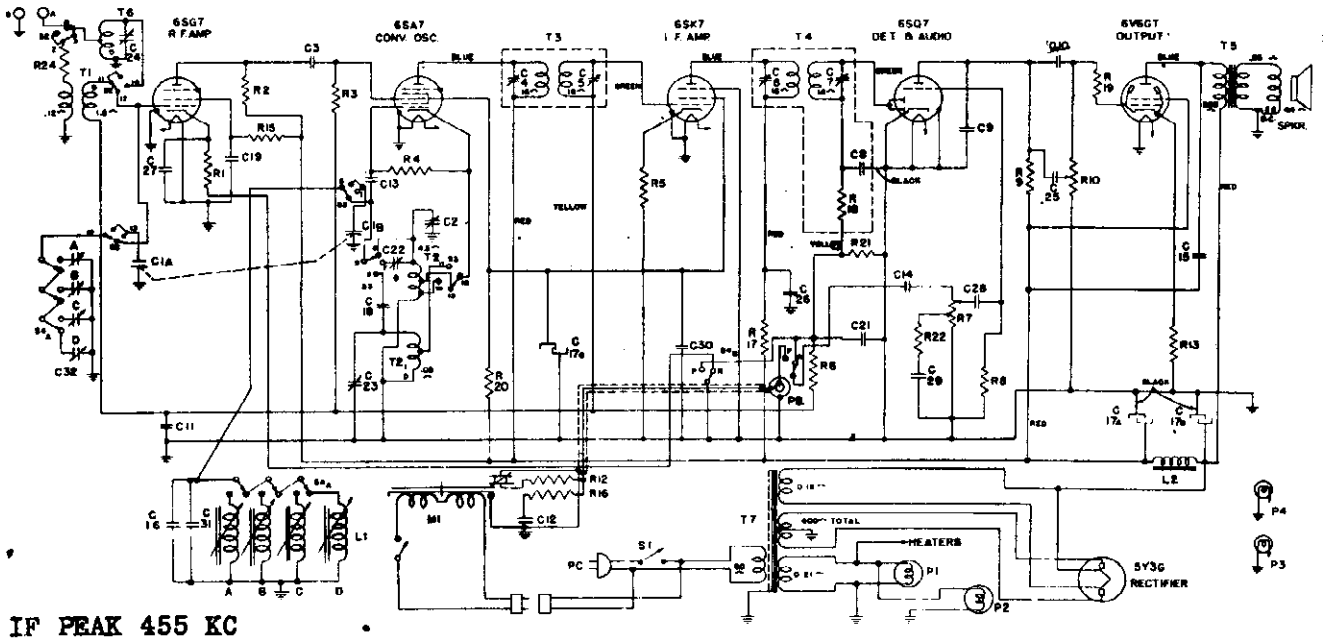
Type changer ..... Models LRP-162 or LRP-170
Type pickup ..... Crystal
Turntable speed ..... 78 R.P.M.





117 V A.C. LINE NO SIGNAL INPUT
SOCKET VOLTAGES TO GROUND
BAND SWITCH SET FOR BROADCAST BAND
INDICATES VOLTS A.C.

GENERAL ELECTRIC CO.



IF PEAK 455 KC

NOTE—C12 IS OMITTED WHEN RECORD CHANGER LRP-162 IS USED

FOR G.E. RECORD CHANGERS LRP-162 AND LRP-170, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

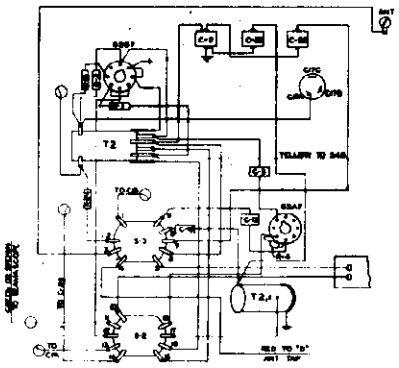


Fig. 2.

Switch Wiring

RADIO REPLACEMENT PARTS LIST

Our Cat. Number	Symbol	Description	List Price
*RC-7061	C1a, C1b	CONDENSER—2 gang tuning condenser	$2.00
*RC-6552	C-2	CAPACITOR—"B" band trimmer (Part of C22, 23)	.55
*RC-235	C-3	CAPACITOR—100 mmf., mica	.25
*RC-242	C-9	CAPACITOR—150 mmf., mica	.25
*RC-048	C-10	CAPACITOR—.02 mfd. 600-V paper	.30
*RC-072	C-11	CAPACITOR—.05 mfd. 200-V paper	.25
*RC-011	C-12	CAPACITOR—.002 mfd. 600-V paper (Used with Model LRP-170 record player only)	.25
*RC-216	C-13	CAPACITOR—47 mmf., mica	.25
*RC-023	C-14	CAPACITOR—.005 mfd. 600-V paper	.25
*RC-055	C-15	CAPACITOR—.003 mfd. 600-V paper	.25
*RC-329	C-16	CAPACITOR—150 mmf., compensating capacitor	.25
RC-5212	C-17a, 17b 17c	CAPACITOR—10-15-10 mfd., electrolytic	1.10
*RC-390	C-18	CAPACITOR—3900 mmf., mica	.35
*RC-039	C-19	CAPACITOR—.01 mfd. 600-V paper	.25
*RC-235	C-21	CAPACITOR—100 mmf., mica	.25
*RC-6552	C-22	CAPACITOR—"B" padder (Part of C2, 23)	.55
*RC-6552	C-23	CAPACITOR—"D" Osc. trimmer (Part of C2, 22)	.55
*RC-6553	C-24	CAPACITOR—"D" antenna trimmer	$0.25
*RC-023	C-25	CAPACITOR—.005 mfd. 600-V paper	.25
*RC-039	C-26, 27, 28	CAPACITOR—.01 mfd. 600-V paper	.25
*RC-049	C-29	CAPACITOR—.0042 mfd. 600-V paper	.35
*RC-039	C-30	CAPACITOR—.01 mfd. 600-V paper	.25
*RC-305	C-31	CAPACITOR—600 mmf., silvered mica	.25
*RT-885	C-32a, b, c, d	TRIMMER STRIP—Push button trimmer strip	.70
*RQ-1247	R-1	RESISTOR—330 ohm, ½-W carbon	.70-
*RQ-1271	R-2	RESISTOR—3300 ohm, ½-W carbon	.70-
*RQ-1299	R-3	RESISTOR—47,000 ohm, ½-W carbon	.70-
*RQ-1291	R-4	RESISTOR—22,000 ohm, ½-W carbon	.70-
*RQ-1239	R-5	RESISTOR—150 ohm, ½-W carbon	.70-
*RQ-1339	R-6	RESISTOR—2.2 megohm, ½-W carbon	.70-
*RV-135	R-7	VOL. CONTROL—2 meg. volume control	.95
*RQ-1355	R-8	RESISTOR—10 megohm, ½-W carbon	.70-
*RQ-1323	R-9	RESISTOR—470,000 ohm, ½-W carbon	.70-
*RT-722	R-10, S1	TONE CONTROL—0.5 meg. tone control	1.45
*RQ-1299	R-12	RESISTOR—47,000 ohm, ½-W carbon (Used only with Model LRP-170 record player)	.70-
*RQ-1315	R-12	RESISTOR—220,000 ohm, ½-W carbon (Used only with Model LRP-162 record player)	.70-
*RQ-1247	R-13	RESISTOR—330 ohm, ½-W carbon	.70-
*RQ-1299	R-15	RESISTOR—47,000 ohm, ½-W carbon	.70-
*RQ-1299	R-16	RESISTOR—47,000 ohm, ½-W carbon (Used only with Model LRP-170 record player)	.70-
*RQ-1313	R-16	RESISTOR—180,000 ohm, ½-W carbon (Used only with Model LRP-162 record player)	.70-
*RQ-1259	R-17	RESISTOR—1000 ohm, ½-W carbon	.70-
*RQ-1299	R-18	RESISTOR—47,000 ohm, ½-W carbon	.70-
*RQ-1259	R-19	RESISTOR—1000 ohm, ½-W carbon	.70-
*RQ-687	R-20	RESISTOR—15,000 ohm, 2-W carbon	.35
*RQ-1323	R-21	RESISTOR—470,000 ohm, ½-W carbon	.70-
*RQ-1303	R-22	RESISTOR—68,000 ohm, ½-W carbon	.70-
*RQ-1259	R-24	RESISTOR—1000 ohm, ½-W carbon	.70-
*RL-9530	L1-a, b, c, and d	COIL—Push button coil assembly	.85
*RS-3142	S-2, S-3	SWITCH—Band switch	1.10
*RS-3130	S4a, 4b	SWITCH—Touch tuning switch	4.00
*RL-591	T-1	BEAM-A-SCOPE—"B" band loop	1.20
*RL-2073	T-2	COIL—"B" band oscillator coil	.50
*RL-2074	T-2t	COIL—"D" band oscillator coil	.30
*RT-3005	T-3	TRANSFORMER—1st IF transformer	.90
*RT-3010	T-4	TRANSFORMER—2nd IF transformer	1.20
RT-4033	T-5	TRANSFORMER—Output transformer	1.25
*RL-592	T-6	BEAM-A-SCOPE—"D" band loop	.50
RT-0629	T-7	TRANSFORMER—50 or 60 cycle power transformer	5.05
RS-1096	SPKR	SPEAKER—12-inch EM speaker	8.05

* Used on previous receivers.

Prices subject to change without notice.

MODEL LC619W

GENERAL ELECTRIC CO.

Our Cat. Number	Description	List Price	Our Cat. Number	Description	List Price
*RB-013	BOARD—2 lug terminal board	$0.10	* RK-092	KNOB—Tone or band control knob	$0.10
*RB-023	BOARD—4 lug terminal board	.10	* RK-229	KEY—Push button key	.20
*RB-093	BOARD—6 lug terminal board	.10	* RP-1032	POINTER—Dial pointer assembly	.25
*RB-026	BOARD—Antenna terminal board	.10	*RS-238	SOCKET—Octal base tube socket	.15
*RB-636	BEZEL—Pilot lamp bezel (bottom of cab.)	.15	*RS-257	SOCKET—Electrolytic mtg. socket	.05
*RB-646	BEZEL—Phono compartment lamp bezel	.20	*RS-266	SOCKET—Dial scale lamp socket	.15
*RB-1030	BOARD—Phono terminal board	.10	*RS-292	SOCKET—Pilot lamp socket (bottom of cabinet)	.25
*RC-1989	CUSHION—Tuning condenser mtg. cushion	.05-5	*RS-298	SOCKET—Phono compartment lamp socket	.20
*RC-8154	CORD—Power cord	.40	*RS-444	SPRING—Volume, tuning or push button control springs	.10-10
*RC-8500	CARDS—Station letter cards (set)	.20			
RC-9052	CONE—12 in. speaker cone	1.50	*RS-463	SPRING—Drive cord tension spring	.10-5
*RC-8231	CABLE—Speaker cable and plug	.50	*RS-511	SLEEVE—Tuning condenser mtg. spacer sleeve	.15-10
*RD-426	DRUM—Condenser drive drum assembly	.20	*RS-4012	SPRING—Tone or band control spring	.10-10
*RD-775	DIAL—Dial scale assembly	.85	*RS-9042	SHAFT—Tuning shaft	.10
*RG-449	GRILLE—Cabinet grille cloth	1.05	*RT-959	TERMINAL—Speaker and loop lead terminal	.05-5
*RK-091	KNOB—Volume and tuning control knob	.10	*RW-101	WASHER—Felt washer for knobs	.05-10

* Used on previous receivers.

Prices subject to change without notice.

SPECIFICATIONS

Height ..... 35 inches
Width ..... 32 5/16 inches
Depth ..... 16 3/16 inches

Electrical Rating

Rating "A6"—110-125 volts, 60 cycles, 80 watts.
Rating "A5"—110-125 volts, 50 cycles, 80 watts.

Tuning Frequency Range

"BC" Band ..... 540–1720 KC
"SW" Band ..... 5.3–18.0 MC

Intermediate Frequency ..... 455 KC

Electrical Power Output

Undistorted ..... 2.5 watts
Maximum ..... 4.5 watts

Loud-speaker—EM Dynamic

Outside Cone diameter ..... 12 inches
Voice Coil Impedance (400 cycles) ..... 5.0 ohms

Phonograph Mechanism

Type changer ..... Models LRP-162 or LRP-170
Type pickup ..... Crystal
Turntable speed ..... 78 Rpm

Tubes

RF Amplifier GE-6SG7
Converter-Oscillator GE-6SA7
IF Amplifier GE-6SK7
Detector, 1st Audio, AVC GE-6SQ7
Power Output GE-6V6GT
Rectifier GE-5Y3G
Dial Lamps ..... (2) MAZDA No. 44

GENERAL INFORMATION

Two different types of record changers were used during the production of the Model LC-619W phonograph combination.

The Model LRP-170 record changer is identified by the single record post and the eccentric turntable spindle, whereas the LRP-162 changers make use of a two-post record holder. Different pickup compensation is used for the two changers as noted at the bottom of the schematic diagram and the change in value of resistors, R12 and R16, as given in the replacement parts list.

Special Service Information

The following data are taken with a vacuum tube voltmeter or similar voltage measuring device.

(1) Stage Gains

Antenna Post to RF Grid	5 at 1000 KC
RF Grid to Converter Grid	5 at 1000 KC
Converter Grid to IF Grid	40 at 1000 KC
Converter Grid to IF Grid	60 at 455 KC
IF Grid to 6SQ7 diode plates	90 at 455 KC

(2) Audio Gains
.14 volts, 400 cycles signal across volume control with control set to maximum will give approximately ½-watt speaker output.

(3) DC voltage developed across oscillator grid resistor R4 averages 10 volts at 1000 KC or 8.0 volts at 10,000 KC.

Variations of ±20% permissible. All readings taken with AVC shorted out.

ALIGNMENT PROCEDURE

The location of trimmers is shown in Fig. 4. All oscillator and RF trimmers are accessible through a slot through the back cover of the cabinet.

The alignment procedure is given in table form. All IF alignments may be made with the chassis removed from the cabinet. However, the RF alignments are made with the chassis and loop antennas securely fastened in the cabinet, as the relative position of the loop antenna with respect to the chassis materially affects it. The RF signal should be capacity coupled by placing a two-foot wire for an antenna on the test-oscillator output post (high side). Keeping this antenna two feet or more from the receiver loop will generally insure freedom from too much coupling. Metal objects such as meters, tools, etc., should not be placed on top of the receiver cabinet.

ALIGNMENT CHART

Step	Connect Test-Osc. to	Test-Osc. Setting	Pointer Setting	Adjust Trimmers for Maximum Output
1	6SK7 IF Grid in series with .05 mfd.	455 KC	"BC" Band 550 KC	C6 & C7
2	6SA7 Conv. grid in series with .05 mfd.	455 KC	"BC" Band 550 KC	C4 & C5
3	With input on 6SA7 Conv., repeat step 1			
4	Capacity Coupled	580 KC	"BC" Band 580 KC	C22**
5	Capacity Coupled	1500 KC	"BC" Band 1500 KC	C2** (Osc.)
6	Repeat Step 4			
7	Capacity Coupled	18 MC	"SW" Band 18 MC	C23* (Osc.)
8	Capacity Coupled	18 MC	"SW" Band 18 MC	C24** (Ant.)

* Use minimum capacity peak.
** Rock gang condenser when making alignment.

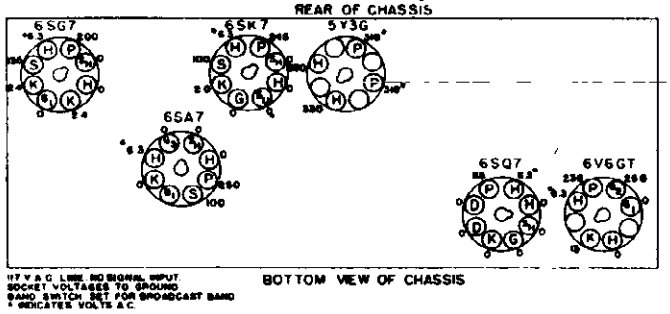


Fig. 3. Socket Voltages

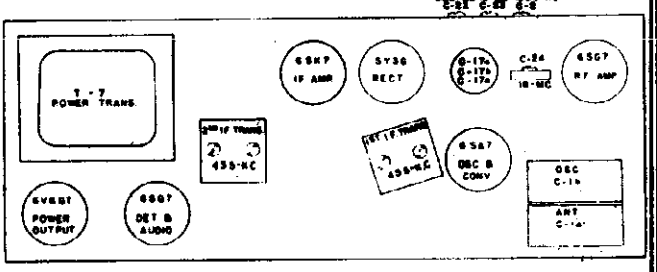


Fig. 4. Trimmer Location

GENERAL ELECTRIC CO.

Musaphonic

RADIO-PHONOGRAPH COMBINATION

MODEL 35

SERVICE DATA

Cabinet Dimensions

Height ..... 41¾ in
Depth ..... 18 in.
Width ..... 23½ in.

Electrical Rating

Rating "A-6" 105-125 volts, 60 cycles, AC, 125 watts

Tuning Frequency Range

Band "B" ..... 540–1600 KC
Band "C" ..... 2200–7000 KC
Bnad "D" ..... 7000–22,000 KC

Intermediate Frequency ..... 455 KC

Electrical Power Output

Undistorted ..... 8 watts
Maximum ..... 12 watts

Loud-speaker—Permanent Magnet

Cone Diameter ..... 14 inches
Voice Coil Impedance (400 cycles) ..... 3.5 ohms

Tubes

R.F. Amplifier GE-6SK7
Converter-Oscillator GE-6K8
I.F. Amplifier GE-6SK7
Detector-AVC GE-6J5G/6J5GT
Audio Driver GE-6SF5
Audio Phase Inverter GE-6J5G/6J5GT
Power Output ..... (2) GE-6V6G
Rectifier GE-5U4G
Tuning Indicator GE-6U5
Dial Lamp ..... (3) MAZDA No. 44

FOR DATA COVERING RECORD CHANGER SIMILAR TO G.E. LRP-158, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS"

All antenna, R.F. and oscillator transformer switch terminals are numbered in the chassis parts layout drawing to facilitate the location of these common points on the schematic diagram.

Loud-speaker

The voice coil on the speaker is accurately and permanently centered at the factory and should seldom give trouble. In case a voice coil needs recentering it will be necessary to replace the entire cone and voice coil assembly. Assembly instructions accompany each replacement cone.

NOTE: In no case should the magnet be removed from the assembled position as it will lose magnetism.

SPECIAL SERVICE INFORMATION

The following information will be found very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

1. Stage Gains *
   a. Antenna Post to R.F. Amplifier Grid at
      1000 KC 5.0
      4000 KC 3.7
      18,000 KC 2.6
   b. R.F. Amplifier Grid to Converter Grid at
      1000 KC 14.0
      4000 KC 10.0
      18,000 KC ..... 10.0 *
   c. R.F. on Converter Grid to I.F. on 1st I.F. Grid at
      1000 KC ("B" Manual) 16.0
      4000 KC 30.0
      18,000 KC 34.0
   d. I.F. on Converter Grid to I.F. on 1st I.F. Grid at 455 KC ("B" Manual—Gang Closed) 24.0
   e. I.F. Amplifier Grid to Detector Grid at 455 KC 112.0
2. Voltage Across Volume Control to Give ½-watt Speake Output at 400 Cycles 0.05*
3. D.C. Voltage Developed Across Oscillator Grid Resisto (R-2) with gang closed
   "B" Band 6.2*
   "C" Band 7.8*
   "D" Band 4.8*

* Variations of +10%, −20% are permissible.
** On "D" band, stray oscillator voltage may upset reading.

VOLTAGE CHART

Tubes	Plate to Gnd. Volts	Screen to Gnd Volts	Cathode to Gnd. Volts	Filament Volts
6SK7 (R.F.)	235	95	4.7	6.3
6K8	Con.-235 Osc.-105	95	4.7	6.3
6SK7 (I.F.)	235	95	3	6.3
6J5G (Det.)	0		0	6.3
6SF5	120		1	6.3
6J5G (Inverter)	90		4	6.3
6V6G	290	230	12.5	6.3
5U4G	277 a.c.		300	5.1
6U5	170			6.3

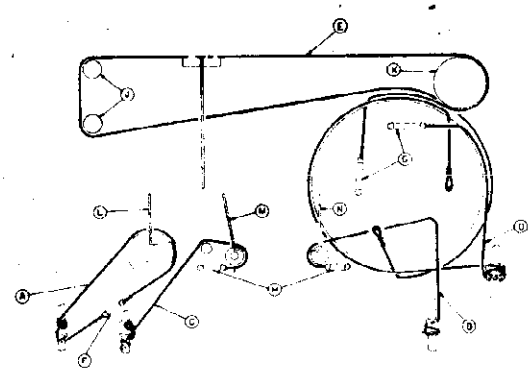
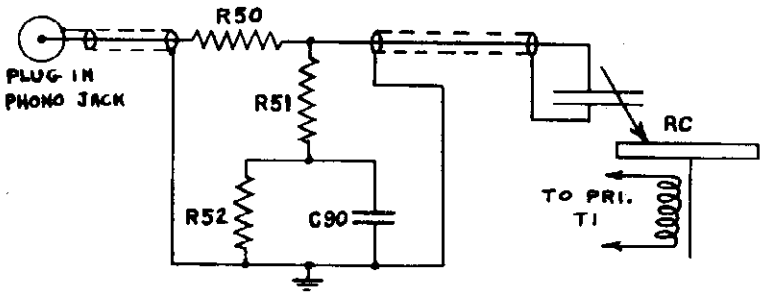


Fig. 1. Stringing Diagram



Symbol	Description	Symbol	Description
R50	100,000 ohms, carbon	R52	220,000 ohms, carbon
R51	150,000 ohms, carbon	C90	.002 mfd., paper

Fig. 4. Phonograph Schematic

ALIGNMENT PROCEDURE

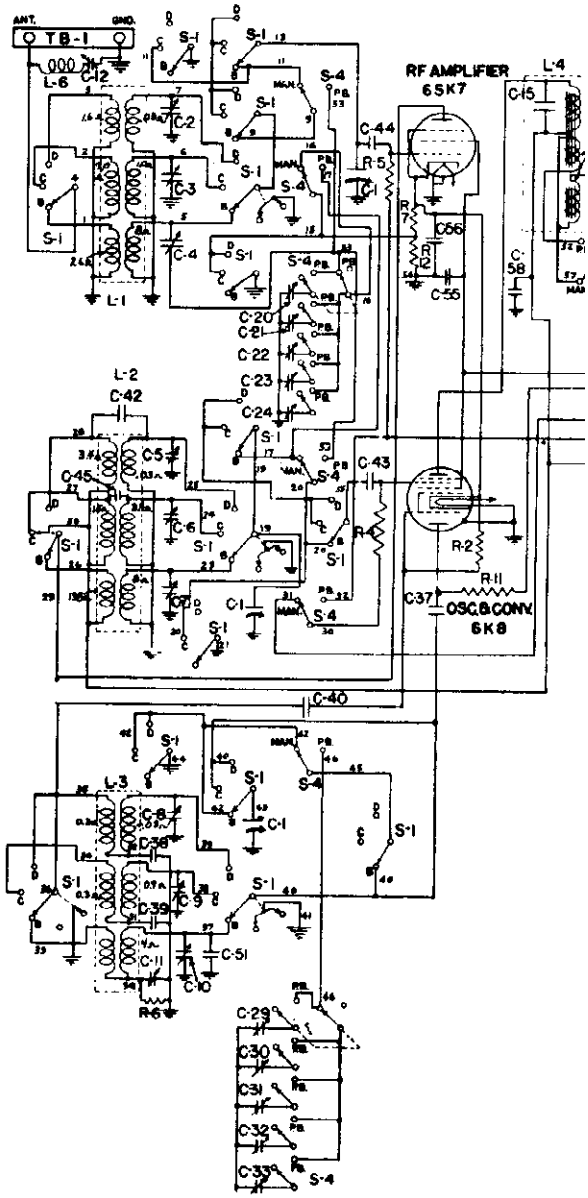
The location of trimmers is shown in Fig. 3 and alignment procedure is given in table form below.

Before making the R.F. alignment make sure the pointer is set to the line at the extreme low frequency end of the dial scale when the gang condenser plates are closed. Output meter alignment is preferable and the meter may be connected across the voice coil leads, then turn volume control partially up. Keep the signal input as low as possible to avoid AVC action. NOTE—the wave trap trimmer C-12 is aligned to give minimum output.

Alignment Chart

Step	Connect Test—Osc. to	Test—Osc. Setting	Pointer Setting	Adjust Trimmers for Max. Output
1	IF grid in series with .05 mfd.	455 KC	Band "B" 550 KC	2nd IF primary and secondary
2	Conv. grid in series with .05 mfd.	455 KC	Band "B" 550 KC	1st IF primary and secondary
3	Ant. post in series with 200 mmf.	455 KC	Band "B" 550 KC	C-12 *
4	Ant. post in series with 200 mmf.	21 MC	Band "D" 21 MC	Osc. (C-8)** RF. (C-5)*** Ant. (C-2)
5	Ant. post in series with 200 mmf.	6 MC	Band "C" 6 MC	Osc. (C-9)** RF. (C-6) Ant. (C-3)
6	Ant. post in series with 200 mmf.	1500 KC	Band "B" 1500 KC	Osc. (C-10) RF. (C-7) Ant. (C-4)
7	Ant. post in series with 200 mmf.	580 KC	Band "B" 580 KC	Osc. padder (C-11)***
8	Repeat operation 6.			

* Peak for minimum output.
** Use minimum capacity peak.
***Rock gang condenser when making alignment.



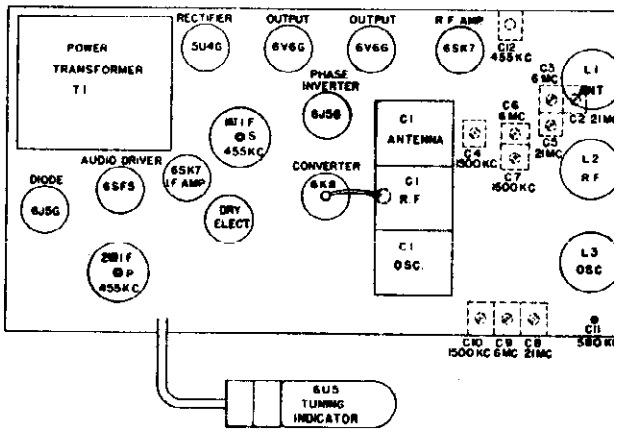


Fig. 3. Trimmer Location

ELECTRIC CO.

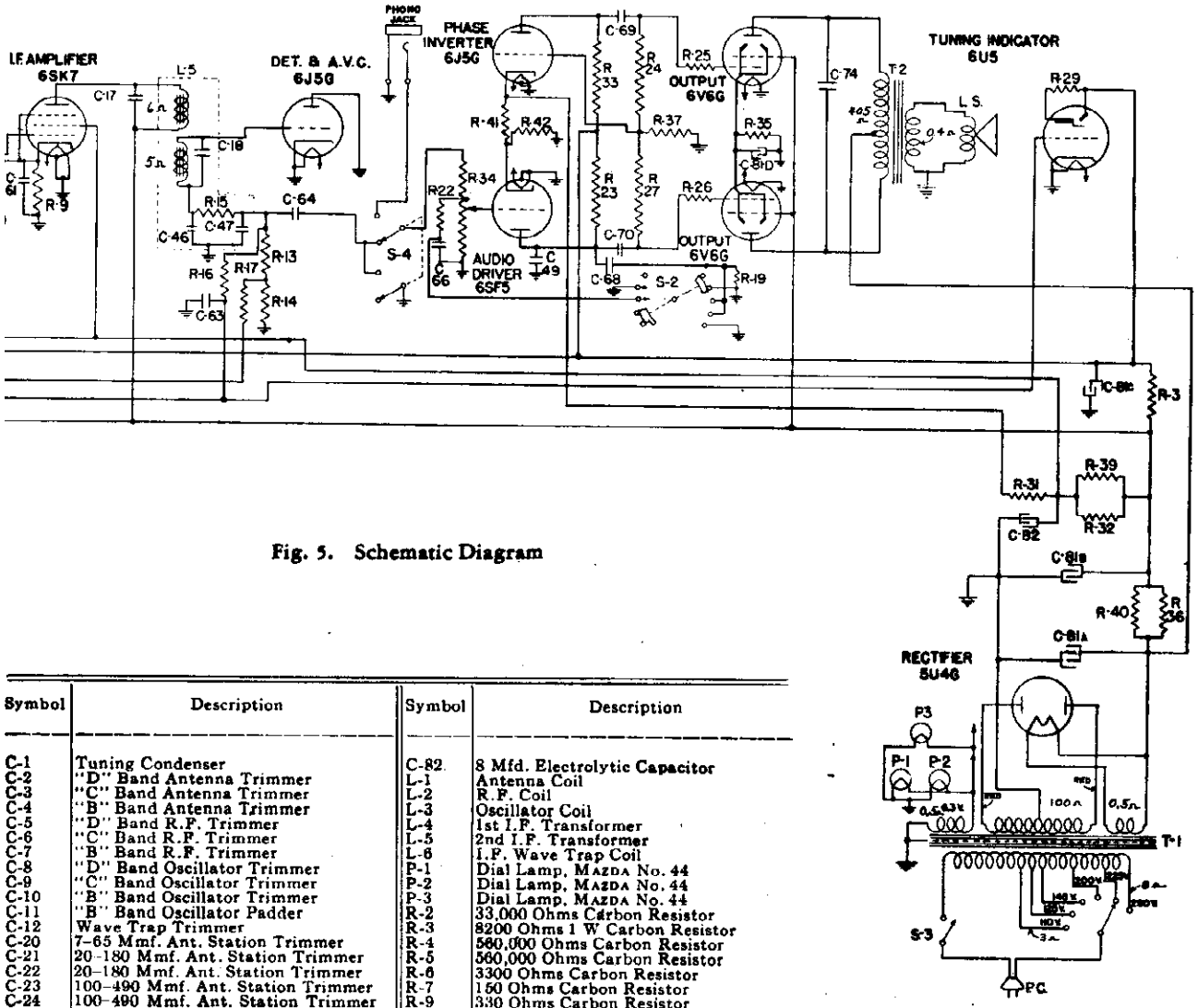


Fig. 5. Schematic Diagram

Symbol	Description
C-1	Tuning Condenser
C-2	"D" Band Antenna Trimmer
C-3	"C" Band Antenna Trimmer
C-4	"B" Band Antenna Trimmer
C-5	"D" Band R.F. Trimmer
C-6	"C" Band R.F. Trimmer
C-7	"B" Band R.F. Trimmer
C-8	"D" Band Oscillator Trimmer
C-9	"C" Band Oscillator Trimmer
C-10	"B" Band Oscillator Trimmer
C-11	"B" Band Oscillator Padder
C-12	Wave Trap Trimmer
C-20	7-65 Mmf. Ant. Station Trimmer
C-21	20-180 Mmf. Ant. Station Trimmer
C-22	20-180 Mmf. Ant. Station Trimmer
C-23	100-490 Mmf. Ant. Station Trimmer
C-24	100-490 Mmf. Ant. Station Trimmer
C-29	7-65 Mmf. Osc. Station Selector
C-30	20-180 Mmf. Osc. Station Selector
C-31	20-180 Mmf. Osc. Station Selector
C-32	100-490 Mmf. Osc. Station Selector
C-33	100-490 Mmf. Osc. Station Selector
C-37	470 Mmf. Mica Capacity
C-38	4300 Mmf. ±5% Mica Capacitor
C-39	1600 Mmf. ±5% Mica Capacitor
C-40	47 Mmf. Mica Capacitor
C-42	22 Mmf. Mica Capacitor L.P.F.
C-43	470 Mmf. Mica Capacitor
C-44	470 Mmf. Mica Capacitor
C-45	6 Mmf. Mica Capacitor L.P.F.
C-46	100 Mmf. Mica Capacitor
C-47	100 Mmf. Mica Capacitor
C-49	330 Mmf. Mica Capacitor
C-51	10 Mmf. Compensating Capacitor
C-55	.05 Mfd. Paper Capacitor
C-56	.05 Mfd. Paper Capacitor
C-58	.05 Mfd. Paper Capacitor
C-60	.05 Mfd. Paper Capacitor
C-61	.05 Mfd. Paper Capacitor
C-63	.05 Mfd. Paper Capacitor
C-64	.02 Mfd. Paper Capacitor
C-66	.003 Mfd. Paper Capacitor
C-68	.008 Mfd. Paper Capacitor
C-69	.05 Mfd. Paper Capacitor
C-70	.05 Mfd. Paper Capacitor
C-74	.001 Mfd. 1500 V. Paper Capacitor
C-81A	40 Mfd. Electrolytic Capacitor
C-81B	20 Mfd. Electrolytic Capacitor
C-81C	5 Mfd. Electrolytic Capacitor
C-81D	40 Mfd. Electrolytic Capacitor
C-82	8 Mfd. Electrolytic Capacitor
L-1	Antenna Coil
L-2	R.F. Coil
L-3	Oscillator Coil
L-4	1st I.F. Transformer
L-5	2nd I.F. Transformer
L-6	I.F. Wave Trap Coil
P-1	Dial Lamp, MAZDA No. 44
P-2	Dial Lamp, MAZDA No. 44
P-3	Dial Lamp, MAZDA No. 44
R-2	33,000 Ohms Carbon Resistor
R-3	8200 Ohms 1 W Carbon Resistor
R-4	560,000 Ohms Carbon Resistor
R-5	560,000 Ohms Carbon Resistor
R-6	3300 Ohms Carbon Resistor
R-7	150 Ohms Carbon Resistor
R-9	330 Ohms Carbon Resistor
R-11	22,000 Ohms Carbon Resistor
R-12	150 Ohms Carbon Resistor
R-13	120,000 Ohms Carbon Resistor
R-14	120,000 Ohms Carbon Resistor
R-15	47,000 Ohms Carbon Resistor
R-16	2.2 Megohms Carbon Resistor
R-17	1.5 Megohms Carbon Resistor
R-19	1.0 Megohms Carbon Resistor
R-22	82,000 Ohms Carbon Resistor
R-23	100,000 Ohms Carbon Resistor
R-24	220,000 Ohms Carbon Resistor
R-25	1000 Ohms Carbon Resistor
R-26	1000 Ohms Carbon Resistor
R-27	150,000 Ohms Carbon Resistor
R-29	1.0 Megohm Carbon Resistor
R-31	10,000 Ohms 2 W Carbon Resistor
R-32	15,000 Ohms 2 W Carbon Resistor
R-33	68,000 Ohms Carbon Resistor
R-34	2 Megohm Volume Control, ½ Megohm Tap
R-35	180 Ohms 2 W Carbon Resistor
R-36	3300 Ohms 2 W Carbon Resistor
R-37	56,000 Ohms Carbon Resistor
R-39	15,000 Ohms 2 W Carbon Resistor
R-40	3300 Ohms 2 W Carbon Resistor
R-41	330 Ohms Carbon Resistor
R-42	82 Ohms Carbon Resistor
S-1	Band Change Switch
S-2	Tone Control Switch
S-3	Power Switch
S-4	Touch Tuning Switch
T-1	Power Transformer
T-2	Output Transformer

IMPORTANT

Although the schematic diagram indicates that this model is adaptable to line-voltages up to 250 volts, do not attempt to operate it from any power source other than 105-125 volts, 60 cycles as so doing will result in damage to the record changer.

MODEL 35

GENERAL ELECTRIC CO.

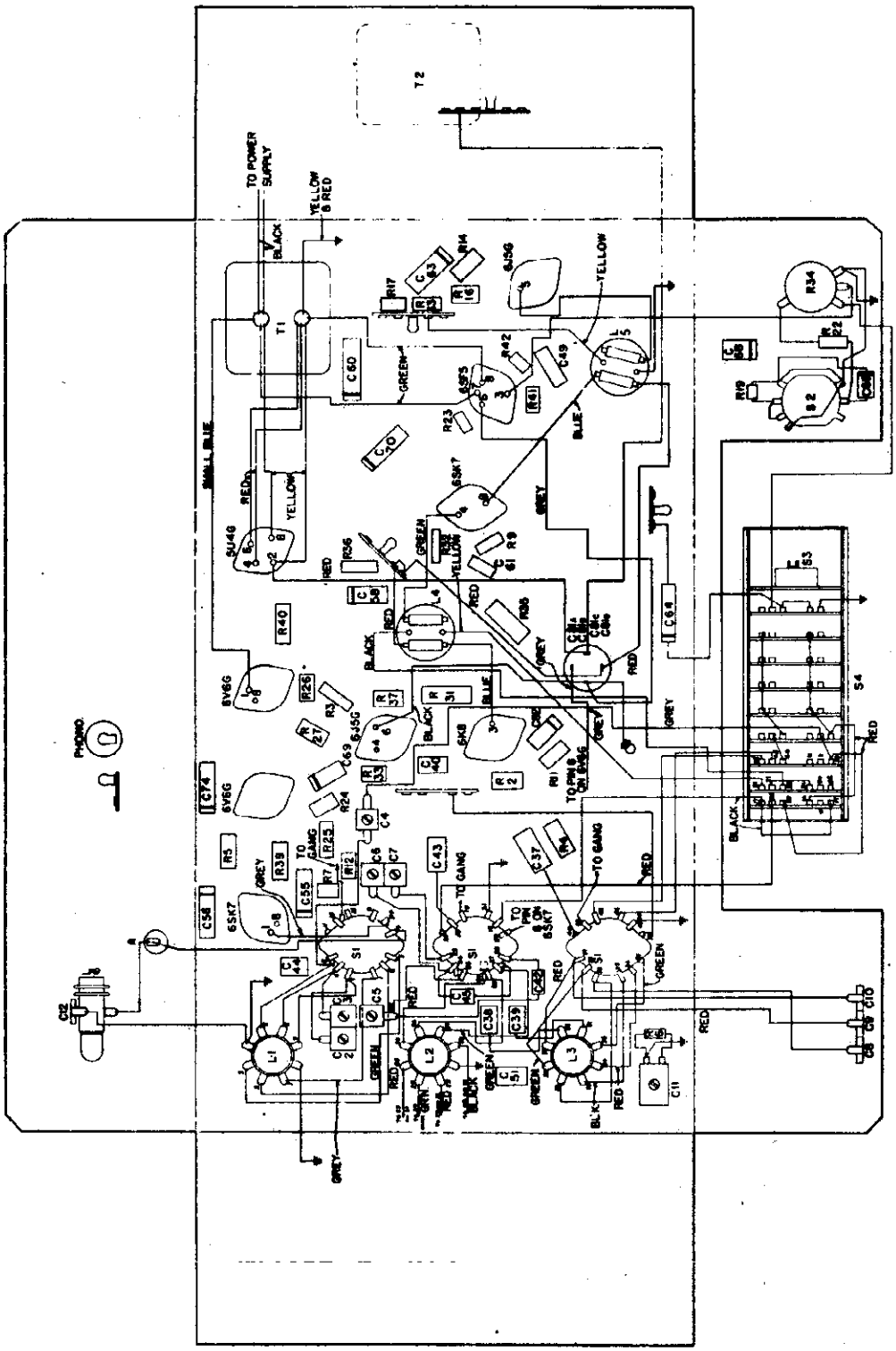
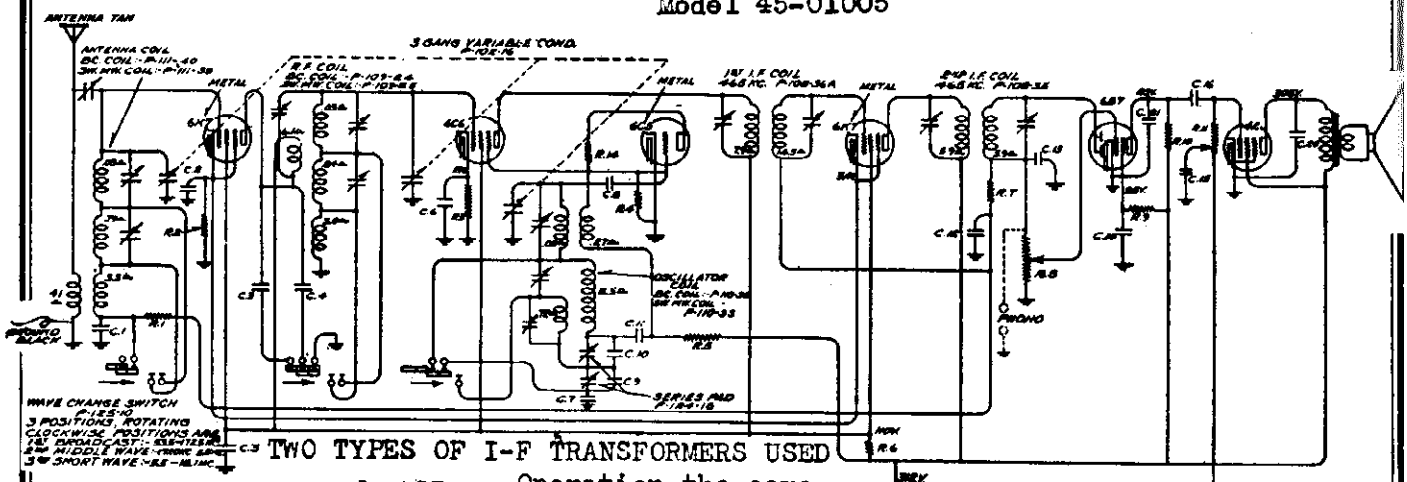


Fig. 2. Chassis Parts Layout

GOODYEAR TIRE & RUBBER CO., INC.

MODEL 45-01005
Series A.B

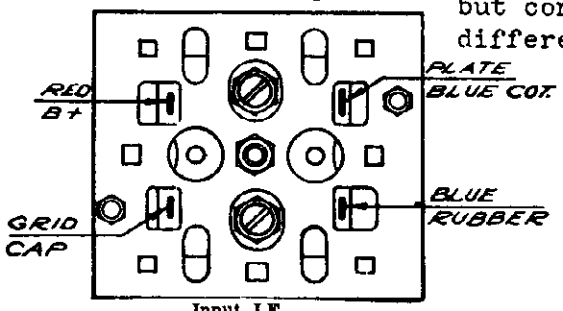
Model 45-01005



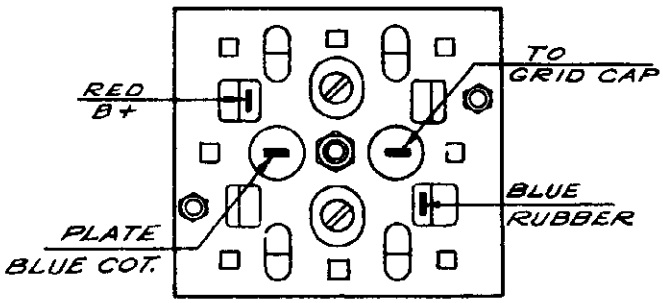
TWO TYPES OF I-F TRANSFORMERS USED

Operation the same, but connected differently.

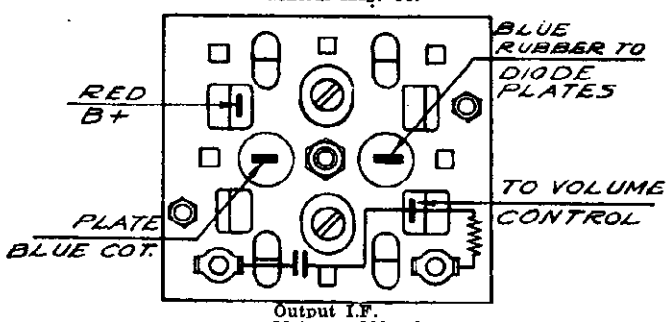
Input I.F.
Meissner Mfg. Co.



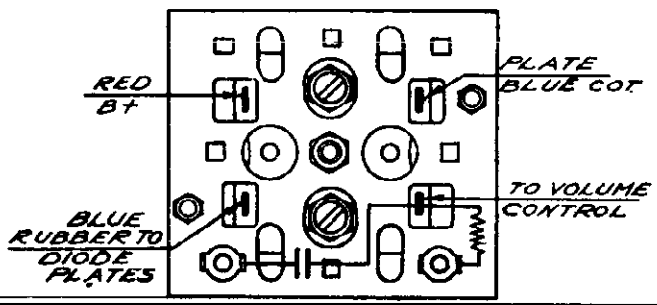
Input I.F.
General Mfg. Co.

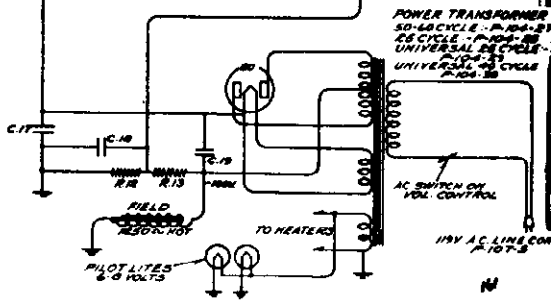


Output I.F.
General Mfg. Co.



Output I.F.
Meissner Mfg. Co.



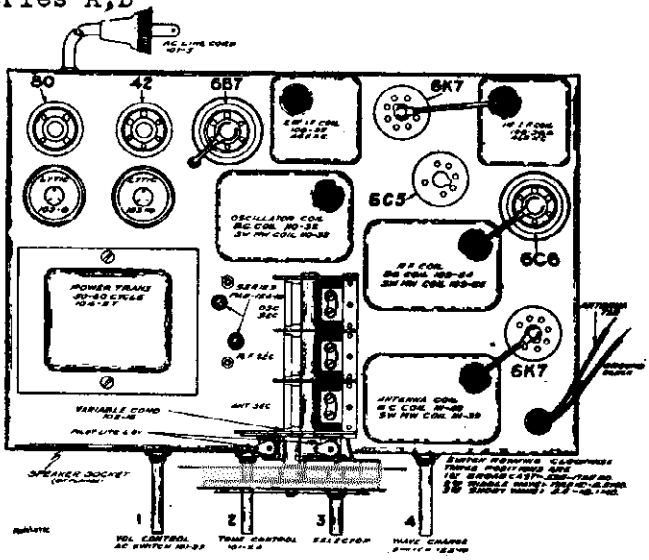


No.	Part No.	Description
		RESISTORS
R1.	130—20	100M Ohms—⅛ Watt—20%—50 V.
R2.	130—53	180 Ohms—⅛ Watt—10%—10 V.
R3.	130—54	500 Ohms—⅛ Watt—20%—10 V.
R4.	130—52	50M Ohms—⅛ Watt—20%—10 V.
R5.	130—49	12M Ohms—1 Watt—20%—150 V.
R6.	130—61	15M Ohms—2 Watt—20%—180 V.
R7.	130—3	500M Ohms—⅛ Watt—20%—100 V.
R8.	101—23	1 meg ohm—Volume Control
R9.	130—19	1 meg ohm—⅛ Watt—20%—100 V.
R10.	130—63	250M Ohms—⅛ Watt—20%—50 V.
R11.	101—24	300M Ohms—Tone Control
R12.	130—11	250M Ohms—⅛ Watt—20%—50 V.
R13.	130—37	750M Ohms—¼ Watt—20%—50 V.
R14.	130—60	100 Ohms—⅛ Watt—20%—10 V.
		CONDENSERS
C1.	100—9	.05 x 200 V.—25%
C2.	100—6	.25 x 200 V.—25%
C3.	129—30	.0014 Mica—MW.—20%
C4.	129—21	.0002 Mica—MT—20%
C5.	100—24	.25 x 400 V.—25%
C6.	100—20	.1 x 200 V.—25%
C7.	129—29	.0038 Mica—MW—2½%
C8.	129—31	.000025 Mica—MT—15%
C9.	129—25	.0012 Mica—MW.—5%
C10.	129—28	.00064 Mica—MT—5%
C11.	100—13	.05 x 400 V.—25%
C12.	100—13	.05 x 400 V.—25%
C13.	129—32	.00003 Mica—MT—30%
C14.	118—12	.1 x 200 V.—25%
C15.	100—11	.01 x 400 V.—25%
C16.	100—13	.05 x 400 V.—25%
C17.	103—4	16 mfd. x 350 V. Electrolytic
C18.	118—12	.25 x 200 V.—20%
C19.	103—8	14 mfd. x 400 V.
C20.	100—19	.006 x 600 V.—25%
C21.	129—5	.0001 Mica—MT—20%

	MISCELLANEOUS
111—40	B.C. Coil
111—39	S.W.—MW. Coil
	R.F. Coil
109—24	B.C. Coil
109—25	S.W. M.W. Coil
	Oscillator
110—32	B. C. Coil
110—33	S.W. M.W. Coil
108—36A	Input I.F. Coil 465 Kc.
108—35	Output I.F. Coil 465 Kc.
124—18	Dual Series Pad
125—10	Wave change switch
114—13	Speaker 6 in. Field 1250 ohms
114—27	Speaker 8 in. Field 1250 ohms
104—27	Power Transformer 50-60 Cycle
104—28	Power Transformer 25 Cycle
104—29	Power Transformer 25 Cycle Universal
104—30	Power Transformer 40 Cycle Universal

MODEL 45-01005
Series A,B

GOODYEAR TIRE & RUBBER CO., INC.



NOTE: IN SERIES B THE TYPE 75 WAS REPLACED BY TYPE 6B7, DUPLEX DIODE PENTODE AS A SECOND DETECTOR, A.V.C. AND AUDIO.

Series A and B chassis are serially numbered on the back flange of the chassis, series A beginning with number "5B104021A" and up, series B chassis beginning with number "5D114175B" and up. Series A and B may be identified by the letter "A" and "B" at the end of the serial numbers.

Transformers are available and chassis are sometimes equipped with universal transformers for operation on 40 and 60 cycles and with primary taps for 108, 125, 150, 220 and 250 volts (see instructions) and also sometimes equipped with 25 cycle transformers with 105-115 volt or 220 volt primaries, not universals.

ALIGNING INSTRUCTIONS

Dummy Antennas

The following dummy antennas are used in aligning both series A and B 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.

ALIGNMENT PROCEDURE SERIES A ONLY

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

BROADCAST BAND ALIGNMENT:

1. With wave changing switch in the broadcast position, extreme left of its rotation, and with external oscillator set at 550 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 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 electrolytic condenser. See top view.
   (b) Re-set external oscillator to 1500 K.C., move dial pointer to 1500 K.C. and adjust oscillator (adjustment number 3), R.F. (adjustment number 2) and antenna (adjustment number 1) to resonance. See bottom view for location of these adjustments.
   (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 wave 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 8), short wave R.F. (adjustment number 7) 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 for sensitivity.

INTERMEDIATE BAND ALIGNMENT:

1. With wave changing switch in the intermediate position center of its rotation, and with external oscillator set at 5 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 5 megacycles and adjust intermediate wave oscillator (adjustment number 9), intermediate wave R.F. (adjustment number 5) and intermediate antenna (adjustment number 4) to resonance.
   (b) Re-set external oscillator to 1500 K.C. and pick up signal by rotating variable condenser and check for sensitivity.
   (c) Re-check broadcast sensitivity as outlined under "Broadcast Band Alignment".

Series "A" chassis have no intermediate band series oscillator pad adjustment.

ALIGNMENT PROCEDURE SERIES B ONLY

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

BROADCAST BAND ALIGNMENT:

1. With wave 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 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 electrolytic condenser. See top view.
   (b) Re-set external oscillator to 1400 K.C., move dial pointer to 1400 K.C. and adjust oscillator (adjustment number 3), R.F. (adjustment number 2) and antenna (adjustment number 1) to resonance. See bottom view for location of these adjustments.
   (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 wave 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 8), short wave R.F. (adjustment number 7) 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 for sensitivity.

INTERMEDIATE BAND ALIGNMENT:

1. With wave changing switch in the intermediate wave position, center of its rotation, and with external oscillator set at 1000 K.C. and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
   (a) Rotate variable condenser to approximately 1500 K.C., tune in oscillator signal and adjust M.W. series pad (see top view) to resonance. Slowly rock condenser to and fro while making this adjustment to be sure maximum output is obtained.
   (b) Set external oscillator at 5 M.C., rotate condenser, pick up signal and adjust intermediate wave R.F. (adjustment number 5), intermediate wave antenna (adjustment number 4) and intermediate wave oscillator (adjustment number 9) to resonance.
   (c) 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. intermediate wave adjustments.

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

Series A and B.

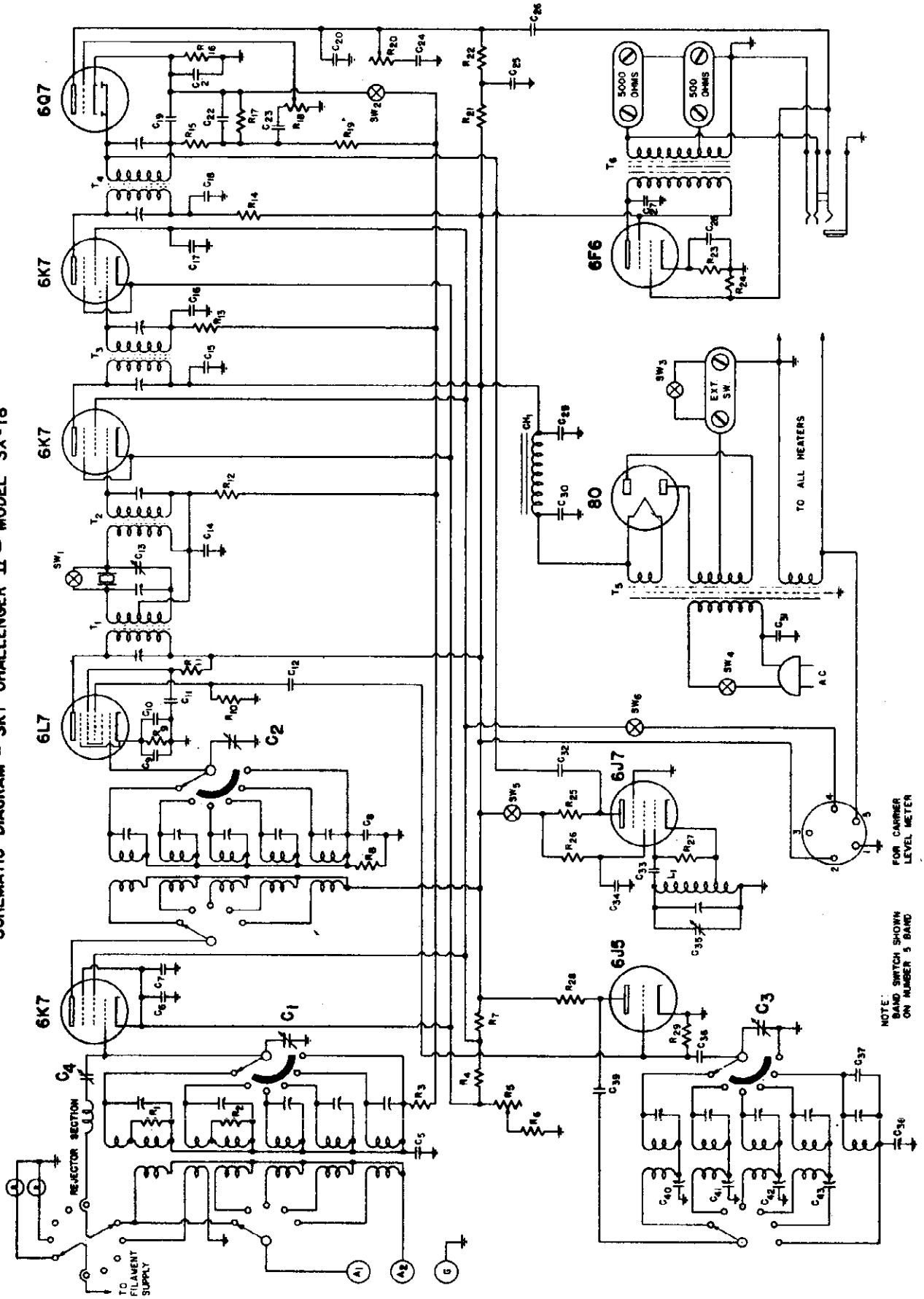
Series A—Part No. 108-35 Output I.F. Transformer
Series A—Part No. 108-36 Input I.F. Transformer
Series B—Part No. 108-35 Output I.F. Transformer
Series B—Part No. 108-36 Input I.F. Transformer

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

1. **With volume control full on, the extreme right of its rotation, and with wave changing switch in the broadcast position, extreme left of its rotation, and with 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 6D6 tube, located between the two I.F. transformers, and adjust the output I.F. transformer to resonance.
   (b) With "Dummy 1" still connected, move oscillator output clip from grid of 6D6 to grid cap to 6C6 and adjust input I.F. transformer to resonance.
   (c) With oscillator still connected to 6C6, re-adjust output I.F. transformer.

THE HALLICRAFTERS INC.

SCHEMATIC DIAGRAM - SKY CHALLENGER II - MODEL SX-18



MODELS S-16, SX-16
Sky Challenger II

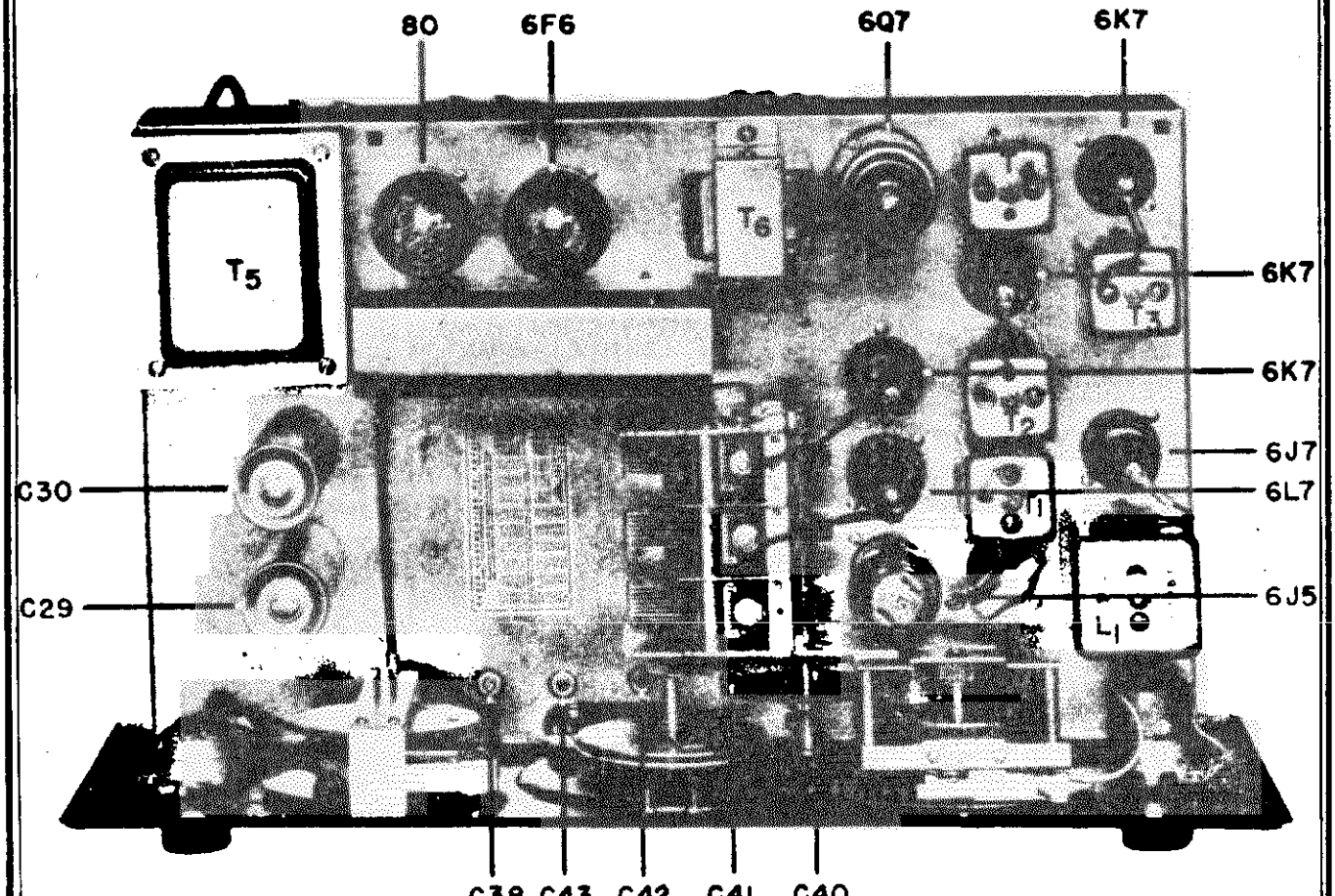
THE HALLICRAFTERS INC.

CONDENSERS

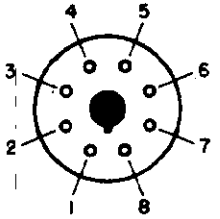
C1	250	MMFD	
C2	250	"	
C3	250	"	
C4	15	"	AIR VARIABLE
C5	.002	MFD	
C6	.002	MFD	400 VOLT MICA
C7	.25	"	200 "
C8	.002	"	"
C9-	.05	"	" "
C10	.002	"	"
C11	.05	"	400 "
C12	50	MMFD	"
C13	25	"	AIR VARIABLE
C14	.02	MFD	200 VOLT
C15	.25	"	400 "
C16	.02	"	200 "
C17	.1	"	400 "
C18	.05	"	" "
C19	250	MMFD	
C20	500	"	
C21	10	MFD	25 " ELECTROLYTIC
C22	250	MMFD	
C23	.05	MFD	200 "
C24	.005	"	400 "
C25	.1	"	" "
C26	.05	"	" "
C27	.003	"	
C28	10	"	25 " "
C29	16	"	400 " " WET
C30	16	"	" " " "
C31	.01	"	"
C32	10	MMFD	
C33	250	"	
C34	.02	MFD	" "
C35	25	MMFD	AIR VARIABLE
C36	25	"	
C37	10	"	
C38	200	"	VARIABLE PAD
C39	25	"	MICA
C40	.0012	MFD	VARIABLE PAD
C41	.0011	"	" "
C42	.00093	"	" "
C43	.00039	"	" "

RESISTORS

No.	OHMS	
R1	250	
R2	125	
R3	100,000	
R4	30,000	
R5	10,000	R. F. GAIN CONTROL
R6	250	
R7	15,000	
R8	100,000	
R9	600	
R10	100,000	
R11	30,000	
R12	100,000	
R13	100,000	
R14	1,000	
R15	20,000	
R16	4,000	
R17	500,000	
R18	500,000	VOLUME CONTROL
R19	1,000,000	
R20	500,000	TONE CONTROL
R21	100,000	
R22	250,000	
R23	500	
R24	250,000	
R25	100,000	
R26	100,000	
R27	50,000	
R28	10,000	
R29	50,000	



THE FOLLOWING MEASUREMENTS MADE WITH 1000 OHMS PER VOLT METER AND TAKEN FROM THE POINT INDICATED TO GROUND WITH THE AVC SWITCH IN THE "ON" POSITION. ANTENNA AND GROUND DISCONNECTED AND R. F. AND A. F. GAIN CONTROLS SET AT MAXIMUM. LINE VOLTAGE OF 115 AT THE TIME THESE MEASUREMENTS WERE TAKEN. NORMAL TOLERANCE ALLOWS VARIATIONS OF PLUS OR MINUS 10% FROM THE VALUES INDICATED. "DL" INDICATES A DEAD LUG BUT WILL INDICATE VOLTAGE WHEN USED AS A TIE.



BOTTOM VIEW OF SOCKET

TUBE	FUNCTION	1	2	3	4	5	6	7	8
6K7	R. F. AMP.			260	125	-5	DL	6.3	5
6L7	MIXER			260	105	-6	DL	6.3	4.5
6J5G	OSC.			168	DL	-19	DL	6.3	0
6K7	IF AMP (1)			265	125	5	DL	6.3	5
6K7	IF AMP (2)			250	125	5	260DL	6.3	5
6Q7G	2ND DET. A.V.C. 1ST AUDIO			75	1	1		6.3	2
6F6G	2ND AUDIO			245	260	0	16DL	6.3	16
6J7	BEAT OSC.			105	105	0	ODL	6.3	0

INTERMEDIATE FREQUENCY ALIGNMENT (465 KC)

HAVE THE CONTROLS SET IN THE FOLLOWING POSITIONS:

B.F.O. SWITCH "OFF"
A. F. AND R. F. GAIN CONTROLS ON FULL.
CRYSTAL PHASING CONDENSER MIDWAY (POINTER STRAIGHT UP).
A.V.C. SWITCH "OFF".
CRYSTAL SWITCH "IN".
BAND SWITCH ON #1 BAND - TUNING GANG OPEN (MINIMUM CAPACITY).
REMOVE 6J5G OSCILLATOR TUBE FROM ITS SOCKET.
REMOVE THE 6L7 GRID CAP.

CONNECT THE SIGNAL GENERATOR TO GRID OF THE 6L7 TUBE THROUGH A .1 MFD CONDENSER. TUNE THE SIGNAL GENERATOR TO 465 KC AND THEN ADJUST THE CONDENSERS ON THE INTERMEDIATE FREQUENCY TRANSFORMERS T1, T2, T3, T4, RESPECTIVELY. NOW THROW THE CRYSTAL SWITCH TO THE "OUT" POSITION AND READJUST T1 FOR MAXIMUM OUTPUT. AS AN OUTPUT INDICATOR IT IS SUGGESTED THAT A RECTIFIER TYPE METER BE USED.

ALIGNMENT USING A 465 KC CRYSTAL

SHOULD THE RECEIVER BE A CRYSTAL MODEL IT IS NECESSARY THAT THE CRYSTAL BE USED IN AN EXTERNAL OSCILLATOR IN PLACE OF A SIGNAL GENERATOR SUCH AS THE ABOVE. THE OUTPUT OF THIS CRYSTAL CONTROLLED OSCILLATOR IS THEN FED TO THE GRID OF THE 6L7 TUBE AND THE ABOVE PROCEDURE FOLLOWED. WHEN THE IF AMPLIFIER HAS BEEN ALIGNED FROM THE CRYSTAL OSCILLATOR'S OUTPUT, RE-INSERTING THE CRYSTAL IN ITS SOCKET IN THE RECEIVER WILL SHOW LITTLE DIFFERENCE IN OUTPUT WHETHER THE CRYSTAL IS "IN" OR "OUT" OF THE CIRCUIT AS INDICATED BY THE CRYSTAL SWITCH.

R. F. ALIGNMENT PROCEDURE

ON BAND #1, OR BROADCAST, USE A .0002 MFD CONDENSER IN SERIES WITH THE OUTPUT LEAD FROM THE GENERATOR TO A1 ON THE RECEIVER. ON THE OTHER BANDS A 400 OHM RESISTOR SHOULD BE USED. BE SURE THE JUMPER FROM THE DOUBLET, OR A2 POST, TO GROUND REMAINS CONNECTED WHEN ALIGNING THE RECEIVER.
ALL PAD ADJUSTMENTS (LOCATED ON THE TOP OF THE CHASSIS) ARE FOR THE LOW FREQUENCY ENDS OF THE BANDS.
ALL TRIMMER ADJUSTMENTS (LOCATED ON THE BOTTOM OF THE CHASSIS) ARE FOR THE HIGH FREQUENCY ENDS OF THE BANDS.
REDUCE R.F. GAIN CONTROL BELOW THE POINT OF BLOCKING OR OVERLOADING; ALSO BE SURE THAT THE CRYSTAL SWITCH IS IN THE "OUT" POSITION AND THE AVC SWITCH IS IN THE "OFF" POSITION.
BE SURE TO CHECK IMAGES - IMAGES WILL FALL A LITTLE LESS THAN 1 MC LOWER IN FREQUENCY ON BANDS 1 TO 4 INCLUSIVE. ON BAND 5 THE IMAGE WILL FALL ABOUT 1 MC HIGHER IN FREQUENCY THAN THE FUNDAMENTAL.
REJECTOR ADJUSTMENT - ON BANDS 1, 2 AND 3 THE REJECTOR CIRCUIT SHOULD BE LEFT AT 34 MC. ON BANDS 4 AND 5 THE REJECTOR IS IN THE CIRCUIT. CARE SHOULD BE EXERCISED TO SEE THAT THE REJECTOR CIRCUIT IS NOT ADJUSTED SO THAT IT WILL REJECT THE SIGNAL FREQUENCY. IF THIS OCCURS VERY LOW SENSITIVITY WILL RESULT WHICH CAN BE CURED BY DETUNING THE REJECTOR ABOUT 1 MC.
WHEN ALIGNING THE R.F. END OF THE RECEIVER THE TUNING GANG SHOULD BE ROCKED BACK AND FORTH ACROSS THE SIGNAL SO THAT YOU ARE SURE YOUR ADJUSTMENTS ARE SUCH THAT YOU HAVE OBTAINED MAXIMUM GAIN AND ACCURATE TRACKING.

NOTE #1 HARMONICS OF SUITABLE FREQUENCIES MAY BE USED IF THE FOLLOWING FREQUENCIES SUGGESTED ARE NOT AVAILABLE.

NOTE #2 IT IS NECESSARY TO REPEAT EACH PAIR OF OPERATIONS SEVERAL TIMES UNTIL NO CHANGE IS NOTED.

MODELS S-18, SX-18
Sky Challenger II

THE HALLICRAFTERS INC.

OPR.	BAND	RECEIVER DIAL SETTING	SIGNAL GENERATOR FREQUENCY	ADJUST OSC. WITH	TRIMMERS R. F. & MIXER WITH	ADJUST OSC. PAD WITH	SET REJECTOR DIAL AT
1	1	600KC	600KC	------	--------	C38	-------
2	1	1100KC	1100KC	CA	CC - CB	------	-------
3	2	1300KC	1300KC	------	--------	C43	-------
4	2	2600KC	2600KC	CD	CF - CE	------	-------
5	3	3000KC	3000KC	------	--------	C42	-------
6	3	6000KC	6000KC	CG	CI - CH	------	-------
7	4	7000KC	7000KC	------	--------	C41	9 MC
8	4	14000KC	14000KC	CJ	CL - CK	------	14MC
9	5	17000KC	17000KC	------	--------	C40	24MC
10	5	34000KC	34000KC	CM	CO - CN	------	34MC

IT IS HELPFUL TO REMEMBER THAT THE CARTRIDGE TYPE AIR TRIMMING CONDENSERS WILL SHOW AN INCREASE OF CAPACITY WHEN THE SCREW IS ROTATED COUNTER-CLOCKWISE.

WHEN MAKING ADJUSTMENTS ON THIS RECEIVER IT IS SUGGESTED THAT GAIN BE CONTROLLED BY USING THE R.F. GAIN CONTROL ONLY. LEAVE THE A.F. GAIN CONTROL ON FULL AT ALL TIMES.

TO MAKE A RAPID CHECK OF THE RECEIVER REMOVE THE GRID CAP OF THE 6Q7 TUBE AND TOUCH THE GRID OF THE TUBE WITH YOUR FINGER. IF A LOUD HUM IS HEARD THE AUDIO END OF THE RECEIVER IS OK.

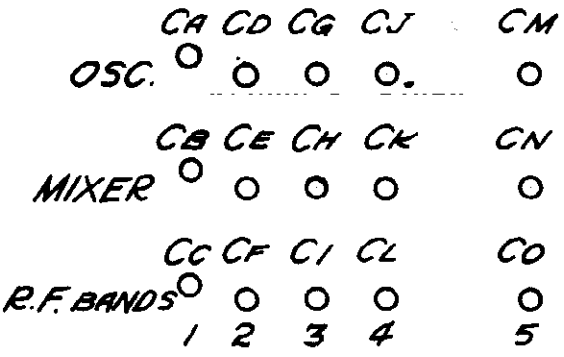
DEAD SET. CHECK BIAS ON THE R. F. TUBES. IF THIS BIAS IS TOO HIGH CHECK THE R.F. GAIN CONTROL FOR AN OPEN CIRCUIT. ADDITIONALLY, CHECK THE PLATE AND SCREEN VOLTAGE OF THE R.F. TUBES - (SEE CHART). CHECK B PLUS FOR A SHORT TO GROUND - IF SO CHECK ALL TUBES.

IF THE TUNING GANG IS NOISY WHEN THE SET IS JARRED, INCREASE THE TENSION ON THE GANG WIPERS.

NOISY COIL ASSEMBLY - CHECK SWITCH CONTACTS. ALSO CHECK THE TRIMMERS ON THE PARTICULAR BAND IN WHICH NOISE OCCURS. IT IS POSSIBLE THAT THE TRIMMER HAS DEVELOPED A PARTIAL SHORT.

IF LOW SIGNAL AND HIGH NOISE LEVEL DEVELOPS, REPLACE THE 6L7 TUBE.

DEAD BEAT OSCILLATOR - IF THE 6J7 SHOULD SHORT TO GROUND THE BEAT OSCILLATOR WILL BE DEFECTIVE. CHECK B PLUS TO BO COIL FOR A GROUND. IN MOST CASES A NEW 6J7 WILL CORRECT A DEAD BO.



BOTTOM VIEW SHOWING AD-JUSTMENT SCREWS

SPEAKER - HEADPHONES ETC.

ON THE LOWER RIGHT HAND CORNER OF THE BACK OF THE CHASSIS YOU WILL FIND A TERMINAL STRIP MARKED 5000 OHMS. TO THIS STRIP SHOULD BE CONNECTED THE HALLICRAFTERS PERMANENT MAGNET DYNAMIC SPEAKER. THE TERMINAL STRIP DIRECTLY ABOVE THE 5000 OHM STRIP AND MARKED 500 OHMS CAN BE CONNECTED TO A LOAD OF THAT IMPEDANCE VALUE. THE OTHER TERMINAL STRIP TO THE RIGHT OF THESE TWO, AND MARKED "EXT SW", IS USED TO MAKE THE RECEIVER TEMPORARILY INOPERATIVE FOR STAND-BY DURING TRANSMISSION PERIODS. THESE TWO TERMINALS SHOULD BE CONNECTED TO ANEXTERNAL SWITCH WITHER IN CONJUNCTION WITH THE POWER SWITCH ON YOUR TRANSMITTER OR A MANUALLY OPERATED SWITCH AT YOUR OPERATING POSITION. WHEN USING AN EXTERNAL SWITCH THE SEND RECEIVE SWITCH ON THE RECEIVER SHOULD BE IN THE SEND POSITION.

IN THIS RECEIVER THE SPEAKER IS NOT A PORTION OF THE FILTER SYSTEM. THIS ALLOWS THE RECEIVER TO BE OPERATED INDEPENDENTLY OF THE SPEAKER. FOR MOST SATISFACTORY RESULTS AN 8 INCH HALLICRAFTERS SPEAKER SHOULD BE USED WITH THE SKY CHALLENGER II .

THE HEADPHONE JACK IS CONNECTED TO THE PLATE OF THE 6Q7 TUBE THROUGH A CONDENSER. THE POSSIBILITY OF SHOCK TO THE OPERATOR IS ELIMINATED BY HAVING NO DIRECT CURRENT FLOWING THROUGH THE HEADPHONES. CRYSTAL TYPE HEADPHONES CAN BE USED WITH THIS RECEIVER WITHOUT USING A SPECIAL COUPLING TRANSFORMER.

CRYSTAL OPERATION

TO PROPERLY ADJUST THE CRYSTAL CIRCUIT FOR BEST PERFORMANCE THE FOLLOWING PROCEDURE SHOULD BE CAREFULLY FOLLOWED:

TUNE IN SOME STATION TRANSMITTING CONTINUOUSLY. BE VERY CAREFUL TO GET THE SIGNAL RIGHT ON THE NOSE. AFTER YOU ARE SURE THAT YOU HAVE THE SIGNAL RESONATED PERFECTLY, SNAP THE "BFO" SWITCH TO THE "ON" POSITION. YOU SHOULD HEAR A WHISTLE, OR BEAT NOTE. AFTER THE BFO IS ON ROTATION OF THE "PITCH CONTROL" WILL CHANGE THE TONE OF THE BEAT NOTE. PROPER OPERATION OF THIS CONTROL WILL BE INDICATED BY HEARING THE SIGNAL TWICE IN ONE COMPLETE ROTATION OF THE KNOB; THERE BEING TWO POSITIONS AT WHICH NO SIGNAL, OR WHISTLE, WILL BE HEARD. THESE TWO POSITIONS ARE KNOWN AS THE "ZERO BEAT" POSITIONS.

NOW SNAP THE "CRYSTAL SWITCH" TO THE "ON" POSITION. YOU WILL NOTICE A GREAT REDUCTION IN NOISE. CAREFULLY RETUNE THE SIGNAL ON THE BAND SPREAD DIAL. NOTICE HOW SHARPLY THE SIGNAL PEAKS. NOW TUNE THROUGH THE SIGNAL AND FIND WHICH SIDE OF THE SIGNAL IS THE WEAKER. TUNE IN THE WEAKER SIDE AND THEN CAREFULLY ADJUST THE "CRYSTAL PHASING" CONTROL UNTIL THE SIGNAL IS INAUDIBLE. GOING BACK TO THE OTHER SIDE OF THE SIGNAL SHOULD FIND NO CHANGE IN ITS VOLUME, AND KNIFE-LIKE SELECTIVITY RESULTING. USE WHICHEVER SIDE OF ZERO-BEAT ADJUSTMENT OF THE PITCH CONTROL, IN CONJUNCTION WITH CRITICAL ADJUSTMENT OF THE PHASING CONTROL GIVES THE GREATER REJECTION OF THE INTERFERING SIGNAL.

THE PHASING CONTROL AFFECTS THE SENSITIVITY AND SELECTIVITY OF THE RECEIVER WHETHER THE CRYSTAL IS IN THE CIRCUIT OR NOT. THE CRYSTAL MAY BE USED WHEN RECEIVING TELEPHONE SIGNALS WITH SOME SACRIFICE IN THEIR QUALITY DUE TO THE EXTREME SELECTIVITY DEVELOPED.

THE IMAGE REJECTOR

THE REJECTOR CIRCUIT INCORPORATED IN THE SKY CHALLENGER II REPRESENTS A NOTEWORTHY CONTRIBUTION BY THE HALLICRAFTERS TO IMAGE-FREE HIGH-FREQUENCY RECEPTION. IT HAS LONG BEEN APPRECIATED THAT ADDITIONAL STAGES OF RADIO FREQUENCY AMPLIFICATION WAS NOT THE CORRECT ANSWER TO IMAGE SUPPRESSION. THROUGH THE USE OF THE "INFINITE IMAGE REJECTOR" IN THE SKY CHALLENGER II ALL PREVIOUS IMAGE RATIOS ARE OUT-MODED. IMAGE REJECTION OF INFINITY/1 IS NOW POSSIBLE.

THE REJECTOR IS UNIQUE. BECAUSE OF THAT YOUR ATTENTION IS CLOSELY DRAWN TO THE PROPER OPERATION OF THE CONTROL AS WELL AS WHAT TO EXPECT FROM ITS USE.

THE REJECTOR IS SWITCHED INTO THE CIRCUIT ONLY WHEN THE RECEIVER IS OPERATED ON BANDS #4 AND #5. YOU WILL NOTICE A LIGHT APPEAR BEHIND THE PARTICULAR CALIBRATED SCALE THAT SHOULD BE USED.

LET US OPERATE THE RECEIVER ON THE 14 MC, OR 20 METER AMATEUR BAND. IN TUNING ACROSS THE BAND YOU RUN ACROSS THE IMAGE OF SOME COMMERCIAL STATION, THE FUNDAMENTAL OF THIS STATION AS WE ALL KNOW IS REMOVED FROM THE 20 METER BAND BY DOUBLE THE FREQUENCY TO WHICH THE I. F. AMPLIFIER OF THE RECEIVER IS TUNED. NOW ADJUST THE REJECTOR CONTROL CAREFULLY IN THE VICINITY OF 14 MC ON THE CALIBRATED REJECTOR DIAL. WHEN PROPERLY ADJUSTED THE IMAGE WILL BE COMPLETELY ELIMINATED WITHOUT SERIOUSLY AFFECTING THE SENSITIVITY OF THE RECEIVER ON THE FREQUENCY TO WHICH IT HAD BEEN TUNED.

SHOULD YOU BE LISTENING AT A FREQUENCY NOT BEING BOTHERED WITH IMAGES, AND YOU DO NOT WISH TO USE THE REJECTOR LEAVE THE CONTROL AS FOLLOWS FOR THE TWO AMATEUR BANDS COVERED BY THE REJECTOR CIRCUIT.

20 METERS - LEAVE THE REJECTOR AT APPROXIMATELY 15 MC. (ON THIS BAND THE 14 MC HIGH FREQUENCY OSCILLATOR IS ON THE HIGH-FREQUENCY SIDE).
NOTE: THE 7 MC OR 40 METER BAND IS ALSO ON BAND #4 OF THE RECEIVER. WHEN RECEIVING ON 40 METERS THE REJECTOR CONTROL SHOULD BE LEFT 9 MC. USE OF THE REJECTOR CIRCUIT ON THIS BAND IS NOT NECESSARY.

10 METERS - LEAVE THE REJECTOR AT APPROXIMATELY 27 MC. (THE OSCILLATOR 28 MC IS ON THE LOW FREQUENCY SIDE ON THIS BAND).

CAUTION: SHOULD YOU NOT BE ABLE TO GET SIGNALS THROUGH AT ALL CHECK THESETTING OF THE REJECTOR CONTROL. IT IS POSSIBLE THAT YOU HAVE THE REJECTOR CONTROL AT A POINT WHERE THE FREQUENCY TO WHICH YOU WISH TO LISTEN IS BEING REJECTED, OR "BEING DROPPED IN THE SLOT".

ALWAYS REMEMBER TO KEEP THE REJECTOR CONTROL SET AT APPROXIMATELY THE SAME FREQUENCY AS THAT TO WHICH YOU ARE LISTENING. WHEN YOU MOVE THE MAIN TUNING CONTROL FOLLOW UP WITH THE REJECTOR OR OTHERWISE YOU WILL RUN INTO THE POSSIBILITY OF LEAVING YOUR MAIN TUNING DIAL AT A GROUP OF FREQUENCIES BEING REJECTED.

THE TOTAL POWER CONSUMPTION OF THE SKY CHALLENGER II IS 75 WATTS AT 115 VOLTS 60 CYCLE ALTERNATING CURRENT.

OPERATING INSTRUCTIONS - SKY CHALLENGER II MODELS S-18, SX-18

THE SKY CHALLENGER II IS A 5 BAND 9 TUBE SUPERHETERODYNE RECEIVER COVERING THE FOLLOWING FREQUENCIES:

BANDS	COVERAGE							
1	545	TO	1230	KC	(550	TO	243	METERS)
2	1.18	TO	2.85	MC	(254	TO	105	METERS)
3	2.75	TO	6.82	MC	(109	TO	44	METERS)
4	6.75	TO	16.40	MC	(45	TO	18.3	METERS)
5	15.40	TO	38.10	MC	(19.5	TO	7.85	METERS)

SEPARATE COILS ARE USED TO COVER EACH BAND. INDUCTIVE COUPLING TO THE ANTENNA PERMITS THE MAXIMUM TRANSFER OF SIGNAL ENERGY FROM EACH SEPARATE PRIMARY TO THE PARTICULAR SECONDARY COIL IN THE CIRCUIT. THE UNUSED COILS ARE SHORTED.

THE MAIN DIAL IS CALIBRATED IN KILOCYCLES ON BAND #1 AND IN MEGACYCLES ON THE REMAINING FOUR BANDS. THE CALIBRATION OF THE MAIN DIAL WILL HOLD ACCURACY ONLY WHEN THE BAND-SPREAD DIAL IS SET AT "0", WHICH IS THE POSITION OF MINIMUM CAPACITY OF THE BAND-SPREAD SECTION.

ANTENNA

IN THE BACK OF THE CHASSIS WILL BE FOUND THE ANTENNA, DOUBLET AND GROUND TERMINAL STRIP. WHEN A CONVENTIONAL ANTENNA IS USED IT SHOULD BE CONNECTED TO A1. WHEN USING THIS TYPE OF ANTENNA BE SURE THE JUMPER REMAINS CONNECTED TO A2 AND G. IF A DOUBLET ANTENNA IS USED THE JUMPER SHOULD BE REMOVED AND THE TWO WIRES OF THE DOUBLET LEAD-IN CONNECTED TO A1 AND A2 RESPECTIVELY. PLEASE REMEMBER THAT THE NORMAL SHORT WAVE DOUBLET ANTENNA IS DESIGNED TO WORK BEST ON THE SHORT WAVE BROADCAST FREQUENCIES. IT WILL NOT PERFORM EQUALLY WELL ON THE AMATEUR BANDS, OR FREQUENCIES IN BETWEEN THE SHORT WAVE BROADCAST CHANNELS. ANTENNA LOCATION, LENGTH AND TYPE PLAY A MOST IMPORTANT PART IN THE SUCCESSFUL OPERATION OF THE RECEIVER. ON THE HIGHER FREQUENCIES COVERED BY THIS UNIT IT IS PARTICULARLY IMPORTANT TO USE THE PROPER TYPE OF ANTENNA. FOR MOST EFFICIENT ANTENNA SYSTEMS YOU ARE REFERRED TO THE ANTENNA DESIGN SECTION OF THE A.R.R.L. HANDBOOK, AS WELL AS CURRENT RADIO PERIODICALS. IT IS SUGGESTED THAT A LITTLE EXPERIMENTING BE DONE WITH ANTENNAE SO THAT YOU WILL EXPERIENCE THE MAXIMUM IN PERFORMANCE FROM YOUR RECEIVER.

OPERATION

PLUG THE CORD ON THE RECEIVER INTO THE POWER SOCKET. (UNLESS OTHERWISE SPECIFIED THE RECEIVER OPERATES ON 60 CYCLE 110-120 VOLT ALTERNATING CURRENT.) TURN THE CONTROL MARKED "TONE" TO THE RIGHT. THIS WILL TURN THE RECEIVER ON. DURING THE TIME THE RECEIVER IS WARMING UP ALSO TURN THE "R.F. GAIN" AND "A.F.GAIN" KNOBS TO THE RIGHT. THE RECEIVER IS SHIPPED WITH THE BAND CHANGE SWITCH IN THEHIGHEST FREQUENCY POSITION. ADJUST THE "BANDS" SWITCH UNTIL THE POINTER ON THE KNOB INDICATES THAT YOU HAVE THE BAND YOU WISH TO TUNE IN THE CIRCUIT. WHEN LISTENING FOR DISTANT OR POSSIBLY WEAK STATIONS, IT IS RECOMMENDED THAT THE CONTROL MARKED "BFO" BE USED BY SNAPPING THE SWITCH TO THE "ON" POSITION. ONCE THE TELEPHONE SIGNALS HAVE BEEN LOCATED THE BFO SHOULD BE TURNED OFF OR A CONTINUOUS WHISTLE WILL RESULT. WHEN LISTENING FOR OR TO CW CODE TRANSMISSIONS THE BFO MUST BE LEFT ON. THE "PITCH CONTROL" WILL PROVE MOST HELPFUL IN CHANGING THE BEAT NOTE TO ONE MOST PLEASING TO THE OPERATOR. IT IS ADVISABLE TO HAVE THE "AVC" SWITCH IN THE OFF POSITION WHENEVER THE BFO SWITCH IS ON.

THE TUBE LINE-UP

6K7 PRE-SELECTOR, R.F. AMPLIFIER

6L7 1ST DETECTOR-MIXER

6J5 SIGNAL FREQUENCY OSCILLATOR

6K7 1ST I. F. AMPLIFIER

6K7 2ND I. F. AMPLIFIER

6Q7 2ND DETECTOR, AVC, 1ST STAGE OF AUDIO

6F6 2ND AUDIO STAGE

6J7 BEAT FREQUENCY OSCILLATOR

80 FULL WAVE RECTIFIER

THE 6K7 R. F. STAGE GIVES MAXIMUM GAIN IN INVERSE RELATION TO FREQUENCY AND PROVIDES INCREASED SELECTIVITY.

THE FIRST DETECTOR-MIXER IS A 6L7. THE OUTPUT OF THE 6J5 SIGNAL FREQUENCY OSCILLATOR IS ELECTRON COUPLED TO THE INJECTOR, OR # 3 GRID, OF THE 6L7. BECAUSE NO OSCILLATOR PLATE CURRENT FLOWS IN THE 1ST DETECTOR THE RATIO OF SIGNAL TO NOISE IS MORE FAVORABLE THAN THAT OBTAINED IN A COMPOSITE TUBE, OR IN CIRCUITS WHERE THE CATHODES OF TWO TUBES ARE TIED TOGETHER.

THE 6J5 OSCILLATOR HAS SEPARATE COILS FOR EACH BAND. SUPERIOR OVERALL PERFORMANCE OF THE SKY CHALLENGER II IS IN PART DUE TO THE DESIGN OF THE SIGNAL FREQUENCY OSCILLATOR. NO HARMONICS OF THE OSCILLATOR ARE USED ON ANY OF THE BANDS COVERED BY THIS RECEIVER.

THE TWO 6K7 I. F. AMPLIFIER STAGES USE IRON-CORE TRANSFORMERS WHICH RESONATE AT 465 KC. THIS TYPE OF TRANSFORMER HAS SO DEFINITELY SHOWN ITS SUPERIORITY OVER THE AIR CORE TYPE AS TO WARRANT ITS USE IN THE SKY CHALLENGER II . TREMENDOUS GAIN, AND A BETTER SIGNAL TO NOISE RATIO ARE BUT TWO OF THE MANY ADVANTAGES OF THE IRON-CORE SYSTEM.

THE 6J7 BEAT OSCILLATOR OUTPUT IS COUPLED TO THE DIODE PLATES OF THE 6Q7 SECOND DETECTOR. THE 6J7 OSCILLATOR IS ELECTRON COUPLED.

THE 6F6 AUDIO OUTPUT STAGE IS CAPABLE OF DELIVERING 3.5 WATTS OF AUDIO.

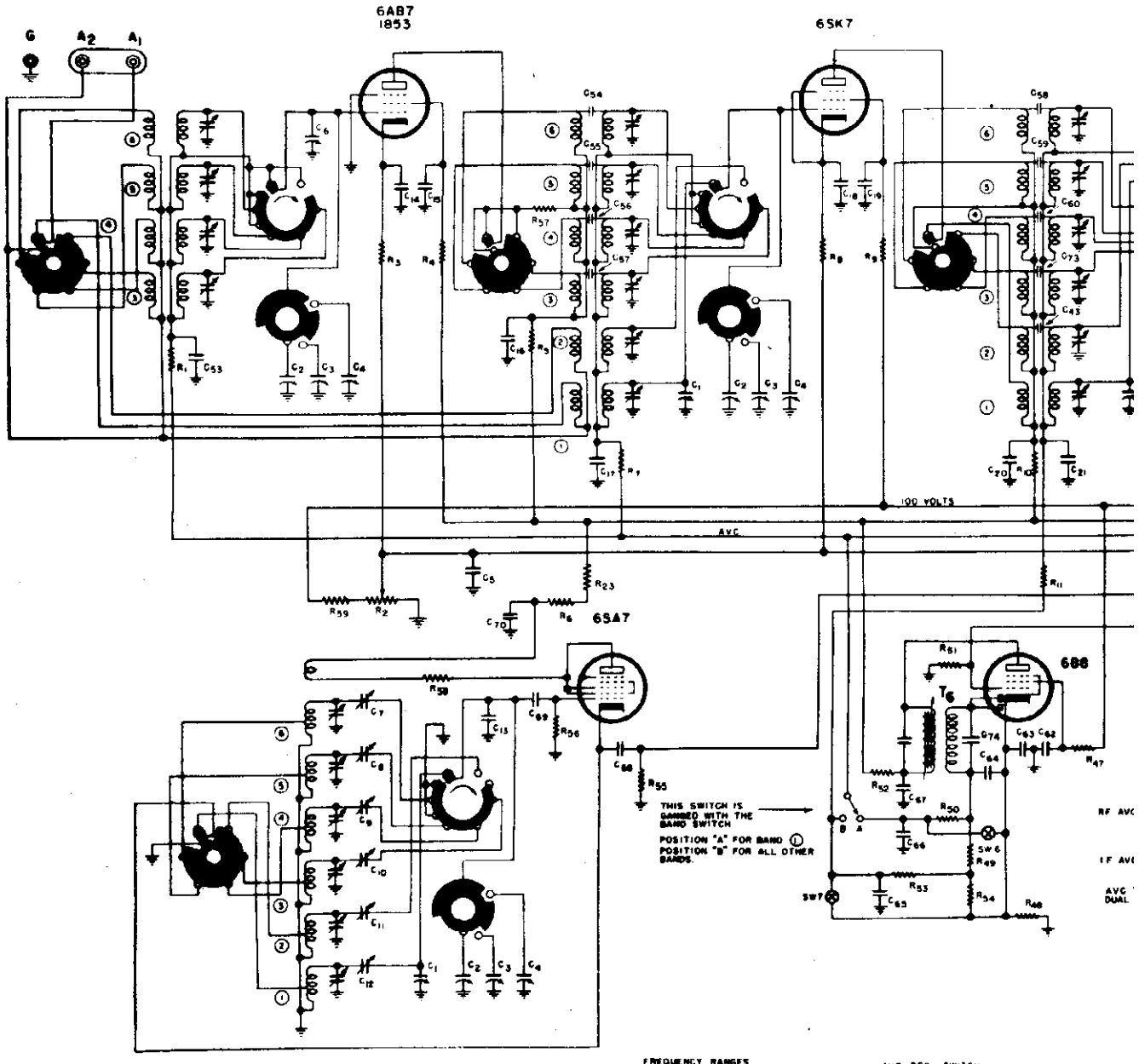
THE HALLICRAFTERS INC. MODEL SX-32, Sky Ri

MODEL SX-32 SKYRIDER CONDENSERS

No.	Value	Voltage or Purpose	Type
C 1	Band No. 1	tuning condenser	....
C 2	Main	tuning condenser	....
C 3	3 plate	band spread cond.	....
C 4	5 plate	band spread cond.	....
C 5	.25 mfd	200	tubular
C 6	50 mmf	condenser	Variable Air
C 7	1550 mmf	Band No. 6 pad	mica
C 8	3160 mmf	Band No. 5 pad	mica
C 9	2830 mmf	Band No. 4 pad	mica
C10	1430 mmf	Band No. 3 pad	mica
C11	790 mmf	Band No. 2 pad	mica
C12	380 mmf	Band No. 1 pad	mica
C13	temperature	Compensated condenser	....
C14	.02 mfd	400	tubular
C15	.02 mfd	400	tubular
C16	.02 mfd	400	tubular
C17	.05 mfd	200	tubular
C18	.02 mfd	400	tubular
C19	.02 mfd	400	tubular
C20	.02 mfd	400	tubular
C21	.05 mfd	200	tubular
C22	.02 mfd	400	tubular
C23	.02 mfd	400	tubular
C24	.02 mfd	400	tubular
C25	2000 mmf	....	mica
C26	.02 mfd	400	tubular
C27	.02 mfd	400	tubular
C28	.02 mfd	400	tubular
C29	20 mmf	trimming condenser	....
C30	20 mmf	trimming condenser	....
C31	20 mmf	trimming condenser	....
C32	20 mmf	crystal phasing	air
C33	.02 mfd	400	tubular
C34	.02 mfd	400	tubular
C35	.05 mfd	200	tubular
C36	2000 mmf	....	mica
C37	50 mmf	....	mica
C38	.05 mfd	200	tubular
C39	.01 mfd	400	tubular
C40	500 mmf	....	mica
C41	30 mfd	25	electrolytic
C42	.02 mfd	400	tubular
C43	2 mmf	....	twisted leads
C44	500 mmf	10%	mica
C45	.05 mfd	400	tubular
C46	.05 mfd	400	tubular
C47	2000 mmf	....	mica
C48	30 mfd	450	electrolytic
C49	30 mfd	450	electrolytic
C50	.02 mfd	400	tubular
C51	.01 mfd	600	tubular
C52	.01 mfd	600	tubular
C53	.05 mfd	200	tubular
C54	10 mmf	....	ceramic
C55	5 mmf	....	ceramic
C56	5 mmf	....	ceramic
C57	2 mmf	twisted leads	....
C58	10 mmf	....	ceramic
C59	5 mmf	....	ceramic
C60	2 mmf	twisted leads	....
C61	250 mmf	....	mica IN-TI
C62	.02 mfd	400	tubular
C63	.05 mfd	200	tubular
C64	100 mmf	....	mica
C65	.02 mfd	400	tubular
C66	.05 mfd	200	tubular
C67	.02 mfd	400	tubular
C68	50 mmf	....	mica
C69	50 mmf	....	mica
C70	2000 mmf	....	mica
C71	100 mmf	....	mica
C72	2 mmf	twisted leads	....
C73	2 mmf	twisted leads	....
C74	25 mmf	....	mica

MODEL SX-32 SKYRIDER RESISTORS

No.	Value in Ohms	Wattage or Purpose
R 1	100,000	1/3
R 2	10,000	RF Gain
R 3	300	1/3
R 4	25,000	1/2
R 5	1,000	1/3
R 6	7,000	2
R 7	100,000	1/3
R 8	300	1/3
R 9	1,000	1/3
R10	3,000	1/3
R11	100,000	1/3
R12	400	1/3
R13	1,000	1/3
R14	3,000	1/3
R15	100,000	1/3
R16	3,000	1/3
R17	30,000	—1 watt
R18	3,000	1/3
R19	100,000	1/3
R20	500,000	1/3
R21	250	1/3
R22	60,000	1/2
R23	5,000	1/2
R24	100,000	1/3
R25	250,000	1/3
R26	5,000	1/3
R27	2. meg	1/3
R28	100	1/3
R29	500	S Meter Control
R30	1. meg	1/3
R31	11,000	Candohm 1-1/2 Wa
R32	4,000	Candohm 7 Watts
R33	500,000	Audio Gain
R34	1,000	1/3
R35	500,000	Tone Control
R36	100,000	1/3
R37	100,000	1/3
R38	2,500	2
R39	200,000	1/3
R40	250,000	1/3
R41	250,000	1/3
R42	200	2 10%
R43	20,000	1
R44	5,000	10
R45	20,000	1
R46	50,000	1/3
R47	1,000	1/3
R48	200	1/3
R49	250,000	1/3
R50	500,000	1/3
R51	500,000	1/3 Inside of T1
R52	3,000	1/3
R53	500,000	1/3
R54	50,000	1/3
R55	50,000	1/3
R56	50,000	1/3
R57	500	1/3
R58	8	1/3
R59	15,000	1/2
R60	50,000	1/3



NOTE: BAND SWITCH IS SHOWN IN NO 1 POSITION
UNLABELED CONDENSERS ACROSS COILS ARE TRIMMERS.

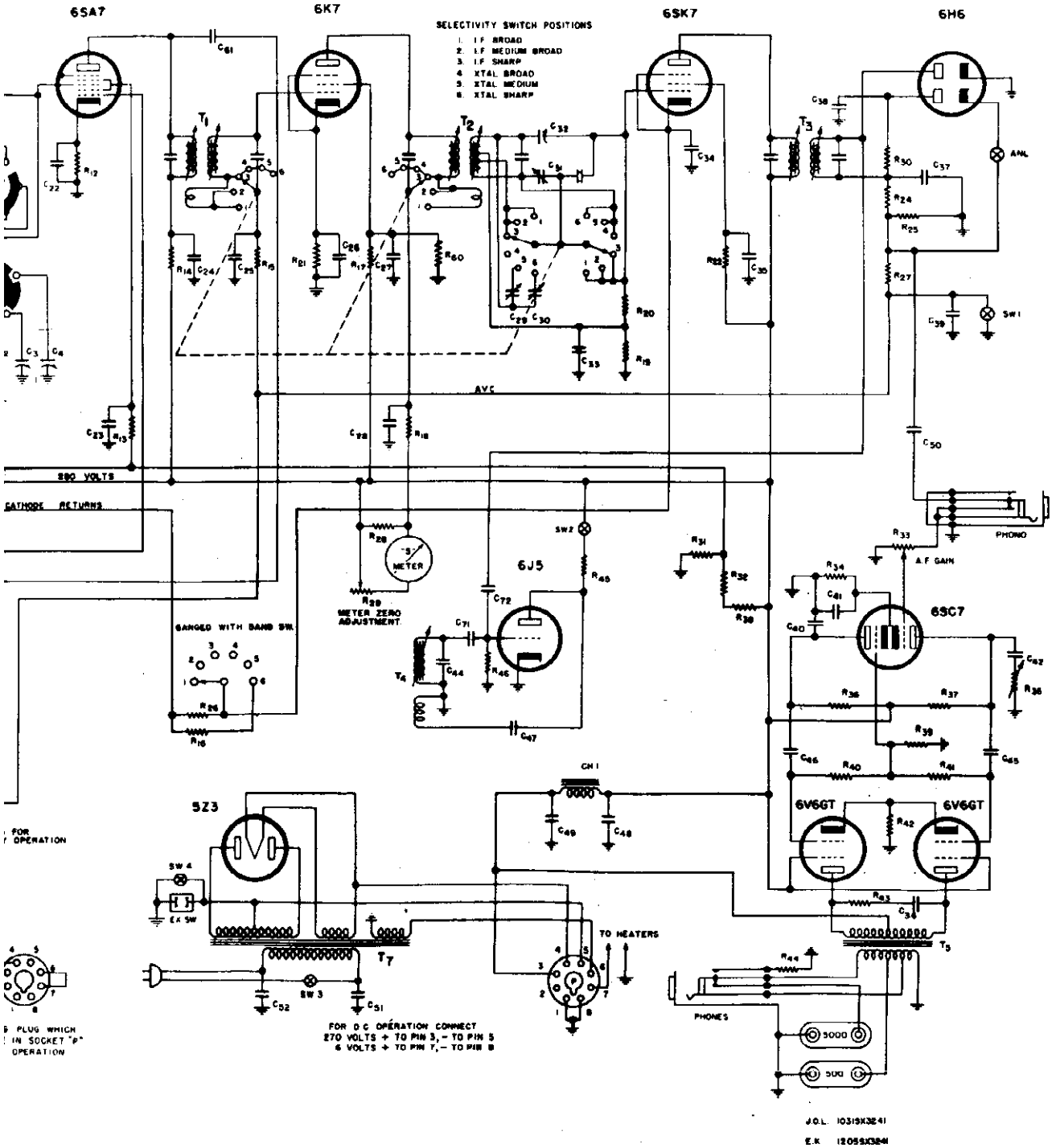
FREQUENCY RANGES

1	485 KC	TO	1455 KC
2	1340 KC	TO	2890 KC
3	2670 KC	TO	5800 KC
4	5.3 MC	TO	11.5 MC
5	10.8 MC	TO	23.1 MC
6	20.9 MC	TO	42.0 MC

AVC-BFO SWITCH

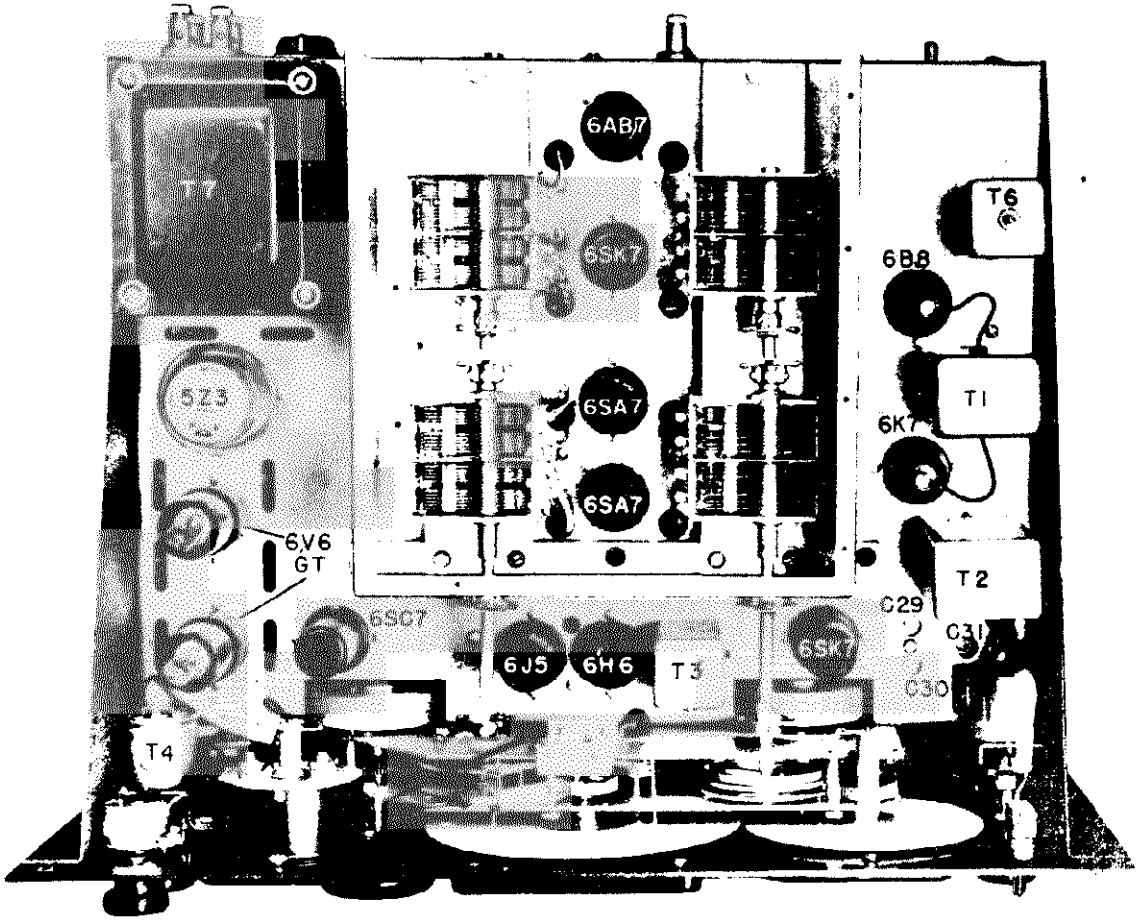
	LEFT	CENTER	RIGHT
SW 1	OPEN	CLOSED	CLOSED
SW 6	OPEN	CLOSED	CLOSED
SW 7	OPEN	CLOSED	CLOSED
SW 2	OPEN	OPEN	CLOSED

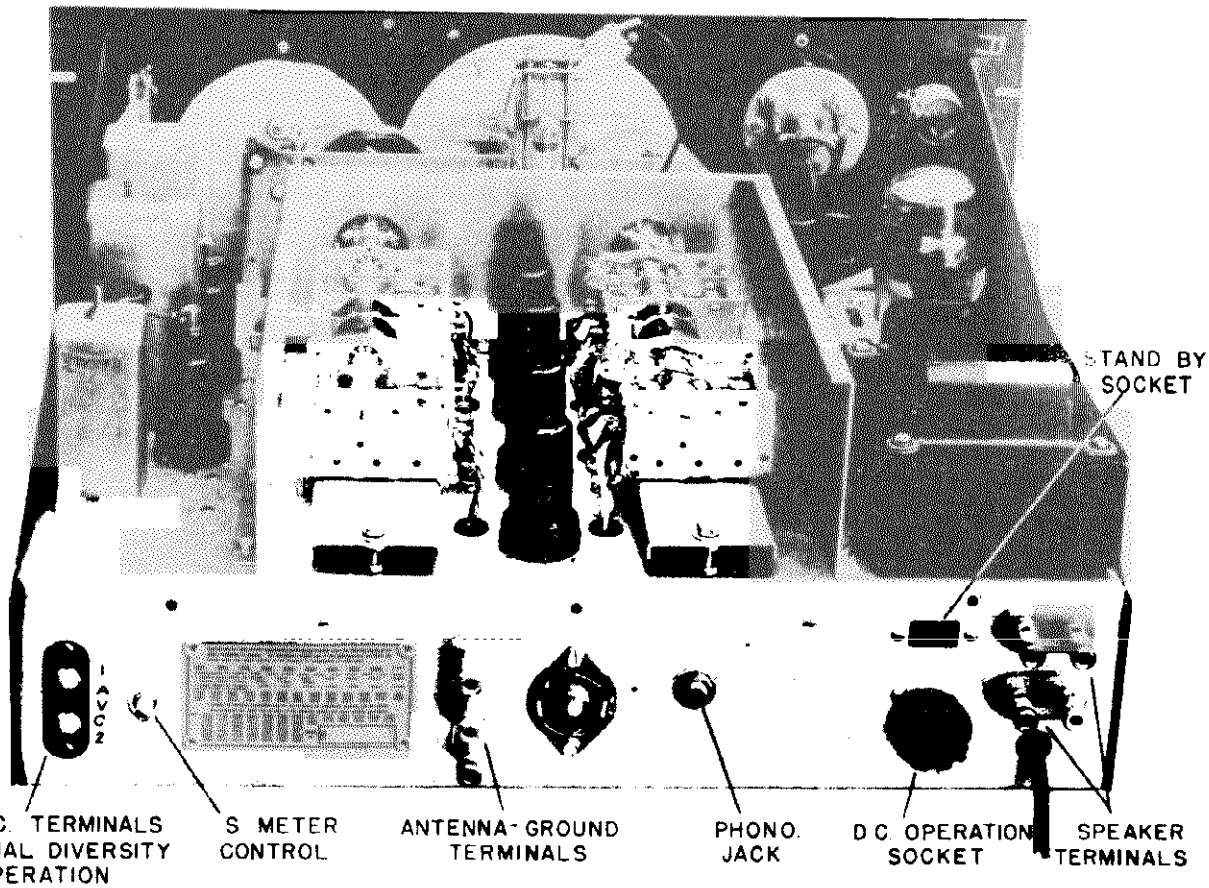
FTERS INC.


6SA7
6K7
6SK7
6H6
SELECTIVITY SWITCH POSITIONS
1. I.F. BROAD
2. I.F. MEDIUM BROAD
3. I.F. SHARP
4. XTAL BROAD
5. XTAL MEDIUM
6. XTAL SHARP
AVC
250 VOLTS
CATHODE RETURNS
S METER
METER ZERO ADJUSTMENT
GANGED WITH BAND SW.
6J5
6SC7
A.F. GAIN
PHONO
ANL
SW1
SW2
SW4
EX SW
5Z3
6V6GT
6V6GT
SW3
TO HEATERS
PHONES
5000
500
FOR D.C. OPERATION CONNECT
270 VOLTS + TO PIN 3, - TO PIN 5
6 VOLTS + TO PIN 7, - TO PIN 8
J.O.L. 10319X3241
E.K. 12055X3241

MODEL SX-32, Sky Rider

THE HALLICRAFTERS INC.





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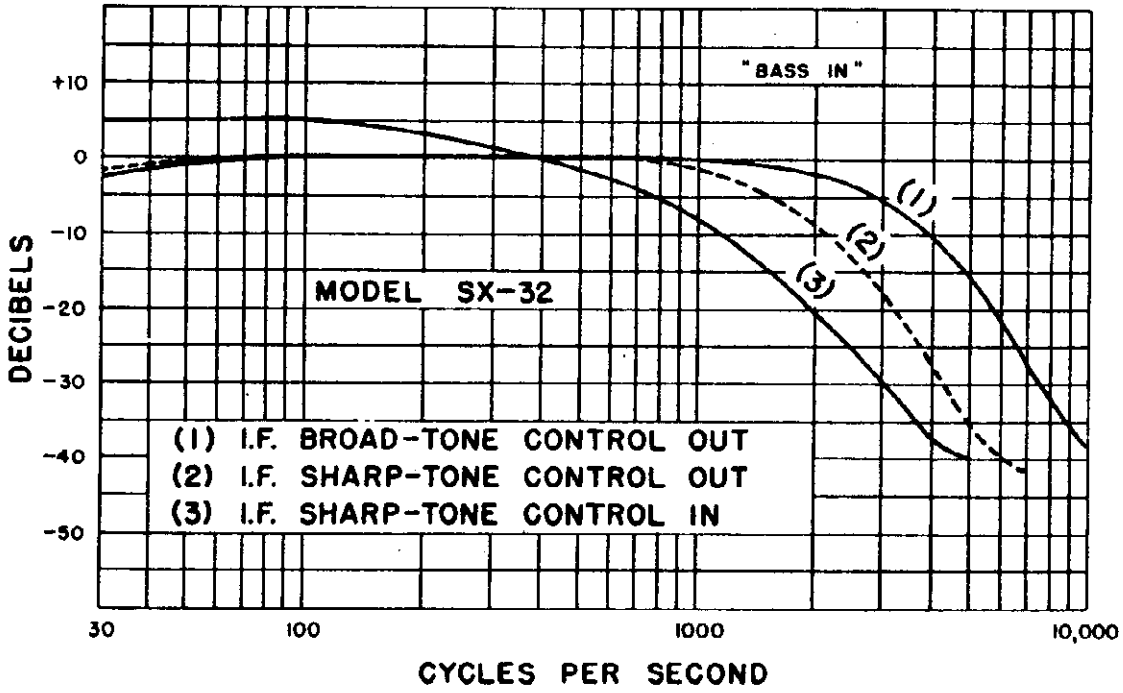
AUDIO FIDELITY CURVE



The following measurements made with a 20,000 ohms per volt meter and taken from the socket terminal indicat to ground or receiver chassis. Antenna and ground were disconnected from the receiver when these measuremen were taken and the RF and AF gain controls set at maximum. "DL" means Dead Lug but will indicate volta when used as a tie. Normal tolerance allows a variation of ±10% from the indicated values.

TUBE	FUNCTION	SOCKET TERMINALS								
		1	2	3	4	5	6	7	8	Cap.
6AB7	RF Amp. (1)	...	...	...	...	4.5	180	6.3	245	.....
6SK7	RF Amp. (2)	...	...	4.35	0.1	4.35	120	6.3	230	.....
6SA7	Mixer	...	...	250	100	...	3.7	6.3	...	.....
6SA7	HF Osc.	...	...	120	120	0.3	...	6.3	120	.....
6K7	IF Amp. (1)	...	...	280	120	...	...	6.3	4	—.075
6SK7	IF Amp. 2	...	...	4	...	4	120	6.3	280	.....
6B8	AVC Amp.	...	...	230	0.2	0.2	120	6.3	2	.....
6H6	ANL and DET.	...	...	...	...	...	...	6.3	...	.....
6J5	Beat Osc.	...	...	130	...	—7	...	6.3	...	BFO ON ONLY FOR TES
6SC7	1st Audio Amp.	...	140	...	...	137	1.4	6.3	...	.....
6V6GT	P.P. Audio Amp.	...	...	290	265	...	...	6.3	17	.....
6V6GT	P.P. Audio Amp.	...	...	290	265	...	...	6.3	17	.....
5Z3	Rectifier	320	340 AC	340 AC	320	...	...	...	...	.....

THE 1942 MODEL SX-32 SKYRIDER RECEIVER

INSTRUCTIONS FOR INSTALLATION, OPERATION AND SERVICE

INSTALLATION

It is recommended that, upon receipt, the carton and then the receiver be carefully examined for any damage which might have occurred in transit. Should any sign of damage be apparent immediately file claim with the carrier stating the extent of the damage.

Important: Unless otherwise marked, this receiver is to be operated from 110-125 volts of 50/60 cycle alternating current. A universal 110-220 volt model is obtainable on order. This model can be operated at either of those two voltages with 25/60 cycle current. If the voltages are higher than indicated an external stepdown transformer must be used. A switch mounted on the top of the universal transformer case, will allow convenient 110-220 voltage change.

The standard model SX-32 receiver comes equipped with a cabinet for table mounting. The standard 8¾" x 19" panel dimension with holes suitably spaced make it possible for the chassis to be mounted in a standard relay rack. Maximum overall chassis length is 17⅜" and depth 13½". When the model SX-32 is so mounted the table cabinet is replaced with a dust cover. The maximum over-all length of the receiver will then allow it to be mounted in a rack with upright channel clearance of 17½"

TERMINALS AND CONNECTIONS ON REAR OF RECEIVER

SPEAKER

On the rear apron of the receiver's chassis appear two terminal strips for connecting either a 500 or 5000 ohm speaker to the receiver. Should a matching HALLICRAFTERS Bass-Reflex speaker be used with the receiver, it should be connected to the 5000 ohm terminals. The 500 ohm terminals can be connected to a speaker or other load of that impedance value.

ANTENNA

To the terminals marked A1-A2 and G should be connected the antenna you have chosen to use with the model SX-32 receiver.

Very satisfactory results throughout the tuning range of the SX-32 will be obtained with a conventional inverted "L" Marconi type of antenna 75 to 100 feet long including lead-in. This antenna should be erected as high as possible and removed from surrounding objects. Be sure that the antenna is insulated from the ground at all points. When this type of antenna is used it is connected to terminal A-1. The Jumper between A-2 and G should remain connected.

In the event a doublet antenna is used with the model SX-32 SKYRIDER receiver, the two wires of the doublet lead-in should be connected to terminals A1 and A2. The Jumper between A2 and G can remain connected or removed, depending upon its effect on favorable reception.

A ground can be used if desired and should be connected to the G terminal. Connecting the receiver to a good ground (cold water pipe or 6 foot rod driven in moist soil) might improve reception and reduce noise. Under normal conditions no noticeable difference will exist so a ground is suggested only if it aids reception.

Should you wish to have a separate antenna for some one short wave frequency or band, a half-wave antenna cut to the proper length for the desired frequency will prove very effective. The following formula will give the length of the ½ wavelength antenna depending on the desired frequency.

$$\text{Length in feet} = \frac{463}{\text{frequency in megacycles}}.$$

or, for example, a half wave 40 meter antenna would be $\frac{463}{7} = 66.14$ feet long.

The antenna should preferably be of solid soft drawn enameled copper wire for ease in handling. The center of the wire is cut and an insulator inserted at that point. The twisted pair, or open wire transmission line, is then soldered to each 33 foot length, after the enamel has been scraped off, directly on either side of this center insulator. The other end of the transmission line should be connected to A1 and A2 on the receiver. It should be remembered that such an antenna has directional properties broadside to its length and should be so oriented if maximum pickup from a certain direction is to be expected.

In designing transmission line systems for a more accurate match of the line to the antenna input circuit, it will be helpful to know that the approximate antenna input impedance of the receiver is 400 ohms.

STAND-BY SOCKET

The Send-Receive switch on the front panel makes the receiver inoperative by removing the plate voltage from the tubes when the switch is in the SEND position. Connected in parallel with this switch is the standard 110 volt receptacle on the rear chassis edge. Should you wish to make the receiver inoperative by using a remote relay or switch, connect the contacts of the relay to a standard plug, insert it in the STAND-BY switch socket and the external relay or switch will close and open the circuit so long as the SEND-RECEIVE switch on the front panel is in the SEND position.

PHONO-JACK

The Phono-Jack enables you to use the high fidelity audio amplifier of the receiver for phonograph record or transcription play-back purposes. A high impedance crystal or magnetic pick-up arm should be used for this purpose and connected to a standard headphone plug. This plug is then inserted in the PHONO-JACK when record playing is desired. The receiver is inoperative to radio signals, when the plug is in the phono-jack.

The volume of the audio amplifier is varied by rotating the AF Gain control until the proper level is obtained. Removal of the plug from the Phono-Jack once more places the RF and IF portions of the receiver in operation.

6 VOLT DC SOCKET

The DC Operation Socket can be used when it is necessary to furnish power to the receiver from a direct current source. For conventional AC operation, the shorting plug must remain in the DC Operation socket. This plug should be removed for battery or vibrapack operation. A similar plug to the shorting plug should be wired as shown on the Schematic diagram and connected to the external source of DC power. The DC operation plug is then inserted in the socket and operation from batteries or a vibrapack is secured.

270 volts of plate voltage, or B supply, at 150 milliamperes current are necessary for successful operation of the receiver, should it be operated in this manner.

"S" METER ZERO SET

"S" METER CONTROL is obtained by varying the knurled knob appearing on the left hand chassis apron edge. This control enables you to properly set the "S" Meter to zero. In order to make the adjustment correctly, the RF GAIN CONTROL must be advanced clockwise as far as it will go. In addition, the switch directly below the bandspread hand-wheel must be in the AVC—ON Position. When these conditions have been complied with, remove the antenna from the Receiver and then adjust the S meter control until the S meter reads zero. Reconnecting the antenna to the receiver will then make the meter indicate the relative carrier strength of each incoming signal as various signals are tuned in.

The large calibrated main dial shows the frequencies covered throughout the 6 band, 500 K.C. to 42 m.c. frequency range of the reciever. They are as follows:

Band 1—	500	to	1400	kilocycles
Band 2—	1.4	to	2.7	megacycles
Band 3—	2.7	to	5.3	megacycles
Band 4—	5.3	to	11	megacycles
Band 5—	11	to	21	megacycles
Band 6—	21	to	42	megacycles

ALIGNMENT PROCEDURE MODEL SX-32 SKYRIDER

Equipment Needed for Aligning:

1—An all wave signal generator which will provide an accurately calibrated signal at the test frequencies indicated.

2—Output indicating meter connected to 5000 ohm output terminals.

3—Non-metallic screw driver.

4—Dummy antenna of 200 mmf and also 400 ohm carbon resistor.

Setting of controls prior to alignment—IF and RF.

Tone control at maximum high frequency position (#9)—BFO at 0—AF Gain at #9—RF Gain at #9—Band switch—IF alignment position .5 to 1.4 band.—RF alignment depending on band aligned.

Selectivity control sharp IF, Send-Receive switch in Receive, Crystal phasing at #3 on left side, ANL—OFF,—AVC OFF.

Important: Have bandspread control so logging scale reads 100.

Antenna trimmer adjusted for Maximum gain at each RF alignment point on Bands 3-4-5-6.

Note: Antenna trimmer not in circuit on bands 1 and 2.

455 KC—IF Alignment: Tune main dial to 1400 kc on .5 to 1.4 m.c. band. Connect the hot lead from the signal generator to 6SA7 mixer terminal #8—Ground to chassis. Roughly adjust the aligning screws of T1, the lower screw of which is accessible through hole in right mounting bracket, for maximum gain. Now adjust lower screw on T2 (do not adjust upper screw). Also adjust C31 and the trimmer screws at the top of T3 for maximum gain.

Switch to Crystal Broad Position—Turn on BFO and adjust to a tone of about 1000 cycles. Vary the frequency of the signal generator while adjusting the top screw on T2 until the output goes through a maximum, dips down and starts going up again. Adjust the phasing control for maximum selectivity and then back off the top screw on T2 until the output reaches a minimum value between the two maximum values first noted. The frequency of the signal generator should be varied over a small range while adjusting the top screw of T2. A swishing note, in contrast to the usual sharp crystal tone will be apparent when the correct adjustment has been reached.

Switch to "Xtal Sharp" and adjust C_{36} for maximum output while varying signal generator frequency. Two points of maximum output will be noted corresponding to two adjustments of C_{36}. Either one of these points may be used at which to leave C_{36}. A sharply peaked tone will result at the correct adjustment.

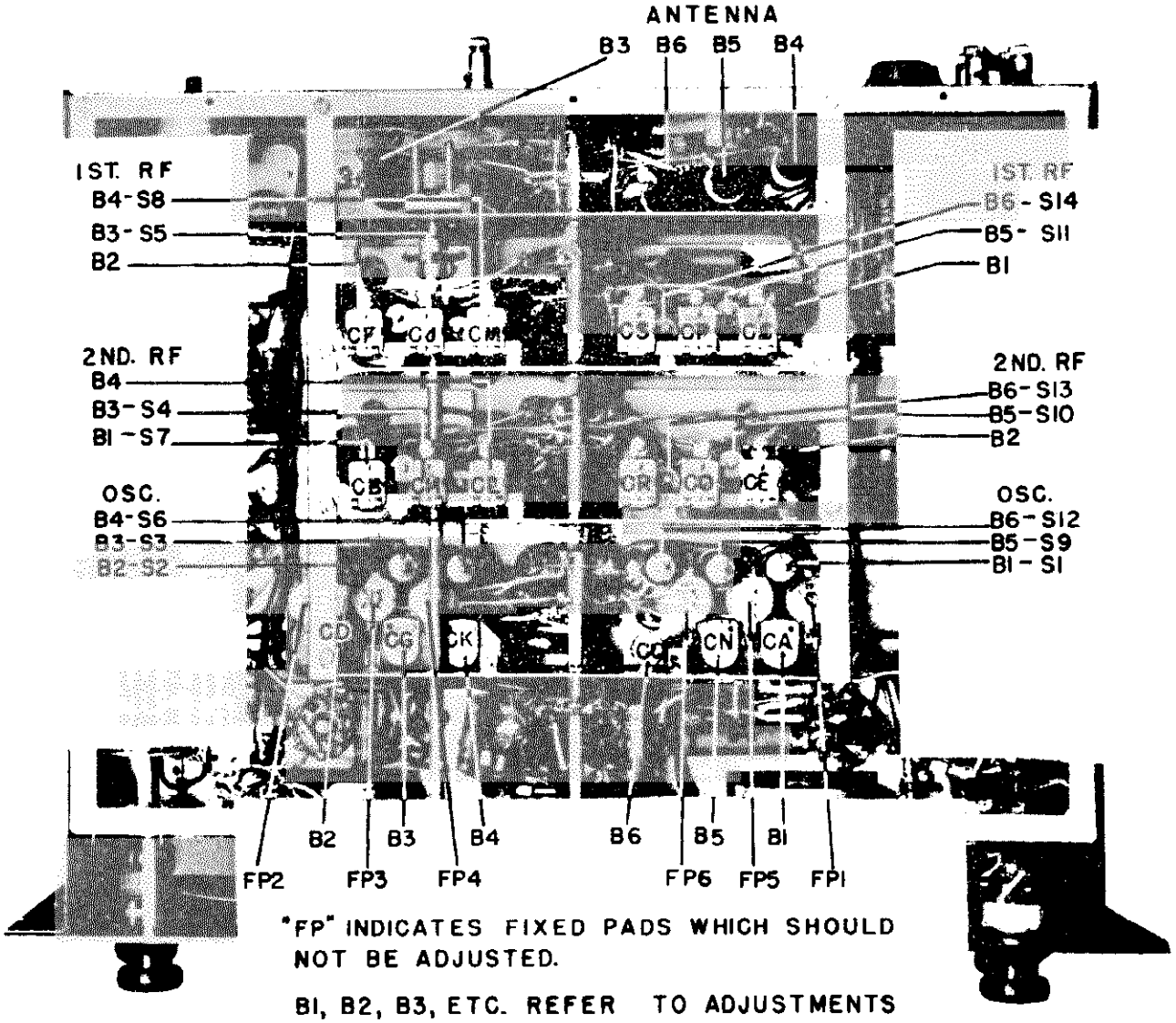
Switch to "Xtal Medium" and adjust C_{35} till the output is midway between the outputs reached while aligning the "Xtal Sharp" and "Xtal Broad" positions. The apparent sharpness of tone should be midway between the "Sharp" and "Broad" positions.

Switch again to "Xtal Sharp" and set the signal generator to exact crystal frequency. Set BFO front panel control to a tone of approximately 1000 cycles. Switch again to "Sharp IF" and carefully realign the IF transformers as earlier described in the first paragraph of these instructions.

Beat Frequency Oscillator Adjustment:—In the center of the "Pitch Control" shaft, after the knob has been removed, you will find a recessed screw for the adjustment of the Beat Frequency Oscillator. Before rotating this screw with a suitable screw driver, loosen the set screw on this shaft. This set screw can be reached with a spintite wrench from the top. With the signal generator connected to the 6SA7 mixer terminal #8 as above, the generator set to the frequency of the crystal, and the BFO switch on, adjust the screw in the center of the pitch control till zero beat is heard. Tighten the set screw and assemble the knob so that this zero beat position will occur in the center of the total angular rotation of the pitch control knob.

AVC Amplifier Adjustment:—Connect a high resistance voltmeter across resistors R-49 and R-54. With the signal generator tuned to the crystal frequency as above, adjust the trimming screw on top of T-6 till the volumeter reads maximum.

THE HALLICRAFTERS INC. MODEL SX-32, Sky Rider



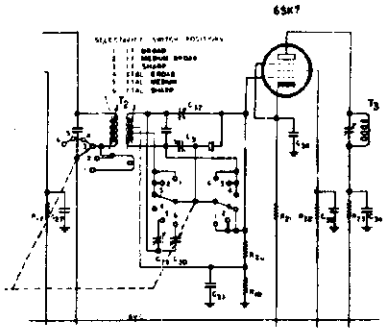
"FP" INDICATES FIXED PADS WHICH SHOULD NOT BE ADJUSTED.

B1, B2, B3, ETC. REFER TO ADJUSTMENTS ON BAND 1, BAND 2, BAND 3, ETC.

RF ALIGNMENT

Connect hot lead of signal generator to A_1—through dummy antenna shown in table. Leave jumper connected between A_2 and G. Ground of Generator to Chassis.

Band	Rec. Dial Setting	Sig. Gen. Freq.	Dummy Antenna	HIGH FREQUENCY END		LOW FREQUENCY END	
				Adjust Osc. With	Adjust Trimmers for Max. Gain	Adjust Osc. With	Permeability Tuned By
1	1.2 mc	1.2 mc	200 mmf	C_A	C_B C_C	....	.....
1	.6	.6	200 mmf	....	.....	S_1	.....
2	2.6	2.6	400 ohms	C_D	C_E C_F	....	.....
2	1.5	1.5	400 ohms	....	.....	S_2	.....
3	5	5	400 ohms	C_G	C_H C_J	....	.....
3	3.0	3	400 ohms	....	.....	S_3	S_4 S_5
4	10	10	400 ohms	C_K	C_L C_M	....	.....
4	5.6	5.6	400 ohms	....	.....	S_6	S_7 S_8
5	20	20	400 ohms	C_N	C_O C_P	....	.....
5	11	11	400 ohms	....	.....	S_9	S_{10} S_{11}
6	38	38	400 ohms	C_Q	C_R C_S	....	.....
6	22	22	400 ohms	....	.....	S_{12}	S_{13} S_{14}



CRYSTAL FILTER CIRCUIT

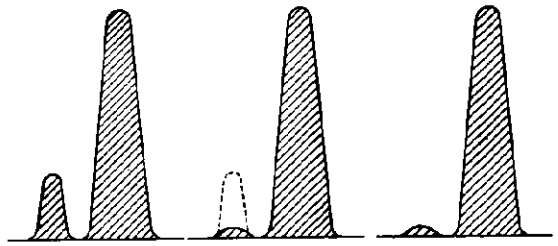
In positions 1, 2, 3 the crystal is short circuited. In position 4 the short across the crystal is opened and the iron core in the secondary of the transformer is adjusted for Broad Crystal Action and at this point is accurately tuned to the crystal frequency. Due to the close coupling of the secondary to the crystal, the sharply rising resonance curve of the crystal causes, in contrast, a sharply falling resonance curve in the secondary. The combined action of these two characteristics results in a relatively broad resonance curve for the CRYSTAL BROAD selectivity setting. In the MEDIUM CRYSTAL No. 5 position, C_{36} is adjusted for selectivity midway between the BROAD and CRYSTAL SHARP settings.

In position 6, or CRYSTAL SHARP, the trimmer C_{36} is adjusted for the Sharpest crystal action. Under this condition, the Secondary is slightly detuned from the resonant crystal frequency sufficiently so that its resonance curve is not greatly affected by the crystal but still coupled tightly enough so that it can transfer energy to the crystal circuit. When this point is reached it is indicated by a rise in the output. Two such points of increased output will normally occur—one for each adjustment of the secondary on either side of the resonant frequency of the crystal.

SINGLE SIGNAL ADJUSTMENT

It is extremely simple to attain single signal reception with the SX-32. First, turn on the BFO to the desired Beat Note and turn the selectivity switch to the XTAL SHARP position. Pick a good solid CW signal, preferably a commercial station because a commercial is likely to stay on long enough for you to complete the phasing adjustment for single signal reception.

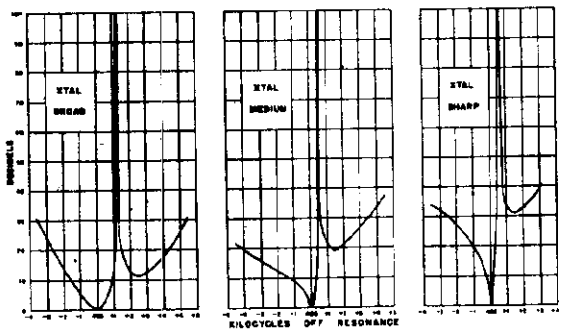
You will find on tuning across this signal that it has two amplitudes. Tune first to the weaker of these two amplitudes. Now, turn the PHASING control until this weaker of the two amplitudes is reduced to a minimum. (If the weaker amplitude appears on the right the above procedure still holds.) Then tune to stronger of the two amplitudes and adjust the BFO control to a tone most pleasing to you. This adjustment for single signal selectivity will hold with no further adjustment unless you change the phasing control.



With Selective Switch in XTAL Sharp position identify the weaker amplitude—Tune Receiver to the weaker.

Adjust phasing control carefully until this weaker amplitude is reduced to a minimum.

Retune Receiver to the stronger amplitude and then adjust pitch control until you get note most pleasing to copy.



CRYSTAL FILTER CURVES

NOTE: The CRYSTAL FILTER and holder are wired directly into the receiver and do not plug in as heretofore. In this manner exceptional crystal filter action is obtained because of the elimination of the capacity and losses of a socket. So mounting the crystal prevents possible change in polarity which would occur if the crystal were improperly inserted in the circuit. The size of the crystal has been carefully determined to allow the BROAD CRYSTAL position to tune as broadly as possible. The capacity of the crystal holder has been reduced to a minimum through the use of a specially designed polystyrene holder.

AVC ACTION

A double AVC system is used. The RF and mixer tubes are operated by the broadly tuned carrier coming through only three tuned IF circuits. The final signal however passes through six-tuned IF circuits. As a result, when the signal is slightly detuned, the receiver output has dropped considerably while the AVC action has dropped but very little. This results in a reduction of between-station noise and a more sharply defined aural tuning action.

"S" OR SIGNAL INTENSITY METER

The approximate DB per S unit equivalent is 6 DB's. As is known, a DB, or decibel, is a unit of change in signal level and is defined as being the least detectable change the average ear can appreciate when listening to a single pitched tone. 3DB is the least change the ear detects when listening to sounds varying in both amplitude and pitch. By comparison, a variation of one S unit on the meter will indicate a change of two detectable steps in signal level. Quantitatively, a DB gain or loss is equal to 20 $\log_{10}\left(\frac{E_1}{E_2}\right)$ where E_1 = input voltage and E_2 = output voltage.

THE SECOND DETECTOR

As will be noted, a diode type of second detector is used in the Model SX-32. Its choice was prompted by the fact that such a detector is capable of handling large percentages of modulation with very little distortion. This is due to the output of the diode being easily filtered (IF Removed). In addition, the rectified output contains a DC component which can be used for AVC purposes.

THE BEAT FREQUENCY OSCILLATOR

The BFO is turned on with the switch below the band-spread handwheel and adjusted by the skirted knob directly below the tone control. The BFO circuit, as will be seen by referring to the schematic, is the well known Hartley oscillator. It will be noticed that a plate dropping resistor is used to compensate for plate voltage variations. An increase in receiver voltage causes an increase in the plate current of the oscillator. This increase in turn causes the voltage drop across the resistor to increase, thus maintaining a more constant voltage at the plate of the beat oscillator tube. A favorable ratio of capacity to inductance is used. The fixed tank capacity has been artifically aged by alternately exposing it to very high and then low temperatures. In this manner any residual strains of the component parts are removed and the capacity of the condenser remains constant. The BFO coil is permeability tuned which further removes the possibility of drift which would occur should a compression variable be used to resonate the circuit.

Proper location of the Beat Oscillator tube and its associated components plus excellent shielding and mechanical rigidity do much to keep stray fields from being established. Little BFO leakage is to be expected in the Model SX-32 so "tweets" or BFO harmonics will not prove to be bothersome.

THE AUDIO AMPLIFIER

The second or output stage of the audio amplifier in the Model SX-32 receiver uses two 6V6GT tubes connected in push-pull. These tubes are driven by the 6SC7 double triode. One of the triode sections of the 6SC7 tube is used as the inverter to the 6V6GT tubes. A portion of the signal from the plate circuit of the first 6SC7 triode is fed to the grid of the other 6SC7 triode Section, thereby giving two output voltages in opposite phase suitable for exciting the push-pull 6V6GT output amplifier.

THE POWER SUPPLY

The power supply in the Model SX-32 is quite normal except that it supplies voltage for the 6V6GT output tubes directly from the rectifier or before the filter system. Voltage fluctuations in the receiver are greatly reduced—increasing the audio output of the receiver and stabilizing the operation of all circuits.

The filter circuit consisting of a total of 60 mfds of capacity and a 12 henry choke keep the hum level of the receiver in excess of 60 DB below maximum output. The power transformer is built to withstand continuous operation at 250 degrees F but has been designed to run at approximately 160 degrees F under normal conditions.

SPECIFICATIONS

Tubes:

1—6AB7	1st RF Amplifier
1—6SK7	2nd RF Amplifier
1—6SA7	Mixer
1—6SA7	HF Oscillator
1—6K7	1st IF Amplifier
1—6SK7	2nd IF Amplifier
1—6B8	AVC Amplifier
1—6H6	2nd Detector and A.N.L. Tube
1—6J5	Beat Oscillator
1—6SC7	1st Audio Amplifier
2—6V6GT	Push-Pull Output Amplifiers
1—5Z3	Rectifier

Power Consumption—at 117 volts—60 cycles—138 watts
Power Consumption—DC operation—18 amp. at 6 volts or 108 watts
Power Output—8 watts undistorted
Sensitivity—(for .05 watts output) Bands 1 to 5—2 MV and under; 6th band 4 MV

	2 x	1000 x
Selectivity—IF broad (high fidelity)	12 kc	36 kc
IF Sharp	4.1 kc	22 kc

Frequency Range RF—Note: These are the actual frequencies covered corresponding to nominal figures indicated on the front panel.

500	to 1450	kilocycles
1.4	to 2.8	megacycles
2.7	to 5.4	megacycles
5.2	to 11	megacycles
10.5	to 22	megacycles
21	to 42	megacycles

Frequency response AF broad IF—tone control high-70 to 3000 cycles = 2½ DB
Speaker Output Impedances—5000 and 500 ohms
Intermediate Frequency—455 kc
Table cabinet dimensions—20½" long x 10" high x 14¾" deep
Relay Rack dust cover dimensions—14¾" deep x 17⅝" long x 8¾" high
Panel dimensions—19" x 8¾"
Chassis dimensions—17⅜" x 13½"
Weight—(unpacked) -75 lbs.—packed 87 lbs.

HAMMARLUND MFG. CO., INC.

MODELS SP-200X
SP-200S

FIG. 7—Top view of "SP-200-X" receiver showing the general layout of parts. All important parts are labeled. Encircled numbers correspond to numbers appearing in the circuit diagram.

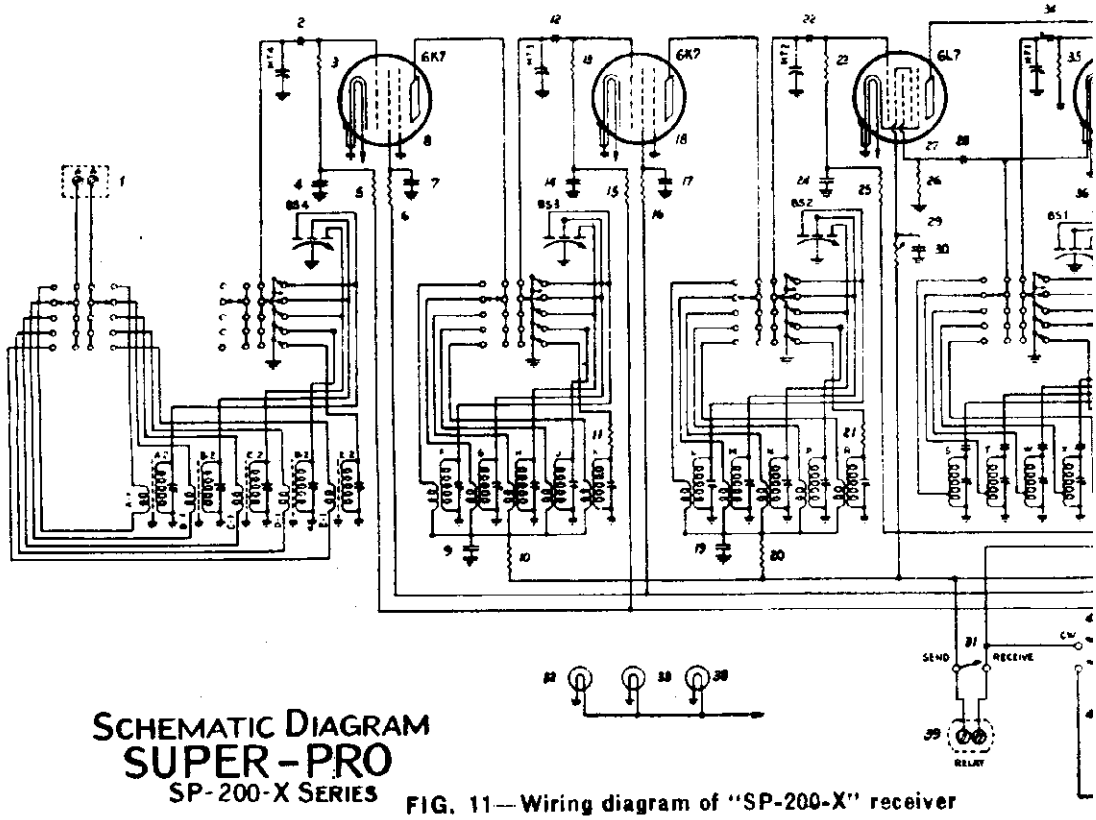
FIG. 9—Bottom view of the "SP-200-X" showing the coil assembly and general lay-out of parts.

(MEGACYCLES)			
10.0 TO 20.0	5.0 TO 10.0	20.0 TO 40.0	2.5 TO 5.0	1.25 TO 2.50

H.F. OSCILLATOR AND R.F. ALIGNMENT

(FOR OTHER DATA SEE INDEX)

FIG. 10—Complete tuning unit used in all "Super-Pro" receivers. Includes all tuning condensers, coils, and band change switch. Each coil is mounted on an isolantite base with its associated trimmer condenser.



SCHEMATIC DIAGRAM
SUPER-PRO
SP-200-X SERIES

FIG. 11—Wiring diagram of "SP-200-X" receiver

FOR OTHER DATA SEE THAT OF MODEL SP-200X, Early, IN INDEX

"SUPER-PRO" MODEL SP-200-SX PARTS LIST
(This parts list should be used to identify parts shown in the illustrations)

Schematic Designation	*DESCRIPTION — RECEIVER PARTS*	*Part No.*
A1	Antenna Input Coil Assembly 10.0 to 20.0 m.c.	SA-46
A2	Antenna Output Coil Assembly 10.0 to 20.0 m.c.	SA-110
B1	Antenna Input Coil Assembly 5.0 to 10.0 m.c.	SA-47
B2	Antenna Output Coil Assembly 5.0 to 10.0 m.c.	SA-113
C1	Antenna Input Coil Assembly 20.0 to 40.0 m.c.	SA-46
C2	Antenna Output Coil Assembly 20.0 to 40.0 m.c.	SA-130
D1	Antenna Input Coil Assembly 2.5 to 5.0 m.c.	SA-48
D2	Antenna Output Coil Assembly 2.5 to 5.0 m.c.	SA-116
E1	Antenna Input Coil Assembly 1250 to 2500 k.c.	SA-49
E2	Antenna Output Coil Assembly 1250 to 2500 k.c.	SA-136
F	1st R.F. Coil Assembly 10.0 to 20.0 m.c.	SA-111
G	1st R.F. Coil Assembly 5.0 to 10.0 m.c.	SA-114
H	1st R.F. Coil Assembly 20.0 to 40.0 m.c.	SA-131
J	1st R.F. Coil Assembly 2.5 to 5.0 m.c.	SA-117
K	1st R.F. Coil Assembly 1250 to 1160 k.c.	SA-137
L	2nd R.F. Coil Assembly 10.0 to 20.0 m.c.	SA-111
M	2nd R.F. Coil Assembly 5.0 to 10.0 m.c.	SA-114
N	2nd R.F. Coil Assembly 20.0 to 40.0 m.c.	SA-131
P	2nd R.F. Coil Assembly 2.5 to 5.0 m.c.	SA-117
R	2nd R.F. Coil Assembly 1250 to 2500 k.c.	SA-137
S	High Frequency Osc. Coil Assembly 10.0 to 20.0 m.c.	SA-112
T	High Frequency Osc. Coil Assembly 5.0 to 10.0 m.c.	SA-115
W	High Frequency Osc. Coil Assembly 20.0 to 40.0 m.c.	SA-132
X	High Frequency Osc. Coil Assembly 2.5 to 5.0 m.c.	SA-118
Y	High Frequency Osc. Coil Assembly 1250 to 2500 k.c.	SA-138
T-1	Crystal filter assembly (465 kc.)	SA-178
T-2, T-3	1st and 2nd, I.F. Transformer Coil Assembly	SA-166
T-4	Detector plate coil assembly	SA-167
T-5	Beat oscillator co
T-6	A.V.C. Plate coil
T-7	Push-Pull Input
T-8	Push-Pull Output
1	Antenna terminal
2-12-22	Capacitor Fixed
28	Capacitor Fixed
34	Capacitor Fixed
77	Capacitor Fixed
69	Capacitor Fixed
4-14-24	Capacitor Fixed
7-17-30-36-43-46-48-51-56-58-61-63-73-85-92	Capacitor Fixed
40-101-102	Capacitor Fixed
88	Capacitor Dry El
80	Resistor 4 ohms
89	Resistor 750 ohm
11-21	Resistor 20 ohms
96	Resistor 300 ohm
98	Resistor 1,70
10-20-44-6-47-49-57-59-16	Resistor 2,00
99	Resistor 3,00
86	Resistor 5,00
5-15-25-50-60	Resistor 10,00
37	Resistor 12,00
29	Resistor 25,00
35-26	Resistor 25,00
66-84	Resistor 50,00
64-72-93	Resistor 50,00

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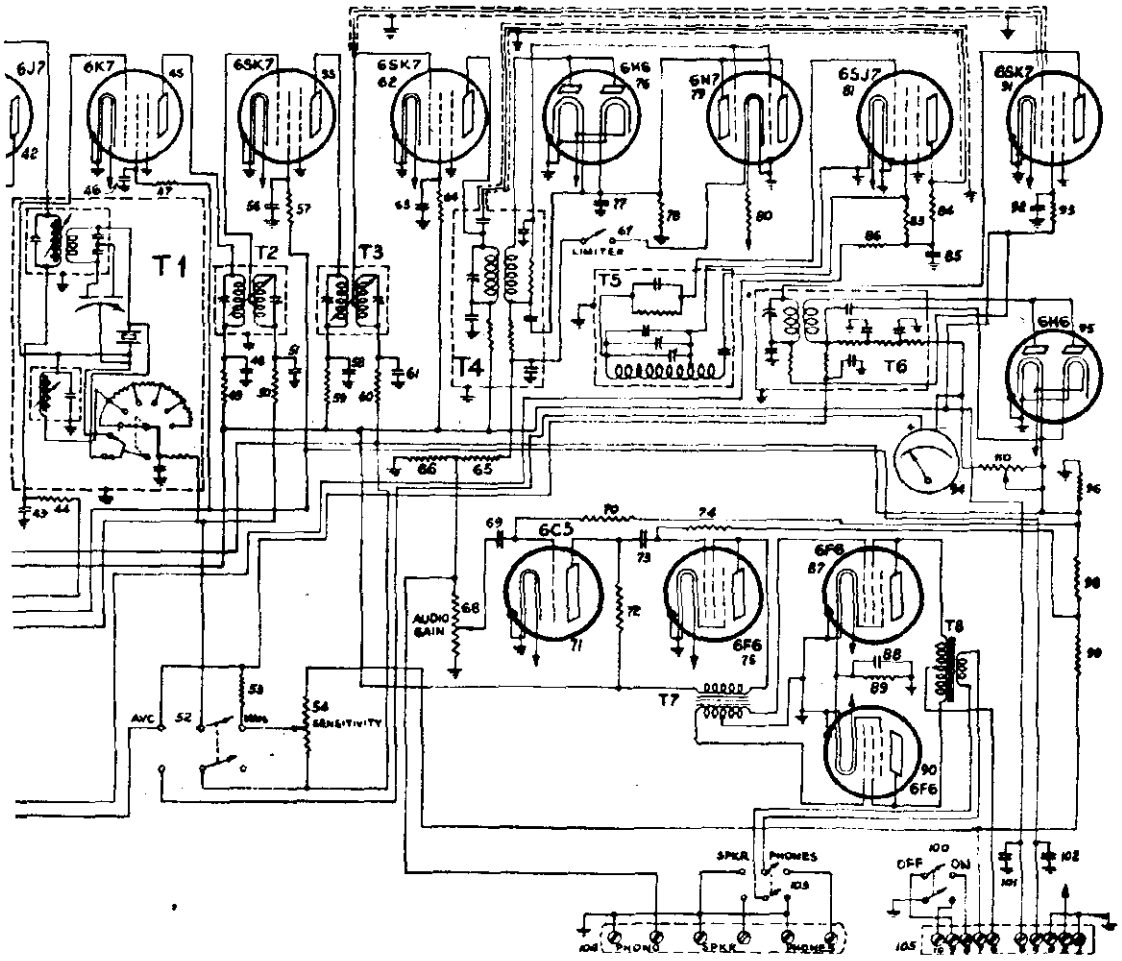


		32-33	Dial lamps 6.3 volt .15 amp.	3920
ably	SA-169	38	Meter lamp 6.3 volt .15 amp. Bayonet type	6036
ily	SA-168	94	Tuning meter	4903
rmer	4827	100	Off-on Switch	2983
former	4828	52-103	AVC-MANUAL and SPEAKER-PHONES Switch	2990
	3842	41	CW-MOD Switch	4915
type 600 mmf	6073	31	Send-Receive Switch	4917
type 95 mmf.	6195	67	Limiter switch	4916
type 50 mmf.	6074	54	Sensitivity control 50,000 ohm	4918
type 50 mmf.	6199	68	Audio Gain Control 250,000 ohm	4919
type .02 mf. 500 V.	6176	39	Relay terminal strip	4904
type .01 mf. 500 V.	6175	104	Phono-Speaker-Phones terminal strip	4905
		105	Connecting terminal strip	3838
type .05 mf. 500 V.	6174	110	Meter adjusting potentiometer 1,000 W wire wound	4932
			POWER SUPPLY	
		1	Power transformer 110 volts 60 cycle A.C.	4801
type .25 mf. 400 V.	3820	2	Filter choke	2981
ic 40 mf. 150 V.	6171	3	A.C. input Cord and Plug	3900
und 5 watt	4921	4	Fuse Block for 2A. fuse	3859
ound 10 watt	3836	5	Line Voltage Adjusting Strip	3858
und ½ watt	3987	6	Speaker Field Terminal Strip	3840
lized ½ watt	6169	7	Connecting Terminal Strip	3838
metallized ½ watt	4947	8-9-10	Filter Condenser 16 mfd. electrolytic 450 volts	3832
		11	Filter Condenser 8-8-8 mfd. electrolytic 450 volts	3834
metallized ½ watt	6160	12	Resistor 18,000 ohms (2 taps)	3997
		13	Resistor 18,000 ohms (1 tap)	4946
metallized 1 watt	3809	14	Tube socket 80	4807
metallized ½ watt	4814	15	Tube socket 5Z3	3828
metallized ½ watt	6165	16	1 mf. paper filter condenser	4945
metallized 2 watt	4840	65	Resistor 75,000 ohms metallized ½ watt	4914
metallized 2 watt	3999	78	Resistor 250,000 ohms metallized ½ watt	4912
metallized ⅛ watt	4960	3-13-23	Resistor 250,000 ohms metallized ⅛ watt	4959
metallized ½ watt	6075	70-74-83	Resistor 500,000 ohms metallized ½ watt	6076
metallized 1 watt	6166	53	Resistor 2,000,000 ohms metallized ½ watt	4920

The "Super-Pro" is available to cover several frequency ranges. Such information as is given will pertain to all models. The two standard models have the following tuning ranges:

SP-200	SP-200-S
540 – 1160 kc.	1250 – 2500 kc.
1160 – 2500 kc.	2.5 – 5 mc.
2.5 – 5 mc.	5 – 10 mc.
5 – 10 mc.	10 – 20 mc.
10 – 20 mc.	20 – 40 mc.

The sensitivity of the new "Super-Pro" is truly remarkable. By careful circuit design, the overall set noise has been held down to a minimum, thus making it possible to receive extremely weak signals with favorable signal-to-noise ratio. The variable selectivity feature of the "Super-Pro" permits the operator to make full use of the extreme sensitivity even under most severe conditions of interference. Selectivity can be adjusted to cut down interference within very close limits. The advantages of variable selectivity are tremendous when one considers that conditions of interference are not always the same. Under certain conditions, it may be possible to use quite a wide band width and thus enjoy improved tone, as well as easier tuning. Under other conditions, where interference is quite bad, the band width can be narrowed just enough to eliminate interference and in that case, the best possible fidelity that can be obtained without too much interference, is available. In a case where there is practically no interference from other stations, the band width can be adjusted to its widest point and high fidelity reception can be enjoyed.

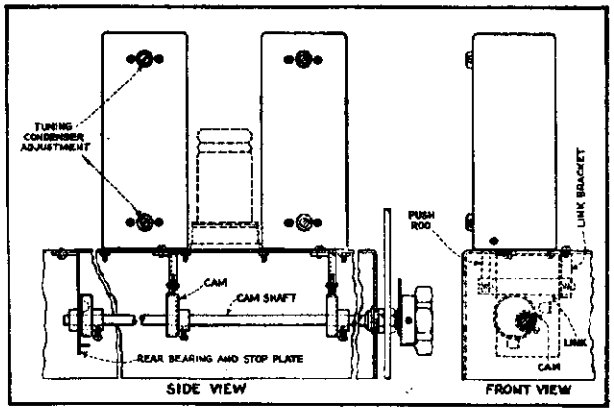


FIG. 1—Band width control which varies selectivity and permits the operator to adjust the receiver for best quality obtainable with minimum interference.

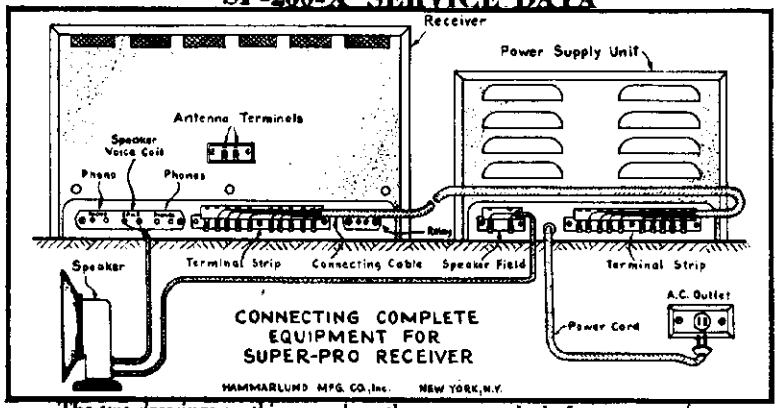
TUBE LINE-UP

6K7 — First tuned R.F.	6N7 — Noise limiter
6K7 — Second tuned R.F.	6SK7 — AVC driver
6L7 — Mixer	6H6 — AVC Diode
6J7 — H.F. Oscillator	6SJ7 — B.F. Oscillator
6K7 — First I.F. Amplifier	6C5 — First A.F. Amplifier
6SK7 — Second I.F. Amplifier	6F6 — Second A.F. Amplifier
6SK7 — Third I.F. Amplifier	2-6F6— Third A.F. Amplifier (Push-Pull)
6H6 — Second Detector	5Z3 — High Voltage Rectifier
	80 — C-Bias Rectifier

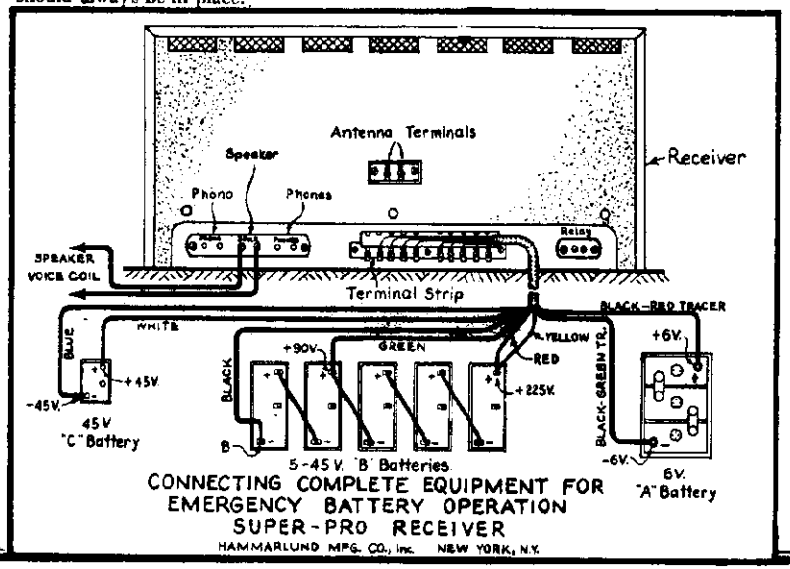
ANTENNA REQUIREMENTS

The input of the Series 200 "Super-Pro" is approximately 112 ohms. This means that for best results, the antenna should be coupled to the receiver by means of a low impedance transmission line. The doublet type antenna produces best results. Any well-known low impedance lead-in cable can be used with satisfaction. The use of low impedance lead-ins provides less chance for the lead-in itself to pick up extraneous noises. The low impedance lead-in, together with the electrostatic shield built into the antenna coil of the receiver, reduces noise to a minimum. It must be remembered that every antenna has a period of resonance and works best at that frequency. When erecting a doublet antenna, it is advisable to arrange its physical dimensions so that it will resonate in the band of frequencies where most sensitivity is desired. Care taken in designing and erecting an antenna will pay for itself many times in superior results.

SP-200-X SERVICE DATA



The two drawings on this page show the proper method of connecting the receiver, power supply, and speaker together. The drawing above shows a standard installation, while the diagram below indicates receiver connections when batteries furnish the power. Protective covers are furnished for all important terminal strips and they should always be in place.



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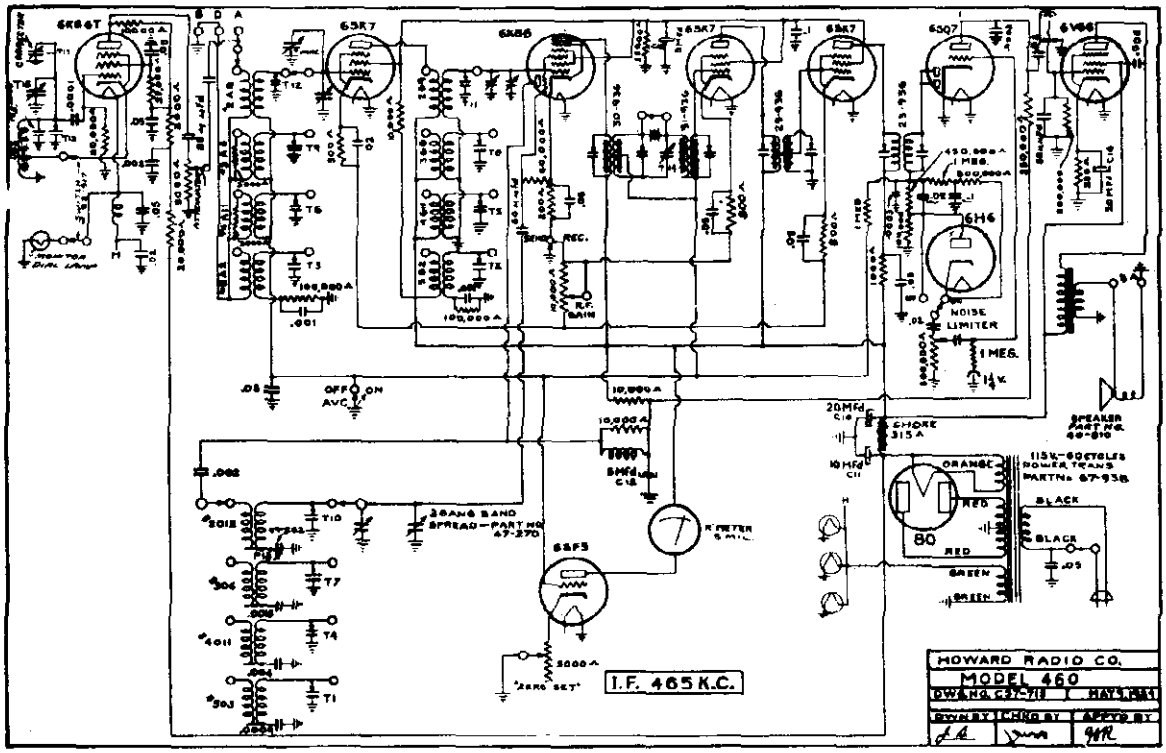


ALIGNMENT CHART

BAND MC	GENERATOR FREQUENCY	GENERATOR CONNECTION	TRIMMER LOCATION	TRIMMER ADJUSTMENTS	TRIMMER FUNCTION	APPROX. MICROVOLTS
IF	465 KC	Grid of 6K8G	See Fig. 6	C1, C2, C3, C4, C5, C6, C7	IF	15
42-16	32 MC	A and DG	See Fig. 5	T1, T2, T3	OSC. RF. ANT.	8
18- 5.5	17 MC	A and DG	See Fig. 5	T4, T5, T6	OSC. RF. ANT.	3
5.5- 1.7	5 MC	A and DG	See Fig. 6	T7, T8, T9	OSC. RF. ANT.	1
1.6- 5.5	1400 KC	A and DG	See Fig. 6	T10, T11, T12	OSC. RF. ANT.	1
1.6- 5.5	600 KC	A and DG	See Fig. 6	P13	OSC. PAD.	1

ALIGNMENT INSTRUCTIONS - FOR RECEIVERS EQUIPPED WITH CRYSTALS

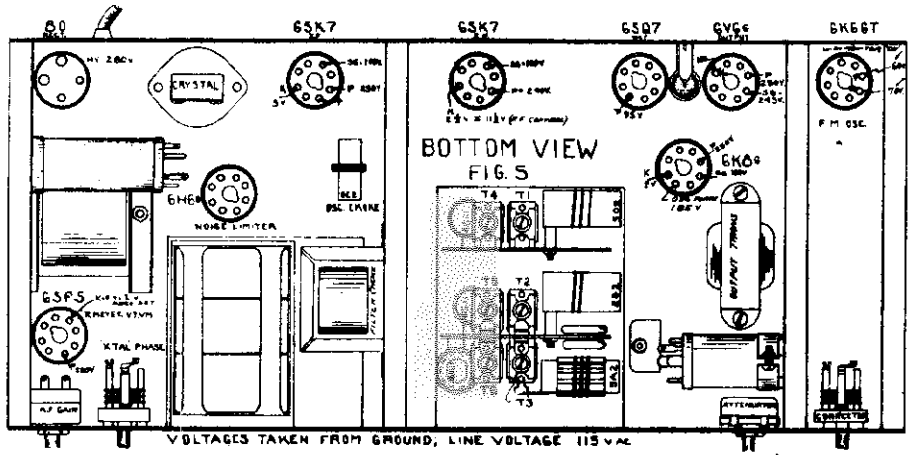
(1) REMOVE CRYSTAL, set crystal phasing condenser to almost minimum capacity and throw "XTAL" switch t "IN" position.

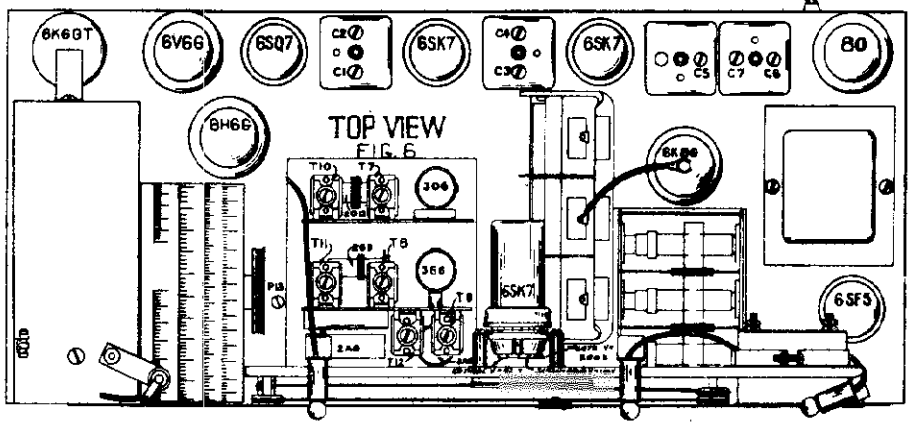
(2) With the 465 KC signal, re-adjust the I.F. Trimmer C-6 by turning the screw counterclockwise. The signal now may be slightly weaker than before and sound "off-side". This, however, is a normal condition.

(3) REPLACE THE CRYSTAL - A very noticeable drop in signal strength may be noted due to the filtering tion of the crystal and the frequency control of the signal generator must be "rocked" slowly back and fort until the increase in signal strength indicates the exact frequency of the crystal being used. Now re-alig the entire I.F. system to this frequency.

(4) *Adjust "XTAL" phasing condenser for the lowest pitched note possible and re-adjust signal generato* frequency. Repeat and continue to repeat this alignment procedure until no further improvement in the alig ment can be accomplished.

NOTE: If the "XTAL" switch should now be thrown to another position, an apparent rise in gain will be noticed, which is caused by the addition of higher frequencies and background noise, so it does not mean that the sensitivity of this set is impaired in any way by use of the crystal.





NOTE 1: When aligning the I.F. channel, a condenser of .05 MFD may be used in series with the generator lead.

NOTE 2: When aligning the broadcast band, a 250 MMFD condenser may be used in series with the signal generator.

NOTE 3: When aligning the short wave bands, a 400 ohm resistor may be used in series with the signal generator.

NOTE 4: When using a CRYSTAL, set PHASING CONTROL to almost minimum capacity. See special alignment instructions below for Crystal.

BAND SPREADING THE RELAY BANDS

The following table shows the amount of spread obtained by the Band Spread Needle after the exact setting and re-setting of the main tuning hand is made on the LOG SCALE in even divisions. Make the first setting at the left end of the band, further settings are towards the right since the Band Spread Needle is tuning to lower frequencies as it approaches zero.

The Band Spread of the regular amateur bands has been covered in the regular instructions in conjunction with the Frequency Monitor.

RELAY BANDS

MAIN TUNING HAND SET TO LOG SCALE AT	FREQ. MC	BAND SPREAD NEEDLE TRAVEL FROM	ACTUAL SPREAD TO
2	17.90	100 to 41	17.22
15	15.79	100 to 30	14.80
32	12.29	100 to 8	11.59
36	11.59	100 to 32	11.20
45	9.9	100 to 21	9.60
47	9.60	100 to 16	9.30
49	9.30	100 to 19	9.00
82	6.25	100 to 33	6.17
83	6.17	100 to 34	6.10
84	6.10	100 to 33	6.04
85	6.04	100 to 33	5.98
86	5.98	100 to 36	5.95
87	5.95	100 to 2	5.88
75	18.10	100 to 2	17.81
77	17.81	100 to 31	17.68
78	17.68	100 to 30	17.55
79	17.55	100 to 30	17.40
80	17.40	100 to 36	17.30
54	22.25	100 to 11	21.80
56	21.80	100 to 11	21.33
58	21.33	100 to 10	20.80

NOTE 5: Check for an image signal about .9 mc. lower in frequency. For example:- If a peak has been made at 6 mc. an image should be heard at about 5.1 mc. Otherwise the original setting was not correct.

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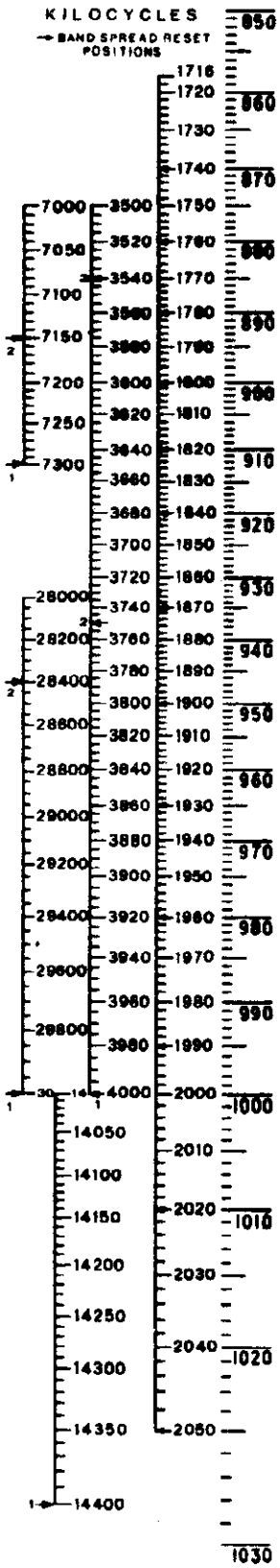


FOR USE WITH ALTERNATING CURRENT ONLY
105–120 V. 60 Cycles, Power consumption 80 W.
(Unless otherwise specified on set)

The Model 460 is designed as an efficient communications type receiver. Although it will cover the regular broadcast band, it is built primarily for Amateur short wave work and for those interested in short wave reception at its best.

The frequency coverage from .55 to 43 megacycles is divided into four bands. The left-hand pointer indicates the band in operation. For correct tuning calibration, the band spread pointer must be set at 100. The lower scale 0 to 100 is for additional help in logging. SEE INSTALLATION INSTRUCTIONS ON FOLLOWING PAGES, SEC. VII.

I – THE FREQUENCY MONITOR

For successful results with the HOWARD FREQUENCY MONITOR SYSTEM the following rules must be followed:

(1) Turn on the set but wait at least fifteen minutes until the circuits reach their normal operating conditions before using the Frequency Monitor. This will maintain uniformity in dial settings.

(2) Turn Monitor Switch to "ON" position, set the fundamental frequency calibration (the scale at the right side of the Monitor Dial), to the known frequency of a nearby broadcast station. (Between 850 & 1030 KC).

(3) With the BAND SWITCH in the broadcast band position and the BAND SPREAD HAND SET TO 100, tune in the same station as selected on the Monitor Dial to exact resonance.

(4) Adjust the "CORRECTOR" to "Zero Beat" with the broadcast station, keeping the "ATTENUATOR" to as low an output as possible (with knob toward the left); otherwise spurious oscillations will be present, with the possibility of zero-beating to a wrong signal near the fundamental with confusing results.

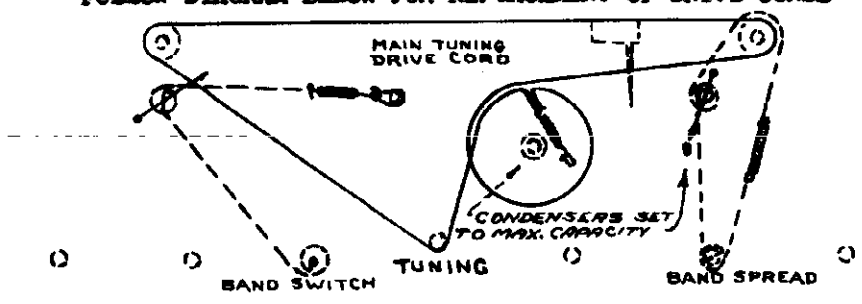
"Zero Beat" refers to the position of the "Corrector" knob, causing the contained oscillator to beat against the incoming signal exactly. A movement of the knob in either direction from this point causes a frequency difference that falls in the Audio range.

(5) The adjacent calibrated scales to the left of the fundamental scale just used are harmonics that fall in the amateur bands and therefore can be depended upon as an accurate means of pre-tuning, checking and logging the stations. Read Section II showing how these harmonics are derived and how other harmonics are possible which can be ignored. The accuracy of this system is without question.

(6) To determine the exact frequency of an incoming signal, merely set the monitor to zero beat with the station and read the frequency direct on the monitor scale. Take note of course the scale position of the band switch and read the correct harmonic scale.

CAUTION: TAKE SPECIAL CARE NOT TO MOVE THE "CORRECTOR" KNOB ACCIDENTALLY OR OTHERWISE AFTER IT HAS ONCE BEEN SET FOR A CERTAIN FREQUENCY.

FOLLOW DIAGRAM BELOW FOR REPLACEMENT OF DRIVE CORDS



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II THEORY OF OPERATION

The Frequency Monitor in the Howard Model 460 receiver consists of a highly stabilized oscillator covering the fundamental frequency range of 850 to 1030 kilocycles. The RF output of this oscillator is loosely coupled to the antenna circuit of the receiver and the voltage applied to the receiver is controlled by a variable resistance attenuator.

The Oscillator is tuned by a precision ceramic insulated variable condenser carrying an extremely accurate frequency scale covering the 10, 20, 40, 80, and 160 meter amateur bands as well as the fundamental range. The range is so selected that harmonics cover the entire length of all amateur bands and these are calibrated so that frequency can be read within one kilocycle on the lower frequency bands and several kilocycles on the highest band.

The accuracy of the oscillator is established by setting its dial so that the fundamental frequency shown exactly corresponds to that of some known broadcast station within range. This station is then tuned in on the receiver and the frequency monitor corrector set to zero beat with this station. This establishes the oscillator frequency as exactly the same as that of the broadcast station. The Federal Communications Commission requires all broadcast stations to operate within 50 cycles of their assigned frequency and most of them are within a very few cycles. With the accuracy of the frequency monitor dial established at any one point, it may be depended on to be accurate throughout its range.

Harmonics of the oscillator may be tuned directly on the receiver and exact receiver frequency established in this way or the monitor can be set to zero beat with any station heard and that station's frequency read directly on the monitor dial. The 160 meter band is covered by the second harmonic of the oscillator fundamental; the 80 meter band the fourth harmonic; the 40 meter band the ninth harmonic; the 20 meter band the fourteenth harmonic; the 10 meter band the thirtieth harmonic. These harmonics bear a mathematical relationship of exactly 2, 4, 9, 14, and 30 times the fundamental frequency covered. There are of course other harmonic frequencies present in the oscillator output but the one desired is easily found by tuning the receiver to the approximate frequency as indicated by the receiver dial as this will always be approximately correct. The exactly correct frequency will be found near this point. Harmonics heard at frequencies not corresponding to monitor dial are ignored. Harmonics that fall outside the amateur bands may be used if there is any reason to use them.

THE ATTENUATOR

The Attenuator will be found of invaluable aid in controlling the Frequency Monitor Output. The circuits leading from the monitor have been completely filtered and the shielding is complete, in order that the greatest percentage of output from monitor is controlled by attenuator.

Advancing attenuator to right increases the R.F. Output from monitor.

No fixed rules can be set down as to the proper use of the attenuator. The operator will find after practice just what positions give best results for the various applications of Frequency Monitor.

IN GENERAL THE ATTENUATOR SHOULD BE ADVANCED, MAKING MONITOR SIGNAL EASY TO LOCATE. AFTER SIGNAL HAS BEEN LOCATED THE ATTENUATOR SHOULD BE TURNED BACK TO LEFT AS FAR AS POSSIBLE, WITH THE SIGNAL JUST AUDIBLE. The practice of using as weak a monitor signal as possible will avoid making mistakes on "spurious" beats.

The attenuator will also be found very convenient in controlling voltage for BFO code reception. The perfect control afforded by the attenuator enables the injection voltage to be held very close to the threshold level, which makes for better CW reception.

III BAND SPREAD - USING FREQUENCY MONITOR FOR ESTABLISHING BAND SPREAD STARTING POSITIONS

The following procedure should be followed for band spreading, using frequency reference:

(1) ESTABLISH FREQUENCY CORRECTION OF MONITOR AS OUTLINED IN SECTION I.

(2) SET BAND SPREAD POINTER AT 100.

(3) SET MONITOR DIAL TO POINT WHERE SPREAD IS TO START, CORRESPONDING TO THE POSITION OF THE MAIN DIAL HAND THAT HAS BEEN SET TO THE HIGH FREQUENCY END OF THE PARTICULAR ALLOTTED BAND. TUNE THIS SIGNAL FOR EXACT RESONANCE WITH MAIN TUNING CONTROL, WATCHING "R" METER. USE THE ATTENUATOR TO INCREASE MONITOR SIGNAL IF NECESSARY, DECREASE OUTPUT OF ATTENUATOR IF RESONANCE PEAK IS BEYOND "R" METER SCALE READING.

NOTE 2: The frequency monitor signal can be identified from other signals in that it is slightly modulated at 120 cycles per second. Only enough modulation is used (approximately five per cent) to make the signal easily identified, while the carrier is sufficiently clean to give good beat note performance.

Turn Monitor off and band spread over the limits of band spread for the particular step chosen.

Any one of the reset positions may be chosen at will. However, if band spreading the entire band is desired the steps should be chosen consecutively, as 1, 2, etc.

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It is good practice to get in the habit of following the operations as outlined above. By so doing, all records or logs of stations heard can be accurately logged BY FREQUENCY and CAN ALWAYS BE FOUND IN THE SAME POSITION.

STATION FREQUENCY MEASUREMENT

It is quite simple to measure the frequency of any signal being heard while covering the range with band spread. Turn Monitor on and zero beat signal by tuning monitor dial, using attenuator if necessary to get correct monitor signal strength for proper zero beating. READ STATION FREQUENCY DIRECTLY ON MONITOR SCALE. Special care must be taken in checking frequencies in 10 meter band in that the image frequency can be mistaken for the true signal frequency. In other words, it is possible to hear the monitor in two spots on signals in this band -- rotate monitor dial until the LOWEST frequency is heard. This is the true signal frequency.

FREQUENCY CHECK OF OWN TRANSMITTER as required by the FCC is possible by the method explained above providing a reasonable amount of isolation is maintained between the transmitter and the receiver.

The following explanation of band spread starting positions may be of help in a better understanding of BAND SPREADING BY FREQUENCY REFERENCE:

It has always been known that if the starting positions of band spread can be established to be exactly the same in FREQUENCY, each time band spreading is started the signal positions and logging can be repeated accurately.

In establishing these starting positions in the past it has been customary to set the main tuning indicator as close as possible to the original or logging position. This naturally leaves much to be desired in accuracy because a slight error, even smaller than the eye can detect, would make a tremendous difference in repeating the band spread dial reading. Also, the oscillator in any receiver drifts somewhat over a period of time. The visual mechanical methods of setting band spread of course never corrected for these things.

The frequency reference method as used in the Howard 460 does correct for these discrepancies and enables an accurate log to be kept either by frequency or by actual band spread indicator position.

It will be noticed that on the Frequency Monitor dial there are positions indicated by an arrow and in some cases these arrows are numbered as 1, 2, etc; these arrows indicate the limits of frequency span of band spread and should be used as the starting positions.

It is customary not to band spread the 160 meter band. However, it can be done quite accurately by using the starting positions as shown on monitor scale.

The positions for each of the amateur bands are as follows:

The 20 meter band starts at 14,000 KC. Band spread covers the entire band. Band spread scale will read from 100 to 50 for this band.

The 10 meter band starts at 30,000 KC and goes to 28,400 KC in first step; therefore, the second reset position is at 28,400 KC. The balance of the band is covered in the second setting of band spread.

The 40 meter band starts at 7,300 KC and goes to 7,150 KC in first step. 7,150 KC is start of second position. The balance of this band to 7,000 KC is covered in second setting.

The 80 meter band is covered in three steps, starting at 4,000 KC, going to 3,750 KC, then to 3,540 KC, and finish band to 3,500 in a short step.

The 160 meter band is covered in thirteen steps, starting at 2,050 and going to 2020, 1990, 1960, 1930, 1900, 1870, 1840, 1820, 1800, 1780, 1760, 1740, and finishes at 1716 KC.

IV C.W. RECEPTION

Use the Frequency Monitor to zero beat the received signal on its fundamental frequency. The customary intermediate frequency beat system is not used, thus eliminating certain unnecessary harmonics that would fall in the amateur band. Throw AVC Switch to "OFF" position.

V THE NOISE LIMITER

The Noise Limiter (with switch in the "ON" position) is so designed to help receive signals that might not come through certain types of interference such as automobile ignition noise, and a high percentage of static impulses from various sources. The noise limiter must not be considered as a "noise eliminator"; such an arrangement would impair the sensitivity of the receiver.

VI THE USE OF THE CRYSTAL

NOTE THAT THE "XTAL PHASE" CONTROL AFFECTS THE SELECTIVITY AND SENSITIVITY OF THE RECEIVER EVEN THOUGH THE CRYSTAL IS NOT BEING USED.

(1) Set the BAND SPREAD to about 50 on its dial, tune in a station on the main dial to exact resonance, watching the meter deflection.

(2) Turn Frequency Monitor "ON" and set to same frequency as incoming signal, beat to null point with "Corrector".

(3) Snap XTAL Switch "IN" and rock Band Spread hand back and fourth, which will show two "sides" of the signal,

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one of which is weaker than the other. Set Band Spread hand to the weaker position.

(4) Now "Phase Out" the weaker side with the XTAL phase control.

(5) Retune back to the strong side, which will be found to be free from noise and very selective.

THE SUCCESS OF THE CRYSTAL OPERATION WILL DEPEND UPON TUNING THE SIGNAL TO EXACT RESONANCE.

VII EXTERNAL CONNECTIONS

From the SPEAKER UNIT extends a two lug cable which must be connected to the "5 Ohm" terminal strip on the back of the chassis. No other connections are necessary to the speaker.

The terminals A, D, and G are for antenna and ground connections. Connect the conventional antenna lead-in to terminal "A" and the ground lead to "G"; leave shorting jumper between "G" and "D" unless a Doublet system is used.

For a Doublet system, remove jumper between "G" and "D" and connect doublet wires to "D" and "A". The ground connection can remain.

Due to varied conditions in different localities, it is not possible to give definite recommendations regarding the antenna structure. It is suggested that a little experimenting be done and to follow information given by current radio periodicals, also the A.R.R.L. Handbook.

Special consideration must be taken for reception on the higher frequency bands. There will be periods within a short space of time when no reception is possible. Since the set is designed to meet the conditions for satisfactory short wave reception, there should be no question as to the sensitivity of the set itself, and the receiver should be given a fair chance to produce the required results.

THE MODEL 460 IS DESIGNED TO BE USED EITHER WITH OR WITHOUT THE CRYSTAL. IF THE SET IS NOT EQUIPPED WITH THE CRYSTAL BE SURE TO LEAVE XTAL SWITCH IN THE "OUT" POSITION.

TO LOCATE OR INSERT THE 465 KC CRYSTAL, TURN SET BOTTOM SIDE UP AND REMOVE THE TWO SCREWS HOLDING THE SMALL FLAT COVER.

METER ZERO SET With the Antenna terminal grounded (or the AVC switch in the "OFF" position) turn this control until the "R" Meter hand rests at the 0 point. This will establish accurate readings on this meter.

THE RF GAIN varies the sensitivity of the receiver and under certain conditions is used in conjunction with THE AF GAIN Control to obtain a suitable "signal to noise" ratio.

THE HEADPHONE JACK at the back of the chassis cuts out the regular speaker from the circuit when the plug is inserted.

THE SEND-RECEIVE SWITCH opens the cathode circuits of the RF and IF stages for "standing by".

THE AVC SWITCH should be in the OFF position for reception of C.W.

THE POWER OUTPUT will be about 4.2 watts, undistorted.

GENERAL INFORMATION

For each band there is a Radio Frequency stage with individual coils for the RF Oscillator and Mixer stages for each band.

Ceramic coil forms are used on the high frequency band. Ceramic trimmers are used throughout. The unused coil secondaries of the lower frequency bands are shorted as the band switch is shifted to the higher bands.

The tubes are accessible by removing two screws holding screen to back of cabinet.

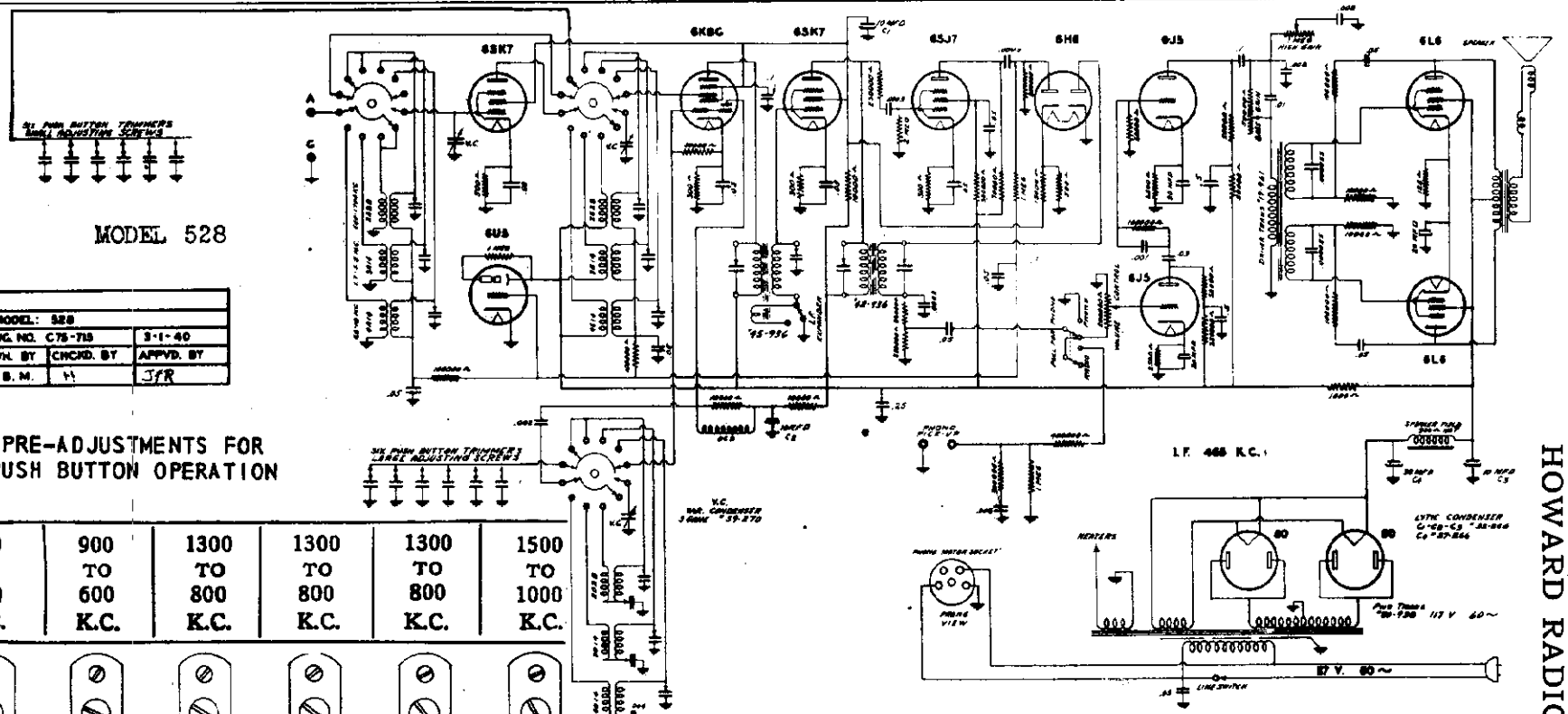
The Intermediate Frequency is 465 KC. The Crystal input, Crystal output, and the 2nd IF consist of windings wound on iron cores.

The chassis dimensions are such that the model is adaptable to a standard panel rack.

THE FREQUENCY MONITOR ADJUSTMENTS

The electrical alignment of this circuit has been set at the factory and under no circumstances should any changes be attempted since there will be no necessity for any change.

For correct calibration see that the Frequency Monitor Dial, when rotated to the lower frequency, stops at the last line above 850 with the condenser at full capacity. If necessary, adjust scale by shifting drum on condenser shaft by loosening hub set screws.

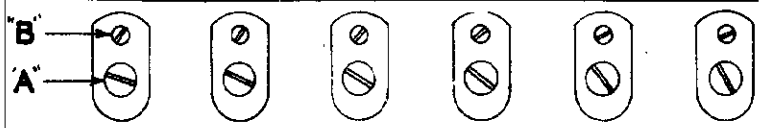


MODEL 528

MODEL: 528		
DWG. NO. C75-719		3-1-40
DWN. BY	CHCKD. BY	APPVD. BY
R. B. M.		JfR

PRE-ADJUSTMENTS FOR PUSH BUTTON OPERATION

700 TO 540 K.C.	900 TO 600 K.C.	1300 TO 800 K.C.	1300 TO 800 K.C.	1300 TO 800 K.C.	1500 TO 1000 K.C.



MODEL 700. SEE INDEX FOR OTHER DATA

(1) Leave set turned on at least twenty minutes allowing receiver circuits to reach their normal operating condition before starting push button adjustment.

(2) Remove screws holding escutcheon plate for push buttons.

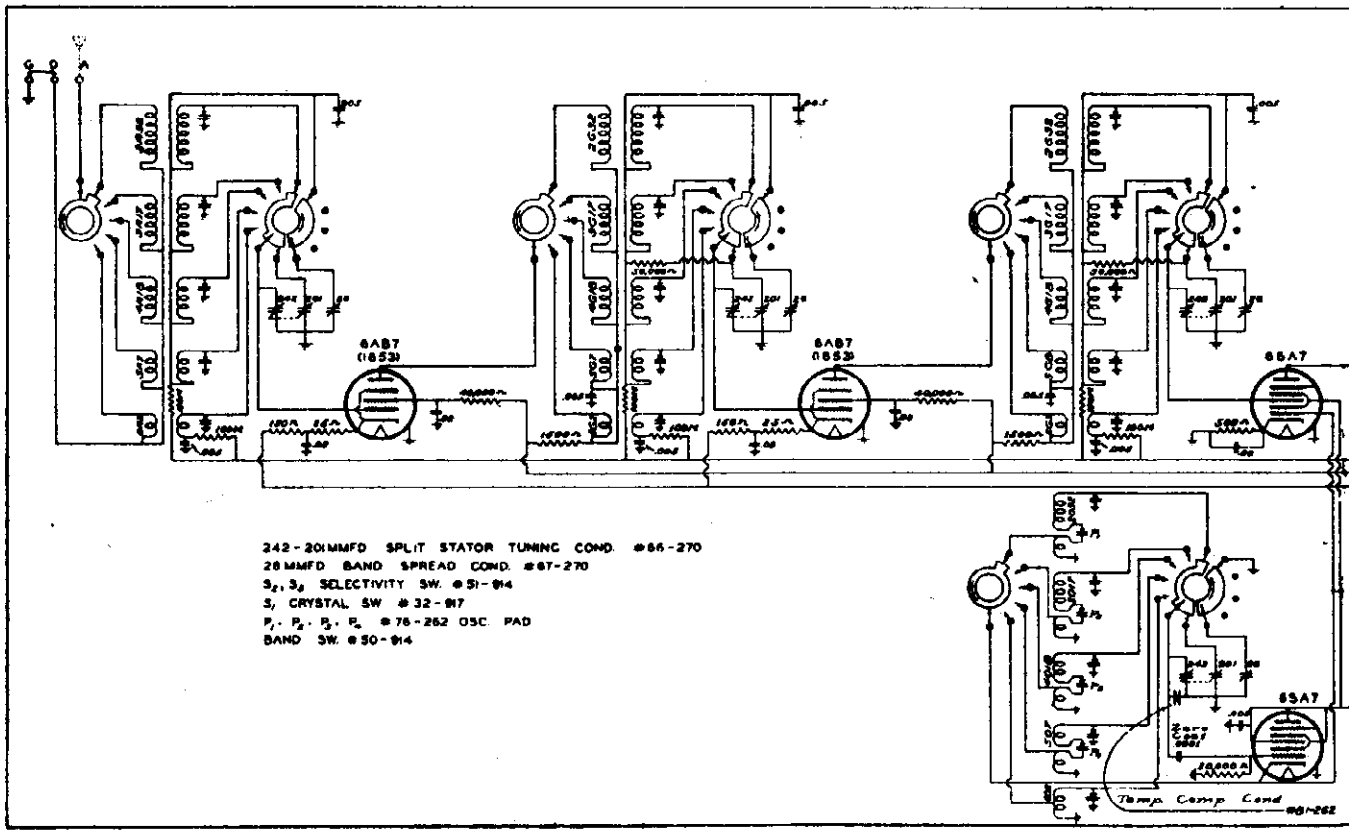
(3) Note the ranges shown on label above adjusting screws. For example: 700 to 540 KC means you should adjust this set of screws for any station having a frequency between 700 and 540 KC. This rule applies for the other five ranges. There is, of course, some overlapping of range coverage.

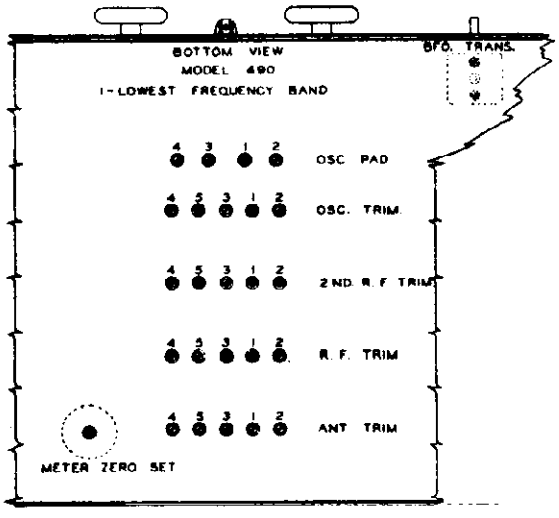
(4) Select a station by manual tuning in the regular way. Assuming it is within the 700 to 540 KC range, turn Band Switch to "Push Button" position and push in on button

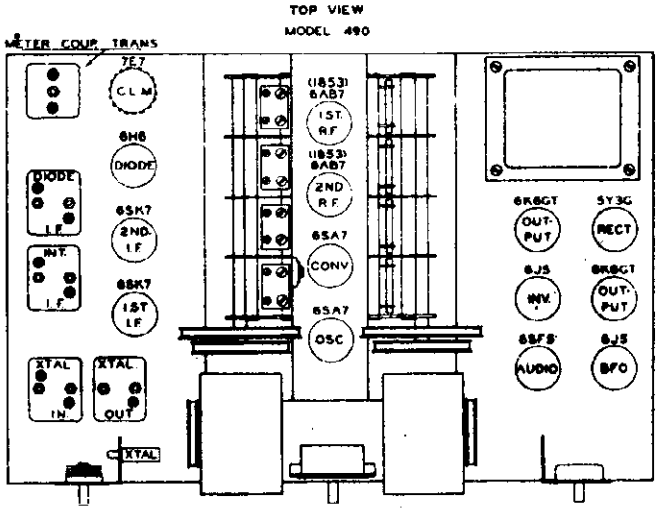
As will be noted, the adjustments consist of two screws, one with a large head (A) and one with a small head (B). With a small screw driver, turn screw "A" back and forth until you locate the station. It is suggested that you switch back to manual tuning if necessary to recognize the particular type program to help you find it when you again turn the adjusting screw.

After the "A" Screw has been set to exact resonance by watching the tuning eye deflection, turn the small screw "B" for the maximum deflection of the tuning eye. Now recheck screw "B". When all six buttons have been set, repeat the "trimming" process for accuracy.

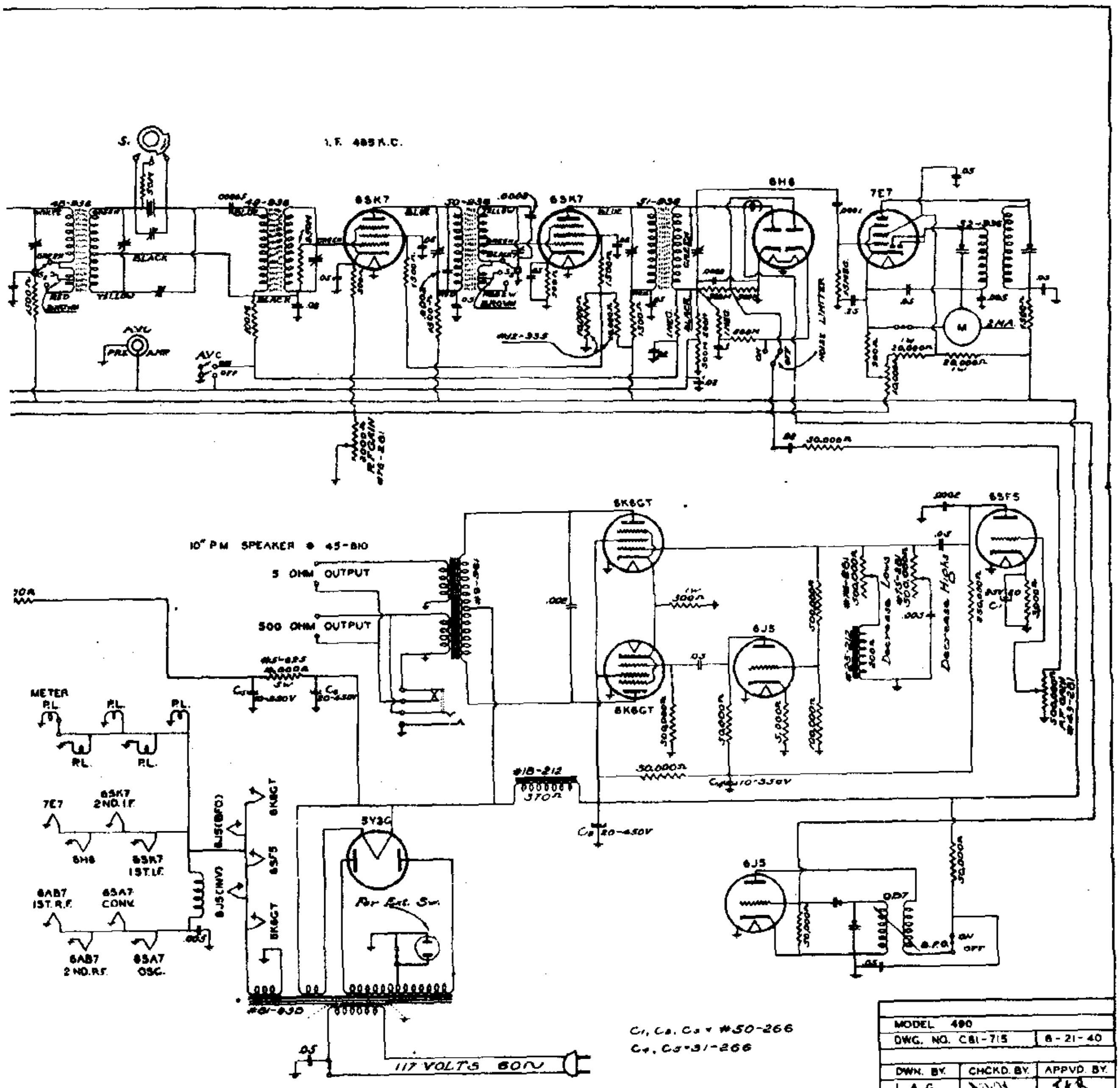
IT WILL BE OF IMPORTANCE TO NOTE THAT IF THE STATION CANNOT AT FIRST BE LOCATED BY MOVING SCREW "A" IN AND OUT, PERHAPS YOU WILL FIND ADJUSTMENT "B" TOO FAR IN OR TOO FAR OUT. In such a case, check its position by turning it in all the way (to the right) then reverse it about a


6AB7
(1853)
6AB7
(1853)
6SA7
6SA7
242-20(MMFD SPLIT STATOR TUNING COND. #66-270
28 MMFD BAND SPREAD COND. #67-270
S2, S3 SELECTIVITY SW. #51-914
S1 CRYSTAL SW #32-917
P1, P2, P3, P4 #76-262 OSC. PAD
BAND SW. #50-914
Temp. Comp. Cond.


BOTTOM VIEW
MODEL 490
1-LOWEST FREQUENCY BAND
BFO. TRANS.
OSC. PAD
OSC. TRIM
2ND R.F. TRIM
R.F. TRIM
ANT. TRIM
METER ZERO SET


TOP VIEW
MODEL 490
METER COUP. TRANS
7E7
C.L.M.
6H6
DIODE
DIODE
I.F.
INT.
I.F.
6SK7
2ND
I.F.
6SK7
1ST
I.F.
XTAL
IN
XTAL
OUT
XTAL
(1853)
6AB7
1ST
R.F.
(1853)
6AB7
2ND
R.F.
6SA7
CONV.
6SA7
OSC.
6R8GT
OUT-
PUT
5Y3G
RECT.
6J5
INV.
6R8GT
OUT-
PUT
6SF5
AUDIO
6J5
BFO

RADIO CO.


I.F. 465 K.C.
6SK7
6SK7
6H6
7E7
AVC
PRE AMP
NOISE LIMITER
6K6GT
6K6GT
6SF5
6J5
6J5
10" P.M. SPEAKER # 45-810
5 OHM OUTPUT
500 OHM OUTPUT
Decrease Lows
Decrease Highs
METER
P.L.
7E7
6SK7 2ND. I.F.
6H6
6SK7 1ST. I.F.
6AB7 1ST. R.F.
6SA7 CONV.
6AB7 2 ND. R.F.
6SA7 OSC.
6K6GT
6SF5
6K6GT
5Y3G
For Ext. Sw.
#18-212
370Ω
30,000Ω
#61-630
117 VOLTS 60~
C1, C2, C3 = #50-266
C4, C5 - 31-266
MODEL 490
DWG. NO. C81-715
8-21-40
DWN. BY
CHCKD. BY
APPVD. BY
L. A. G.

HOWARD RADIO CO.

Align the Intermediate frequency stages at 465 KC.
Reach trimmer through top of shield cans.
Set dial at 1400 KC and adjust oscillator trimmer which is located on front section of variable condenser inside chassis, then peak antenna stage trimmer on back section of variable condenser to 1400 KC.
No adjustment is required at the low frequency end of the dial other than the conventional bending of the split condenser plates.
The tubes are connected in series in the order as shown by the schematic diagram.
The dual section filter condenser has a common negative, but note that it does not return to ground as the can is insulated from the chassis.

SOCKET BOLTAGE READINGS:

Voltage taken from ground with line voltage at - 117 V. AC.
High voltage reading off rectifier = 115 V.
Drop across speaker field = 20 V.
Voltage taken with 1,000 Ohm per volt meter, from cathode return to points as given.

TUBE	FUNCTION	CATHODE	SCR. GRID	PLATE	OSC. PLATE
12SA7	Mixer		95	95	95
12SK7	I.F.Amp.	3.5	95	95	
12SQ7	Det.			45	
50L6GT	Output	6	9	82	

POWER SUPPLY— (Standard Models) = 105-125 V. AC-DC CONSUMPTION 30 WATTS

SEE LABEL ON BACK OF CHASSIS

ANTENNA SYSTEM = Built-in loop on back of cabinet. Available connection (BROWN lead) for outside antenna.

TUNING RANGES = 540-1720 KC (178-550 Meters)

I.F.= 465 KC TYPE = Conventional | POWER OUTPUT - (MAX.) = 1 W. UPO .5 W.

CONTROLS - Tuning, Volume with Power Switch.

TUNING SYSTEM =

String Drive, Airplane dial

SPEAKER = Electro-dynamic | SIZE = 5" | V.C.IMP.(400CPS) = 5 Ohms | FIELD = 450 Ohms

REPLACEMENT PARTS LIST

Part No.	DESCRIPTION
	CONTROLS
69-281	Volume
	CONDENSERS
62-270	Tuning
47-266	Filter,20-30 mfd.150,150 Volt
	COIL ASSEMBLIES
L-21	Ant. Loop
2030	Osc.Coil 175-555 Meters (1700-540 KC)
22-936-3	1st I.F. Assembly Complete
23-936	Last I.F.Assembly Complete
	CABINETS
79-188	Plastic
	DIAL & CONTROL PARTS
129-310	Calibrated Dial Plate or Scale
1-288	Drive string
4-498	Dial Lamp-Bayonet type
28-427	Dial Window
39-829	Spring for drive cord tension
35-448	Tuning hand
60-720	Shaft - Tuning
	KNOBS
48-490	Tuning Hand Control
	LINE CORDS
1-290	Standard
	MISCELLANEOUS
6-167	Rubber Drive Washers
	SOCKETS, JACKS, CONNECTORS
23-771	Tube Sockets (Octal moulded)
18-768	Dial Lamp Socket-Bayonet type
	SPEAKERS (Specify Manufacturer)
11-805	Table Model Speaker
11-805T	Transformer for above
11-805C	Cone for above

HOWARD RADIO CO.

MODEL 718-FM
MODEL 718-FM Series

GENERAL SPECIFICATIONS

14 Tube, 4 Band, Frequency Modulation, R.F. Stage and Loop for Broadcast band only, Mechanical Push-Button Tuning with declutching system, Built-in Phono Switch, Bass Boost, Treble Control, Beam Power Output, Inverse Feed-Back, 6 Ohm Voice Coil, Power Consumption 115 Watts, Alternating Current only.

THIS SHEET INCLUDES:

- Socket voltage chart (also indicates tube function).
- Alignment chart with pictorials showing trimmer and tube locations.
- Replacement parts list with list prices.
- Schematic diagram.
- SEE FORM 31-480 for dial mechanism.

SOCKET VOLTAGE READINGS FOR MODEL 718-FM

* Socket Terminal Number

Voltage taken from ground with voltage at 117 Volts AC. Drop across speaker field 65 V. Use at least a 1000 Ohm per Volt Meter. High voltage reading off rectifier 315 V. DC.

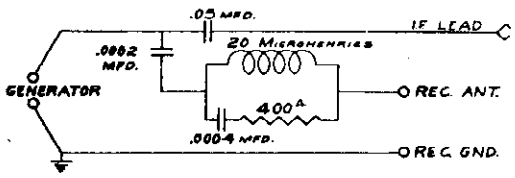
TUBE	FUNCTION FOR 718 FM / Series X only	CATH.	*	SG.		PLATE			
6SK7	R. F. Amp.	2	5	92	6	230	8		
6SA7	Converter		6	92	4	220	3		
6AC7	1st I. F.	2	5	155	6	225	8		
6AC7	2nd I. F.	2	5	155	6	210	8		
6SJ7	Limiter		5	55	6	95	8		
6H6	FM Des-Det.								
6H6	AM Det.								

TUBE	FUNCTION	CATH.		SG.		PLATE			
6SF5	A. F.					55	5		
6SF5	Bass Boost					115	5		
6U5	Tuning eye					230			
6J5	Inverter	8	8			160	3		
6V6GT	Output	16	8	250	4	245	3		
6V6GT	Output	16	8	250	4	245	3		
5Y3G	Rectifier								

ALIGNMENT PROCEDURE FOR 718 FM

EQUIPMENT REQUIRED:

1. SIGNAL GENERATOR to accurately cover the alignment frequencies as shown below.
2. GALVANOMETER 75 microamperes center "0" (Such as Simpson Type 25) USE SERIES RESISTOR of 100,000 Ohms in positive lead. Leads from meter to set to be as short as possible.
3. OUTPUT METER (0 to 3 V. AC if used in voice coil circuit).
4. DUMMY ANTENNA. Although the values as shown in below table for antenna load may be satisfactory, we urgently recommend the circuit as shown at the right to properly take care of the various frequencies to accomplish the correct alignment.



START ALIGNMENT WITH:

Treble and Bass controls turned toward left, Volume Control full ON to right and Band Switch in Broadcast position. After checking for pointer travel to last line above 550, set dial to point where there is no interference with generator signal and proceed with AM-IF alignment.

NOTE A: When a re-alignment is made of either the AM I.F. or FM I.F. it should not be necessary to turn the adjustments very far in either direction. The AM I.F. adjustments are reached through holes in the base from underside of chassis. Should the screws be turned too far in, they might fall out of position which would require that the coil be re-assembled. At the other extreme, if the screws are forced too far out, there is danger of breaking the iron cores.

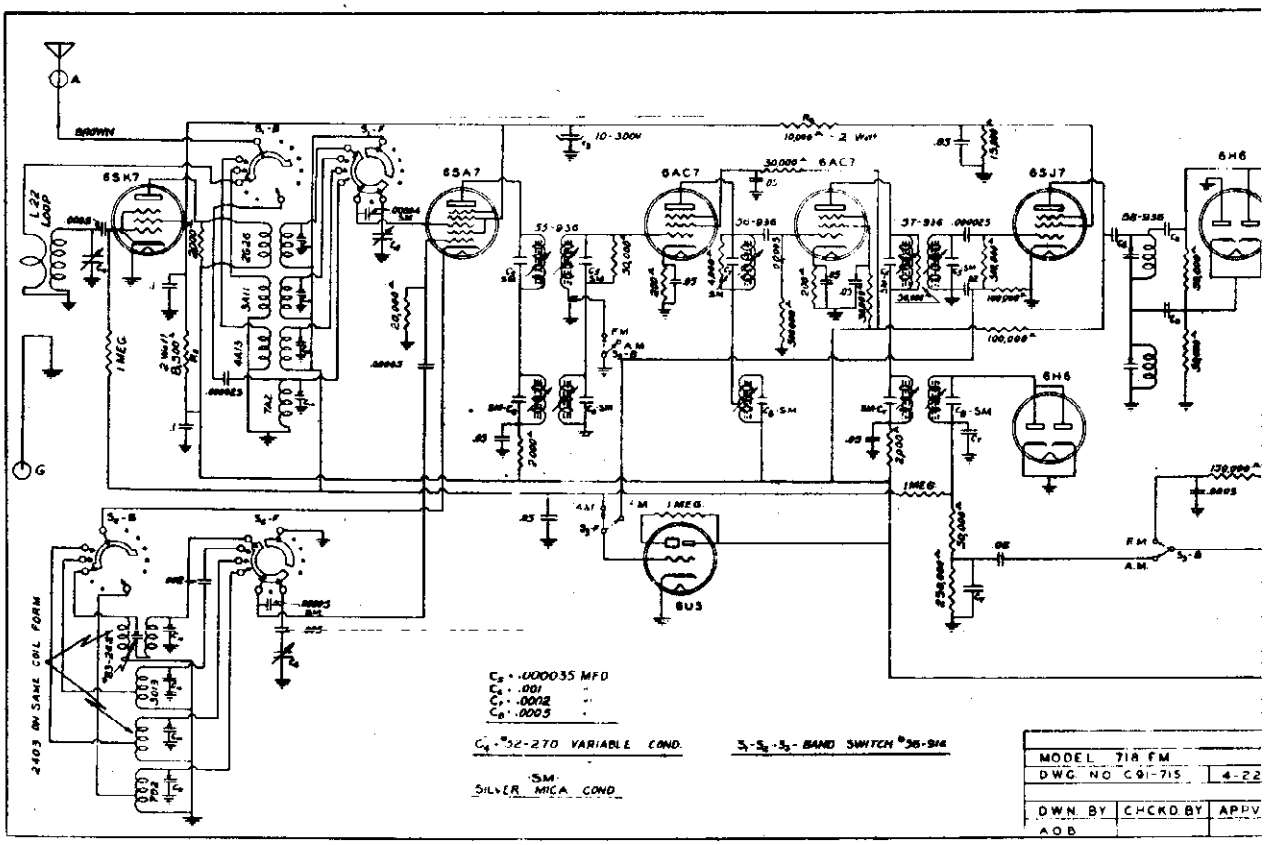
NOTE B: Connect Galvanometer from tap of limiter grid load circuit to ground. See Fig. 1. Adjust for max. current. Normal gain should give deflection (with meter as specified) of 22 with 2,000 to 3,000 microvolt input. Now shift generator frequency each side of 4.3; that is, to 4.2 and 4.4. The drop-in meter deflection should be approximately proportional to change in frequency. If not, recheck alignment.

NOTE C: With Galvanometer connected to FM Detector output (See Fig.1) and Trimmer 11 turned all the way in temporarily, adjust Trimmer 12 for max. deflection at 4.4 M.C. Normal gain should give deflection of 9 with 2,000 to 3,000 microvolts input.

NOTE D: After Trimmer 12 is adjusted to 4.4, adjust Trimmer 11 to zero deflection at 4.3. Then shift generator to 4.2 MC. Meter should then show deflection approximately same as at 4.4 at reverse polarity. If the I.F. circuits are ever readjusted, always recheck detector afterwards.

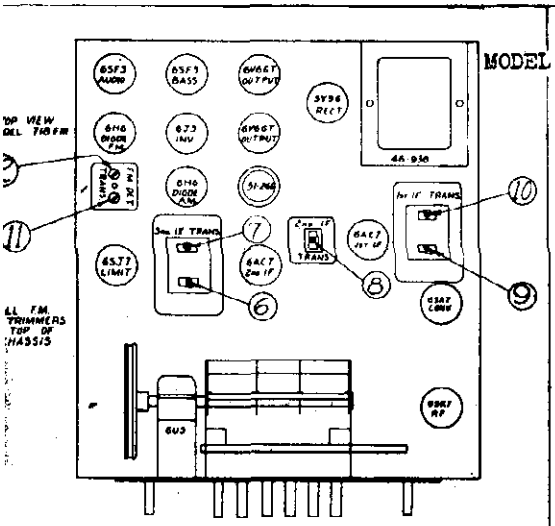
NOTE E: Peak for greatest deflection of output meter.

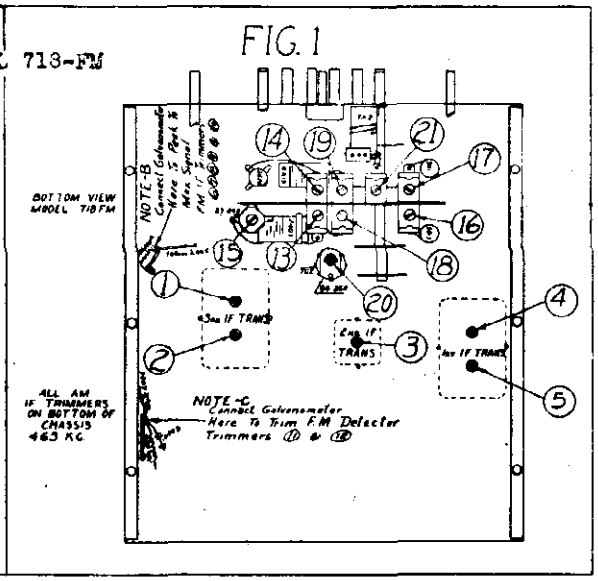
DUMMY ANTENNA	SIG.GEN. CONNECTION TO	GEN. FREQ.	BAND SW. POSITION	DIAL SETTING	ORDER OF TRIMMER ADJUSTMENTS	TRIMMER FUNCTION	SEE NOTE
.05 Mfd.	Grid of 6SA7	465 KC	BC	Off Station	See Fig. 1 ①②③④⑤	AM I.F. peak to Max. Output	A
"	Grid of 6SA7 Remove tuned circuit	4.3 MC Unmod.	FM	"	See Fig. 2 ⑥⑦⑧⑨⑩	FM I.F. - See Fig. 1 Galvanometer Position	B
"	"	4.4 MC Unmod.	FM	"	Turn ⑪ down tight - then adjust ⑫	See Fig. 2 FM Detector	C
"	"	4.3 MC Unmod.	FM	"	After ⑫, adjust ⑪ for zero deflection	See Fig. 2 FM Detector	D
400 OHM Resistor	"A" Antenna Post	1400 KC	BC	1400 KC	See Fig. 1 ⑬ then ⑭	BC Osc. and RF	E
"	"	600 KC	BC	600 KC	⑮ Rock Dial	BC Osc. Pad	E
"	"	5 MC	Police	5 MC	⑯ then ⑰	Osc. - Ant. Check image at 4.1	E
"	"	16 MC	SW	16 MC	⑱ then ⑲	Osc. - Ant. Check image at 15.1	E
"	"	48 MC 8th Har. of 6 MC	FM	48 MC	⑳ then ㉑	FM Osc. - Ant.	E



DIO CO.

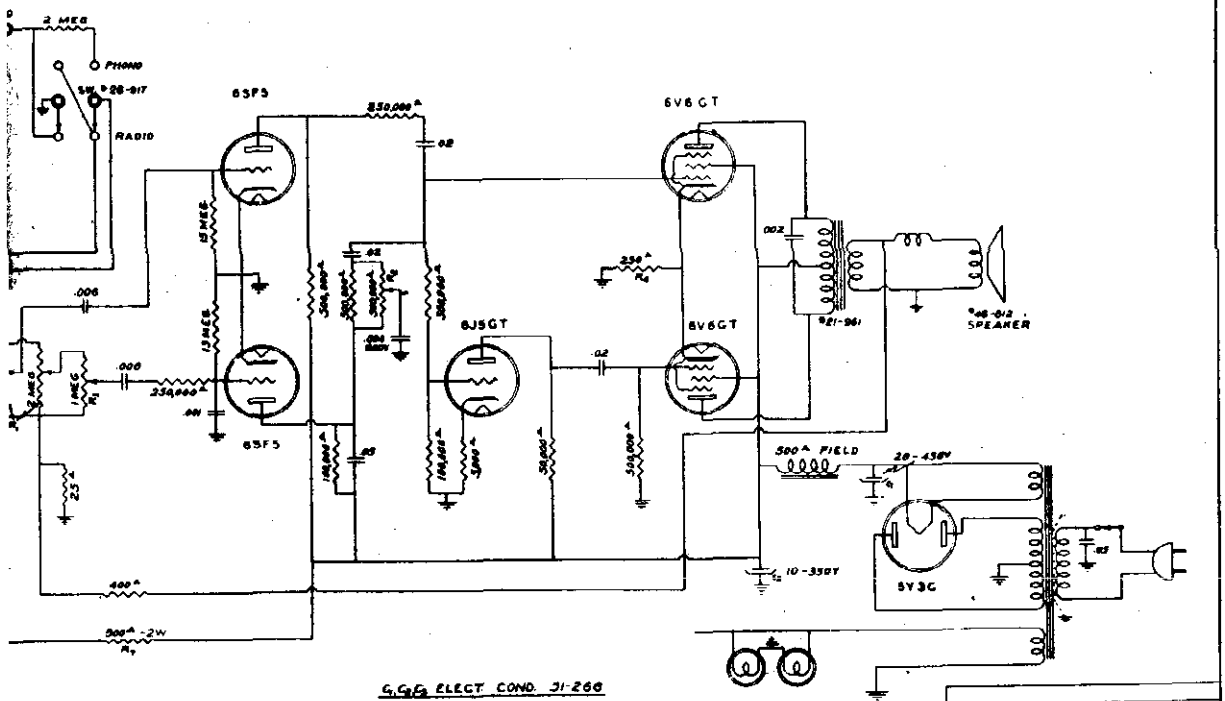
MODEL 718-FM
MODEL 718-FM, Series X





ment for 718 FM series X same as for 718 FM except for these trimmer nos. 16 to 24.

) ohm le	"A" Ant. Post	5 MC	Police	5 MC	(16) (17) (18)	Osc. - RF - Ant. Check image at 4.1	E
"	"	16 MC	S.W.	16 MC	(19) (20) (21)	Osc. - RF - Ant. Check image at 15.1	E
"	"	48 MC 8th Har. of 6 MC	FM	48 MC	(22) (23) (24)	FM Osc.- RF - Ant	E

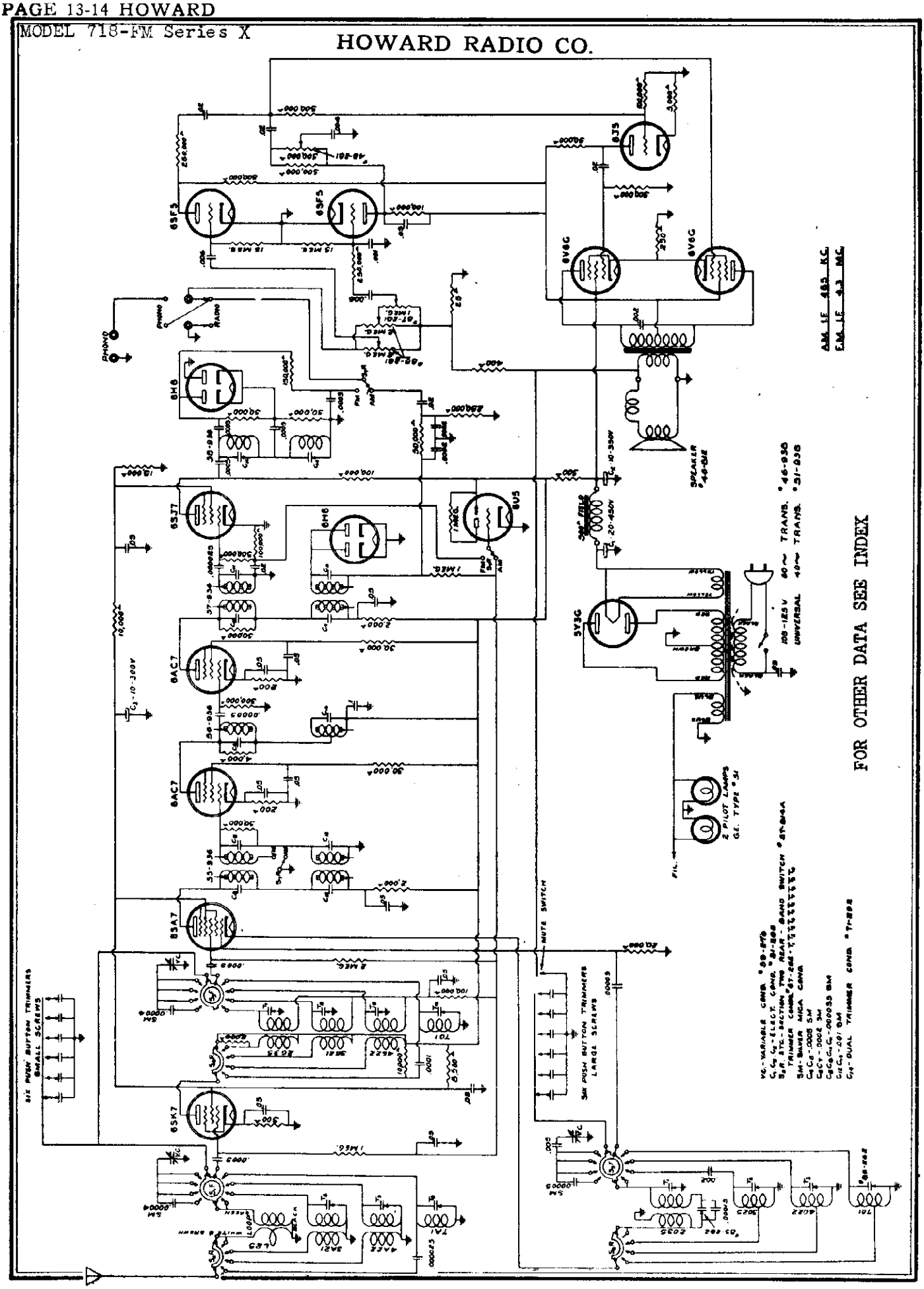


DEL 718-FM

MODEL 718 FM	
DWG NO C91-715	
DWN BY AOB	CHCKD BY
	APPVD BY JFH

MODEL 718-FM Series X

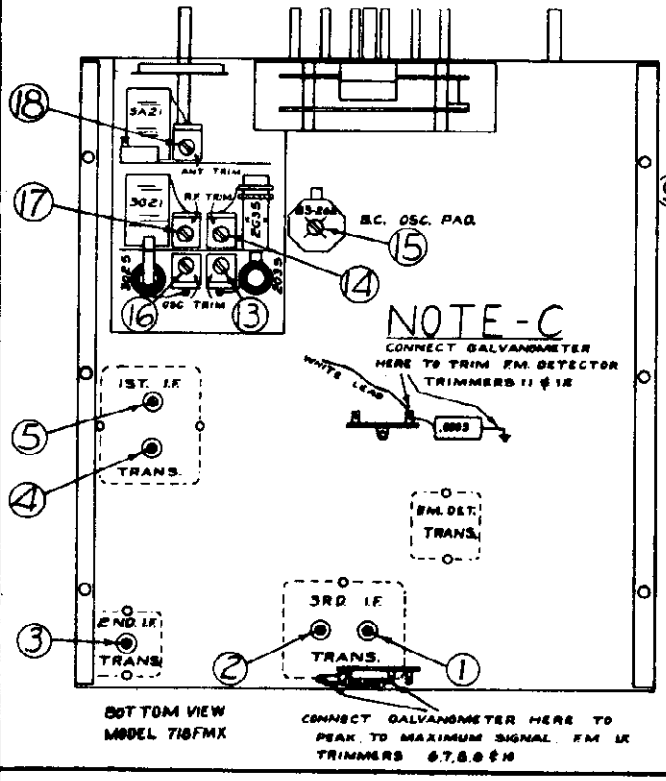
HOWARD RADIO CO.

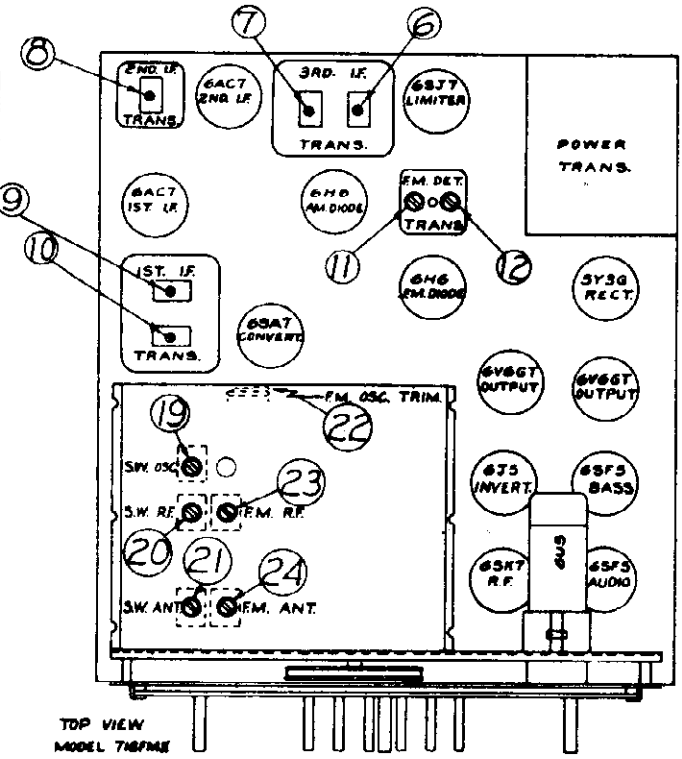


HOWARD RADIO CO.

MODEL 718-FM Series X
MODEL 806
MODEL 808 Spread Band

MODEL 718-FM SERIES X



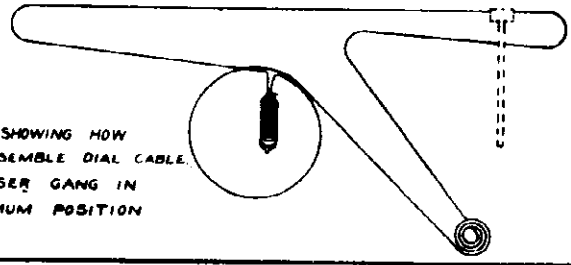


MODEL 308 SPREAD BAND

Voltage taken at 117 Volts A.C. Drop across speaker field 55V. Use 100 ohms per Volt meter. High Voltage of rect. 320VDC.

TUBE	FUNCTION	CATH.	*	SG.	*	PLATE	*		*
6SD7GT	R.F.	2 & 5	* 5	108	* 6	260	* 8		*
6SA7	Converter		6	108	4	260	3		
6SK7	I.F.	3	5	108	6	250	8		
6SQ7	Det.					92	6		

TUBE	FUNCTION	CATH.	*	SG.	*	PLATE	*		*
6J5	Inverter	8	* 8		*	170	* 3		*
6K6GT	Output	18	8	265	4	255	3		
6K6GT	Output	18	8	265	4	255	3		
5Y3GT	Rectifier								



TUBE	FUNCTION	CATH.	*	SG.	*	PLATE	*
6SD7	R.F.	2 & 4.2	* 5	90	* 6	235	* 8
6SA7	Converter	-	6	90	4	270	3
6SK7	I.F.	3	5	90	6	260	8

TUBE	FUNCTION	CATH.	*	SG.	*	PLATE	*
6SQ7	Det.		*		*	90	* 6
6V6GT	Output	13	8	270	4	258	3
5Y3GT	Rectifier	MODEL 806					

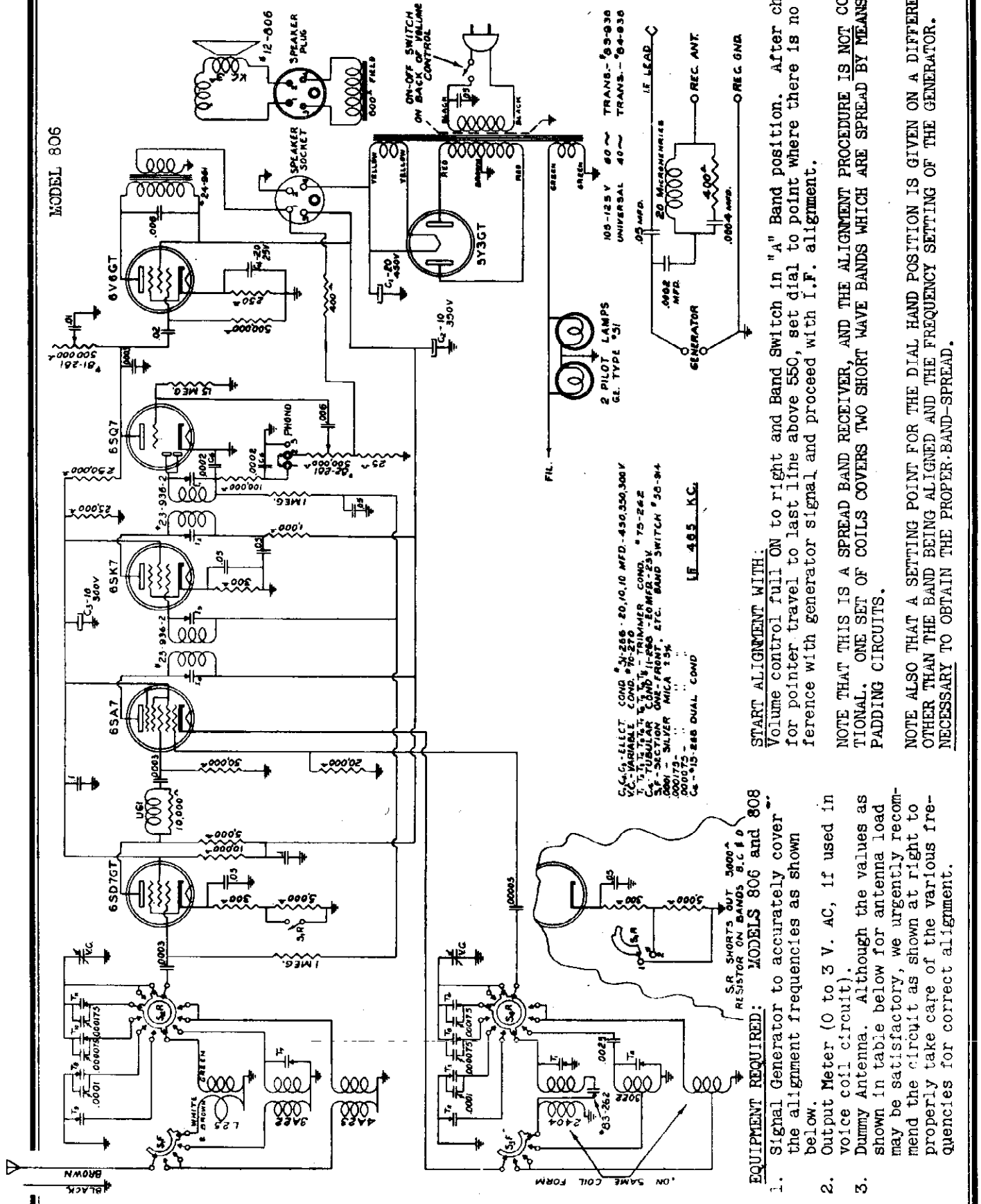
SOCKET VOLTAGE READINGS FOR MODEL 806

* Socket Terminal Number

Voltage taken from ground with voltage at 117 Volts AC. Drop across speaker field 44 V. Use at least a 1000 ohm per Volt Meter. High Voltage reading off rectifier 314 V. DC.

MODEL 806
MODEL 808

HOWARD RADIO CO.



START ALIGNMENT WITH:
Volume control full ON to right and Band Switch in "A" Band position. After checking for pointer travel to last line above 550, set dial to point where there is no interference with generator signal and proceed with I.F. alignment.

NOTE THAT THIS IS A SPREAD BAND RECEIVER, AND THE ALIGNMENT PROCEDURE IS NOT CONVENTIONAL. ONE SET OF COILS COVERS TWO SHORT WAVE BANDS WHICH ARE SPREAD BY MEANS OF PADDING CIRCUITS.

NOTE ALSO THAT A SETTING POINT FOR THE DIAL HAND POSITION IS GIVEN ON A DIFFERENT BAND OTHER THAN THE BAND BEING ALIGNED AND THE FREQUENCY SETTING OF THE GENERATOR. THIS IS NECESSARY TO OBTAIN THE PROPER BAND-SPREAD.

EQUIPMENT REQUIRED: MODELS 806 and 808

1. Signal Generator to accurately cover the alignment frequencies as shown below.
2. Output Meter (0 to 3 V. AC, if used in voice coil circuit).
3. Dummy Antenna. Although the values as shown in table below for antenna load may be satisfactory, we urgently recommend the circuit as shown at right to properly take care of the various frequencies for correct alignment.

HOWARD RADIO CO

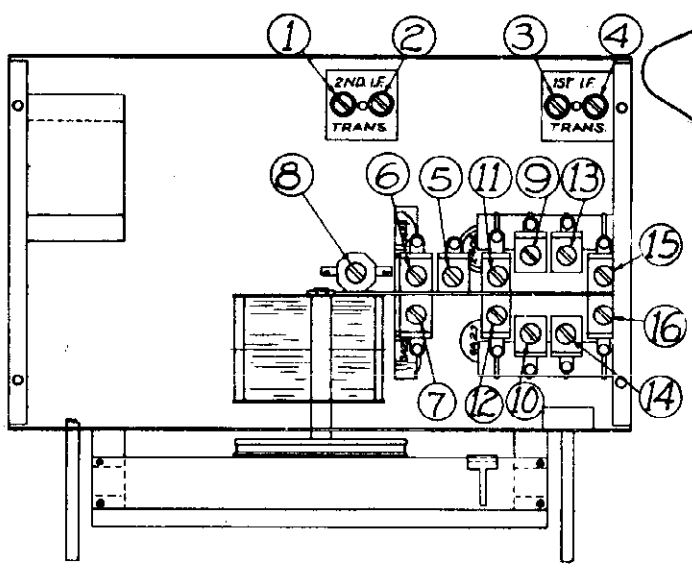
MODEL 806
MODEL 808 Spread Ban

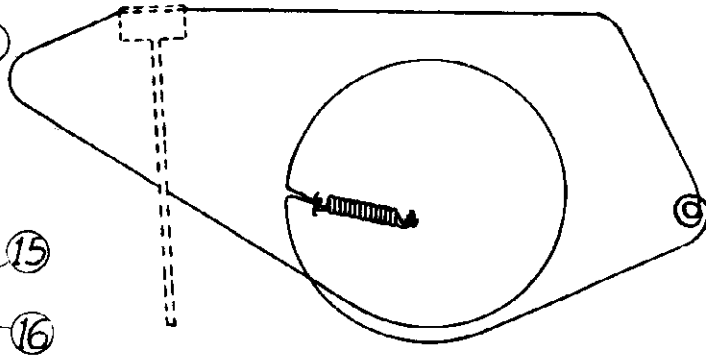
DUMMY ANTENNA	SIG. GEN. CONNECTION TO	GEN. FREQ.	BAND SW. POSITION	DIAL SETTING	ORDER OF TRIMMER ADJUSTMENTS	TRIMMER FUNCTION	SEE NOTE
.05 Mfd.	Grid of 6SA7	465 KC	"A" Band	Off Station	See Pictorial ① ② ③ ④	I. F. peak to max. output	
400 Ohm Resistor	Ant.	1400 KC	"A" Band	1400 KC	See Pictorial ⑤	BC Osc.	
"	"	600 KC	"A" Band	600 KC	⑧ Rock Dial	BC Osc. Pad.	
"	"	5 MC	"B" Band	5 MC	⑥ then ⑦	Pol.Band Osc. - Ant. Check Image at 4.1	
"	"	10 MC	"C" Band	15.6 MC on "D" Band	⑨ then ⑩	⑨ Osc. Pad. ⑩ Ant. Pad.	
"	"	12 MC	"C" Band	12 MC	⑪ then ⑫	⑪ Osc. Trimmer ⑫ Ant. Trimmer	
"	"	16 MC	"D" Band	2.4 MC on "B" Band	⑬ then ⑭	⑬ Osc. Pad. ⑭ Ant. Pad.	
"	"	20 MC	"D" Band	20 MC	⑮ then ⑯	⑮ Osc. Trimmer ⑯ Ant. Trimmer	

NOTE 1: The I.F. adjustments are reached through holes in top of cans on under side of chassis.

NOTE 2: Trimmers 11 and 12 set to minimum capacity temporarily; peak 9 and 10. Then peak 11 and 12. Check dial calibration at 9, 10, and 12 MC.

NOTE 3: Trimmers 15 and 16 set to minimum capacity temporarily; peak 13 and 14. Then peak 15 and 16. Check dial calibration at 15, 16, 18, and 20 MC.



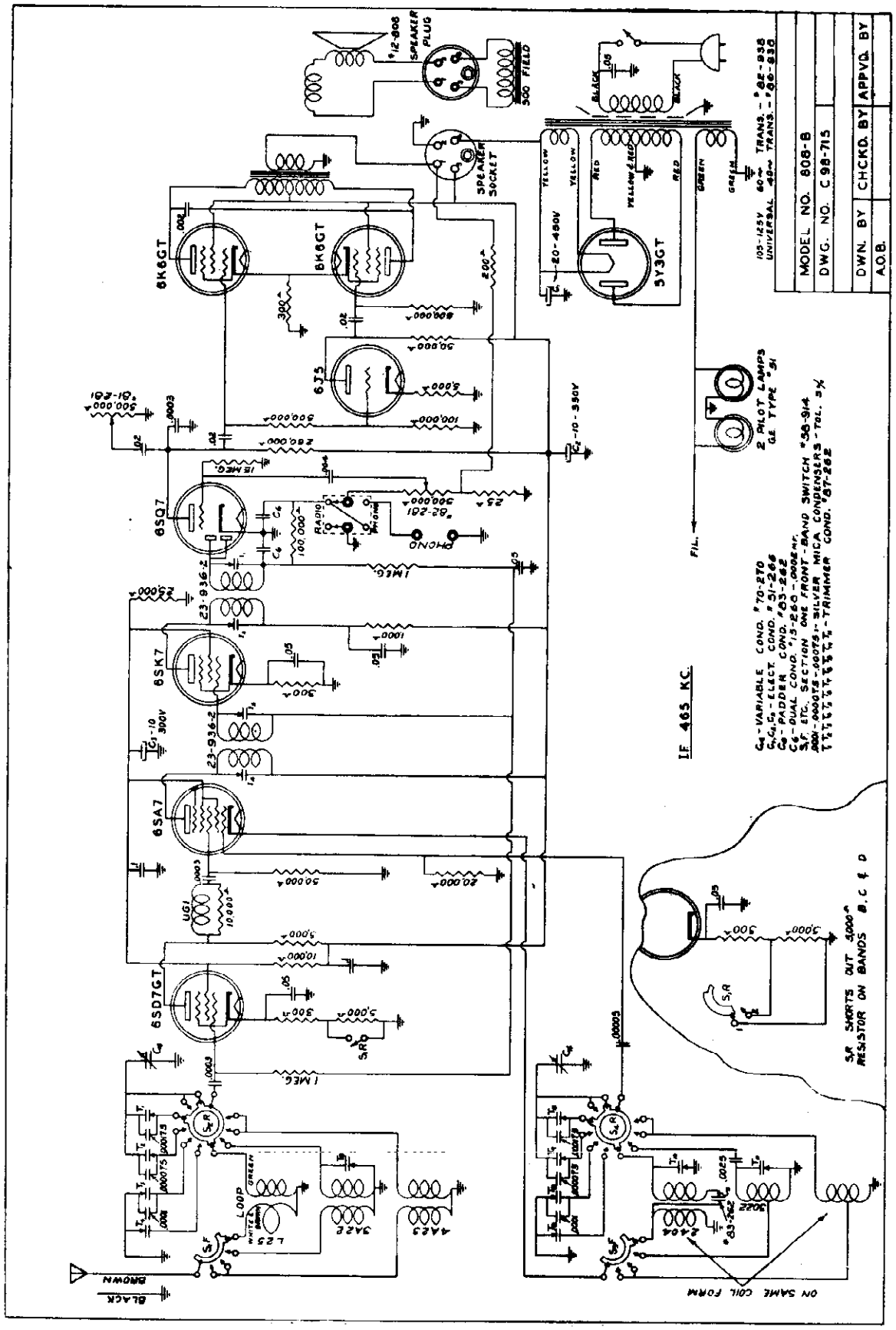


CONDENSER GANG IN MAXIMUM POSITION

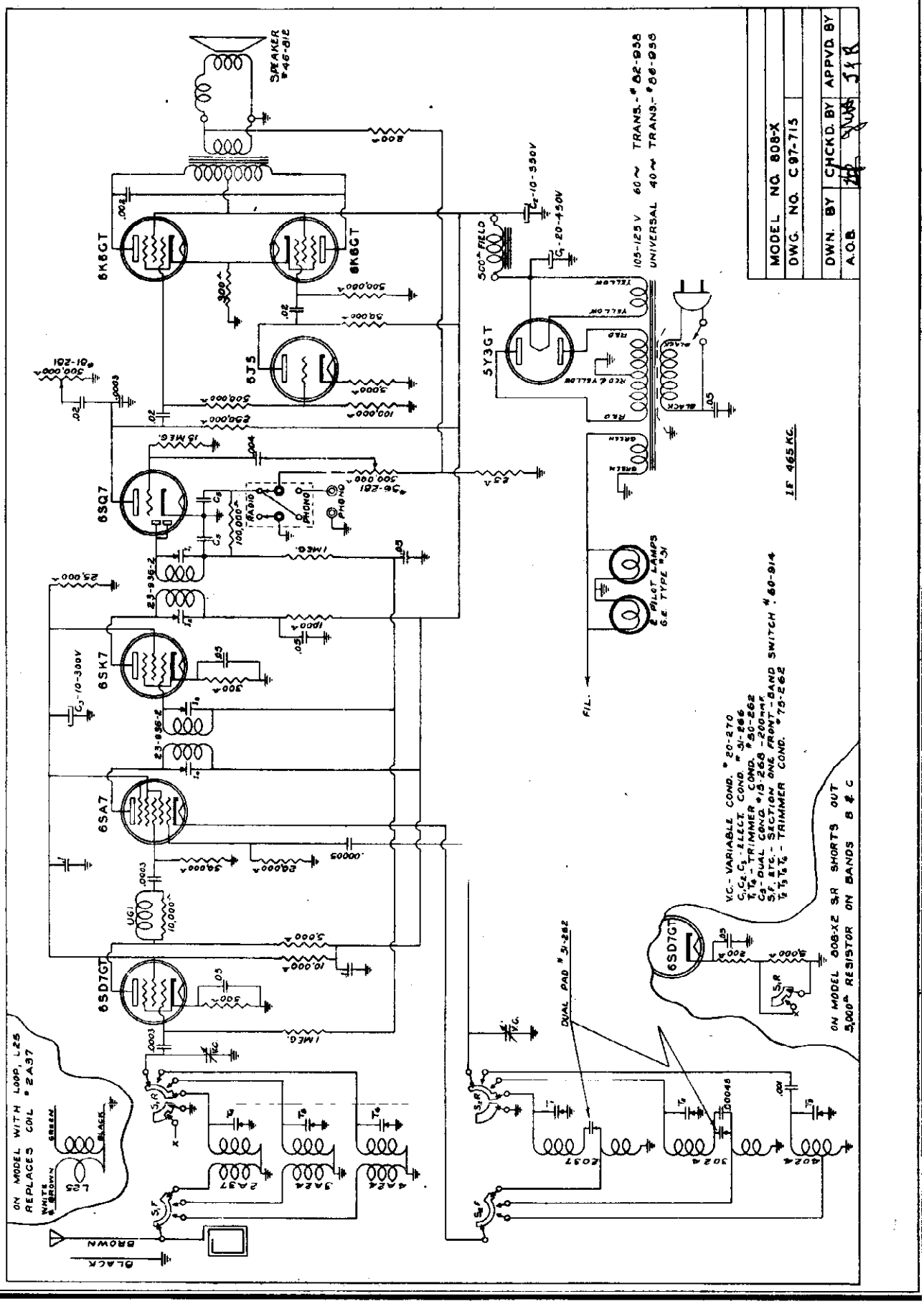
LAYOUT SHOWING HOW TO ASSEMBLE DIAL CABLE ON MODEL 806-808 ETC, VERTICAL MOUNTING.

MODEL 808 Spread Band

HOWARD RADIO CO.



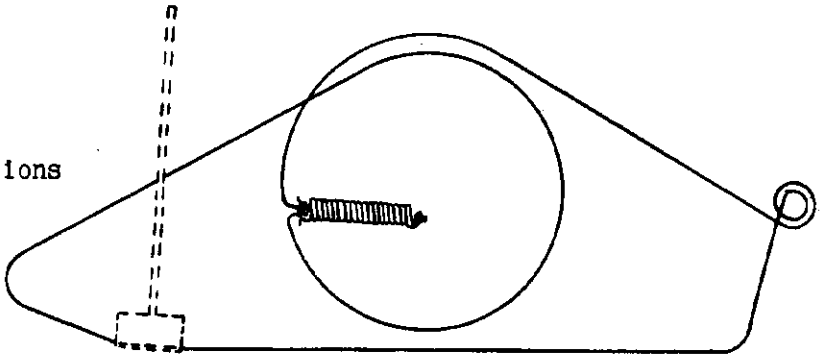
HOWARD RADIO CO.



V.C.- VARIABLE COND. #20-270
C,C₂,C₃ - ELECT. COND. #31-266
T,T₂ - TRIMMER COND. #30-262
C₆ - DUAL CONG. #19-268 - 200mmf.
S.F. ETC. - SECTION ONE FRONT - BAND SWITCH #60-814
T₃ T₄ T₅ T₆ - TRIMMER COND. #75-262

THIS SHEET INCLUDES:

- Socket voltage chart (also indicates tube function).
- Alignment chart with pictorials showing trimmer and tube locations
- Replacement Parts list with list prices.
- Schematic diagram.



SOCKET VOLTAGE READINGS FOR MODEL 808-X
*Socket Terminal Number

Voltage taken from ground with voltage at 117 Volts AC. Drop across speaker field 50V. Use at least a 1000 Ohm per Volt Meter. High voltage reading off rectifier 310 V. DC.

TUBE	FUNCTION	CATH.	*	SG.	*	PLATE.	*	. .	*	TUBE	FUNCTION	CATH.	*	SG.	*	PLATE.	*	. .	*
6SD7GT	R.F.	2.5	5	110	6	250	8			6J5	Inverter	8	8			175	3		
6SA7	Converter		6	110	4	260	3			6K6GT	Output	19	8	260	4	252	3		
6SK7	I.F.	2	5	110	6	255	8			6K6GT	Output	19	8	260	4	252	3		
6SQ7	Det.					85	6			5Y3GT	Rectifier								

Condenser gang in maximum position.

Layout showing how to assemble dial cable on model 808-X-A horizontal mounting.

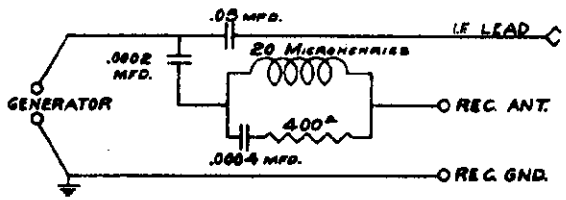
MODEL 808 SERIES X

HOWARD RADIO CO.

ALIGNMENT PROCEDURE FOR 808-X SERIES

Before starting alignment see that the tuning hand falls exactly on the last line above 550 when the condenser is at full capacity.

DUMMY ANTENNA. Although the values as shown in below table for antenna load may be satisfactory, we urgently recommend the circuit as shown at the right to properly take care of the various frequencies to accomplish the correct alignment.

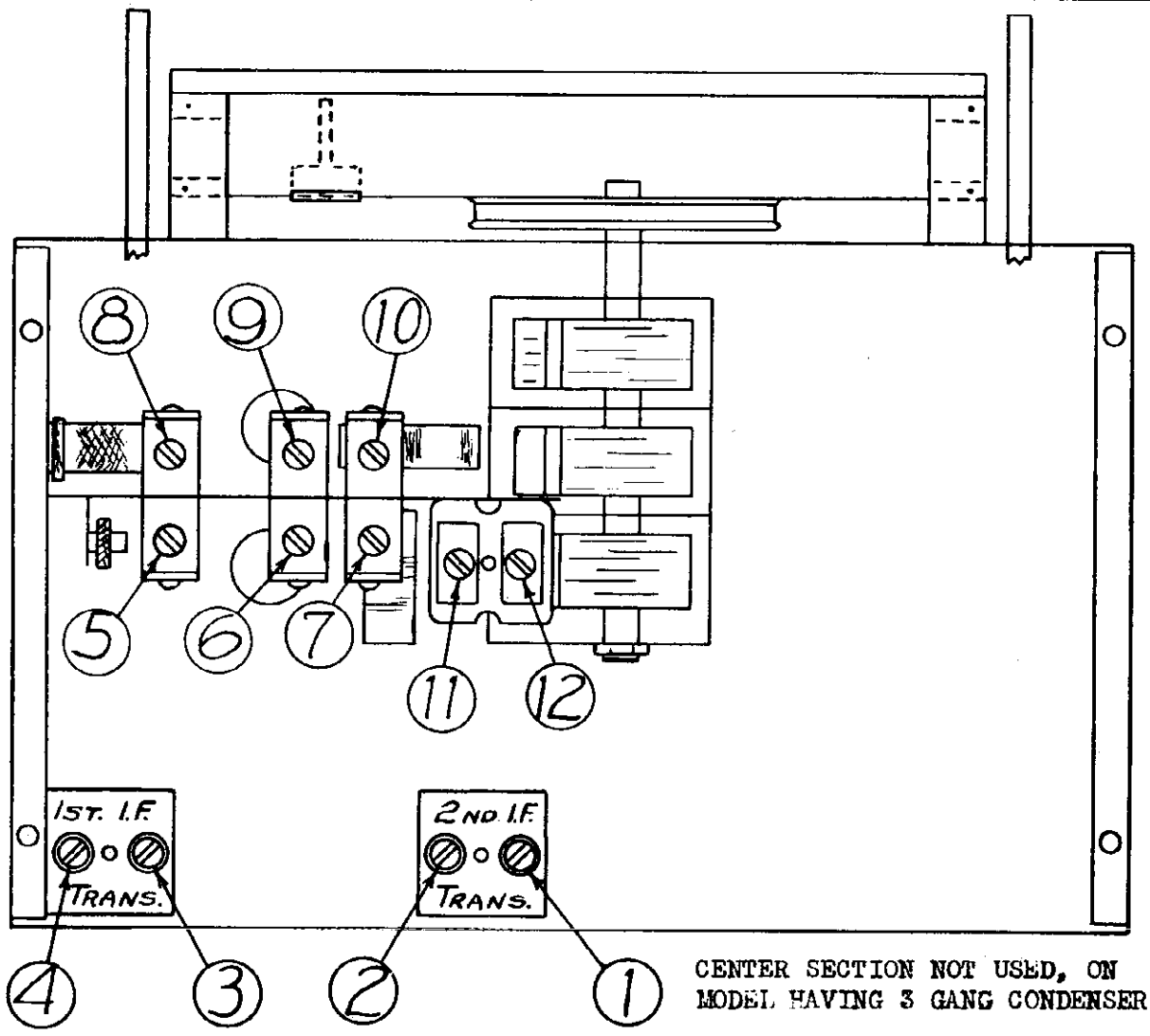


Note 1: The IF adjustments are reached through holes in top of cans on underside of chassis.

Note 2: Peak for greatest deflection of output meter

HOWARD RADIO CO.

DUMMY ANTENNA	SIG;GEN. CONNECTION TO	GEN. FREQ.	BAND SW. POSITION	DIAL SETTING	ORDER OF TRIMMER ADJUSTMENTS	TRIMMER FUNCTION	SEE NOTE
.05 Mfd.	Grid of 6SA7	465 KC	A	Off Station	See Pictorial ①②③④	I. F. Peak to Max. Output	1
400 Ohm Resistor	Brown Lead	1400 KC	A	1400 KC	See Pictorial ⑤ then ⑧	BC Osc. and Ant.	2
"	"	600 KC	A	600 KC	See Pictorial ⑪ Rock Dial	BC Osc. Pad.	2
"	"	6 MC	B	6 MC	See Pictorial ⑦ then ⑩	Pol. Band Osc. & Ant. Check Image at 5.1	2
"	"	3 MC	B	3 MC	See Pictorial ⑫ Rock Dial	Pol. Band. Osc. Pad	2
"	"	21 MC	C	21 MC	See Pictorial ⑥ then ⑨	SW Osc. and Ant. Check Image at 20.1	2



CENTER SECTION NOT USED, ON MODEL HAVING 3 GANG CONDENSER

GENERAL SPECIFICATIONS

8 Tube, Three Band, Untuned R. F. Stage, Built-in Phono Switch, Treble Control, Inverse Feed-Back, 6 Ohm Voice Coil, 500 Ohm Field. Power Consumption, 80 Watts, Alternating Current Only.

MODEL 14 ACB

HOWARD RADIO CO.

TUNING RANGES = 540 to 1700 KC		BATTERY OUTPUT = Max. = 300 MW. UPO = 260 MW.
I. F. = 465 KC	TYPE = Conventional	POWER OUTPUT - (MAX.) = 500 MW. UPO = 300 MW.

CONTROLS - Tuning, Volume with Power Switch, Line cord plugs in back of chassis to close circuit for battery operation.

TUNING SYSTEM = Conventional string drive, airplane type dial.

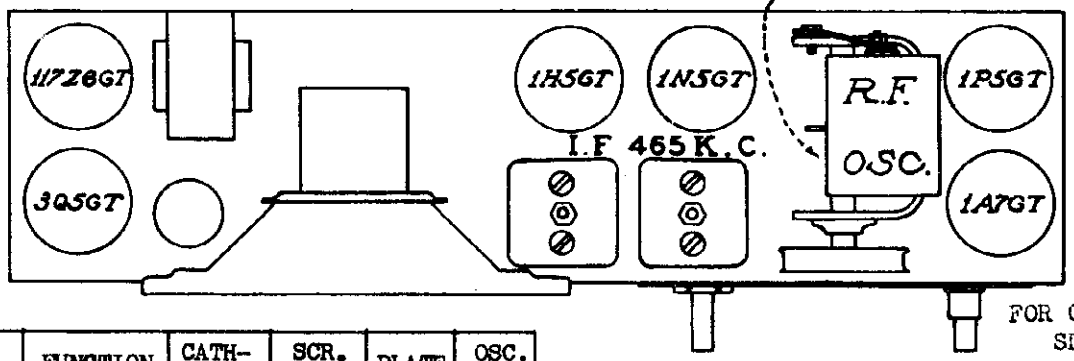
SPEAKER = Permanent Magnet	SIZE = 5"	V.C.IMP.(400CPS) = 3 OHMS	FIELD =

REPLACEMENT PARTS LIST

Part No.	DESCRIPTION
	CHOKE
24-212	"B" filter
	CONTROLS
70-281	Volume
	CONDENSERS
61-270	Tuning
50-262	Single trimmer
47-266	Filter,20-30 mfd. 150,150 V.
48-266	Tubular Electrolytic, 50 mfd. 25 V.
	COIL ASSEMBLIES
L-20	Ant. Loop
2029	Osc. Coil 1700-540 KC.
2G29	R.F. Coil 1700-540 KC.
22-936	1st. I.F. Assembly Complete
23-936	Last I.F. Assembly Complete
	CABINET
77-188	Portable
	DIAL & CONTROL PARTS
130-310	Calibrated Dial Plate
1-288	Drive string
20-427	Dial Window
39-829	Spring for drive cord tension

Part No.	DESCRIPTION
	DIAL & CONTROL PARTS
35-448	Tuning hand
42-720	Shaft - Tuning
	GRILL WORK
9-655	Speaker Screen
	KNOBS
49-490	Tuning Hand Control
	LINE CORDS
1-290	Standard
	RESISTORS
5-335	Candohm Type, 50 Ohm
	SOCKETS, JACKS, CONNECTORS
23-771	Tube sockets (Octal moulded)
22-602	Plug - 2 prong for "A" battery
17-602	Plug - 3 prong for "B" battery
	SPEAKERS (Specify Manufacturer)
P9-805	Table Model Speaker
P9-805T	Transformer for above
P9-805C	Cone for above
	SWITCHES
29-917	Change-Over AC-DC Battery
7-758	TUBE SHIELDS
	MISCELLANEOUS
6-167	Rubber Drive Washers

14 -ACB



FOR OTHER DATA SEE INDEX

TUBE	FUNCTION	CATH-ODE	SCR. GRID	PLATE	OSC. PLATE
1P5GT	RF	—	98	98	
1A7GT	Mixer	—	54	98	98
1N5GT	IF	—	98	98	
1H5GT	2nd Det.	--	--	30	
3Q5GT	Output	—	98	94	

High Voltage off Rect. - 114 V.
Drop across choke - 16 V.
Voltages taken from ground with line voltage of 177 V. AC.

"B" drain at 90 Volts - .0125 A.
"A" drain at 9 Volts - .050 A.

* * * * * * * * * *

All of the tube filaments are connected in series with the exception of the rectifier which has a 117 Volt filament.

A filament current equalizing system is employed using a 2,000 Ohm resistor from the power tube filament to ground and a 600 Ohm in the mixer tube filament circuit. See diagram.

The alignment of this receiver is conventional, the Intermediate Frequency being 465 KC.

The Loop and Oscillator circuits are aligned at 1400 KC. If necessary, the condenser cut plates can be varied at the lower frequencies.

HUDSON MOTOR CAR CO.

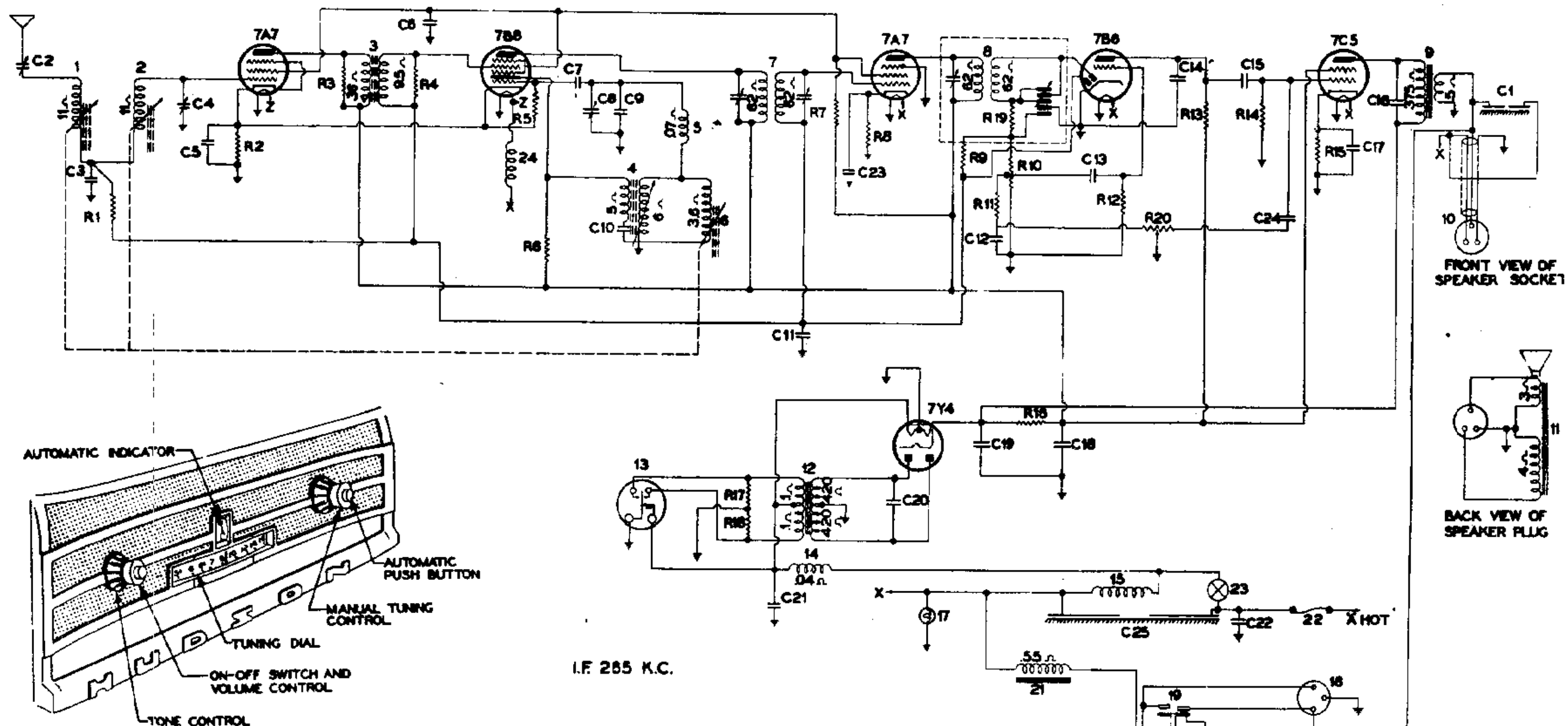


Fig. 2—Operating Controls.

1942 HUDSON AUTOMOBILE RECEIVER

MODEL DB-42 PART No. HA-204800

DWG NO.	PART NO.	CONDENSERS
1	[illegible]	LOW REACTOR
2	[illegible]	[illegible] 250MMF
3	[illegible]	[illegible] MICA
4	[illegible]	[illegible] 50MMF
5	[illegible]	[illegible] 200V
6	[illegible]	[illegible] 400V
7	[illegible]	[illegible] MICA
8	[illegible]	[illegible] 250MMF
9	[illegible]	[illegible]ENSATOR
10	[illegible]	[illegible] MICA
11	[illegible]	[illegible] 200V
12	[illegible]	[illegible] 200V
13	[illegible]	[illegible] 200V
14	[illegible]	[illegible] MICA
15	[illegible]	[illegible] 600V
16	[illegible]	[illegible] 600V
17		[illegible] 25W.V
18	[illegible]	[illegible] 300W.V
19		[illegible] 350W.V
20	[illegible]	[illegible] 1600V
21	[illegible]	[illegible] 120V
22	[illegible]	[illegible] 120V
23	[illegible]	[illegible] 200V
24	[illegible]	[illegible] 200V
25	[illegible]	LOW REACTOR (DUAL 250MMFD.)

DWG NO.	PART NO.	RESISTORS
1	63-598	[illegible]
2	63-265	[illegible]
3	63-645	[illegible]
4	63-646	[illegible]
5	63-594	[illegible]
6	63-607	[illegible]
7	63-957	[illegible]
8	63-294	[illegible] OHMS 1/4 W ± 10%
9	63-271	[illegible] MEG 1/4 W ± 20%
10	63-1248	[illegible] TAP AT 75000Ω
11	63-763	22,000 OHMS 1/4 W ± 10%
12	63-978	15 MEG 1/4 W ± 20%
13	63-596	330,000 OHMS 1/4 W ± 20%
14	63-596	330,000 OHMS 1/4 W ± 20%
15	63-941	390 OHMS 1 W ± 10%
16	63-968	1800 OHMS 2 W ± 10%
17	63-1197	82 OHMS 1/2 W ± 20%
18	63-1197	82 OHMS 1/2 W ± 20%
19	63-712	33,000 OHMS 1/4 W ± 10%
20	63-1248	1 MEG TONE CONTROL

DWG NO.	PART NO.	MISCELLANEOUS
1	S-10064	[illegible]A COIL
2	S-10064	[illegible] COIL
3	S-9762	[illegible] RF TR[illegible]MER
4	S-10095	[illegible]NT COIL
5	20-242	[illegible]ES COIL
6	S-10063	[illegible]NG COIL
7	95-819	[illegible]ANSFOR[illegible]
8	95-820	[illegible]ANSFOR[illegible]
9	95-837	[illegible] TRANSF[illegible]
10	53-228	[illegible] CABLE[illegible]ET
11	49-476	[illegible] & PLUG
12	95-832	[illegible] POWER TRANSFORMER
13	190-19	[illegible]
14	20-213	[illegible]OKE
15	S-5844	[illegible]OISE CHOKE
16		
17	100-32	[illegible]
18	78-406	[illegible]OCKET
19	S-10115	[illegible]LECTOR SWITCH
20	S-10115	[illegible] AUTOM. SET UP
21	S-10127	[illegible]
22	136-12	[illegible]
23	63-1248	[illegible] ON VOL. CONTROL
24	S-9841	[illegible]KE

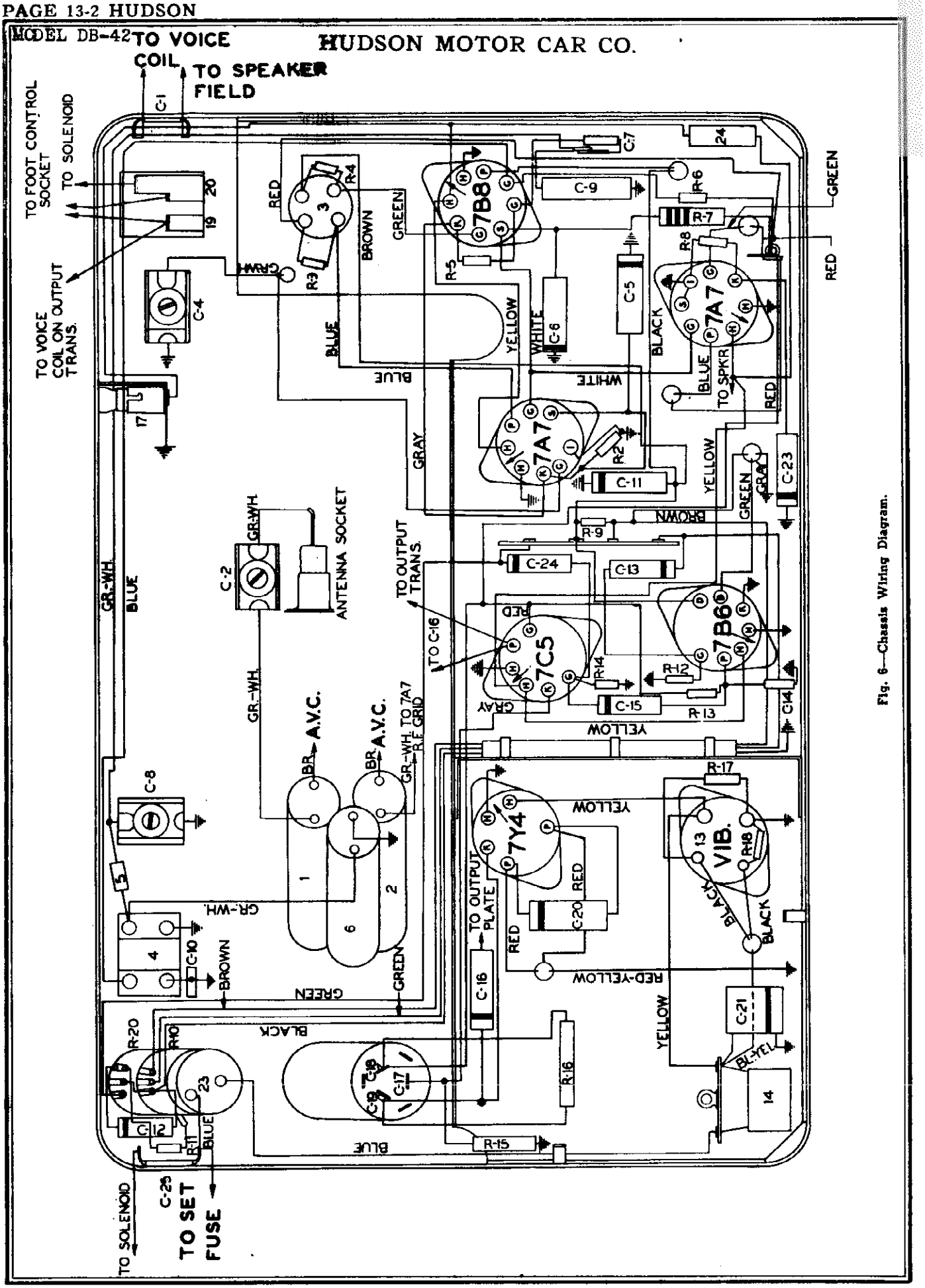


Fig. 6—Chassis Wiring Diagram.

HUDSON MOTOR CAR CO.

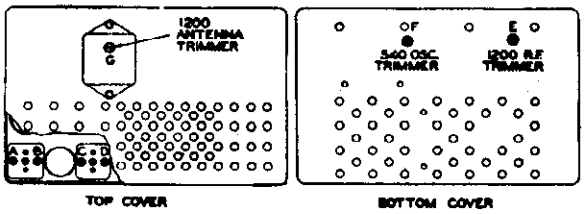


Fig. 4—Trimmer Positions.

ALIGNMENT

CAUTION—Care should be taken while making all adjustments on the receiver to have the volume control turned full on. The signal fed to the receiver through a 30 mmfd. series and 30 mmfd. shunt dummy to the antenna socket of the receiver. The intensity of the signal should be reduced only at the signal generator. Let receiver warm up a while before making adjustments.

I. F.

1. Set signal generator to 265 K.C.
2. Place set in manual tuning position and set dial pointer at 600 K.C.
3. Adjust screws D, C, B and A in sequence for maximum response on the output meter.

R. F.

1. Set signal generator to 540 K.C.
2. Place set in manual tuning position and tune set to the extremity of the dial scale at 540 K.C.
3. Adjust trimmer F, Fig. 4, for maximum response.
4. Set signal generator to 1200 K.C.
5. Tune set to 1200 K.C.
6. Adjust E, Fig. 4, for maximum response.

WARNING: The following adjustments are to be made only if a core or coil is replaced.

OSCILLATOR CORE OR COIL REPLACEMENT ONLY

On all adjustments give set sufficient time to warm up.

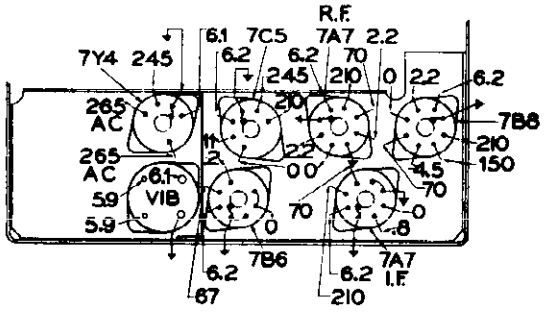
1. Replace coil or core.
2. Set signal generator to 540 K.C.
3. Tune the set to the 540 K.C. end of the dial scale.
4. Adjust core for maximum peak.
5. Back off trimmer F, Fig. 4, to ⅓ of output reading.
6. Repeat operations 4 and 5 until no further gain can be reached by adjusting core.
7. Re-cement core screw with speaker cement.
8. Follow instructions given under general R.F. alignment.

R. F. CORE OR COIL REPLACEMENT ONLY

On all adjustments give set sufficient time to warm up.

1. Replace coil or core.
2. Set the signal generator to 540 K.C.
3. Tune set all the way to low end of 540 K.C. dial scale.
4. Adjust core for maximum response.
5. Back off trimmer (E if R.F. or trimmer G if antenna stage) until output is reduced by approximately one third.
6. Repeat 4 and 5 until no further gain is obtained from core adjustment.
7. Set signal generator to 600 K.C.
8. Tune set to 600 K.C.
9. Adjust trimmer (E if R.F.—G if antenna stage) Fig. 5 for maximum response.
10. Set signal generator to 1400 K.C.
11. Tune set to 1400 K.C.
12. Adjust core for maximum output.
13. Re-cement core screw with speaker cement.
14. Peak set following general instruction given under R.F., alignment.

SOCKET VOLTAGES AS MEASURED WITH 1000 OHM PER VOLT METER TO CHASSIS. VOLUME CONTROL AT MAXIMUM WITH NO SIGNAL. BATTERY 6.3 VOLTS.



NORMAL CURRENT CONSUMPTION-7.0 AMP.

MOMENTARY CURRENT CONSUMPTION OF AUTOMATIC-9.0 AMP.

Fig. 5—Socket Voltages.

MODEL DB-42

HUDSON MOTOR CAR CO.

CIRCUIT: 6 Tube Superheterodyne.
TUBE COMPLEMENT: 7A7 R.F., 7B8 Converter, 7A7 I.F., 7B6 Detector, A.V.C., 1st Audio, 7C5 Beam Power Output, 7Y4 Rectifier. Fig. 1.
TUNING RANGE: 540 to 1600 Kilocycles.
AUTOMATIC POSITIONS: 5 plus "Dial."
SPEAKER: 6" Dynamic externally mounted behind instrument panel. Voice coil impedance 3.2 ohms at 400 cycles. Field resistance 4 ohms cold.
TONE CONTROL: Variable with bass, high fidelity and voice positions.
POWER OUTPUT: Maximum 4.5 watts. Undistorted 1.5 watts.
VIBRATOR: Non-synchronous.
POWER RATING: Current drain 7.5 amperes. Fuse—20 amperes.
TUNING RATIO: 15 to 1.
SENSITIVITY: 5 microvolts overall.
I. F. FREQUENCY: 265 K.C.

TUBE LAYOUT

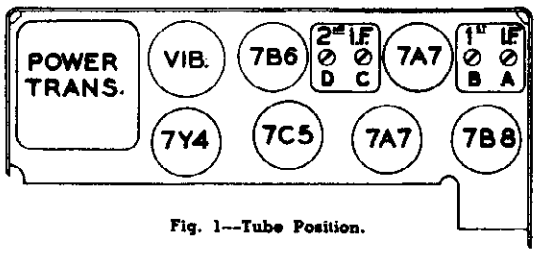


Fig. 1--Tube Position.

Turn receiver on and tune to a weak station near 1200 K.C. (see instruction card.) Adjust antenna trimmer on top of receiver through ash tray opening for maximum volume. Place ash tray back into instrument panel.

SUPPRESSION

Attach condenser, part No. 22-1262 to rear of generator with machine screw and lockwasher provided. Connect condenser lead to generator "A" terminal, Fig. 3-D.

Install suppressor in center hole of distributor cap being sure to make good contact. Place distributor lead in top of suppressor Fig. 3-E.

Mount ignition lock condenser part No. 22-1263 under rear left nut holding ventilator handle guide assembly. Connect the other lead to the "AM" terminal of the ignition lock Fig. 3.

Attach condenser part No. 22-1260 to the upper rear cap screw on the engine water manifold plate and attach the condenser lead to the heat indicator terminal, Fig. 3-F.

Install bonnet grounding spring under hood lacing 23½" to left of center line of car as shown, using no. 8 sheet metal screw Fig. 3-G.

Remove tape from special hole in dash and install flat ground strap from rear cylinder head stud to dash. Fasten it to dash with sheet metal screw and shake proof washer. The ground strap is mounted under the regular stud nut on the eight cylinder cars. The ground strap is placed on top of the regular stud nut on the six cylinder cars and held in place by special nut furnished in kit. Fig. 3-F.

1942 OPERATING INSTRUCTIONS

This radio incorporates the new Hudson Automatic Touch Tuning with Foot Control.

1. TO TURN RADIO ON—Rotate left control knob in a clockwise direction and allow receiver to reach operating temperature. (Approximately 60 seconds.)
2. Press the Automatic Push Button several times or until the word DIAL appears on the Automatic Indicator.
3. MANUAL TUNING — Turn right hand control knob to tune in stations on the tuning dial. Be sure to tune to point where tone is deepest.
4. TONE CONTROL — The tone control knob is located behind the volume control knob. Turn in either direction to most pleasing tone position.
5. VOLUME — Adjust volume control knob to desired level.

AUTOMATIC TUNING

If not previously set up for Automatic operation by the dealer, proceed as follows:

1. Press the Automatic button in the center of the right hand knob, until Number 1 position appears on the Automatic Indicator.
2. Pull the tuning knob OUT to engage the Automatic mechanism.
3. Select the station desired and tune to its corresponding frequency by rotating the tuning knob. Tune very carefully for deepest and clearest reception.
4. Push the tuning knob IN to its original position. Automatic push button and Foot Control will not operate if tuning knob is left in the OUT position.
5. Follow above procedure in setting automatic positions (i.e. 2, 3, 4 and 5.)

HUDSON MOTOR CAR CO.

When the five automatic positions have been adjusted to the five desired stations as instructed, it is only necessary to press the Automatic button to return to Dial tuning, or any one of the stations selected on the Automatic.

FOOT CONTROL

The foot control button provides a convenient means of automatically tuning the receiver from the floor board, thus avoiding the necessity of removing the hands from the wheel, or the eyes from the road. Its function is identical to that of the automatic push button in the center of the right hand knob, and therefore requires no set-up or other adjustment.

Press the foot control button all the way down to change stations.

Press lightly to silence radio during conversation.

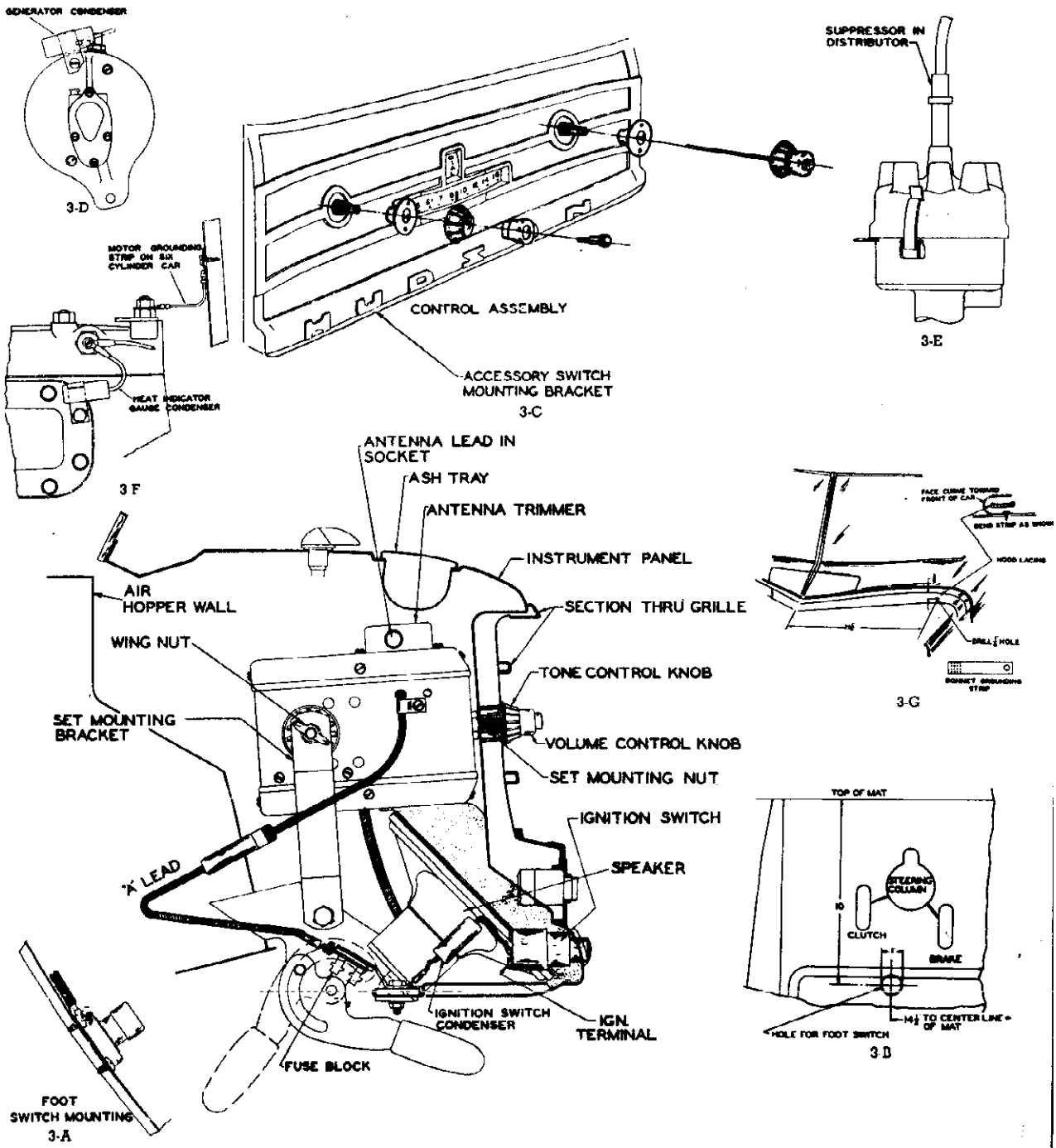
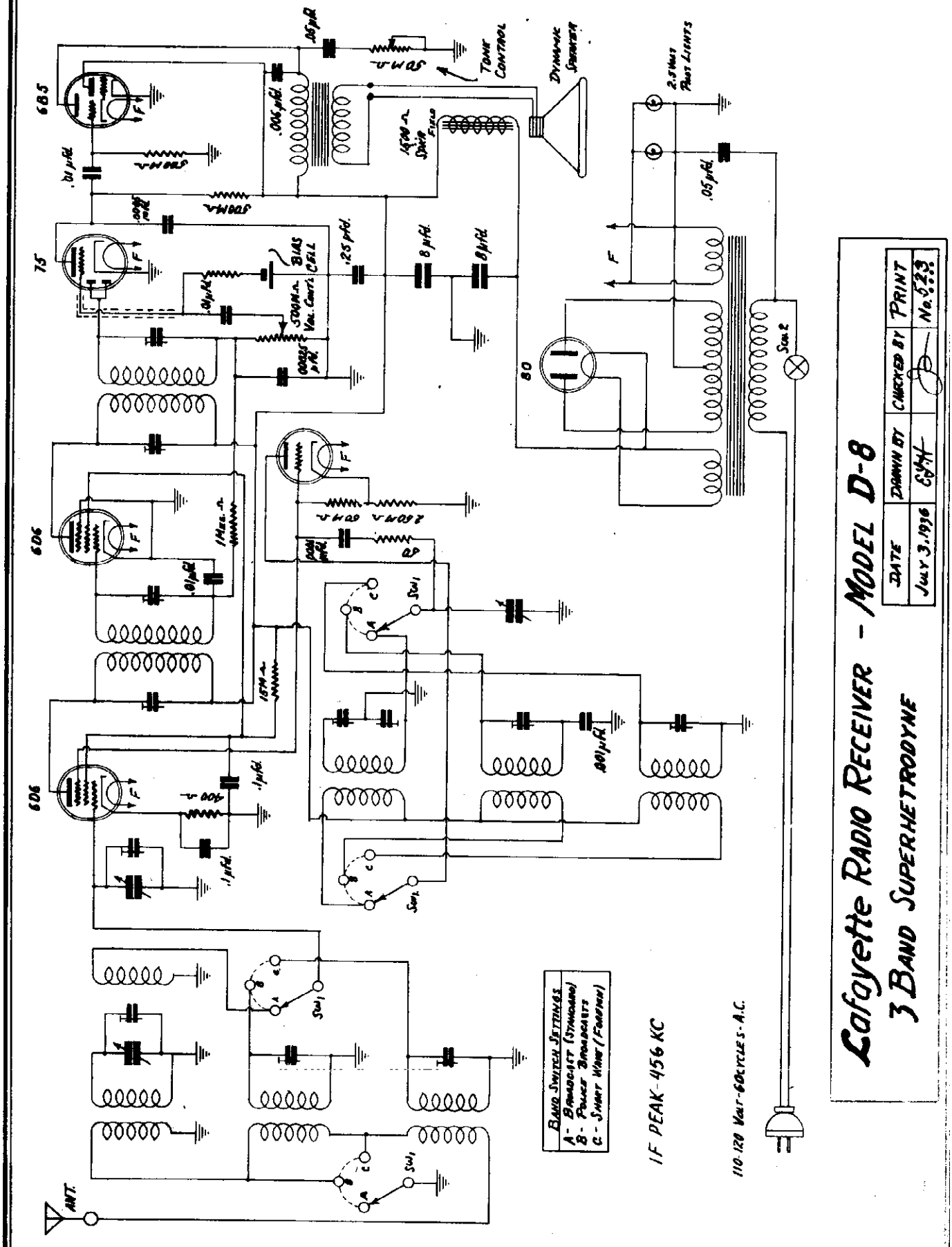


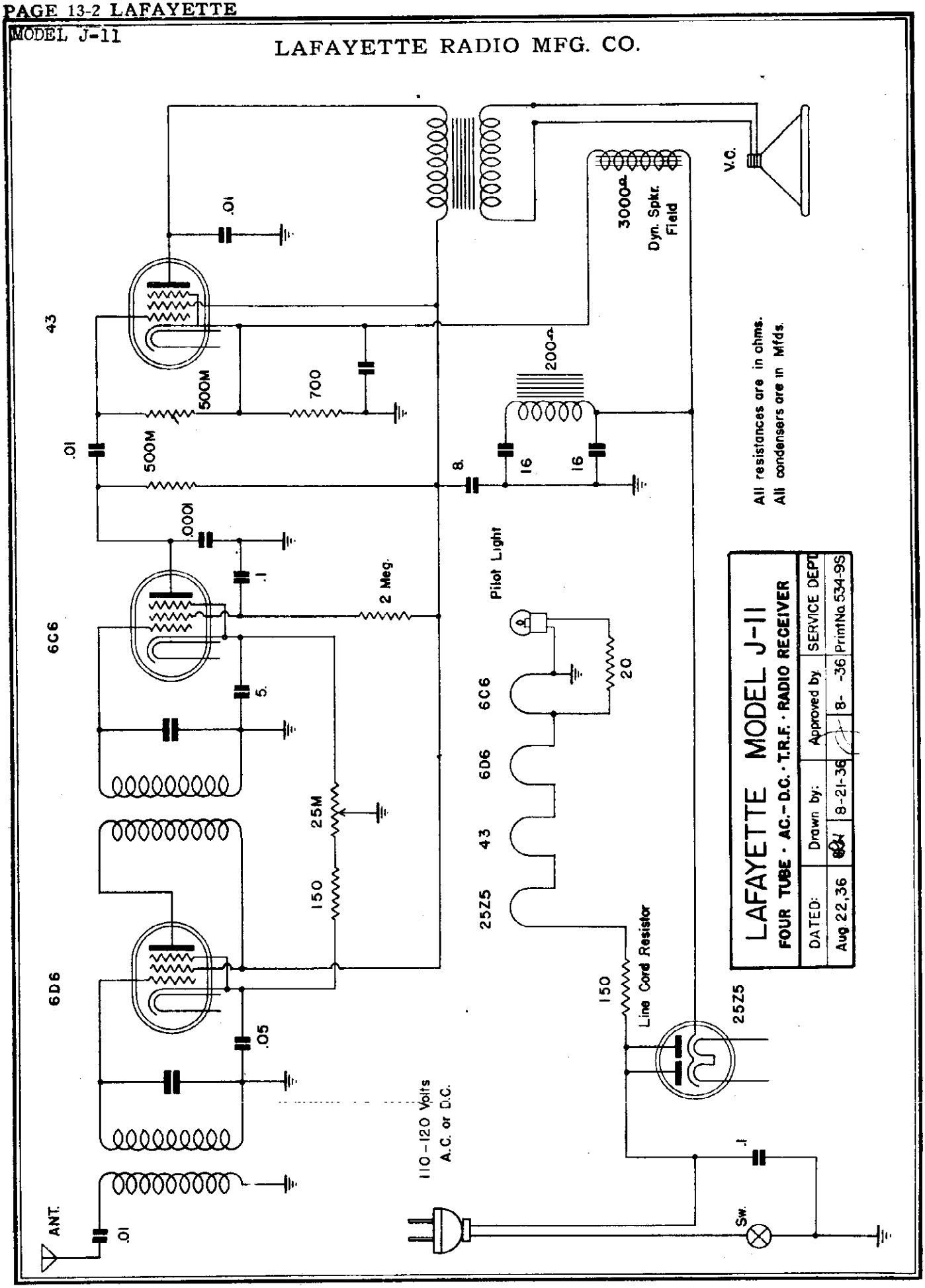
Fig. 3—Mounting Details and Connections.

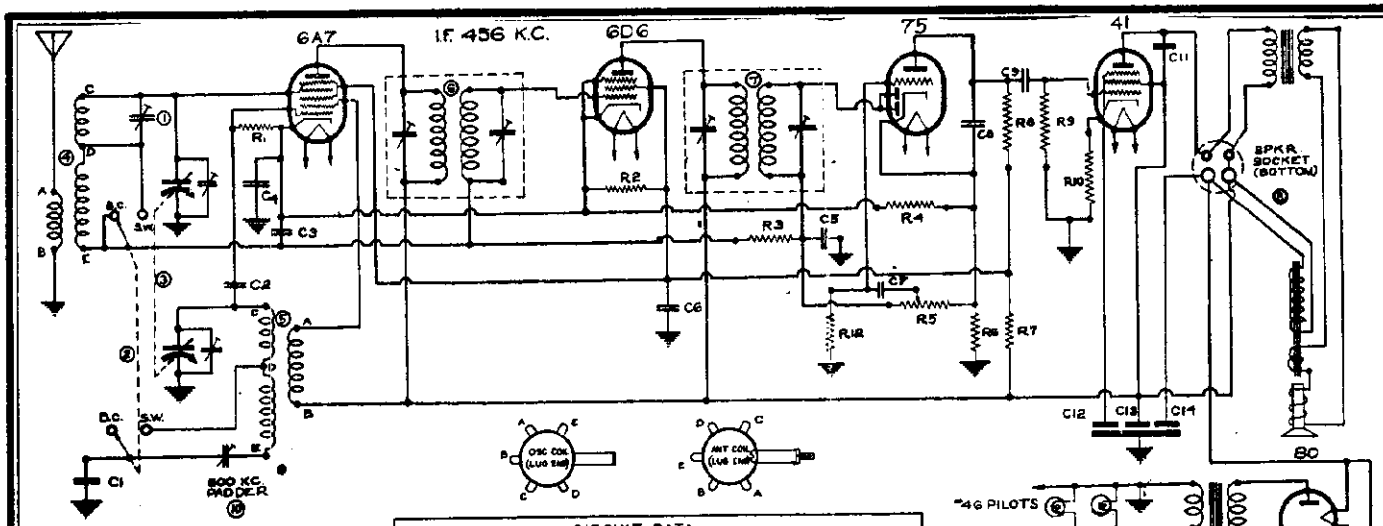
LAFAYETTE RADIO MFG. CO.

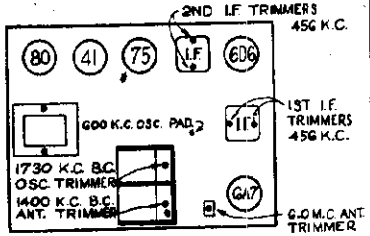


MODEL J-11

LAFAYETTE RADIO MFG. CO.







TUBE LOCATION

CIRCUIT DATA

PART NO.		DESCRIPTION	
C1	15-100	.00157 MFD.	
C2	1581	.0001 "	
C3	1582	.05 "	200v.
C4	1546	.25 "	"
C5	1504	.00025 "	
C6	1607	.05 "	400v.
C7	1605	.01 "	
C8	1504	.00025 "	
C9	1605	.01 "	
C10	1651	.004 "	600v
C11	1651	.004 "	600v.
C12	18-102	6 MFD. 25v. YELLOW	
C13		4 " 250v. GREEN	
C14		6 " 250v. RED	
1	2034	S.W. ANT. TRIMMER	
2	6922	WAVE BAND S.W.	
3	19-107	GANG CONDENSER	
4	10-125	ANT. COIL	

PART NO.		DESCRIPTION	
R1	6028	40,000 OHMS	1/3 W
R2	6117	25,000 OHMS	1/2 W
R3	6018	500,000 "	1/3 W
R4	6011	100 "	"
R5	24-102	500,000 "	VOL. CONT.
R6	6009	50 "	1/3 W
R7	6105	10,000 "	1/2 W
R8	6056	200,000 "	1/3 W
R9	6018	500,000 "	"
R10	6052	800 "	"
R12	6017	1.0 MEG "	"
5	10-147	OSC. COIL	
6	1123	FIRST I.F. COIL	
7	1124	SECOND I.F. "	
8		SPEAKER	
9	80-104	POWER TRANSFORMER	
10	80-100	PADDER	

This receiver is a 5 tube Alternating Current operated superheterodyne. The tubes used are a 6A7 as oscillator modulator, a 6D6 as I.F. Amplifier, a 75 as AVC and Audio rectifier and audio voltage amplifier, a 41 as power audio amplifier and an 80 as a power rectifier.

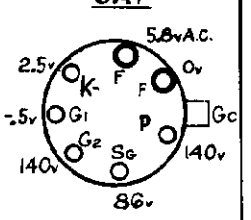
The receiver is made to cover two tuning bands, the standard broadcast band which ranges from 1730 KC to 535 KC and the middle or police band which has a frequency range of from 6.4 MC to 21 MC.

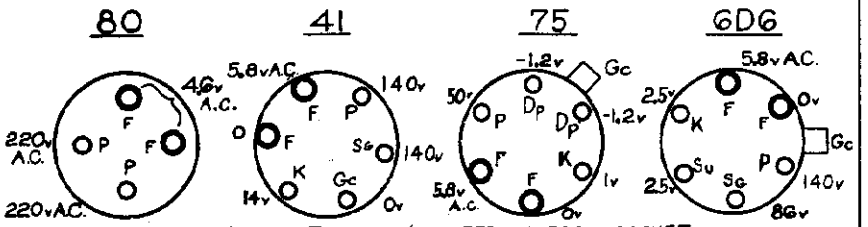
Connect the signal generator to the grid cap of the 6A7 tube through a .1 M.F. condenser. Connect the ground of the generator to the ground lead of the receiver. With the wave switch on broadcast position and the dial set to about 1000 K.C., feed in a 456 K.C. signal. Adjust the trimmers on top of the first and second I.F. transformers until the maximum output is obtained. Connect output meter thru a .5 mf dummy, total resistance 7000 ohms to speaker plug. This aligns the I F

Leaving the wave switch on broadcast position turn the dial to the extreme high frequency end. Feed a 1730 K.C. signal to the receiver antenna lead through a .00025 M.F. mica condenser. Adjust the 1730 K.C. broadcast oscillator trimmer until maximum output is shown. Set the generator to 1400 K.C. and tune in this signal on the receiver. Then adjust the 1400 K.C. broadcast antenna trimmer to maximum output. Set the generator to 600 K.C. and adjust the 600 K.C. broadcast oscillator pad to maximum output while tuning the receiver back and forth across the signal from the generator. This completes the alignment of the broadcast band.

The short wave band is aligned while feeding a 6.0 M.C. signal to the receiver antenna lead through a .00025 M.F. mica condenser. Turn the wave switch to short wave position and tune in the 6.0 M.C. signal. Adjust the 6.0 M.C. short wave trimmer to maximum output.

F - FILAMENT
P - PLATE
K - CATHODE
Sg - SCREEN GRID
Su - SUPPRESSOR
Dp - DIODE PLATE
Gc - CONTROL GRID
G1 - OSC. GRID
G2 - OSC. PLATE



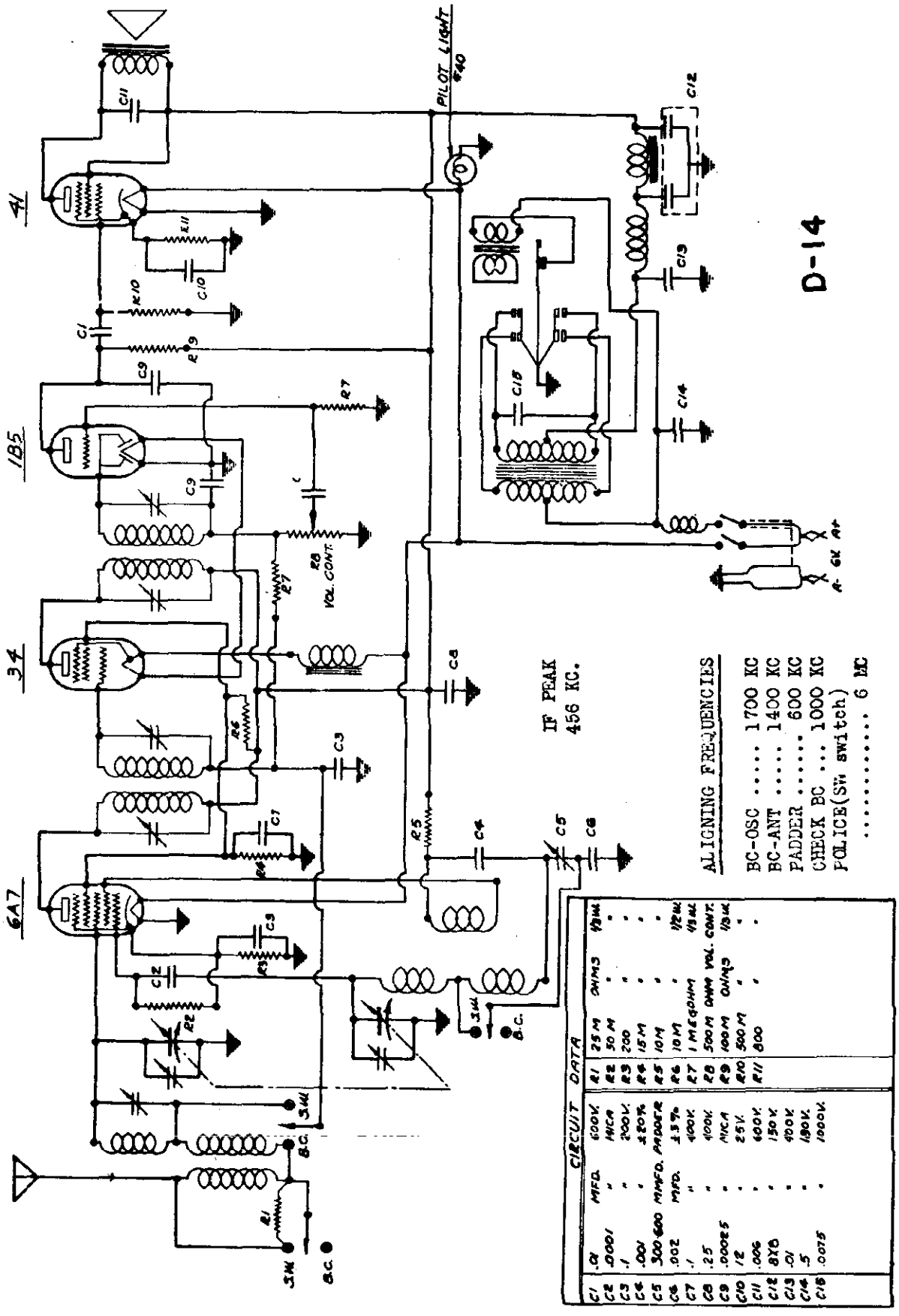


FILAMENT VOLTAGES MEASURED ACROSS SOCKET
ALL OTHER VOLTAGES MEASURED TO GROUND WITH 1000 OHM PER VOLT VOLTMETER

LAFAYETTE RADIO MFG. CO.

MODEL D-14

LAFAYETTE RADIO MFG. CO.

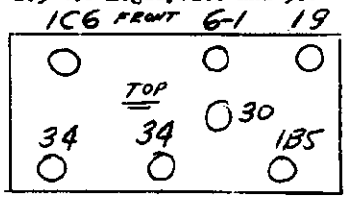


INSTRUCTIONS AND SERVICE NOTES FOR THE MODEL C-17 2 AND 3 VOLT BATTERY SUPERHETERODYNE

Frequency Range - 540 - 1500 Kilocycles, 1.5-4.2 Megacycles and 5.6-15 Megacycles.

TUBE COMPLEMENT

1 TYPE 106 Det.-Osc.
2 TYPE 34 I.F. Amplifier
1 TYPE 185 Diode Detector and Amp.
1 TYPE 30 Audio Amplifier
1 TYPE 19 Class B Twin Amplifier
1 TYPE 6-1 Ballast Tube



ANTENNA AND GROUND

For best reception, an antenna 75 to 100 feet long and erected high and clear of surrounding objects should be used.

A good ground connection is essential with this receiver, preferably to a water pipe with the ground wire as short as possible.

BATTERY CONNECTIONS

Red Lead A+2 or 3 Volts
Blue Lead B+135 Volts
Black Lead B-(connected to A-)
Black Lead A-

"C" BATTERY CONNECTIONS

A "C" battery should be connected to leads extending from the top of the chassis. Provision is made for mounting "C" battery within the cabinet.

On models using a tapped "9" volt "C" battery, three leads are connected as follows: Brown wire to C+, yellow wire -3 volts and the green wire to -9 volts. On models using a tapped 22½ volt battery, four leads from the chassis are connected as follows: Black wire to C+, green wire to -3 volts, orange wire to -4½ volts and red wire to -9 volts.

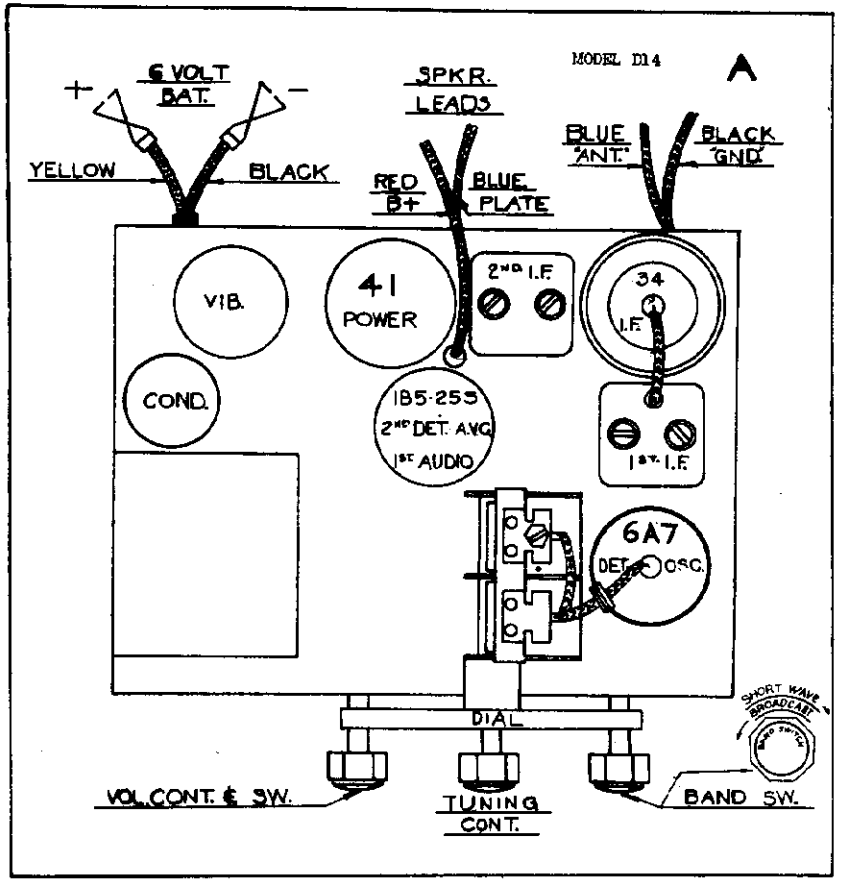
Use a test oscillator and connect an output meter from plate to plate of the 19 output tube.

I.F. ALIGNMENT - Connect the oscillator through a .00025 condenser to the grid of the 106 tube and set the oscillator to 456 kilocycles. Peak each I.F. stage to resonance as indicated by maximum output or the output meter.

R.F. ALIGNMENT - With the wave change switch in the broadcast position, set oscillator to 1500 kilocycles and connect in series with a .00025 condenser to the antenna of the receiver. Rotate the variable condenser to the 1500 setting of the dial and adjust the trimmer condenser of the broadcast oscillator to resonance. This trimmer is located on the right side of the chassis, third position from the front. Reset the test oscillator to 1400 kilocycles and adjust antenna trimmer located in front of the chassis, first position from the left. Now set oscillator to 600 kilocycles and adjust padder located on top of the chassis, second from the front. Check alignment at 1000 kilo.

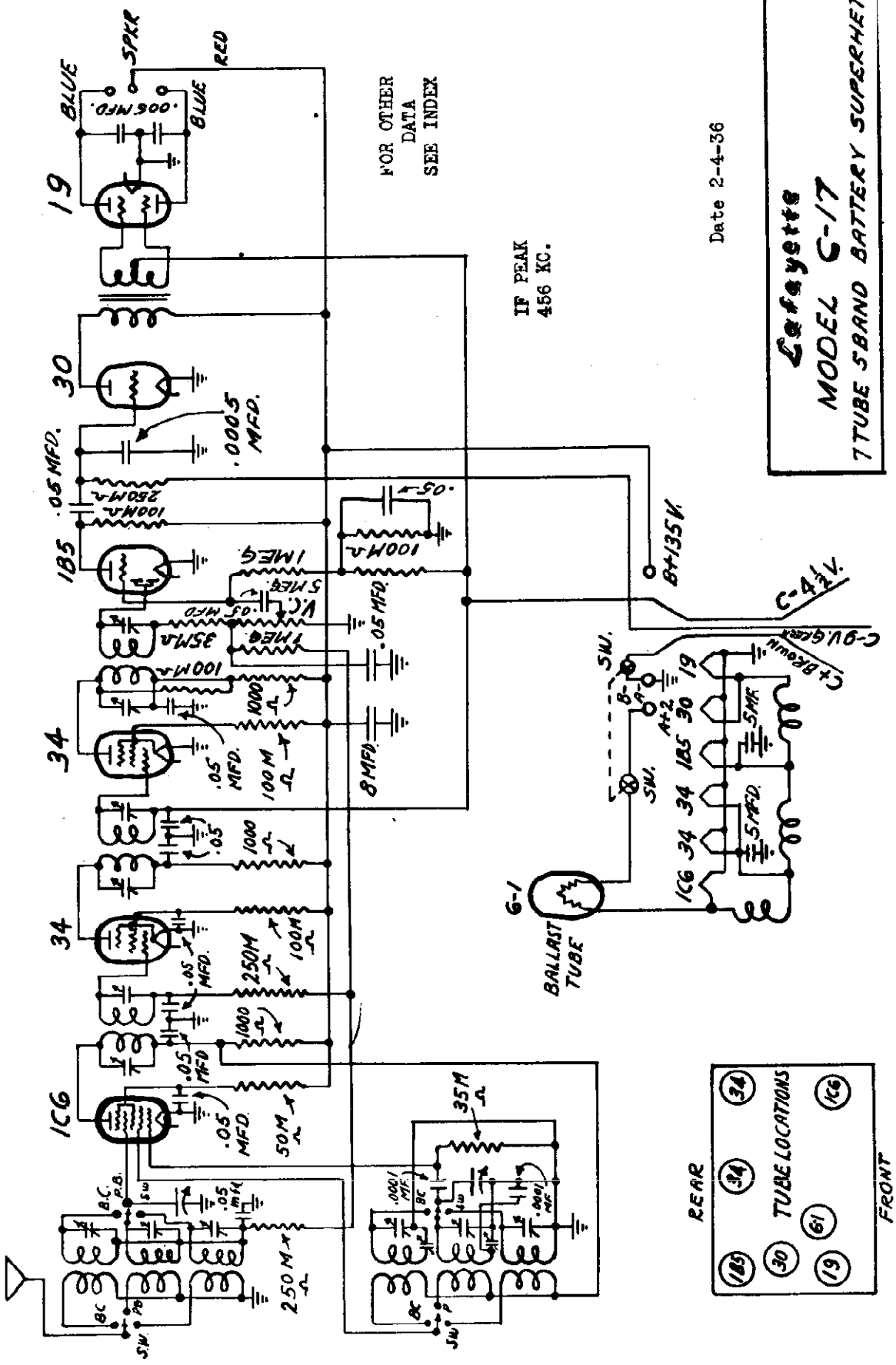
For aligning the police band, set test oscillator to 4.2 megacycles and switch to the police band position on the set. With the condenser rotated to this frequency setting as indicated on the dial, adjust oscillator trimmer located on the right side of the chassis, second position from the front. Set test oscillator to 4.0 megacycles and rotate condenser to the corresponding dial reading. Now adjust antenna trimmer located on the front of the chassis, center position to resonance. Then set oscillator to 2.0 megacycles and rotate the condenser to the 2 megacycle reading. Adjust padder located on top of chassis, first position from the front.

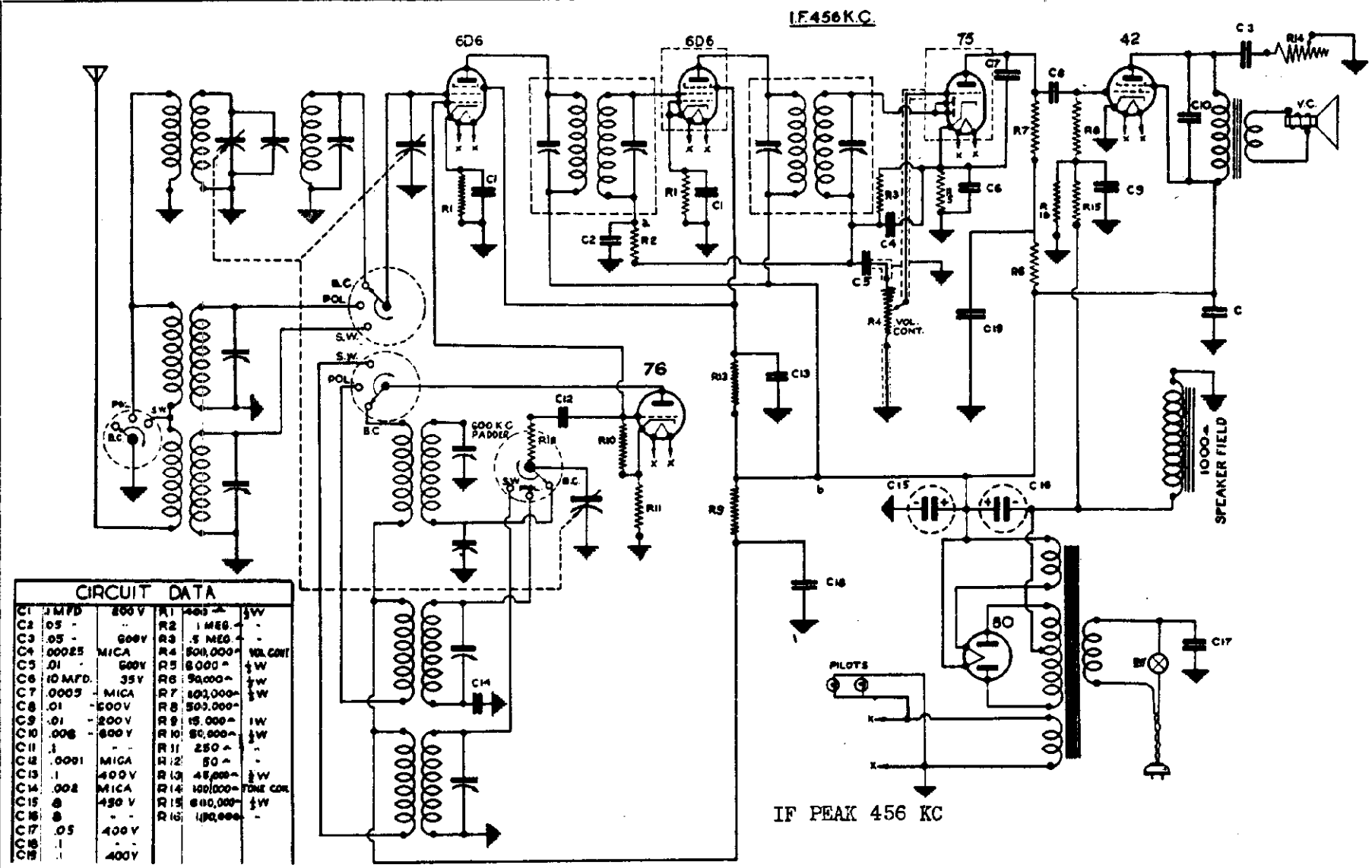
The short wave band is aligned by setting the condenser to 15 megacycles and adjust the oscillator trimmer located on the right side of the chassis, third position from the front to resonance with a 15 megacycle signal from the test oscillator. At the same time adjust the antenna trimmer located in front of the chassis, third position from the left.



MODEL C-17

LAFAYETTE RADIO MFG. CO.





CIRCUIT DATA

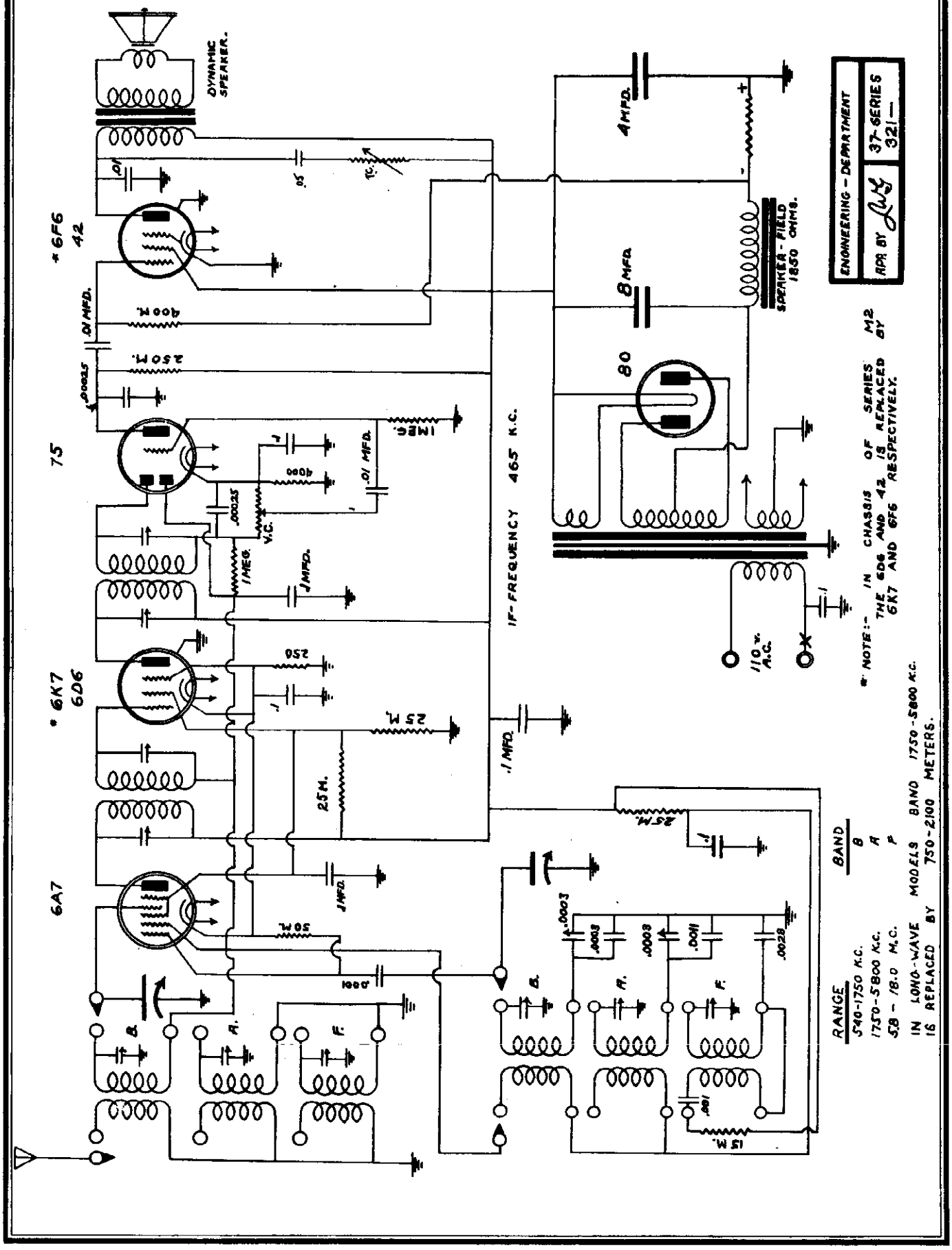
C1	.1 MFD	200 V	R1	400 Ω	½W
C2	.05 -	"	R2	1 MEG -	-
C3	.05 -	600V	R3	.5 MEG -	-
C4	.00025	MICA	R4	500,000 Ω	VOL CONT
C5	.01 -	600V	R5	8,000 Ω	½W
C6	10 MFD.	35V	R6	90,000 Ω	½W
C7	.0005 -	MICA	R7	600,000 Ω	½W
C8	.01 -	600V	R8	500,000 Ω	
C9	.01 -	200V	R9	15,000 Ω	1W
C10	.006 -	600V	R10	80,000 Ω	½W
C11	.1	- -	R11	250 Ω	-
C12	.0001	MICA	R12	50 Ω	-
C13	.1	400V	R13	45,000 Ω	½W
C14	.002	MICA	R14	100,000 Ω	TONE CON.
C15	8	450 V	R15	600,000 Ω	½W
C16	8	- -	R16	1,250,000 Ω	-
C17	.05	400 V			
C18		- -			
C19		400V			

ALIGNMENT

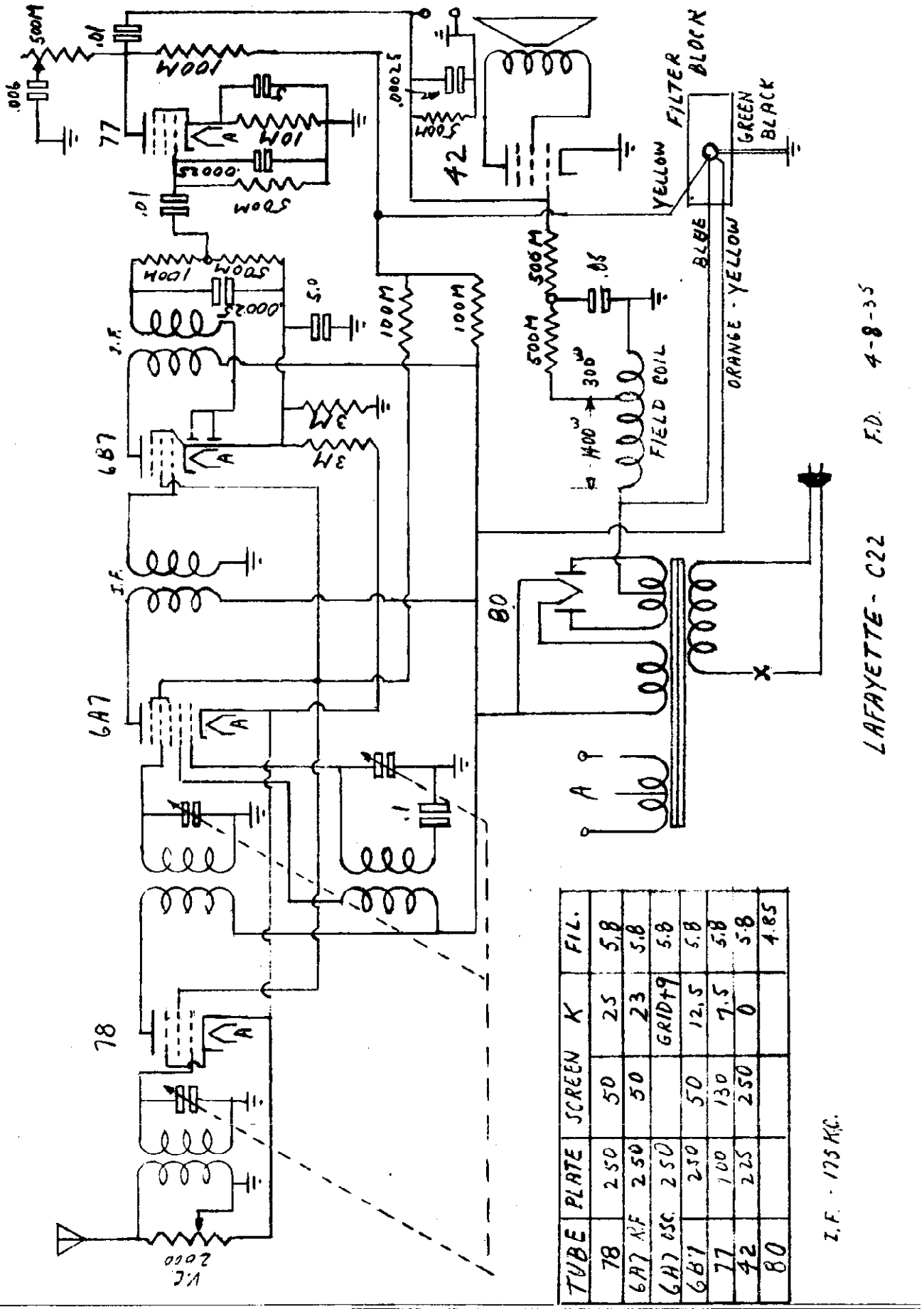
(1) IF 456 kc.
(2) BC-Osc. & dial - 1400 kc. (Trim. in front of range SW.)
(3) Preselector trim. in center at front of chassis - 1400 kc.
(4) Adj. trim. on top of gang cond.
(5) Padder 600 kc (right end of chassis).
(6) Middle Wave Band - 2 trims. on top of SW coils, on top of chassis - 4000 kc.
(7) SW pos. - 2 trims. at bases of SW coils - 15 mc.

MODEL D-20P

LAFAYETTE RADIO MFG. CO.



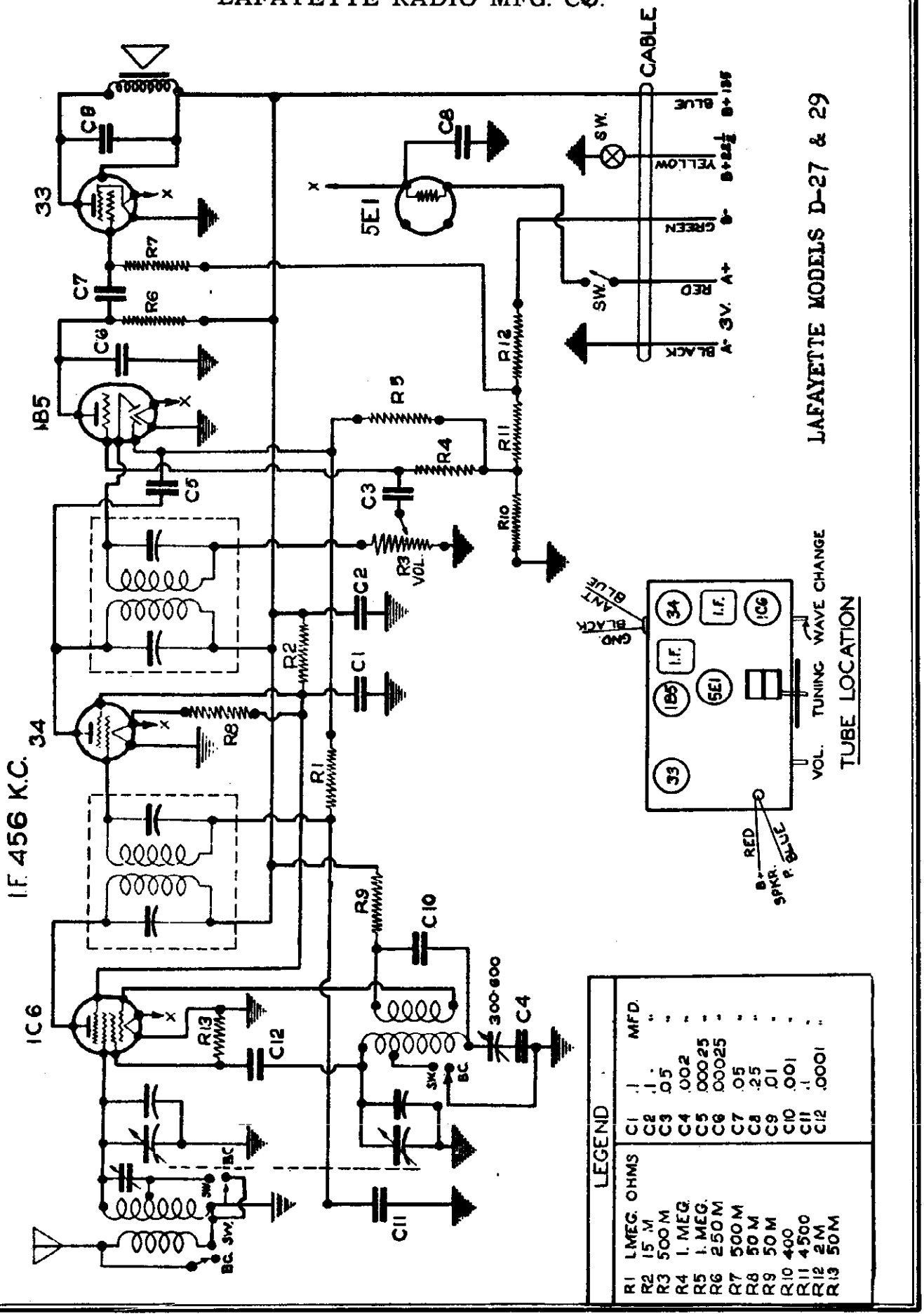
LAFAYETTE RADIO MFG. CO.

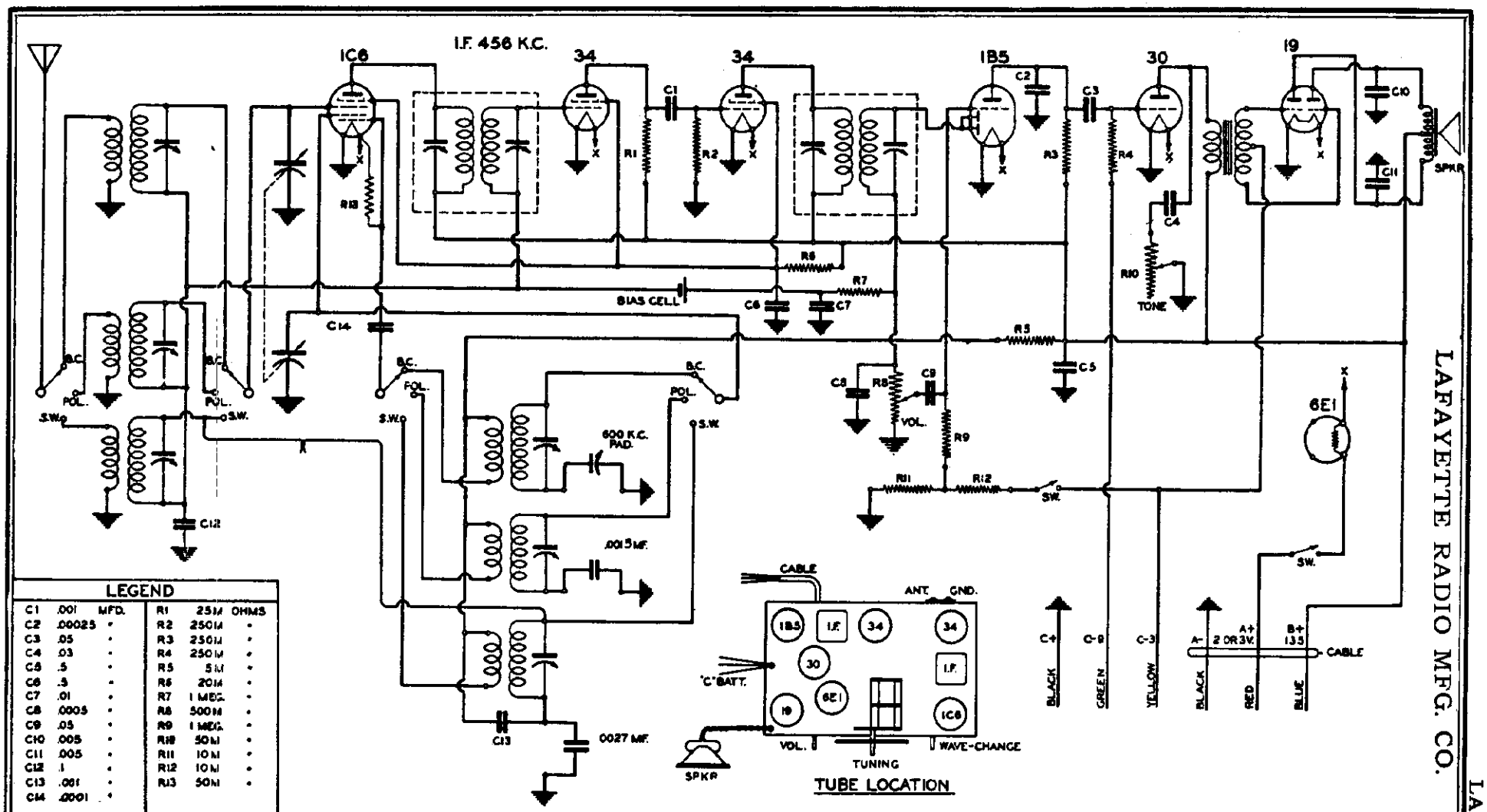


TUBE	PLATE	SCREEN	K	FIL.
78	250	50	25	5.8
6A7 M.F.	250	50	23	5.8
6A7 OSC.	250		GRID+9	5.8
6B7	250	50	12.5	5.8
77	100	130	7.5	5.8
42	225	250	0	4.85
80				

MODELS D-27,29

LAFAYETTE RADIO MFG. CO.





LEGEND					
C1	.001	MFD.	R1	25M	OHMS
C2	.00025	"	R2	250M	"
C3	.05	"	R3	250M	"
C4	.03	"	R4	250M	"
C5	.5	"	R5	5M	"
C6	.5	"	R6	20M	"
C7	.01	"	R7	1 MEG.	"
C8	.0005	"	R8	500M	"
C9	.05	"	R9	1 MEG.	"
C10	.005	"	R10	50M	"
C11	.005	"	R11	10M	"
C12	.1	"	R12	10M	"
C13	.001	"	R13	50M	"
C14	.0001	"			

ALIGNMENT

IF: 456 kc.

BC-OSC: 1700 kc. Trimmer located on right side of chassis, 2nd pos. from front.

BC-ANT: 1400 kc. Trimmer located under chassis.

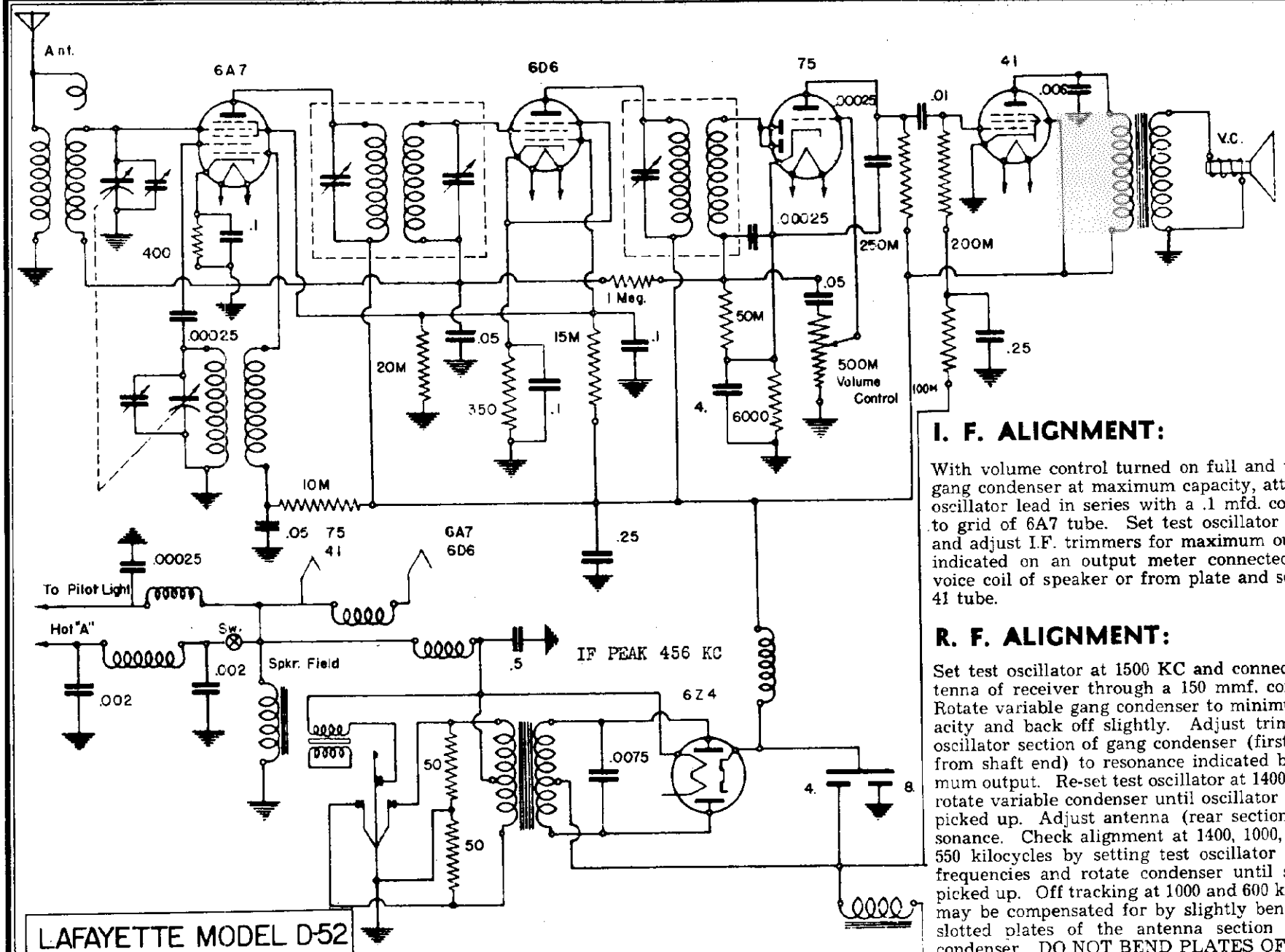
PADDER: 600 kc. Located on top of chassis.

CHECK BC at 1000 kc.

POLICE: Osc. trim 5 mc., on right side of chassis, 1st position from front. Ant. trim. 5 mc, on front of chassis, left position.

SW: Osc. trim. 18 mc, on right side of chassis, 3rd position from front.

SW: Ant. trim 16 mc, thru right-hand hold in front of chassis.



LAFAYETTE MODEL D-52
SUPERHET AUTOMOBILE RADIO RCVR.

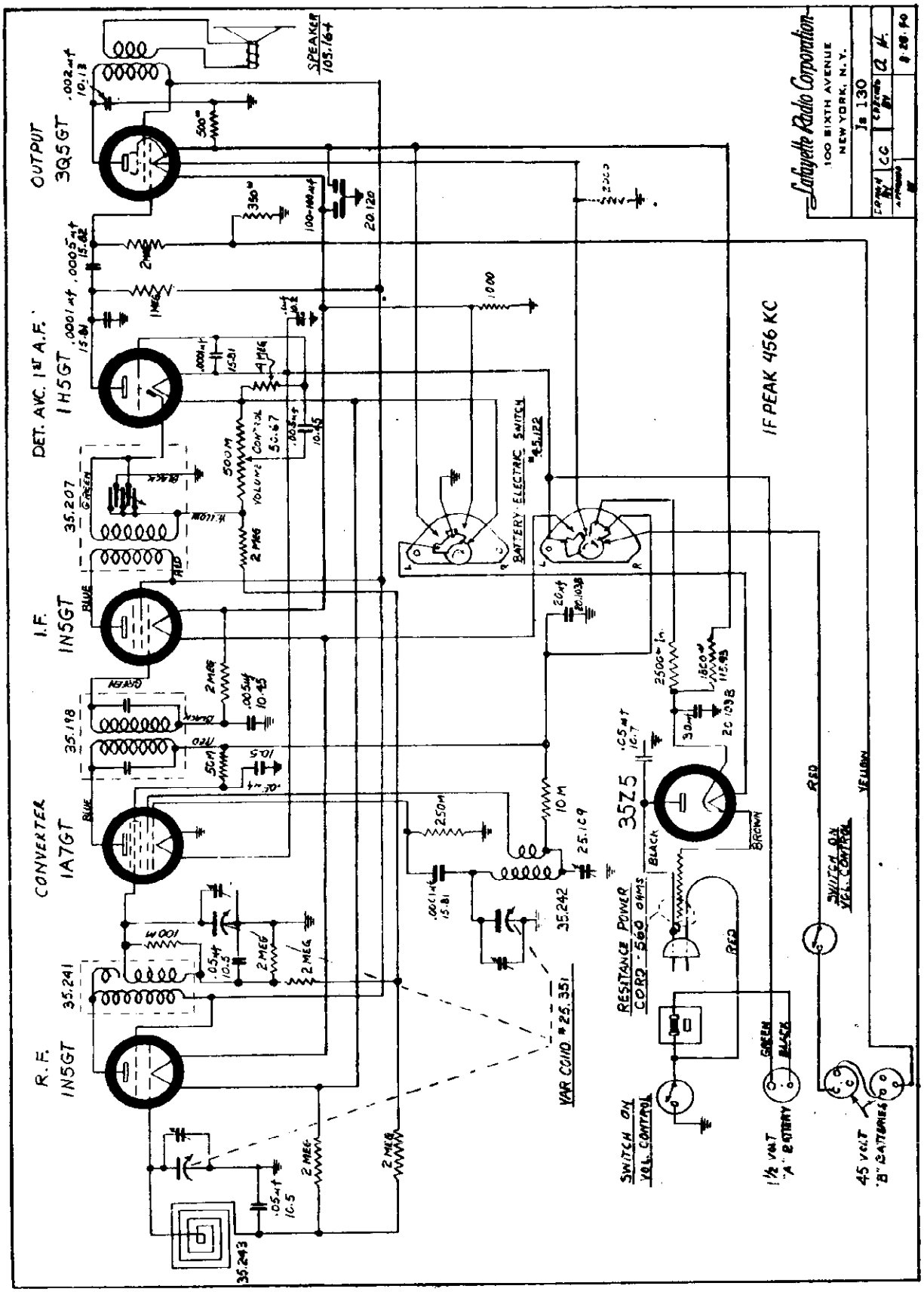
I. F. ALIGNMENT:

With volume control turned on full and variable gang condenser at maximum capacity, attach test oscillator lead in series with a .1 mfd. condenser to grid of 6A7 tube. Set test oscillator 456 KC and adjust I.F. trimmers for maximum output as indicated on an output meter connected across voice coil of speaker or from plate and screen of 41 tube.

R. F. ALIGNMENT:

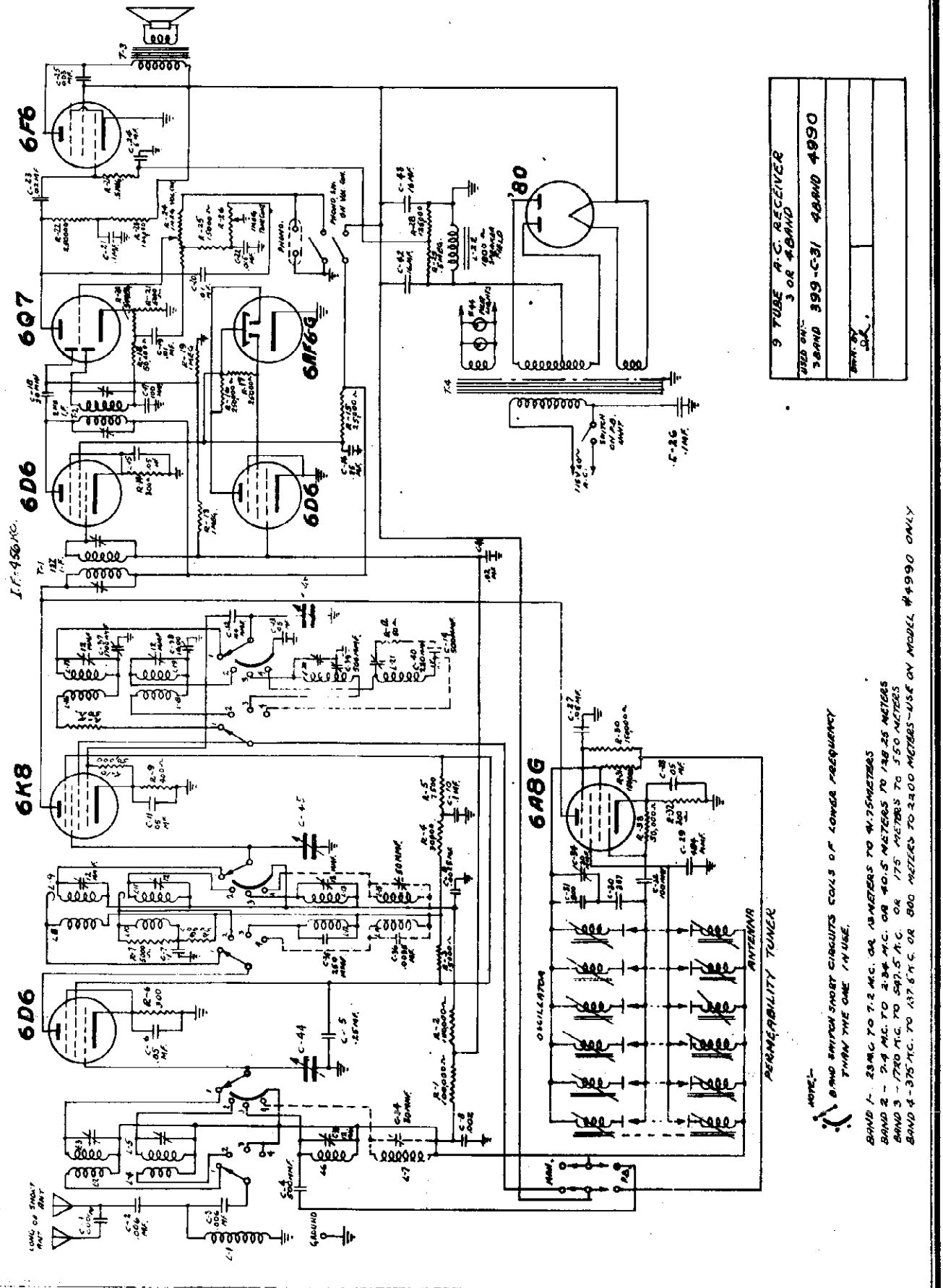
Set test oscillator at 1500 KC and connect to antenna of receiver through a 150 mmf. condenser. Rotate variable gang condenser to minimum capacity and back off slightly. Adjust trimmer on oscillator section of gang condenser (first section from shaft end) to resonance indicated by maximum output. Re-set test oscillator at 1400 KC and rotate variable condenser until oscillator signal is picked up. Adjust antenna (rear section) to resonance. Check alignment at 1400, 1000, 600 and 550 kilocycles by setting test oscillator to these frequencies and rotate condenser until signal is picked up. Off tracking at 1000 and 600 kilocycles may be compensated for by slightly bending the slotted plates of the antenna section of gang condenser. DO NOT BEND PLATES OF OSCILLATOR SECTION.

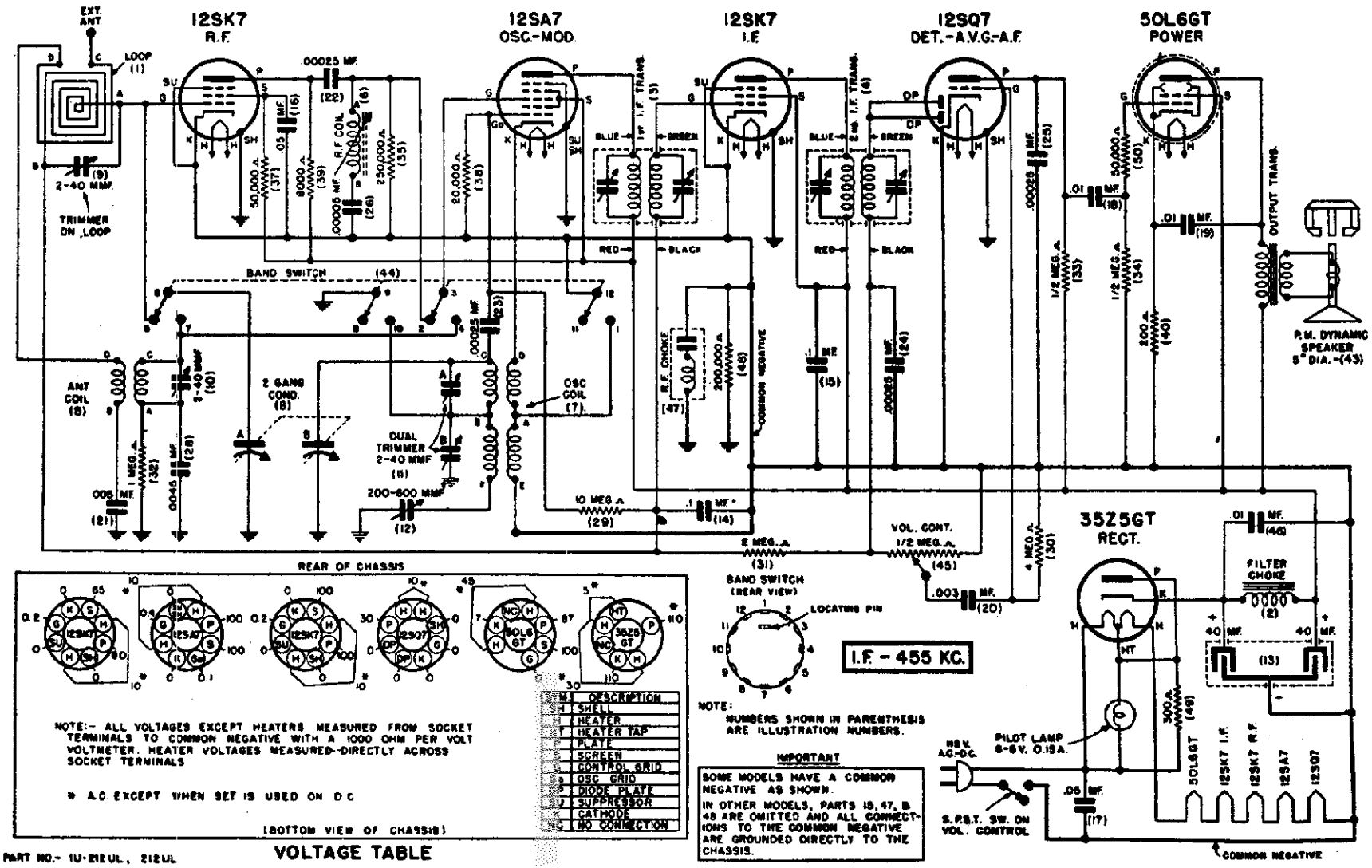
LAFAYETTE RADIO MFG. CO.



MODELS 399-C31, 4990

LAFAYETTE RADIO MFG. CO





NOTE:- ALL VOLTAGES EXCEPT HEATERS MEASURED FROM SOCKET TERMINALS TO COMMON NEGATIVE WITH A 1000 OHM PER VOLT VOLTMETER. HEATER VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS

* A.C. EXCEPT WHEN SET IS USED ON D.C.

M.	DESCRIPTION
S	SHELL
H	HEATER
HT	HEATER TAP
P	PLATE
SG	SCREEN
G	CONTROL GRID
OG	OSC. GRID
DP	DIODE PLATE
SU	SUPPRESSOR
K	CATHODE
NC	NO CONNECTION

NOTE: NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.

IMPORTANT

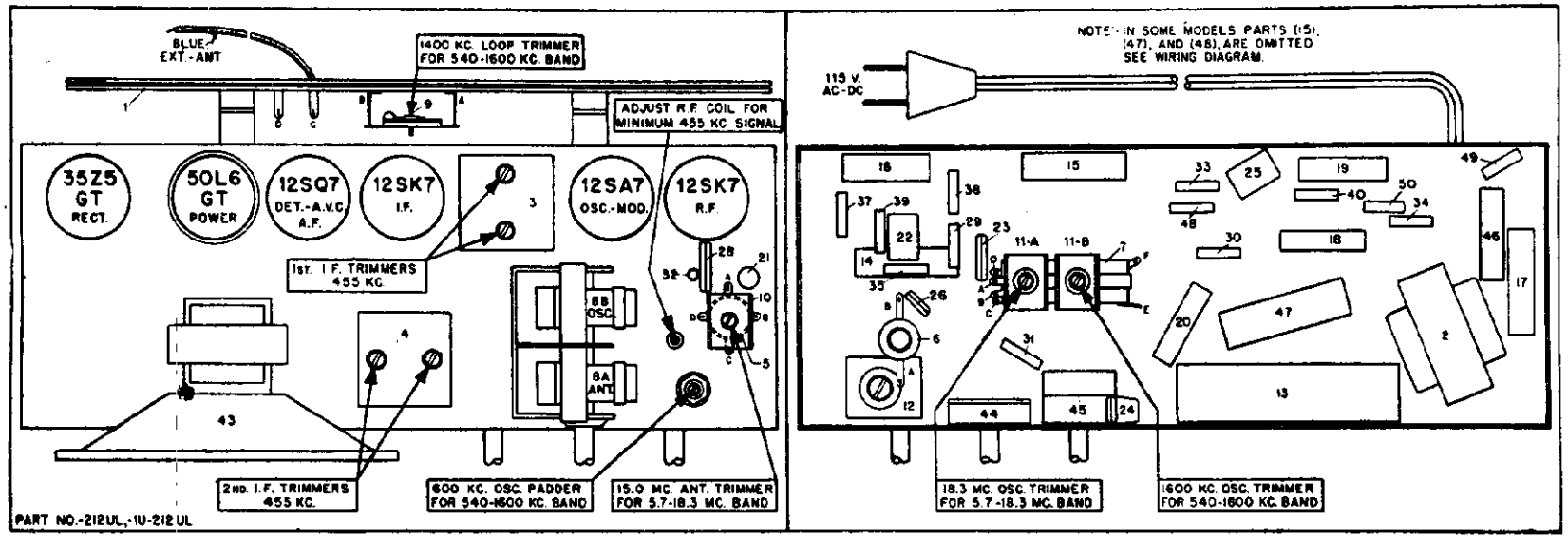
SOME MODELS HAVE A COMMON NEGATIVE AS SHOWN.

IN OTHER MODELS, PARTS 15, 47, & 48 ARE OMITTED AND ALL CONNECTIONS TO THE COMMON NEGATIVE ARE GROUNDED DIRECTLY TO THE CHASSIS.

PART NO.- 1U-212UL, 212UL

VOLTAGE TABLE

Illus. No.	Part No.	Part Name	Description	List Price
1	12842	Antenna	Loop	$0.75
2	12841	Choke	Filter	.90
3	11347	Coil	1st I. F. Transformer	.90
4	11376	Coil	2nd I. F. Transformer	.80
5	12035	Coil	Antenna	.55
6	12036	Coil	R. F.	.50
7	12040	Coil	Oscillator	.50
8	12028	Condenser	Tuning (2 Gang)	1.70
9	1597	Condenser	Trimmer (Loop 2-40 Mmf.)	.21
10	1597	Condenser	Trimmer (Coil Ant.)	.21
11	12000	Condenser	Trimmer (Dual)	.25
12	3287	Condenser	Padder 200-600 Mmf.	.45
13	12001	Condenser	Tubular Dry Elec. 150 V 40-40 Mfd.	.75
14	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20
15	1147	Condenser	Tubular .05 Mfd. 200 Volt	.18
17	9457	Condenser	Tubular .05 Mfd. 400 Volt	.18
18	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
19	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
20	1368	Condenser	Tubular .003 Mfd. 400 Volt	.17
22	9458	Condenser	Mica .00025 Mfd.	.21
23	9458	Condenser	Mica .00025 Mfd.	.21
24	9458	Condenser	Mica .00025 Mfd.	$0.21
25	9458	Condenser	Mica .00025 Mfd.	.21
26	1544	Condenser	Mica .00005 Mfd.	.21
27	1544	Condenser	Mica .00005 Mfd.	.21
28	1628	Condenser	Mica .0045 Mfd.	.27
29	4804	Resister	Carbon 10 Meg. Ohm 1/3 Watt	.19
30	1694	Resister	Carbon 4 Meg. Ohm 1/3 Watt	.19
31	2705	Resister	Carbon 2 Meg. Ohm 1/3 Watt	.19
33	6954	Resister	Carbon 1/2 Meg. Ohm 1/3 Watt	.19
34	6864	Resister	Carbon 1/2 Meg. Ohm 1/3 Watt	.19
35	8906	Resister	Carbon 250,000 Ohm 1/3 Watt	.19
36	2155	Resister	Carbon 200,000 Ohm 1/3 Watt	.19
37	6879	Resister	Carbon 50,000 Ohm 1/3 Watt	.19
38	1784	Resister	Carbon 20,000 Ohm 1/3 Watt	.19
39	9337	Resister	Carbon 8,000 Ohm 1/3 Watt	.19
40	1498	Resister	Carbon 200 Ohm 1/3 Watt	.19
41	11860	Resister	220 Volt Ext. Line Cord	1.50
42	11861	Resister	125 Volt Ext. Line Cord	1.50
43	12046	Speaker	P.M. Dynamic 5"	2.70
44	12034	Switch	Band (4 Pole — 2 Pos.)	.75
45	12033	Vol. Control	With S.P.S.T. Switch	.75
46	9468	Condenser	Tubular .01 Mfd. 400 Volt	$0.17
47	12312	Condenser choke	Tubular .2 Mfd. 400 Volt with Choke Coil	.26
48	2155	Resister	Carbon 200,000 Ohm 1/3 Watt	.19



ALIGNMENT PROCEDURE

For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third. IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA IN THE SAME POSITION IT WILL BE IN WHEN THE SET IS IN THE CABINET.

When adjusting 1600 kilocycle oscillator trimmer 600 K.C. padder, 455 K.C. R.F. trimmer and 1400 kilocycle antenna trimmer, do not connect test oscillator to loop. Couple test oscillator to receiver loop by: (a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator. (b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

Place band switch for operation on:	Set receiver dial to:	TEST OSCILLATOR: Adjust test oscillator frequency to:	TEST OSCILLATOR: Use dummy antenna in series with output of test oscillator consisting of:	TEST OSCILLATOR: Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below:
I. F. alignment use any band position.	Any point where no interfering signal is received	Exactly 455 K.C.	0.2 Mfd. condenser	High side to grid cap of 12SA7 tube. Low side to frame of condenser through .01 Mfd. condenser.	Adjust each of the second I.F. transformer trimmer for maximum output, then adjust each of the first I.F. transformer trimmers for maximum output.
1600 to 540 K.C. Band	1 Rotate gang condenser to Maximum Capacity	Exactly 455 K.C.	None	Use Small Loop to couple test oscillator to receiver loop. Low side to frame of condenser through .01 Mfd. condenser.	Adjust R.F. coil for minimum 455 K.C. signal.
	2 Exactly 1600 K.C.	Exactly 1600 K.C.	None	Use Small Loop to couple test oscillator to receiver loop. Low side to frame of condenser through .01 Mfd. condenser.	Adjust 1600 K. C. oscillator trimmer for maximum output
	3 Approx. 1400 K.C.	Approx. 1400 K.C.	None	Use Small Loop to couple test Oscillator to receiver loop. Low side to frame of condenser through .01 Mfd. condenser.	While rocking gang condenser adjust 1400 K. C. loop trimmer for maximum output.
	4 Approx. 600 K.C.	Approx. 600 K.C.	None	Use Small Loop to couple test oscillator to receiver loop. Low side to frame of condenser through .01 Mfd. condenser.	While rocking gang condenser adjust 600 K. C. oscillator padder for maximum output.
5.7 to 18.3 M.C. Band	1 Exactly 18.3 M.C.	Exactly 18.3 M.C.	400 Ohm carbon resistor	High side to Blue Ant. Lead, Low side to frame of gang condenser through .01 Mfd. condenser.	Adjust 18.3 M.C. oscillator trimmer for maximum output—be sure to use proper peak. If more than one peak is noticed, back off trimmer to minimum capacity, then screw down trimmer (add capacity) until the second peak —which is the proper one to use is tuned in.
	2 Approx. 15 M.C.	Approx. 15 M.C.	400 Ohm	High side to Blue Ant. Lead, Low side to frame of gang condenser.	While rocking gang condenser adjust 15 M. C. antenna trimmer for maximum output.

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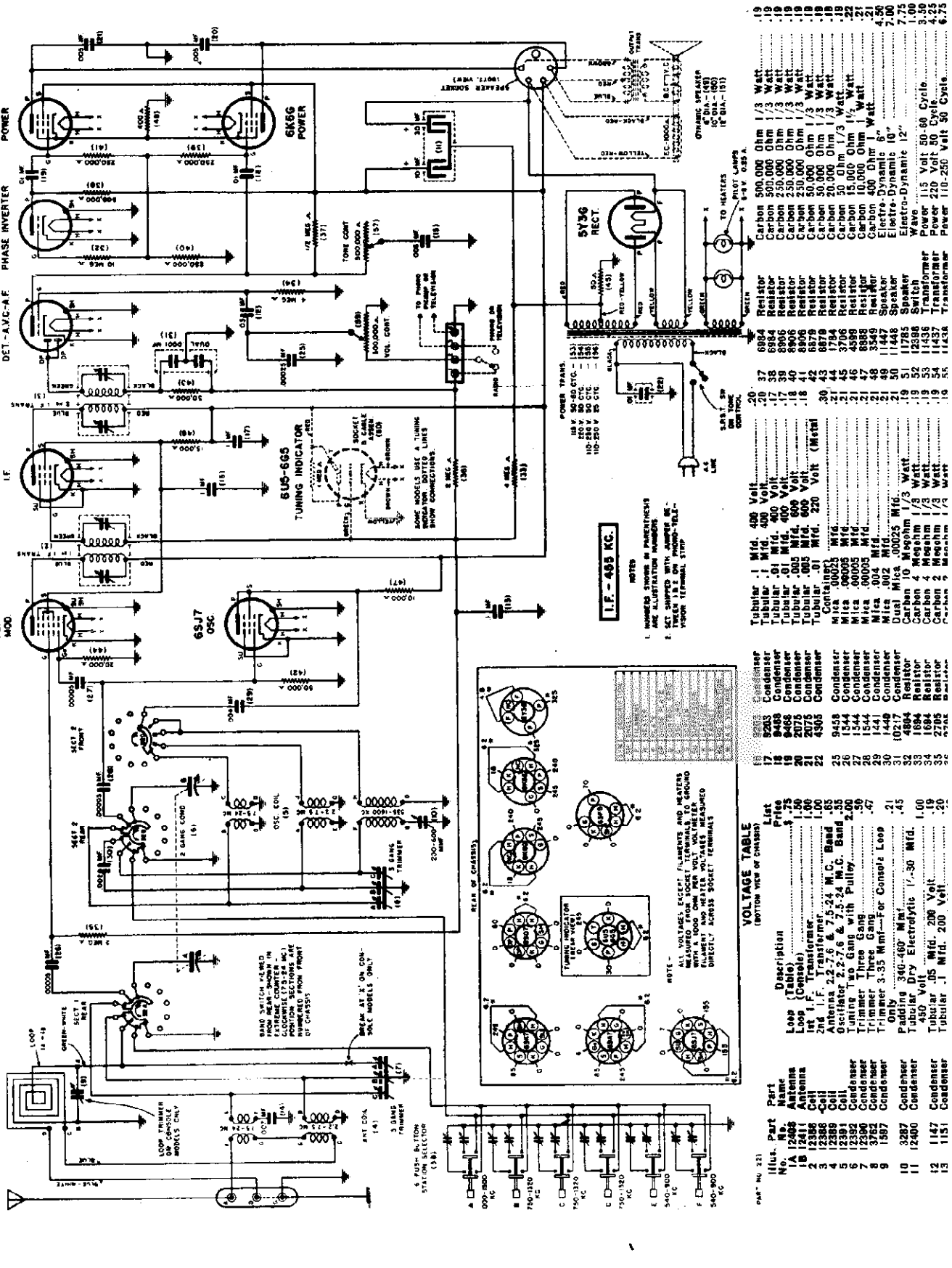
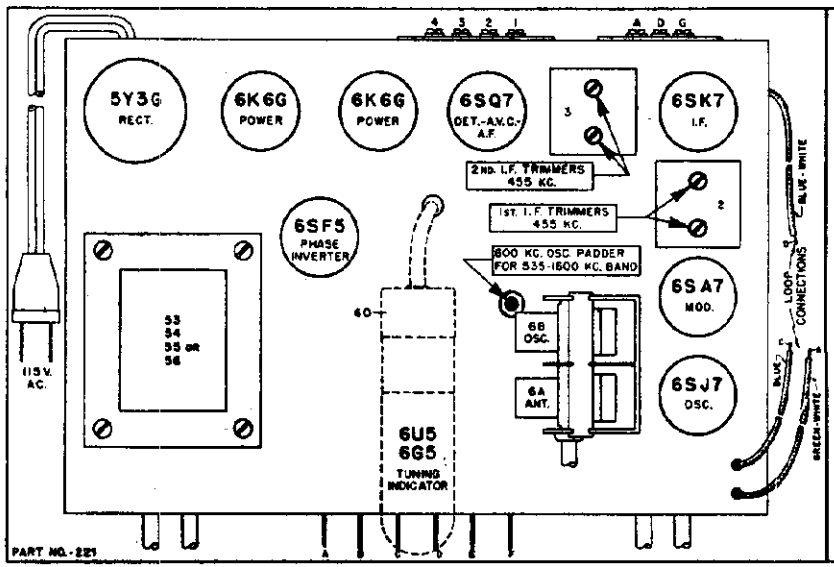


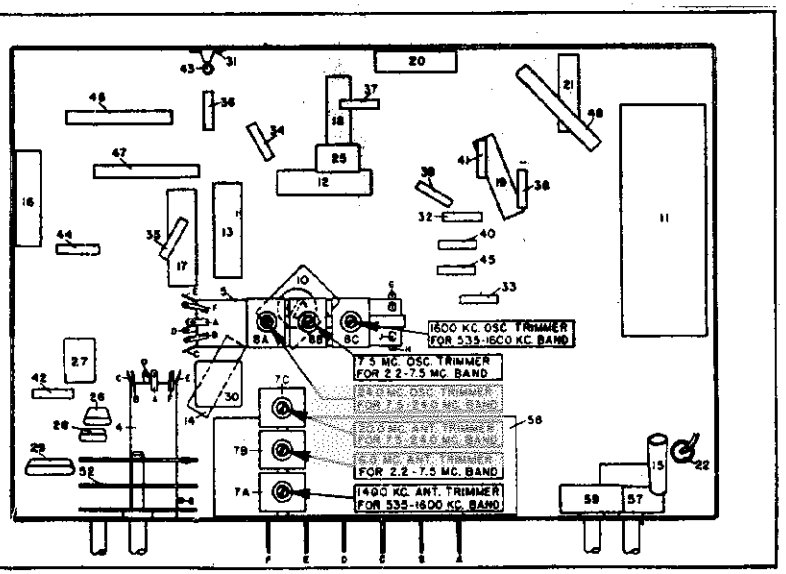
Illus. No.	Part No.	Part Name	Description	List Price
1A	12406	Antenna	Loop (Table)	$ .75
1B	12411	Antenna	Loop (Console)	1.50
2	12386	Coil	Int. I.F. Transformer	1.00
3	12388	Coil	2nd I.F. Transformer	1.00
4	12389	Coil	Antenna 2.2-7.6 & 7.5-24 M.C. Band	.65
5	12391	Coil	Oscillator 2.2-7.6 & 7.5-24 M.C. Band	.55
6	12392	Condenser	Tuning Two Gang with Pulley	2.00
7	12396	Condenser	Trimmer Three Gang	.50
8	37852	Condenser	Trimmer Three Gang	.47
9	1597	Condenser	Trimmer 3-35 Mmf—For Console Loop Only	.21
10	3287	Condenser	Padding .340-460 Mmf.	.45
11	12400	Condenser	Tubular Dry Electrolytic 1/-30 Mfd. 450 Volt	1.00
12	1147	Condenser	Tubular .05 Mfd. 200 Volt	.19
13	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20

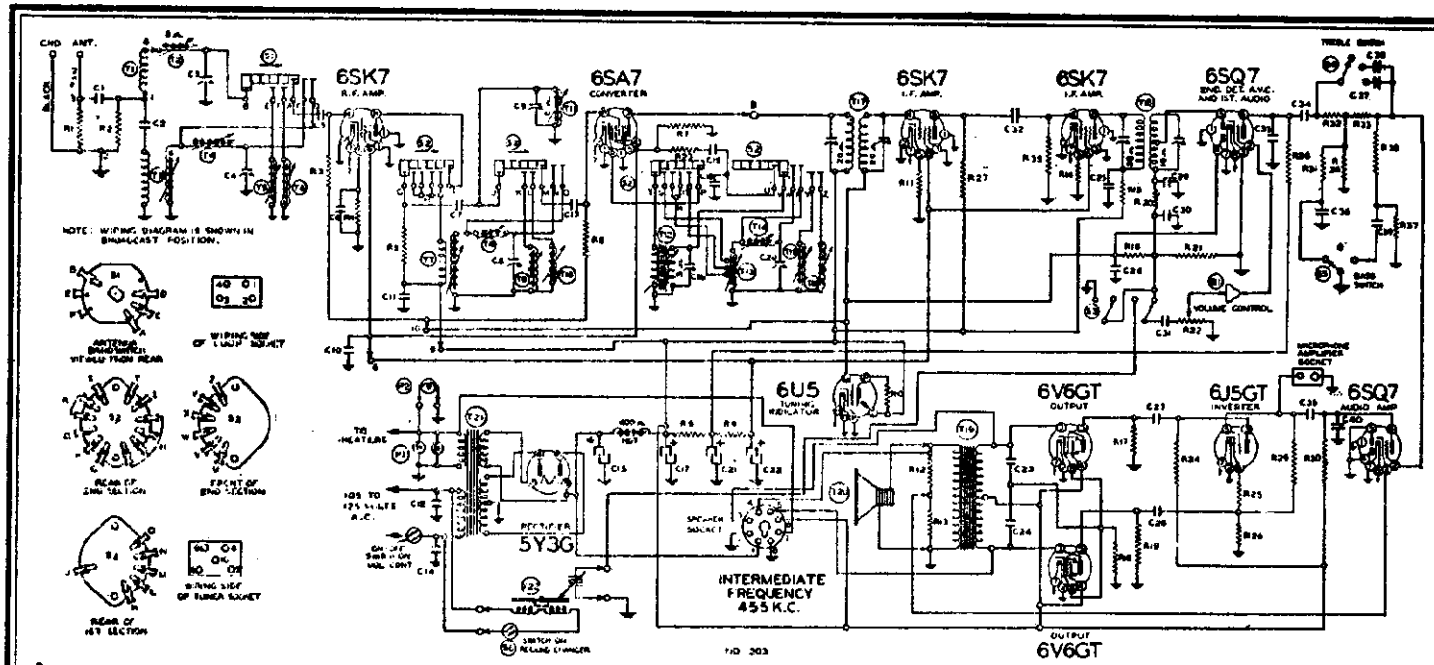
14	9203	Condenser	Tubular .1 Mfd. 400 Volt	.19
15	9468	Condenser	Tubular .1 Mfd. 400 Volt	.19
16	9468	Condenser	Tubular .01 Mfd. 400 Volt	.19
17	9468	Condenser	Tubular .005 Mfd. 600 Volt	.19
18	9468	Condenser	Tubular .005 Mfd. 600 Volt	.19
19	9468	Condenser	Tubular .01 Mfd. 220 Volt (Metal Container)	.19
20	2075	Condenser	Mica .00025 Mfd.	.21
21	2075	Condenser	Mica .00005 Mfd.	.21
22	4305	Condenser	Mica .00005 Mfd.	.21
23	9458	Condenser	Mica .00005 Mfd.	.21
24	1544	Condenser	Mica .00005 Mfd.	.21
25	1544	Condenser	Mica .004 Mfd.	.21
26	1544	Condenser	Mica .002 Mfd.	.21
27	1441	Condenser	Dual Mica .00025 Mfd.	.21
28	1440	Condenser	Carbon 10 Megohm 1/3 Watt	.19
29	10217	Resistor	Carbon 4 Megohm 1/3 Watt	.19
30	4804	Resistor	Carbon 4 Megohm 1/3 Watt	.19
31	1694	Resistor	Carbon 2 Megohm 1/3 Watt	.19
32	1694	Resistor	Carbon 2 Megohm 1/3 Watt	.19
33	2705	Resistor	Carbon 500,000 Ohm 1/3 Watt	.19
34			Carbon 500,000 Ohm 1/3 Watt	.19
35			Carbon 250,000 Ohm 1/3 Watt	.19
36			Carbon 250,000 Ohm 1/3 Watt	.19
37			Carbon 250,000 Ohm 1/3 Watt	.19
38			Carbon 50,000 Ohm 1/3 Watt	.19
39			Carbon 50,000 Ohm 1/3 Watt	.19
40			Carbon 20,000 Ohm 1/3 Watt	.19
41			Carbon 50 Ohm 1/3 Watt	.19
42			Carbon 15,000 Ohm 1½ Watt	.22
43			Carbon 10,000 Ohm 1 Watt	.21
44			Carbon 400 Ohm 1 Watt	.21
45			Electro-Dynamic 6"	4.50
46			Electro-Dynamic 10"	7.00
47			Electro-Dynamic 12"	7.75
48			Wave	1.00
49	6984	Resistor	Power 105 Volt 50-60 Cycle	3.50
50	6984	Resistor	Power 220 Volt 50 Cycle	4.25
51	8966	Resistor	Power 110-250 Volt 50 Cycle	6.75
52	8906	Resistor		
53	6879	Resistor		
54	8879	Resistor		
55	1784	Resistor		
56	3706	Resistor		
57	4596	Resistor		
58	8888	Resistor		
59	3549	Resistor		
60	11448	Speaker		
61	11785	Speaker		
62	12388	Switch		
63	11436	Transformer		
64	11437	Transformer		
65	11438	Transformer		

When adjusting 1600 kilocycle oscillator trimmer, 600 K.C. Padder and 1400 kilocycle antenna trimmer, do not connect test oscillator to loop. Couple test oscillator to receiver loop by: (a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator. (b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

Place band switch for operation on:	Set receiver dial to:		TEST OSCILLATOR: Adjust test oscillator frequency to	TEST OSCILLATOR: Use dummy antenna in series with output of test oscillator consisting of:	TEST OSCILLATOR: Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below:
I. F. alignment use any band position	Any point where no interfering signal is received		Exactly 455 K.C.	0.2 Mfd. condenser	High side to grid cap of 6SA7 tube. Do not remove cap.	Adjust each of the second I.F. transformer trimmers for maximum output—then adjust each of the first I.F. transformer trimmers for maximum output.
1600 to 535 K.C. Band Using Loop Aerial	1	Exactly 1500 K.C.	Exactly 1600 K.C.	None	Use Small Loop to couple test oscillator to receiver loop.	Adjust 1600 K. C. oscillator trimmer for maximum output.
	2	Approx. 1400 K.C.	Approx. 1400 K.C.	None	Use Small Loop to couple test oscillator to receiver loop.	While rocking gang condenser adjust 1400 K. C. loop antenna trimmer for maximum output.
	3	Approx. 600 K.C.	Approx. 600 K.C.	None	Use Small Loop to couple test oscillator to receiver loop.	While rocking gang condenser adjust 600 K. C. loop oscillator padder for maximum output.
2.2 to 7.6 M.C. Band	1	Exactly 7.6 M.C.	Exactly 7.6 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	Adjust 7.6 M. C. oscillator trimmer for maximum output.
	2	Approx. 6. M.C.	Approx. 6. M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	While rocking gang condenser adjust 6 M. C. antenna trimmer for maximum output.
7.4 to 24 M.C. Band	1	Exactly 24 M.C.	Exactly 24 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	Adjust 24 M. C. oscillator trimmer for maximum output—be sure to use proper peak. If more than one peak is noticed, back off trimmer to minimum capacity, then screw down trimmer (add capacity) until the second peak—which is the proper one to use is tuned in.
	2	Approx. 20 M.C.	Approx. 20 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	While rocking gang condenser adjust 20 M. C. antenna trimmer for maximum output.

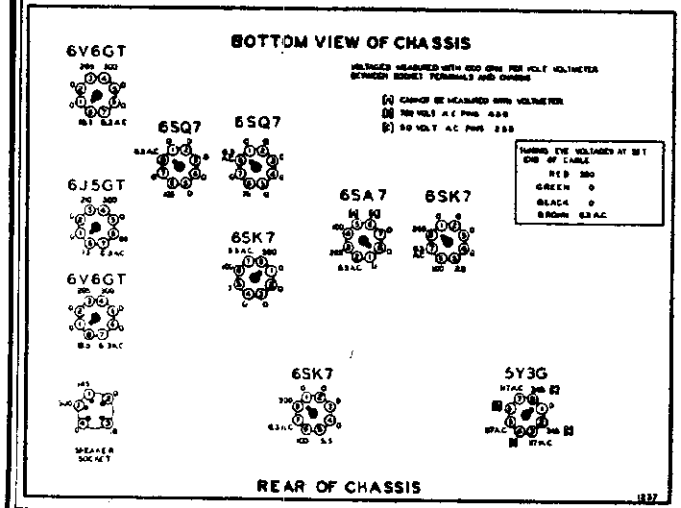






RESISTORS

R1	130232	25M ohm—½ w.
R2	130232	25M ohm—½ w.
R3	13019	1 megohm—½ w.
R4	130239	250 ohm—½ w.
R5	130218	5M ohm—½ w.
R6	13019	1 megohm—½ w.
R7	130232	25M ohm—½ w.
R8	130318	6M ohm—2 watt
R9	130319	10M ohm—2 watt
R10		1 megohm in tuning indicator cable
R11	130200	700 ohm—½ w.
R12	13082	10M ohm—½ w.
R13	130235	1500 ohm—½ w.
R14	130235	1500 ohm—½ w.
R15	130192	2M ohm—½ w.
R16	13019	1 megohm—½ w.
R17	1303	500M ohm—½ w.
R18	130317	250 ohm—2 watt
R19	1303	500M ohm—½ w.
R20	13020	100M ohm—½ w.
R21	130238	400M ohm—½ w.
R22	101234	500M ohm volume control and switch
R23	130174	50 ohm—½ w.
R24	13094	50M ohm—½ w.
R25	130218	5M ohm—½ w.
R26	13094	50M ohm—½ w.
R27	13073	15M ohm—½ w.
R28	130172	250M ohm—½ w.
R29	1303	500M ohm—½ w.
R30	130172	250M ohm—½ w.
R31	1307	40M ohm—½ w.
R32	13080	150M ohm—½ w.
R33	130309	350M ohm—½ w.
R34	130172	250M ohm—½ w.
R35	13020	100M ohm—½ w.
R36	13080	150M ohm—½ w.
R37	1303	500M ohm—½ w.



TECHNICAL DATA

Power Consumption Radio Only - - - - - 120 Watts
Power Output - - - - 10 Watts Undistorted
Sensitivity for 500 Milliwatt Output: 10 Microvolts Average
Selectivity - 27 KC Broad at 1000 Times Signal at 1000 KC
Tuning Frequency Range Broadcast Band - 540 to 1600 KC
49M Band - - - 5.9 to 6.1 MC
31M Band - - - 9.1 to 10 MC
25M Band - - 11.4 to 12.1 MC
19M Band - - 14.9 to 15.4 MC
Intermediate Frequency - - - - - - 455 KC
Speaker - - - - - - 12 in. Electro Dynamic

CONDENSERS

C1	1292	.0005 mica
C2	10047	.002 x 600 v.
C3	124143	B.C. antenna trimmer
C4	124143	9 mc. antenna trimmer
C5	1292	.0005 mica
C6	10020	.1 x 200 v. tubular
C7	129168	.00001 mica
C8	124138	9 mc. R.F. trimmer
C9	124139	B.C. R.F. trimmer
C10	10074	.1 x 400 v.
C11	10074	.1 x 400 v.
C12	10061	.02 x 600 v.
C13	1292	.0005 mica
C14	10061	.02 x 600 v.
C15	119112	30.0 mfd. lytic x 450 w.v.
C16	124144	B.C. oscillator trimmer
C17	119112	30.0 mfd. lytic x 450 w.v.
C18	129167	.0002 silver mica
C19	129165	.00005 mica
C20	124145	9 mc. oscillator trimmer
C21	119112	10.0 mfd. lytic
C22	11969	16 mfd. x 350 w.v.
C23	10065	.015 x 600 v.
C24	10065	.015 x 600 v.
C25	1001	.1 x 400 v.
C26	10022	.05 x 200 v.
C27	10013	.05 x 400 v.
C28	1009	.05 x 200 v.
C29	129161	.0001 mica
C30	129161	.0001 mica
C31	10020	.1 x 200 v.
C32	1292	.0005 mica
C33	12912	.00025 mica
C34	1001	.1 x 400 v.
C35	10013	.05 x 400 v.
C36	100118	.008 x 600 v.
C37	12936	.0003 mica
C38	129166	.000125 mica
C39	10037	.003 x 600 v.
C40	12912	.00025 mica

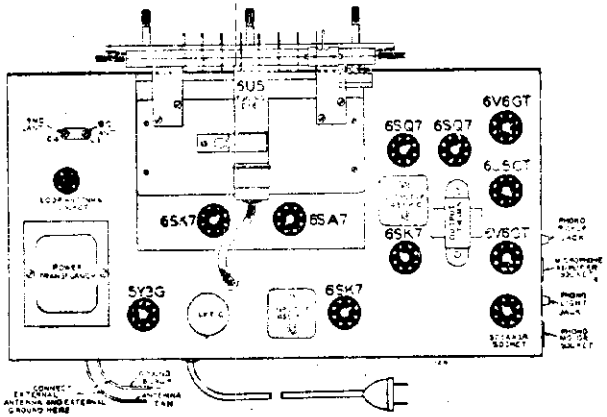
C4 and C3 in same unit
C15, C17 and C21 in same unit

PARTS

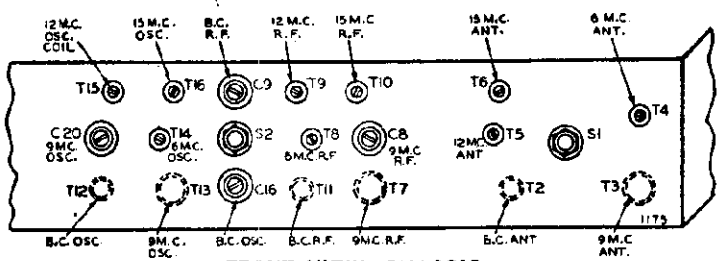
T1	111209	Loop antenna assembly
T2	111195	B.C. antenna Coil
T3	111190	9 mc. antenna coil
T4	111189	6 mc. antenna coil
T5	111191	12 mc. antenna coil
T6	111192	15 mc. antenna coil
T7	10959	9 mc. R.F. coil
T8	10958	6 mc. R.F. coil
T9	10960	12 mc. R.F. coil
T10	10961	15 mc. R.F. coil
T11	10962	B.C. R.F. coil
T12	110161	B.C. Oscillator coil
T13	110157	9 mc. oscillator coil
T14	110156	6 mc. oscillator coil
T15	110158	12 mc. oscillator coil
T16	110159	15 mc. oscillator coil
T17	108177B	Input I.F. coil—455 kc.
T18	108130E	Output I.F. coil—455 kc.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Dial Pointer Setting	Trimmers Adjusted in Order Shown	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Grid of 6SK7 (I.F.)	Broadcast	Set Dial at 1600 Kc.	Two Trimmers on Top	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 6SA7	Broadcast	Set Dial at 1600 Kc.	Two Trimmers on Top	Input I. F.	Adjust to maximum output
31 METER BAND	9.6 Mc.	400 ohms	Antenna lead	31M	Set Dial at 9.6 Mc.	(See Trimmer View) C20 (See Trimmer View) C8 (See Trimmer on Top) C4	Osc. R. F. Ant.	Adjust to maximum output
49 METER BAND	6.1 Mc.	400 ohms	Antenna lead	49M	Set Dial at 6.1 Mc.	(See Trimmer View) T14 (See Trimmer View) T8 (See Trimmer View) T4	Osc. R. F. Ant.	Adjust to maximum output
25 METER BAND	11.8 Mc.	400 ohms	Antenna lead	25M	Set Dial at 11.8 Mc.	(See Trimmer View) T15 (See Trimmer View) T9 (See Trimmer View) T5	Osc. R. F. Ant.	Adjust to maximum output
19 METER BAND	15.2 Mc.	400 ohms	Antenna lead	19M	Set Dial at 15.2 Mc.	(See Trimmer View) T16 (See Trimmer View) T10 (See Trimmer View) T6	Osc. R. F. Ant.	Adjust to maximum output
BROAD-CAST BAND	1600 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1600 Kc.	(See Trimmer View) C16 (See Trimmer View) C9 (See Trimmer on Top) C3	Osc. R. F. Ant.	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1400 Kc.	Rotate Core T11 Rotate Core T2 (See Iron Core Adjustment View)	R. F. Ant.	Adjust to maximum output

● Dummy antennas—.1 mf., 200 mmf., and 400 ohms.

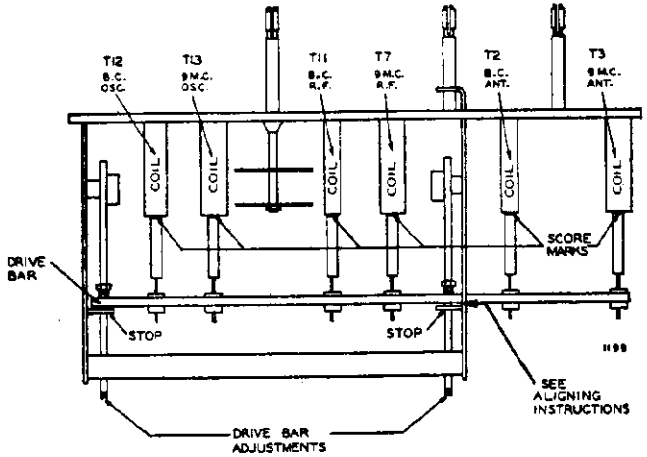


CHASSIS VIEW



FRONT VIEW CHASSIS

TRIMMER VIEW



IRON CORE ADJUSTMENT VIEW

Aligning Instructions

First refer to the "Iron Core Adjustment View" now turn the tuning knob until the drive bar comes within 1/64 to 1/32 from the stops. (A piece of blotting paper is about the right thickness and will serve as a gauge). The clearance of the bar must be the same at both stops. If far off you can raise one drive screw gently and equalize them. Minor adjustments may be made with the drive bar adjustments.

Next rotate each iron core until the fine score marks are even with the edge of the coil forms.

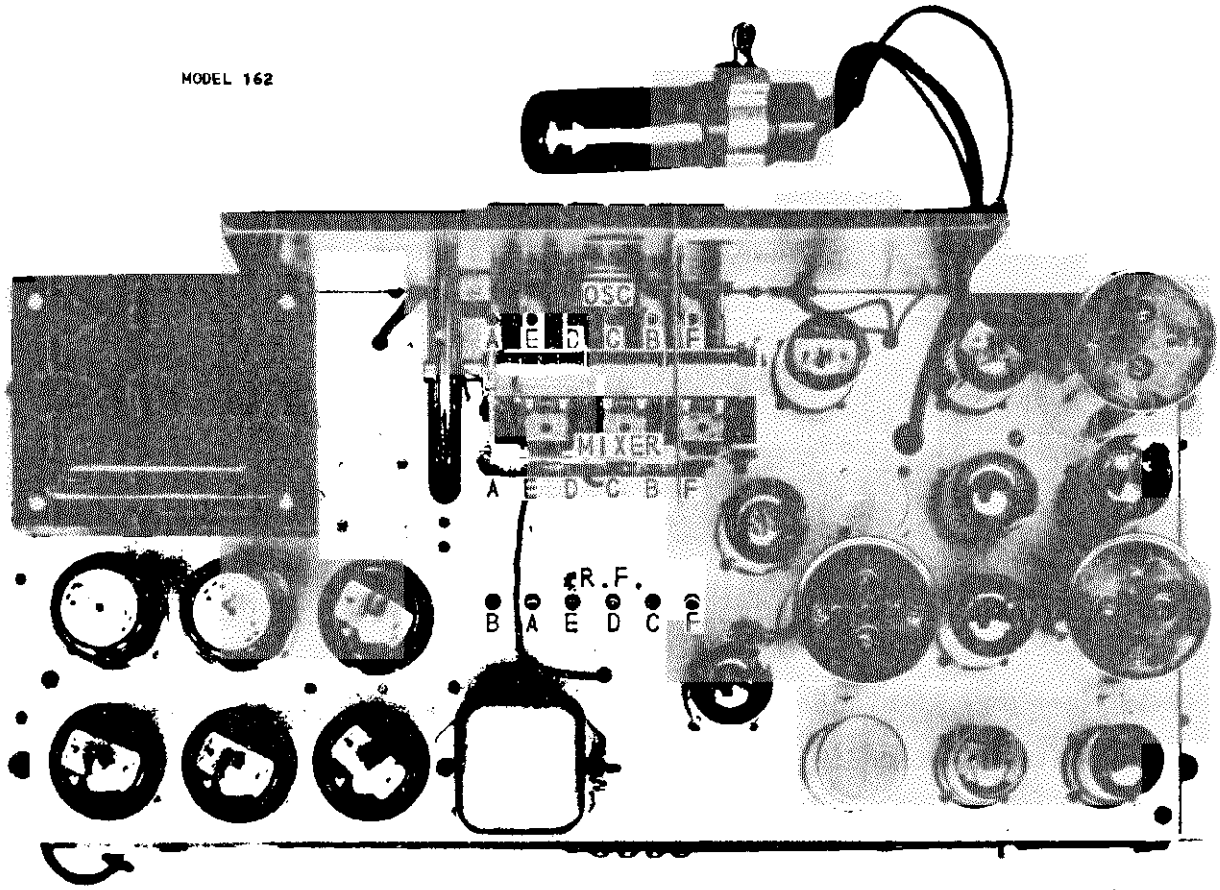
You are now ready to continue with the trimmer adjustments as shown on the alignment chart.

Replacing Pushbuttons

Should it ever be necessary to replace a broken or lost pushbutton you will notice they are made in two parts, a clear front and a brown body. To separate the two portions first take off the escutcheon. Push the button in—Next push the brown body of the button back until it snaps free from the clear front. You can now lift the clear portion off and take out the brown body. To replace the pushbutton, reverse the procedure.

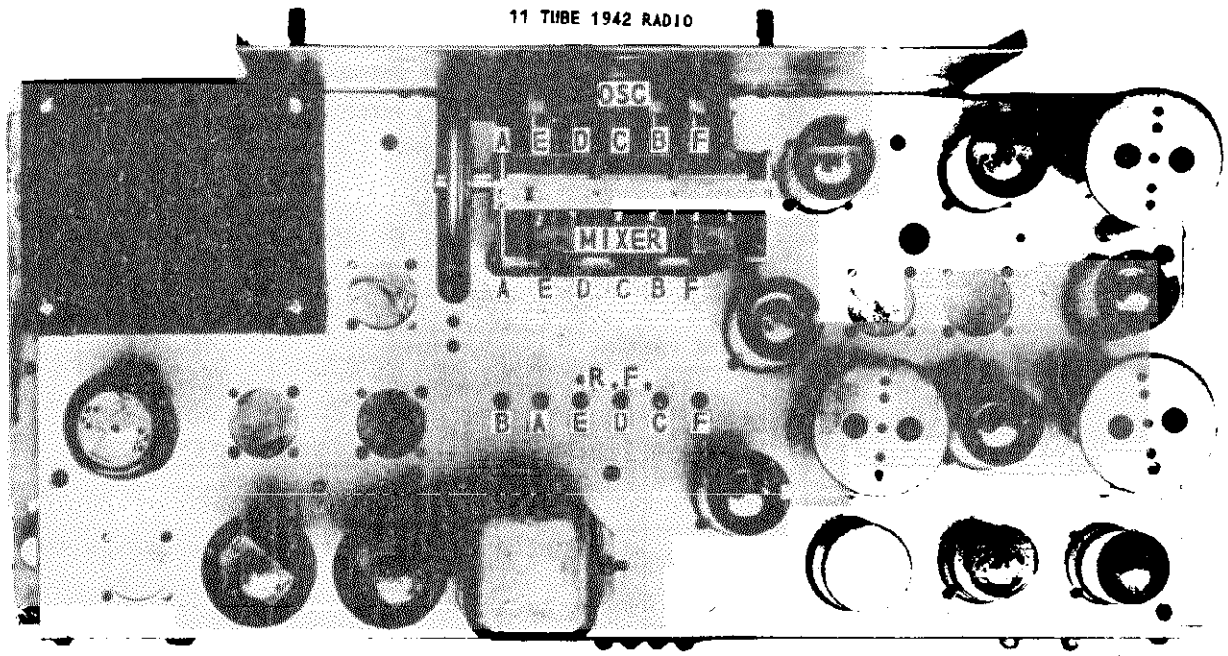
THE MAGNAVOX CO., INC. CHASSIS CR-176 and CR-17

MODEL 162



MODEL 112

11 TUBE 1942 RADIO

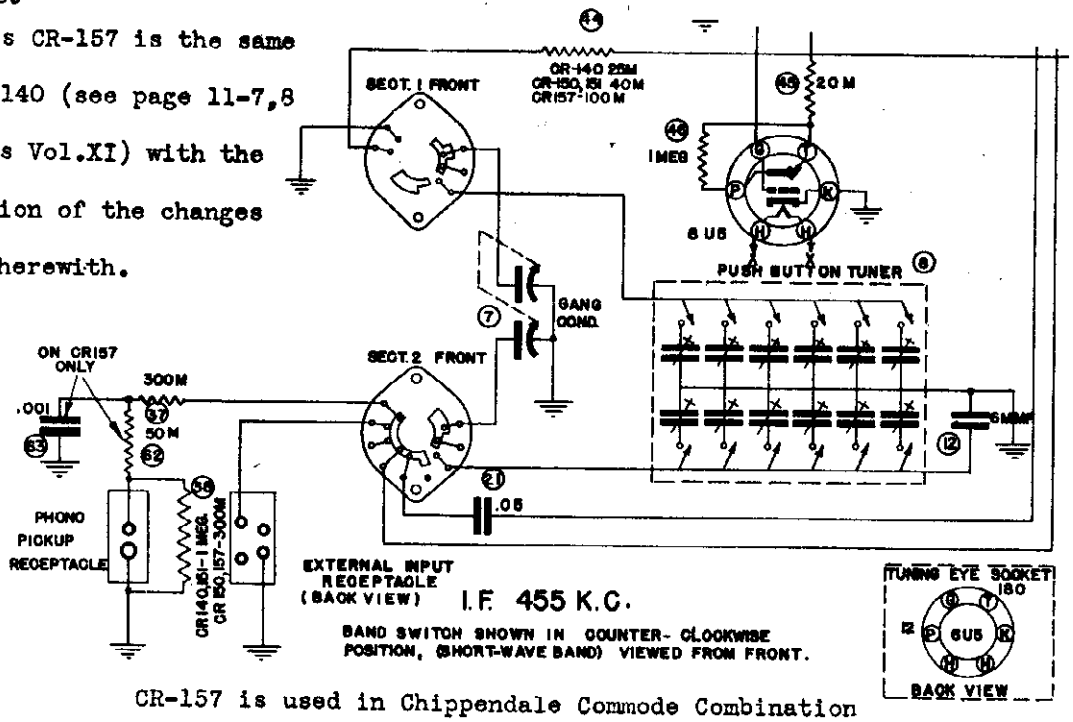


CHASSIS CR-157
CHASSIS CR-159

THE MAGNAVOX CO., INC.

CHASSIS CR-160

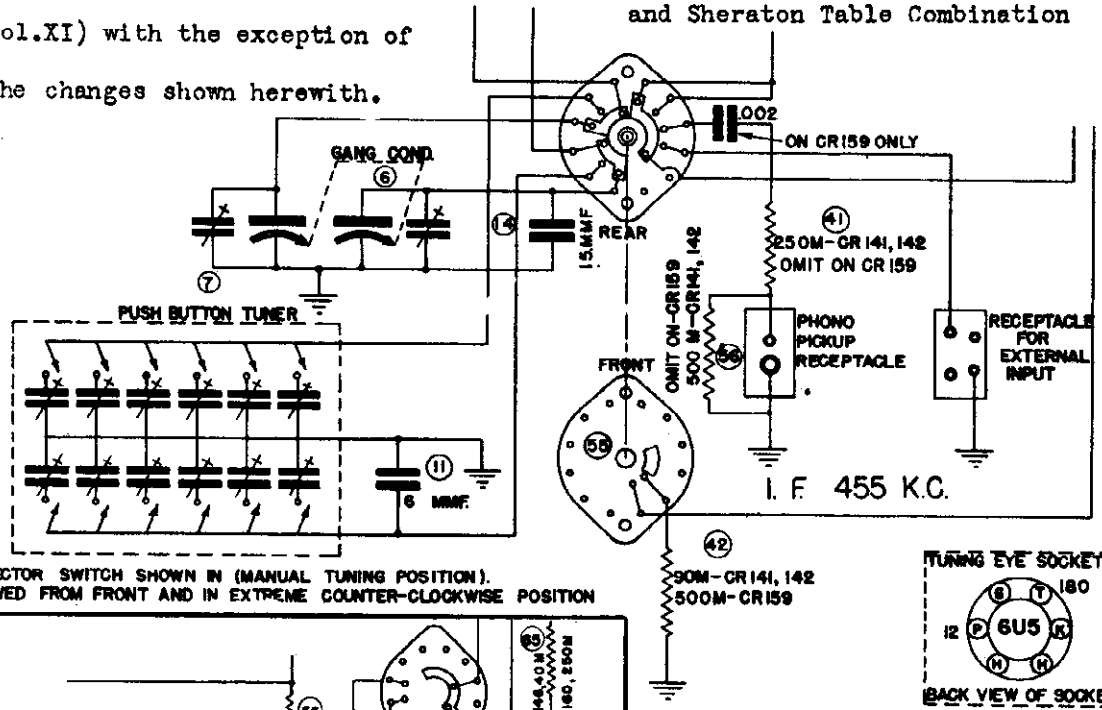
Chassis CR-157 is the same as CR-140 (see page 11-7,8 Rider's Vol.XI) with the exception of the changes shown herewith.

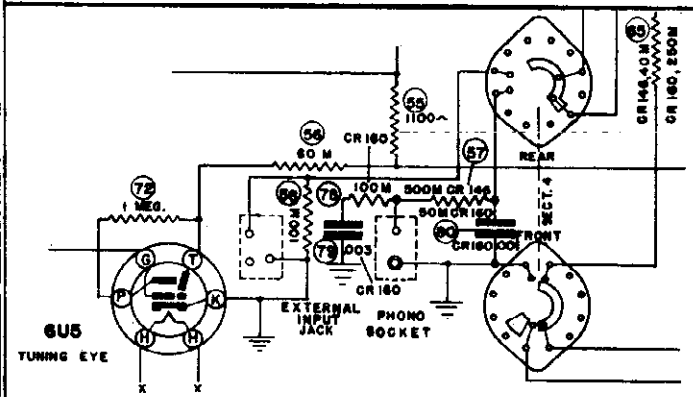


CR-157 is used in Chippendale Commode Combination

Chassis CR-159 is the same as CR-141 (see page 11-13 Rider's Vol.XI) with the exception of the changes shown herewith.

CR-159 is used in Concerto Combination and Sheraton Table Combination

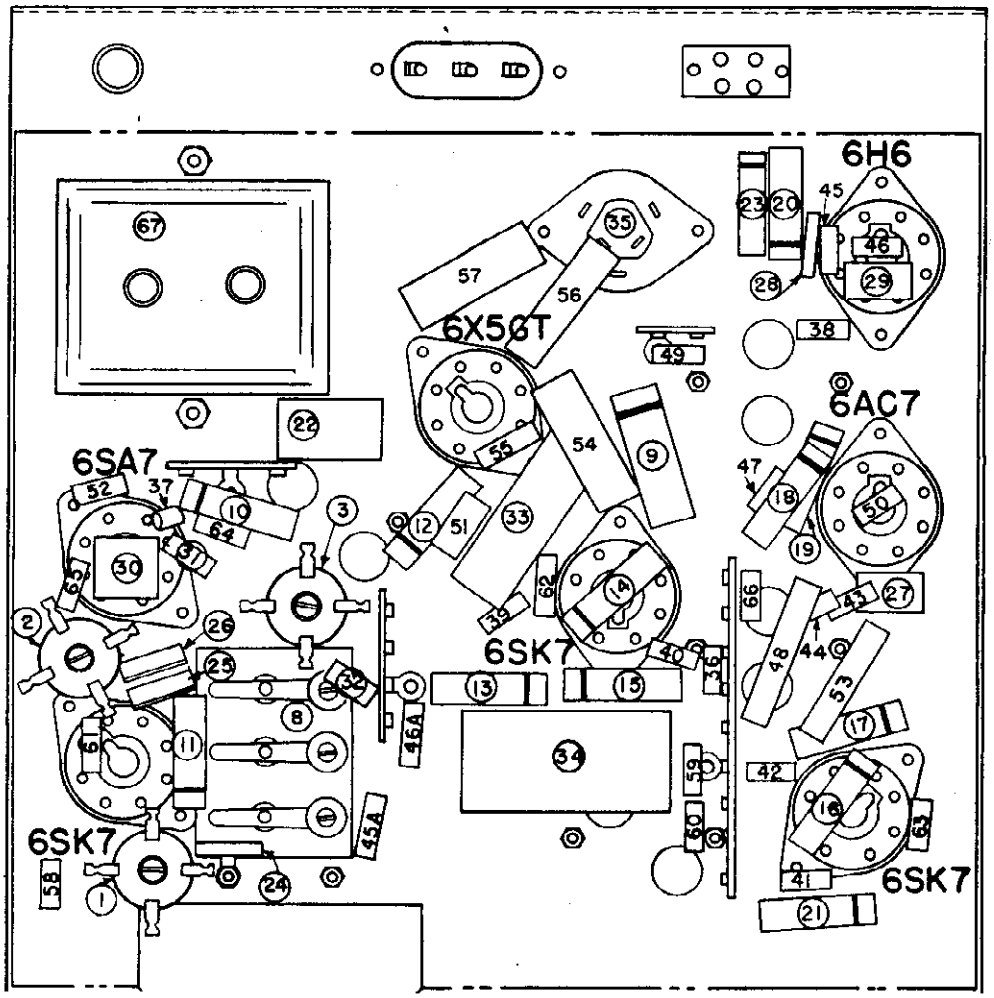




CHASSIS CR-160 is the same as CR-146 with the exception of the change that is shown at the left.

CR-160 used in AC Hepplewhite Combination.

THE MAGNAVOX CO., INC.

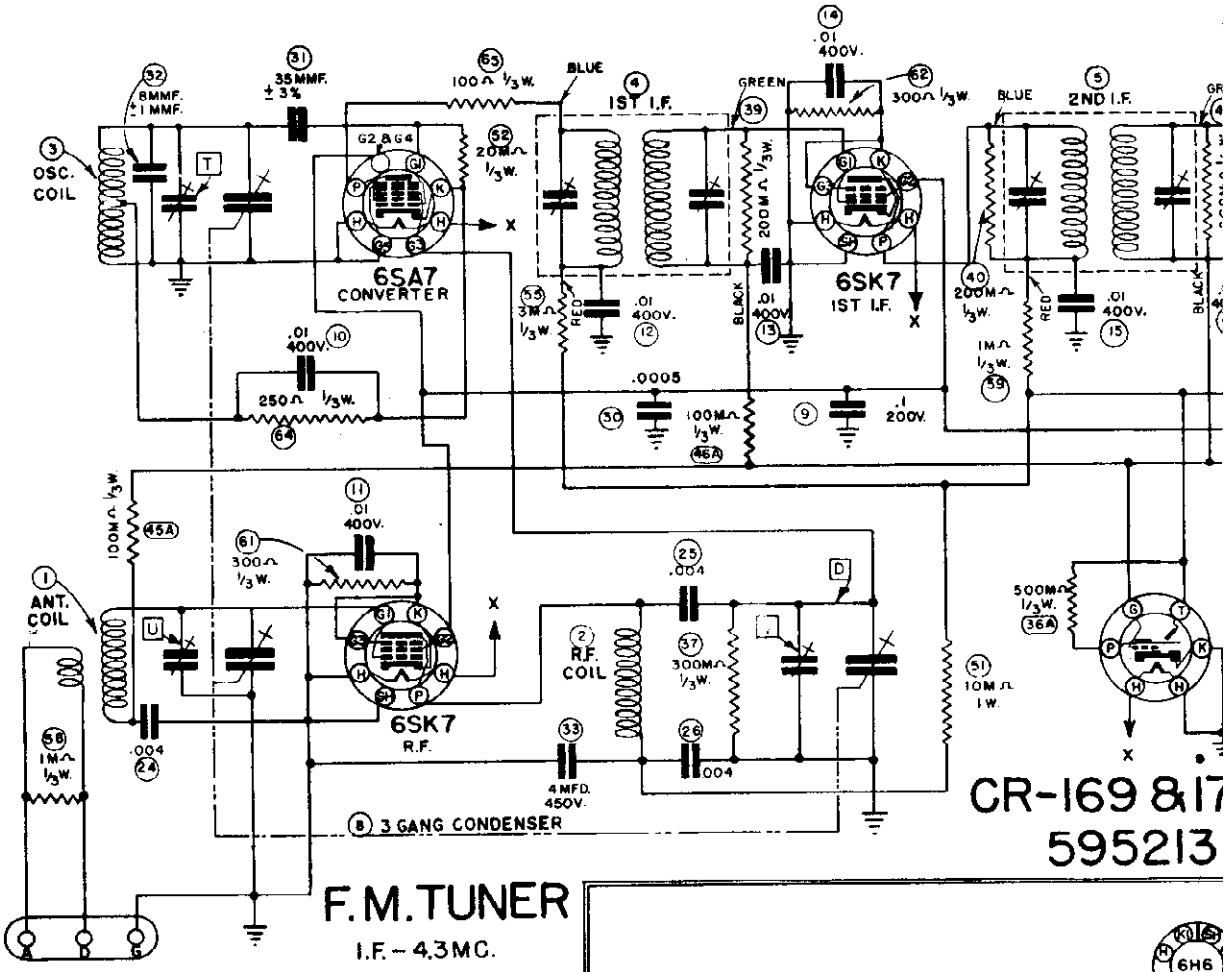


5. The discriminator will be adjusted next. Connect the microammeter in parallel with the 40,000 ohm resistor (49). This is indicated as point "X" on the diagram. The positive side of the meter is connected to ground. Instead of this, a high impedance electronic voltmeter, such as an Analyst or similar device, can be connected across this resistor. This measures the detector output current or voltage.

6. Adjust the test generator to 4375 kc. Adjust both trimmers on the discriminator transformer (7) for a peak. Adjust the output of the generator so that the meter reads at least 60 microamperes or 2.4 volts. Readjust the oscillator to 4300 kc. Adjust the trimmer nearest the 6H6 tube until the current or voltage is zero. A non-metallic screwdriver is essential; this is an extremely important operation. Re-set the oscillator to 4375 kc. and note the meter reading.

   Now reverse the meter connections so that the negative terminal is connected to ground. Set the generator to 4225 kc. and the meter reading should be within 10% of being the same. If not, the tuning of the discriminator transformer was not done carefully enough and must be repeated. This completes the adjustment of the discriminator. Remove the meter from the circuit.

7. Re-connect the control grid of the 6SA7 to the mixer coil if this connection had been removed and disconnect the generator from this point.



CR-169 &17
595213

F.M. TUNER

I.F. – 4.3MC.

BAND RANGE — 41.7 – 504 MC.

VOLTAGE TABLE

BOTTOM VIEW OF CHASSIS

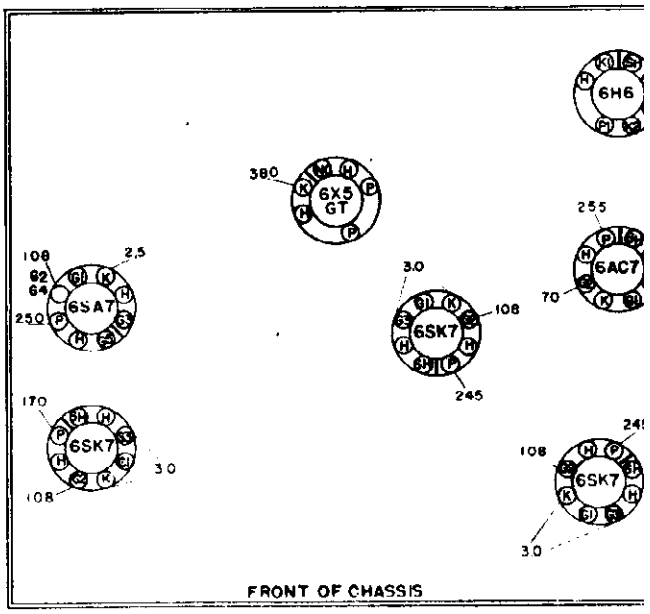
ALL VOLTAGES MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER
ALL HEATERS (H) 6.3V. A.C.
MEASURE CATHODES (K) EXCEPT 6X5 GT, ON 30V. SCALE
ALL OTHERS ON 600 V. SCALE
LINE VOLTAGE 117V. A.C.

PRIMARY VOLTAGE 117 v. 50-60 cycles

POWER CONSUMPTION 70 watts

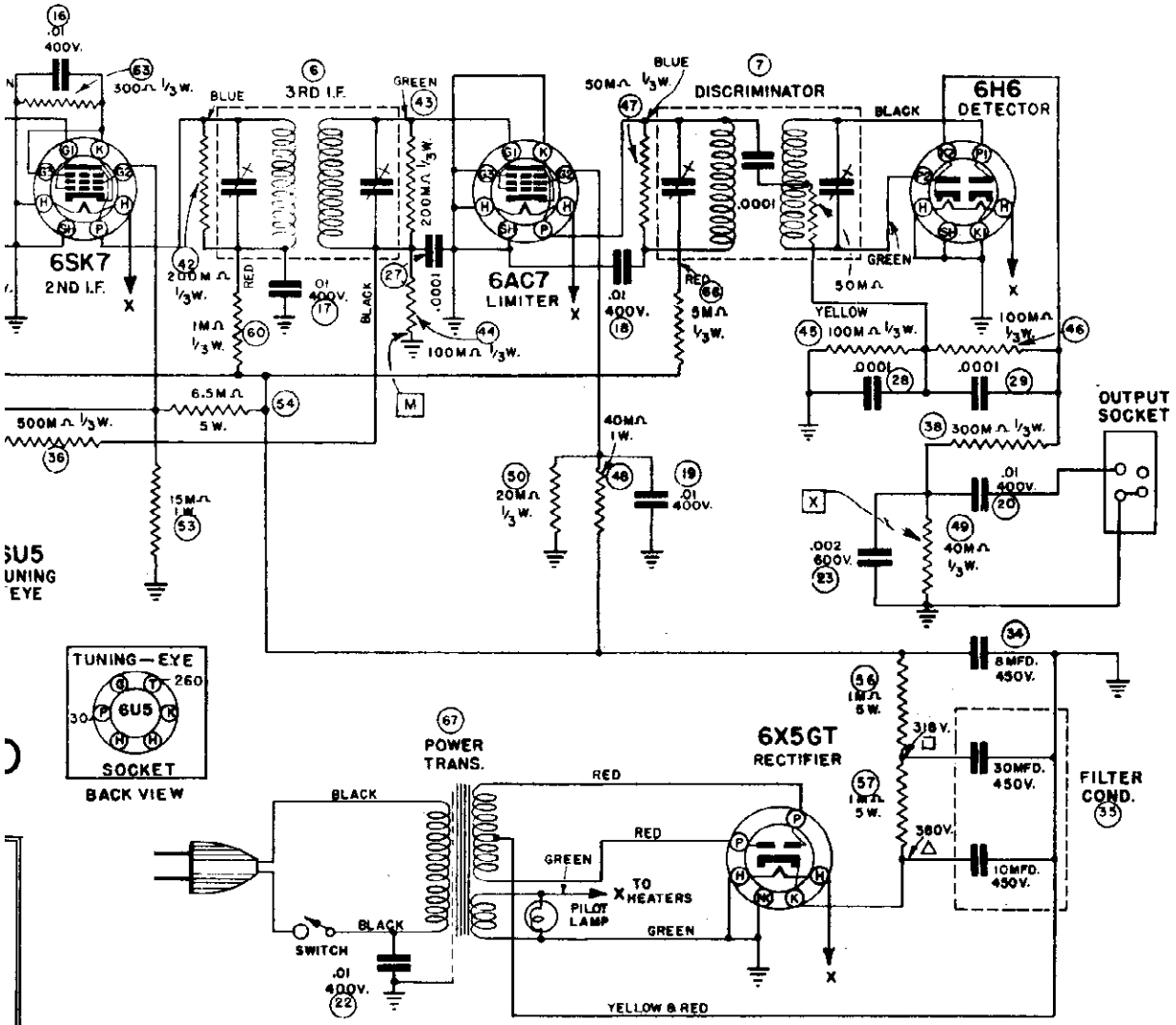
TUNING RANGE 41.7 - 50.4 MC

IF PEAK 4.3 MC



ALIGNMENT PROCEDURE

Although it is most convenient to align this received with a frequency-modulated oscillator, a satisfactory job can also be done with an accurately-calibrated signal generator or oscillator covering a range in the vicinity of 4.3 megacycles. The object of alignment is to adjust the I.F. trimmers so that the I.F. system has a pass band from 4.2 to 4.4 megacycles, and then to adjust the discriminator transformer to cover exactly the same band. Proceed as follows:



1. Connect the "high" side of the generator output to the grid (G3) of the 6SA7 converter, and the "low" side of the generator to the ground of the chassis. The connection to the grid is most easily made by connecting to the stator or middle condenser in the tuning gang. If it is found that the generator does not furnish enough signal, it will be necessary to make this connection directly to the control grid of the 6SA7 tube and to disconnect the R.F. coil from this grid. This point is indicated at "D" on the schematic diagram.

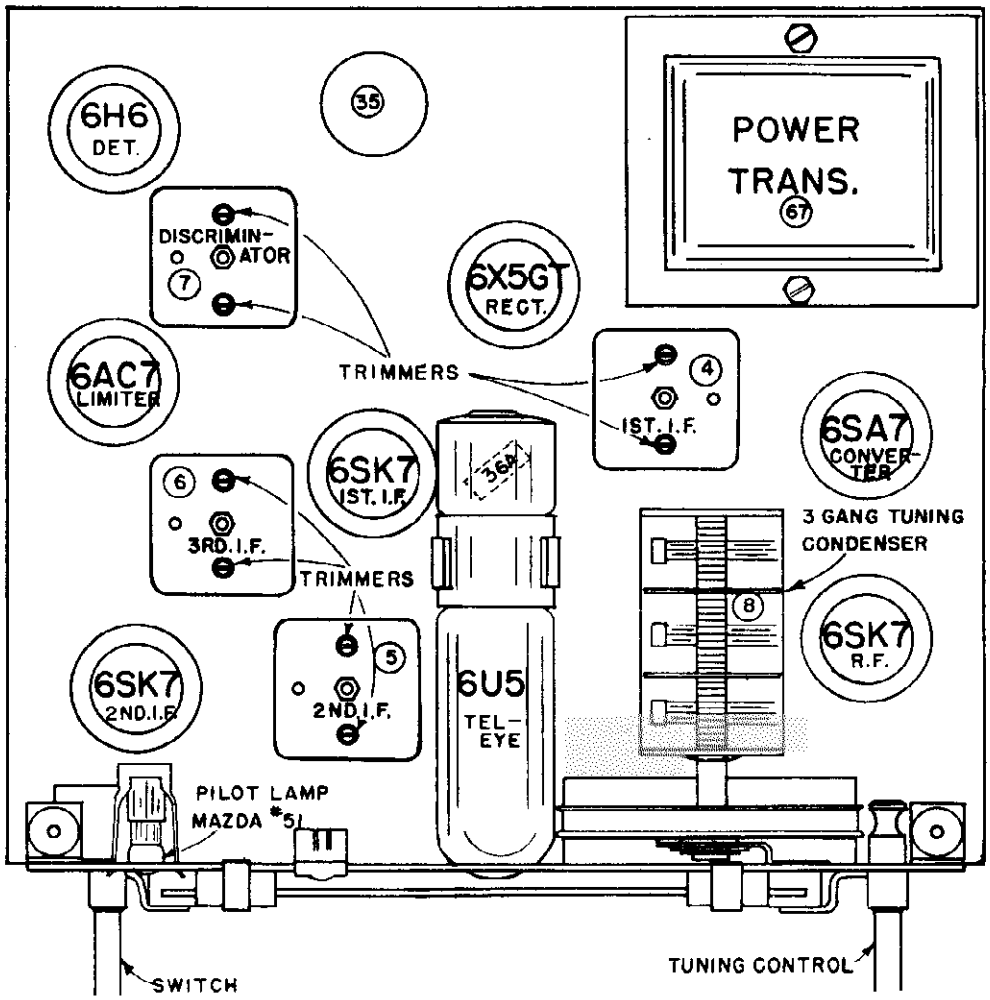
2. Connect a 0-50 or 0-200 microammeter in series with the "ground" end of the 100,000 ohm resistor (44). This is point "M" on the diagram. Connect the positive terminal of the meter to ground. This will measure the grid current of the 6AC7 tube. A reading of 30 to 100 microamperes is all that should be expected at this point. If an Analyst or a D.C. electronic voltmeter is available, it can be connected directly across this 100,000 ohm resistor (62) without disconnecting the resistor. This measures the limiter grid bias voltage. A reading of 3 to 10 volts should be considered normal.

3. Set the generator at 4300 kc. and align the I.F. Trimmers for maximum grid current in the 6AC7 tube as indicated by the microammeter or voltmeter.

4. The I.F. stages are now aligned. Remove the microammeter and re-connect the 100,000 ohm resistor (44) as it was before.

CHASSIS CR-169,CR-170

THE MAGNAVOX CO., INC.



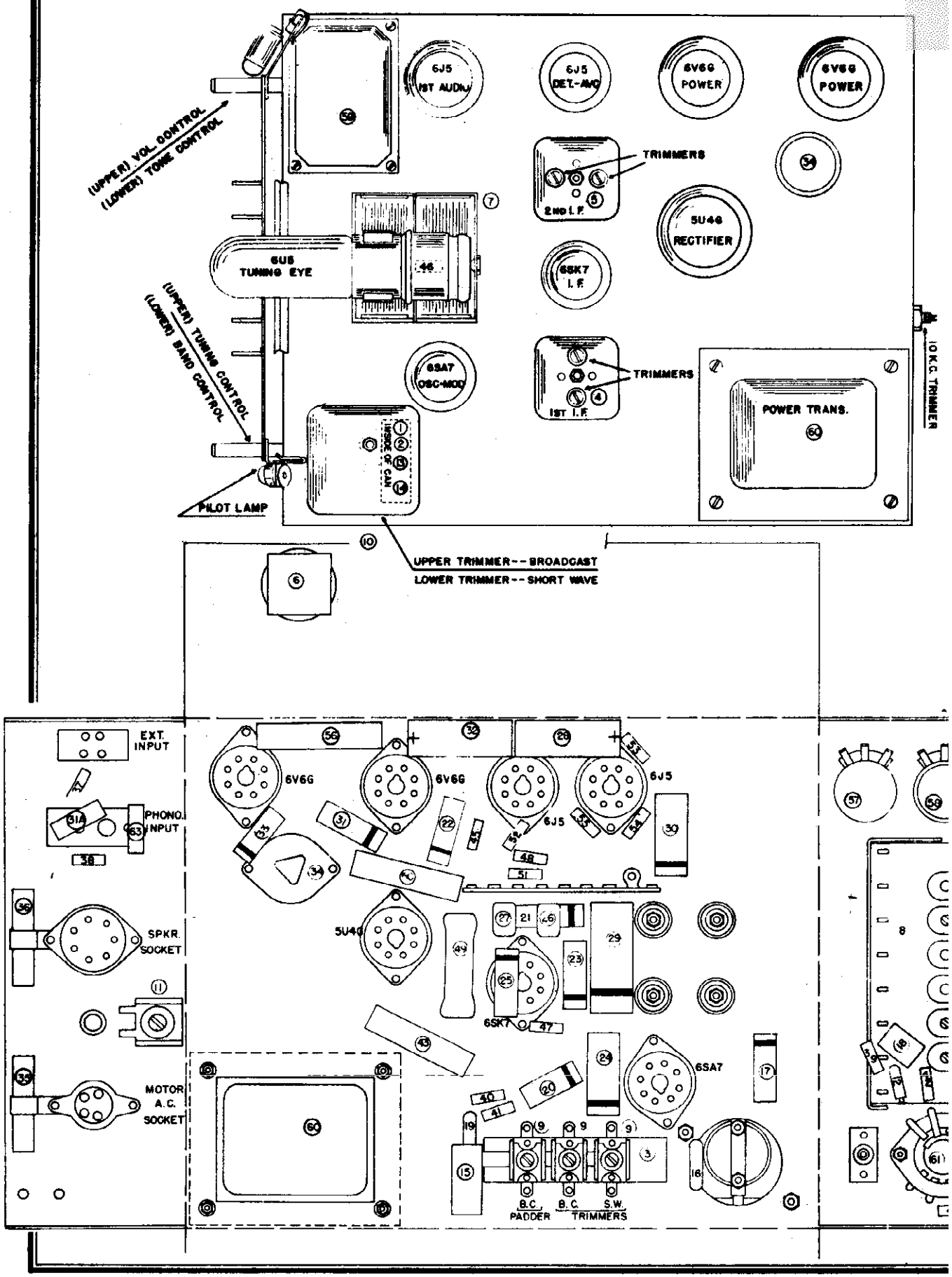
8. The antenna, mixer, and oscillator coils are now ready to be aligned. Check to see that the dial pointer is at the end of the dial calibration (41.7 mc.) when the tuning gang is fully meshed.

9. Prepare to measure the limiter grid current by again connecting the microammeter as described in paragraph 2.

10. If an extremely accurate signal generator is available, it may be used for setting the oscillator to the dial calibration. The generator is connected to the antenna post through a 70 ohm resistor. Otherwise it will be necessary to connect an antenna to the receiver and use a F.M. transmitter for the frequency standard, preferably one between 47 mc. and 50 mc.

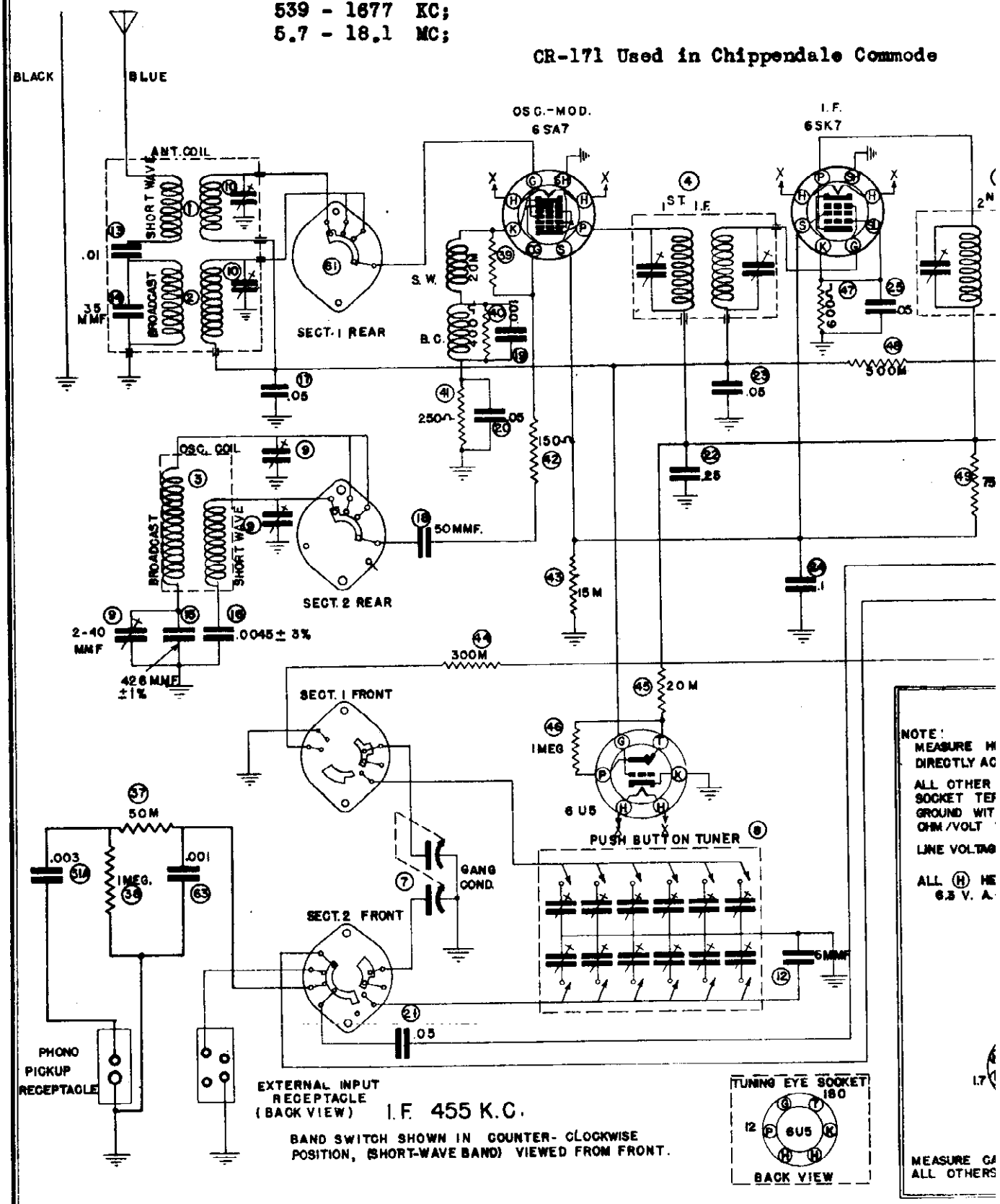
11. Set the dial to the known frequency of the transmitter and adjust the oscillator air trimmer "T" until the signal produces a maximum reading on the microammeter. Then adjust the trimmers "U" and "V" on the antenna and R.F. coils for maximum reading. If too much signal is fed to the receiver, it will appear at several settings of the dial and confuse the adjusting. These trimmers should align rather loosely. If they are tightened so that the frequency of the R.F. circuit equals the oscillator frequency, spurious oscillations and responses are produced. The oscillatorfrequency is normally 4300 kc. lower than the signal frequency. When the above adjustments are completed and the 100,000 ohm resistor (44) is again grounded, the receiver has been aligned.

THE MAGNAVOX CO., INC.



Intermediate frequency.....455 KC;
Tuning frequency range:
539 - 1677 KC;
5.7 - 18.1 MC;

CR-171 Used in Chippendale Commode

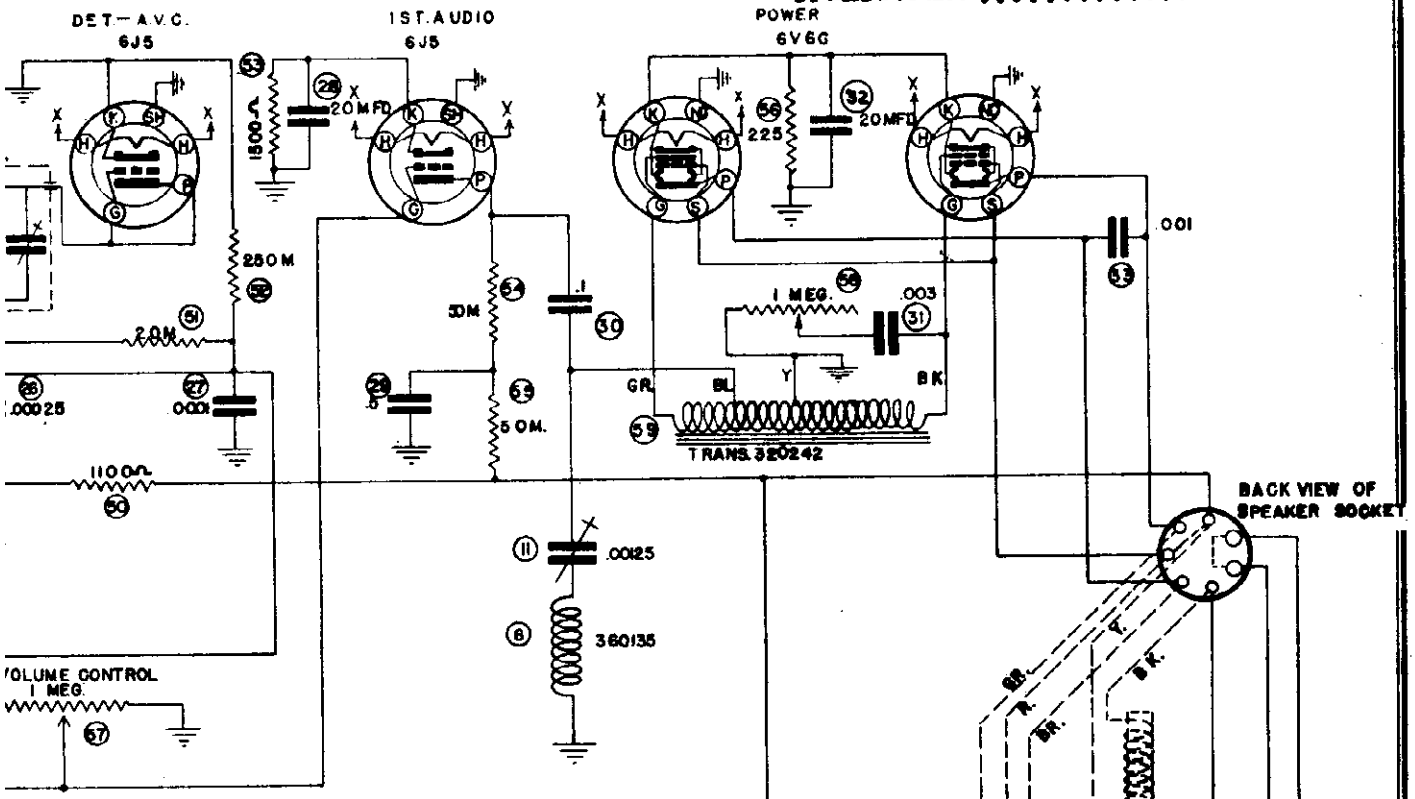


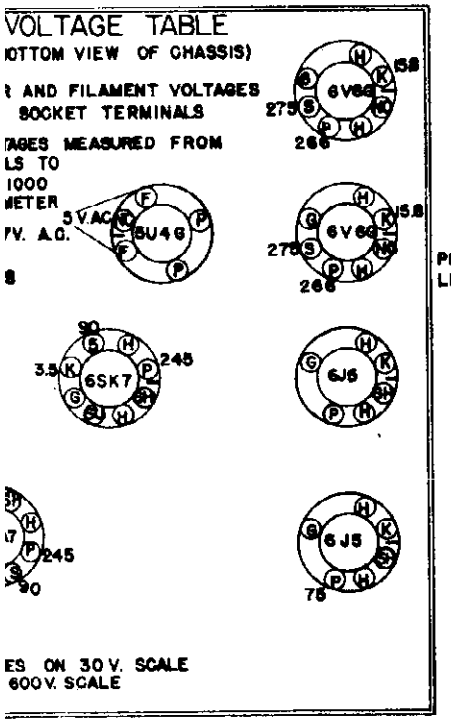
VOX CO., INC.

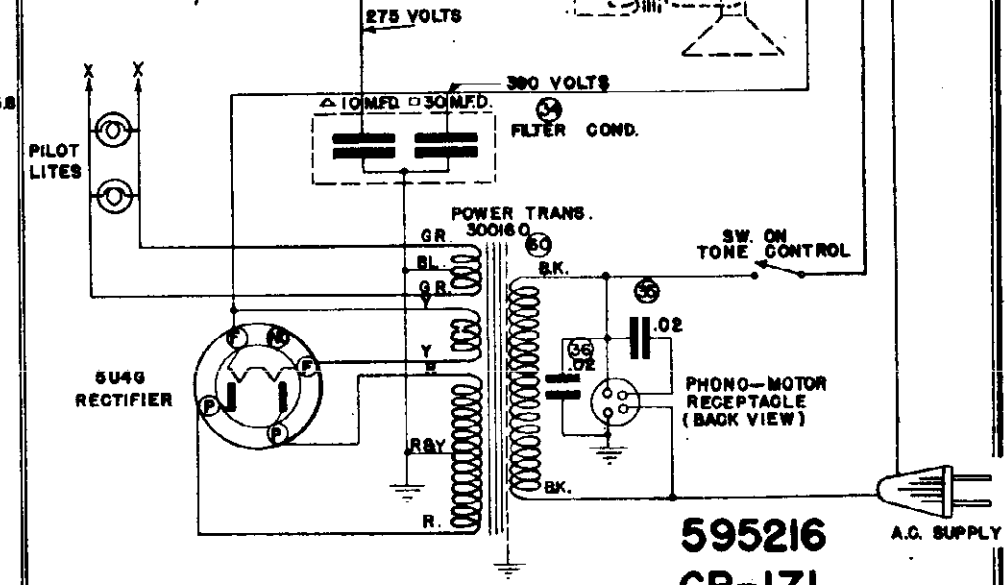
Primary voltage....117 V. 50-60 cycle AC;
Power consumption..... 100 watts;
Power output..... 12 watts;

Speaker:

Field Coil..... 1000 ohms;
Transformer..... 8000 ohms;







595216
CR-171

5-1-41 R.F.A.

CR-171 ALIGNING THE I.F. AT 455 KILOCYCLES

1. Connect the ground lead of the test oscillator to the chassis or radio ground lead. Connect the other lead of the test oscillator to the oscillator grid of the 6SA7 tube through a .00025 mfd series condenser.

2. Set the test oscillator to EXACTLY 455 kilocycles and turn the receiver volume to its maximum setting.

3. Peak each of the second I.F. transformer trimmer condensers.

4. Peak each of the first I.F. transformer trimmer condensers.

To insure most accurate trimmer setting, repeat the above adjustment several times, always using the lowest possible test oscillator output consistent with readable output meter scale deflection.

ALIGNING THE 539-1677 K.C. BAND

1. Remove the test oscillator lead from the grid lead of the 6SA7 tube and connect it to the receiver antenna lead (blue) through a .00025 mfd. series condenser.

2. Check the tuning dial adjustment by turning the gang condenser until the plates are completely meshed, at which point the dial pointer must be exactly even with the last line at the low frequency end of the dial calibration.

3. Adjust the band selector switch for operation of the 539-1677 kilocycle BROADCAST band.

4. Set the test oscillator frequency and receiver dial to EXACTLY 1400 kilocycles. Adjust the BROADCAST oscillator trimmer and the antenna trimmer to bring in the 1400 kilocycle test oscillator signal to maximum output.

5. Set the test oscillator and receiver frequency to 600 kilocycles. While rocking the gang condenser slightly to the right and to the left, adjust the 600 kilocycle oscillator padder for maximum output.

ALIGNING THE 5.7-18.1 M.C. BAND

1. Substitute a 400 ohm resistor for the .00025 mfd. condenser in series with the test oscillator output feeding the antenna lead.

2. Adjust the band selector switch to the 5.7-18.1 megacycle SHORT-WAVE band, tune the receiver and test oscillator frequency to EXACTLY 15 megacycles, and adjust the SHORT WAVE oscillator trimmer and antenna trimmer for maximum output consistent with readable output meter scale deflection.

While adjusting the oscillator trimmer, two peaks may be noticed, in which case, care must be taken so that the proper peak is used for aligning the receiver at 15 megacycles. Always screw in the trimmer to maximum capacity, then back off the trimmer until the second peak (if more than one is noticed) which is the correct one, is tuned in.

NOTE: To assure most accurate trimmer setting, repeat all of the above adjustments several times, always using the lowest possible test oscillator output consistent with readable output meter scale deflection.

10 K.C. FILTER ADJUSTMENT

With the tone control set for maximum treble response, tune the receiver to a point between two stations of about the same signal strength on adjacent channels. If a 10,000 cycle heterodyne is heard as the beat note between the two carriers, it may be eliminated by retuning the 10 KC output filter by means of the 10 KC trimmer condenser at the rear center of the chassis.

CR-172, 178 ALIGNING THE I.F. AT 455 KILOCYCLES

1. Connect the ground lead of the test oscillator to the chassis or radio ground lead. Connect the other lead of the test oscillator to the oscillator grid of the 6SA7 tube through a .00025 mfd. series condenser.

2. Set the test oscillator to EXACTLY 455 kilocycles and turn the receiver volume to its maximum setting.

3. Peak each of the second I.F. transformer trimmer condensers.

4. Peak each of the first I.F. transformer trimmer condensers.

To insure most accurate trimmer setting, repeat the above adjustment several times, always using the lowest possible test oscillator output consistent with readable output meter scale deflection.

ALIGNING THE 541-1630 K.C. BAND

Remove the test oscillator lead from the grid of the 6SA7 tube and connect it to the receiver antenna lead (blue) through a .00025 mfd. series condenser.

Set the ANT-LOOP switch switch to the ANT position.

Check the tuning dial adjustment by turning the gang condenser until the plates are completely meshed, at which point the dial pointer must be exactly even with the last line at the low frequency end of the dial calibration.

Set the test oscillator frequency and receiver dial to EXACTLY 1400 kilocycles. Adjust the oscillator trimmer (on condenser gang) and the antenna trimmer (accessible through opening in top of chassis — see layout diagram) to bring in the 1400 kilocycles test oscillator signal to maximum output.

Set the test oscillator frequency and receiver dial to EXACTLY 600 kilocycles. While rocking the gang condenser slightly to the right and to the left, adjust the 600 kc. oscillator padder (accessible through opening in top of chassis back of condenser gang) for maximum output.

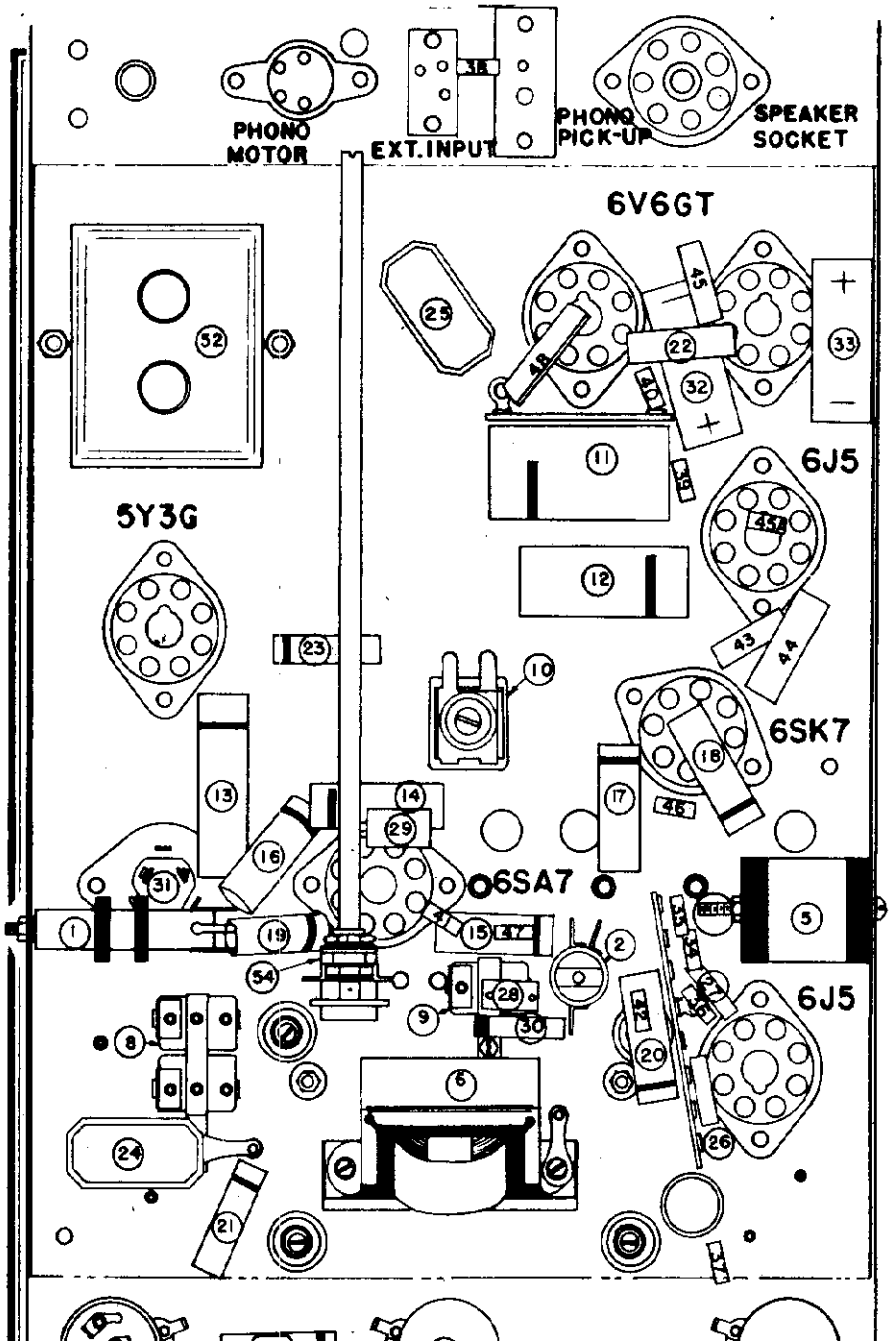
The loop trimmer adjustment must now be made to provide for maximum possible signal pickup with the loop. This adjustment must be made while the chassis and loop are in the cabinet, or with the chassis and loop in the same relative positions as when they are mounted in the cabinet.

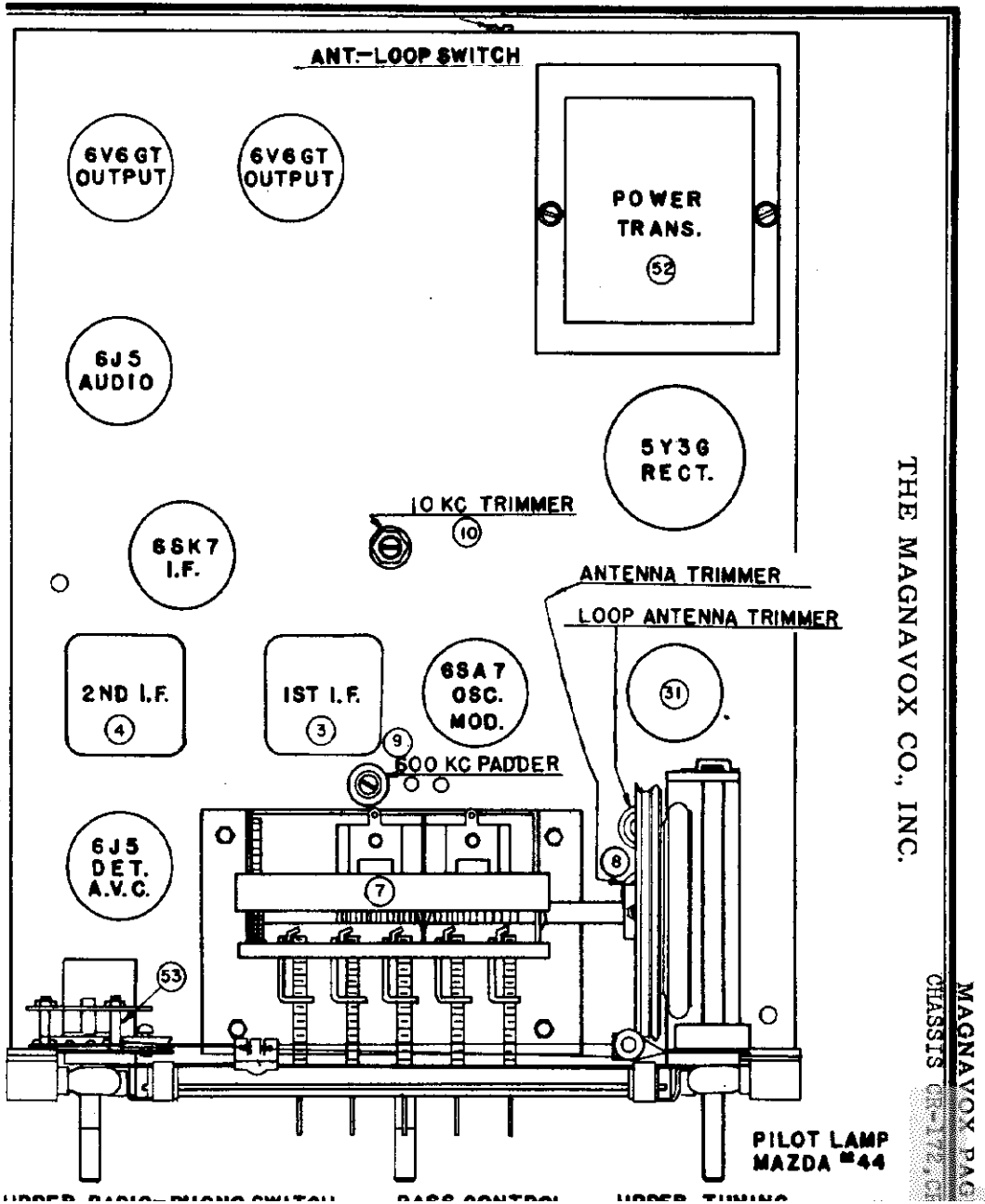
Connect the output of a signal generator that has been adjusted to 1400 kilocycles, to a loop of about five turns of wire, eight inches in diameter. Set the ANT-LOOP switch to the LOOP position.

Tune the receiver to 1400 kilocycles and adjust the loop trimmer (accessible through an opening in the top of chassis -- see layout diagram) for maximum output as indicated on an output meter connected across the voice coil while holding the smaller loop approximately 18 inches from the set loop and in the same plane.

10 K.C. FILTER ADJUSTMENT

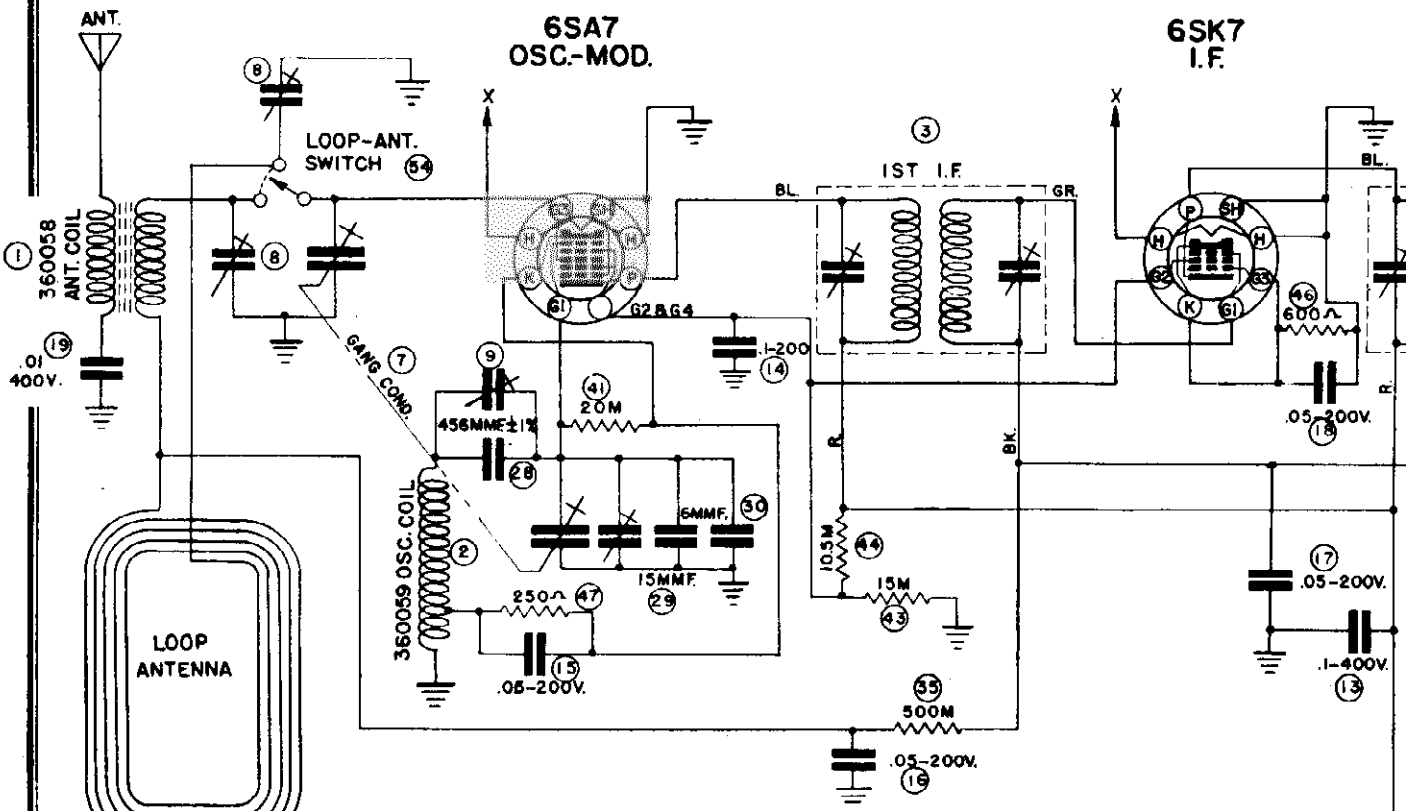
With the treble control set for maximum treble response, tune the receiver to a point between two stations of about the same signal strength on adjacent channels. If a 10,000 cycle heterodyne is heard as the beat note between the two carriers, it may be eliminated by returning the 10 KC output filter by means of the 10 KC trimmer condenser at the top center of the chassis.





THE MAGNAVOX CO., INC.

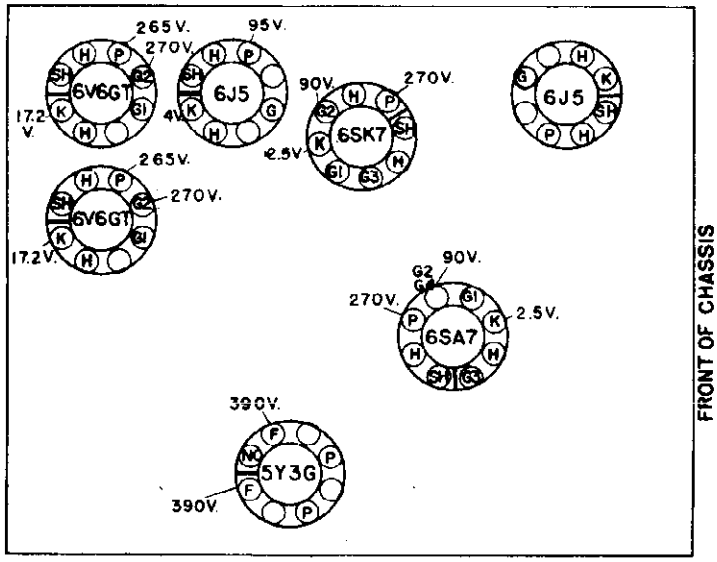
MAGNAVOX RAD
CHASSIS CR-177



CR-172 -- Used in Chippendale End Table Combination

CR-178 -- Used in Chairside Combination
Used in Chippendale Commode Combination
Used in Hepplewhite Combination

Circuit: Superheterodyne with treble and bass controls (bass control CR-178 only), bass compensation in volume control for phonograph pickup, temperature stabilized oscillator, external input receptacle.



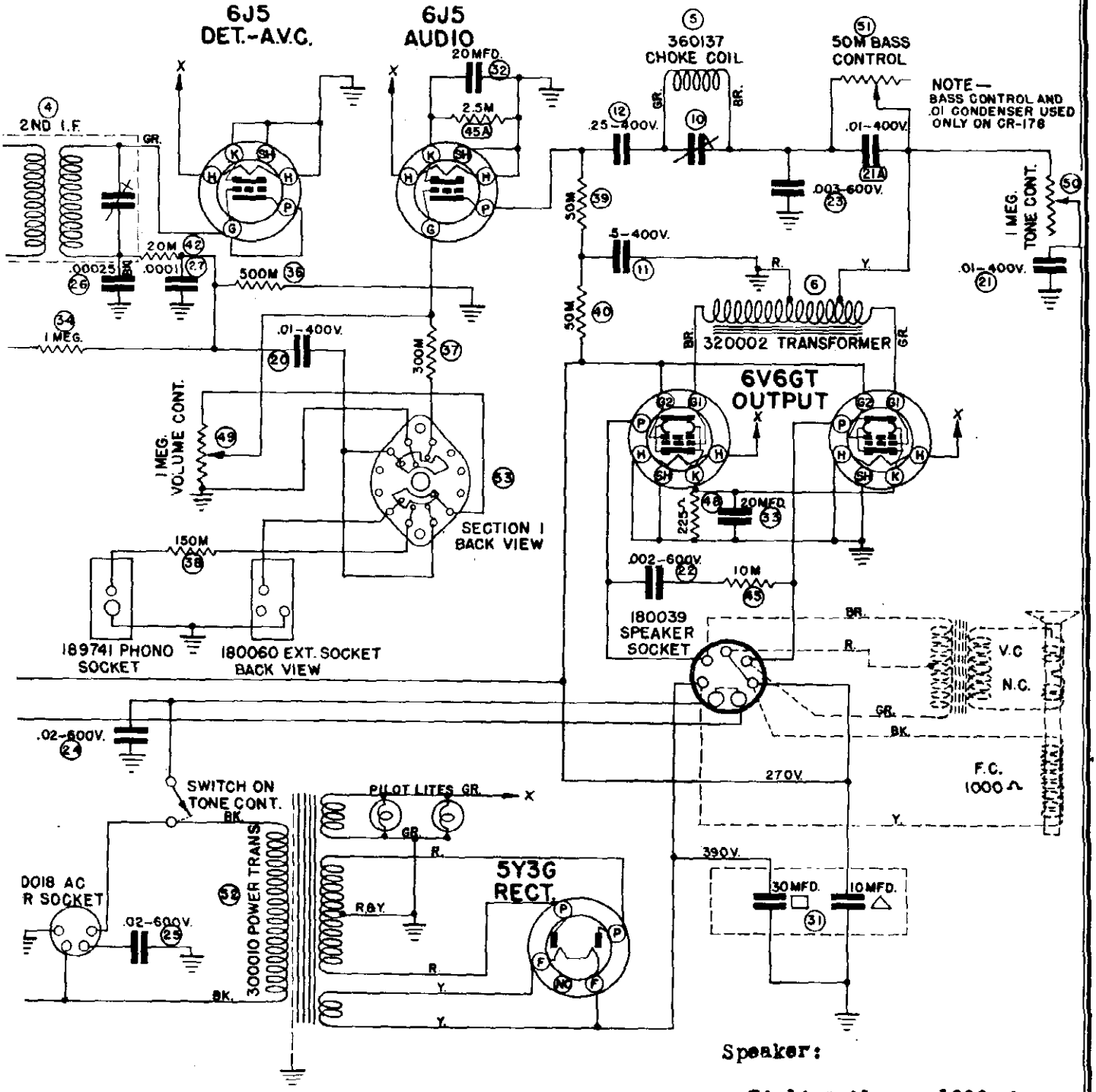
VOLTAGE TABLE

(BOTTOM VIEW OF CHASSIS)

MEASURE HEATER AND FILAMENT VOLTAGES DIRECTLY ACROSS SOCKET TERMINALS. ALL OTHER VOLTAGES MEASURED FROM SOCKET TERMINAL TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER. MEASURE CATHODES (K) ON 30V. SCALE. ALL OTHERS ON 600V. SCALE WITH NO SIGNAL INPUT.
LINE VOLTAGE 117 VOLTS. AC.

Primary voltage.....117 V. 50-60 cyc
Power consumption.....100
Power output.....12

NAVOX CO., INC.



Speaker:

Field Coil.....1000 ohms;
Transformer....8000 ohms;

I. F.—455 KC.

TUNING RANGE 540-1630 KC.

AUDIO SELECTIVE SWITCH IN EXTERNAL POSITION (EXTREME COUNTER CLOCKWISE) AS VIEWED FROM FRONT.

AC; Intermediate frequency.....455 KC;
ts; Tuning frequency range:
ts; 541 - 1630 KC;

CR-172 & 178
595226

ALIGNING THE I.F. AT 455 KC.

Models 152, 154, 155, 156, 161, 165, 174, 174C, 176, 177.

1. Connect the ground lead of the test oscillator to the chassis or set ground lead (black). Connect the other lead of the test oscillator to the #6 grid terminal on the 6SA7 tube socket, through a .00025 mfd. series condenser.

2. Set the test oscillator to EXACTLY 455 kilocycles and turn the receiver volume to its maximum setting.

3. Peak both of the second I.F. transformer trimmers.

4. Peak both of the first I.F. transformer trimmers.

To assure most accurate trimmer setting, repeat the above adjustment several times, always using the lowest possible test oscillator output consistent with readable output meter scale deflection.

ALIGNING THE 535-1720 KILOCYCLE BAND

Models 152, 154, 155, 161, 174, 174C.

1. Check the tuning dial adjustment by turning the gang condenser until the condenser plates are completely meshed, at which point the dial pointer must coincide with the last line at the low-frequency end of the dial scale. If the pointer does not have this setting, move it to the correct position, holding the condensers in complete mesh. This is accomplished by loosening the two set-screws in the hub of the large pulley on the condenser shaft.

2. Remove the test oscillator lead from the grid on the 6SA7 tube and connect it to the receiver antenna lead (blue) through a .00025 mfd. series condenser.

3. Set the band selector switch for operation on the broadcast band.

4. Set the test oscillator frequency and receiver dial to EXACTLY 1400 kilocycles. Adjust the 1400 kilocycle oscillator trimmer, the R.F. trimmer and the antenna trimmer to bring in the test oscillator signal at maximum output as indicated on the output meter.

5. Set the test oscillator and receiver frequency to 600 kilocycles. While rocking the gang condenser slightly to the right and to the left, adjust the 600 kilocycle oscillator padder for maximum output. If this padder needs much adjusting, then finish up by repeating operation (4) above.

ALIGNING THE 1667-5680 KILOCYCLE BAND

Models 152, 154, 155, 161, 174, 174C.

1. Replace the .00025 mfd. test oscillator antenna lead series condenser with a 400 ohm resistor.

2. Adjust the band selector switch for operation on the Police band.

3. Set the radio and test oscillator frequency to EXACTLY 5000 kilocycles. Now adjust the 5000 kilocycle oscillator trimmer, the R.F. trimmer and the antenna trimmer to bring in the test oscillator signal to maximum output as indicated on the output meter.

ALIGNING THE 5.6-18.4 MEGACYCLE BAND

Models 152, 154, 155, 161, 174, 174C.

1. With the 400 ohm resistor in series with the test oscillator lead to the antenna lead of the radio receiver, set the band selector switch to the Short Wave band.

2. Set the radio and test oscillator frequency to EXACTLY 15 megacycles and adjust the 15 megacycle oscillator trimmer, the R.F. trimmer and the antenna trimmer to bring the test oscillator signal in to maximum output as indicated on the output meter. SEE NOTE A (FOR ALL MODELS)

Models 152, 154, 155, 161, 174, 174C.

10 KC. FILTER ADJUSTMENT

With the tone control set for maximum treble response and the Band Expander set in the High-Fidelity position (accomplished by rotating the treble control to the right as far as possible), tune the receiver to a point between two stations of about the same signal strength on adjacent channels. If a 10,000 cycle heterodyne is heard as the beat note between the two carriers, it may be eliminated by returning the 10 KC output filter by means of the 10 KC trimmer condenser located on the top of the chassis between the two 6J5 tubes. In the absence of such a signal source in the daytime, an ACCURATE audio oscillator may be used to feed 10 KC into the phonograph input socket.

ALIGNING THE 540-1710 KC. BAND

Models 156, 165, 176, 177.

1. Remove the test oscillator lead from the grid of the 6SA7 tube and connect it to the receiver antenna lead (blue) through a .00025 mfd. series condenser.

2. Check the tuning dial adjustment by turning the gang condenser until the plates are completely meshed, at which point the dial pointer must be exactly even with the last line at the low frequency end of the dial calibration.

3. Adjust the band selector switch for radio operation on the 540-1710 K. C. (broadcast) band.

4. Set the test oscillator and receiver frequency to 600 kilocycles. While rocking the gang condenser slightly to the right and to the left, adjust the 600 kilocycle oscillator padder for maximum output.

5. Loosen the adjustment screw on the preselector trimmer (indicated on the layout diagram) as far as possible.

6. Set the test oscillator frequency and receiver dial to EXACTLY 1400 kilocycles. Adjust the BROADCAST oscillator trimmer and the antenna trimmer to bring in the 1400 kilocycle test oscillator signal to maximum output.

7. Now adjust the preselector trimmer for maximum deflection on the output meter, after which the broadcast antenna trimmer should be returned for maximum output.

ALIGNING THE 5.7—18.3 MC. BAND

Models 156, 165, 176, 177.

1. Substitute a 400 ohm resistor for the .00025 mfd. condenser in series with the test oscillator output feeding the antenna lead.

2. Adjust the band selector switch to the 5.7 - 18.3 megacycle (short-wave) band, tune the receiver and test oscillator frequency to EXACTLY 15 megacycles, and adjust the SHORT WAVE oscillator trimmer and antenna trimmer for maximum output as indicated on the output meter.

NOTE A

While adjusting the oscillator trimmer, two peaks may be noticed, in which case, care must be taken so that the proper peak is used for aligning the receiver at 15 megacycles. Always screw in the trimmer to maximum capacity, then back off the trimmer until the second peak (if more than one is noticed) which is the correct one, is tuned in.

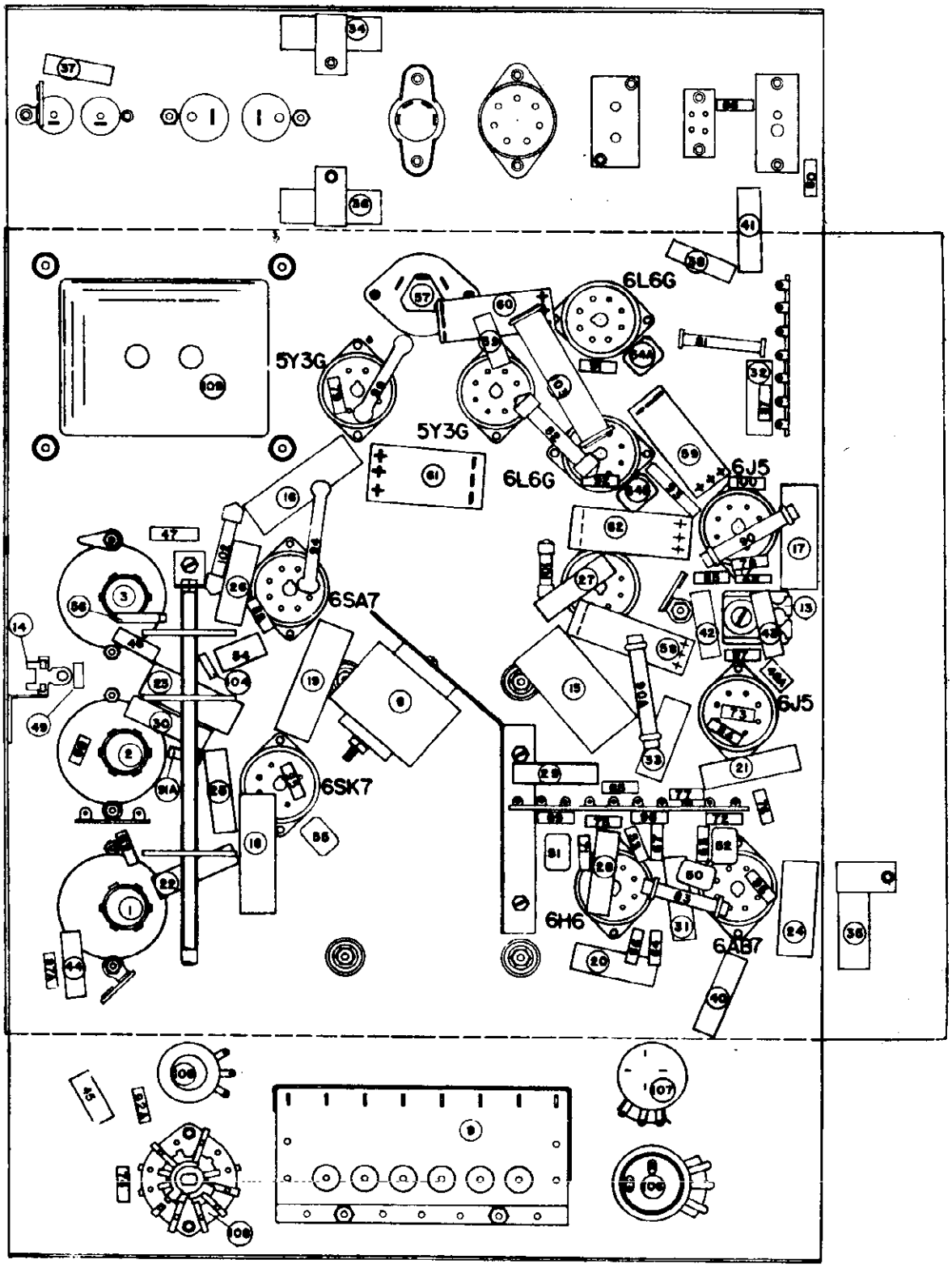
NOTE: To assure most accurate trimmer setting, repeat all of the above adjustments several times, always using the lowest possible test oscillator output consistent with readable output meter scale deflection.

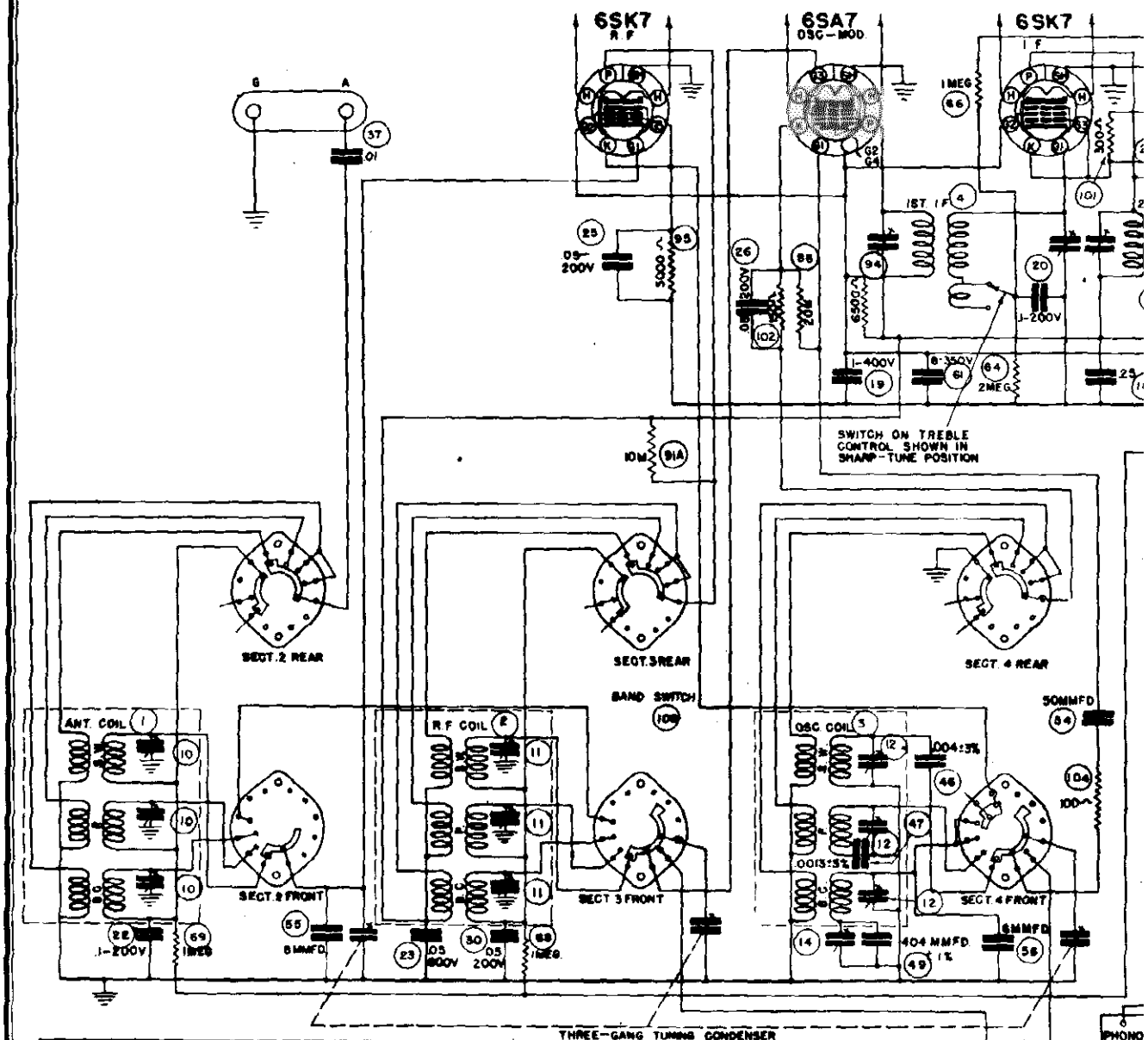
10 KC. FILTER ADJUSTMENT

Models 156, 165, 176, 177.

With the tone control set for maximum treble response, tune the receiver to a point between two stations of about the same signal strength on adjacent channels. If a 10,000 cycle heterodyne is heard as the beat note between the two carriers, it may be eliminated by returning the 10 KC output filter by means of the 10 KC trimmer condenser at the top of the chassis, adjacent the spare fuse.

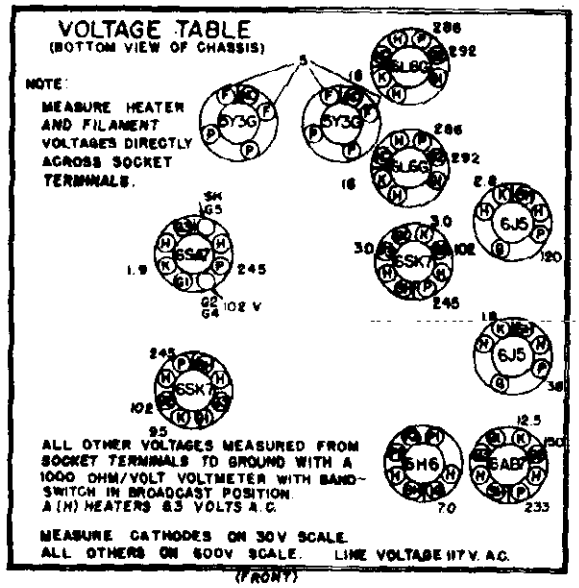
THE MAGNAVOX CO., INC.





VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)

NOTE:
MEASURE HEATER AND FILAMENT VOLTAGES DIRECTLY ACROSS SOCKET TERMINALS.

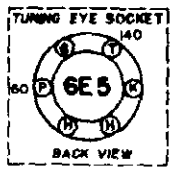


ALL OTHER VOLTAGES MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM/VOLT VOLTMETER WITH BAND-SWITCH IN BROADCAST POSITION. A (H) HEATERS 6.3 VOLTS A.C.

MEASURE CATHODES ON 30 V SCALE. ALL OTHERS ON 600V SCALE. LINE VOLTAGE 117 V. A.C.

(FRONT)

TUNING EYE SOCKET

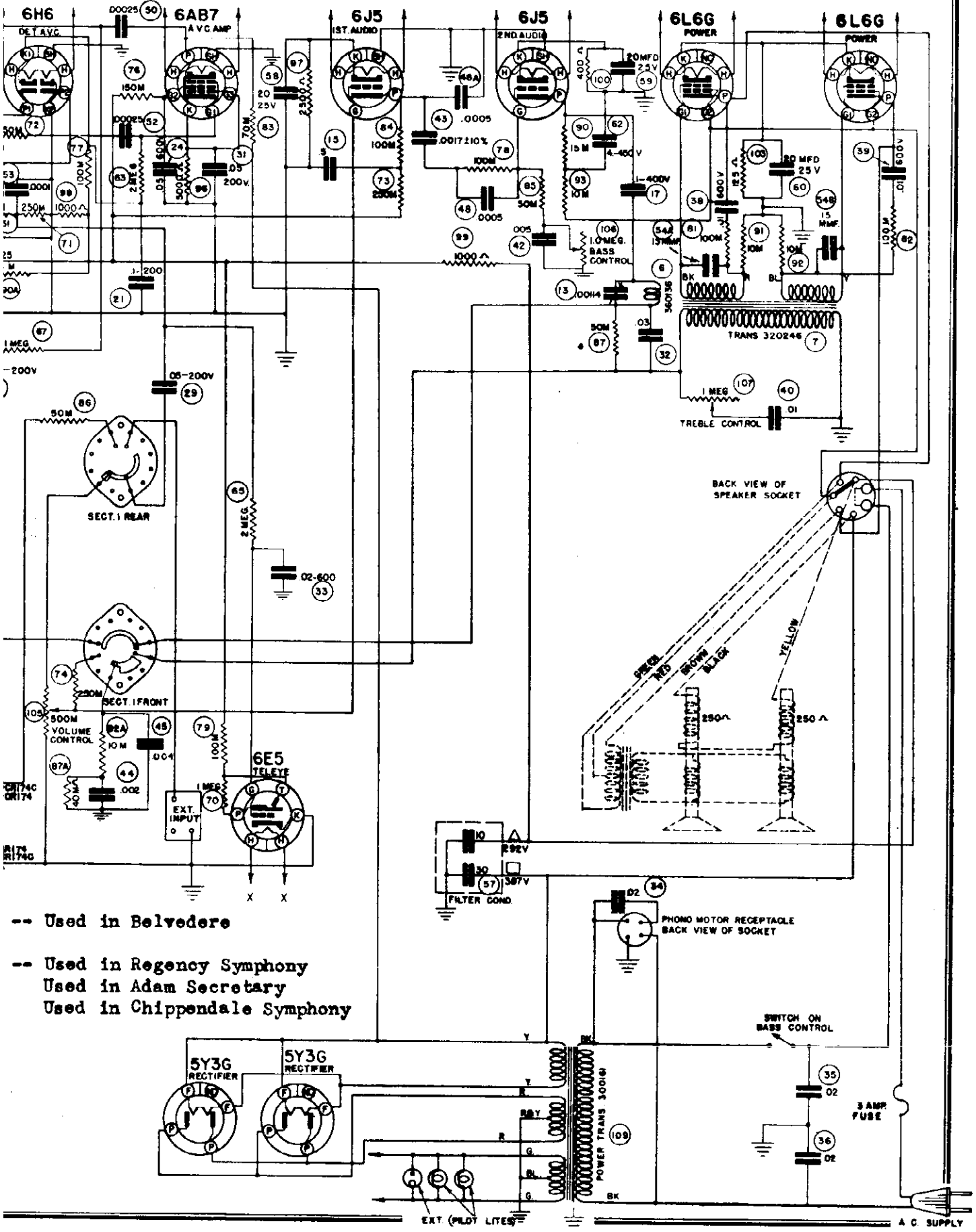


I. F.—455 K.C.

BAND SWITCH SHOWN IN COUNTER-CLOCKWISE (SHORT WAVE BAND) VIEWED FROM FR

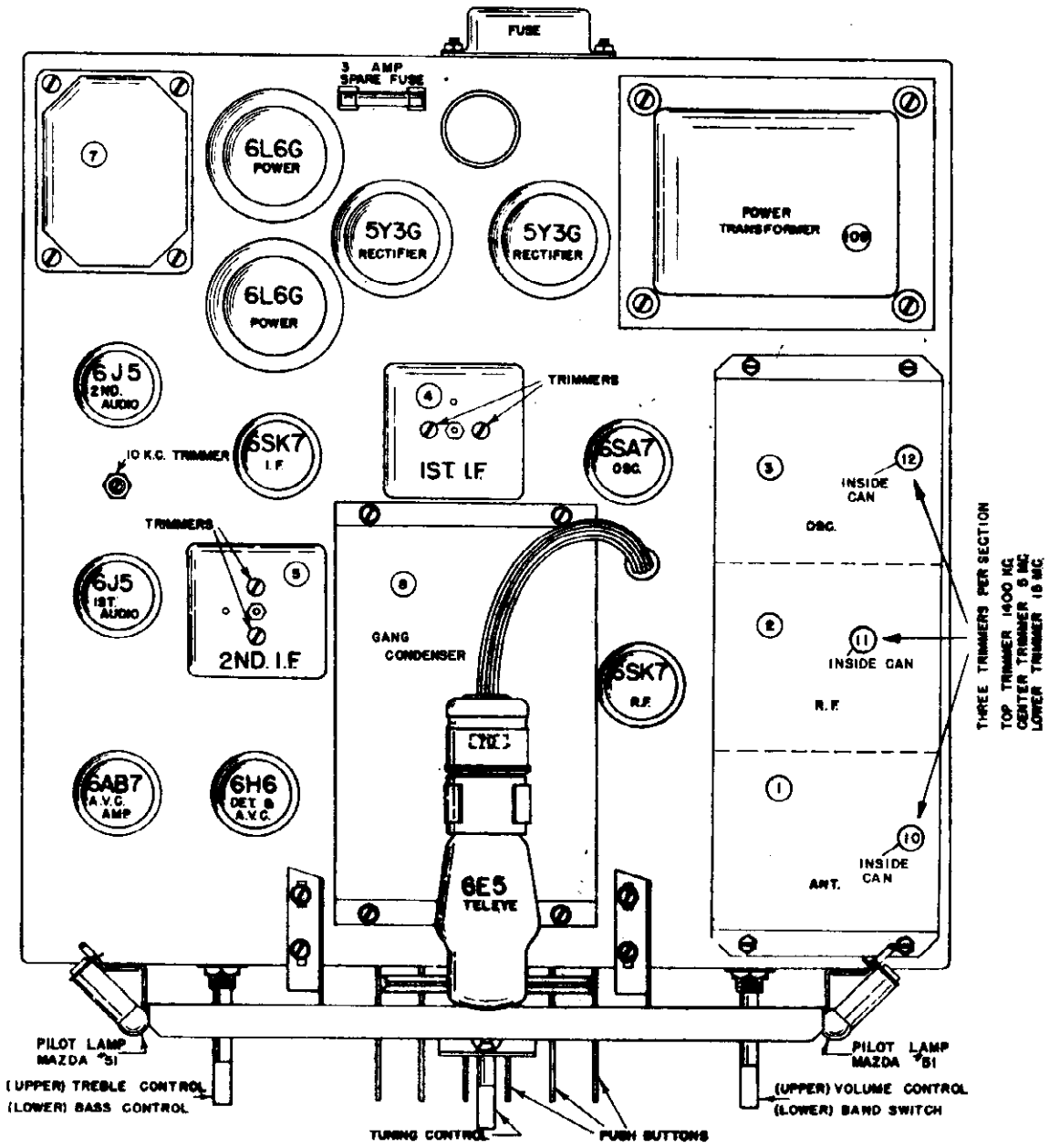
CR174,174C - 595229

AVOX CO., INC.


6H6
DET. A.V.C.
6AB7
A.V.C. AMP
6J5
1ST. AUDIO
6J5
2ND. AUDIO
6L6G
POWER
6L6G
POWER
TRANS 320246
TREBLE CONTROL
BACK VIEW OF SPEAKER SOCKET
SECT. I REAR
SECT. I FRONT
500M VOLUME CONTROL
6E5 TELEYE
EXT. INPUT
FILTER COND.
PHONO MOTOR RECEPTACLE BACK VIEW OF SOCKET
SWITCH ON BASS CONTROL
5Y3G RECTIFIER
5Y3G RECTIFIER
POWER TRANS. 300161
EXT. (PILOT LITES)
A.C. SUPPLY
3 AMP FUSE
1.0 MEG. BASS CONTROL
-- Used in Belvedere
-- Used in Regency Symphony
Used in Adam Secretary
Used in Chippendale Symphony

CHASSIS CR-174,CR-174C

THE MAGNAVOX CO., INC.



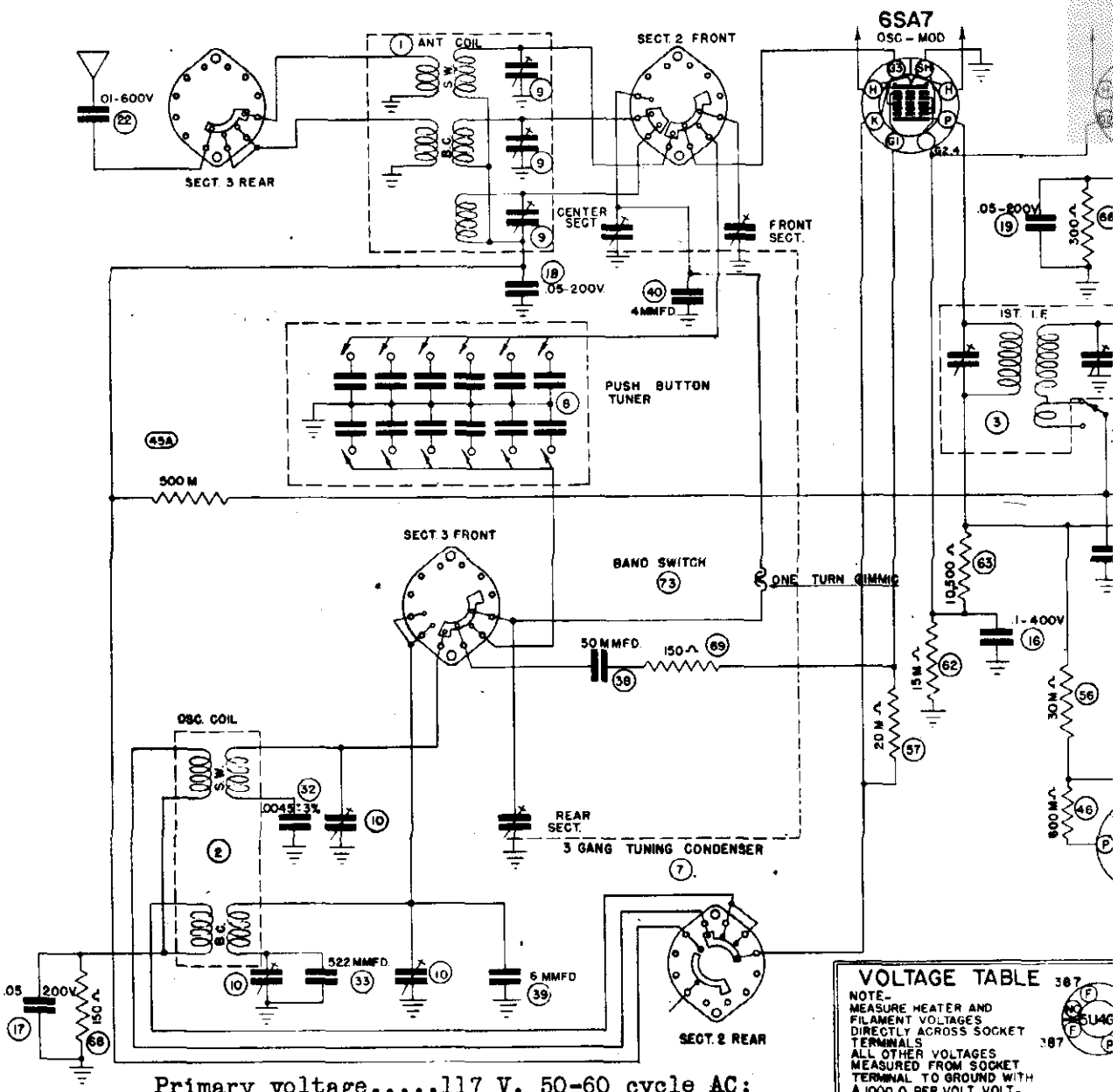
Primary voltage.....117 V. AC;
Power consumption.....180 watts;

Speaker (12C131):
Field Coil.....250 ohms;
Transformer.....NONE
Speaker (302):
Field Coil.....250 ohms;
Transformer..... 5M ohms;
(for dual speakers)

Intermediate frequency.....455 KC;
Tuning frequency range: 535 - 1720 KC;
1667 - 5680 KC;
5.6 - 18.4 MC;

Circuit: Superheterodyne with three tuning ranges, treble and bass controls, I.F. band expansion, amplified A.V.C., inverse feedback circuit, bass compensation in volume control for phonograph pickup, push button condenser-type tuner temperature stabilized.

FOR ALIGNMENT SEE PAGE 13-12



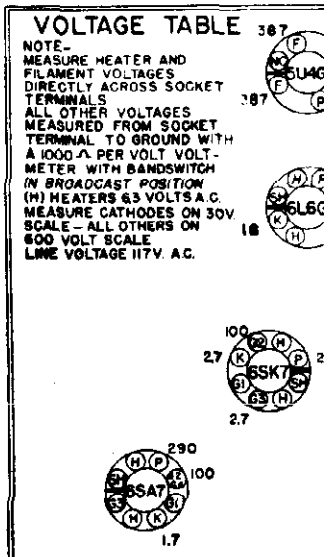
Primary voltage.....117 V. 50-60 cycle AC;
Power consumption.....165 watts;

Speaker: (12C131)
Field Coil.....250 ohms;
Transformer.....NONE
Speaker: (302)
Field Coil.....250 ohms;
Transformer..... 5M ohms;
(for dual speakers)

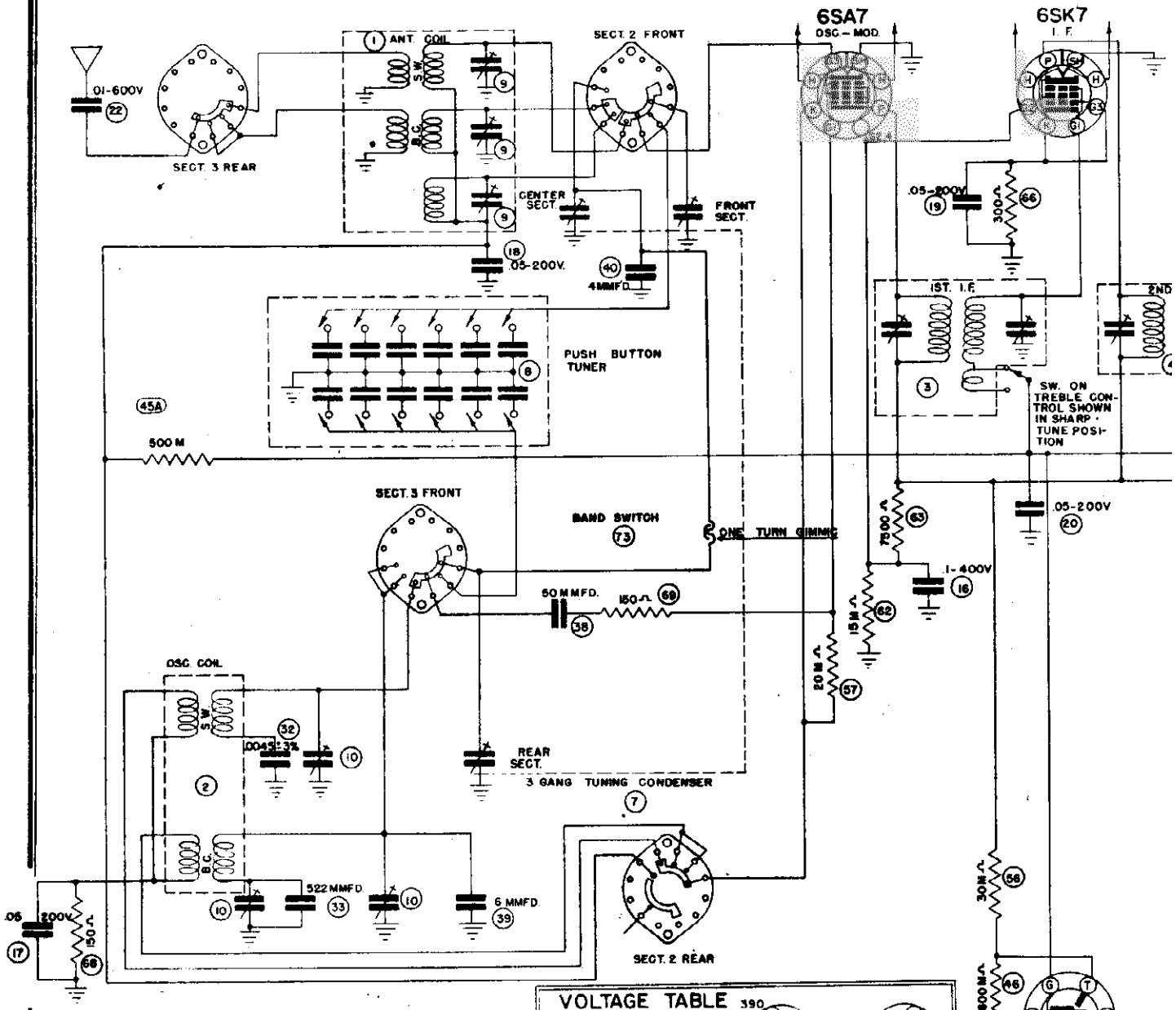
Intermediate frequency.....455 KC;
Tuning frequency range:
540 - 1710 KC;
5.7 - 18.3 MC;

VOLTAGE TABLE

NOTE-
MEASURE HEATER AND FILAMENT VOLTAGES DIRECTLY ACROSS SOCKET TERMINALS
ALL OTHER VOLTAGES MEASURED FROM SOCKET TERMINAL TO GROUND WITH A 1000 Ω PER VOLT VOLTMETER WITH BANDSWITCH *IN BROADCAST POSITION*
(H) HEATERS 6.3 VOLTS A.C.
MEASURE CATHODES ON 30V. SCALE - ALL OTHERS ON 600 VOLT SCALE
LINE VOLTAGE 117V. A.C.



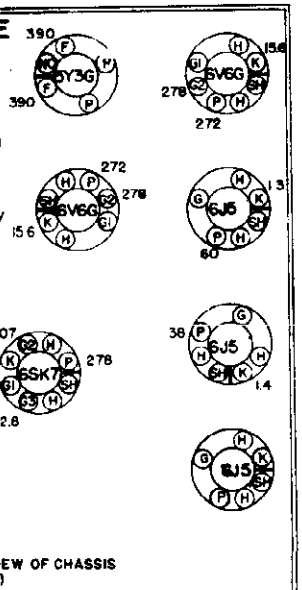
BOTTOM VIEW OF CHAS
(FRONT)



Intermediate frequency.....455 KC;
Tuning frequency range:
540 - 1710 KC;
5.7 - 18.3 MC;

VOLTAGE TABLE

NOTE–
MEASURE HEATER AND FILAMENT VOLTAGES DIRECTLY ACROSS SOCKET TERMINALS.
ALL OTHER VOLTAGES MEASURED FROM SOCKET TERMINAL TO GROUND WITH A 1000Ω PER VOLT VOLTMETER WITH BANDSWITCH IN BROADCAST POSITION
(H) HEATERS 6.3 VOLTS A.C.
MEASURE CATHODES ON 30V SCALE – ALL OTHERS ON 600 VOLT SCALE
LINE VOLTAGE 117V. A.C.



BOTTOM VIEW OF CHASSIS (FRONT)

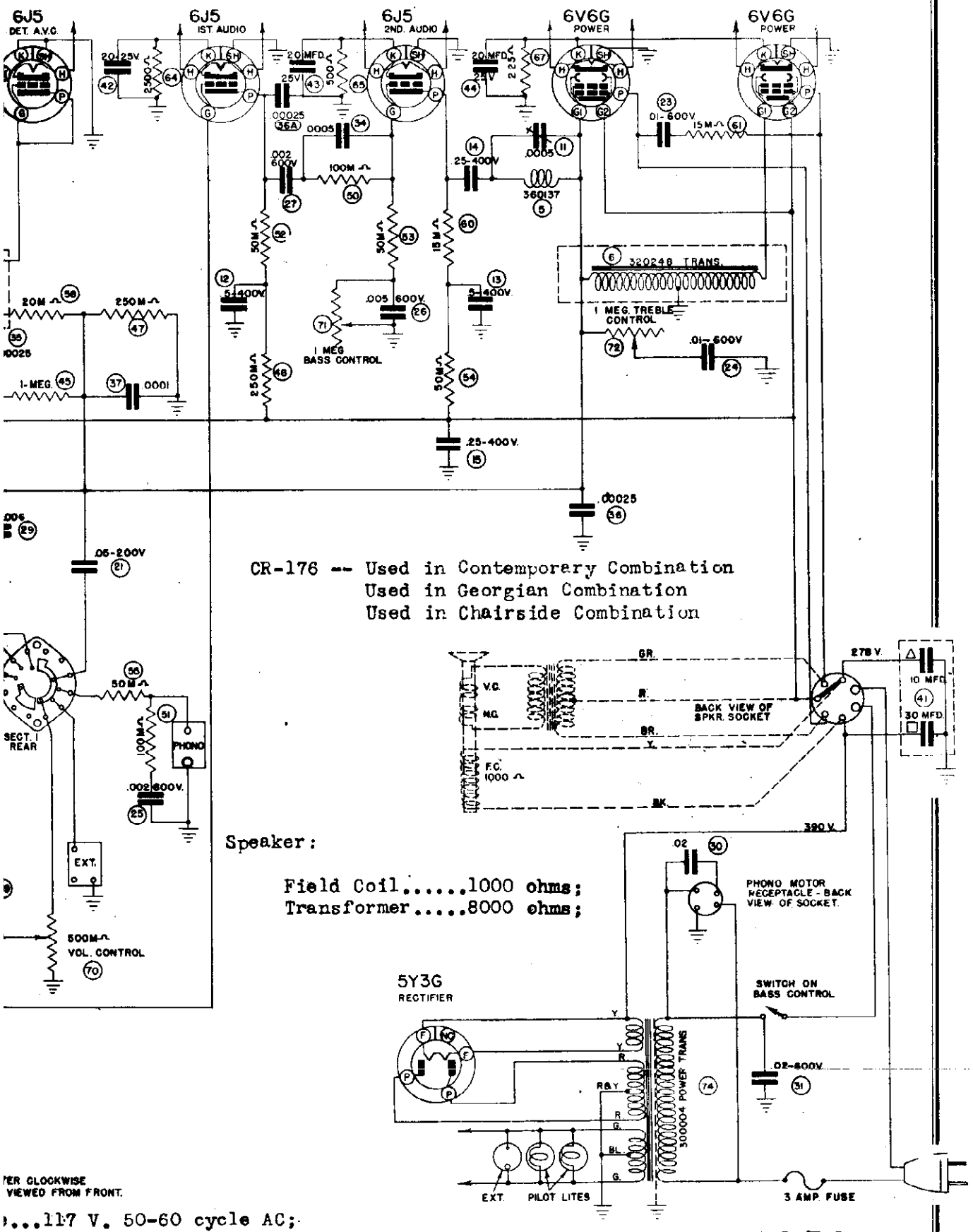
I.F.–455 K

BAND SWITCH SHOW
POSITION (SHORT W

Primary v
Power con

CO., INC.

CHASSIS CR-176



CR-176 -- Used in Contemporary Combination
Used in Georgian Combination
Used in Chairside Combination

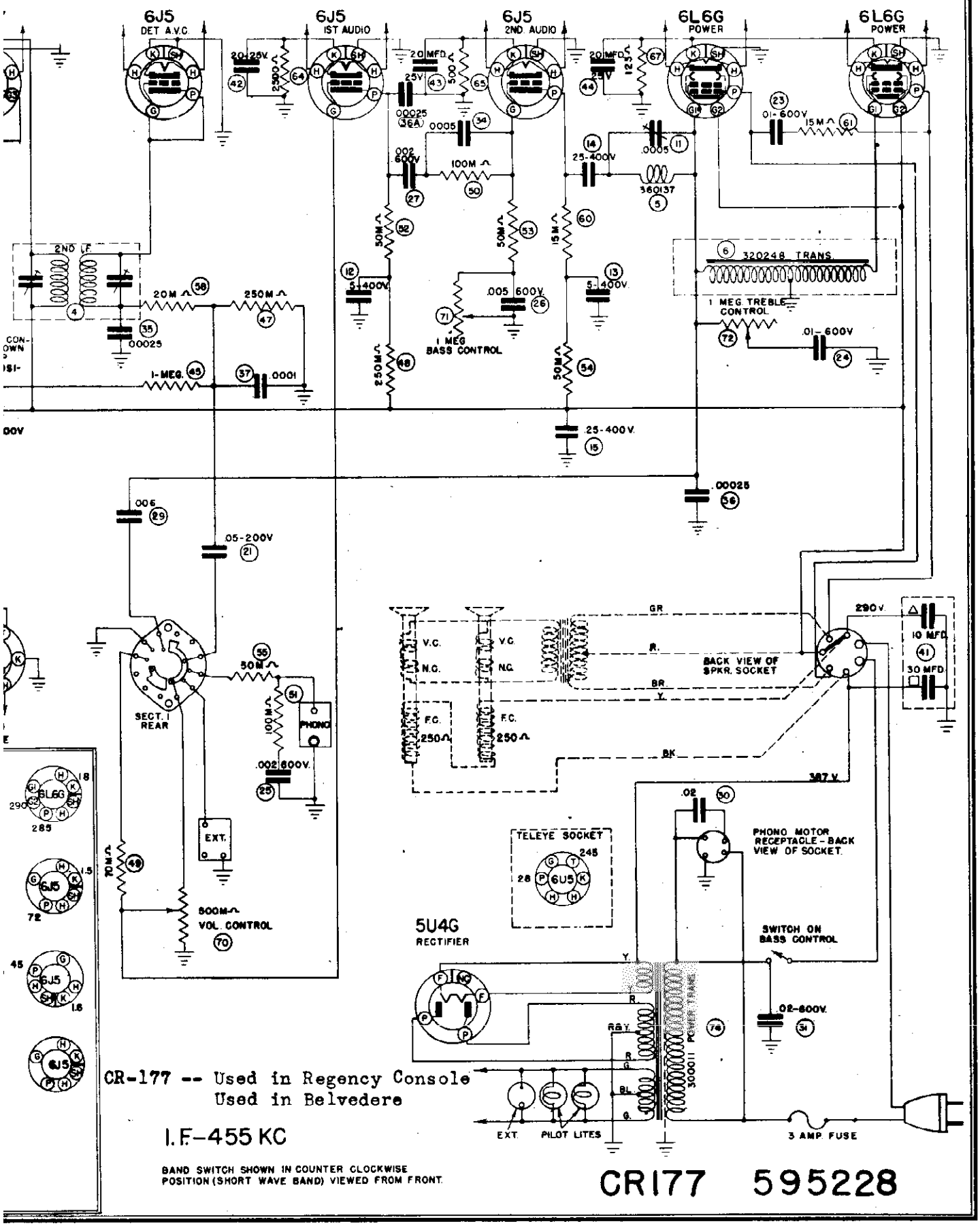
Speaker:

Field Coil.....1000 ohms;
Transformer.....8000 ohms;

ER CLOCKWISE
VIEWED FROM FRONT.

...117 V. 50-60 cycle AC;
ion.....108 watts;

CR176 595227



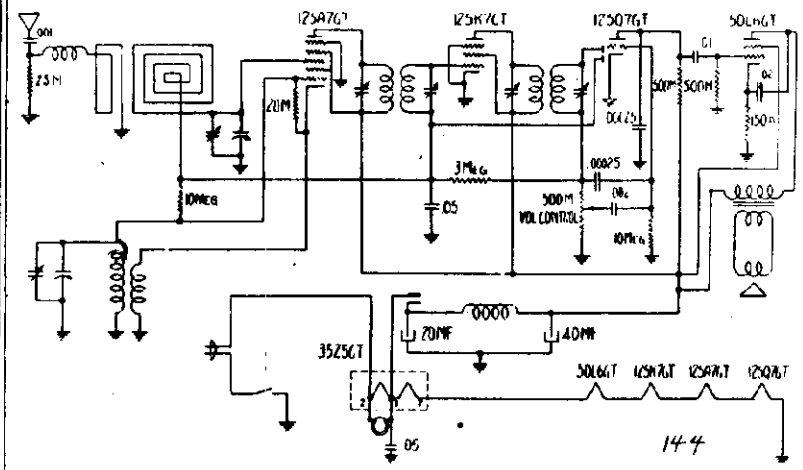
CR-177 -- Used in Regency Console
Used in Belvedere

I.F.-455 KC

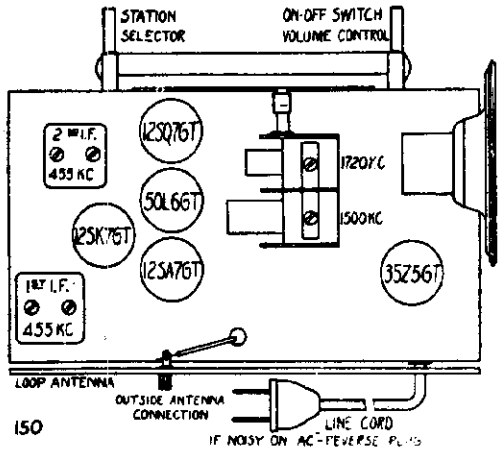
BAND SWITCH SHOWN IN COUNTER CLOCKWISE POSITION (SHORT WAVE BAND) VIEWED FROM FRONT.

CR177 595228

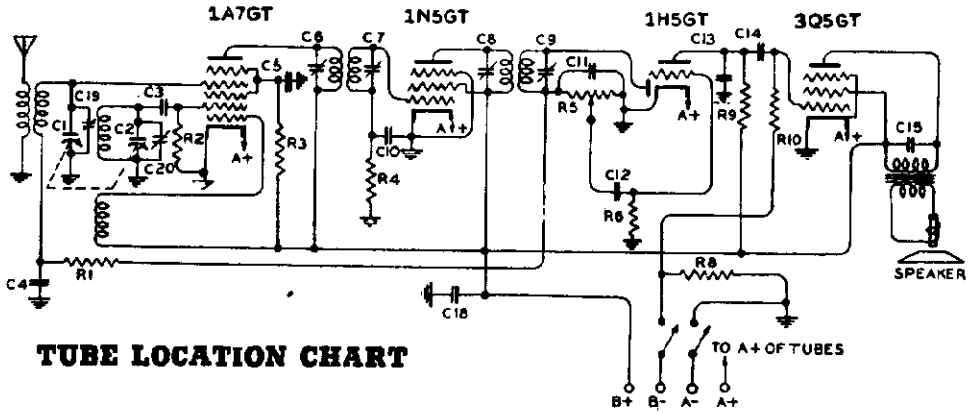
SCHEMATIC DIAGRAM MODEL 5TIO & 5TIOW



TUBE LAYOUT

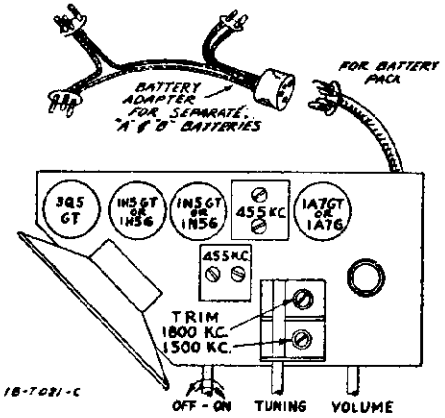


SCHEMATIC DIAGRAM



TUBE LOCATION CHART

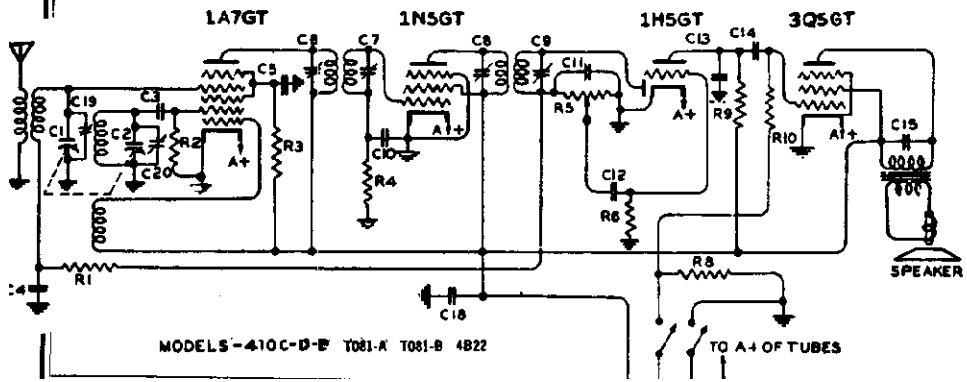
TUBE LAYOUT MODEL T-081-C-D

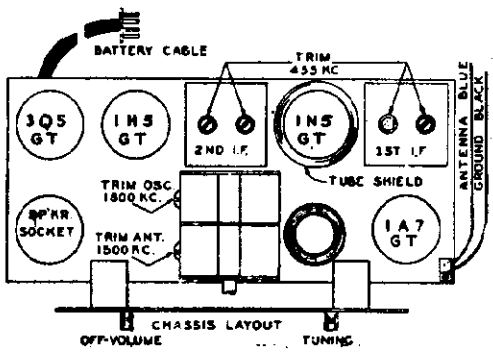


REPLACEMENT PARTS LIST

Schematic Location	Part No.	Description
R1,R4,R10	R-15500	2 Megohm ½ Watt Resistor 20%
R8	R-157	430 ohm ½ Watt Resistor 20%
R2	R-15523	200K ohm ½ Watt Resistor 20%
R3	R-15552	30K ohm ½ Watt Resistor 20%
R9	R-154	470K ohm ½ Watt Resistor 20%
R6	R-149	4.7 Megohm ½ Watt Resistor 20%

Schematic Location	Part No.	Description
C4	C-15752	.05 mfd. 200 Volt Condenser
C10,C5	C-15754	.01 mfd. 400 Volt Condenser
C15	C-25	.006 mfd. 400 Volt Condenser
C12,C14	C-15774	.002 mfd. 400 Volt Condenser
C3	CM-31	100 mmfd. Mica Condenser
C11,C13	CM-30	250 mmfd. Mica Condenser
C18	CE-35	8 mfd. 150V Electrolytic





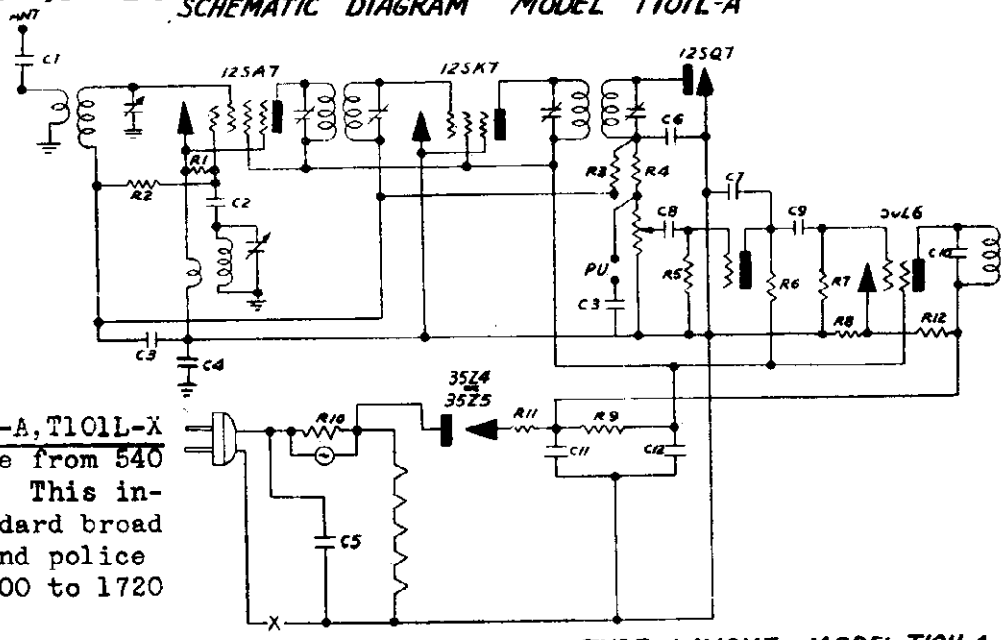
R9	R-15520	500K ohm	¼ Watt Resistor
R10	R-15517	1 Megohm	¼ Watt Resistor
R8	R-76	400 ohm	¼ Watt Resistor
R2	R-15523	200K ohm	¼ Watt Resistor
R6	R-15559	3 Megohm	¼ Watt Resistor
R3	R-44	30K ohm	¼ Watt Resistor
R1,R4	R-15500	2 Megohm	¼ Watt Resistor
C4,C5	C-15752	.05 mfd.	200V
C10,C12	C-15763	.01 mfd.	200V
C15	C-25	.006 mfd.	400V
C14	C 44	002 mfd.	600V
C3,C11,C13	CM-44	100 mmfd.	Mica
C18	CE-35	8 mfd. 150V	Electrolytic

MODELS 5T10, 5T10W
MODELS T081A, T081B, 4B22, 410C, -D, -E

MODELS T101L-A, T101L-X
MODELS T102L-A, T102L-X

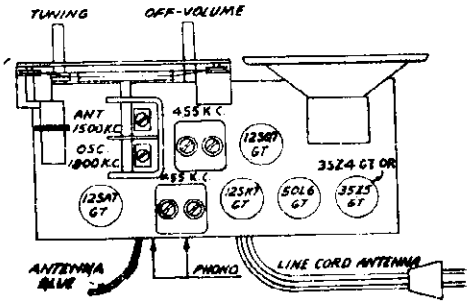
MAJESTIC RADIO & TELEV. CORP.

SCHEMATIC DIAGRAM MODEL T101L-A



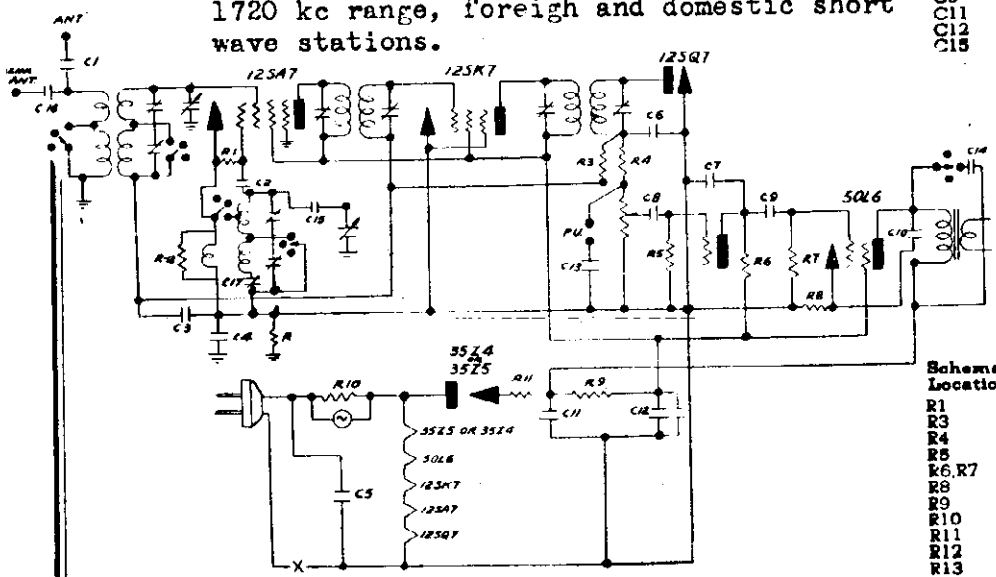
MODEL T101L-A, T101L-X Tuning range from 540 to 1720 kc. This includes standard broad cast band and police calls in 1600 to 1720 kc range.

TUBE LAYOUT MODEL T101L-A



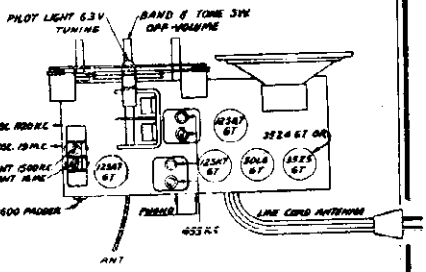
Schematic Location	Part No.	Description
R1	R-15510	20K ohm ¼ Watt Resistor 20%
R2,R5	R-63	10 Megohm ¼ Watt Resistor 20%
R3	R-15500	2 Megohm ¼ Watt Resistor 20%
R4	R-15504	150K ohm ¼ Watt Resistor 20%
R6,R7	R-15520	500K ohm ¼ Watt Resistor 20%
R8	R-59	110 ohm ½ Watt Resistor 10%
R9	R-138	1000 ohm 1 Watt Resistor 20%
R10	R-150	15 ohm 1 Watt Resistor 20%
R11	R-85	35 ohm 1 Watt Resistor 20%
R12	R-145	9K ohm 2 Watt Resistor 10%
R13	R-15512	250K ohm ¼ Watt Resistor 20%
C1	C-15754	.01 mfd. 400 Volt Condenser
C2	CM-29	50 mmfd. Mica Condenser
C3	C-15752	.05 mfd. 200 Volt Condenser
C4	C-15770	.2 mfd. 200 Volt Condenser
C5	C-15756	.05 mfd. 400 Volt Condenser
C6	CM-30	250 mmfd. Mica Condenser
C7	CM-37	500 mmfd. Mica Condenser
C8	C-15774	.002 mfd. 400 Volt Condenser
C9	C-47	.004 mfd. 400 Volt Condenser
C10	C-25	.006 mfd. 400 Volt Condenser
C11,C12	Y-CE-66-1	40 mfd. & 75 mfd. Electr. Cond

MODEL T102L-A, T102L-X: Tuning range from 540 to 1720 kc and 5,500 to 18,600 kc. This includes standard broadcast band, police calls 1600 to 1720 kc range, foreigh and domestic short wave stations.



Schematic Location	Part No.	Description
C1,C16,C14	C-15754	.01 mfd. 400 Volt Condenser
C2	CM-31	100 mmfd. Mica Condenser
C3,C13	C-15752	.05 mfd. 200 Volt Condenser
C4	C-15770	.20 mfd. 200 Volt Condenser
C5	C-15756	.05 mfd. 400 Volt Condenser
C6,C7	CM-30	250 mmfd. Mica Condenser
C8	C-15774	.002 mfd. 400 Volt Condenser
C10	C-47	.004 mfd 400 Volt Condenser
C9	C-25	.006 mfd. 400 Volt Condenser
C11	CE-66-1	75 mfd. Elec Condenser
C12	CE-66-1	40 mfd. Elec. Condenser
C15	CM-2	4300 mmfd. Mica Condenser

TUBE LAYOUT MODEL T102L-A

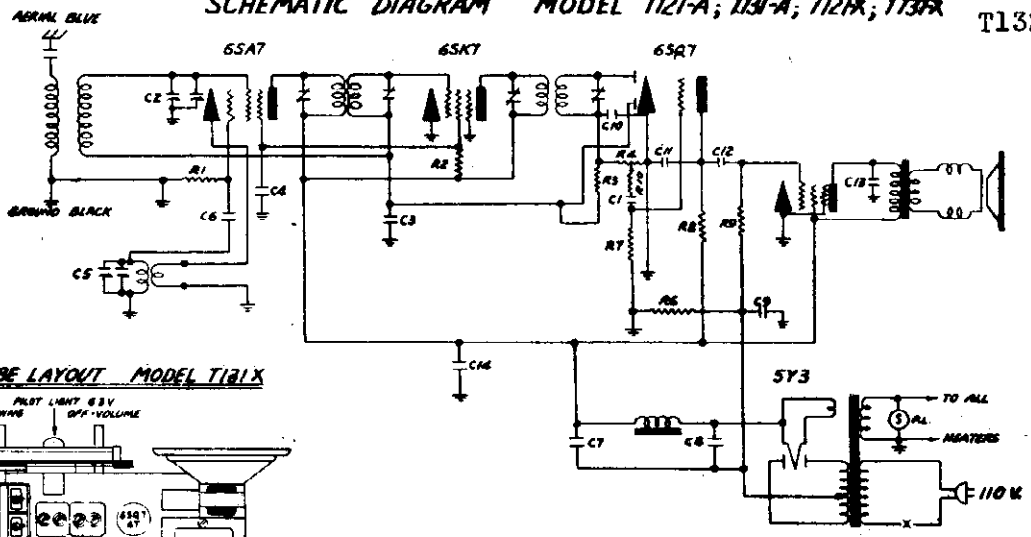


Schematic Location	Part No.	Description
R1	R-15510	20K ohm ¼ Watt Resistor 20%
R3	R-15500	2 Megohm ¼ Watt Resistor 20%
R4	R-146	150K ohm ¼ Watt Resistor 20%
R5	R-50	5 Megohm ¼ Watt Resistor 20%
R6,R7	R-15520	250K ohm ¼ Watt Resistor 20%
R8	R-59	110 ohm ½ Watt Resistor 20%
R9	R-138	1000 ohm 1 Watt Resistor 20%
R10	R-150	15 ohm ¼ Watt Resistor 20%
R11	R-85	35 ohm 1 Watt Resistor 20%
R12	R-72	600 ohm ¼ Watt Resistor 20%
R13	R-15512	250K ohm ¼ Watt Resistor 20%

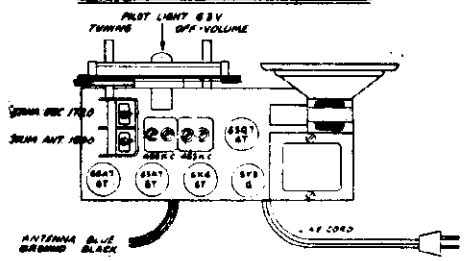
MAJESTIC RADIO & TELEV. CORP.

MODELS T121-A, T121-X, T131-A, T131-X
MODELS T122-A, T122-X, T132-A, T132-X

SCHEMATIC DIAGRAM MODEL T121-A; T131-A; T121X; T131X



TUBE LAYOUT MODEL T121X

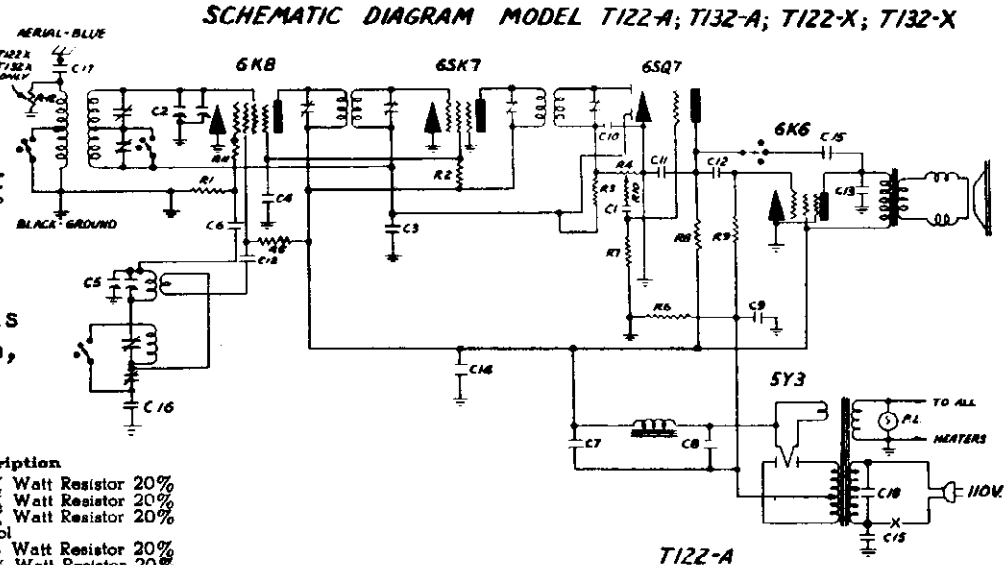


Schematic Location	Part No.		Description
R1	R-15510	20K ohm	½ Watt Resistor
R2	R-15526	10K ohm	1 Watt Resistor
R3	R-15500	2 Megohm	½ Watt Resistor
R4	Y-VC-21	Volume Control	
R6	R-117	275 ohm	½ Watt Resistor
R7	R-63	10 Megohm	½ Watt Resistor
R8,R9	R-15520	500K ohm	½ Watt Resistor
R10	R-15515	100K ohm	½ Watt Resistor
R11	R-15559	3 Megohm	½ Watt Resistor

Schematic Location	Part No.	Description
C1	C-15774	.002 mfd. 400 Volt Condenser
C3	C-15752	.05 mfd. 200 Volt Condenser
C4	C-15754	.05 mfd. 400 Volt Condenser
C6	CM-29	50 mmfd Mica Condenser
C7,C8,C9	Y-CE-43	Electrolytic
C10,C11	CM-30	250 mmfd. Mica Condenser
C12	C-15754	.01 mfd. 400 Volt Condenser
C13	C-25	.006 mfd. 400 Volt Condenser
C14	C-15757	.1 mfd. 400 Volt Condenser
C15	C-19	.05 mfd. Molded
C16	CM-15912	1000 mmfd. Mica Condenser

MODELS T121-A, T131-A, T121-X, T131-X: Tuning range from 540-1720 kc Includes standard b.c. band and police calls in the 1600-1720 kc range.

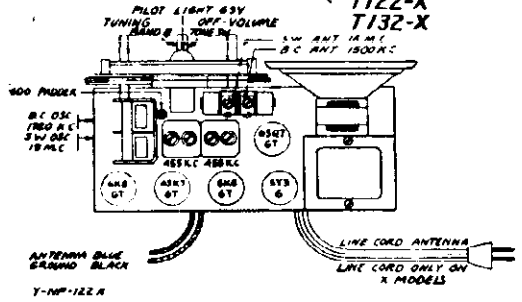
SCHEMATIC DIAGRAM MODEL T122-A; T132-A; T122-X; T132-X



MODELS T122-A, T122-X, T132-A, T132-X: Tuning range 540-1720 kc, & 5,500-18,600 kc; includes stand. b.c. bands and police calls in 1600-1720 kc range, foreign and domestic short wave stations.

Schematic Location	Part No.		Description
R1	R-15511	50K ohm	½ Watt Resistor 20%
R2	R-15525	35K ohm	½ Watt Resistor 20%
R3	R-15500	2 Megohm	½ Watt Resistor 20%
R4	Y-VC-21	Volume Control	
R5	R-15541	5K ohm	½ Watt Resistor 20%
R6	R-117	275 ohm	½ Watt Resistor 20%
R7	R-109	5 Megohm	½ Watt Resistor 20%
R8,R9	R-15520	500K ohm	½ Watt Resistor 20%
R10	R-15515	2 Megohm	½ Watt Resistor 20%
R11	R-15601	100 ohm	½ Watt Resistor 20%
R12	R-60	25K ohm	½ Watt Resistor 20%
C1	C-15774	.002 mfd. 400 Volt Condenser	
C3	C-15752	.05 mfd. 200 Volt Condenser	
C4	C-15756	.05 mfd. 400 Volt Condenser	
C6	CM-29	50 mmfd. Mica Condenser	
C7,C8,C9	CE 43-A	Electrolytic Condenser	
C18	C-19	.05 mfd. 400 Volt mold. cond.	
C10,C11	CM-30	250 mmfd. Mica Condenser	
C12	C-15754	.01 mfd. 400 Volt Condenser	
C13,C15	C-25	.006 mfd. 400 Volt Condenser	
C14	C-15757	.1 mfd. 400 Volt Condenser	
C16	CM-2	4330 mmfd. Mica Condenser	
C17	C-18	.01 mfd. 400 Volt mold. cond.	

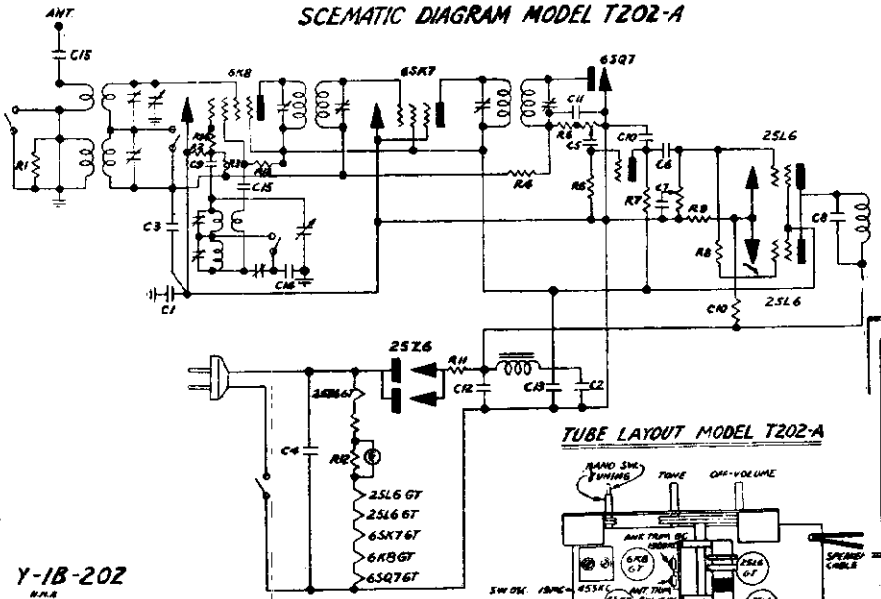
TUBE LAYOUT MODEL T122-A T132-A T122-X T132-X



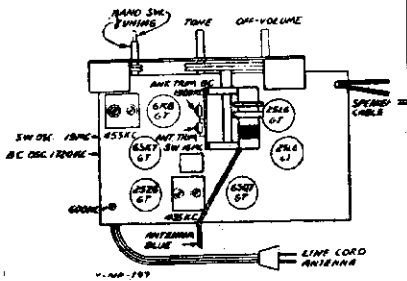
MODEL T201-A
MODEL T202-A
MODELS TP221-A, TP231-A

MAJESTIC RADIO & TELEV. CORP.

SCEMATIC DIAGRAM MODEL T202-A



TUBE LAYOUT MODEL T202-A

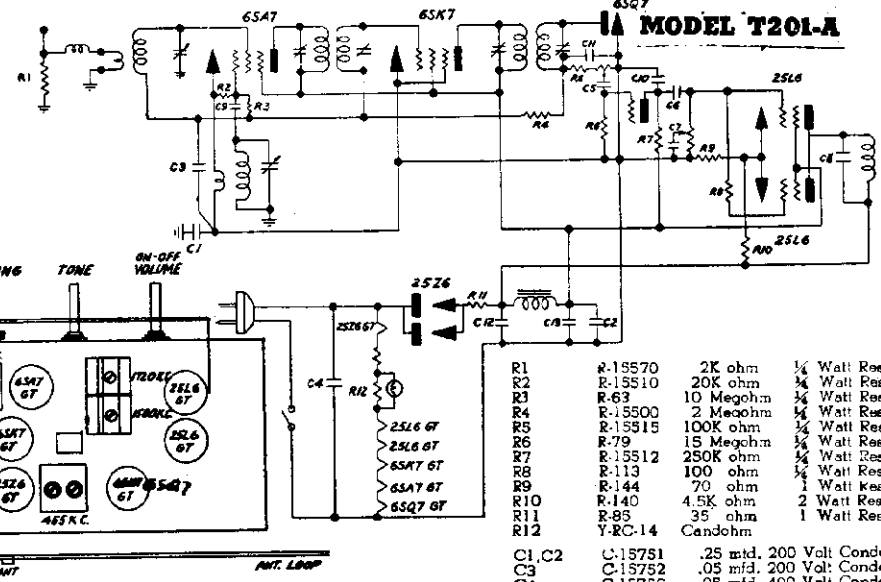


Y-1B-202

R1	R-60	25K ohm	½ Watt Resistor
R2	R-15511	50K ohm	½ Watt Resistor
R3	R-79	15 Megohm	½ Watt Resistor
R4	R-15500	2 Megohm	½ Watt Resistor
R5	R-15515	100K ohm	½ Watt Resistor
R6	R-63	10 Megohm	½ Watt Resistor
R7	R-15512	250K ohm	½ Watt Resistor
R8,R14	R-113	100 ohm	½ Watt Resistor
R9	R-144	70 ohm	1 Watt Resistor
R10	R-140	4.5K ohm	2 Watt Resistor
R11	R-85	35 ohm	1 Watt Resistor
R12	RC-14	Candohm	
R13	R-2	5K ohm	½ Watt Resistor
C1,C2	C-15751	.25 mfd. 200 Volt Condenser	
C3	C-15752	.05 mfd. 200 Volt Condenser	
C4	C-15756	.05 mfd. 400 Volt Condenser	
C5	C-44	.002 mfd. 400 Volt Condenser	
C6,C15	C-15754	.01 mfd. 400 Volt Condenser	
C7	C-25	.006 mfd. 400 Volt Condenser	
C8	C-31	.004 mfd. 400 Volt Condenser	
C9	CM-31	100 mmfd. Mica Condenser	
C10,C11C15	CM-30	250 mmfd. Mica Condenser	
C14	CM-2	4330 mmfd. Mica Condenser	
C12	CE-66	75 mfd. Electrolytic Condenser	
C13	CE-66	40 mfd. Electrolytic Condenser	

MODEL T202-A: Tuning 540 to 1720 kc; includes standard b.c. and police calls in 1600 to 1720 kc spectrum. Also 5,800 to 13,600 kc, American and foreign short wave, ships, planes, trans-Atlantic phone.

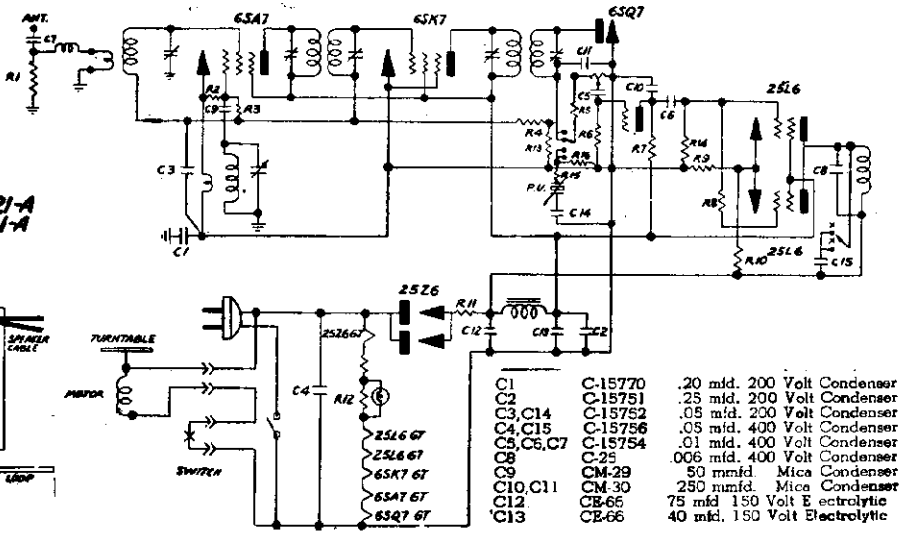
MODEL T201-A



MODEL T201-A: Tuning range 540 kc to 1720 kc. This includes standard broadcast band and 1600 kc to 1720 kc police calls.

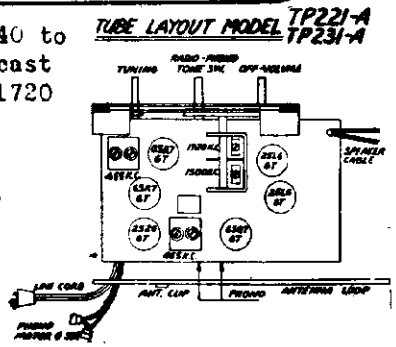
R1	R-15570	2K ohm	½ Watt Resistor
R2	R-15510	20K ohm	½ Watt Resistor
R3	R-63	10 Megohm	½ Watt Resistor
R4	R-15500	2 Megohm	½ Watt Resistor
R5	R-15515	100K ohm	½ Watt Resistor
R6	R-79	15 Megohm	½ Watt Resistor
R7	R-15512	250K ohm	½ Watt Resistor
R8	R-113	100 ohm	½ Watt Resistor
R9	R-144	70 ohm	1 Watt Resistor
R10	R-140	4.5K ohm	2 Watt Resistor
R11	R-85	35 ohm	1 Watt Resistor
R12	Y-RC-14	Candohm	
C1,C2	C-15751	.25 mfd. 200 Volt Condenser	
C3	C-15752	.05 mfd. 200 Volt Condenser	
C4	C-15756	.05 mfd. 400 Volt Condenser	
C5	C-44	.002 mfd. 600 Volt Condenser	
C6	C-15754	.01 mfd. 400 Volt Condenser	
C7	C-25	.006 mfd. 400 Volt Condenser	
C8	C-31	.004 mfd. 400 Volt Condenser	
C9	CM-29	50 mmfd. Mica Condenser	
C10,C11	CM-30	250 mmfd. Mica Condenser	
C12	CE-66	75 mfd. Electrolytic Condenser	
C13	CE-66	40 mfd. Electrolytic Condenser	

SCHEMATIC DIAGRAM MODEL TP221-A TP231-A

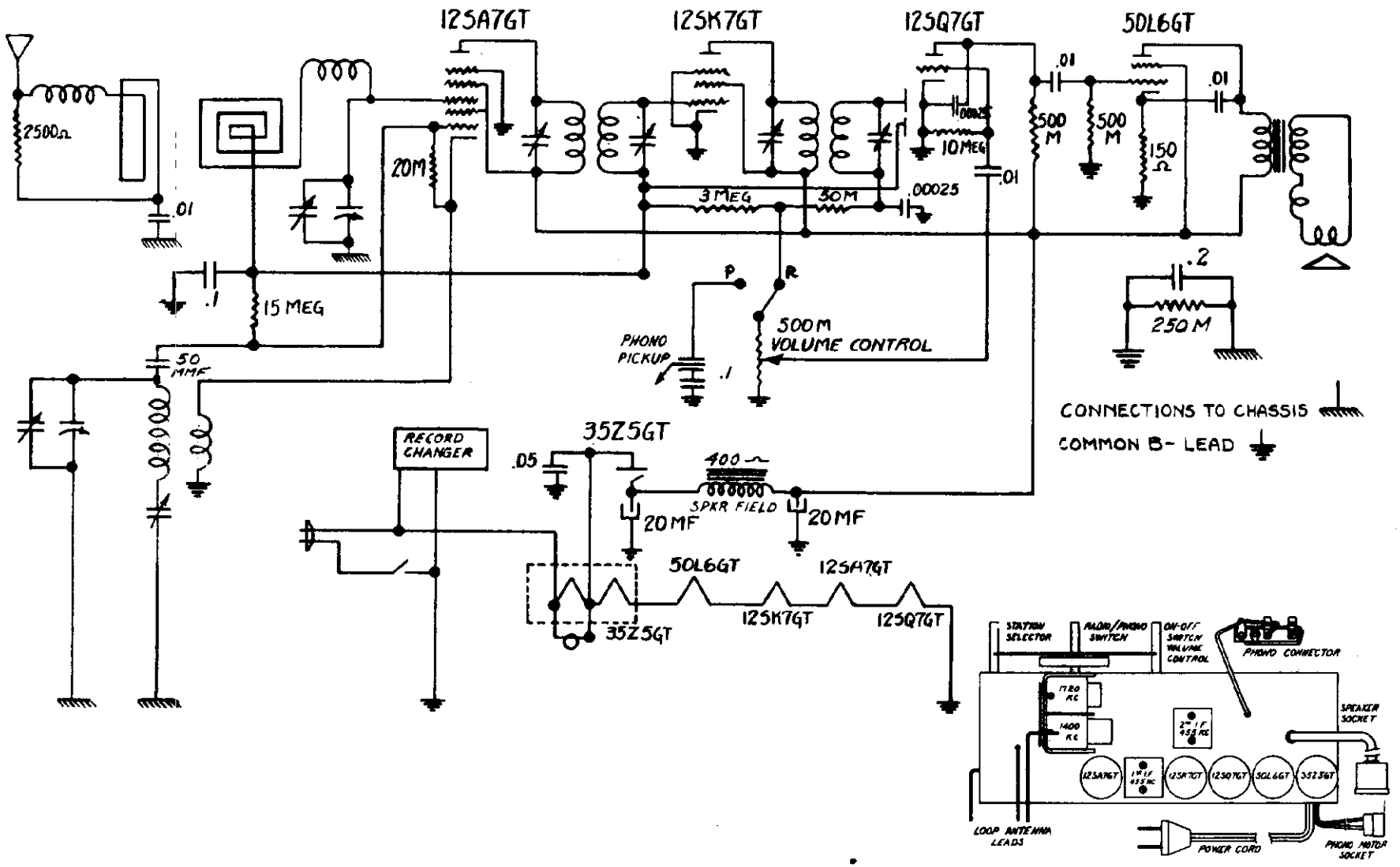


MODEL TP221-A, TP231-A: Tuning range 540 to 1720 kc. This includes standard broadcast and police calls lying in the 1600 to 1720 kc range.

TUBE LAYOUT MODEL TP221-A TP231-A

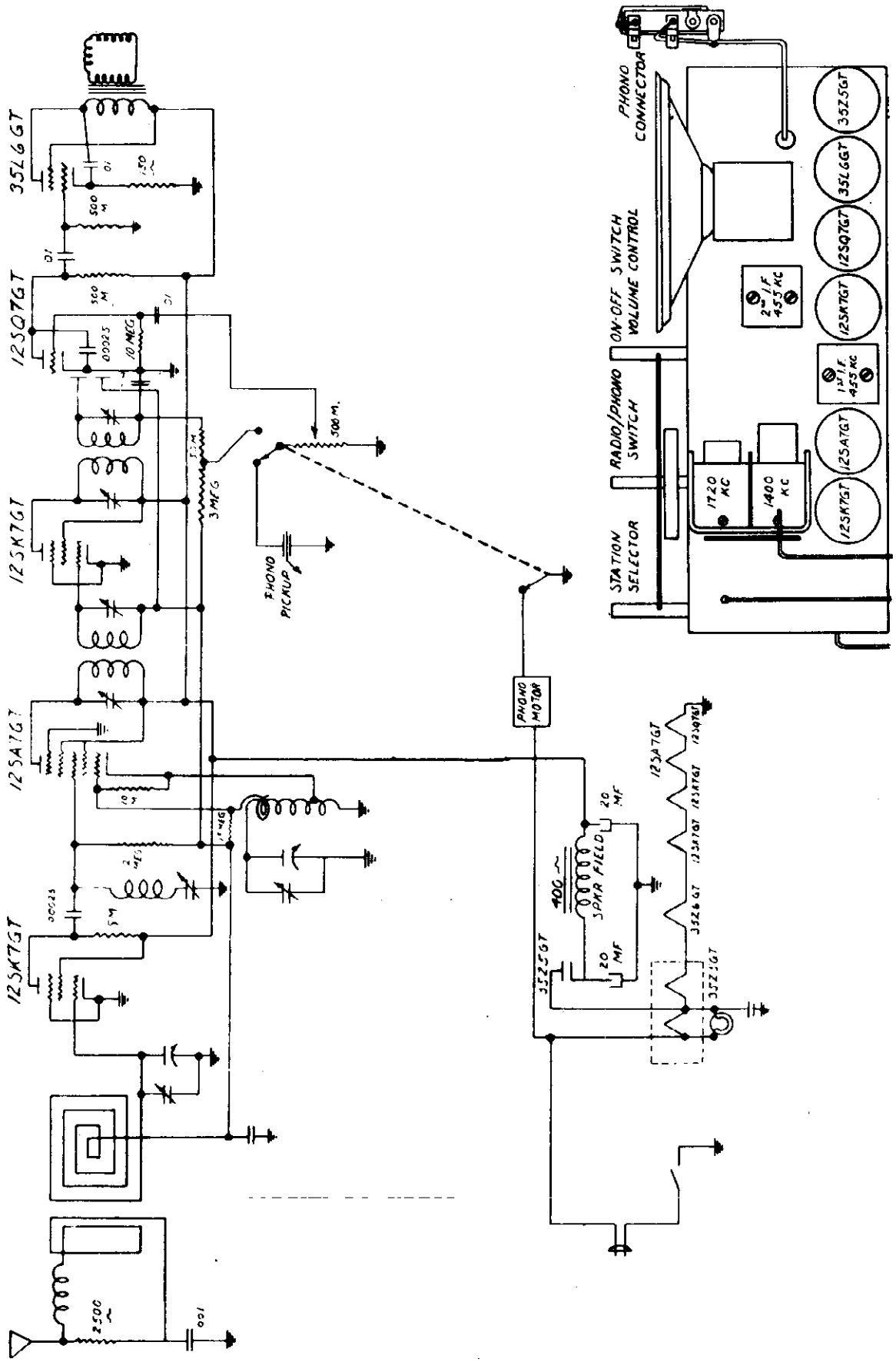


R1	R-15570	2000 ohm	½ Watt Resistor
R2	R-15510	20K ohm	½ Watt Resistor
R3	R-79	15 Megohm	½ Watt Resistor
R4,R13	R-15500	2 Megohm	½ Watt Resistor
R5	R-15515	100K ohm	½ Watt Resistor
R7,R14	R-15512	250K ohm	½ Watt Resistor
R6	R-149	4.7 Megohm	½ Watt Resistor
R8	R-113	100 ohm	½ Watt Resistor
R9	R-144	70 ohm	½ Watt Resistor
R10	R-147	4K ohm	3 Watt Resistor
R11	R-85	35 ohm	1 Watt Resistor
R12	RC-14	Candohm	
R15	R-148	300K ohm	½ Watt Resistor
R16	R-54	50K ohm	½ Watt Resistor
C1	C-15770	.20 mfd. 200 Volt Condenser	
C2	C-15751	.25 mfd. 200 Volt Condenser	
C3,C14	C-15752	.05 mfd. 200 Volt Condenser	
C4,C15	C-15756	.05 mfd. 400 Volt Condenser	
C5,C6,C7	C-15754	.01 mfd. 400 Volt Condenser	
C8	C-25	.006 mfd. 400 Volt Condenser	
C9	CM-29	50 mmfd. Mica Condenser	
C10,C11	CM-30	250 mmfd. Mica Condenser	
C12	CE-66	75 mfd 150 Volt E ectrolytic	
C13	CE-66	40 mfd. 150 Volt Electrolytic	


12SA7GT
12SK7GT
12SQ7GT
50L6GT
35Z5GT
2500Ω
.01
20M
3 MEG
30M
.00025
10MEG
500 M
500 M
150 Ω
.2
250 M
.1
15 MEG
50 MMF
PHONO PICKUP
P
R
500M VOLUME CONTROL
RECORD CHANGER
.05
400 ~
SPKR FIELD
20MF
20MF
CONNECTIONS TO CHASSIS
COMMON B- LEAD
STATION SELECTOR
RADIO/PHONO SWITCH
ON-OFF SWITCH VOLUME CONTROL
PHONO CONNECTOR
SPEAKER SOCKET
1720 KC
1400 KC
2nd I.F. 455 KC
1st I.F. 455 KC
LOOP ANTENNA LEADS
POWER CORD
PHONO MOTOR SOCKET

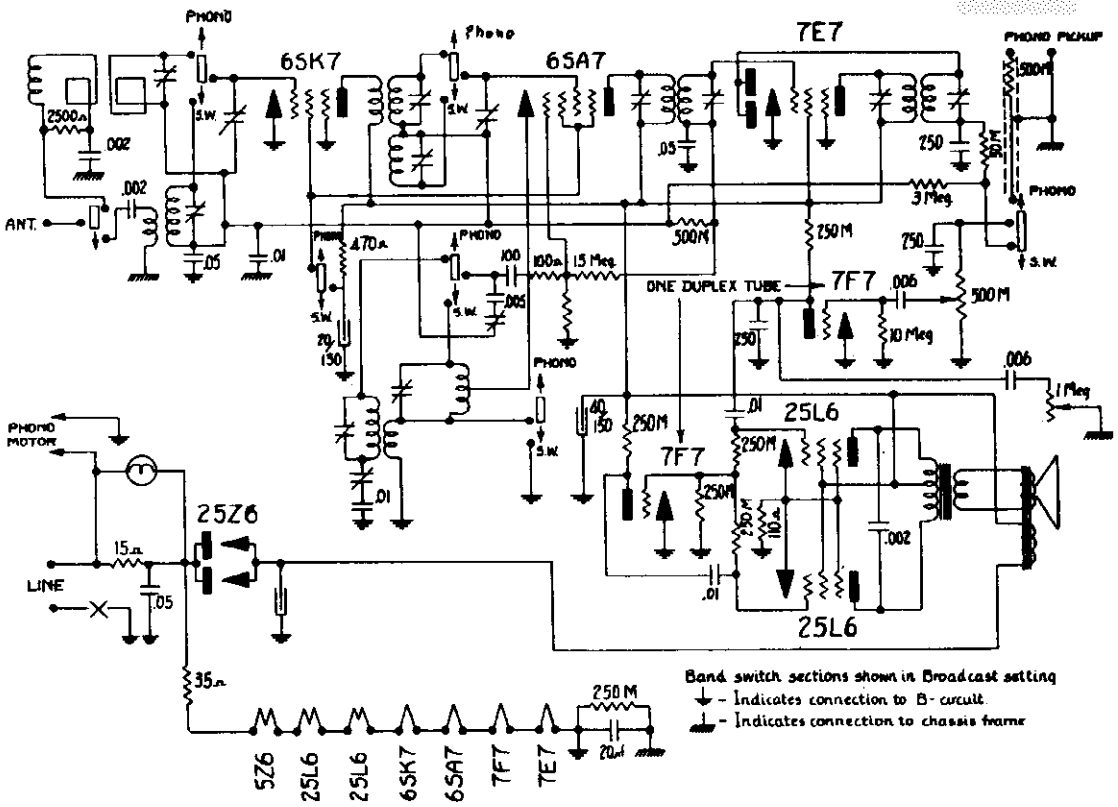
MODEL 5CU36

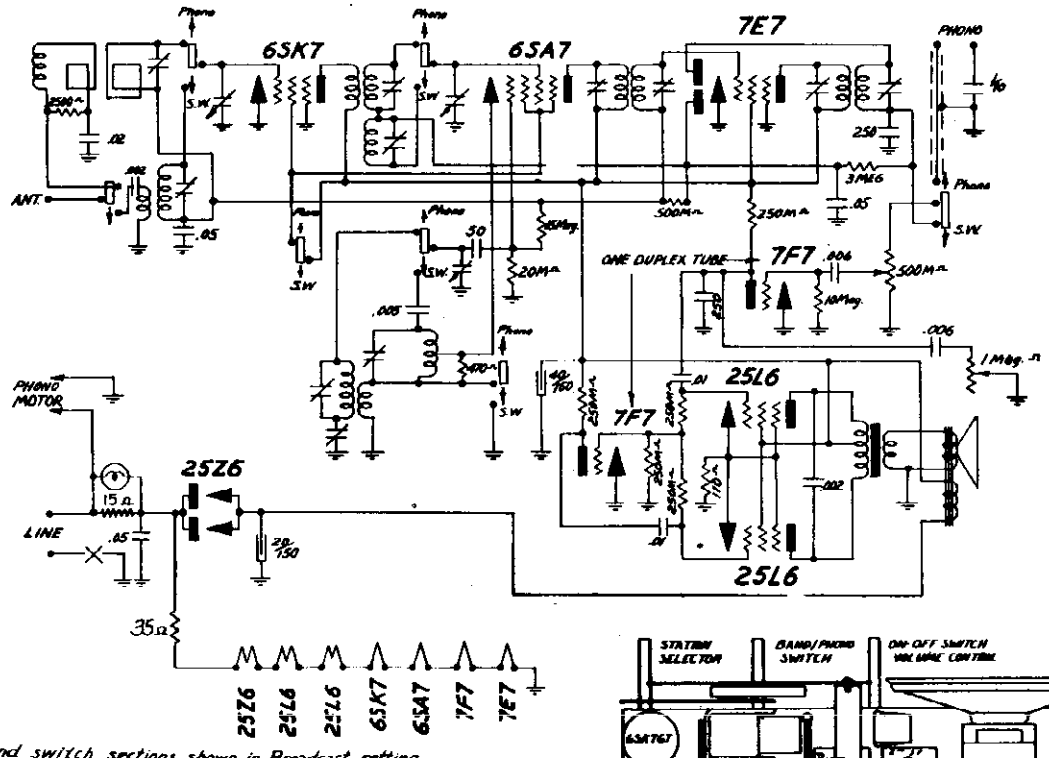
MAJESTIC RADIO & TELEV. CORP.



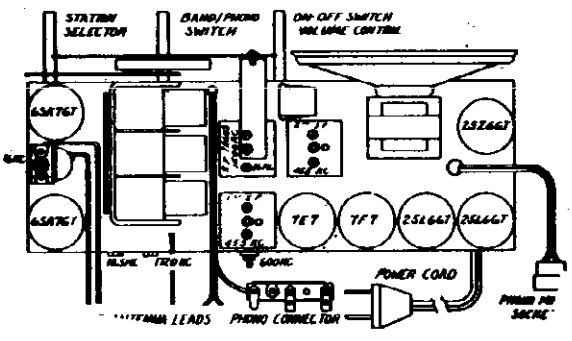
MODEL 7C40
MODEL 7CU40

MAJESTIC RADIO & TELEV. CORP.





Band switch sections shown in Broadcast setting.

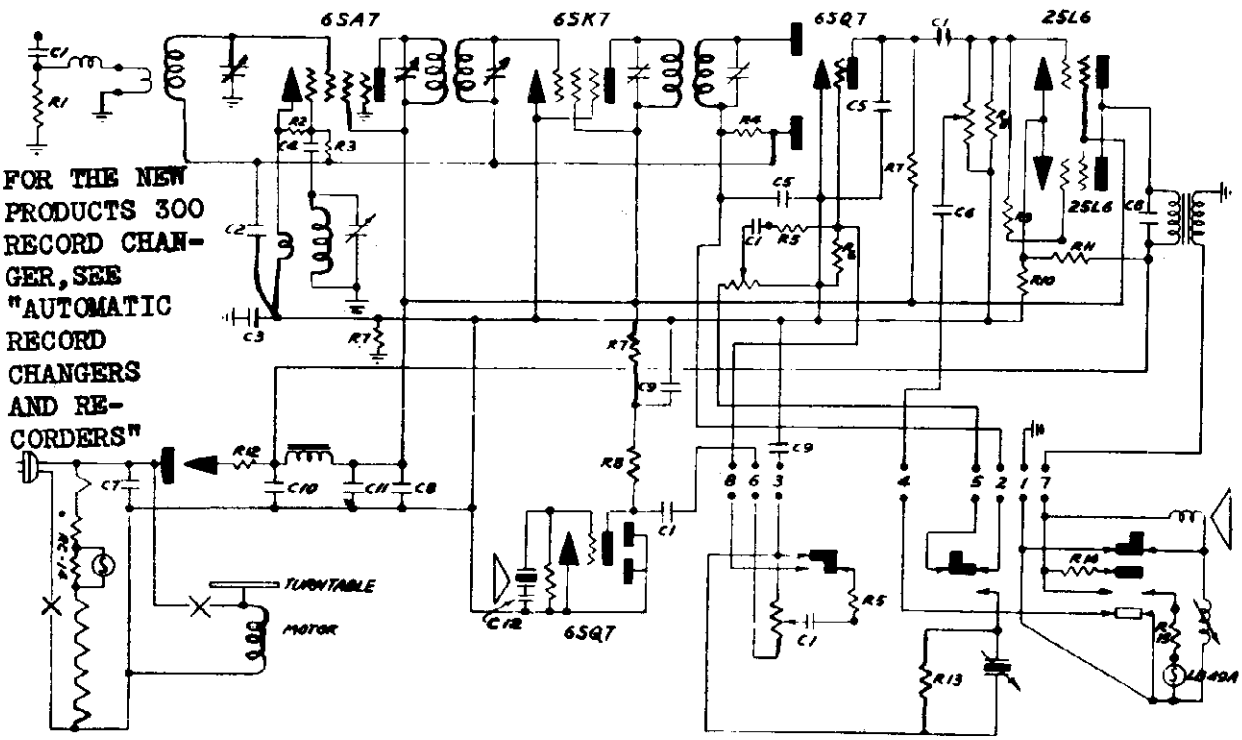


FOR NEW PRODUCTS 300 RECORD CHANGER, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

MODELS TR321A, TR331A

MAJESTIC RADIO & TELEV. CORP.

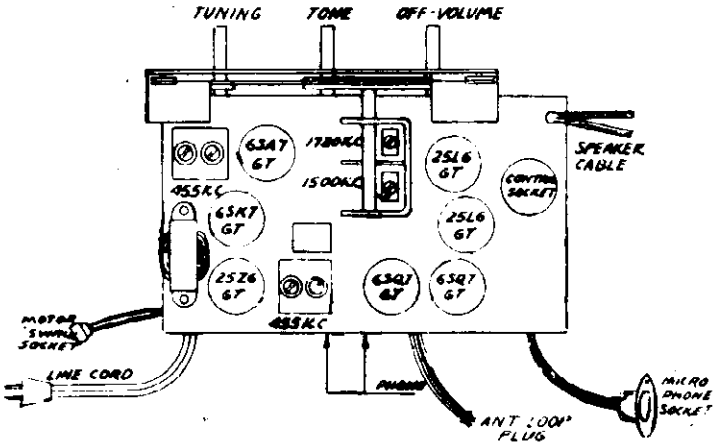
SCHEMATIC DIAGRAM MODEL TR321-A TR331-A



REPLACEMENT PARTS LIST

Schematic Location	Part No.	Description
R1	R-15570	2K ohm ½ Watt Resistor 20%
R2	R-15510	20K ohm ½ Watt Resistor 20%
R3	R-79	15 Megohm ½ Watt Resistor 20%
R4	R-15500	2 Megohm ½ Watt Resistor 20%
R5	R-15504	150K ohm ½ Watt Resistor 20%
R6	R-149	4.7Megohm ½ Watt Resistor 20%
R7	R-153	270K ohm ½ Watt Resistor 20%
R8	R-154	470K ohm ½ Watt Resistor 20%
R9	R-15601	100 ohm ½ Watt Resistor 20%
R10	R-155	68 ohm 1 Watt Resistor 20%
R11	R-147	4K ohm 3 Watt Resistor 20%
R12	R-85	35 ohm 1 Watt Resistor 20%
R13	R-100	300K ohm ½ Watt Resistor 20%
R14	R-152	4 ohm 1 Watt Resistor 20%
R15	R-151	7.5 ohm 1 Watt Resistor 20%
RC-14	RC-14	Candohm
C1	C-15754	.01 mfd. 400 Volt Condenser
C2	C-15752	.05 mfd. 200 Volt Condenser
C3	C-15770	.2 mfd. 200 Volt Condenser
C4	CM-29	50 mmfd Mica Condenser
C5	CM-30	250 mmfd. Mica Condenser
C6	C-25	.006 mfd. 400 Volt Condenser
C7	C-15756	.05 mfd. 400 Volt Condenser
C8	C-15751	.25 mfd. 200 Volt Condenser
C9,C12	C-15761	.10 mfd. 200 Volt Condenser
C10	CE-66-2	100 mfd Electrolytic
C11	CE-66-2	40 mfd. Electrolytic

TUBE LAYOUT MODEL TR321-A TR331-A



This receiver is equipped with a built-in loop antenna and, under normal conditions, should not require an external antenna. Since reception of loops is directional, reception can be improved by orienting the set for best reception of preferred stations. In very difficult locations, an external antenna should be used. This should be connected to the clip on the back of the receiver. No ground should be used on this set.

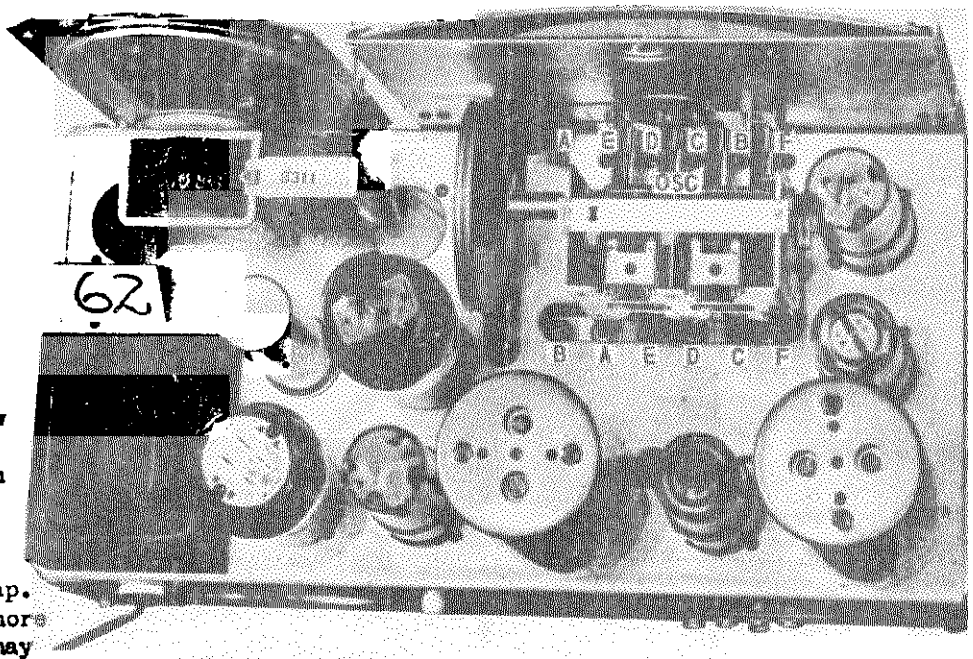
Model TR321-A operates on 105-125 volts 60 cycles AC only.

Model TR331-A operates on 105-125 volts 50 cycles AC only.

This is a seven tube combination superheterdyne radio receiver, home recorder, phonograph, and public address amplifier.

The tuning range is from 540 to 1720 kilocycles. This includes the standard broadcast band and police calls in 1600 to 1720 kilocycles range.

MIDWEST RADIO CORP.



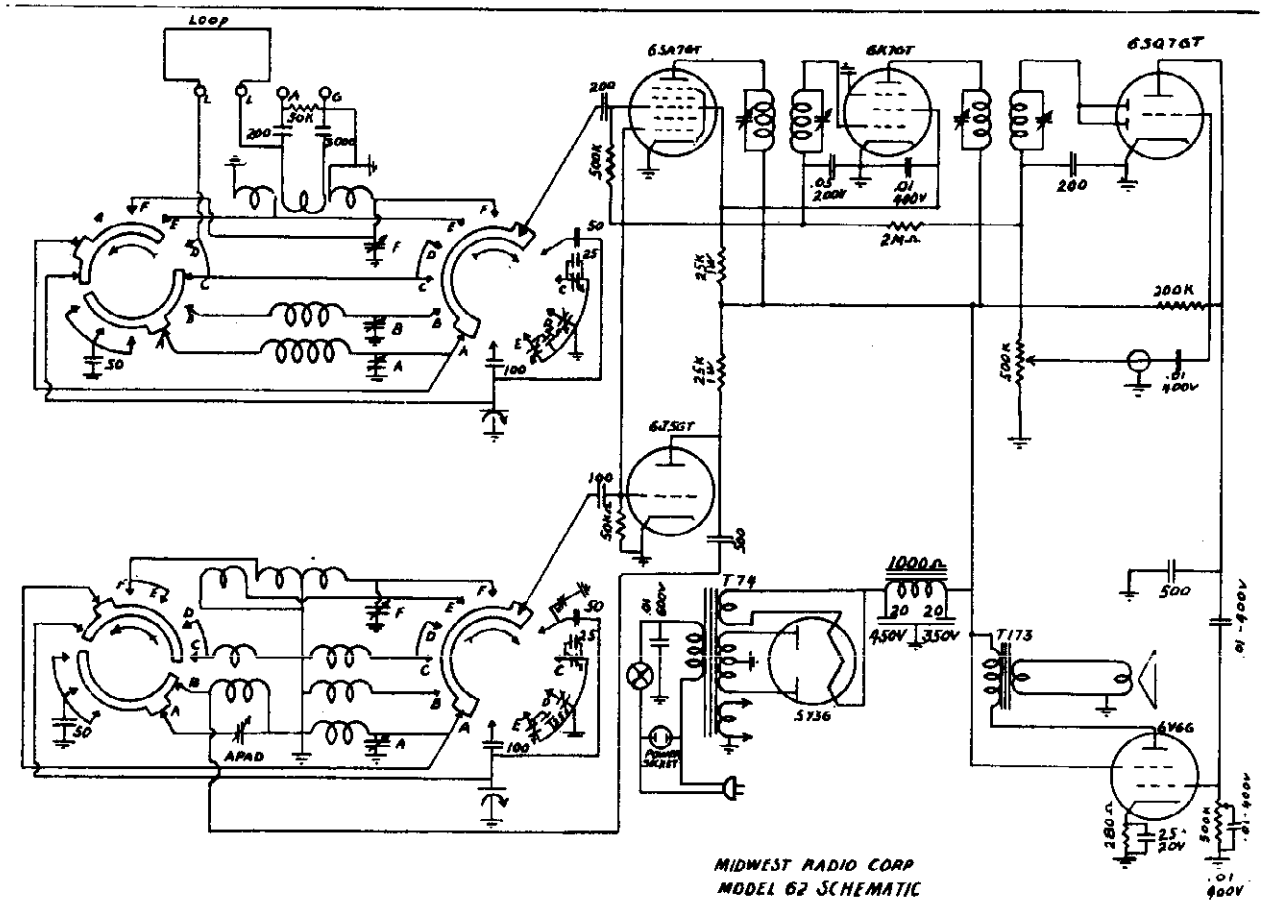
SETTING PUSH BUTTONS

1. Expose locking screw by removing push button.
2. Loosen locking screw about one full turn.
3. With locking screw loose, and button depressed, tune in desired station accurately.
4. Tighten screw and replace moulded cap.

DO NOT LOOSEN screw more than 4 turns. Screw may come out and may be hard to replace.

ALIGNMENT FREQUENCIES

I.F.456 KC. A_ 1400 KC. C_ 9.8 MC. E_ 15.7 MC.
B_ 6.6 MC. D_ 11.7 MC. F_ 24 MC.



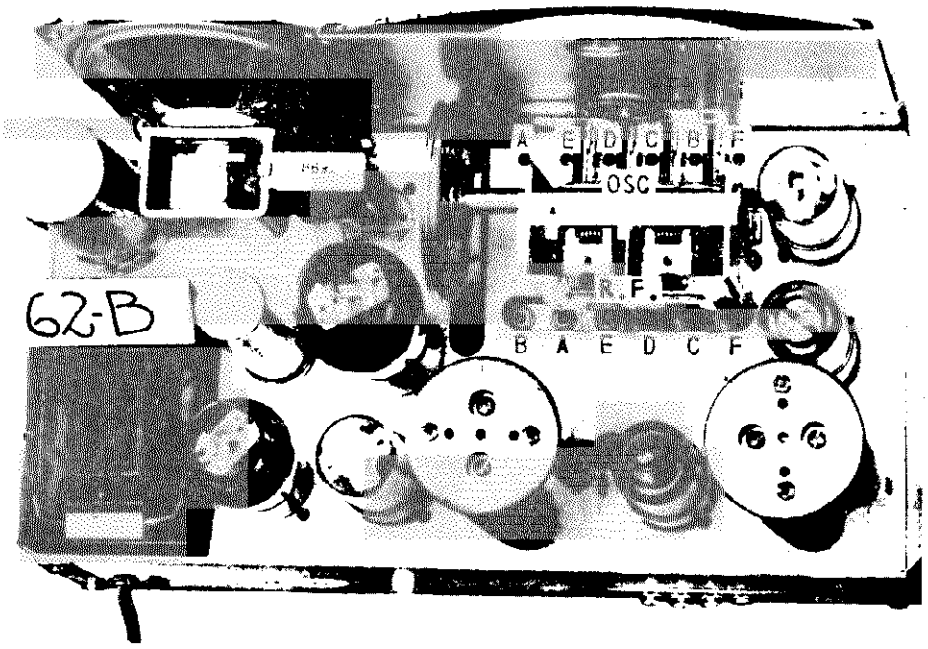
MODEL 62B

MIDWEST RADIO CORP.

SETTING PUSH BUTTONS

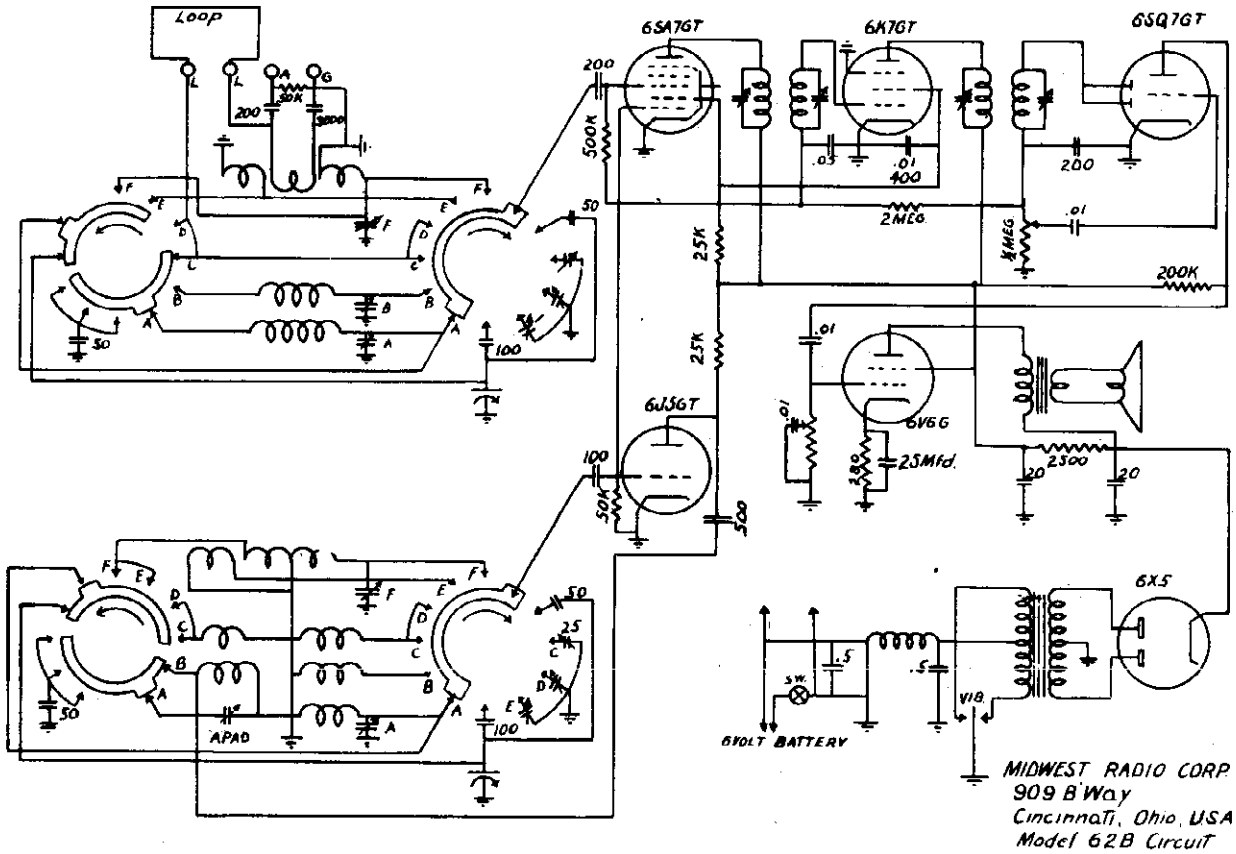
1. Expose locking screw by removing push button.
2. Loosen locking screw about one full turn.
3. With locking screw loose, and button depressed, tune in desired station accurately.
4. Tighten screw and replace moulded cap.

DO NOT LOOSEN screw more than 4 turns. Screw may come out and may be hard to replace.



ALIGNMENT FREQUENCIES

IF - 456 KC	A - 1400 KC	C - 9.8 MC	E - 15.7 MC
	B - 6.6 MC	D - 11.7 MC	F - 24 MC

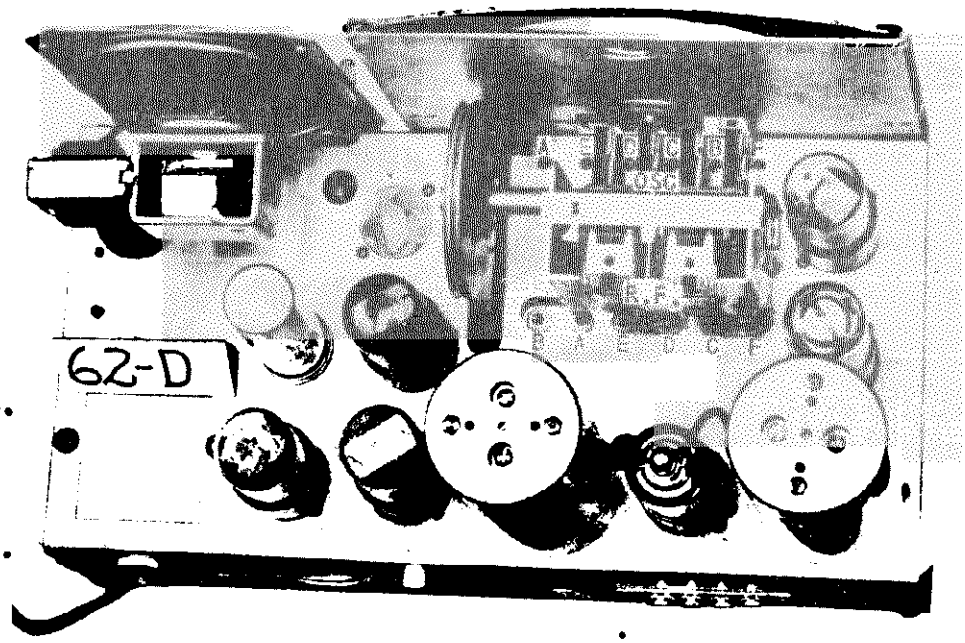


MIDWEST RADIO CORP.

SETTING PUSH BUTTONS

1. Expose locking screw by removing push button.
2. Loosen locking screw about one full turn.
3. With locking screw loose, and button depressed, tune in desired station accurately.
4. Tighten screw and replace moulded cap.

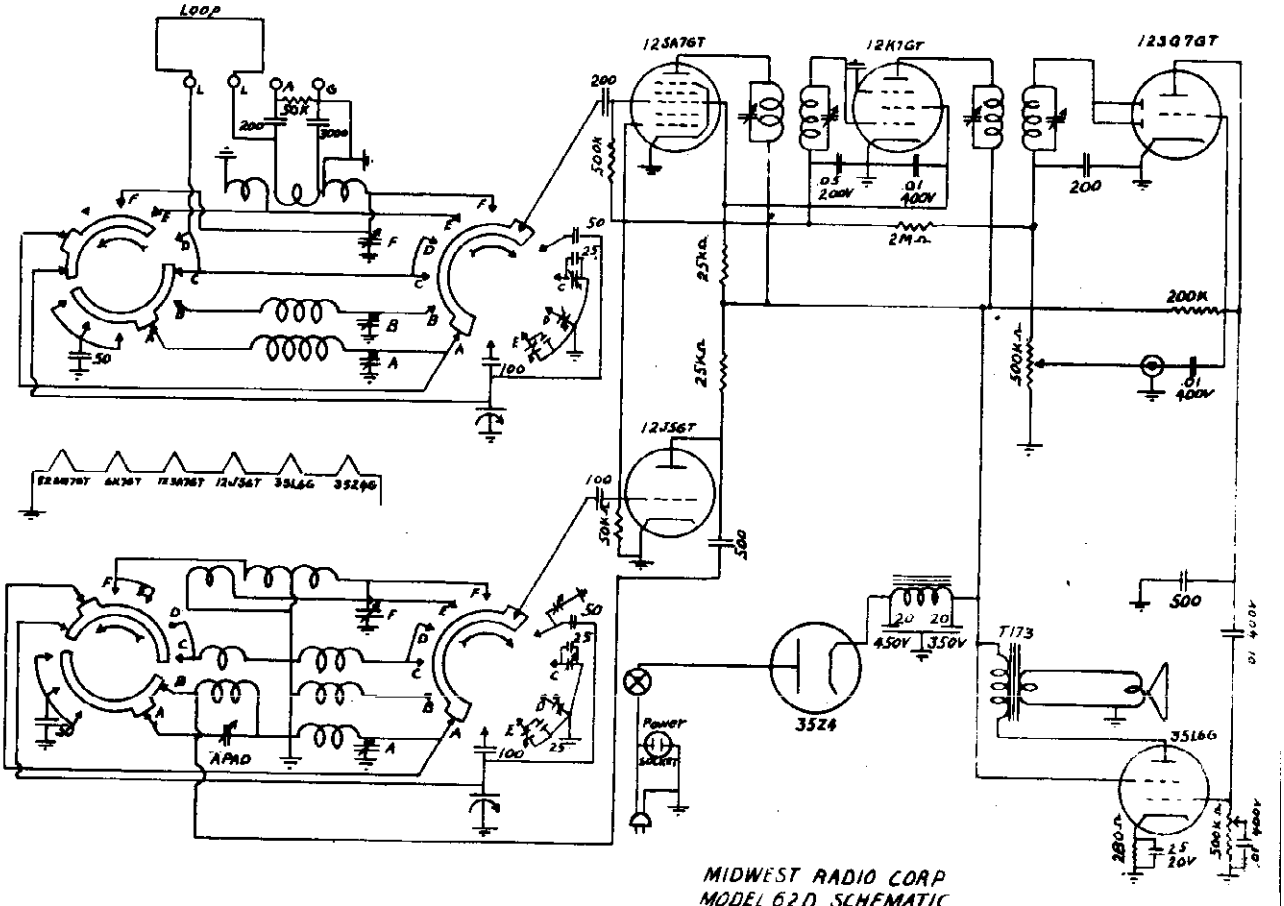
DO NOT LOOSEN screw more than 4 turns. Screw may come out and may be hard to replace.



ALLIGNMENT FREQUENCIES

IF - 456 KC

A - 1400 KC
B - 6.6 MC
C - 9.8 MC
D - 11.7 MC
E - 15.7 MC
F - 24 MC



MIDWEST RADIO CORP
MODEL 62D SCHEMATIC

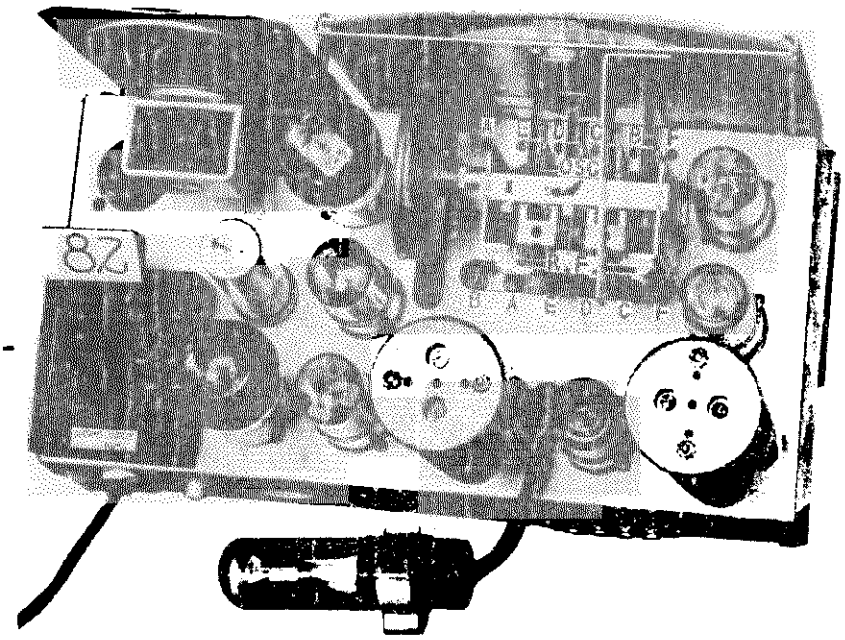
MODEL 82

MIDWEST RADIO CORP.

SETTING PUSH BUTTONS

1. Expose locking screw by removing push button.
2. Loosen locking screw about one full turn.
3. With locking screw loose, and button depressed, tune in desired station accurately.
4. Tighten screw and replace moulded cap.

DO NOT LOOSEN screw more than 4 turns. Screw may come out and may be hard to replace.



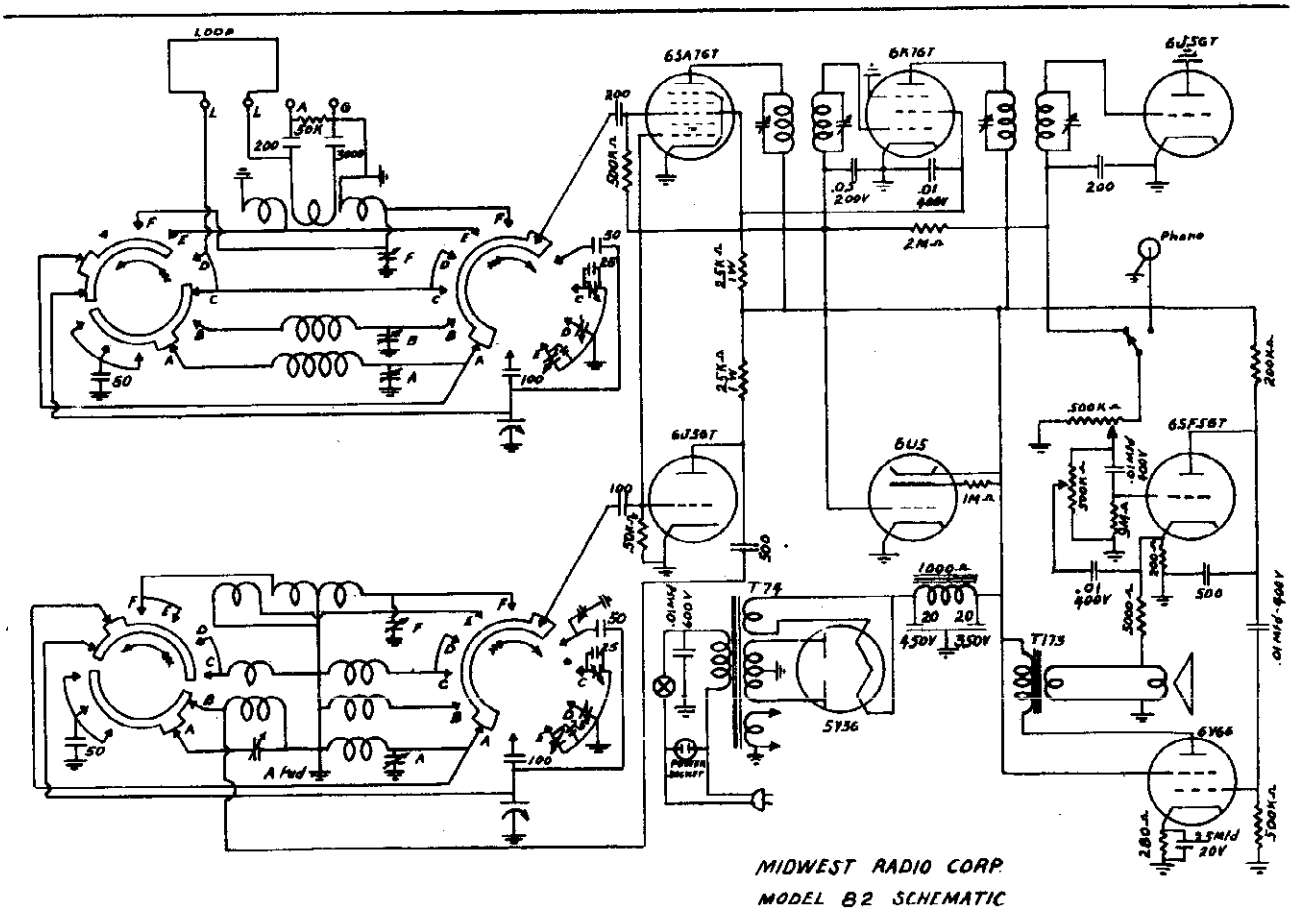
ALIGNMENT FREQUENCIES

IF - 456 KC

A - 1400 KC
B - 6.6 MC

C - 9.8 MC
D - 11.7 MC

E - 15.7 MC
F - 24 MC

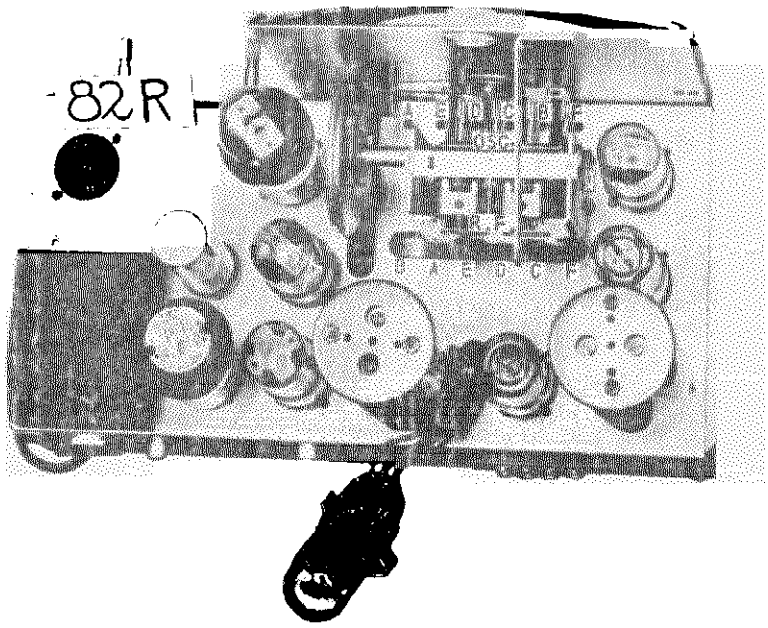


MIDWEST RADIO CORP.

SETTING PUSH BUTTONS

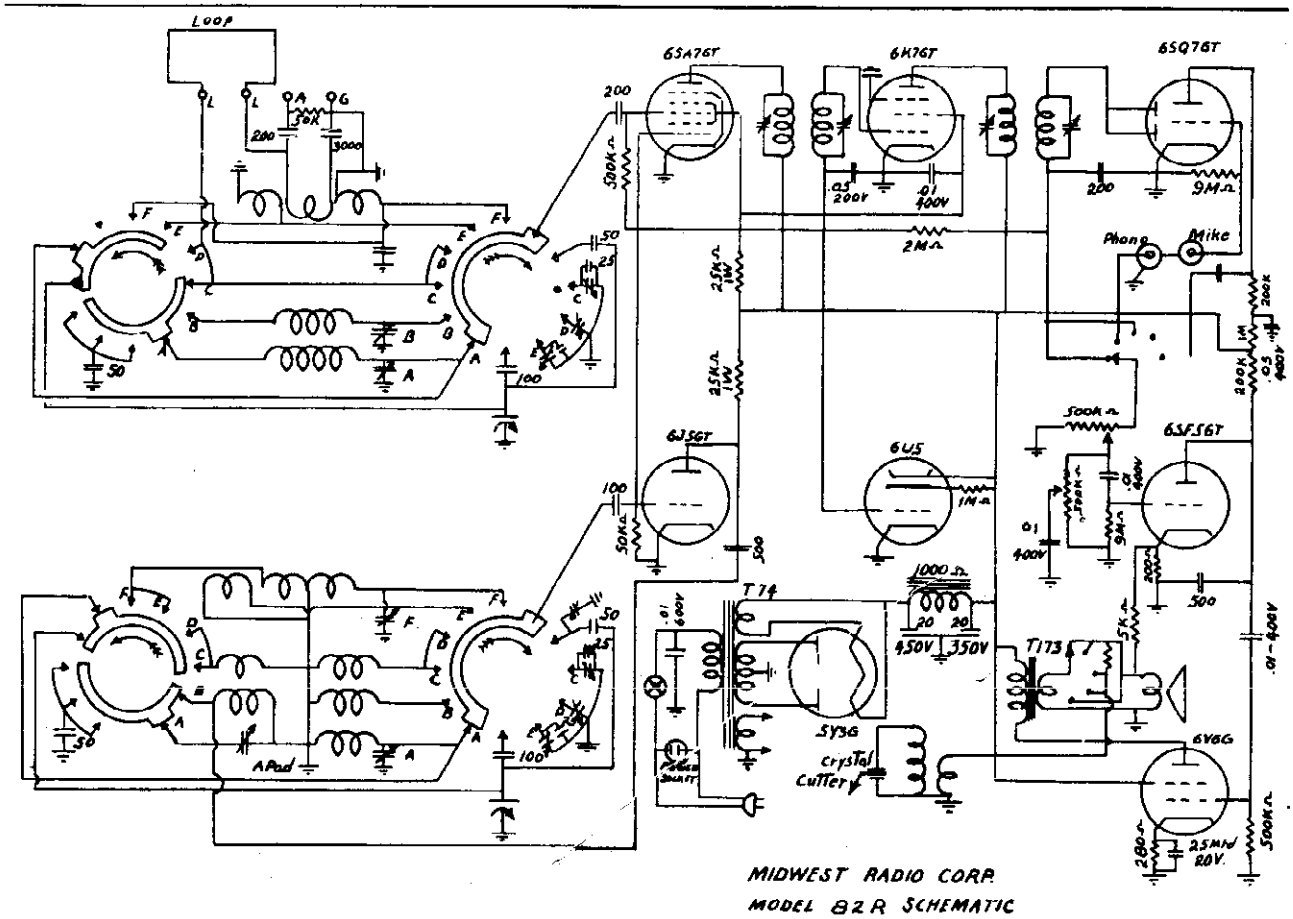
1. Expose locking screw by removing push button.
2. Loosen locking screw about one full turn.
3. With locking screw loose, and button depressed, tune in desired station accurately.
4. Tighten screw and replace moulded cap.

DO NOT LOOSEN screw more than 4 turns. Screw may come out and may be hard to replace.



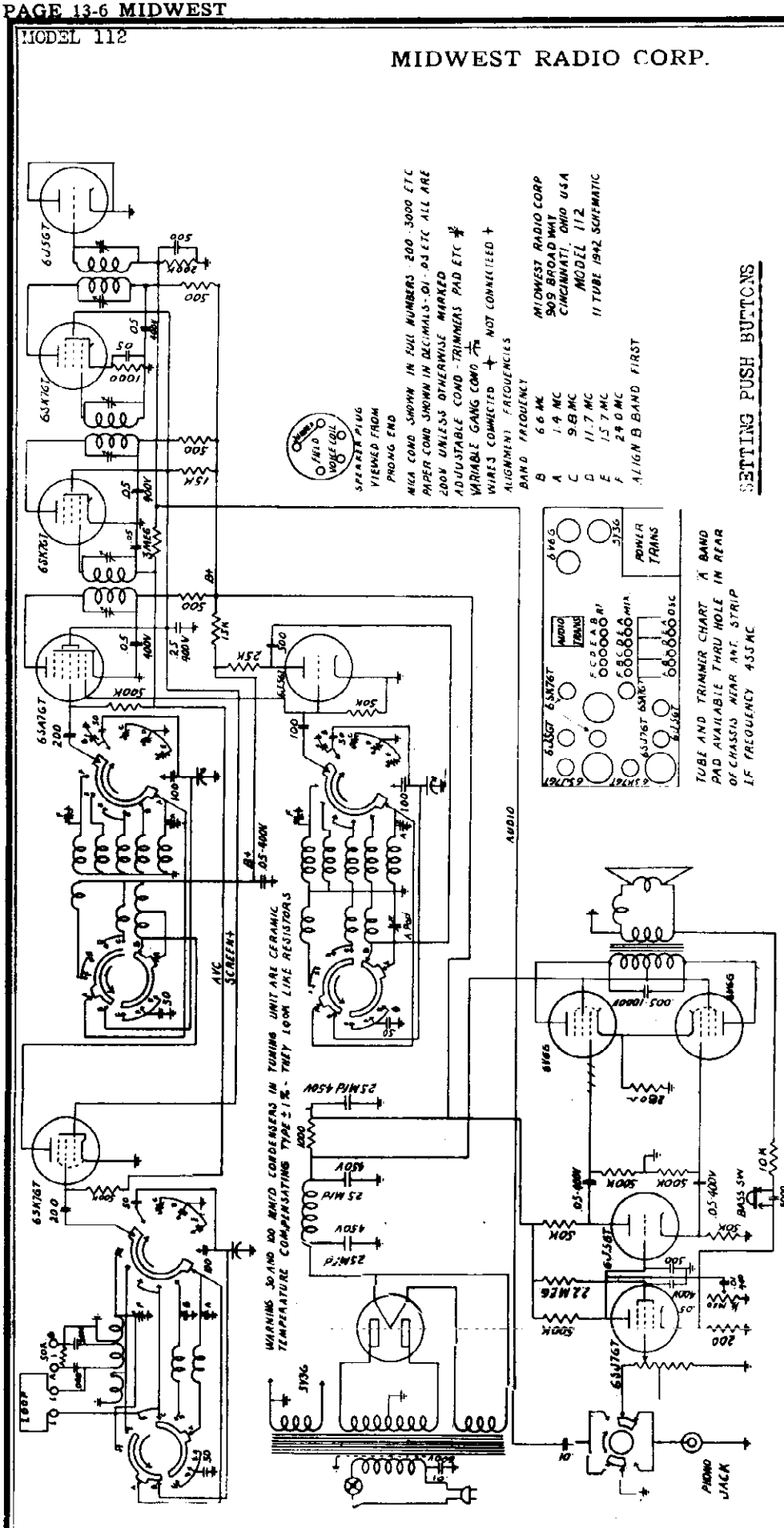
ALLIGNMENT FREQUENCIES

IF - 456 KC	A - 1400 KC	C - 9.8 MC	E - 15.7 MC
	B - 6.5 MC	D - 11.7 MC	F - 24 MC



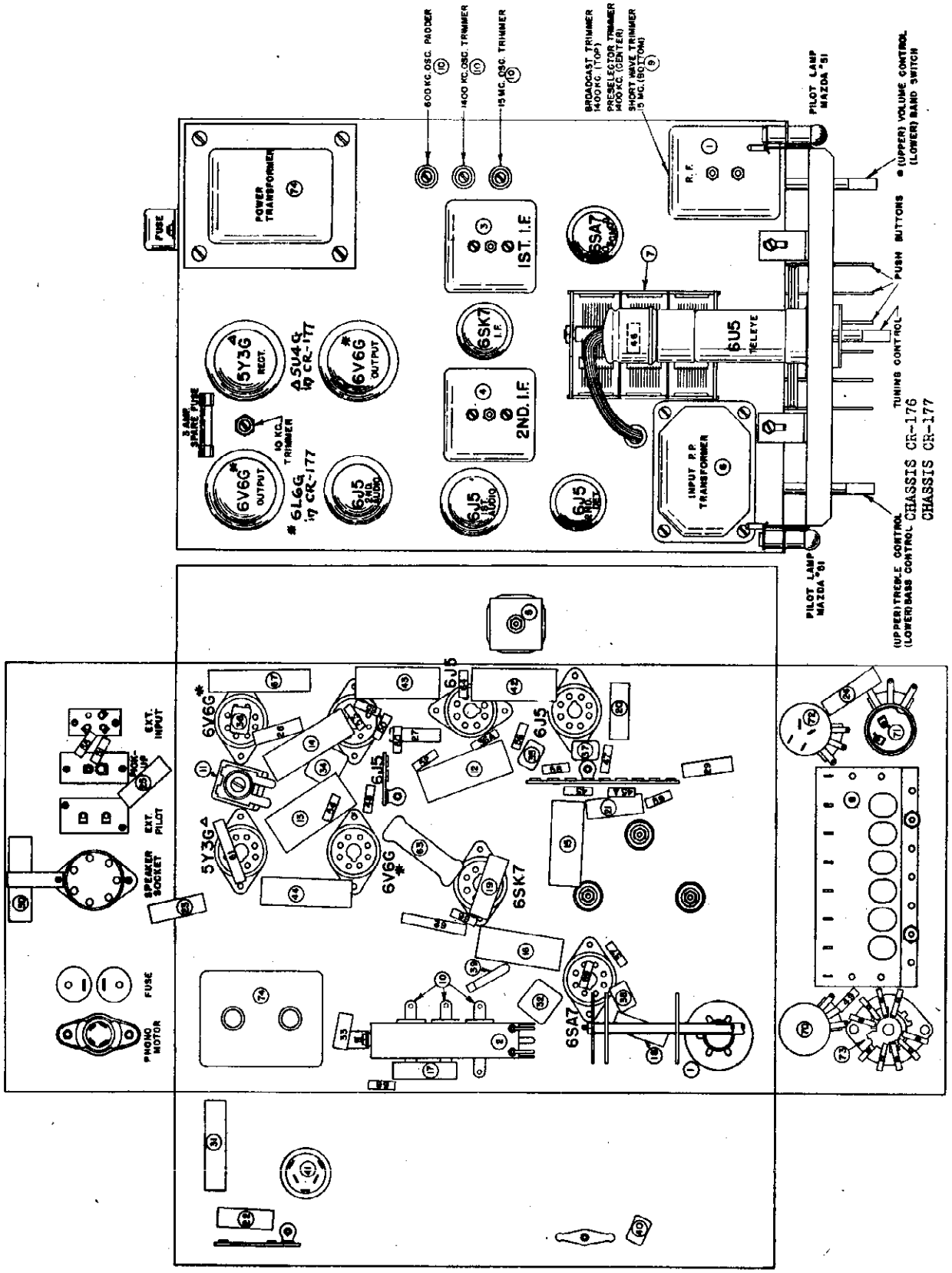
MODEL 112

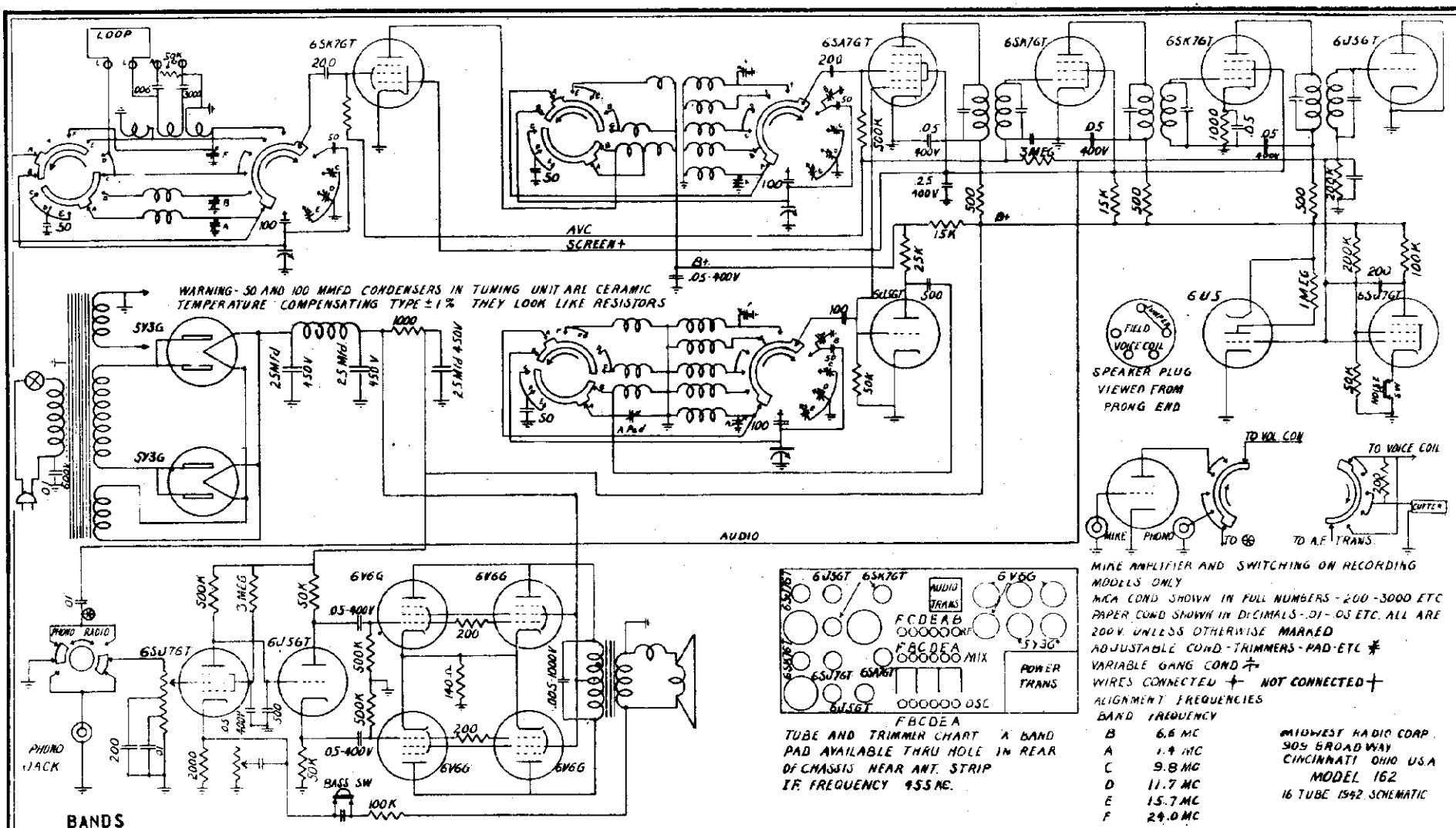
MIDWEST RADIO CORP.



MIDWEST RADIO CORP.

MODEL 11
MODEL 16





TUBE AND TRIMMER CHART A BAND PAD AVAILABLE THRU HOLE IN REAR OF CHASSIS NEAR ANT. STRIP
I.F. FREQUENCY 455 KC.

MIKE AMPLIFIER AND SWITCHING ON RECORDING MODELS ONLY
MICA COND SHOWN IN FULL NUMBERS - 200 - 3000 ETC
PAPER COND SHOWN IN DECIMALS - .01 - .05 ETC. ALL ARE 200 V. UNLESS OTHERWISE MARKED
ADJUSTABLE COND - TRIMMERS - PAD - ETC ⊁
VARIABLE GANG COND ⫩
WIRES CONNECTED ⊹ NOT CONNECTED ⊹

ALIGNMENT FREQUENCIES

BAND	FREQUENCY
B	6.6 MC
A	1.4 MC
C	9.8 MC
D	11.7 MC
E	15.7 MC
F	24.0 MC

ALIGN B BAND FIRST

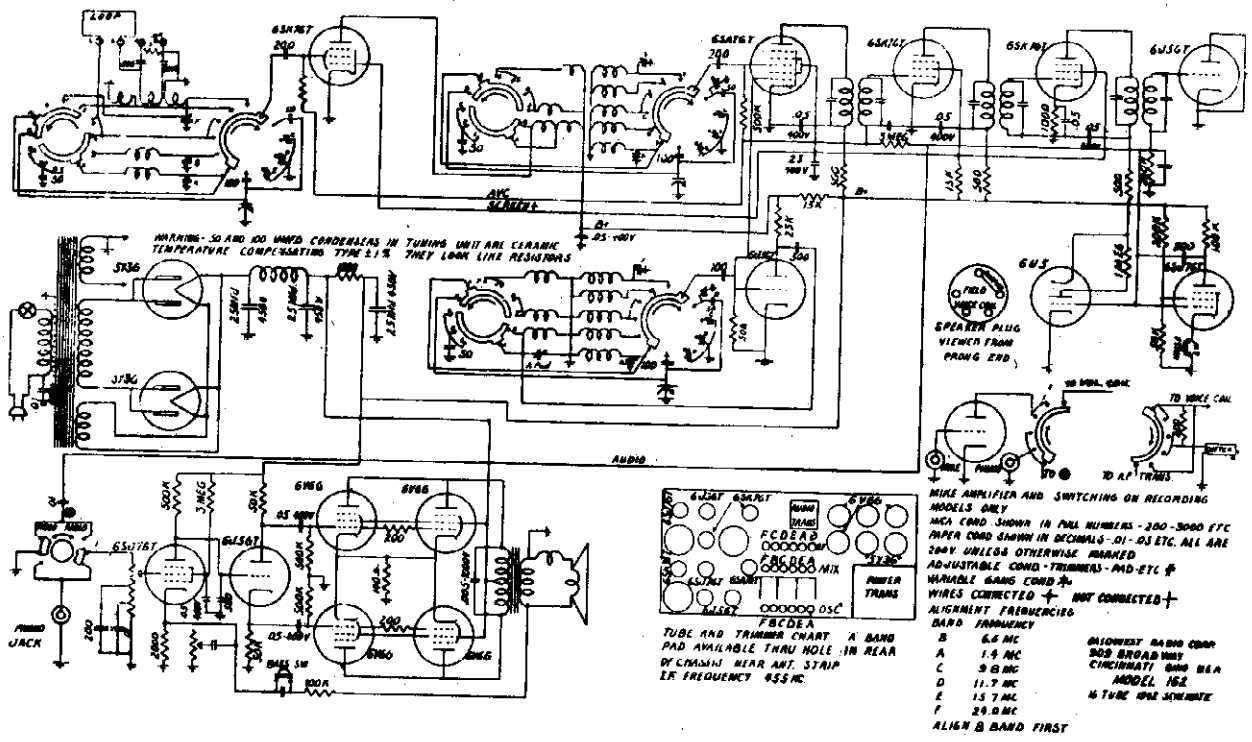
MIDWEST RADIO CORP.
909 BROADWAY
CINCINNATI OHIO U.S.A.
MODEL 162
16 TUBE 1942 SCHEMATIC

BANDS

This receiver has six separate and distinct wave bands. It is designed so that you may easily receive all of the foreign and domestic stations now operating in the radio spectrum. Bands are lettered "A B C D E and F." The "A" band is the usual broadcast band and on it you will receive your favorite U.S. broadcast stations. The tuning range of the other five bands is so designed that you may tune in your favorite short wave stations during the day or night time. For example: In the early morning hours you will find most of the short wave stations on the "E" or "F" bands. As daylight increases you will find that these stations will disappear and reappear again on the "C" and "D" bands. At night you will find that these stations have again changed and will appear on the "B" and "C" bands.

Push button data same as for model 82R.

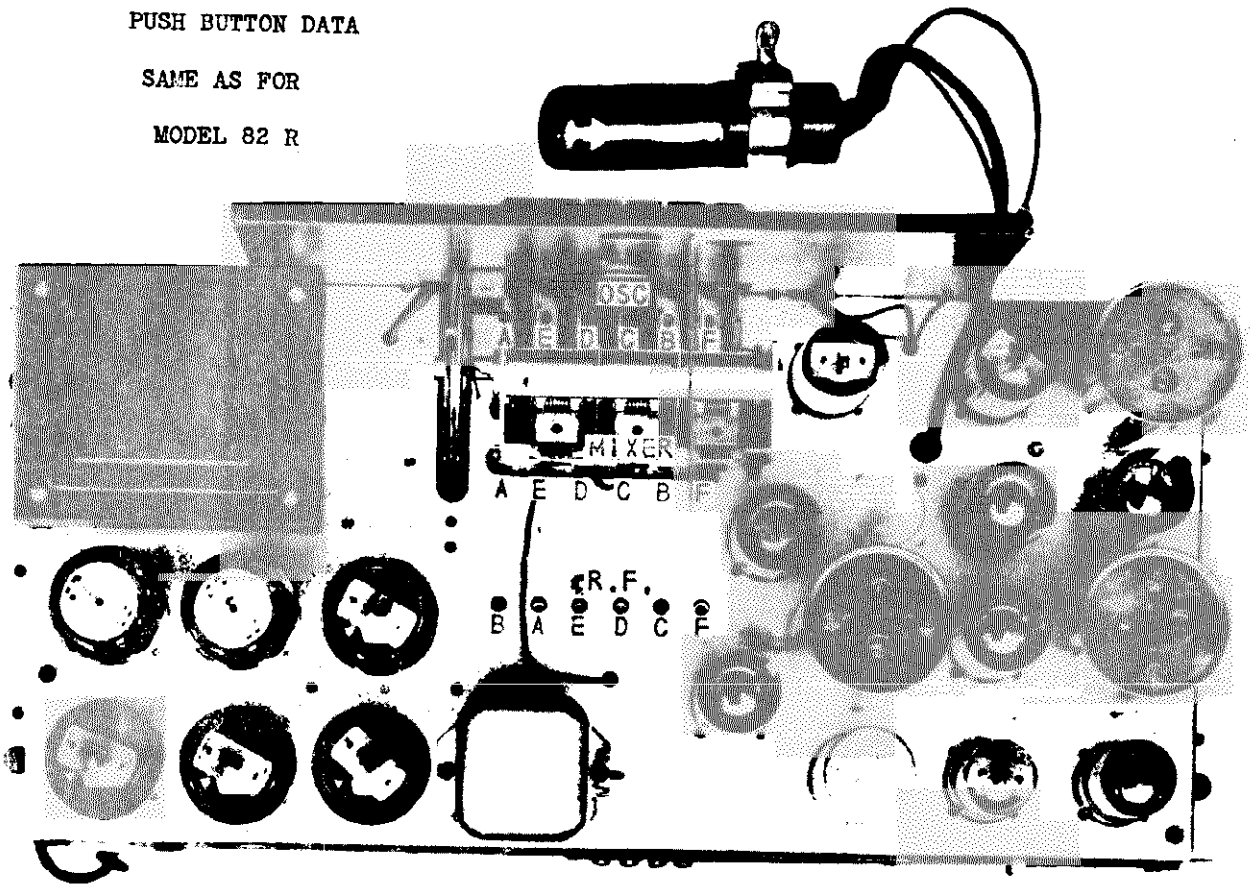
MIDWEST RADIO CORP.

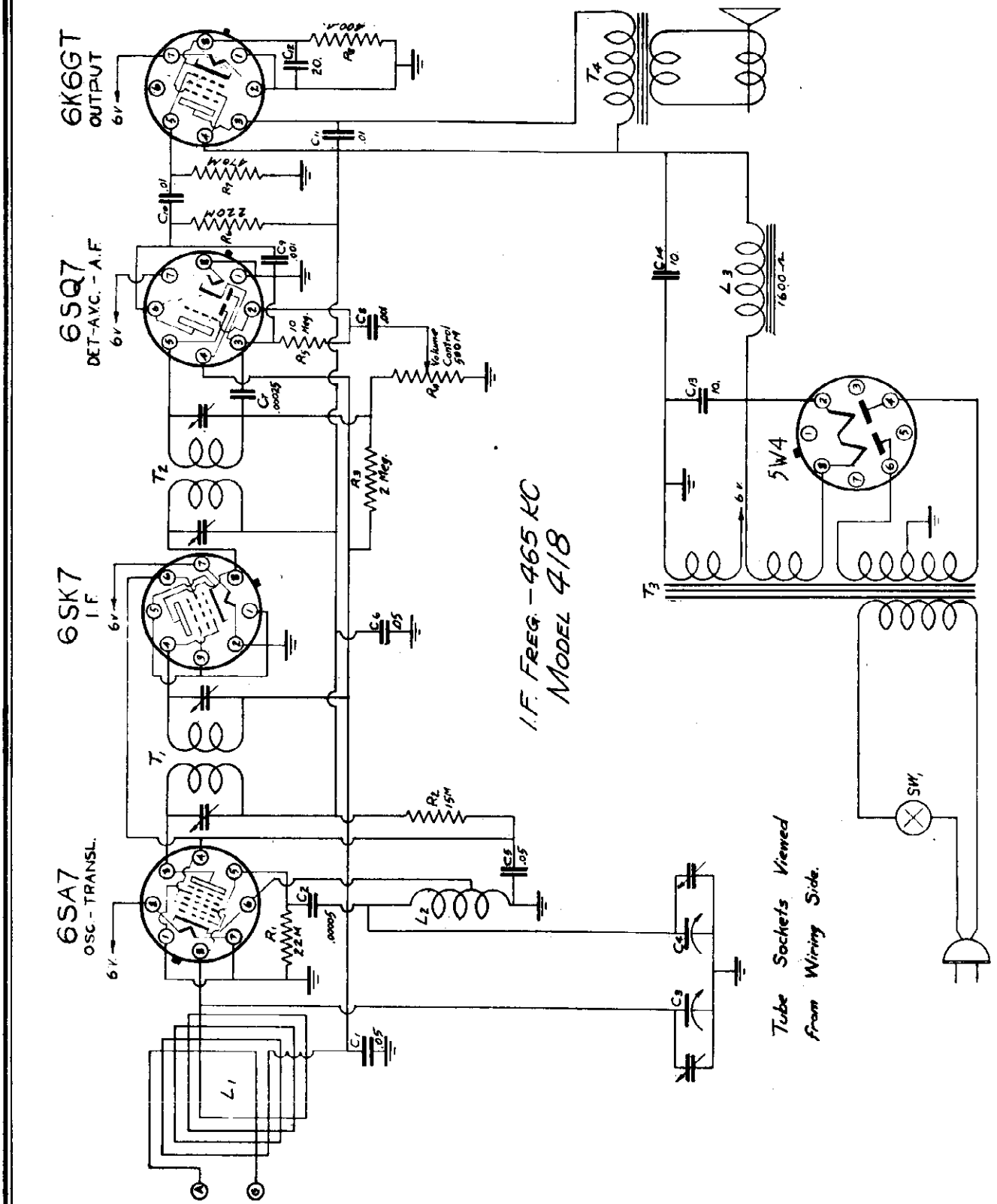


PUSH BUTTON DATA

SAME AS FOR

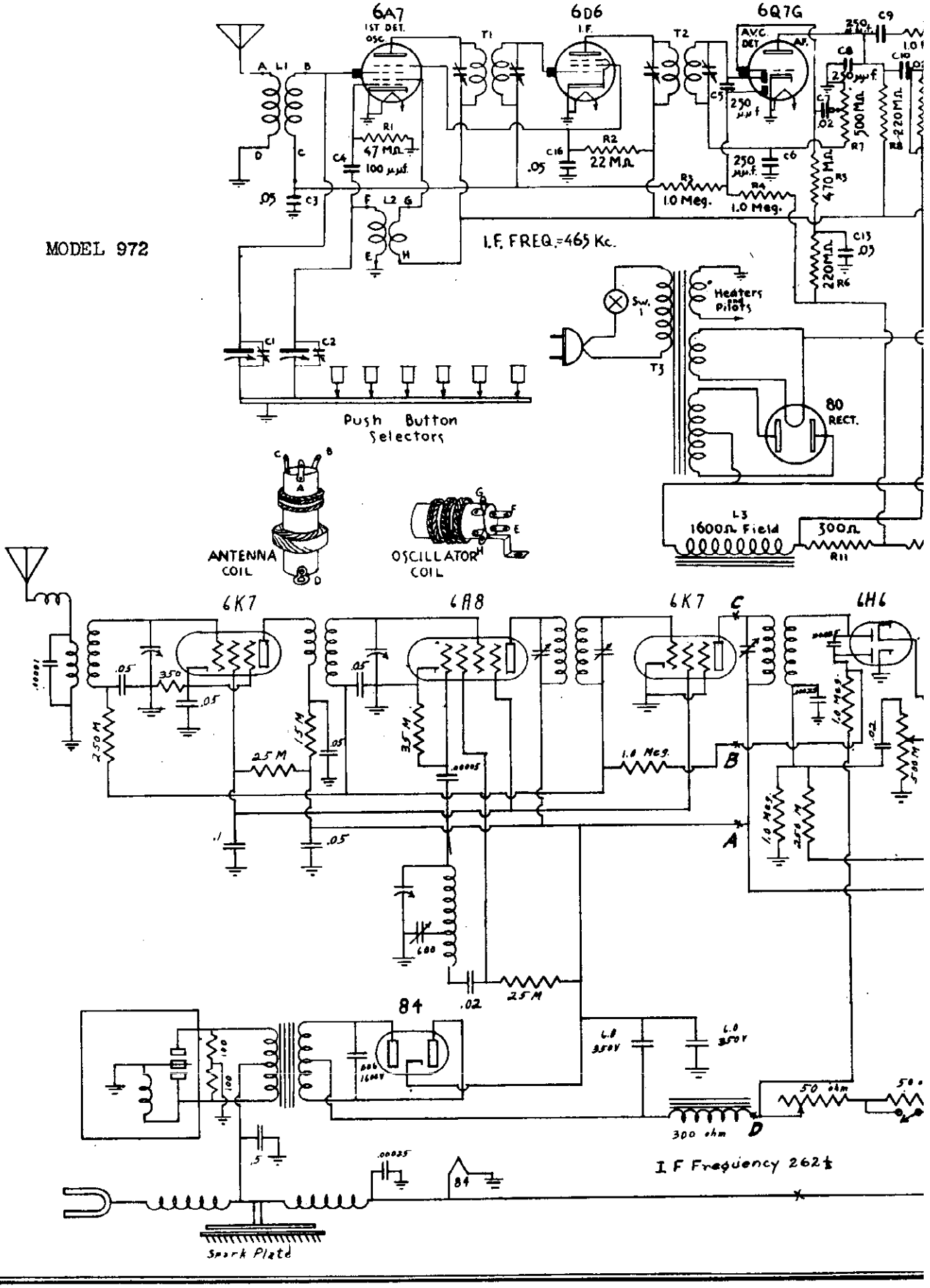
MODEL 82 R




6K6GT
OUTPUT
6V
6SQ7
DET-A.V.C. - A.F.
6SK7
I.F.
6SA7
OSC - TRANSL.
I.F. FREQ. - 465 KC
MODEL 418
Volume Control 500 M
5W4
SW1
Tube Sockets Viewed
from Wiring Side.

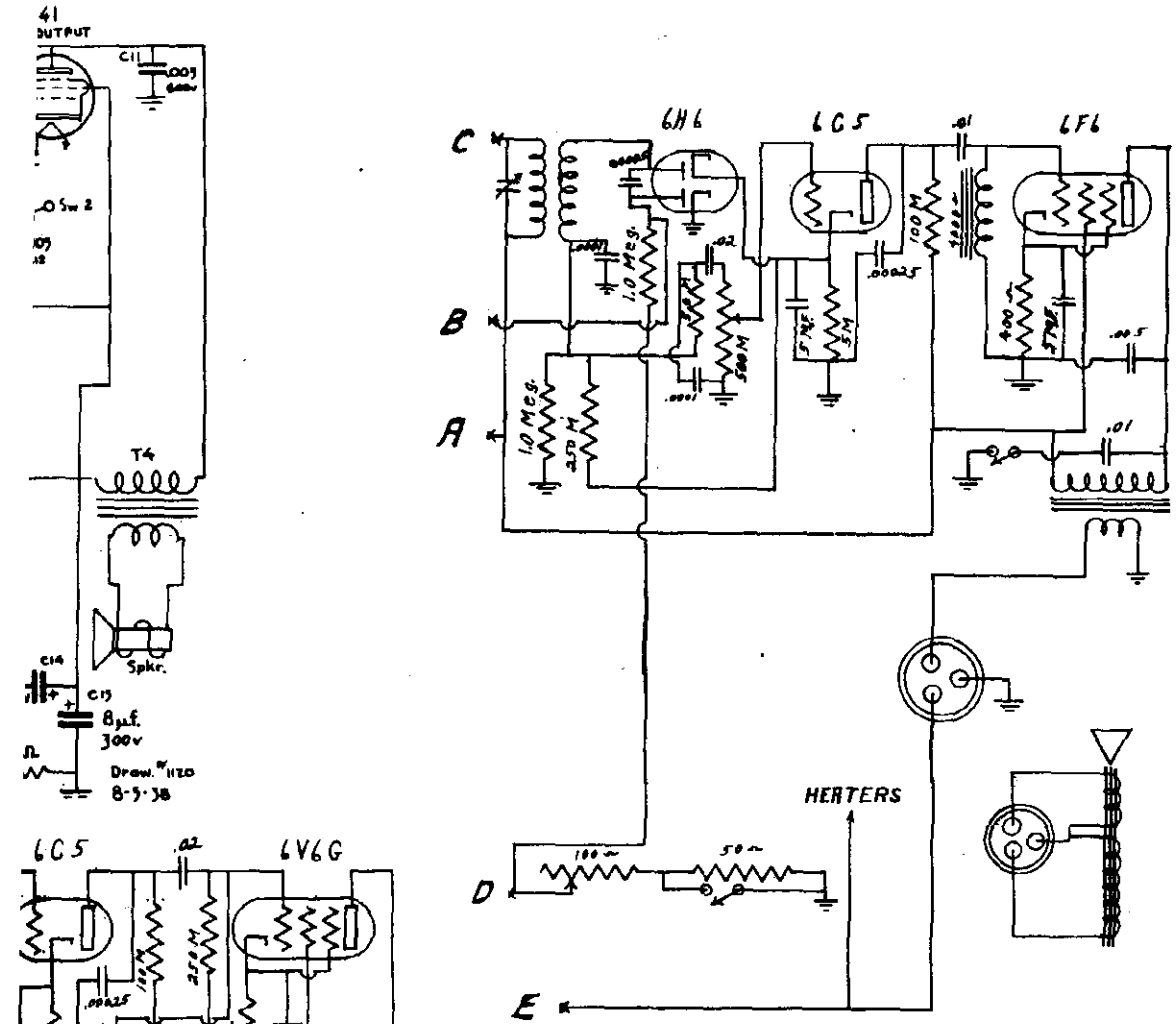
MISSION BELL RAD

MODEL 972



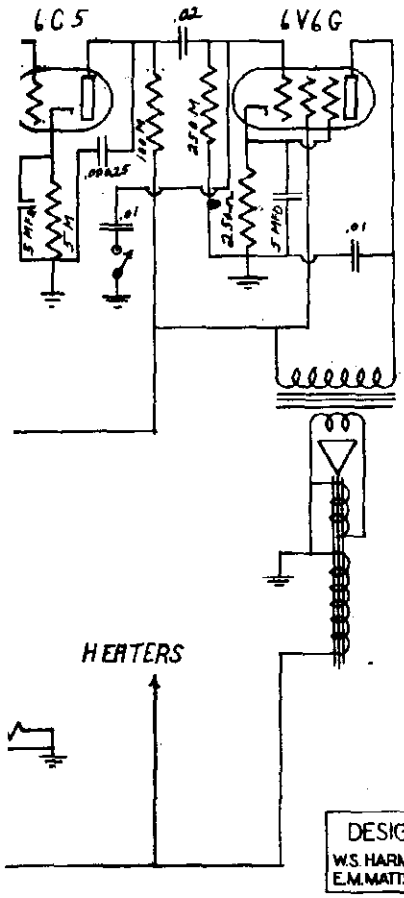
MFG. CO., INC.

MODEL 972
MODEL 3818
MODEL 3820



MODEL No. 3820.
APRIL 10-1937.

DESIGNED BY
W.S. HARMON Chief Engr.
E.M. MATTSON Asst. Engr.

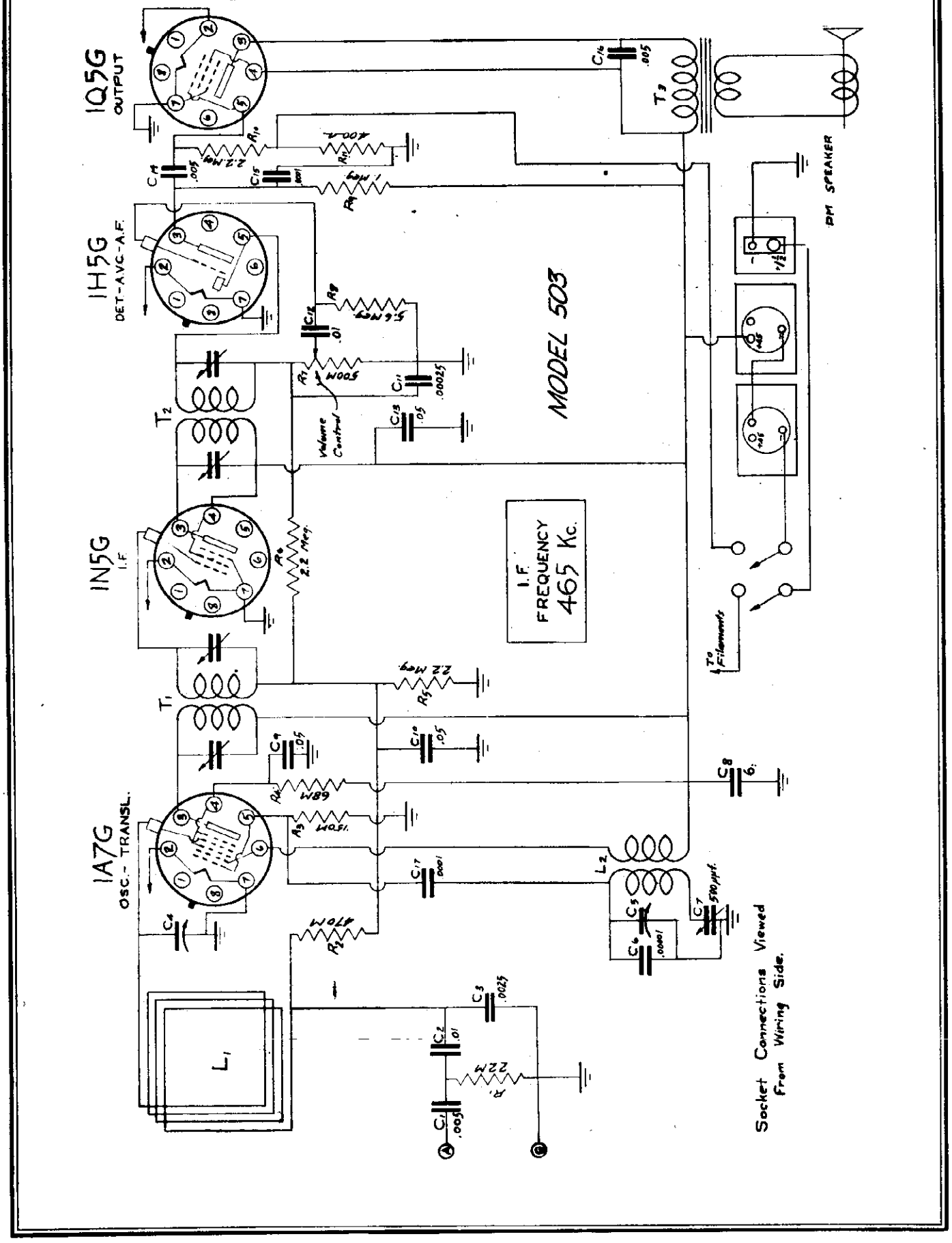


PARTIAL SCHEMATIC SHOWING DIFFERENCES BETWEEN MODEL 3818 AND MODEL 3820; FOR BALANCE OF CONNECTIONS FOR MODEL 3820, SEE MODEL 3818 ABOVE.

DESIGNED BY
W.S. HARMON Chief Engr.
E.M. MATTSON Asst. Engr.

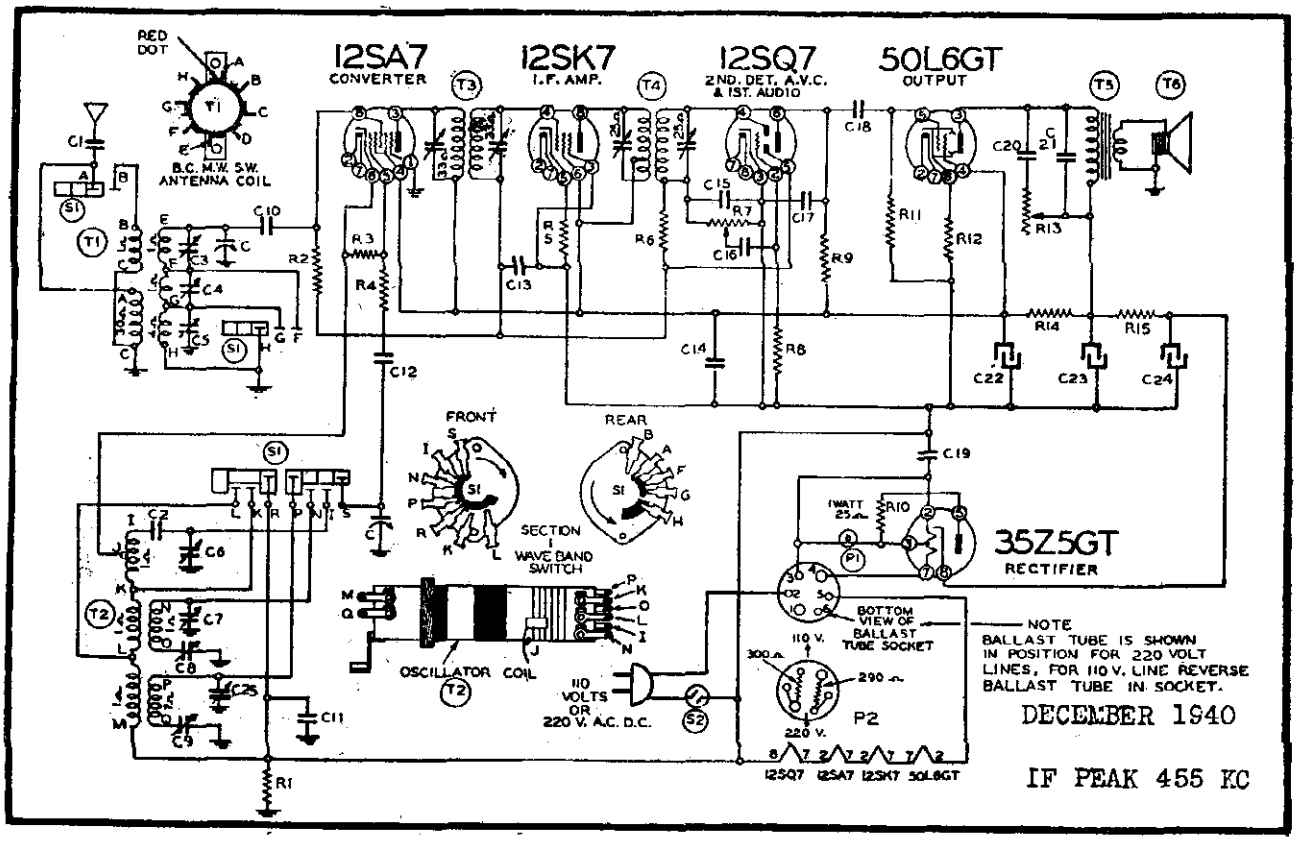
MODEL No. 3818.
APRIL 10-1937

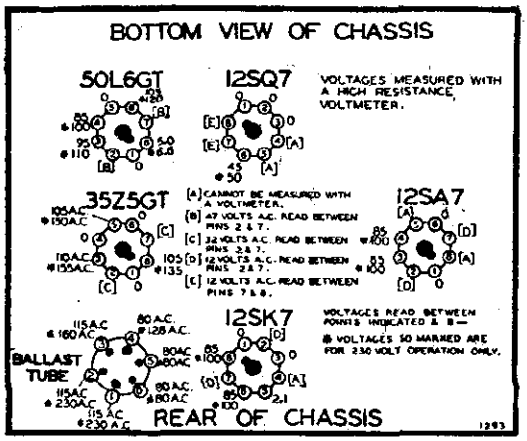
MODEL 503

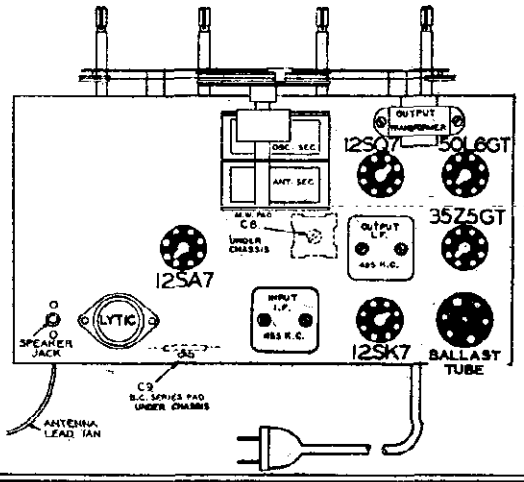

1Q5G
OUTPUT
1H5G
DET-AVC-A.F.
1N5G
I.F.
1A7G
OSC.- TRANSL.
MODEL 503
I.F. FREQUENCY 465 Kc.
Volume Control
To Filaments
PM SPEAKER
Socket Connections Viewed From Wiring Side.

MODEL 04BR-397

MONTGOMERY WARD & CO.







Prices subject to change without notice

Part No.	Circuit Diagram Reference	Description	No. Used In Set	List Price Each
		CONDENSERS		
BE1001	C19	.1 x 400 Volt Tubular Condenser	1	.12
BE1009	C20	.05 x 200 Volt Tubular Condenser	1	.12
BE10020	C14	.1 x 200 Volt Tubular Condenser	1	.12
BE10024	C11	.25 x 400 Volt Tubular Condenser	1	.26
BE10025	C16	.002 x 600 Volt Tubular Condenser	1	.12
BE10026	C13, C18, C21	.02 x 400 Volt Tubular Condenser	3	.12
BE119101	C22, C23, C24	20 Mfd. x 20 Mfd. x 40 Mfd. Electrolytic Filter Condenser		1.26
BE124123	C6, C7, C25	Trimmer Condenser Strip—3 Gang S.W.—M.W.—B.C. Osc.	1	.40
BE124124	C3, C4, C5	Trimmer Condenser Strip—3 Gang S.W.—M.W.—B.C. Ant.	1	.40
BE1292	C1, C10, C17	.0005 Mica Type Condenser—20%	3	.12
BE1295	C12, C15	.0001 Mica Type Condenser—20%	2	.12
BE129153	C2	.006 Compression Type Mica Condenser	1	.40
BE129154	C8	.0025 Compression Type Mica Condenser	1	.28
BE129155	C9	.000483 Compression Type Condenser—3%	1	.20
		RESISTORS		
BE13011	R1, R9, R11	250M Ohm—½ Watt Resistor—20%	3	.10
BE13019	R2	1 Megohm—½ Watt Resistor—20%	1	.10
BE13081	R5	250 Ohm—½ Watt Resistor—20%	1	.10
BE130166	R12	150 Ohm—½ Watt Resistor—10%	1	.10
BE130170	R6	3 Megohm—½ Watt Resistor—25%	1	.10
BE13057	R3	35M Ohm—½ Watt Resistor—20%	1	.10
BE130296	R15	200 Ohm—1 Watt Resistor—10%	1	.10
BE130287	R14	1200 Ohm—1 Watt Resistor—10%	1	.10
BE130295	R10	25 Ohm—1 Watt Resistor—10%	1	.10
BE130327	R4	10 Ohm—½ Watt Resistor—20%	1	.10
BE130223	R8	10 Megohm—½ Watt Resistor—20%	1	.10
BE10663	P2	Ballast Tube—110 and 220 Volts	1	.60

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- 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., 400 Ohms.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (In Order Shown)	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Grid of 12SK7 I. F. Tube	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Chassis View)	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 12SA7	Broadcast (Extreme Left Rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Chassis View)	Input I. F.	Adjust to maximum output
SHORT WAVE BAND	21 Mc.	400 ohms	Antenna lead	Short Wave (Extreme Right Rotation)	Set Dial at 21 MC	Trimmer (C6) (See Trimmer View)	Short wave oscillator	See Note "A" Adjust to maximum output
	21 Mc.	400 ohms	Antenna lead	Short Wave (Extreme Right Rotation)	Set Dial at 21 MC	Trimmer (C3) (See Trimmer View)	Short wave antenna	Adjust to maximum output
MEDIUM WAVE BAND	6 Mc.	400 ohms	Antenna lead	Medium Wave	Set Dial at 6 MC	Trimmers (C7, C4) (See Trimmer View)	Medium wave oscillator and antenna	Adjust to maximum output
	2.3 Mc.	400 ohms	Antenna lead	Medium Wave	Set Dial at 2.3 MC	Trimmer (C8) (See Chassis View)	Medium wave osc. series pad	Adjust to maximum rock dial. (See note "B")
BROAD-CAST BAND	1730 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme Left Rotation)	Rotor full open (Plates out of mesh)	Trimmer (C25) (See Trimmer View)	Broadcast oscillator	Adjust to maximum output
	1500 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1500 Kc.	Trimmer (C5) (See Trimmer View)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 600 Kc.	Trimmer (C9) (See Chassis View)	Broadcast oscillator series pad	Adjust to maximum rock dial. (See note "B")

NOTE "A"—It is extremely necessary when making this adjustment that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental.

NOTE "B"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

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.

TECHNICAL DATA

TEST FREQUENCIES USED

	K.C.	Meters
I. F.	455	645.1
Short Wave	21000	14.2
Medium Wave	6000	50
Medium Wave	2300	130
Broadcast	1730	173.4
Broadcast	1500	200
Broadcast	600	500

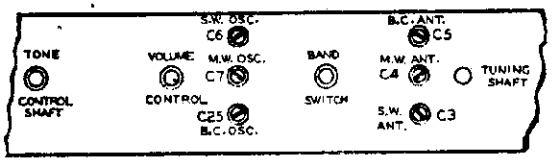
Power Consumption - - - - - - - - 110 V. 35 Watts
220 V. 65 Watts

Power Output - - - - - - 1½ Watts Undistorted

Tuning Frequency Range Broadcast Band - 540 to 1735 KC
Medium Band - - - 2.2 to 7 MC
Short Wave Band - 6.6 to 23 MC

Intermediate Frequency - - - - - - - - 455 KC

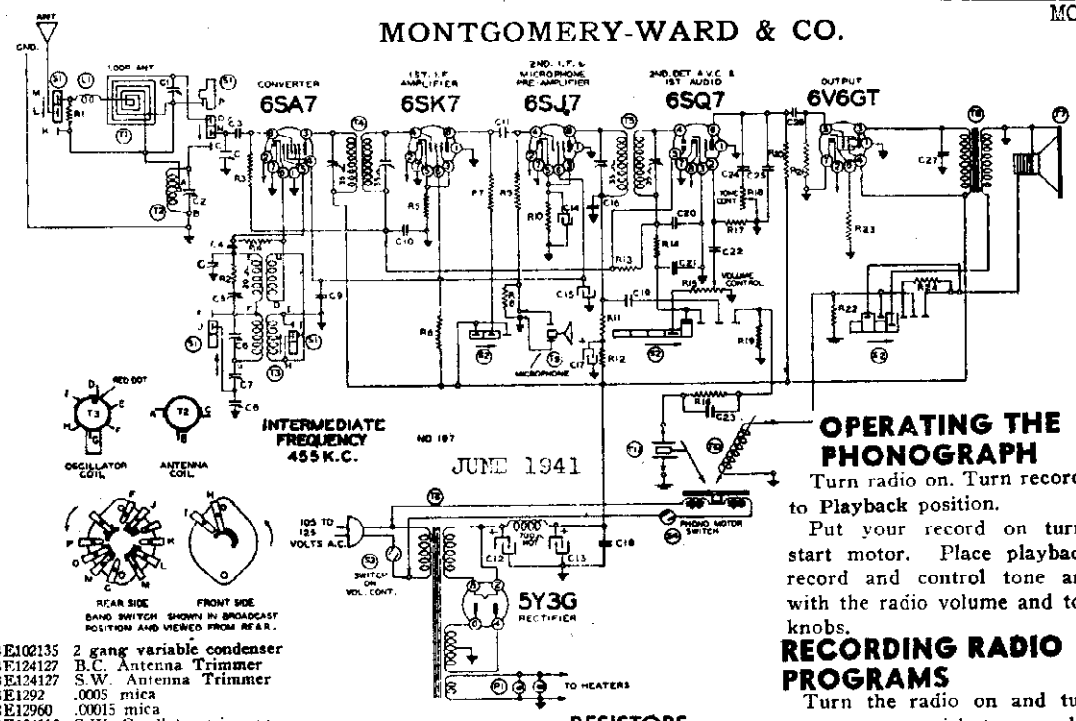
Speaker - - - - - - - - 6 in. Electro Dynamic



TRIMMER VIEW

MODEL 04ER-615A

MONTGOMERY-WARD & CO.



C	BE102135	2 gang variable condenser
C1	BE124127	B.C. Antenna Trimmer
C2	BE124127	S.W. Antenna Trimmer
C3	BE1292	.0005 mica
C4	BE12960	.00015 mica
C5	BE124112	S.W. Oscillator trimmer
C6	BE124112	B.C. Oscillator trimmer
C7	BE124146	B.C. Oscillator series padder
C8	BE124146	S.W. Oscillator series padder
C9	BE10013	.05 x 400 v. condenser
C10	BE1009	.05 x 200 v. condenser
C11	BE12921	.0002 mica
C12	BE119114	15 mfd. x 400 v. lytic
C13	BE119114	15 mfd. x 400 v. lytic
C14	BE119114	20 mfd. x 25 v. lytic
C15	BE119114	10 mfd. x 300 v. lytic
C16	BE1292	.0005 mica
C17	BE11967	8 mfd. x 450 v. lytic
C18	BE1001	.1 x 400 v. condenser
C19	BE10011	.01 x 400 v. condenser
C20	BE129161	.0001 mica
C21	BE129161	.0001 mica
C22	BE10012	.003 x 600 v. condenser
C23	BE1292	.0005 mica
C24	BE10089	.008 x 800 v.
C25	BE1292	.0005 mica
C26	BE10026	.02 x 400 v.
C27	BE10011	.01 x 400 v.

C1 and C2 in one unit C5 and C6 in one unit
C7 and C8 in one unit C12, C13, C14 and C15 in one unit C20 and C21 in one unit

RESISTORS

R1	BE130321	3500 ohms—½ w.
R2	BE130197	20 ohms—½ w.
R3	BE1304	3 megohm—½ w.
R4	BE13076	30M ohms—½ w.
R5	BE13097	200 ohms—½ w.
R6	BE130165	15M ohms—1 w.
R7	BE13022	5M ohms—½ w.
R8	BE13019	1 megohm—½ w.
R9	BE13012	50M ohms—½ w.
R10	BE130192	2M ohms—½ w.
R11	BE1302	75M ohms—½ w.
R12	BE1301	25M ohms—½ w.
R13	BE1304	3 megohm—½ w.
R14	BE13012	50M ohms—½ w.
R15	BE101142	1 megohm volume control
R16	BE13028	750M ohm—½ w.
R17	BE130252	5 megohm—½ w.
R18	BE101143	Tone control
R19	BE13019	1 megohm—½ w.
R20	BE13011	250M ohm—½ w.
R21	BE1303	500M ohm—½ w.
R22	BE130322	10 ohm—1 w.
R23	BE130227	250 ohm—1 w.
R24	BE130203	40 ohm—½ w.

OPERATING THE PHONOGRAPH

Turn radio on. Turn recording switch to Playback position.

Put your record on turntable and start motor. Place playback arm on record and control tone and volume with the radio volume and tone control knobs.

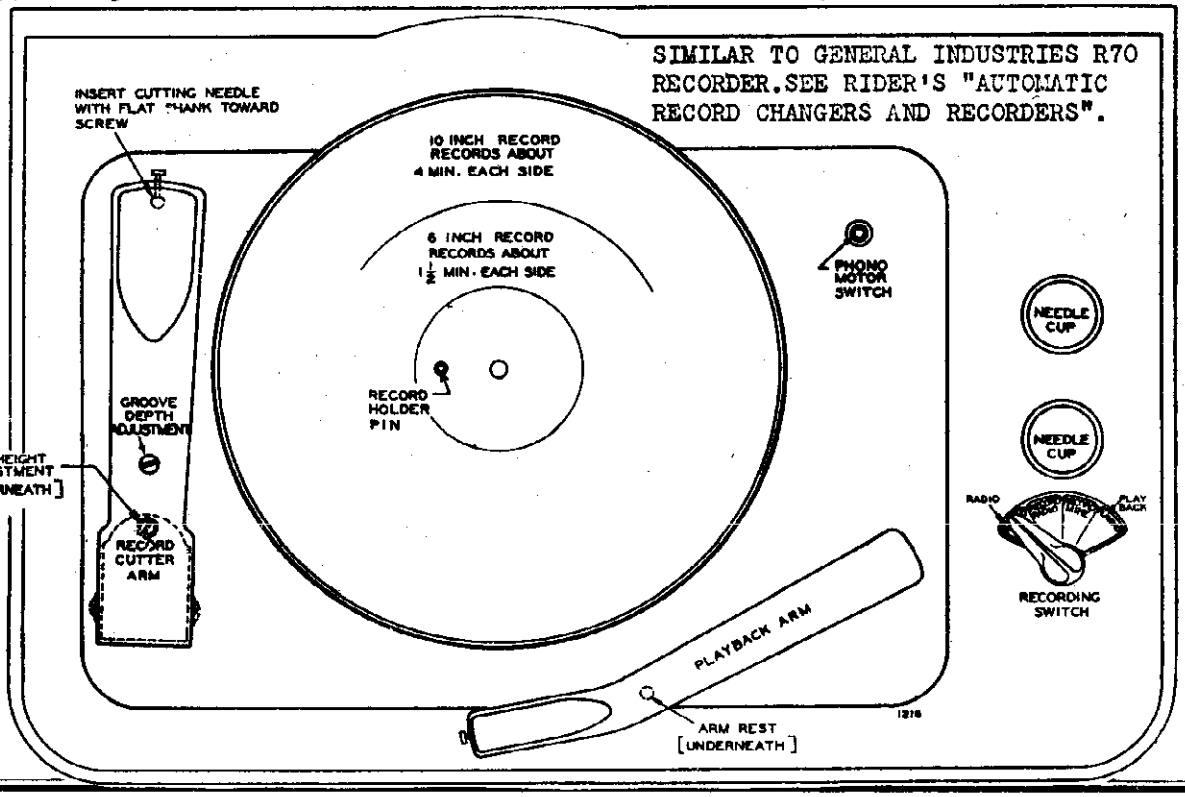
RECORDING RADIO PROGRAMS

Turn the radio on and tune in the program you wish to record. Put recording switch in "Record-Radio" position. The volume will drop. Start motor and then gently lower cutting needle onto blank record, about ¼" from outer edge.

RECORDING VOICE

Turn the radio volume control nearly full on. Recording switch should be in Record "Mike" position. Start motor, and set cutting needle gently on start of record. Turn mike switch on and talk.

NOTE: The cutting arm must be raised about three inches to move it freely across the record.



- Volume control—Maximum all adjustments.
- Connect radio ground to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- 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., 400 ohms.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Grid of 6SJ7 I. F.	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Top View)	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 6SA7 Mixer	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Top View)	Input I. F.	Adjust to maximum output
SHORT WAVE BAND (See Note A)	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C5	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C2	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 6 Mc.	Trimmer C8	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "C")
BROAD-CAST BAND (See Note A)	1600 Kc.	200 mmf.	Grid of 6SA7	Broadcast	Rotor full open (Plates out of mesh)	Trimmer C6	Broadcast oscillator	Adjust to maximum output
	535 Kc.	200 mmf.	Grid of 6SA7	Broadcast	Rotor full closed	Trimmer C7	Broadcast oscillator series pad	Adjust to maximum output
LOOP ALIGN-MENT (See Note B)	1400 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 1400 Kc.	Trimmer C1 (See Top View)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 600 Kc.	Trimmer C7 (See Top View)	Broadcast osc. Series Pad	Adjust to maximum output

NOTE "A"—The signal generator is connected to the "ANT." and "GND." leads when aligning the **Short Wave Band** and to the grid of the 6SA7 tube and ground terminal when setting the **Broadcast Band** oscillator end frequencies, (1600 and 535 K. C.).

The loop **antenna** should be connected to the radio when making these adjustments.

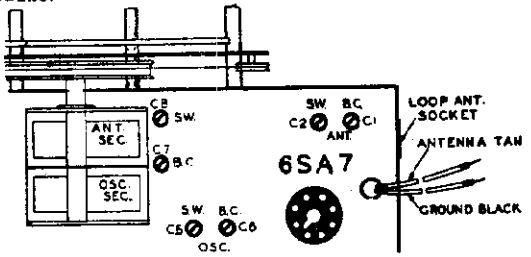
NOTE "B"—Loop alignment is made with the **chassis** mounted in the cabinet and the loop antenna connected. The signal generator is connected to the "ANT." and "GND." terminals.

NOTE "C"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

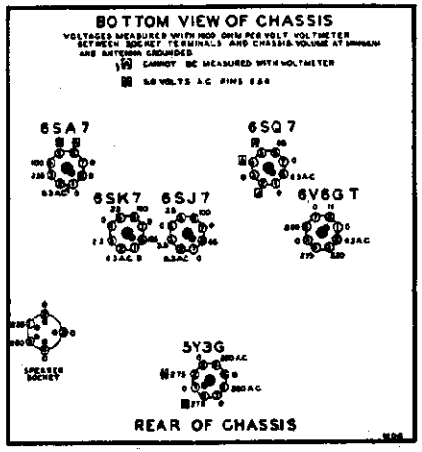
Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

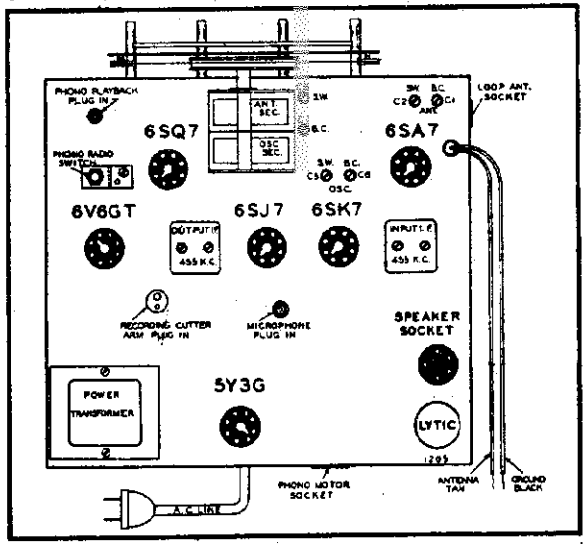
After each band is completed, repeat the procedure as a final check.

Power Consumption — Radio Only - - - - - 70 Watts; Motor Only - - - - - 40 Watts
Power Output - - - - - - - - 2.1 Watts Undistorted
Sensitivity for 500 Milliwatt Output: 15 Microvolts Average
Selectivity - 51 KC Broad at 1000 Times Signal at 1000 KC
Tuning Frequency Range Broadcast Band - 535 to 1600 KC
Shortwave Band - 5.46 to 18.3 MC
Intermediate Frequency - - - - - - - - - 455 KC
Speaker - - - - - - - - - 6 in. Electro Dynamic



TRIMMER VIEW





MONTGOMERY WARD & CO.

MODEL 04JP-399D
Phono-Recorder
P-A System

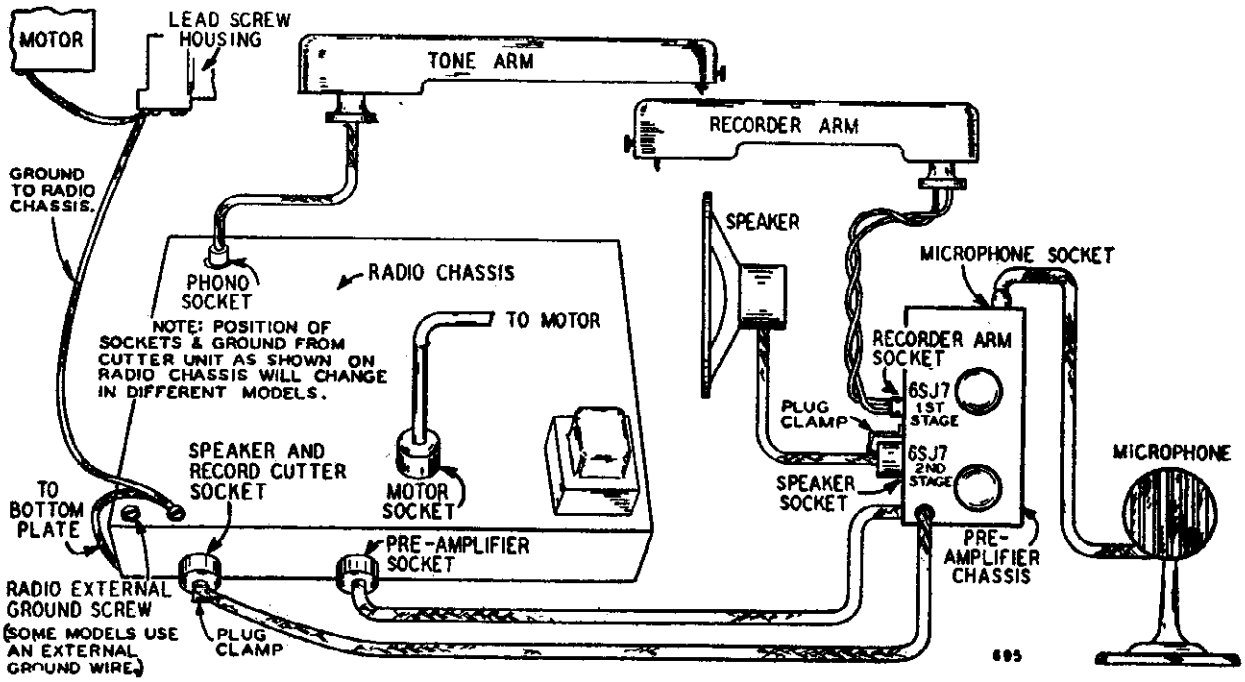


Fig. 13—Cable Interconnections

Model 04JP-399D can be used with the following model receivers:
04WG-732 04BR-904 04BR-906 04BR-1106 14WG-732 14BR-904
14BR-906 14BR-1106

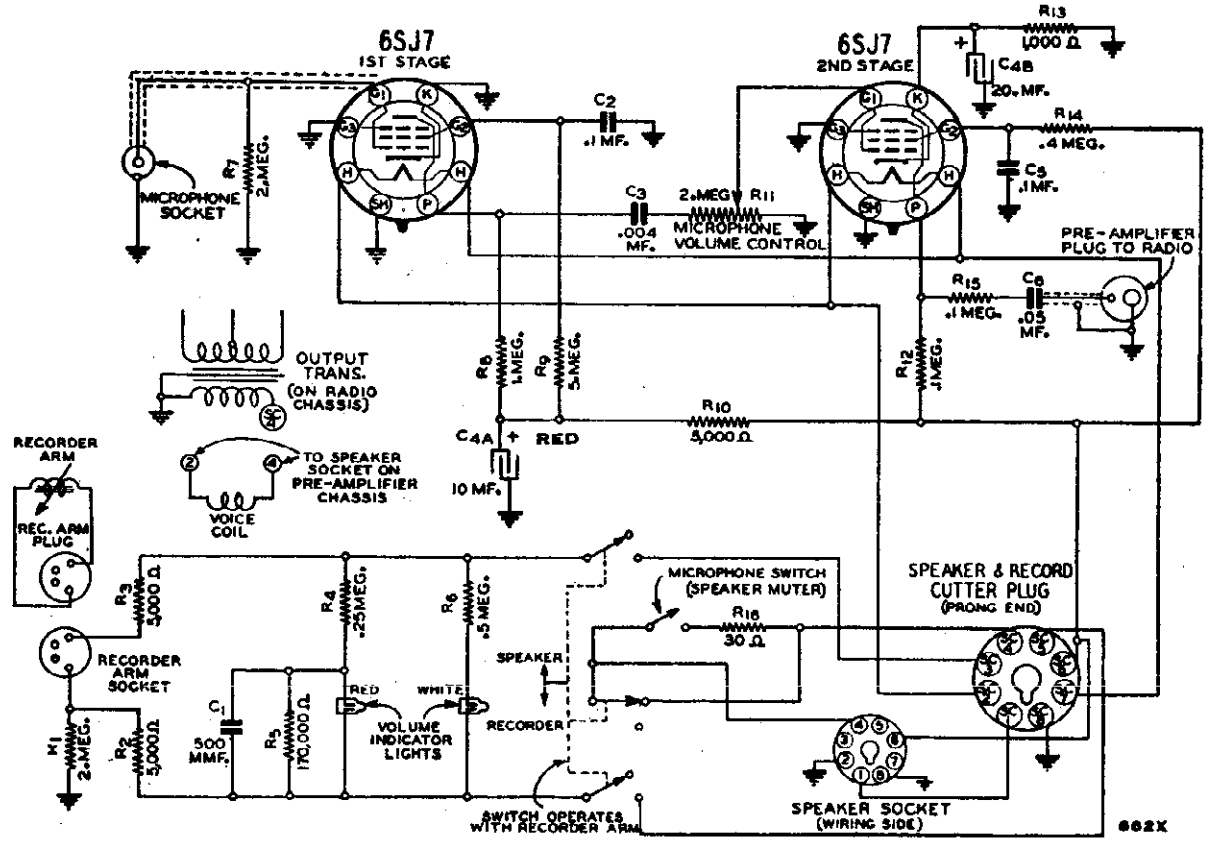


Fig. 14—Pre-Amplifier Unit Schematic Circuit Diagram

MODEL 04JP-399D

MONTGOMERY WARD & CO.

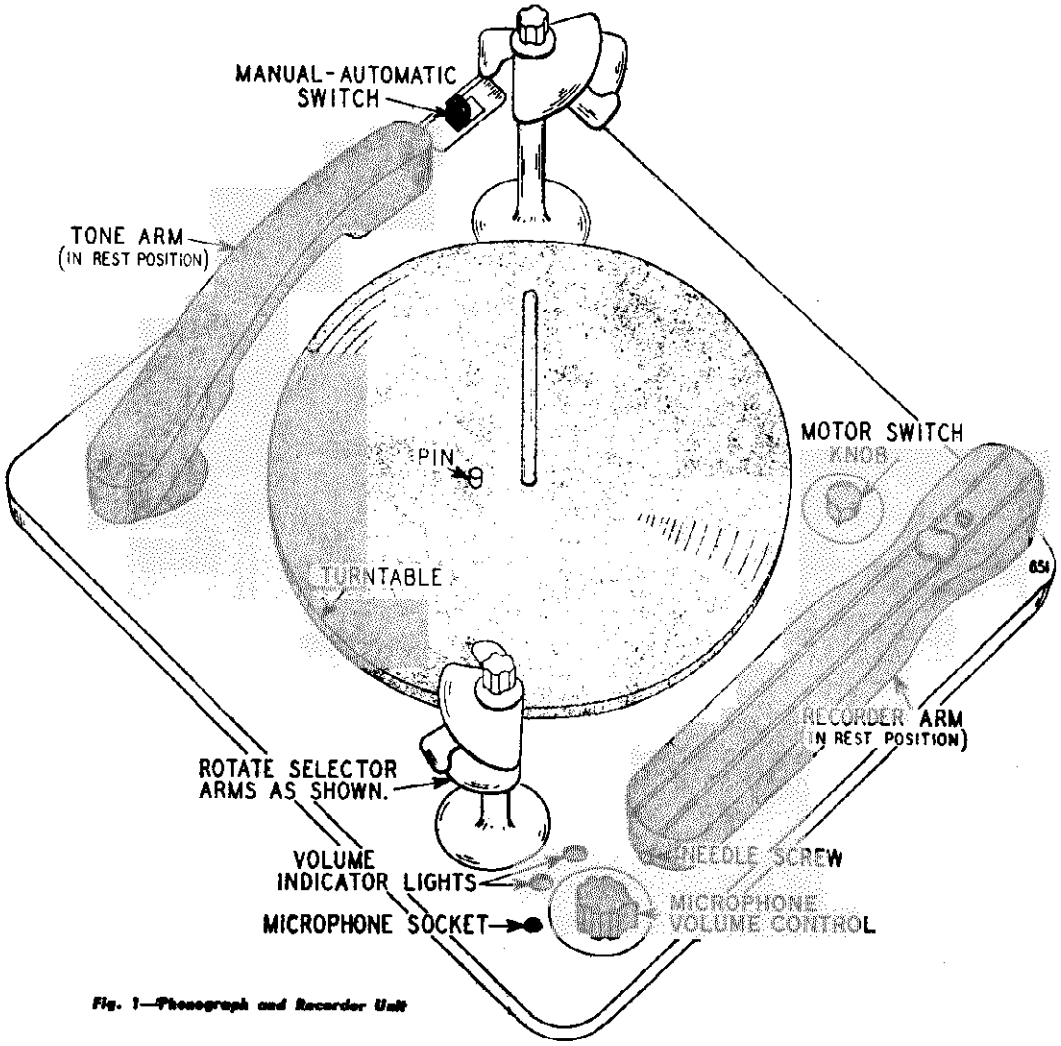


Fig. 1—Phonograph and Recorder Unit

SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS" FOR COMPLETE DATA ON SEEBURG JR RECORD CHANGER AND THE MONT-GOMERY-WARD SECTION FOR SIMILAR USE OF MICROPHONE AND RADIO FOR A PUBLIC-ADDRESS SYSTEM.

PRE-AMPLIFIER UNIT REPLACEMENT PARTS LIST

GENERAL

Bin No.	Part No.	Description	Selling Price
	28A37	Recording Microphone complete with Stand and 12 Ft. Cable	$9.70
	4X390	Escutcheon for Microphone Volume Control	.18
	7A119	Neon Lamps for Red and White Volume Indicators	Ea. .22
	15X175	Celluloid Indicator—Red	Doz. .12
	15X176	Celluloid Indicator—White	Doz. .12
	13X408	Power Cable with Molded Octal Plug	.54
	13X410	Amplifier Output Cable with 2 Prong Plug	.18
	3A303	Tubes and Speaker Sockets—Octal (8 prong)	Ea. .06
	3A305	Microphone Socket—Single Pin Tip	.06
	3A308	Cutter Socket	.06
	2A184	Record Cutter Changeover Switch	.30
	37X194	Trip Arm and Hub Assembly for Changeover Switch	.16
	10A314	Knob for Microphone Volume Control	.06

RESISTORS

Bin No.	Part No.	Code	Resistance	Wattage		Selling Price
	885205	R1,R7	2 Megohm	0.5	Carbon	$0.06
	D93502	R2,R3	5,000 Ohm	0.5	Carbon	.20
	883254	R4	250,000 Ohm	0.5	Carbon	.10
	883174	R5	170,000 Ohm	0.5	Carbon	.10
	884504	R6	500,000 Ohm	0.5	Carbon	.08
11188	885106	R8	1 Megohm	0.5	Carbon	.06
	885505	R9	5 Megohm	0.5	Carbon	.06
	885502	R10	5,000 Ohm	0.5	Carbon	.06
	36X292	R11	2 Megohm		Volume Control and Microphone Switch.	.42
10968	884104	R12	100,000 Ohm	0.5	Carbon	.08
	884102	R13	1,000 Ohm	0.5	Carbon	.08
	884404	R14	400,000 Ohm	0.5	Carbon	.08
	885104	R15	100,000 Ohm	0.5	Carbon	.06
	885300	R16	30 Ohm	0.5	Carbon	.06

CONDENSERS

Bin No.	Part No.	Code	Capacitance	Voltage		Selling Price
10508	47X61	C1	500 mmf.		Molded	$0.10
10979	46X257	C2,C5	.10 mf.	240	Tubular	.06
10888	46X284	C3	.004 mf.	180	Tubular	.06
	45X287	C4A	10 mf.	300	Dry Electrolytic	.28
		C4B	20 mf.	25		
	46X311	C6	.05 mf.	240	Tubular	.06

Use only GENUINE factory tested parts to insure service jobs you can depend on and to obtain original set performance.

Prices Subject to Change Without Notice.

MONTGOMERY WARD & CO.

ALIGNMENT PROCEDURE

Volume Control—Maximum 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.

IMPORTANT—Follow procedure in the order shown.

The following equipment is required for aligning:

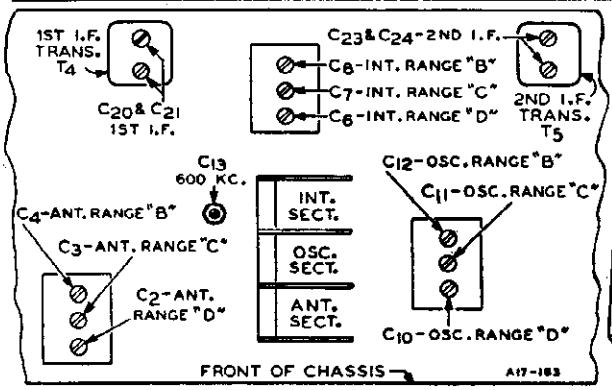
An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

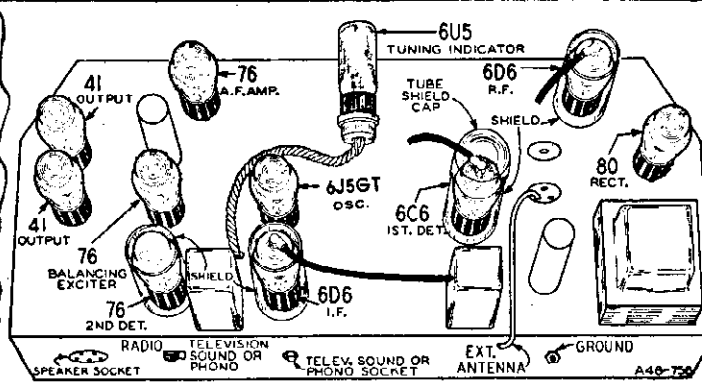
Output Indicating Meter—Non-Metallic Screwdriver.

Dummy Antennas—.1 mf., 100 mmf., and 400 ohms.

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I. F. 456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	2nd I.F. (C23) & (C24) 1st I.F. (C20) & (C21)
RANGE D 18,300 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C10)
15,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C2) Int. Range D (C6) Rock Rotor—See Note A
RANGE C 5400 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Full Open	Oscillator Range C (C11)
5000 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Max. Output	Antenna Range C (C3) Int. Range C (C7)
RANGE B 1600 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C12)
1400 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC—See Note B	Ant. Range B (C4) Int. Range B (C8)
600 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C13) Rock Rotor—See Note A

LOOP RANGE B—If chassis has been aligned in the cabinet, no loop trimmer re-adjustment is required. If, however, chassis has been removed, re-assemble in cabinet and re-adjust Antenna Range B (C4) trimmer as covered in 1400 KC adjustment.





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—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

NOTE B—If the pointer is not at 1400 KC on the dial, loosen the 2 clamps which hold the pointer assembly on the cord, move the pointer to the 1400 KC mark, and tighten the clamps.

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.

Voltages at Sockets

These voltages are read under the following conditions:

Line Voltage—117.

Band Switch—Broadcast.

Volume Control—Maximum.

Antenna Shorted to Ground.

Readings taken with 1000 ohm-per-volt meter. Plate and screen voltages are read on 500 volt scale.

Power Consumption - 80 Watts (At 117 volts 60 cycles)

Power Output - - - - - - 5.0 Watts Undistorted 5.5 Watts Maximum

Selectivity - - 32 KC Broad at 1000 times Signal

Intermediate Frequency - - - - - - 456 KC.

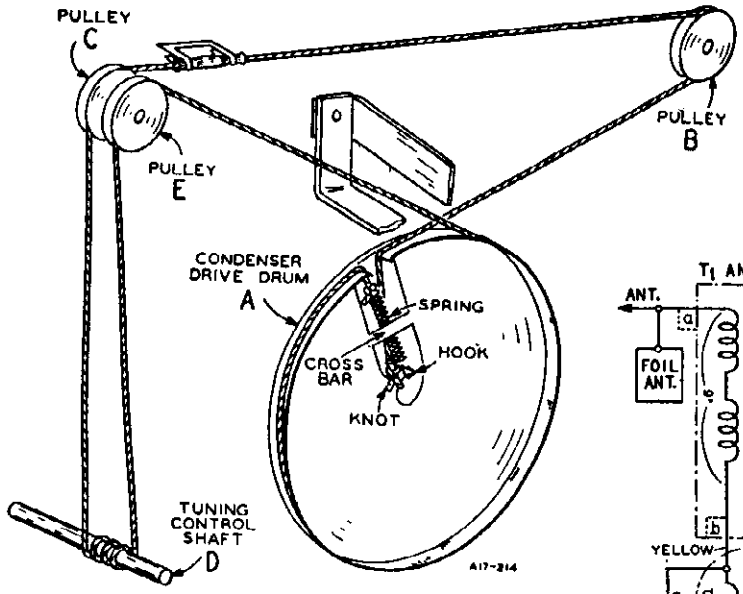
Speaker - - - - - - - 10" Electro-Dynamic

Tuning Frequency Range

B Range ..... 528 to 1600 KC.
C Range ..... 1585 to 5400 KC.
D Range ..... 5350 to 18300 KC.

Sensitivity —External Antenna—(For 0.5 Watt Output)

B Range .....5.0 Microvolts Average
C Range .....3.0 Microvolts Average
D Range .....8.0 Microvolts Average



Drive Cord Replacement

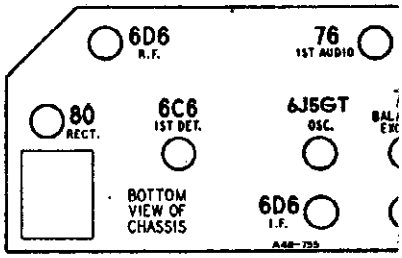
Tie a knot with a small loop at one end of the new drive cord. Slide a 1¾ inch length of fabric tubing on the cord. The free end of the drive cord should be tied to the tension spring in such a manner that there is a distance of 56⅜ inches between the knots.

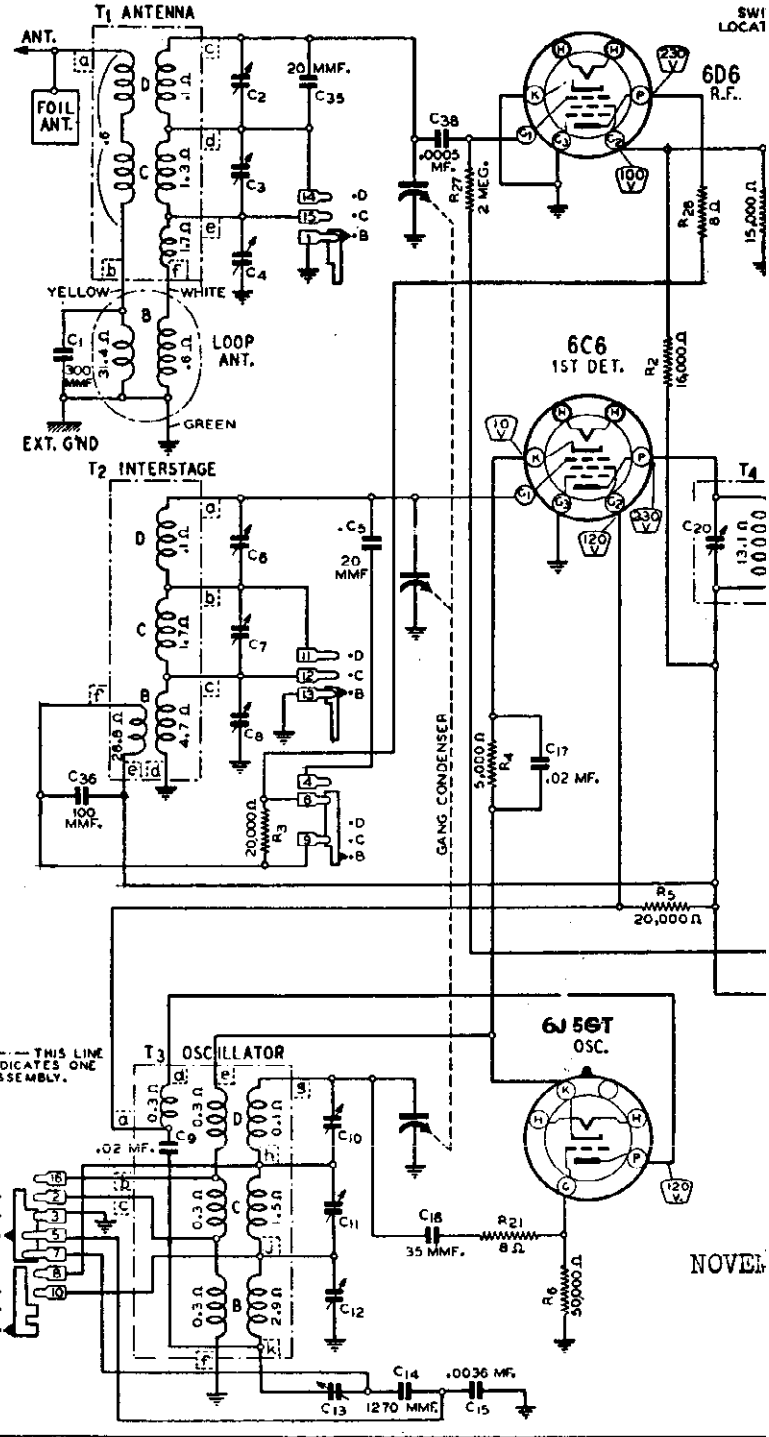
Turn the gang condenser to full open position.

Place the looped end of the drive cord over the hook on condenser drive drum A—See illustration. Bring the cord up through the slot in the drum rim and pass to the right (from back of chassis) and around pulley B. Then bring the cord to the left and over pulley C. See that the fabric tubing is now between pulleys B and C. Continue cord down to control shaft D and wind 3½ turns counter-clockwise (from back of chassis) on shaft D. Bring cord up to and over pulley E. Bring cord down to top of drive drum A and wind one turn clockwise around the drum rim.

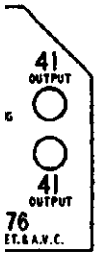
Pass the remaining drive cord and tension spring through the slot in the drum. Place free end of spring over the hook on the condenser drive drum.

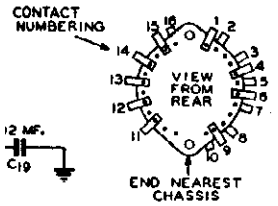
ATTACHING DIAL POINTER—Tune in a 1500 KC signal. Move the pointer to the 1500 KC mark on the dial and clamp it tightly over the fabric tubing on the cord.

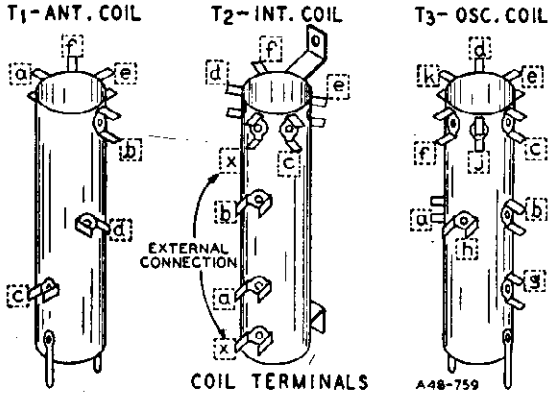




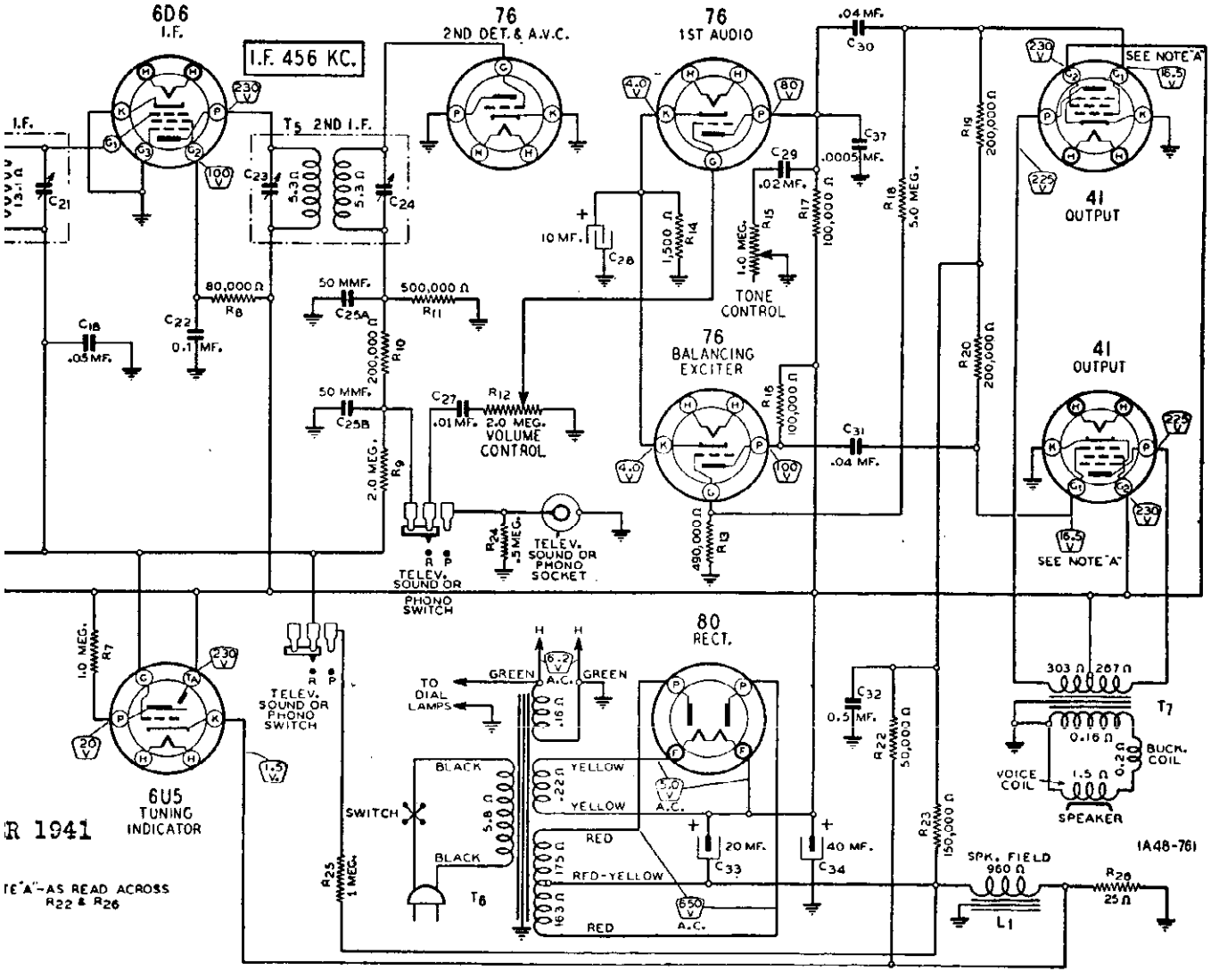
WARD & CO.







RANGE "B" 528 TO 1,600 KILOCYCLES.
RANGE "C" 1,585 TO 5,400 KILOCYCLES.
RANGE "D" 5,350 TO 18,300 KILOCYCLES.



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TE "A"-AS READ ACROSS R22 & R26

MODEL 14JP-399D
Phono-Recorder
P-A System

MONTGOMERY-WARD & CO.

FOR SEEBURG JR RECORD CHANGER AND RECORDER, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

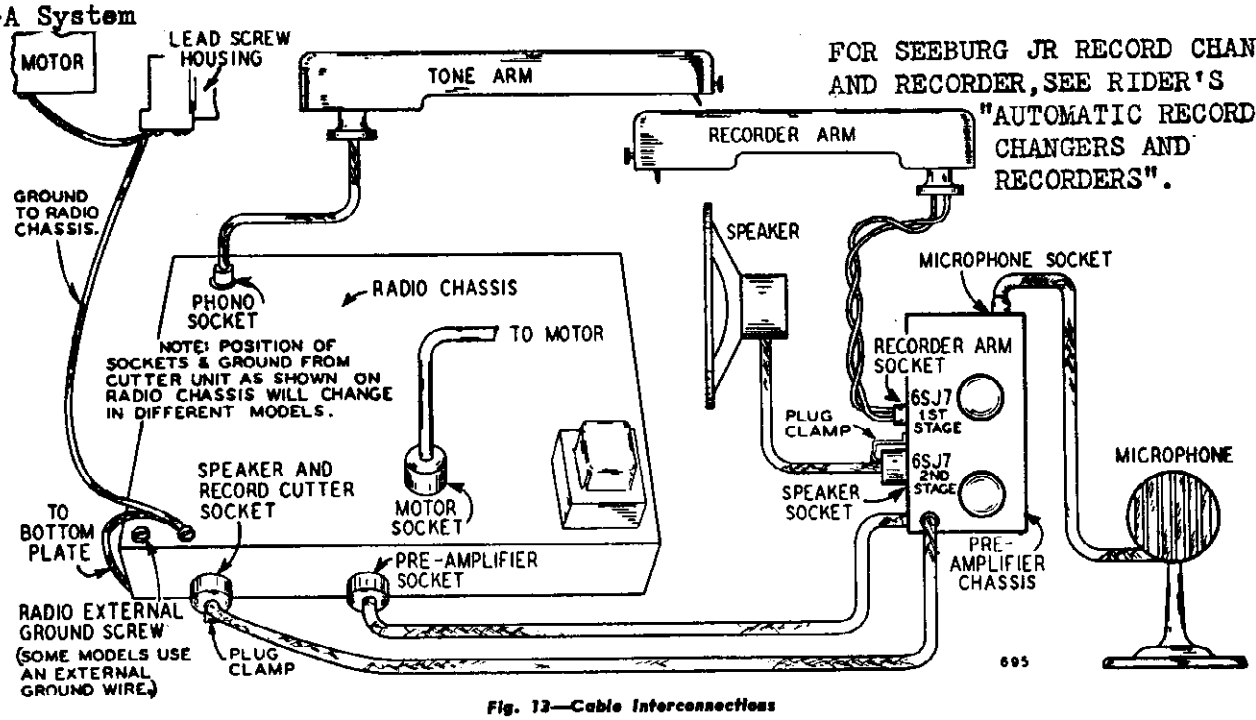
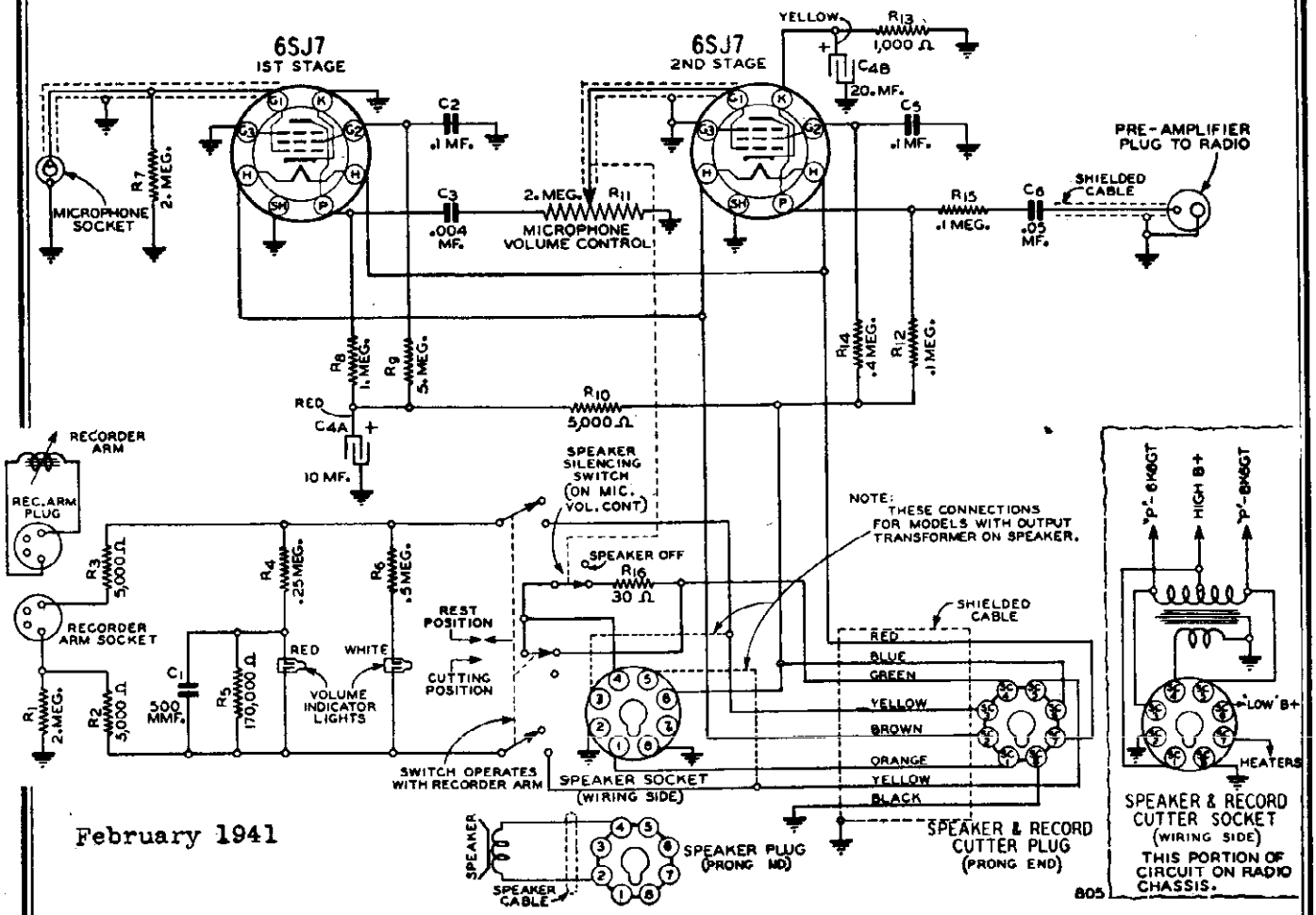


Fig. 13—Cable Interconnections

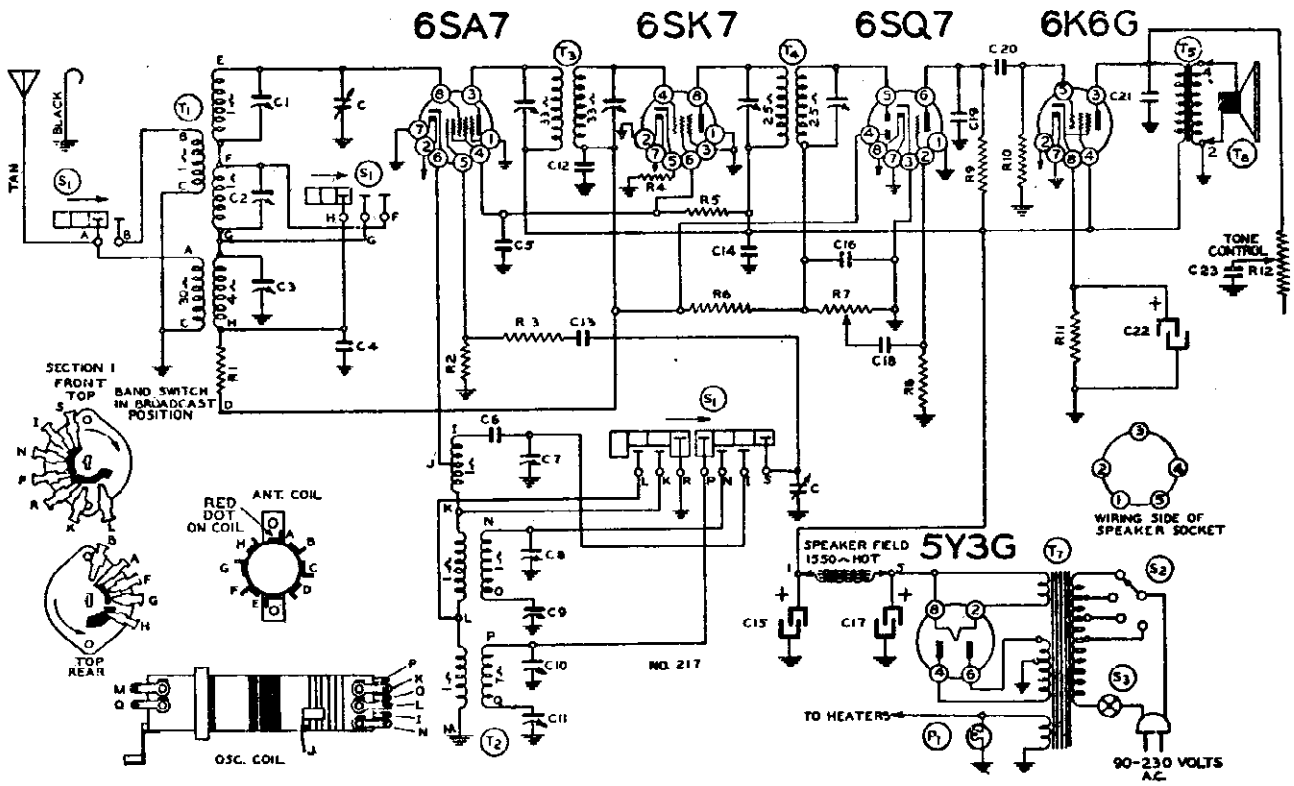


February 1941

FOR USE WITH MODELS 14WG-732, 14BR-904, 14BR-906, 14BR-1106

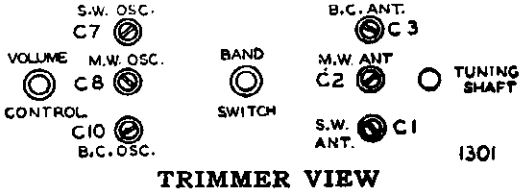
MODEL 14BR-440A

MONTGOMERY-WARD & CO.



TECHNICAL DATA

Power Consumption	55 Watts
Power Output	1½ Watts Undistorted
Sensitivity Broadcast Band 540 to 1735 Kc.	25 M.V.
Medium Band 2.2 to 7 Mc.	35 M.V.
Short Wave Band 6.6 to 23 Mc.	40 M.V.
Intermediate Frequency	455 KC
Speaker	6 in. Electro Dynamic



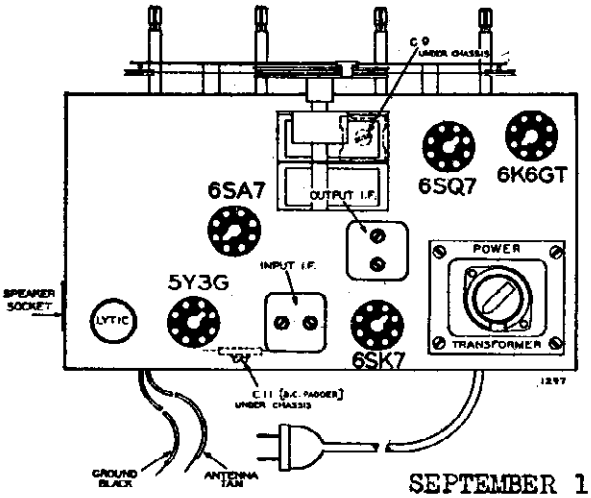
TRIMMER VIEW

Part No.	Schematic Diagram Reference	Description	No. Selling Used Price In Set	Each
CONDENSERS				
BE10013	C23	.1 x 400 Volt Tubular Condenser	1	.12
BE1001	C5, C14	.1 x 400 Volt Tubular Condenser	2	.12
BE1009	C4	.05 x 200 Volt Tubular Condenser	1	.12
BE10025	C18	.003 x 600 Volt Tubular Condenser	1	.12
BE10026	C12, C20	.02 x 400 Volt Tubular Condenser	2	.12
BE10071	C21	.004 x 600 Volt Tubular Condenser	1	.12
BE119103	C15, C17, C22	40 Mfd.—10 Mfd.—20 Mfd. Electrolytic Condenser	1	.86
BE124123	C7, C8, C10	Trimmer Condenser Strip (3 Gang) (S.W. M.W.—Bc. Osc.)	1	.40
BE124124	C1, C2, C3	Trimmer Condenser Strip (3 Gang) (S.W.—M.W.—Bc. Ant.)	1	.40
BE1292	C19	.0005 Mica Type Condenser—20%	1	.12
BE1295	C13, C16	.0001 Mica Type Condenser—20%	2	.12
BE129153	C6	.005 Compression Type Condenser—2% (S.W. Pad)	1	.40
BE129154	C9	.0025 Compression Type Condenser—3%	1	.28
BE129155	C11	.000483 Compression Type Condenser—3%	1	.20
RESISTORS				
BE1304	R6	3 Megohm—⅓ Watt Resistor—20%	1	.10
BE13011	R1, R9	250M Ohm—⅓ Watt Resistor—20%	2	.10
BE13019	R10	1 Megohm—⅓ Watt Resistor—20%	1	.10
BE13070	R11	500 Ohm—⅓ Watt Resistor—10%	1	.10
BE130194	R2	35M Ohm—⅓ Watt Resistor—10%	1	.10
BE130223	R8	10 Megohm—⅓ Watt Resistor—20%	1	.10
BE130239	R4	250 Ohm—⅓ Watt Resistor—10%	1	.10
BE130242	R5	12M Ohm—1 Watt Resistor—10%	1	.10
BE130299	R3	10 Ohm—⅓ Watt Resistor—10%	1	.10
COILS				
BE108169H	T3	Input I.F. Coil Complete in Can	1	.70
BE108170C	T4	Output I.F. Coil Complete in Can	1	.70
BE110143	T2	Bc.—M.W.—S.W. Oscillator Coil Complete	1	.70
BE111169	T1	Bc.—M.W.—S.W. Antenna Coil Complete	1	.80
SOCKETS				
BE1218		Five Prong Socket "SPKR"	1	.05
BE121245		Eight Prong Octal Socket "6SK7"	1	.10
BE121246		Eight Prong Octal Socket "6SQ7"	1	.10
BE121247		Eight Prong Octal Socket "6SA7"	1	.10
BE121250		Eight Prong Octal Socket "5Y3"	1	.10
BE121251		Eight Prong Octal Socket "6K6"	1	.10
TRANSFORMERS				
BE104193B	T7, S2	Power Transformer Universal Primary Tapped (95 V.—110 V.—130 V.—230 V.) 40/60 Cycle	1	4.30
BE10575C	T5	Output Transformer for Speaker	1	.60
SPEAKER				
BE114176	T6	Six Inch Dynamic Speaker (1550 Ohm Field)	1	3.10
BE10575C	T5	Output Transformer for Speaker	1	.60

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

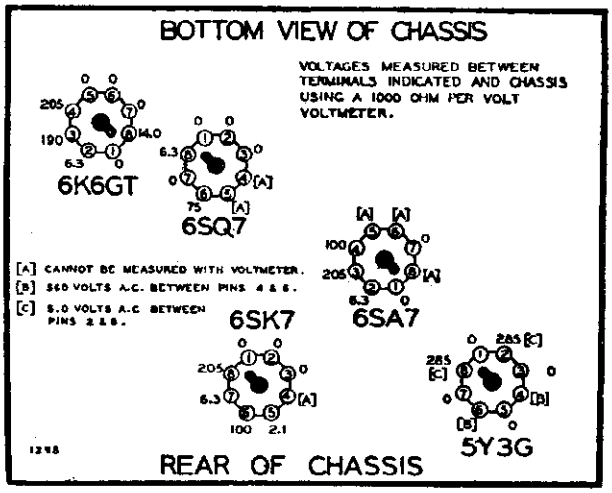
MODEL 14BR-440A

MONTGOMERY-WARD & CO.



SEPTEMBER 1941

CHASSIS VIEW showing tube location.
NOTE: Antenna and ground leads at back of chassis.



VOLTAGE CHART

ANTENNA For best results, an outside antenna approximately 50 to 75 feet long including lead-in is recommended. It should be erected as high as possible and as far from surrounding objects as practical. For minimum interference it should be at right angles to street car lines, incoming power lines and other electrical apparatus which may be in the vicinity. A ground is advisable. A good ground will often reduce noise. The ground wire should be connected with a clamp to a well cleaned water pipe or to a piece of pipe driven several feet into damp earth.

POWER SUPPLY—This radio is equipped with a universal transformer, 40 to 60 cycles which has the following taps: 95-110-130-150-230 volts. A rotary switch mounted on top of the transformer selects the proper voltage tap.

Set the switch for various line voltages to conform with the following table: 95 mark for current of 85 to 105 volts; 110 mark for current of 105 to 125 volts; 130 mark for current of 125 to 145 volts; 150 mark for current of 145 to 165 volts; 230 mark for current of 210 to 250 volts.

To set the switch, unloosen the set screw on the side of the switch and rotate the knob so that the mark desired shows up in the small framed window on the top of the switch Tighten the set screw.

ALIGNMENT PROCEDURE

● Volume control—Maximum all adjustments. ● Connect radio chassis to ground post of signal generator.

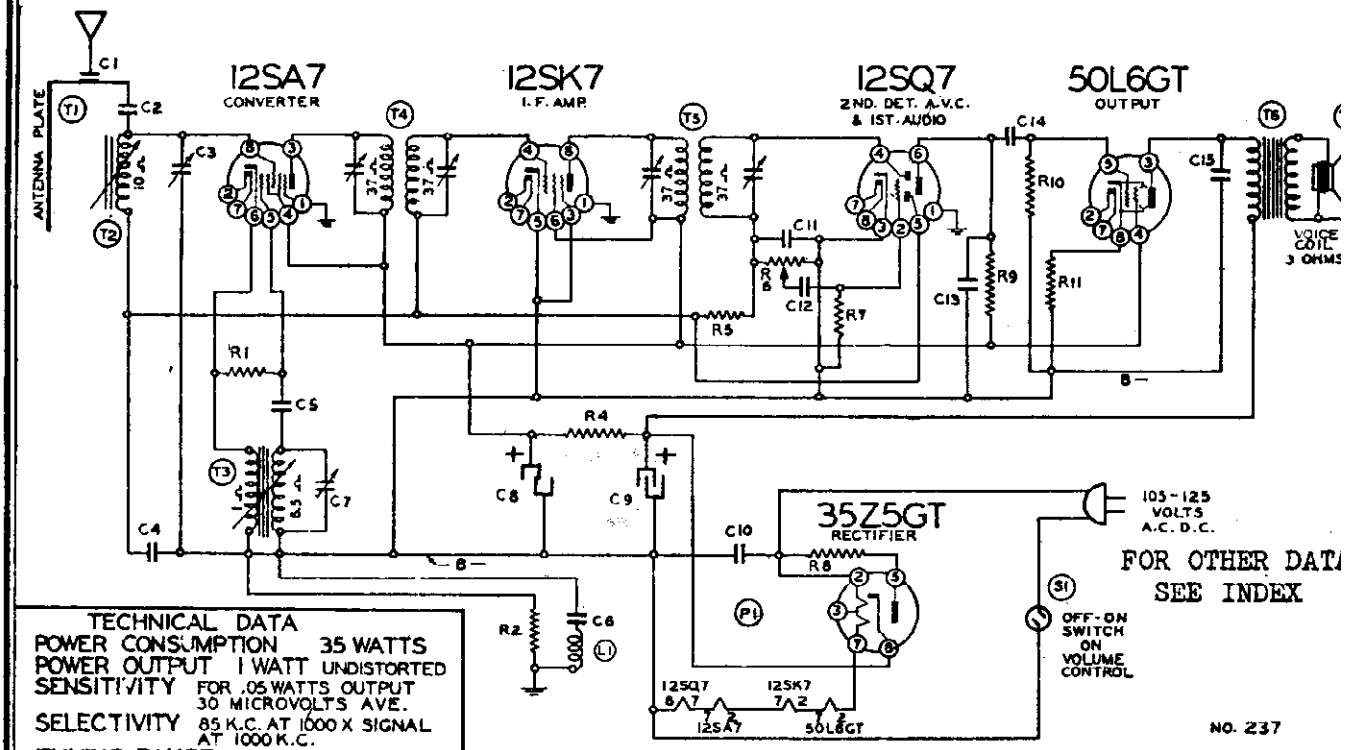
BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted to Maximum (in Order Shown)
I. F.	455 Kc.	.1 MFD.	Grid of 6SK7 I. F. Tube	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top of Output I. F. (See Chassis View)
	455 Kc.	.1 MFD.	Grid of 6SA7	Broadcast (Extreme Left Rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top of Input I. F. (See Chassis View)
SHORT WAVE BAND	21 Mc.	400 ohms	Antenna lead	Short Wave (Extreme Right Rotation)	Set Dial at 21 MC	Trimmer (C7) Short wave oscillator (See Trimmer View) See Note "A"
	21 Mc.	400 ohms	Antenna lead	Short Wave (Extreme Right Rotation)	Set Dial at 21 MC	Trimmer (C1) Short wave antenna (See Trimmer View)
MEDIUM WAVE BAND	6 Mc.	400 ohms	Antenna lead	Medium Wave	Set Dial at 6 MC	Trimmers (C8, C2) Medium-wave oscillator and antenna (See Trimmer View)
	2.3 Mc.	400 ohms	Antenna lead	Medium Wave	Set Dial at 2.3 MC	Trimmer (C9) Medium wave osc series pad (See Chassis View) See Note "B"
BROAD-CAST BAND	1730 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme Left Rotation)	Rotor full open (Plates out of mesh)	Trimmer (C10) Broadcast osc. (See Trimmer View)
	1500 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1500 Kc.	Trimmer (C3) Broadcast antenna (See Trimmer View)
	600 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 600 Kc.	Trimmer (C11) Broadcast osc. series pad (See Chassis View) See Note "B"

NOTE "A"—It is extremely necessary that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental.

NOTE "B"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained. **After each range is completed, repeat the procedure as a final check.**

MONTGOMERY-WARD & CO.

MODELS 14BR-521
14BR-522



TECHNICAL DATA

POWER CONSUMPTION 35 WATTS
POWER OUTPUT 1 WATT UNDISTORTED
SENSITIVITY FOR .05 WATTS OUTPUT 30 MICROVOLTS AVE.
SELECTIVITY 85 K.C. AT 1000 X SIGNAL AT 1000 K.C.
TUNING RANGE 535 TO 1720 K.C.
INTERMEDIATE FREQUENCY 455 K.C.

RESISTORS

Code No.	Part No.	Description
R1	BE130176	20M ohm—½ w.
R2	BE130100	150M ohm—½ w.
R4	BE130279	1M ohm—1 w.
R5	BE1304	3 megohm—½ w.
R6	BE101255	500M ohm—Volume control and switch
R7	BE130257	5 megohm—½ w.
R8	BE130240	30 ohm—½ w.
R9	BE130100	150M ohm—½ w.
R10	BE13011	250M ohm—½ w.
R11	BE130166	150 ohm—½ w.

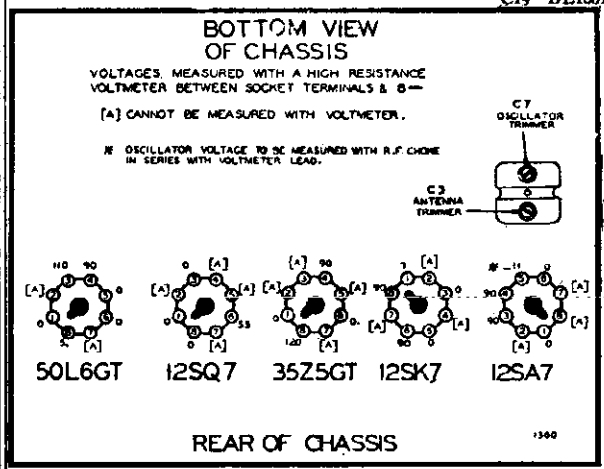
CONDENSERS

C1	BE131262	.00001 washer condenser (antenna clip on back plate)
C2	BE129114	.0003 mica
C3	BE124137	Trimmer on antenna coil
C4	BE1009	.05 x 200 v.
C5	BE12939	.00005 mica
C6	BE10091	.15 x 400 v.
C7	BE124137	Trimmer on oscillator coil
C8	BE11992	20 Mfd. lytic x 150 w.v.
C9	BE11992	40 mfd. lytic x 150 w. v.
C10	BE10013	.05 x 400 v.
C11	BE12912	.00025 mica
C12	BE10025	.002 x 600 v.
C13	BE1292	.0005 mica
C14	BE10011	.01 x 400 v.
C15	BE10026	.02 x 400 v.

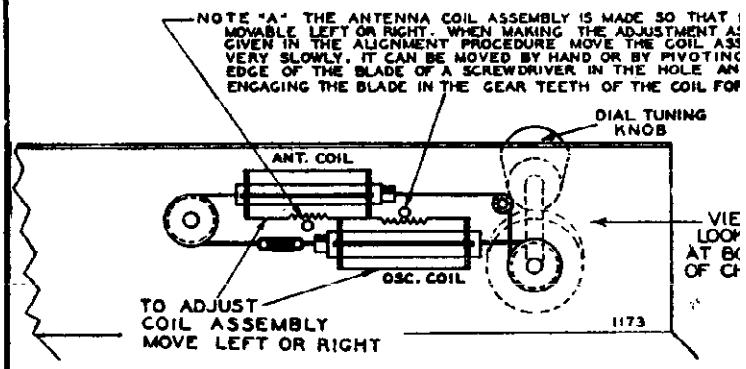
C3 and C7 are in same un
C8 and C9 are in same un

PARTS

T1	BE115597-18	Antenna plate (Walnut
or	BE115597-9	Antenna plate (Ivory)
T2	BE111181	Antenna permeability co
T3	BE110153	Oscillator permeability c
T4	BE108157-H	Input I.F. coil—455 kc.
T5	BE108157-I	Output I.F. coil—455 k
T6	BE105128	Output transformer
T7	BE114199	4" PM speaker
or		
T7	BE114259	4" Electrodynamic speak
S1		Switch on Volume contr
L1	BE105138	R.F. choke

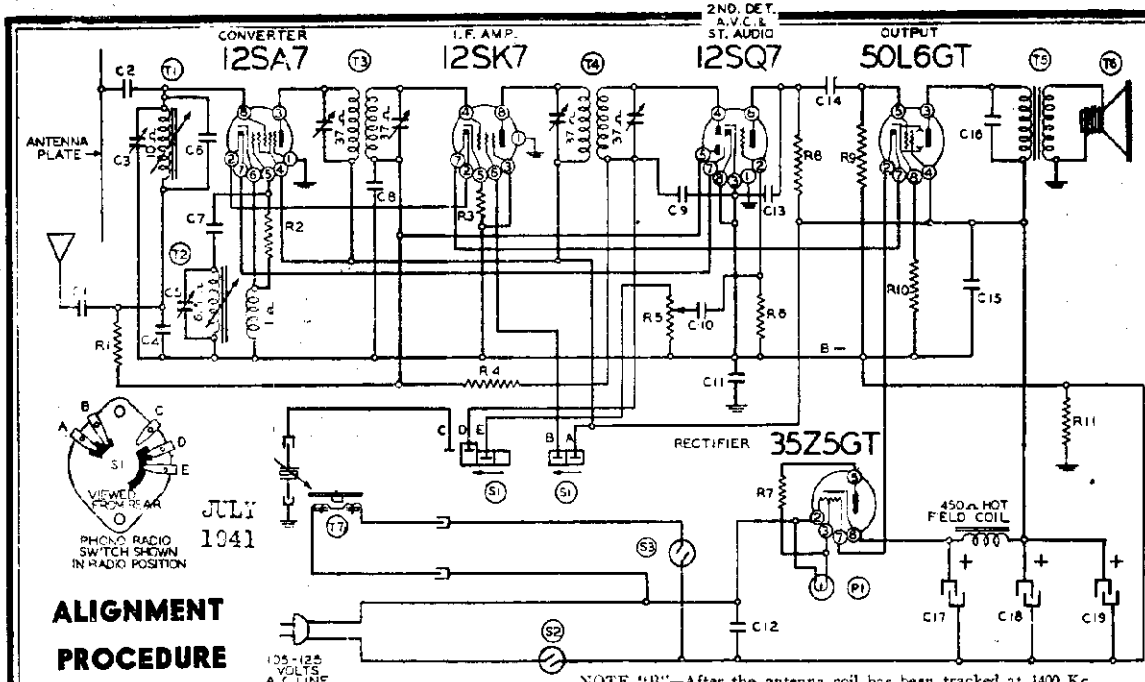


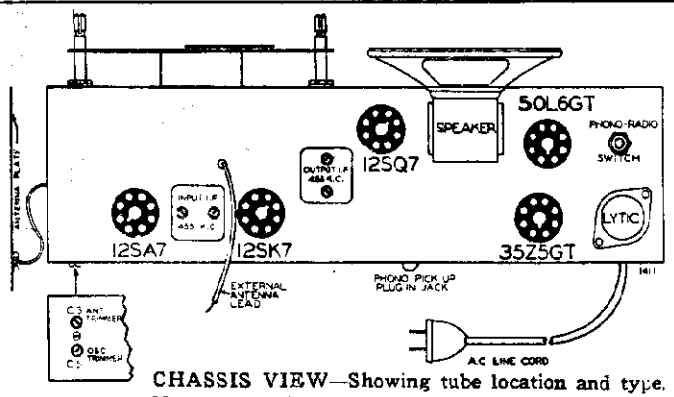
VOLTAGE CHART



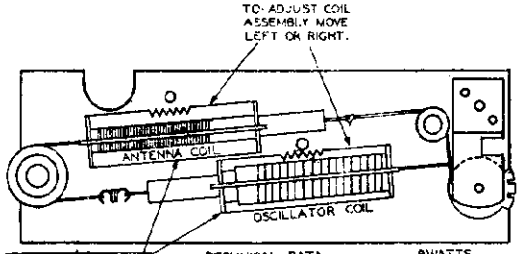
COIL ASSEMBLY VIEW

JULY 1941





CHASSIS VIEW—Showing tube location and type. Note External Antenna Lead at back of chassis.



NOTE: THE ANTENNA COIL ASSEMBLY IS MADE SO THAT IT IS MOVABLE LEFT OR RIGHT. WHEN MAKING THE ADJUSTMENT AS GIVEN IN THE ALIGNMENT PROCEDURE MOVE COIL ASSEMBLY VERY SLOWLY

TECHNICAL DATA
TUNING RANGE 535 TO 1690 K.C
SENSITIVITY 30 MICROVOLTS AVERAGE.
SELECTIVITY 50 K.C. AT 1000 K.C. AT 1900 K.C.
UNDISTORTED POWER OUTPUT .8 WATTS
MAX. POWER OUTPUT 1.4 WATTS IN VOICE COIL.
POWER CONSUMPTION RADIO CHASSIS 85 WATTS PHONO MOTOR 20 WATTS
I.F. 455 K.C.

ALIGNMENT PROCEDURE

NOTE "A"—The antenna coil assembly is made so that it is movable right or left. When making the adjustment as given in the alignment procedure move the coil assembly very slowly. It can be moved by hand or by pivoting one edge of the blade of a screwdriver in the hole and engaging the blade in the gear teeth of the coil form.

NOTE "B"—After the antenna coil has been tracked at 1400 Kc. it is necessary to check the antenna trimmer (C3) adjustment again at 1690 Kc. If no appreciable change in trimmer adjustment is made the coil is in track, if the trimmer requires considerable change it will be necessary to again adjust the position of the antenna coil at 1400 Kc. These two adjustments should be tried several times until no change of trimmer adjustment is required at 1690 Kc.

● Volume control—Maximum all adjustments. ● Connect B— of radio chassis to ground post of signal generator through .1 Mfd. condenser.

SIGNAL GENERATOR

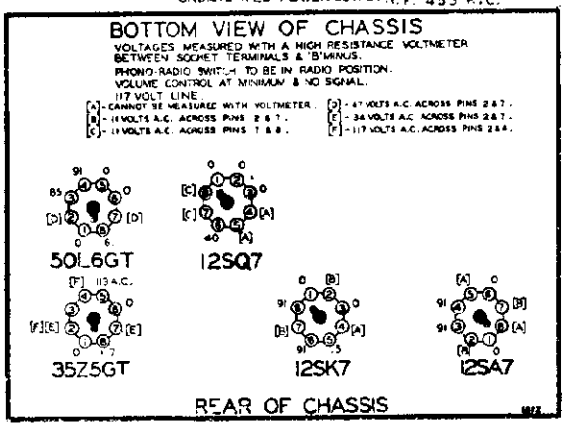
BAND	Frequency Setting	Dummy Antenna	Connection to Radio	Position of Iron Cores (Dial Setting)	Trimmers Adjusted to Maximum (in Order Shown)
I. F.	455 Kc.	.1 MFD.	Connect to Antenna Plate	Iron Cores All the way out	Two trimmers on top of output I.F. (See Chassis View)
	455 Kc.	.1 MFD.	Connect to Antenna Plate	Iron Cores All the way out	Two trimmers on top of input I.F. (See Chassis View)
BROAD-CAST BAND	1690 Kc.	.1 MFD.	Connect to Antenna Plate	Iron Cores All the way out	Oscillator trimmer (C5) (See Chassis View)
	1690 Kc.	200 MMF.	Connect to Antenna Lead	Iron Cores All the way out	Antenna trimmer (C3) (See Chassis View)
	1400 Kc.	200 MMF.	Connect to Antenna Lead	Turn Dial to 1400 Kc.	Adjust position of antenna coil right or left. (See Note "A")
	1690 Kc.	200 MMF.	Connect to Antenna Lead	Turn Dial to 1690 Kc.	Adjust antenna trimmer (C3) (See Chassis View) (See Note "B")

FOR SEEBURG C RECORD CHANGER SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

ALIGNMENT FOR MODEL 14BR-692A is the same as that for 14BR-523A except that oscillator trimmer number is C6

CONDENSERS

BE1009	C8, C15	.05 x 200 Volt Tubular Condenser	.12
BE100119	C11	.1 x 400 Volt Tubular Condenser	.12
BE10025	C10	.002 x 600 Volt Tubular Condenser	.12
BE10019	C14	.005 x 500 Volt Tubular Condenser	.12
BE10011	C16	.01 x 400 Volt Tubular Condenser	.12
BE1001	C12	.1 x 400 Volt Tubular Condenser	.12
BE11994	C17, C18, C19	Electrolytic Filter Condenser, 50 to 60 Cycles. 40 Mfd.—20 Mfd.—20 Mfd. x 150 Volts	.86
BE11995	C17, C18, C19	Electrolytic Filter Condenser, 25 Cycles, 60 Mfd.—40 Mfd.—40 Mfd. x 150 Volts	1.20
BE124136	C3, C5	Antenna and Oscillator Dual Trimmer Condenser	.24
BE129144	C2	.0003 Mica Type Condenser—20%	.12
BE1295	C1, C7, C9	.0001 Mica Type Condenser—20%	.12
BE129162	C4	.0004 Mica Type Condenser—10%	.12
BE12912	C13	.00025 Mica Type Condenser—20%	.12
BE129183	C6	.00005 Ceramicon Condenser—10%	.16



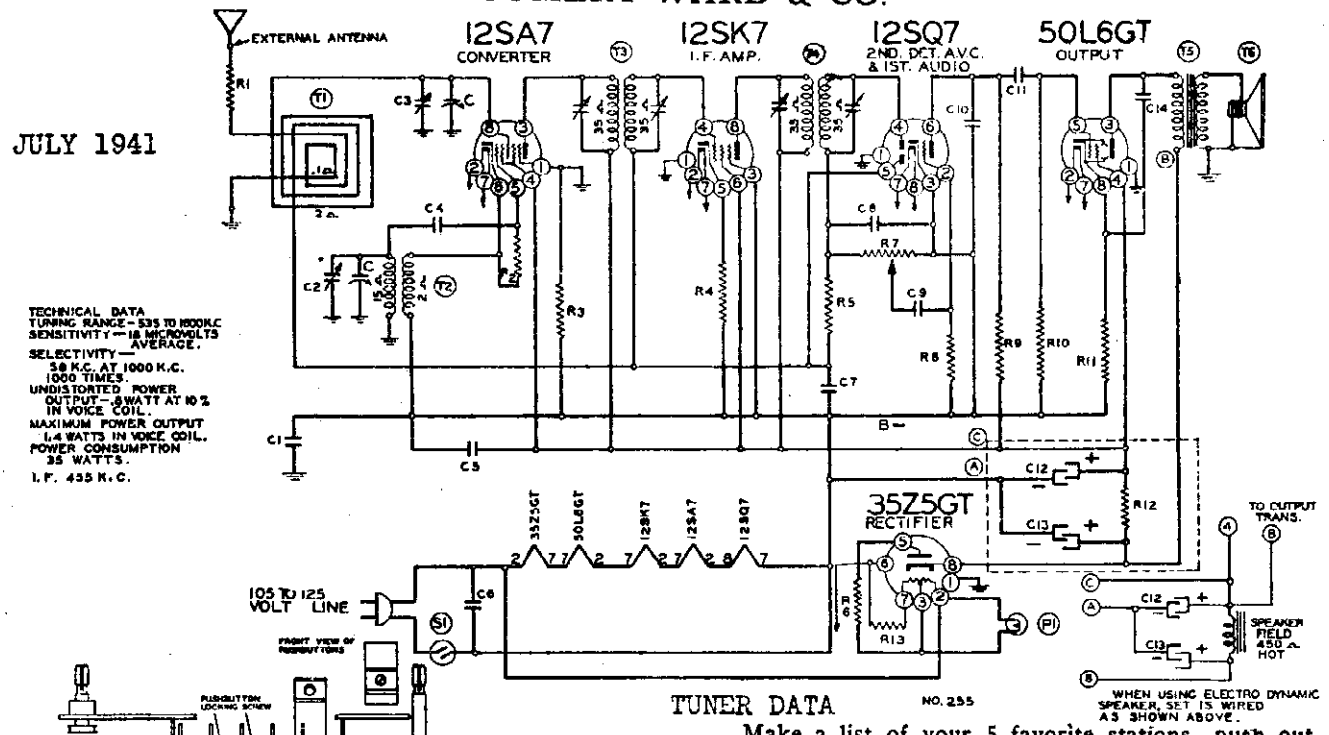
RESISTORS

BE1309	R1, R11	200M Ohm—½ Watt Resistor—20%	.10
BE130176	R2	20M Ohm—½ Watt Resistor—10%	.10
BE130168	R3	100 Ohm—½ Watt Resistor—10%	.10
BE1304	R4	3 Megohm—½ Watt Resistor—20%	.10
BE13011	R8	250M Ohm—½ Watt Resistor—20%	.10
BE130257	R5	5 Megohm—½ Watt Resistor—25%	.10
BE130215	R7	25 Ohm—½ Watt Resistor—10%	.10
BE13037	R9	750M Ohm—½ Watt Resistor—20%	.10
BE130166	R10	150 Ohm—½ Watt Resistor—10%	.10
BE130293	R12	30 Ohm—1 Watt Resistor—20%	.10

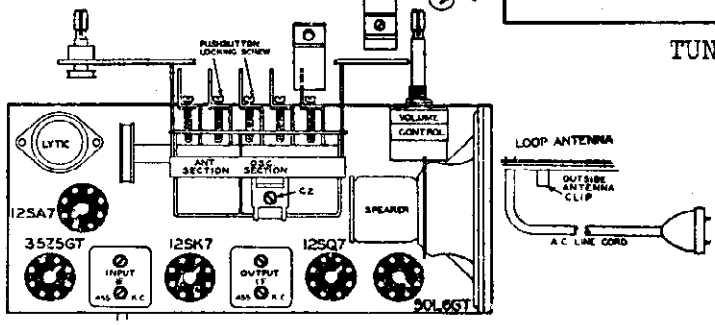
MONTGOMERY-WARD & CO.

MODELS 14BR-525A, 14BR-526A

JULY 1941



TECHNICAL DATA
TUNING RANGE — 535 TO 1600 K.C.
SENSITIVITY — 18 MICROVOLTS AVERAGE.
SELECTIVITY — 30 K.C. AT 1000 K.C. 1000 TIMES.
UNDISTORTED POWER OUTPUT — .5 WATT AT 10% IN VOICE COIL.
MAXIMUM POWER OUTPUT 1.4 WATTS IN VOICE COIL.
POWER CONSUMPTION 35 WATTS.
I. F. 455 K.C.



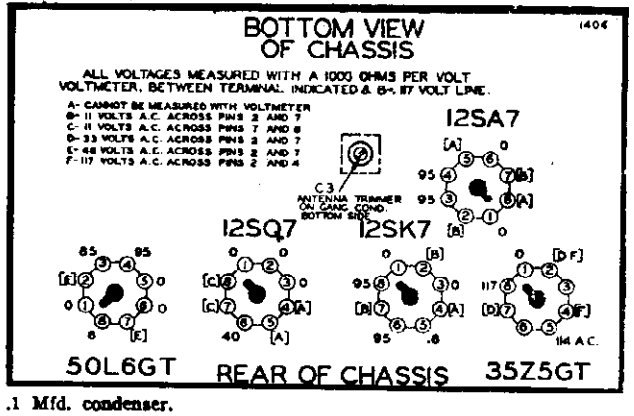
TUNER DATA

NO. 255

Make a list of your 5 favorite stations—push out the call letters of these stations from the call letter sheets supplied. Next insert a long slim screw driver into the hole in front of one of the pushbuttons and unscrew the pushbutton locking screw (to the left) several turns. Now with the screw driver still engaged in the locking screw slot push it all the way in. Hold it in this position and tune in the station you want with the tuning knob. Now tighten up the pushbutton locking screw by turning it to the right. Tighten firmly. Continue setting each button in the same way. When you have set your stations insert the call letter of each station in the front of the proper button and put one of the celluloid tabs over the station call letter.

To change stations simply repeat the above procedure.

BE10026	C14	.02 x 400 Volt Tubular Condenser	1	.12
BE100106	C11	.004 x 600 Volt Tubular Condenser	1	.12
BE1009	C5, C7	.05 x 200 Volt Tubular Condenser	2	.12
BE100110	C1	.2 x 400 Volt Tubular Condenser	1	.12
BE1001	C6	.1 x 400 Volt Tubular Condenser	1	.12
BE10025	C9	.002 x 600 Volt Tubular Condenser	1	.12
BE11992	C12, C13	Electrolytic Filter Condenser, 50 to 60 Cycles, 20 Mfd.-40 Mfd. x 150 Volts	1	.74
		NOTE: BE11992 can be used on 25 to 60 cycles if set uses Electrodynamic Speaker.		
BE11993	C12, C13	Electrolytic Filter Condenser, 25 Cycles, 40 Mfd.-60 Mfd. x 150 Volts		1.24
BE1295	C8	.0001 Mica Type Condenser—20%	1	.12
BE12912	C10	.00025 Mica Type Condenser—20%	1	.12
BE12921	C4	.0002 Mica Type Condenser—20%	1	.12
BE13026	R1	1M Ohm—½ Watt Resistor—20%	1	.10
BE1303	R9	500M Ohm—½ Watt Resistor—20%	1	.10
BE130166	R11	150 Ohm—½ Watt Resistor—10%	1	.10
BE1309	R3	200M Ohm—½ Watt Resistor—20%	1	.10
BE130257	R8	5 Megohm—½ Watt Resistor—25%	1	.10
BE1304	P5	3 Megohm—½ Watt Resistor—20%	1	.10
BE130174	R4	50 Ohm—½ Watt Resistor—10%	1	.10
BE13094	R2	50M Ohm—½ Watt Resistor—10%	1	.10
BE130287	R12	1200 Ohm—1 Watt Resistor—10%	1	.10
BE130215	R6	25 Ohm—½ Watt Resistor—10%	1	.10
BE13037	R10	750M Ohm—½ Watt Resistor—20%	1	.10
BE130293	R13	30 Ohm—1 Watt Resistor—20%	1	.10



PRICES SUBJECT TO CHANGE WITHOUT NOTICE

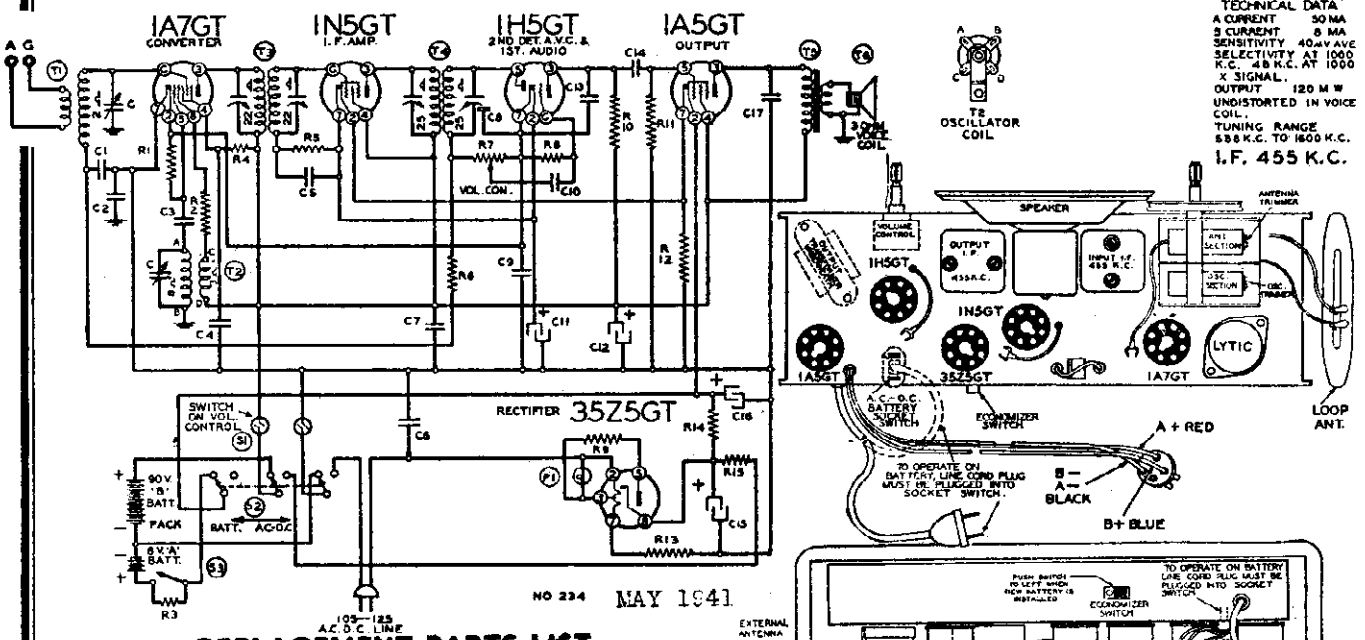
- Volume control—Maximum all adjustments.
- Connect B—of radio chassis to ground post of signal generator through .1 Mfd. condenser.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted to Maximum
I. F.	455 Kc.	.1 MFD.	Grid of 12SK7 I. F.	Rotor full open (Plates out of mesh)	Two trimmers on top of Output I. F.
	455 Kc.	.1 MFD.	Grid of 12SA7 Mixer	Rotor full open (Plates out of mesh)	Two trimmers on top of Input I. F.
BROAD-CAST BAND	1600 Kc.	.1 mmf.	Grid of 12SA7	Rotor full open (Plates out of mesh)	B.C. Osc. trimmer C2 on Gang
	1400 Kc.	200 mmf.	External Antenna and B—	Set Dial at 1400 K. C.	B.C. Ant. trimmer C3 under Gang

The loop antenna should be connected to the radio and in its proper position whenmaking all adjustments.

MODEL 14BR-573A

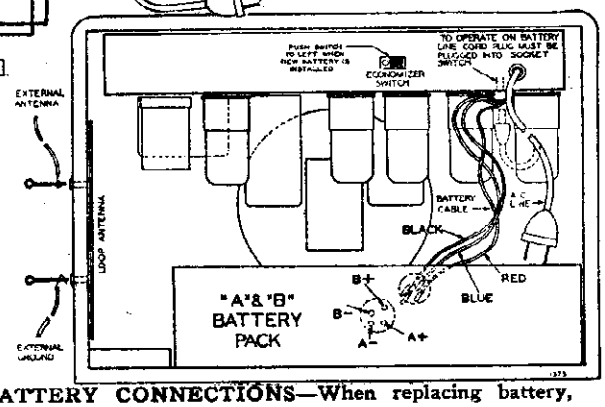
MONTGOMERY WARD & CO



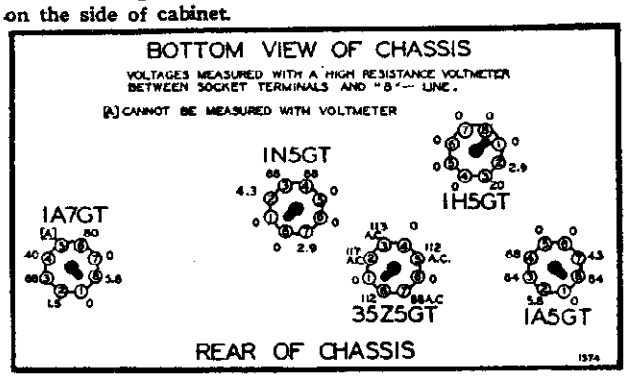
NO 234 MAY 1941

REPLACEMENT PARTS LIST

Part No.	Schematic Diagram Reference	Description	No. Used In Set	Selling Price Each
		CONDENSERS		
BE10025	C17	.002 x 600 Volt Tubular Condenser	1	.12
BE10026	C6	.02 x 400 Volt Tubular Condenser	1	.12
BE100110	C2	.2 x 400 Volt Tubular Condenser	1	.12
BE100127	C4, C5	.01 x 120 Volt Tubular Condenser	2	.12
BE100128	C1	.05 x 120 Volt Tubular Condenser	1	.12
BE100133	C9	.1 x 120 Volt Tubular Condenser	1	.12
BE100134	C10	.006 x 120 Volt Tubular Condenser	1	.12
BE100135	C7	.25 x 120 Volt Tubular Condenser	1	.12
BE100137	C13, C14	.01 x 200 Volt—.0001 x 200 Volt Dual Tubular Condenser	1	.24
BE119126	C11, C12, C15, C16	Electrolytic Filter Condenser, 20 Mfd. x 150 V.; 40 Mfd. x 150 V.; 40 Mfd. x 150 V.; 200 Mfd. x 10 V. 50-60 Cycles	1	.74
BE1295	C3	.0001 Mica Type Condenser	1	.12
		RESISTORS		
BE1304	R6, R11	3 Megohm—½ Watt Resistor—20%	2	.10
BE1309	R1	200M Ohm—½ Watt Resistor—20%	1	.10
BE13019	R10	1 Megohm—½ Watt Resistor—20%	1	.10
BE13085	R2	3M Ohm—½ Watt Resistor—20%	1	.10
BE130129	R15	2500 Ohm—½ Watt Resistor—10%	1	.10
BE130197	R3, R9	20 Ohm—½ Watt Resistor—10%	2	.10
BE130200	R12	700 Ohm—½ Watt Resistor—10%	1	.10
BE130223	R5, R8	10 Megohm—½ Watt Resistor—20%	2	.10
BE130305	R4	65M Ohm—½ Watt Resistor—10%	1	.10
BE130343	R13	545 Ohm—14 Watt Resistor—5%	1	.28
BE130344	R14	1975 Ohm—6 Watt Resistor—5%	1	.28



BATTERY CONNECTIONS—When replacing battery, plug cable into battery socket as shown above. Note: Clips for connecting an external antenna and ground are shown on the side of cabinet.



ALIGNMENT PROCEDURE

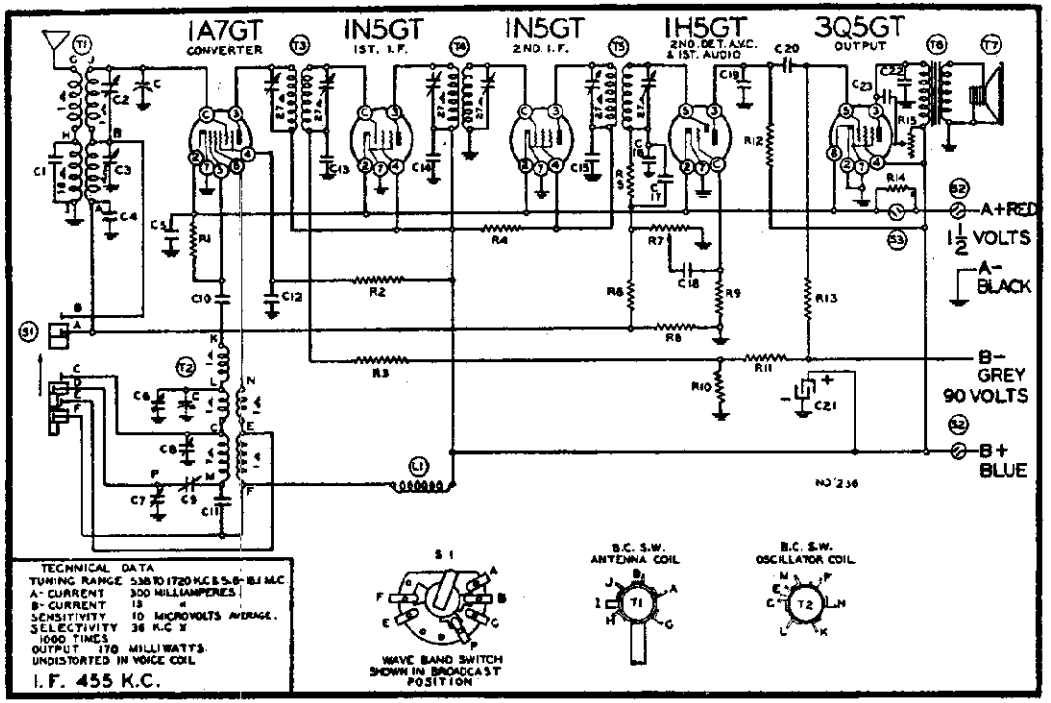
The following equipment is required for aligning.

- Dummy antenna .1 mfd. and 200 mmf.
- Volume control—Maximum all adjustments.
- Connect B— of radio chassis to ground post of signal generator.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Dial Setting	Trimmers Adjusted (in Order Shown)	Adjustment
455 Kc. I. F.	455 Kc.	.1 MFD.	Connect to Grid of 1A7	Rotor full open (Plates out of mesh)	Input and Output Trimmers on Top of I. F. cans	Maximum output (See Note "A")
BROAD-CAST BAND	1600 Kc.	.1 MFD.	Connect to Grid of 1A7	Rotor full open (Plates out of mesh)	Osc. Trimmer on gang (See chassis view)	Maximum output (See Note "A")
	1400 Kc.	200 MMF.	Connect to Antenna Clip	Set dial at 1400 Kc.	Ant. Trimmer on gang (See chassis view)	Maximum output (See Note "B")

NOTE "A"—The loop antenna need not be connected to the radio when making these adjustments, but a 1. Meg. Resistor must be substituted across the loop clips. The ground of the signal generator is connected to the B— and the other lead from the signal generator in series with .1 MFD. dummy to the grid of the 1A7GT tube.

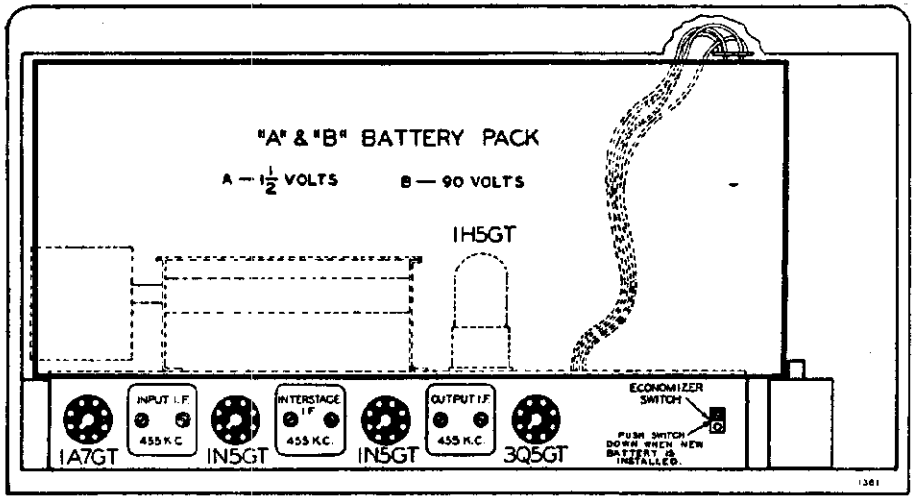
NOTE "B"—This adjustment should be made with the ground lead of the signal generator connected to the external ground terminal. The other lead of the signal generator is connected in series with a 200 Mmf. dummy to the external antenna terminal.



REPLACEMENT PARTS LIST

BE10071	C22	.004 x 600 Volt Tubular Condenser	.12
BE10019	C18	.006 x 600 Volt Tubular Condenser	.12
BE10020	C12, C15	.1 x 200 Volt Tubular Condenser	.12
BE10011	C20	.01 x 400 Volt Tubular Condenser	.12
BE1006	C5, C14	.25 x 200 Volt Tubular Condenser	.12
BE10022	C4, C13	.05 x 200 Volt Tubular Condenser	.12
BE10087	C23	.01 x 600 Volt Tubular Condenser	.12
BE100133	C11	.1 x 120 Volt Tubular Condenser	.12
BE119130	C21	Electrolytic Filter Condenser. 10 Mfd. x 150 Volts	.26
BE124171	C2, C3, C8	Triple Unit Trimmer Cond. C2, S.W. Ant. Trimmer. C3, B.C. Ant. Trimmer. C8, B.C. Osc. Trimmer	.40
BE124173	C9	B.C. Series Pad. 580 Mmfd.	.24
BE129161	C16, C17	.0001 Dual Mica Condenser	.14
BE129125	C7	.004 Mica—S.W. Series Pad	.50
BE12939	C10	.00005 Mica Type Condenser—20%	.12
BE1295	C1	.0001 Mica Type Condenser—20%	.12
BE12921	C19	.0002 Mica Type Condenser—20%	.12
BE13099	R11	300 Ohm—½ Watt Resistor—20%	.10
BE13019	R3, R13	1 Megohm—½ Watt Resistor—20%	.10
BE130257	R9	5 Megohm—½ Watt Resistor—25%	.10
BE130348	R8	4 Megohm—½ Watt Resistor—20%	.10
BE13038	R6	2 Megohm—½ Watt Resistor—20%	.10
BE1303	R12	500M Ohm—½ Watt Resistor—20%	.10
BE13085	R4	3M Ohm—½ Watt Resistor—20%	.10
BE13056	R10	100 Ohm—½ Watt Resistor—20%	.10
BE13012	R2, R5	50M Ohm—½ Watt Resistor—20%	.10
BE1309	R1	200M Ohm—½ Watt Resistor—20%	.10
BE130346	R14	.56 Ohm—½ Watt Resistor—10%	.10

PRICES SUBJECT TO CHANGE WITHOUT NOTICE



BATTERY VIEW—When replacing battery, plug cable into battery socket as shown above. Note: Battery can be placed in back of cabinet as shown.

BATTERIES REQUIRED

The battery pack must contain a 1½ volt "A" battery and 90 volts of "B" battery. Plug the Battery Cable from the radio into the socket on the battery pack. The pack will fit nicely into the back of the cabinet as shown in the battery view.

Replacement batteries may be obtained from Wards Stores or Mail Order Houses. Order battery pack No. 62-5033.

ECONOMIZER SWITCH—When the A battery is fresh the economizer switch on the back of the chassis should be pushed down.

After the radio has been in use several weeks and reception becomes weaker push the switch up, (the white dot will show). Leave in this position until new batteries are installed.

MODEL 14BR-574A

MONTGOMERY WARD & CO.

ALIGNMENT PROCEDURE

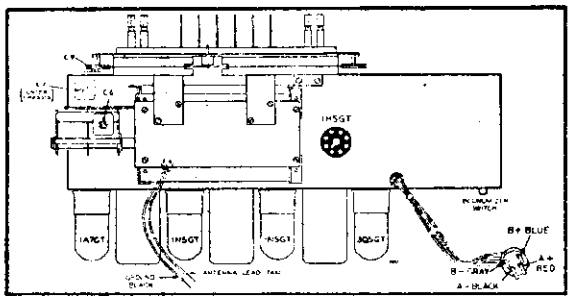
- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted to Max.
I. F.	455 Kc.	.1 MFD.	Grid of 1N5G 2nd I. F.	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top of Output I. F.
	455 Kc.	.1 MFD.	Grid of 1N5G 1st I. F.	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top of Interstage I. F.
	455 Kc.	.1 MFD.	Grid of 1A7G Mixer	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top of Input I. F.
SHORT WAVE BAND	16 Mc.	400 ohms	Antenna lead	Short Wave	Set Dial at 16 Mc.	Trimmer C6— S. W. osc. Top of front section of gang
	16 Mc.	400 ohms	Antenna lead	Short Wave	Set Dial at 16 Mc.	Trimmer C2 S. W. antenna
	6 Mc.	400 ohms	Antenna lead	Short Wave	Set Dial at 6 Mc.	Trimmer C7 S. W. osc. series pad (See note "A")
BROAD-CAST BAND	1720 Kc.	200 mmf.	Antenna lead	Broadcast	Rotor full open (Plates out of mesh)	Trimmer C8 B. C. osc.
	1500 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1500 Kc.	Trimmer C3 B. C. antenna
	600 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 600 Kc.	Trimmer C9 B. C. osc. series pad (See note "A")

NOTE "A" Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

ANTENNA

For best results, an outside antenna approximately 50 to 75 feet long including lead-in is recommended. It should be erected as high as possible and as far from surrounding objects as practical. For minimum interference it should be at right angles to street car lines, incoming power lines and other electrical apparatus which may be in the vicinity. A ground is advisable. A good ground will often reduce noise. The ground wire should be connected with a clamp to a well cleaned water pipe or to a piece of pipe driven several feet into damp earth.



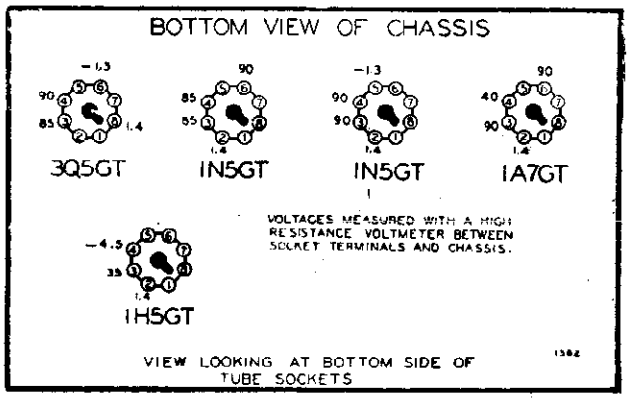
CHASSIS VIEW showing tube location and battery cable. NOTE: Antenna and ground leads at back of chassis.

SETTING THE PUSHBUTTONS

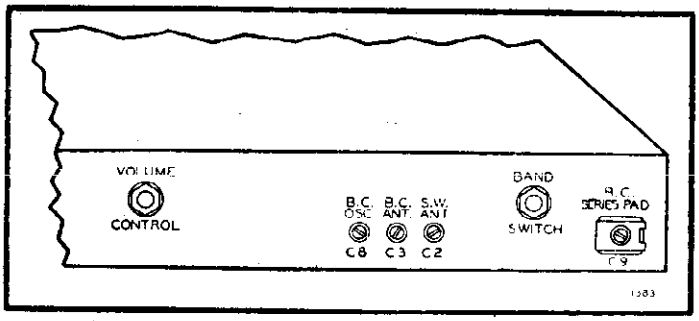
Make a list of your 6 favorite stations. Push out the call letters of these stations from the call letter sheets supplied. Insert a call letter in the slot on top of each pushbutton.

Next pull one of the pushbuttons all the way out as far as it will come (pull, with fingers on top and bottom of button). Now tune in the station you want with the tuning knob—Tune back and forth until the station is clear and distinct. Now push the button **hard** all the way in to lock the station in place. Continue setting each pushbutton in the same way. Pressing the proper button will now tune the station you want. If it does not do so you did not push the button hard enough to lock it in place when setting up the station.

To change stations simply repeat the procedure above.



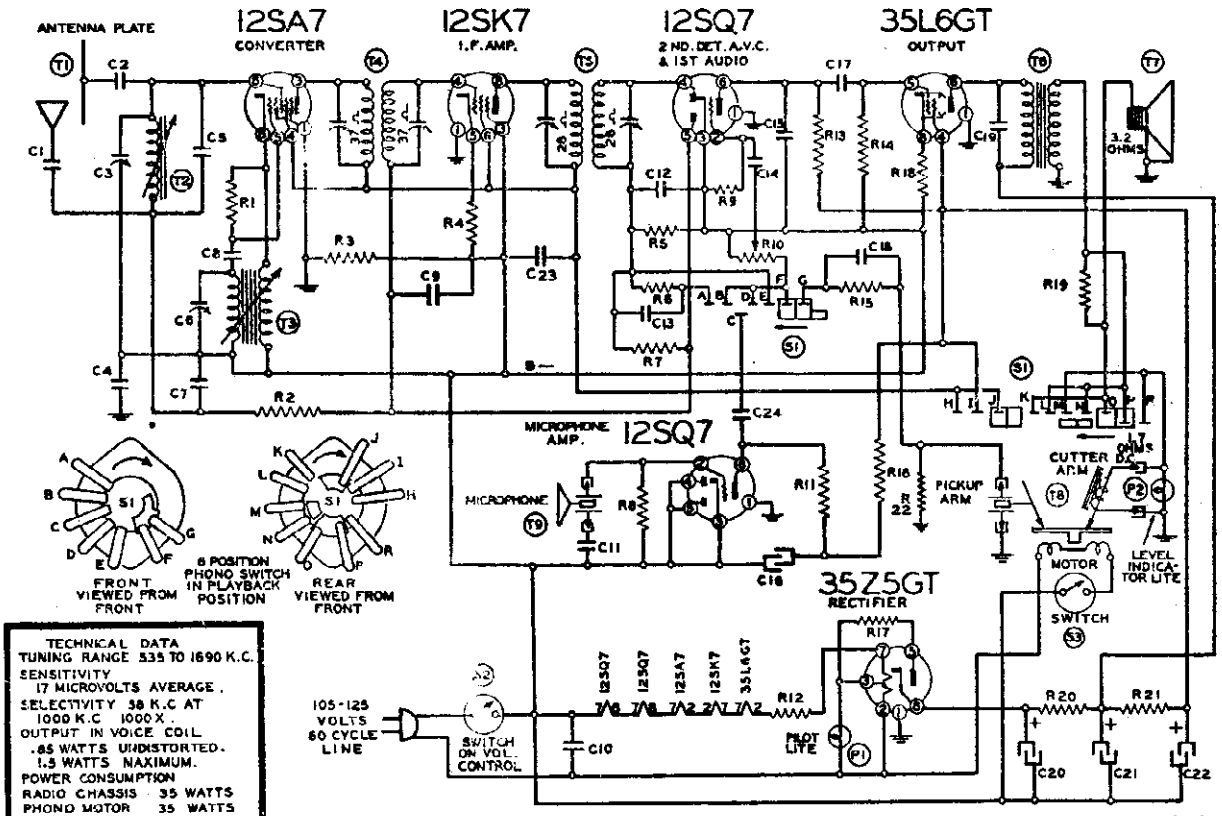
VOLTAGE CHART



TRIMMER VIEW—Looking at front of chassis.

MODEL 14BR-629A

MONTGOMERY-WARD & CO.



TECHNICAL DATA
TUNING RANGE 535 TO 1690 K.C.
SENSITIVITY
17 MICROVOLTS AVERAGE.
SELECTIVITY 38 K.C AT 1000 K.C 1000 X.
OUTPUT IN VOICE COIL
.85 WATTS UNDISTORTED.
1.5 WATTS NAXIMUM.
POWER CONSUMPTION
RADIO CHASSIS 35 WATTS
PHONO MOTOR 35 WATTS
I.F. 455 K.C.

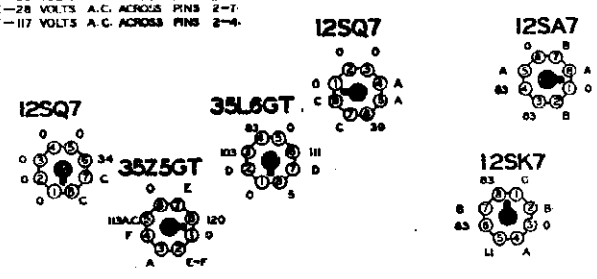
JULY 1941

BOTTOM VIEW OF CHASSIS

ALL VOLTAGES MEASURED BETWEEN B- & TERMINAL INDICATED, WITH A 1000 OHMS PER VOLT VOLTMETER. 117 VOLT LINE, PHONO SWITCH IN RADIO POSITION, VOLUME CONTROL AT MINIMUM & ANTENNA LEAD GROUNDED TO CHASSIS.

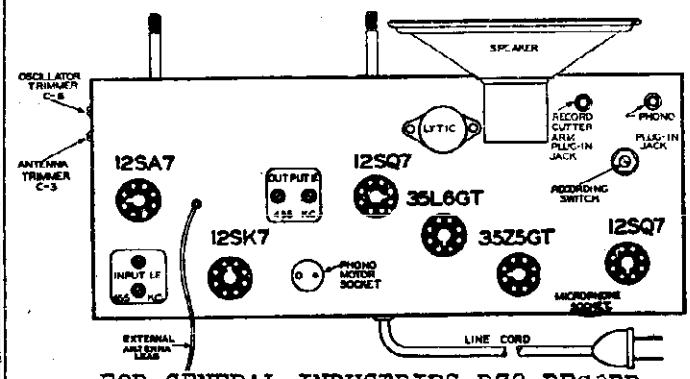
A—CANNOT BE MEASURED WITH VOLTMETER.
B—11.5 VOLTS A.C. ACROSS PINS 2-7.
C—11.5 VOLTS A.C. ACROSS PINS 7-8.
D—35 VOLTS A.C. ACROSS PINS 2-7.
E—28 VOLTS A.C. ACROSS PINS 2-7.
F—117 VOLTS A.C. ACROSS PINS 2-4.

VOLTAGE CHART

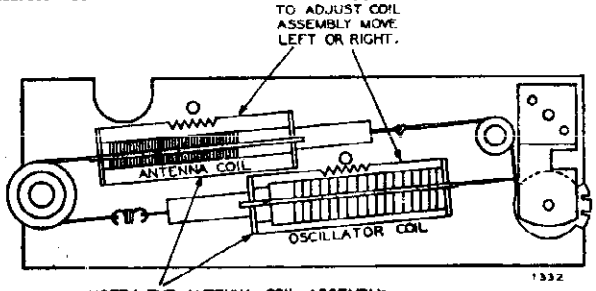


BE101273	R10, S2	Volume Control and Switch (1 Megohm)	1
BE130176	R1	20M Ohm—½ Watt Resistor—10%	1
BE130168	R4, R19	100 Ohm—½ Watt Resistor—10%	2
BE1309	R2, R3	200M Ohm—½ Watt Resistor—20%	2
BE1304	R7, R8	3 Megohm—½ Watt Resistor—20%	2
BE130118	R5	600M Ohm—½ Watt Resistor—20%	1
BE130257	R9	5 Megohm—½ Watt Resistor—25%	1
BE1303	R11, R13	500M Ohm—½ Watt Resistor—20%	2
BE130166	R18	150 Ohm—½ Watt Resistor—10%	1
BE13037	R14	750M Ohm—½ Watt Resistor—20%	1
BE13097	R20	200 Ohm—½ Watt Resistor—10%	1
BE130287	R21	1200 Ohm—1 Watt Resistor—10%	1
BE130215	R17	25 Ohm—½ Watt Resistor—10%	1
BE13020	R16	100M Ohm—½ Watt Resistor—20%	1
BE13019	R15, R22	1 Megohm—½ Watt Resistor—20%	1
BE130288	R12	50 Ohm—1½ Watt Resistor—20%	1
BE13038	R6	2 Megohm—½ Watt Resistor—20%	1
BE100119	C4	.1 x 400 Volt Tubular Condenser	1
BE1001	C10	.1 x 400 Volt Tubular Condenser	1
BE1009	C9, C23	.05 x 200 Volt Tubular Condenser	2
BE10019	C17	.006 x 600 Volt Tubular Condenser	1
BE10011	C19	.01 x 400 Volt Tubular Condenser	1
BE10025	C14	.002 x 600 Volt Tubular Condenser	1
BE100141	C11	.22 x 200 Volt Tubular Condenser	1
BE11994	C20, C21, C22	Electrolytic Filter Condenser. 60 Cycles. 40 Mfd. x 150 V.; 20 Mfd. x 150 V.; 20 Mfd. x 150 V.	1
BE119117B	C16	Electrolytic Filter Condenser. 10 Mfd. x 150 Volts	1
BE124136	C3, C6	Ant. and Osc. Dual Adjustable Condenser	1
BE129114	C2, C15	.0003 Mica Type Condenser—20%	2
BE1295	C1, C8	.0001 Mica Type Condenser—20%	2
BE129162	C7	.0008 Mica Type Condenser—10%	1
BE12960	C12	.00015 Mica Type Condenser—20%	1
BE12921	C18	.0002 Mica Type Condenser—20%	1
BE1292	C13, C24	.0005 Mica Type Condenser—20%	2
BE129183	C5	.00005 Ceramicon Type Condenser—10%	1

PRICES SUBJECT TO CHANGE WITHOUT NOTICE



FOR GENERAL INDUSTRIES R70 RECORD CHANGER, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

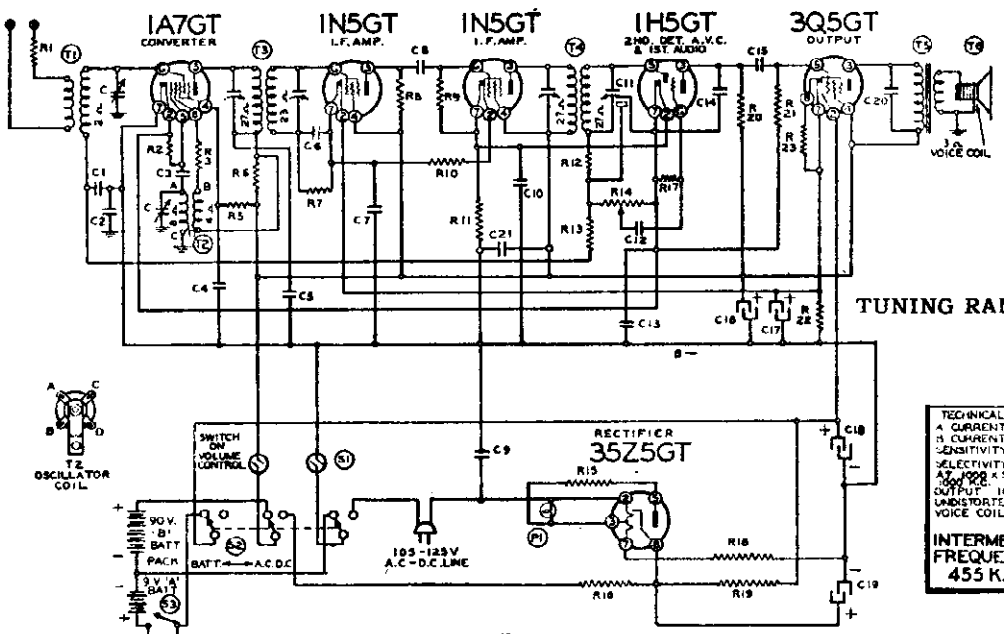


NOTE: THE ANTENNA COIL ASSEMBLY IS MADE SO THAT IT IS MOVABLE LEFT OR RIGHT. WHEN MAKING THE ADJUSTMENT AS GIVEN IN THE ALIGNMENT PROCEDURE MOVE COIL ASSEMBLY VERY SLOWLY

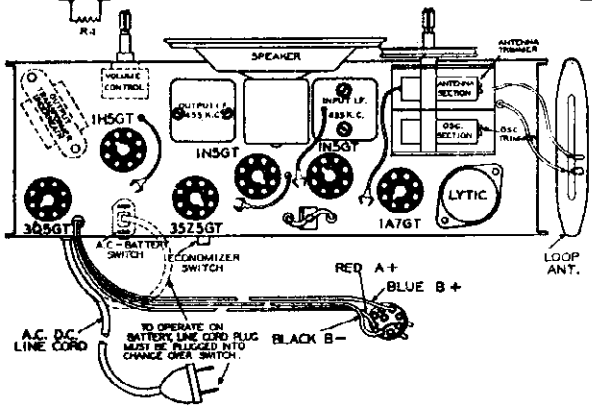
FOR ALIGNMENT SEE INDEX

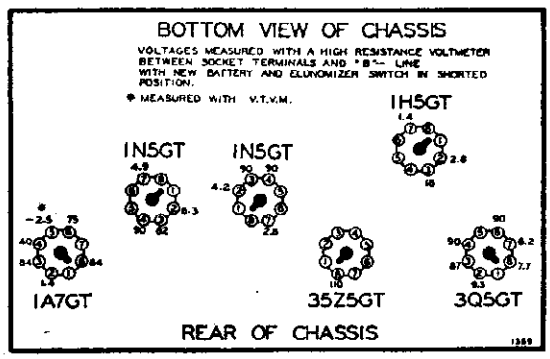
MODEL 14BR-684A

MONTGOMERY-WARD & CO.



AUGUST 1941





BE13019	R20	1 Megohm—½ Watt Resistor—20%	.10
BE1304	R13, R21	3 Megohm—½ Watt Resistor—20%	.10
BE130257	R7, R9, R17	5 Megohm—½ Watt Resistor—25%	.10
BE130197	R4, R15	20 Ohm—½ Watt Resistor—10%	.10
BE130129	R16	2500 Ohm—½ Watt Resistor—10%	.10
BE130192	R11	2M Ohm—½ Watt Resistor—10%	.10
BE130347	R10	15 Ohm—½ Watt Resistor—10%	.10
BE13022	R8	5M Ohm—½ Watt Resistor—20%	.10
BE13085	R3, R6	3M Ohm—½ Watt Resistor—20%	.10
BE130200	R22	700 Ohm—½ Watt Resistor—10%	.10
BE1309	R2	200M Ohm—½ Watt Resistor—20%	.10
BE130305	R5	65M Ohm—½ Watt Resistor—10%	.10
BE13026	R1	1M Ohm—½ Watt Resistor—20%	.10
BE130329	R12	47M Ohm—½ Watt Resistor—20%	.10
BE130343	R18	545 Ohm—1/4 Watt W.W. Resistor—5%	.28
BE130344	R19	1975 Ohm—6 Watt W.W. Resistor—5%	.22
BE130222	R23	350 Ohm—½ Watt Resistor—10%	.10
BE10071	C20	.004 x 600 V. Tubular Condenser	.12
BE100110	C2	.2 x 400 V. Tubular Condenser	.12
BE100127	C4, C6	.01 x 120 V. Tubular Condenser	.12
BE100128	C1	.05 x 120 V. Tubular Condenser	.12
BE100133	C5	.1 x 200 V. Tubular Condenser	.12
BE100134	C12	.006 x 120 V. Tubular Condenser	.12
BE100135	C7, C10, C13	.25 x 200 V. Tubular Condenser	.12
BE100137	C15, C14	.01 x 200 V.; .0001 x 200 V. Dual Tubular Condenser	.24
BE10020	C21	.1 x 200 V. Tubular Condenser	.12
BE119126	C16, C17, C18, C19	Electrolytic Filter Condenser 20 Mfd. x 50 V.; 40 Mfd. x 150 V.; 40 Mfd. x 150 V.; 200 Mfd. x 10 V. 50-60 Cycles	.74
BE1292	C8	.0005 Mica Type Condenser—20%	.12
BE1295	C3	.0001 Mica Type Condenser—20%	.12
BE10026	C9	.02 x 400 Volt Tubular Condenser	.12

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

ALIGNMENT PROCEDURE

The following equipment is required for aligning.

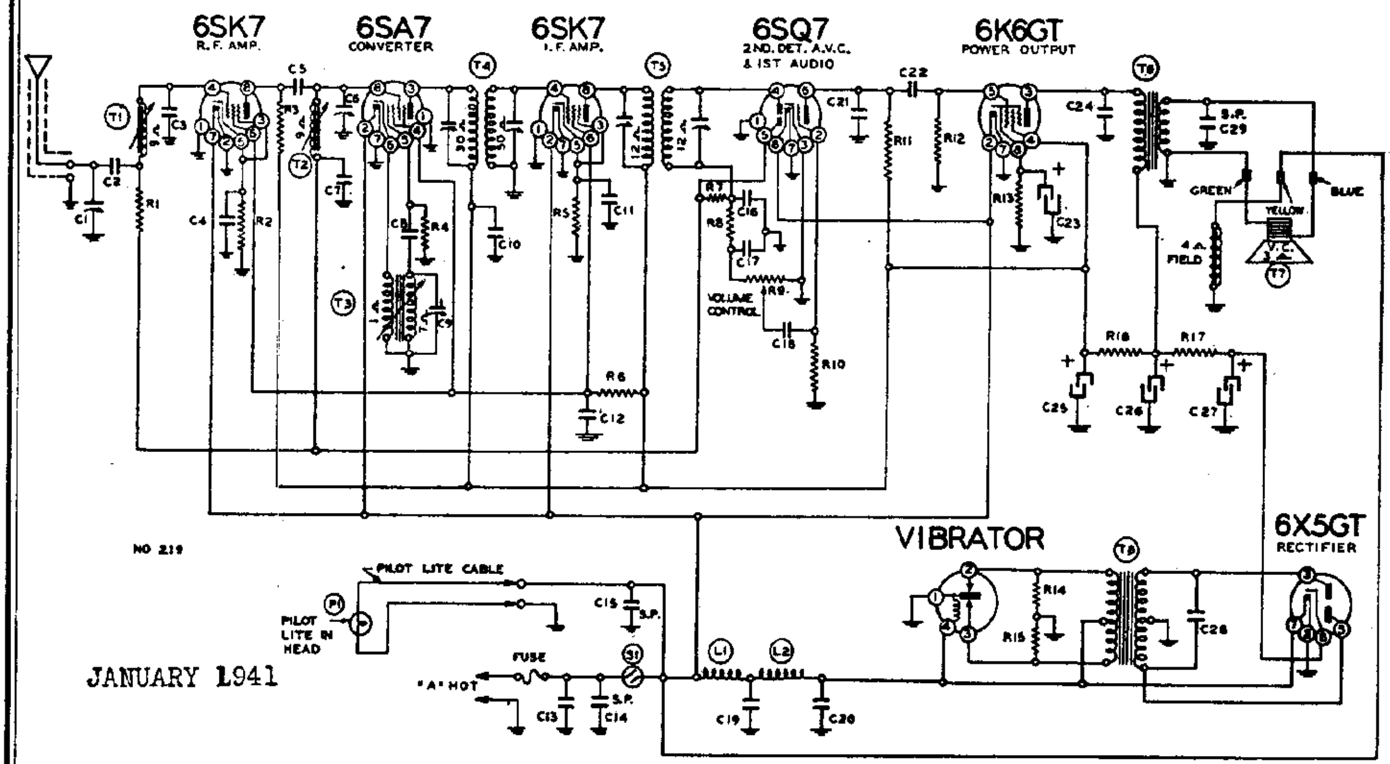
- Dummy antenna .1 mfd. and 200 mmf.
- Volume control—Maximum all adjustments.
- Connect B— of radio chassis to ground post of signal generator.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Dial Setting	Trimmers Adjusted (in Order Shown)	Adjustment
455 Kc. I. F.	455 Kc.	.1 MFD.	Connect to Grid of 1A7	Rotor full open (Plates out of mesh)	Input and Output Trimmers on Top of I. F. cans	Maximum output (See Note "A")
BROAD-CAST BAND	1600 Kc.	.1 MFD.	Connect to Grid of 1A7	Rotor full open (Plates out of mesh)	Osc. Trimmer on gang (See chassis view)	Maximum output (See Note "A")
	1400 Kc.	200 MMF.	Connect to Antenna Clip	Set dial at 1400 Kc.	Ant. Trimmer on gang (See chassis view)	Maximum output (See Note "B")

NOTE "A"—The loop antenna need not be connected to the radio when making these adjustments, but a 1. Meg. Resistor must be substituted across the loop clips. The ground of the signal generator is connected to the B— and the other lead from the signal generator in series with .1 MFD. dummy to the grid of the 1A7GT tube.

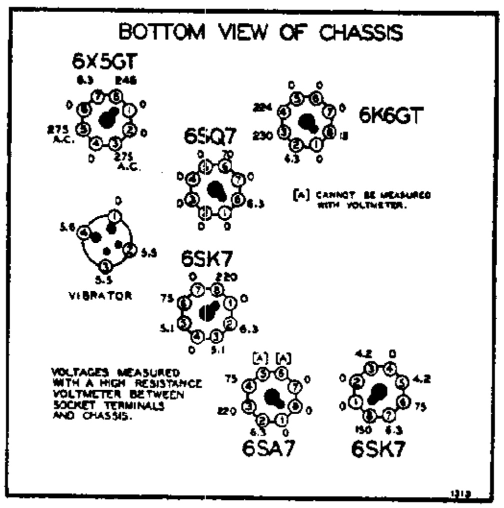
NOTE "B"—This adjustment should be made with the ground lead of the signal generator connected to the external ground terminal. The other lead of the signal generator is connected in series with a 200 Mmf. dummy to the external antenna terminal.

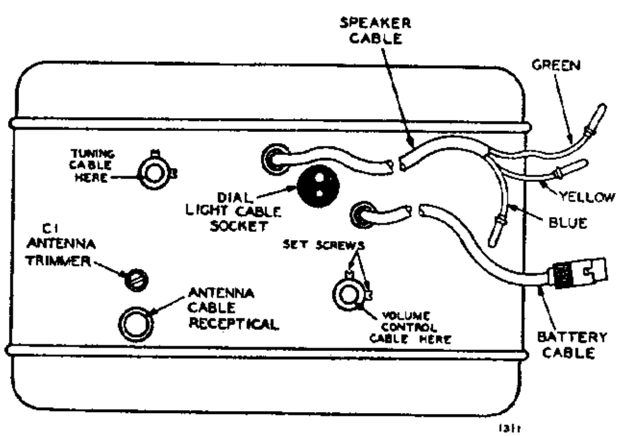
MONTGOMERY WARD & CO.



JANUARY 1941

INTERMEDIATE FREQUENCY 455 K.C.





Schematic Diagram Ref. No.	Part No.	Description

RESISTORS

R1	BE130330	220M ohm—⅓ w.
R2	BE130333	1500 ohm—⅓ w.
R3	BE130334	25M ohm—⅓ w.
R4	BE130329	47M ohm—⅓ w.
R5	BE130192	2M ohm—⅓ w.
R6	BE130196	30M ohm—1 watt
R7	BE13019	1 Megohm—⅓ w.
R8	BE130329	47M ohm—⅓ w.
R9	BE101246	500M ohm volume control
R10	BE130257	5 megohm—⅓ w.
R11	BE13011	250M ohm—⅓ w.
R12	BE13019	1 Megohm—⅓ w.
R13	BE130267	550 ohm—⅓ w.
R14	BE130168	100 ohm—⅓ w.
R15	BE130168	100 ohm—⅓ w.
R16	BE130199	1500 ohm—1 watt
R17	BE130168	100 ohm—⅓ w.

CONDENSERS

C1	BE124157	Antenna Trimmer
C2	BE100127	.01 x 120 v.
C3	BE129172	.0001 Ceramicon
C4	BE100128	.05 x 120 v.
C5	BE129141	.00001 Ceramicon
C6	BE124129	R.F. Trimmer
C7	BE100129	.02 x 120 v.
C8	BE100172	.0001 Ceramicon
C9	BE124158	Oscillator Trimmer
C10	BE1001	.1 x 400 v.
C11	BE100128	.05 x 120 v.
C12	BE10053	.25 x 400 v.
C13	BE10031	.5 x 120 v.
C14	BE115687	Spark Plate
C15	BE115710	Spark Plate
C16	BE129165B	.00005 Mica
C17	BE129165B	.00005 Mica
C18	BE100127	.01 x 120 v.
C19	BE10031	.5 x 120 v.
C20	BE10031	.5 x 120 v.
C21	BE100130	.00025 x 400 v.
C22	BE100130	.02 x 400 v.
C23	BE11975	10.0 mfd. x 25 volt lytic
C24	BE10087	.01 x 600 v.
C25	BE119120	15.0 mfd. x 350 v. lytic
C26	BE119120	15.0 mfd. x 350 v. lytic
C27	BE119120	15.0 mfd. x 350 v. lytic
C28	BE100100	.008 x 1600 v.
C29	BE115710	Spark Plate

C16 and C17 are in same unit.
C21 and C22 are in same unit.
C25, C26, and C27 are in same unit.

PARTS

T1	BE111231	Antenna Coil Assembly
T2	BE10963	R.F. Coil Assembly
T3	BE110174	Oscillator Coil Assembly
T4	BE108194	Input I.F. Coil 455 Kc.
T5	BE108196	Output I.F. Coil 455 Kc.
T6	BE105125	Output Transformer
T7	BE114234	6" Dynamic Speaker
T8	BE104159C	Power Transformer
L1	BE10519	"A" Choke
L2	BE10519	"A" Choke
S1	on	and off switch on volume control
P1	BE10797	Pilot Lite

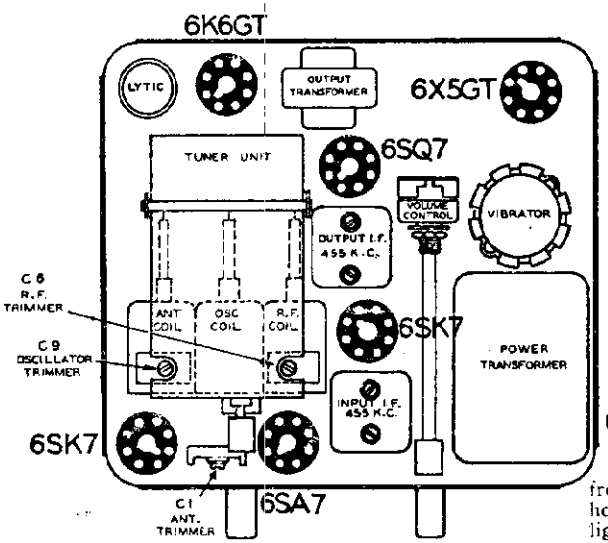
ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- 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., 35 mmf.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Remote Tuner Dial Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Grid of 6SK7 I. F. Tube	Set dial at 1400 Kc.	See Chassis View	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 6SA7 I. F. Tube	Set dial at 1400 Kc.	See Chassis View	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1600 Kc.	35 mmf.	Antenna lead	Set dial at 1600 Kc.	Trimmer C9, C6, C1 See Chassis View	Oscillator R. F. antenna	Adjust to maximum output
	1400 Kc.	35 mmf.	Antenna lead	Set dial at 1400 Kc.	Rotate cores of antenna and R. F. coils	Antenna and R. F.	Adjust to maximum output



CHASSIS VIEW
SHOWING TRIMMER POSITIONS

Battery Drain - - - - - - - - 7 Amps.
Power Output - - - - - 1.8 Watts Undistorted
Sensitivity for 1 Watt Output - - 6 Microvolt Average
Selectivity - 38 KC Broad at 1000 Times Signal at 1000 KC
Tuning Frequency Range - - - 540 to 1600 KC
Intermediate Frequency - - - - 455 KC
Speaker - - - - - - 6 in. Electro Dynamic

CALIBRATING THE DIAL

Tune set to some station of a known frequency (between 800 and 1200 K.C.), hold selector knob, then remove pilot light assembly from back of remote head and with a screw driver adjust the slotted screw through this opening and in this way adjust the dial pointer to the correct frequency setting.

GENERATOR CONDENSER

A Generator Condenser must be connected in all cases from the battery terminal of the generator to the Generator frame.

This condenser must not be connected across the field winding terminal on late cars which use Automatic Cutouts.

It is advisable that you find out from your local car dealers where the manufacturer recommends the condenser be connected for each make of car.

HIGH AND LOW TENSION LEADS

In many cars the low tension battery leads, etc., are grouped together with the high tension wires. These leads will very often pick up motor noise and feed it into the receiver through the battery circuit. In cases such as these it will be necessary to separate the low tension from the high tension wires and run them through another hole if they run from the engine compartment up to the instrument panel. This condition is particularly true on the V-8 Ford as the battery and primary leads run through a special tube which also houses the high tension leads. Shield and ground these leads.

AMMETER CONDENSER

A .5 Mfd. by pass condenser should be connected from one ammeter terminal to a good ground on the instrument panel. Usually this condenser plus the generator condenser and distributor suppressor will remove all objectionable ignition noise.

ADJUSTING THE ANTENNA TRIMMER

The input circuit has been especially designed to be used with a low capacity antenna of the fish pole or whip type.

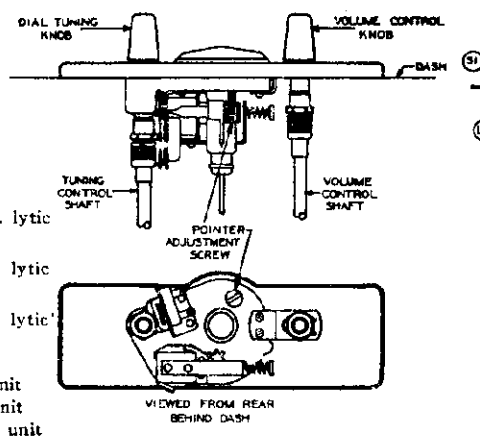
The antenna lead supplied with the radio should not be shortened or otherwise altered.

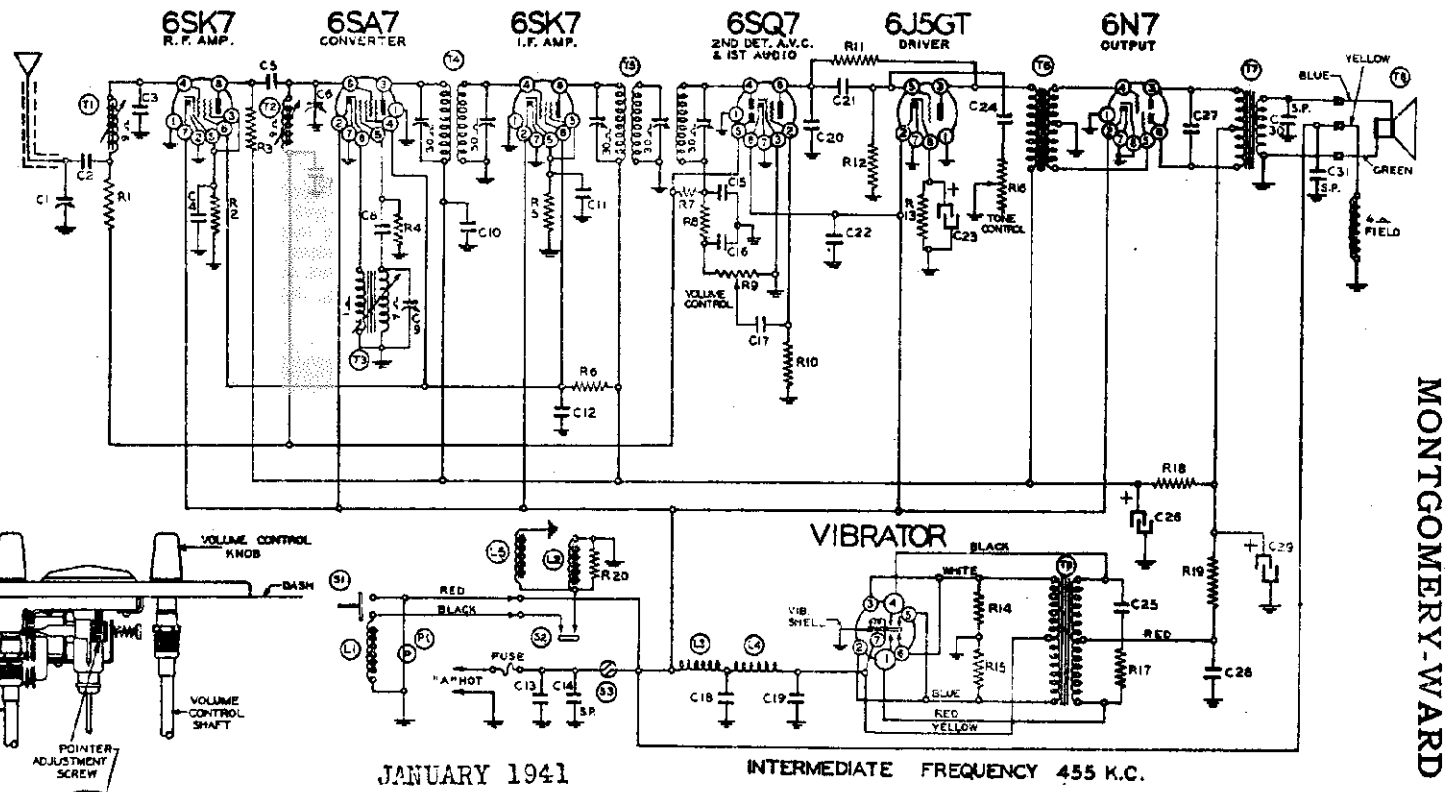
It is important that the grounding lead on the end of the antenna cable be carefully grounded to the car body, otherwise it may prove difficult to eliminate ignition noise.

Tune in a station on the high frequency end of the dial and adjust the antenna trimmer for maximum volume. A weak station which does not fade is best for this adjustment.

R1	BE130330	220M ohm—⅓ w.
R2	BE130332	250 ohm—⅓ w.
R3	BE130331	15M ohm—⅓ w.
R4	BE130329	47M ohm—⅓ w.
R5	BE13016	900 ohm—⅓ w.
R6	BE130196	30M ohm—1 w.
R7	BE13019	1 megohm—⅓ w.
R8	BE130329	47M ohm—⅓ w.
R9	BE101242	500M ohm volume control
R10	BE130257	5 megohm—⅓ w.
R11	BE130102	500M ohm—⅓ w.
R12	BE130102	500M ohm—⅓ w.
R13	BE13092	1M ohm—⅓ w.
R14	BE130168	100 ohm—⅓ w.
R15	BE130168	100 ohm—⅓ w.
R16	BE101245	1 megohm tone control
R17	BE13092	1M ohm—⅓ w.
R18	BE130199	1500 ohm—1 w.
R19	BE130328	75 ohm—⅓ w.
R20	BE13060	100 ohm—⅓ w.
C1	BE124157	Antenna trimmer
C2	BE100127	.01 x 120 v.
C3	BE129172	.0001 ceramicon
C4	BE100128	.05 x 120 v.
C5	BE129145	.00001 ceramicon
C6	BE124159	R.F. trimmer
C7	BE100129	.02 x 120 v.
C8	BE129172	.0001 ceramicon
C9	BE124158	Oscillator trimmer
C10	BE1001	.1 x 400 v.
C11	BE100128	.05 x 120 v.
C12	BE10053	.25 x 400 v.
C13	BE10031	.5 x 120 v.
C14	BE115687	Spark plate
C15	BE129165B	.00005 mica
C16	BE129165B	.00005 mica
C17	BE100127	.01 x 120 v.
C18	BE10031	.5 x 120 v.
C19	BE10031	.5 x 120 v.
C20	BE100130	.00025 x 400 v.
C21	BE100130	.02 x 400 v.
C22	BE1292	.0005 mica
C23	BE119118	20.0 mfd. x 25 v. lytic
C24	BE10011	.01 x 400 v.
C25	BE10008	.005 x 1600 v.
C26	BE119118	20 mfd. x 400 v. lytic
C27	BE100126	.005 x 800 v.
C28	BE1001	.1 x 400 v.
C29	BE119118	20 mfd. x 400 v. lytic
C30	BE115710	Spark plate
C31	BE115710	Spark plate

C15 and C16 are in same unit
C20 and C21 are in same unit
C23, C26 and C29 are in same unit



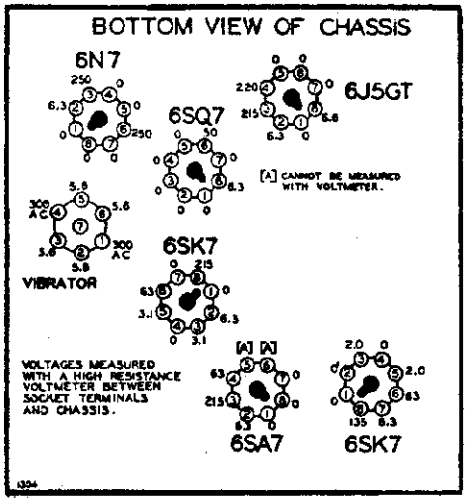


JANUARY 1941

CALIBRATING THE DIAL

Turn the manual tuning knob and set the dial at 540 KC or 1600 KC whichever end the dial scale will reach. Now tighten the pointer adjustment screw (see Dash Control Rear View) this will lock the dial scale in place.

Turn the manual tuning knob to the right until it stops if you have the dial scale set at 540 Kc. Turn it to the left if it is set at 1600 Kc. Next loosen the adjustment screw to unlock the dial scale.



Battery Drain	7.8 Amps.
Power Output	5½ Watts Undistorted
Sensitivity for 1 Watt Output	1 Microvolt Average
Selectivity	38 KC Broad at 1000 Times Signal at 1000 KC
Tuning Frequency Range	540 to 1600 KC
Intermediate Frequency	455 KC
Speaker	6 in. Electro Dynamic

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- 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., 35 mmf.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Remote Tuner Dial Setting	Trimmers Adjusted (In Order Shown)	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Grid of 6SK7 I. F. Tube	Set dial at 1400 Kc.	See Chassis View	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 6SA7 I. F. Tube	Set dial at 1400 Kc.	See Chassis View	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1600 Kc.	35 mmf.	Antenna lead	Set dial at 1600 Kc.	Trimmer C9, C6, C1 Chassis View	Oscil'ator R. F. antenna	Adjust to maximum output
	1400 Kc.	35 mmf.	Antenna lead	Set dial at 1400 Kc.	Rotate cores of antenna and R. F. coils	Antenna and R. F.	Adjust to maximum output

SETTING UP THE AUTOMATIC TUNING

NOTE: Stations may be set up on the bench, before installing radio.

There are three major steps in setting up the automatic. Take these steps in order. After you become familiar with them, you may vary the routine, but you will then know the operations needed.

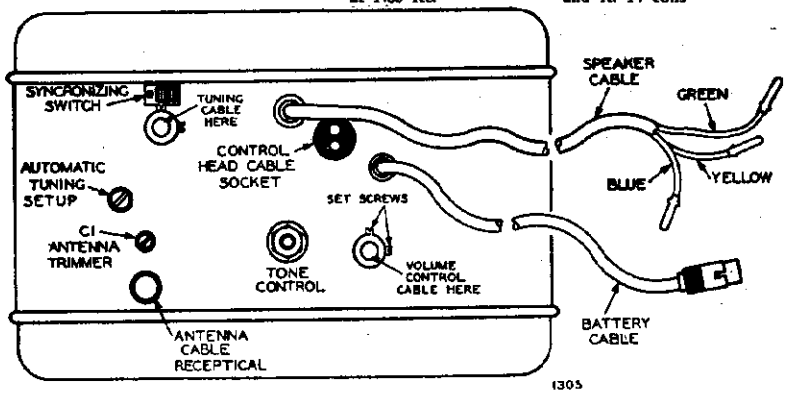
1st—To Synchronize the word "Dial" on the dial scale with the "Dial" position in the Chassis Tuner.

Note—The word "dial" is short for manual tuning.

2nd—To select one station and put it on the first automatic position.

3rd—To put the call letter on the dial.

The synchronizing must be done only once, but items two and three are repeated until 5 Automatic Positions are set up.



ADJUSTING THE ANTENNA TRIMMER

The input circuit has been especially designed to be used with a low capacity antenna of the fish pole or whip type.

The antenna lead supplied with the radio should not be shortened or otherwise altered.

It is important that the grounding lead on the end of the antenna cable be carefully grounded to the car body, otherwise it may prove difficult to eliminate ignition noise.

Tune in a station on the high frequency end of the dial and adjust the antenna trimmer for maximum volume. A weak station which does not fade is best for this adjustment.

SYNCHRONIZING (Step 1)

See that the Synchronizing Switch on the chassis case is closed (white dot showing). Press the tuning knob once. Let it come back—and then see if the knob will tune in stations (Don't forget to turn up the volume control). Repeat this until the radio can be tuned with the tuning knob. It is now in the Manual Tuning (Dial) Position.

Now open the "Synchronizer" Switch (No white dot showing). This will disconnect the tuner and keep it from shifting. Next press the tuner knob several times or until the word "Dial" shows up on the dial scale. Close the synchronizer switch (white dot showing) and the dial and tuner are now in synchronism.

SELECT ONE STATION (Step 2)

With the Tuning Knob in "Dial" Position, press the knob once and release. It is now in the first automatic step. Insert a long screw driver in the automatic tuner set up hole and turn the screw until you hear the station you want.

There are two methods for finding the station quickly. One—tune it in on another radio (A portable if you set up the station in the car) and then adjust the screw for the same program; or two—Tune the station on the manual first—Note the program and then move to the first Automatic Position and locate the program on the screw.

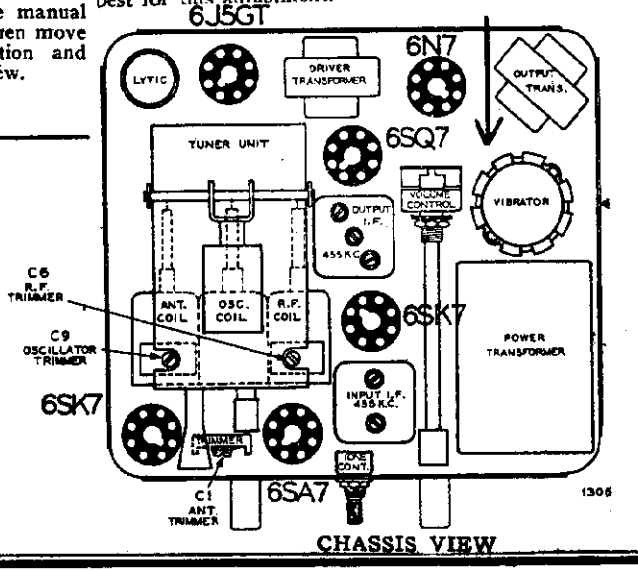
CALL LETTER ON THE DIAL (Step 3)

So that you will know which Automatic Position the station has been set up on, paste the call letter on the dial before setting up another station.

The dial crystal should be removed for this purpose and the proper station call pasted on the automatic scale at the top where it will show thru the crystal window.

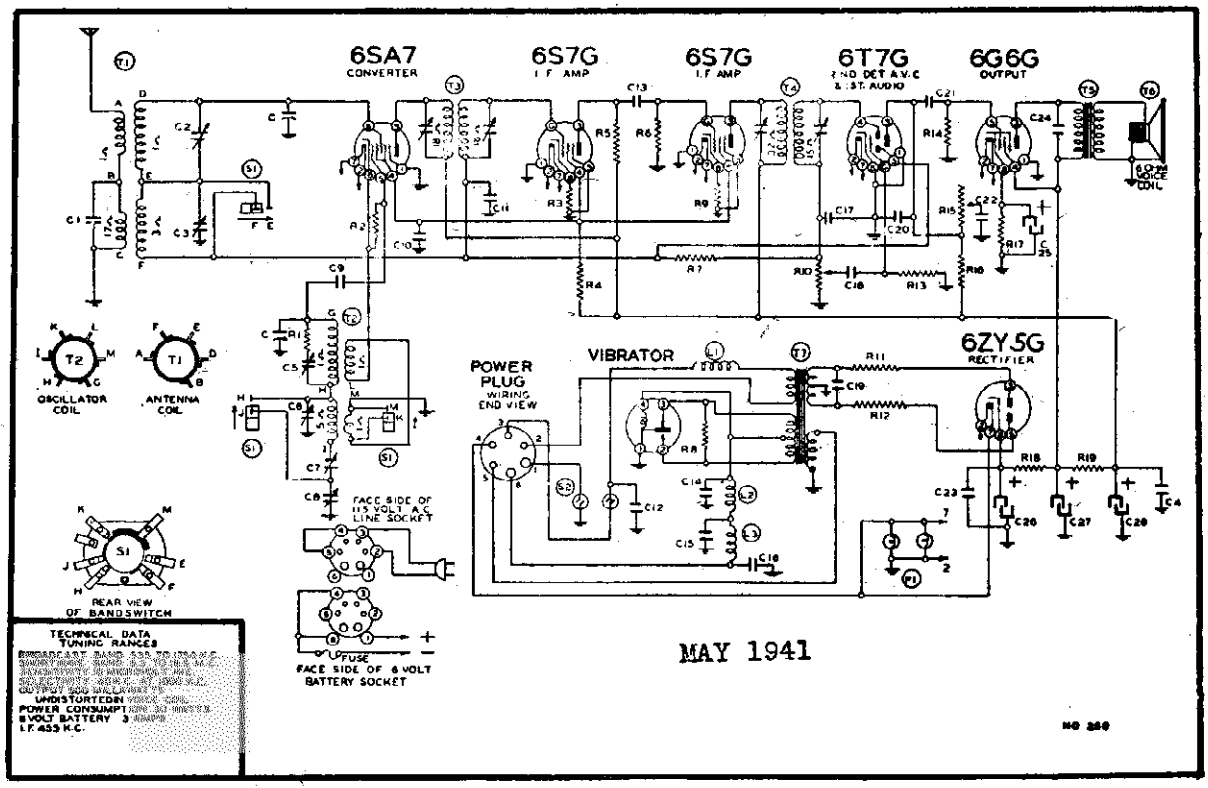
Having set up the first station proceed to repeat steps one and two except that you will press the tuning knob into the 2nd Automatic Position.

Continue the same operation thru the 3rd, 4th and 5th automatic positions.



CHASSIS VIEW

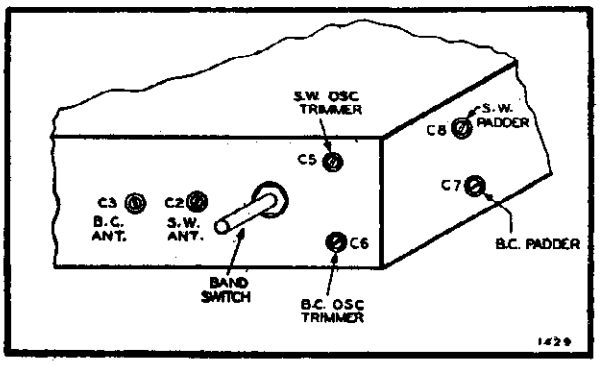
MONTGOMERY-WARD & CO.



REPLACEMENT PARTS LIST

Part No.	Schematic Diagram Reference	Description	No. Used In Set	Selling Price Each
		CONDENSERS		
BE102133	C	Two Gang Variable Condenser	1	1.88
BE10020	C4, C23	.1 x 200 Volt Tubular Condenser	2	.12
BE1009	C11	.05 x 200 Volt Tubular Condenser	1	.12
BE10019	C18	.006 x 600 Volt Tubular Condenser	1	.12
BE10026	C21	.02 x 400 Volt Tubular Condenser	1	.12
BE10025	C24	.002 x 600 Volt Tubular Condenser	1	.12
BE10013	C12	.05 x 400 Volt Tubular Condenser	1	.12
BE10031	C14, C15, C16	.5 x 120 Volt Tubular Condenser	3	.36
BE100106	C22	.004 x 600 Volt Tubular Condenser	1	.12
BE10048	C10	.25 x 200 Volt Tubular Condenser	1	.20
BE10073	C19	.008 x 1200 Volt Tubular Condenser	1	.12
BE119111	C25, C26, C27, C28	Electrolytic Filter Condenser. 20 Mfd. x 20 V.; 40 Mfd. x 200 V.; 20 Mfd. x 200 V.; 20 Mfd. x 200 V.	1	1.30
BE124176	C2, C3	S.W. and B.C. Dual Antenna Trimmer	1	.24
BE124177	C5, C6	S.W. and B.C. Dual Oscillator Trimmer	1	.24
BE124178	C7, C8	B.C. and S.W. Dual Padder Condenser	1	.56
BE1292	C13, C20	.0005 Mica Type Condenser—20%	2	.12
BE1295	C1, C17	.0001 Mica Type Condenser—20%	2	.12
BE12938	C9	.00005 Mica Type Condenser—10%	1	.12
		In some sets 124178 Dual Condenser is replaced by one each of the following:		
BE129186	C7	Compression Mica Cond. .004	1	.36
BE124184	C8	Adjustable Condenser	1	.24

PRICES SUBJECT TO CHANGE WITHOUT NOTICE



TRIMMER VIEW—Looking at front of chassis.

Part No.	Schematic Diagram Reference	Description	No. Used In Set	Selling Price Each
		RESISTORS		
BE101268	R10, S2	Volume Control and Switch (1 Megohm)	1	.60
BE101269	R15	Tone Control (2 Megohm)	1	.20
BE130157	R5	12M Ohm—½ Watt Resistor—10%	1	.10
BE13067	R4	9M Ohm—½ Watt Resistor—10%	1	.10
BE130276	R1	10 Ohm—½ Watt Resistor—10%	1	.10
BE130192	R9	2M Ohm—½ Watt Resistor—10%	1	.10
BE13019	R6	1 Megohm—½ Watt Resistor—20%	1	.10
BE130170	R7	3 Megohm—½ Watt Resistor—25%	1	.10
BE130266	R16	200M Ohm—½ Watt Resistor—10%	1	.10
BE130223	R13	10 Megohm—½ Watt Resistor—20%	1	.10
BE1303	R14	500M Ohm—½ Watt Resistor—20%	1	.10
BE13079	R17	400 Ohm—½ Watt Resistor—10%	1	.10
BE130235	R19	1500 Ohm—½ Watt Resistor—10%	1	.10
BE130222	R18	350 Ohm—½ Watt Resistor—10%	1	.10
BE130233	R11, R12	60 Ohm—½ Watt Resistor—10%	2	.10
BE13084	R8	200 Ohm—½ Watt Resistor—20%	1	.10
BE130236	R2	30M Ohm—½ Watt Resistor—10%	1	.10
BE13070	R3	500 Ohm—½ Watt Resistor—10%	1	.10

POWER SUPPLY—Unless marked otherwise, this radio will operate on either a 6 volt storage battery or on 105 to 125 volts A.C. 50 to 60 cycle line. Two power cords are supplied one for battery and one for electric operation. Whichever cord is required should be plugged into the back of the chassis. When using a battery be sure A+ lead is connected to + battery terminal. Do not lengthen battery cable. Keep antenna lead away from battery cable.

MODELS 14BR-688A, 14BR-689A

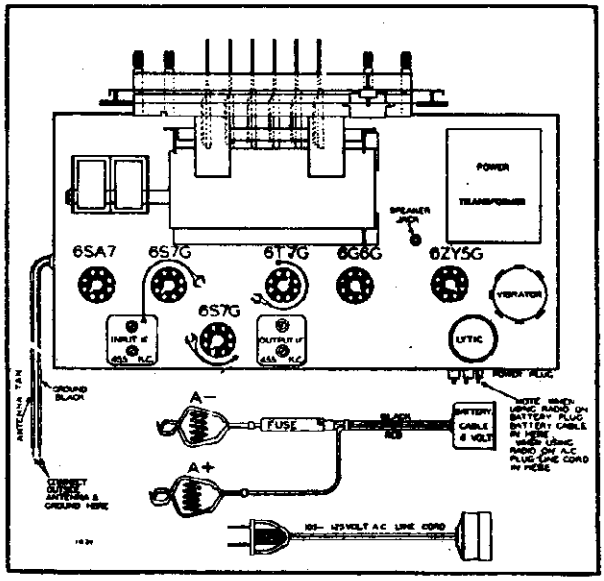
MONTGOMERY-WARD & CO.

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted to Max.
I. F.	455 Kc.	.1 MFD.	Grid of 6S7 I. F.	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top of Output I. F.
	455 Kc.	.1 MFD.	Grid of 6SA7 Mixer	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top of Input I. F.
SHORT WAVE BAND	17 Mc.	400 Ohms	Antenna lead	Short Wave	Set Dial at 17 Mc.	Trimmer C5— S. W. osc.
	17 Mc.	400 Ohms	Antenna lead	Short Wave	Set Dial at 17 Mc.	Trimmer C2 S. W. antenna
	6 Mc.	400 Ohms	Antenna lead	Short Wave	Set Dial at 6 Mc.	Trimmer C8 S. W. osc. series pad (See note "A")
BROAD CAST BAND	1750 Kc.	200 mmf.	Antenna lead	Broadcast	Rotor full open (Plates out of mesh)	Trimmer C6 B. C. osc.
	1500 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1500 Kc.	Trimmer C3 B. C. antenna
	600 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 600 Kc.	Trimmer C7 B. C. osc. series pad (See note "A")

NOTE "A" Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.



CHASSIS VIEW showing tube location and power cables.
NOTE: Antenna and ground leads at side of chassis.

SETTING THE PUSHBUTTONS

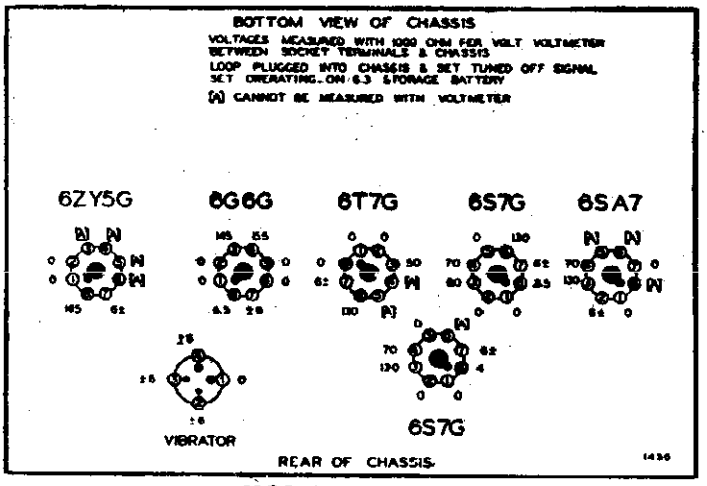
Make a list of your 6 favorite stations. Push out the call letters of these stations from the call letter sheets supplied. Insert a call letter in the slot on top of each pushbutton.

Next pull one of the pushbuttons all the way out as far as it will come. Now tune in the station you want with the tuning knob—Tune back and forth until the station is clear and distinct. Now push the button hard all the way in to lock the station in place. Continue setting each pushbutton in the same way. Pressing the proper button will now tune the station you want. If it does not do so you did not push the button hard enough to lock it in place when setting up the station.

To change stations simply repeat the procedure above.

ANTENNA

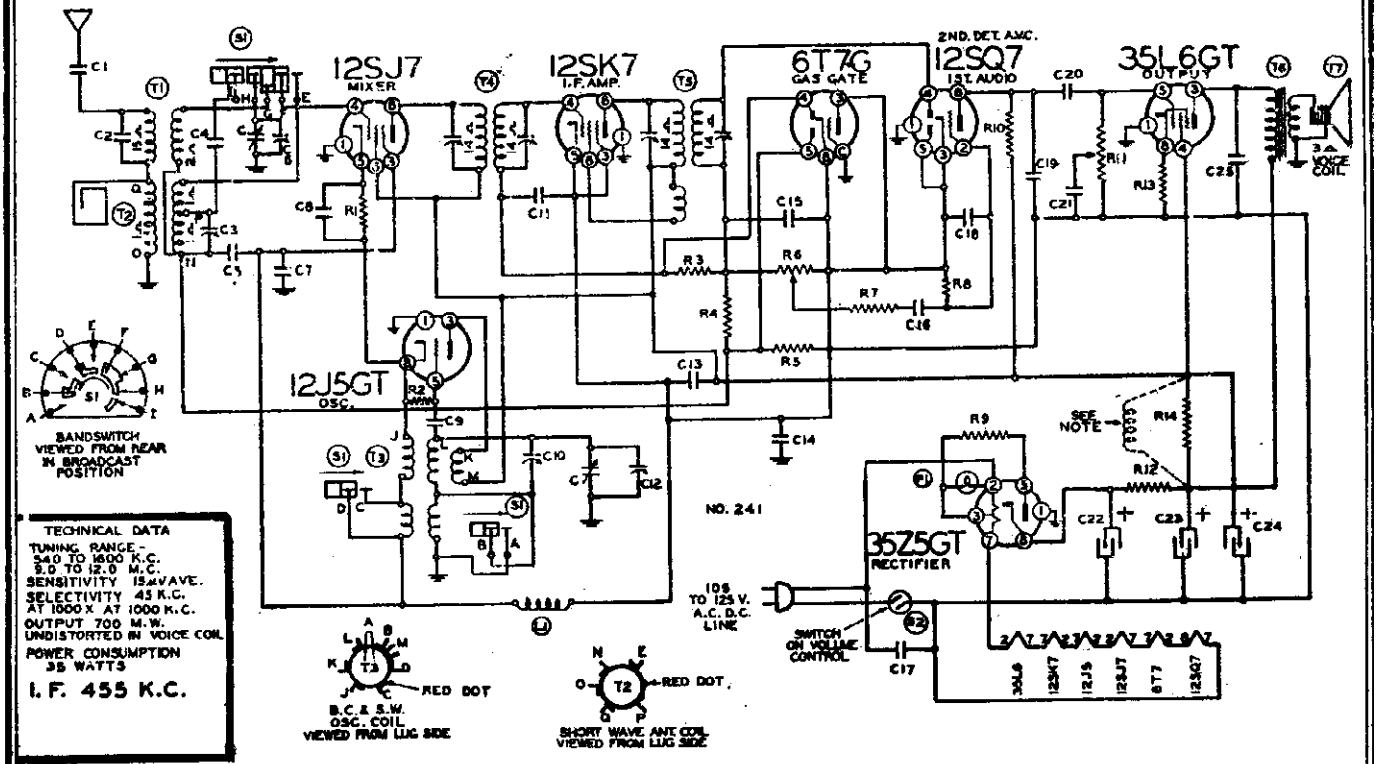
For best results, an outside antenna approximately 50 to 75 feet long including lead-in is recommended. It should be erected as high as possible and as far from surrounding objects as practical. For minimum interference it should be at right angles to street car lines, incoming power lines and other electrical apparatus which may be in the vicinity. A ground is necessary. The ground wire should be connected with a clamp to a well cleaned water pipe or to a piece of pipe driven several feet into damp earth.



VOLTAGE CHART

MONTGOMERY-WARD & CO.

MODELS 14BR-734A, 14BR-735A



On sets which have an electrodynamic speaker, R12 is eliminated and the hot side of C22 is connected in parallel with C23. R14 is replaced by the speaker field.

IS YOUR LINE VOLTAGE CORRECT?

MAY 1941

Unless your radio is marked otherwise, it must be operated from 10. to 125 volts, 50 to 60 cycle current or the same D. C. Voltage. If in doubt, phone your electric light company. Receivers of this same model which are for use on special voltages are marked accordingly. When using your radio on A. C. current, reversing the plug may reduce station hum. If set does not operate in one minute on direct current reverse the plug.

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect B—of radio chassis to ground post of signal generator through .1 Mfd. condenser.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted to Maximum
I. F.	455 Kc.	.1 MFD.	Grid of 12SK7 I. F.	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top of Output I. F.
	455 Kc.	.1 MFD.	Grid of 12SJ7 Mixer	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top of Input I. F.
SHORT WAVE BAND	12 Mc.	400 Ohms	External Antenna and B—	Short Wave	Set Dial at 12 Mc.	S.W. Osc. trimmer C10 S.W. Ant. trimmer C3
BROAD-CAST BAND	1600 Kc.	.1 mmf.	Grid of 12SJ7	Broadcast	Rotor full open (Plates out of mesh)	B.C. Osc. trimmer C12 on Gang
	1400 Kc.	200 mmf.	External Antenna and B—	Broadcast	Set Dial at 1400 K. C.	B.C. Ant. trimmer C6

NOTE: The Oscillator Frequency is lower than the signal frequency and should be aligned accordingly. The loop antenna should be connected to the radio when making all adjustments.

MODELS 14BR-734A, 14BR-735A

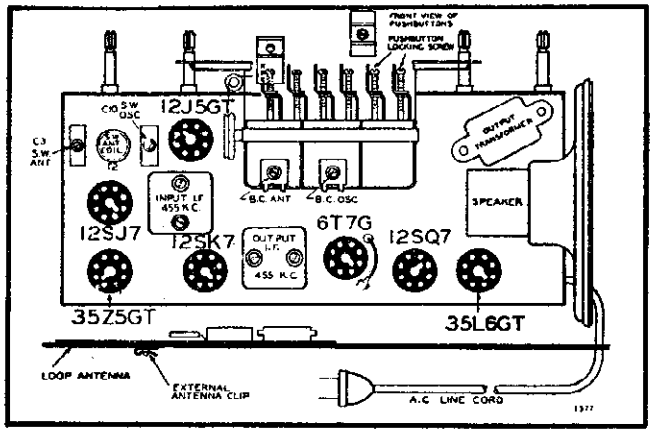
MONTGOMERY-WARD & CO.

SETTING THE PUSHBUTTONS

Make a list of your 6 favorite stations—push out the call letters of these stations from the call letter sheets supplied. Next insert a long slim screw driver into the hole in front of one of the pushbuttons and unscrew the pushbutton locking screw (to the left) several turns. Now with the screw driver still engaged in the locking screw slot push it all the way in. Hold it in this position and tune in the station you want with the tuning knob. Now tighten up the pushbutton locking screw by turning it to the right. Tighten firmly. Continue setting each button in the same way. When you have set your stations insert the call letter of each station in the front of the proper button and put one of the celluloid tabs over the station call letter.

To change stations simply repeat the above procedure.

If you are unable to set a station on any particular button it is probably because the pushbutton locking screw has not been fully unloosened (turned to the left).



Chassis View, showing Tube Location and the Outside Antenna Clip.

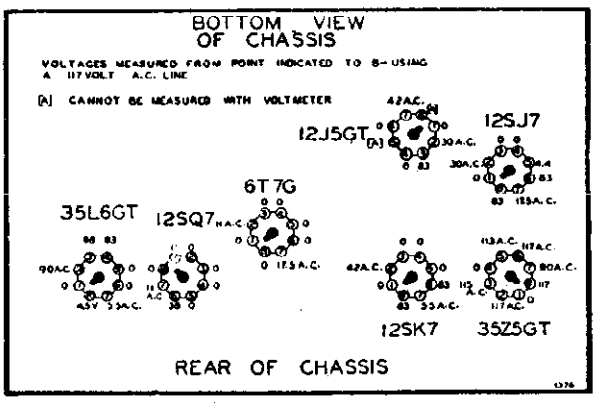
REPLACEMENT PARTS LIST

Part No.	Schematic Reference	Description	No. Used In Set	Selling Price Each
		CONDENSERS		
BE1009	C11	.05 x 200 Volt Tubular Condenser	1	.12
BE10019	C16, C21	.006 x 600 Volt Tubular Condenser	2	.12
BE10020	C13	.1 x 200 Volt Tubular Condenser	1	.12
BE10026	C25, C20	.02 x 400 Volt Tubular Condenser	1	.12
BE10037	C1	.003 x 600 Volt Tubular Condenser	1	.12
BE100119	C7, C14	.1 x 400 Volt Tubular Condenser	2	.12
BE100127	C8	.01 x 120 Volt Tubular Condenser	1	.12
BE100128	C5	.05 x 120 Volt Tubular Condenser	1	.12
BE100138	C17	.03 x 400 Volt Tubular Condenser	1	.12
BE119129		Electrolytic Filter Cond. added for 25 cycle only. 40 mfd. x 150 Volts across C22 and 20 Mfd. x 150 Volts across C23		.70
BE119128	C22, C23, C24	Electrolytic Filter Condenser—40 mfd.—20 mfd.—20 mfd. x 150 Volts	1	.70
BE124139	C3, C10	S. W. Antenna and Oscillator Trimmer Condenser	2	.16
BE1295	C9, C18	.0001 Mica Type Condenser—20%	2	.12
BE12921	C15	.0002 Mica Type Condenser—20%	1	.12
BE12960	C2	.00015 Mica Type Condenser—10%	1	.12
BE129181	C4	.000445 Mica Type Condenser—3%	1	.18
BE12912	C19	.00025 Mica Type Condenser	1	.12
		RESISTORS		
BE1309	R10	200M ohm—½ Watt Resistor—20%	1	.10
BE13012	R2, R7	50M ohm—½ Watt Resistor—20%	2	.10
BE13038	R4	2 Megohm—½ Watt Resistor—20%	1	.10
BE13084	R12	200 Ohm—½ Watt Resistor—20%	1	.10
BE130128	R9	20 Ohm—½ Watt Resistor—20%	1	.10
BE130166	R13	150 Ohm—½ Watt Resistor—10%	1	.10
BE130218	R1	5M Ohm—½ Watt Resistor—10%	1	.10
BE130257	R8	5 Megohm—½ Watt Resistor—25%	1	.10
BE130287	R14	1200 Ohm—1 Watt Resistor—10%	1	.10
BE130350	R3, R5	3, 2 Megohm—½ Watt Resistor—20%	2	.10
		SOCKETS		
BE121210		Eight Prong Molded Octal Socket	6	.10
BE121273		Eight Prong Wafer Octal Socket—with Shield for Guide Pin	1	.10
		SPEAKER		
BE114247	T7	Six inch P. M. Dynamic Speaker (less Output Transformer)	1	2.50
		OR		
BE114264	T7	Six Inch Electro Dynamic Speaker. Less Output Transformer.		
BE105134	T6	Output Transformer for Speaker	1	.50
		COILS		
BE108206	T4	Input I. F. Coil Complete in Can	1	.76
BE108205	T5	Output I. F. Coil Complete in Can	1	.76
BE110184	T3	B. C. - S. W. Oscillator Coil	1	.60
BE111249	T2	S. W. Antenna Coil	1	.30
BE111250	T1	Loop Antenna Assembly	1	.90
BE12316	L1	Choke Coil	1	.18

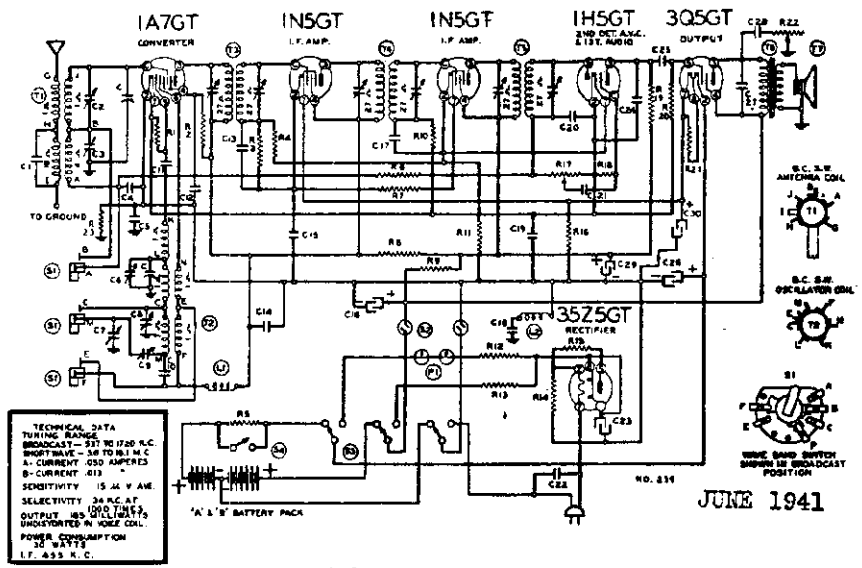
ANTENNA

This radio is designed to pick up strong local stations without requiring an outside antenna. For best results, however, an outside antenna approximately 50 to 75 feet long including lead-in is recommended. It should be erected as high as possible and as far from surrounding objects as practical. For minimum interference it should be at right angles to street car lines, incoming power lines and other electrical apparatus which may be in the vicinity. A ground is not required.

Periodic inspection of the antenna system is recommended to be sure that all connections are clean and tight, and that the antenna is well insulated from the ground at all points.



Voltage Chart



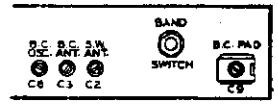
JUNE 1941

SETTING THE PUSHBUTTONS

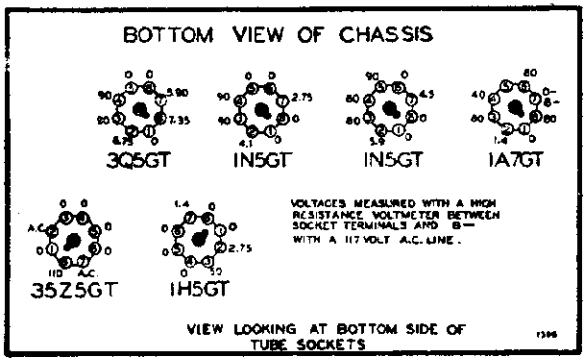
Make a list of your 6 favorite stations. Push out the call letters of these stations from the call letter sheets supplied. Insert a call letter in the slot on top of each pushbutton.

Next pull one of the pushbuttons all the way out as far as it will come. Now tune in the station you want with the tuning knob—Tune back and forth until the station is clear and distinct. Now push the button hard all the way in to lock the station in place. Continue setting each pushbutton in the same way. Pressing the proper button will now tune the station you want. If it does not do so you did not push the button hard enough to lock it in place when setting up the station.

To change stations simply repeat the procedure above.



TRIMMER VIEW
Looking at front of chassis.



CONDENSERS

BE100133	C10, C14	.1 x 120 Volt Tubular Condenser—2	.12	
BE100135	C15, C19	.25 x 120 Volt Tubular Condenser—2	.12	
BE100128	C13, C17	.05 x 120 Volt Tubular Condenser—2	.12	
BE100105	C22	.02 x 400 Volt Tubular Condenser—1	.12	
BE100127	C28	.01 x 120 Volt Tubular Condenser—1	.12	
BE10097	C18	.02 x 600 Volt Tubular Condenser—1	.12	
BE10071	C27	.004 x 600 Volt Tubular Condenser—1	.12	
BE10019	C21	.006 x 600 Volt Tubular Condenser—1	.12	
BE10026	C25	.02 x 400 Volt Tubular Condenser—1	.12	
BE1009	C4, C12	.05 x 200 Volt Tubular Condenser—2	.12	
BE100140	C5	.2 x 400 Volt Tubular Condenser—1	.12	
BE119132	C30	Electrolytic Filter Condenser, 20 Mfd. x 25 Volts—1	.28	
BE119131	C16, C23, C26, C29	Electrolytic Filter Cond. 50-60 Cycles. 40 Mfd. x 150 V.; 40 Mfd. x 150 V.; 200 Mfd. x 10 V.; 10 Mfd. x 150 V.—1	.90	
BE124171	C2, C3, C8	Triple Unit Trimmer Cond. C2, S.W. Ant. Trimmer. C3, B.C. Ant. Trimmer. C8, B.C. Osc. Trimmer—1	.40	
BE124173	C9	B.C. Series Pad. 580 Mmfd.—1	.24	
BE1295	C1	.0001 Mica Type Condenser—20%—1	.12	
BE12912	C20, C24	.00025 Mica Type Condenser—20%—2	.12	
BE12939	C11	.00005 Mica Type Condenser—20%—1	.12	
BE129125	C7	S.W. Padder Condenser—1	.50	

RESISTORS

BE130223	R3	10 Megohm—½ Watt Resistor—20%—1	.10	
BE130235	R13	1500 Ohm—½ Watt Resistor—10%—1	.10	
BE1309	R1	200M Ohm—½ Watt Resistor—20%—1	.10	
BE13012	R2	50M Ohm—½ Watt Resistor—20%—1	.10	
BE130257	R4, R10, R18	5 Megohm—½ Watt Resistor—25%—3	.10	
BE130347	R7	15 Ohm—½ Watt Resistor—10%—1	.10	
BE1305	R23	300M Ohm—½ Watt Resistor—20%—1	.12	
BE130192	R11	2M Ohm—½ Watt Resistor—10%—1	.10	
BE1303	R19	500M Ohm—½ Watt Resistor—20%—1	.10	
BE1304	R6, R20	3 Megohm—½ Watt Resistor—20%—2	.10	
BE130200	R16	700 Ohm—½ Watt Resistor—10%—1	.10	
BE130197	R5	20 Ohm—½ Watt Resistor—10%—1	.10	
BE130345	R9	1000 Ohm—½ Watt Resistor—10%—1	.10	
BE130343	R14	545 Ohm—1/4 Watt Resistor—5%—1	.28	
BE130353	R12	2075 Ohm—6 Watt Resistor—5%—1	.22	
BE130233	R15	60 Ohm—½ Watt Resistor—10%—1	.10	
BE130222	R21	350 Ohm—½ Watt Resistor—10%—1	.10	
BE130193	R8	3M Ohm—½ Watt Resistor—10%—1	.10	

COILS

BE108204	T3	Input I.F. Complete in Can—1	.76
BE108204B	T5	Interstage I.F. Complete in Can—1	.76
BE108188B	T4	Output I.F. Complete in Can—1	.76
BE110183	T2	B.C.-S.W. Oscillator Coil—1	.60
BE111248	T1	B.C.-S.W. Antenna Coil—1	.60
BE1233	L1	R.F. Choke Coil—1	.26
BE105137	L2	Choke Coil—1	.08

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator.

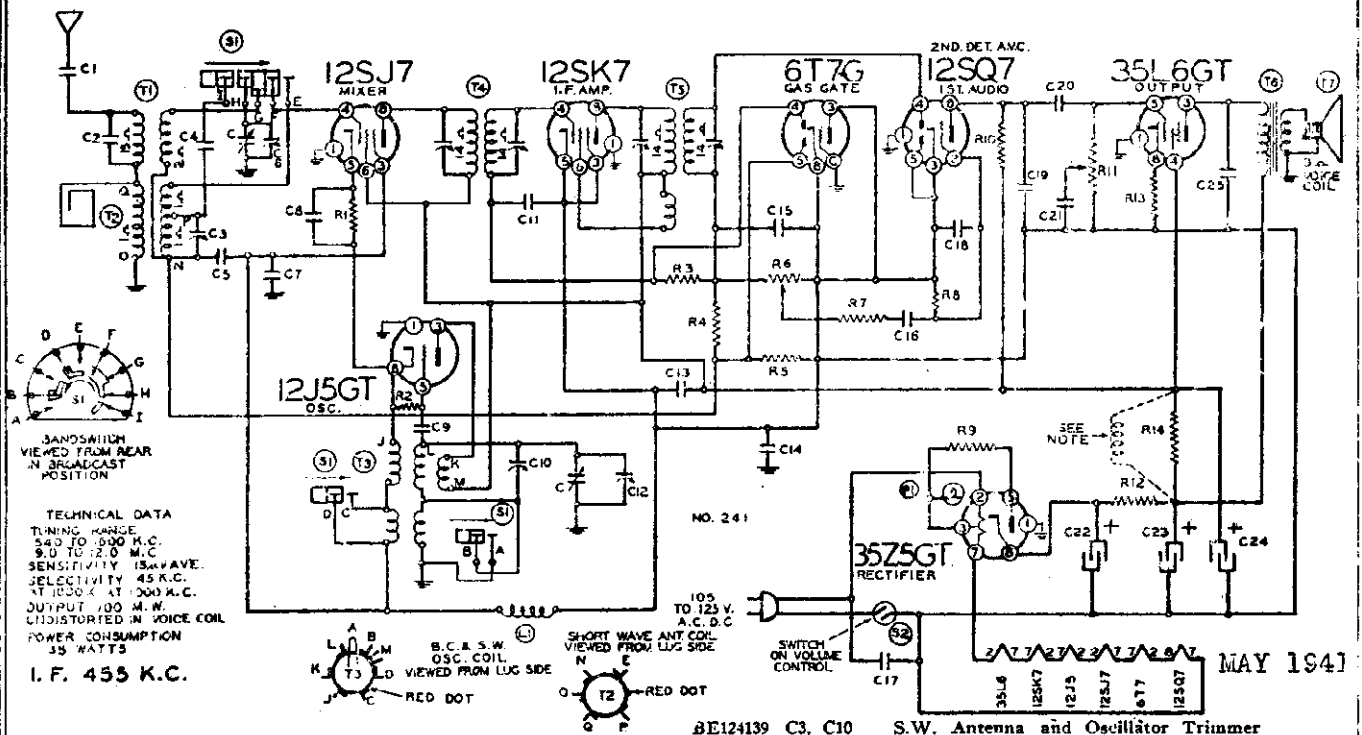
ALIGNMENT PROCEDURE

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted to Max.
I. F.	455 Kc.	.1 MFD.	Grid of 1N5G 2nd I. F.	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top of Output I. F.
	455 Kc.	.1 MFD.	Grid of 1N5G 1st I. F.	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top of Interstage I. F.
	455 Kc.	.1 MFD.	Grid of 1A7G Mixer	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top of Input I. F.
SHORT WAVE BAND	16 Mc.	400 ohms	Antenna lead	Short Wave	Set Dial at 16 Mc.	Trimmer C6—S. W. osc. Top of front section of gang
	16 Mc.	400 ohms	Antenna lead	Short Wave	Set Dial at 16 Mc.	Trimmer C2 S. W. antenna
	6 Mc.	400 ohms	Antenna lead	Short Wave	Set Dial at 6 Mc.	Trimmer C7 S. W. osc. series pad (See note "A")
BROAD-CAST BAND	1720 Kc.	200 mmf.	Antenna lead	Broadcast	Rotor full open (Plates out of mesh)	Trimmer C8 B. C. osc.
	1500 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1500 Kc.	Trimmer C3 B. C. antenna
	600 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 600 Kc.	Trimmer C9 B. C. osc. series pad (See note "A"

NOTE "A" Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

MODEL 14BR-736A

MONTGOMERY-WARD & CO.

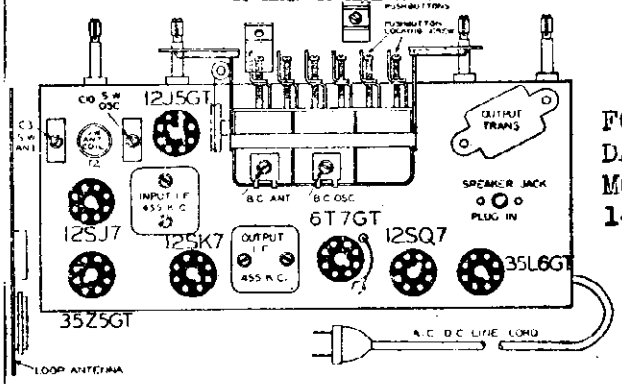


TECHNICAL DATA
TUNING RANGE
540 TO 1600 K.C.
9.0 TO 21.0 M.C.
SENSITIVITY 15 MICROVOLTS
SELECTIVITY 45 K.C. AT 1000 K.C. AT 1000 K.C.
OUTPUT 4.00 M. W. UNDISTORTED IN VOICE COIL
POWER CONSUMPTION 35 WATTS

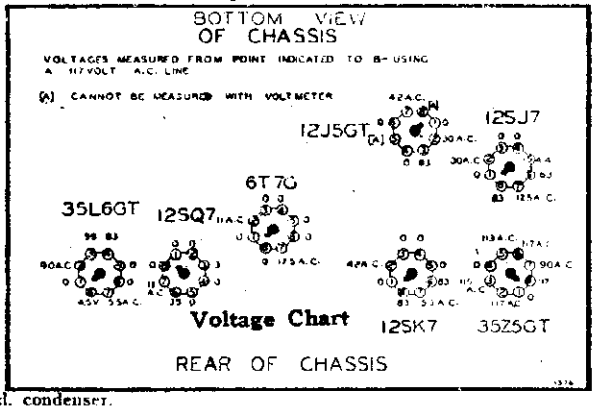
I. F. 455 K.C.

MAY 1941

BE100128	C5	.05 x 120 Volt Tubular Condenser	1	.12	BE124139	C3, C10	S.W. Antenna and Oscillator Trimmer Condenser	2	.15
BE100119	C7, C14	.1 x 400 Volt Tubular Condenser	2	.12	BE129181	C4	.000445 Mica Type Condenser—3%	1	.13
BE100127	C8	.01 x 120 Volt Tubular Condenser	1	.12	BE12921	C15	.0002 Mica Type Condenser—20%	1	.12
BE10020	C13	.1 x 200 Volt Tubular Condenser	1	.12	BE1295	C9, C18	.0001 Mica Type Condenser—20%	2	.12
BE1009	C11	.05 x 200 Volt Tubular Condenser	1	.12	BE12960	C2	.00015 Mica Type Condenser—20%	1	.12
BE100138	C17	.03 x 400 Volt Tubular Condenser	1	.12	BE12912	C19	.00025 Mica Type Condenser	1	.12
BE10026	C25, C20	.02 x 400 Volt Tubular Condenser	1	.12	BE130218	R1	5M Ohm—⅓ Watt Resistor—10%	1	.10
BE10019	C16, C21	.006 x 600 Volt Tubular Condenser	2	.12	BE130166	R13	150 Ohm—⅓ Watt Resistor—10%	1	.10
BE10037	C1	.003 x 600 Volt Tubular Condenser	1	.12	BE13084	R12	200 Ohm—⅓ Watt Resistor—20%	1	.10
BE119129		Electrolytic Filter Cond. Added for 25 Cycle Only. 40 Mfd x 150 Volts Across C22 and 20 Mfd. x 150 Volts Across C23	1	.70	BE130128	R9	20 Ohm—⅓ Watt Resistor—20%	1	.10
					BE13012	R2, R7	50M Ohm—⅓ Watt Resistor—20%	2	.10
BE119128	C22, C23, C24	Electrolytic Filter Condenser. 40 Mfd.—20 Mfd.—20 Mfd. x 150 Volts	1	.70	BE130287	R14	1200 Ohm—1 Watt Resistor—10%	1	.10
					BE130350	R3, R5	3.2 Megohm—½ Watt Resistor—20%	2	.10
					BE13038	R4	2 Megohm—⅓ Watt Resistor—20%	1	.10
					BE130257	R8	5 Megohm—⅓ Watt Resistor—25%	1	.10
					BE1309	R10	200M Ohm—⅓ Watt Resistor—20%	1	.10



FOR TUNER DATA SEE MODEL 14BR-734A



ALIGNMENT PROCEDURE

Connect B—of radio chassis to ground post of signal generator through .1 Mfd. condenser.

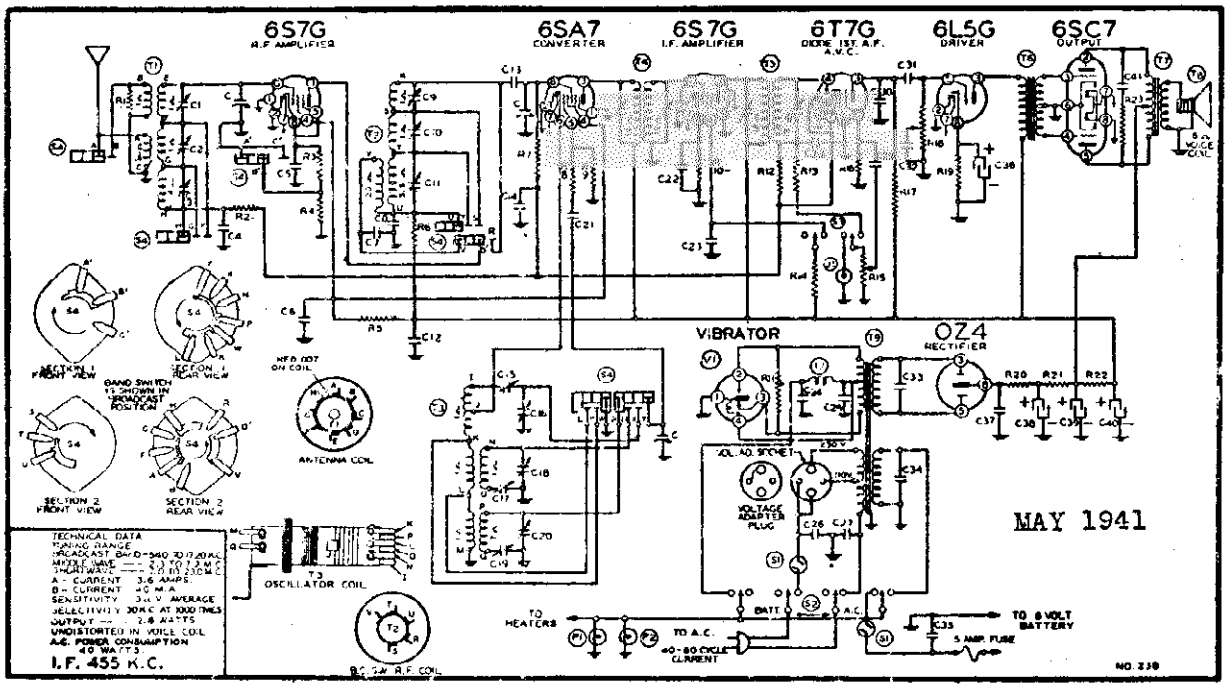
BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted to Maximum
I. F.	455 Kc.	.1 MFD.	Grid of 12SK7 I. F.	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top of Output I. F.
	455 Kc.	.1 MFD.	Grid of 12SJ7 Mixer	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top of Input I. F.
SHORT WAVE BAND	12 Mc.	400 Ohms	External Antenna and B—	Short Wave	Set Dial at 12 Mc.	S.W. Osc. trimmer C10 S.W. Ant. trimmer C3
BROAD-CAST BAND	1600 Kc.	.1 mmf.	Grid of 12SJ7	Broadcast	Rotor full open (Plates out of mesh)	B.C. Osc. trimmer C12 on Gang
	1400 Kc.	200 mmf.	External Antenna and B—	Broadcast	Set Dial at 1400 Kc.	B.C. Ant. trimmer C6

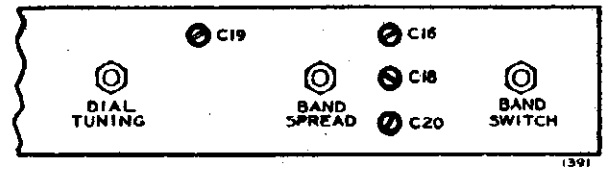
NOTE: The Oscillator Frequency is lower than the signal frequency and should be aligned accordingly.

The loop antenna should be connected to the radio when making all adjustments.

MODEL 14BR-742A

MONTGOMERY-WARD & CO.





TRIMMER VIEW—Looking at front of chassis.

REPLACEMENT PARTS LIST

Part No.	Schematic Diagram Reference	Description	In Set	Selling Price Each
CONDENSERS				
BE1001	C6, C37	.1 x 400 Volt Tubular Condenser	2	.12
BE10011	C26, C27, C31, C32, C34	.01 x 400 Volt Tubular Condenser	5	.12
BE10013	C8, C23	.05 x 400 Volt Tubular Condenser	2	.12
BE10020	C5	.1 x 200 Volt Tubular Condenser	1	.12
BE10022	C4, C22, C35	.05 x 200 Volt Tubular Condenser	3	.12
BE10025	C29	.002 x 600 Volt Tubular Condenser	1	.12
BE10026	C13, C14	.02 x 400 Volt Tubular Condenser	2	.12
BE10031	C24, C25	.5 x 120 Volt Tubular Condenser	2	.36
BE10071	C41	.004 x 600 Volt Tubular Condenser	1	.12
BE100100	C33	.008 x 1600 Volt Tubular Condenser	1	.12
BE100117	C12	.25 x 400 Volt Tubular Condenser with Bracket	1	.20
BE119127	C36, C38, C39,	C40 Electrolytic Filter Condenser, 40 Mfd. x 25 V.; 40 Mfd. x 300 V.—20 Mfd. x 300 V.—20 Mfd. x 300 V.	1	.90
BE124169	C9, C10, C11	S.W.—M.W.—B.C.—Triple Unit R. F. Trimmer Condenser Strip	1	.48
BE124170	C1, C2, C3	S.W.—M.W.—B.C.—Triple Unit Antenna Trimmer Strip	1	.48
BE124172	C16, C18, C20	S.W.—M.W.—B.C.—Triple Unit Antenna Trimmer Strip	1	.44
BE129178	C19	B.C. Osc. Series Pad Condenser	1	.16
BE129179	C17	M.W. Osc. Series Pad Condenser	1	.36
BE129180	C15	S.W. Osc. Series Pad Condenser	1	.44
BE1295	C21, C28	.0001 Mica Type Condenser—20%	2	.12
BE12912	C30	.00025 Mica Type Condenser—20%	1	.12
BE12940	C7	.0001 Mica Type Condenser—10%	1	.12
RESISTORS				
BE1304	R12	3 Megohm—½ Watt Resistor—20%	1	.10
BE1309	R17	200M Ohm—½ Watt Resistor—20%	1	.10
BE13012	R13	50M Ohm—½ Watt Resistor—20%	1	.10
BE13019	R7	1 Megohm—½ Watt Resistor—20%	1	.10
BE13020	R2	100M Ohm—½ Watt Resistor—20%	1	.10
BE13027	R20	50 Ohm—½ Watt Resistor—20%	1	.10
BE13031	R6	1500 Ohm—½ Watt Resistor—20%	1	.10
BE13057	R9	35M Ohm—½ Watt Resistor—20%	1	.10
BE13064	R4	3500 Ohm—½ Watt Resistor—20%	1	.10
BE13066	R14	75M Ohm—½ Watt Resistor—10%	1	.10
BE13084	R11, R21	200 Ohm—½ Watt Resistor—20%	2	.10
BE13099	R3	300 Ohm—½ Watt Resistor—20%	1	.10
BE130199	R22	1500 Ohm—1 Watt Resistor—10%	1	.10
BE130235	R19	1500 Ohm—½ Watt Resistor—10%	1	.10
BE130257	R16	5 Megohm—½ Watt Resistor—25%	1	.10
BE130304	R5	12M Ohm—2 Watt Resistor—10%	1	.10
BE130345	R10	1M Ohm—½ Watt Resistor—10%	1	.10
BE13023	R1	2M Ohm—½ Watt Resistor—20%	1	.10
BE130149	R23	15M Ohm—½ Watt Resistor—20%	1	.10
BE130327	R8	10 Ohm—½ Watt Resistor—20%	1	.10

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

ANTENNA

For best results, an outside antenna approximately 50 to 75 feet long including lead-in is recommended. It should be erected as high as possible and as far from surrounding objects as practical. For minimum interference it should be at right angles to street car lines, incoming power lines and other electrical apparatus which may be in the vicinity. A ground is advisable. A good ground will often reduce noise. The ground wire should be connected with a clamp to a well cleaned water pipe or to a piece of pipe driven several feet into damp earth.

SPEAKER

BE114250	T8	Eight Inch P.M. Dynamic Speaker Less Output Transformer	1	4.00

COILS

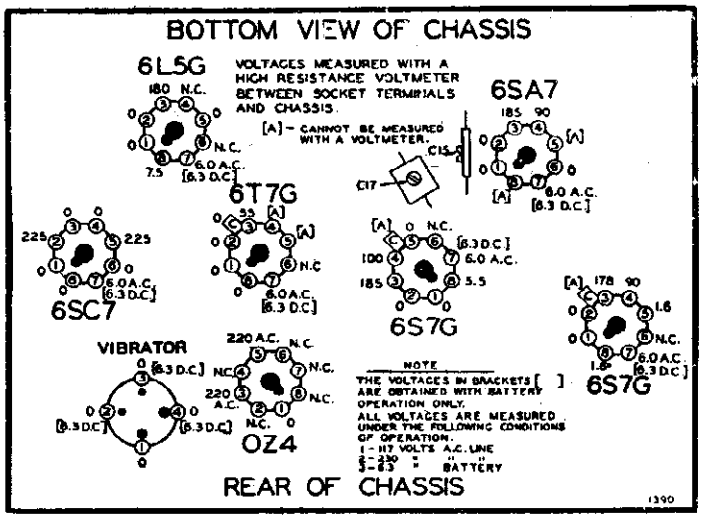
BE108207	T4	Input I.F. Coil Complete in Can	1	1.00
BE108208	T5	Output I.F. Coil Complete in Can	1	1.00
BE10968	T2	B.C. R.F. Coil Complete in Can	1	.80
BE110181	T3	B.C.—M.W.—S.W. Oscillator Coil in Can	1	.60
BE111246	T1	B.C.—M.W.—S.W. Antenna Coil in Can	1	.72

TRANSFORMERS

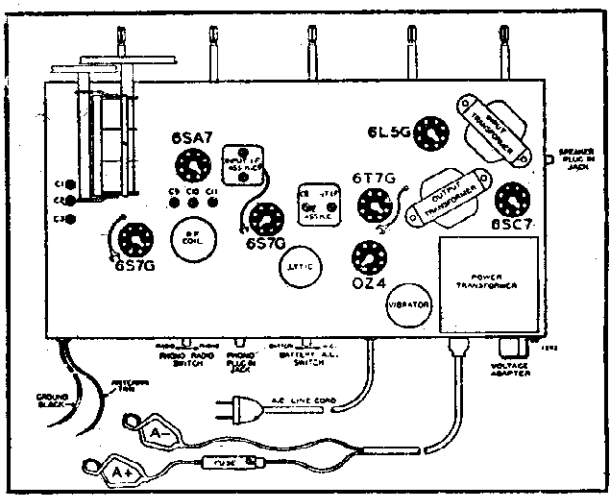
BE104265	T9	Power Transformer	1	2.50
BE105101B	T6	Input Audio Transformer	1	1.12
BE105133	T7	Output Transformer for Speaker	1	1.1

MODEL 14BR-742A

MONTGOMERY-WARD & CO.



VOLTAGE CHART



CHASSIS VIEW showing tube location.
NOTE: Antenna and ground leads at back of chassis.

POWER SUPPLY

Unless your radio is marked otherwise it is designed to operate on the following power supplies:

6 volt storage battery
105 to 125 volts 40 to 60 cycles (A.C.)
200 to 250 volts 40 to 60 cycles (A.C.)

For 6 Volt Battery Operation—The Batt-A.C. switch (see chassis view) must be in battery position and battery cables connected to battery.

For 105 to 125 Volt Operation—The red dot on "Adapter Plug" (see chassis view) must point to 110 V.

For 200 to 250 Volt Operation—The red dot on "Adapter Plug" must point to 230 V.

To Change "Adapter Plug" loosen the bracket, pull the plug out and replace it in the desired position.

Caution: The Batt-A.C. switch must be in the proper position before connecting receiver to the electrical supply.

ALIGNMENT PROCEDURE

● Volume control—Maximum all adjustments. ● Connect radio chassis to ground post of signal generator.

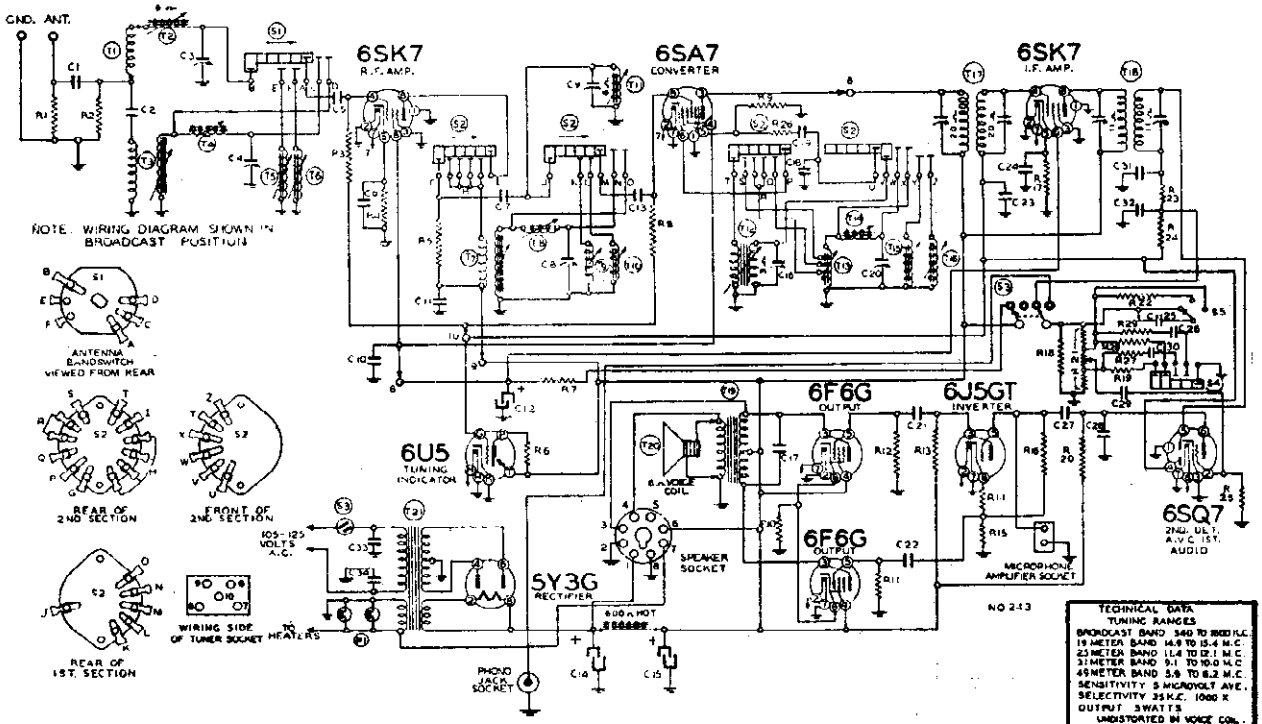
BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted to Max.
I. F.	455 Kc.	.1 MFD.	Grid of 6S7 I. F.	Broadcast	Tuning & Bandspread Plates out of mesh	Two trimmers on top of Output I. F.
	455 Kc.	.1 MFD.	Grid of 6SA7 I. F.	Broadcast	Tuning & Bandspread Plates out of mesh	Two trimmers on top of Input I. F.
SHORT WAVE BAND	17 Mc.	400 ohms	Antenna lead	Short Wave	Set Dial at 17 Mc.	Trimmer C16—S. W. osc. (See Note A)
	17 Mc.	400 ohms	Antenna lead	Short Wave	Set Dial at 17 Mc.	Trimmer C1-C9 S. W. ant. and R. F.
	8 Mc.	400 ohms	Antenna lead	Short Wave	Set Dial at 8 Mc.	Trimmer C15 S. W. osc. series pad (See note "B")
MEDIUM WAVE BAND	6 Mc.	400 ohms	Antenna lead	Medium Wave	Set Dial at 6 Mc.	Trimmer C18 M. W. osc.
	6 Mc.	400 ohms	Antenna lead	Medium Wave	Set Dial at 6 Mc.	Trimmer C2-C10 ant. and R. F.
	2.5 Mc.	400 ohms	Antenna lead	Medium Wave	Set Dial at 2.5 Mc.	Trimmer C17 osc. series pad (See note "B")
BROADCAST BAND	1720 Kc.	200 mmf.	Antenna lead	Broadcast	Tuning & Bandspread Plates out of mesh	Trimmer C20 B. C. osc.
	1400 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1400 Kc.	Trimmer C3-C11 B. C. ant. R. F.
	600 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 600 Kc.	Trimmer C19 B. C. osc. series pad (See note "B")

NOTE "A"—It is extremely necessary that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental.

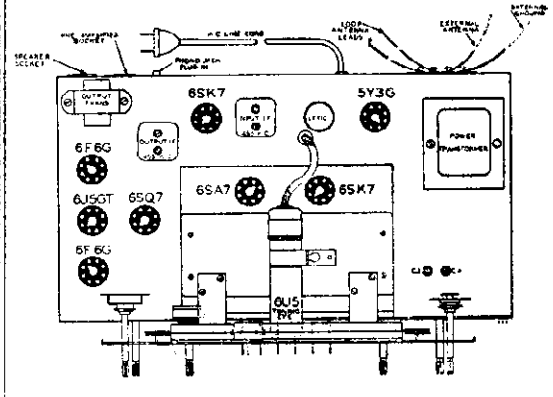
NOTE "B"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained. **After each range is completed, repeat the procedure as a final check.**

MODEL 14BR-911A

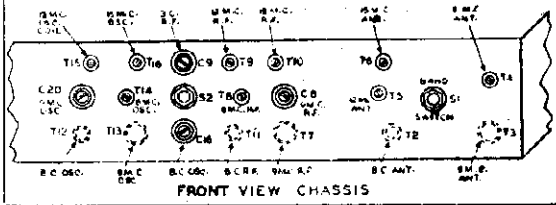
MONTGOMERY-WARD & CO.



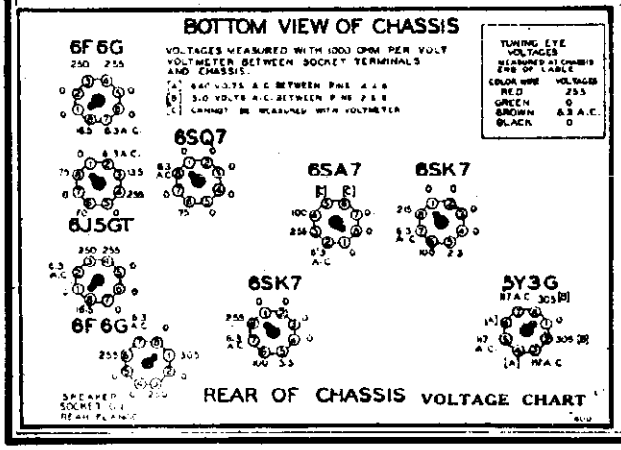
TECHNICAL DATA
TUNING RANGES
BROADCAST BAND 540 TO 1600 K.C.
19 METER BAND 14.6 TO 15.4 M.C.
25 METER BAND 11.4 TO 12.1 M.C.
31 METER BAND 9.1 TO 10.0 M.C.
49 METER BAND 5.9 TO 6.2 M.C.
SENSITIVITY 5 MICROVOLT AVE.
SELECTIVITY 25 K.C. 1000 X
OUTPUT 5 WATTS
UNDISTORTED IN VOICE COIL.
POWER CONSUMPTION 100 WATTS.
I.F. 455 K.C.



TRIMMER VIEW



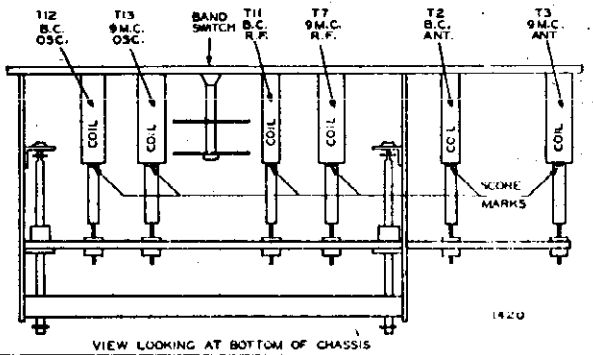
FRONT VIEW CHASSIS



R1	BE1301	25M ohm—½ w.
R2	BE1301	25M ohm—½ w.
R3	BE13019	1 Megohm—½ w.
R4	BE130239	250 ohm—½ w.
R5	BE130218	5M ohm—½ w.
R6		1 megohm in tuning indicator cable
R7	BE10662	12,500 ohm—3 w.
R8	BE13019	1 megohm—½ w.
R9	BE130232	25M ohm—½ w.
R10	BE130220	300 ohm—1 w.
R11	BE1303	500M ohm—½ w.
R12	BE1303	500M ohm—½ w.
R13	BE130103	100M ohm—½ w.
R14	BE130218	5M ohm—½ w.
R15	BE130103	100M ohm—½ w.
R16	BE13019	1 megohm—½ w.
R17	BE13070	500 ohm—½ w.
R18	BE1303	500M ohm—½ w.
R19	BE1303	500M ohm—½ w.
R20	BE13011	250M ohm—½ w.
R21	BE101267	2.8 megohm—Volume control
R22	BE130191	1.5 megohm—½ w.
R23	BE13012	50M ohm—½ w.
R24	BE1304	3 megohm—½ w.
R25	BE130257	5 megohm—½ w.
R26	BE130174	50 ohm—½ w.
R27	BE1307	10M ohm—½ w.
R28	BE130352	150M ohm—½ w.
R29	BE130351	80M ohm—½ w.
C1	BE1292	.0005 mica
C2	BE10047	.002 x 600 v.
C3	BE124143	B.C. antenna trimmer
C4	BE124143	9 mc. antenna trimmer
C5	BE1292	.0005 mica
C6	BE10020	.1 x 200 v. tubular condenser
C7	BE129168	.00001 mica
C8	BE124138	9 mc. R.F. trimmer
C9	BE124139	B.C. R.F. trimmer
C10	BE10074	.1 x 400 v.
C11	BE10074	.1 x 400 v.
C12	BE119109	10.0 mfd. x 350 w. v. lytic
C13	BE1292	.0005 mica
C14	BE119109	15.0 mfd. x 450 w. v. lytic
C15	BE119109	15.0 mfd. x 450 w. v. lytic
C16	BE124144	B.C. oscillator trimmer
C17	BE10071	.004 x 600 v.
C18	BE129167	.0002 silver mica
C19	BE129165	.00005 mica
C20	BE124145	9 mc. oscillator trimmer
C21	BE10013	.05 x 400 v.
C22	BE1009	.05 x 200 v.
C23	BE10026	.02 x 400 v.
C24	BE10020	.1 x 200 v.
C25	BE12951	.000125 mica
C26	BE1002	.003 x 300 v.
C27	BE10026	.02 x 400 v.
C28	BE12921	.0002 mica
C29	BE10019	.006 x 600 v.
C30	BE100139	.0015 x 200 v.
C31	BE129165	.00005 mica
C32	BE129165	.00005 mica
C33	BE10061	.02 x 600 v. Bakelite
C34	BE10061	.02 x 600 v. Bakelite

C12, C14 and C15 are in same unit

JUNE 1941

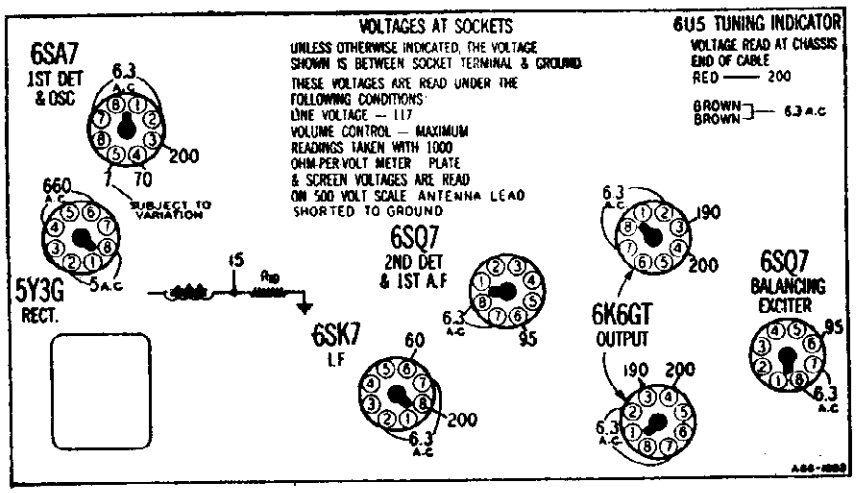


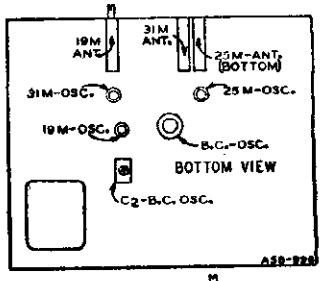
VIEW LOOKING AT BOTTOM OF CHASSIS

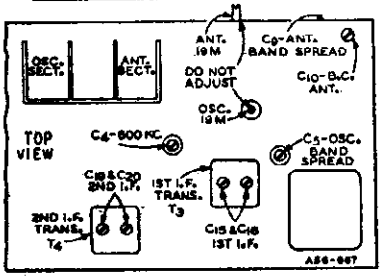
MODEL 14BR-911A

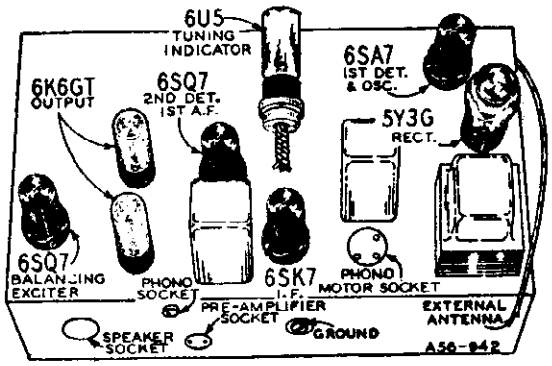
MONTGOMERY-WARD & CO.

MODELS 14WG-808M, 14WG-808W









ALIGNMENT FOR MODELS 14WG-808M, 14WG-808W IS THE SAME AS THAT FOR MODEL 14WG-807

FOR SEEBURG C RECORD CHANGER SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

SPECIFICATIONS

Power Consumption	57 Watts (at 117 volts 60 cycles) 77 Watts (Phonograph Operating)
Power Output	3.0 Watts Undistorted 4.5 Watts Maximum
Selectivity	38 KC Broad at 1000 times Signal
Intermediate Frequency	456 KC
Speaker	10" Electro-Dynamic

Band	Tuning Frequency Range	Sensitivity External Antenna (For 0.5 Watt Output)
B Range	535 to 1610 KC	15 Microvolts Aver.
19 Meter	14.6 to 15.8 MC	26 Microvolts Aver.
25 Meter	11.1 to 12.0 MC	25 Microvolts Aver.
31 Meter	9.3 to 10.05 MC	22 Microvolts Aver.

- Tone control—Treble
- Volume control—Maximum all adjustments.
- Use an all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.

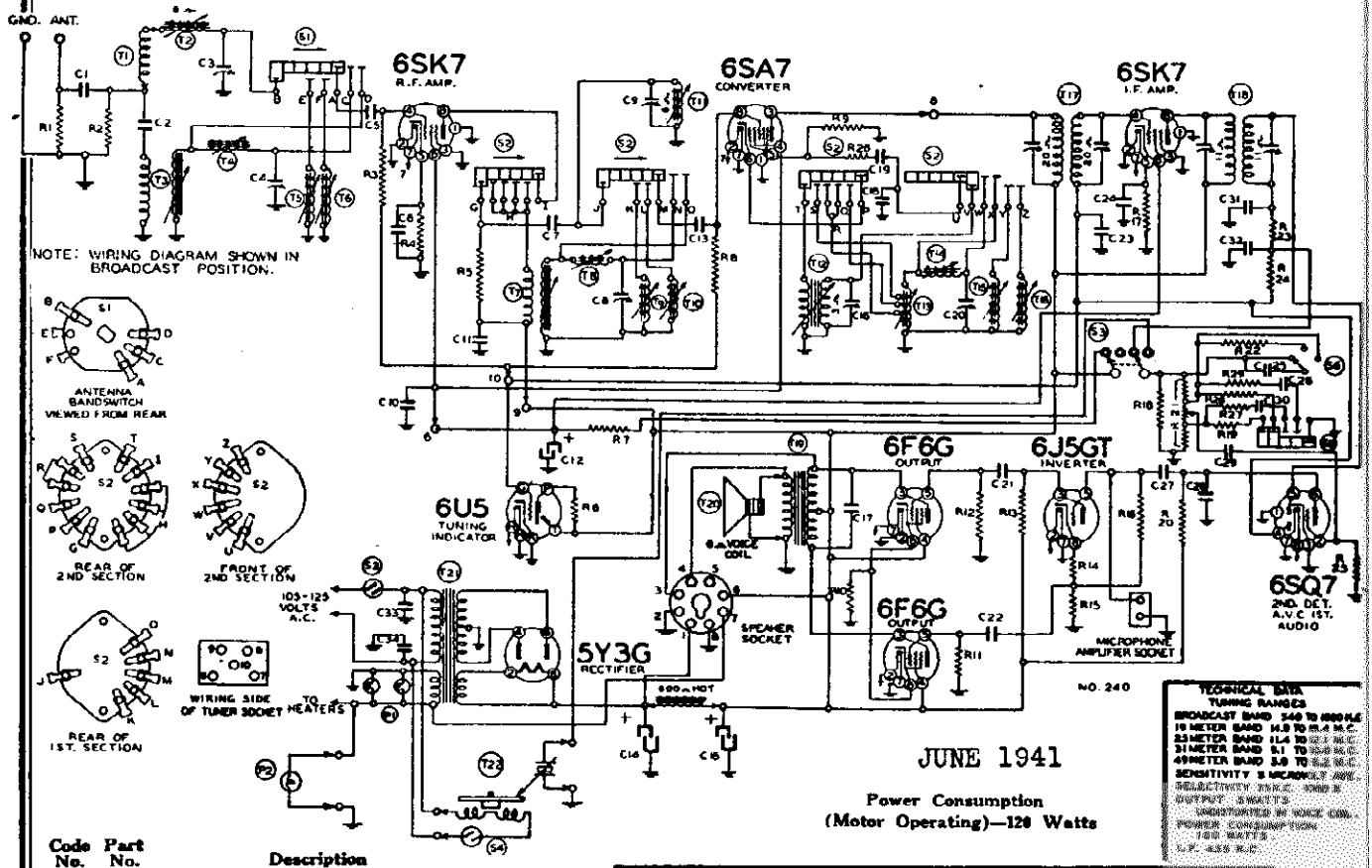
MODEL 14BR-911A

ALIGNMENT PROCEDURE

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Dial Pointer Setting	Trimmers Adjusted To Maximum
I. F.	455 Kc.	.1 MFD.	Grid of 6SK7 (I.F.)	Broadcast	Set Dial at 1600 Kc.	On Top of Output I.F.
	455 Kc.	.1 MFD.	Grid of 6SA7	Broadcast	Set Dial at 1600 Kc.	On Top of Input I.F.
31 METER BAND	9.6 Mc.	400 ohms	Antenna lead	31M	Set Dial at 9.6 Mc.	(See Trimmer View) C20—Osc. (See Trimmer View) C8—R.F. (See Chassis View) C4—Ant.
49 METER BAND	6.1 Mc.	400 ohms	Antenna lead	49M	Set Dial at 6.1 Mc.	(See Trimmer View) T14—Osc. (See Trimmer View) T8—R.F. (See Trimmer View) T4—Ant.
25 METER BAND	11.8 Mc.	400 ohms	Antenna lead	25M	Set Dial at 11.8 Mc.	(See Trimmer View) T15—Osc. (See Trimmer View) T9—R.F. (See Trimmer View) T5—Ant.
19 METER BAND	15.2 Mc.	400 ohms	Antenna lead	19M	Set Dial at 15.2 Mc.	(See Trimmer View) T16—Osc. (See Trimmer View) T10—R.F. (See Trimmer View) T6—Ant.
BROAD-CAST BAND	1600 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1600 Kc.	(See Trimmer View) C16—Osc. (See Trimmer View) C9—R.F. (See Chassis View) C3—Ant.
	1400 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1400 Kc.	Rotate Core T11—R.F. Rotate Core T2—Ant. (See Iron Core Adjustment View)

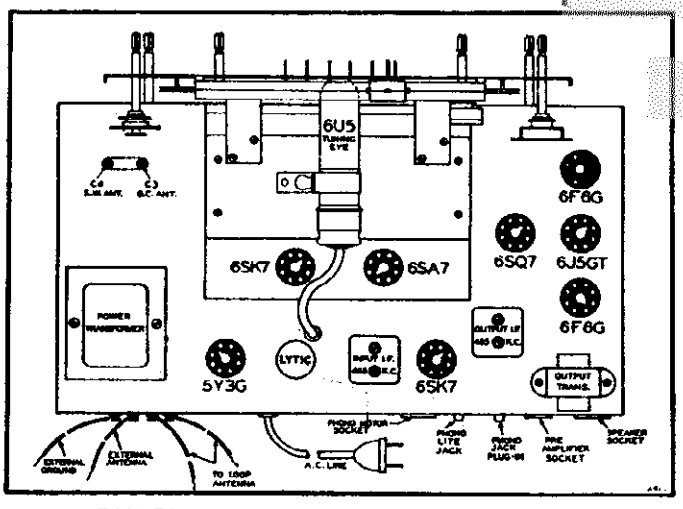
MODEL 14BR-912A

MONTGOMERY-WARD & CO.



JUNE 1941

Power Consumption (Motor Operating)—120 Watts



CHASSIS VIEW. Showing Tube Location

Note: Antenna and Ground Terminals at Back of Chassis

Code No.	Part No.	Description
		RESISTORS
R1	BE1301	25M ohm—½ w.
R2	BE1301	25M ohm—½ w.
R3	BE13019	1 megohm—½ w.
R4	BE130239	250 ohm—½ w.
R5	BE130218	5M ohm—½ w.
R6		1 megohm in tuning indicator cable
R7	BE10662	12,500 ohm—3 w.
R8	BE13019	1 megohm—½ w.
R9	BE130232	25M ohm—½ w.
R10	BE130220	300 ohm—1 w.
R11	BE1303	500M ohm—½ w.
R12	BE1303	500M ohm—½ w.
R13	BE130103	100M ohm—½ w.
R14	BE130218	5M ohm—½ w.
R15	BE130103	100M ohm—½ w.
R16	BE13019	1 megohm—½ w.
R17	BE13070	500 ohm—½ w.
R18	BE1303	500M ohm—½ w.
R19	BE1303	500M ohm—½ w.
R20	BE13011	250M ohm—½ w.
R21	BE101267	2.8 megohm—volume control
R22	BE130191	1.5 megohm—½ w.
R23	BE13012	50M ohm—½ w.
R24	BE1304	3 megohm—½ w.
R25	BE130257	5 megohm—½ w.
R26	BE130174	50 ohm—½ w.
R27	BE1307	40M ohm—½ w.
R28	BE130352	150M ohm—½ w.
R29	BE130351	80M ohm—½ w.
		CONDENSERS
C1	BE1292	.0005 mica
C2	BE10047	.002 x 600 v.
C3	BE124143	B.C. antenna trimmer
C4	BE124143	9 mc. antenna trimmer
C5	BE1292	.0005 mica
C6	BE10020	.1 x 200 v. tubular condenser
C7	BE129168	.00001 mica
C8	BE124138	9 mc. R.F. trimmer
C9	BE124139	B.C. R.F. trimmer
C10	BE10074	.1 x 400 v
C11	BE10074	.1 x 400 v.
C12	BE119109	10.0 mfd. x 350 w. v. lytic
	—or—	
C12	BE119109B	10.0 mfd. x 350 w. v. lytic
C13	BE1292	.0005 mica
C14	BE119109	15.0 mfd. x 450 w. v. lytic
	—or—	
C14	BE119109B	15.0 mfd. x 450 w. v. lytic
C15	BE119109	15.0 mfd x 450 w. v. lytic
	—or—	
C15	BE119109B	15.0 mfd. x 450 w. v. lytic
C16	BE124144	B.C. oscillator trimmer

Code No.	Part No.	Description
C17	BE10071	.004 x 600 v.
C18	BE129167	.0003 silver mica
C19	BE129165	.00005 mica
C20	BE124145	9 mc. oscillator trimmer
C21	BE10083	.05 x 400 v.
C22	BE1009	.05 x 200 v.
C23	BE10026	.02 x 400 v.
C24	BE10020	.1 x 200 v.
C25	BE12951	.000125 mica
C26	BE1002	.003 x 300 v.
C27	BE10026	.02 x 400 v.
C28	BE12921	.0002 mica
C29	BE10019	.006 x 600 v.
C30	BE100139	.0015 x 200 v.
C31	BE129165	.00005 mica
C32	BE129165	.00005 mica
C33	BE10061	.02 x 600 v. Bakelite
C34	BE10061	.02 x 600 v. Bakelite

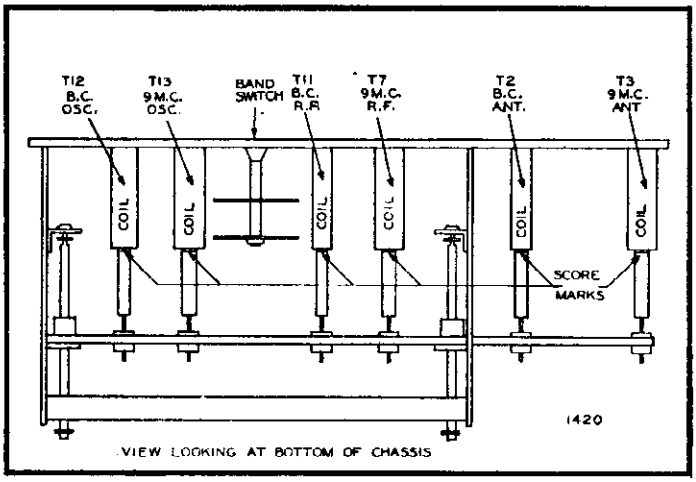
C12, C14 and C15 are in same unit

FOR PUSH-BUTTON DATA SEE THAT OF MODEL 14BR-688A

FOR SEEBURG B RECORD CHANGER SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

MODEL 14BR-912A

MONTGOMERY-WARD & CO.



IRON CORE ADJUSTMENT VIEW

ALIGNING INSTRUCTIONS

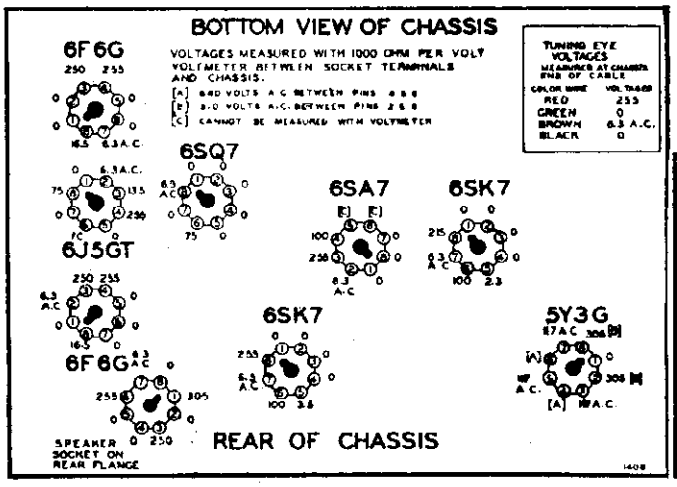
CAUTION:—No Aligning adjustments should be attempted without first thoroughly checking over all other possible causes of trouble, such as poor installations, open or grounded antenna systems, low line voltage, defective tubes, condensers and resistors. In order to properly align this radio, the chassis should be removed from the cabinet. Although the short wave bands on this radio are of the band spread type the Alignment Procedure is not difficult. However because each short wave scale covers only a small portion of the short wave spectrum you must do the work carefully and your oscillator must be accurate.

Do not realign the band spread scales unless you are positive they are out of adjustment. When adjustment is necessary proceed as follows.

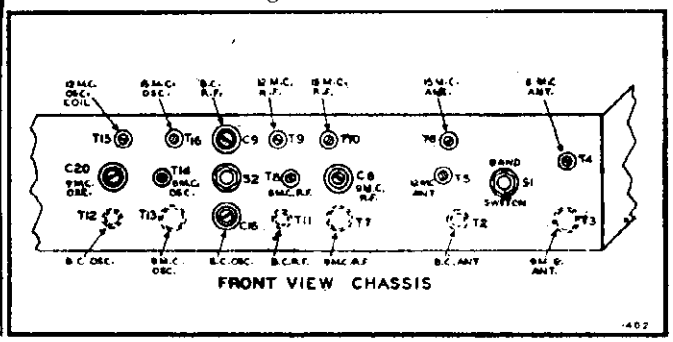
Tune set to high frequency end of dial scale on any band.

Rotate each iron core until the fine score marks are even with the edge of the coil forms.

You are now ready to continue with the trimmer adjustments as shown on the alignment chart.



VOLTAGE CHART



TRIMMER VIEW

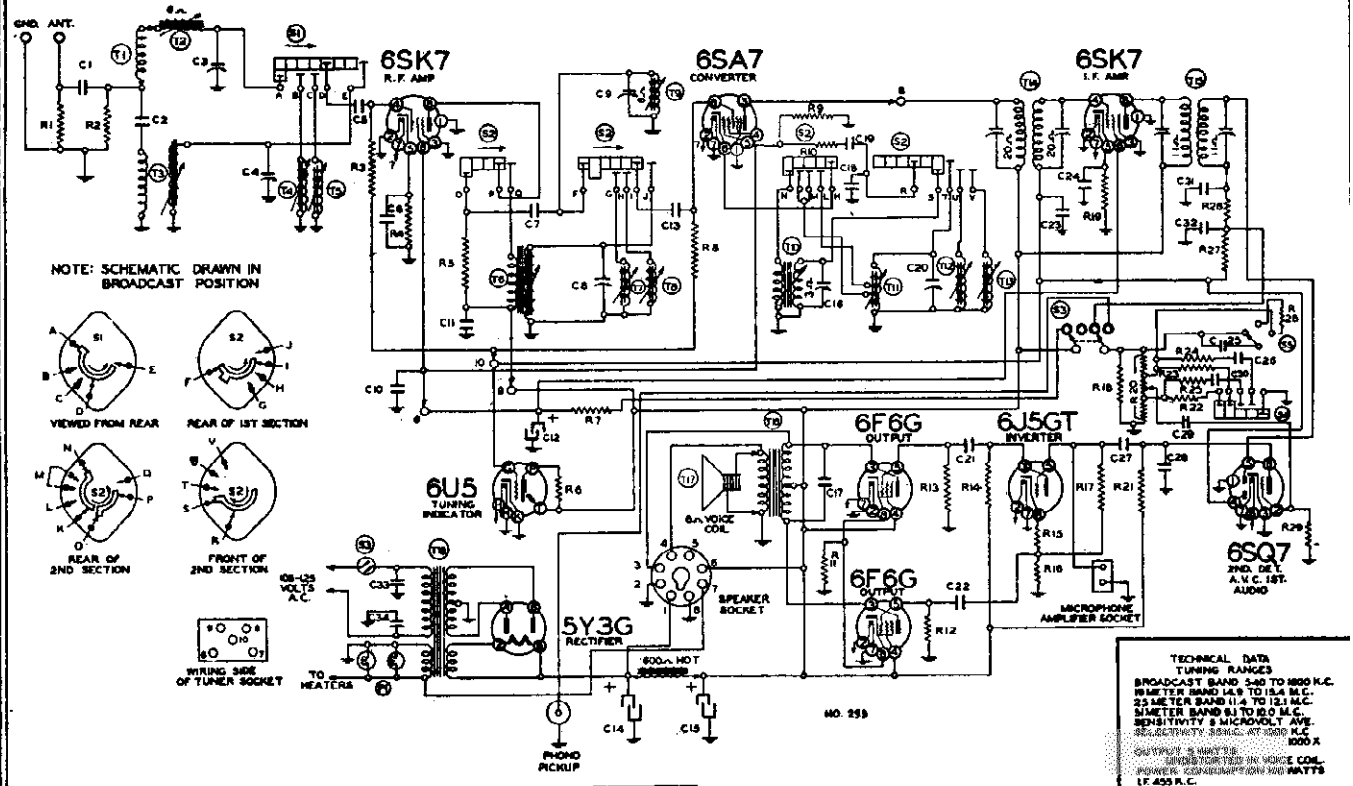
ALIGNMENT PROCEDURE

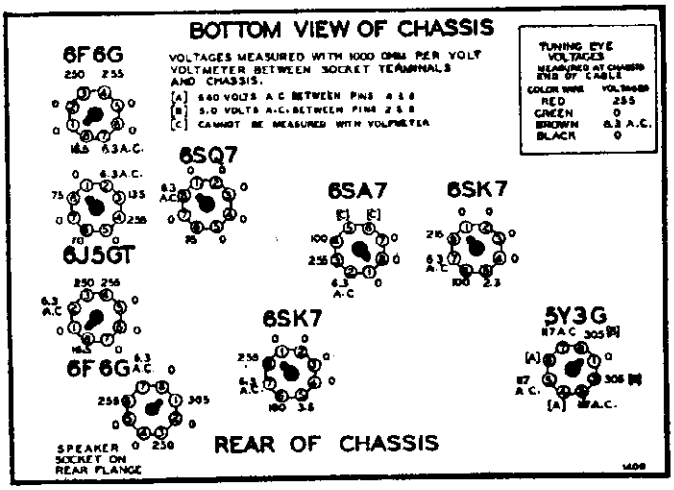
- Tone control—Treble.
- Volume control—Maximum all adjustments.
- Connect dummy antenna value in series with generator output lead.
- Use an all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.

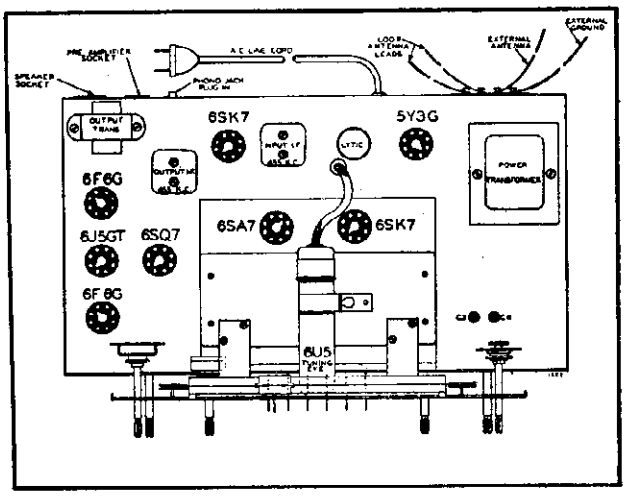
BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Dial Pointer Setting	Trimmers Adjusted To Maximum in Order Shown
I. F.	455 Kc.	.1 MFD.	Grid of 6SK7 (I.F.)	Broadcast	Set Dial at 1600 Kc.	On Top of Output I.F.
	455 Kc.	.1 MFD.	Grid of 6SA7	Broadcast	Set Dial at 1600 Kc.	On Top of Input I.F.
31 METER BAND	9.6 Mc.	400 ohms	Antenna lead	31M	Set Dial at 9.6 Mc.	(See Trimmer View) C20—Osc. (See Trimmer View) C3—R.F. (See Chassis View) C4—Ant.
49 METER BAND	6.1 Mc.	400 ohms	Antenna lead	49M	Set Dial at 6.1 Mc.	(See Trimmer View) T14—Osc. (See Trimmer View) T8—R.F. (See Trimmer View) T4—Ant.
25 METER BAND	11.8 Mc.	400 ohms	Antenna lead	25M	Set Dial at 11.8 Mc.	(See Trimmer View) T15—Osc. (See Trimmer View) T9—R.F. (See Trimmer View) T5—Ant.
19 METER BAND	15.2 Mc.	400 ohms	Antenna lead	19M	Set Dial at 15.2 Mc.	(See Trimmer View) T16—Osc. (See Trimmer View) T10—R.F. (See Trimmer View) T6—Ant.
BROAD-CAST BAND	1600 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1600 Kc.	(See Trimmer View) C16—Osc. (See Trimmer View) C9—R.F. (See Chassis View) C3—Ant.
	1400 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1400 Kc.	Rotate Core T11—R.F. Rotate Core T2—Ant. (See Iron Core Adjustment View)

MODEL 14BR-913A

MONTGOMERY-WARD & CO.







VOLTAGE CHART

R1	BE1301	25M ohm—½ w.
R2	BE1301	25M ohm—½ w.
R3	BE13019	1 megohm—½ w.
R4	BE130239	250 ohm—½ w.
R5	BE130218	5M ohm—½ w.
R6		1 megohm—in tuning indicator cable
R7	BE10662	12,500 ohm—3 w.
R8	BE13019	1 megohm—½ w.
R9	BE130232	25M ohm—½ w.
R10	BE130174	50 ohm—½ w.
R11	BE130220	300 ohm—1 w.
R12	BE1303	500M ohm—½ w.
R13	BE1303	500M ohm—½ w.
R14	BE130103	100M ohm—½ w.
R15	BE130218	5M ohm— ½ w.
R16	BE130103	100M ohm—½ w.
R17	BE13019	1 megohm—½ w.
R18	BE1303	500M ohm—½ w.
R19	BE13070	500 ohm—½ w.
R20	BE101267	2.8 megohm volume control
R21	BE13011	250M ohm—½ w.
R22	BE1303	500M ohm—½ w.
R23	BE130352	150M ohm—½ w.
R24	BE130351	80M ohm—½ w.
R25	BE1307	40M ohm—½ w.
R26	BE13012	50M ohm—½ w.
R27	BE1304	3 megohm—½ w.
R28	BE139191	1.5 megohm—½ w.
R29	BE130257	5 megohm—½ w.

C14	BE119109	15.0 x 450 w. v.
	—or—	
C14	BE119109B	15.0 x 450 w. v.
C15	BE119109	15.0 x 450 w. v.
	—or—	
C15	BE119109B	15.0 x 450 w. v.
C16	BE124144	B.C. oscillator trimmer
C17	BE10071	.004 x 600 v.
C18	BE129167	.0002 silver mica
C19	BE129165	.00005 mica
C20	BE124145	9 mc. osc. trimmer
C21	BE10013	.05 x 400 v.
C22	BE1009	.05 x 200 v.
C23	BE10026	.02 x 400 v.
C24	BE10020	.1 x 200 v.
C25	BE12951	.000125 mica
C26	BE1002	.003 x 300
C27	BE10026	.02 x 400 v.
C28	BE12921	.0002 mica
C29	BE10019	.006 x 600 v.
C30	BE100139	.0015 x 200 v.
C31	BE129165	.00005 mica
C32	BE129165	.00005 mica
C33	BE10061	.02 x 600 v. bakelite
C34	BE10061	.02 x 600 v. bakelite

C12, C14 and C15 are in same unit
C31 and C32 are in same unit

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C1	BE1292	.0005 mica
C2	BE10047	.002 x 600 v.—10%
C3	BE124143	B.C. antenna trimmer
C4	BE124143	9 mc. antenna trimmer
C5	BE1292	.0005 mica
C6	BE10020	.1 x 200 v. tubular
C7	BE129168	.00001 mica
C8	BE124138	9 mc. R.F. trimmer
C9	BE124139	B.C. R.F. trimmer
C10	BE10074	.1 x 400 v.
C11	BE10074	.1 x 400 v.
C12	BE119109	10.0 x 350 w. v.
	—or—	
C12	BE119109B	10.0 x 350 w. v.
C13	BE1292	.0005 mica

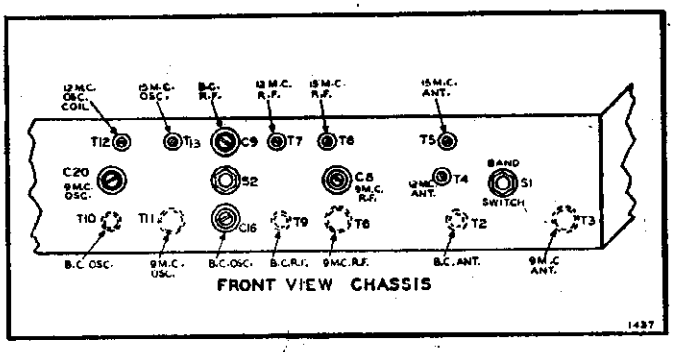
MODEL 14BR-913A

MONTGOMERY-WARD & CO.

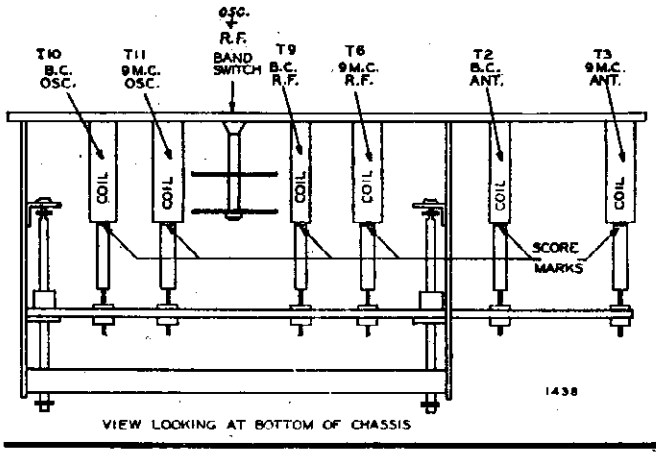
ALIGNMENT PROCEDURE

- Tone control—Treble
- Volume control—Maximum all adjustments.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Dial Pointer Setting	Trimmers Adjusted To Maximum
I. F.	455 Kc.	.1 MFD.	Grid of 6SK7 (I.F.)	Broadcast	Set Dial at 1600 Kc.	On Top of Output I.F.
	455 Kc.	.1 MFD.	Grid of 6SA7	Broadcast	Set Dial at 1600 Kc.	On Top of Input I.F.
31 METER BAND	9.6 Mc.	400 ohms	Antenna lead	31M	Set Dial at 9.6 Mc.	(See Trimmer View) C20—Osc. (See Trimmer View) C8—R.F. (See Chassis View) C4—Ant.
25 METER BAND	11.8 Mc.	400 ohms	Antenna lead	25M	Set Dial at 11.8 Mc.	(See Trimmer View) T12—Osc. (See Trimmer View) T7—R.F. (See Trimmer View) T4—Ant.
19 METER BAND	15.2 Mc.	400 ohms	Antenna lead	19M	Set Dial at 15.2 Mc.	(See Trimmer View) T13—Osc. (See Trimmer View) T8—R.F. (See Trimmer View T5—Ant.
BROAD-CAST BAND	1600 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1600 Kc.	(See Trimmer View) C16—Osc. (See Trimmer View) C9—R.F. (See Chassis View) C3—Ant.
	1400 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1400 Kc.	Rotate Core T9—R.F. Rotate Core T2—Ant. (See Iron Core Adjustment View)



TRIMMER VIEW



IRON CORE ADJUSTMENT VIEW

ANTENNA

This radio is designed to pick up strong local stations without requiring an outside antenna. The built-in aerial may be slightly directional therefore try the radio in several positions. For best results, however, an outside antenna approximately 50 to 75 feet long including lead-in is recommended. It should be erected as high as possible and as far from surrounding objects as practical. For minimum interference it should be at right angles to street car lines, incoming power lines and other electrical apparatus which may be in the vicinity. A ground is advisable. A good ground will often reduce noise. The ground wire should be connected with a clamp to a well cleaned water pipe or to a piece of pipe driven several feet into damp earth.

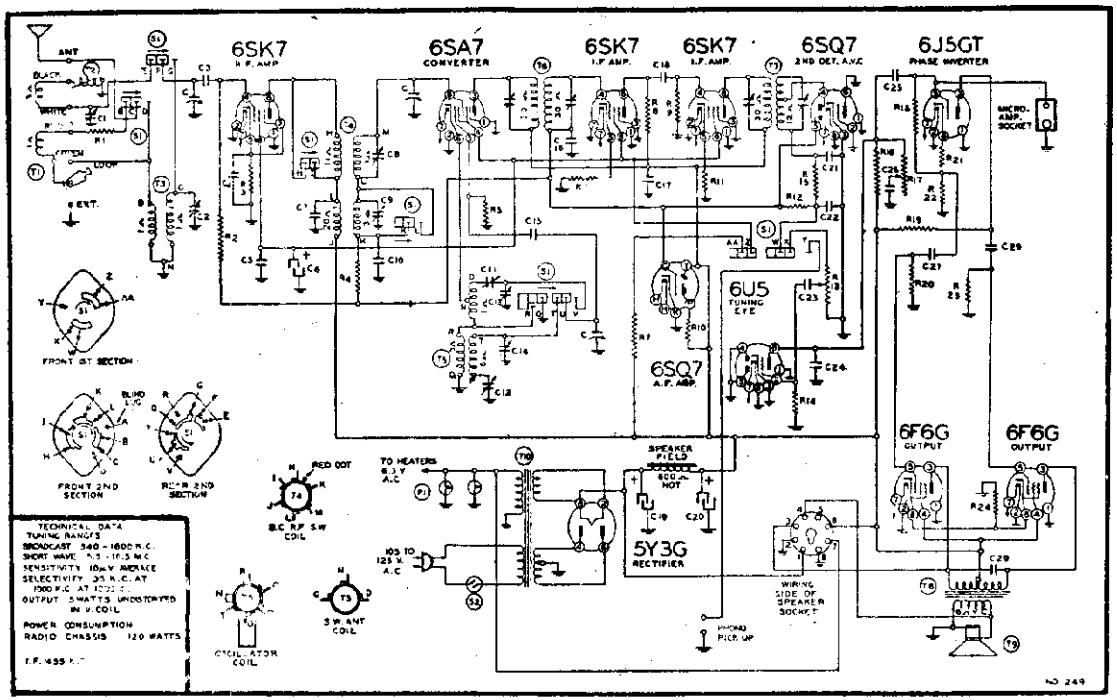
Periodic inspection of the antenna system is recommended to be sure that all connections are clean and tight, and that the antenna is well insulated from the ground at all points.

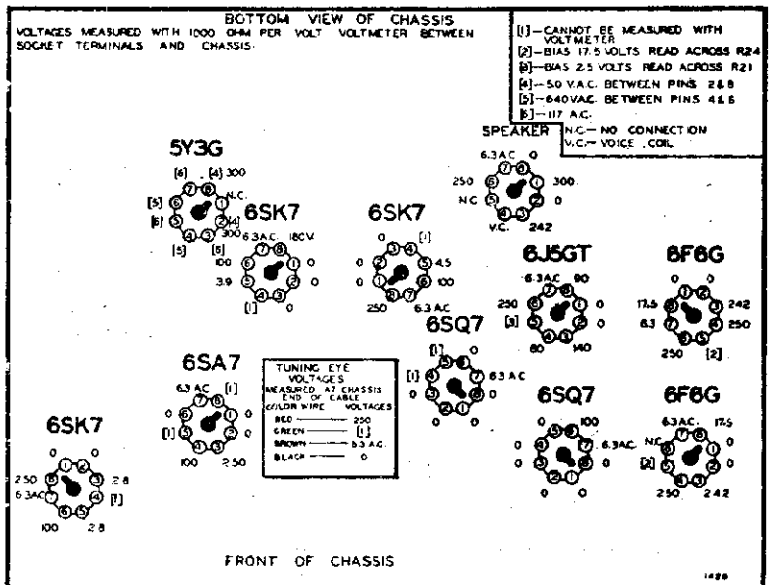
PHONOGRAPH-TELEVISION AND FM. JACK

Should you wish to use an external phonograph it should be plugged into the phono jack shown in the chassis view. The radio-phono-on-off knob on the front panel will then switch from radio to phono operation.

If television or frequency modulation (FM) programs ever become available in your community this radio may still be used in conjunction with the necessary converters.

The jack marked phono-jack plug in in the chassis view will accommodate either the Phono or a television or FM converter.





PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Part No.	Schematic Diagram Reference	Description	No. Used In Set	Selling Price Each
		CONDENSERS		
BE102152	C	Three Gang Variable Condenser	1	3.00
BE10020	C4	.1 x 200 Volt Tubular Condenser	1	.10
BE10026	C10, C16, C25	.02 x 400 Volt Tubular Condenser	3	.10
BE10025	C23	.002 x 600 Volt Tubular Condenser	1	.10
BE1009	C27	.05 x 200 Volt Tubular Condenser	1	.10
BE10013	C28	.05 x 400 Volt Tubular Condenser	1	.10
BE10011	C26	.01 x 400 Volt Tubular Condenser	1	.10
BE10071	C29	.004 x 600 Volt Tubular Condenser	1	.10
BE100117	C5, C17	.25 x 400 Volt Tubular Condenser	2	.20
BE119124	C6, C19, C20	Electrolytic Filter Condenser—10 Mfd. x 350 V.; 25 Mfd. x 450 V.; 25 Mfd. x 450 V.	1	.90
BE124180	C2	S.W. Antenna Trimmer	1	.44
BE124179	C8, C9	S.W. and B.C. R.F. Trimmer—Dual	1	.36
BE124181	C13, C14	S.W. and B.C. Osc. Trimmer—Dual	1	.24
BE124182	C1	B.C. Antenna Trimmer	1	.12
BE129157	C12	.000525 Compression Cond.—B.C. Pad	1	.22
BE1292	C3, C18	.0005 Mica Type Condenser—20%	2	.12
BE129160	C7	.0004 Mica Type Condenser—20%	1	.12
BE12939	C15	.00005 Mica Type Condenser—20%	1	.12
BE1295	C21, C22	.0001 Mica Type Condenser—20%	2	.12
BE129156	C11	.0024 Compression Mica Condenser	1	.30
BE12912	C24	.00025 Mica Type Condenser—20%	1	.12
		RESISTORS		
BE101270	R13, S2	Volume Control and Switch (500M Ohms)	1	.62
BE101271	R17	Tone Control (1 Megohm)	1	.50
BE13019	R2, R18	1 Megohm—½ Watt Resistor—20%	2	.10
BE1305	R4	300M Ohm—½ Watt Resistor—20%	1	.12
BE130208	R5	40M Ohm—½ Watt Resistor—20%	1	.10
BE13054	R6, R11	500 Ohm—½ Watt Resistor—20%	2	.10
BE130263	R8	12M Ohm—½ Watt Resistor—20%	1	.10
BE13020	R9, R19, R22	100M Ohm—½ Watt Resistors—20%	3	.10
BE130304	R7	12M Ohm—2 Watt Resistor—10%	1	.10
BE13012	R15	50M Ohm—½ Watt Resistor—20%	1	.10
BE130170	R12	3 Megohm—½ Watt Resistor—25%	1	.10
BE130225	R14	15 Megohm—½ Watt Resistor—30%	1	.10
BE13043	R21	2500 Ohm—½ Watt Resistor—20%	1	.10
BE1303	R20, R23	500M Ohm—½ Watt Resistor—20%	2	.10
BE13011	R16	250M Ohm—½ Watt Resistor—20%	1	.10
BE130311	R24	300 Ohm—1 Watt Resistor—20%	1	.10
BE13099	R3	300 Ohm—½ Watt Resistor—20%	1	.10
BE13024	R1	400 Ohm—½ Watt Resistor—20%	1	.10
	R10	1 Megohm—In Eye Socket	1	.10
		COILS		
BE108169J	T6	Input I.F. Coil Complete in Can	1	.76
BE108130C	T7	Output I.F. Coil Complete in Can	1	.76
BE10957	T4	B.C.—S.W. R.F. Coil Complete in Can	1	.70
BE110149	T5	B.C.—S.W. Oscillator Coil	1	.50
BE111176	T3	S.W. Antenna Coil	1	.30
BE111153	T2	Loop Adjusting Coil With Iron Slug	1	.30
BE111257	T1	Loop Antenna Assembly	1	1.20
		SPEAKER		
BE114261	T9	Ten Inch Electrodynamic Speaker (Less Output Transformer)	1	4.00
		TRANSFORMERS		
BE10554F	T8	Output Transformer for Speaker	1	1.00
BE104202C	T10	Power Transformer, 50 to 60 Cycles 105-125 Volt Primary	1	3.00
BE104203C		Power Transformer 25 to 60 Cycles 105-		

MONTGOMERY-WARD & CO.

MODEL 14BR-1109

MODEL 14BR-1109A

MONTGOMERY-WARD & CO.

ALIGNMENT PROCEDURE

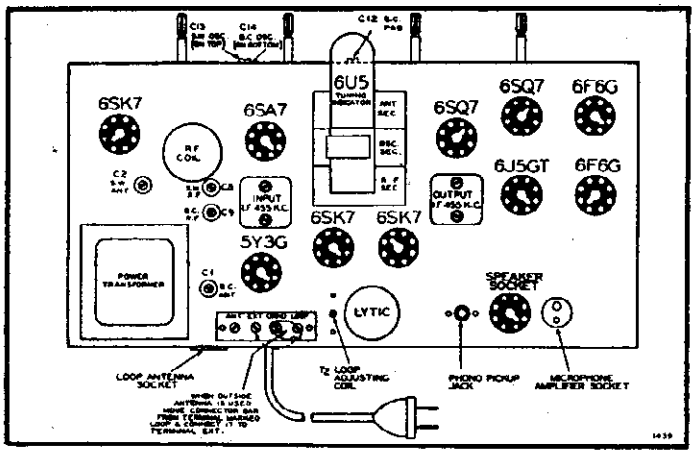
- Volume control—Maximum all adjustments.
- Connect dummy antenna value in series with generator output lead.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)
I. F.	455 Kc.	.1 MFD.	Grid of 6SK7 I. F.	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top Output I. F.
	455 Kc.	.1 MFD.	Grid of 6SA7 Mixer	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top Input I. F.
SHORT WAVE BAND	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	C13, S.W. Osc.
	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	C8, S.W. R.F., C2 S.W. Antenna
	6 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 6 Mc.	C11 S.W. Osc. Series Pad See Note "A"
BROAD-CAST BAND	1600 Kc.	200 mmf.	Grid of 6SK7 R. F. Tube	Broadcast	Rotor full open (Plates out of mesh)	C14 B.C. Osc.
	540 Kc.	200 mmf.	Grid of 6SK7 R. F. Tube	Broadcast	Set Dial at 540 Kc. (Plates in Mesh)	C12 B.C. Osc. Series Pad
	1400 Kc.	200 mmf.	Grid of 6SK7 R. F. Tube	Broadcast	Set Dial at 1400 Kc.	C9 B.C. R.F.
LOOP ALIGN-MENT	1400 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 1400 Kc.	C1 B.C. Ant.
	600 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 600 Kc.	T2 Iron Core Tracking Coil

NOTE "A"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

After each band is completed, repeat the procedure as a final check.

JUNE 1941



CHASSIS VIEW

ANTENNA AND GROUND TERMINALS

When using an external antenna and ground, move the metal strap (connector bar) from terminal marked LOOP and connect it to terminal marked EXT.

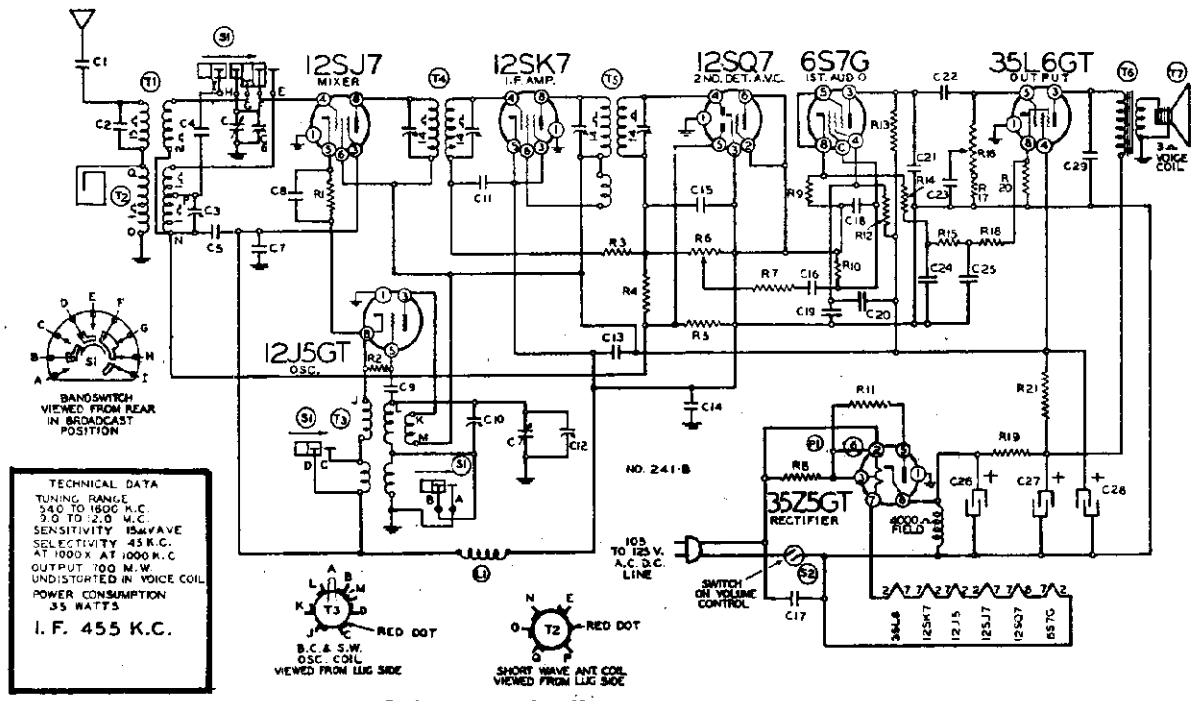
The antenna and ground wires should then be connected to the terminals marked "Ant."—"Gnd."

ANTENNA

This radio is designed to pick up strong local stations without requiring an outside antenna. The built-in aerial may be slightly directional therefore try the radio in several positions. **For best results, however,** an outside antenna approximately 50 to 75 feet long including lead-in is recommended. It should be erected as high as possible and as far from surrounding objects as practical. For minimum interference it should be at right angles to street car lines, incoming power lines and other electrical apparatus which may be in the vicinity. A ground is advisable. A good ground will often reduce noise. The ground wire should be connected with a clamp to a well cleaned water pipe or to a piece of pipe driven several feet into damp earth.

Periodic inspection of the antenna system is recommended to be sure that all connections are clean and tight, and that the antenna is well insulated from the ground at all points.

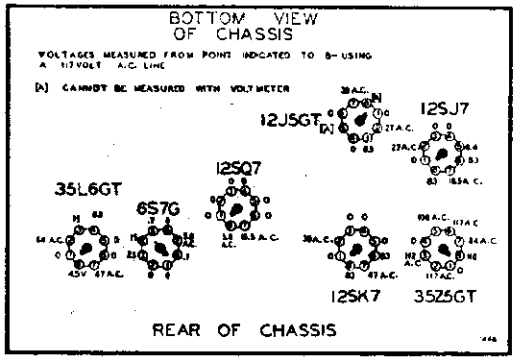
POWER SUPPLY—Unless your radio is marked otherwise, it must be operated from 105 to 125 volts, 50 to 60 cycle A.C. If in doubt, phone your electric light company. Receivers of this same model which are for use on special voltages are marked accordingly.



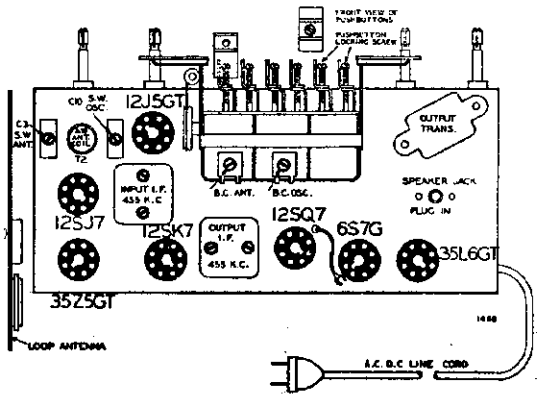
TECHNICAL DATA

TUNING RANGE
540 TO 1600 K.C.
5.9 TO 2.0 M.C.
SENSITIVITY 15 MICROVOLTS
SELECTIVITY 45 K.C. AT 1000 K.C. AT 1000 K.C.
OUTPUT 700 M.W. UNDISTORTED IN VOICE COIL
POWER CONSUMPTION 35 WATTS

I. F. 455 K.C.



Voltage Chart



BE100142	C20	.04 x 200 Volt Tubular Condenser	.12
BE100130	C21, C22	Dual Condenser—.00025 x .02 x 400 Volt	.24
BE10011	C29	.01 x 400 Volt Tubular Condenser	.12
BE100128	C5	.05 x 120 Volt Tubular Condenser	.12
BE100119	C7, C14	.1 x 400 Volt Tubular Condenser—2	.12
BE100127	C8	.01 x 120 Volt Tubular Condenser	.12
BE10020	C13, C19, C24, C25	.1 x 200 Volt Tubular Condenser—4	.12
BE1009	C11	.05 x 200 Volt Tubular Condenser	.12
BE100138	C17	.03 x 400 Volt Tubular Condenser	.12
BE10019	C16, C23	.006 x 600 Volt Tubular Condenser—2	.12
BE10037	C1	.003 x 600 Volt Tubular Condenser	.12
BE119129		Electrolytic Filter Cond. Added for 25 Cycle Only. 40 Mfd x 150 Volts Across C22 and 20 Mfd. x 150 Volts Across C23	.70
BE119128	C26, C27, C28	Electrolytic Filter Condenser. 40 Mfd.—20 Mfd.—20 Mfd. x 150 Volts	.70
BE124139	C3, C10	S.W. Antenna and Oscillator Trimmer Condenser—2	.16
BE129181	C4	.000445 Mica Type Condenser—3%	.18
BE12921	C15	.0002 Mica Type Condenser—20%	.12
BE1295	C9, C18	.0001 Mica Type Condenser—20%—2	.12
BE12960	C2	.00015 Mica Type Condenser—20%	.12
BE12912	C19	.00025 Mica Type Condenser	.12
BE130218	R1	5M Ohm—½ Watt Resistor—10%	.10
BE130166	R8, R20	150 Ohm—½ Watt Resistor—10%—2	.10
BE13084	R19	200 Ohm—½ Watt Resistor—20%	.10
BE130128	R11	20 Ohm—½ Watt Resistor—20%	.10
BE13042	R2, R7	50M Ohm—½ Watt Resistor—20%—2	.10
BE130287	R21	1200 Ohm—1 Watt Resistor—10%	.10
BE130850	R3, R5	3.2 Megohm—½ Watt Resistor—20%—2	.10
BE13038	R4	2 Megohm—½ Watt Resistor—20%	.10
BE130257	R10	5 Megohm—½ Watt Resistor—25%	.10
BE13092	R9	1M Ohm—½ Watt Resistor	.10
BE130354	R12	525M Ohm—½ Watt Resistor	.10
BE130103	R13	100M Ohm—½ Watt Resistor	.10
BE130193	R14, R18	3M Ohm—½ Watt Resistor—2	.10
BE130355	R15	8M Ohm—½ Watt Resistor	.10
BE130100	R17	150M Ohm—½ Watt Resistor	.10

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

OCTOBER 1941

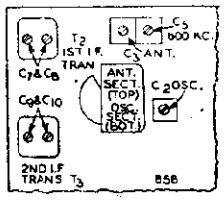
ALIGNMENT PROCEDURE

- **Volume control—Maximum all adjustments.**
- **Connect B—of radio chassis to ground post of signal generator through .1 Mfd. condenser.**

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted to Maximum
I. F.	455 Kc.	.1 MFD.	Grid of 12SK7 I. F.	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top of Output I. F.
	455 Kc.	.1 MFD.	Grid of 12SJ7 Mixer	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top of Input I. F.
SHORT WAVE BAND	12 Mc.	400 Ohms	External Antenna and B—	Short Wave	Set Dial at 12 Mc.	S.W. Osc. trimmer C10 S.W. Ant. trimmer C3
BROAD-CAST BAND	1600 Kc.	.1 mmf.	Grid of 12SJ7	Broadcast	Rotor full open (Plates out of mesh)	B.C. Osc. trimmer C12 on Gang
	1400 Kc.	200 mmf.	External Antenna and B—	Broadcast	Set Dial at 1400 Kc.	B.C. Ant. trimmer C6

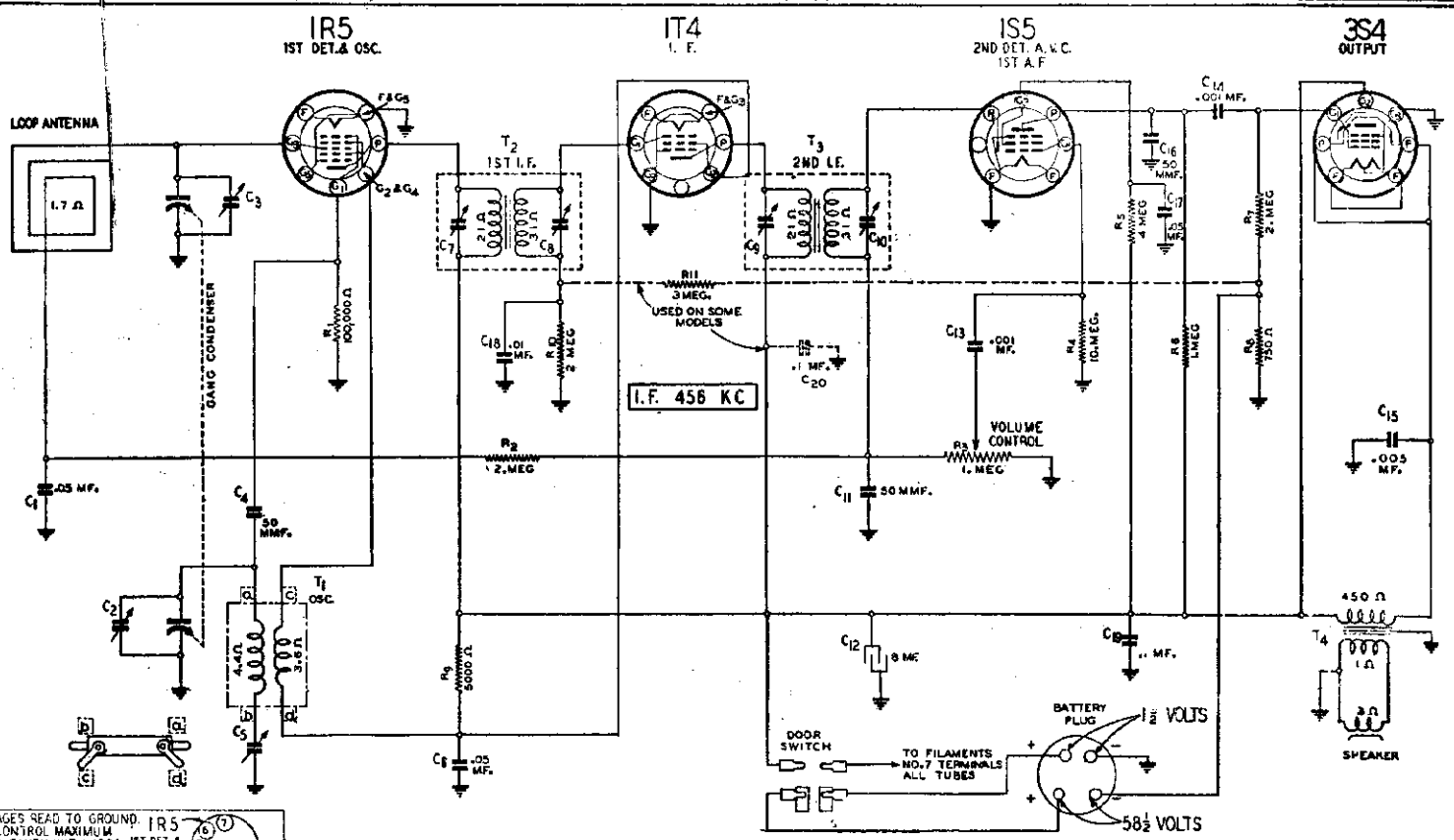
NOTE: The Oscillator Frequency is lower than the signal frequency and should be aligned accordingly.

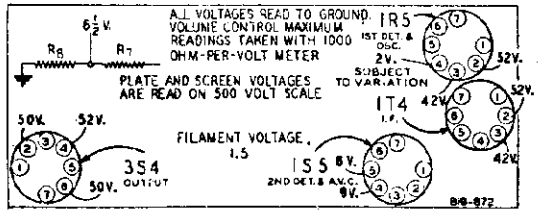
The loop antenna should be connected to the radio when making all adjustments.



NOTE A—Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. Place radio approximately 2 feet (6" for I.F. adjustment) from loop.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.





SPECIFICATIONS

Input Voltages and Currents
"A" Battery - - 1.5 Volts—.25 Amperes
"B" Battery - - - - 58½ Volts—8 Ma.
Power Output - - 55 Milliwatts Undistorted
110 Milliwatts Maximum
Selectivity - 40 KC Broad at 1000 Times Signal
Intermediate Frequency - - - - 456 KC
Speaker - - - - - - 4" P.M. Dynamic
Tuning Frequency Range - 528 to 1610 KC
Sensitivity - 400 Microvolts per Meter Average (For .05 Watt Output)

ALIGNMENT PROCEDURE

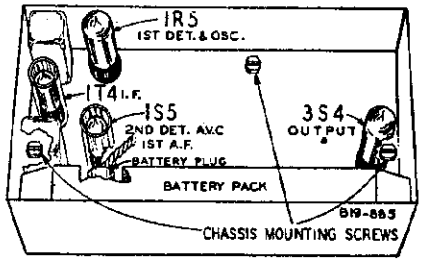
Volume Control—Maximum All Adjustments.
Allow Chassis and Signal Generator to "Heat Up" for several minutes.
The following equipment is required for aligning:
A Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter—Non-Metallic Screwdriver.

Use Loop for All Adjustments—See Note "A"

Signal Gen. FREQUENCY SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration)
456 KC	Turn Rotor to Full Open	1st I.F. (C7) & (C8) 2nd I.F. (C9) & (C10)
1610 KC	Turn Rotor to Full Open	Oscillator (C2)
1500 KC	Turn Rotor to Max. Output Set Knob to 1500 KC	Antenna (C3)
600 KC	Turn Rotor to Max. Output	600 KC (C5) Rock Rotor—See Note B
1500 KC	Turn Rotor to Max. Output	Antenna (C3)

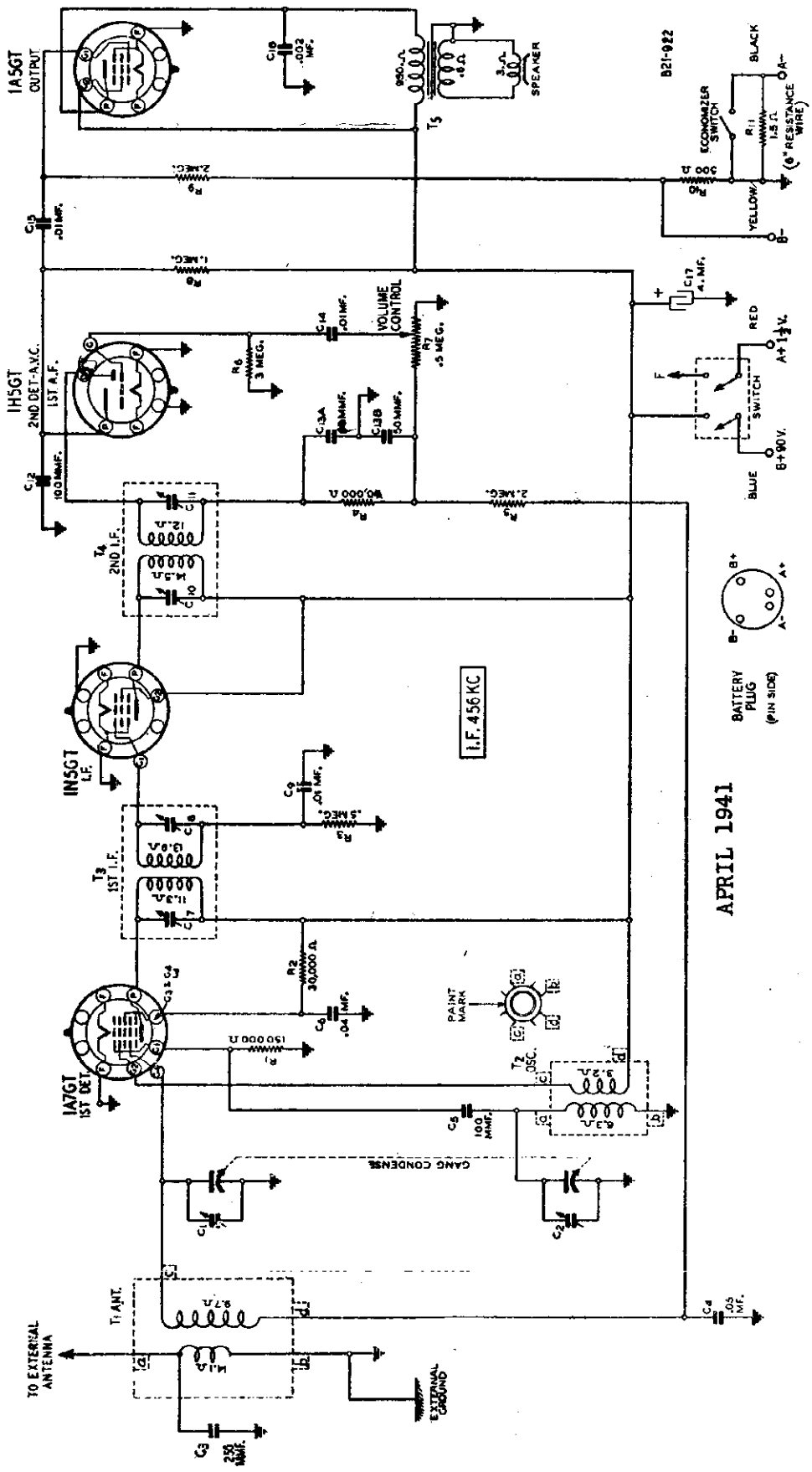
TUBES

The tube types and position of the tubes and tube shields are shown in the illustration below.



APRIL 1941

MONTGOMERY-WARD & CO.



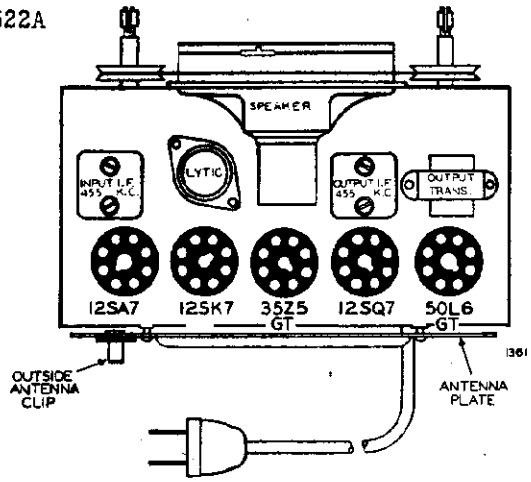
ALIGNMENT PROCEDURE, MODELS 14BR-521A, 14BR-522A

- Volume control—Maximum all adjustments.
- Connect B—of radio chassis to ground post of signal generator through .1 Mfd. condenser.

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Position of Iron Cores (Dial Setting)	Adjust Trimmers to Maximum (In Order Shown)
I. F.	455 Kc.	.1 MFD	Connect to Metal Antenna Backplate	Iron Cores All the way out	Two trimmers on top of output I. F. can
	455 Kc.	.1 MFD	Connect to Metal Antenna Backplate	Iron Cores All the way out	Two trimmers on top of input I. F. can
BROAD-CAST BAND	1720 Kc.	.1 MFD	Connect to Metal Antenna Backplate	Iron Cores All the way out	Osc. Trimmer (C7) (See voltage chart)
	1720 Kc.	200 MMF.	Connect to Outside Antenna Clip	Iron Cores All the way out	Ant. Trimmer (C3) (See voltage chart)
	1400 Kc.	200 MMF.	Connect to Outside Antenna Clip	Turn Dial to 1400 Kc.	Adjust position of antenna coil (See coil assembly view)
	1720 Kc.	200 MMF.	Connect to Outside Antenna Clip	Turn Dial to 1720 Kc.	Adjust trimmer (C3) (See voltage chart)

NOTE "A"—The antenna coil assembly is made so that it is movable. When making the adjustment as given in the alignment procedure move the coil assembly very slowly. It can be moved by hand or by pivoting one edge of the blade of a screwdriver in the hole and engaging the blade in the gear teeth of the coil form.

NOTE "B"—After the antenna coil has been tracked at 1400 Kc. it is necessary to check the antenna trimmer (C3) adjustment again at 1720 Kc. If no appreciable change in trimmer adjustment is made the coil is in track, if the trimmer requires considerable change it will be necessary to again adjust the position of the antenna coil at 1400 Kc. These two adjustments should be tried several times until no change of trimmer adjustment is required at 1720 Kc.



SPECIFICATIONS

Input Voltages and Currents

"A" Battery - - 1.5 Volts—.2 Amperes

"B" Battery - - - - 90 Volts—8.5 Ma.

Power Output - - 70 Milliwatts Undistorted
160 Milliwatts Maximum

Selectivity - 40 KC Broad at 1000 Times Signal

Intermediate Frequency - - - - - 456 KC

Speaker - - - - - - 5" P.M. Dynamic

Tuning Frequency Range - 528 to 1730 KC

Sensitivity - - - - - 50 Microvolts Average
(For .05 Watt Output)

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.

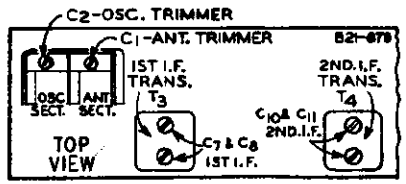
Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning:

A Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

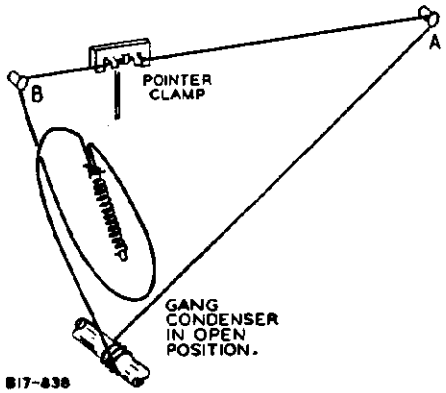
Output Indicating Meter—Non-Metallic Screwdriver.

Dummy Antennas—.1 mf. & 200 mmf.



SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration)
456 KC	Signal Grid of 1st Det. (Top Cap)	.1 mf.	Turn rotor to full open	1st I.F. (C7) & (C8) 2nd I.F. (C10) & (C11)
1730 KC	Signal Grid of 1st Det.	.1 mf.	Turn rotor to full open	Oscillator (C2)
1400 KC	Antenna Lead	200 mmf.	Turn Rotor to Max. Output Set Indicator to 1400 KC—See Note A	Antenna (C1)

NOTE A—If the pointer is set at 1400 KC on the dial, remove pointer from drive cord. Set pointer at the 1400 KC mark on the dial scale. Attach pointer to drive cord.



MODEL 14WG-469

DRIVE CORD REPLACEMENT

Use a new drive cord approximately 36 inches in length. Tie one end to tension spring. Secure other end of spring to hook on gang condenser drive pulley. Thread free end of cord through hole in pulley rim. Turn gang condenser to full open position—See Illustration.

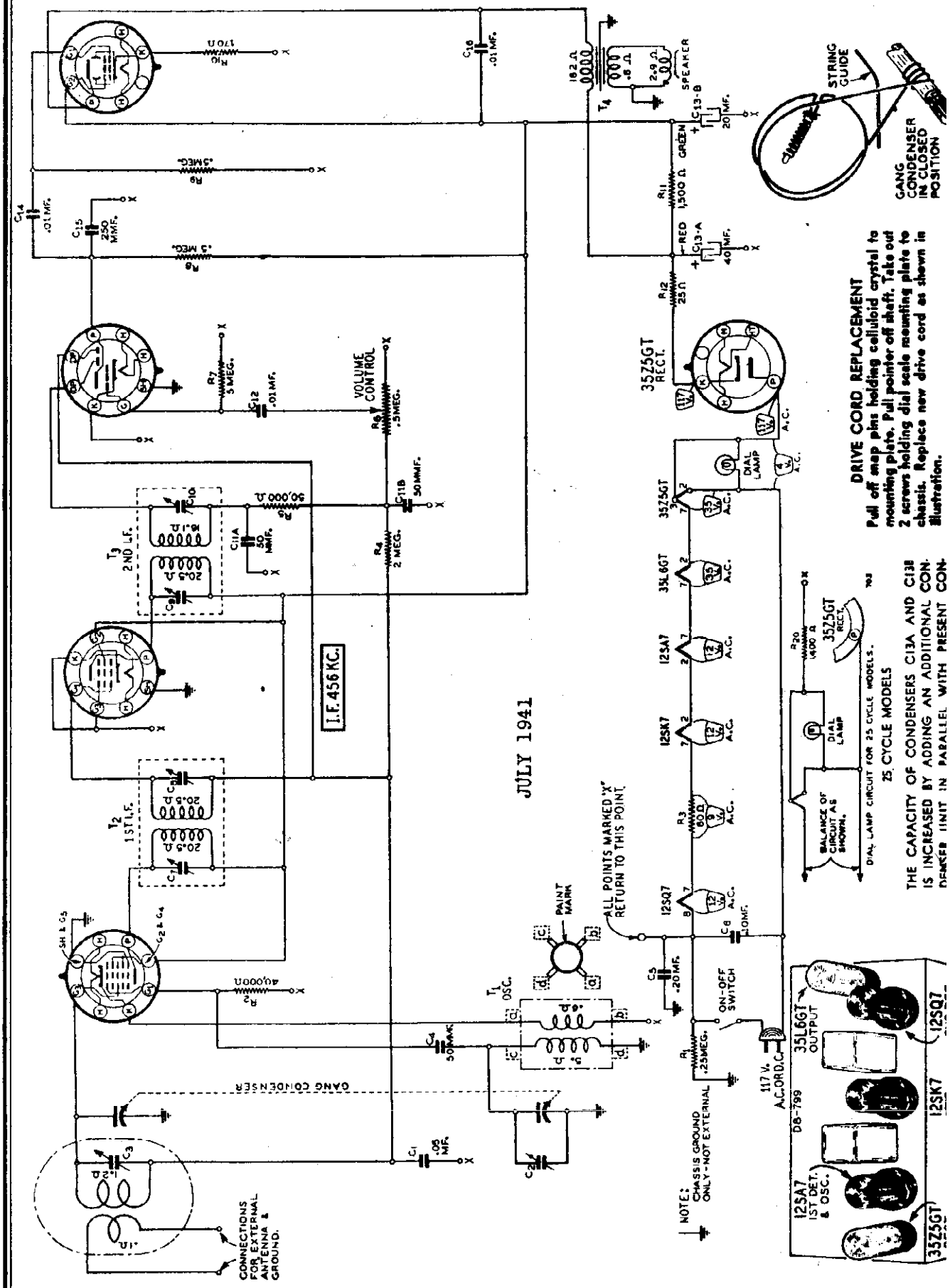
Wind cord ¼ turn counter-clockwise (from gang condenser end of chassis) around drive pulley. Wind cord 3½ turns counter-clockwise (from rear of chassis) around tuning control shaft. Turns should progress toward front of chassis. Pass cord over idler studs A and B as shown in illustration. Wind cord ¾ turn counter-clockwise (from gang condenser side of chassis) around drive pulley. Turn should be on right side (from rear of chassis) of pulley groove.

Pass cord through hole in pulley rim. Stretch tension spring and tie cord to tension spring.

DIAL POINTER ATTACHMENT—Tune in a signal of known frequency. Set the pointer at this frequency on the dial scale. Attach pointer to cord —See Illustration.

MONTGOMERY-WARD & CO.

MODELS 14WG-518, 14WG-51



ISSUE "C" June 12, 1941

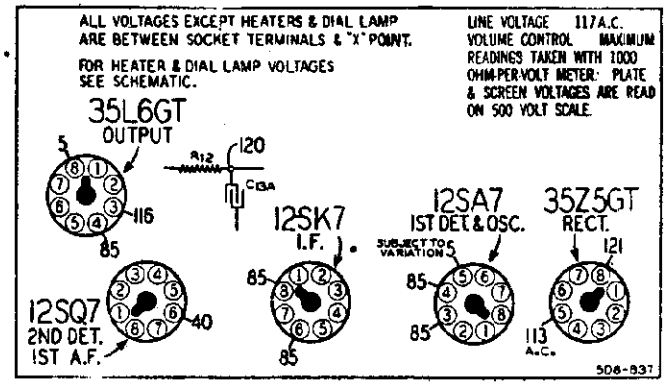
When the 4" Electro-Dynamic Speaker replaces the 4" P.M. Speaker on the above chassis, the issue letter advances to "C". The speaker field replaces the 1500 ohm B+ filter resistor with additional changes in the B+ circuit connections to the 35L6GT Output tube. A 20 mf. 25 volt electrolytic condenser is placed across the 170 ohm 35L6GT cathode resistor. A 60 ohm 1.5 watt resistor is inserted in the heater circuit between the 12SK7 and 12SA7 tube heaters.

Part No.		Description	
The following NEW PARTS are used on the issue "C" chassis:			
12A408	4"	Electro-Dynamic Speaker.....	$ 1.76
45X317	C17	20 mf, 25 Volt Dry Electrolytic....	.24
D95600	R13	60 ohm 1.5 Watt Carbon Resistor....	.12
The following parts are used on issues "A" and "B" chassis only:			
12A380	4"	P.M. Speaker.....	1.46
C95152	R11	1500 Ohm 1.0 Watt Carbon Resistor..	.06

Issues "A," "B" and "C" chassis of the above models used an antenna trimmer (C3) mounted on the loop aerial assembly, On issue "D" chassis, the antenna trimmer (C3) has been replaced by a "Gimmick" fixed capacitance, consisting of 2 wires, one wrapped around the other. The 1400 KC adjustment is made at the factory and need not be made in the field.

The following part is used on issues "A," "B" and "C" chassis only:

17A116	C3	2.5-23 mmf. antenna trimmer	$0.06



SPECIFICATIONS

Power Consumption - 28 Watts (At 117 volts AC Supply)
Power Output - - - - - - .8 Watt Undistorted
Selectivity - - 55 KC Broad at 1000 times Signal
Intermediate Frequency - - - - - - - - 456 KC
Speaker - - - - - - - - - - 4" P.M. Dynamic
Tuning Frequency Range - - - 528 to 1600 KC
Sensitivity (For .05 Watt Output)
External Antenna - - - - - - 20 Microvolts Average

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Allow Chassis and Signal Generator to "Heat Up" for several Minutes.

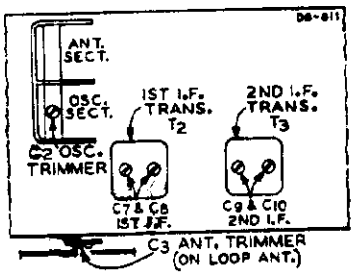
The equipment in column at right is required for aligning:

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., 50 mmf.

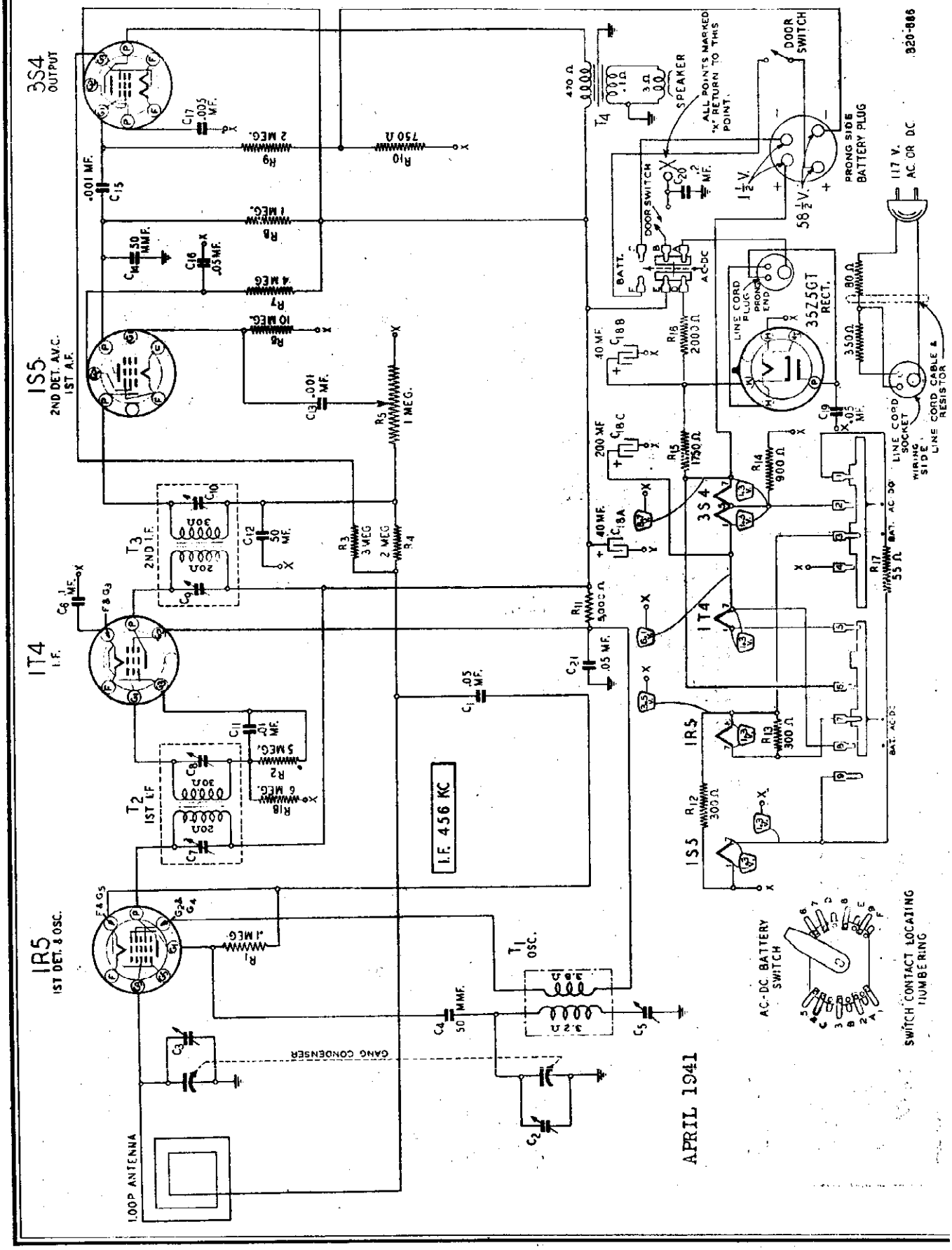
SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR ANTENNA CONNECTION	SIGNAL GENERATOR GROUND CONNECTION	DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration)
456 KC	Control Grid 12SK7—I.F.	Point "X" (12SK7—I.F. Prong No. 3	.1 mf.	Turn Rotor to full open	2nd I.F. (C9) & (C10)
456 KC	Control Grid 12SA7—1st Det.	Same As Above	.1 mf.	Turn Rotor to full open	1st I.F. (C7) & (C8)
1600 KC	Control Grid 12SA7—1st Det.	Same As Above	.1 mf.	Turn Rotor to full open	Oscillator (C2)
1400 KC	External Antenna Clip On Loop —See Note A	External Ground Clip On Loop	50 mmf.	Turn Rotor to Max. Output Set Indicator to 1400 KC— See Note B	Antenna (C3)



NOTE A—Re-assemble chassis in cabinet. Replace back on cabinet.

NOTE B—Tune in a 1400 KC signal. If pointer is not at the 1400 KC mark on the dial scale, remove chassis and pull pointer off shaft. Set pointer at the 1400 KC mark and push back on shaft.

MONTGOMERY WARD & CO



PERSONAL PORTABLE RADIO WITH BUILT-IN AIR WAVE LOOP AERIAL

MONTGOMERY WARD & CO.

ALIGNMENT PROCEDURE

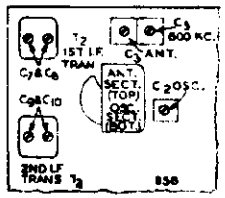
Volume Control—Maximum All Adjustments.

Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning:

A Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

Output Indicating Meter—Non-Metallic Screwdriver.



Use Loop for All Adjustments—See Note "A"		
Signal Gen. FREQUENCY SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration)
456 KC	Turn Rotor to Full Open	1st I.F. (C7) & (C8) 2nd I.F. (C9) & (C10)
1610 KC	Turn Rotor to Full Open	Oscillator (C2)
1500 KC	Turn Rotor to Max. Output Set Knob to 1500 KC	Antenna (C3)
600 KC	Turn Rotor to Max. Output	600 KC (C5) Rock Rotor—See Note B
1500 KC	Turn Rotor to Max. Output	Antenna (C3)

NOTE A—Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. Place radio approximately 2 feet (6" for I.F. adjustment) from loop.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

SPECIFICATIONS

Input Voltages and Currents—Battery Operation

"A" Battery - - - - 1½ Volts—.25 Amp.

"B" Battery - - - - 58½ Volts—8. Ma.

Power Consumption - - - - - - 30 Watts (At 117 Volts AC Supply)

Power Output

Battery Operation - 55 Mw. Undistorted 110 Mw. Maximum

AC Operation - - 80 Mw. Undistorted 170 Mw. Maximum

Selectivity - 40 KC Broad at 1000 Times Signal

Intermediate Frequency - - - - - - 456 KC

Speaker - - - - - - - - - 4" P.M. Dynamic

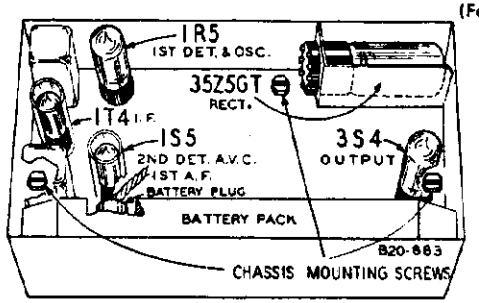
Tuning Frequency Range - 528 to 1610 KC

Sensitivity - 400 Microvolts per Meter Average (For .05 Watt Output)

ANTENNA

An Airwave Loop Aerial is built inside the front cover of this radio.

With the built-in loop aerial, directional effects are obtained. The signal pickup may be increased and interference from nearby stations can be reduced by rotating the radio until the signal is at a maximum.



BATTERY OPERATION

The following battery pack is required:

Battery Pack Catalog No. 62-5032.

To install battery pack, grasp case handle and pull open back cover at handle side of case. Note position of prongs on battery cable plug and holes in socket on battery. Then insert plug in socket. Install battery pack in case as shown in illustration on page 2. Close back cover tightly, first getting bottom hooks in place in slots.

AC-DC OPERATION

Line Cord—Plug 3 hole socket on line cord into 3 prong plug which can be seen through a hole in the side of the case.

Check Your Line Voltage—Unless otherwise marked, this radio must be operated on a power supply of 105-125 volts AC, 50 to 60 cycles only, or 105-125 volts DC.

Radios for 25 cycle AC operation are so marked.

When using the radio on AC, if there appears to be excessive hum, reverse the plug. Leave the plug inserted the way which gives the least hum.

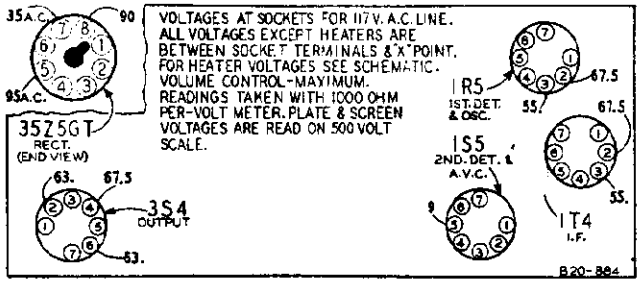
110 Volt DC Operation—Insert plug so that red mark is on positive side of the line.

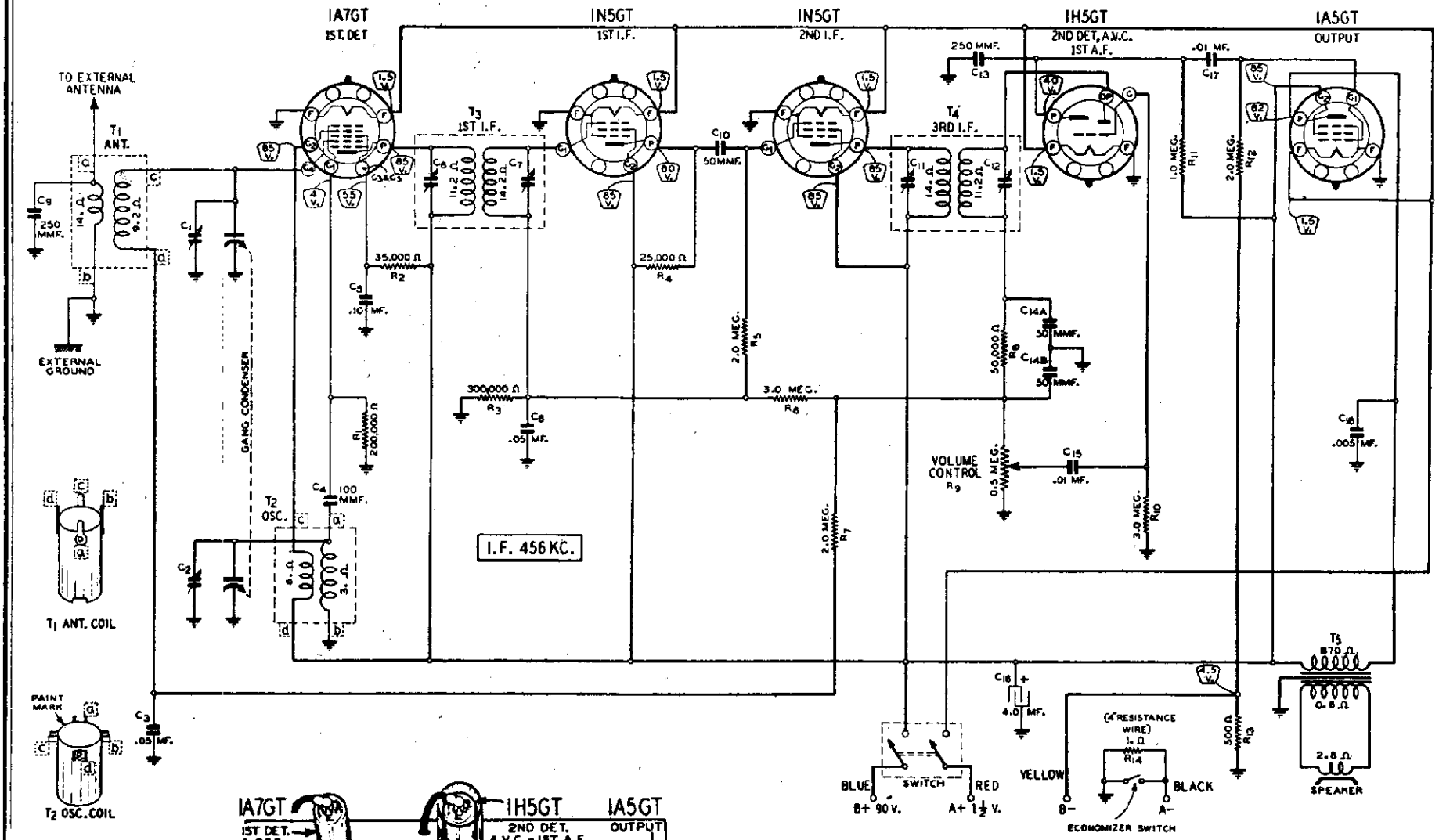
CAUTION—If polarity of line is not known, insert plug; if set does not operate after one minute, reverse plug.

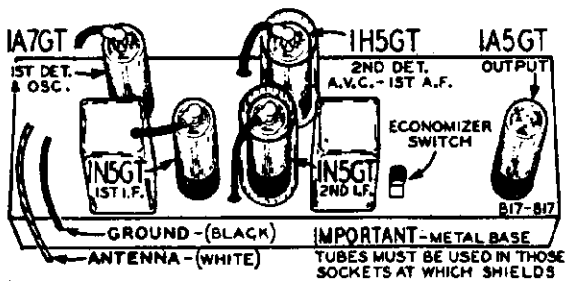
TUBES

The tube types and position of the tubes and tube shields are shown in the illustration.

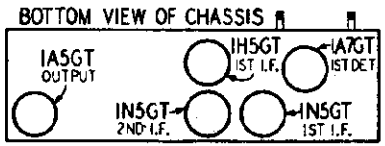
To replace the 35Z5GT rectifier tube, pull line cord plug out of case. Carefully pry off the 2 control knobs. Then take out the 3 chassis screws (shown in illustration) with a ¼ inch socket wrench. Carefully lift chassis, tilting it at the same time, as far as connecting wires permit. Insert a screwdriver between rectifier tube and socket and pry tube out of socket.







MARCH 1941



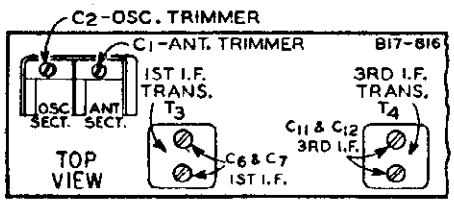
FOR OTHER DATA SEE INDEX

MODEL 14WG-572
MODEL 14WG-575
MODEL 14WG-572

MONTGOMERY-WARD & CO.

ALIGNMENT PROCEDURE

Volume Control — Maximum 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:
A 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.



SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration)
456 KC	Signal Grid of 1st Det. (Top Cap)	.1 mf.	Turn rotor to full open	1st I.F. (C6) & (C7) 3rd I.F. (C11) & (C12)
1730 KC	Signal Grid of 1st Det.	.1 mf	Turn rotor to full open	Oscillator (C2)
1400 KC	Antenna Lead	200 mmf.	Turn Rotor to Max. Output Set Indicator to 1400 KC— See Note A	Antenna (C1)

Models having a new drive cord stringing arrangement in which the drive cord has been shortened to 23 1/8 inches and the drive drum has been rotated 90 degrees from its previous position, should have the issue letter advanced to "D".

SPECIFICATIONS

Input Voltages and Currents
"A" Battery.....1.5 Volts—.25 Amperes
"B" Battery.....90 Volts—11 Ma.
Power Output.....{70 Milliwatts Undistorted / 160 Milliwatts Maximum}
Selectivity.....40 KC Broad at 1000 Times Signal
Intermediate Frequency.....456 KC
Speaker.....5" P.M. Dynamic
Tuning Frequency Range.....528 to 1730 KC
Sensitivity (For .05 Watt Output)...14 Microvolts Average

MODEL 14WG-575

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments. Allow Chassis and Signal Generator to "Heat Up" for several Minutes.

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration)
456 KC	Signal Grid of 1st Det.	.1 mf.	Turn rotor to full open	1st I.F. (C6) & (C7) 2nd I.F. (C11) & (C12)
1730 KC	Grid of 1st Det.	.1 mf.	Turn rotor to full open	Oscillator (C4)
1500 KC	Antenna Lead	200 mmf.	Turn rotor to max. output	Antenna (C3)

SPECIFICATIONS

Power Consumption
Battery Operation - 2.2 Amp. at 6.3 Volts
AC Operation - - 32 Watts at 117 Volts AC
Power Output - - - - .5 Watt Undistorted / 1.0 Watt Maximum
Selectivity - 41 KC Broad at 1000 times Signal
Intermediate Frequency - - - - - 456 KC.
Speaker - - - - - - - 5" P.M. Dynamic
Tuning Frequency Range - 528 to 1730 KC.
Sensitivity (For .05 Watt Output) - 10 Microvolts Aver.

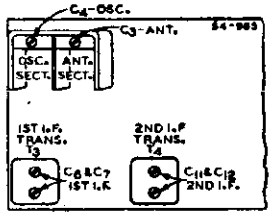
The following equipment is required for aligning:

Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

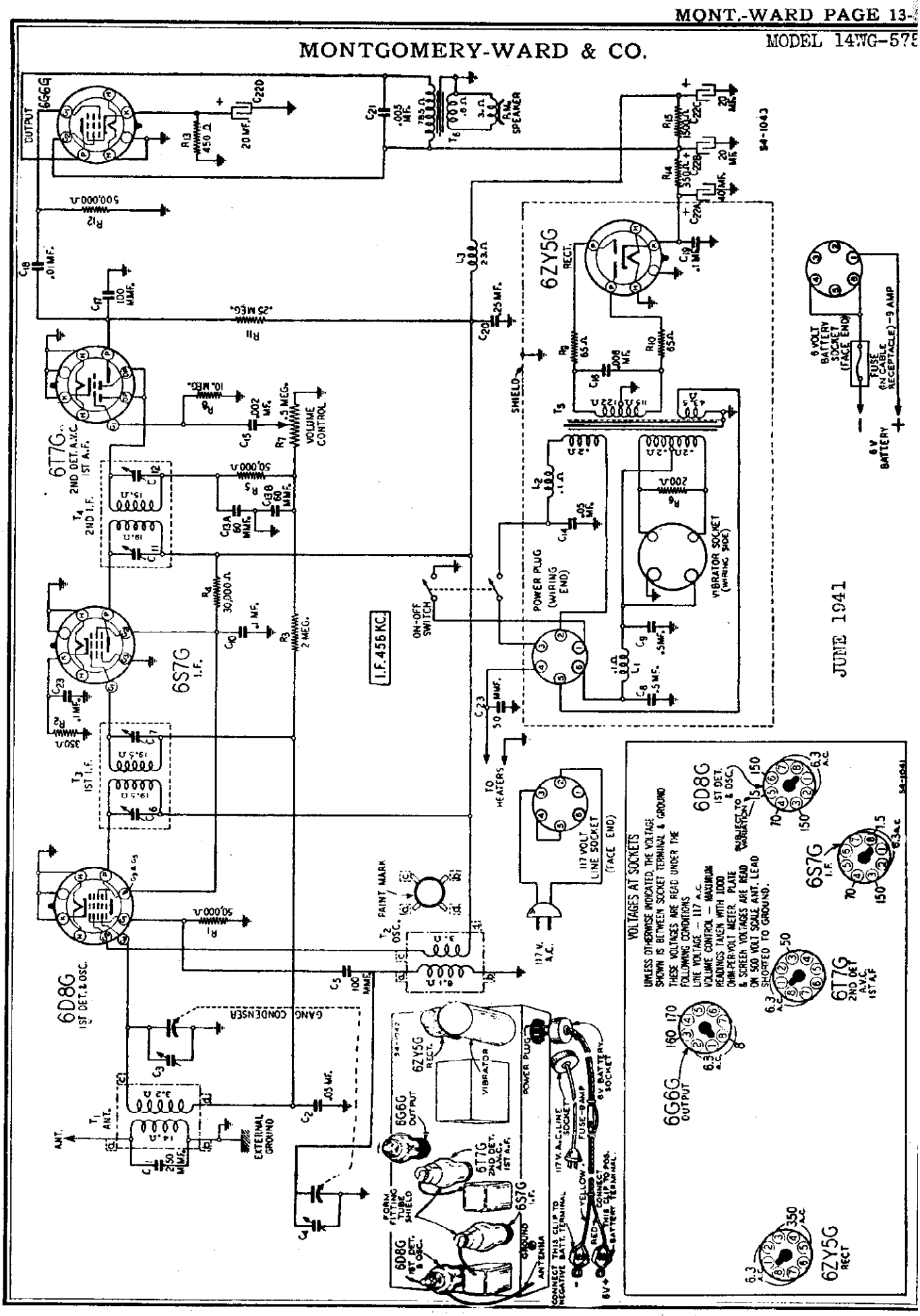
Output Indicating Meter; Non-Metallic Screwdriver.

Dummy Antennas—.1 mf. and 200 mmf.

CALIBRATION—If it is necessary to calibrate the radio, tune in an 800 KC signal. If the pointer is not at the 800 KC mark on the dial, remove it from drive cord and set it at the 800 KC mark.

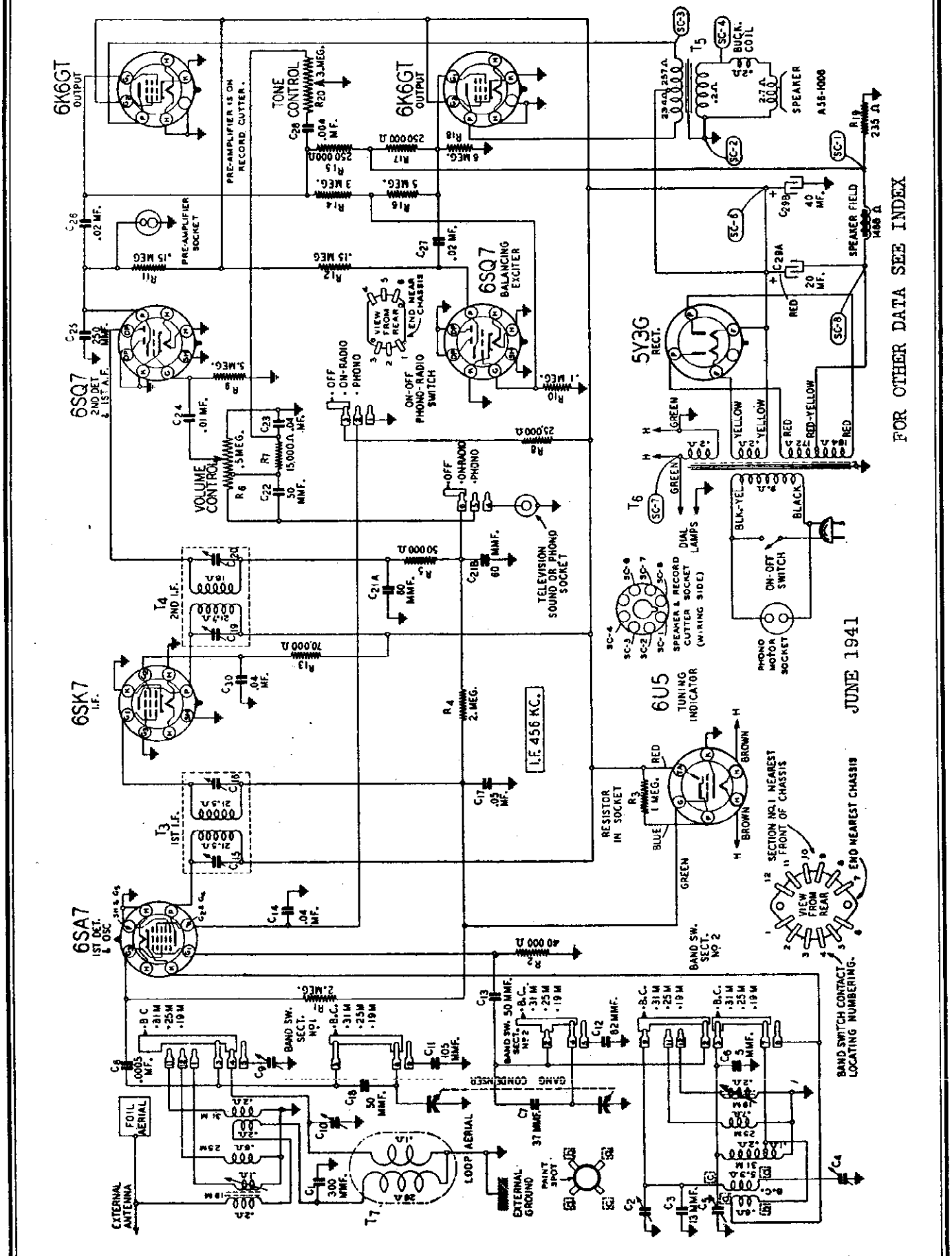


MONTGOMERY-WARD & CO.

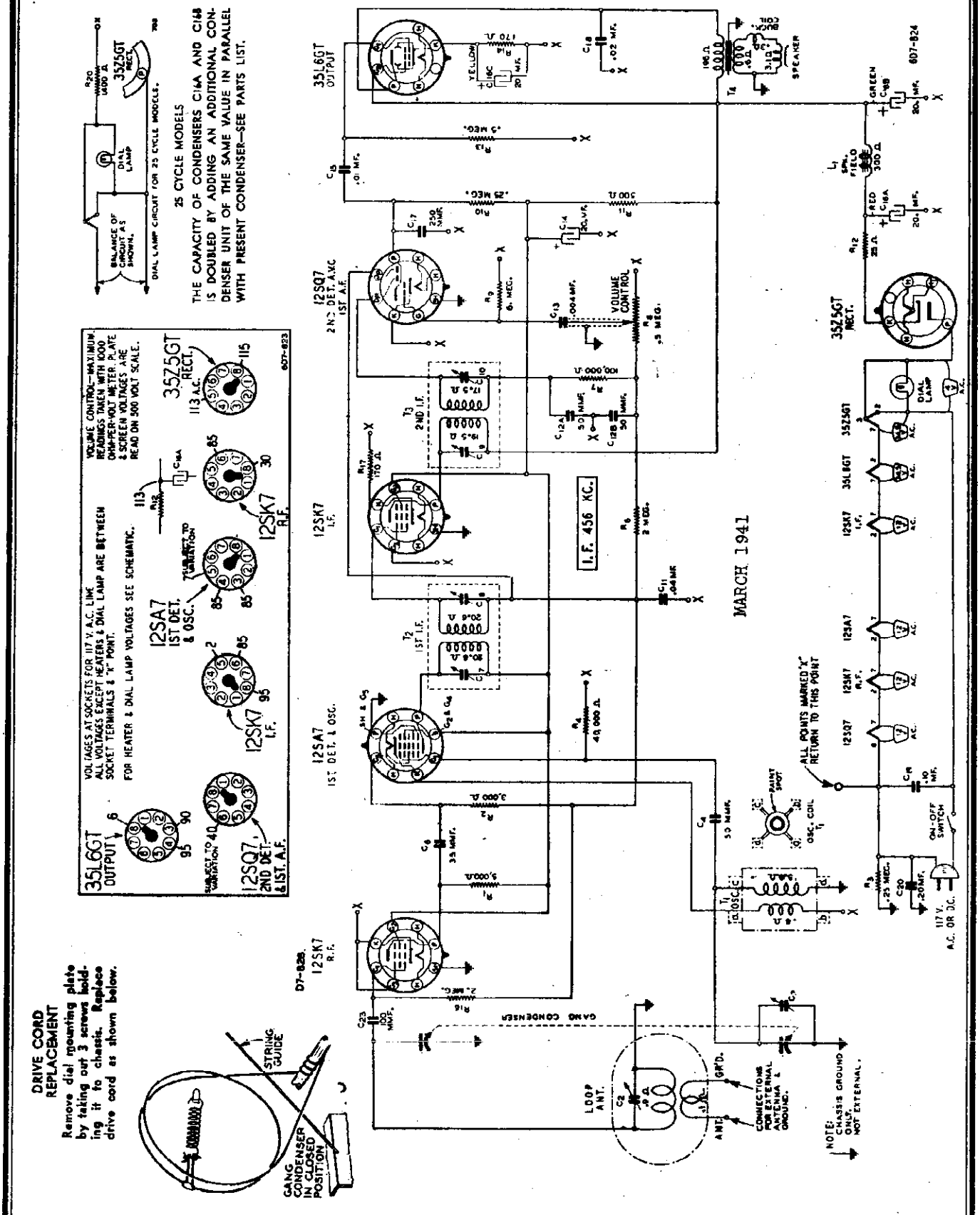


MODELS 14WG-808M, 14WG-808W

MONTGOMERY-WARD & CO.



MONTGOMERY WARD & CO. MODELS 14WG-624A, 14WG-628A, 14WC-628A



MODELS 14WG-624A, 14WG-625A, 14WG-628A

MONTGOMERY-WARD & CO.

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Allow Chassis and Signal Generator to "Heat Up" for several Minutes.

The equipment in column at right is required for aligning:

Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

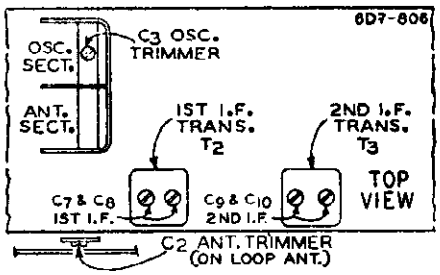
Output Indicating Meter; Non-Metallic Screwdriver.

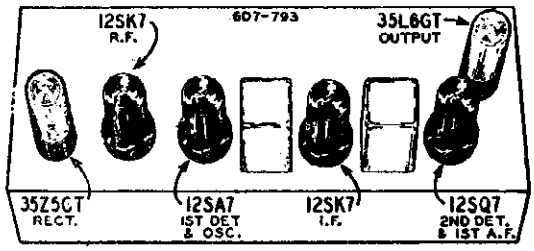
Dummy Antennas—.1 mf., 50 mmf.

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR ANTENNA CONNECTION	SIGNAL GENERATOR GROUND CONNECTION	DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration)
456 KC	Control Grid 12SK7—I.F.	Point "X" 12SK7—R.F. Prong No. 3	.1 mf.	Turn Rotor to full open	2nd I.F. (C9) & (C10)
456 KC	Control Grid 12SA7—1st Det.	Same As Above	.1 mf.	Turn Rotor to full open	1st I.F. (C7) & (C8)
1600 KC	Control Grid 12SA7—1st Det.	Same As Above	.1 mf.	Turn Rotor to full open	Oscillator (C3)
1400 KC	External Antenna Clip On Loop —See Note A	External Ground Clip On Loop	50 mmf.	Turn Rotor to Max. Output Set Indicator to 1400 KC See Note B	Antenna (C2)

SPECIFICATIONS

Power Consumption - 28 Watts (At 117 volts AC Supply)
Power Output - - - - - - - .8 Watt Undistorted
Selectivity - - 50 KC Broad at 1000 times Signal
Intermediate Frequency - - - - - - - - 456 KC
Speaker - - - - - - - - 5" Electro Dynamic
Tuning Frequency Range - - - 528 to 1600 KC
Sensitivity (For .05 Watt Output)
External Antenna - - - - - - - 10 Microvolts Average





NOTE A—Re-assemble chassis in cabinet. Fasten loop assembly to back of cabinet. pointer is not at the 1400 KC mark on the dial scale, pull pointer off shaft. Set pointer

NOTE B—Tune in a 1400 KC signal. If at the 1400 KC mark and push back on shaft.

ANTENNA

An Air Wave Loop Aerial is built on the inside of the back cover of the cabinet of this radio. For reception of local or powerful nearby stations no other antenna or ground is usually required.

However, more stations will be heard and noise will often be reduced by using an outside antenna and a good ground. For locations in the city or close to the broadcasting stations, the antenna should be 20 to 35 feet in length while for locations in the country or at a distance from the broadcasting stations, use a 35 to 60 foot antenna.

A GROUND CONNECTION IS REQUIRED if an external antenna is used. A ground connection may be obtained by connecting to a water pipe, radiator, or a pipe driven into the ground.

The antenna and ground connections are made at the clips marked "External Antenna" and "External Ground" on the cabinet back.

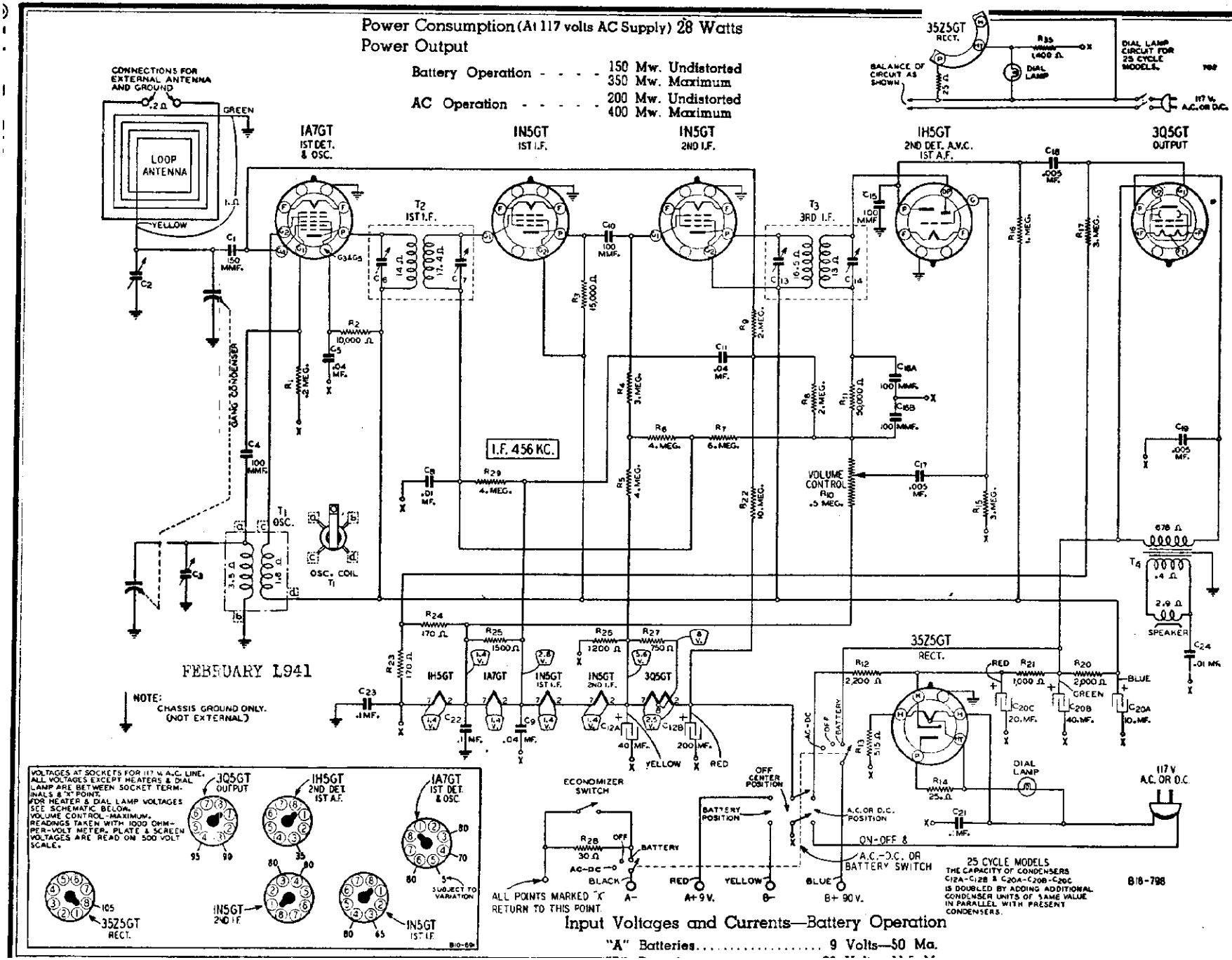
When using the radio on AC, if there appears to be excessive hum, reverse the plug. Leave the plug inserted the way which gives the least hum.

Radios for 25 cycle AC operation are so marked.

110 Volt D.C. Operation—Insert plug so that prong on same side as *ribbed* side of cord is on the positive side of the line. *CAUTION*—If polarity of line is not known, insert plug. If set does not operate after one minute, reverse plug.

CHECK YOUR LINE VOLTAGE

Unless otherwise marked, this radio must be operated on a power supply of 105-125 Volts AC, 50 to 60 cycles only, or 105-125 Volts DC.


Power Consumption (At 117 volts AC Supply) 28 Watts
Power Output
Battery Operation - - - - 150 Mw. Undistorted
350 Mw. Maximum
AC Operation - - - - - 200 Mw. Undistorted
400 Mw. Maximum
CONNECTIONS FOR EXTERNAL ANTENNA AND GROUND
LOOP ANTENNA
GREEN
YELLOW
GANG CONDENSER
1A7GT 1ST DET. & OSC.
1N5GT 1ST I.F.
1N5GT 2ND I.F.
1H5GT 2ND DET. A.V.C. 1ST A.F.
3Q5GT OUTPUT
35Z5GT RECT.
T1 OSC.
T2 1ST I.F.
T3 3RD I.F.
T4
OSC. COIL T1
I.F. 456 KC.
VOLUME CONTROL R10 .5 MEG.
SPEAKER
DIAL LAMP CIRCUIT FOR 25 CYCLE MODELS.
BALANCE OF CIRCUIT AS SHOWN
117 V. A.C. OR D.C.
DIAL LAMP
ON-OFF & BATTERY SWITCH
ECONOMIZER SWITCH
OFF CENTER POSITION
BATTERY POSITION
A.C. OR D.C. POSITION
A.C.-D.C. OR BATTERY SWITCH
ALL POINTS MARKED "X" RETURN TO THIS POINT.
A- A+ 9 V. B- B+ 90 V.
25 CYCLE MODELS
THE CAPACITY OF CONDENSERS C12A-C12B & C20A-C20B-C20C IS DOUBLED BY ADDING ADDITIONAL CONDENSER UNITS OF SAME VALUE IN PARALLEL WITH PRESENT CONDENSERS.
B18-798
FEBRUARY 1941
NOTE: CHASSIS GROUND ONLY. (NOT EXTERNAL)
VOLTAGES AT SOCKETS FOR 117 V. A.C. LINE. ALL VOLTAGES EXCEPT HEATERS & DIAL LAMP ARE BETWEEN SOCKET TERMINALS & "X" POINT. FOR HEATER & DIAL LAMP VOLTAGES SEE SCHEMATIC BELOW. VOLUME CONTROL - MAXIMUM. READINGS TAKEN WITH 1000 OHM-PER-VOLT METER. PLATE & SCREEN VOLTAGES ARE READ ON 500 VOLT SCALE.
3Q5GT OUTPUT
1H5GT 2ND DET. 1ST A.F.
1A7GT 1ST DET. & OSC.
1N5GT 2ND I.F.
1N5GT 1ST I.F.
35Z5GT RECT.
SUBJECT TO VARIATION
B10-69
Input Voltages and Currents—Battery Operation
"A" Batteries..... 9 Volts—50 Ma.

CHANGES MADE FOR ISSUE "D"

Starting with Issue "D", chassis of the above series will use a plug-in resistor to replace the former dual wire wound type. In addition a new oscillator coil and 2 section dry electrolytic are used with this issue chassis. Listed below are the parts changes:

Date 2/21/41

New Parts used on "D" Issue Chassis:

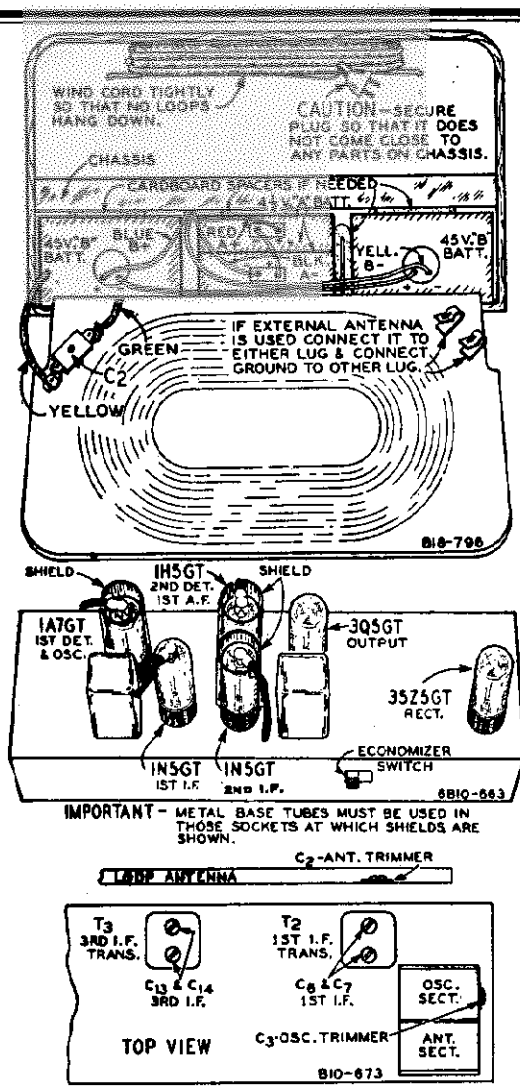
Part No.	Description	Selling Price
9A1396	T1 Oscillator Coil Assembly.....	.76
45X301	(C12A 40 mf. 35 V.) (C12B 200 mf. 35 V.) Dry Electrolytic...	.34
43X106	(R12 2200 Ohm 5 Watts) (R13 515 Ohm 12 Watts) Plug-in Resistor	.34

The following Parts are used on "C" Issue Chassis only:

Part No.	Description	Selling Price
32X217	Tubular Shield for Wire Wound Resistor....	.12
9A1375	T1 Oscillator Coil Assembly.....	.22
45X284	(C12A 40 mf. 35 V.) (C12B 200 mf. 35 V.) Dry Electrolytic....	.36
43X105	(R12 2200 Ohm 5 Watts) (R13 515 Ohm 12 Watts) Wire Wound Resistor	.42

ALIGNMENT PROCEDURE

SIGNAL GENERATOR			DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration below)
FREQUENCY SETTING	ANTENNA CONNECTION	GROUND CONNECTION			
456 KC	External Antenna Clip on Loop	External Ground Clip on Loop	.1 mf.	Turn Rotor to full open	1st I.F. (C6) & (C7) 3rd I.F. (C13) & (C14)
1600 KC	External Antenna Clip	External Ground Clip	.1 mf.	Turn Rotor to full open	Oscillator (C3)
1400 KC	External Antenna Clip See Note A	External Ground Clip	50 mmf.	Turn Rotor to max. output	Antenna (C2)



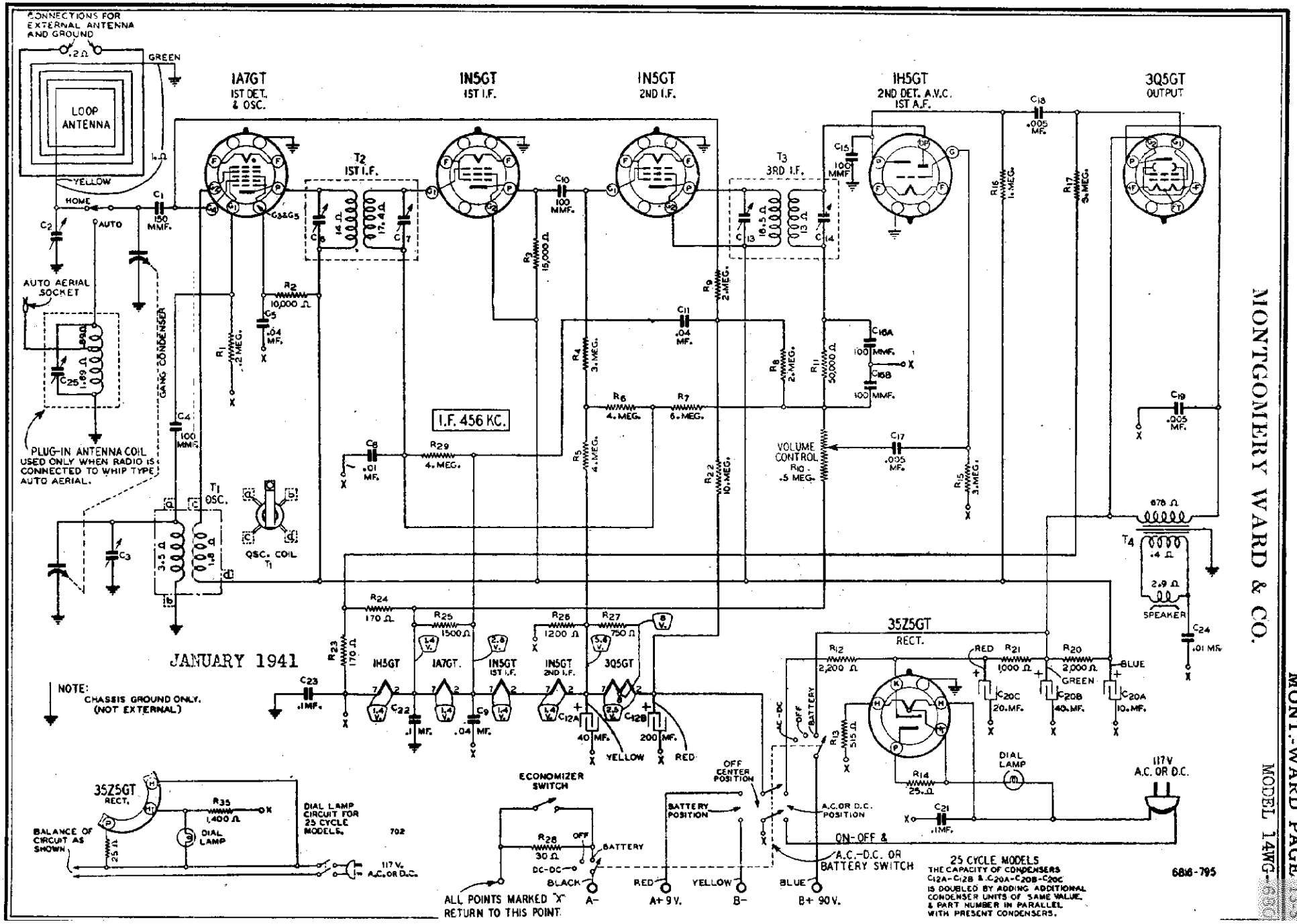
Selectivity - 50 KC Broad at 1000 Times Signal

Intermediate Frequency - - - - - - 456 KC

Speaker - - - - - - - - - 6" P.M. Dynamic

Tuning Frequency Range - - 540 to 1600 KC

Sensitivity (For .05 Watt Output)
External Antenna - - - 10 Microvolts Average



MONTGOMERY WARD & CO.

MONT.-WARD PAGE 135

MODEL 14WG-6850

SPECIFICATIONS

Input Voltages and Currents—Battery Operation
"A" Battery ..... 9 Volts—50 Ma.
"B" Battery ..... 90 Volts—11.5 Ma.

Power Consumption (At 117 volts AC Supply) 28 Watts

Power Output
Battery Operation - - - - 150 Mw. Undistorted, 350 Mw. Maximum
AC Operation - - - - - 200 Mw. Undistorted, 400 Mw. Maximum

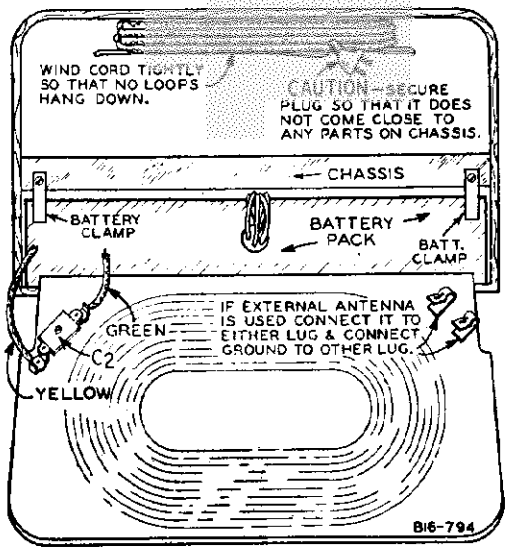
Selectivity - 50 KC Broad at 1000 Times Signal

Intermediate Frequency - - - - - - 456 KC

Speaker - - - - - - - - - 6" P.M. Dynamic

Tuning Frequency Range - - 540 to 1600 KC

Sensitivity (For .05 Watt Output)
External Antenna - - - 10 Microvolts Average



ALIGNMENT PROCEDURE

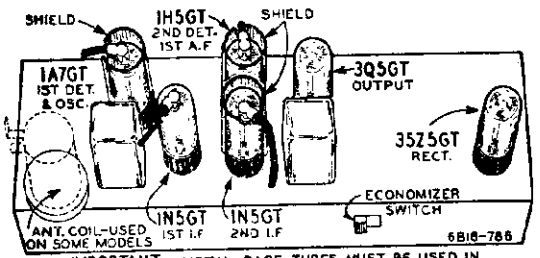
Volume Control—Maximum All Adjustments.

Allow Chassis and Signal Generator to "Heat Up" for several minutes.

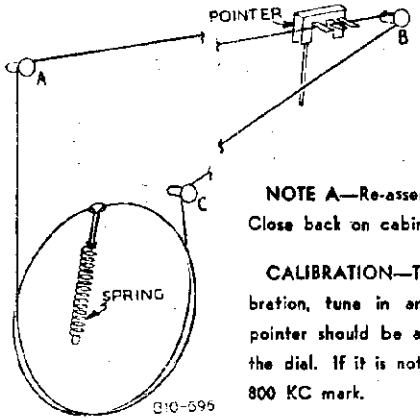
The following equipment is required for aligning:
A Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter—Non-Metallic Screwdriver.
Dummy Antennas—.1 mf., 50 mmf.

SIGNAL GENERATOR					
FREQUENCY SETTING	ANTENNA CONNECTION	GROUND CONNECTION	DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration below)
456 KC	External Antenna Clip on Loop	External Ground Clip on Loop	.1 mf.	Turn Rotor to full open	1st I.F. (C6) & (C7) 3rd I.F. (C13) & (C14)
1600 KC	External Antenna Clip	External Ground Clip	.1 mf.	Turn Rotor to full open	Oscillator (C3)
1400 KC	External Antenna Clip See Note A	External Ground Clip	50 mmf.	Turn Rotor to max. output	Antenna (C2)

Car Antenna Adjustment—Tune in weak signal near 1400 KC—Adjust Car Antenna Trimmer C25 for maximum output. This trimmer is in special antenna coil can at left side of chassis (See illustration in Auto Installation Sheet).



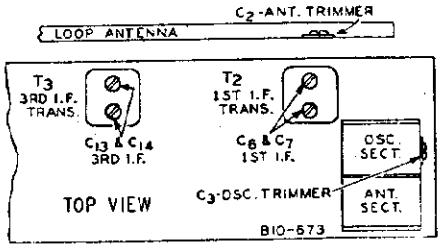
IMPORTANT - METAL BASE TUBES MUST BE USED IN THOSE SOCKETS AT WHICH SHIELDS ARE SHOWN.



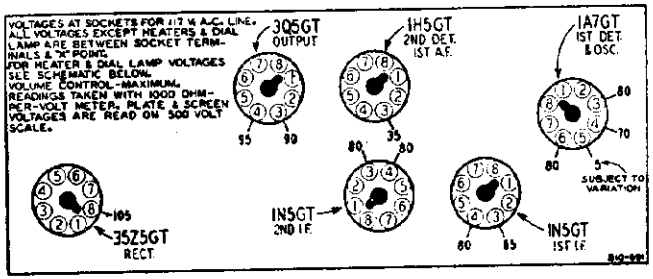
Dial Pointer Attachment—Tune in a signal of known frequency. Set pointer to this frequency mark on dial scale. Attach pointer to drive cord—See illustration.

NOTE A—Re-assemble chassis in cabinet. Close back on cabinet.

CALIBRATION—To obtain dial scale calibration, tune in an 800 KC signal. The pointer should be at the 800 KC mark on the dial. If it is not, set the pointer at the 800 KC mark.

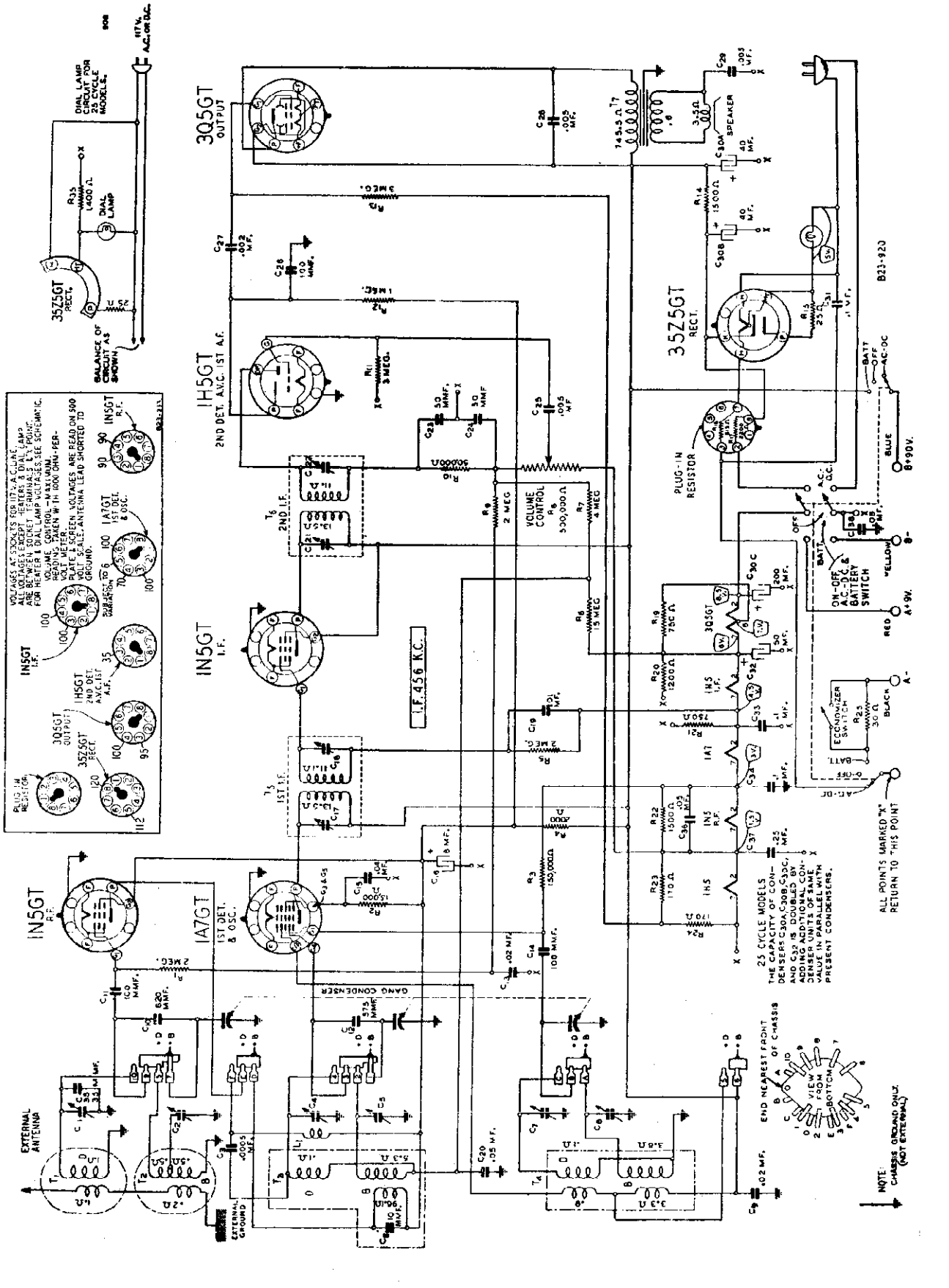


If radio is equipped with special antenna coil for use in car, make the following additional adjustment after the radio is installed in the car and the car antenna is connected.



MODEL 14WG-683

MONTGOMERY-WARD & CO.



MODEL 14WG-683B

MONTGOMERY-WARD & CO.

SERVICE DATA (For Professional Service Men)

ALIGNMENT PROCEDURE MAY 1941

Volume Control—Maximum All Adjustments.

Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The equipment in column at right 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.

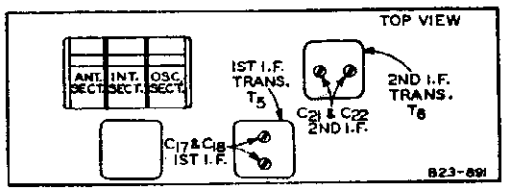
Dummy Antennas—.1 mf., 100 mmf., and 400 ohms.

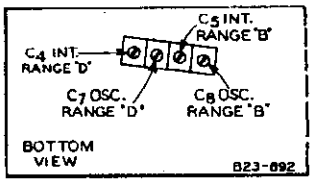
After each range is completed, repeat the procedure as a final check.

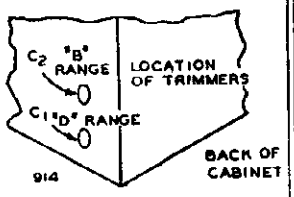
NOTE A—If the pointer is not at 1400 KC. set it at the 1400 KC mark on the dial scale.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

FREQUENCY SETTING	SIGNAL GENERATOR ANTENNA CONNECTION	SIGNAL GENERATOR GROUND CONNECTION	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER OR DIAL SETTING	ADJUST TRIMMERS TO MAXIMUM
Remove chassis from cabinet—disconnect the 3 loop leads at terminal strip on chassis.						
I.F. 456 KC	Top Grid 1A7GT 1st Det.	Point "X" {1H5GT—2nd Det. Prong No. 7}	.1 mf.	B Range	Turn Rotor to Full Open	2nd I.F. (C21) & (C22) 1st I.F. (C17) & (C18)
RANGE B 1610 KC	Top Grid 1N5GT RF Tube	Same as Above	.1 mf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C8)
1400 KC	Same as Above	Same as Above	.1 mf.	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC—See Note A	Int. Range B (C5)
RANGE D 18,300 KC	Same as Above	Same as Above	.1 mf.	D Range	Turn Rotor to Full Open	Oscillator Range D (C7)
17,500 KC	Same as Above	Same as Above	.1 mf.	D Range	Turn Rotor to Max. Output	Int. Range D (C4) Rock Rotor—See Note B
Reassemble chassis in the cabinet. Resolder loop leads. Both antenna terminals are reached through openings in the side of cabinet.						
LOOP RANGE B 1400 KC	External Antenna Clip	External Ground Clip	100 mmf.	B Range	Turn Rotor to Max. Output	Ant. Range B (C2)
LOOP RANGE D 17,500 KC	External Antenna Clip	External Ground Clip	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C1)







Issue "B" Service Manual Supplement

JUNE 1941

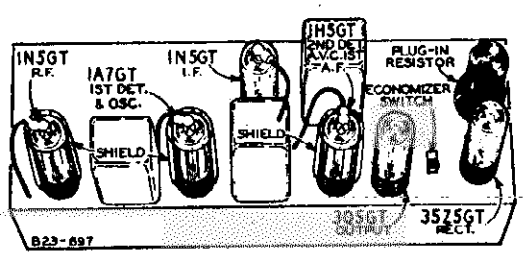
In the issue "B" chassis, a loading coil with an adjustable iron core is connected across the secondary winding of the shortwave loop aerial—See partial schematic circuit diagram below.

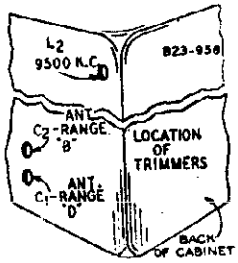
The interstage range "D" and interstage range "B" trimmers have been relocated—See trimmer illustrations below.

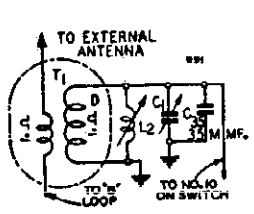
ADDITIONAL ALIGNMENT PROCEDURE

First complete the alignment procedure through Loop Range "B" as given in the instruction manual. Then make the following adjustment:

FREQUENCY SETTING	SIGNAL GENERATOR ANTENNA CONNECTION	SIGNAL GENERATOR GROUND CONNECTION	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER OR DIAL SETTING	ADJUST TRIMMERS TO MAXIMUM
LOOP RANGE D 17,500 KC	External Antenna Clip	External Ground Clip	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C1) Int. Range D (C4) Rock Rotor—See Note B
9,500 KC	Same as Above	Same as Above	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D Loading Coil

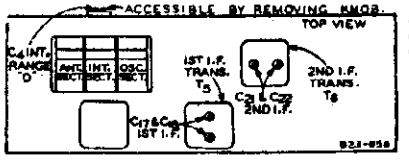


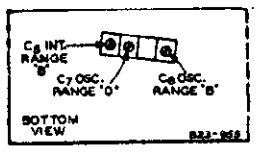




The following NEW PARTS are used in Issue "B" models:

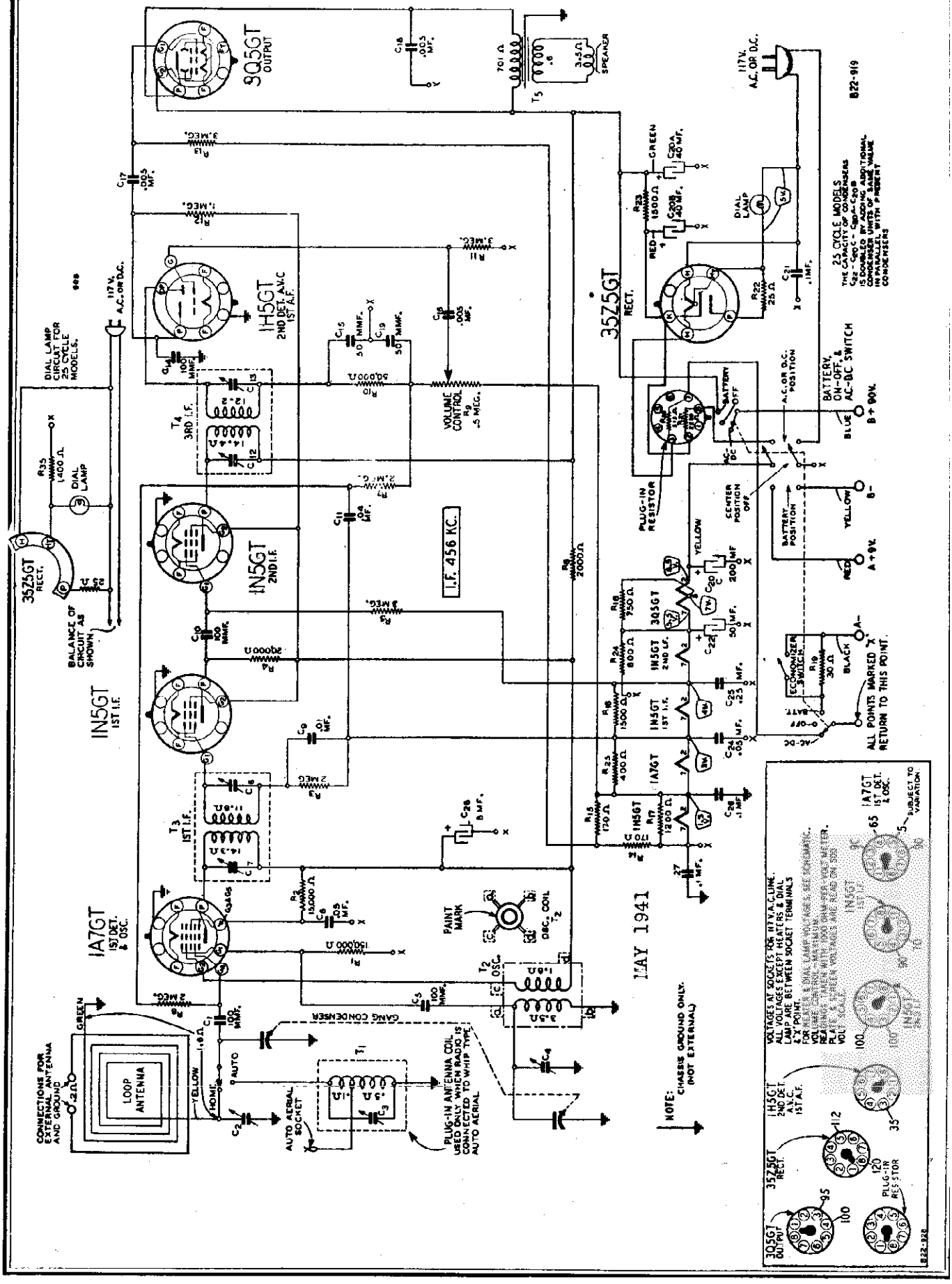
Part No.	Description	Selling Price
9A1437	L2 Loading Coil Assembly	$0.36
17A116	C4 Trimmer Condenser	.10





MODEL 14WG-800

MONTGOMERY-WARD & CO.



SPECIFICATIONS

Input Voltages and Currents—Battery Operation

"A" Battery - - - - 9 Volts—50 Ma.

"B" Battery - - - - 90 Volts—11.5 Ma.

Power Consumption - - - - - - 28 Watts (At 117 volts AC Supply)

Power Output

Battery Operation - 150 Mw. Undistorted, 350 Mw. Maximum

AC Operation - - - 200 Mw. Undistorted, 400 Mw. Maximum

Selectivity - 50 KC Broad at 1000 Times Signal

Intermediate Frequency - - - - - - 456 KC

Speaker - - - - - - 5¼" P.M. Dynamic

Tuning Frequency Range - - 540 to 1600 KC

Sensitivity (For .05 Watt Output)

External Antenna - 10 Microvolts Average

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning:

A Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

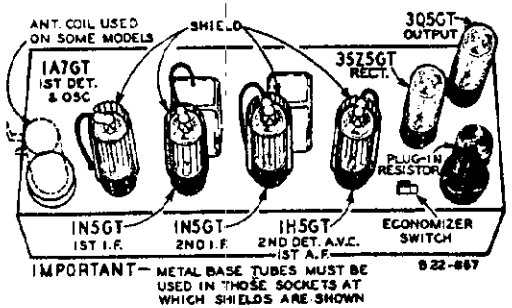
Output Indicating Meter—Non-Metallic Screwdriver.

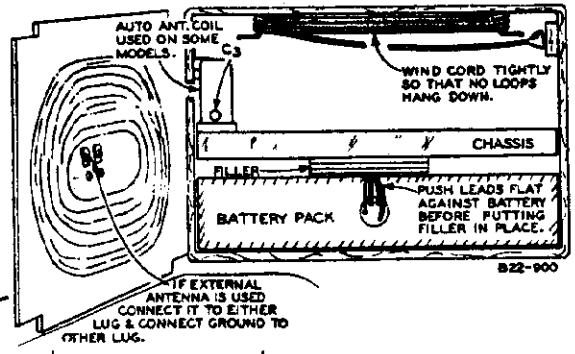
Dummy Antennas—.1 mf., 50 mmf.

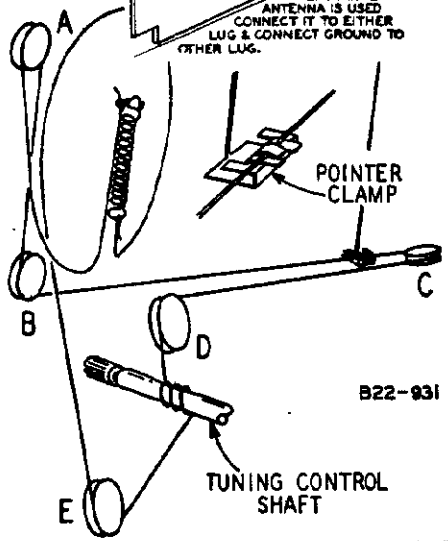
Signal Gen. FREQUENCY SETTING	Signal Gen. ANTENNA CONNECTION	Signal Gen. GROUND CONNECTION	DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration)
456 KC	External Antenna Clip on Loop	External Ground Clip on Loop	.1 mf.	Turn Rotor to full open	1st I.F. (C7) & (C8) 3rd I.F. (C12) & (C13)
1600 KC	External Antenna Clip	External Ground Clip	.1 mf.	Turn Rotor to full open	Oscillator (C4)
If radio is equipped with special antenna coil for use in car, make the following additional adjustment after the radio is installed in the car and the car antenna is connected.					
Car Antenna Adjustment—Tune in weak signal near 1400 KC—Adjust Car Antenna Trimmer C3 for maximum output. This trimmer is in special antenna coil can at left side of chassis (See illustration in Auto Installation Sheet).					

NOTE A—Reassemble chassis in Cabinet. Close back on cabinet.

CALIBRATION—To obtain dial scale calibration, tune in an 800 KC signal. The pointer should be at the 800 KC mark on the dial. If it is not, set the pointer at the 800 KC mark.







DRIVE CORD REPLACEMENT

Turn gang condenser to completely closed position—See illustration. Use a new drive cord 35 inches in length. Tie a knot with small loop at one end of drive cord. Secure loop to hook on drive pulley. Thread cord through hole in rim of drive pulley. Pass cord clockwise (from pulley side of chassis) around drive pulley and around pulleys A, B, C, and D as shown.

Wind cord 3½ turns clockwise (from rear of chassis) around tuning control shaft. Turns should progress toward back of chassis. Continue cord around pulley E and around gang condenser drive pulley as shown. Thread cord through hole in pulley rim and tie to tension spring. Fasten other end of spring to hook on pulley.

ANTENNA

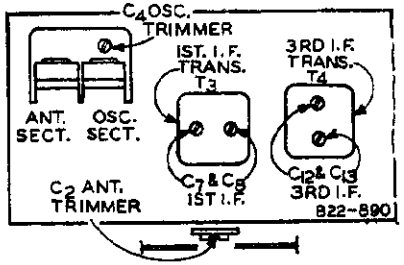
This radio is equipped with a built-in Airwave Loop Aerial. For reception of local or powerful nearby stations, no other antenna or ground is usually required. Directional effects are obtained when using the loop aerial. Rotate the radio until signal pickup is at a maximum and there is least interference from nearby stations.

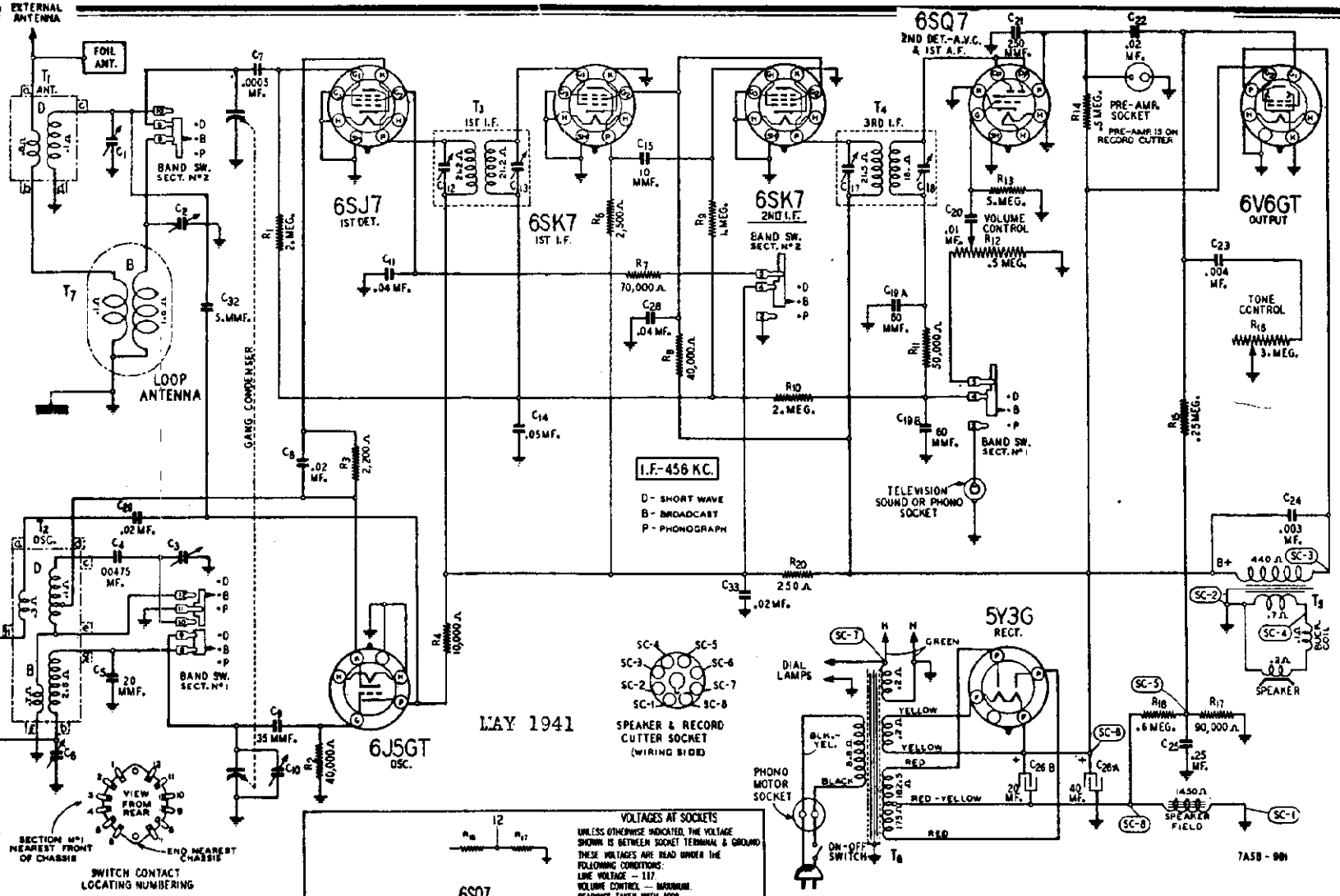
More stations will be heard and noise will often be reduced by using an outside antenna and a good ground.

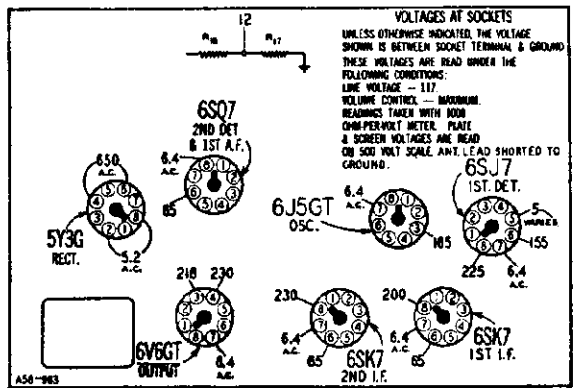
For locations in the city or close to broadcasting stations, the antenna should be 20 to 35 feet in length while for locations in the country or at a distance from the broadcasting stations, use a 35 to 60 foot antenna.

A GROUND CONNECTION IS REQUIRED if an external antenna is used. A ground connection may be obtained by connecting to a water pipe, radiator, or pipe driven into the ground.

The antenna and ground connections are made at the clips on the loop aerial. Open the cabinet back and pass the antenna and ground leads through the holes in the cabinet back—See illustration. Connect the antenna lead to either clip and the ground lead to the other clip.







PHONOGRAPH CONNECTIONS

Phonograph records may be played through this radio. On the back of the chassis base is a socket for a single shielded pin tip at which connections are made—See illustration. The connector on the cable from any standard phono pickup can be inserted in the socket.

ALIGNMENT PROCEDURE

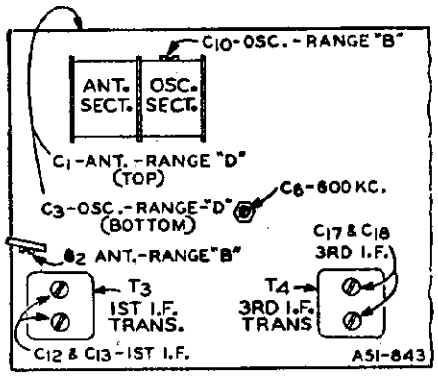
Volume Control—Maximum All Adjustments.

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., 100 mmf., and 400 ohms.

	SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I.F.	456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C12) & (C13) 3rd I.F. (C17) & (C18)
RANGE B	1600 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C10)
	1400 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC See Note A	Ant. Range B (C2)
	600 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C6) Rock Rotor—See Note B
RANGE D	18,300 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C3)
	17,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C1) Rock Rotor—See Note B
LOOP RANGE B	Reassemble chassis in cabinet.					
	1400 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output	Ant. Range B (C2)



After each range is completed, repeat the procedure as a final check.

NOTE A—If the pointer is not at 1400 KC on the dial, remove pointer from drive cord. Set pointer at the 1400 KC mark on the dial scale. Attach pointer to drive cord.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

TELEVISION SOUND AND FREQUENCY MODULATION CONNECTIONS

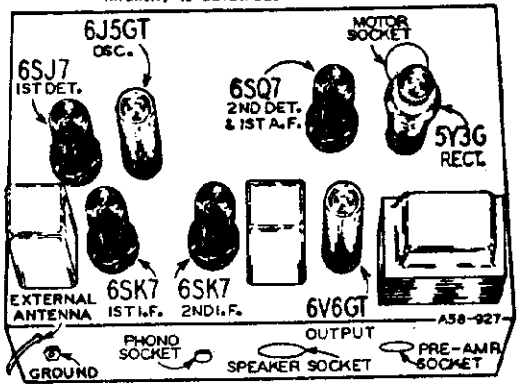
If Television or Frequency Modulation programs become available in your community, this radio may be used in conjunction with a Television Picture Receiver and Sound Converter, or a Frequency Modulation Converter to reproduce these programs.

On the back of the chassis base is a single pin tip socket. The connector on the cable from a television receiver or a frequency modulation converter can be inserted in this socket.

DIAL AND DRIVE ASSEMBLY

26A317	Pulley Mounting Plate Assembly complete with Idler Pulleys, Idler Studs, and Brace Bracket	
58X539	Dial Scale Glass	.28
58X541	Cardboard Background for Dial Scale Glass	.04
28X56	Snap Pins (To hold Background to Mounting Plate)	Doz. .06
30X184	Clamps for Dial Scale Glass	Ea. .06
4X627	Escutcheon for Dial Scale Glass	
	6 Escutcheon Screws—No. 2 x 3/8" Phillips Fr. Oval Hd. Stat. Bronze	Doz. .06
41X62	Lucite Light Intensifier (on Escutcheon)	.54
15X190	Pointer for Dial Scale	.06
	Drive Cord (18 lb. Test)	
28X44	Tension Spring for Drive Cord	.02
25X580	Tuning Shaft	.04
19X192	"C" Washers for Above Shaft	Doz. .06
7A142	Dial Lamp Socket and Cable Assembly	.10
7A32	Dial Lamp (No. 51)	.10

PRICES SUBJECT TO CHANGE WITHOUT NOTICE



SPECIFICATIONS

Power Consumption
60 Watts (At 117 volts 60 cycles)
80 Watts (Phonograph Operating)

Power Output - - - - - - - 2.5 Watts Undistorted
3.5 Watts Maximum

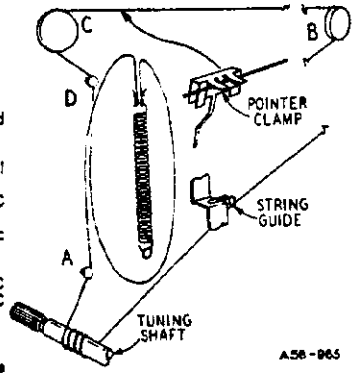
Selectivity - 40 KC Broad at 1000 times Signal

Intermediate Frequency - - - - - - - 456 KC

Speaker - - - - - - - - 8" Electro-Dynamic

Tuning Frequency Range
B Range - - - - - - - 528 to 1600 KC
D Range - - - - - - - 5750 to 18300 KC

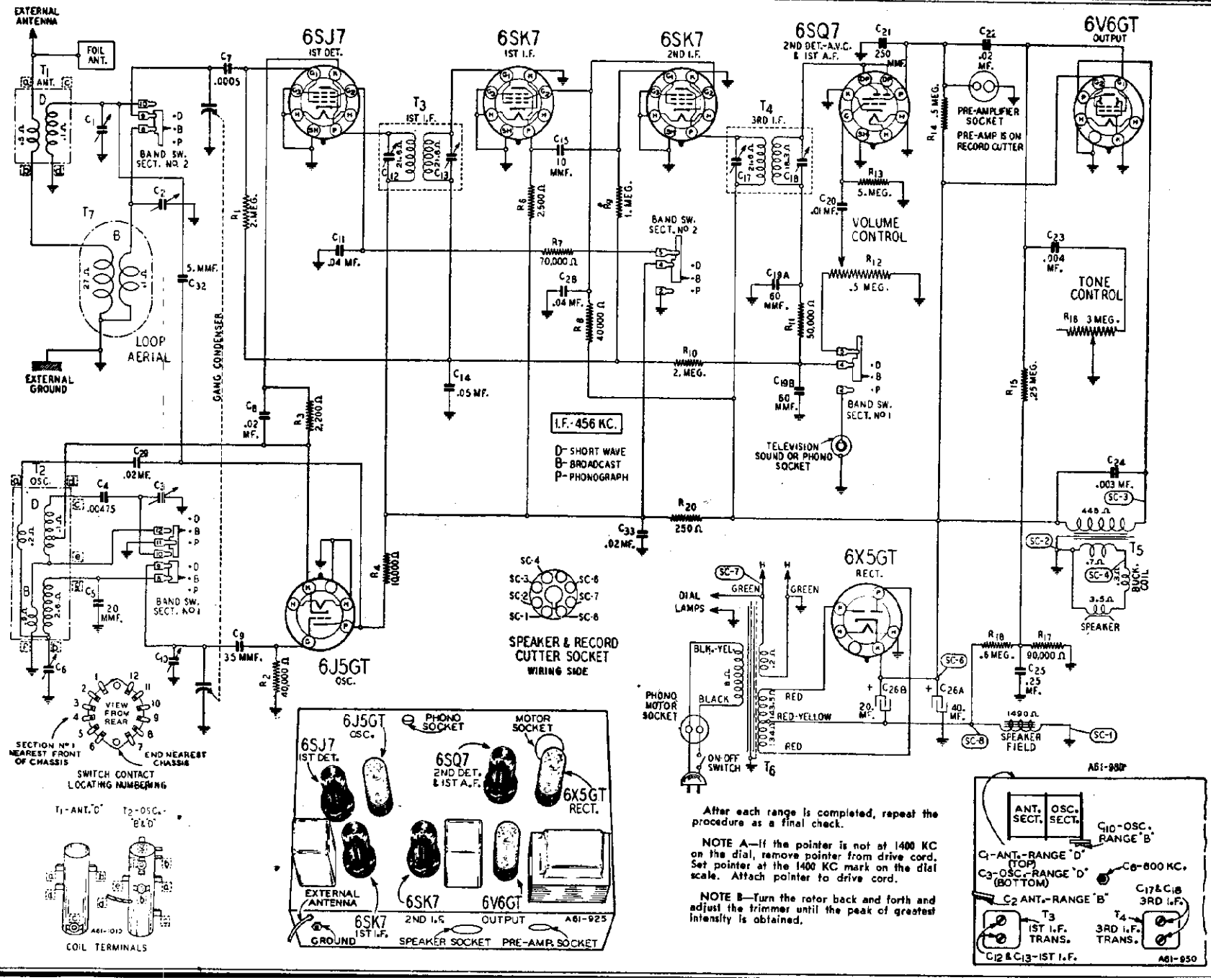
Sensitivity—External Antenna
(For 0.5 Watt output)
B Range - - - - - - 3 Microvolts Average
D Range - - - - - - 6 Microvolts Average



DRIVE CORD REPLACEMENT

Turn gang condenser to full open position. Using a new drive cord 43" in length, tie one end to tension spring. Fasten other end of tension spring to hook on drive pulley. Pass cord through slot in drive pulley rim and continue 1/4 turn around drive pulley toward front of chassis. Continue cord around idler stud "A." Wind 3 1/2 turns clockwise (from front of chassis) around tuning shaft. Turns should progress toward rear of chassis.

Pass cord through string guide, around idler pulleys "B" and "C" and idler stud "D"—See Illustration. Continue cord 3/4 turn counter-clockwise (from gang end of chassis) around drive pulley. Cord should be on left side of pulley groove (from front of chassis). Pass cord through slot in pulley rim. Stretch tension spring and tie free end of cord to spring.



After each range is completed, repeat the procedure as a final check.

NOTE A—If the pointer is not at 1400 KC on the dial, remove pointer from drive cord. Set pointer at the 1400 KC mark on the dial scale. Attach pointer to drive cord.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

MONTGOMERY-WARD & CO.

MONT.-WARD MODEL

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MODEL 14WG-739

MONTGOMERY-WARD & CO.

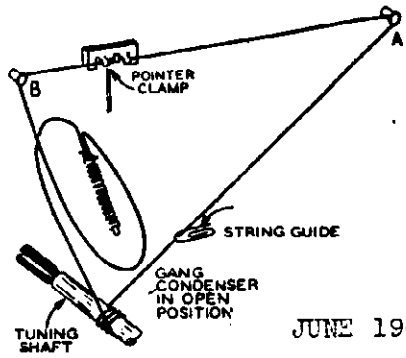
DRIVE CORD REPLACEMENT

Turn gang condenser to full open position—See illustration. Use a new drive cord 37 inches in length.

Tie one end of cord to tension spring. Pass other end of cord up through hole in groove of drive pulley. Pull cord through hole until spring is flush against inside of pulley rim.

Wind cord ¼ turn counter-clockwise (from gang end of chassis) around drive pulley. Then wind 3½ turns clockwise (from front of chassis) around tuning control shaft. These turns should progress away from chassis. Pass cord through wire string guide and over idler studs A and B as shown, then wind cord ¾ turn counter-clockwise (from gang end of chassis) around drive pulley. This turn should be on right side (from front of chassis) of pulley groove.

Pass cord through hole in groove of drive pulley. Tie cord to tension spring. Fasten other end of spring to hook on drive pulley.



ALIGNMENT PROCEDURE

Volume Control—Maximum 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., 100 mmf., and 400 ohms.

	SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I.F.	456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C12) & (C13) 3rd I.F. (C17) & (C18)
RANGE B	1600 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C10)
	1400 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC See Note A	Ant. Range B (C2)
	600 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C4) Rock Rotor—See Note B
RANGE D	18,300 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C3)
	17,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C1) Rock Rotor—See Note B
LOOP RANGE B	Reassemble chassis in cabinet.					
	1400 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output	Ant. Range B (C2)

FOR RECORD CHANGER SIMILAR TO SEEBURG C SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

SPECIFICATIONS

Power Consumption 60 Watts (At 117 volts 60 cycles)
80 Watts (Phonograph Operating)

Power Output - - - 2.5 Watts Undistorted
3.5 Watts Maximum

Selectivity - 40 KC Broad at 1000 times Signal

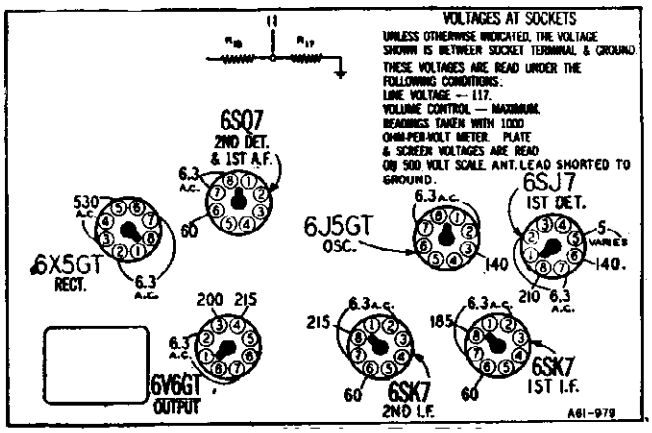
Intermediate Frequency - - - - - - - 456 KC

Speaker - - - - - - - - 6" Electro-Dynamic

Tuning Frequency Range
B Range - - - - - - - 528 to 1600 KC
D Range - - - - - - - 5750 to 18300 KC

Sensitivity—External Antenna—
(For 0.5 Watt output)
B Range - - - - - 3 Microvolts Average
D Range - - - - - 5 Microvolts Average

JUNE 1941



Unless otherwise marked, this radio must be operated on 105 to 125 volt, 60 cycle AC supply only. If there is any doubt, consult the local power company before inserting the plug. Radios of this model which are to be used on 25 cycle, 230 volt, or other service are so marked.

ANTENNA AND GROUND

Two built-in Air Wave Aerials are incorporated in the cabinet.

One of these, the loop aerial, is used for broadcast band reception. The other, a counterpoise foil aerial, is used for reception on the short wave band. For the reception of local or nearby stations, an outside antenna and ground are usually not required.

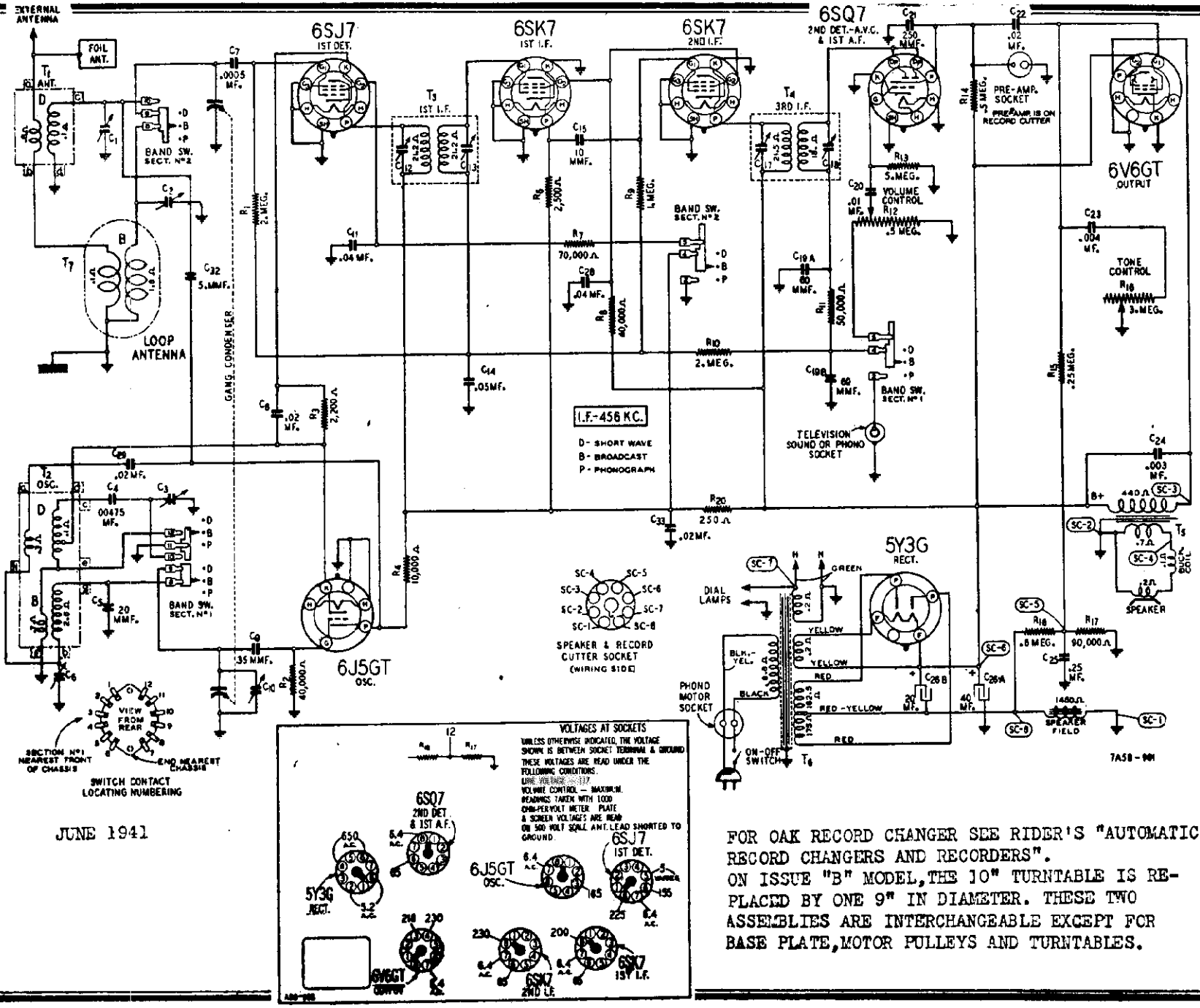
In general, however, more stations will be heard by using an outside antenna and ground. To receive distant short wave stations, an outside antenna is essential.

If an outside antenna is used, it should be 50 to 60 feet long, including the lead-in.

A good ground connection is recommended if an outside antenna is used. A ground connection may be obtained by connecting to a water pipe, radiator, or a pipe driven into the ground.

Avoid using gas pipes or electrical conduits for grounds.

The ground connection is made under the screw (marked GND) on the back panel of the chassis base.



JUNE 1941

FOR OAK RECORD CHANGER SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".
ON ISSUE "B" MODEL, THE 10" TURNTABLE IS REPLACED BY ONE 9" IN DIAMETER. THESE TWO ASSEMBLIES ARE INTERCHANGEABLE EXCEPT FOR BASE PLATE, MOTOR PULLEYS AND TURNTABLES.

ANTENNA AND GROUND

Two built-in Air Wave Aerials are incorporated in the cabinet.

A white wire with black tracer and an antenna marker will be found coming out of the chassis. If it is desired to operate the radio using the loop and counterpoise foil antennas, do not connect this wire to anything. If it is desired to operate the radio using an outside antenna, connect this wire to the lead from the outside antenna.

The wire which is connected to the counterpoise foil antenna should never be disconnected.

If an outside antenna is used, it should be 50 to 60 feet long, including the lead-in.

A good ground connection is recommended if an outside antenna is used. A ground connection may be obtained by connecting to a water pipe, radiator, or a pipe driven into the ground.

Avoid using gas pipes or electrical conduits for grounds.

The ground connection is made under the screw (marked GND) on the back panel of the chassis base.

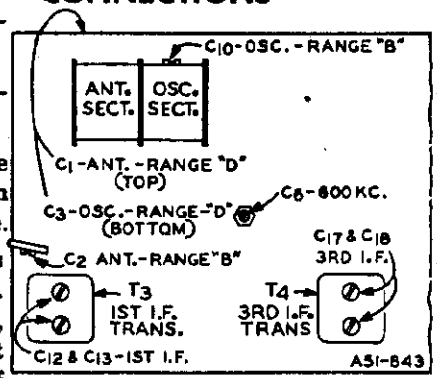
One of these, the loop aerial, is used for broadcast band reception. The other, a counterpoise foil aerial, is used for reception on the short wave band. For the reception of local or nearby stations, an outside antenna and ground are usually not required.

SPECIFICATIONS

Power Consumption	60 Watts (At 117 volts 60 cycles) 90 Watts (Phonograph Operating)
Power Output	2.5 Watts Undistorted 3.5 Watts Maximum
Selectivity	40 KC Broad at 1000 times Signal
Intermediate Frequency	456 KC
Speaker	8" Electro-Dynamic
Tuning Frequency Range	
B Range	529 to 1600 KC
D Range	5750 to 18300 KC
Sensitivity—External Antenna—(For 0.5 Watt output)	
B Range	3 Microvolts Average
D Range	5 Microvolts Average

In general, however, more stations will be heard by using an outside antenna and ground. To receive distant short wave stations, an outside antenna is essential.

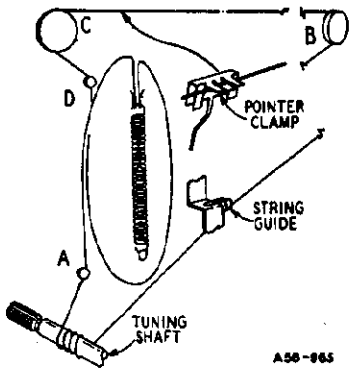
TELEVISION SOUND AND FREQUENCY MODULATION CONNECTIONS



After each range is completed, repeat the procedure as a final check.

NOTE A—If the pointer is not at 1400 KC on the dial, remove pointer from drive cord. Set pointer at the 1400 KC mark on the dial scale. Attach pointer to drive cord.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

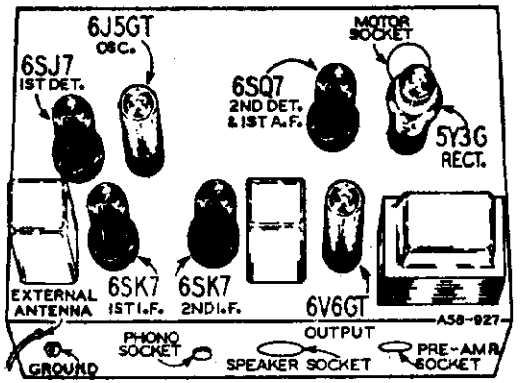


DRIVE CORD REPLACEMENT

Turn gang condenser to full open position. Using a new drive cord 43" in length, tie one end to tension spring. Fasten other end of tension spring to hook on drive pulley. Pass cord through slot in drive pulley rim and continue ¼ turn around drive pulley toward front of chassis. Continue cord around idler stud "A." Wind 3½ turns clockwise (from front of chassis) around tuning shaft. Turns should progress toward rear of chassis.

Pass cord through string guide, around idler pulleys "B" and "C" and idler stud "D"—See Illustration. Continue cord ¾ turn counter-clockwise (from gang end of chassis) around drive pulley. Cord should be on left side of pulley groove (from front of chassis). Pass cord through slot in pulley rim. Stretch tension spring and tie free end of cord to spring.

On the back of the chassis base is a socket to which is connected the phono cable shielded pin tip. Upon removal of this pin tip, the connector on the cable from a television receiver or a frequency modulation converter can be inserted in the socket.

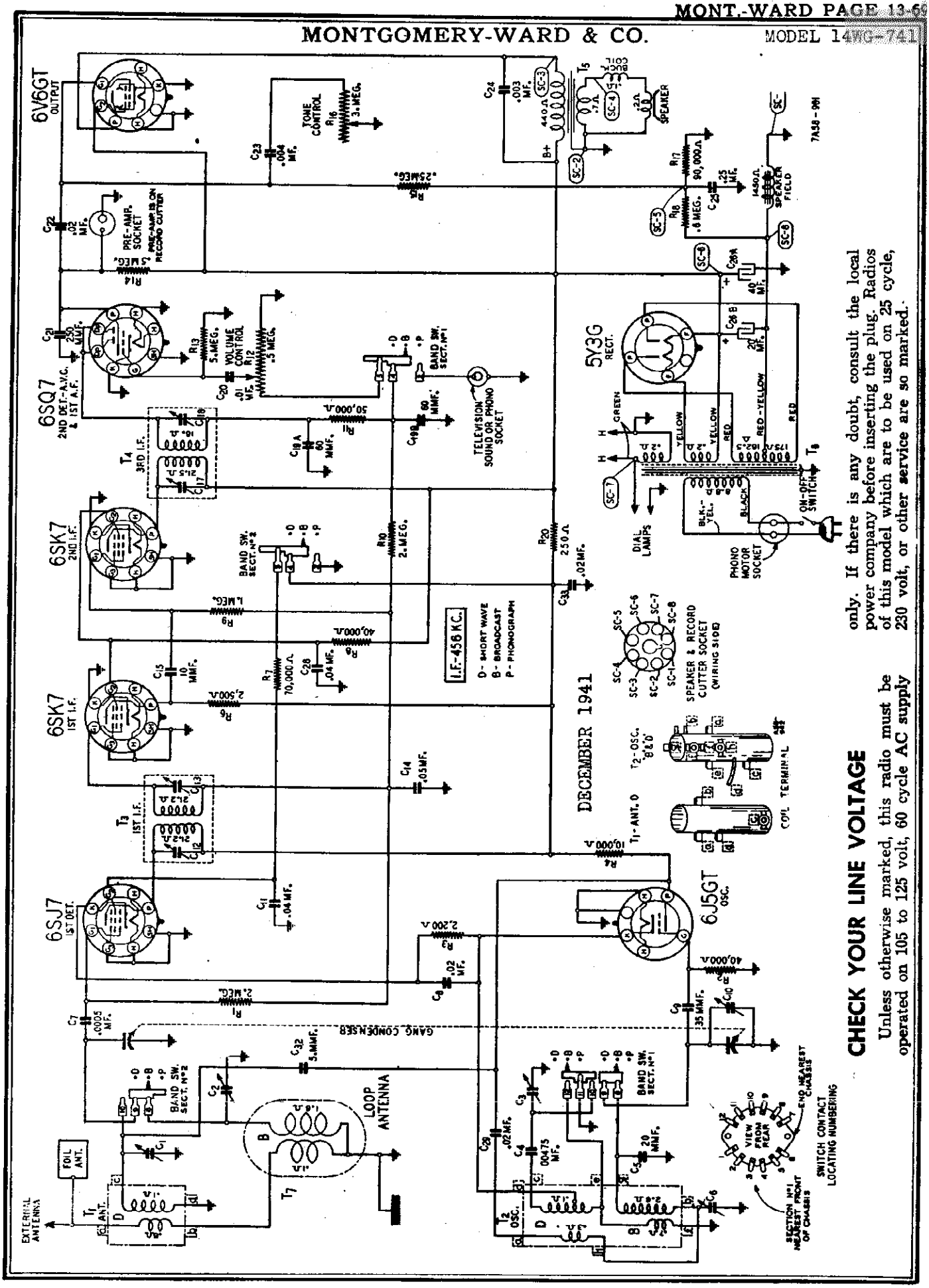


ALIGNMENT PROCEDURE

Volume Control—Maximum 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., 100 mmf., and 400 ohms.

	SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I.F.	456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C12) & (C13) 3rd I.F. (C17) & (C18)
RANGE B	1600 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C10)
	1400 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC See Note A	Ant. Range B (C2)
	600 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C6) Rock Rotor—See Note B
RANGE D	18,300 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C3)
	17,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C1) Rock Rotor—See Note B
LOOP RANGE B	Reassemble chassis in cabinet.					
	1400 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output	Ant. Range B (C2)



CHECK YOUR LINE VOLTAGE

Unless otherwise marked, this radio must be operated on 105 to 125 volt, 60 cycle AC supply only. If there is any doubt, consult the local power company before inserting the plug. Radios of this model which are to be used on 25 cycle, 230 volt, or other service are so marked.

MODEL 14WG-741

MONTGOMERY-WARD & CO.

ALIGNMENT PROCEDURE

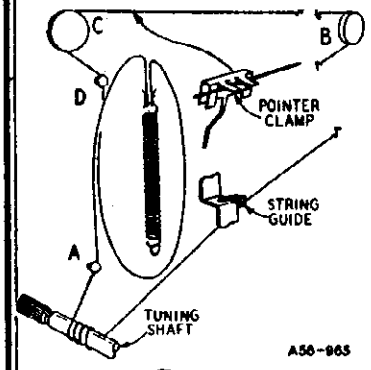
Volume Control—Maximum All Adjustments.

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., 100 mmf., and 400 ohms.

	SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I.F.	456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C12) & (C13) 3rd I.F. (C17) & (C18)
RANGE B	1600 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C10)
	1400 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC See Note A	Ant. Range B (C2)
	600 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C6) Rock Rotor—See Note B
RANGE D	18,300 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C3)
	17,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C1) Rock Rotor—See Note B
LOOP RANGE B	Reassemble chassis in cabinet. 1400 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output	Ant. Range B (C2)



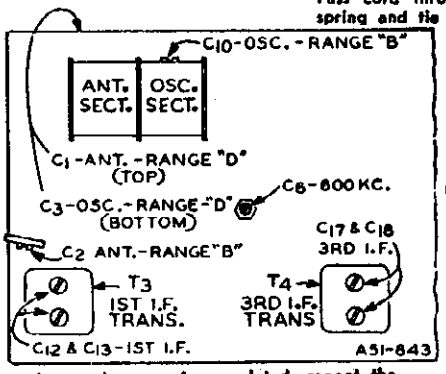
DRIVE CORD REPLACEMENT

Turn gang condenser to full open position. Using a new drive cord 43" in length, tie one end to tension spring. Fasten other end of tension spring to hook on drive pulley. Pass cord through slot in drive pulley rim and continue ⅛ turn around drive pulley toward front of chassis. Continue cord around idler stud "A." Wind 3½ turns clockwise (from front of chassis) around tuning shaft. Turns should progress toward rear of chassis.

Pass cord through string guide, around idler pulleys "B" and "C" and idler stud "D"—See Illustration. Continue cord ⅝ turn counter-clockwise (from gang end of chassis) around drive pulley. Cord should be on left side of pulley groove (from front of chassis). Pass cord through slot in pulley rim. Stretch tension spring and tie free end of cord to spring.

A white wire with black tracer and an antenna marker will be found coming out of the chassis. If it is desired to operate the radio using the loop and counterpoise foil antennas, do not connect this wire to anything. If it is desired to operate the radio using an outside antenna, connect this wire to the lead from the outside antenna.

The wire which is connected to the counterpoise foil antenna should never be disconnected.

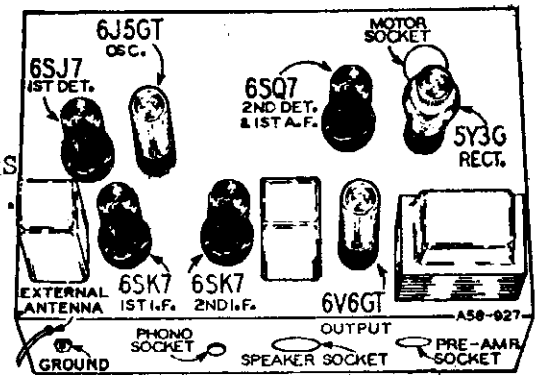


After each range is completed, repeat the procedure as a final check.

NOTE A—If the pointer is not at 1400 KC on the dial, remove pointer from drive cord. Set pointer at the 1400 KC mark on the dial scale. Attach pointer to drive cord.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

FOR SEEBURG MODEL J RECORD CHANGER SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".



SPECIFICATIONS

Power Consumption — 60 Watts (At 117 volts 60 cycles) 80 Watts (Phonograph Operating)

Power Output — 2.5 Watts Undistorted 3.5 Watts Maximum

Selectivity - 40 KC Broad at 1000 times Signal

Intermediate Frequency - - - - - - 456 KC

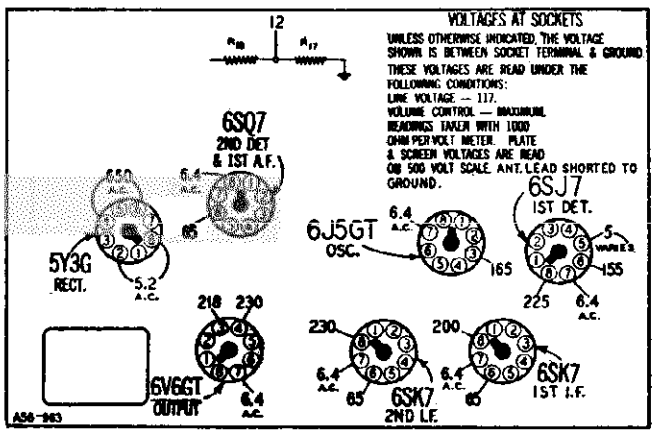
Speaker - - - - - - 8" Electro-Dynamic

Tuning Frequency Range

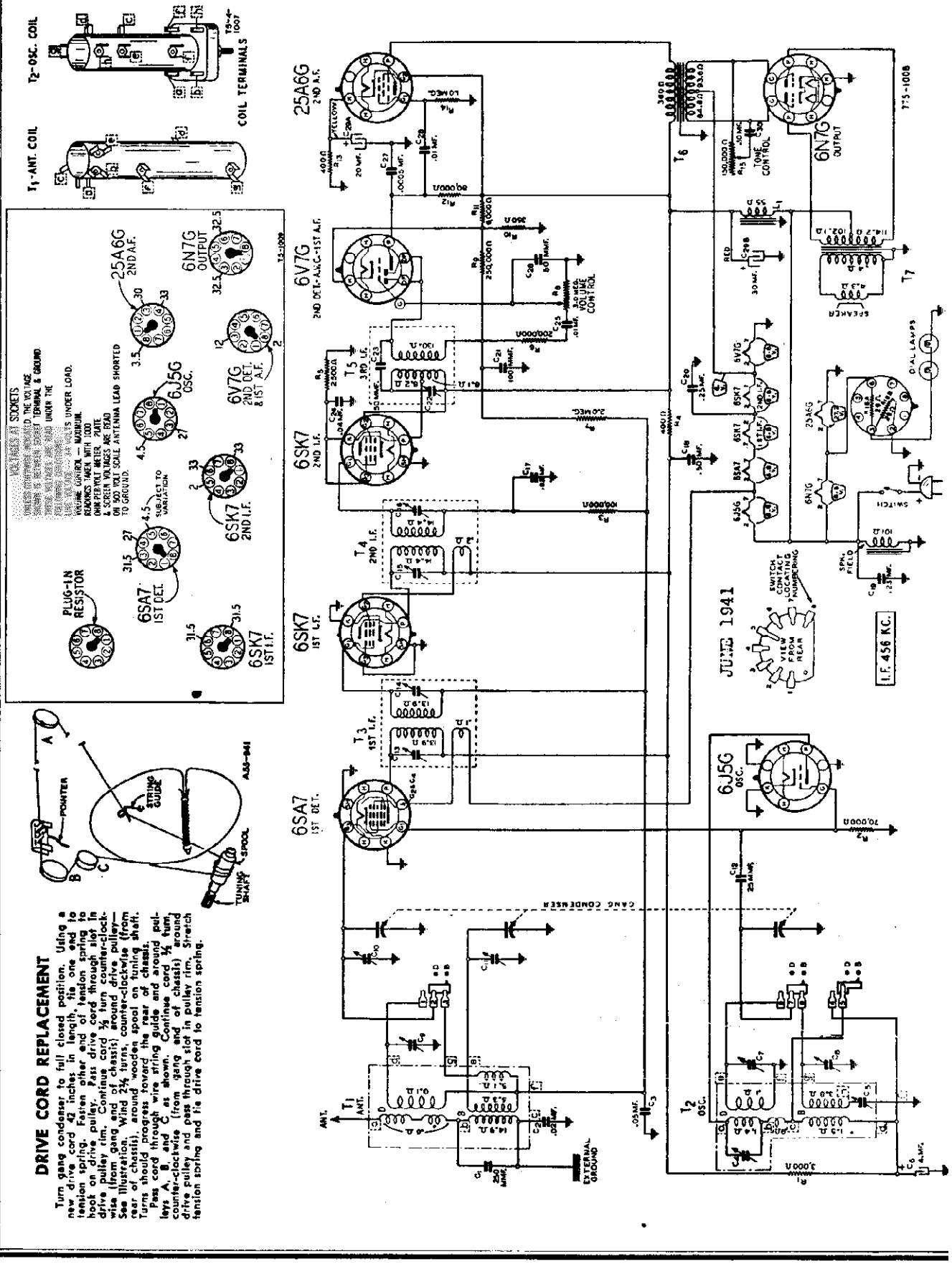
B Range - - - - - - 528 to 1600 KC
D Range - - - - - - 5750 to 18300 KC

Sensitivity—External Antenna—(For 0.5 Watt output)

B Range - - - - - 3 Microvolts Average
D Range - - - - - 5 Microvolts Average



MONTGOMERY-WARD & CO.



DRIVE CORD REPLACEMENT

Turn gang condenser to full closed position. Using a new drive cord 42 inches in length, tie one end to tension spring. Fasten other end of tension spring to hook on drive pulley. Pass drive cord through slot in drive pulley rim. Continue cord ½ turn counter-clockwise (from gang end of chassis) around drive pulley—See Illustration. Wind 2¾ turns, counter-clockwise (from rear of chassis), around wooden spool on tuning shaft. Turns should progress toward the rear of chassis.

Pass cord through wire string guide and around pulleys A, B, and C as shown. Continue cord ¾ turn, counter-clockwise (from gang end of chassis) around drive pulley and pass through slot in pulley rim. Stretch tension spring and tie drive cord to tension spring.

ANTENNA AND GROUND

For best results, an outside antenna 50 to 60 feet long, including the lead-in, should be used. An inside antenna is not satisfactory for this radio. The antenna should be as high and as far from surrounding objects as possible.

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 good ground connection is required. A ground connection may be obtained by connecting to a water pipe, a pipe driven into the ground, or to the metal jacket of a water pump. *Do not ground the radio to the 32 volt system conduit or fittings at any point.*

Two wires will be found coming out of the chassis. Connect the wire with the antenna marker to the antenna lead and the wire with the ground marker to the ground lead.

32 VOLT POWER SUPPLY

This radio is designed for use on farms and in those places where the power supply consists of a 32 volt direct current generating plant. The radio may not be satisfactory on plants which do not use storage batteries.

Polarity of 32 Volt Power Supply—Insert plug so that prong on same side as *ribbed* side of cord is on the positive side of the line.

If the polarity of the line is not known, insert plug. If the tubes light but no sounds are heard from the speaker after the plug has been in one minute, reverse the plug.

ALIGNMENT PROCEDURE

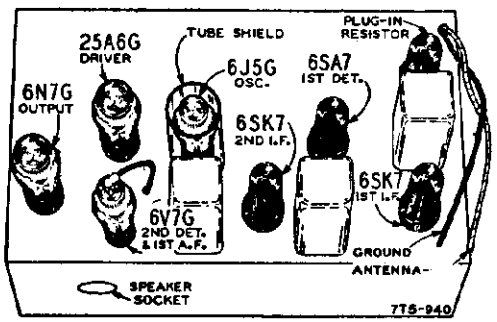
Volume Control—Maximum All Adjustments.
Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.
Allow Chassis and Signal Generator to "Heat Up" for several minutes.

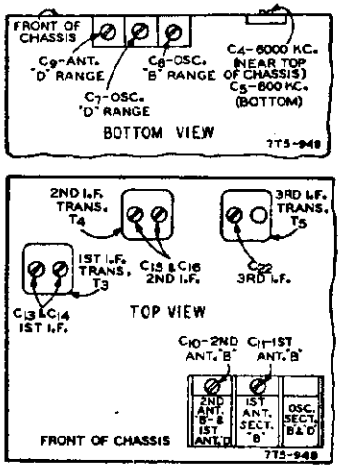
The following equipment is required for aligning: An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter—Non-Metallic Screwdriver.
Dummy Antennas—.1 mf., 200 mmf., and 400 ohms.

	SIGNAL GENERATOR FREQUENCY SETTING	CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I. F.	456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C13) & (C14) 2nd I.F. (C15) & (C16) 3rd I.F. (C22)
RANGE B	1610 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C8)
	1500 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1500 KC—See Note A	1st Ant. Range B (C11) 2nd Ant. Range B (C10)
	600 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C5) Rock Rotor—See Note B
RANGE D	18,300 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C7)
	16,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C9) Rock Rotor—See Note B
	6000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	6000 KC (C4) Rock Rotor—See Note B

LINE VOLTAGE RANGE

The radio will operate satisfactorily within a line voltage range of 25 to 42 volts. 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.





SPECIFICATIONS

Power Consumption	1.60 Amperes at 36 Volts DC
Power Output	.17 Watt Undistorted .40 Watt Maximum
Selectivity	30 KC Broad at 1000 times Signal
Sensitivity (For .05 watt output)	
B Range	6.0 Microvolts Average
D Range	8.0 Microvolts Average
Intermediate Frequency	456 KC
Speaker	6" or 8" Electro-Dynamic
Tuning Frequency Range	
B Range	535 to 1610 KC (Kilocycles)
D Range	5750 to 18300 KC (Kilocycles)

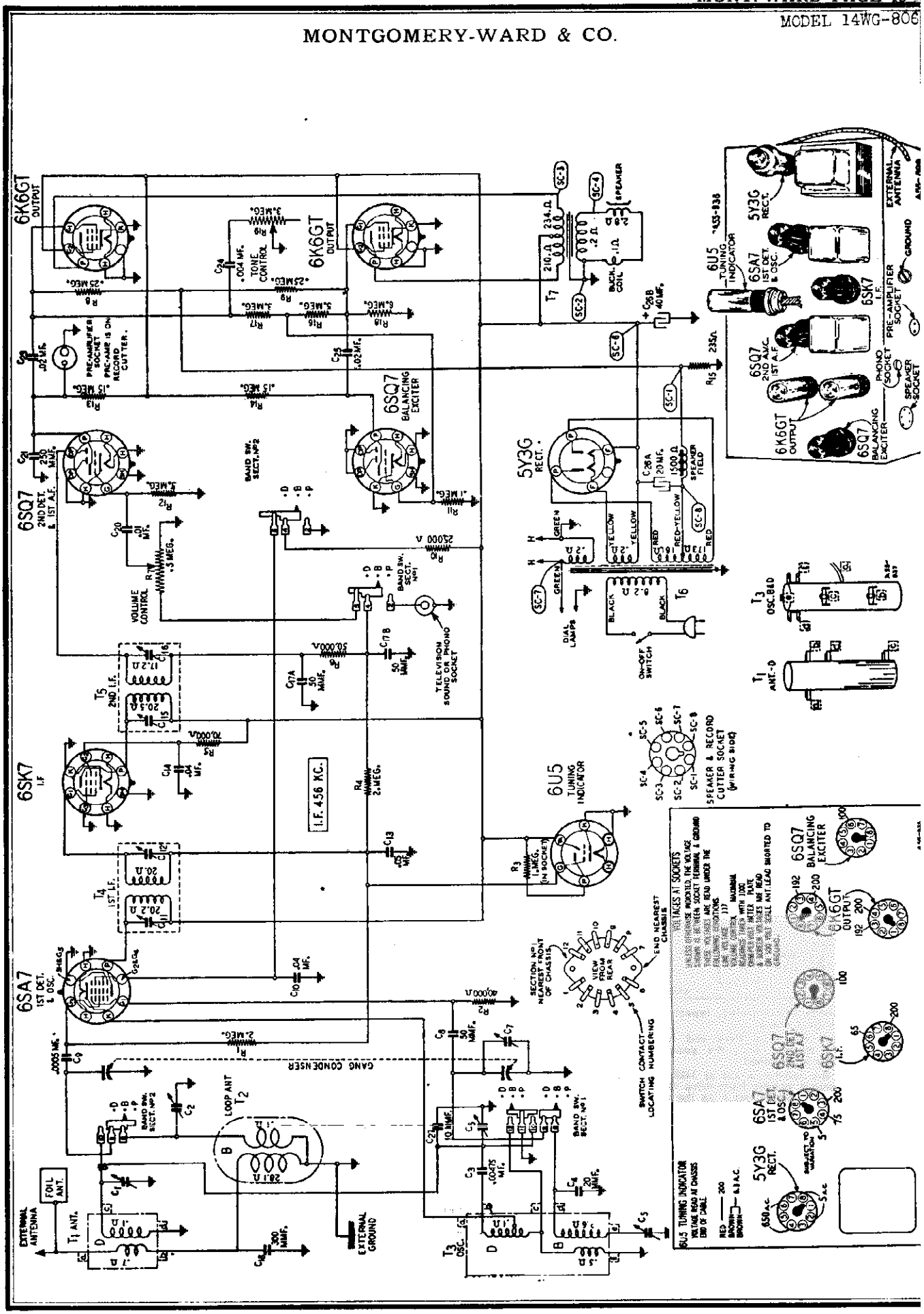
After each range is completed, repeat the procedure as a final check.

NOTE A—If the pointer is not at 1500 KC on the dial, remove pointer from drive cord. Set pointer at the 1500 KC mark on the dial scale. Attach pointer to drive cord.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

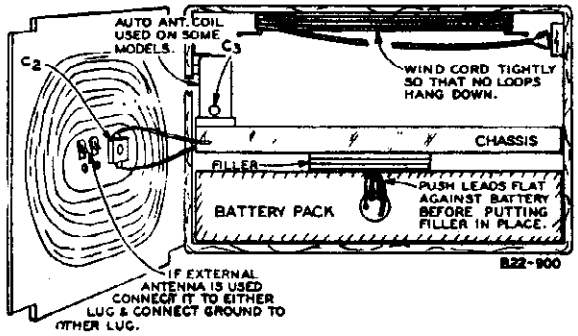
MONTGOMERY-WARD & CO.

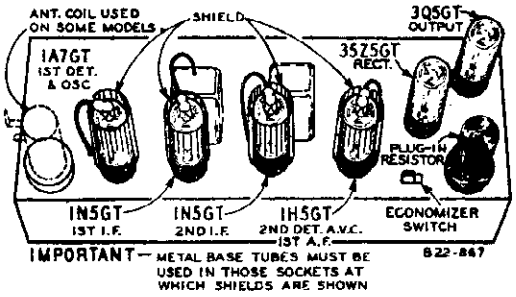
MODEL 14WG-806



MODEL 14WG-690
MODEL 14WC-806

MONTGOMERY-WARD & CO.





MODEL 14WG-690

Input Voltages and Currents—Battery Operation

"A" Battery - - - - 9 Volts—50 Ma.

"B" Battery - - - - 90 Volts—11.5 Ma.

Power Consumption - - - - - - 28 Watts (At 117 volts AC Supply)

Power Output

Battery Operation - 150 Mw. Undistorted, 350 Mw. Maximum

AC Operation - - - 200 Mw. Undistorted, 400 Mw. Maximum

Selectivity - 50 KC Broad at 1000 Times Signal

Intermediate Frequency - - - - - 456 KC

Speaker - - - - - - 5½" P.M. Dynamic

Tuning Frequency Range - - 540 to 1600 KC

Sensitivity (For .05 Watt Output)
External Antenna - 10 Microvolts Average

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

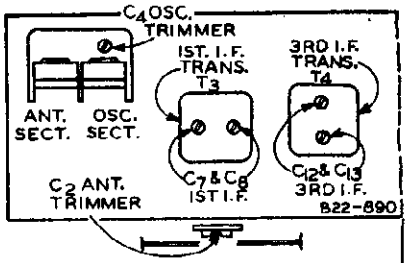
Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning:

A 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., 50 mmf.



Signal Gen. FREQUENCY SETTING	ANTENNA CONNECTION	GROUND CONNECTION	DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration)
456 KC	External Antenna Clip on Loop	External Ground Clip on Loop	.1 mf.	Turn Rotor to full open	1st I.F. (C7) & (C8) 3rd I.F. (C12) & (C13)
1600 KC	External Antenna Clip	External Ground Clip	.1 mf.	Turn Rotor to full open	Oscillator (C4)
1400 KC	External Antenna Clip See Note A	External Ground Clip	50 mmf.	Turn Rotor to max. output	Antenna (C2)

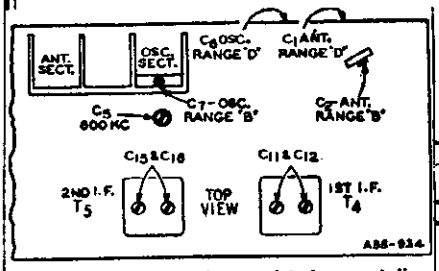
If radio is equipped with special antenna coil for use in car, make the following additional adjustment after the radio is installed in the car and the car antenna is connected.

Car Antenna Adjustment—Tune in weak signal near 1400 KC—Adjust Car Antenna Trimmer C3 for maximum output. This trimmer is in special antenna coil can at left side of chassis (See Illustration in Auto Installation Sheet).

NOTE A—Reassemble chassis in Cabinet. Close back on cabinet.

CALIBRATION—To obtain dial scale calibration, tune in an 800 KC signal. The pointer should be at the 800 KC mark on the dial. If it is not, set the pointer at the 800 KC mark.

MODEL 14WG-806



After each range is completed, repeat the procedure as a final check.

NOTE A—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

NOTE B—If the pointer is not at 1400 KC on the dial, remove pointer from drive cord. Set pointer at the 1400 KC mark on the dial scale. Attach pointer to drive cord.

ALIGNMENT PROCEDURE

Volume Control—Maximum 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., 100 mmf., and 400 ohms.

SIGNAL GENERATOR FREQUENCY SETTING	CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
Loosen chassis mounting bolts and swing chassis back a sufficient amount to get at the trimmers.					
I.F. 456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C11) & (C12) 2nd I.F. (C15) & (C16)
RANGE D 18,300 KC	External Antenna Clip or Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C6)
17,000 KC	External Antenna Clip or Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C1) Rock Rotor—See Note A
Reassemble chassis in cabinet.					
RANGE B 1600 KC	External Antenna Clip or Lead	100 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C7)
1400 KC	External Antenna Clip or Lead	100 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC—See Note B	Ant. Range B (C2)
600 KC	External Antenna Clip or Lead	100 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C5) Rock Rotor—See Note A

SPECIFICATIONS

Tuning Frequency Range
B Range - - - - - - - 528 to 1600 KC
D Range - - - - - - - 5750 to 18200 KC

Sensitivity—External Antenna—(For 0.5 Watt output)
B Range - - - - - - - 15 Microvolts Average
D Range - - - - - - - 25 Microvolts Average

Power Consumption 57 Watts (At 117 volts 60 cycles)

Power Output - - - - - - - - 3.0 Watts Undistorted, 4.0 Watts Maximum

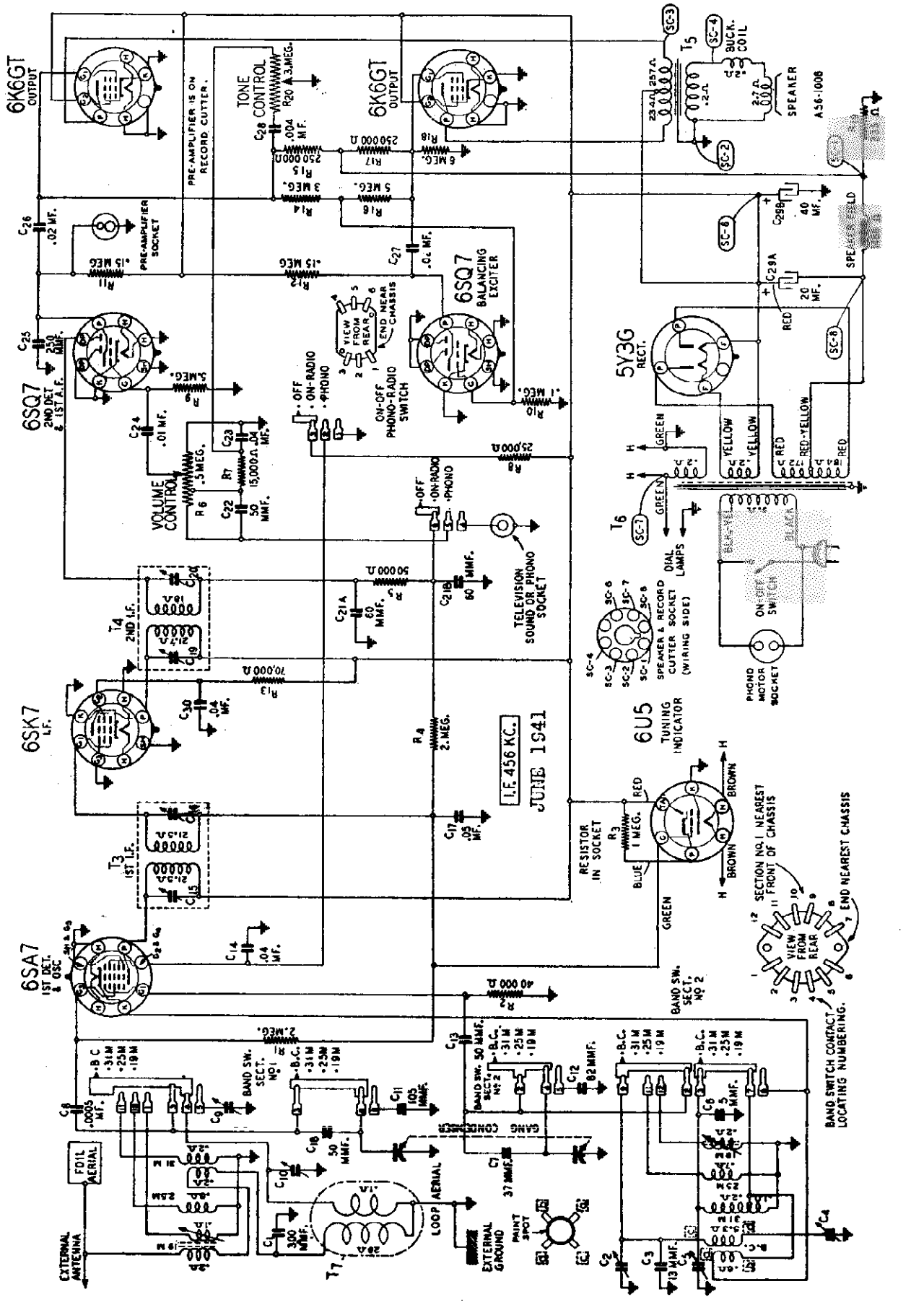
Selectivity - - - - - - 40 KC Broad at 1000 times Signal

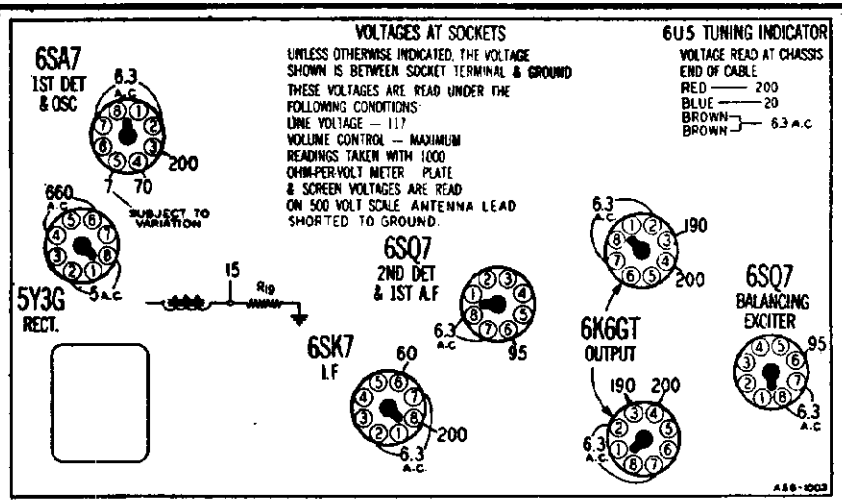
Intermediate Frequency - - - - - - - - 456 KC

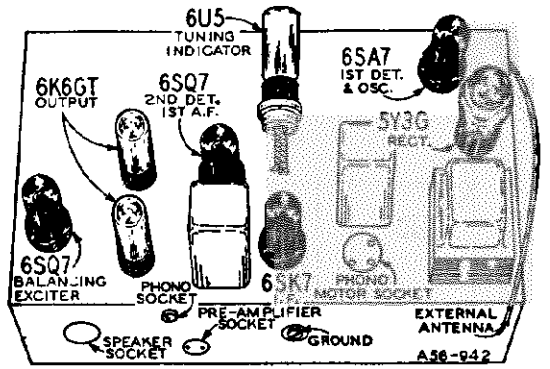
Speaker - - - - - - - - - 6" Electro-Dynamic

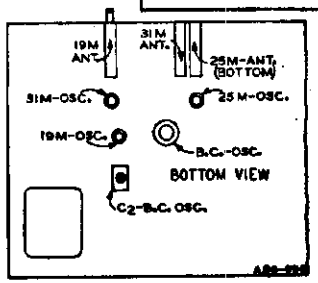
MONTGOMERY-WARD & CO.

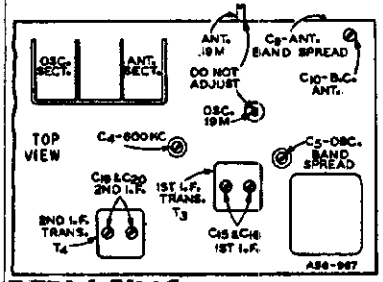
MODEL 14WG-60











ALIGNMENT PROCEDURE

Volume Control—Maximum 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., 100 mmf., and 400 ohms.

	SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
	Remove chassis from cabinet but do not disconnect leads to loop aerial.					
I.F.	456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C15) & (C16) 2nd I.F. (C19) & (C20)
RANGE B	1610 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C2)
	1400 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC—See Note A	Ant. Range B (C10)
	600 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C4) Rock Rotor—See Note B
SHORT WAVE BANDS	9700 KC	Antenna Lead	400 Ohm	31 Meter	Turn Tuning Knob until Pointer is at 9.7 MC	Oscillator Band Spread (C5)
	9700 KC	Antenna Lead	400 Ohm	31 Meter	Leave Setting as above	Antenna Band Spread (C9)
LOOP RANGE B	1400 KC	Antenna Lead See Note C	100 mmf.	B Range	Turn Rotor to Max. Output	Ant. Range B (C10)

CAUTION—Two of the coils in the band spread coil assembly, the 19 Meter Antenna and Oscillator coils, have adjustable iron cores. One of the adjusting screws extends out from the front panel of the chassis base at the left of the band switch. The other adjusting screw extends up from the chassis base in front of the 1st I.F. Transformer.

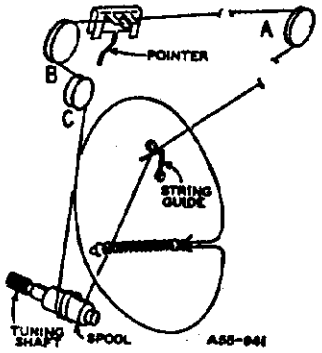
DO NOT CHANGE THE POSITION OF THESE ADJUSTING SCREWS as they have been properly set at the factory and cannot be satisfactorily re-adjusted in the field.

After each range is completed, repeat the procedure as a final check.

NOTE A—If the pointer is not at 1400 KC on the dial, remove pointer from drive cord. Set pointer at the 1400 KC mark on the dial scale. Attach pointer to drive cord.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

NOTE C—Reassemble chassis in cabinet.



SPECIFICATIONS

Power Consumption	57 Watts (At 117 volts 60 cycles)
Power Output	3.0 Watts Undistorted 4.5 Watts Maximum
Selectivity	38 KC Broad at 1000 times Signal
Intermediate Frequency	456 KC
Speaker	10" Electro-Dynamic

Band	Tuning Frequency Range	Sensitivity External Antenna (For 0.5 Watt Output)
B Range	535 to 1610 KC	15 Microvolts Aver.
19 Meter	14.6 to 15.8 MC	26 Microvolts Aver.
25 Meter	11.1 to 12.0 MC	25 Microvolts Aver.
31 Meter	9.3 to 10.05 MC	22 Microvolts Aver.

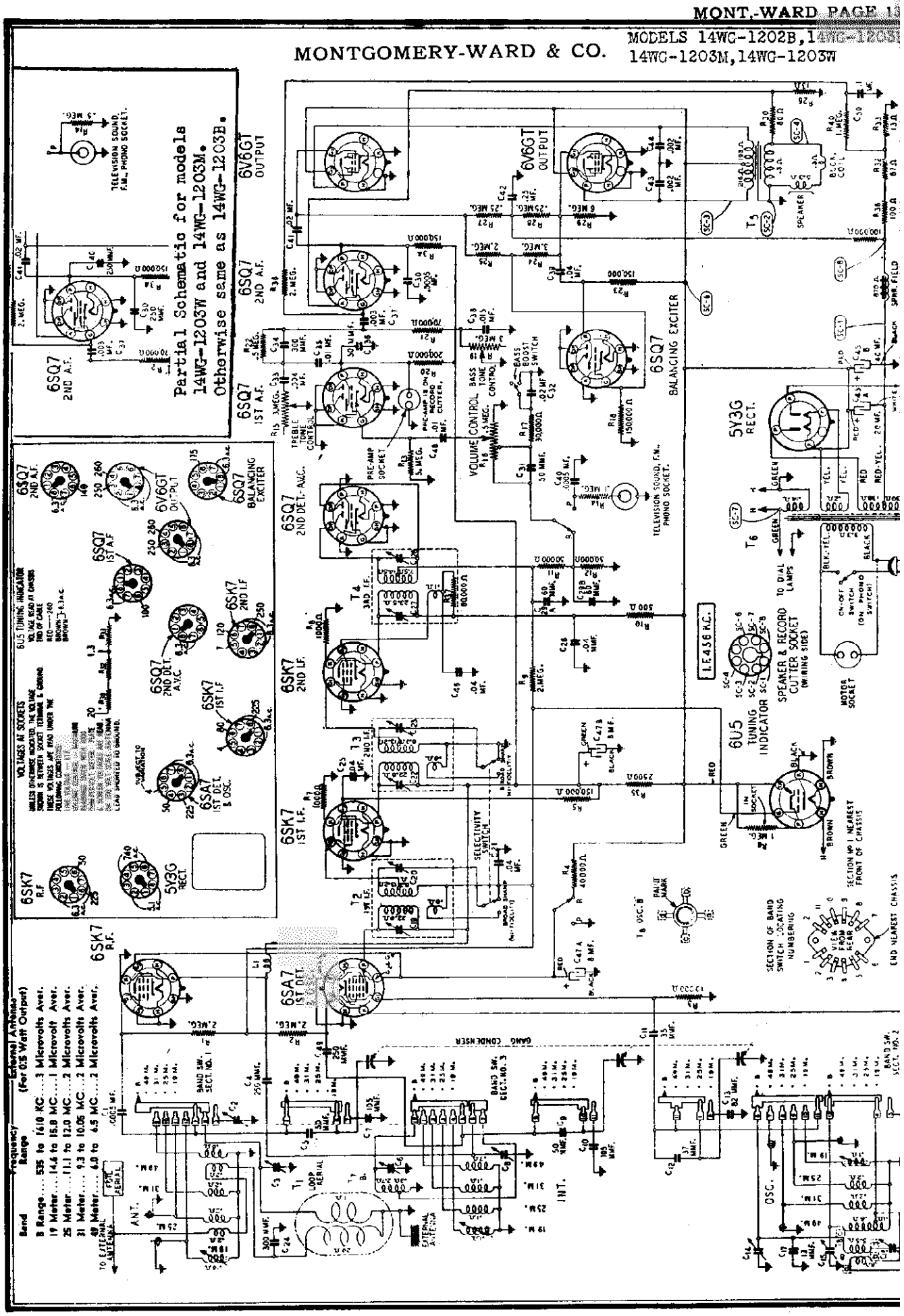
REPLACING BAND SPREAD COILS

It is not practicable to make field replacements of the individual antenna and oscillator coils in the Band Spread Assembly Unit.

Should one of these coils be damaged in any way, remove the Band Spread Assembly Unit (consisting of the 3 antenna and 4 oscillator coils, the right-angle mounting plate, and the band switch) from the chassis and return to the factory for replacement.

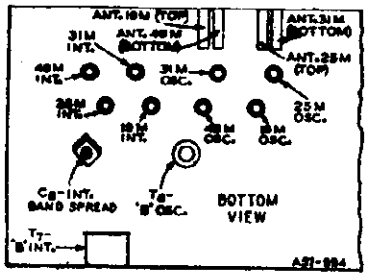
MONTGOMERY-WARD & CO.

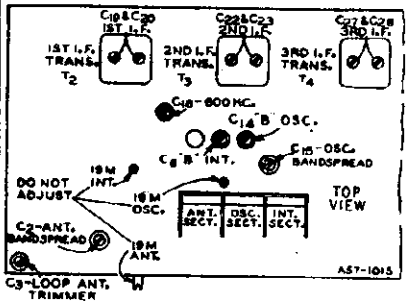
MODELS 14WG-1202B, 14WG-1203
14WG-1203M, 14WG-1203W



MODELS 14WG-1202B, 14WG-1203B, 14WG-1203M, 14WG-1203W

MONTGOMERY-WARD & CO.





ALIGNMENT PROCEDURE

Volume Control—Maximum 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.

Selectivity Control—In Sharp Position.

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., 100 mmf., and 400 ohms.

SIGNAL GENERATOR FREQUENCY SETTING	CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
Remove chassis from cabinet but do not disconnect leads to loop aerial.					
I. F. 456 KC	Grid of 2nd I.F. Tube	.1 mf.	B Range	Turn Rotor to Full Open	3rd I.F. (C27) & (C28)
456 KC	Grid of 1st I.F. Tube	.1 mf.	B Range	Turn Rotor to Full Open	2nd I.F. (C22) & (C23)
456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C19) & (C20)
RANGE B 1610 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C14)
1400 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC—See Note A	Ant. Range B (C3) Int. Range B (C6)
600 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C16) Rock Rotor—See Note B
SHORT WAVE BANDS 6300 KC	Antenna Lead	400 Ohm	49 Meter	Turn Tuning Knob until Pointer is at 6.3 MC	Ant. Band Spread (C2) Int. Band Spread (C8) Rock Rotor—See Note B
6300 KC	Antenna Lead	400 Ohm	49 Meter	Leave Setting as above	Antenna Band Spread (C2)
LOOP RANGE B—Reassemble chassis in cabinet. 1400 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output	Ant. Range B (C3)

REPLACING BAND SPREAD COILS

It is not practicable to make field replacements of the individual Antenna, R.F. Interstage or Oscillator coils in the Band Spread Assembly Unit.

Should one of these coils be damaged in any way, remove the Band Spread Assembly Unit (consisting of the Antenna, R. F. Interstage and Oscillator Coils, the right-angle mounting plate, and the band switch) from the chassis and return to the factory for replacement.

CAUTION — Three of the coils in the band spread coil assembly, the 19 Meter Antenna, R.F. Interstage, and Oscillator Coils, have adjustable iron cores. One of the adjusting screws extends out from the front panel of the chassis base at the right of the band switch. The other two adjusting screws extend up from the chassis base.

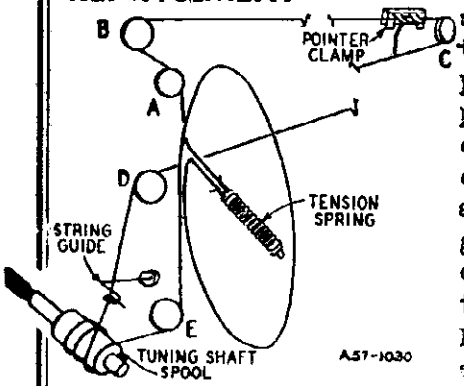
DO NOT CHANGE THE POSITION OF THESE ADJUSTING SCREWS as they have been properly set at the factory and cannot be satisfactorily re-adjusted in the field.

After each range is completed, repeat the procedure as a final check.

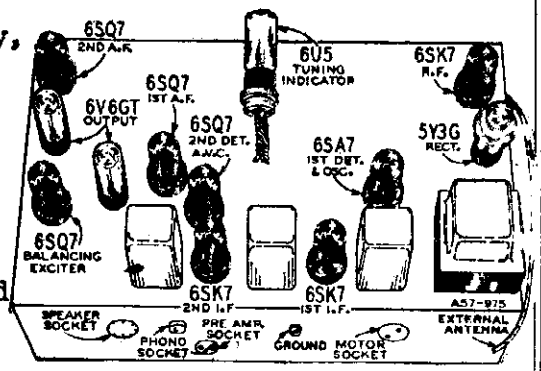
NOTE A — If the pointer is not at 1400 KC on the dial, remove pointer from drive cord. Set pointer at the 1400 KC mark on the dial scale. Attach pointer to drive cord.

NOTE B — Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

DRIVE CORD REPLACEMENT



Tie 57" drive cord to spring. Thread other end thru hole in drive pulley, pull flush with inside pulley rim. Gang cord in open pos.-pass cord around idler pulley A,B,C, and D,and thru string guide. Wind 2 1/2 turns counterclockwise around tuning shaft spool,around E. Wind 1 turn clockwise around drive pulley.



PROCEDURE FOR SETTING THE STATION BUTTONS

Make a list of your six favorite stations, those which you tune in regularly. It is better to list the station with the highest kilocycle number first, the station with the next lower kilocycle number next, and so on.

The selectivity control should be in the Sharp Position.

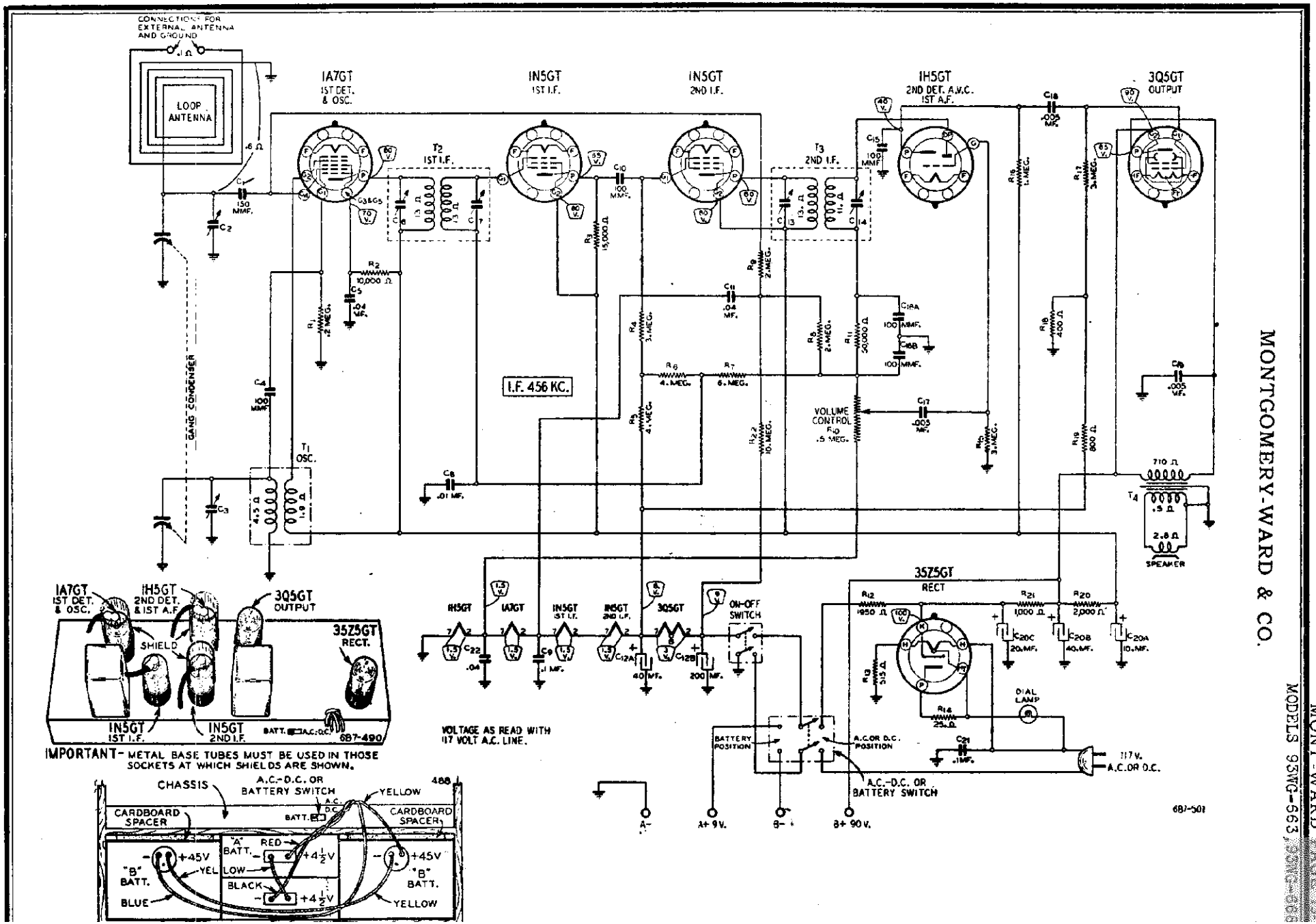
Grasp the left-hand button at the sides (depress the adjacent button) and pull it out as far as it will go. A click will be heard. If it is impossible to depress the button which is adjacent to the button you are setting, rotate the tuning knob a few turns.

Select the first station from the list you have prepared. *Carefully* tune in this station by means of the manual tuning knob until the dark sector in the tuning eye is narrowest.

Now lock the mechanism by pushing the button all the way in until it is felt to lock into place.

Proceed in the same manner to set stations on any of the remaining buttons. Any button may be used for any station you can receive, although it will be more convenient to set the stations so that the kilocycle numbers decrease from left to right.

EACH MODEL EXCEPT 14WG-1202B, HAS A SEEBURG B-3A RECORD CHANGER INCORPORATED. FOR DATA ON THIS SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".



MONTGOMERY-WARD & CO.

MONT-WARD PAGE 13
MODELS 93WG-663, 93WG-664

MODELS 93WG-663, 93WG-668

MONTGOMERY-WARD & CO.

Input Voltages and Currents—Battery Operation
"A" Battery..... 9 Volts—50 Ma.
"B" Battery.....90 Volts—11.5 Ma.
Power Consumption (At 117 volts AC Supply) 28 Watts
Power Output
Battery Operation - - - - 150 Mw. Undistorted, 350 Mw. Maximum
AC Operation - - - - - 200 Mw. Undistorted, 400 Mw. Maximum

Selectivity - 50 KC Broad at 1000 Times Signal
Intermediate Frequency - - - - - - 456 KC
Speaker - - - - - - - - - 6" P.M. Dynamic
Tuning Frequency Range - - 540 to 1600 KC
Sensitivity (For .05 Watt Output)
External Antenna - - - 10 Microvolts Average

Removing Chassis from Cabinet

Take out the 2 screws, one at each rear corner of the chassis shelf. Grasp the chassis shelf at each rear corner and edge it away from the cabinet front until the chassis shelf and chassis slide easily out of the cabinet.

To remove the shelf from the chassis, take out the bolt and the 2 screws at the bottom of the shelf.

CAUTION—When Operated on AC or DC Power. As the chassis is connected to one side of the line, in any service work, keep the chassis on a wood or other insulated surface to avoid contacts with ground.

ALIGNMENT PROCEDURE

Volume Control—Maximum 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.

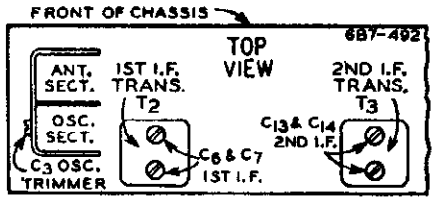
The following equipment is required for aligning:
A Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter—Non-Metallic Screwdriver.
Dummy Antenna—.1 mf.

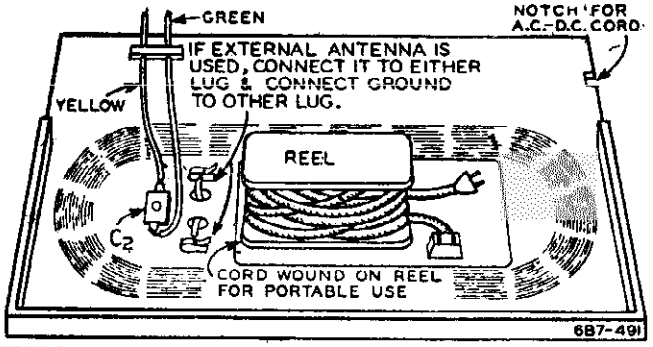
The chassis may be aligned on either AC-DC or Battery power. If AC-DC power is used, see precaution above about avoiding external grounds. Also do not connect the signal generator to any outside ground as the ground terminal of the generator will be connected to the chassis.

SIGNAL GENERATOR				ADJUST TRIMMERS TO MAXIMUM
FREQUENCY SETTING	CONNECTION AT RADIO	DUMMY ANTENNA	CONDENSER SETTING	(See Trimmer Illustration below and Illustration of Back—Page 1)
456 KC	Signal Grid of 1st Det. (Top Cap)	.1 mf.	Turn Rotor to full open	1st I.F. (C6) & (C7) 2nd I.F. (C13) & (C14)
1600 KC	Signal Grid of 1st Det.	.1 mf.	Turn Rotor to full open	Oscillator (C3)
1500 KC	None—See Note A		Turn Rotor to max. output	Antenna (C2)

NOTE A—Chassis must be in cabinet. Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. The back of the cabinet must be in place. Place radio approximately 3 feet from loop so as to pick up signal. Radio should not be in proximity to any metal (metal bench, etc.).

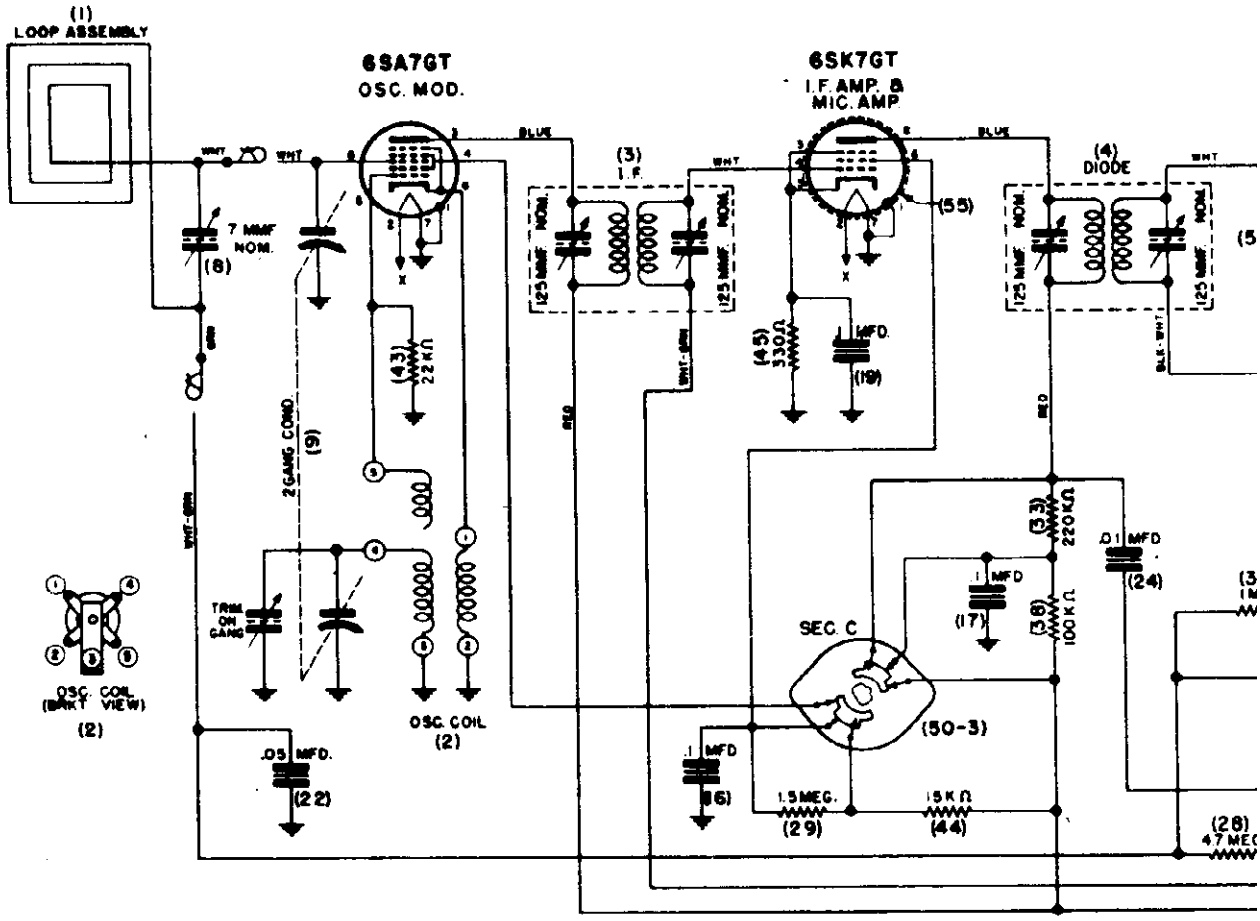
CALIBRATION (For models with pointer in front of dial scale)—To obtain dial scale calibration, tune in an 800 KC signal. The pointer should be at the 800 KC mark on the dial. If it is not, hold the pulley at the back of the dial and loosen the pointer screw. Set the pointer at the 800 KC mark. Hold the pointer and retighten the pointer screw.

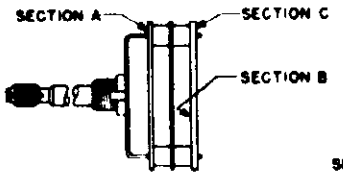




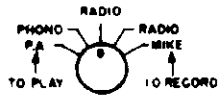
INSIDE VIEW OF BACK COVER

MODEL 51R11





SELECTOR SWITCH DETAIL
(50)



SELECTOR SWITCH POSITIONS
(SWITCH IN DIAGRAM SHOWN IN RADIO POSITION-
VIEWED FROM KNOB END)

VOLTAGE CHART - 117 V AC INPUT				
TUBE		PLATE TO GND	SCREEN TO GND	CATH TO GND
6SA7GT	OSC.-MOD.	210 V	90 V	0
6SK7GT	I.F. AMP & MIC AMP	210 V	90 V	3 V
6SQ7GT	DET.-AVC. A.F.	65 V	——	0
6V6GT⊕	PWR. AMP	198 V	210 V	0
5W4GT	RECT.	AC	——	310 V FROM FIL

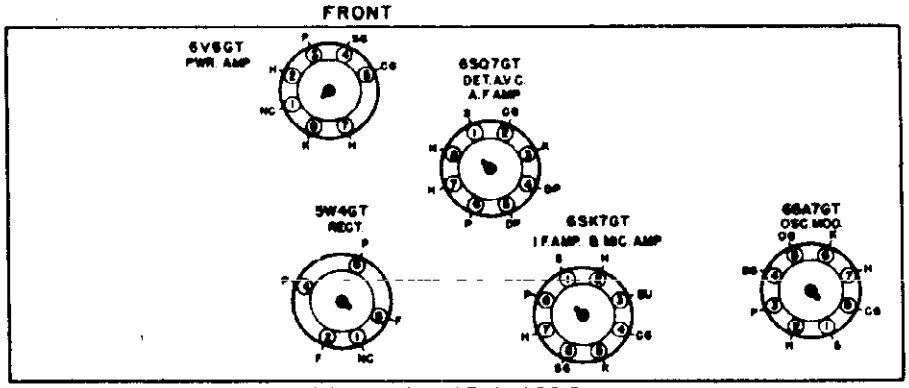
⊕ BIAS MEASURED FROM B- TO CHASS

ALL MEASUREMENTS MADE WITH A 20,000 OHM PER VOLT VOLTMETER

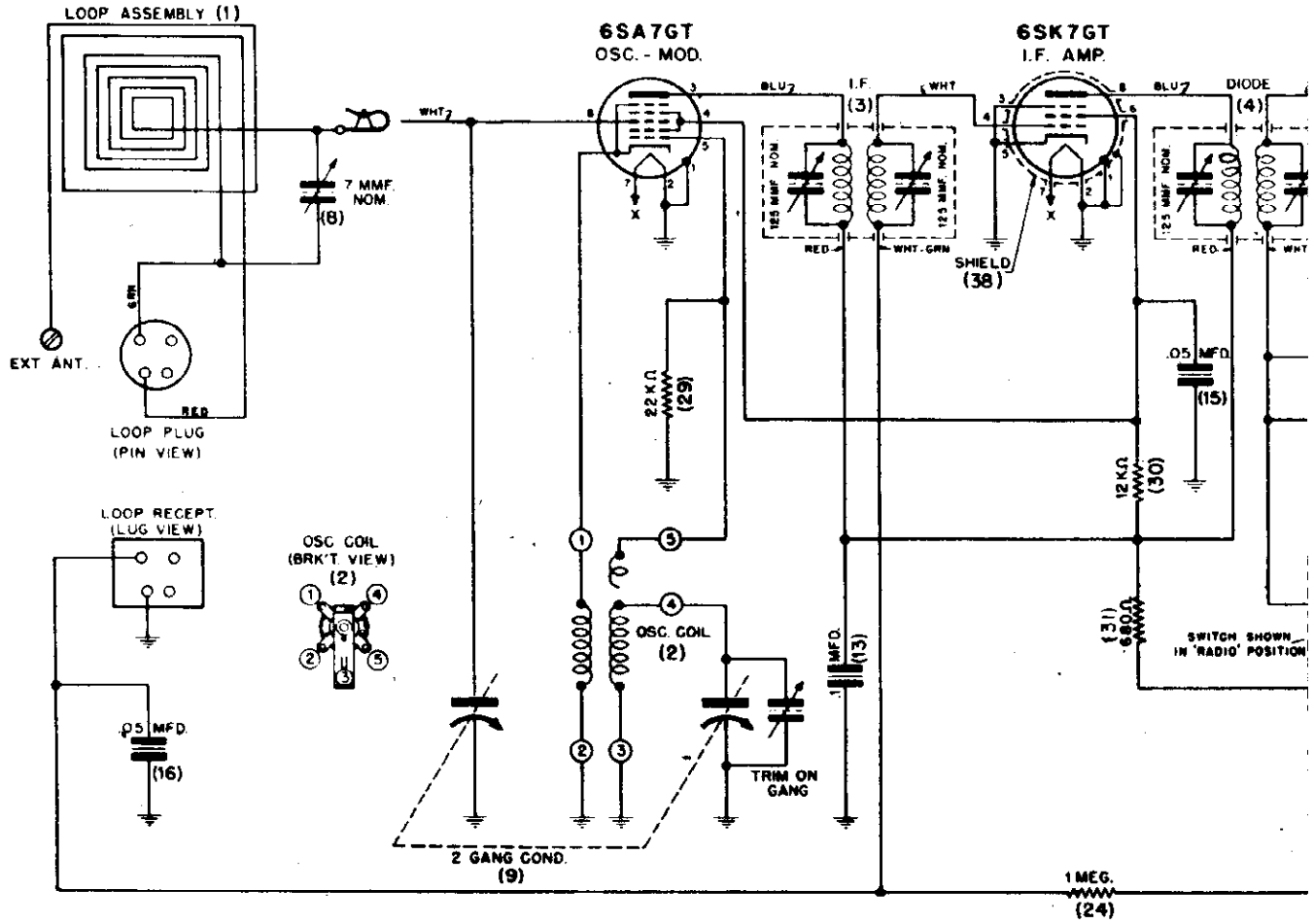
MAXIMUM POWER OUTPUT - 3.5 WA

I.F. = 455 KC

FREQUENCY RANGE = 538 KC

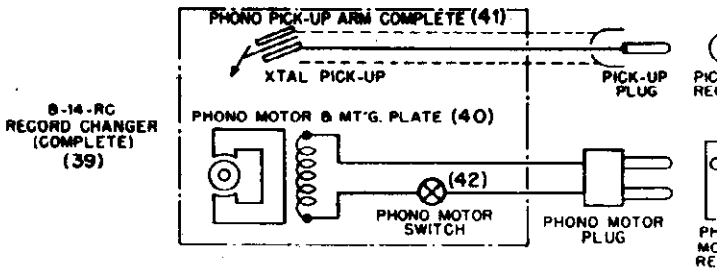


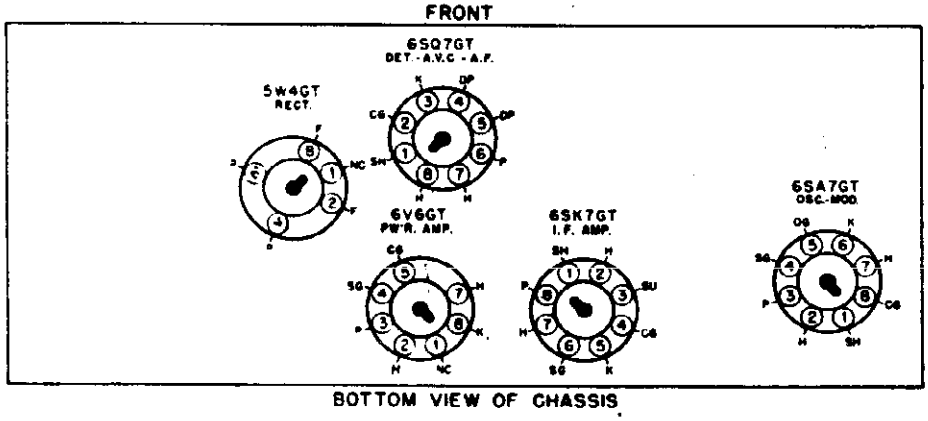
BOTTOM VIEW OF CHASSIS



I.F. = 455 KC

FREQUENCY RANGE = 538 KC TO 1720 KC





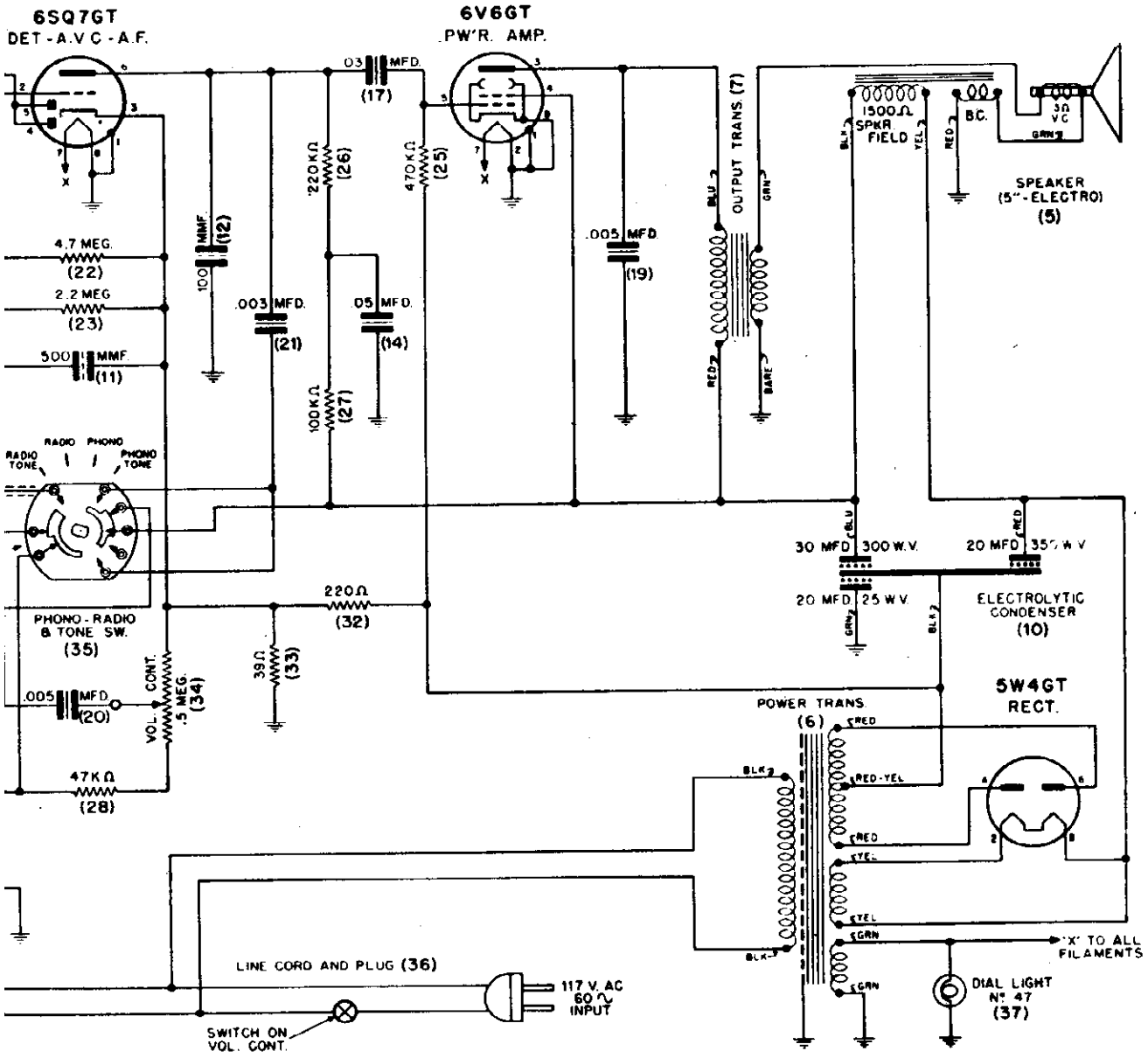
BOTTOM VIEW OF CHASSIS

VOLTAGE CHART - 117 V. AC INPUT ※				
TUBE		PLATE TO GND.	SCREEN TO GND.	CATH. TO GND.
6SA7GT	OSC.-MOD.	210 V	100 V	0
6SK7GT	I.F. AMP.	220V	100V	0
6SQ7GT	DET.-A.V.C. A.F.	90V	—	-2.2 V
6V6GT ※※	PW'R. AMP.	205V	220V	0
5W4GT	RECT.	A.C.	—	300 V FROM FIL.

NOTE:- ALL VOLTAGES MEASURED WITH A 20,000 OHM PER VOLT VOLTMETER.

MAX PWR OUTPUT - 3.5 WATTS
※ PHONO-RADIO-TONE SWITCH IN RADIO POSITION
※※ BIAS, MEASURED FROM B- TO CHASSIS, -15 VOLTS

MFG. CO.



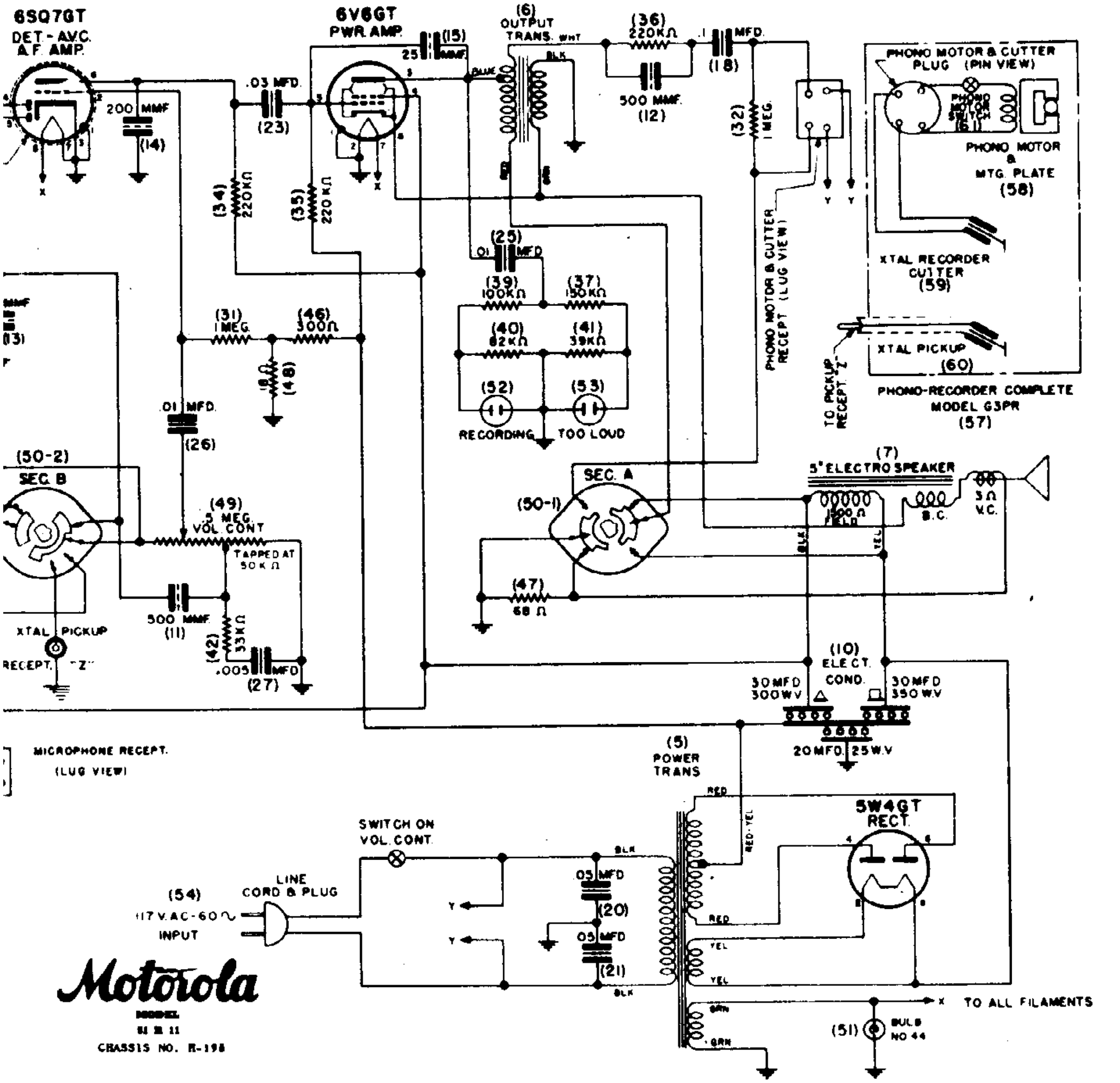
Motorola

MODEL

51 F 11

MODEL 51F11 SCHEMATIC DIAGRAM PARTS LIST

DIAG. NO.	PART NO.	DESCRIPTION
1	1X27689	BACK & LOOP ASSEMBLY
2	2LA26942	OSCILLATOR COIL
3	1X27860	I.F. COIL & SHIELD ASSEMBLY
4	1X27858	DIODE COIL & SHIELD ASSEMBLY
5	50688307	SPEAKER (5" ELECTRO)
6	25A28202	POWER TRANSFORMER
7	25A19876	OUTPUT TRANSFORMER
8	20A16740	TRIMMER & "U" BRACKET (7 MMF NOM.)
9	19B20507	VARIABLE CONDENSER (2 GANG)
10	23A27881	ELECT. COND. & STRAP (20 MFD/350W.V.-30 MFD/300W.V.-20 MFD/25W.V.)
11	21B6500	MOLDED MICA COND. (500 MMF-20%-500W.V.) BRN "0"
12	21B6511	MOLDED MICA COND. (100MMF-20%-500W.V.) BRN "0"
13	899807	TUBULAR CONDENSER (.1 MFD-400W.V.)
14	899816	TUBULAR CONDENSER (.05 MFD-400W.V.)
15	899821	TUBULAR CONDENSER (.05 MFD-200W.V.)
16	899805	TUBULAR CONDENSER (.05 MFD-100W.V.)
17	899804	TUBULAR CONDENSER (.03 MFD-400W.V.)
18	899833	TUBULAR CONDENSER (.03 MFD-200W.V.)
19	899808	TUBULAR CONDENSER (.005 MFD-1000W.V.)
20	899813	TUBULAR CONDENSER (.005 MFD-600W.V.)
21	899835	TUBULAR CONDENSER (.005 MFD-600W.V.)
22	686968	CARBON RESISTOR (4.7 MEG-1/2WATT-20%) INS.
23	686202	CARBON RESISTOR (2.2 MEG-1/2WATT-20%) INS.
24	686159	CARBON RESISTOR (1 MEG-1/2WATT-20%) INS.
25	686160	CARBON RESISTOR (470,000Ω-1/2WATT-20%) INS.
26	686204	CARBON RESISTOR (220,000Ω-1/2WATT-20%) INS.
27	686165	CARBON RESISTOR (100,000Ω-1/2WATT-20%) INS.
28	686321	CARBON RESISTOR (47,000Ω-1/2WATT-20%) INS.
29	686212	CARBON RESISTOR (22,000Ω-1/2WATT-20%) INS.
30	686045	CARBON RESISTOR (12,000Ω-1WATT-10%) N.I.
31	686085	CARBON RESISTOR (5600Ω-1/2WATT-20%) N.I.
32	686282	CARBON RESISTOR (220Ω-1/2WATT-10%) N.I.
33	686203	CARBON RESISTOR (39Ω-1/2WATT-10%) N.I.
34	18K19939	VOL. CONT. & SWITCH (.5 MEG)
35	40A27880	PHONO-RADIO & TONE SWITCH
36	30A151	LINE CORD & PLUG (6 FT.)
37	65K11854	BULB (6.3V.-.15A TUB. BAY) CLEAR
38	25A14760	BANTAM TUBE SHIELD
39	1X27890	MODEL B-14-RC RECORD CHANGER (COMPLETE)
40	59B27667	PHONO MOTOR & MTG. PLATE (117 VOLT 60 CYCLE)
41	99K27840	PHONO PICKUP ARM (COMPLETE)
	99K27841	CARTRIDGE & LEADS (ONLY)
42	40K21758	SLIDER SWITCH (2 POS.) (S.P.D.T.)



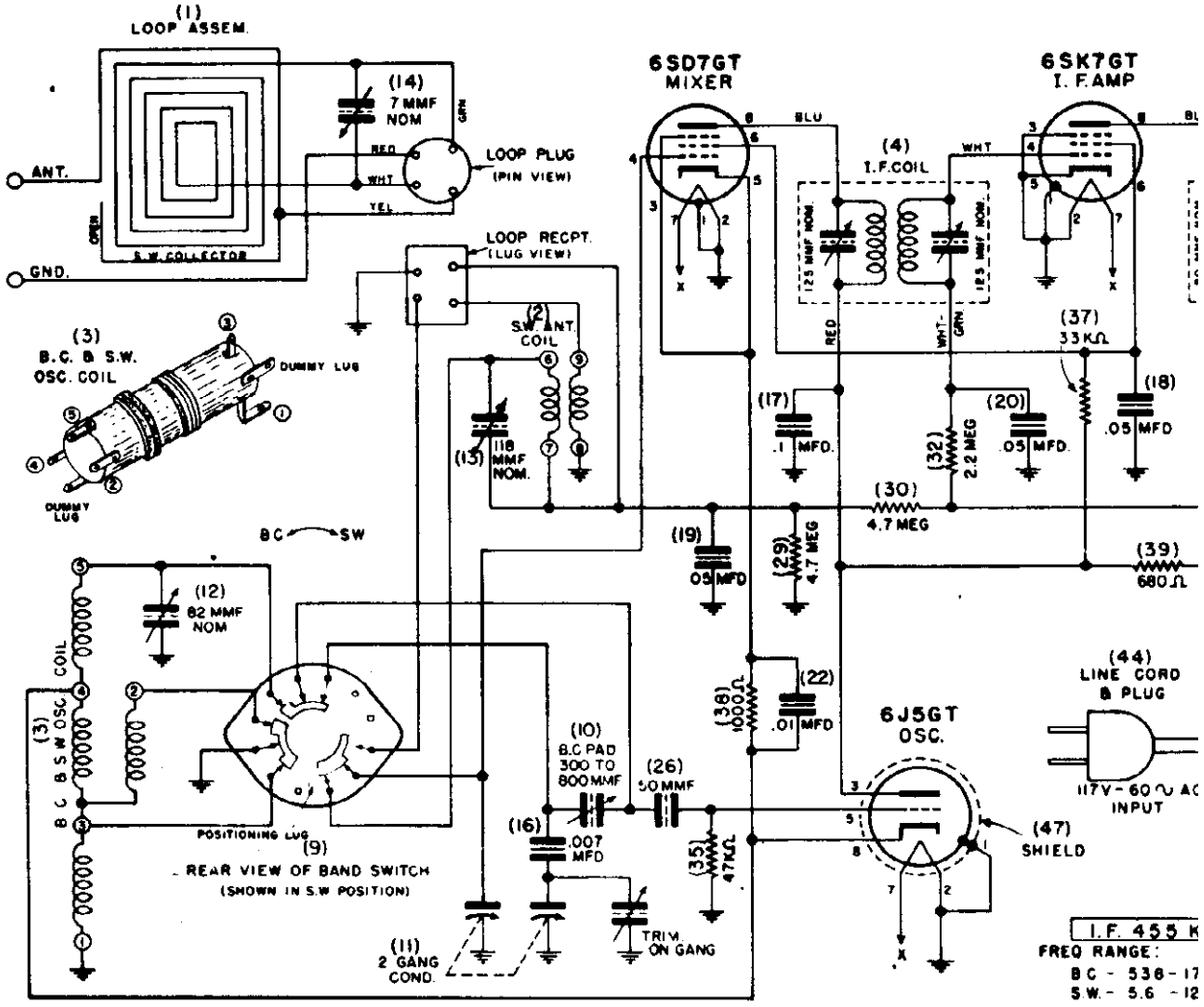
5V

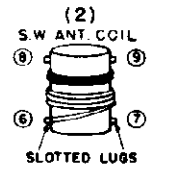
720 KC.

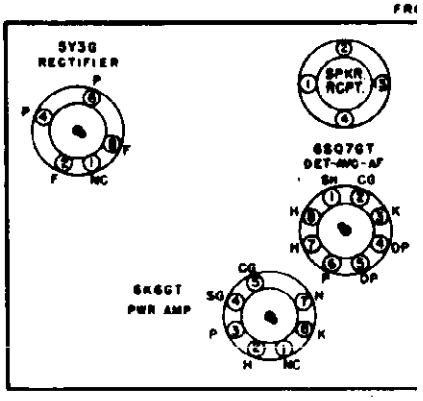
MODEL 61 R 11 SCHEMATIC DIAGRAM PARTS LIST

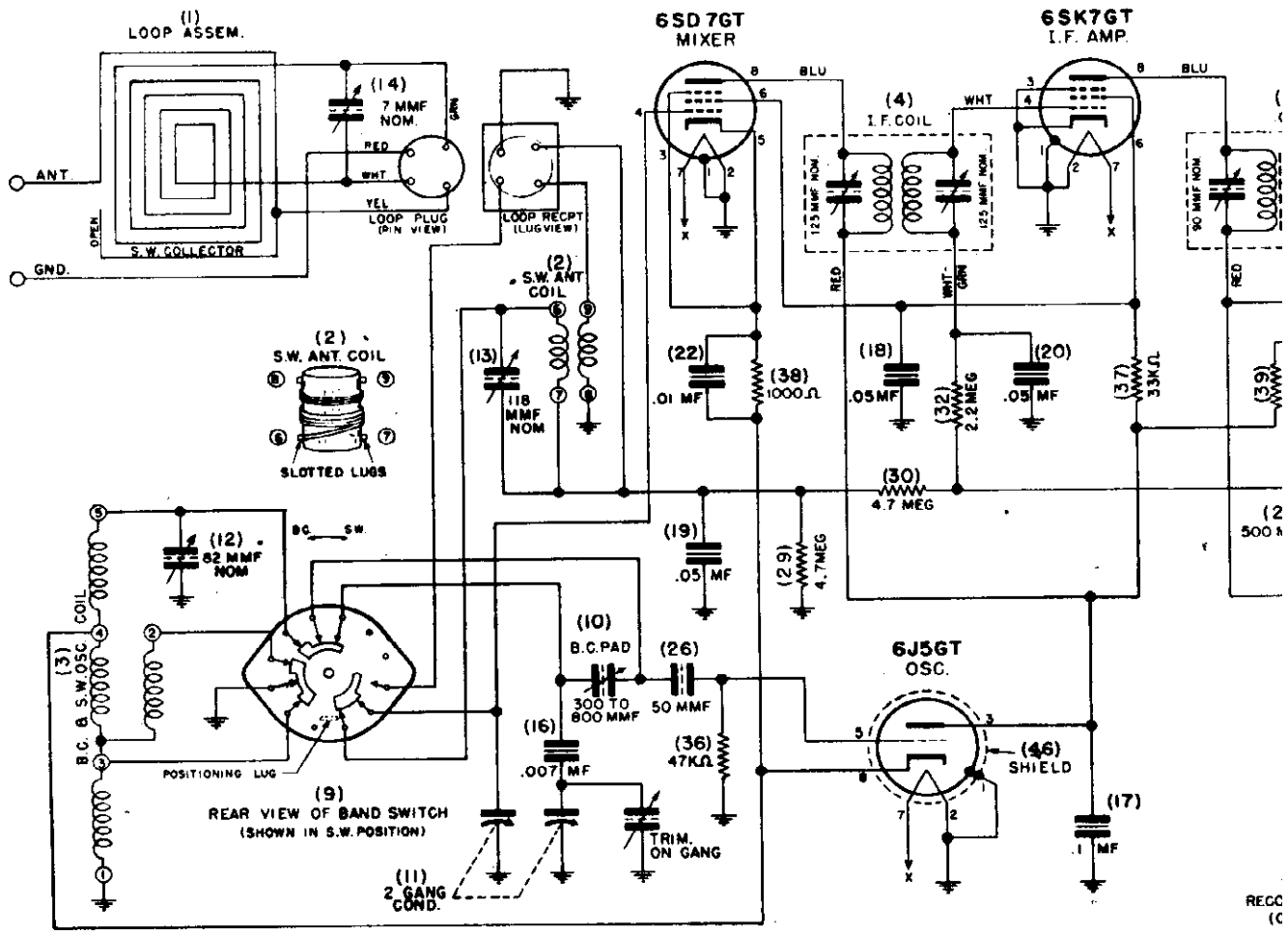
DIAG. NO.	PART NO.	DESCRIPTION
1	24A29755	LOOP ANTENNA & BACK
2	24A26962	OSCILLATOR COIL
3	11K28727	I.F. COIL & SHIELD ASSEMBLY
4	11K28725	DIODE COIL & SHIELD ASSEMBLY
5	25B28202	POWER TRANSFORMER
6	25B28749	OUTPUT TRANSFORMER
7	50B28507	SPEAKER (5" ELECTRO)
8	20A18740	TRIMMER & "U" BRACKET (7 MMF. NOM.)
9	19B28507	VARIABLE CONDENSER (2 GANG)
10	23A27718	ELECT. COND. (30 MFD/350W.V.-30 MFD/300W.V.-20 MFD/25W.V.)
11	2186500	MOLDED MICA COND. (500MMF-20%-400W.V.) BRN "O"
12	2186500	MOLDED MICA COND. (500 MMF-20%-400W.V.) BRN "O"
13	2186517	MOLDED MICA COND. (250 MMF-20%-400W.V.) BRN "O"
14	2186501	MOLDED MICA COND. (200MMF-20%-400W.V.) BRN "O"
15	2186535	MOLDED MICA COND. (25 MMF-20%-400W.V.) BRN "O"
16	889807	TUBULAR CONDENSER (.1 MFD-400W.V.)
17	889807	TUBULAR CONDENSER (.1 MFD-400W.V.)
18	889807	TUBULAR CONDENSER (.1 MFD-400W.V.)
19	889814	TUBULAR CONDENSER (.1 MFD-100W.V.)
20	6A28966	TUBULAR CONDENSER (.05 MFD-600W.V.)
21	6A28966	TUBULAR CONDENSER (.05 MFD-600W.V.)
22	889805	TUBULAR CONDENSER (.05 MFD-100W.V.)
23	889804	TUBULAR CONDENSER (.05 MFD-400W.V.)
24	889809	TUBULAR CONDENSER (.01 MFD-400W.V.)
25	889809	TUBULAR CONDENSER (.01 MFD-400W.V.)
26	889801	TUBULAR CONDENSER (.01 MFD-100W.V.)
27	889813	TUBULAR CONDENSER (.005 MFD-600W.V.)
28	606368	CARBON RESISTOR (4.7 MEG-1/3WATT-20%) INS.
29	605998	CARBON RESISTOR (1.5 MEG-1/3WATT-20%) INS.
30	606159	CARBON RESISTOR (1 MEG-1/3WATT-20%) INS.
31	606159	CARBON RESISTOR (1 MEG-1/3WATT-20%) INS.
32	606159	CARBON RESISTOR (1 MEG-1/3WATT-20%) INS.
33	606204	CARBON RESISTOR (220,000Ω-1/3WATT-20%) INS.
34	606204	CARBON RESISTOR (220,000Ω-1/3WATT-20%) INS.
35	606204	CARBON RESISTOR (220,000Ω-1/3WATT-20%) INS.
36	606204	CARBON RESISTOR (220,000Ω-1/3WATT-20%) INS.
37	605999	CARBON RESISTOR (150,000Ω-1/3WATT-5%) INS.
38	606165	CARBON RESISTOR (100,000Ω-1/3WATT-20%) INS.
39	606495	CARBON RESISTOR (100,000Ω-1/3WATT-5%) INS.
40	606496	CARBON RESISTOR (82,000Ω-1/3WATT-5%) INS.
41	606426	CARBON RESISTOR (39,000Ω-1/3WATT-5%) INS.
42	606329	CARBON RESISTOR (33,000Ω-1/3WATT-20%) INS.
43	606212	CARBON RESISTOR (22,000Ω-1/3WATT-20%) INS.
44	606013	CARBON RESISTOR (15,000Ω-1 WATT-20%) N.I.
45	606464	CARBON RESISTOR (330Ω-1/3WATT-20%) INS.
46	606187	CARBON RESISTOR (300Ω-1WATT-10%) N.I.
47	606495	CARBON RESISTOR (68Ω-1/3WATT-10%) INS.
48	606475	CARBON RESISTOR (18Ω-1/3 WATT-10%) N.I.
49	10A20750	VOLUME CONTROL & SWITCH (.5 MEG)
50	40A20721	SELECTOR SWITCH (5 POSITION)
51	65K10867	BULB (6.3V.-.25A TUB. BAY.) CLEAR #44
52	65K22177	NEON BULB
53	65K22177	NEON BULB
54	30K21699	LINE CORD & PLUG (9 FT.)
55	26A14760	BANTAM TUBE SHIELD
56	26A14760	BANTAM TUBE SHIELD
57	1K28765	MODEL G3PR PHONO-RECORDER (COMPLETE)
58	59K28759	PHONO-RECORDER MOTOR (117V. 60C)
59	59K28766	CUTTER ARM (LESS MOUNTING)
	48K28767	CUTTER CARTRIDGE (ONLY)
60	59K28775	PICKUP ARM (WITH MOUNTING)
	48K28776	PICKUP CARTRIDGE (ONLY)
61	40A11989	SLIDER SWITCH (S.P.S.T.)
62	59C20841	CRYSTAL MICROPHONE (COMPLETE)
	59K20844	CRYSTAL MICROPHONE CARTRIDGE (ONLY)

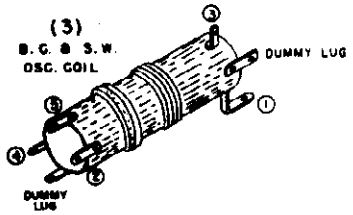
MODEL 61T21





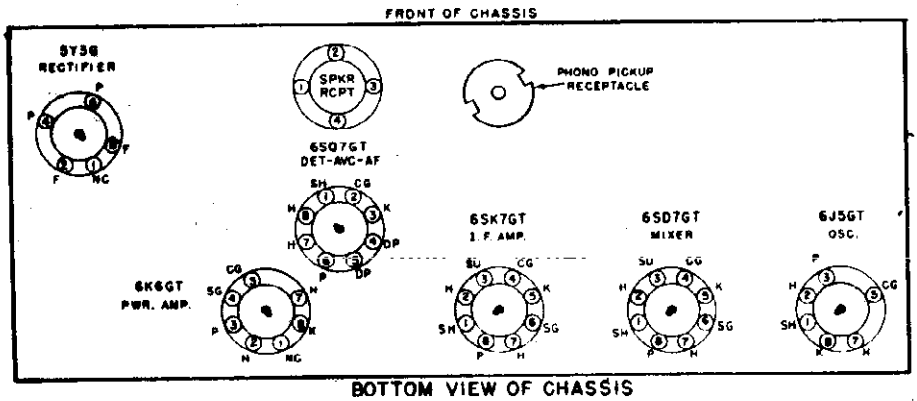






I.F. 455 Kc

FREQ. RANGE
B.C. – 538–1720 KC
S.W. – 5.6 – 12.2 Mc



VOLTAGE CHART				
TUBE		PLATE TO GND	SCREEN TO GND	CATH TO GND
6SD7GT	MIXER	185 V.	80V	3 V.
6SK7GT	I.F.AMP.	200V.	80V	0
6SQ7GT	DET-AVC-AF	65V.	—	-1.5V.
*6K6GT	PWR.AMP.	190V.	200V	0
6J5GT	OSC.	185V.	—	0
5Y3G	RECT	A.C.	—	290 V. FROM FIL

*BIAS MEASURED FROM 8– TO CHASSIS = 16.5 VOLTS

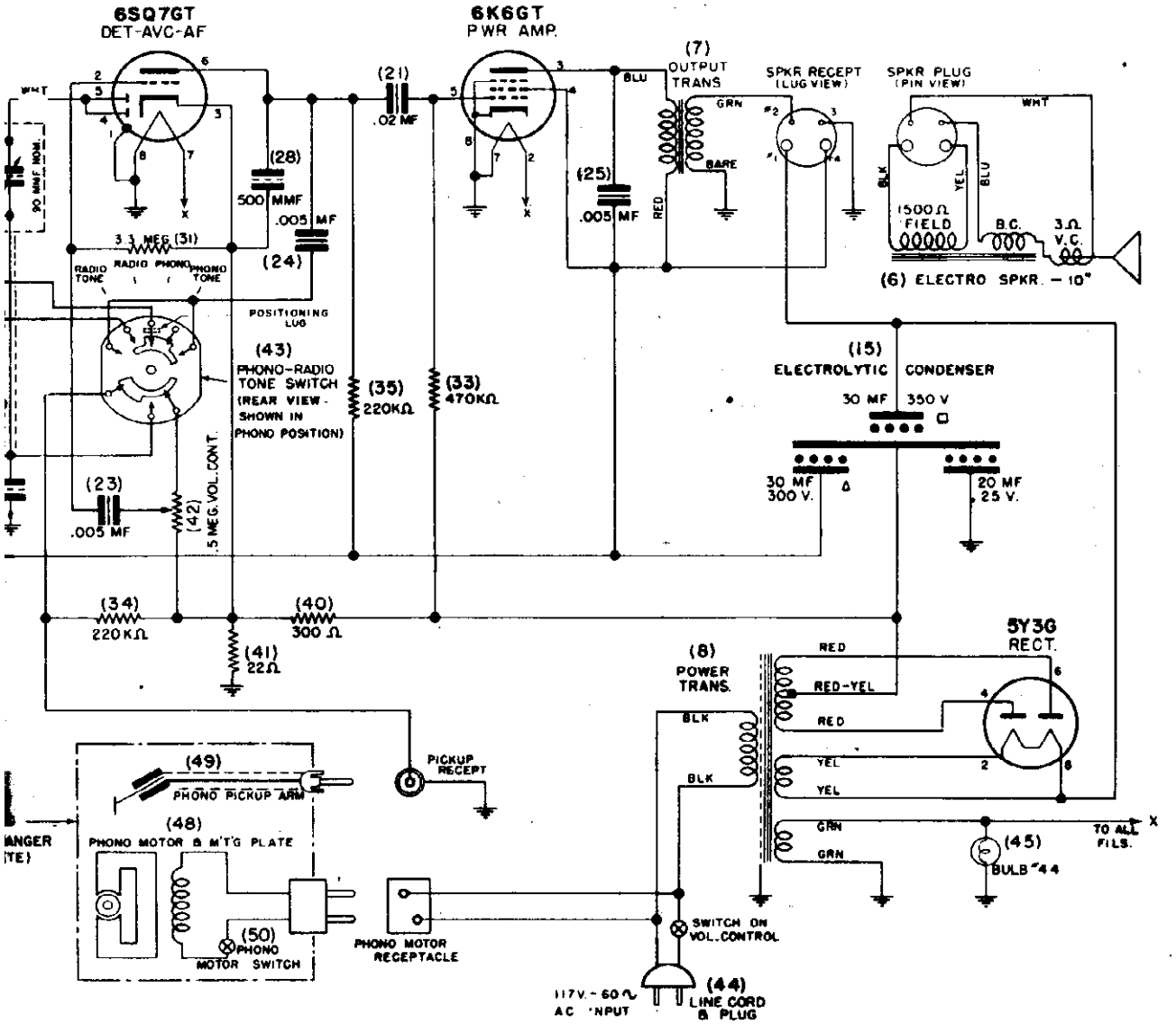
ALL MEASUREMENTS MADE WITH A 1000 OHMS PER VOLT VOLTMETER

VOLTAGES MEASURED WITH PHONO-RADIO-TONE SWITCH IN PHONO POSITION.

117 VOLT A.C. LINE INPUT

MAX. POWER OUTPUT – 3.5 WATTS

FG. CO.



Motorola

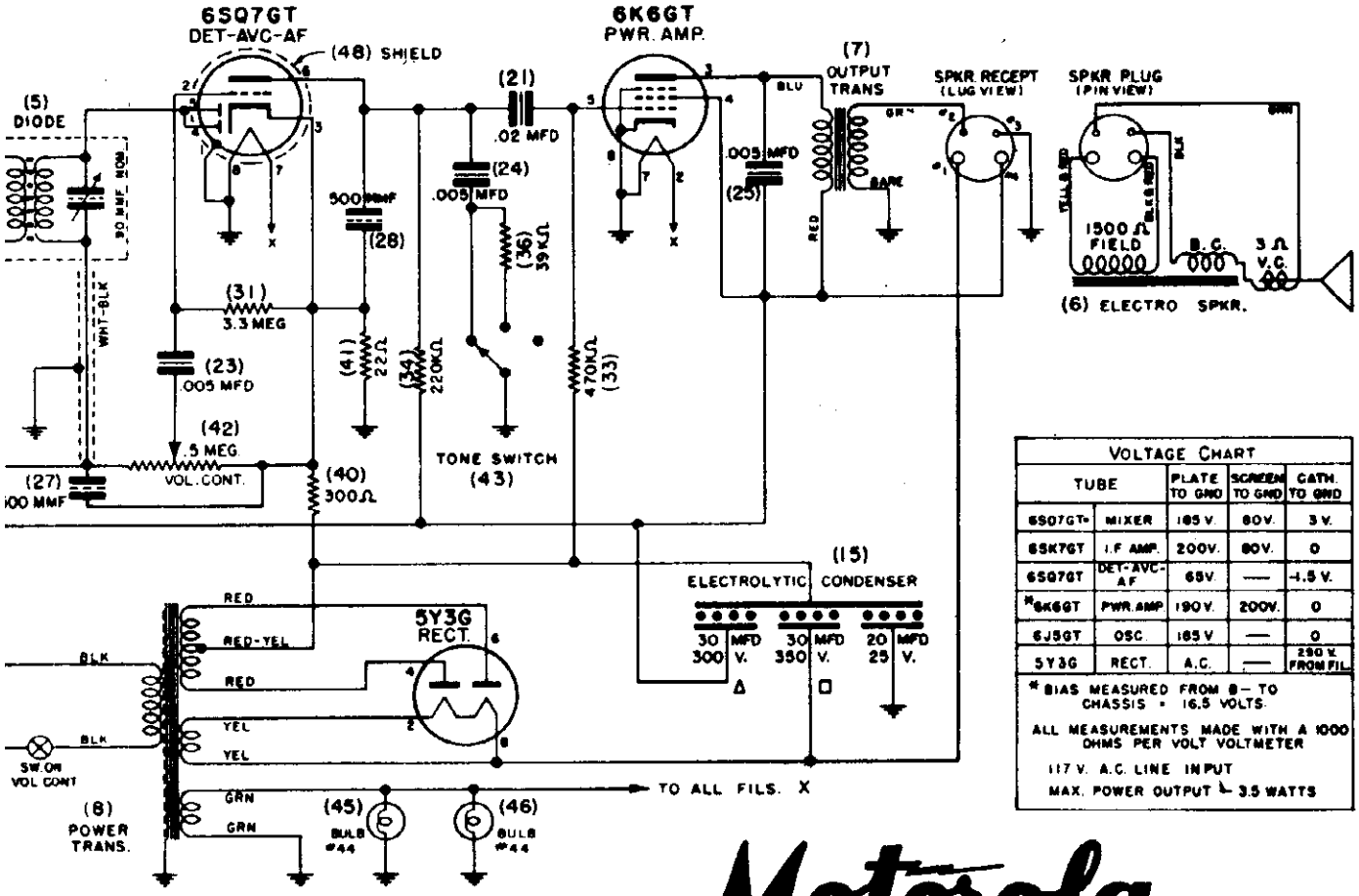
MODEL
61 F 21

H-185

MODEL 61F21 SCHEMATIC DIAGRAM PARTS LIST

DIAG. NO.	PART NO.	DESCRIPTION
1	1X28191	BACK & LOOP ASSEMBLY
2	21A27298	SHORT WAVE ANTENNA COIL
3	21A27297	B.C. & S.W. OSCILLATOR COIL
4	1X28090	I.F. COIL & SHIELD ASSEMBLY
5	1X28088	DIODE COIL & SHIELD ASSEMBLY
6	50827374	SPEAKER (10" ELECTRO)
7	25A21175	OUTPUT TRANSFORMER
8	25821268	POWER TRANSFORMER
9	40A20041	BAND SWITCH (2 POSITION)
10	20A17935	B.C. PADDER (RANGE 300 MMF TO 800 MMF)
11	1X28096	GANG & PULLEY ASSEMBLY (2 GANG)
12	20A27273	TRIMMER & "2" BRACKET (62 MMF NOM)
13	20A27346	TRIMMER & "2" BRACKET (118 MMF NOM)
14	20A16740	TRIMMER & "U" BRACKET (7 MMF NOM)
15	23A27716	ELECT. COND. (30 MFD/350V.-30 MFD/300V.) (20 MFD/25V.)
16	8A27296	POLYSTYRENE TUB. COND. (.007 MFD-5%-1000V.)
17	859807	TUBULAR CONDENSER (.1 MFD-400V.)
18	859816	TUBULAR CONDENSER (.05 MFD-400V.)
19	859805	TUBULAR CONDENSER (.05 MFD-100V.)
20	859505	TUBULAR CONDENSER (.05 MFD-100V.)
21	859802	TUBULAR CONDENSER (.02 MFD-400V.)
22	859801	TUBULAR CONDENSER (.01 MFD-100V.)
23	859813	TUBULAR CONDENSER (.005 MFD-600V.)
24	859813	TUBULAR CONDENSER (.005 MFD-600V.)
25	859813	TUBULAR CONDENSER (.005 MFD-600V.)
26	2186503	MOLDED MICA COND. (50 MMF-20%-400V.) BRN "0"
27	2186500	MOLDED MICA COND. (500 MMF-20%-400V.) BRN "0"
28	2186500	MOLDED MICA COND. (500 MMF-20%-400V.) BRN "0"
29	686368	CARBON RESISTOR (4.7 MEG-1/2WATT-20%) INS.
30	686368	CARBON RESISTOR (4.7 MEG-1/2WATT-20%) INS.
31	686301	CARBON RESISTOR (3.3 MEG-1/2WATT-20%) INS.
32	686302	CARBON RESISTOR (2.2 MEG-1/2WATT-20%) INS.
33	686160	CARBON RESISTOR (470,000Ω-1/2WATT-20%) INS.
34	686349	CARBON RESISTOR (220,000Ω-1/2WATT-10%) INS.
35	686304	CARBON RESISTOR (220,000Ω-1/2WATT-20%) INS.
36	686321	CARBON RESISTOR (47,000Ω-1/2WATT-20%) INS.
37	686358	CARBON RESISTOR (33,000Ω-1/2WATT-10%) INS.
38	686472	CARBON RESISTOR (1,000Ω-1/2WATT-20%) INS.
39	686026	CARBON RESISTOR (680Ω-1/2WATT-20%) N.I.
40	686487	CARBON RESISTOR (300Ω-1WATT-10%) N.I.
41	686474	CARBON RESISTOR (220Ω-1/2WATT-10%) N.I.
42	18A26478	VOLUME CONTROL & SWITCH (.5 MEG)
43	40K26108	PHONO-RADIO & TONE SWITCH
44	30K21892	LINE CORD & PLUG (9 FT.)
45	65X10867	BULB (6.3V-.25A TUB. BAY) CLEAR 944
46	20A11760	BANTAM TUBE SHIELD
47	1K27800	MODEL B-11-RC RECORD CHANGER (COMPLETE)
48	59B27687	PHONO MOTOR & MTG. PLATE (117V-40 CYCLES)
49	59K28740	PHONO PICKUP ARM (COMPLETE)
50	40A27146	SLIDER SWITCH & SHELL (PHONO MOTOR ON-OFF)

'IN MFG. CO.



VOLTAGE CHART				
TUBE		PLATE TO GND	SCREEN TO GND	CATH. TO GND
6SQ7GT*	MIXER	185 V.	80V.	3 V.
6SK7GT	I.F AMP.	200V.	80V.	0
6SQ7GT	DET-AVC-AF	65V.	—	-1.5 V.
*6K6GT	PWR. AMP.	190 V.	200V.	0
6J5GT	OSC.	185 V.	—	0
5Y3G	RECT.	A.C.	—	290 V. FROM FIL.

* BIAS MEASURED FROM 8— TO CHASSIS = 16.5 VOLTS.

ALL MEASUREMENTS MADE WITH A 1000 OHMS PER VOLT VOLTMETER

117 V. A.C. LINE INPUT

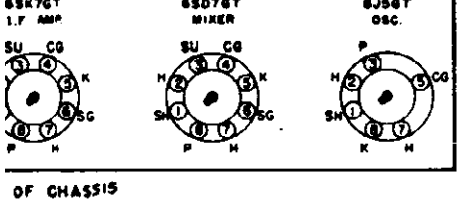
MAX. POWER OUTPUT — 3.5 WATTS

Motorola

MODELS

61 T 21

CHASSIS



OF CHASSIS

MODEL 61T21 SCHEMATIC DIAGRAM PARTS LIST

DIAG. NO.	PART NO.	DESCRIPTION
1	1X27482	BACK & LOOP ASSEMBLY
2	2A27298	SHORT WAVE ANTENNA COIL
3	2A27297	B.C. & S.W. OSCILLATOR COIL
4	1X28012	I.F. COIL & SHIELD ASSEMBLY
5	1X28010	DIODE COIL & SHIELD ASSEMBLY
6	50821574	SPEAKER (6" ELECTRO)
7	25A21175	OUTPUT TRANSFORMER
8	25A21268	POWER TRANSFORMER
9	40A28041	BAND SWITCH (2 POSITION)
10	20A17935	B.C. PADDER (RANGE 300 MMF TO 800 MMF)
11	19B27808	VARIABLE CONDENSER (2 GANG)
12	20A27273	TRIMMER & "Z" BRACKET (82 MMF NOM)
13	20A27326	TRIMMER & "Z" BRACKET (118 MMF NOM)
14	20A18740	TRIMMER & "U" BRACKET (7 MMF NOM)
15	23A27718	ELECT. CON. (30 MFD/350W.V.-30 MFD/300W.V.) (20 MFD/25W.V.)
16	8A27296	POLYSTYRENE BUR. COND. (.007 MFD-5%-100W.V.)
17	899807	TUBULAR CONDENSER (.1 MFD-400W.V.)
18	899816	TUBULAR CONDENSER (.05 MFD-400W.V.)
19	899805	TUBULAR CONDENSER (.05 MFD-100W.V.)
20	899605	TUBULAR CONDENSER (.05 MFD-100W.V.)
21	899802	TUBULAR CONDENSER (.02 MFD-400W.V.)
22	899801	TUBULAR CONDENSER (.01 MFD-100W.V.)
23	899813	TUBULAR CONDENSER (.005 MFD-600W.V.)
24	899813	TUBULAR CONDENSER (.005 MFD-600W.V.)
25	899813	TUBULAR CONDENSER (.005 MFD-600W.V.)
26	21B6503	MOLDED MICA COND. (50 MMF-20%-1,000W.V.) BRN "0"
27	21B6500	MOLDED MICA COND. (500 MMF-20%-1,000W.V.) BRN "0"
28	21B6500	MOLDED MICA COND. (500 MMF-20%-1,000W.V.) BRN "0"

DIAG. NO.	PART NO.	DESCRIPTION
29	686368	CARBON RESISTOR (4.7 MEG-1/2WATT-20%) INS.
30	686368	CARBON RESISTOR (4.7 MEG-1/2WATT-20%) INS.
31	686201	CARBON RESISTOR (3.3 MEG-1/2WATT-20%) INS.
32	686202	CARBON RESISTOR (2.2 MEG-1/2WATT-20%) INS.
33	686160	CARBON RESISTOR (470,000Ω-1/2WATT-20%) INS.
34	686204	CARBON RESISTOR (220,000Ω-1/2WATT-20%) INS.
35	686321	CARBON RESISTOR (47,000Ω-1/2WATT-20%) INS.
36	686266	CARBON RESISTOR (39,000Ω-1/2WATT-10%) INS.
37	686398	CARBON RESISTOR (33,000Ω-1/2WATT-10%) INS.
38	686172	CARBON RESISTOR (1,000Ω-1/2WATT-20%) INS.
39	686026	CARBON RESISTOR (660Ω-1/2WATT-20%) N.I.
40	686187	CARBON RESISTOR (300Ω-1WATT-10%) N.I.
41	686356	CARBON RESISTOR (82Ω-1/2WATT-10%) INS.
42	18A26678	VOLUME CONTROL & SWITCH (.5 MEG)
43	40A26679	TONE CONTROL SWITCH (3 POS.)
44	30A151	LINE CORD & PLUG (6 FT.)
45	65X10867	BULB (6.3V-.25A TUB. BAY) CLEAR #44
46	65X10867	BULB (6.3V-.25A TUB. BAY) CLEAR #44
47	26A14760	BANTAM TUBE SHIELD
48	26A14760	BANTAM TUBE SHIELD

MODELS
61 K 21
61 T 22

ALIGNMENT CHART

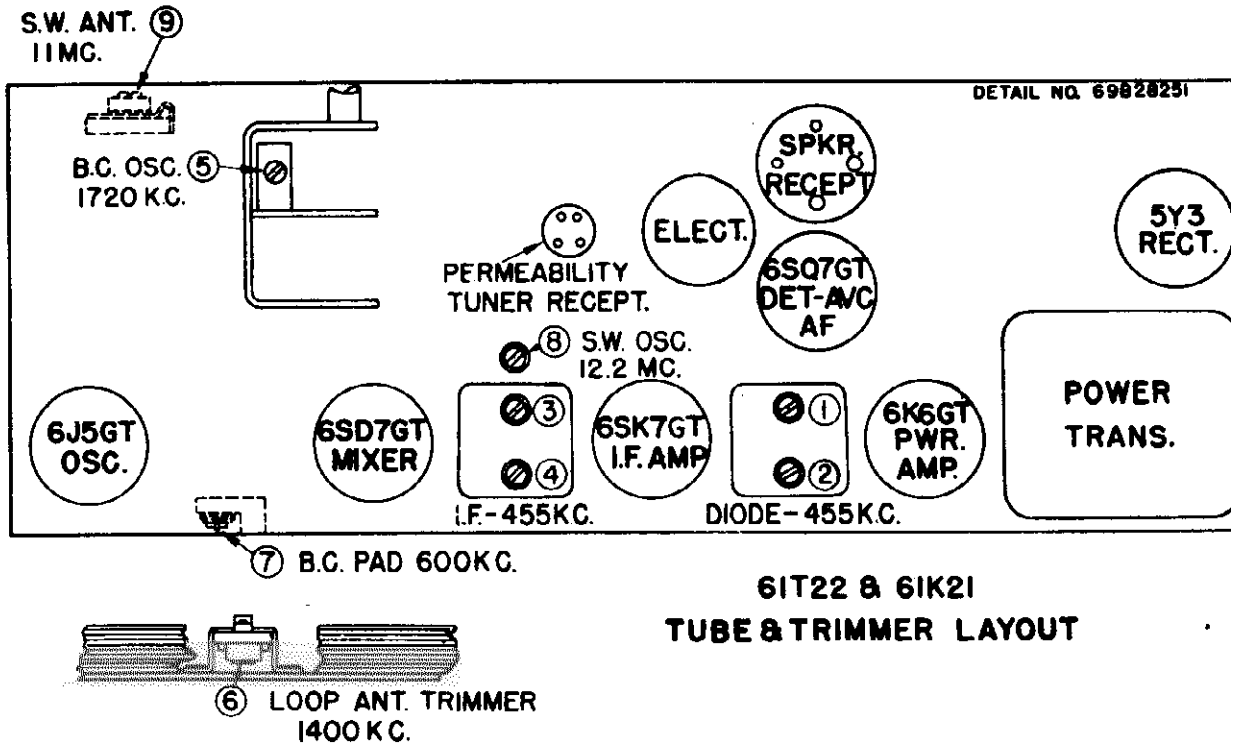
Operations In Order	Gang Condenser Set At	Dummy Antenna	Band Switch Set At	Generator Connected To	Adjust Trimmers No.	Generator Set At
1	1720 K.C.	.1 Mfd.	B.C.	Osc.Mod.Grid	1-2-3-4	455 K.C.
2	1720 K.C.	200 Mmf	B.C.	Ext.Ant. Connection	5	1720 K.C.
3	1400 K.C.	200 Mmf	B.C.	Ext.Ant. Connection	6	1400 K.C.
4	600 K.C.	200 Mmf	B.C.	Ext.Ant. Connection	7	600 K.C.
5	12.2 M.C.	400 Ohms	S.W.	S.W.Collector	8	12.2 M.C.
6	11 M.C.	400 Ohms	S.W.	S.W.Collector	9	11 M.C.

SENSITIVITY AND STAGE GAIN MEASUREMENTS

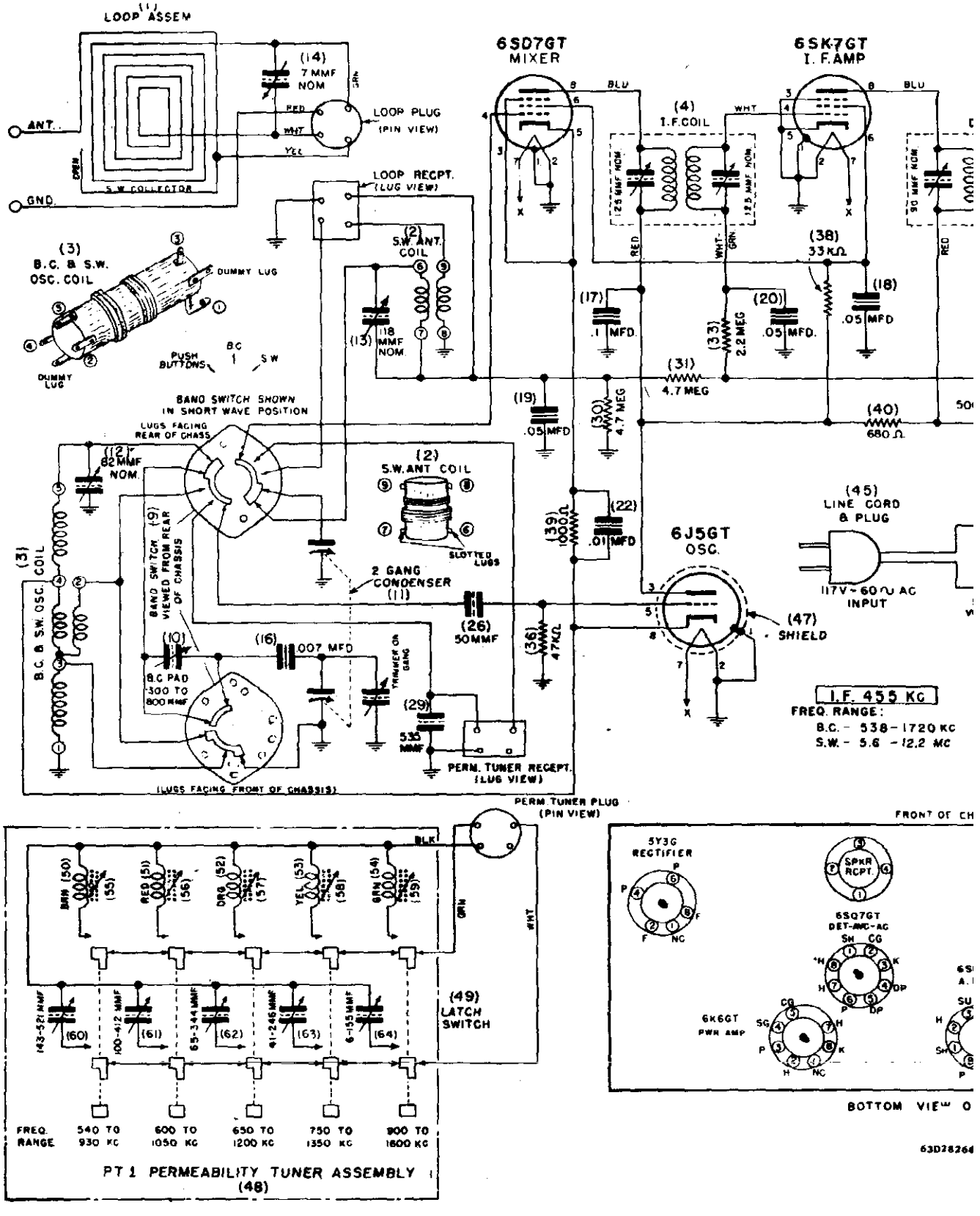
Average Microvolt Input *	Generator Set At	Generator Feeder Connected To	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
2100	455 K.C.	I.F. Grid	.1 Mmf.	.5 Meg.	.38
10	455 K.C.	Mod. Grid	.1 Mmf.	.5 Meg.	.38
12	600 K.C.	Mod. Grid	.1 Mmf.	.5 Meg.	.38
11	600 K.C.	Ant.Terminal	200 Mmf.	None	.38

Volume Control Set at Maximum
* .05 Watts .38 Volts
Master Switch at B.C. Position

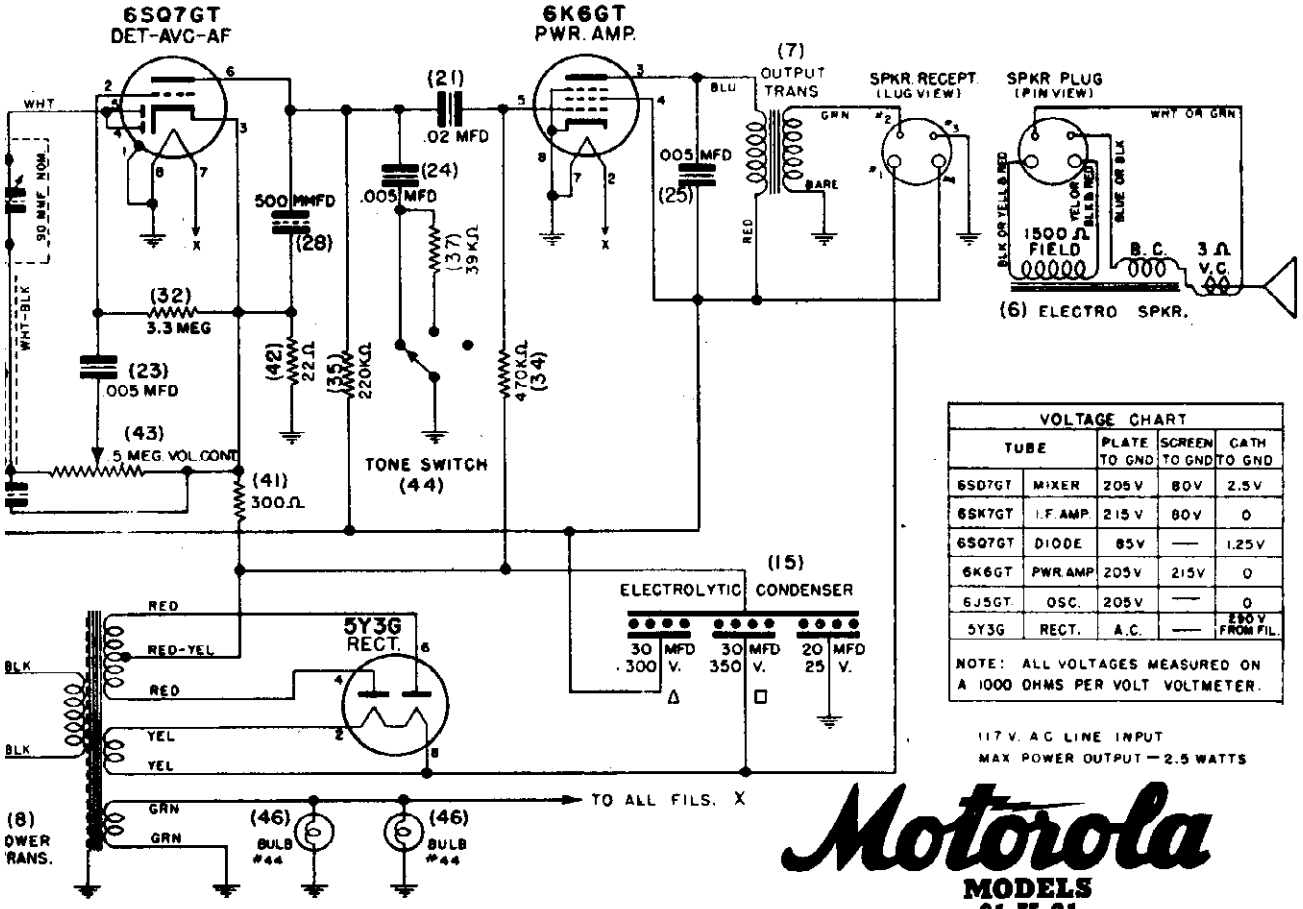
Tone Control Set at High Position.
** Output Meter Connected Across Voice Coil.



6IT22 & 6IK21
TUBE & TRIMMER LAYOUT


(1) LOOP ASSEM
ANT.
GND
S.W. COLLECTOR
OPEN
(14) 7 MMF NOM
LOOP PLUG (PIN VIEW)
RED
WHT
YEL
LOOP RECPT. (LUG VIEW)
(2) S.W. ANT. COIL
(3) B.C. & S.W. OSC. COIL
DUMMY LUG
PUSH BUTTONS
B.C. 1 S.W.
DUMMY LUG
(13) 118 MMF NOM.
6SD7GT MIXER
6SK7GT I.F. AMP
(4) I.F. COIL
125 MMF NOM.
125 MMF NOM.
90 MMF NOM.
BLU
WHT
RED
WHT-GRN
(38) 33 KΩ
(18) .05 MFD
(17) .1 MFD.
(20) .05 MFD.
(33) 2.2 MEG
(31) 4.7 MEG
(19) .05 MFD
(30) 4.7 MEG
(40) 680 Ω
BAND SWITCH SHOWN IN SHORT WAVE POSITION
LUGS FACING REAR OF CHASS
(12) 82 MMF NOM.
(2) S.W. ANT. COIL
SLOTTED LUGS
(3) B.C. & S.W. OSC. COIL
BAND SWITCH (9) VIEWED FROM REAR OF CHASSIS
2 GANG CONDENSER (11)
(10) B.C. PAD 300 TO 800 MMF
(16) .007 MFD
TRIMMER ON GANG
(29) 535 MMF
(26) 50 MMF
(36) 47 KΩ
(39) 1000 Ω
(22) .01 MFD
6J5GT OSC.
(47) SHIELD
(45) LINE CORD & PLUG
117V ~ 60 ∿ AC INPUT
I.F. 455 KC
FREQ. RANGE:
B.C. - 538 - 1720 KC
S.W. - 5.6 - 12.2 MC
PERM. TUNER RECEPT. (LUG VIEW)
(LUGS FACING FRONT OF CHASSIS)
PERM. TUNER PLUG (PIN VIEW)
BLK
GRN
WHT
BRN (50)
RED (51)
ORG (52)
YEL (53)
GRN (54)
(55)
(56)
(57)
(58)
(59)
143-521 MMF
100-412 MMF
65-344 MMF
41-246 MMF
6-155 MMF
(60)
(61)
(62)
(63)
(64)
(49) LATCH SWITCH
FREQ. RANGE
540 TO 930 KC
600 TO 1050 KC
650 TO 1200 KC
750 TO 1350 KC
900 TO 1800 KC
PT 1 PERMEABILITY TUNER ASSEMBLY (48)
FRONT OF CH
5Y3G RECTIFIER
SPKR RCPT.
6SQ7GT DET-AVC-AC
6K6GT PWR AMP
BOTTOM VIEW O
63D28264

FG. CO.



VOLTAGE CHART				
TUBE		PLATE TO GND	SCREEN TO GND	CATH TO GND
6SQ7GT	MIXER	205 V	80 V	2.5 V
6SK7GT	I.F. AMP	215 V	80 V	0
6SQ7GT	DIODE	85 V	—	1.25 V
6K6GT	PWR. AMP	205 V	215 V	0
6J5GT	OSC.	205 V	—	0
5Y3G	RECT.	A.C.	—	290 V FROM FIL.

NOTE: ALL VOLTAGES MEASURED ON A 1000 OHMS PER VOLT VOLTMETER.

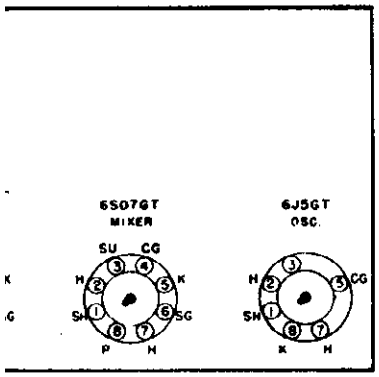
117 V. A.C. LINE INPUT
MAX POWER OUTPUT — 2.5 WATTS

Motorola

MODELS
61 K 21
61 T 22

FOR OTHER DATA SEE INDEX

MODEL 61T22 & 61K21 SCHEMATIC DIAGRAM PARTS LIST



DIAG. NO.	PART NO.	DESCRIPTION
1	1X27427	BACK & LOOP ASSEMBLY (MODEL 61T22)
	1X27375	BACK & LOOP ASSEMBLY (MODEL 61K21)
2	21A27296	SHORT WAVE ANTENNA COIL
3	21A27297	B.C. & S.W. OSCILLATOR COIL
4	1X28012	I.F. COIL & SHIELD ASSEMBLY
5	1X28010	DIODE COIL & SHIELD ASSEMBLY
6	50B21574	SPEAKER (6" ELECTRO) (MODEL 61T22)
	50B27374	SPEAKER (10" ELECTRO) (MODEL 61K21)
7	25A21175	OUTPUT TRANSFORMER
8	25B21268	POWER TRANSFORMER
9	40A28018	BAND SWITCH (3 POSITION)
10	20A17935	B.C. PADDER (RANGE 300 MMF TO 800 MMF)
11	19B27008	VARIABLE CONDENSER (2 GANG)
12	20A27273	TRIMMER & "Z" BRACKET (82 MMF NOM)
13	20K27386	TRIMMER & "Z" BRACKET (116 MMF NOM)
14	20A18740	TRIMMER & "U" BRACKET (7 MMF NOM)
15	25A27718	ELECT. COND. (30 MFD/350W.V.-30 MFD/300W.V.) (20 MFD/25W.V.)
16	8A27296	POLYSTYRENE TUB. COND. (.007 MFD-5%-100W.V.)
17	8S9807	TUBULAR CONDENSER (.1 MFD±20%-400W.V.)
18	8S9816	TUBULAR CONDENSER (.05 MFD±20%-400W.V.)
19	8S9805	TUBULAR CONDENSER (.05 MFD±20%-100W.V.)
20	8S9605	TUBULAR CONDENSER (.05 MFD±20%-100W.V.)
21	8S9802	TUBULAR CONDENSER (.02 MFD±20%-400W.V.)
22	8S9801	TUBULAR CONDENSER (.01 MFD±20%-100W.V.)
23	8S9813	TUBULAR CONDENSER (.005 MFD±20%-600W.V.)
24	8S9813	TUBULAR CONDENSER (.005 MFD±20%-600W.V.)
25	8S9813	TUBULAR CONDENSER (.005 MFD±20%-600W.V.)
26	21B6503	MOLDED MICA COND. (50 MMF-20%-400W.V.) GRN "0"
27	21B6500	MOLDED MICA COND. (500 MMF-20%-400W.V.) GRN "0"
28	21B6500	MOLDED MICA COND. (500 MMF-20%-400W.V.) GRN "0"
29	21A28020	CERAMIC MICA COND. (535 MMF-3%-500W.V.) SILVER

DIAG. NO.	PART NO.	DESCRIPTION
30	6B6368	CARBON RESISTOR (4.7 MEG -1/2WATT-20%) INS.
31	6B6368	CARBON RESISTOR (4.7 MEG -1/2WATT-20%) INS.
32	6B6201	CARBON RESISTOR (3.3 MEG -1/2WATT-20%) INS.
33	6B6202	CARBON RESISTOR (2.2 MEG -1/2WATT-20%) INS.
34	6B6100	CARBON RESISTOR (470,000Ω-1/2WATT-20%) INS.
35	6B6201	CARBON RESISTOR (220,000Ω-1/2WATT-20%) INS.
36	6H6321	CARBON RESISTOR (47,000Ω-1/2WATT-20%) INS.
37	6B6166	CARBON RESISTOR (39,000Ω-1/2WATT-10%) INS.
38	6H6350	CARBON RESISTOR (33,000Ω-1/2WATT-10%) N.I.
39	6B6172	CARBON RESISTOR (1,000Ω-1/2WATT-20%) INS.
40	6B6026	CARBON RESISTOR (600Ω-1/2WATT-20%) N.I.
41	6B6107	CARBON RESISTOR (300Ω-1WATT-10%) N.I.
42	6B6356	CARBON RESISTOR (22Ω-1/2WATT-10%) INS.
43	18A26678	VOLUME CONTROL & SWITCH (.5 MEG)
44	40A26679	TONE CONTROL SWITCH (3 POS.)
45	30A151	LINE CORD & PLUG (5 FT.)
46	65X1867	BULB (6.3V-.25A TUB. BAY) CLEAR #44
47	26A14760	BANTAM TUBE SHIELD
48	1X27721	MODEL PT-1 PERMEABILITY TUNER (COMPLETE)
49	40B27243	SP.B. LATCH SWITCH & BRACKETS
50	21B27311	PERMEABILITY OSC. COIL (BROWN) #1
51	21B27312	PERMEABILITY OSC. COIL (RED) #2
52	21B27313	PERMEABILITY OSC. COIL (ORANGE) #3
53	21B27314	PERMEABILITY OSC. COIL (YELLOW) #4
54	21B27315	PERMEABILITY OSC. COIL (GREEN) #5
55	67A27263	IRON CORE & ADJUSTMENT SCREW
56	67A27263	IRON CORE & ADJUSTMENT SCREW
57	67A27263	IRON CORE & ADJUSTMENT SCREW
58	67A27263	IRON CORE & ADJUSTMENT SCREW
59	67A27263	IRON CORE & ADJUSTMENT SCREW
60	20A27381	P.B. ANTENNA TRIMMER (145 TO 581 MMF) #1
61	20K27362	P.B. ANTENNA TRIMMER (100 TO 412 MMF) #2
62	20K27383	P.B. ANTENNA TRIMMER (65 TO 344 MMF) #3
63	20K27384	P.B. ANTENNA TRIMMER (41 TO 216 MMF) #4
64	20K27385	P.B. ANTENNA TRIMMER (6 TO 155 MMF) #5

N MFG. CO.

MODELS

62L11
62L12

ALIGNMENT CHART

OPERATIONS IN ORDER	GANG CONDENSER SET AT	DUMMY ANTENNA	GENERATOR CONNECTED TO	ADJUST TRIMMERS NO.	GENERATOR SET AT
1	Minimum	.1 Mfd.	Osc.-Mod. Grid	1-2-3-4	455 K.C.
2	Minimum *	.1 Mfd.	RF Grid	5	1600 K.C.
3	1400 K.C.	.1 Mfd.	RF Grid	6	1400 K.C.
4	600 K.C.	.1 Mfd.	RF Grid	7 **	600 K.C.
5	1400 K.C.	None	***	8	1400 K.C.
6	Repeat above steps for maximum accuracy.				

* *Adjust pointer to zero.*

** *Rock condenser until greatest output is obtained.*

*** *Connect output of signal generator to a 5' diameter 3 turn loop. With volume on full and output meter connected across voice coil bring loop close enough to receiver loop (receiver loop should be in front up position) until an output of 50 Milliwatts is obtained. 50 Milliwatts = .38 Volts on output meter.*

Vary distance between generator and receiver loop to maintain this output during alignment.

NOTE: *Trimmer No. 8 is adjusted with chassis in cabinet.*

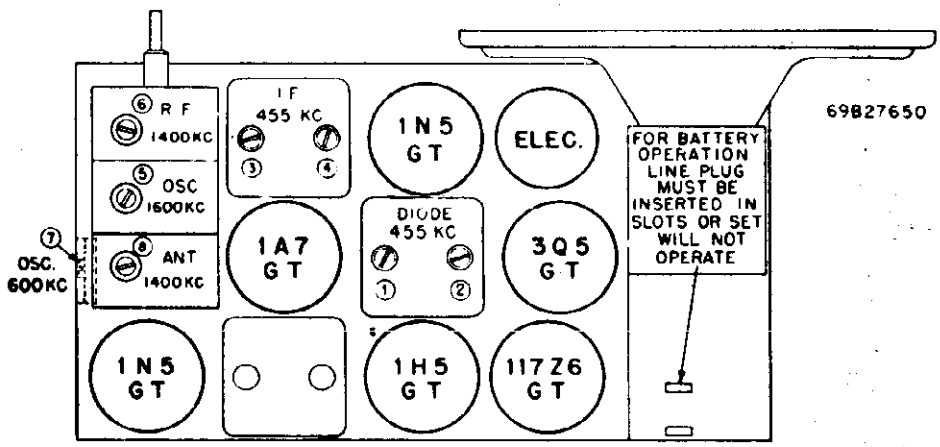
SENSITIVITY AND STAGE GAIN MEASUREMENTS

AVERAGE MICROVOLT INPUT	GENERATOR SET AT	GENERATOR FEEDER CONNECTED TO	DUMMY ANTENNA CAPACITY	LEAK RESISTANCE	OUTPUT METER READING
5500	455	IF Grid	.1 Mfd.	.5 Meg.	.38
105	455	Mod. Grid	.1 Mfd.	.5 Meg.	.38
110	600	Mod. Grid	.1 Mfd.	.5 Meg.	.38
6	600	RF Grid	.1 Mfd.	None	.38

Volume Control Set at Maximum

* .05 Watts = 38 Volts

** *Output meter connected across voice coil.*



MODEL 61 T 23

ALIGNMENT CHART
Model 61T23

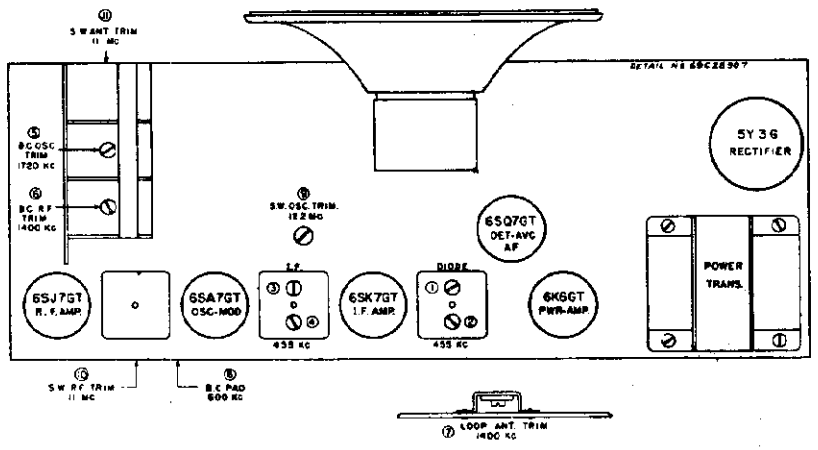
Operations In Order	Gang Condenser Set At	Dummy Antenna	Band Switch Set At	Generator Connected to	Adjust Trimmers No.	Generator Set At
1	1720 K.C.	.1 Mfd.	B.C.	Osc.Mod.Grid	1-2-3-4	455 K.C.
2	1720 K.C.	200 Mmf	B.C.	R.F.Grid	5	1720 K.C.
3	1400 K.C.	200 Mmf	B.C.	Ext.Ant. Connection	6	1400 K.C.
4	1400 K.C.	200 Mmf	B.C.	Ext.Ant. Connection	7	1400 K.C.
5	600 K.C.	200 Mmf	B.C.	Ext.Ant. Connection	8	600 K.C.
5	12.2 M.C.	400 Ohms	S.W.	Ext.Ant. Connection	9	12.2 M.C.
7	11.0 M.C.	400 Ohms	S.W.	Ext.Ant. Connection	10	11.0 M.C.
8	11.0 M.C.	400 Ohms	S.W.	Ext.Ant. Connection	11	11.0 M.C.

SENSITIVITY AND STAGE GAIN MEASUREMENTS

Average Microvolt Input *	Generator Set At	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
2500	455 K.C.	I.F. Grid	.1 Mfd	.5 Meg.	.38
55	455 K.C.	Mod. Grid	.1 Mfd	.5 Meg.	.38
50	600 K.C.	Mod. Grid	.1 Mfd	.5 Meg.	.38
6	600 K.C.	R.F. Grid	.1 Mfd	.5 Meg.	.38
4	600 K.C.	Ant.Terminal	200 Mmf	None	.38

Volumn Control Set at Maximum
* .05 Watts = .38 Volts

Tone Control Set at High Position.
** Output meter connected across voice coil.



TUBE & TRIMMER LAYOUT

MODEL 81 F 21

ALIGNMENT CHART

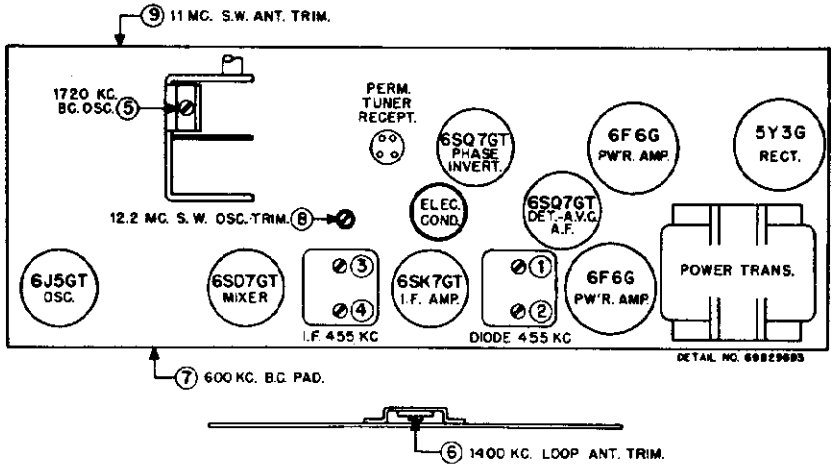
Operations In Order	Gang Condenser Set At	Dummy Antenna	Band Switch Set At	Generator Connected To	Adjust Trimmers No.	Generator Set At
1	1720 K.C.	.1 Mfd.	B.C.	Mixer Grid	1-2-3-4	456 K.C.
2	1720 K.C.	200 Mmf.	B.C.	Ext.Ant. Connection	5	1720 K.C.
3	1400 K.C.	200 Mmf.	B.C.	Ext.Ant. Connection	6	1400 K.C.
4	600 K.C.	200 Mmf.	B.C.	Ext.Ant. Connection	7	600 K.C.
5	12.2 M.C.	400 Ohms	S.W.	Ext.Ant. Connection	8	12.2 M.C.
6	11.0 M.C.	400 Ohms	S.W.	Ext.Ant. Connection	9	11.0 M.C.

SENSITIVITY AND STAGE GAIN MEASUREMENTS

Average Microvolt Input *	Generator Set At	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
1900	455 K.C.	I.F. Grid	.1	.5 Meg.	.38
6	455 K.C.	Mixer Grid	.1	.5 Meg.	.38
8	600 K.C.	Mixer Grid	.1	.5 Meg.	.38
7	600 K.C.	Ant.Terminal	200 Mmf.	None	.38

Volume Control Set at Maximum
* .05 Watts = .38 Volts

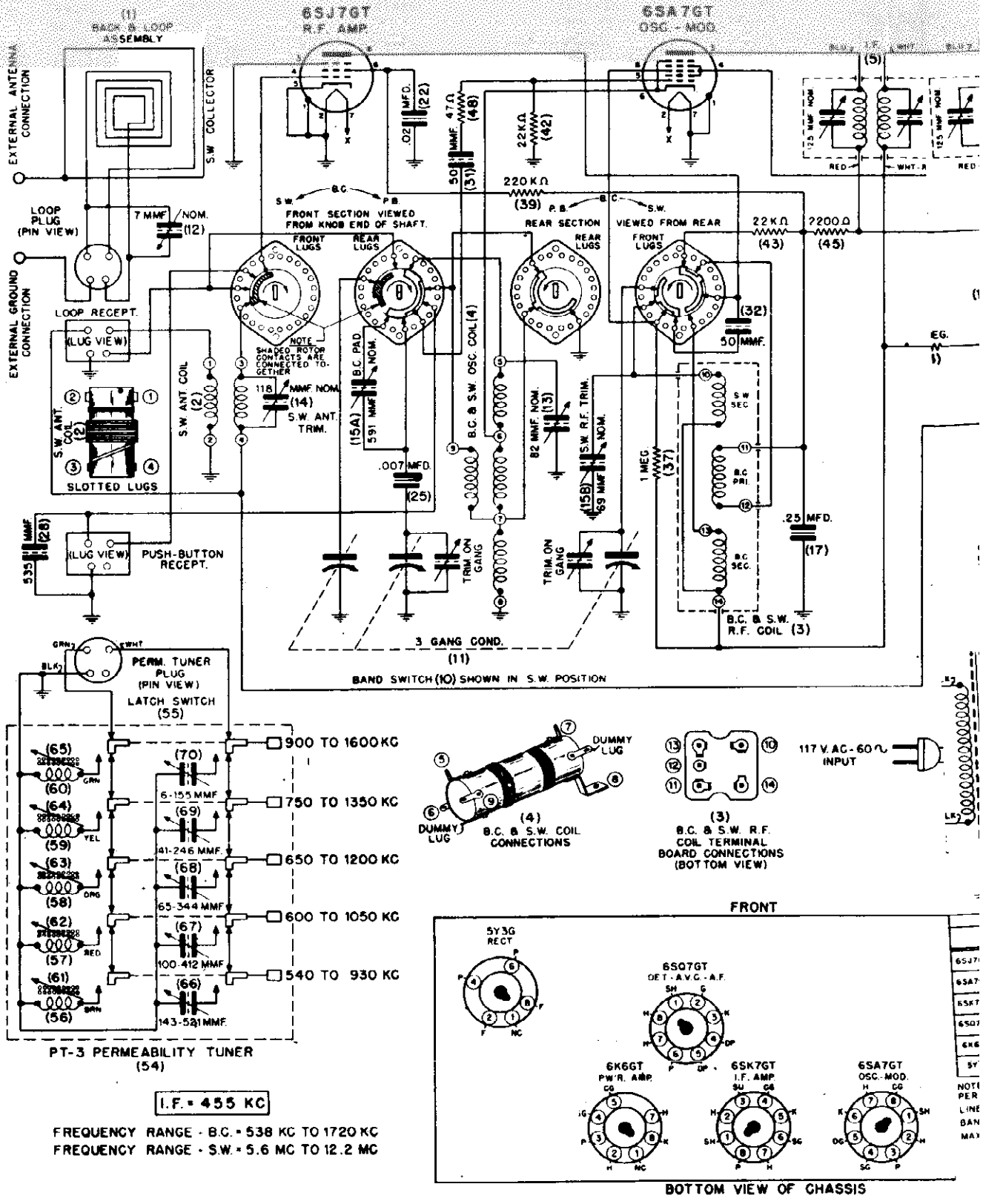
Tone Control Set At High Position.
** Output meter connected across voice coil.



TUBE & TRIMMER DETAIL

MODEL NO. 81F21

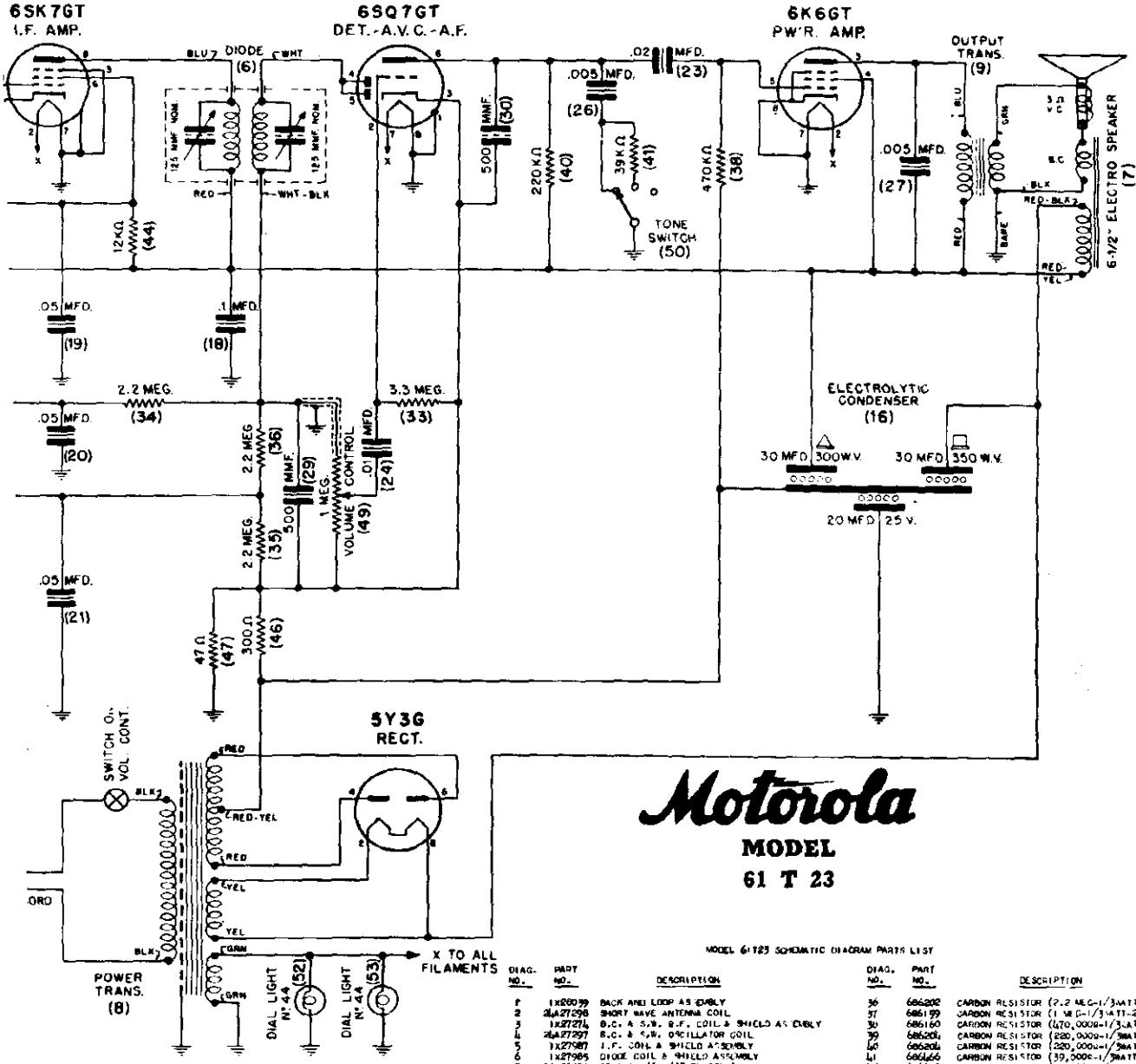
CHASSIS NO. H-186



I.F. = 455 KC

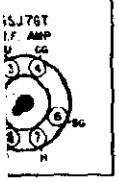
FREQUENCY RANGE - B.C. = 538 KC TO 1720 KC
FREQUENCY RANGE - S.W. = 5.6 MC TO 12.2 MC

IN MFG. CO.



VOLTAGE CHART - 117 V. AC INPUT					
TUBE		PLATE TO GND	SCREEN TO GND	CATH. TO GND	BIAS
6SJ7GT	R.F. AMP	220V	45 V	0	1.5 V FROM CATH OF 6SQ7GT TO GND
6SA7GT	OSC-MOD.	225V	100 V	0	" "
6SK7GT	I.F. AMP	225V	100 V	0	" "
6SQ7GT	DET-AVC A.F.	75V	—	-1.25 V.	———
6K6GT	PWR AMP	215V	225V.	0	16.5 V. FROM B- TO GND
5Y3G	RECT.	AC.	—	295 V FROM FIL	———

NOTE:- ALL VOLTAGES MEASURED WITH A 1,000 OHM PER VOLT VOLTMETER.
LINE VOLTAGE -117 VOLTS.
BAND SWITCH IN B.C. POSITION.
MAXIMUM POWER OUTPUT - 3.5 WATTS.

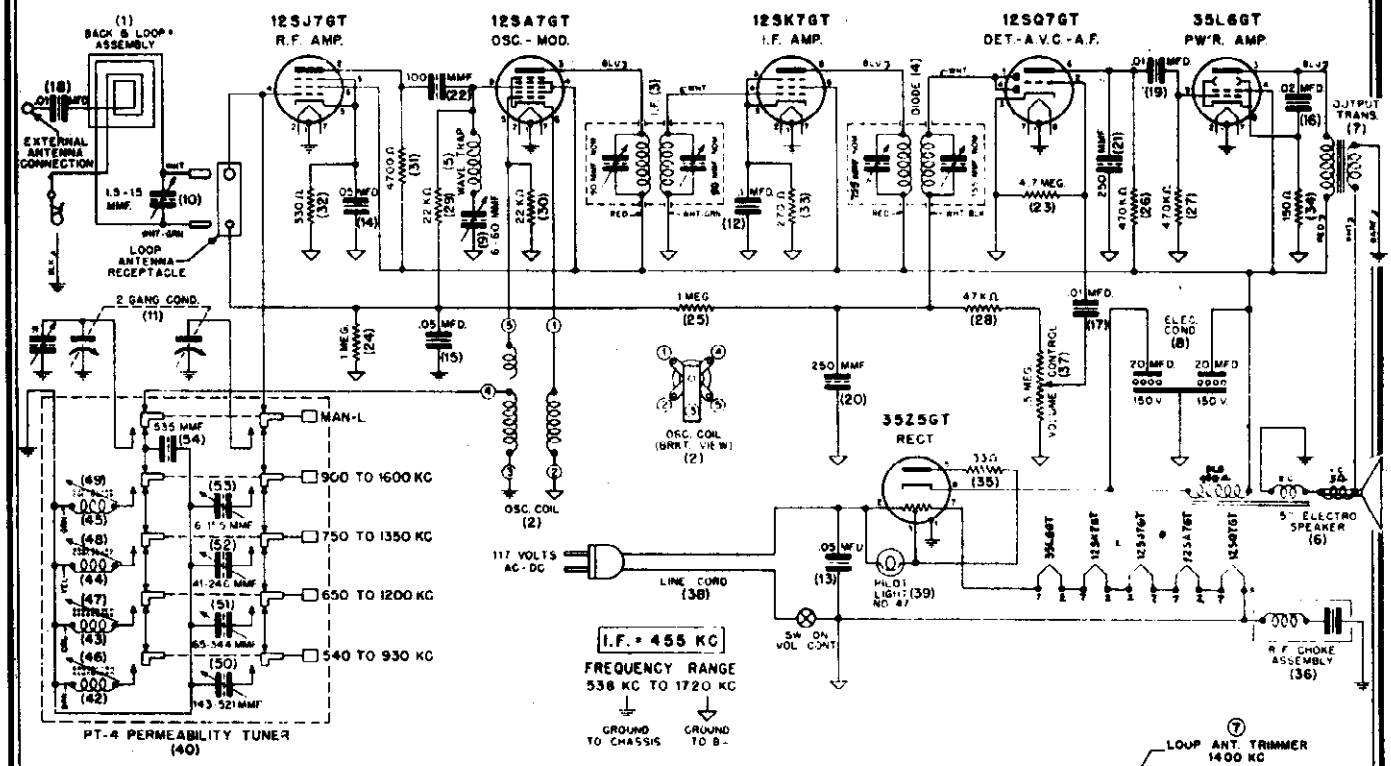


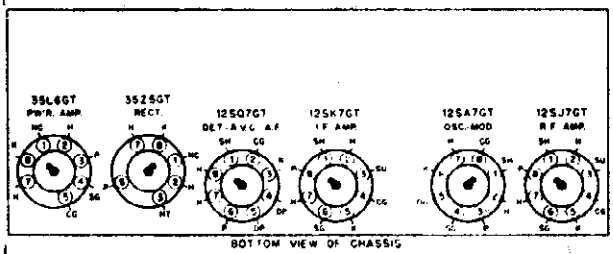
MODEL 61T23 SCHEMATIC DIAGRAM PARTS LIST

DIAG. NO.	PART NO.	DESCRIPTION
1	1X26039	BACK AND LOOP ASSEMBLY
2	21A27298	SHORT WAVE ANTENNA COIL
3	1X27274	B.C. & S.W. R.F. COIL & SHIELD ASSEMBLY
4	21A27297	B.C. & S.W. OSCILLATOR COIL
5	1X27987	I.F. COIL & SHIELD ASSEMBLY
6	1X27984	DIODE COIL & SHIELD ASSEMBLY
7	50X26275	SPEAKER (6-1/2" ELECTRO)
8	25821248	POWER TRANSFORMER
9	25821175	OUTPUT TRANSFORMER
10	40X27295	BAND SWITCH (3 POSITION)
11	19X27809	VARIABLE CONDENSER (3 GANG)
12	20A27240	TRIMMER & "D" BRACKET (7 MMF NOM)
13	20A27273	TRIMMER & "E" BRACKET (62 MMF NOM)
14	20A27326	TRIMMER & "E" BRACKET (115 MMF NOM)
15	20A27320	O.C. PAD. & S.W. TRIM PAD - 991 MMF NOM) (TRIM - 59 MMF NOM)
16	23A27318	ELECT. COND. (30 MFD/350W.V.-30 MFD/300W.V) (20 MFD/25W.V.)
17	839611	TUBULAR CONDENSER (.25 MFD-400W.V.)
18	839607	TUBULAR CONDENSER (.1 MFD-400W.V.)
19	839616	TUBULAR CONDENSER (.05 MFD-400W.V.)
20	839605	TUBULAR CONDENSER (.05 MFD-100W.V.)
21	839605	TUBULAR CONDENSER (.05 MFD-100W.V.)
22	839602	TUBULAR CONDENSER (.02 MFD-400W.V.)
23	839602	TUBULAR CONDENSER (.02 MFD-400W.V.)
24	839601	TUBULAR CONDENSER (.01 MFD-100W.V.)
25	84X27396	POLYSTYRENE TUB. COND. (.001 MFD-100W.V.)
26	839613	TUBULAR CONDENSER (.005 MFD-600W.V.)
27	839613	TUBULAR CONDENSER (.005 MFD-600W.V.)
28	21A28020	MICA CONDENSER (535 MMF-2%-500W.V.)
29	21B6500	MICA CONDENSER (500 MMF-20%-400W.V.) BRN "O"
30	21B6500	MICA CONDENSER (500 MMF-20%-400W.V.) BRN "O"
31	21B6503	MICA CONDENSER (50 MMF-20%-400W.V.) BRN "O"
32	21B6505	MICA CONDENSER (50 MMF-20%-400W.V.) BRN "O"
33	686801	CARBON RESISTOR (3.3 MEG-1/3WATT-20%) INS.
34	686802	CARBON RESISTOR (2.2 MEG-1/3WATT-20%) INS.
35	686802	CARBON RESISTOR (2.2 MEG -1/3WATT-20%) INS.
36	686802	CARBON RESISTOR (2.2 MEG-1/3WATT-20%) INS.
37	686199	CARBON RESISTOR (1 MEG-1/3WATT-20%) INS.
38	686160	CARBON RESISTOR (470,000Ω-1/3WATT-20%) INS.
39	686201	CARBON RESISTOR (220,000Ω-1/3WATT-20%) INS.
40	686201	CARBON RESISTOR (220,000Ω-1/3WATT-20%) INS.
41	686166	CARBON RESISTOR (39,000Ω-1/3WATT-10%) INS.
42	686212	CARBON RESISTOR (22,000Ω-1/3WATT-20%) INS.
43	686212	CARBON RESISTOR (22,000Ω-1/3WATT-20%) INS.
44	686205	CARBON RESISTOR (12,000Ω-1WATT-10%) N.I.
45	686165	CARBON RESISTOR (2,200Ω-1/2WATT-20%) N.I.
46	686157	CARBON RESISTOR (300Ω-1WATT-10%) N.I.
47	686128	CARBON RESISTOR (47Ω-1/3WATT-10%) N.I.
48	686166	CARBON RESISTOR (47Ω-1/3WATT-10%) INS.
49	19X26678	VOLUME CONTROL & SWITCH (1.5 MEG)
50	40A26679	TONE CONTROL SWITCH (3 POSITION)
51	30A151	LINE CORD & PLUG (6 FT.)
52	6SX10867	BULB (6.3V.-.25A TUB. BAY.) CLEAR #44
53	6SX10867	BULB (6.3V.-.25A TUB. BAY.) CLEAR #44
54	1X26005	MODEL PT-1 PERMEABILITY TUNER (COMPLETE)
55	40X27295	5 P.B. LATCH SWITCH & BRACKETS
56	21A27311	PERMEABILITY OSC. COIL (BROWN) #4
57	21A27312	PERMEABILITY OSC. COIL (RED) #2
58	21A27313	PERMEABILITY OSC. COIL (ORANGE) #3
59	21A27314	PERMEABILITY OSC. COIL (YELLOW) #1
60	21A27315	PERMEABILITY OSC. COIL (GREEN) #5
61	67A27283	IRON CORE & ADJUSTMENT SCREW
62	67A27283	IRON CORE & ADJUSTMENT SCREW
63	67A27283	IRON CORE & ADJUSTMENT SCREW
64	67A27283	IRON CORE & ADJUSTMENT SCREW
65	67A27283	IRON CORE & ADJUSTMENT SCREW
66	20A27381	P.B. ANTENNA TRIMMER (11.3 TO 52¹ MMF) #1
67	20A27382	P.B. ANTENNA TRIMMER (100 TO 412 MMF) #2
68	20A27383	P.B. ANTENNA TRIMMER (65 TO 344 MMF) #3
69	20A27384	P.B. ANTENNA TRIMMER (41 TO 246 MMF) #4
70	20A27385	P.B. ANTENNA TRIMMER (6 TO 155 MMF) #5

MODEL 61X14

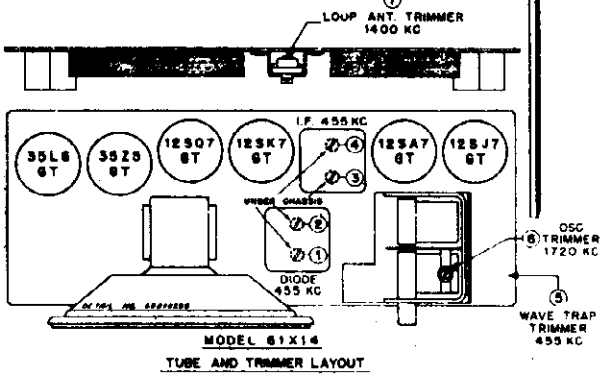
GALVIN MFG. CO.





VOLTAGE CHART 117 V AC INPUT				
TUBE		PLATE	SCREEN	CATHODE
12SJ7GT	R.F. AMP.	67 V	85 V	1.5 V
12SA7GT	OSC.-MOD.	85 V	85 V	0
12SK7GT	I.F. AMP.	85 V	85 V	2.5 V
12SQ7GT	DET. A.V.C. A.F.	55 V	—	0
35L6GT	PWR. AMP.	75 V	85 V	4.5 V
35Z5GT	RECT.	AC	—	90 V

NOTE: ALL VOLTAGES MEASURED ON A 1,000 OHM PER VOLT VOLTMETER
MAX. PWR. OUTPUT 1.75 WATTS
= TRIMMER ON GANG



MODEL 61X14
TUBE AND TRIMMER LAYOUT

ALIGNMENT CHART

OPERATIONS IN ORDER	GANG CONDENSER SET AT	DUMMY ANTENNA	GENERATOR CONNECTED TO	ADJUST TRIMMERS NO.	GENERATOR SET AT
1	1720 K.C.	.1 Mfd.	Osc. Mod. Grid	1-3-3-4	455 K.C.
2	1720 K.C.	.1 Mfd.	Ant. Terminal	5*	455 K.C.
3	1720 K.C.	200 Mmf.	Ant. Terminal	6	1720 K.C.
4	1400 K.C.	200 Mmf.	Ant. Terminal	7	1400 K.C.

* *Adjust (wave trap) to minimum reading of output meter – Volume Control set at Maximum.*

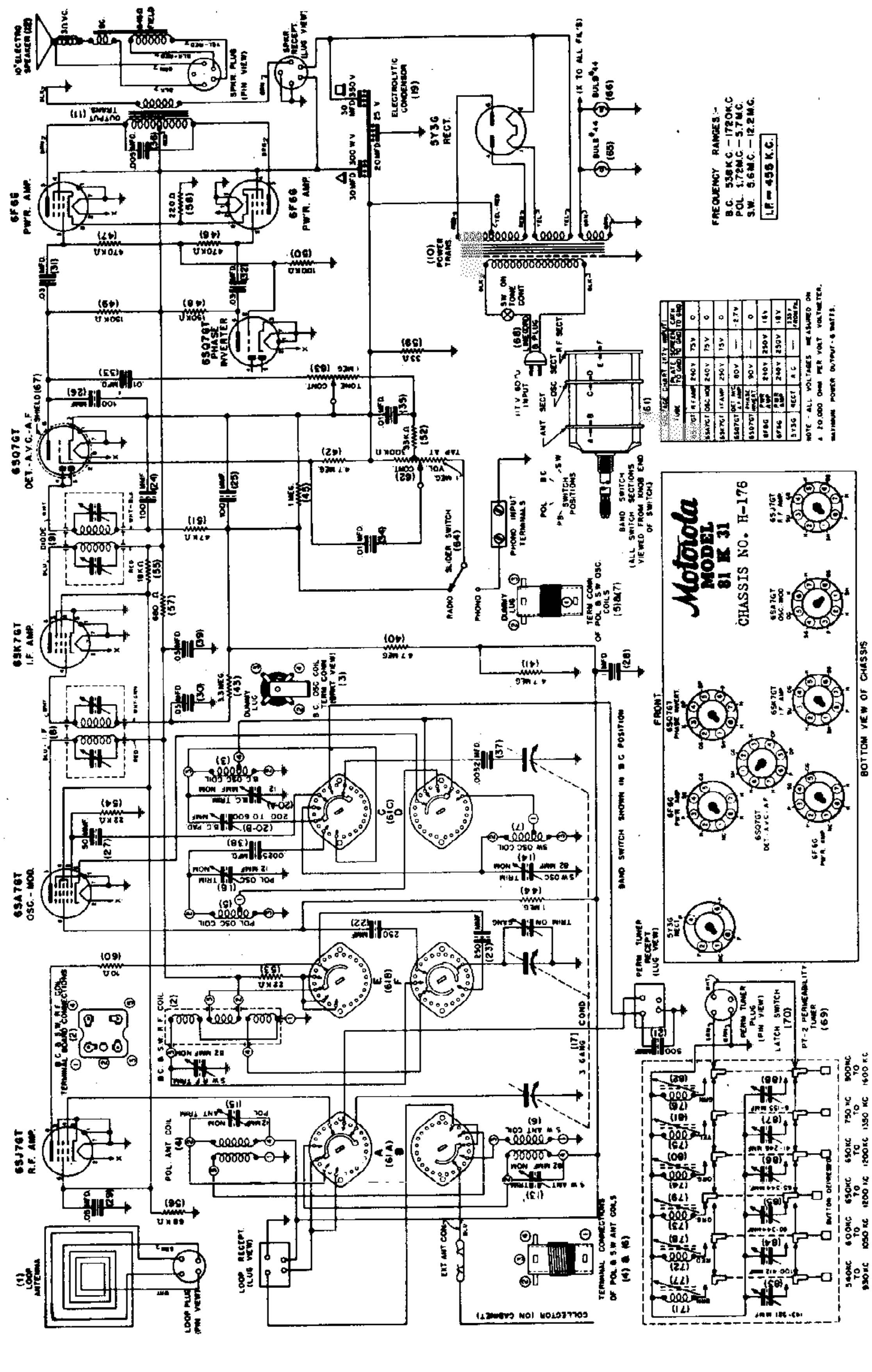
SENSITIVITY AND STAGE GAIN MEASUREMENTS

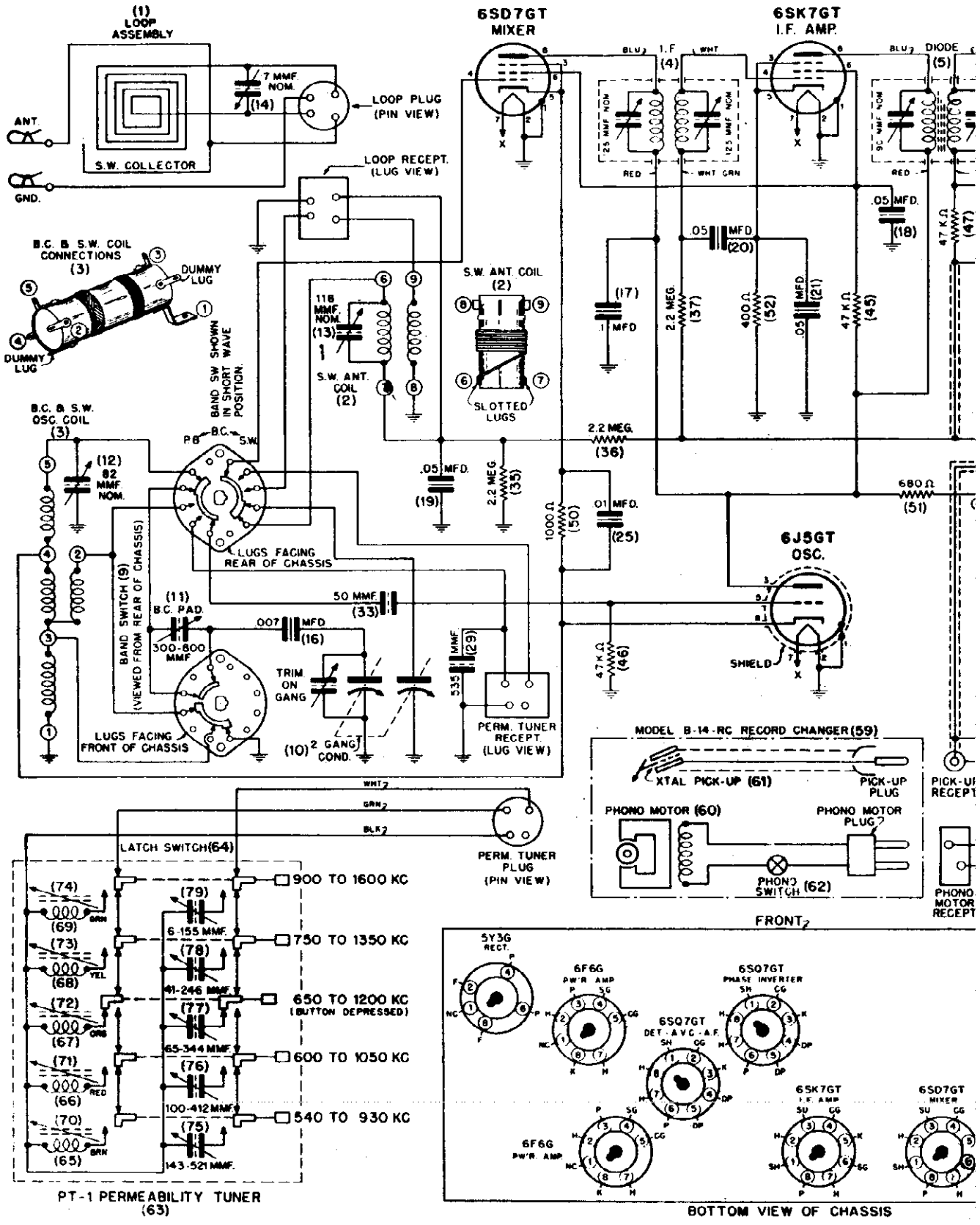
AVERAGE MICROVOLT INPUT *	GENERATOR SET AT	GENERATOR FEEDER CONNECTED TO	DUMMY ANTENNA CAPACITY	LEAK RESISTANCE	OUTPUT METER READING **
4750	455	I.F. Grid	.1 Mfd.	.5 Meg.	.38
55	455	Mod. Grid	.1 Mfd.	.5 Meg.	.38
8	600	Mod. Grid	.1 Mfd.	.5 Meg.	.38
5	600	Ant. Terminal	200 Mmf.	None	.38

Volume Control Set at Maximum
* *.05 Watt = .38 Volts*

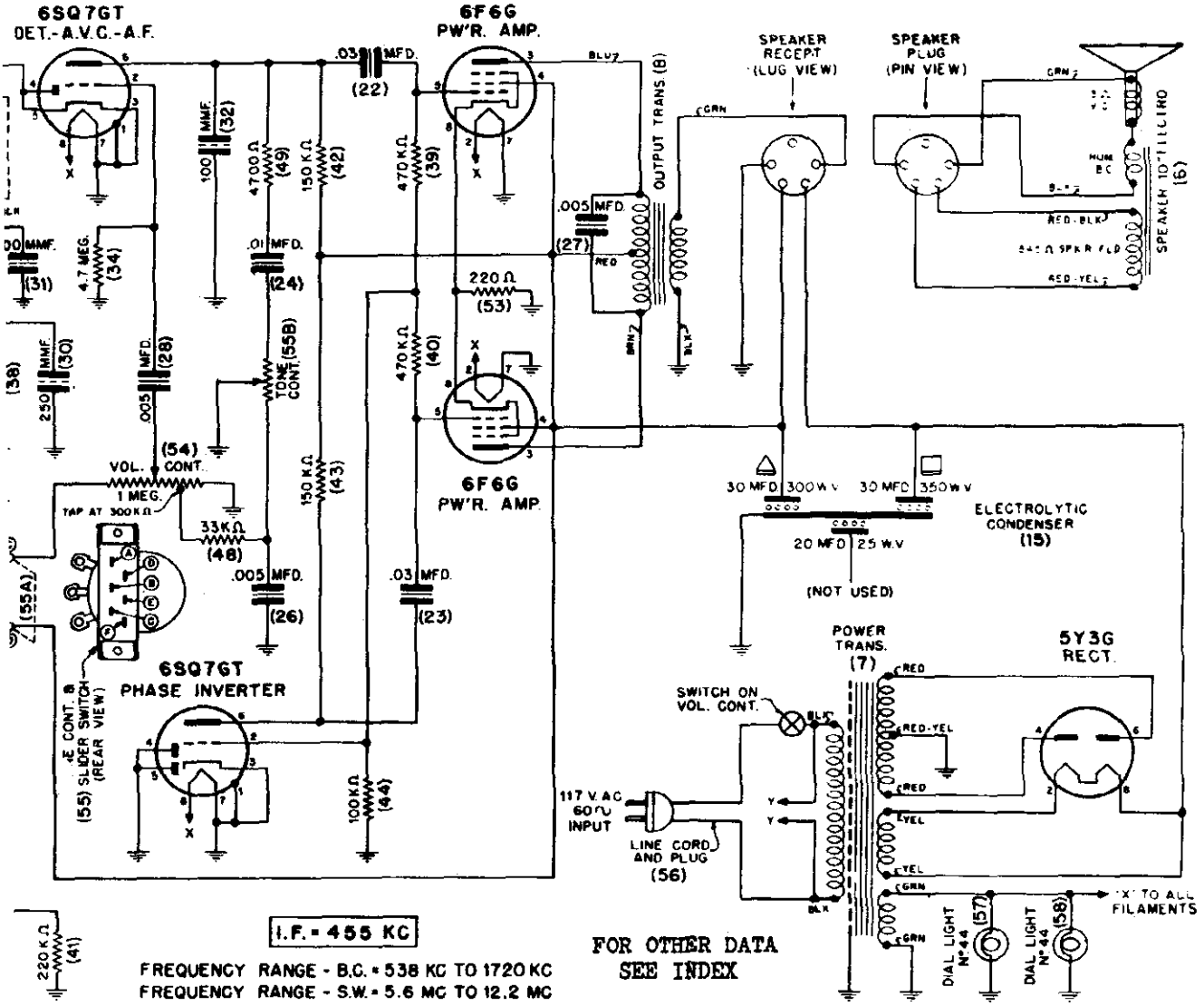
** *Output meter connected across voice coil.*

GALVIN MFG. CO.




(1) LOOP ASSEMBLY
7 MMF. NOM.
(14)
LOOP PLUG (PIN VIEW)
ANT.
GND.
S.W. COLLECTOR
LOOP RECEPT. (LUG VIEW)
6SD7GT MIXER
6SK7GT I.F. AMP.
DIODE (5)
I.F. (4)
B.C. & S.W. COIL CONNECTIONS (3)
DUMMY LUG
DUMMY LUG
BAND SW SHOWN IN SHORT WAVE POSITION.
118 MMF. NOM. (13)
S.W. ANT. COIL (2)
S.W. ANT. COIL (2)
SLOTTED LUGS
.05 MFD. (18)
47 KΩ (47)
.05 MFD. (20)
(17) .1 MFD.
2.2 MEG. (37)
400 Ω (52)
.05 MFD. (21)
47 KΩ (45)
B.C. & S.W. OSC. COIL (3)
(12) 82 MMF. NOM.
BAND SWITCH (9) (VIEWED FROM REAR OF CHASSIS)
LUGS FACING REAR OF CHASSIS
LUGS FACING FRONT OF CHASSIS
(11) B.C. PAD. 300-800 MMF
.007 MFD. (16)
TRIM ON GANG
(10) 2 GANG COND.
50 MMF. (33)
535 MMF. (29)
PERM. TUNER RECEPT. (LUG VIEW)
.05 MFD. (19)
2.2 MEG. (35)
1000 Ω (50)
.01 MFD. (25)
2.2 MEG. (36)
47 KΩ (46)
6J5GT OSC.
SHIELD
680 Ω (51)
MODEL B-14-RC RECORD CHANGER (59)
XTAL PICK-UP (61)
PICK-UP PLUG
PHONO MOTOR (60)
PHONO MOTOR PLUG
PHONO SWITCH (62)
PICK-UP RECEPT.
PHONO MOTOR RECEPT.
WHT
GRN
BLK
PERM. TUNER PLUG (PIN VIEW)
LATCH SWITCH (64)
(74) GRN (69)
(73) YEL (68)
(72) ORG (67)
(71) RED (66)
(70) BRN (65)
(79) 6-155 MMF.
(78) 41-246 MMF.
(77) 65-344 MMF.
(76) 100-412 MMF.
(75) 143-521 MMF.
900 TO 1600 KC
750 TO 1350 KC
650 TO 1200 KC (BUTTON DEPRESSED)
600 TO 1050 KC
540 TO 930 KC
PT-1 PERMEABILITY TUNER (63)
FRONT
5Y3G RECT.
6F6G PWR AMP
6SQ7GT PHASE INVERTER
6SQ7GT DET.-AVC.-A.F.
6F6G PWR AMP
6SK7GT I.F. AMP
6SD7GT MIXER
BOTTOM VIEW OF CHASSIS

O.

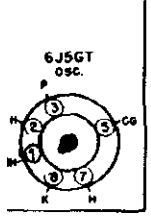


I.F. = 455 KC

FREQUENCY RANGE - B.C. = 538 KC TO 1720 KC
FREQUENCY RANGE - S.W. = 5.6 MC TO 12.2 MC

FOR OTHER DATA SEE INDEX

Motorola
MODEL
81 F 21



VOLTAGE CHART - 117 V. AC INPUT					
TUBE			PLATE TO GND.	SCREEN TO GND	CATH. TO GND
6SQ7GT	MIXER		195 V.	85 V.	3.6 V.
6SK7GT	I.F. AMP		205 V	85 V	3.5 V.
6SQ7GT	DET.-AVC.-A.F.		100 V	— —	0
6SQ7GT	PHASE INVERT.		80 V	——	0
6J5GT	OSC.		195 V.	——	0
6F6G	PW'R AMP.		195 V.	205 V.	13 V.
6F6G	PW'R AMP.		195 V.	205 V.	13 V.
5Y3G	RECT.		AC	——	275 V. FROM FIL.

NOTE: ALL VOLTAGES MEASURED WITH A 20,000 OHM PER VOLT VOLTMETER.
MAXIMUM POWER OUTPUT = 7.5 WATTS.

MODEL 81F21 SCHEMATIC DIAGRAM PARTS LIST

DIAG. NO.	PART NO.	DESCRIPTION
1	1X26291	LOOP ASSEMBLY
2	21A27298	S.W. ANTENNA COIL
3	21A27297	B.C. & S.W. OSCILLATOR COIL
4	1X28096	I.F. COIL & SHIELD ASSEMBLY
5	1X28094	DIODE COIL & SHIELD ASSEMBLY
6	50828312 OR 50828404	SPEAKER (10" ELECTRO) SPEAKER (10" ELECTRO)
7	25A26035	POWER TRANSFORMER
8	25A27661	OUTPUT TRANSFORMER
9	40A28018	BAND SWITCH (3 POS.)
10	19A27606	VARIABLE CONDENSER (2 GANG)
11	20A17935	B.C. PADDER (RANGE 300 MMF TO 800 MMF)
12	20A27273	TRIMMER & "Z" BRACKET (62 MMF NOM.)
13	20A27326	TRIMMER & "Z" BRACKET (118 MMF NOM.)
14	20A16740	TRIMMER & "U" BRACKET (7 MMF NOM.)
15	23A27718	ELECT. COND. (30 MFD/350W.V.)-(30 MFD/300W.V.) (20 MFD/25W.V. NOT USED)
16	8A27296	POLYSTYRENE TUB. COND. (.007 MFD-5%-100W.V.)
17	859807	TUBULAR CONDENSER (.1 MFD-400W.V.)
18	859816	TUBULAR CONDENSER (.05 MFD-400W.V.)
19	859805	TUBULAR CONDENSER (.05 MFD-100W.V.)
20	859805	TUBULAR CONDENSER (.05 MFD-100W.V.)
21	859805	TUBULAR CONDENSER (.05 MFD-100W.V.)
22	859804	TUBULAR CONDENSER (.03 MFD-400W.V.)
23	859804	TUBULAR CONDENSER (.03 MFD-400W.V.)
24	859825	TUBULAR CONDENSER (.01 MFD-200W.V.)
25	859801	TUBULAR CONDENSER (.01 MFD-400W.V.)
26	859808	TUBULAR CONDENSER (.005 MFD-1000W.V.)
27	859808	TUBULAR CONDENSER (.005 MFD-1000W.V.)
28	859813	TUBULAR CONDENSER (.005 MFD-600W.V.)
29	21A28020	SILVER MICA COND. (535 MMF-3%)
30	21A6517	MICA COND. (250 MMF-20%-400W.V.) BRN "0"
31	21A6511	MICA COND. (100 MMF-20%-400W.V.) BRN "0"
32	21A6511	MICA COND. (100 MMF-20%-400W.V.) BRN "0"
33	21A6503	MICA COND. (50 MMF-20%-400W.V.) BRN "0"
34	686368	CARBON RESISTOR (4.7 MEG-1/5WATT-20%) INS.
35	686292	CARBON RESISTOR (2.2 MEG-1/5WATT-20%) INS.
36	686292	CARBON RESISTOR (2.2 MEG-1/5WATT-20%) INS.
37	686292	CARBON RESISTOR (2.2 MEG-1/5WATT-20%) INS.
38	686199	CARBON RESISTOR (1 MEG-1/5WATT-20%) INS.

DIAG. NO.	PART NO.	DESCRIPTION
39	686338	CARBON RESISTOR (470,000Ω-1/5WATT-10%) INS.
40	686339	CARBON RESISTOR (470,000Ω-1/5WATT-10%) INS.
41	686349	CARBON RESISTOR (220,000Ω-1/5WATT-10%) INS.
42	686382	CARBON RESISTOR (150,000Ω-1/5WATT-10%) INS.
43	686382	CARBON RESISTOR (150,000Ω-1/5WATT-10%) INS.
44	686369	CARBON RESISTOR (100,000Ω-1/5WATT-10%) INS.
45	686056	CARBON RESISTOR (47,000Ω-1/2WATT-20%) INS.
46	686321	CARBON RESISTOR (47,000Ω-1/5WATT-20%) INS.
47	686329	CARBON RESISTOR (47,000Ω-1/5WATT-10%) INS.
48	686309	CARBON RESISTOR (33,000Ω-1/5WATT-20%) INS.
49	686303	CARBON RESISTOR (4,700Ω-1/5WATT-20%) INS.
50	686472	CARBON RESISTOR (1000Ω-1/5WATT-20%) INS.
51	686026	CARBON RESISTOR (6000Ω-1/5WATT-20%) N.I.
52	686025	CARBON RESISTOR (4,000Ω-1/5WATT-10%) N.I.
53	686060	CARBON RESISTOR (220Ω-1/2WATT-10%) N.I.
54	1A22065	VOLUME CONTROL & SWITCH (1 MEG)
55	1A28062	TONE CONTROL & SLIDER SWITCH
56	30K21859	LINE CORD & PLUG (9 FT.)
57	65X10867	BULB (6.3V.-.25A TUB. BAY.) CLEAR #44
58	65X10867	BULB (6.3V.-.25A TUB. BAY.) CLEAR #44
59	1X27690	MODEL B-11-RC RECORD CHANGER
60	59R27687	PHONO MOTOR & MTG. PLATE (117 VOLT- 60 CYCLES)
61	59K27840	PHONO PICK-UP ARM (COMPLETE)
62	40A27846	SLIDER SWITCH & SHIELD (PHONO MOTOR ON-OFF)
63	1X27721	MODEL PT-1 PERMEABILITY TUNER (COMPLETE)
64	40R27243	S.P.S.T. ROTARY SWITCH & BRACKETS
65	21A27311	PERMEABILITY OSC. COIL (BROWN) #1
66	21A27312	PERMEABILITY OSC. COIL (RED) #2
67	21A27313	PERMEABILITY OSC. COIL (ORANGE) #3
68	21A27314	PERMEABILITY OSC. COIL (YELLOW) #4
69	21A27315	PERMEABILITY OSC. COIL (GRN) #5
70	67A27203	IRON CORE AND ADJUSTING SCREW
71	57A27203	IRON CORE AND ADJUSTING SCREW
72	67A27283	IRON CORE AND ADJUSTING SCREW
73	67A27263	IRON CORE AND ADJUSTING SCREW
74	67A27283	IRON CORE AND ADJUSTING SCREW
75	40A27381	P.P. ANTENNA TRIMMER (143 TO 521 MMF) #1
76	20K27382	P.P. ANTENNA TRIMMER (100 TO 412 MMF) #2
77	20K27383	P.P. ANTENNA TRIMMER (65 TO 324 MMF) #3
78	20K27384	P.P. ANTENNA TRIMMER (41 TO 216 MMF) #4
79	20K27385	P.P. ANTENNA TRIMMER (6 TO 155 MMF) #5

MODEL 81K31

GALVIN MFG. CO.

ALIGNMENT CHART

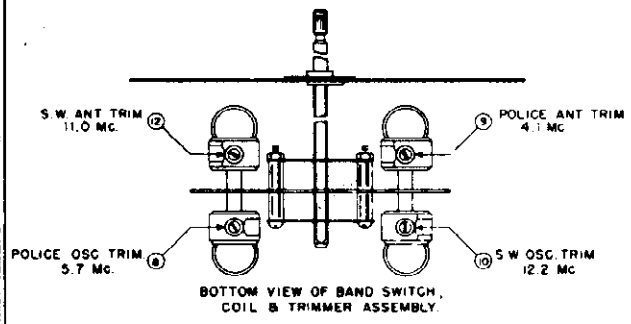
Operations In Order	Gang Condenser Set At	Dummy Antenna	Band Switch Set At	Generator Connected To	Adjust Trimmers No	Generator Set At
1	1720 K.C.	.1 Mfd.	B.C.	Osc.Mod.Grid	1-2-3-4	455 K.C.
2	1720 K.C.	200 Mmf	B.C.	Ext.Ant. Connection	5	1720 K.C.
3	1400 K.C.	200 Mmf	B.C.	Ext.Ant. Connection	6	1400 K.C.
4	600 K.C.	200 Mmf	B.C.	Ext.Ant. Connection	7	600 K.C.
5	5.7 M.C.	400 Ohms	Pol.	Ext.Ant. Connection	8	5.7 M.C.
6	4.1 M.C.	400 Ohms	Pol.	Ext.Ant. Connection	9	4.1 M.C.
7	12.2 M.C.	400 Ohms	S.W.	Ext.Ant. Connection	10	12.2 M.C.
8	11.0 M.C.	400 Ohms	S.W.	Ext.Ant. Connection	11	11.0 M.C.
9	11.0 M.C.	400 Ohms	S.W.	Ext.Ant. Connection	12	11 M.C.

SENSITIVITY AND STAGE GAIN MEASUREMENTS

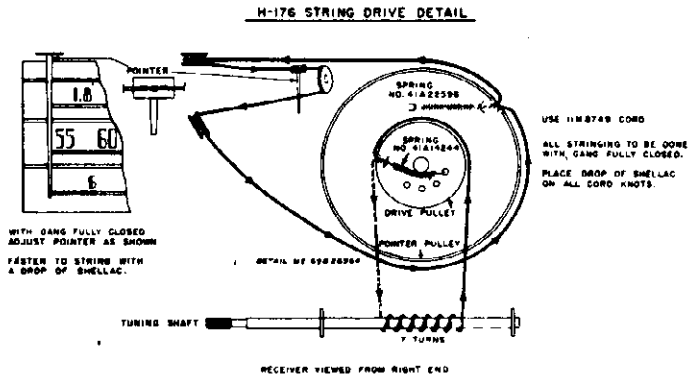
Average Microvolt Input *	Generator Set At	Generator Feeder Connected to	Dummy Antenna Capacity	Leak Resistance	Output Meter Reading **
4000	455 K.C.	I.F. Grid	.1 Mfd.	.5 Meg.	.38
70	455 K.C.	Osc.Mod.Grid	.1 Mfd.	.5 Meg.	.38
75	600 K.C.	Osc.Mod.Grid	.1 Mfd.	.5 Meg.	.38
4	600 K.C.	R.F. Grid	.1 Mfd.	.5 Meg.	.38
3	600 K.C.	Ant.Terminal	200 Mmf.	None	.38

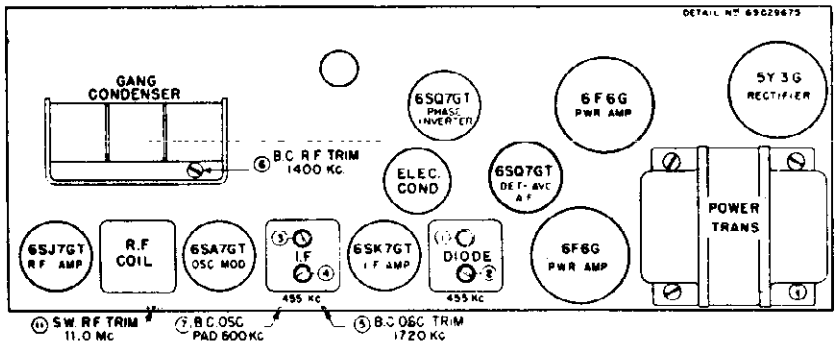
Volume Control Set at Maximum
* .05 Watts = .38 Volts
Band Switch Set at B.C.

Tone Control Set At High
** Output meter connected across voice coil.



BOTTOM VIEW OF BAND SWITCH, COIL & TRIMMER ASSEMBLY.



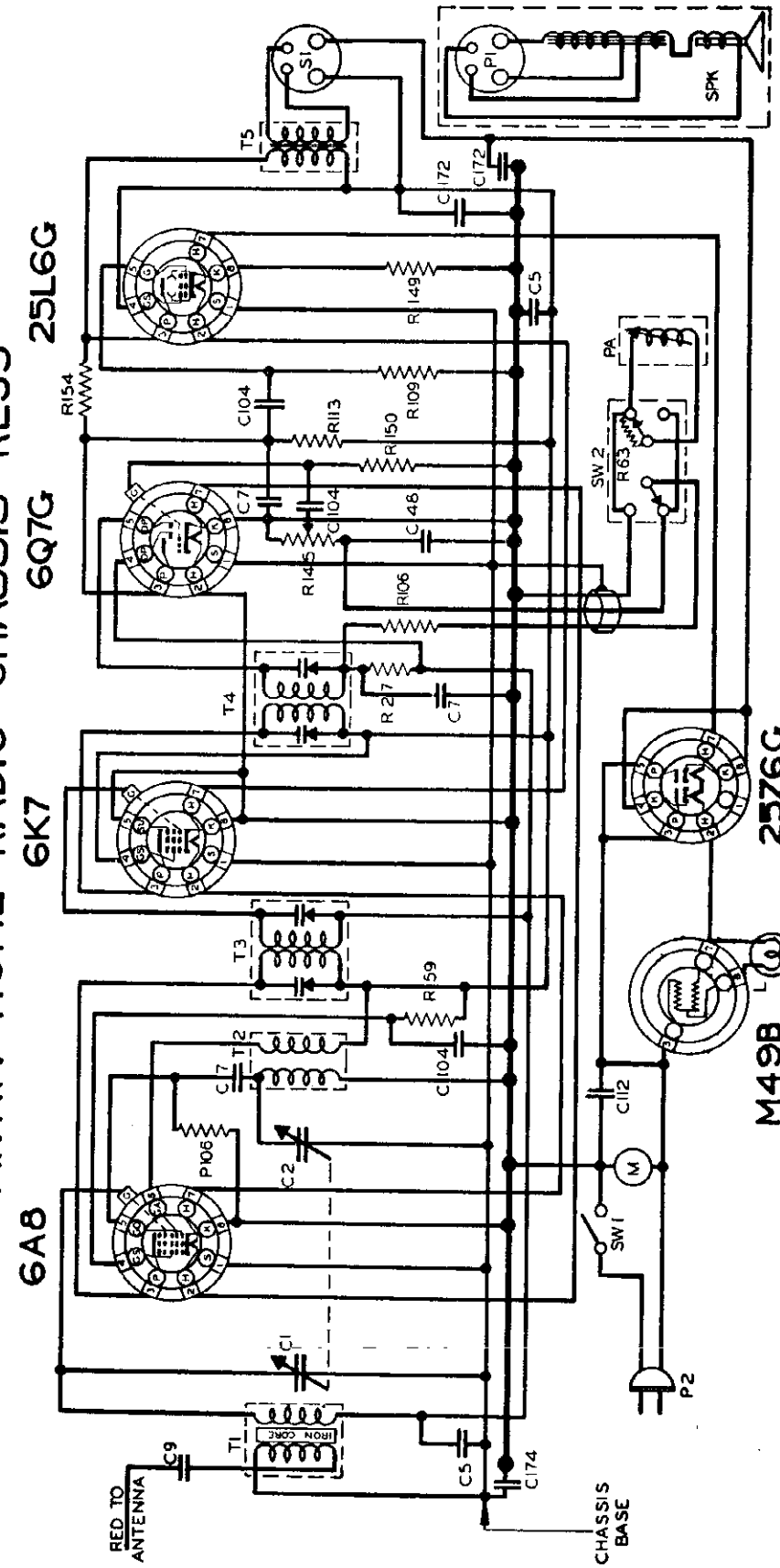


TUBE & TRIMMER LAYOUT DETAIL
MODEL NO. 81K31 CHASSIS NO. H-176

NOBLITT-SPARKS INDUSTRIES, INC.

MODEL 88
Chassis RE35

SCHEMATIC CIRCUIT DIAGRAM
ARVIN HOME RADIO CHASSIS RE35



RESISTORS

R	OHM	W	PART NO
27	2M	1/4	17-4186
59	1.5K	1/4	17-4191
83	2.3K	1/2	17-14094
106	50K	1/4	17-14171
109	500K	1/4	17-14174
113	250K	1/4	17-14178
145	300K	V.C.	17-13984
149	150	1/2	17-14241
150	5M	1/4	17-14242
154	1.5M	1/4	17-14244

CONDENSERS

C	CAPACITY	VOLT	PART NO
1	TWO-GANG		17-15998
2	VARIABLE	250	17-15999
5	.05	600	17-14095
7	.0001	600	17-14096
9	.001	600	17-14097
46	.00025	600	17-14098
104	.01	200	17-14288
112	.05	400	17-14135
172A	20 MFD	150	17-14238
172B	20 MFD	150	17-14239
174	.2	400	17-14248

TRANSFORMERS

T	TYPE	PART NO
1	ANTENNA COIL	00-16083
2	OSCILLATOR COIL	00-15979
3	FIRST I F COIL	00-16080
4	SECOND I F COIL	00-16081
5	OUTPUT TRANS	00-16078

MISCELLANEOUS UNITS

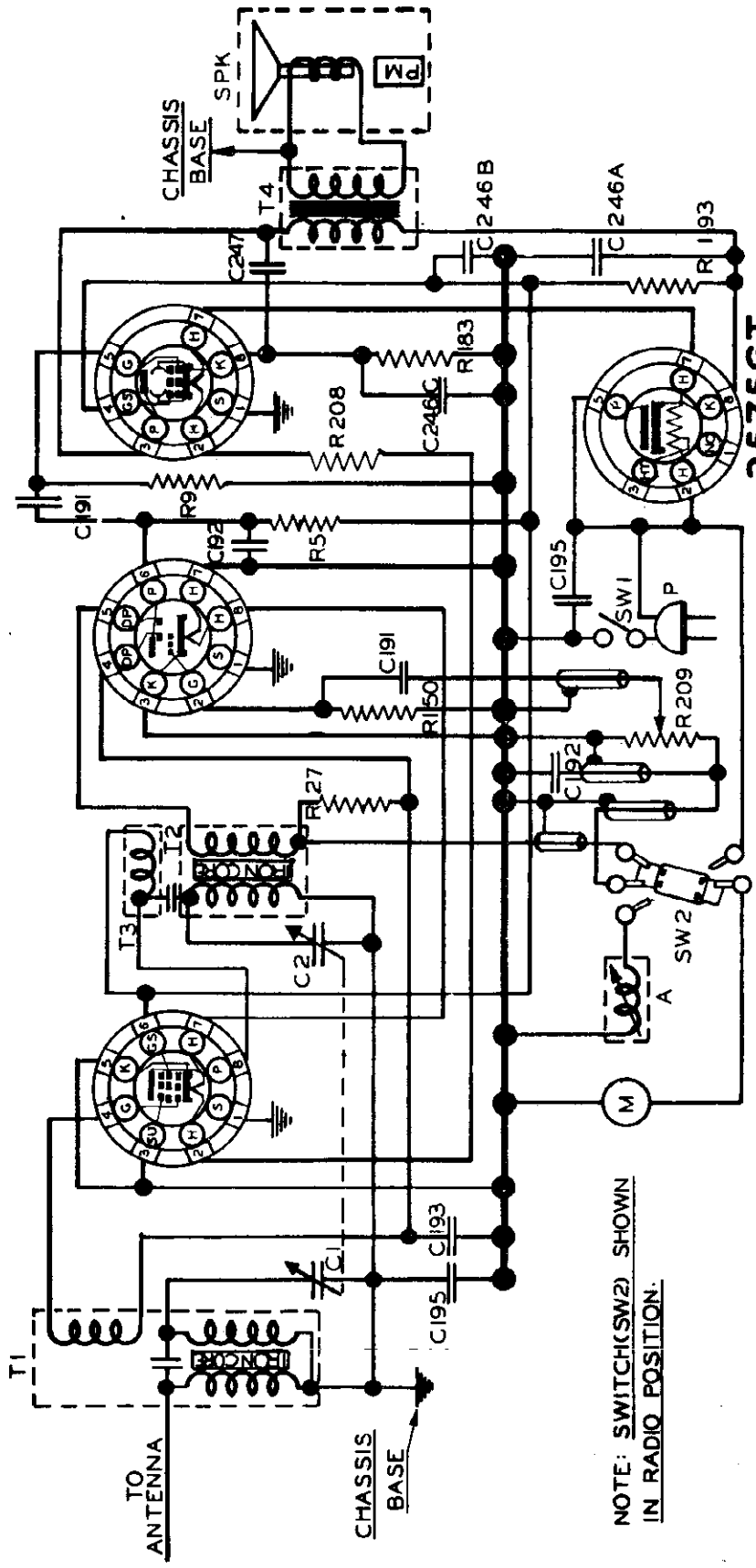
SYMBOL	DESCRIPTION	PART NO
L	DIAL LIGHT BULB - MAZDA 51	17-13904
M	PHONOGRAPH MOTOR & TURNTABLE	17-16022
PA	PHONOGRAPH PICK-UP ARM	17-14021
P1	SPEAKER PLUG	—
P2	LINE CORD & PLUG ASSEMBLY	17-15791E
S1	SPEAKER SOCKET	17-13249
SPK	SPEAKER ASSEMBLY	17-15988
SW1	LINE SWITCH	17-15938A
SW2	PHONOGRAPH-RADIO SWITCH	17-16065

I.F. PEAK 455 K.C.
BROADCAST BAND: BALANCE 1400 K.C.
CHECK AT 600 K.C.
NOBLITT-SPARKS INDUSTRIES, INC.,
COLUMBUS, INDIANA.

MODELS 302, 302A
Chassis RE64

NOBLITT-SPARKS INDUSTRIES, INC.

ARVIN HOME RADIO CHASSIS RE-64
12SK7 50L6GT 12SQ7 3525GT



NOTE: SWITCH(SW2) SHOWN IN RADIO POSITION.

RESISTORS			
R	OHM	W	PART NO.
5	500K	1/4	17 2070
9	1 M	1/4	17 2080
27	2 M	1/4	17 4788
150	5 M	1/4	17 14242
183	150	1/4	17 14316
193	2K	1/4	17 14337
208	75	1 3/4	17 14362
209	250 K V C		17 16630

CONDENSERS				
C	CAPACITY	VOLT	PART NO.	
1	TWO GANG		17 16619	
2	VARIABLE			
191	.01	400	17 14272	
192	.00025	600	17 14273	
193	.05	200	17 14274	
195	.05	400	17 14276	
246A	40 MFD	150		
246B	20 MFD	150	17 16637	
246C	20 MFD	25		
247	.04	400	17 14363	

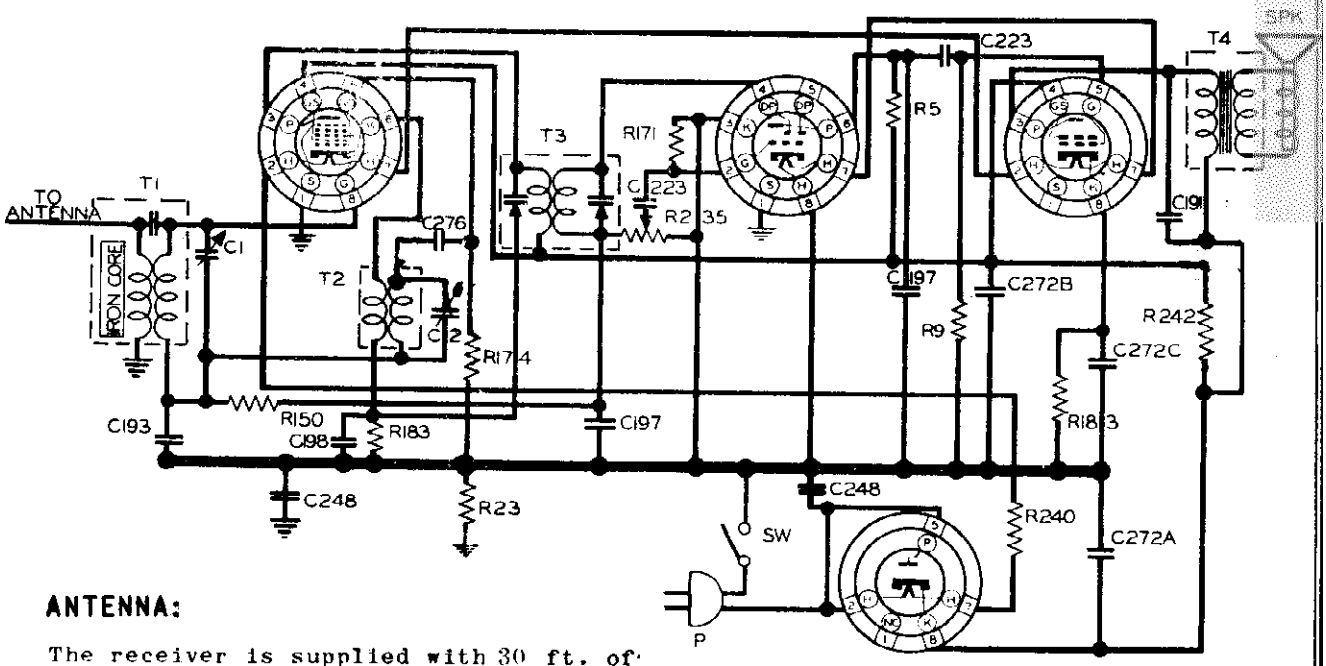
MISCELLANEOUS UNITS		
SYMBOL	DESCRIPTION	PART NO.
A	PHONO PICK-UP ARM	17 16597
M	PHONO TURNTABLE MOTOR	17 16611
P	LINE CORD & PLUG ASSEMBLY	17 16632
SPK	SPEAKER 4" P.M.	17 16621
SW1	LINE SWITCH	17 16650
SW2	CHANGE OVER SWITCH	17 16651
T1	ANTENNA COIL	00 16634
T2	R F COIL	00 16635
T3	PLATE CHOKE	00 16507
T4	OUTPUT TRANSFORMER	00 16638

FREQUENCY RANGE 1700 K.C. TO 540 K.C.
NOBLITT SPARKS INDUSTRIES, INC.,
COLUMBUS, INDIANA.

NOBLITT-SPARKS INDUSTRIES, INC.

MODELS 422, 422A
Chassis RE-61

12SA7 12SQ7 50L6GT



ANTENNA:

The receiver is supplied with 30 ft. of aerial wire fixed to the chassis. This wire is in the form of a tightly wrapped bundle and should be stretched out full length under a rug or around the edge of the room, for best operation of the receiver. When practical, although not necessary, even better results will be obtained if a small outside aerial is used.

In rural areas, or in areas where signal strengths are low, use of a small outside antenna will result in better reception.

GENERAL: 35Z4GT OR 35Z5GT

This carton contains one superheterodyne radio receiver.

It is designed for operation on 115 volts AC or DC. Power consumption is 30 watts.

This receiver is complete and ready to operate when installed as described in the following paragraphs.

RESISTORS				CONDENSERS				MISCELLANEOUS UNITS		
R	OHM	W	PART NO.	C	CAPACITY	VOLT	PART NO.	SYMBOL	DESCRIPTION	PART NO.
174	20 K.	1/4	17-14291					T1	ANTENNA COIL	00-17130
9	1 M.	1/4	17-2080	193	.05	200	17-14274	T2	OSCILLATOR COIL	00-17223
171	15 M.	1/4	17-14288	248	.05	400	17-14366	T3	I.F. COIL	00-17210
5	500 K	1/4	17-2070	198	.005	400	17-14279	T4	OUTPUT TRANSFORMER	00-17131
183	150	1/4	17-14316	223	.002	400	17-14318	SPK	SPEAKER	17-17209
235	2 M.	V.C.	17-17117	191	.01	400	17-14272			
23	250 K	1/4	17-3011	1	TWO GANG		17-17115			
240	47	1	17-14397	2	VARIABLE					
150	5 M.	1/4	17-14242	272A	40 MFD.	150				
242	2000	1	17-14399	272B	20 MFD.	150	17-14398			
				272C	20 MFD.	25				
				197	.0001	600	17-14278			
				276	.00005	600	17-14404			

FREQUENCY RANGE
1750 TO 540 K.C.
NOBLITT-SPARKS INDUSTRIES, INC.
COLUMBUS, INDIANA

RESISTORS

Schematic Location	Part No.	Description	Price
R-235	17-17117	Volume Control 2 meg.	$1.00
R-183	17-14316	150 ohm 1/4 watt	.20
R-174	17-14291	20,000 ohm 1/4 watt	.20
R-5	17-2070	500,000 ohm 1/4 watt	.20
R-9	17-2080	1 megohm 1/4 watt	.20
R-171	17-14288	15 megohm 1/4 watt	.20
R-240	17-14397	47 ohm 1 watt	.40
R-23	17-3011	250,000 ohm 1/4 watt	.20
R-150	17-14242	5 megohm 1/4 watt	.20
R-242	17-14399	2000 ohm 1 watt	.30

CONDENSERS

Schematic Location	Part No.	Description	Price
C-1 & 2	17-17115	Variable Condenser	1.75
C-272	17-14398	Electrolytic Condenser 40-20 uf. 150 V 20 uf. 25 V	.75
C-223	17-14318	.002 uf. 400 V	.30
C-248	17-14366	.05 uf. 400 V	.30
C-193	17-14274	.05 uf. 200 V	.30
C-198	17-14279	.005 uf. 400 V	.30
C-197	17-14278	.0001 uf. 600 V	.30
C-191	17-14272	.01 uf. 400 V	.30

COILS & TRANSFORMERS

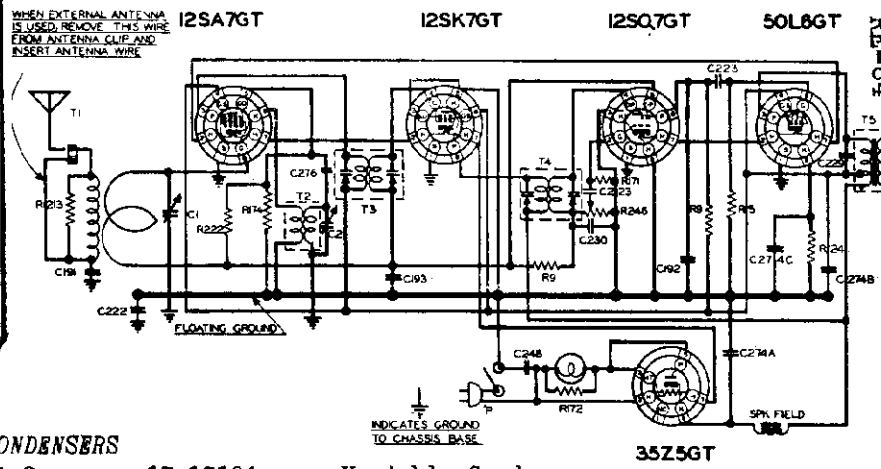
Schematic Location	Part No.	Description	Price
T-1	00-17130	Antenna Coil	.50
T-2	00-17223	Oscillator Coil	.40
T-3	00-17210	I.F.Coil	.75
T-4	00-17131	Output Transformer	1.25

MISCELLANEOUS

Part No.	Description	Price
17-17118	Line Cord and Plug Assembly	.40
17-17209	Speaker 4"	2.50
31-16511	Cabinet (mahogany)	1.00
31-16511-A	Cabinet (ivory)	1.00
29-16545	Knob (dial)	.20
29-16201	Knob (volume)	.15
29-17116	Dial Emblem	.15
31-16361	Cabinet rear cover (mahogany)	.25
31-16361-A	Cabinet rear cover (ivory)	.25

NOBLITT-SPARKS INDUSTRIES, INC.

ARVIN HOME RADIO — CHASSIS RE-92



CONDENSERS

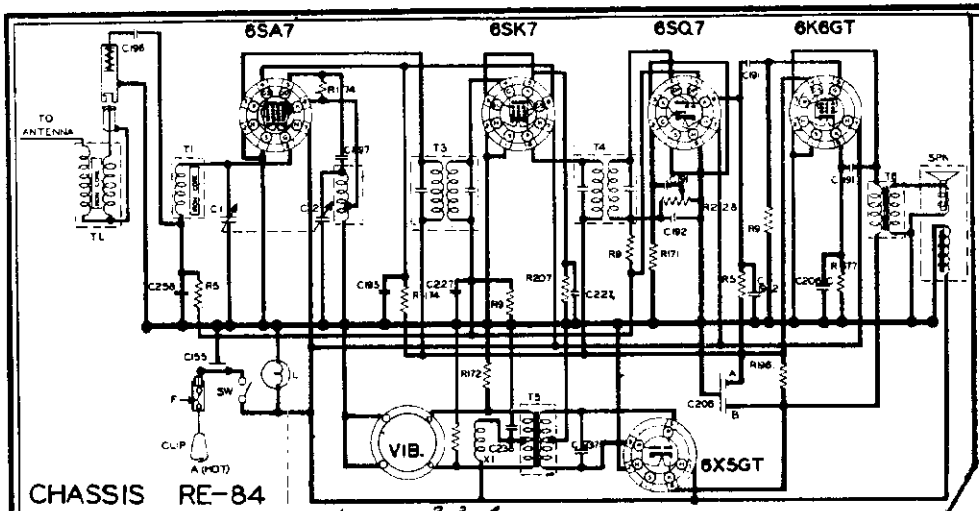
C-1 & 2	17-17194	Variable Condenser
C-274-A,B,C	17-17140	Electrolytic Condenser 20-10 mfd. 150V 20 mfd. 25V
C-223	17-14318	Condenser .002 mfd. 400 V
C-229	17-14327	Condenser .02 mfd. 400 V
C-230	17-14328	Condenser .0005 mfd. 400 V
C-222	17-14317	Condenser .2 mfd. 400 V
C-193	17-14274	Condenser .05 mfd. 200 V
C-248	17-14366	Condenser .05 mfd. 400 V
C-191	17-14272	Condenser .01 mfd. 400 V

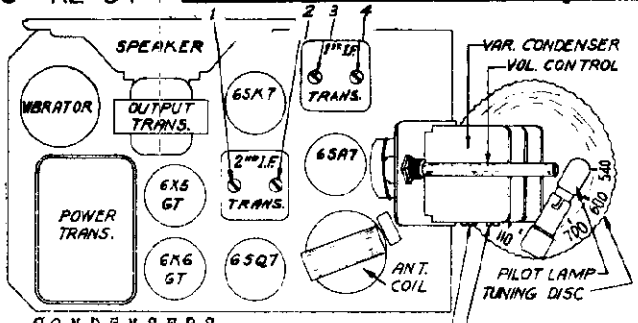
RESISTORS

R-246	17-17193	Volume control and switch 1 megohm
R-9	17-2080	Resistor 1 megohm 1/4 watt
R-241	17 14395	Resistor 175 ohm 1/4 watt
R-5	17-2070	Resistor 500,000 ohm 1/4 watt
R-171	17-14288	Resistor 15 megohm 1/4 watt
R-174	17-14291	Resistor 20,000 ohm 1/4 watt
R-172	17-14289	Resistor 100 ohm 1/4 watt
R-222	17-14377	Resistor 10 megohm 1/4 watt

The power consumption of this radio is 30 watts.

CHASSIS RE-84





CONDENSERS

Ref.No	Part No.	Description	Prices
C1-2	17-16421	Tuning Condenser	2.50
C155	17-14217	.0002 mfd. 200 V	.25
C237	17-14345	.005 mfd. 1200 V	.50
C206	17-14297	10-10 mfd. 300 V, 20 mfd. 25 V	1.25
C191	17-14272	.01 mfd. 400 V	.35
C192	17-14273	.00025 mfd. 600V	.25
C195	17-14276	.05 mfd. 400 V	.35
C196	17-14277	.1 mfd. 200 V	.35
C197	17-14278	.0001 mfd. 600 V	.25
C238	17-14346	.5 mfd. 150 V	.40
C227	17-14323	.05 mfd. 200 V	.30
C258	17-14381	.004 mfd. 600 V	.30

I.F. PEAK 455 K.C.
FREQUENCY RANGE 1575 TO 540 K.C.
NOBLITT-SPARKS INDUSTRIES, INC.
COLUMBUS, INDIANA

RESISTORS

Ref. No.	Part No.	Description	Price
R5	17-2070	500,000 ohm ½W	.20
R9	17-2080	1,000,000 ohm ½W	.20
R171	17-14288	15,000,000 ohm ½W	.20
R172	17-14289	100 ohm ½W	.20
R174	17-14291	20,000 ohm ½W	.20
R177	17-14296	650 ohm ½W	.20
R228	17-17006	1,000,000 ohm Vol.Con.	1.00
R196	17-14340	500 ohm 1W	.30
R207	17-14361	300 ohm ½W	.20

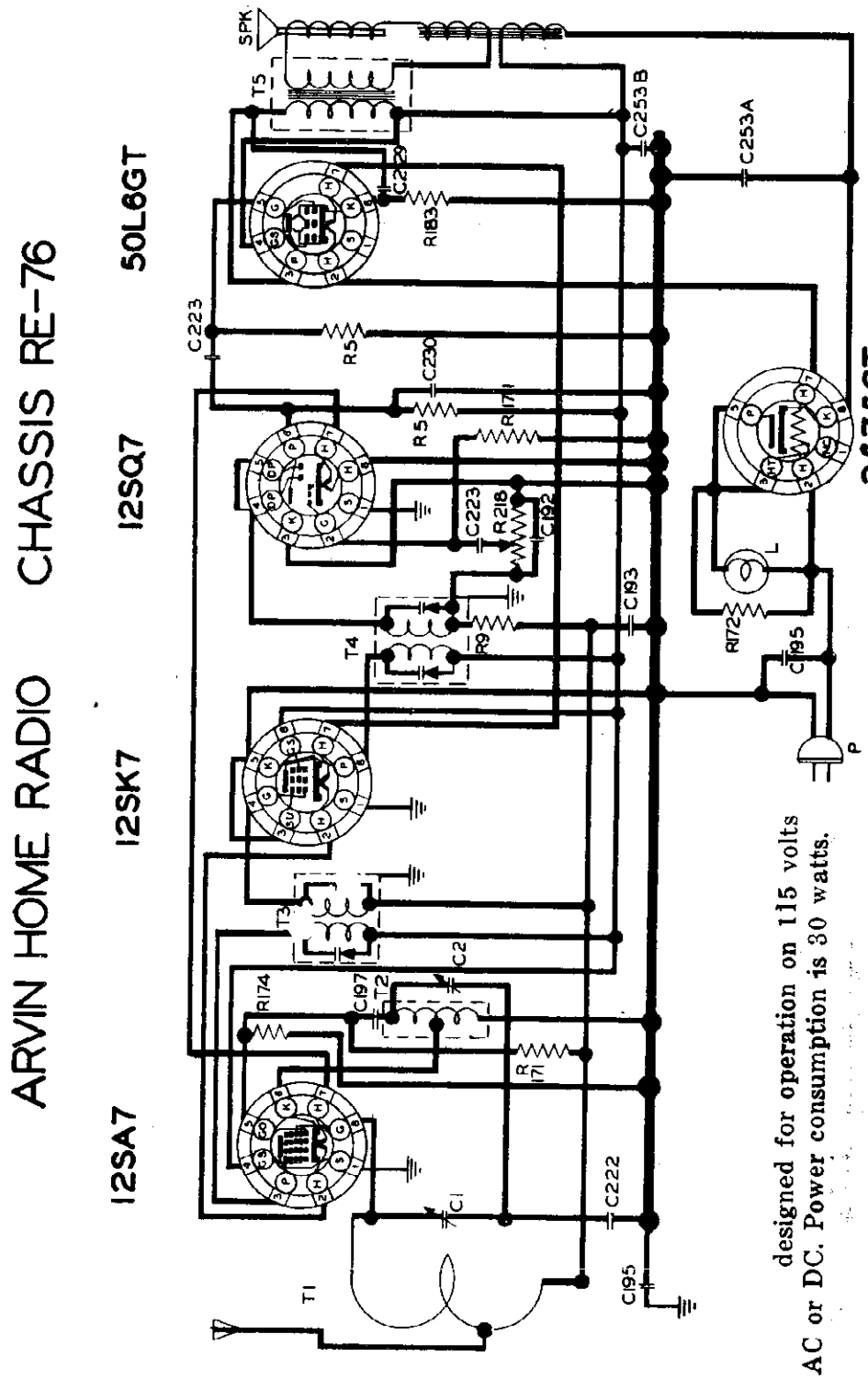
Balancing Instructions

All sensitivities given for 1/2 watt output = 1.4 across Voice Coil

Operation No.	Connect Bal. Oscillator To	Bal. Oscillator Frequency	Adjust Padder No.	Dial Setting	Sensitivity
1	6SA7 Grid	455	1,2,3 & 4	550 KC	50uv
2	Antenna Coupler Through 20 uuf	1400	5	1400	
3	"	1400	6	1400	10uv

NOBLITT-SPARKS INDUSTRIES, INC.

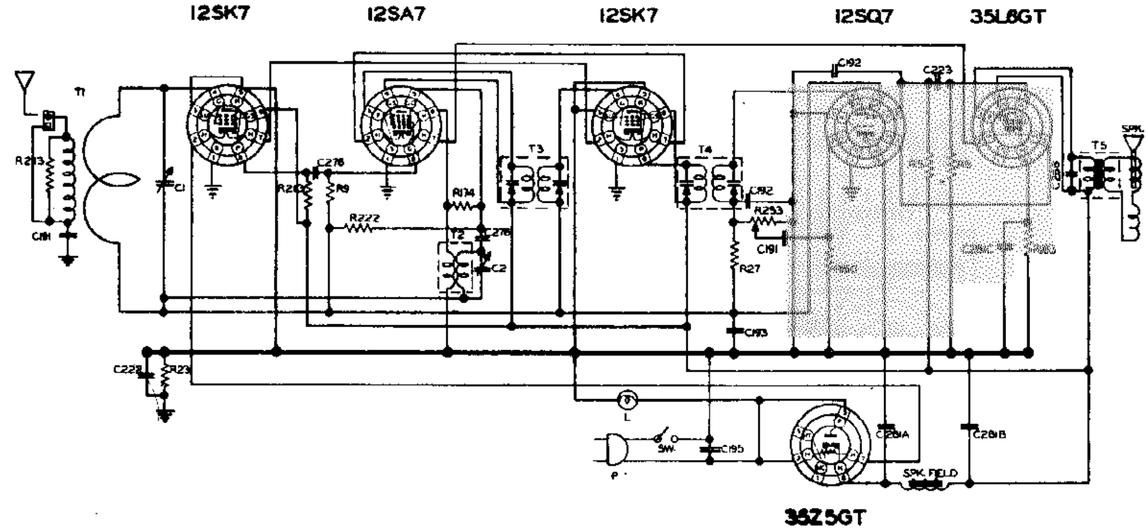
MODELS 522, 522A
Chassis RE-76



MODELS 524, 524A
Chassis RE-99
MODELS 616, 616A
Chassis RE-98

NOBLITT-SPARKS INDUSTRIES, INC.

ARVIN HOME RADIO – CHASSIS RE-98



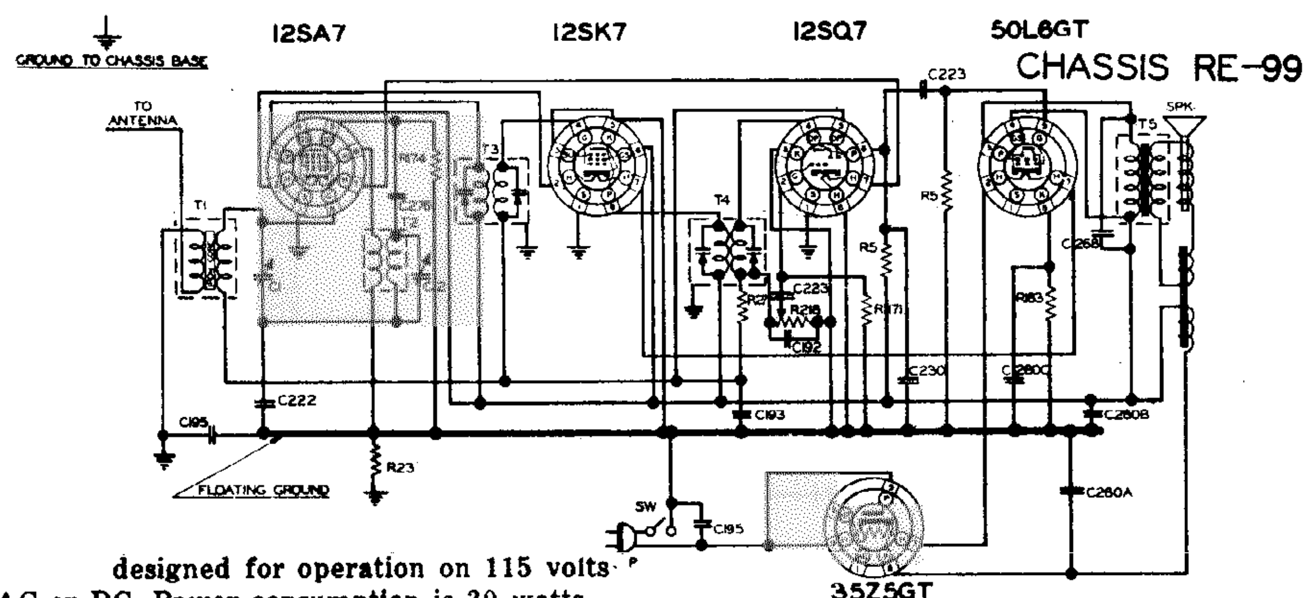
RESISTORS				CONDENSERS				COILS & TRANSFORMERS			
R	OHM	W	PART NO.	C	CAPACITY	VOLT	PART NO.	T	DESCRIPTION	PART NO.	
9	1MEG.	1/4	17-2080	222	2	400	17-14317	1	ANTENNA LOOP ASSY.	00-17298	
222	10 MEG	1/4	17-4377	192	.00025	600	17-14273	2	OSCILLATOR COIL	00-17299	
174	20 K	1/4	17-4291	191	.01	400	17-14272	3	FIRST I.F. COIL	00-17300	
27	2 MEG	1/4	17-4788	193	.05	200	17-14274	4	SECOND I.F. COIL	00 17301	
150	5 MEG.	1/4	17-14242	223	.002	400	17-14318	5	OUTPUT TRANSF.	00-17302	
5	300 K	1/4	17-2070	268	.03	400	17-14392				
183	150	1/4	17-14316	195	.05	400	17-14276				
213	10 K	1/4	17-14389	276	.00005	600	17-14404				
23	250 K.	1/4	17-3011	1	TWO GANG		17-17248				
253	1 MEG.	V.C.	17-17291	2	VARIABLE						
				281A	40 MFD.	150					
				281B	20 MFD.	150	17-14417				
				281C	20 MFD.	25					

MISCELLANEOUS UNITS		
SYMBOL	DESCRIPTION	PART NO.
SPK.	SPEAKER 5 INCH E.M.	17-17251
P	LINE CORD & PLUG ASSY.	17-17303
L	DIAL LIGHT - MAZDA G-7 7 WATTS	17-16701
SW.	VOLUME CONTROL & SW.	17-17291

I.F. PEAK 455 K.C.
BALANCE 1400 K.C. – CHECK AT 600 K.C.

NOBLITT-SPARKS INDUSTRIES, INC.
COLUMBUS, INDIANA

CHASSIS RE-99



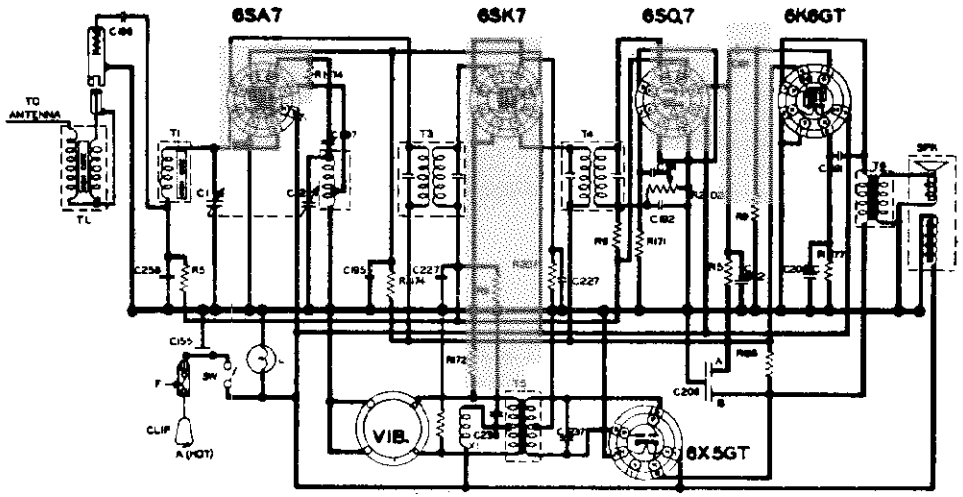
designed for operation on 115 volts AC or DC. Power consumption is 30 watts.

RESISTORS					CONDENSERS				TRANSFORMERS			
R	OHM	W	PART NO.		C	CAPACITY	VOLT	PART NO.	T	TYPE	PART NO.	
218	1M	V.C.	17-16857		[illegible]	[illegible]	[illegible]	[illegible]	1	ANTENNA COIL	00-7264	
5	500K	1/4	17-2070		[illegible]	[illegible]	[illegible]	[illegible]	2	OSCILLATOR COIL	00-7265	
183	150	1/4	17-14316		[illegible]	[illegible]	[illegible]	[illegible]	3	FIRST I.F. COIL	29-16853	
174	20K	1/4	17-14291		[illegible]	[illegible]	[illegible]	[illegible]	4	SECOND I.F. COIL	29-16854	
171	15M.	1/4	17-14286		[illegible]	[illegible]	[illegible]	[illegible]	5	OUTPUT TRANSF.	00-16889	
[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]				
[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]				
					[illegible]	.00025	600	17-14273				
					[illegible]	.002	400	17-14318				
					[illegible]	.05	200	17-14274				
					268	.03	400	17-14392				
					230	.0005	400	17-14328				
					278	.00005	600	17-14404				

MISCELLANEOUS UNITS			
SYMBOL	DESCRIPTION	PART NO.	
SW	[illegible] SWITCH	17-16857	
P	[illegible] CORD & PLUG ASSEMBLY	17-16844	
SPK.	SPEAKER ASSEMBLY	17-16843	

I.F. PEAK 455 K.C.
BALANCE 1400 K.C. – CHECK AT 600 K.C.
NOBLITT-SPARKS INDUSTRIES, INC.
COLUMBUS, INDIANA

SCHEMATIC CIRCUIT DIAGRAM
ARVIN CAR RADIO CHASSIS RE-85



DESCRIPTION:

The Arvin Model 620 is a five tube combination dial and push button single unit Car Radio Receiver. This receiver is designed to mount under the lower edge of the instrument panel on most models of cars.

The radio may be tuned either by rotating the calibrated thumb wheel on the lower front of the radio, or by pressing any one of the four push buttons which are disposed vertically along the left front of the radio.

BALANCING INSTRUCTIONS:

All sensitivities given for ½ watt output=1.4 across Voice Coil

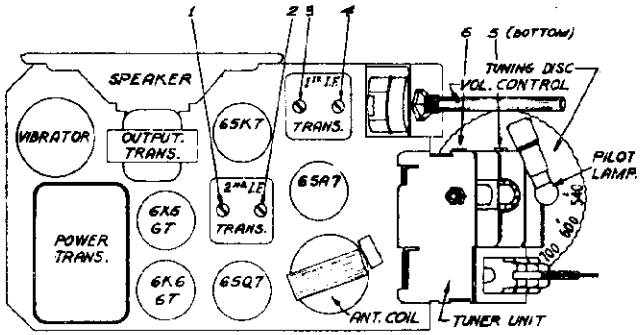
Operation No.	*Connect Bal. Oscillator To*	*Bal. Oscillator Frequency*	*Adjust Padder No.*	*Dial Setting*	*Sensitivity*
1	6SA7 Grid	455	1,2,3 & 4	550 KC	50 uv
2	Ant. Coupler Through 20 uuf	1400	5	1400	
3	"	1400	6	1400	10 uv

RESISTORS

Ref.No.	*Part No.*	*Description*	*Price*
R5	17-2070	500,000 ohm ±W	.20
R9	17-2080	1,000,000 ohm ±W	.20
R171	17-14288	15,000,000 ohm ±W	.20
R172	17-14289	100 ohm ±W	.20
R174	17-14291	20,000 ohm ±W	.20
R177	17-14296	650 ohm ±W	.20
R202	17-16488	1,000,000 Vol.Con.	1.00
R196	17-14340	500 ohm 1W	.30
R207	17-14361	300 ohm ±W	.20

CONDENSERS

Ref.No.	*Part No.*	*Description*	*Price*
C1-2	17-16471	Tuner Unit	4.00
C155	17-14217	.0002 mfd.200V	.25
C237	17-14345	.005 mfd.1200V.	.50
C206	17-14297	10-10 mfd.300V., 20 mfd. 25V	1.25
C191	17-14272	.01 mfd 400V	.35
C192	17-14273	.00025 mfd. 600V	.25
C195	17-14276	.05 mfd. 400V	.35
C196	17-14277	.1 mfd.200V	.35
C197	17-14278	.0001 mfd.600V	.25
C238	17-14346	.5 mfd. 150V	.40
C227	17-14323	.05 mfd. 200V	.30
C258	17-14381	.004 mfd. 600V	.30



PUSH BUTTON ADJUSTMENT:

Any button may be set to any station desired. First, tune in the desired station by means of the thumb wheel. Second, turn the push button counterclockwise two full turns. Then depress this button the full length of its stroke, and while depressed, tighten the button again by turning it clockwise.

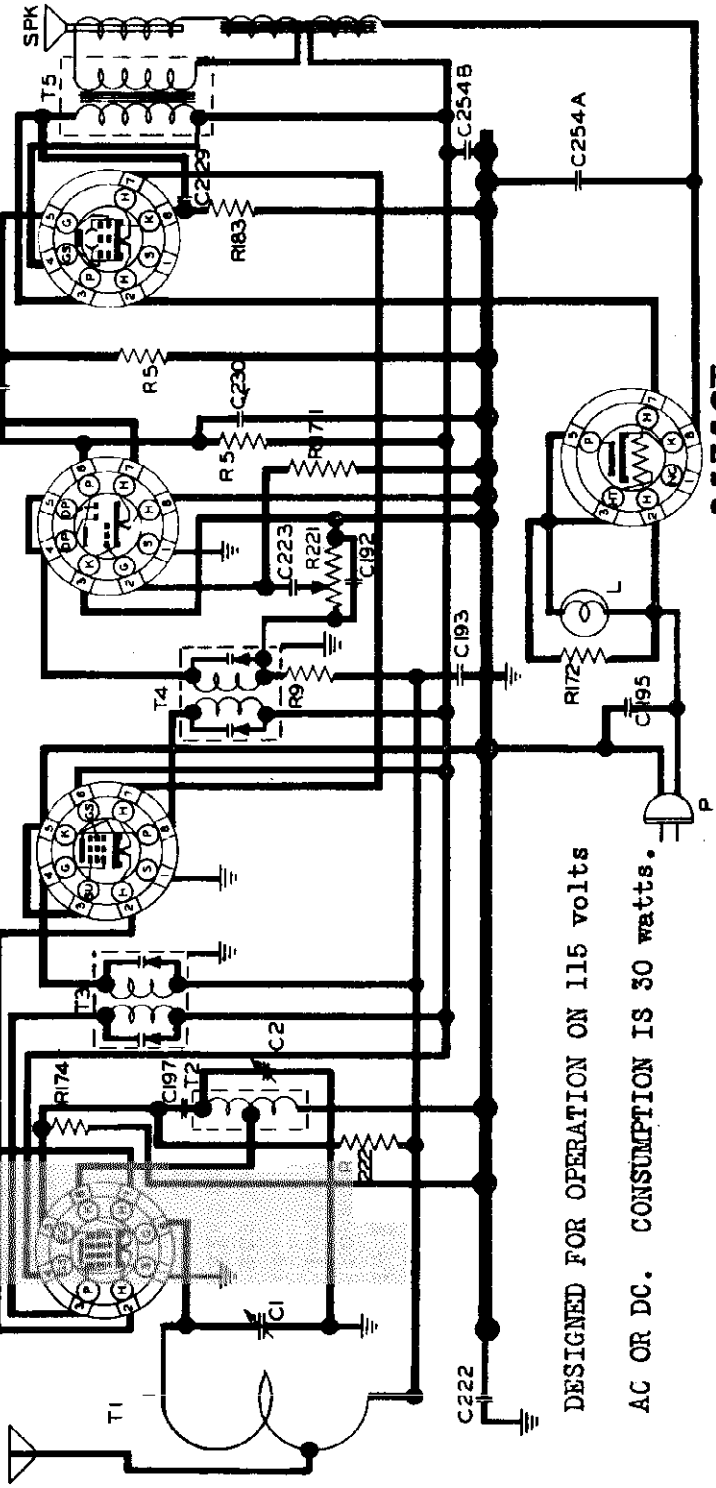
The button may now be released. To check the correct setting for this button, turn the thumb wheel to some other point and depress the push button. This will return the tuning mechanism to the station just set up. If it does not, repeat the foregoing sequence of operations more carefully. Each of the remaining buttons may be set to other stations in a like manner.

MODEL 632
Chassis RE-79

NOBLITT-SPARKS INDUSTRIES, INC.

ARVIN HOME RADIO - CHASSIS RE-79

12SA7 12SK7 12SQ7 50L6GT 3525GT



DESIGNED FOR OPERATION ON 115 volts AC OR DC. CONSUMPTION IS 30 watts.

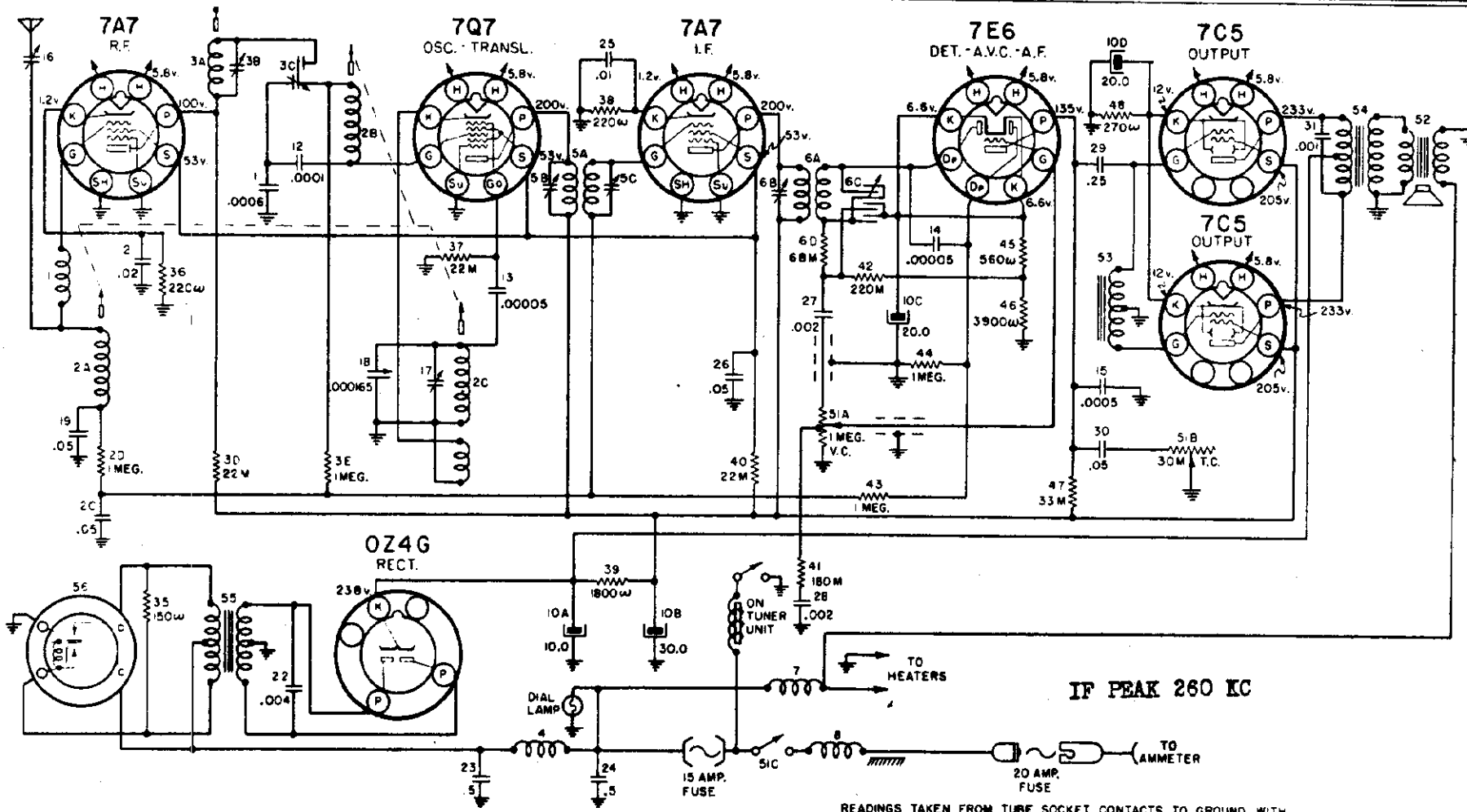
RESISTORS				
R	OHM	W	VOLT	PART NO
221	1 M	V.C.		17-16839
5	500K	1/4		17-2070
183	150	1/4		17-14316
174	20 K	1/4		17-14329
172	800	1/4		17-14269
222	10 M	1/4		17-14377
8	1 M	1/4		17-2060

CONDENSERS				
C	CAPACITY	VOLT		PART NO
1	TWO GANG			17-16841
2	VARIABLE			
234A	20 MFD.	150		17-14378
234B	10 MFD.	150		
192	.00025	600		17-14273
193	.05	400		17-14276
222	.2	400		17-14317
229	.02	400		17-14327
223	.002	400		17-14318
193	.05	200		17-14274
197	.0001	600		17-14278
230	.0005	400		17-14328

TRANSFORMERS			
T	TYPE		PART NO
1	ANTENNA LOOP		00-16900
2	OSCILLATOR COIL		00-16891
3	FIRST I.F. COIL		00-16885
4	SECOND I.F. COIL		00-16886
5	OUTPUT TRANSF.		00-16883

MISCELLANEOUS UNITS		
SYMBOL	DESCRIPTION	PART NO
L	DIAL LIGHT BULB MAZDA #47	17-16878
P	LINE CORD & PLUG ASSY	17-16874
SPK	SPEAKER ASSY.	17-16867

I.F. PEAK 455 K.C.
BALANCE 1400 K.C. - CHECK AT 600 K.C.
NOBLITT-SPARKS INDUSTRIES, INC.
COLUMBUS, INDIANA



OLDSMOBILE MODEL 982282 CIRCUIT DIAGRAM

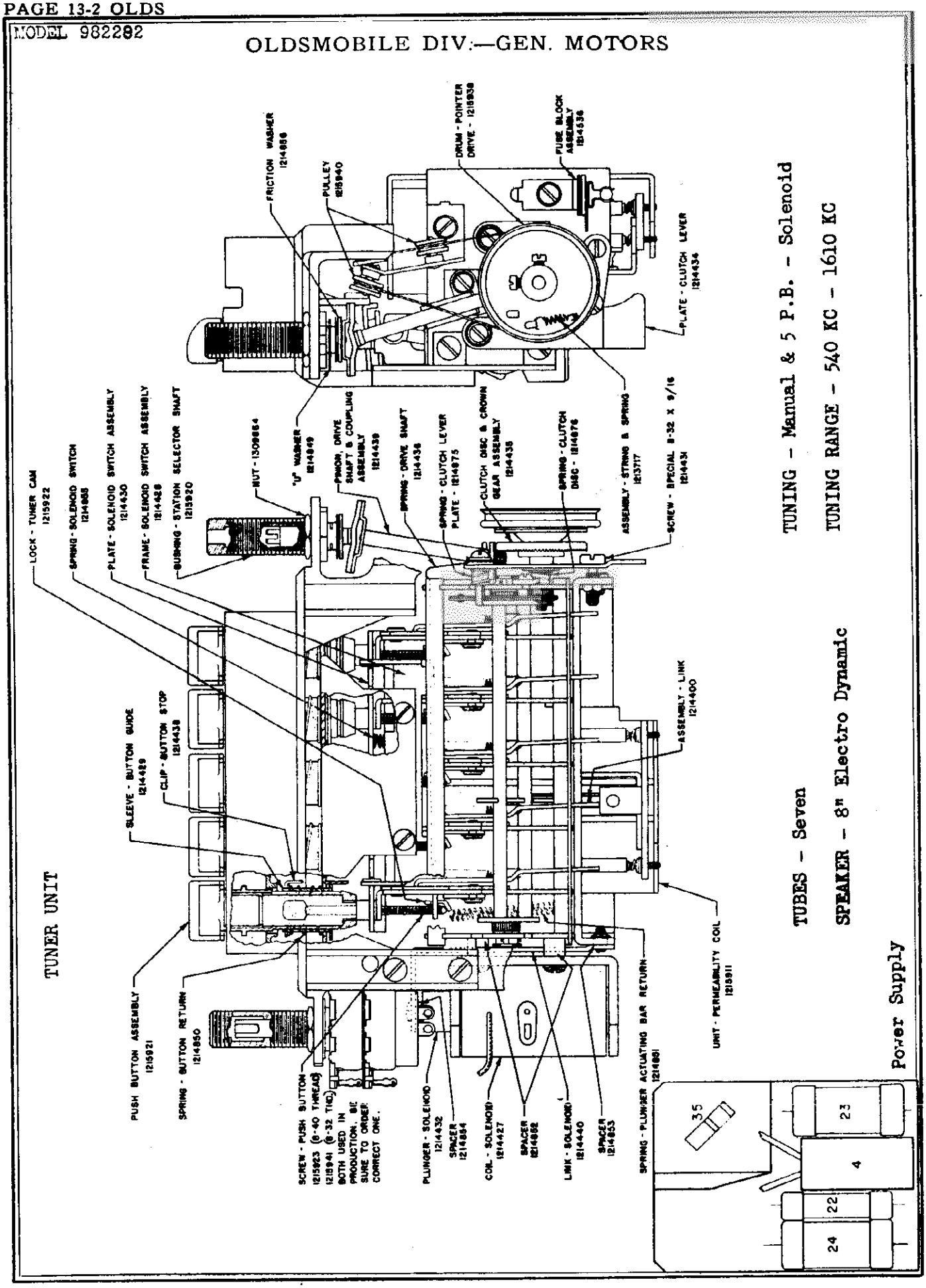
READINGS TAKEN FROM TUBE SOCKET CONTACTS TO GROUND WITH A 1000 OHMS PER VOLT D.C. VOLTMETER. "A" BATTERY — 6.0 VOLTS. CURRENT DRAIN — 8.1 AMPERES. "B" SUPPLY DRAIN — APPROX. 60 MA. ALL READINGS ±10%.

PUSH BUTTON SET UP

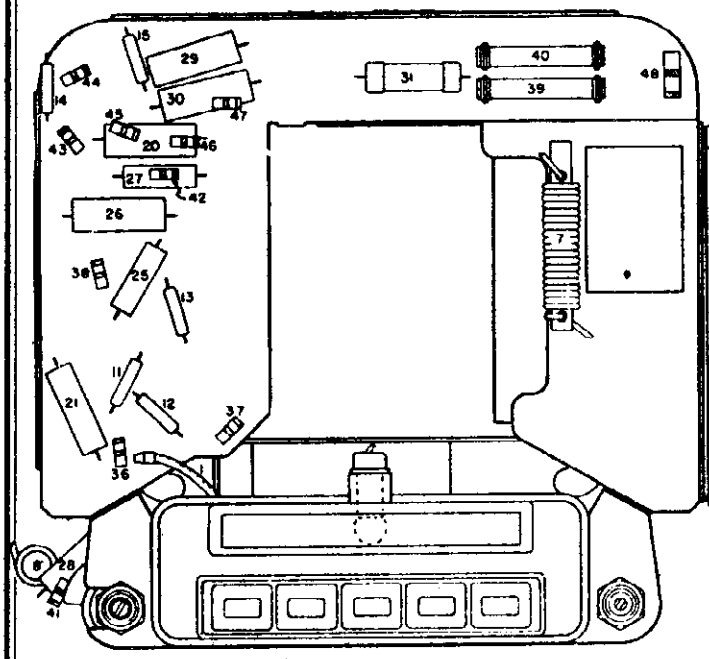
Pull button out – turn counter-clockwise until definite latching is observed – Loosen two turns – Tune in desired station manually – Depress loosened button – Pull button out again and tighten by turning clockwise – Return to normal position

MODEL 982282

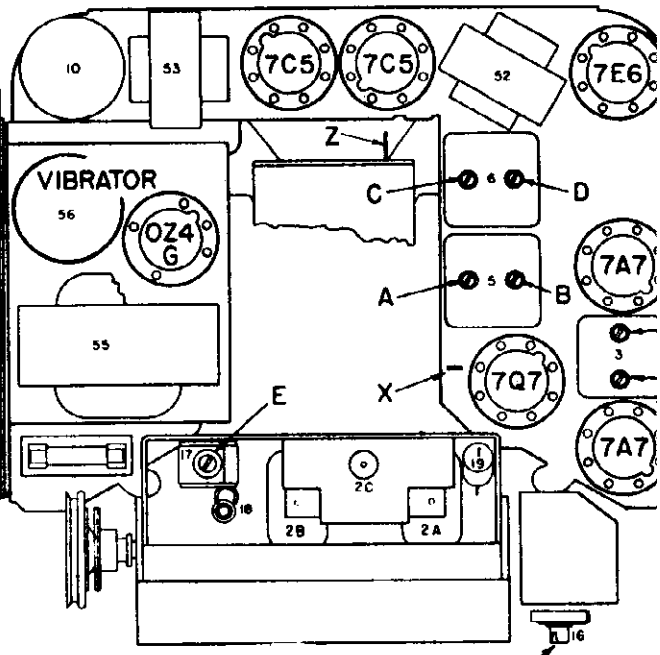
OLDSMOBILE DIV.—GEN. MOTORS



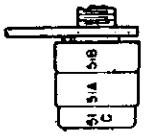
OLDSMOBILE DIV.—GEN. MOTORS



Chassis View

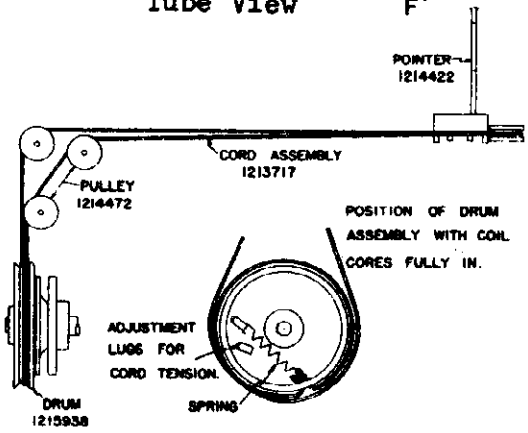


Tube View



CAR ANTENNA CAPACITY - 75 mmfd.

FOR COMPLETE ALIGNMENT PROCEDURE
SEE UNITED MOTORS SERVICE
MODEL R-698



Pointer and Tuner Drive String Hooku

ALIGNMENT PROCEDURE

Volume Control Maximum

Signal Generator Output minimum for satisfactory output indication

Series Condenser Or Dummy Antenna	Connect To	Signal Generator Frequency	Adjust Screws In Order
0.1 mfd.	Terminal X	260 KC	A-B-C-D
.000075 mfd.	Antenna Terminal	1610 KC	E-F-H
.000075 mfd.	Antenna Terminal	260 KC	G *

* Adjust for minimum output indication.

Low frequency alignment not required.

Adjust Trimmer E to match car antenna (1400 KC) when radio is installed.

MODEL 982283

OLDSMOBILE DIV.—GEN. MOTORS

ALIGNMENT PROCEDURE

Volume Control Maximum-Tone Control on treble.

Signal Generator minimum for satisfactory output indication.

Series Condenser Or Dummy Antenna	Connect To	Signal Generator Frequency	Adjust Screws In Order
0.1 MFD	Grid side of Trimmer F	262 KC	A B C D
.000070 MFD	Antenna Terminal	1615 KC	E
.000070 MFD	Antenna Terminal	1400 KC	F G

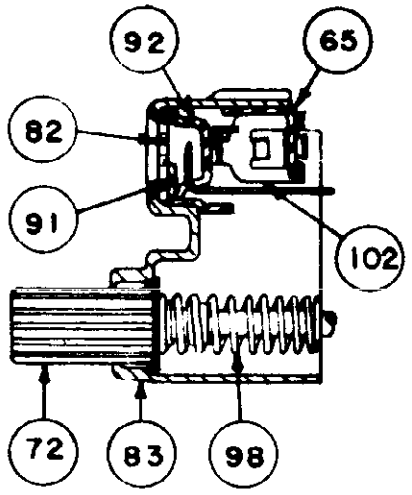
Adjust trimmer G to match car antenna (1400 KC) when radio is installed. For complete alignment procedure see United Motors Service Model R698

SPECIAL INSTRUCTIONS

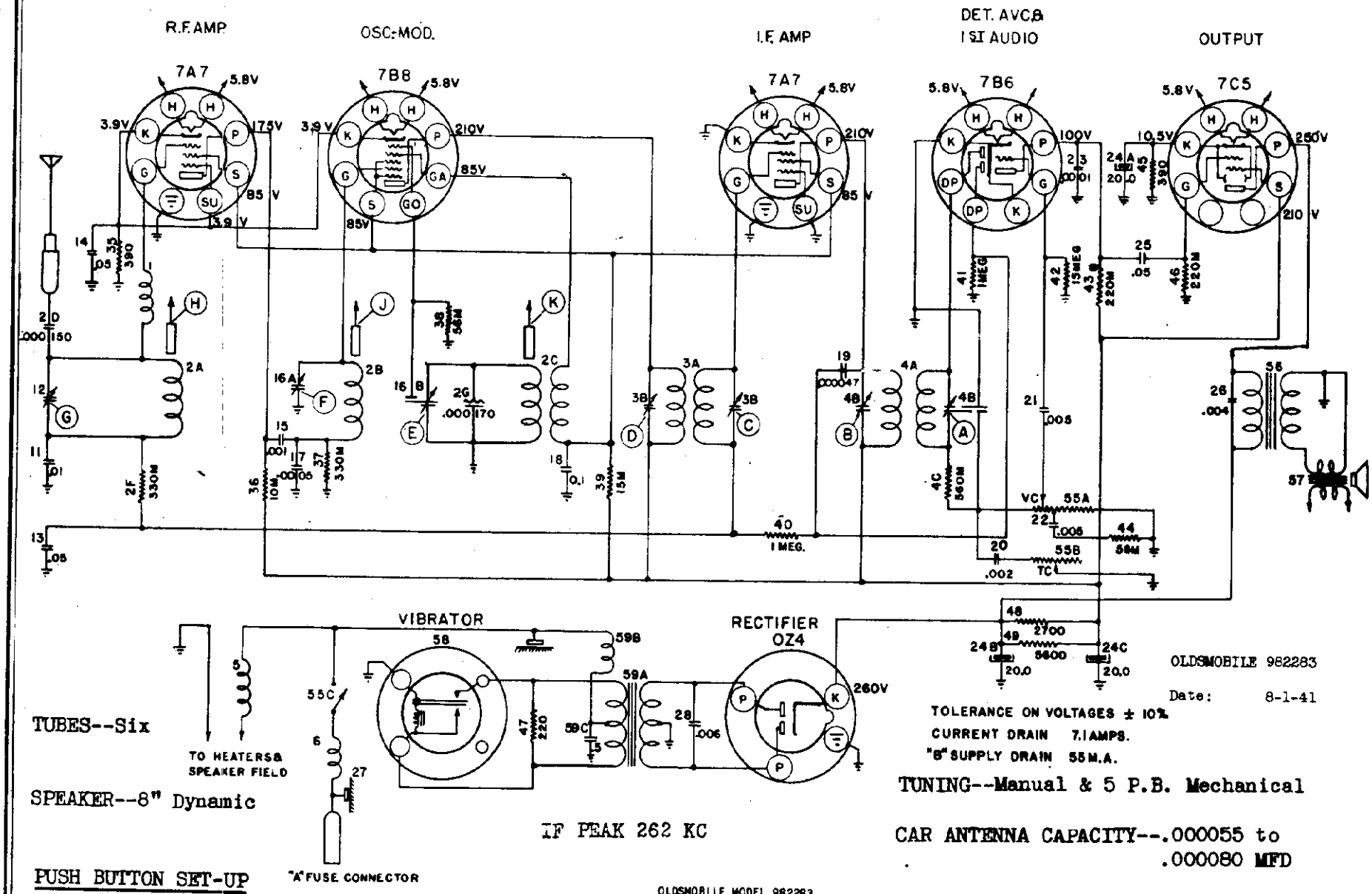
Mechanical alignment of iron cores. Tune to stop at H.F. end of dial. Adjust cores H, J, & K to extend 1-5/32" out from end of coil form. Adjust trimmer E, F, & G, (1615 KC). Adjust cores H & J for maximum output at 1400 KC. Repeat alignment of trimmers E, F, & G at 1615 KC. Repeat alignment of cores H & J at 1400 KC. Align trimmers F & G at 1400 KC.

TUNER MECHANICAL PARTS

Illus. No.	Part No.	Part Name	Description
65	7241046	Baffle	Light Shield
66	7241029	Bar	Parallel Guide
67	7241957	Bearing	Face Worm
68	7242033	Bracket	Outrigger Assy.
69	7241265	Bracket	Slide Assy.
70	7242420	Bumper	Button Shock Absorber
71	7240998	Bushing	Man Drive
72	7242436	Button	P.B. Assy.
74	7242847	Clamp	Core
75	7240893	Clutch	Assy.
76	7241267	Collar	Man. Shaft
77	7241675	Cord	Pointer
78	7242138	Core	Antenna, & Oscillator Coil Tuning
79	7242139	Core	R.F. Coil Tuning
80	7240921	Coupling	Core
82	7242340	Dial	Calibrated
83	7240774	Escutcheon	
84	7241658	Extension	Control Shafts
86	7241370	Lever	String Drive
87	7240922	Link	Connecting
88	7242516	Nut	Spacer
90	7241956	Plate	Tuner Mounting
91	7242441	Plate	Dial Back Plate
92	7242545	Plate	Pointer Back Plate
93	7242214	Pointer	Assy. Comp.
95	7241657	Screw	Shaft Extension
96	7241276	Shaft	Man. Drive Assy.
97	7240882	Spacer	Shoulder Spacing Slide Bracket
98	7241044	Spring	Button Return
99	7240915	Spring	Clutch Shaft Tension
100	7241042	Spring	Connecting Link-Also Slide Bracket Return
101	7241045	Spring	Core Coupling
102	7240947	Spring	Dial Retainer
103	7241178	Spring	Pointer Return
105	7242475	Tuner	Assy. Includes items 106-111
106	7241037	Screw	Push Button Screws
107	7241039	Spring	Latch Bar
108	7241169	Spring	P.B. Screw Return
109	7241835	Spring	Tuning Nut Yoke
110	7242426	Tip	Latching Button
111	7240548	Yoke	Tuning Nut



ESCUTCHEON CROSS SECTION



OLDSMOBILE 982283

Date: 8-1-41

TOLERANCE ON VOLTAGES ± 10%

CURRENT DRAIN 7.1 AMPS.

"B" SUPPLY DRAIN 55 M.A.

TUBES--Six

SPEAKER--8" Dynamic

IF PEAK 262 KC

TUNING--Manual & 5 P.B. Mechanical

CAR ANTENNA CAPACITY--.000055 to .000080 MFD

TUNING RANGE--540-1600 K.C.

MOUNTING--All 1942 Oldsmobile Cars

PUSH BUTTON SET-UP

Push button in and latch. Allow to return to normal position. Turn button until desired station is brought in. Do not hold button in while adjusting.

OLDSMOBILE MODEL 982283

MODEL 982283

OLDSMOBILE DIV.—GEN. MOTORS

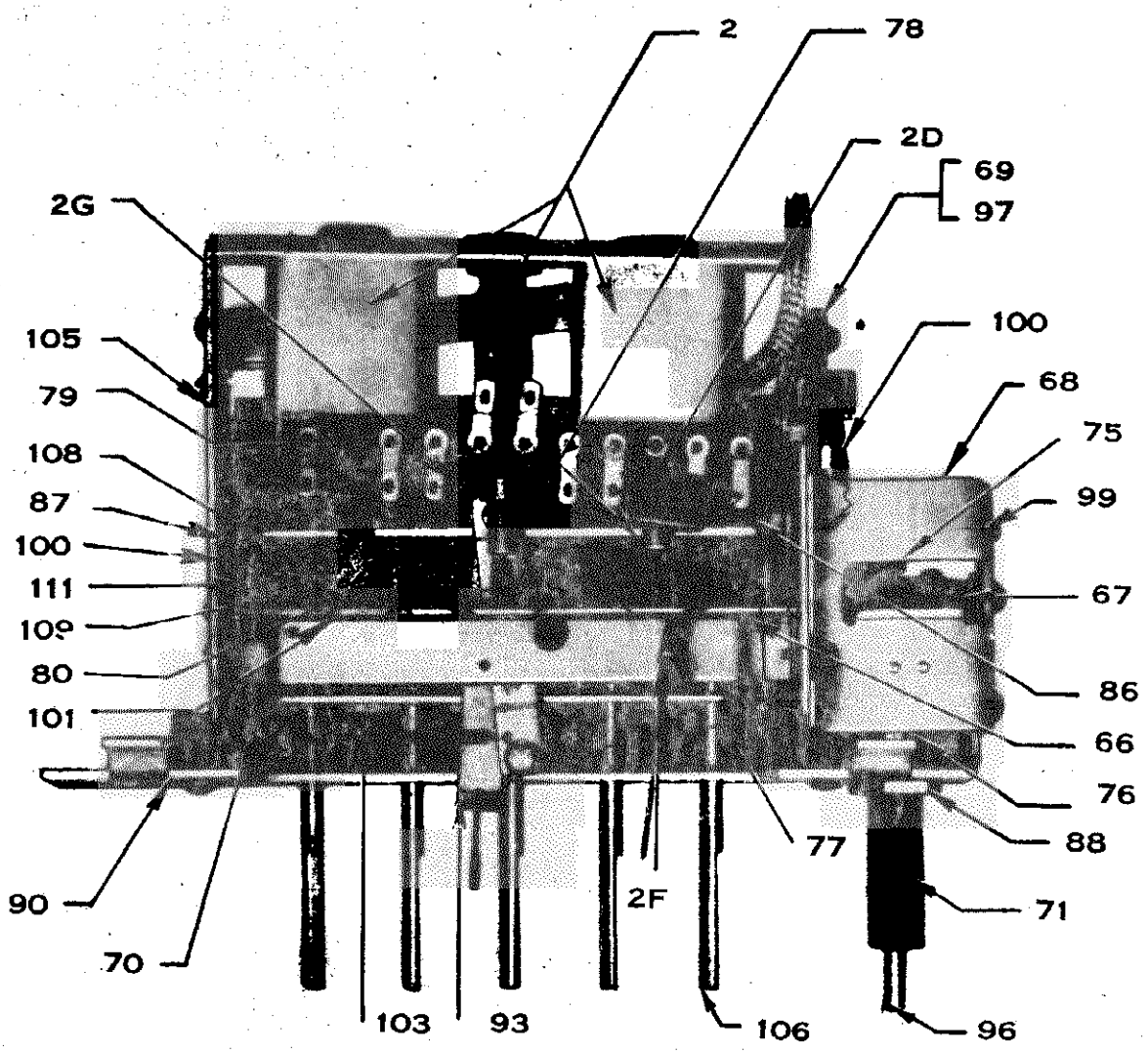
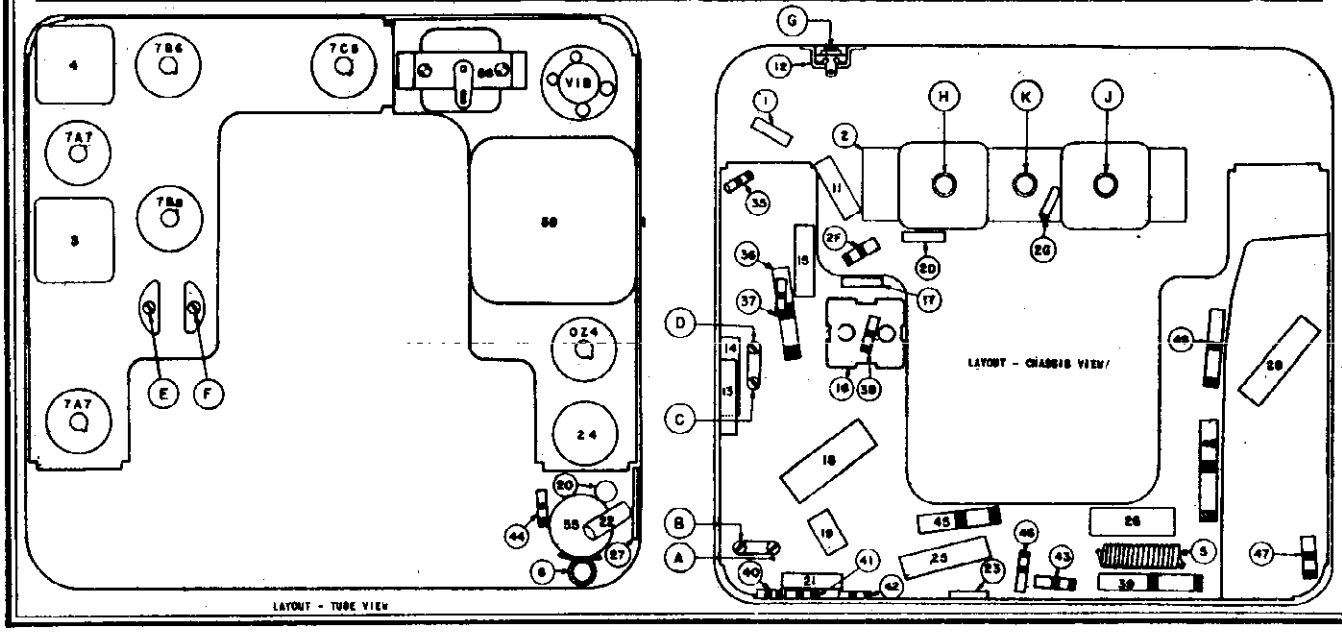
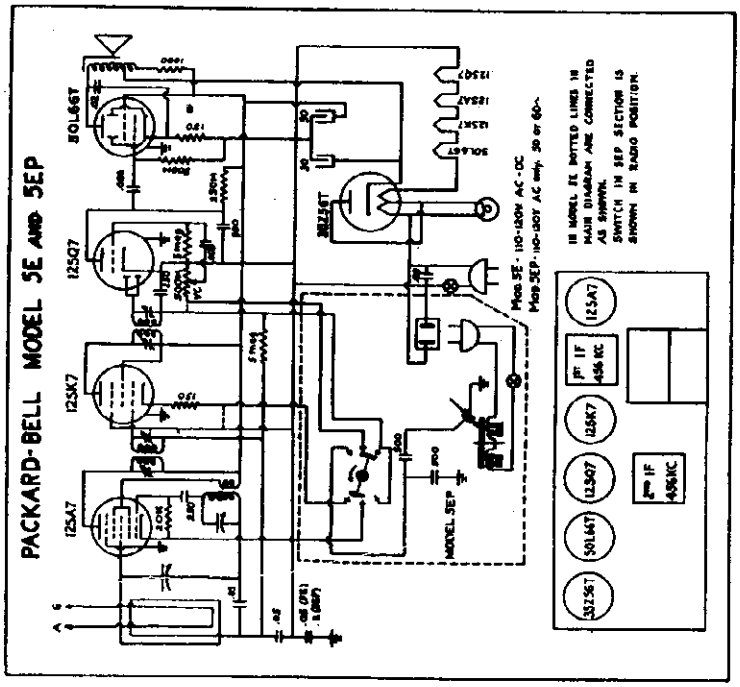
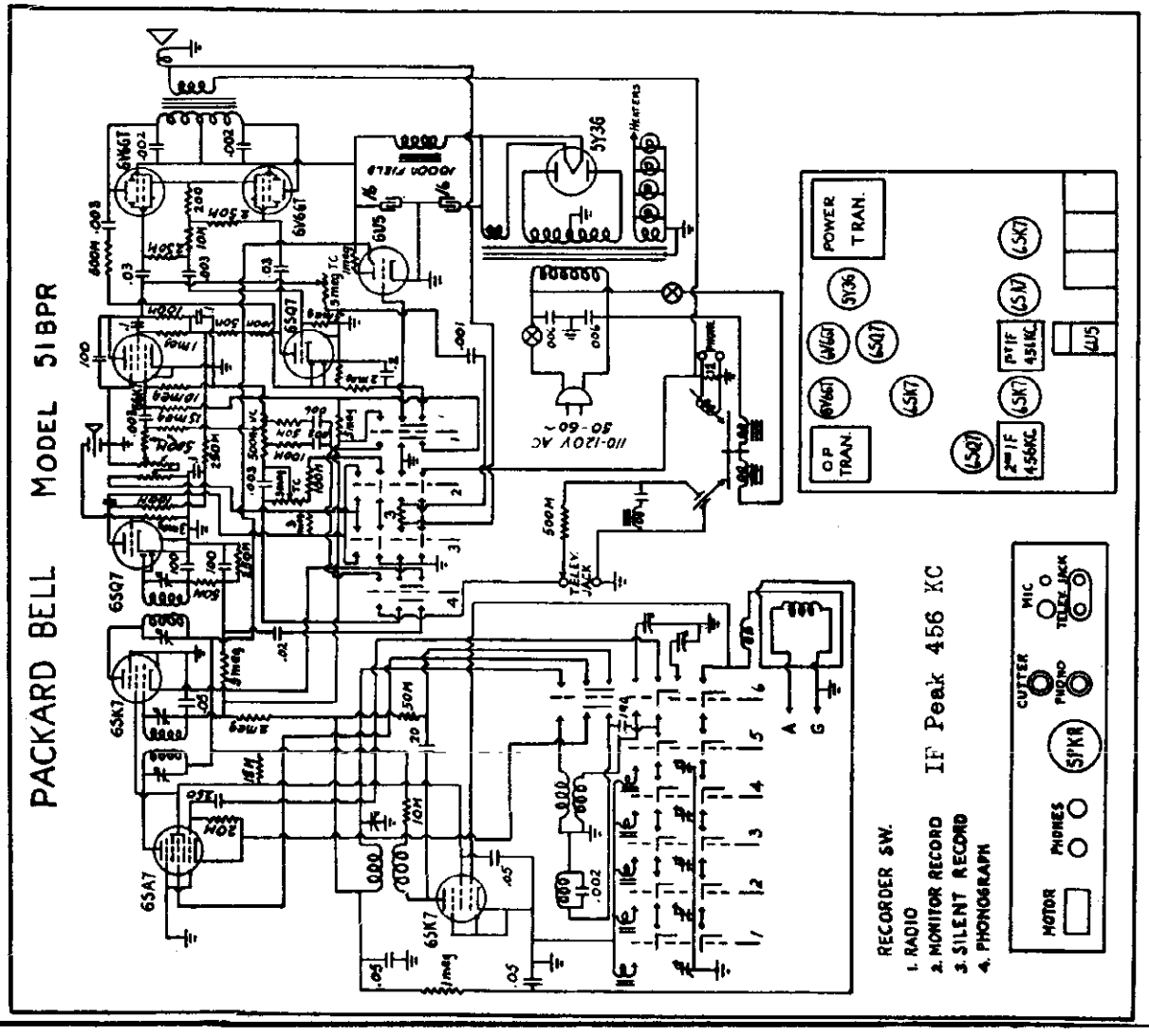


Fig. 5 - Tuning Control Unit - 982283



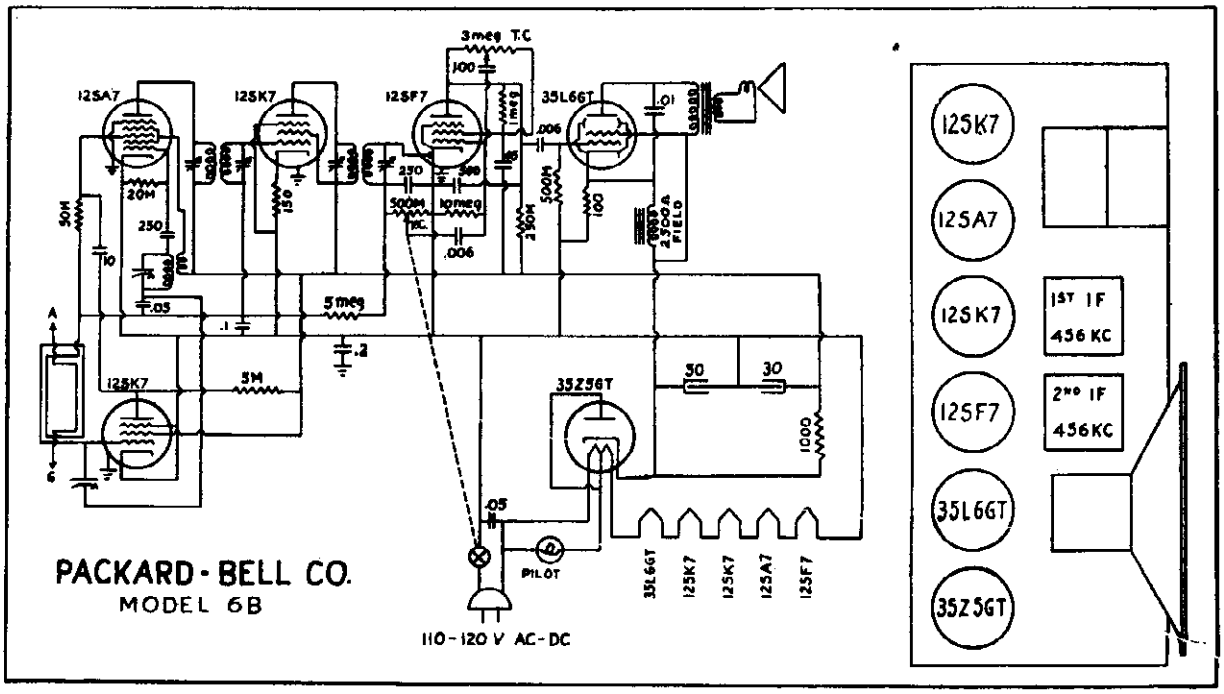
PACKARD BELL CO.

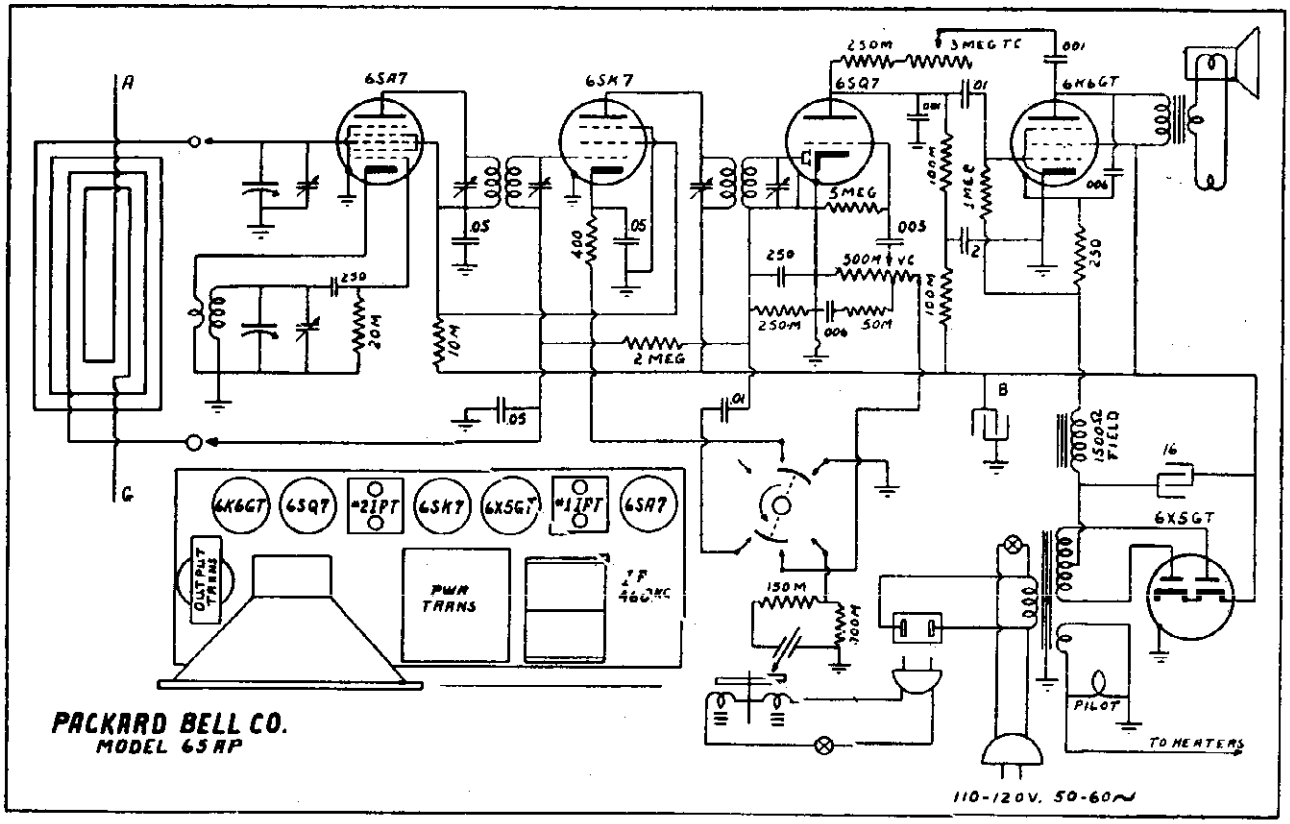




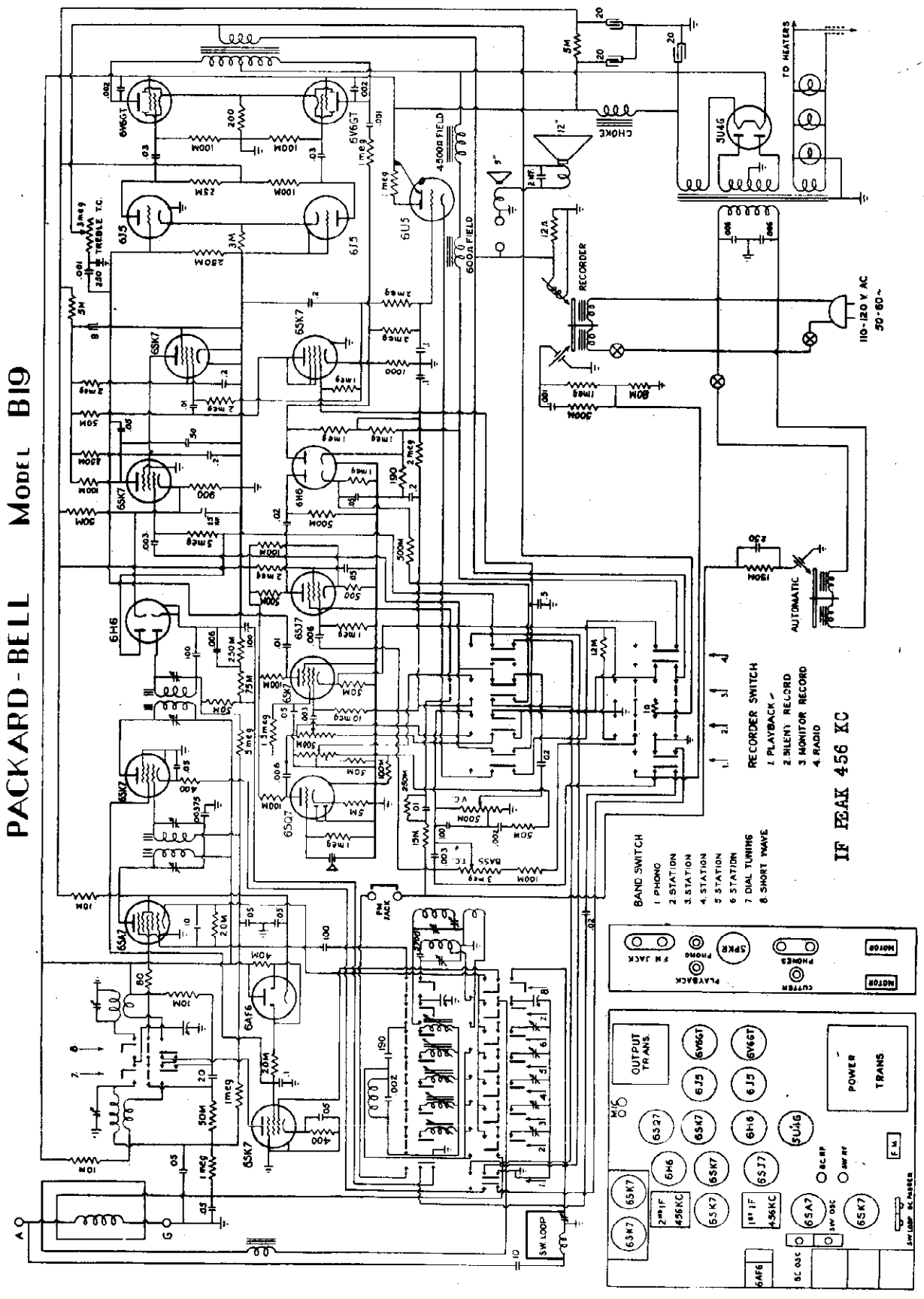
MODEL 6B
MODEL 65AP

PACKARD BELL CO.



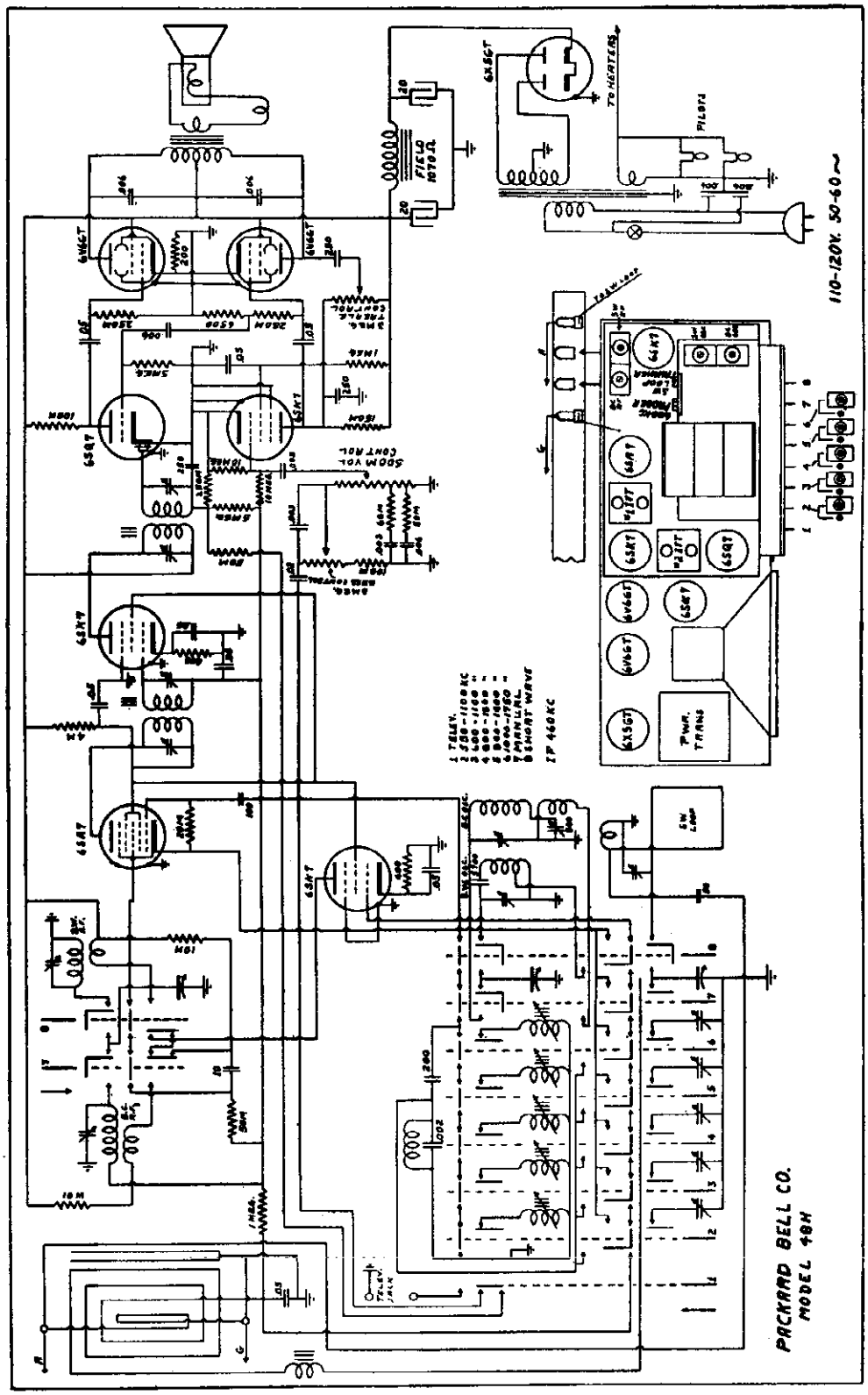


PACKARD BELL CO.



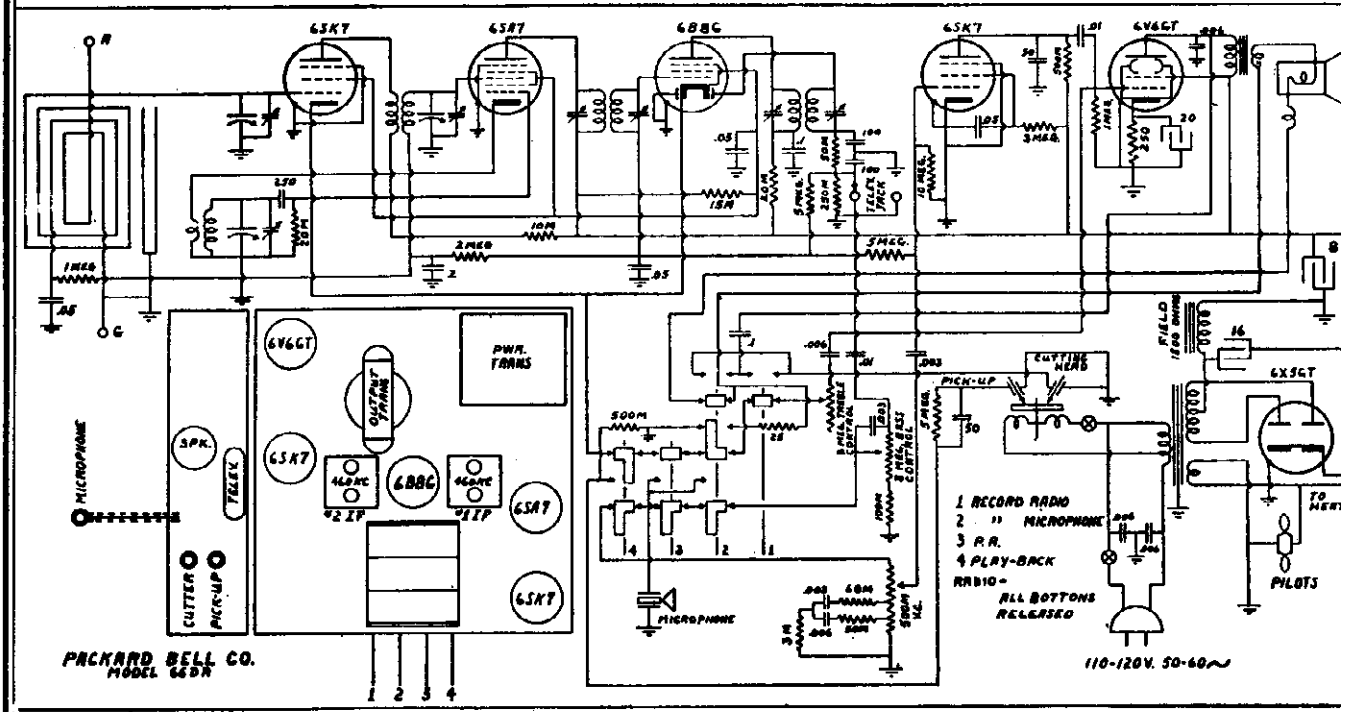
MODEL 48H

PACKARD BELL CO.

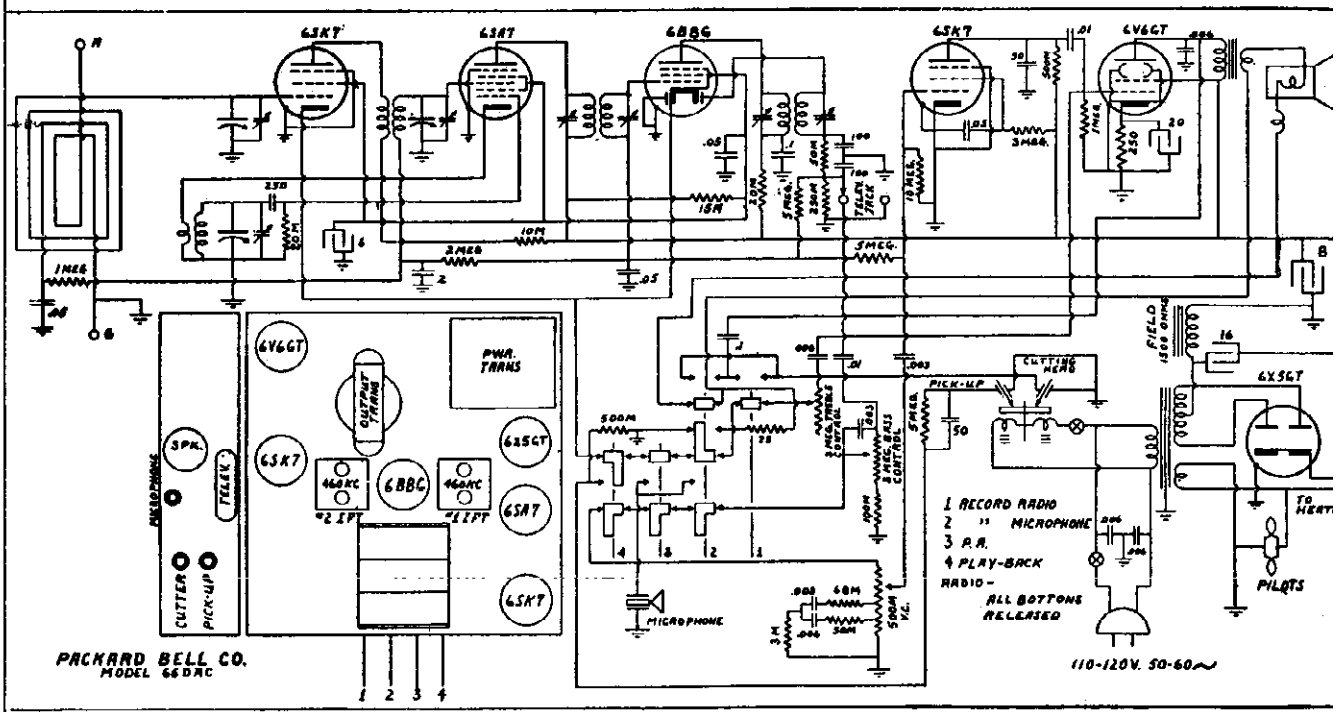


MODEL 66DR

PACKARD BELL CO.

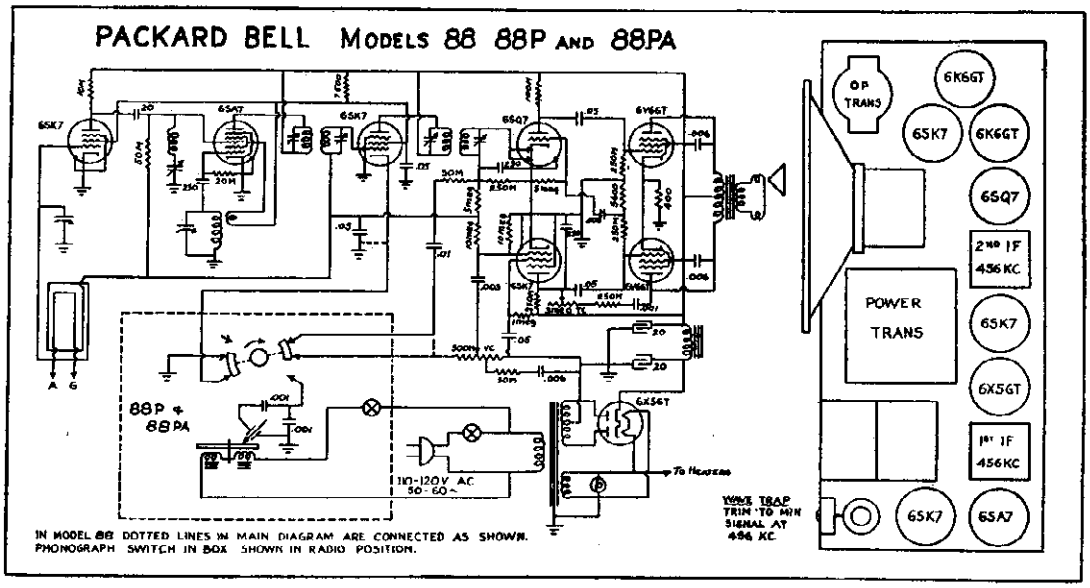


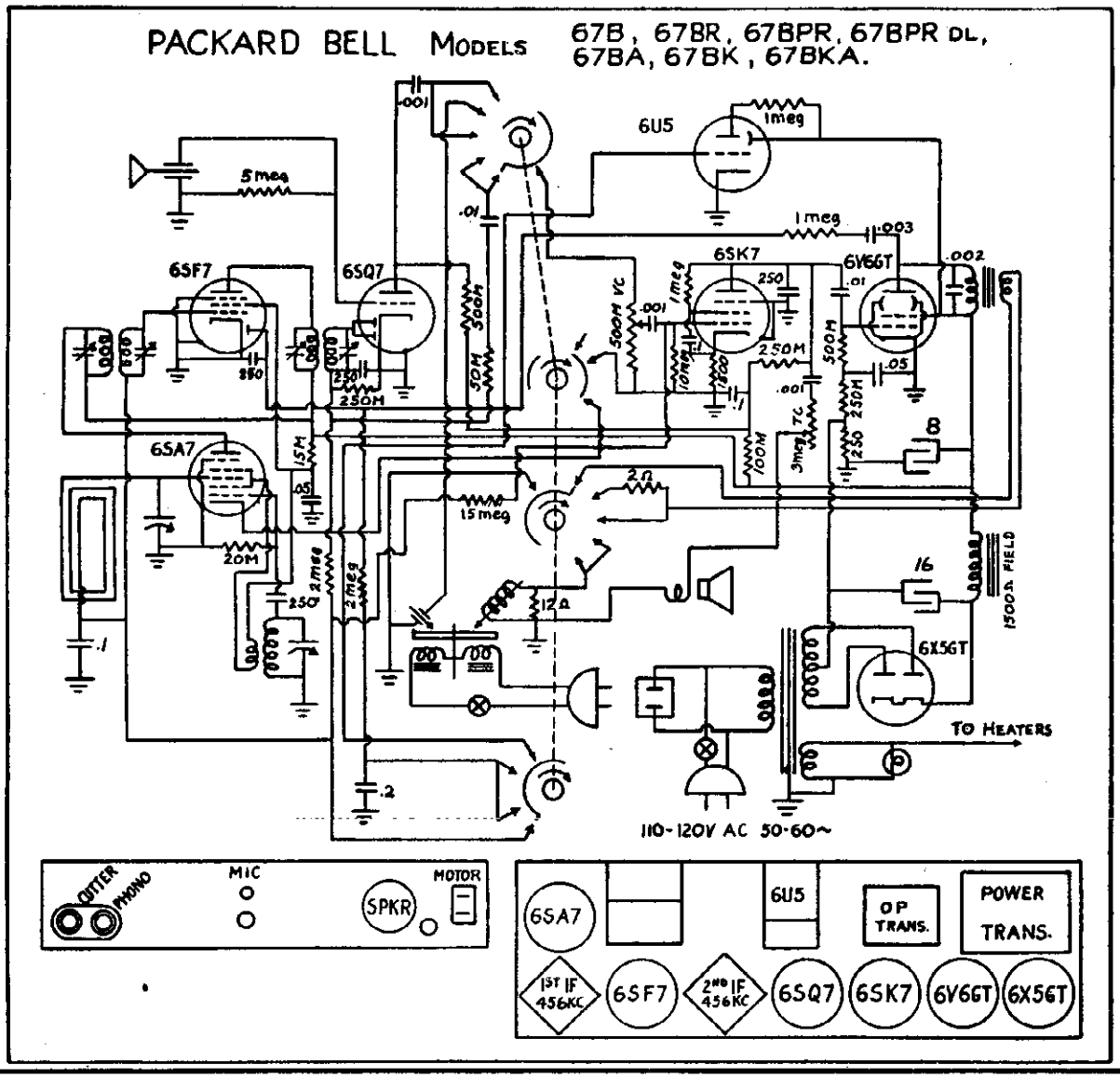
IF PEAK 460 KC



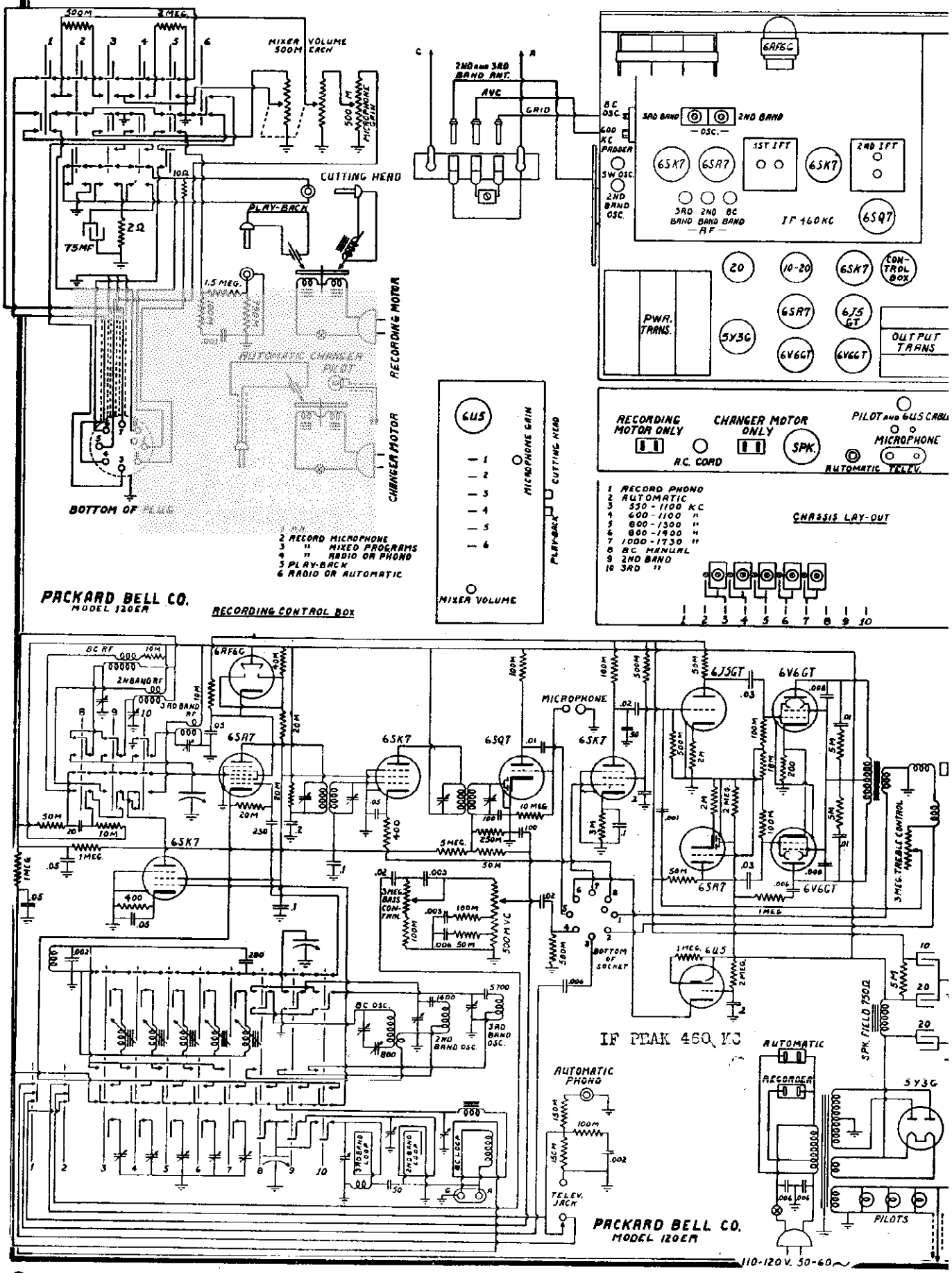
MODELS 67B,67BA,67BK,67BKA,
67BPR,67BPRDL,67BR
MODELS 88,88P,88PA

PACKARD BELL CO.



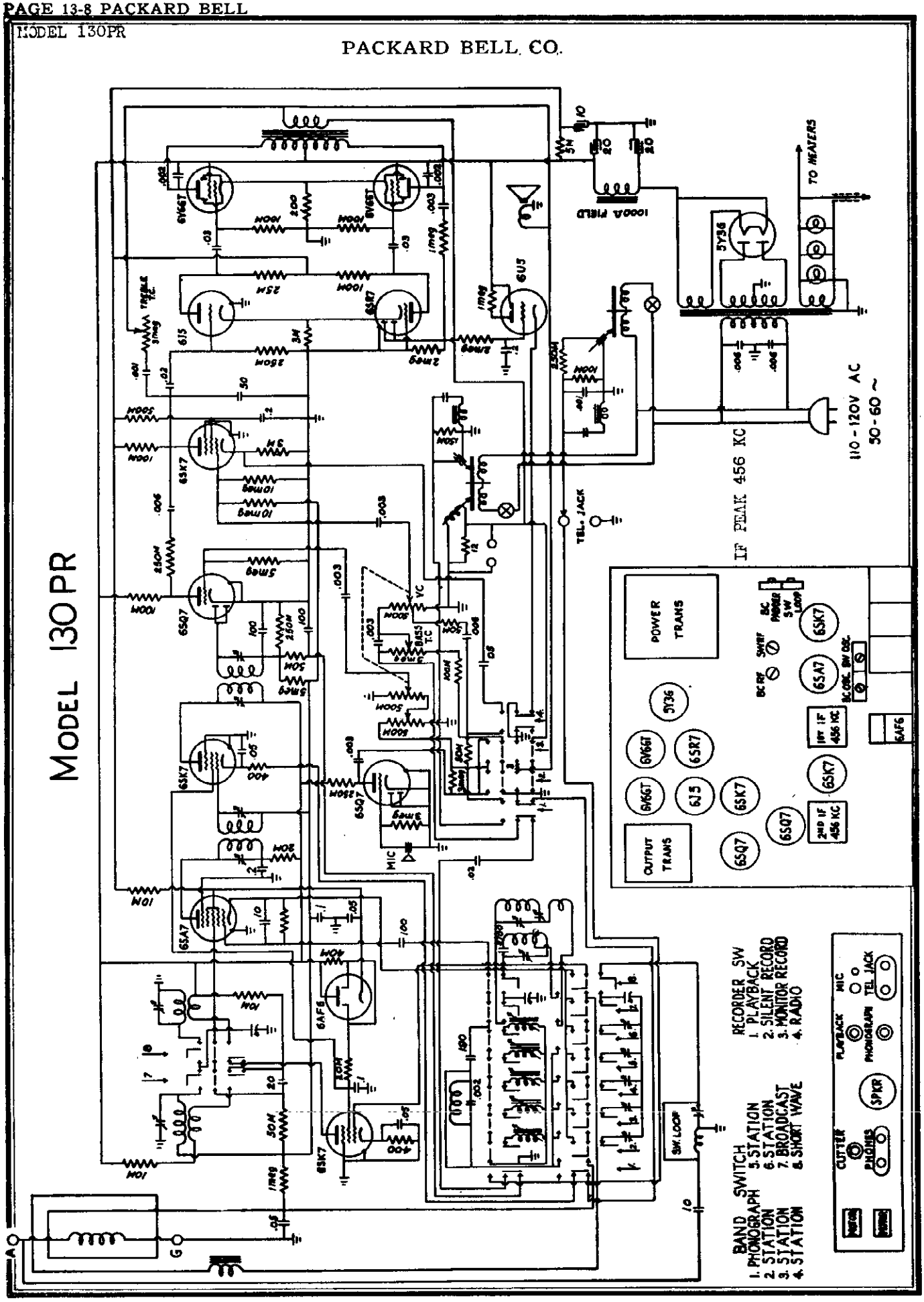


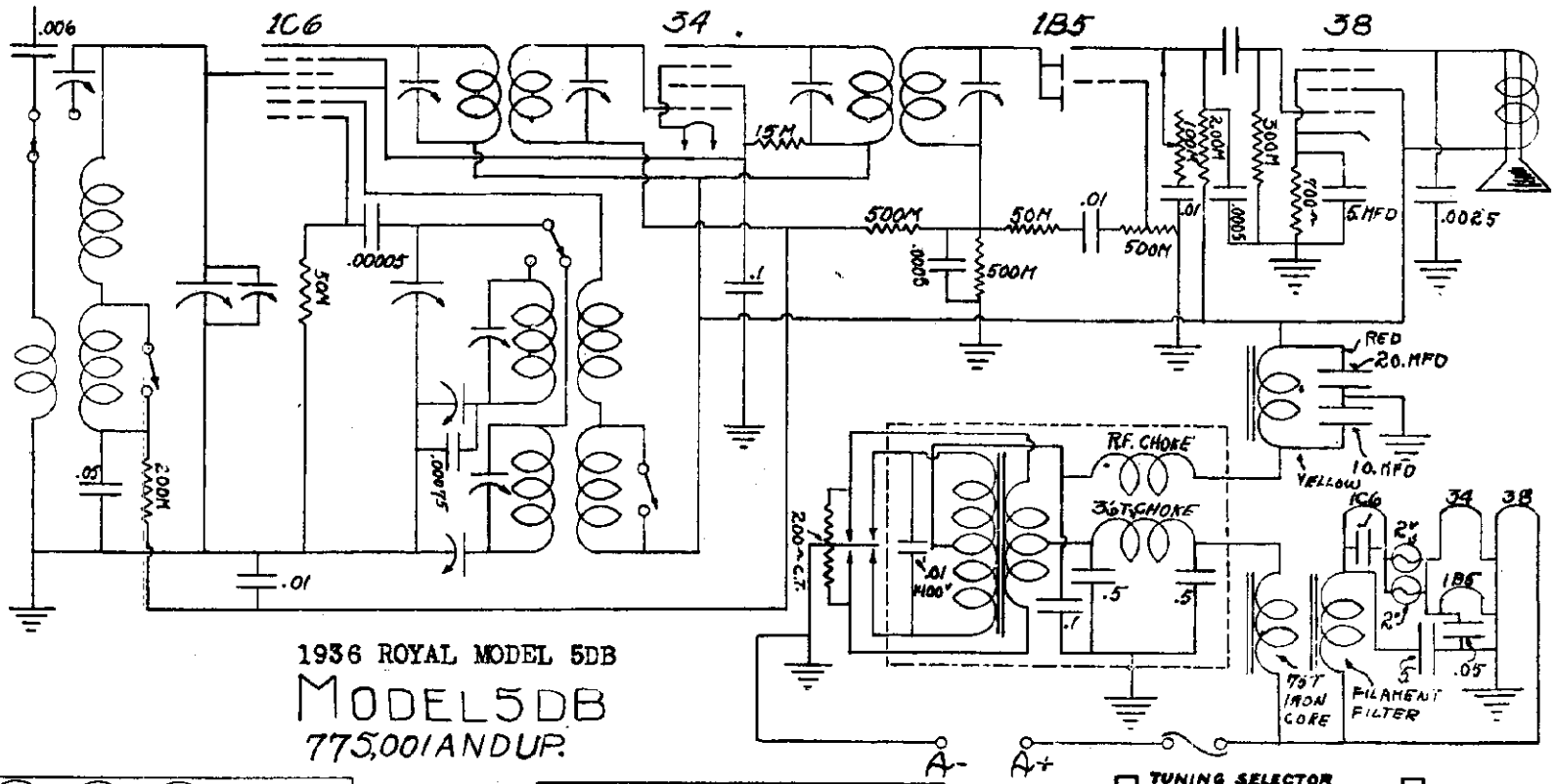
PACKARD BELL CO.



MODEL 130PR

PACKARD BELL CO.

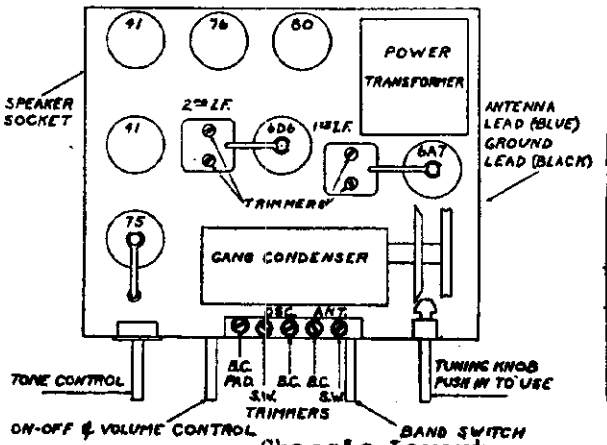




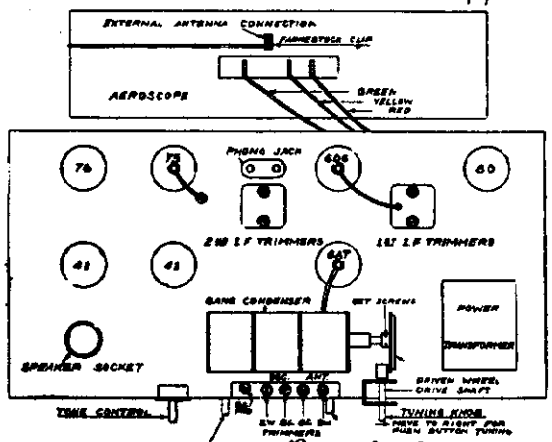
1936 ROYAL MODEL 5DB

MODEL 5DB

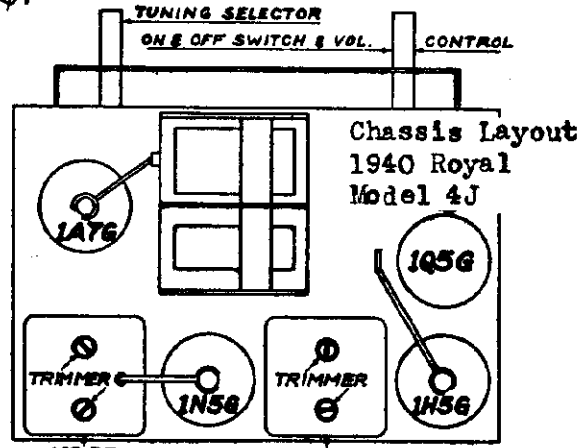
775,001 AND UP.



Chassis Layout
1940 Imperial



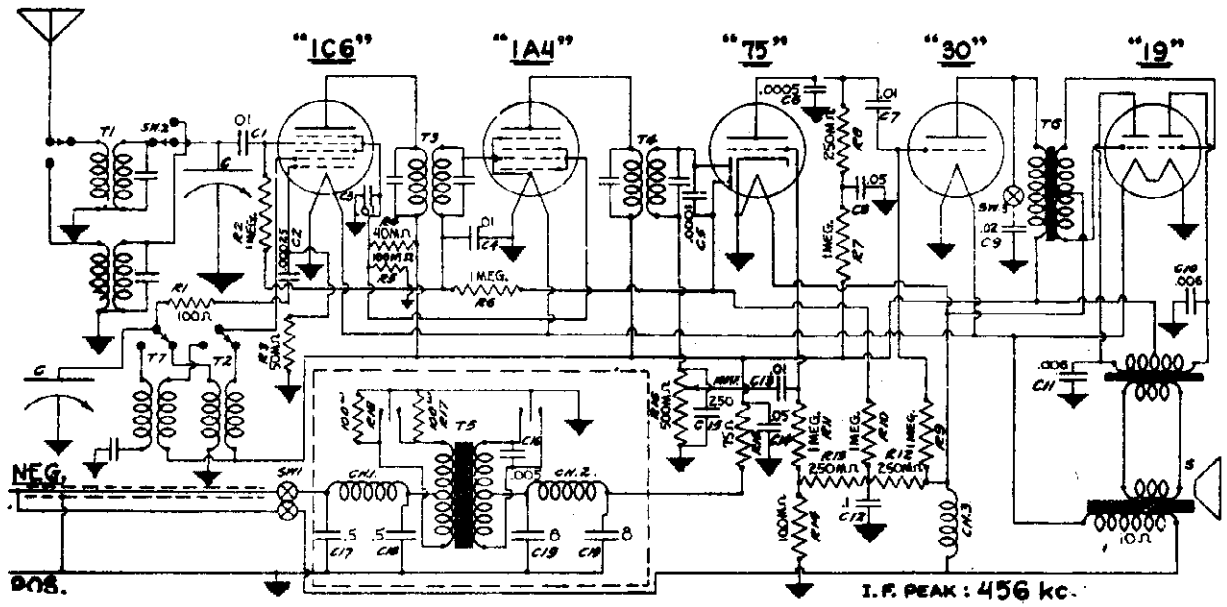
Chassis Layout
1940 Imperial



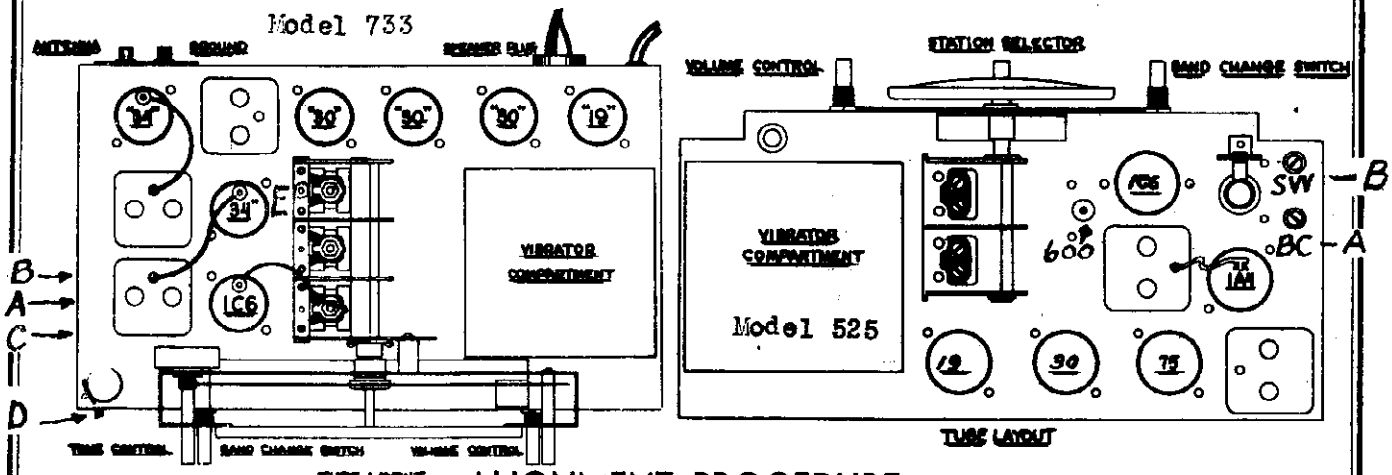
Chassis Layout
1940 Royal
Model 4J

SCHEMATICS IN RIDERS VOL XII

MODEL 525 1937 DeLuxe
MODEL 733 1937 Masterpiece **PARKER McCRORY MFG. CO.**



1937 DELUXE MODEL 525



ALIGNMENT PROCEDURE

1937 Masterpiece Model 733

WARNING: The following information is to be used only by an experienced serviceman with the proper equipment. In most cases it is necessary only when set has been tampered with or damaged by accident.

I.F. ALIGNMENT: Connect signal generator, through .00025 cond., to grid cap of 1C6 tube. Set signal generator at 456 K.C. (this must be accurate), dial pointer at 1700 K.C. Short out oscillator section (center section) of variable cond. gang. Connect suitable output meter across voice coil of loud speaker. (If output meter is not available it will be necessary to adjust by ear, using the loudest note from signal generator.) Increase attenuator until output meter shows deflection or a note is heard from signal generator. Carefully adjust I.F. transformer trimmers for greatest deflection of meter or loudest note from generator. Reduce generator output as intensity of signal increases as I.F.s are tuned nearer their original 456 K.C. setting. Signal should be just audible by ear. Go back over the adjustments to be sure they are correct. Remove short from oscillator section of variable cond. and adjustment is complete.

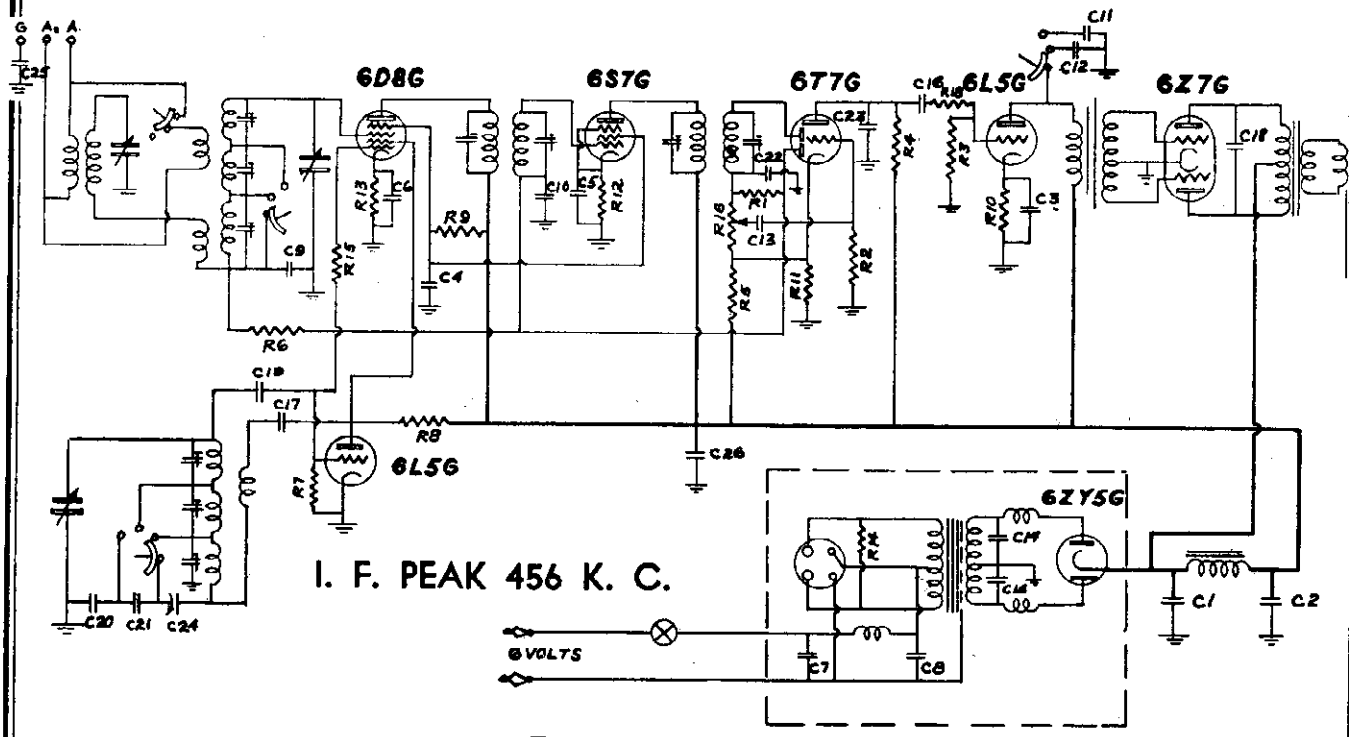
B.C.—R.F. ALIGNMENT: (1) Connect signal generator, through .00025 cond., to antenna post A1. Short wave switch in broadcast position. (2) Set signal generator and dial pointer to 1400 K.C. (3) Adjust osc. B.C. trimmer "A" (see diagram) for greatest deflection of meter or loudest note. (4) Set generator and dial pointer to 1400 K.C. Adjust antenna B.C. trimmer and trimmer "E" for greatest deflection of meter or loudest note. (5) Set generator and dial pointer to 600 K.C. Adjust trimmer "D" for greatest deflection or loudest note. (This adjustment is critical and must be accurate.) Rock cond. gang across 600 K.C. note while adjusting trimmer "D." Repeat adjustment at least twice to be sure it is correct.

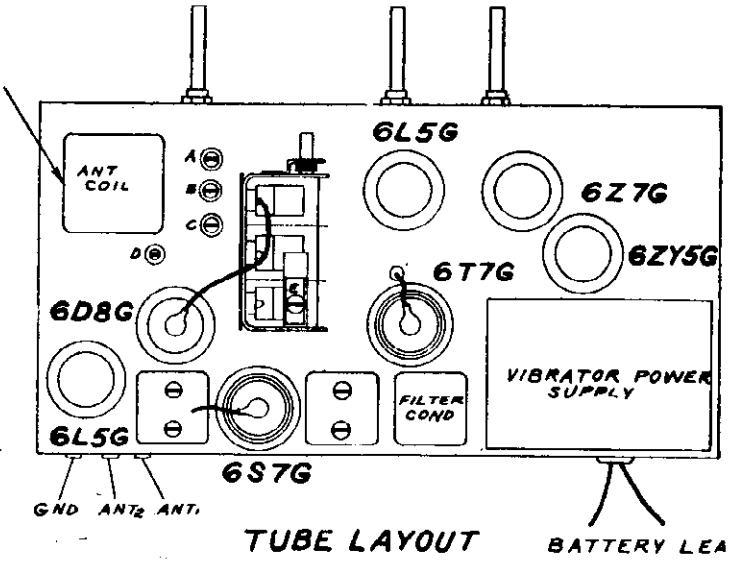
POLICE AND AMATEUR BAND ADJUSTMENT: (1) Set switch in Police-Amateur position. Connect signal gen. to ant. post A1 through 400 ohm resistor. (2) Set gen. and dial pointer to 6 meg. (6000 K.C.). Carefully adjust trimmer "B" for greatest deflection or loudest note. Check adjustment with gen. and dial pointer at 2 meg. (2000 K.C.).

FOREIGN BAND ADJUSTMENT: (1) Set switch in Foreign position. Connect gen. to ant. post A1 through 400 ohm resistor. (2) Set generator and dial pointer to 18 meg. (18000 K.C.). This must be accurate. (3) Carefully adjust trimmer "C" and ant. S.W. trimmer for greatest deflection or loudest note. Check adjustment with gen. and dial pointer at 7 meg. (7000 K.C.). This completes all R.F. adjustments.

PARKER & McCRORY MFG. CO.

MODEL 680 1938 Masterpiece





A—Osc. B.C. Trim.
B—Osc. Pol. Trim.
C—Osc. SW. Trim.
D—Osc. B.C. Pad.
E—Pres. B.C. Trim.

C1, C2-8.
C3 -5.
C4, C5, C6-.1-200V.
C7, C8-.5-150V.
C9, C10-.05-200V.
C11-.03-400V.

C12, C13, C16- .01-400V.
C14, C15- .01-1000V.
C17, C18- .003-400V.
C19- .0005 Ceramicon
C20- .004 Mica.
C21- .0018 Mica.

C22- .0001 Mica.
C23- .00025 Mica.
C24- .0006 Paddler.
C25- .05-200V.
C26- .1-400V

R1- 3 Megohms ¼W.
R2- 1 Megohms ¼W.
R3- ½ Megohms ¼W.
R4, R18- 150,000 ¼W.
R5, R6- 100,000 ¼W.
R15- 75 ¼W.
R7- 50,000 ¼W.
R8- 20,000 ¼W.
R9- 12,000 ½W.
R10 2,000 ¼W.
R16- 500,000 VC.
R11- 1,000 ¼W.
R12- 750 ¾W.
R13- 500 ¼W.
R14- 200 ¼W.
R17- 500,000 1-10W.

ALIGNMENT PROCEDURE

WARNING: The following information is to be used only by an experienced serviceman with the proper equipment. In most cases it is necessary only when set has been tampered with or damaged by accident.

I.F. ALIGNMENT: Connect signal generator, through .00025 cond., to grid cap of 6D8 tube. Set signal generator at 456 K.C. (this must be accurate), dial pointer at 1700 K.C. Short out oscillator section (center section) of variable cond. gang. Connect suitable output meter across voice coil of loud speaker. (If output meter is not available it will be necessary to adjust by ear, using the loudest note from signal generator.) Increase attenuator until output meter shows deflection or a note is heard from signal generator. Carefully adjust I.F. transformer trimmers for greatest deflection of meter or loudest note from generator. Reduce generator output as intensity of signal increases as I.F.s are tuned nearer their original 456 K.C. setting. Signal should be just audible by ear. Go back over the adjustments to be sure they are correct. Remove short from oscillator section of variable cond. and adjustment is complete.

B.C.—R.F. ALIGNMENT: (1) Connect signal generator, through .00025 cond., to antenna post A1. Short wave switch in broadcast position. (2) Set signal generator and dial pointer to 1700 K.C. (3) Adjust osc. B.C. trimmer "A" (see diagram) for greatest deflection of meter or loudest note. (4) Set generator and dial pointer to 1400 K.C. Adjust antenna B.C. trimmer and trimmer "E" for greatest deflection of meter or loudest note. (5) Set generator and dial pointer to 600 K.C. Adjust trimmer "D" for greatest deflection or loudest note. (This adjustment is critical and must be accurate.) Rock cond. gang across 600 K.C. note while adjusting trimmer "D." Repeat adjustment at least twice to be sure it is correct.

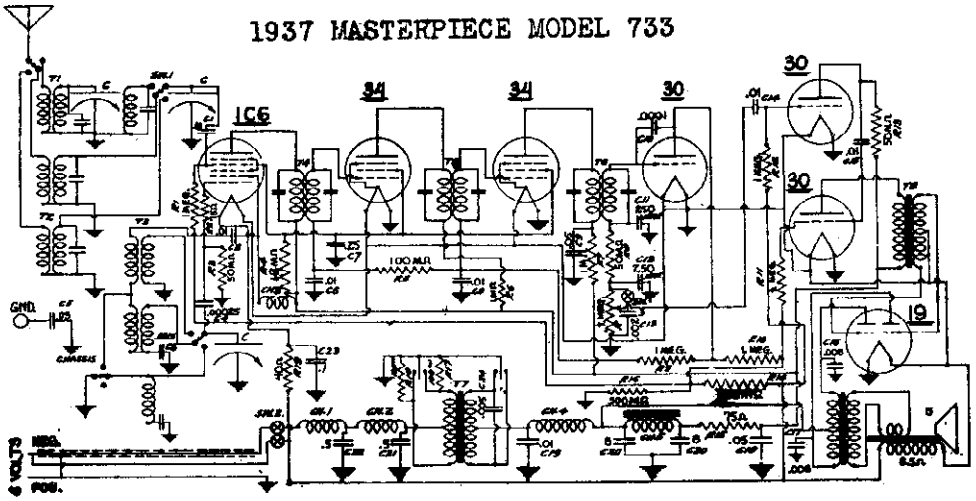
POLICE AND AMATEUR BAND ADJUSTMENT: (1) Set switch in Police-Amateur position. Connect signal gen. to ant. post A1 through 400 ohm resistor. (2) Set gen. and dial pointer to 6 meg. (6000 K.C.). Carefully adjust trimmer "B" for greatest deflection or loudest note. Check adjustment with gen. and dial pointer at 2 meg. (2000 K.C.).

FOREIGN BAND ADJUSTMENT: (1) Set switch in Foreign position. Connect gen. to ant. post A1 through 400 ohm resistor. (2) Set generator and dial pointer to 18 meg. (18000 K.C.). This must be accurate. (3) Carefully adjust trimmer "C" and ant. S.W. trimmer for greatest deflection or loudest note. Check adjustment with gen. and dial pointer at 7 meg. (7000 K.C.). This completes all R.F. adjustments.

MODEL 733 1937 Masterpiece
MODEL BA41 1936 Regal

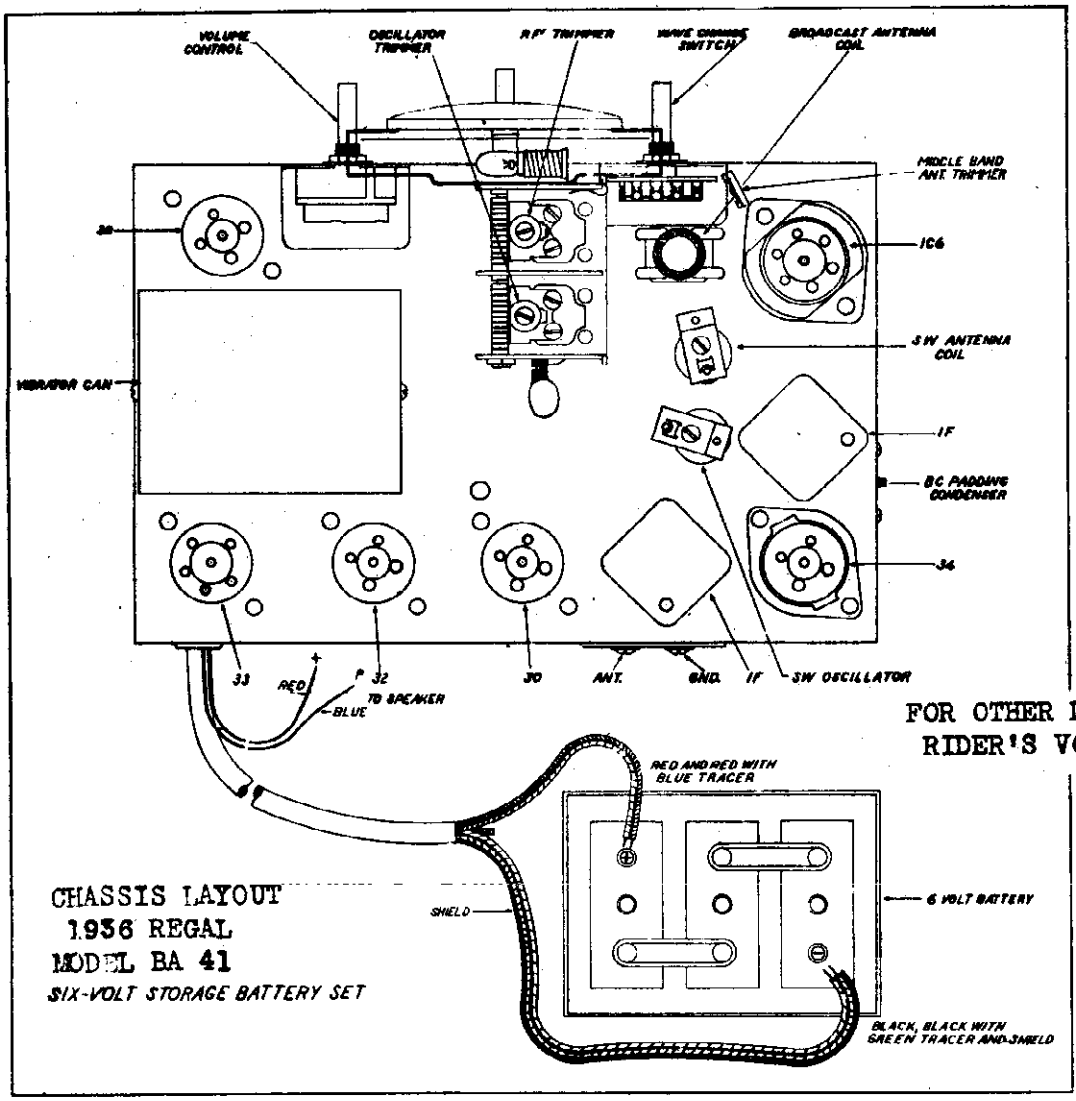
PARKER McCRORY MFG. CO.

1937 MASTERPIECE MODEL 733



I.F. 456 KC

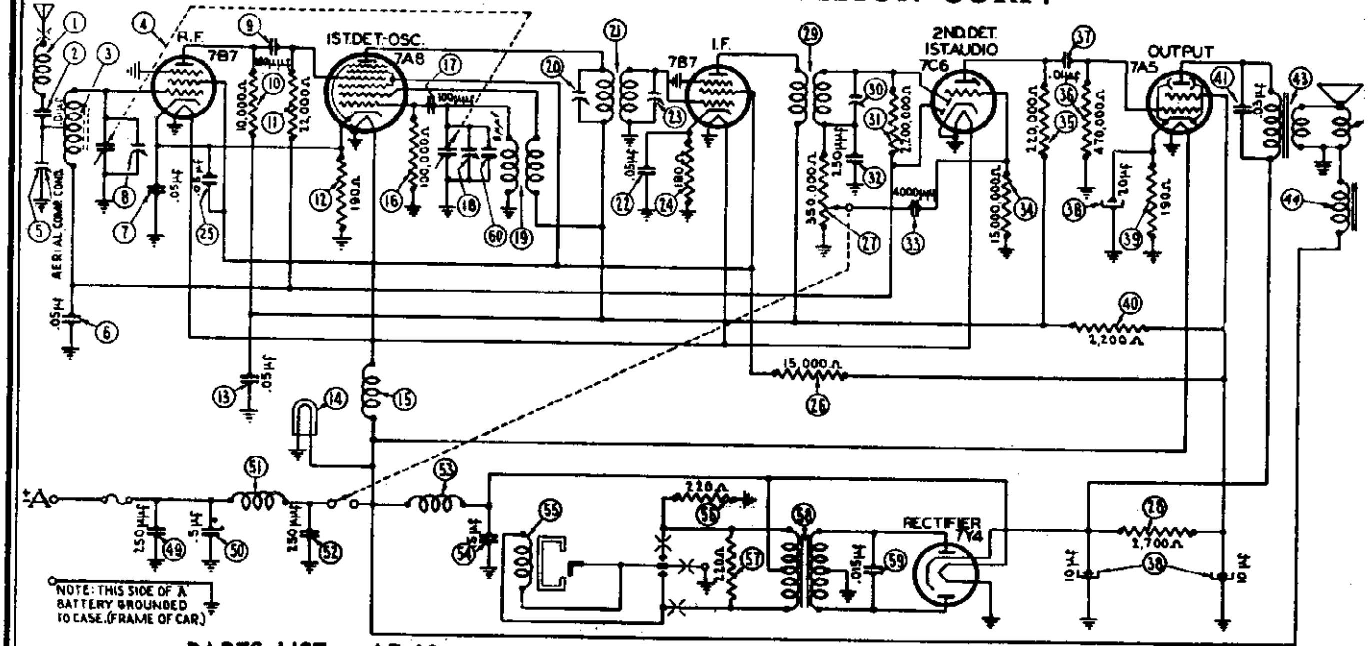
FOR OTHER DATA SEE INDEX



CHASSIS LAYOUT
1936 REGAL
MODEL BA 41
SIX-VOLT STORAGE BATTERY SET

FOR OTHER DATA SEE RIDER'S VOL.XII

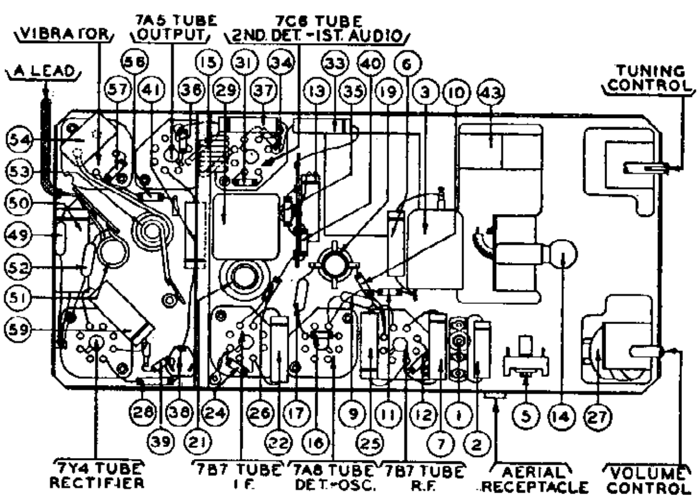
PHILCO RADIO & TELEVISION CORP.

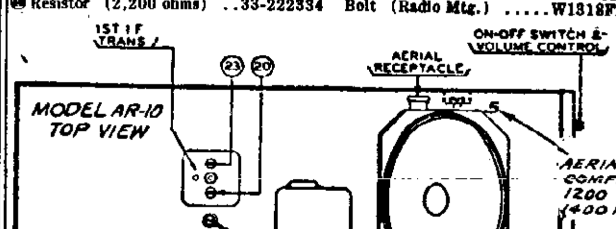


PARTS LIST — AR-10

No.	Description	Part No.
1	Antenna Choke	65-0102
2	Condenser (.01 Mfd.)	61-0114
3	Antenna Transformer	65-0196
4	Tuning Condenser	63-0028
5	Aerial Compensator	63-0030
6	Condenser (.05 Mfd.)	61-0101
7	Condenser (.05 Mfd.)	61-0111
8	Antenna Padder (on Tun. Cond.)	
9	Condenser (100 Mmfd.)	60-110157
10	Resistor (10,000 ohms)	33-310154
11	Resistor (22,000 ohms)	33-322154
12	Resistor (190 ohms)	33-119336
13	Condenser (.05 Mfd.)	61-0111
14	Pilot Lamp	69-0004
15	Filament Choke	65-0158
16	Resistor (100,000 ohms)	33-410154
17	Condenser (100 Mmfd.)	60-110157
18	Oscillator Padder (on Tun. Cond.)	
19	Oscillator Transformer	65-0194
20	Padder (Pri. 1st I. F. Trans.)	
21	First I. F. Transformer	65-0191
22	Condenser (.05 Mfd.)	61-0111
23	Padder (Sec. 1st I. F. Trans.)	
24	Resistor (190 ohms)	33-119336
25	Condenser (.05 Mfd.)	61-0111
26	Resistor (15,000 ohms)	33-315334
27	Volume Control (350,000 ohms) & On-Off Switch	67-0020
28	Resistor (2,700 ohms)	33-227434
29	Second I. F. Transformer	65-0192
30	Padder (Sec. 1st I. F. Trans.)	
31	Resistor (2,200,000 ohms)	33-522154
32	Condenser (250 Mmfd.)	60-125157
33	Condenser (4,000 Mmfd.)	61-0128
34	Resistor (15,000,000 ohms)	33-615154
35	Resistor (220,000 ohms)	33-422154
36	Resistor (470,000 ohms)	33-447154
37	Condenser (.01 Mfd.)	61-0120
38	Filter Condenser (10-10-20 Mfd.)	61-0068
39	Resistor (190 ohms)	33-119336
40	Resistor (2,200 ohms)	33-222334
41	Condenser (.03 Mfd.)	61-0119
42	Replacement Cone (For 73-0027-1)	91-0076
	(For 73-0027-2)	91-0077
43	Output Transformer	65-0258
44	Field Coil	(Not Replaceable)
49	Condenser (250 Mmfd.)	60-125157
50	Condenser (.5 Mfd.)	61-0106
51	"A" Choke	32-2477
52	Condenser (250 Mmfd.)	60-125157
53	Vibrator Choke	65-0204
54	Condenser (.5 Mfd.)	61-0137
55	Vibrator	83-0025
56	Resistor (220 ohms)	33-122334
57	Resistor (220 ohms)	33-122334
58	Power Transformer	65-0185
59	Condenser (.015 Mfd.)	61-0138
60	Condenser (8 Mmfd.)	60-008337
	Tuning & Volume Knob	77-0765
	Dial	55-1200
	Dial Cord (16½")	55-0588
	(5¾")	55-0589
	(13¾")	55-0652
	(7⅝")	55-0653
	Pointer	57-1940
	Tuning Shaft	57-1802
	Window Crystal	55-0501
	Speaker Unit	73-0027
	Tube Side Cover	57-0791FC59
	Wiring Side Cover	77-0561FC59
	Back Strap	28-5998FA3
	Mounting Bracket	57-0812FC59
	Cover Screws	W1586FA3
	Front Screws	97-0111FA3
	Fuse Lead	77-0235
	Fuse	45-2559
	Vibrator Socket	27-6044
	Loktal Socket	55-0575
	Pilot Lamp Assembly	77-0342
	"A" Lead	77-0217
	Interference Condenser	30-4007
	Distributor Resistor	33-1196
	Bolt (Radio Mtg.)	W1318FA3

I.F. = 455KC





Signal Generator Connection	Dummy Antenna	Signal Generator Frequency	Receiver Wave-band Switch	Receiver Dial Setting	Trimmer Number
...	...	...	...	...	Note 1
Ant. recept.	0.1 mf	455 kc	...	Note 2	30
"	"	"	...	"	23
"	"	"	...	"	20
"	"	"	...	"	30
"	"	"	...	"	23
"	"	"	...	"	20
Note 3	30 mmf	1580 kc	...	"	18
"	"	1400 kc	...	1400 kc	8 [4]
...	...	...	...	1200-1400 kc	5 [5]

Note 1.—Adjust antenna compensator (5) two turns from tight position.

Note 2.—Turn condenser rotor plates completely out of mesh as far as they will go.

Note 3.—Connect antenna lead, Part No. 95-0185, to antenna receptacle in the radio. Connect a 30 mmf condenser in series between signal generator and antenna lead.

Note 4.—When antenna stage adjustment is made with radio installed in car, the radio antenna lead must be connected to car antenna in usual manner. Connect signal generator output lead to a wire placed near car antenna but not connected to it.

Note 5.—After installing radio in car, tune in a weak broadcast signal between 1200 and 1400 kc. Remove plug button on side of radio and adjust antenna compensator (5) for maximum signal.

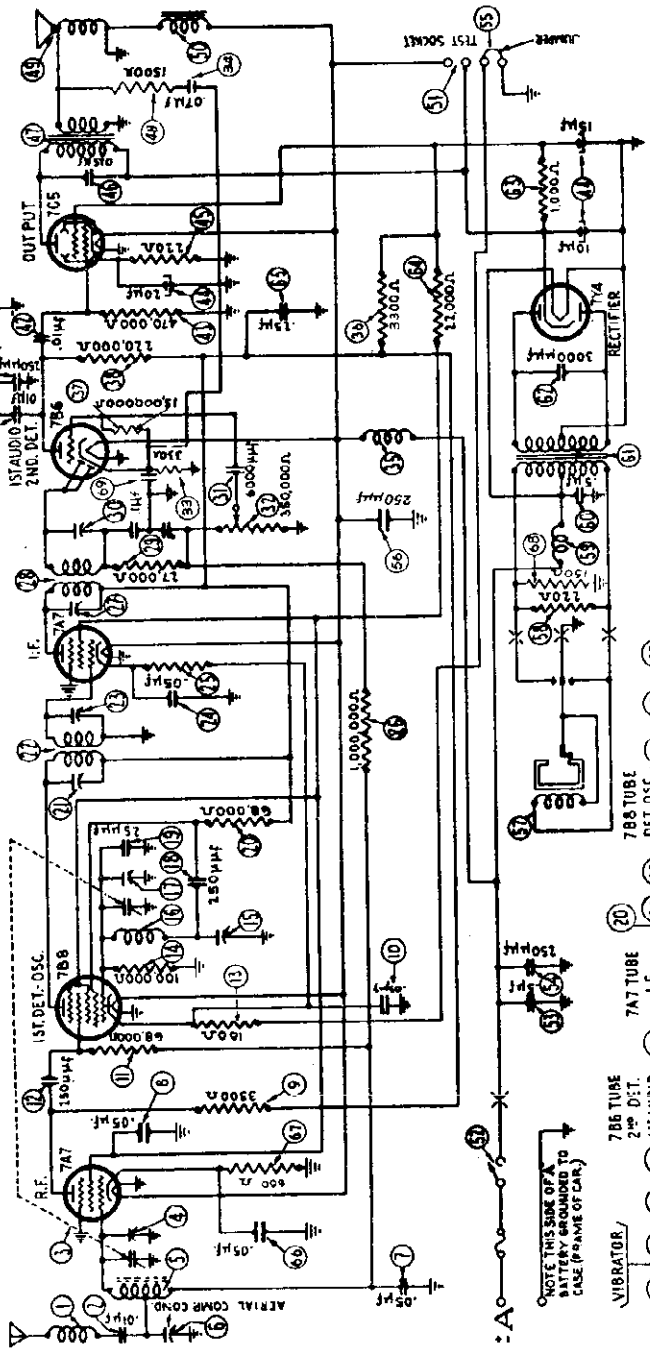
MODEL AR-40

PHILCO RADIO & TELEVISION CORP.

SCHEMATIC MODEL AR-40

I.F. = 455 KC

No.	Description	Part No.
1	Antenna Choke	65-0102
2	Condenser (.01 Mfd.)	61-0114
3	Tuning Condenser	63-0047
4	Antenna Padder (on Tun. Cond.)	65-0323
5	Antenna Transformer	77-0545
6	Aerial Compensator	61-0101
7	Condenser (.05 Mfd.)	61-0101
8	Condenser (.05 Mfd.)	61-0101
9	Resistor (3300 ohms)	33-233334
10	Condenser (.05 Mfd.)	61-0101
11	Resistor (68,000 ohms)	33-368154
12	Condenser (250 Mmfd.)	60-125157
13	Resistor (180 ohms)	33-118386
14	Resistor (100,000 ohms)	33-410154
15	Low Frequency Padder	63-0048
16	Oscillator Transformer	65-0420
17	Oscillator Padder (on Tun. Cond.)	
18	Condenser (250 Mmfd.)	60-125157
19	Condenser (25 Mmfd.)	60-095337
20	Resistor (68,000 ohms)	33-368334
21	Padder (Tri. 1st I. F. Trans.)	
22	First I. F. Transformer	65-0318
23	Padder (Sec. 1st I. F. Trans.)	
24	Condenser (.05 Mfd.)	61-0101



No.	Description	Part No.
25	Condenser (250 Mmfd.)	60-125157
26	Resistor (180 ohms)	33-118386
27	Resistor (100,000 ohms)	33-410154
28	Low Frequency Padder	63-0048
29	Oscillator Transformer	65-0420
30	Oscillator Padder (on Tun. Cond.)	
31	Condenser (250 Mmfd.)	60-125157
32	Condenser (25 Mmfd.)	60-095337
33	Resistor (68,000 ohms)	33-368334
34	Padder (Tri. 1st I. F. Trans.)	
35	First I. F. Transformer	65-0318
36	Padder (Sec. 1st I. F. Trans.)	
37	Condenser (.05 Mfd.)	61-0101
38	Resistor (470 ohms)	33-147338
39	Resistor (1,000,000 ohms)	33-510154
40	Padder (Pri. 2nd I. F. Trans.)	65-0320
41	Second I. F. Transformer	33-327154
42	Resistor (27,000 ohms)	33-233334
43	Padder (Sec. 2nd I. F. Trans.)	61-0155
44	Condenser (6000 Mmfd.)	67-0043
45	Volume Control (350,000 ohms)	33-133334
46	Resistor (330 ohms)	61-0152
47	Condenser (.07 Mfd.)	32-2729
48	Filament Choke	33-233334
49	Resistor (3300 ohms)	61-0120
50	Resistor (220,000 ohms)	33-423334
51	Condenser (.01 Mfd.)	61-0114
52	Condenser (250 Mmfd.)	60-125157
53	Tone Control Switch Wafer	77-0733
54	Condenser (.01 Mfd.)	61-0120
55	Resistor (4,700,000 ohms)	33-447154
56	Filter Condenser (10-15-20 Mfd.)	61-0089
57	Resistor (220 ohms)	33-122436
58	Condenser (.015 Mfd.)	61-0104
59	Output Transformer	65-0419
60	Resistor (1500 ohms)	33-215334
61	Replacement Cone (For 73-0059-4 Speaker)	91-0209
	(For 73-0059-9 Speaker)	91-0213
62	Field Coil	Not Replaceable
63	Test Socket	55-1118
64	On-Off Switch	85-0112
65	Condenser (.5 Mfd.)	61-0106
66	Condenser (250 Mmfd.)	60-125157
67	Test Link	57-1121
68	Condenser (250 Mmfd.)	60-125157
69	Vibrator	83-0025
70	Resistor (220 ohms)	33-122334
71	Vibrator Choke	65-0075
72	Condenser (.5 Mfd.)	61-0137
73	Power Transformer	65-0318
74	Condenser (3000 Mmfd.)	61-0115
75	Resistor (1000 ohms)	33-210434
76	Resistor (22,000 ohms)	33-322434
77	Condenser (.25 Mfd.)	61-0125
78	Condenser (.05 Mfd.)	61-0101
79	Resistor (850 ohms)	33-168330
80	Resistor (150 ohms)	33-115334
81	Condenser (.1 Mfd.)	61-0152
82	Resistor (47,000 ohms)	33-347334
83	Radio Housing	77-0751RC51
84	Control Assembly	85-0134
85	Dial	55-1194
86	Drive Cord	55-0935
87	Drive Cord Spring	57-1423PA3
88	Tuning Shaft	57-1385
89	Volume Shaft	57-1384
90	Pointer	57-1389RCP
91	Tone Control Lead	95-0135
92	Hook Bolt (Radio Mfg.)	57-1340PA3
93	Lockwasher (Radio Mfg.)	W166SFE7
94	Nut (Radio Mfg.)	W98PA3
95	Speaker Unit	73-0059
96	Speaker Cover	57-1943RC51
97	Wiring Side Cover	57-1345RC51
98	Interference Condenser	30-4007
99	Distributor Resistor	33-1196
100	Lortal Socket	55-0375
101	Vibrator Socket	27-8153
102	Control Shaft Clamp	57-1429FA38

MODELS AR-40, AR-45

Signal Generator Connection	Dummy Antenna	Signal Generator Frequency	Receiver Wave-band Switch	Receiver Dial Setting	Trimmer Number
...	...	...	...	...	Note 1
Ant. recept.	0.1 mf	455 kc	...	Note 2	30
"	"	"	...	"	27
"	"	"	...	"	23
"	"	"	...	"	21
"	"	"	...	"	30
"	"	"	...	"	27
"	"	"	...	"	23
"	"	"	...	"	21
Note 3	10 mmf	1580 kc	...	"	17
"	"	1400 kc	...	1400 kc	4 [4]
"	"	580 kc	...	580 kc	15 *
"	"	1580 kc	...	Note 2	17
"	"	1400 kc	...	1400 kc	4 [4]
"	"	580 kc	...	580 kc	15 *
...	...	...	...	1200-1400 kc	6 [5]

Note 1.—Adjust aerial compensator (6) two turns from tight position.

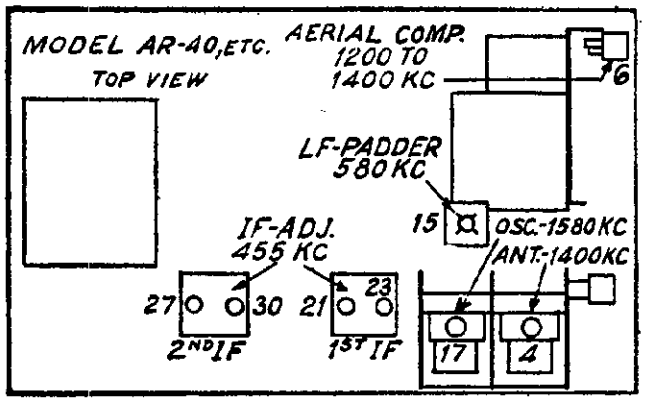
Note 2.—Turn condenser rotor plates completely out of mesh as far as they will go.

Note 3.—Connect antenna lead, Part No. 95-0185, to antenna receptacle in radio. Connect a 10 mmf condenser in series between signal generator and antenna lead.

Note 4.—When antenna stage adjustment is made with radio installed in car, the radio antenna lead must be connected to car antenna in usual manner. Connect signal generator output lead to a wire placed near car antenna but not connected to it.

Note 5.—After installing radio in the car, tune in a weak broadcast signal between 1200 and 1400 kc and adjust aerial compensator (6) for maximum signal.

* While rocking.



MODELS AR-50, AR-55, AR-75

Signal Generator Connection	Dummy Antenna	Signal Generator Frequency	Receiver Wave-band Switch	Receiver Dial Setting	Trimmer Number
...	...	...	...	Note 1	Note 2
Ant. recept.	0.1 mf	455 kc	...	Note 3	1
"	"	"	...	"	2
"	"	"	...	"	3
"	"	"	...	"	4
"	"	"	...	"	1
"	"	"	...	"	2
"	"	"	...	"	3
"	"	"	...	"	4
"	"	"	...	"	5 [4]
Note 5	10 mmf	1580 kc	...	"	6
"	"	1400 kc	...	1400 kc	7 [6]
"	"	580 kc	...	580 kc	8 *
"	"	1580 kc	...	Note 3	6
"	"	1400 kc	...	1400 kc	7 [6]
"	"	580 kc	...	580 kc	8 *
...	...	...	...	1200-1400 kc	9 [7]

Note 1.—Push in right knob on the control until "D" appears in station indicator window so stations can be tuned in by manual tuning.

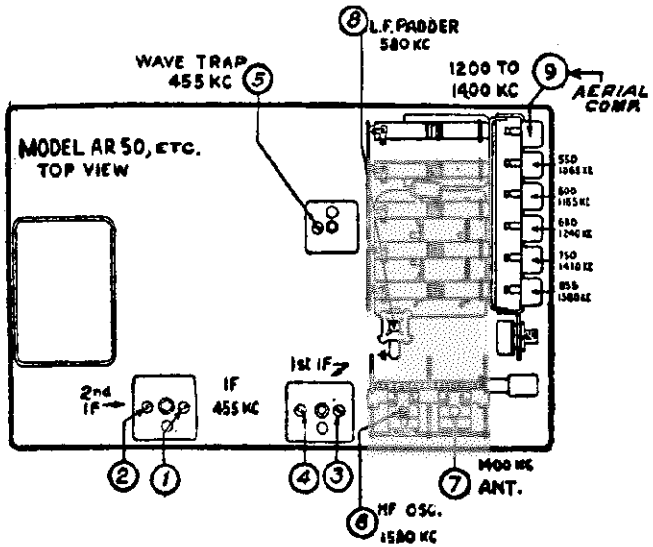
Note 2.—Adjust antenna compensator (9) two turns from tight position.

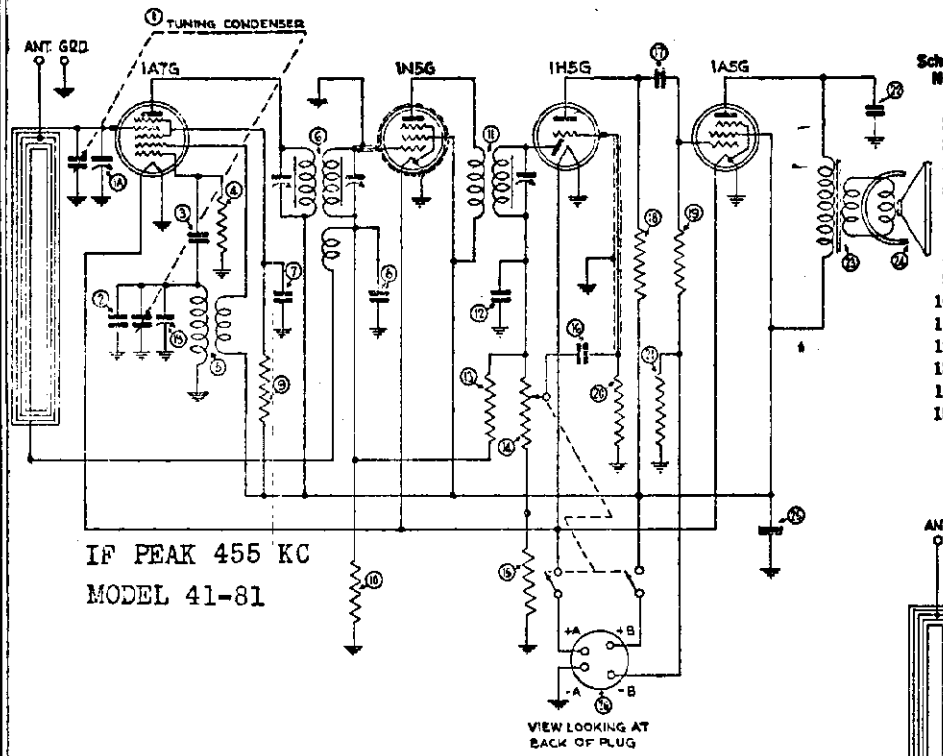
Note 3.—Turn condenser rotor plates completely out of mesh as far as they will go.

Note 4.—Adjust (5) for *minimum* output signal.

Note 5.—Connect antenna lead, Part No. 95-0185, to antenna receptacle in radio. Connect a 10 mmf condenser in series between signal generator and antenna lead.

Note 6.—When antenna stage adjustment is made with radio installed in car, the radio antenna lead must be connected to car antenna in usual manner.



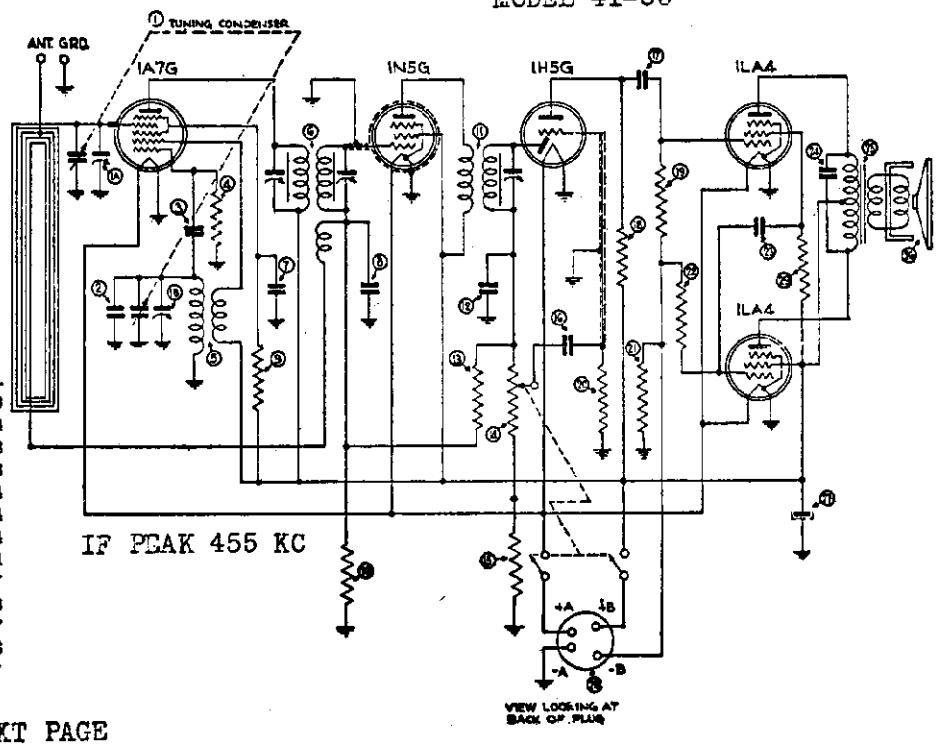


IF PEAK 455 KC
MODEL 41-81

REPLACEMENT PARTS
PHILCO MODEL 41-81

Schem. No.	Description	Philco Part No.
1	Tuning Condenser	31-2455
2	Mica Condenser (10 mmf.)	60-010157
3	Mica Condenser (110 mmf.)	60-111157
4	Resistor (220,000 ohms ¼ watt)	33-422154
5	Oscillator Transformer	32-3425
6	1st I.F. Transformer	32-3265
7	Tubular Condenser (.01 mf. 400v)	30-4572
8	Tubular Condenser (.05 mf. 200v)	30-4519
9	Resistor (33,000 ohms ¼ watt)	33-333154
10	Resistor (4.7 megs. ¼ watt)	33-547154
11	2nd I.F. Transformer	32-3266
12	Mica Condenser (250 mmf.)	60-125157
13	Resistor (10 megs. ¼ watt)	33-610154
14	Volume Control (1 meg.)	33-5389
15	Resistor (6800 ohms ½ watt)	33-268344
16	Tubular Condenser (.004 mf. 400v)	30-4578
17	Tubular Condenser (.004 mf. 400v)	30-4578
18	Resistor (2.2 meg. ¼ watt)	33-522154
19	Resistor (2.2 meg. ¼ watt)	33-522154
20	Resistor (4.7 meg. ¼ watt)	33-547154
21	Resistor (560 ohms ½ watt)	33-156321
22	Resistor (2.2 meg. ¼ watt)	33-522154
23	Tubular Condenser (.01 mf. 400v)	30-4572
24	Mica Condenser (.0005 mf.)	60-150157
25	Output Transformer	32-8107
26	Speaker	36-1481 "C"
27	Electrolytic Condenser (10 mf. 150v)	30-2396
28	Battery Cable	41-3487
29	Resistor (10,000 ohms ¼ watt)	33-310154

MODEL 41-83

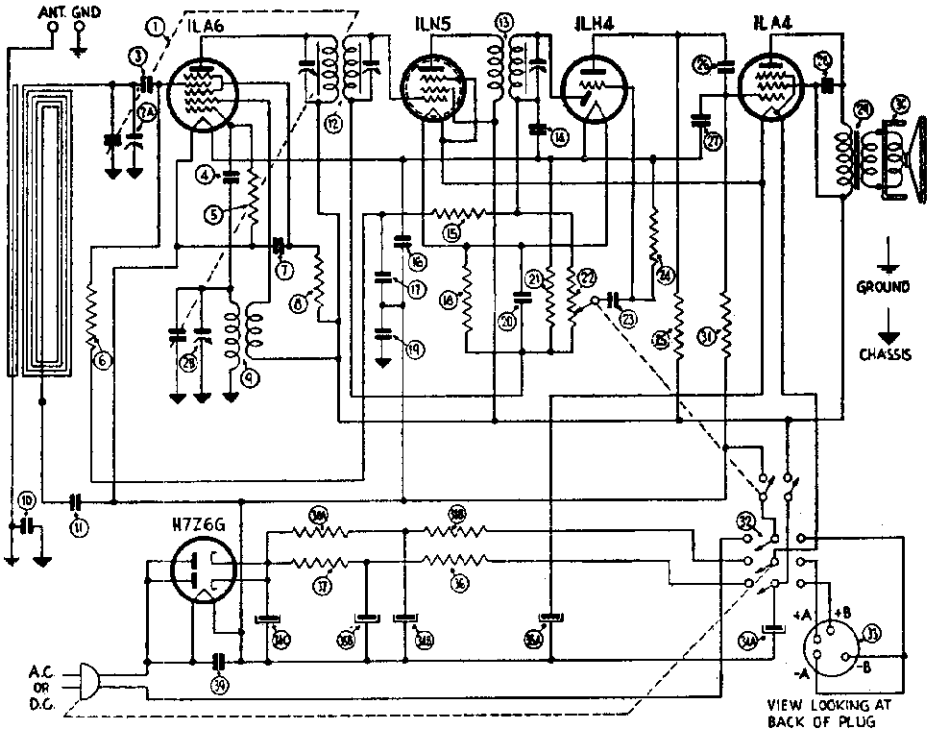


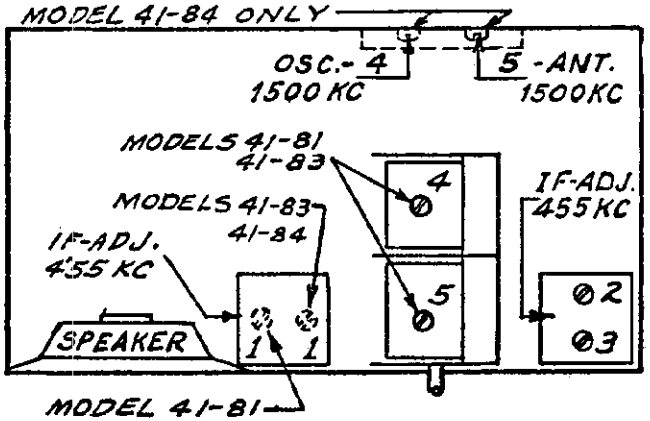
IF PEAK 455 KC

REPLACEMENT PARTS
PHILCO MODEL 41-83

Schem. No.	Description	Philco Part No.
1	Tuning Condenser	31-2455
2	Mica Condenser	60-010157
3	Mica Condenser	60-111157
4	Resistor (220,000 ohms ¼ watt)	33-422154
5	Oscillator Transformer	32-3425
6	1st I.F. Transformer	32-3265
7	Tubular Condenser (.01 mf. 400v)	30-4572
8	Tubular Condenser (.05 mf. 200v)	30-4519
9	Resistor (33,000 ohms ¼ watt)	33-333154
10	Resistor (4.7 megs. ¼ watt)	33-547154
11	2nd I.F. Transformer	32-3266
12	Mica Condenser (250 mmf.)	60-125157
13	Resistor (10 megs. ¼ watt)	33-610154
14	Volume Control (1 meg.)	33-5389
15	Resistor (6800 ohms ½ watt)	33-268344
16	Tubular Condenser (.004 mf. 400v)	30-4578
17	Tubular Condenser (.004 mf. 400v)	30-4578
18	Resistor (2.2 meg. ¼ watt)	33-522154
19	Resistor (2.2 meg. ¼ watt)	33-522154
20	Resistor (4.7 meg. ¼ watt)	33-547154
21	Resistor (680 ohms ½ watt)	33-168321
22	Mica Condenser (680 mmf.)	60-166157
23	Output Transformer	32-8063
24	Speaker	36-1481 "C"
25	Electrolytic Condenser (10 mf. 150v)	30-2396
26	Battery Cable	41-3487

FOR OTHER DATA SEE NEXT PAGE





REPLACEMENT PARTS
PHILCO MODEL 41-84

Schem. No.	Description	Philco Part No.
1	Tuning Condenser	31-2433
2	Padder	31-6346
3	Mica Condenser (110 mmf.)	60-111157
4	Mica Condenser (110 mmf.)	60-111157
5	Resistor (220,000 ohms ¼ watt)	33-422154
6	Resistor (1 meg. ¼ watt)	33-510154
7	Tubular Condenser (.05 mf. 400 V)	30-4518
8	Resistor (3300 ohms ¼ watt)	33-333154
9	Oscillator Transformer	32-3424
10	Tubular Condenser (.0015 mf. 200 V.)	30-4555
11	Tubular Condenser (.1 mf. 400 V)	30-4455
12	1st I. F. Transformer	32-3384
13	2nd I. F. Transformer	32-3266
14	Mica Condenser (110 mmf.)	30-111157
15	Resistor (4.7 meg. ¼ watt)	33-547154
16	Tubular Condenser (.1 mf. 400 V.)	30-4455
17	Tubular Condenser (.05 mf. 400 V)	30-4519
18	Resistor (3300 ohms ½ watt)	33-233334
19	Tubular Condenser (.25 mf. 400 V)	30-4604
20	Tubular Condenser (.01 mf. 400 V)	30-4572
21	Resistor (3300 ohms ½ watt)	33-233334

Schem. No.	Description	Philco Part No.
22	Volume Control (1 meg.)	33-5390
23	Tubular Condenser (.01 mf. 400 V)	30-4572
24	Resistor (4.7 meg. ¼ watt)	33-547154
25	Resistor (1 meg. ¼ watt)	33-510154
26	Tubular Condenser (.01 mf. 400 V)	30-4572
27	Mica Condenser (110 mmf.)	60-111154
28	Mica Condenser (660 mmf.)	60-166127
29	Output Transformer	32-3100
30	Speaker	36-1508
31	Resistor (2.2 meg. ¼ watt)	33-522154
32	Automatic Switch	42-1553
33	Battery Cable	41-3528
34	Electrolytic Condenser (20 mf. 10 mf. 10 mf. 150 V)	30-2452
35	Electrolytic Condenser (20 mf. 25 V 10 mf. 150 V)	30-2453
36	Resistor (1500 ohms ½ watt)	33-215334
37	Resistor (1500 ohms ½ watt)	33-215334
38	Filament Resistors (1500 ohms 1000 ohms)	33-3387
39	Tubular Condenser (.05 mf. 400 V)	30-4518

MODELS 41-81, 41-83, 41-84,

Signal Generator Connection	Dummy Antenna	Signal Generator Frequency	Receiver Wave-band Switch	Receiver Dial Setting	Trimmer Number
Control grid of 1A7G	0.1 mf	455 kc	...	Tuning-cond.[1] fully closed	1
"	"	"		"	2
"	"	"	...	"	3
..... Note 2		1500 kc	...	1500 kc	4
"		"	...	"	5

Note 1.—DIAL CALIBRATION: With tuning-condenser at maximum-capacity position (fully closed), set tuning pointer on small dot at low-frequency end of scale.

Note 2.—Construct loop aerial of several turns of wire, and connect to signal-generator output terminals—place near receiver loop.

MODEL 41-85

PHILCO RADIO & TELEVISION CORP.

MODELS 41-85

Signal Generator Connection	Dummy Antenna	Signal Generator Frequency	Receiver Wave-band Switch	Receiver Dial Setting	Trimmer Number
Note 1	0.1 mf	455 kc	B.C.	540 [2]	1
"	"	"	"	"	2
"	"	"	"	"	3
..... Note 3		1500 kc	"	1500 kc	Note 4
"		"	"	"	Note 5
"		580 kc	"	580 kc	6[6], *
"		1500 kc	"	1500 kc	Note 4
"		"	"	"	Note 5
"		6 mc	S.W.	6 mc	7[7], *
"		15 mc	"	15 mc	8[8]
"		"	"	14.090 mc	Image check
"		"	"	15 mc	9

Note 1.—When adjusting i-f trimmers, the high side of signal-generator is connected through 0.1 mf condenser to loop-section stator lug of tuning-condenser.

Note 2.—DIAL CALIBRATION: With tuning-condenser fully closed (maximum capacity), set dial pointer on small dot below 550 kc.

Note 3.—When aligning r-f trimmers, a loop antenna is made from a few turns of wire and connected to signal-generator output terminals; this loop being placed a few feet from receiver loop.

Note 4.—Trimmer (4) on *Model 41-85* or (5) on *Model 41-851*.

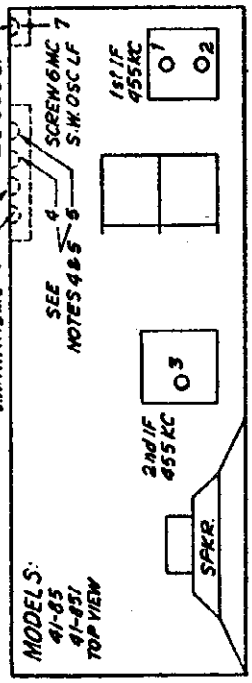
Note 4.—Trimmer (5) on *Model 41-85* or (4) on *Model 41-851*.

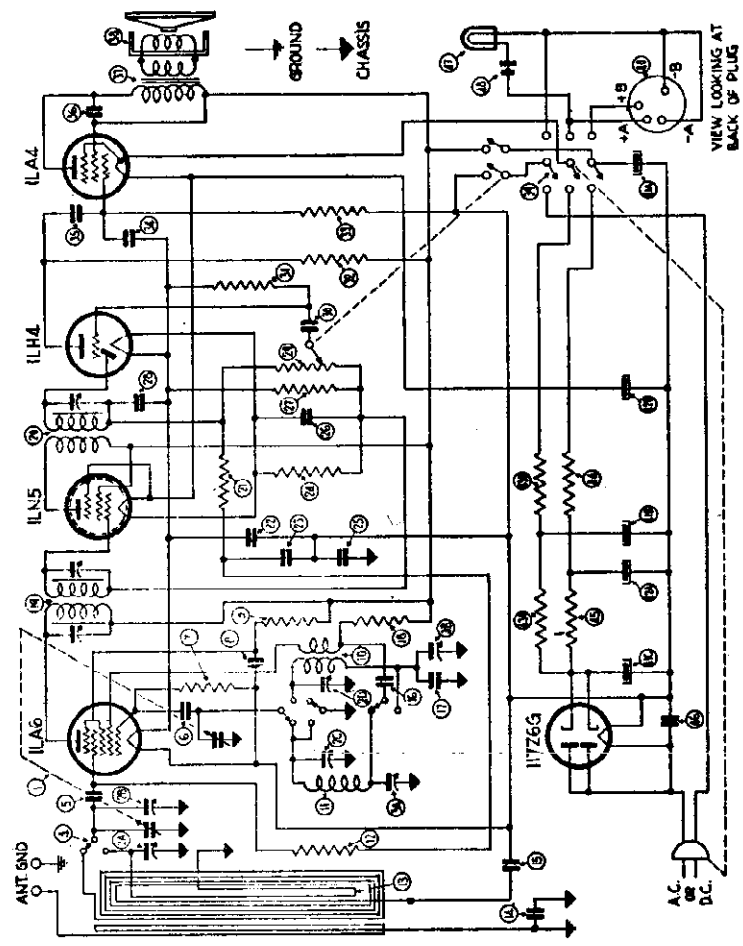
Note 6.—Trimmer (6) is nut adjustment.

Note 7.—Trimmer (7) is screw adjustment.

Note 8.—Adjust to maximum on fundamental-signal peak.

* While rocking.

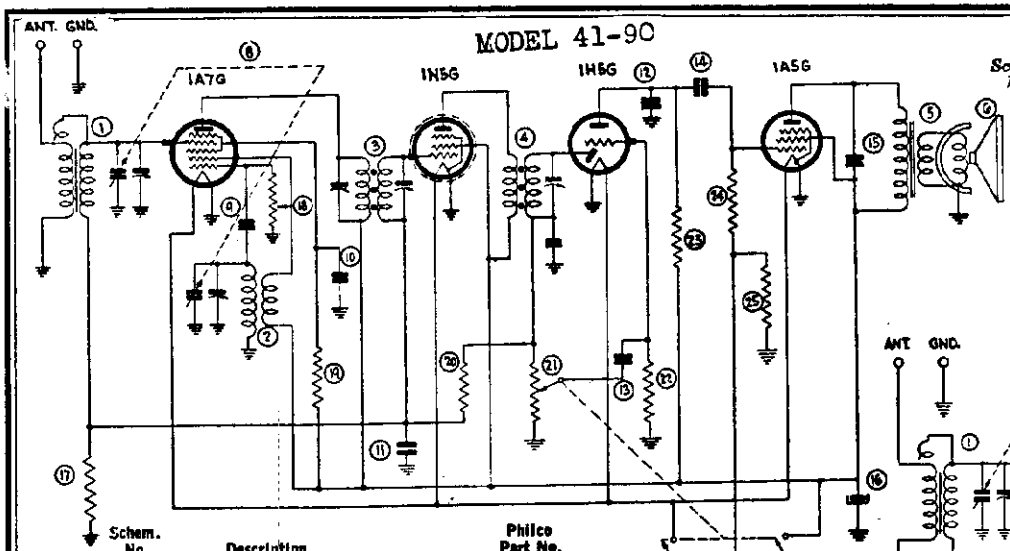




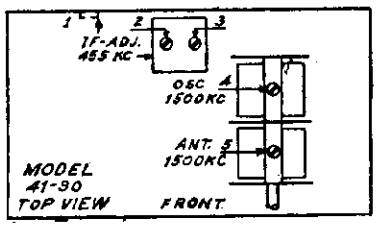
IF PEAK 455 KC REPLACEMENT PARTS
PHILCO MODEL 41-85

Schem. No.	Description	Philco Part No.	Schem. No.	Description	Philco Part No.
1	Tuning Condenser	31-2459	26	Tubular Condenser (.01 mf., 400 V.)	30-4572
2	Padder	31-6347	27	Resistor (3300 ohms, ½ watt)	33-233334
3	Padder	31-6100	28	Mica Condenser (250 mmf.)	60-125157
4	Wave Switch	42-1570	29	Volume Control (1 meg.)	33-5390
5	Mica Condenser (110 mmf.)	60-111157	30	Tubular Condenser (.01 mf., 400 V.)	30-4572
6	Mica Condenser (110 mmf.)	60-111157	31	Resistor (4.7 meg., ½ watt)	33-547154
-	Resistor (220,000 ohms, ¼ watt)	33-422154	32	Resistor (1 meg., ½ watt)	33-510154
8	Tubular Condenser (.05 mf., 400 V.)	30-4518	33	Resistor (2.2 meg., ½ watt)	33-522154
9	Resistor (33,000 ohms, ½ watt)	33-333154	34	Mica Condenser (110 mmf.)	60-111157
10	S. W. Oscillator Transformer	32-3432	35	Tubular Condenser (.01 mf., 400 V.)	30-4572
11	B. C. Oscillator Transformer	32-3431	36	Mica Condenser (660 mmf.)	60-166127
12	Resistor (1 meg., ½ watt)	33-510154	37	Output Transformer	32-8100
13	S. W. Loop	76-1042	38	Speaker	36-1506
14	Tubular Condenser (.0015 mf., 200 V.)	30-4555	39	Automatic Switch	42-1553
15	Tubular Condenser (.1 mf., 400 V.)	30-4455	40	Battery Cable	41-3326
16	Mica Condenser (500 mmf.)	60-150137	41	Electrolytic Condenser (20 mf., 10 mf., 10 mf., 150 V.)	30-2452
17	Mica Condenser (3000 mmf.)	60-230334	42	Electrolytic Condenser (10 mf., 150 V., 20 mf., 25 V.)	30-2453
18	Resistor (4700 ohms, ½ watt)	33-247344	43	Filament Resistor (1000 ohms, 1500 ohms)	33-3387
19	1st I. F. Transformer	32-3384	44	Resistor (1500 ohms, ½ watt)	33-215334
20	2nd I. F. Transformer	32-3386	45	Resistor (1500 ohms, ½ watt)	33-215334
21	Resistor (4.7 meg., ½ watt)	33-547154	46	Tubular Condenser (.05 mf., 400 V.)	30-4518
22	Tubular Condenser (.1 mf., 400 V.)	30-4455	47	Pilot Lamp	76-1074
23	Tubular Condenser (.05 mf., 400 V.)	30-4518			
24	Resistor (3300 ohms, ½ watt)	33-233334			
25	Tubular Condenser (.25 mf., 400 V.)	30-4604			

MODEL 41-90

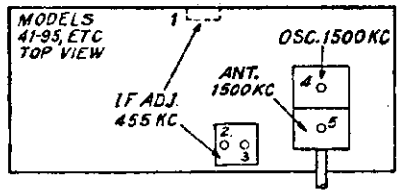


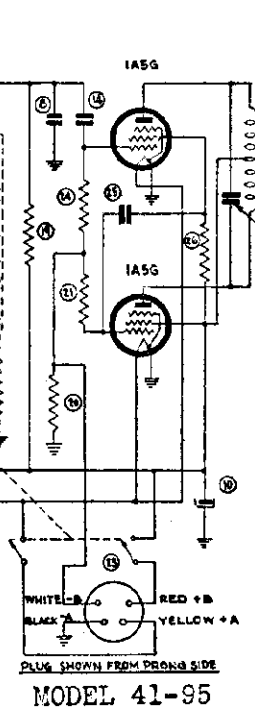
Schem. No.	Description	Philco Part No.
1	Antenna Transformer	32-3490
2	Oscillator Transformer	32-3491
3	First I.F. Transformer	32-3492
4	Second I.F. Transformer	32-3199
5	Output Transformer	32-8100
6	Speaker	36-1507
7	Battery Cable	41-3505
8	Tuning Condenser	31-2485
9	Moulded Mica Condenser (100 mmf.)	60-110157
10	Tubular Condenser (.05 mf. 200 V)	30-4519
11	Tubular Condenser (.05 mf. 200 V)	30-4519
12	Moulded Mica Condenser (100 mmf.)	60-110157
13	Tubular Condenser (.004 mf. 400 V)	30-4578
14	Tubular Condenser (.01 mf. 400 V)	30-4572
15	Moulded Mica Condenser (500 mmf.)	60-150157
16	Electrolytic Condenser (10 mf. 150 V)	30-2396
17	Resistor (4.7 meg. ¼ watt)	33-547154
18	Resistor (220,000 ohms ¼ watt)	33-422154
19	Resistor (68,000 ohms ¼ watt)	33-368154
20	Resistor (10 meg. ¼ watt)	33-610154
21	Volume Control and "On-Off" Switch	33-5407
22	Resistor (4.7 meg. ¼ watt)	33-547154
23	Resistor (1.0 meg. ¼ watt)	33-510154
24	Resistor (2.2 meg. ¼ watt)	33-522154
25	Resistor (1000 ohms ½ watt)	33-210336



Signal Generator Connection	Dummy Antenna	Signal Generator Frequency	Receiver Wave-band Switch	Receiver Dial Setting	Trimmer Number
Control grid of 1A7G	0.1 mf	455 kc	...	540 kc [1]	1
"	"	"	...	"	2
"	"	"	...	"	3
Ant. term.	225 mmf	1500 kc	...	1500 kc	4
"	"	"	...	"	5

Note 1.—DIAL CALIBRATION: With tuning-condenser in closed position (maximum capacity) set dial pointer on small dash below 540 kc.



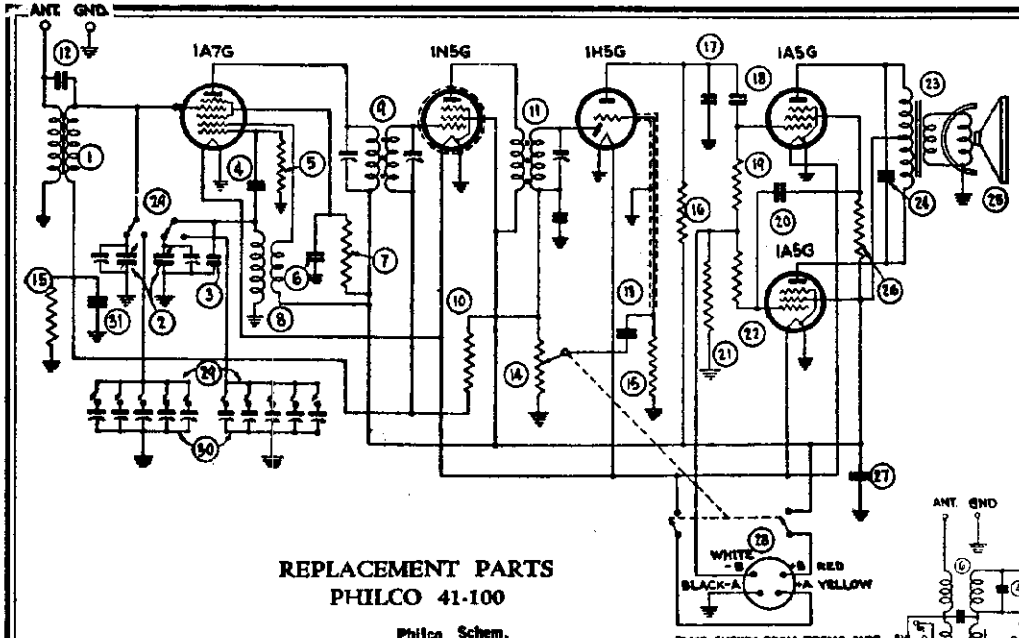


MODEL 41-95

MODELS 41-95, 41-100

Signal Generator Connection	Dummy Antenna	Signal Generator Frequency	Receiver Wave-band Switch	Receiver Dial Setting	Trimmer Number
Control grid of 1A7G	0.1 mf	455 kc	...	540 kc [1]	1
"	"	"	...	"	2
"	"	"	...	"	3
Ant. term.	225 mmf	1500 kc	...	1500 kc	4
"	"	"	...	"	5

Note 1.—DIAL CALIBRATION: With tuning-condenser in closed position (maximum capacity) set dial pointer on small dash below 540 kc.



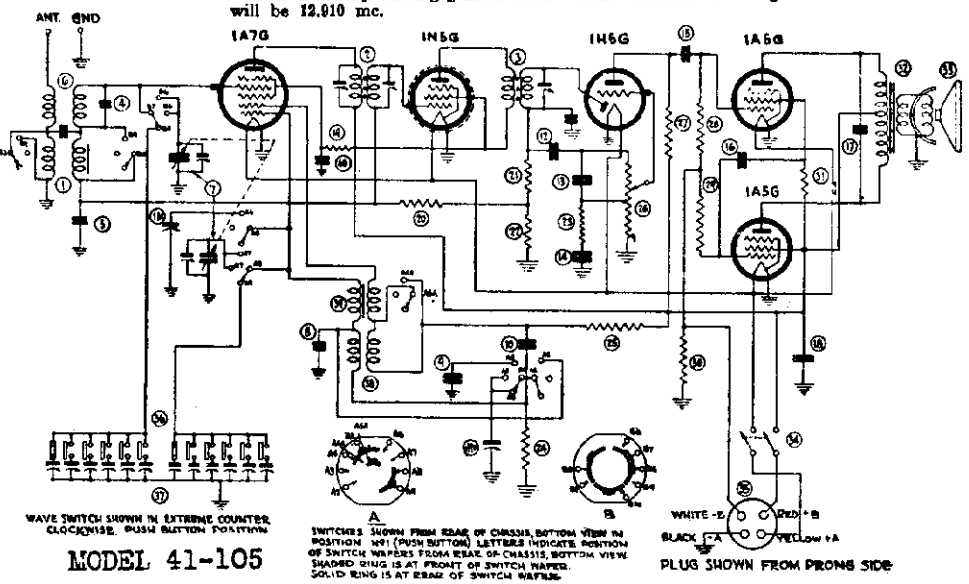
MODEL 41-105

Signal Generator Connection	Dummy Antenna	Signal Generator Frequency	Receiver Wave-band Switch	Receiver Dial Setting	Trimmer Number
Control grid of 1A7G	0.1 mf	455 kc	B.C.	540 kc [1]	1
"	"	"	"	"	2
"	"	"	"	"	3
Ant. term.	225 mmf	1500 kc	"	1500 kc	4
"	"	"	"	"	5
"	"	580 kc	"	580 kc	6 *
"	"	1500 kc	"	1500 kc	4
"	"	"	"	"	5
"	400 ohms	12 mc	S.W.	12 mc	7 [2]
"	"	12.910 mc	"	"	Image check

* While rocking.

Note 1.—DIAL CALIBRATION: With tuning-condenser in closed position (maximum capacity) set dial pointer on small dash below 540 kc.

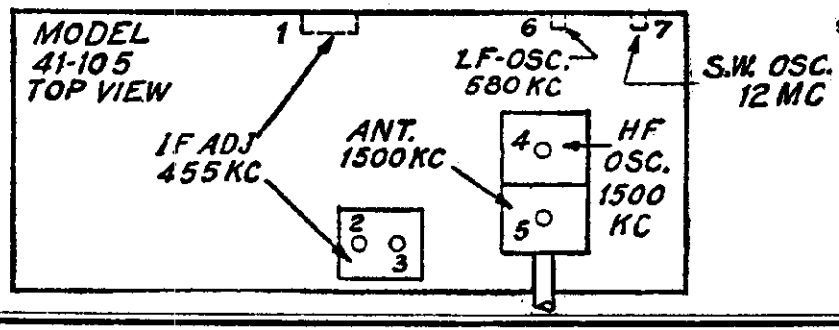
Note 2.—When adjusting trimmer (7) be sure to tune in fundamental signal (12 mc) instead of image signal. If trimmer is correctly adjusted, the image will be found by turning generator 910 kc above fundamental signal which will be 12.910 mc.



MODEL 41-105

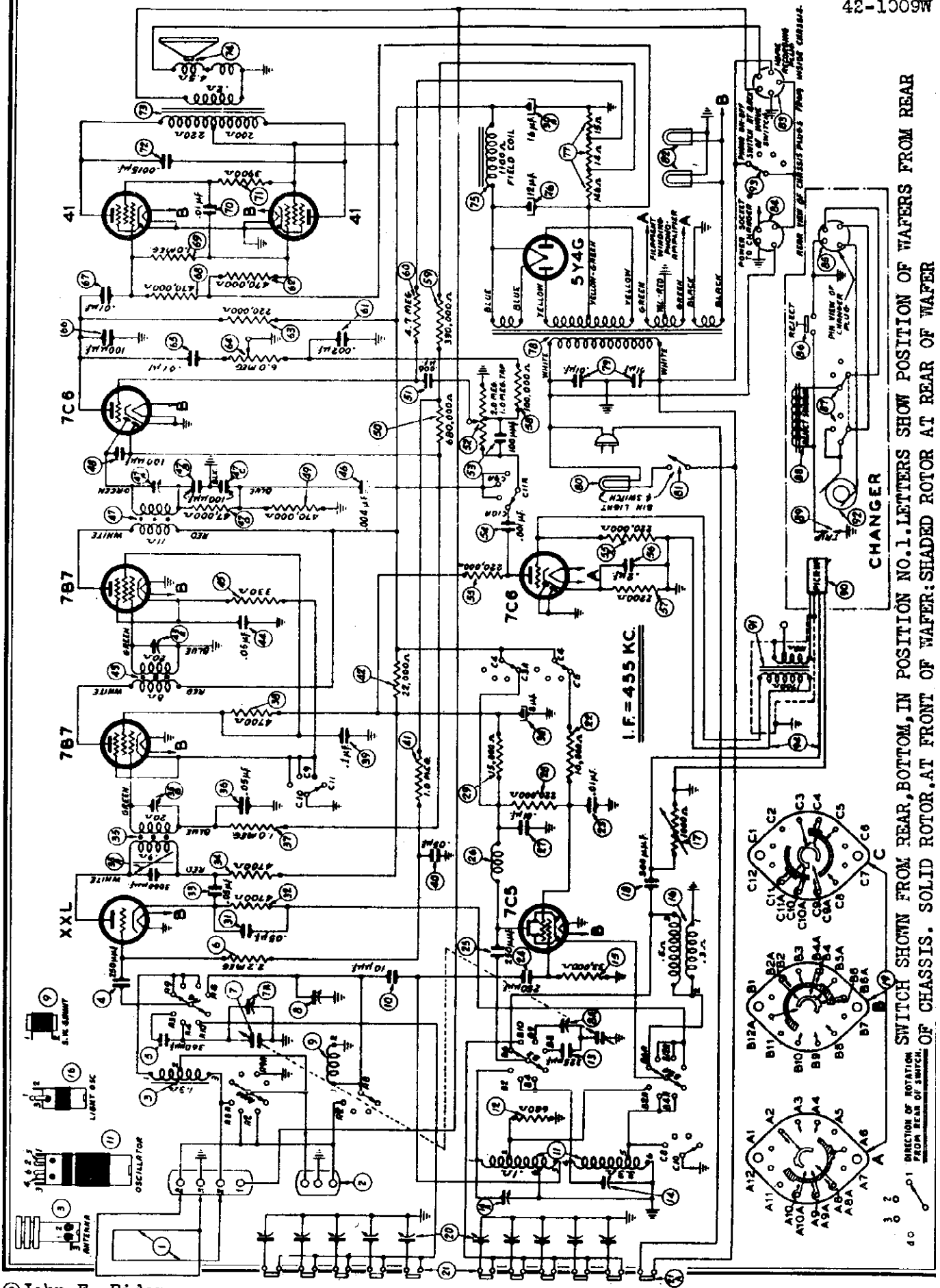
REPLACEMENT PARTS
PHILCO 41-100

	Description	Philco Part No.
1	Antenna Transformer	32-3248
2	Tuning Condenser	31-2461
3	Silver Mica Condenser	30-1113
4	Molded Mica Condenser (100 mmf.)	60-110157
5	Resistor (220,000 ohms ¼ watt)	33-422154
6	Tubular Condenser (.05 mf. 200 V)	30-4444
7	Resistor (68,000 ohms ¼ watt)	33-368154
8	Oscillator Transformer	32-3214
9	1st I. F. Transformer	32-3198
10	Resistor (10 Meg. ¼ watt)	33-610154
11	2nd I. F. Transformer	32-3199
12	Molded Mica Condenser (5 mmf. Included in Ant. Trans. Assy.)	
13	Tubular Condenser (.004 mf. 400 V)	30-4578
14	Volume Control (1 Meg. & DPST Switch)	33-5398
15	Resistor (4.7 Meg. ¼ watt)	33-547154
16	Resistor (1 Meg. ¼ watt)	33-510154
17	Molded Mica Condenser (100 mmf.)	60-110157
18	Tubular Condenser (.01 mf., 400 V)	30-4572
19	Resistor (2.2 Meg. ¼ watt)	33-522154
20	Tubular Condenser (.01 mf. 400 V)	30-4572
21	Resistor (680 ohms ½ watt)	33-168326
22	Resistor (2.2 Meg. ¼ watt)	33-522154
23	Output Transformer	32-8107
24	Molded Mica Cond. (250 mmf.)	60-125157
25	5" Speaker for Compact	36-1507
	8" Speaker for Console	36-1488
26	Resistor (10,000 ohms ¼ watt)	33-310154
27	Electrolytic Condenser (10 mf. 150 V)	30-2396
28	Battery Cable	41-3505
29	Push Button Switch	42-1528
30	Push Button Padder Strip	31-6349
31	Tubular Condenser (.05 mf. 200 V)	30-4519



Schem. No.	Description	Philco Part No.
1.	Broadcast Antenna Transformer	32-3468
2.	1st I.F. Transformer	32-3198
3.	2nd I.F. Transformer	32-3199
4.	Moulded Mica Condenser (130 mmf.)	60-113117
5.	Tubular Condenser (.05 mf., 200 v.)	30-4519
6.	Short Wave Ant. Trans.	32-3471
7.	Tuning Condenser	31-2474
8.	Moulded Mica Condenser (20 mmf.)	60-020127
9.	Moulded Mica Condenser (4500 mmf.)	60-245124
10.	Moulded Mica Condenser (500 mmf.)	60-150157
11.	Dual Padding Condenser	31-6353
12.	Tubular Condenser (.02 mf., 400 v.)	30-4516
13.	Moulded Mica Condenser (250 mmf.)	60-125157
14.	Tubular Condenser (1003 mf., 1000 v.)	30-4469
15.	Tubular Condenser (.01 mf., 400 v.)	30-4572
16.	Tubular Condenser (.01 mf., 400 v.)	30-4572
17.	Moulded Mica Condenser (730 mmf.)	60-173127
18.	Electrolytic Condenser (10 mf., 150 v.)	30-2396
19.	Resistor (68,000 ohms, ¼ watt)	33-368154
20.	Resistor (2.2 meg., ¼ watt)	33-522154
21.	Resistor (330,000 ohms, ¼ watt)	33-433154
22.	Resistor (150,000 ohms, ¼ watt)	33-415154
23.	Resistor (47,000 ohms, ¼ watt)	33-347154
24.	Resistor (220,000 ohms, ¼ watt)	33-422154
25.	Resistor (10,000 ohms, ¼ watt)	33-310154
26.	Volume Control (2 meg., tap at 1 meg.)	33-5402
27.	Resistor (1 meg., ¼ watt)	33-510154
28.	Resistor (2.2 meg., ¼ watt)	33-522154
29.	Resistor (2.2 meg., ¼ watt)	33-522154
30.	Resistor (560 ohms, ½ watt)	33-156326
31.	Resistor (10,000 ohms, ¼ watt)	33-310154

PHILCO RADIO & TELEVISION CORP. MODELS 42-1008, 42-1009X, 42-1009W



REPLACEMENT PARTS — MODELS 42-1008, 42-1009

Schem. No.	Description	Part No.
	Loop Aerial (42-1008)	76-1345
	Loop Aerial (42-1009)	76-1397
	Sleeve (Loop Mtg.)	28-3806
	Spring Washer (Loop Mtg.)	28-4186
	Washer (Loop Mtg.)	W-151
	Washer (Loop Mtg.)	W-425
	Screw (Loop Mtg.)	W-722
	Terminal Panel	38-9870
2.	External Aerial Socket	27-6145
3	Aerial Transformer (Broadcast)	32-3784
	Mtg. Clip	28-5002
4.	Mica Condenser (250 mmfd.)	60-125157
5.	Mica Condenser (360 mmfd.)	30-1211
6.	Resistor (2.2 megohms)	33-522339
7.	Tuning Condenser	31-2482
	Drive Cord (Pointer)	31-2502
	Spring	28-8913
	Drive Drum	38-9856
	Mtg. Sleeve	28-5665
	Mtg. Screw (Tuning Cond.)	W-2002
	Tuning Shaft	31-2589
	Spring Washer	56-4659
	"C" Washer	28-2043
8.	Compensator (Aerial—SW)	31-6401
8A.	Compensator (Oscillator—580 K.C.) Part of 8	
9.	Aerial Transformer (S.W.——)	32-3786
10.	Mica Condenser (10 mmfd.)	60-010137
11.	Oscillator Transformer (Brdcst.-S.W.)	32-3782
	Mtg. Clip	28-5003
12.	Resistor (680 ohms)	33-168336
13.	Mica Condenser (325 mmfd.)	30-1212
14.	Compensator (Broadcast Oscillator)	31-6448
14A.	Compensator (S.W. Oscillator) Part of 14	
15.	Resistor (33,000 ohms)	33-333339
16.	Light-Beam Oscillator Transformer	32-3785
	Mtg. Clip	28-5002
17.	Light-Beam Oscillator Control	33-5435
18.	Mica Condenser (300 mmfd.)	60-130127
19.	Band Switch	42-1688
	Mtg. Nut	W-2157
	Drive Cord (Indicator)	31-2590
	Spring	28-8953
20.	Push-Button Compensator Assembly	31-6446
21.	Push-Button and Power Switch Assem.	42-1693
21A.	Push-Button Power Switch (Part of 21)	42-1714
	Mtg. Sleeve	56-1505
	Mtg. Screw	W-523
22.	Resistor (10,000 ohms)	33-310339
23.	Condenser (.01 mfd., 400 volts)	30-4572
24.	Mica Condenser (250 mmfd.)	60-125157
25.	Mica Condenser (250 mmfd.)	60-125157
26.	Oscillator Plate Choke	32-3615
27.	Condenser (.01 mfd., 400 volts)	30-4572
28.	Resistor (220,000 ohms)	33-422339
29.	Resistor (15,000 ohms)	33-315339
30.	Electrolytic Condenser (8-16 mfd.)	30-2480
30A.	Electrolytic Condenser (16 mfd.) (Part of 30)	
	Mtg. Clamp	56-1848
31.	Condenser (.05 mfd., 200 volts)	30-4519
32.	Resistor (4700 ohms)	33-247339
33.	Condenser (.05 mfd., 400 volts)	30-4518
34.	Resistor (4700 ohms)	33-247339
35.	1st I. F. Transformer	32-3623
	Mtg. Nut	W-1948
35A.	Primary Compensator (Iron Core) (Part of 35)	
35B.	Secondary Compensator (Part of 35)	
35C.	Condenser (3000 mmfd.) (Part of 35)	
36.	Condenser (.05 mfd., 200 volts)	30-4518
37.	Resistor (1 megohm)	33-510339
38.	Resistor (4700 ohms)	33-247339
39.	Condenser (.1 mfd., 400 volts)	30-4527
40.	Condenser (.05 mfd., 200 volts)	30-4519

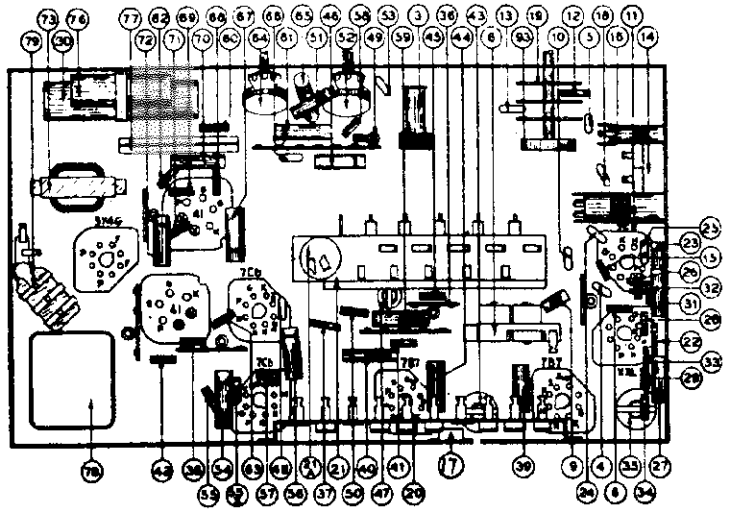


Fig. 2. Locations of Parts—Under Chassis Model 42-1008, 42-1009

41.	Resistor (1 megohm)	33-510339
42.	Resistor (22,000 ohms, 1 watt)	63-322439
43.	2nd I. F. Transformer	32-3466
	Mtg. Nut	W-1949
43A.	Secondary Compensator (Part of 43)	
44.	Condenser (.05 mfd., 200 volts)	30-4519
45.	Resistor (330 ohms)	33-133336
46.	Condenser (.004 mfd., 600 volts)	30-4523
47.	3rd I. F. Transformer	32-3625
	Mtg. Nut	W-1949
47A.	Secondary Compensator (Part of 47)	
47B.	Condenser (100 mmfd.) (Part of 47)	
47C.	Condenser (100 mmfd.) (Part of 47)	
47D.	Resistor (47,000 ohms)	33-347339
48.	Condenser (100 mmfd.)	60-110157
49.	Resistor (470,000 ohms)	33-447339
50.	Resistor (680,000 ohms)	33-468339
51.	Condenser (.006 mfd., 400 volts)	30-4591
52.	Volume Control	33-5468
	Mtg. Nut	W-2157
53.	Mica Condenser (100 mmfd.)	60-110157
54.	Condenser (.001 mfd. 600 volts)	30-4620
55.	Resistor (220,000 ohms)	33-422339
55X.	Resistor (220,000 ohms)	33-422339
56.	Condenser (.2 mfd., 200 volts)	30-4587
57.	Resistor (2200 ohms)	33-222339
58.	Resistor (100,000 ohms)	33-410339
59.	Resistor (330,000 ohms)	33-433339
60.	Resistor (4.7 megohms)	33-547339
61.	Condenser (.002 mfd., 600 volts)	30-4622
62.	Resistor (470,000 ohms)	33-447339
63.	Resistor (220,000 ohms)	33-422339
64.	Tone Control	33-5467
	Mtg. Nut	W-2157
65.	Condenser (.004 mfd., 600 volts)	30-4623
66.	Mica Condenser (100 mmfd.)	60-110157
67.	Condenser (.01 mfd., 400 volts)	30-4572
68.	Resistor (470,000 ohms)	33-447339
69.	Resistor (1 megohm)	33-510339
70.	Condenser (.01 mfd., 400 volts)	30-4572
71.	Resistor (3900 ohms)	33-239339
72.	Condenser (.0015 mfd., 1000 volts)	30-4616
73.	Output Transformer	32-8133
74.	Speaker	36-1528-4
	Speaker	36-1528-9
	Cone Assembly (Speaker 36-1528-4)	36-4176
	Cone Assembly (Speaker 36-1528-9)	36-4203
	Speaker Cable	41-3593
	Rubber Grommet (Mtg. Speaker)	27-4596
	Mtg. Nut	W-124
	Washer	28-3320
	Sleeve	56-2044
75.	Field Coil (Replace Speaker 36-1528)	
76.	Electrolyte Condenser (12 mfd., 475 v.)	30-2481
77.	Bias Resistor (14, 15, 146 ohms)	33-3395
78.	Power Transformer (115 v., 60 cycles)	32-8128
79.	Line Filter Condenser (.01-01 mfd.)	3903-ODG
80.	Record Changer Compartment Light Cable and Socket Assembly	34-2484 41-3627
81.	Compartment Light Switch & Cable	76-1363
82.	Pilot Lamp (Dial)	34-2218
	Socket Assembly (Dial Light)	38-9607
	Pilot Lamp (Band Indicator)	34-2064
	Socket Assembly (Band Indicator)	76-1212
83.	Socket (Home Recording, on Chassis)	27-6179
84.	Changer Power Socket (on Chassis)	27-6182
85.	Power Cable & Plug (Record Changer)	35-2548
86.	Reject Button (Record Changer)	35-2545
87.	Selector Switch (OFF-Automatic-Manual-Record Changer)	35-2547
88.	Reject Solenoid	35-2549
89.	Electric Reject Trip (on Changer)	
90.	Light Beam Reproducer	35-2518
91.	Phonograph Input Transformer	32-8196
	Pulsating Lever Assembly	35-2550
	Trip Switch and Tone Arm Position Lever Assembly	35-2551
92.	Motor (Record Changer, 115 v., 60 cy.)	35-2552

MISCELLANEOUS PARTS

Models 42-1008, 42-1009

Automatic Record Changer, Complete	35-1285
Cabinet (42-1008)	10577-A
Cabinet (Walnut—42-1009)	10555-A
Cabinet (Mahogany—42-1009)	10555-B
Cable (Power)	L-3245
Dial	27-5752
Dial Background Card	27-9880
Dial Pointer	56-1516
Mtg. Clamp	56-1517
Mtg. Spring (Background Card)	28-8908
Mtg. Screw (Dial Clamp)	W-1974
Escutcheon (Push-Buttons)	56-2316
Screw (Mtg. Escutcheon)	W-2073
Knob (Tuning-Volume-Tone) (42-1008, 42-1009-W)	54-4185
Knob (Push-Buttons) (42-1008, 42-1009-W)	54-4186
Knob (Tuning-Volume-Tone) (42-1009-M)	54-4154
Knob (Push-Button—42-1009-M)	54-4175
Rubber Grommet (Mtg. Chassis)	27-4571
Socket (Rubber—7C5 Tube)	27-6129
Socket (Loktal Tubes)	27-6158
Socket (41 Tubes)	27-6168
Socket (6X5G Tube)	27-6173
Mtg. Eyelet	W-1658
Socket Assembly (P. B. Indication)	38-9607
Socket Assembly (Pilot Light)	76-1212
Screw (Mtg. Chassis)	W-1345
Tab Kit	40-6660
Tab (OFF-ON)	27-5738
Tab (Television)	27-5778
Tab Cover	27-5737
Washer (Chassis Mtg.)	28-5114
Wiring Panel (3 lug)	38-8369
Wiring Panel (4 lug)	38-9117
Wiring Panel (9 lug)	38-9433
Wiring Panel (5 lug)	38-9579
Wiring Panel (4 lug)	38-9699
Wiring Panel (7 lug)	76-1322

D.C. indicated at the tube elements in the diagram were measured with a 1000 ohms per voltmeter, Philco Model 027, using the 300-volt scale line voltage 117 volts A.C. no signal being received-range switch broadcast.

Tube	Location	Radio Position D.C. Voltage	Phono. Position D.C. Voltage
7C5 Osc.	Plate	50	200
7C5 Osc.	Screen	8	110
7C5 Osc.	Bias (Grid Leak)	3	2½
XXL 1st Det.	Plate	80	180
XXL 1st Det.	Bias (Cathode)	2	19

Tube	Location	Radio Position D.C. Voltage	Phono Position D.C. Voltage
787 1st & 2nd I.F.	Plate	215	190
	Screen	75	175
787 2nd I.F.	Bias (Cathode)	2½	45
7C6 2nd Det. 1st Audio	Plate	95	90

Tube	Location	Radio Position D.C. Voltage	Phono. Position D.C. Voltage
7C6 Preamp.	Plate	35	65
41 Output (Phase inverter)	Plate	210	190
	Screen	200	180
41 Output	Plate	210	190
	Screen	215	195

Location	Radio Position D.C. Voltage	Phono. Position D.C. Voltage
12 mf. elect. to ground	300	290
16 mf. elect. to ground	215	195
8 mf. elect. to ground	85	180

* Condenser changed to .01 mfd., part No. 30-4572 in run 2nd chassis.

† Two types of speakers are used on these models. These speakers are interchangeable and will have the same part number, with the exception of a suffix number -4, -9 added to the part number. The cone assemblies, however, of these speakers are not interchangeable.

PHILCO RADIO & TELEVISION CORP. MODELS 42-1008, 42-1009M 42-1009W

ALIGNING R. F. AND I. F. COMPENSATORS

MODEL 42-1008, CODE 121; 42-1009W, AND 42-1009M, CODE 121

The following procedure is the same for both models.

EQUIPMENT REQUIRED

1. **SIGNAL GENERATOR:** Covering the frequency range of the receiver, such as Philco Model 070.
2. **ALIGNING INDICATOR:** Either a vacuum tube voltmeter or an audio output meter may be used as an aligning indicator. Philco Models 027 and 028. Circuit testers contain both these meters.
3. **TOOLS:** Philco Fiber Screw Driver, Part No. 45-2610.

CONNECTING ALIGNING INSTRUMENTS

VACUUM TUBE VOLTMETER: To use the vacuum tube voltmeter as an aligning indicator, make the following connections: Attach the negative (−) terminal of the voltmeter to any point in the circuit where the A.V.C. voltage can be obtained. Connect the positive (+) terminal of the vacuum tube voltmeter to the chassis.

AUDIO OUTPUT METER: Terminal No. 1 is provided on the loop aerial panel for connecting one lead of the audio output meter to the voice coil of the speaker. The other lead of the meter is connected to the chassis. When using these connections, the lowest A.C. scale of the meter must be used. (0 to 10 volts).

The audio output meter can also be connected between the plate of the output tube and the ground of the chassis.

SIGNAL GENERATOR: When adjusting the "I. F." padders, the high side of the signal generator is connected through a .1 mfd. condenser to the antenna section of the tuning condenser. Connect the ground or low side of the generator to the chassis.

When aligning the R. F. padders a loop is made from a few turns of wire and connected to the signal generator output terminals; the signal generator is then placed close to the loop of the radio.

When adjusting the radio outside the cabinet the loop aerial should be placed in approximately the same position around or near the chassis as when assembled.

After connecting the aligning instruments, adjust the compensators as shown in the tabulation below. Locations of the compensators are shown in the figure 3. If the indicating meter pointer goes off scale when adjusting the compensator, reduce the strength of the signal from the generator. Keep volume control of radio at maximum position.

Operations In Order	SIGNAL GENERATOR		RECEIVER			Special Instructions
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Settings	Adjust Compensators in Order	
1	Ant. Section of Tuning Cond. with .1 mfd. Cond.	455 K.C.	Tuning Cond. Closed	Vol. Max. Bands Switch S. W.	3S, 3SB 43A, 47A	
2	Loop Signal Generator	1720 K.C.	1720 K.C.	Bands Switch "Brdcst"	14	Note A
3	Loop Signal Generator	1500 K.C.	1500 K.C.	Bands Switch "Brdcst"	7A	
4	Loop Signal Generator	580 K.C.	580 K.C.	Bands Switch "Brdcst"	8A	Roll comp. (8A) to "max." Recheck Operation No. 2
5	Loop Signal Generator	1720 K.C.	1720 K.C.	Bands Switch "Brdcst"	14	
6	Loop Signal Generator	15 M.C.	15 M.C.	Bands Switch S. W.	14A, 8	Note B

AERIAL CONNECTIONS: The built-in loop aerial system is designed to operate without an outside aerial or ground and to give exceptionally sensitive receiving performance of stations on the standard and short wave frequencies. When operating the radio, however, in steel reinforced buildings and other shielded locations, the PHILCO Outdoor Aerial Part No. 45-2817 is recommended for maximum receiving performance. The outdoor aerial can be easily connected to the radio by inserting the plug attached to the transformer unit into the socket provided at the rear of the chassis. This aerial can be obtained from your local PHILCO distributors. A ground connection is not required with either type of installation.

NOTE A.—Dial calibration: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, proceed as follows: Turn the tuning condenser to the maximum capacity position (plates fully meshed). With the condenser in this position, set the tuning pointer on the extreme left index line at the low frequency end of the broadcast scale.

NOTE B.—Adjust padder (14A) to the second signal peak from the tight position. Roll padder (8) slowly to maximum on the first peak from tight position.

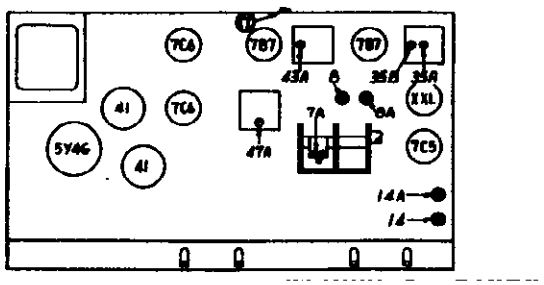


FIG. 3. LOCATIONS OF COMPENSATORS—TOP OF CHASSIS MODELS 42-1008, 42-1009

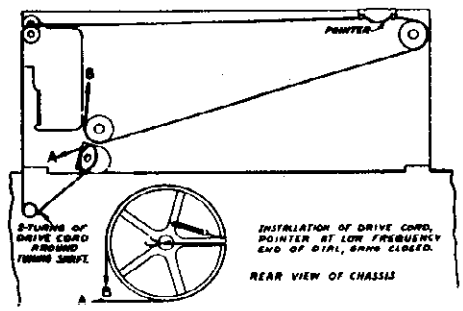


FIG. 4. INSTALLATION OF DRIVE CORDS POINTER AT LOW FREQUENCY END OF DIAL TUNING CONDENSER CLOSED.

INTERMEDIATE FREQUENCY: 455 K.C.

TUNING BAND FREQUENCIES: 540 to 1720 K.C.; 9 to 15.5 M.C.

POWER SUPPLY: 115 volts, 50 or 60 cycle A.C., Consumption Watts. These models are shipped for operation on a 115-volt, 60-cycle, A.C. power supply. To operate on a 115-volt, 50-cycle current, the phonograph motor must be changed to

PHILCO TUBES USED: Nine; one 7C5, oscillator; one XXL, converter; two 7B7, I. F. amplifiers; 7C6, 2nd detector, 1st audio; 7C6, Phonograph pre-amplifier; two, 41 audio output, and a 6X5G, Rectifier.

MODELS 42-1008,42-1009M, 42-1009W
MODELS 42-1010,42-1011M

PHILCO RADIO & TELEVISION CORP.

MODELS 42-1008,42-1009M,42-1009W

ADJUSTING ELECTRIC PUSH-BUTTON TUNING

Select five of the most popular stations received in the locality. Insert the station call letters into the spaces on the buttons. The station with the lowest frequency is placed in the second button from the left and the highest frequency is placed in the sixth push button on the right. Each push button is adjusted by two adjusting screws located on the rear of the chassis. Each set of screws is numbered and labeled "Ant.", "Osc." and covers a frequency range as follows:

KC.	KC.	KC.	KC.	KC.
1185	850	710	540	540
TO	TO	TO	TO	TC
1720	1600	1185	980	980
10 9	8 7	6 5	4 3	2 1

Looking at the front of the cabinet, the second button on the left is adjusted by adjusting screws No. 1 and 2. The next push button by adjusting screws No. 3 and 4, and the remaining push buttons in order.

1. Press in "Off-On" push button, turn "Bands" knob to "Broadcast."

2. Set up a Model 070 Signal Generator near the receiver and connect a loop aerial (made from a few turns of wire 12 inches in diameter) to the high and ground output jacks of the signal generator. Turn the output controls to maximum and set the modulation control to "MOD. ON."

3. Manually tune in the station to be set up on the first push button. After doing this set the indicator of the 070 Signal Generator to the frequency of the station being received. As the indicator approaches the frequency of the station a whistle will be heard; leave the indicator at this point.

4. Turn "Bands" knob to "Push button" position. Using the insulated screw driver, turn the No. 2 "Osc." screw until the broadcast station identified by the signal generator is heard; at this point, turn the indicator of the signal generator away from the frequency of the station. Readjust No. 2 "Osc." and No. 1 "Ant." screws until the station is clearly and distinctly heard. The push button should then be adjusted properly to the station.

After setting up the first station the same procedure as outlined above is used for the remaining stations. When these models are set up to receive the sound of a television program tuned in by the special type Philco Television Sets or if it is to be used in conjunction with a Philco Record Player, the lowest frequency push button should be used. To tune in these programs, the same procedure as given for broadcast stations above is used.

Further details for setting up these Radios for operation with Philco Television Sets or Record Players are supplied with the instruments.

ADJUSTING ELECTRIC PUSH BUTTON TUNING

The Electric push button tuning mechanism consists of ten push buttons. Five push buttons control and select power supply, Broadcast, Police and Shortwave Bands and Phonograph Operation. The remaining five push buttons are used for automatically selecting five standard broadcast stations.

Select five of the most popular stations received in the locality. Insert the station call letters into the spaces above the buttons. The station with the lowest frequency is placed in the second button from the left and the highest frequency is placed in the sixth push button from the left. Each push button is adjusted by two adjusting screws located on the rear of the chassis. Each set of screws is numbered and labeled "Ant.", "Osc." and covers a frequency range as shown in Fig. 1.

Looking at the front of the cabinet, the second button from the left is adjusted by adjusting screws No. 1. The next push button by adjusting screws No. 2, and the remaining push buttons in order.

1. Press in "Broadcast" push button.

2. Set up a Model 070 Signal Generator near the receiver and connect a loop aerial (made from a few turns of wire 12 inches in diameter) to the high and ground output jacks of the signal generator. Turn the output controls to maximum and set the modulation control to "MOD. ON."

3. Manually tune in the station to be set up on the first station push button. After doing this set the indicator of the 070 Signal Generator to the frequency of the station being received. As the indicator approaches the frequency of the station a whistle will be heard; leave the indicator at this point.

4. Press "in" the second push button from the left of cabinet. Using the insulated screw driver, turn the No. 1 "Osc." screw until the broadcast station identified by the signal generator is heard; at this point, turn the indicator of the signal generator away from the frequency of the station. Readjust No. 1 "Osc." and "Ant." screws until the station is clearly and distinctly heard. The push button should then be adjusted properly to the station.

After setting up the first station the same procedure as outlined above is used for the remaining stations. When these models are set up to receive the sound of a television program tuned in by the special type Philco Television Sets or if it is to be used in conjunction with a Philco Record Player, the lowest frequency push button should be used. To tune in these programs, the same procedure as given for broadcast stations above is used.

Further details for setting up these Radios for operation with Philco Television Sets or Record Players are supplied with the instruments.

MODELS 42-1010,42-1011M

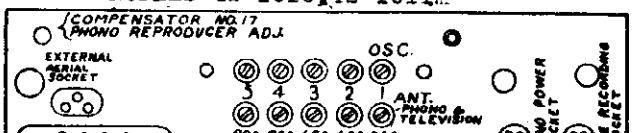


FIG. 1.—PUSH BUTTON COMPENSATOR LOCATIONS

LIGHT-BEAM REPRODUCER ADJUSTMENTS

To reproduce the sound from a record, the light beam of the reproducer must be carefully positioned on the light sensitive cell. If the light beam is not carefully set, the sound reproduction will be distorted, weak or, if the light beam is completely on or off the cell, the phonograph will be silent.

If any of these conditions exist, the following adjustment procedure should be made:

NOTE—These adjustments should be made with the power line voltage at 117 volts A.C.

A. ADJUSTING WIDTH OF LIGHT BEAM

To make this adjustment push the lamp socket assembly into its holder until a clear image of the lamp filament appears on the light cell. The socket should then be slightly pushed in beyond this point until the rectangular spot of light is 5/32" in width. The socket assembly is now rotated so that the spotlight is vertical.

B. POSITIONING THE LIGHT BEAM

To position the light beam on the light cell, turn the adjusting screw at the lower left side of the reproducer until the spot is half on the cell and half on the metal frame surrounding the cell.

C. ADJUSTING INTENSITY OF LAMP

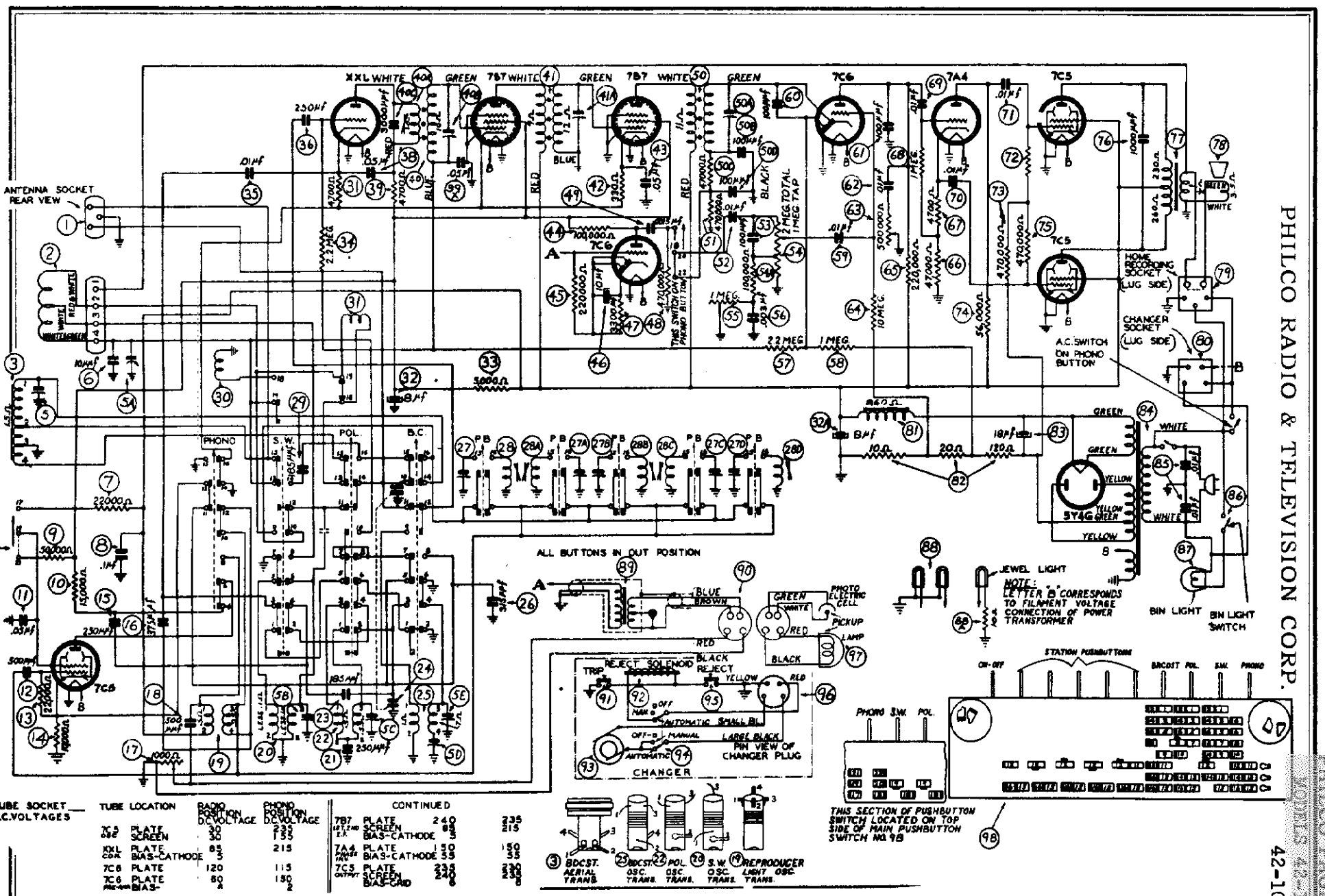
When shipped from the factory, the lamp of the reproducer is adjusted for best operating efficiency. The intensity of the light from the lamp is adjusted by Compensator No. 17 located on the radio chassis. Under ordinary circumstances, an adjustment will not be necessary. When replacing the reproducer or lamp, however, it may be necessary to readjust the light intensity. In this case the compensator is adjusted as follows:

1. Turn volume control on full and play a record.
2. While the record is playing, turn compensator 17 in the direction necessary to obtain the best operating point without distortion. By turning the compensator the strength of the pick-up output is increased or decreased.

D. INSTALLING NEW LAMP

When installing a new lamp in the socket, there are two positions in which the lamp can be inserted. Ordinarily, either of these positions can be used. In some cases, however, due to the lamp filament being off center, the lamp must be inserted in the position that gives the best centering of the spot of light on the vibrating mirror.

FOR BOTH CHASSIS



TUBE SOCKET D.C. VOLTAGES

TUBE	LOCATION	RADIO POSITION D.C. VOLTAGE	PHONO POSITION D.C. VOLTAGE
7C5 OSC	PLATE	30	235
	SCREEN	30	155
XXL CON.	PLATE	85	215
	BIAS-CATHODE	3	
7C6	PLATE	120	115
7C6 PRE-AMP	PLATE	80	150
	BIAS-	4	2

CONTINUED

7B7 1ST. 2ND I.F.	PLATE	240	235
	SCREEN	85	215
	BIAS-CATHODE	5	
7A4 PHONO DET.	PLATE	150	150
	BIAS-CATHODE	35	55
7C5 OUTPUT	PLATE	235	230
	SCREEN	220	230
	BIAS-CAD	8	8

FOR PUSH-BUTTON AND PICK-UP ADJUSTMENTS SEE OPPOSITE PAGE

PHILCO RADIO & TELEVISION CORP.

PHILCO RADIO & TELEVISION CORP.

Schem. No.	Description	Part No.
1.	External Aerial Socket	27-6145
2.	Loop Aerial	76-1386
	Terminal Panel	38-9870
	Mtg. Sleeve	28-3806FA3
	Mtg. Screw	W-1827FE11
	Spring Washer	28-4186FE7
3.	Aerial Transformer (Police)	32-3852
4.	Condenser (S.W.) (consisting of a lug and wire)	
5.	Compensator (Broadcast Band—Aerial)	31-6433
5a.	Compensator (S.W. Band—Aerial)	Part of 5
5b.	Compensator (S.W. Band—Oscillator)	Part of 5
5c.	Compensator (Police Band—Oscillator	Part of 5
5d.	Compensator (Broadcast Band—Osc. Series)	Part of 5
5e.	Compensator (Broadcast Band—Osc. Shunt)	Part of 5
6.	Condenser (10 mmfd.)	60-110157
7.	Resistor (33,000 ohms)	33-333339
8.	Condenser (.1 mfd., 400 volts)	30-4527
9.	Resistor (150,000 ohms)	33-415339
10.	Resistor (15,000 ohms)	33-315439
11.	Condenser (.05 mfd., 400 volts)	30-4516
12.	Mica Condenser (500 mmfd.)	60-150157
13.	Resistor (22,000 ohms)	33-322339
14.	Resistor (10,000 ohms)	33-310339
15.	Mica Condenser (250 mmfd.)	60-125257
16.	Mica Condenser (375 mmfd.)	20-037517
17.	Phono Reproducer Light Control	33-5435
18.	Mica Condenser (500 mmfd.)	60-150127
19.	Oscillator Transformer (Reproducer Light)	32-3818
	Mtg. Clip	28-5002
20.	Oscillator Transformer (S.W.)	32-3749
	Mtg. Clip	28-5002
21.	Mica Condenser (2500 mmfd.)	60-225124
22.	Oscillator Transformer (Police)	32-3748
	Mtg. Clip	28-5002
23.	Mica Condenser (185 mmfd.)	20-018517
24.	Tuning Condenser	31-2578
	Drive Cord (Tuning Condenser)	31-2603
	Spring	28-8751
	Drive Cord (Pointer)	31-2576
	Spring	28-8953
	Drive Drum	76-1293
	Mtg. Grommet	27-4596
	Mtg. Screw	W-2002FA3
	Mtg. Sleeve	56-1505
	Tuning Shaft	56-6168
	"C" Washer	28-2043
25.	Oscillator Transformer (Broadcast)	32-3747
	Mtg. Clip	28-5002
26.	Mica Condenser (375 mmfd.)	20-037517
27.	Push-button Padder (900 to 1600 KC) Complete Strip	31-6439
27a.	Push-button Padder (850 to 1500 KC)	Part of 27
27b.	Push-button Padder (650 to 1300 KC)	Part of 27
27c.	Push-button Padder (600 to 1200 KC)	Part of 27
27d.	Push-button Padder (510 to 1000 KC)	Part of 27
	Mtg. Screw	W-2150FA3
28.	Push-button Oscillator Transformer (900 to 1600 KC)	32-3779
28a.	Push-button Oscillator Transformer (850 to 1500 KC)	32-3779
28b.	Push-button Oscillator Transformer (650 to 1300 KC)	32-3780
28c.	Push-button Oscillator Transformer (600 to 1200 KC)	32-3780
28d.	Push-button Oscillator Transformer (510 to 1000 KC)	32-3780
	Clip	56-2250
	Trone Core	56-6100
	Cup	28-6836
29.	Mica Condenser (185 mmfd.)	20-018517
30.	Short Wave Band Aerial Shunt Transformer	32-3725
31.	Police Band Aerial Series Transformer	32-3854
32.	Electrolytic Condenser (8 mfd., 475 volts)	30-2535
32a.	Electrolytic Condenser (8 mfd., 475 volts)	Part of 32
	Mtg. Clamp	56-1466
33.	Resistor (15,000 ohms, 1 watt)	33-315439
34.	Resistor (2.2 megohms)	33-522339
35.	Condenser (.01 mfd., 400 volts)	30-4572
36.	Mica Condenser (250 mmfd.)	60-125258
37.	Resistor (4700 ohms)	33-247339
38.	Condenser (.05 mfd., 400 volts)	30-4518
39.	Resistor (4700 ohms)	33-247339
38x.	Condenser (.05 mfd., 200 volts)	30-4519
40.	First I. F. Transformer	32-3742
40a.	Primary Compensator, Part of 40	
40b.	Secondary Compensator, Part of 40	
40c.	Condenser (3000 mmfd.), Part of 40	30-1028
	Mtg. Nut	W-1949FA3
41.	Second I. F. Transformer	32-3850
41a.	Secondary Compensator, Part of 41	
	Mtg. Nut	W-1949FA3
42.	Resistor (330 ohms)	33-133336
43.	Condenser (.05 mfd., 200 volts)	30-4519
44.	Resistor (100,000 ohms)	33-410339
45.	Resistor (220,000 ohms)	33-422339
46.	Electrolytic Condenser (10 mfd., 25 volts)	30-2500
47.	Resistor (3300 ohms)	33-233339
48.	Resistor (470,000 ohms)	33-447339
49.	Condenser (.0015 mfd., 1000 volts)	30-4516
50.	Third I. F. Transformer	32-3851
50a.	Secondary Compensator (Part of 50)	
50b.	Mica Condenser (100 mmfd.) Part of 50a	
50c.	Resistor (47,000 ohms) Part of 50	33-347339
50d.	Mica Condenser (100 mmfd.) Part of 50a	
	Mtg. Nut	W-1949FA3
51.	Resistor (470,000 ohms)	33-447339
52.	Condenser (.01 mfd., 600 volts)	30-4623
53.	Mica Condenser (100 mmfd.)	60-110157
54.	Volume Control	33-5481
	Mtg. Nut	W-2157FA3
54x.	Resistor (100,000 ohms)	33-410339
55.	Tone Control (Audio Bass)	33-5479
	Mtg. Nut	W-2157FA3
56.	Condenser (.003 mfd., 1000 volts)	30-4469
57.	Resistor (2.2 megohms)	33-522339
58.	Resistor (1 megohm)	33-510339
59.	Condenser (.01 mfd., 400 volts)	30-4572
60.	Mica Condenser (100 mmfd.)	60-110157
61.	Mica Condenser (100 mmfd.)	60-110157
62.	Condenser (.01 mfd., 400 volts)	30-4572
63.	Tone Control (Audio Treble)	33-5480
	Mtg. Nut	W-2157FA3
64.	Resistor (10 megohms)	33-610339
65.	Resistor (220,000 ohms)	33-422339
66.	Resistor (47,000 ohms)	33-347339
67.	Resistor (4700 ohms)	33-247339
68.	Resistor (1 megohm)	33-510339
69.	Condenser (.01 mfd., 400 volts)	30-4572
70.	Condenser (.01 mfd., 400 volts)	30-4572
71.	Condenser (.01 mfd., 400 volts)	30-4572
72.	Resistor (470,000 ohms)	33-447339
73.	Resistor (470,000 ohms)	33-447339
74.	Resistor (56,000 ohms)	33-356339
75.	Resistor (470,000 ohms)	33-447339
76.	Condenser (.001 mmfd., 1000 volts)	30-4601
77.	Audio Output Transformer	32-8191
78.	Speaker—Early Production	36-1524
	Speaker—Later Production	36-1565
	Cone Assembly (For Speaker 36-1524)	36-4178
	Cone Assembly (For Speaker 36-1565)	36-4178
	Cable	41-3656
	Mtg. Grommet (Speaker)	27-4586
	Mtg. Washer	28-3320
	Mtg. Sleeve	56-2944
79.	Home Recording Socket	27-6179
80.	Changer Power Socket (on chassis)	27-6182
81.	Field Coil (Replace Speaker 36-1524 or 36-1565)	
82.	Bias Resistor (10-20-120 ohms)	33-3417
83.	Electrolytic Condenser (18 mfd., 475 volts)	30-2517
84.	Power Transformer (115 volts, 60 cycles)	32-H284
85.	Condenser (.01-.01 mfd.)	3903-ODG
86.	Bin Light Switch and Cable	76-1390
	Mtg. Screw	W-560FE11
87.	Bin Lamp	34-2484
	Cable and Socket	41-3638
88.	Dial Lamps	34-2141
	Socket Assembly	76-1295
88a.	Resistor (10 ohms, Jewel light model 42-1011 only)	33-610430
	Socket Assembly (Jewel Light)	76-1392
89.	Phono Input Transformer	32-8196
	Mtg. Screw	W-560FE11
	Mtg. Screw	W-333FE11
90.	Phono Reproducer and Input Transformer Cable Assembly	41-3637
91.	Phono Electric Reject Trip (see items 39 and 48 on page 4, in Service Bulletin 402)	
92.	Reject Solenoid (see item 36 in Service Bulletin 402)	
93.	Phono Motor (see item 18, page 4 in Service Bulletin 402)	
94.	Automatic Changer-over Switch (see item 50, page 4, in Radio Service Bulletin 402)	
95.	Reject Switch (see item 10, page 4, in Radio Service Bulletin 402)	
96.	Record Changer Power Cable and Plug	
97.	Phono Tone Arm (Light Beam Reproducer complete)	35-2518
98.	Push-button Switch and AC Switch Assembly	42-1718
	Mtg. Screw	W-523FA3
	MISCELLANEOUS PARTS	
	Bezel (Dial—Models 42-1010, 42-1011W)	54-5128
	Mtg. Screw	W-2073FB26
	Bezel (Dial—Model 42-1011M)	54-4156
	Cabinet (Model 42-1010)	10560A
	Cabinet (Model 42-1011W)	10551-A
	Cabinet (Model 42-1011M)	10551-B
	Cable and Plug (Power)	L-3292
	Dial Scale	27-5001
	Background Reflector	27-9004
	Mtg. Spring	28-8998
	Rubber Channel	54-5114
	Mtg. Clamp	56-2314
	Pointer	56-2331
	Jewel (42-1011M Cabinet)	27-4777
	Knob (Tuning, Volume, Tone—Model 42-1011M)	54-4154
	Knob (Push-button—Model 42-1011M)	54-4155
	Knob (Tuning, Volume, Tone—Models 42-1010, 42-1011W)	54-4185
	Knob (Push-buttons, Models 42-1010, 42-1011W)	54-4144
	Spring Assembly	76-1294
	Neon Lamp	34-2482
	Rubber Corner (Mtg. Chassis)	54-4015
	Rubber Grommet (Mtg. Chassis)	27-4571
	Screw (Chassis Mtg.)	W-1345FA3
	Socket (Rectifier Tube)	27-6174
	Socket (Loktal tubes)	27-6177
	Tab (On-Off)	27-5742
	Tab (Television)	27-5779
	Tab (Broadcast)	27-5739
	Tab (Police)	27-5748
	Tab (S. W.)	27-5748
	Tab (Phono)	27-5750
	Tab Cover	27-5815
	Tab Kit	40-6663
	Wiring Panel (2 lug)	38-8323
	Wiring Panel (3 lug)	38-8389
	Wiring Panel (8 lug)	38-9007
	Wiring Panel (4 lug)	38-9117
	Washer (Chassis Mtg.)	28-5414

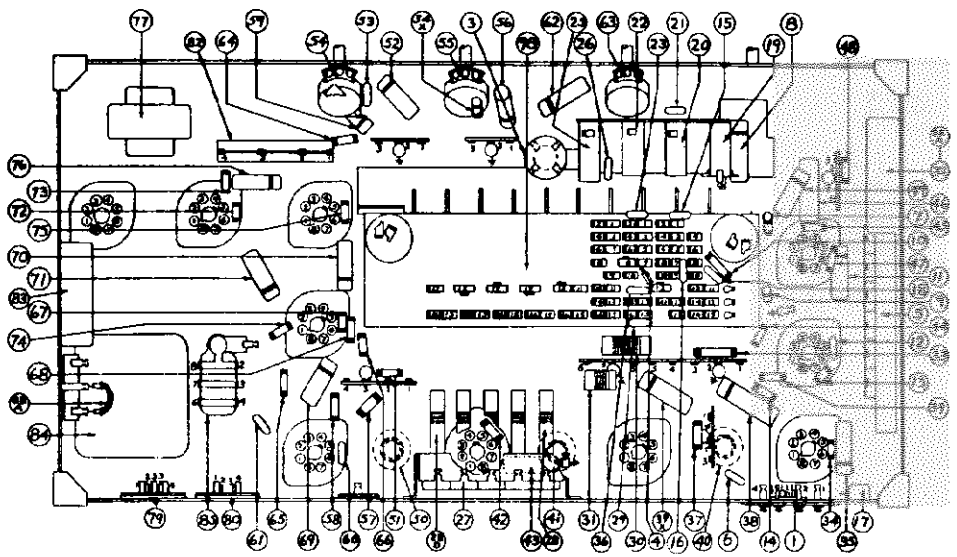


FIG. 3.—LOCATIONS OF PARTS—UNDER CHASSIS.

PHILCO RADIO & TELEVISION CORP.

ALIGNING R. F. AND I. F. COMPENSATORS

The following procedure is the same for both models:

EQUIPMENT REQUIRED

1. **SIGNAL GENERATOR:** Covering the frequency range of the receiver, such as Philco Model 070.

2. **ALIGNING INDICATOR:** Either a vacuum tube voltmeter or an audio output meter may be used as an aligning indicator. Philco Models 027 and 028 circuit testers contain both these meters.

3. TOOLS: Philco Fiber Screw Driver, Part No. 45-2610.

CONNECTING ALIGNING INSTRUMENTS

Either a vacuum tube voltmeter or an audio output meter may be used as a signal indicator when adjusting the receiver.

Vacuum Tube Voltmeter: To use the vacuum tube voltmeter as an aligning indicator, make the following connections: Attach the negative (−) terminal of the voltmeter to any point in the circuit where the A. V. C. voltage can be obtained. Connect the positive (+) terminal of the vacuum tube voltmeter to the chassis.

Audio Output Meter: Terminal No. 1 is provided on the loop aerial panel for connecting one lead of the audio output meter to the voice coil of the speaker. The other lead of the meter is connected to the chassis. When using these connections, the lowest A. C. scale of the meter must be used. (0 to 10 volts).

The audio output meter can also be connected between the plate of the output tube and the ground of the chassis.

Signal Generator: The radio can be aligned in the cabinet or removed from the cabinet. When adjusting the "I. F." padders, the high side of the signal generator is connected through a .1 mfd. condenser to the lug on the aerial section of the tuning condenser. The ground or low side of the signal generator is connected to the ground of the receiver.

When aligning the R. F. padders with the radio in the cabinet, a loop is made from a few turns of wire and connected to the signal generator output terminals; the loop is then placed two or three feet from the loop in the cabinet. If the radio is aligned outside of the cabinet without the loop connected an aerial input transformer, Part No. 76-1134, will be required. Insert the transformer into the external aerial socket on the rear of the chassis. Connect the high output terminal of the signal generator to the terminal on the transformer. Connect the ground terminal to the chassis.

After connecting the aligning indicator, adjust the compensators in the order shown in the tabulation below. Locations of the compensators are shown below. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

Operations in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in Order	
1	Lug Aerial Section of Tuning Condenser	455 KC	580 KC	Vol. Max. "Brdcst" Push-button IN	50A, 41A 40B, 40A	
2	Use Loop on Generator or Aerial Trans.	1500 KC	1500 KC	Vol. Max. "Brdcst" Push-button IN	5E, 5	Note A
3	Use Loop on Generator or Aerial Trans.	580 KC	580 KC	Vol. Max. "Brdcst" Push-button IN	5D	Roll Tuning Condenser Note B
4	Use Loop on Generator	Repeat Operation No. 2				
5	Use Loop on Generator	6 MC	6 MC	Vol. Max. "Police" Push-button IN	5C	
6	Use Loop on Generator	15 MC	15 MC	Vol. Max. "S.W." Push-button IN	5B, 5A	Note C

NOTE A—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: With the tuning condenser closed (maximum capacity), set the dial pointer on the extreme left index line at the low frequency end of the broadcast scale. The arrangement of the drive cable in this position is shown in the schematic.

NOTE B—When adjusting the low frequency compensator of Range One (Broadcast) or the aerial padders 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. Now turn the compensator slightly to the right or left and again vary the receiver tuning condenser for maximum output. This procedure of first setting the compensator and then varying the tuning condenser is continued until maximum output reading is obtained.

NOTE C—To accurately adjust the high frequency oscillator compensator to the fundamental instead of the image signal, turn the oscillator compensator (5B) to the maximum capacity position (clockwise). From this position slowly turn the compensator counter-clockwise until a second peak is obtained on the output meter. Adjust the compensator for maximum output at this second peak.

If the above procedure is correctly performed, the image signal will be found (much weaker) by turning the signal generator dial 910 KC above the frequency being used on any high frequency range.

The aerial padder (5A) must be adjusted to maximum by rolling the tuning condenser. If two signal peaks occur when turning the padder, adjust the maximum output on the first signal peak from the tight position (screw all the way down) of the padder.

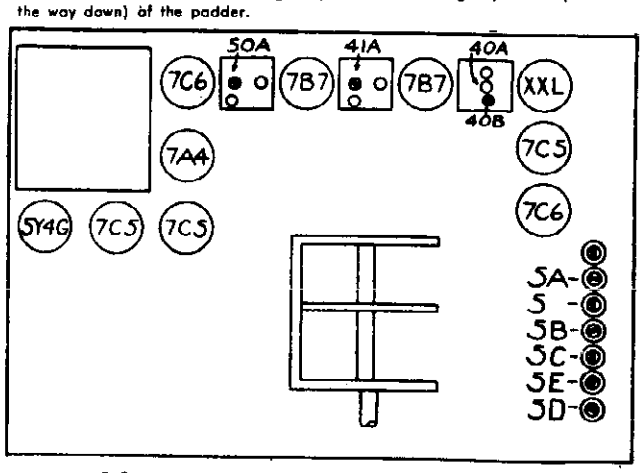


FIG. 4.—LOCATIONS OF COMPENSATORS
TOP OF CHASSIS 42-1010, 42-1011

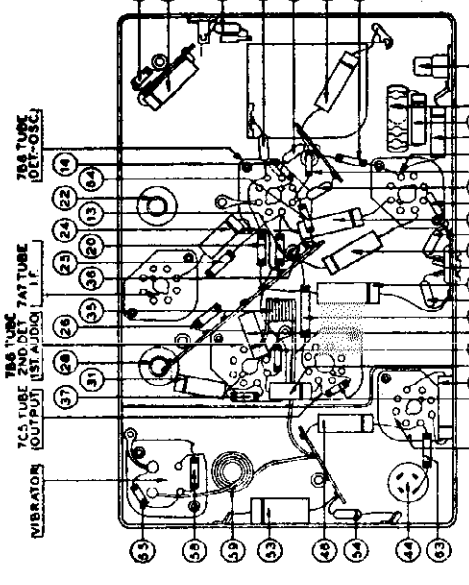
MODEL AR-45

PHILCO RADIO & TELEVISION CORP.

	Condenser (250 Mmfd.)	.60-125157	
	Replacement Cone		
	(For 73-0047-2 Speaker)	91-0086	
	(For 73-0047-3 Speaker)	91-0126	
	(For 73-0058-2 Speaker)	91-0086	
	(For 73-0058-3 Speaker)	91-0126	
	Field Coil	(Not Replaceable)	
	Condenser (250 Mmfd.)	.60-125157	
	"On-Off" Switch	.85-0118	
	Condenser (.5 Mfd.)	.81-0137	
	Condenser (250 Mmfd.)	.60-125157	
	Resistor (150 ohms)	.33-115334	
	Test Socket	.55-1118	
	Vibrator	.83-0025	
	Resistor (220 ohms)	.33-122334	
	Vibrator Choke	.65-0075	
	Condenser (.5 Mfd.)	.81-0137	
	Power Transformer	.65-0318	
	Condenser (3,000 Mmfd.)	.61-0115	
	Resistor (1,000 ohms)	.33-210434	
	Resistor (22,000 ohms)	.33-322434	
	Condenser (.25 Mfd.)	.81-0125	
	Condenser (.05 Mfd.)	.81-0111	
	Resistor (680 ohms)	.33-168338	
	Test Link	.57-1121	
	Condenser (250 Mmfd.)	.60-125157	
	Pilot Lamp	.83-347334	
	Resistor (17,000 ohms)	.77-0053FC51	
	Receiver Housing	.85-0134	
	Control Assembly	.55-1104	
	Dial	.55-0035	
	Drive Cord	.57-1225FA3	
	Drive Cord Spring	.57-1385	
	Tuning Shaft	.57-1384	
	Volume Shaft	.57-1889FCP	
	Pointer	.95-0135	
	Tone Control Lead	.57-1340FA3	
	Hook Bolt (Radio Mtg.)	.W1068FE7	
	Lockwasher (Radio Mtg.)	.W08FA3	
	Nut (Radio Mtg.)	.57-1403FA38	
	Cable Clamps	.80-4007	
	Interference Condenser	.33-1196	
	Distributor Resistor	.818-2388	
	Tube Side Cover	.57-1345FC51	
	Wiring Side Cover	.65-0448	
	Speaker Bezel	.55-0515	
	Lateral Control	.27-6133	
	Vibrator Socket	.W684FA3	
	Volume Control Nut	.57-1539FA3	
	Tone Control Switch Shaft		
	The following parts are for the Dash Speaker:		
	Speaker & Housing Complete	.818-2393	
	Speaker Unit	.73-0058	
	Stud (Speaker Mtg.)	.57-0802	
	Washer (Speaker Mtg.)	.2702FA3	
	Lockwasher (Speaker Mtg.)	.W338	
	Nut (Speaker Mtg.)	.W53FA3	
	Wood Spacer (Speaker Mtg.)	.55-0042	
	The following parts are for the Instrument Board Speaker:		
	Speaker Unit	.73-0047	
	"U" Bracket	.57-0720FA3	
	Rubber Gasket & Screen	.55-0058	
	Side Brackets	.57-1461	
	Cardboard Baffle	.55-0057	
	Cardboard Spacers	.55-0449	
	Nuts (Speaker Mtg.)	.W124FA3	
	Screw (Speaker Mtg.)	.W1582FA4	
	Lockwasher (Speaker Mtg.)	.W291	
	Lockwasher (Speaker Mtg.)	.W286	
	Carriage Bolt	.97-0081FA3	
	Carriage Bolt Nut	.W08FA3	
	Bolt (Bracket Mtg.)	.97-0120FA34	

SCHEMATIC MODEL AR-45
I.F. = 455 KC

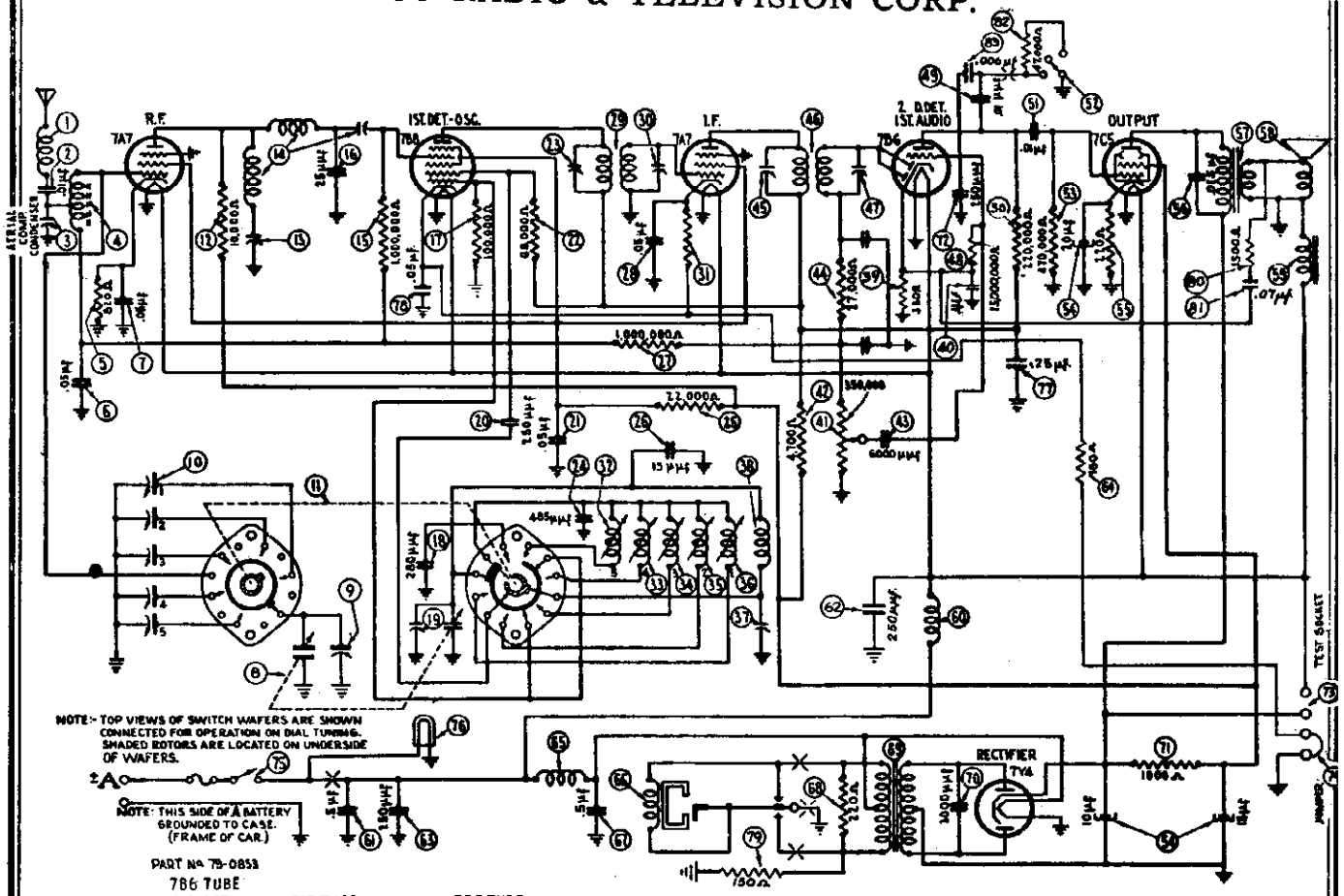
No.	Description	Part No.
1	Antenna Choke	.65-0109
2	Condenser (.01 Mfd.)	.81-0114
3	Tuning Condenser	.63-0047
4	Antenna Padder (on Tun. Cond.)	
5	Antenna Transformer	.65-0323
6	Aerial Compensator	.77-0545
7	Condenser (.05 Mfd.)	.81-0101
8	Condenser (.05 Mfd.)	.81-0101
9	Resistor (3,300 ohms)	.33-233434
10	Condenser (.05 Mfd.)	.81-0101
11	Resistor (68,000 ohms)	.33-268334
12	Condenser (250 Mmfd.)	.60-125157
13	Resistor (150 ohms)	.33-115334
14	Resistor (180,000 ohms)	.33-218344
15	Low Frequency Padder	.63-0048
16	Oscillator Transformer	.65-0320
17	High Frequency Padder (on Tun. Cond.)	
18	Condenser (250 Mmfd.)	.60-125157
19	Condenser (25 Mmfd.)	.60-123327
20	Resistor (68,000 ohms)	.33-268334
21	Padder (1st I. F. Trans.)	
22	First I. F. Transformer	.65-0319
23	Padder (Sec. 1st I. F. Trans.)	
24	Condenser (.05 Mfd.)	.81-0101
25	Resistor (150 ohms)	.33-115334
26	Resistor (1,000,000 ohms)	.33-310434
27	Padder (Pri. 2nd I. F. Trans.)	.65-0320
28	Second I. F. Transformer	.33-327134
29	Resistor (27,000 ohms)	
30	Padder (Sec. 2nd I. F. Trans.)	
31	Condenser (5,000 Mmfd.)	.81-0155
32	Volume Control (500,000 ohms)	.67-0033
33	Resistor (15,000 ohms)	.33-315134
34	Condenser (.01 Mfd.)	.81-0114
35	Filament Choke	.32-3729
36	Resistor (3,300 ohms)	.33-233434
37	Resistor (15,000,000 ohms)	.33-815134
38	Resistor (220,000 ohms)	.33-422334
39	Condenser (6,000 Mmfd.)	.81-0155
40	Condenser (250 Mmfd.)	.60-125157
41	Tone Control Switch	.77-0733
42	Condenser (.01 Mfd.)	.81-0120
43	Resistor (470,000 ohms)	.33-447154
44	Filter Condenser (10-15-20 Mfd.)	.81-0089
45	Resistor (220 ohms)	.33-122436
46	Condenser (.01 Mfd.)	.81-0124
47	Output Transformer	.65-0308

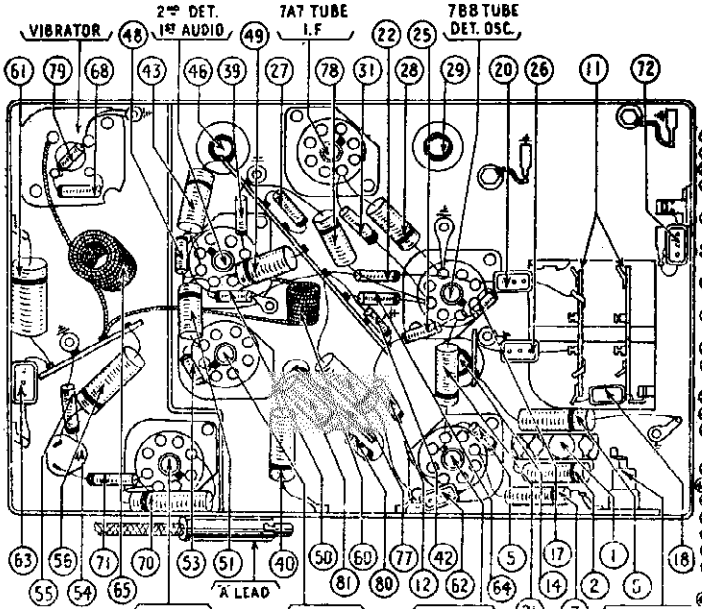


FOR ALIGNMENT SEE INDEX

PHILCO RADIO & TELEVISION CORP.

MODEL AR-5





FOR OTHER DATA SEE INDEX

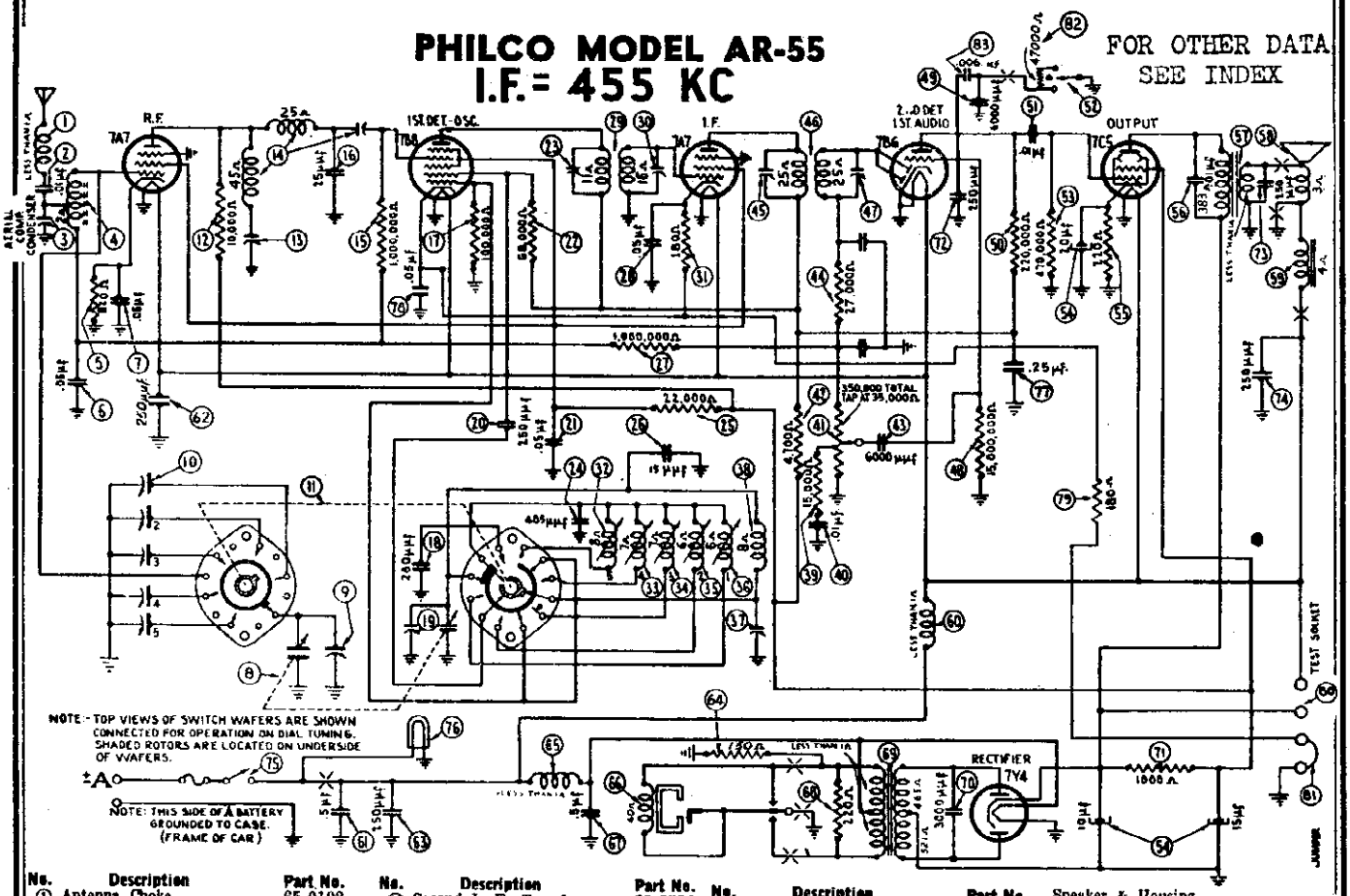
No.	Description	Part No.
1	Antenna Choke	65-0102
2	Condenser (.01 Mfd.)	61-0114
3	Aerial Compensator	Part of 4
4	Antenna Transformer	65-0323
5	Resistor (820 ohms)	33-182336
6	Condenser (.05 Mfd.)	61-0101
7	Condenser (.05 Mfd.)	61-0101
8	Tuning Condenser	63-0047
9	Antenna Padder (on Tun. Cond.)	
10	Antenna Padder Assembly	77-0515
11	Wafer Switch	77-0506
12	Resistor (10,000 ohms)	33-310334
13	Wave Trap Padder	Part of 14
14	R. F. Transformer	65-0321
15	Resistor (1,000,000 ohms)	33-510154
16	Condenser (25 Mmfd.)	30-1067
17	Resistor (100,000 ohms)	33-410154
18	Silver Mica Condenser (280 Mmfd.)	61-0043
19	Oscillator Padder (on Tun. Cond.)	
20	Condenser (250 Mmfd.)	60-125157
21	Condenser (.05 Mfd.)	61-0101
22	Resistor (68,000 ohms)	33-368334
23	Padder (Pri. 1st I. F. Trans.)	
24	Silver Mica Condenser (485 Mmfd.)	61-0144
25	Resistor (22,000 ohms)	33-322434
26	Condenser (15 Mmfd.)	60-015327
27	Resistor (1,000,000 ohms)	33-510154
28	Condenser (.05 Mfd.)	61-0101
29	First I. F. Transformer	65-0319
30	Padder (Sec. 1st. I. F. Trans.)	
31	Resistor (470 ohms)	33-147336
32	Oscillator Transformer (550-1065 KC)	65-0173
33	Oscillator Transformer (600-1165 KC)	65-0172
34	Oscillator Transformer (660-1240 KC)	65-0171
35	Oscillator Transformer (750 1410 KC)	65-0170
36	Oscillator Transformer (855-1580 KC)	65-0169
37	Low Frequency Padder	63-0048
38	Manual Oscillator Transformer	65-0420
39	Resistor (330 ohms)	33-133334
40	Condenser (.1 Mfd.)	61-0104
41	Volume Control (350,000 ohms)	67-0043
42	Resistor (4700 ohms)	33-247334
43	Condenser (6000 Mmfd.)	61-0155
44	Resistor (27,000 ohms)	33-327154
45	Padder (Pri. 2nd I. F. Trans.)	
46	Second I. F. Transformer	65-0320
47	Padder (Sec. 2nd I. F. Trans.)	
48	Resistor (15,000,000 ohms)	33-615154
49	Condenser (.01 Mfd.)	61-0114
50	Resistor (220,000 ohms)	33-422334
51	Condenser (.01 Mfd.)	61-0120
52	Tone Control Switch Wafer	77-0733
53	Resistor (470,000 ohms)	33-447154
54	Filter Condenser (10-15-20 Mfd.)	61-0089
55	Resistor (220 ohms)	33-122436
56	Condenser (.015 Mfd.)	61-0138
57	Output Transformer	65-0419
58	Replacement Cone (For 73-0059-4 Speaker)	91-0209
	(For 73-0059-9 Speaker)	91-0213
59	Field Coil	Not Replaceable
60	Filament Choke	32-2729
61	Condenser (.5 Mfd.)	61-0106
62	Condenser (250 Mfd.)	60-125157
63	Condenser (250 Mmfd.)	60-125157
64	Resistor (180 ohms)	33-118336
65	Vibrator Choke	65-0075
66	Vibrator	83-0025
67	Condenser (.5 Mfd.)	61-0187
68	Resistor (220 ohms)	33-122334
69	Power Transformer	65-0318
70	Condenser (3000 Mmfd.)	61-0115
71	Resistor (1000 ohms)	33-210434
72	Condenser (250 Mmfd.)	60-125157
73	Test Socket	55-1118
74	Test Link	57-1121
75	On-Off Switch	85-0112
76	Pilot Lamp	34-2039
77	Condenser (.25 Mfd.)	61-0125
78	Condenser (.05 Mfd.)	61-0101
79	Resistor (150 ohms)	33-115334
80	Resistor (1500 ohms)	33-215334
81	Condenser (.07 Mfd.)	61-0152
82	Resistor (47,000 ohms)	33-347334
83	Condenser (6000 Mmfd.)	61-0155
	Radio Housing	77-0752FC59
	Control Assembly	85-0133
	Dial	55-1194
	Drive Cord	55-0985
	Drive Cord Spring	57-1425FA3
	Tuning Shaft	57-1385
	Volume Shaft	57-1384
	Push Button Shaft	57-1386
	Cable Clamps	57-1429FA38
	Pointer	57-1889FCP
	Station Indicator Drum	77-0755
	Tone Control Lead	95-0135
	Hook Bolt (Radio Mtg.)	57-1340FA3
	Lockwasher (Radio Mtg.)	W1668FE7
	Nut (Radio Mtg.)	W98FA3
	Speaker Unit	73-0059
	Interference Condenser	80-4007
	Distributor Resistor	33-1196
	Speaker Cover	57-1942FC59
	Wiring Side Cover	57-1345FC59
	Padder Cover	57-1348FC59
	Loktal Socket	55-0575
	Vibrator Socket	27-6153
	Screw & Core Assembly	57-1363
	Brass Coil Cup	W2032
	Speaker Cable	95-0192
	Volume Control Cable	95-0132
	Volume Control Nut	W884FA3
	Tone Switch Shaft	57-1839FA3

MODEL AR-55

PHILCO RADIO & TELEVISION CORP

PHILCO MODEL AR-55
I.F.= 455 KC

FOR OTHER DATA SEE INDEX



No.	Description	Part No.
①	Antenna Choke	65-0102
②	Condenser (.01 Mfd.)	61-0114
③	Aerial Compensator	Part of ⑳
④	Antenna Transformer	65-0323
⑤	Resistor (820 ohms)	33-182336
⑥	Condenser (.05 Mfd.)	61-0101
⑦	Condenser (.05 Mfd.)	61-0101
⑧	Tuning Condenser	63-0047
⑨	Antenna Padder (on Tun. Cond.)	
⑩	Antenna Padder Assembly (For Push Buttons)	77-0512
⑪	Wafer Switch	77-0506
⑫	Resistor (10,000 ohms)	33-310334
⑬	Wave Trap Padder	Part of ⑭
⑭	R. F. Transformer	65-0321
⑮	Resistor (1,000,000 ohms)	33-510154
⑯	Condenser (25 Mmfd.)	30-1067
⑰	Resistor (100,000 ohms)	33-410154
⑱	Condenser (280 Mmfd.)	61-0043
⑲	High Frequency Padder (on Tun. Cond.)	
㉑	Condenser (250 Mmfd.)	60-125157
㉒	Condenser (.05 Mfd.)	61-0101
㉓	Resistor (68,000 ohms)	33-368334
㉔	Padder (Pri. 1st I. F. Trans.)	
㉕	Condenser (485 Mmfd.)	61-0144
㉖	Resistor (22,000 ohms)	33-322434
㉗	Condenser (15 Mmfd.)	60-015327
㉘	Resistor (1,000,000 ohms)	33-510154
㉙	Condenser (.05 Mfd.)	61-0101
㉚	First I. F. Transformer	65-0319
㉛	Padder (Sec. 1st I. F. Trans.)	
㉜	Resistor (180 ohms)	33-118336
㉝	Oscillator Transformer (550-1065 KC)	65-0173
㉞	Oscillator Transformer (600-1165 KC)	65-0172
㉟	Oscillator Transformer (660-1240 KC)	65-0171
㊱	Oscillator Transformer (750-1410 KC)	65-0170
㊲	Oscillator Transformer (855-1580 KC)	65-0168
㊳	Low Frequency Padder	63-0048
㊴	Manual Oscillator Trans.	65-0420
㊵	Resistor (15,000 ohms)	33-315154
㊶	Condenser (.01 Mfd.)	61-0114
㊷	Volume Control (350,000 ohms)	67-0032
㊸	Resistor (4,700 ohms)	33-247334
㊹	Condenser (6,000 Mmfd.)	61-0155
㊺	Resistor (27,000 ohms)	33-327154
㊻	Padder (Pri. 2nd I. F. Trans.)	

No.	Description	Part No.
㊼	Second I. F. Transformer	65-0320
㊽	Padder (Sec. 2nd I. F. Trans.)	
㊾	Resistor (15,000,000 ohms)	33-615154
㊿	Condenser (6,000 Mmfd.)	61-0155
(51)	Resistor (220,000 ohms)	33-422334
(52)	Condenser (.01 Mfd.)	61-0120
(53)	Tone Control Switch Wafer	77-0733
(54)	Resistor (470,000 ohms)	33-447154
(55)	Filter Condenser (10-15-20 Mfd.)	61-0089
(56)	Resistor (220 ohms)	33-122436
(57)	Condenser (.01 Mfd.)	61-0124
(58)	Output Transformer	65-0408
(59)	Replacement Cone (For 73-0047-2 Speaker)	91-0086
	(For 73-0047-3 Speaker)	91-0126
	(For 73-0058-2 Speaker)	91-0086
	(For 73-0058-3 Speaker)	91-0126
(60)	Field Coil Assembly	Not Replaceable
(61)	Filament Choke	32-2729
(62)	Condenser (.5 Mfd.)	61-0106
(63)	Condenser (250 Mmfd.)	60-125157
(64)	Condenser (250 Mmfd.)	60-125157
(65)	Resistor (150 ohms)	33-115334
(66)	Vibrator Choke	65-0075
(67)	Vibrator	83-0025
(68)	Condenser (.5 Mfd.)	61-0137
(69)	Resistor (220 ohms)	33-122334
(70)	Power Transformer	65-0318
(71)	Condenser (3,000 Mmfd.)	61-0115
(72)	Resistor (1,000 ohms)	33-210434
(73)	Condenser (250 Mmfd.)	60-125157
(74)	Condenser (250 Mmfd.)	60-125157
(75)	Condenser (250 Mmfd.)	60-125157
(76)	"On-Off" Switch	85-0112
(77)	Pilot Lamp	34-2039
(78)	Condenser (.25 Mfd.)	61-0125
(79)	Condenser (.05 Mfd.)	61-0101
(80)	Resistor (180 ohms)	33-118336
(81)	Test Socket	55-1118
(82)	Test Link	57-1121
(83)	Resistor (47,000 ohms)	33-347334
(84)	Condenser (6,000 Mmfd.)	61-0155
	Receiver Housing	77-0694FC59
	Control Assembly	85-0133
	Dial	55-1194
	Drive Cord	55-0935
	Drive Cord Spring	57-1425FA3
	Tuning Shaft	57-1385
	Volume Shaft	57-1384
	Push Button Shaft	57-1386
	Pointer	57-1889FCP
	Station Indicator Drum	77-0755
	Tone Control Lead	95-0135

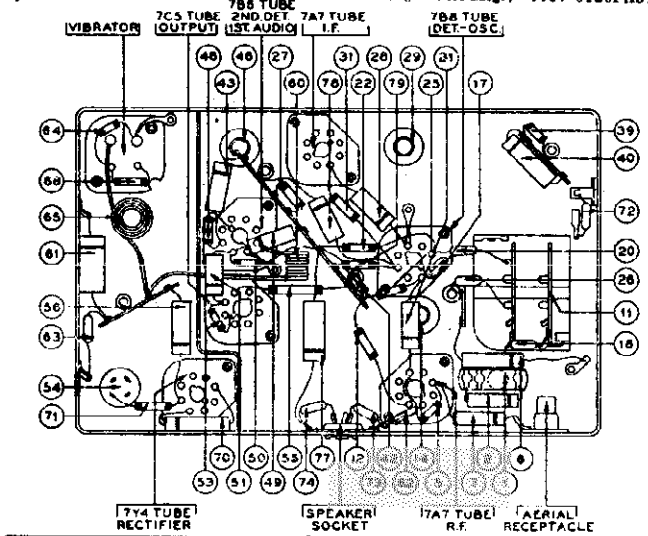
No.	Description	Part No.
	Hook Bolt (Receiver Mtg.)	57-1340FA3
	Lockwasher (Receiver Mtg.)	W166SFE7
	Nut (Receiver Mtg.)	W98FA3
	Cable Clamps	57-1429FA38
	Interference Condenser	30-4007
	Distributor Resistor	33-1196
	Tube Side Cover	318-2382
	Wiring Side Cover	57-1345FC59
	Padder Cover	57-1348FC59
	Speaker Socket	55-0443
	Loktal Socket	55-1075
	Vibrator Socket	27-6153
	Screw & Core Assembly	57-1363
	Coil Cups (Brass)	W-2032
	Volume Control Nut	W684FA3
	Tone Control Switch Shaft	57-1839FA3

The following parts are for the Dash Speaker:

	Speaker & Housing Complete	318-2393
	Speaker Unit	73-0058
	Stud (Speaker Mtg.)	57-0892
	Washer (Speaker Mtg.)	2703FA3
	Lockwasher (Speaker Mtg.)	W338
	Nut (Speaker Mtg.)	W55FA3
	Wood Spacer (Speaker Mtg.)	55-0642

The following parts are for the Instrument Board Speaker:

Speaker	73-0047
"U" Bracket	57-0720FA3
Rubber Gasket & Screen	55-0958
Side Brackets	57-1461
Cardboard Baffle	55-0957
Cardboard Spacers	55-0449
Nuts (Speaker Mtg.)	W124FA3
Screw (Speaker Mtg.)	W1582FA4
Lockwasher (Speaker Mtg.)	W291
Lockwasher (Speaker Mtg.)	W286
Carriage Bolt	97-0061FA3
Carriage Bolt Nut	W98FA3
Bolt (Bracket Mtg.)	97-0120FA34



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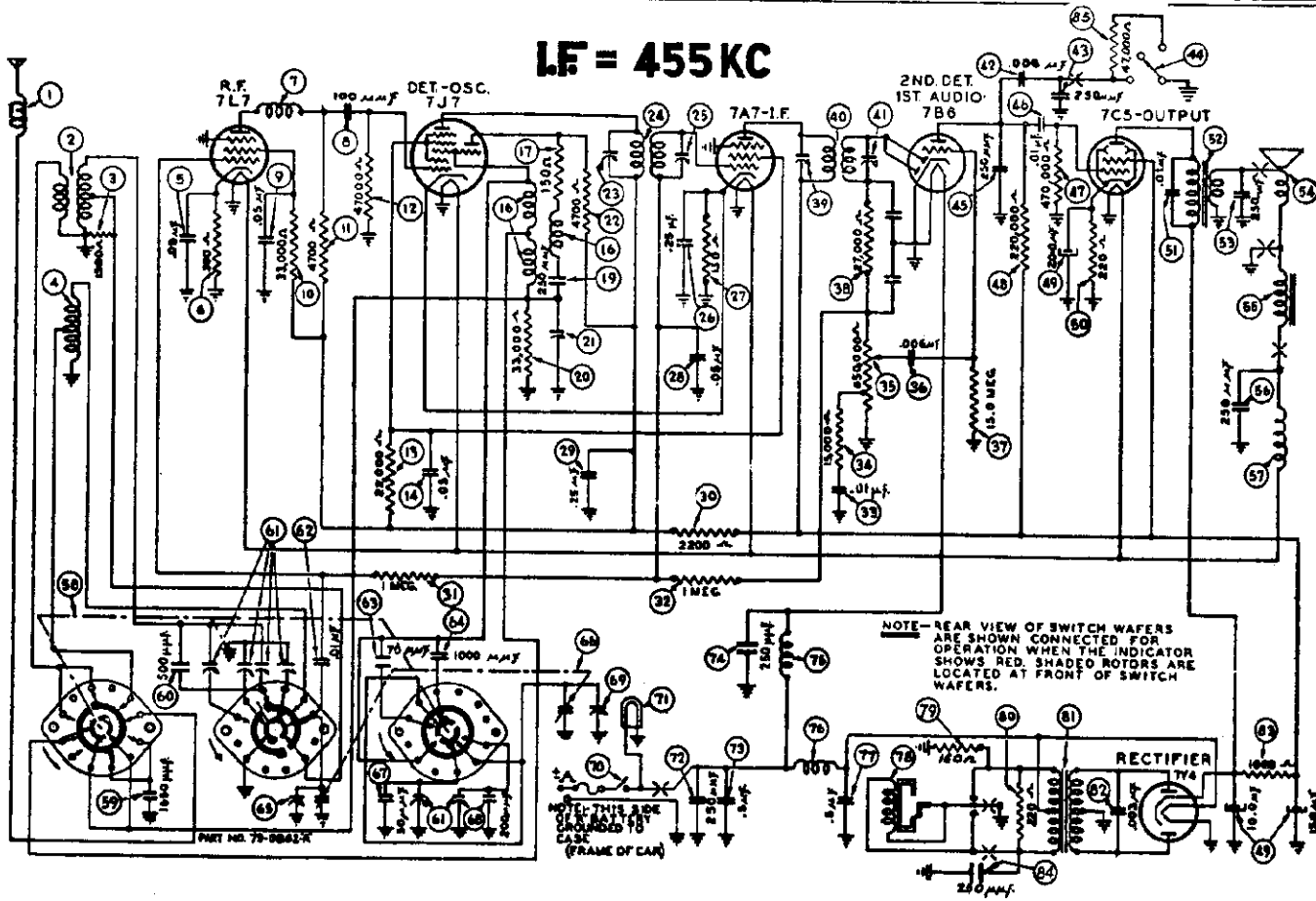


No.	Description	Part No.
1	Antenna Choke	65-0340
2	Short Wave Antenna Transformer	65-0341
3	Resistor (1500 ohms)	33-215334
4	Broadcast Antenna Transformer	65-0085
5	Condenser (.05 Mfd.)	61-0101
6	Resistor (390 ohms)	33-139436
7	Choke	65-0337
8	Condenser (100 Mmfd.)	60-110157
9	Condenser (.05 Mfd.)	61-0111
10	Resistor (33,000 ohms)	33-333334
11	Resistor (4700 ohms)	33-247334
12	Resistor 47,000 ohms)	33-347334
13	Resistor (22,000 ohms)	33-322434
14	Condenser (.05 Mfd.)	61-0101
15	Oscillator Transformer	65-0339
16	Resistor (150 ohms)	33-115334
17	Condenser (250 Mmfd.)	60-125157
18	Resistor (33,000 ohms)	33-333334
19	Low Frequency Padder	63-0048
20	Resistor (4700 ohms)	33-247344
21	Padder (Pri. 1st I. F. Trans.)	
22	First I. F. Transformer	65-0338
23	Padder (Sec. 1st I. F. Trans.)	
24	Condenser (.25 Mfd.)	61-0112
25	Resistor (150 ohms)	33-115336
26	Condenser (.05 Mfd.)	61-0101
27	Condenser (.25 Mfd.)	61-0125
28	Resistor (2200 ohms)	33-222434
29	Resistor (1,000,000 ohms)	33-510154
30	Resistor (1,000,000 ohms)	33-510154
31	Condenser (.01 Mfd.)	61-0114
32	Resistor (15,000 ohms)	33-315154
33	Volume Control (350,000 ohms)	67-0032-2
34	Condenser (6000 Mmfd.)	61-0103
35	Resistor (15,000,000 ohms)	33-615154
36	Resistor (27,000 ohms)	33-327154
37	Padder (Pri. 2nd I. F. Trans.)	
38	Second I. F. Transformer	65-0320
39	Padder (Sec. 2nd I. F. Trans.)	
40	Condenser (6000 Mmfd.)	61-0135
41	Condenser (250 Mmfd.)	60-125157
42	Tone Control Switch Wafer	77-0733
43	Condenser (250 Mmfd.)	60-125157
44	Condenser (.01 Mfd.)	61-0120
45	Resistor (470,000 ohms)	33-447154

No.	Description	Part No.
46	Resistor (220,000 ohms)	33-422334
47	Filter Condenser (10-15-20 Mfd.)	61-0089
48	Resistor (220 ohms)	33-122434
49	Condenser (.01 Mfd.)	61-0121
50	Output Transformer	65-0408
51	Condenser (250 Mmfd.)	60-125157
52	Replacement Cone (For 73-0047-2 Speaker)	91-0086
	(For 73-0047-3 Speaker)	91-0126
	(For 73-0058-2 Speaker)	91-0086
	(For 73-0058-3 Speaker)	91-0126
53	Field Coil	Not Replaceable
54	Condenser (250 Mmfd.)	60-125157
55	"A" Choke	32-1644
56	Wafer Switch	77-0567
57	Mica Condenser (1650 Mmfd.)	5877

58	Silver Mica Condenser (500 Mmfd.)	61-0027
59	Padder Assembly	77-0560
60	Condenser (.01 Mfd.)	61-0110
61	Silver Mica Condenser (70 Mmfd.)	61-0146
62	Condenser (1000 Mmfd.)	61-0079
63	Antenna Padder (on Tun. Cond.)	
64	Tuning Condenser	63-0050
65	Silver Mica Condenser (50 Mmfd.)	61-0140
66	Silver Mica Condenser (200 Mmfd.)	61-0141
67	Oscillator Padder (on Tun. Cond.)	
68	"On-Off" Switch	85-0112
70	Pilot Lamp	34-2039
72	Condenser (250 Mmfd.)	60-125157
73	Condenser (.5 Mfd.)	61-0137
74	Condenser (250 Mmfd.)	60-125157
75	"A" Choke	32-1604
76	Vibrator Choke	65-0075
77	Condenser (.5 Mfd.)	61-0106
78	Vibrator	83-0025
79	Resistor (150 ohms)	33-115334
80	Resistor (200 ohms)	33-122334
81	Power Transformer	65-0318
82	Condenser (3000 Mmfd.)	61-0115
83	Resistor (1000 ohms)	33-210434
84	Condenser (250 Mmfd.)	60-125157
85	Resistor (47,000 ohms)	33-347334
	Receiver Housing	77-0696FC55
	Speaker Socket	55-0443
	Loktal Socket	55-0575
	Antenna Connector	57-0591

Tube Side Cover	57-1358FC55
Wiring Side Cover	57-1345FC55
Padder Plate	57-1348FC55
Hook Bolt (Radio Mtg.)	57-1340FA3
Nut (Radio Mtg.)	W98FA3
Lockwasher (Radio Mtg.)	W1668FE7
Cable Clamps	57-1429FA38
Interference Condenser	30-4007
Interference Condenser (Generator)	30-4490
Spark Plug Suppressor	33-1015
Distributor Resistor	33-1196
Hood Grounding Screws	97-0125FA3
Control Assembly	85-0132

Copper Braid (¾" wide, 24" long)	05-0145
Drive Cord	55-0935
Drive Cord Spring	67-1425FA3
Dial Background Plate	57-1887FCP
Volume Flexible Shaft	57-1384
Tuning Flexible Shaft	57-1385
Station Indicator Flexible Shaft	57-1386
Pointer	57-1889FCP
Tone Switch Shaft	57-1839FA3
Tone Switch Spring	57-1840
Dial	55-1196
Station Indicator Drum	77-0572
Slide & Pawl Assembly	77-0721

MODEL AR-65

PHILCO RADIO & TELEVISION CORP.

INSTRUCTIONS FOR ADJUSTING SHORT WAVE PADDERS
(FIGURE 3)

OPERATION	SIGNAL GENERATOR FREQUENCY	SIGNAL GENERATOR CONNECTION	DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
	PUSH IN THE RIGHT HAND KNOB ON THE CONTROL UNTIL THE "RED" DOT APPEARS IN THE BAND INDICATOR WINDOW				
1	10 M.C.	To Aerial Receptacle on Radio	Note 1	Note 2	OSC. 10 M.C. Pad to Outer Peak
2	9.5 M.C.	To Aerial Receptacle on Radio	Note 1	Rotate Tuning Condenser to 9.5 M.C. Signal	ANT. 9.5 M.C.
3	6 M.C.	To Aerial Receptacle on Radio	Note 1	Rotate Tuning Condenser to 6 M.C. Signal	ANT. 6 M.C.
	PUSH IN THE RIGHT HAND KNOB ON THE CONTROL UNTIL THE "WHITE" DOT APPEARS IN THE BAND INDICATOR WINDOW				
1	12.1 M.C.	To Aerial Receptacle on Radio	Note 1	Note 2	OSC. 12.1 M.C.
2	11.9 M.C.	To Aerial Receptacle on Radio	Note 1	Rotate Tuning Condenser to 11.9 M.C. Signal	ANT. 11.9 M.C.
3	11.7 M.C.	To Aerial Receptacle on Radio	Note 1	Rotate Tuning Condenser to 11.7 M.C. Signal	ANT. 11.7 M.C.
4	OPERATIONS 2 AND 3 ARE IMPORTANT AND MUST BE REPEATED UNTIL MAXIMUM SIGNAL IS RECEIVED				

OPERATION	SIGNAL GENERATOR FREQUENCY	SIGNAL GENERATOR CONNECTION	DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
1	PUSH IN THE RIGHT HAND KNOB ON THE CONTROL UNTIL THE BLACK DOT APPEARS IN THE BAND INDICATOR WINDOW AND STATIONS CAN BE TUNED IN BY MANUAL TUNING				
2	455 K.C.	To Aerial Receptacle on Radio	.1 Mfd.	Note 2	(41) (59) [illegible]
3	1580 K.C.	To Aerial Receptacle on Radio	See Note 1	Note 2	[illegible]
4	1400 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K.C.	[illegible] Note 4
5	580 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 580 K.C.	(21) Note 3
6	1580 K.C.	To Aerial Receptacle on Radio	See Note 1	Note 2	[illegible]
7	1400 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K.C.	[illegible] Note 4
8	580 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 580 K.C.	(21) Note 3

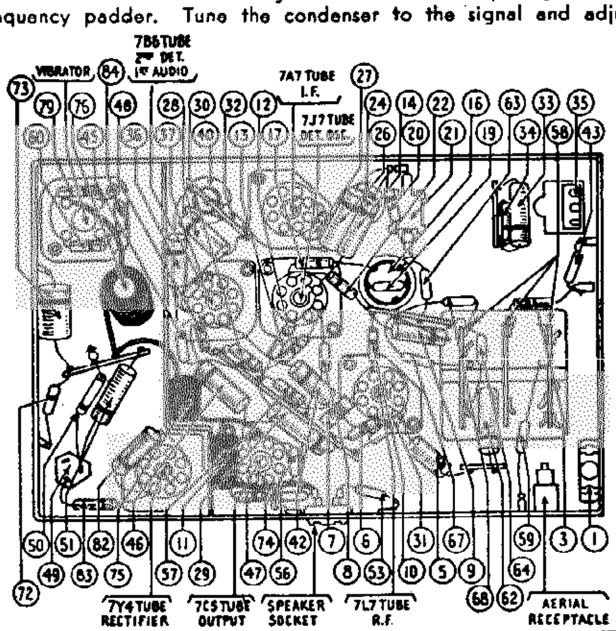
Make all adjustments for maximum reading on the output meter.

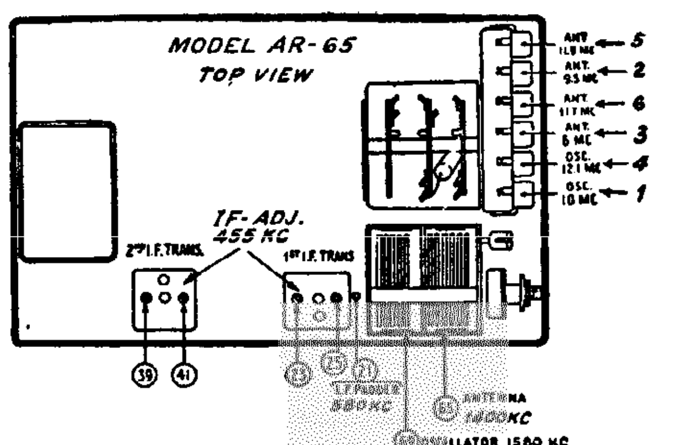
NOTE 1—Connect the aerial lead, Part No. 95-0185, to the aerial receptacle in the radio. Connect a 10 mmfd. Condenser in series between the signal generator and the aerial lead.

NOTE 2—Turn the condenser rotor plates completely out of mesh as far as they will go.

NOTE 3—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 readjust the padder for maximum output. Repeat this procedure until no further improvement is noticed.

NOTE 4—When the aerial stage adjustment is made with the Radio installed in the car, the Radio aerial lead must be connected to the car aerial in the usual manner. Connect the signal generator output lead to a wire placed near the car aerial but not connected to it.



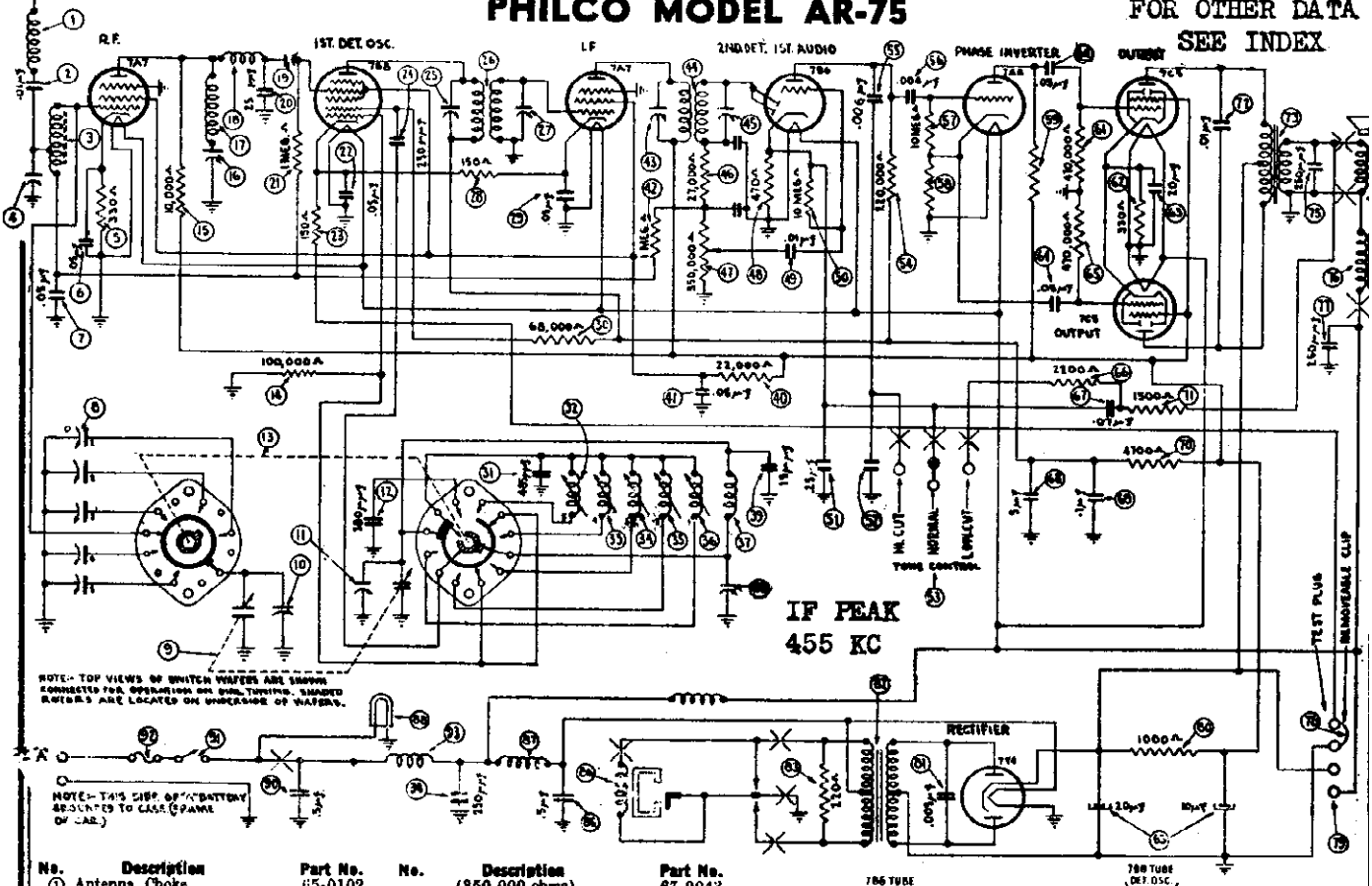


PHILCO RADIO & TELEVISION CORP.

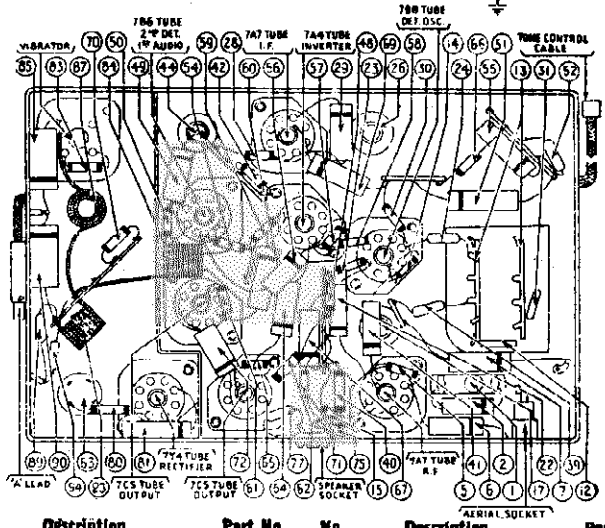
MODEL AR-75

PHILCO MODEL AR-75

FOR OTHER DATA SEE INDEX



No.	Description	Part No.
①	Antenna Choke	65-0102
②	Condenser (.01 Mfd.)	61-0014
③	Antenna Transformer	65-0323
④	Aerial Compensator	Part of ⑧
⑤	Resistor (330 ohms)	33-133336
⑥	Condenser (.05 Mfd.)	61-0111
⑦	Condenser (.05 Mfd.)	61-0101
⑧	Antenna Padder Assembly	77-0512
⑨	Tuning Condenser	63-0047
⑩	R. F. Padder (on Tun. Cond.)	
⑪	Oscillator Padder (on Tun. Cond.)	
⑫	Silver Mica Condenser (280 Mmfd.)	61-0043
⑬	Wafer Switch Assembly	77-0506
⑭	Resistor (100,000 ohms)	33-410154
⑮	Resistor (10,000 ohms)	33-310334
⑯	I. F. Wave Trap Padder	Part of ⑰
⑰	R. F. Transformer	65-0321
⑱	Coil	Part of ⑰
⑲	Padder	Part of ⑰
⑳	Condenser (25 Mmfd.)	30-1067
㉑	Resistor (1,000,000 ohms)	33-510154
㉒	Condenser (.05 Mfd.)	61-0101
㉓	Resistor (150 ohms)	33-115336
㉔	Condenser (250 Mmfd.)	60-125157
㉕	Padder (Pri. 1st I. F. Trans.)	
㉖	First I. F. Transformer	65-0319
㉗	Padder (Sec. 1st I. F. Trans.)	
㉘	Resistor (150 ohms)	33-115336
㉙	Condenser (.05 Mfd.)	61-0111
㉚	Resistor (68,000 ohms)	33-368334
㉛	Silver Mica Condenser (485 Mmfd.)	61-0144
㉜	Oscillator Transformer (550-1065 K.C.)	65-0173
㉝	Oscillator Transformer (600-1165 K.C.)	65-0172
㉞	Oscillator Transformer (660-1240 K.C.)	65-0171
㉟	Oscillator Transformer (750-1410 K.C.)	65-0170
㊱	Oscillator Transformer (855-1580 K.C.)	65-0169
㊲	Manual Oscillator Transformer	65-0420
㊳	Low Frequency Padder	63-0048
㊴	Condenser (15 Mmfd.)	61-015327
㊵	Resistor (22,000 ohms)	33-322434
㊶	Condenser (.05 Mfd.)	61-0101
㊷	Resistor (1,000,000 ohms)	33-510154
㊸	Padder (Pri. 2nd I. F. Trans.)	
㊹	Second I. F. Transformer	65-0320
㊺	Padder (Sec. 2nd I. F. Trans.)	
㊻	Resistor (27,000 ohms)	33-327154
㊼	Volume Control (350,000 ohms)	67-0043
㊽	Resistor (470 ohms)	33-147336
㊾	Condenser (.01 Mfd.)	61-0110
㊿	Resistor (10,000,000 ohms)	33-610154
(51)	Condenser (.25 Mfd.)	61-0112
(52)	Condenser (100 Mmfd.)	60-11015
(53)	Tone Control Switch	77-0733
(54)	Resistor (220,000 ohms)	33-422334
(55)	Condenser (6,000 Mmfd.)	61-006211
(56)	Condenser (4,000 Mmfd.)	61-0129
(57)	Resistor (10,000,000 ohms)	33-610154
(58)	Resistor (47,000 ohms)	33-347334
(59)	Resistor (47,000 ohms)	33-347334
(60)	Condenser (.05 Mfd.)	61-0122
(61)	Resistor (470,000 ohms)	33-447154
(62)	Resistor (330 ohms)	33-133436
(63)	Filter Condenser (5-10-20-20 Mfd.)	61-0150
(64)	Condenser (.05 Mfd.)	61-0101
(65)	Resistor (470,000 ohms)	33-447154
(66)	Resistor (2,200 ohms)	33-222334
(67)	Condenser (.07 Mfd.)	61-0152
(68)	Condenser (.1 Mfd.)	61-0113
(70)	Resistor (4,700 ohms)	33-247334
(71)	Resistor (1,500 ohms)	33-215334
(72)	Condenser (.01 Mfd.)	61-0124
(73)	Output Transformer	65-0402
(74)	Cone & Voice Coil (For 73-0056-2 Speaker)	91-0164
	(For 73-0056-3 Speaker)	91-0165
(75)	Condenser (250 Mmfd.)	60-125157
(76)	Field Coil	Not Replaceable
(77)	Condenser (250 Mmfd.)	60-125157
(78)	Test Plug Link	57-1121
(79)	Test Socket	55-1118
(80)	Resistor (1,000 ohms)	33-210434
(81)	Condenser (5,000 Mmfd.)	61-0153
(82)	Power Transformer	65-0403
(83)	Resistor (220 ohms)	33-122334
(85)	Condenser (.5 Mfd.)	61-0134
(86)	Vibrator	83-0025
(87)	Vibrator Choke	65-0075
(88)	Pilot Lamp	34-2039
(89)	Condenser (.5 Mfd.)	61-0134
(90)	On-Off Switch	85-0112
(92)	Fuse	45-2559
(93)	"A" Choke	32-1561
(94)	Condenser (250 Mmfd.)	60-125157
	Housing	77-0694FC54
	Control Assembly	85-0129
	Dial	55-1194
	Cord	55-0935
	Tuning Shaft	57-1385
	Volume Shaft	57-1384
	Push Button Shaft	57-1386



Description	Part No.
Pointer	57-1889
Station Indicator Drum Assembly	77-0755
Tone Control Lead (Receiver End)	95-0176
Tone Control Lead (Control End)	95-0175
Hook Bolt (Radio Mtg.)	57-1840FA3
Lockwasher (Radio Mtg.)	W1668FE7
Nut (Radio Mtg.)	W98FA3
Interference Condenser	30-4007
Distributor Resistor	33-1196
Tube Side Cover	318-2326
Wiring Side Cover	57-1863FC54
Padder Cover	318-2325
Speaker Socket	55-1117
Loktal Socket	55-0575
Vibrator Socket	27-6153
Screw & Core Assembly	57-1363
Brass Coil Cups	W-2032

The following parts are used for instrument board speaker mounting:

Speaker Unit	73-0064
Cardboard Baffle	55-0957

No.	Description	Part No.
	Rubber Gasket and Screen	55-1320
	"U" Bracket	57-2162FA3
	Side Brackets	57-1461FA3
	Bolt (Bracket Mtg.)	97-0120FA3
	Cardboard Spacers	53-0449
	Nut (Speaker Mtg.)	W124FA3
	Screw (Speaker Mtg.)	W1582FA4
	Lockwasher (Speaker Mtg.)	W291
	Lockwasher (Speaker Mtg.)	W286
	Carriage Bolt	97-C061FA3
	Carriage Bolt Nut	W98FA3

The following parts are used for dash speaker mounting:

Speaker & Housing Complete	77-0749
Speaker Unit	73-0056
Speaker Housing	57-0642FC54
Stud (Speaker Mtg.)	6122
Washer (Speaker Mtg.)	4486
Washer (Speaker Mtg.)	W676
Nut (Speaker Mtg.)	W55A
Back Cover	77-0220
Screen & Cloth Assembly	77-0749
Ornament	57-0607FA8
Speaker Cable	95-0177

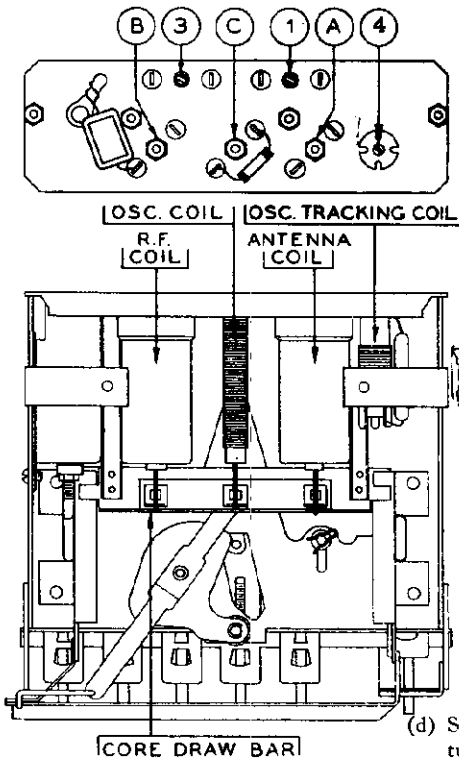


FIG. 1

USE THIS DRAWING FOR PACKARD ONLY

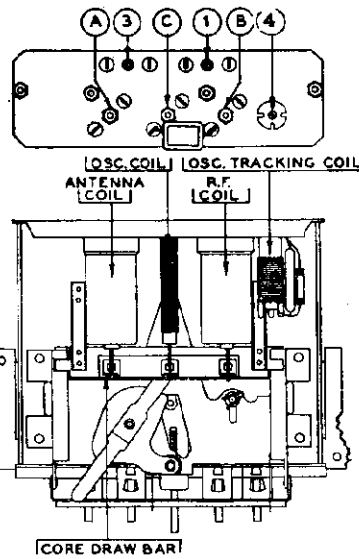


FIG. 1

USE THIS DRAWING FOR STUDEBAKER ONLY

1—COMPLETE ALIGNMENT PROCEDURE

(a) Push in the tuning control knob so that stations can be tuned in by manual tuning.

(b) Turn the tuning control knob clockwise as far as it will go so that the cores will be in the extreme "out" position. Set the signal generator to 1600 K.C. and adjust padder (3) (Fig. 1) for maximum signal. (1) FOR PACKARD

(c) Adjust padder (2) aerial compensator in radio and padder (1) (see Fig. 1) for maximum signal. (3) FOR PACKARD

(d) Set the signal generator at 1400 K.C. and tune the manual control to 1400 K.C. Adjust the R.F. and antenna coil for maximum signal by turning the mounting nuts (A) and (B).

(e) Repeat (c) and (d) until no further improvement is noticed.

(f) Set the signal generator at 600 K.C. and the tuning control at 600 K.C. Adjust the screw (4) (see Fig. 1) for maximum signal. Rock the tuning control when making this adjustment. Tune the control to the signal and adjust the screw for maximum output. Rotate the tuning control back and forth slightly until maximum output is obtained. Then readjust the screw until no further improvement is noticed.

(g) In case a great adjustment was necessary in (f) the adjustments (c) and (d) should be repeated.

(h) In case the dial calibration is off frequency, it can be corrected by changing the starting position of the oscillator core. This is done by unsoldering the piano wire from the lug and moving the core slightly. A change of 1/64" in the position of the core is equivalent to approximately 20 K.C. on the dial. If the dial reads low, it can be corrected by starting the oscillator core further in the coil form. If it reads high, the core should be pulled out. If this position is changed, it will be necessary to realign the radio as described above.

2—ALIGNMENT WHEN ONLY THE ANTENNA COIL OR CORE IS REPLACED

(a) Set the piano wire end of the core 1¼" from the end of the coil form when the core draw bar is in the extreme "out" position, and solder the wire to the lug.

(b) Set up the signal generator to 1600 K.C., and adjust the aerial compensator (2) in the radio for maximum signal.

(c) Adjust the signal generator to 1400 K.C. and set the tuning control at 1400 K.C. Adjust the coil for maximum signal by turning the mounting nut (A) until maximum signal is obtained. In case a peak cannot be obtained, it may be necessary to unsolder the piano wire and move the core slightly, either in or out.

(d) Repeat (b) and (c).

3—AILGNMENT WHEN ONLY THE R.F. TRANSFORMER OR CORE IS REPLACED

(a) Set the piano wire end of core 1¼" from the end of the coil form when the core draw bar is in the extreme "out" position and solder the wire to the lug.

(b) Set up the signal generator to 1600 K.C. and adjust padder (1) (see Fig. 1) for maximum signal. (3) FOR PACKARD

(c) Adjust the signal generator to 1400 K.C adn set the tuning control at 1400 K.C Adjust the coil form by turning the mounting nut (B) until maximum signal is obtained. In case a peak cannot be obtained, it may be necessary to unsolder the piano wire and move the core slightly, either in or out.

4—ALIGNMENT WHEN ONLY THE OSCILLATOR TRACKING COIL OR CORE IS REPLACED

(a) Set the signal generator to 600 K.C. and the tuning control at 600 K.C. Adjust screw (4) (see Fig. 1) for maximum signal. Rock the tuning control while making this adjustment. Tune the control to the signal and adjust the screw for maximum output. Rotate the tuning control back and forth slightly until maximum output is obtained. Then readjust the screw until no further improvement is noticed.

(b) Check and readjust the aerial compensator (2) in the radio, and padders (1), (2), and (4) as described in 1.

5—ALIGNMENT WHEN ONLY THE OSCILLATOR COIL OR CORE IS REPLACED

(a) Set the piano wire end of the core 1¼" from the end of the coil form when the core draw bar is in the extreme "out" position, and solder the wire to the lug.

(b) Set up the signal generator to 1600 K.C. and adjust padder (3) (see Fig. 1) for maximum signal. (1) FOR PACKARD

(c) Follow the same procedure as outlined under "1—Complete Alignment Procedure".

PHILCO RADIO & TELEVISION CORP.

MODEL S-1616

INSTALLING CALL LETTERS IN AUTOMATIC TUNING DIAL

One of the "A" leads on the back of the control head must be connected so that the current is supplied to operate the automatic control dial. Insert the fuse in the fuse housing in the separate "A" lead (supplied in the radio package), and connect to the "A" lead on the control. The eyelet end of this lead should be connected to the terminal of the Gas Gauge nearest the center of the car.

1—Select and remove from the Call Letter Sheets, the Call Letters of five popular stations in the area in which the radio is to be operated and that comes within the frequency range of the positions on the dial as shown in Illustration for Model S-1616.

2—If the section of the dial in which the tab marked "DIAL" is not at the indicator window, push the Automatic Station Selector until it is in position in the indicator window. The control must be held against the edge of the instrument panel in order to complete the electrical circuit.

3—Push the Automatic Station Selector once more and No. 1 section of the dial will rotate to the front. Insert in this position the call letter tab of the station having the highest kilocycle frequency.

EXAMPLE: The No. 1 position may have the call letters of a station operating on 1400 kilocycles; the No. 2 position, a station operating on 1050 kilocycles, etc.

4—Repeat this procedure until all five call letter tabs selected are inserted in the dial in the order of their frequency. Be sure and record the call letters with respect to their position on the dial for use in setting up the adjusting screws.

5—The control unit should now be completely installed. Remove the trim panel covering the control openings and place the control unit in position in the back of the instrument panel. Insert the bezel windows in the bezel plate, and apply the bezel plate to the front of the panel. The control and bezel are assembled to the instrument with gland nuts. Using the special gland nut wrench provided, tighten the nuts and then apply the two knobs.

SETTING UP THE RECEIVER FOR AUTOMATIC TUNING

Before setting up the Receiver for automatic tuning, it is necessary to synchronize the automatic dial to the Receiver as follows:

Try to tune in a station with the tuning control knob. If no station can be picked up, push the automatic station selector button until the position is found where stations can be tuned in. This is the "DIAL" position. Remove the automatic control cable from the Receiver and again push the automatic station selector button until the word "DIAL" appears in the dial window. The automatic control cable should then be replaced in its socket on the Receiver and secured with the two self threading screws supplied.

1—Turn the Receiver on and allow it to operate for TWENTY minutes. Remove the cover plate over the automatic tuning adjusting screws. This plate is on the control end of the Receiver and can easily be pried off.

2—Push the automatic station selector button until the word "DIAL" is at the indicator window. Tune in the station whose call letters are in the No. 5 position on the dial (the lowest frequency station) and note the program. Push the automatic selector button five times and this station's call letters will appear at the indicator window.

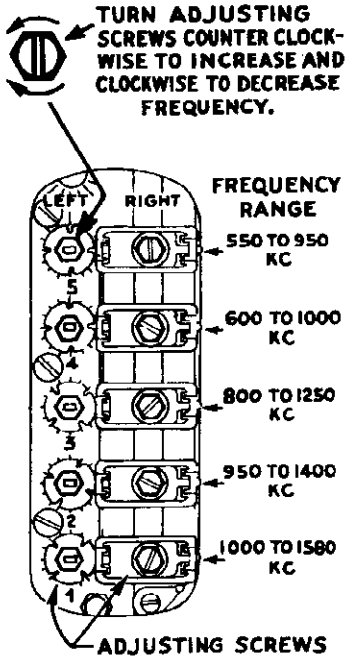
IMPORTANT—Start adjustments with low frequency screws.

3—With a small screwdriver, turn the No. 5 adjusting screw (See Illustration for Model S-1616) in the left column to the right or left until the station is tuned in. Now adjust the corresponding screw in the right column until maximum volume is obtained. Make these adjustments carefully, as it may be easy to pass by the loudest point on some stations.

4—Press the automatic station selector button until "DIAL" again is at the indicator window and tune in the station whose call letters are in the No. 4 position on the automatic dial (the next higher frequency). Press the automatic button four times and adjust the number 4 set of adjusting screws to this station.

Repeat this procedure until each of the five pairs of adjusting screws has been tuned to its respective station.

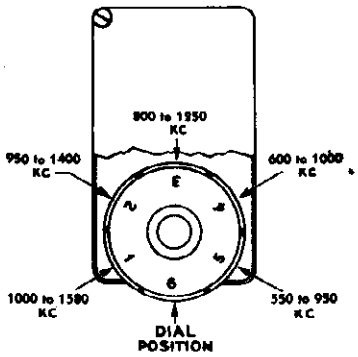
It is NECESSARY that the setting of the adjusting screws be repeated to be sure they are properly set so that maximum performance may be had.



VIEW OF AUTOMATIC ADJUSTING SCREWS

Be sure and save the unused call letters giving them to the owner as they may be needed at some future time if the radio is to be operated in a different area where the local stations are not the same.

If the Stations set up on the Automatic Tuning Dial should at some time tune in at the wrong position, the dial can be easily synchronized to the radio as follows:



PHANTOM VIEW OF THE AUTOMATIC-DIAL SHOWING POSITIONS ON DIAL AND FREQUENCY RANGE OF EACH

1—Find "DIAL" position as explained in the second Paragraph under "Setting up the Receiver for Automatic Tuning."

2—Remove the automatic cable from the socket on the end of the Receiver.

3—Press the automatic station selector button until "DIAL" appears in the Automatic Window.

4—Replace automatic cable.

FOR OTHER DATA SEE INDEX

MODEL P-1617

FOR OTHER DATA ON THESE MODELS SEE INDEX

PREPARING FOR AUTOMATIC TUNING ADJUSTMENTS

Turn on the Receiver and allow it to operate for TWENTY mirutes before starting this procedure.

1—Try to tune in a station with the manual tuning control knob. If no station is received, press the Automatic Station Selector button and again try to tune in a station. Repeat if necessary until the Automatic Station Dial has rotated to a point where stations may be tuned in with the manual tuning knob. This point will be the "DIAL" position of the Automatic Station Selector and call letters may now be inserted in the dial.

2—Remove the right knob, gland nut cover, gland nut and bezel.

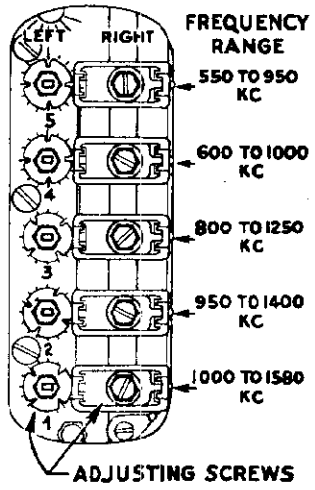
Remove the pilot lamp assembly from the automatic dial housing.

Remove the two screws in the front right side of the automatic dial housing. (These screws can be seen thru the opening in the instrument panel when the bezel is removed.

3—Remove the Automatic Control Dial and assembly from the control units and drop it down below the edge of the instrument panel so that the dial is accessible.

4—Select and remove from the call letter sheets, the call letters of five popular stations received in the area in which the radio is to be operated, and that come within the frequency range of the adjusting screws as shown in Illustration for Model P-1617: Also remove the tab marked "DIAL."

5—Insert the "DIAL" tab in the slot in the dial which is now at the front. (The position just located by being able to tune in a station).



6—Hold the dial assembly against the edge of the instrument panel to complete the electrical connection and press the Automatic Station Selector button once. The dial will now rotate one position. The front slot is for the call letters of the station with the highest frequency in kilocycles.

Press the Selector button once more and insert the call letters of the station with the next highest frequency in kilocycles.

EXAMPLE: The first position may have a station operating on 1400 kilocycles; the second position, station operating on 1050 kilocycles, etc.

Repeat this procedure until all five station call letter tabs selected are inserted in the dial in the order of their frequencies. Be sure to record the call letters with respect to their position on the dial for use in setting up adjusting screws.

7—Replace dial assembly, dial assembly screws, bezel, gland nut, and knob.

8—Remove the plate on the end of the Receiver which covers the adjusting screws. This is held by snap springs and can easily be pried off.

AUTOMATIC TUNING ADJUSTMENTS

It is necessary to adjust the "LOW" frequency adjusting screws first.

Push the Automatic Selector Button until the word "DIAL" appears in the dial window. Tune in the broadcast station whose call letters are in the No. 5 position on the automatic dial (the lowest frequency station) and note the program.

Push the Automatic Selector Button five times and this station's call letters well appear in the dial window.

With a small screwdriver, turn the No. 5 adjusting screw in the left column to the right or left until the same station is tuned in. See illustration for Model P-1617. Now adjust the corresponding screw in the right column until maximum volume is obtained. Make these adjustments carefully, as it may be easy to pass by the loudest point on some stations.

Press the Automatic Selector Button until "DIAL" again appears in the window and tune in the station whose call letters are in the No. 4 position. Then press the automatic selector button four times and adjust the No. 4 set of adjusting screws.

Repeat this procedure until all five parts of adjusting screws have been set on their respective station. It is NECESSARY to recheck the setting of the adjusting screws to be sure they are properly set so that maximum performance may be had. Stations may be set up before installing the Receiver but final adjustment must be made with the radio operating on the antenna in the car.

If at any time the Stations set up on the Automatic Tuning Dial should tune in at the wrong position, the dial can be easily synchronized to the radio as follows:

1—Find "DIAL" position as explained in Paragraph 1, under "Preparing for Automatic Tuning Adjustments."

2—Remove the automatic cable from the socket on the end of the Receiver.

3—Press the Automatic Station Selector button until "DIAL" appears in the Automatic Window.

4—Replace automatic cable.

MODEL C-1708

1. With the antenna installed and connected, turn on the radio and allow it to operate for TWENTY minutes before making adjustments.

The Receiver must be adjusted with the Skyway antenna fully extended and it is recommended that adjustments be made with the car in a shielded area such as under a viaduct or in a steel constructed building. However best results may be obtained using the new signal Antennuator. This permits setting up nearby local stations on the buttons without having the car in a shielded area.

2. Push in the dial button and tune with manual control a weak station between 1350 and 1500 kilocycles. Pull push buttons off. Adjust the antenna compensator with a screw driver by turning the adjusting screw either to the left or right until maximum volume is reached. See illustration.

3. If numbers on buttons are not desired, select and remove from the call letter sheet, five call letter tabs of popular stations received in the area in which the receiver is to be operated, selecting stations within the range of each button as shown in illustration, Model C-1708. Reference to programs published in your local newspaper aids in quick selection of stations. Remove metal caps to install the tabs in push buttons.

4. Push dial button and tune in the station you have selected for the No. 1 button, identify the program and push in the No. 1 push button shaft. Using a small screw driver, turn the No. 1 adjusting screw (inner screw) and tune in the station selected for this position by turning the screw driver counter-clockwise to increase frequency and clockwise to decrease frequency.

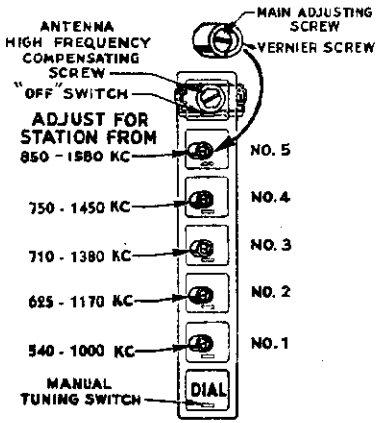
After the station has been tuned in accurately, (see illustration) a finer adjustment can be made by adjusting the vernier screw, which is the outside shell of the adjusting screw. Use a larger screw driver for this operation. Careful adjustment of this screw will insure maximum performance in areas where broadcasting reception is poor.

Proceed in like manner with the adjustment of No. 2, 3, 4 and 5 screws in the order of frequency until all five stations have been tuned in. It is recommended that the above procedure of setting up stations should be repeated in order that accurate adjustments may be insured. for satisfactory reception at some distance from stations.

5. The push buttons may now be replaced on their respective shafts.

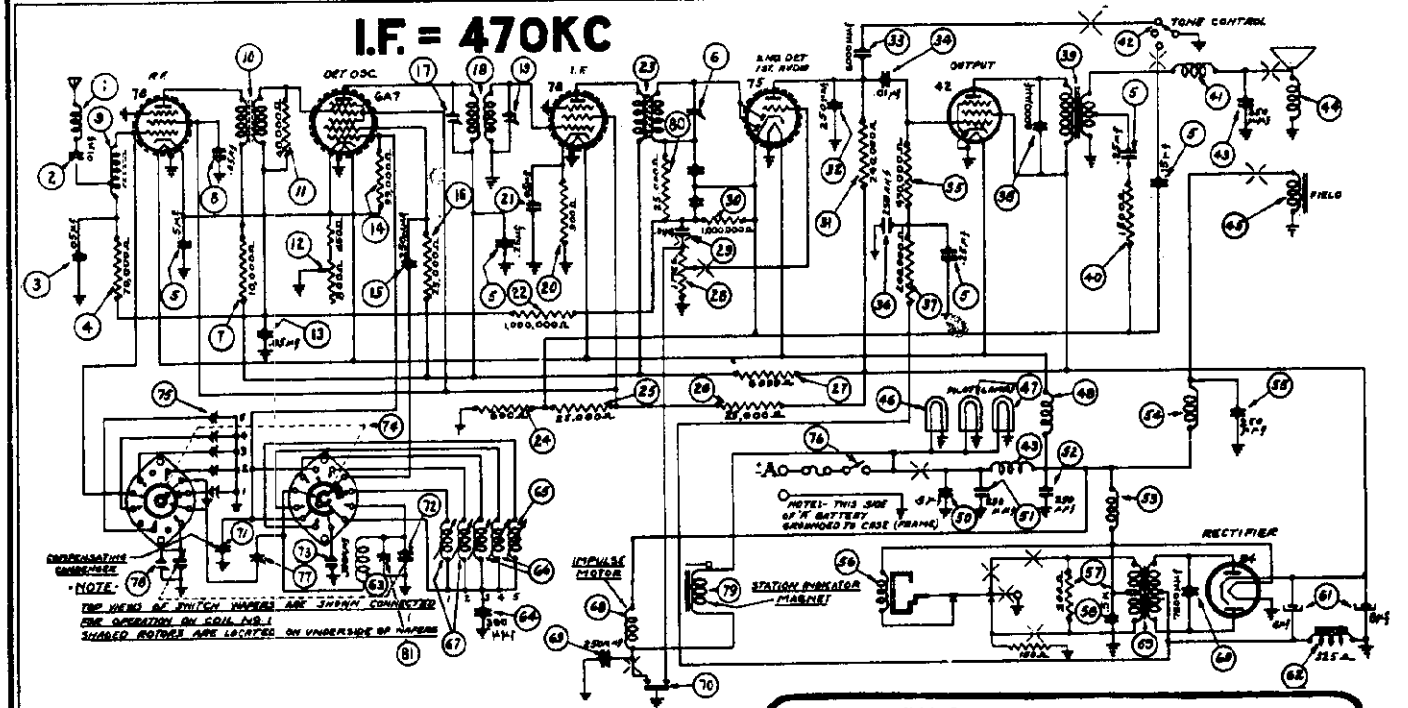
The Receiver may be set up before installing in the car, but FINAL adjustments must be made with the radio operating on the antenna in the car. Eight hundred call letter tabs in sheet form are furnished so that at least five popular radio broadcasting stations can be selected.

BE SURE AND SAVE THE UNUSED CALL LETTERS, GIVING THEM TO THE OWNER AS THEY MAY BE NEEDED AT SOME FUTURE TIME IF THE RADIO IS TO BE OPERATED IN A DIFFERENT AREA WHERE THE LOCAL STATIONS ARE NOT THE SAME.



AUTOMATIC ADJUSTING SCREWS

I.F. = 470KC



Signal Generator Connection	Dummy Antenna	Signal Generator Frequency	Receiver Wave-band Switch	Receiver Dial Setting	Trimmer Number
Control grid of 6A7	0.1 mf	470 kc	Note 1	Note 2	6
"	"	"	"	"	19
"	"	"	"	"	17
Ant.[3]	20 mmf	1580 kc	"	"	81
"	"	1400 kc	"	1400 kc	78
"	"	580 kc	"	580 kc	77 *
"	"	1580 kc	"	Note 2	81
"	"	1400 kc	"	1400 kc	78 [4]

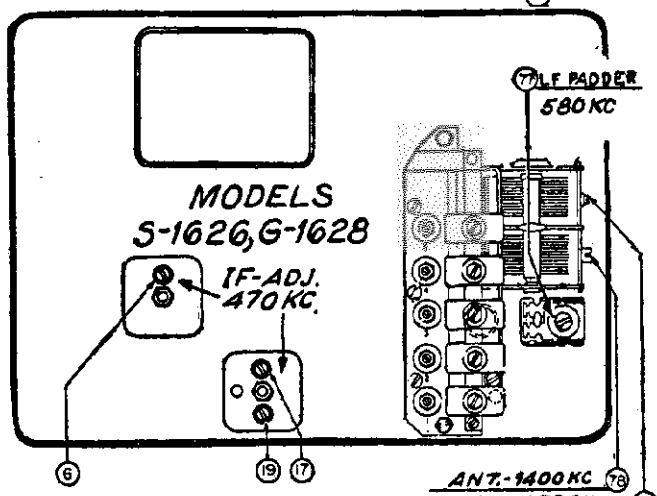
Note 1.—Press Automatic Station-Selector button until "DIAL" appears in the window and stations can be tuned in by manual tuning.

Note 2.—Turn condenser rotor plates completely out of mesh as far as they will go.

Note 3.—Connect antenna lead, Part No. L-2765, to the antenna receptacle in the radio. Connect 20 mmf condenser in series between signal-generator and antenna lead.

Note 4.—When the antenna-stage adjustment is made with the radio installed in the car, the radio 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.

* While rocking.



No.	Description	Part No.
①	Antenna Choke	32-1956
②	Condenser (.01 mfd.)	61-0014
③	Condenser (.05 mfd.)	20-4569
④	Resistor (70,000 ohms)	33-370337
⑤	Condenser	
⑥	Padder (Sec. 2nd I. F. Trans.)	
⑦	Resistor (10,000 ohms)	33-310337
⑧	Condenser (.05 mfd.)	30-4444
⑨	Antenna Transformer	65-0100
⑩	R. F. Transformer	65-0009
⑪	Resistor (40,000 ohms)	33-339137
⑫	Sensitivity Control	33-5264-4
⑬	Condenser (.05 mfd.)	30-4444
⑭	Resistor (90,000 ohms)	33-390337
⑮	Condenser (250 mmfd.)	30-1038
⑯	Resistor (25,000 ohms)	33-325337
⑰	Padder (Pri. 1st I. F. Trans.)	
⑱	First I. F. Transformer	65-0002
⑲	Padder (Sec. 2nd I. F. Trans.)	
⑳	Resistor (900 ohms)	33-190438
㉑	Condenser (.05 mfd.)	30-4569
㉒	Resistor (1,000,000 ohms)	33-510337
㉓	Second I. F. Transformer	65-0003
㉔	Resistor (600 ohms)	33-160438
㉕	Resistor (25,000 ohms)	33-325337
㉖	Resistor (25,000 ohms)	33-325437
㉗	Resistor (6,000 ohms)	33-260337
㉘	Volume Control (1,000,000 ohms) and On-Off Switch	67-0012-1
㉙	Condenser (.01 mfd.)	30-4479
㉚	Resistor (330,000 ohms)	33-433337
㉛	Resistor (240,000 ohms)	33-424337
㉜	Condenser (250 mmfd.)	30-1032
㉝	Condenser (6,000 mmfd.)	30-4504
㉞	Condenser (.01 mfd.)	30-4501
㉟	Resistor (490,000 ohms)	33-449337
㊱	Condenser (250 mmfd.)	30-1032
㊲	Resistor (240,000 ohms)	33-424337
㊳	Condenser (6,000 mmfd.)	30-4024
㊴	Output Transformer	65-0053
㊵	Resistor (1,500 ohms)	33-215337
㊶	Choke	32-1374
㊷	Tone Control Switch complete	85-0030
㊸	Condenser (250 mmfd.)	30-1032
㊹	Cone and Voice Coil	91-0041
㊺	Field Coil	Not Replaceable
㊻	Pilot Lamp	34-2040
㊼	Pilot Lamp	34-2039
㊽	Filament Choke	32-1604
㊾	"A" Choke	32-1644
㊿	Condenser (.5 mfd.)	30-4474
(51)	Condenser (250 mmfd.)	30-1032
(52)	Condenser (250 mmfd.)	30-1032
(53)	Vibrator Choke	32-2812
(54)	Choke	32-2657
(55)	Condenser (250 mmfd.)	30-1032
(56)	Vibrator	41-3170
(57)	Resistor (200 ohms)	33-120337
(58)	Condenser (.5 mfd.)	30-4565
(59)	Power Transformer	65-0016
(60)	Condenser (7,500 mmfd.)	30-4567
(61)	Filter Condenser (4-8 mfd.)	30-2295
(62)	Filter Choke (325 ohms)	32-7810
(63)	Oscillator Transformer	65-0052
(64)	Silver Cap Condenser (390 mmfd.)	61-0031
(65)	Oscillator Transformer (Low Freq.)	65-0051
(66)	Oscillator Transformer (Med. Freq.)	65-0050
(67)	Oscillator Transformer (High Freq.)	65-0049
(68)	Choke	32-1644
(69)	Condenser (250 mmfd.)	30-1032
(70)	Push Button Switch complete	85-0031
(71)	Thermal Coupling Condenser	61-0011
(72)	Tuning Condenser	63-0012
(73)	Silver Cap Condenser (300 mmfd.)	61-0003
(74)	Wafer Switch	77-0185
(75)	Antenna Padder Assembly	77-0035
(76)	On-Off Switch and Volume Control	67-0012-1
(77)	Low Frequency Padder	63-0017
(78)	First Padder (on Tun. Cond.)	
(79)	Impulse Motor	77-0120
(80)	Resistor (25,000 ohms)	33-325337
(81)	Second Padder (on Tun. Cond.) Dial Assembly	85-0020

MODELS S-1626
G-1628

PHILCO RADIO & TELEVISION CORP.

MODELS S-1626 and G-1628

SETTING UP THE RECEIVER FOR AUTOMATIC TUNING

Select and remove from the Call Letter Sheets, the Call Letters of five popular stations received in the area in which the radio is to be operated and that come within the frequency range of the adjusting screws as shown in Illustration for Models S-1626, G-1628. Also remove the tab marked "DIAL."

Insert the "DIAL" tab in the slot in the dial which is at the front.

Hold the control against the edge of the inatrument panel in order to complete the electrical circuit and push the automatic selector button. The dial will rotate one position. Insert in the dial, the call letter tab of the station having the highest frequency in kilocycles. Press the selector button once more and insert the call letters of the station with the next highest frequency in kilocycles.

EXAMPLE—The first position may have the call letters of a station operating on 1400 kilocycles; the second position, a station operating on 1050 kilocycles, etc. Repeat this procedure until all five call letter tabs selected are inserted in the dial in the order of their frequency. Be sure and record the call letters with respect to their position on the dial for use in setting up the adjusting screws.

Before setting up the Receiver for automatic tuning, it is necessary to synchronize the automatic dial to the Receiver as follows:

Try to tune in a station with the tuning control knob. If no station can be picked up, push the automatic station selector button until the position is found where stations can be tuned in. This is the "DIAL" position. Remove the automatic control cable from the Receiver and again push the automatic station selector button until the word "DIAL" appears in the dial window. The automatic control cable should then be replaced in its socket on the Receiver and secured with the two self threading screws supplied.

1—Turn the Receiver on and allow it to operate for TWENTY minutes. Remove the cover plate over the automatic tuning adjusting screws. This plate is on the front of the Receiver and can easily be pried off.

2—Push the automatic station selector button until the word "DIAL" is at the indicator window. Tune in the station whose call letters are in No. 5 position on the dial (the lowest frequency station) and note the program. Push the automatic selector button five times and this station's call letters will appear at the indicator window.

3—With a small screwdriver, turn the No. 5 adjusting screw (See Illustration for Models S-1626, S-1628) in the left column to the right or left until the station is tuned in. Now adjust the corresponding screw in the right column until maximum volume is obtained. Make these adjustments carefully, as it may be easy to pass by the loudest point on some stations.

4—Press the automatic station selector button until "DIAL" again is at the indicator window and tune in the station whose call letters are in the No. 4 position on the automatic dial (the next higher frequency). Press the automatic button four times and adjust the number 4 set of adjusting screws.

Repeat this procedure until each of the five pairs of adjusting screws has been tuned to its respective station.

It is NECESSARY that the setting of the adjusting screws be repeated to be sure they are properly set so that maximum performance may be had.

Be sure and save the unused call letters, giving them to the owner as they may be needed at some future time if the radio is to be operated in a different area where the local stations are not the same.

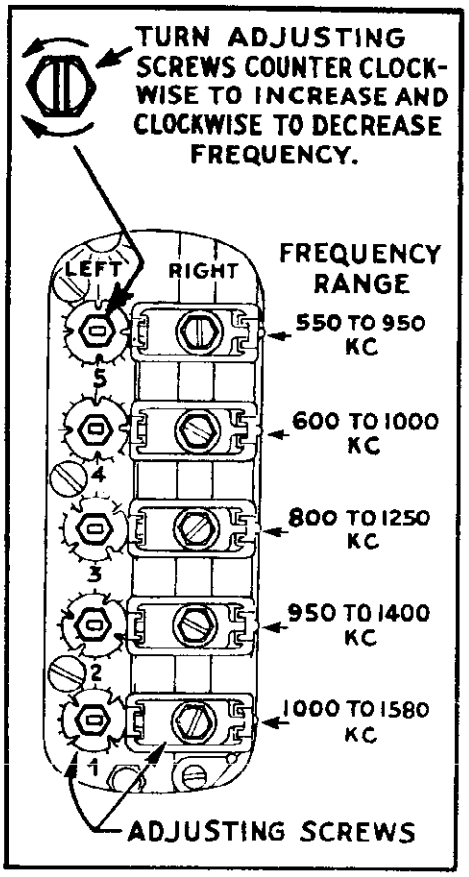
If the Stations set up on the Automatic Tuning Dial should at some time tune in at the wrong position, the dial can be easily synchronized to the radio as follows:

1—Find "DIAL" position as explained in the second Paragraph under "Setting up the Receiver for Automatic Tuning."

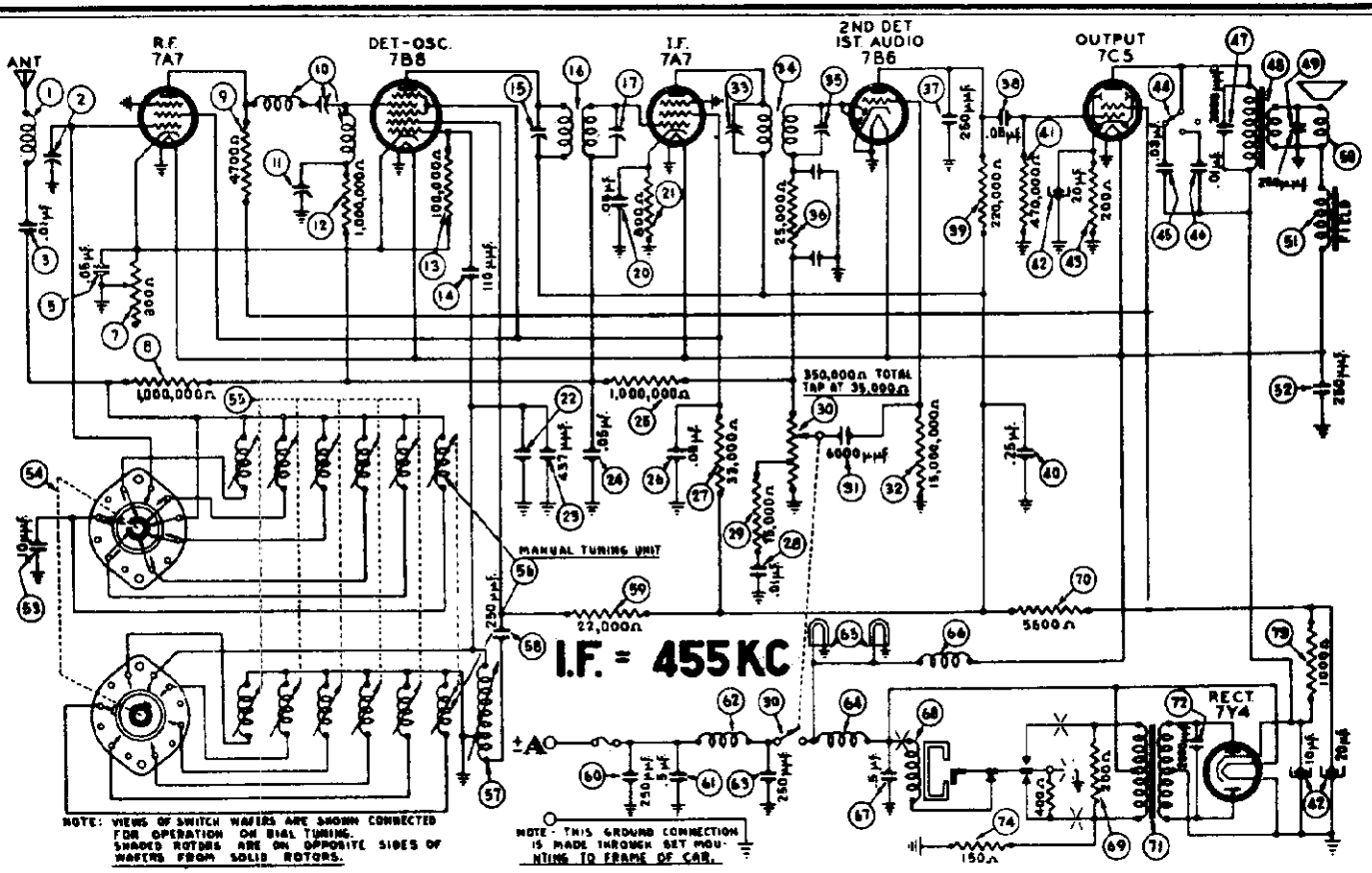
2—Remove the automatic cable from the socket on the end end of the Receiver.

3—Press the automatic station selector button until "DIAL" appears in the Automatic Window.

4—Replace automatic cable.



VIEW OF AUTOMATIC ADJUSTING SCREWS



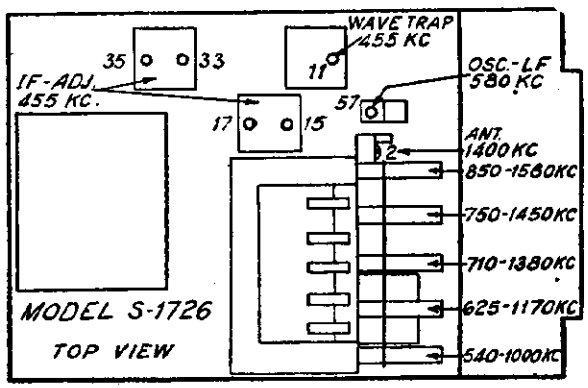
Signal Generator Connection	Dummy Antenna	Signal Generator Frequency	Receiver Wave-band Switch	Receiver Dial Setting	Trimmer Number
Ant. Recept.	0.1 mf	455 kc	Note 1	Note 2	35
"	"	"	"	"	33
"	"	"	"	"	17
"	"	"	"	"	15
"	"	"	"	"	35
"	"	"	"	"	33
"	"	"	"	"	17
"	"	"	"	"	15
"	"	"	"	"	11 [3]
Ant.[4]	30 mmf	1400 kc	"	1400 kc	2
"	"	580 kc	"	580 kc	57 *
"	"	1400 kc	"	1400 kc	2 [5]

Note 1.—Press automatic push button until "DIAL" appears in the window and stations can be tuned in by manual tuning.

Note 2.—Turn tuning-control knob clockwise as far as it will go.

Note 3.—Adjust (11) to obtain minimum output.

Note 4.—Connect antenna lead, Part No. 95-0120, to the antenna receptacle on the radio. Connect 30 mmf condenser in series between signal-generator



Note 5.—When the antenna-stage adjustment is made with the radio installed in the car, the radio antenna lead must be connected to the cowl antenna in the usual manner. Connect the signal-generator output lead to a wire placed near the car antenna lead, but not connected to it; and adjust trimmer (2) for maximum signal at 1400 kc.

No.	Description	Part No.
1	Antenna Choke	65-0102
2	Antenna Padder	63-0035
3	Condenser (.01 mfd.)	61-0014
4	Condenser (.05 mfd.)	61-0101
5	Sensitivity Control	67-0025
6	Resistor (1,000,000 ohms)	33-510154
7	Resistor (4700 ohms)	33-247154
8	R. F. Transformer	65-0276
9	I. F. Wave Trap Padder	
10	Resistor (1,000,000 ohms)	33-510154
11	Resistor (100,000 ohms)	33-410154
12	Condenser (110 mmfd.)	30-1031
13	Padder (Pri. 1st I. F. Trans.)	
14	First I. F. Transformer	65-0274
15	Padder (Sec. 1st I. F. Trans.)	
16	Condenser (.05 mfd.)	61-0101
17	Resistor (800 ohms)	33-180334
18	Thermal Compensator	61-0080
19	Sil. Mica Cond. (437 mmfd.)	61-0071
20	Condenser (.05 mfd.)	61-0101
21	Resistor (1,000,000 ohms)	33-510154
22	Condenser (.05 mfd.)	61-0101
23	Resistor (33,000 ohms)	33-333434
24	Condenser (.01 mfd.)	61-0110
25	Resistor (15,000 ohms)	33-315154
26	Volume Control (350,000 ohms) and On-Off Switch	67-0028
27	Condenser (6000 mmfd.)	61-0103
28	Resistor (15,000,000 ohms)	33-615154
29	Padder (Pri. 2nd I. F. Trans.)	
30	Second I. F. Transformer	65-0275
31	Padder (Sec. 2nd I. F. Trans.)	
32	Resistor (25,000 ohms)	33-325334
33	Condenser (250 mmfd.)	61-0033
34	Condenser (.05 mfd.)	61-0122
35	Resistor (220,000 ohms)	33-422334
36	Condenser (.25 mfd.)	61-0125
37	Resistor (470,000 ohms)	33-447154
38	Filter Cond. (10-20-20 mfd.)	61-0089
39	Resistor (200 ohms)	33-120334
40	Tone Control Switch	86-0104
41	Condenser (.03 mfd.)	61-0126
42	Condenser (.01 mfd.)	61-0124
43	Condenser (2000 mmfd.)	61-0123
44	Output Transformer	65-0277
45	Condenser (250 mmfd.)	61-0033
46	Replacement Cone (For 73-0038-4 Speaker) (For 73-0038-2 Speaker)	91-0101 91-0102
47	Field Coil	Not Replaceable
48	Condenser (250 mmfd.)	61-0033
49	Condenser (10 mmfd.)	61-0065
50	Wafer Switch	318-1782
51	Push-Button Trans. Assy.	77-0412
52	Inductive Tuning Unit	77-0469
53	Oscil. Tracking Coil	65-0270
54	Condenser (250 mmfd.)	61-0033
55	Resistor (22,000 ohms)	33-322334
56	Condenser (250 mmfd.)	61-0033
57	Condenser (.5 mfd.)	61-0106
58	"A" Choke	32-1644
59	Condenser 250 mmfd.)	61-0033
60	Vibrator Choke	65-0075
61	Pilot Lamps	34-2044
62	Filament Choke	32-1374
63	Condenser (.5 mfd.)	61-0107
64	Vibrator	83-0017
65	Resistor (200 ohms)	33-120334
66	Resistor (5600 ohms)	33-256154
67	Power Transformer	65-0272
68	Condenser (2000 mmfd.)	61-0074
69	Resistor (1000 ohms)	33-210434
70	Resistor (150 ohms)	33-115334
71	Push-Button	85-0729

MODEL S-1726

PHILCO RADIO & TELEVISION CORP.

MODEL S-1726

The antenna and touch tuning station adjustments are accessible from the front of the receiver when the two screws holding the cover plate are removed. On cars equipped with the "Climatizer", it will be necessary to remove the screws holding the "Climatizer" control assembly to the lower edge of the instrument panel and drop it down out of the way while making the adjustments.

1—Turn on the radio set and allow it to heat for at least twenty minutes before starting any adjustments.

2—Press the touch control button until the word "DIAL" appears in the "DIAL" window. Tune in a weak station on the manual dial between 1350 and 1500 kilocycles. Now adjust the antenna high frequency compensating screw (See Illustration) until maximum volume is obtained.

3—Select five stations within the frequency range shown over each set of adjusting screws (See Illustration). Remove the call letters for these stations from the call letter tab sheet. Remove the top cover of the set; this exposes the plastic drum into which the tabs should be inserted. It is important to insert these tabs in a definite relationship with respect to frequency in order that tuning adjustments can be made properly. Arrange the tabs in the order of frequency from high to low, placing the highest frequency on the drum immediately next to the dial tab in a counter clockwise direction. Insert the remaining tabs in the order of frequency in this same counter clockwise direction. If the tabs have been inserted correctly, it will be found that when the word "DIAL" shows in the window, the next push of the button will place the call letter for the highest frequency station in the window. Each successive push of the control button will place a next lower frequency station in the window until the series is repeated.

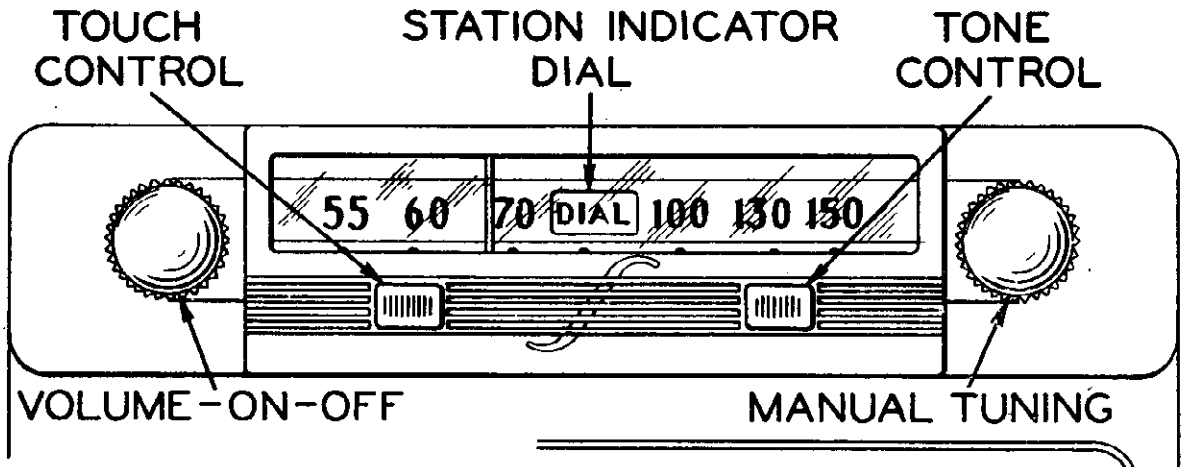
4—With "DIAL" showing in the dial window, manually tune in the station to be set up on push button number 1 and identify the program.

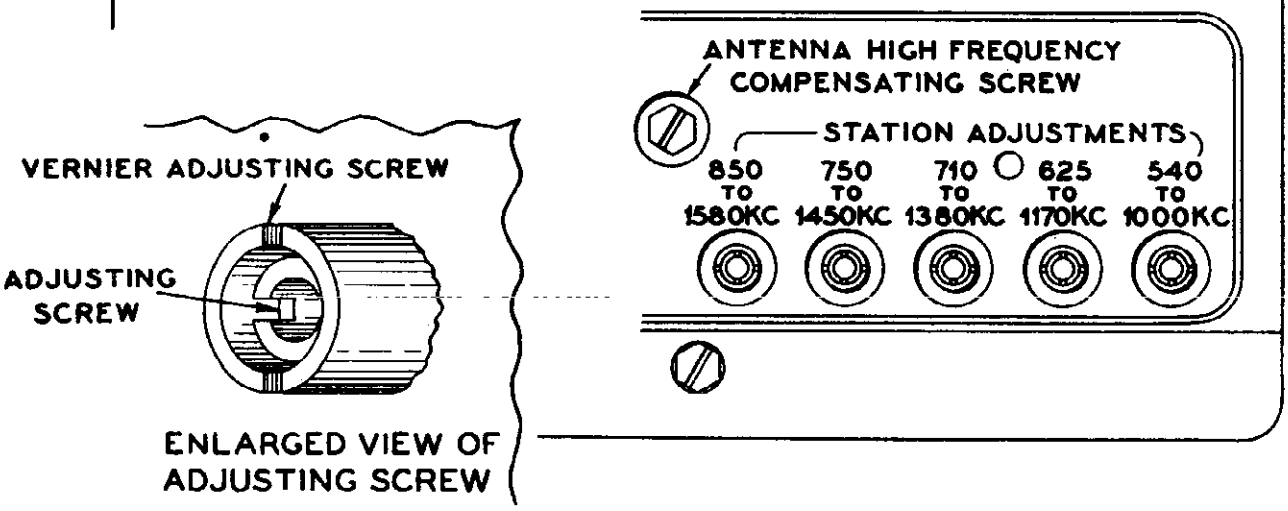
5—Press the touch control button once and adjust the left hand screw using the small end of the special screw driver, until the station identified has been tuned in as accurately as possible. A final adjustment can be made by inserting the large end of the screw driver into the vernier adjusting screw. Careful adjustment of this screw will insure maximum performance in areas where reception is poor. NOTE: Stations of the higher frequencies are tuned in by turning the screws to the left or counter clockwise. Lower frequency stations are tuned by turning to the right or clockwise. Proceed in like manner with the adjustment of each of the remaining stations in the order of frequency until all five stations selected have been tuned in. Because there is some detuning of the coils due to the movements of the cores in adjacent coils, it is necessary to re-check the adjustments again going back from right to left and again re-checking from left to right. This is important for accurate reception while driving at a distance from the broadcasting stations.

6—This final re-checking of adjustments should be made in an area of low signal strength in your service station or in some known "dead" spot where signals can just barely be heard.

7—Replace the cover plate over the adjusting screws and replace the "Climatizer" controls.

BE SURE AND SAVE THE UNUSED CALL LETTERS, GIVING THEM TO THE OWNER AS THEY MAY BE NEEDED AT SOME FUTURE TIME IF THE RADIO IS TO BE OPERATED IN A DIFFERENT AREA WHERE THE LOCAL STATIONS ARE NOT THE SAME.





MODELS L-1760,
L-1761

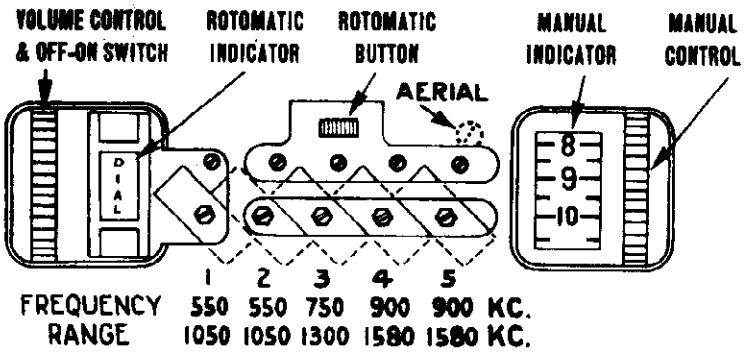
PHILCO RADIO & TELEVISION CORP.

MODELS L-1760 and L-1761

The Aerial and Rotomatic adjustments are easily accessible through the openings in the instrument panel. (See Illustration).

1—Turn the radio set on and allow it to heat for at least TWENTY minutes before starting any adjustments.

2—Press the Rotomatic button until the word "DIAL" appears in the Rotomatic indicator. Tune in a weak station on the manual dial between 1400 and 1500 kilocycles. Now adjust the aerial screw until maximum volume is obtained. (When the special concealed cowl aerial is used, adjustment should be made with the aerial fully extended.)



AUTOMATIC ADJUSTING SCREWS

3—Select five stations within the frequency range shown under each set of adjustment screws shown in Illustration.

4—With "DIAL" showing on the Rotomatic indicator, manually tune in the station to be set up on position No. 1 and identify the program.

5—Press the Rotomatic button until No. 1 appears on the Rotomatic indicator. Now adjust the top screw at position No. 1 until the station selected is brought in with loudest volume. Then adjust the slotted hex screw at the bottom until maximum volume is obtained. NOTE: Stations of the higher frequencies are tuned in by turning the screws to the left or counter clockwise. Lower frequency stations are tuned by turning to the right or clockwise.

6—Proceed with setting up the remaining four stations in the same manner as described under Paragraphs 4 and 5.

7—Because there is some detuning of the coils due to the movements of the cores in adjacent coils, it is necessary to recheck the adjustments again going back from Position No. 5 to No. 1 and again rechecking from No. 1 to No. 5. This is important for accurate reception while driving at a distance from the broadcasting stations.

8—This final rechecking of adjustments should be made in an area of low signal strength in your service station or in some known "dead" spot where signals can just barely be heard.

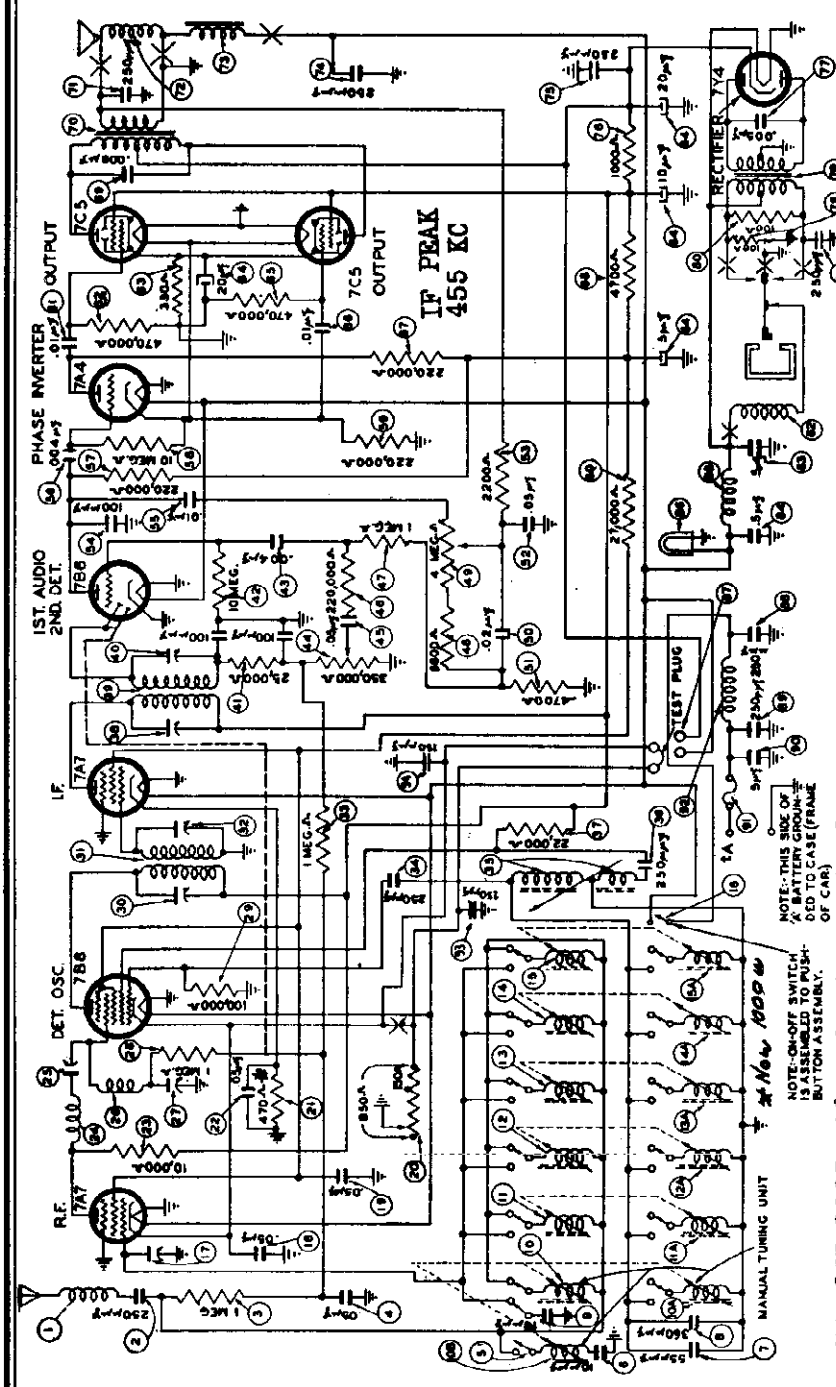
9—Should the Special Concealed Cowl Aerial be installed after the original installation, it is absolutely essential that the aerial change-over switch be shifted counter-clockwise and also that all automatic adjustments be made again as described in Paragraphs Nos. 1 to 8 inclusive.

PARTS LIST

No.	Description	Part No.
①	Antenna Choke	65-0168
②	Condenser (.01 mfd.)	61-0014
③	Antenna Transformer	65-0306
④	Condenser (.05 mfd.)	30-4569
⑤	Resistor (100,000 ohms)	33-410334
⑥	Sensitivity Control	67-0029
⑦	Resistor (10,000 ohms)	33-310334
⑧	R. F. Transformer	65-0305
⑨	I. F. Wave Trap Padder	
⑩	Condenser (25 mmfd.)	33-1108
⑪	Resistor (1,000,000 ohms)	33-510234
⑫	Condenser (.25 mfd.)	61-0088
⑬	Resistor (100,000 ohms)	33-410334
⑭	Resistor (27,000 ohms)	33-327334
⑮	Condenser (250 mmfd.)	61-0034
⑯	Condenser (.1 mfd.)	30-4455
⑰	Padder (Pri. 1st I. F. Trans.)	
⑱	First I. F. Transformer	65-0303
⑲	Padder (Sec. 1st I. F. Trans.)	
⑳	Condenser (.05 mfd.)	30-4444
㉑	Resistor (680 ohms)	33-168334
㉒	Resistor (3300 ohms)	33-233354
㉓	Condenser (.05 mfd.)	30-4569
㉔	Resistor (1,000,000 ohms)	33-510154
㉕	Padder (Pri. 2nd I. F. Trans.)	
㉖	Second I. F. Transformer	65-0304
㉗	Padder (Sec. 2nd I. F. Trans.)	
㉘	Resistor (25,000 ohms	33-325234
㉙	Volume Control (350,000 ohms) and On-Off Switch	67-0026
㉚	Condenser (.01 mfd.)	61-0014
㉛	Resistor (50,000 ohms)	33-347134
㉜	Condenser (.01 mfd.)	30-4479
㉝	Resistor (600 ohms)	33-160334
㉞	Condenser (.01 mfd.)	30-4479
㉟	Resistor (27,000 ohms)	33-327334
㊱	Condenser (.05 mfd.)	30-4444
㊲	Resistor (24,000 ohms)	33-324434
㊳	Resistor (1,000,000 ohms)	33-510154
㊴	Choke	65-0300
㊵	Condenser (250 mmfd.)	61-0033
㊶	Input Transformer	65-0293
㊷	Resistor (82,000 ohms)	33-382334
㊸	Condenser (.02 mfd.)	30-4481
㊹	Filter Cond. (10-20-20 mfd.)	61-0086
㊺	Resistor (300 ohms)	33-130436
㊻	Condenser (.02 mfd.)	30-4419
㊼	Resistor (15,000 ohms)	33-315354
㊽	Tone Control Switch	85-0106
㊾	Condenser (3000 mmfd.)	30-4469
㊿	Output Transformer	65-0295
(51)	Replacement Cone (For 73-0039-2 Speaker)	91-0113
	(For 73-0039-4 Speaker)	91-0114
(52)	Field Coil	Not Replaceable
(53)	Wafer Switch	77-0408
(54)	Antenna Padder Assembly	77-0391
(55)	Tuning Condenser	63-0036
(56)	First Padder (On Tuning Cond.)	
(57)	Low Frequency Padder	63-0037
(58)	Sil. Mica Cond. (300 mmfd.)	61-0003
(59)	Manual Oscil. Transformer	65-0301
(60)	Second Padder (On Tun. Cond.)	
(61)	Condenser (15 mmfd.)	61-0038
(62)	Oscil. Trans. (900-1580 K.C.)	65-0255
(63)	Oscil. Trans. (900-1580 K.C.)	65-0255
(64)	Oscil. Trans. (750-1300 K.C.)	65-0256
(65)	Oscil. Trans. (550-1050 K.C.)	65-0257
(66)	Oscil. Trans. (550-1050 K.C.)	65-0257
(67)	Sil. Mica Cond. (390 mmfd.)	61-0031
(68)	Condenser (250 mmfd.)	61-0033
(69)	Condenser (.5 mfd.)	61-0083
(70)	"A" Choke	32-1644
(71)	Vibrator Choke	Part of ⑬
(72)	Vibrator	83-0017
(73)	Resistor (150 ohms)	33-115354
(74)	Resistor (200 ohms)	33-120354
(75)	Condenser (.5 mfd.)	61-0083
(76)	Power Transformer	65-0294
(77)	Condenser (3000 mmfd.)	61-0059
(78)	Resistor (1000 ohms)	33-210554
(79)	Condenser (.25 mfd.)	61-0125
(80)	Resistor (10,000 ohms)	33-310334
(81)	Pilot Lamps	34-2064
	Volume Control Knob	55-0748
	Manual Control Knob	55-0750

PHILCO RADIO & TELEVISION CORP.

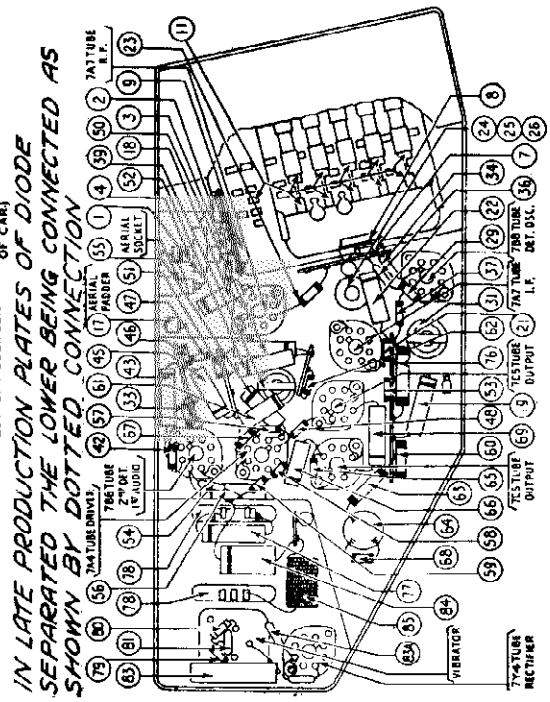
No.	Description	Part No.
①	Condenser (250 Mmfd.)	60-125157
②	Resistor (22,000 ohms)	33-322334
③	Padder (Pri. 2nd I. F. Trans.)	
④	Second I. F. Transformer	65-0366
⑤	Padder Sec. 2nd I. F. Trans.)	
⑥	Resistor (25,000 ohms)	33-325154
⑦	Resistor (10,000,000 ohms)	33-610154
⑧	Condenser (4,000 Mmfd.)	61-0128
⑨	Volume Control (350,000 ohms)	Part of ⑩
⑩	Condenser (.05 Mfd.)	61-0101
⑪	Resistor (220,000 ohms)	33-422154
⑫	Resistor (1,000,000 ohms)	33-510154
⑬	Resistor (6,800 ohms)	33-268154
⑭	Tone Control (4,000,000 ohms)	Part of ⑩
⑮	Condenser (.02 Mfd.)	61-0154
⑯	Resistor (4,700 ohms)	33-347334
⑰	Condenser (.05 Mfd.)	61-0111
⑱	Resistor (2,200 ohms)	33-222154
⑲	Condenser (100 Mmfd.)	60-110157
⑳	Condenser (.01 Mfd.)	61-0110
㉑	Condenser (4,000 Mmfd.)	61-0128
㉒	Resistor (220,000 ohms)	33-422154
㉓	Resistor (10,000,000 ohms)	33-610154
㉔	Resistor (220,000 ohms)	33-422154
㉕	Resistor (27,000 ohms)	33-327434
㉖	Condenser (.01 Mfd.)	61-0110
㉗	Resistor (470,000 ohms)	33-447154
㉘	Resistor (330 ohms)	33-133436
㉙	Filter Condenser (10-20-20 Mfd.)	61-0150
㉚	Resistor (470,000 ohms)	33-447154
㉛	Condenser (.01 Mfd.)	61-0114
㉜	Resistor (220,000 ohms)	33-422154
㉝	Resistor (4,700 ohms)	33-347334
㉞	Condenser (6,000 Mmfd.)	61-0105
㉟	Output Transformer	65-0363
㊱	Condenser (250 Mmfd.)	60-125157
㊲	Cone & Voice Coil (For 73-0051-2 Speaker)	91-0164
	(For 73-0051-3 Speaker)	91-0165
㊳	Field Coil	Not Replaceable
㊴	Condenser (250 Mmfd.)	60-125157
㊵	Condenser (250 Mmfd.)	60-125157
㊶	Resistor (11,000 ohms)	33-211034
㊷	Condenser (5,000 Mmfd.)	61-0153
㊸	Power Transformer	65-0347
㊹	Resistor (100 ohms)	33-110334
㊺	Resistor (100 ohms)	33-110334
㊻	Condenser (250 Mmfd.)	60-125157
㊼	Vibrator	83-0027
㊽	Condenser (.5 Mfd.)	61-0137
㊾	Condenser (.5 Mfd.)	61-0100
㊿	Vibrator Choke	65-0383
(51)	Pilot Lamp	34-2064
(52)	Test Socket	55-1104
(53)	Condenser (250 Mmfd.)	60-125157
(54)	Condenser (250 Mmfd.)	60-125157
(55)	Condenser (.5 Mfd.)	61-0134
(56)	Fuse	45-2559
(57)	"A" Choke	39-1614
(58)	Condenser (250 Mmfd.)	60-125157
(59)	Condenser (250 Mmfd.)	60-125157
(60)	Speaker Unit	73-0051
(61)	Fuse Cause Resistor	67-0041
(62)	Coil Letter Kit	81-0256
(63)	Radio Mtg. Bracket	57-1712F43
(64)	Tube Socket	27-6151
(65)	Vibrator Socket	27-6044
(66)	Pointer Drive Cord	55-1071
(67)	Tone Drive Cord	55-1072



No.	Description	Part No.
①	Antenna Choke	65-0378
②	Condenser (250 Mmfd.)	60-125157
③	Resistor (1,000,000 ohms)	33-510154
④	Condenser (.05 Mfd.)	61-0101
⑤	Push Button Switch	85-0127
⑥	Condenser (10 Mmfd.)	60-020327
⑦	Condenser (55 Mmfd.)	61-0148
⑧	Silver Mica Condenser (360 Mmfd.)	61-0157
⑨	Silver Mica Condenser (20 Mmfd.)	60-011387
⑩	Inductive Tuning Unit	77-0666
⑩a	Inductive Tuning Unit	Part of ⑩
⑩b	Inductive Tuning Unit	Part of ⑩
⑪	Push Button Coil & Switch Assembly	77-0657
⑪a	Push Button Coil & Switch Assembly	Part of ⑪
⑫	Push Button Coil & Switch Assembly	Part of ⑪
⑫a	Push Button Coil & Switch Assembly	Part of ⑪
⑬	Push Button Coil & Switch Assembly	Part of ⑪
⑬a	Push Button Coil & Switch Assembly	Part of ⑪
⑭	Push Button Coil & Switch Assembly	Part of ⑪
⑭a	Push Button Coil & Switch Assembly	Part of ⑪
⑮	Push Button Coil & Switch Assembly	Part of ⑪
⑮a	Push Button Coil & Switch Assembly	Part of ⑪
⑯	Antenna Padder	63-0035
⑰	On-Off Switch	Part of ⑤
⑱	Antenna Padder	63-0035
⑲	Condenser (.05 Mfd.)	61-0101
⑳	Condenser (.05 Mfd.)	61-0101
㉑	Sensitivity Control	67-0025
㉒	Resistor (470 ohms)	33-147338
㉓	Condenser (.05 Mfd.)	61-0101
㉔	Resistor (10,000 ohms)	33-310334
㉕	I. F. Wave Trap	65-0362
㉖	Padder	Part of ㉗
㉗	I. F. Wave Trap	Part of ㉖
㉘	Padder	Part of ㉙
㉙	Resistor (1,000,000 ohms)	33-510154
㉚	Resistor (100,000 ohms)	33-410154
㉛	Padder (Pri. 1st I. F. Trans.)	
㉜	First I. F. Transformer	65-0365
㉝	Padder (Sec. 1st I. F. Trans.)	
㉞	Resistor (1,000,000 ohms)	33-510154
㉟	Condenser (250 Mmfd.)	60-125157
㊱	Oscillator Tracking Coil	65-0379

* NOW 10000

IN LATE PRODUCTION PLATES OF DIODE SEPARATED THE LOWER BEING CONNECTED AS SHOWN BY DOTTED CONNECTION



MODEL C-1808

PHILCO RADIO & TELEVISION CORP.

MODEL C-1808 — 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.

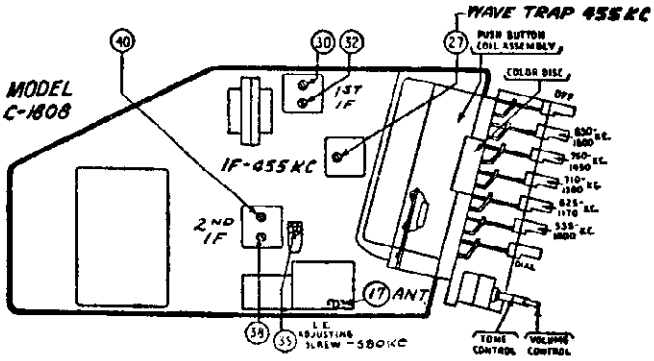
EQUIPMENT — Fully charged heavy duty storage battery or 6 volt power pack, 077 or 177 Philco Signal generator, 027 Philco Vacuum tube voltmeter and set tester or audio output meter, 45-2610 Padding screw driver.

GENERAL — VACUUM TUBE VOLTMETER. The model 027 Vacuum tube voltmeter is an extremely sensitive and accurate test instrument and is recommended for use when aligning and adjusting auto radios. Connect the negative (—) terminal of the Vacuum Tube Voltmeter to the high side (ungrounded side) of the volume control. Connect the positive (+) terminal to the radio housing. Connect the "AC" cord to a 110 volt AC socket. Press the VTVM button and the 10 volt button. Turn the "Set Zero Ohms — VTVM" control clockwise until a click is heard. Allow the tubes to heat up for a few minutes. Short the 150 meg. VTVM terminals and adjust the "Set Zero 150 meg." control until the meter reads zero on the 0-10 range scale (bottom scale). The needle will deflect from left to right.

AUDIO OUTPUT METER. If an audio output meter is used, connect the leads across the voice coil of the speaker. Use the 0-30 volt scale.

the prescribed frequency, turn the Radio volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the meter. The signal in the speaker should be audible but not loud.

The shielding on the generator output lead must be connected to the Radio housing.



OPERATION	SIGNAL GENERATOR FREQUENCY	SIGNAL GENERATOR CONNECTION	DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
1	PRESS THE "DIAL" BUTTON AND STATIONS CAN BE TUNED IN BY "DIAL" TUNING				
2	455 K.C.	To Aerial Receptacle on Radio	.1 Mfd.	Note 2	(38)(40)(30)(32) (38)(40)(30)(32)
3	455 K.C.	To Aerial Receptacle on Radio	.1 Mfd.	Note 2	(27) Min.
4	1400 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Control at 1400 K.C.	(17) Note 4
5	580 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Control at 580 K.C.	(35) Note 3
6	1400 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Control at 1400 K.C.	(17) Note 4
7	580 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Control at 580 K.C.	(35) Note 3

Make all adjustments for maximum reading on the meter.

NOTE 1 — Connect the aerial lead, Part No. 95-0111, to the aerial receptacle in the radio. Connect a 25 Mmfd. Condenser in series between the signal generator and the aerial lead.

NOTE 2—Turn the tuning control clockwise as far as it will go.

NOTE 3 — Rock the tuning control while adjusting the low frequency screw. Tune the control to the signal and adjust the screw for maximum output. Rotate the tuning control back and forth slightly for maximum output. Then readjust the screw for maximum output. Repeat this procedure until no further improvement is noticed.

NOTE 4 — When the aerial stage adjustment is made with the Radio installed in the car, the Radio aerial lead must be connected to the car aerial in the usual manner. Connect the signal generator output lead to a wire placed near the car aerial but not connected to it.

INSTRUCTIONS FOR SETTING UP ELECTRIC PUSH BUTTONS

1. Turn on the radio and allow it to operate for twenty minutes or longer if possible. All adjustments MUST be made with the aerial fully extended. Turn the volume control on full and set the tone control on voice. In metropolitan areas it is best to adjust the push buttons in a shielded building or under a viaduct.

2. Push in the DIAL button so that stations can be tuned in by manual tuning and tune in a weak station around 1400 K.C. on the dial. Then adjust the aerial padder (⑰) for maximum signal.

3. Select the five stations which you desire to use on push button tuning. Tune in a station between 535 and 1000 Kilocycles. Remove the No. 1 push button cover and push in the No. 1 button. Using a coin or a small screw driver, adjust the button until the station selected is tuned in with the loudest volume. Turning the button counter-clockwise will increase the frequency, and clockwise will decrease the frequency. Check the station by pushing in the DIAL button again to identify the program.

4. Proceed in the same manner for adjusting No. 2, No. 3, No. 4 and No. 5 buttons.

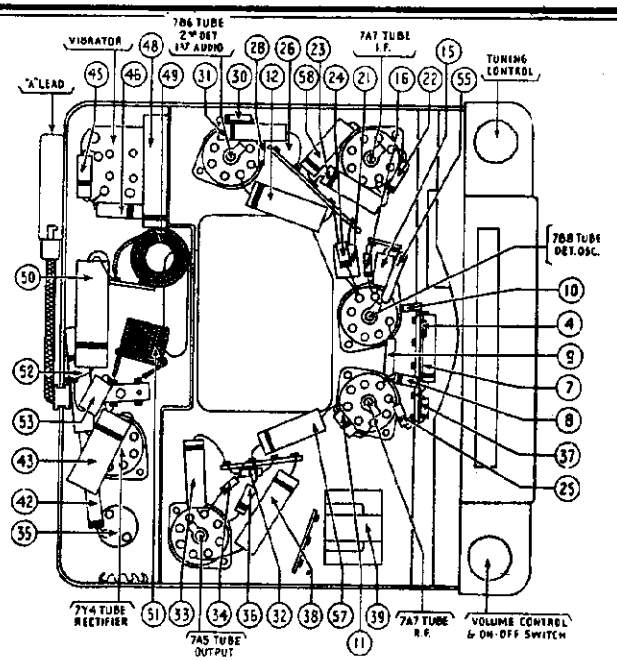
The stations may be set up before installing the radio in the car, but the final adjustments must be made after installation of the radio and connected to the aerial in the car.

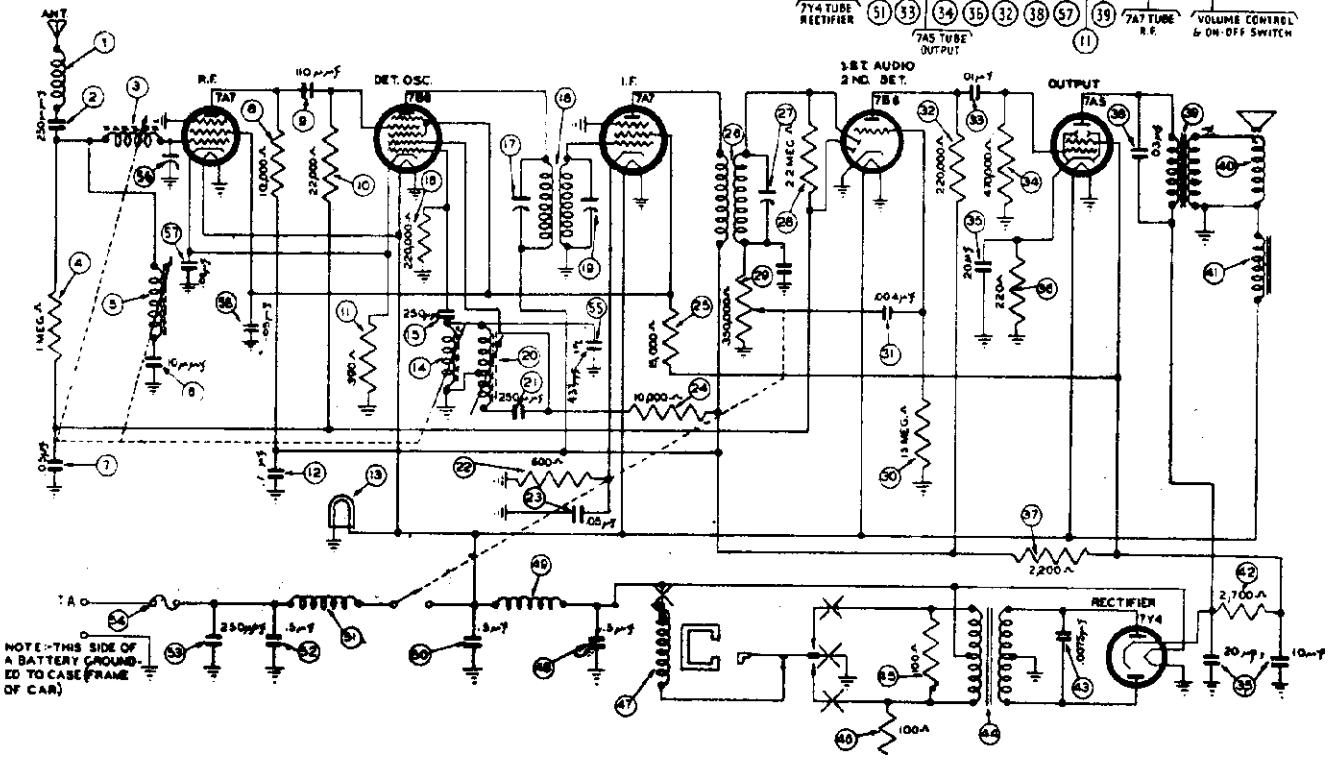
MODEL S-1824

SCHEMATIC

I.F. = 455KC

No.	Description	Part No.
①	Antenna Choke	65-0378
②	Condenser (250 Mmfd.)	60-125157
③	Inductive Tuning Unit	77-0709
④	Resistor (1,000,000 ohms)	33-510154
⑤	Image Trap Coil	Part of ③
⑥	Condenser (10 Mmfd.)	Part of ③
⑦	Condenser (.05 Mfd.)	61-0111
⑧	Resistor (10,000 ohms)	33-310334
⑨	Condenser (110 Mmfd.)	60-110157
⑩	Resistor (22,000 ohms)	33-322154
⑪	Resistor (390 ohms)	33-139336
⑫	Condenser (.1 Mfd.)	61-0104
⑬	Pilot Lamp	34-2064
⑭	Oscillator Coil	Part of ③
⑮	Condenser (250 Mmfd.)	60-125157
⑯	Resistor (220,000 ohms)	33-422154
⑰	Padder (Pri. 1st I. F. Trans.)	
⑱	First I. F. Transformer	65-0399
⑲	Padder (Sec. 1st I. F. Trans.)	
⑳	Oscillator Tracking Coil	65-0401
㉑	Condenser (250 Mmfd.)	60-125157
㉒	Resistor (600 ohms)	33-160336
㉓	Condenser (.05 Mfd.)	61-0111
㉔	Resistor (10,000 ohms)	33-310334
㉕	Resistor (15,000 ohms)	33-315334
㉖	Second I. F. Transformer	65-0400
㉗	Padder (Sec. 2nd I. F. Trans.)	
㉘	Resistor (2,200,000 ohms)	33-522154
㉙	Volume Control (350,000 ohms) & On-Off Switch	67-0037
㉚	Resistor (15,000,000 ohms)	33-615154
㉛	Condenser (4,000 Mmfd.)	61-004311
㉜	Resistor (220,000 ohms)	33-422334
㉝	Condenser (.01 Mfd.)	61-010311
㉞	Resistor (470,000 ohms)	33-447154
㉟	Filter Condenser (10-20-20 Mfd.)	61-0072
㊱	Resistor (220 ohms)	33-122334
㊲	Resistor (2,200 ohms)	33-222334
㊳	Condenser (.03 Mfd.)	61-0115
㊴	Output Transformer	65-0395
㊵	Replacement Cone (For 73-0054-2)	91-0166
㊶	Field Coil	(Not Replaceable)
㊷	Resistor (2,700 ohms)	33-227434
㊸	Condenser (7,500 Mmfd.)	61-007512
㊹	Power Transformer	65-0404
㊺	Resistor (100 ohms)	33-110434
㊻	Resistor (100 ohms)	33-110434
㊼	Vibrator	83-0027
㊽	Condenser (.5 Mfd.)	61-500013
㊾	Vibrator Choke	65-0151
㊿	Condenser (.5 Mfd.)	61-0106
(51)	"A" Choke	32-1644
(52)	Condenser (.5 Mfd.)	61-500013
(53)	Condenser (250 Mmfd.)	60-125157
(54)	Fuse	45-2550
(55)	Silver Mica Condenser (437 Mmfd.)	61-0071
(56)	Aerial Padder	63-0064
(57)	Condenser (.05 Mfd.)	61-0101
(58)	Condenser (.05 Mfd.)	61-0111
	Housing	77-0690FC54
	Tube Side Cover	57-1547FC54
	Speaker Cover	57-1548FC54
	Vibrator Socket	27-6153
	Loktal Socket	27-6151
	Volume Control Cable	95-0154
	Speaker Cable	95-0161
	"A" Switch Cable	95-0155
	"A" Lead	77-0638
	Fuse Lead	77-0052
	Volume Control Nut	W684FA3
	Speaker Unit	73-0054
	Speaker Gasket	55-1045
	Nuts (Speaker Mtg.)	W124FA3
	Bolts (Speaker Mtg.)	W1582FA26
	Lockwashers (Speaker Mtg.)	W291FE7
	Dial Background Plate	55-1159
	Dial	55-1151
	Gland Nuts (Radio Mtg.)	28-6558FA8
	Drive Cord	55-1158
	Pointer Spring	57-1425FA3
	Pointer	57-1797FCP
	Bezel	57-1801FA8
	Tuning & Volume Knob	77-0633
	Fuel Gauge Resistor	77-0760
	Ground Strap	77-0336
	Wing Nut (Radio Mtg.)	97-0048FA3
	Hook Bolt (Radio Mtg.)	97-0135FA3
	Antenna Connector	57-0581FA3
	Screw (Bezel to Housing)	97-0111FA3
	Screw (Wiring Side Cover)	97-0111FA26
	Gland Nut Wrench	28-5636FA3
	Interference Condenser	30-4007
	Interference Condenser	60-125157
	Distributor Suppressor	32-2250





PHILCO RADIO & TELEVISION CORP.

MODEL S-1824

Studebaker "Custom"

MODEL S-1824
Studebaker "Custom"

PHILCO RADIO & TELEVISION CORP.

MODEL S-1824 — 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.

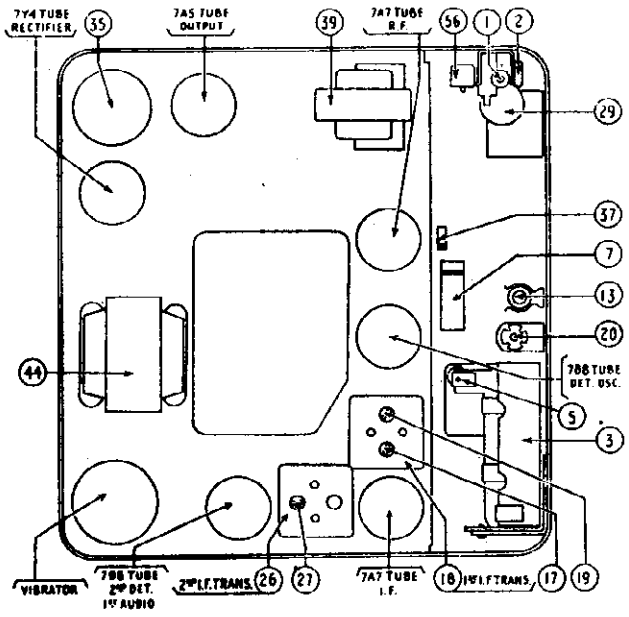
EQUIPMENT — Fully charged heavy duty storage battery or 6 volt power pack, 077 or 177 Philco Signal generator, 027 Philco Vacuum tube voltmeter and set tester or audio output meter, 45-2610 Padding screw driver.

GENERAL — VACUUM TUBE VOLTMETER. The model 027 Vacuum tube voltmeter is an extremely sensitive and accurate test instrument and is recommended for use when aligning and adjusting auto radios. Connect the negative (—) terminal of the Vacuum Tube Voltmeter to the high side (ungrounded side) of the volume control. Connect the positive (+) terminal to the radio housing. Connect the "AC" cord to a 110 volt AC socket. Press the VTVM button and the 10 volt button. Turn the "Set Zero Ohms — VTVM" control clockwise until a click is heard. Allow the tubes to heat up for a few minutes. Short the 150 meg. VTVM terminals and adjust the "Set Zero 150 meg." control until the meter reads zero on the 0-10 range scale (bottom scale). The needle will deflect from left to right.

AUDIO OUTPUT METER. If an audio output meter is used, connect the leads across the voice coil of the speaker. Use the 0-30 volt scale.

With the Radio and signal generator set up for operation at the prescribed frequency, turn the Radio volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the meter. The signal in the speaker should be audible but not loud.

The shielding on the generator output lead must be connected to the Radio housing.



OPERATION	SIGNAL GENERATOR		DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
	FREQUENCY	CONNECTION			
1	455 K.C.	To Aerial Receptacle on Radio	See Note 1	Note 2	(27) (18) (17) (27) (18) (17)
2	1360 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Control at 1360 K.C.	(54)
3	590 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Control at 590 K.C.	(20) Note 3
4	1360 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Control at 1360 K.C.	(54)
5	1200 to 1400 K.C.	Note 5	Note 5	Note 5	(54) Note 4

Make all adjustments for maximum reading on the meter.

NOTE 1 — Connect the aerial lead, Part No. 95-0111, to the aerial receptacle in the radio. Connect a 35 Mmfd. Condenser in series between the signal generator and the aerial lead.

NOTE 2 — Turn the tuning control clockwise as far as it will go.

NOTE 3 — Rock the tuning control while adjusting the low frequency screw. Tune the control to the signal and adjust the screw for maximum output. Rotate the tuning control back and forth slightly for maximum output. Then readjust the screw for maximum output. Repeat this procedure until no further improvement is noticed.

NOTE 4 — When the aerial stage adjustment is made with the Radio installed in the car, the Radio aerial lead must be connected to the car aerial in the usual manner. Connect the signal generator output lead to a wire placed near the car aerial but not connected to it.

NOTE 5 — When installing the radio in the car, follow the installation instructions carefully. Tune in a weak broadcast signal between 1200 and 1400 Kilocycles on the control scale. Remove the plug button on the end of the radio and adjust the aerial compensator (54) (see Figure 3) for maximum signal.

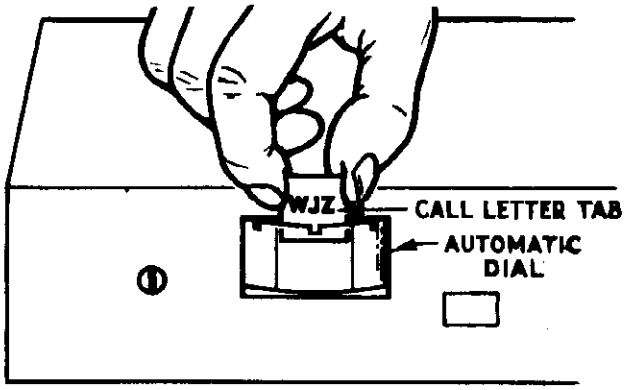
PHILCO RADIO & TELEVISION CORP.

S-1722

INSTALLING CALL LETTERS

Before installing the Receiver, the Call Letters of the stations which are to be tuned in automatically must be inserted in the Automatic Dial. See Illustration, Models S-1622, S-1722. Select and remove from the Call Letter Sheets, the Call Letters of five popular stations received in the area in which the radio is to be operated and that come within the frequency range of the adjusting screws as shown in Illustration Models S-1622, S-1722. Each of the adjusting screws cover the portion of the broadcast band as indicated in Illustration, Models S-1622, S-1722. It is important, therefore, that only such stations be selected as can be tuned in in the range as covered by each screw.

Push the Automatic Station Selector until the word "DIAL" is at the front. This is the starting point. Push the Automatic Station Selector once more and the first position of the dial will be at the front. Insert in this position the call letter tab of the station having the highest frequency in kilocycles. Insert in back of each tab one of the clear celluloid tabs. Press the Automatic Station Selector button once more and insert the call letters of the station with the next highest frequency in kilocycles in the second position.

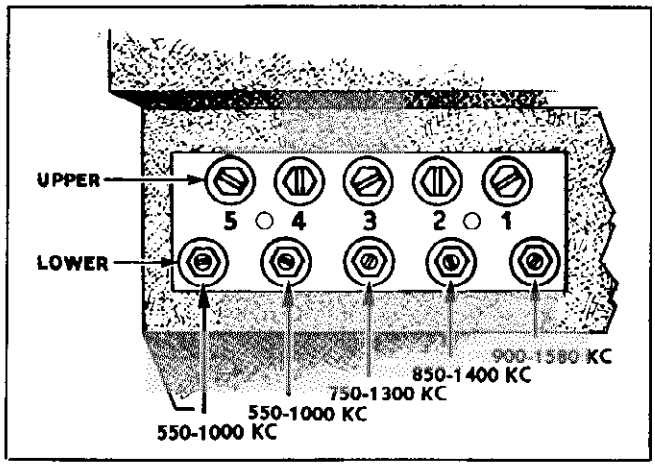


Installing Call Letter Tabs

EXAMPLE—The first position may have the call letters of a station operating on 1400 kilocycles; the second position, a station operating on 1050 kilocycles, etc. Repeat this procedure until all five call letter tabs selected are inserted in the dial in the order of their frequency. Be sure and record the call letters with respect to their position on the dial for use in setting up the adjusting screws.

1—Turn the Receiver on and allow it to operate for TWENTY minutes. Remove the cover plate over the automatic tuning adjusting screws. This plate is on the front of the Receiver and is removed by removing two screws.

2—Push the Automatic Station Selector button until the word "DIAL" is at the indicator window. Tune in the station whose call letters are in the first position on the dial (the highest frequency station) and note the program. Push the Automatic Selector button once and this station's call letters will appear at the indicator window.



3—With a small screwdriver, turn the No. 1 adjusting screw (See Illustration, Models S-1622, S-1722) in the lower column, to the right or left until this station is tuned in. Now adjust the corresponding screw in the upper column until maximum volume is obtained. Make these adjustments carefully, as it may be easy to pass by the loudest point on some stations.

When adjusting for Automatic Tuning on strong local stations the antenna rod should be all the way down and the adjustments made with the car in a shielded area, such as in a steel constructed building or under a viaduct. This is necessary in order to obtain a weak signal so the adjustments can be accurately made.

4—Press the Automatic Station Selector button until "DIAL" again is at the indicator window and tune in the station whose call letters are in the second position on the automatic dial (the next lowest frequency). Press the automatic button two times and adjust the number 2 set of adjusting screws.

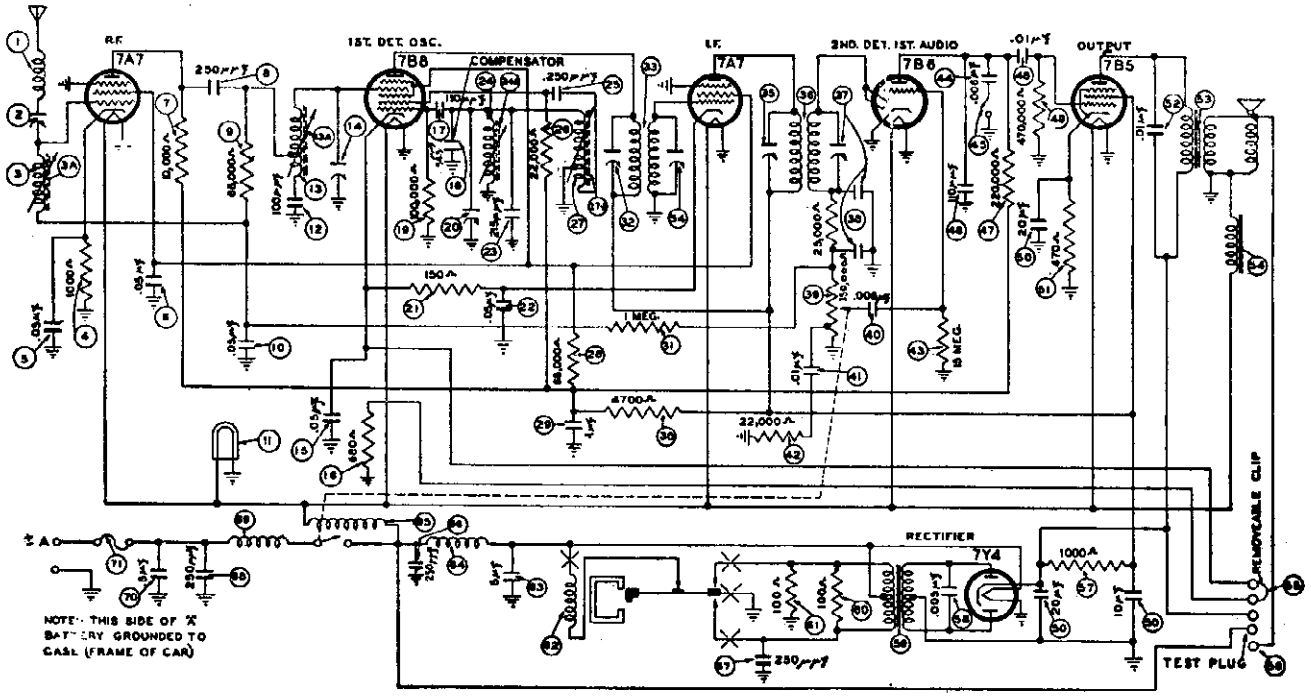
Repeat this procedure until each pair of the five pairs of adjusting screws has been tuned to its respective station.

IT IS NECESSARY THAT THE SETTING OF THE ADJUSTING SCREWS BE REPEATED TO BE SURE THEY ARE PROPERLY SET SO THAT MAXIMUM PERFORMANCE MAY BE HAD.

Be sure and save the unused call letters giving them to the owner as they may be needed at some future time if the radio is to be operated in a different area where the local stations are not the same.

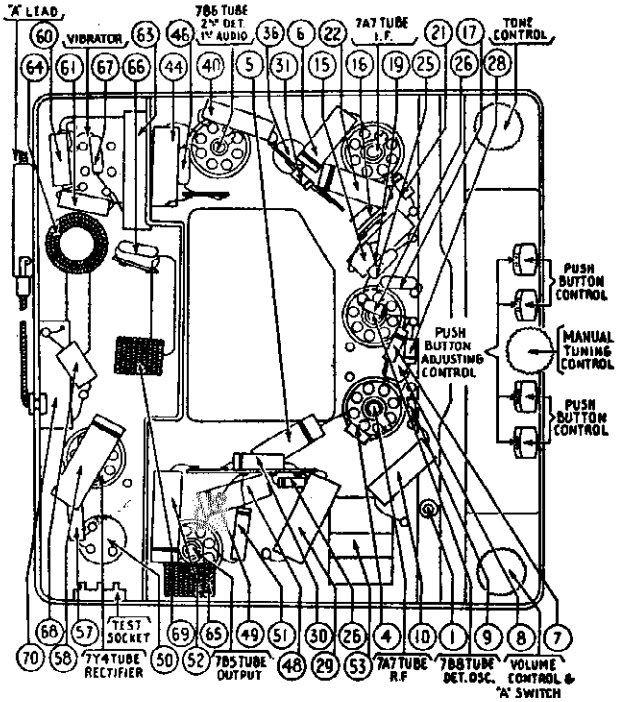
MODEL S-1825
Studebaker "Custom"

PHILCO RADIO & TELEVISION CORP.



PARTS LIST — S-1825

No.	Description	Part No.
1	Antenna Choke	65-0378
2	Antenna Padder	63-0053
3	Antenna Transformer	65-0349
3a	Iron Core	57-1541
4	Resistor (1,000 ohms)	33-210334
5	Condenser (.05 Mfd.)	61-0101
6	Condenser (.05 Mfd.)	61-0111
7	Resistor (10,000 ohms)	33-310334
8	Condenser (250 Mmfd.)	60-125157
9	Resistor (68,000 ohms)	33-368154
10	Condenser (.05 Mfd.)	61-0101
11	Pilot Lamp	34-2064
12	Condenser (100 Mmfd.)	60-110327
13	R. F. Transformer	65-0359
13a	Iron Core	57-1541
14	Padder	63-0055
15	Condenser (.05 Mfd.)	61-0111
16	Resistor (680 ohms)	33-168336
17	Condenser (110 Mmfd.)	60-110157
18	Condenser (54.5 Mmfd.)	61-0149
19	Resistor (100,000 ohms)	33-410154
20	Padder	63-0052
21	Resistor (150 ohms)	33-115336
22	Condenser (.05 Mfd.)	61-0111
23	Condenser (215 Mmfd.)	61-0148
24	Oscillator Transformer	65-0350
24a	Iron Core	57-1542
25	Condenser (250 Mmfd.)	60-125157
26	Resistor (22,000 ohms)	33-322334
27	Series Tracking Transformer	65-0351
27a	Series Tracking Core	57-1650
28	Resistor (68,000 ohms)	33-368334
29	Condenser (.1 Mfd.)	61-0113
30	Resistor (4,700 ohms)	33-247434
31	Resistor (1,000,000 ohms)	33-510154
32	Padder (Pri. 1st I. F. Trans.)	
33	First I. F. Transformer	65-0352
34	Padder (Sec. 1st I. F. Trans.)	
35	Padder (Pri. 2nd I. F. Trans.)	
36	Second I. F. Transformer	65-0353
37	Padder (Sec. 2nd I. F. Trans.)	
38	Resistor (25,000 ohms)	33-325154
39	Volume Control (350,000 ohms) & On-Off Switch	67-0039
40	Condenser (6,000 Mmfd.)	61-0103
41	Condenser (.01 Mfd.)	61-0110
42	Resistor (22,000 ohms)	33-322154
43	Resistor (15,000,000 ohms)	33-615154
44	Condenser (6,000 Mmfd.)	61-0155
45	Tone Control Switch	85 0126
46	Condenser (110 Mmfd.)	60-110157
47	Resistor (220,000 ohms)	33-422334
48	Condenser (.01 Mfd.)	61-0100
48a	Resistor (470,000 ohms)	33-447154
49	Filter Condenser (10-20-20 Mfd.)	61-0072
50	Resistor (470 ohms)	33-147436
51	Condenser (.01 Mfd.)	61-0124
52	Output Transformer	65-0364
53	Field Coil — Not Replaceable	
53a	Cone & Voice Coil	91-0166
54	Jumper	57-1121
55	Test Socket	55-1078
56	Resistor (1,000 ohms)	33-210434
57	Condenser (5,000 Mmfd.)	61-0153
58	Power Transformer	65-0347
59	Resistor (100 ohms)	33-110434
60	Resistor (100 ohms)	33-110434
61	Vibrator	83-0027
62	Condenser (.5 Mfd.)	61-0137
63	Vibrator Choke	65-0151
64	Filament Choke	32-1604
65	Condenser (250 Mmfd.)	60-125157
66	Condenser (250 Mmfd.)	60-125157
67	Condenser (250 Mmfd.)	60-125157
68	"A" Choke	32-1644
69	Condenser (.5 Mfd.)	61-0137
70	Fuse	45-2559
	Manual Knob Sleeve	57-1623
	Manual Knob Spacer	57-1669
	Manual Knob Spring	57-1628FA3
	Manual Knob Skirt	55-1061
	Manual Knob	55-1067
	Tone & Volume Knob	77-0633
	Speaker Cable	95-0161
	Screw (Cover Mtg.)	W-2212FA35
	Tube Side Cover	57-1547FC54
	Wiring Side Cover	57-1548FC54
	Speaker Unit	73-0053
	Speaker Gasket	55-1045
	Bezel Front	57-1582FA3
	Speed Nut	97-0136FB7
	Dial	55-1012
	Gland Nuts	28-6558FA8
	Housing	77-0660FC54
	Vibrator Socket	27-6153
	Tube Socket	27-6151
	Push Button Knob	77-0612
	Tuning Switch	77-0640
	Coil Form Spring	57-1538
	Coil Form Screw	97-0126
	Core Draw Bar Spring	57-1649

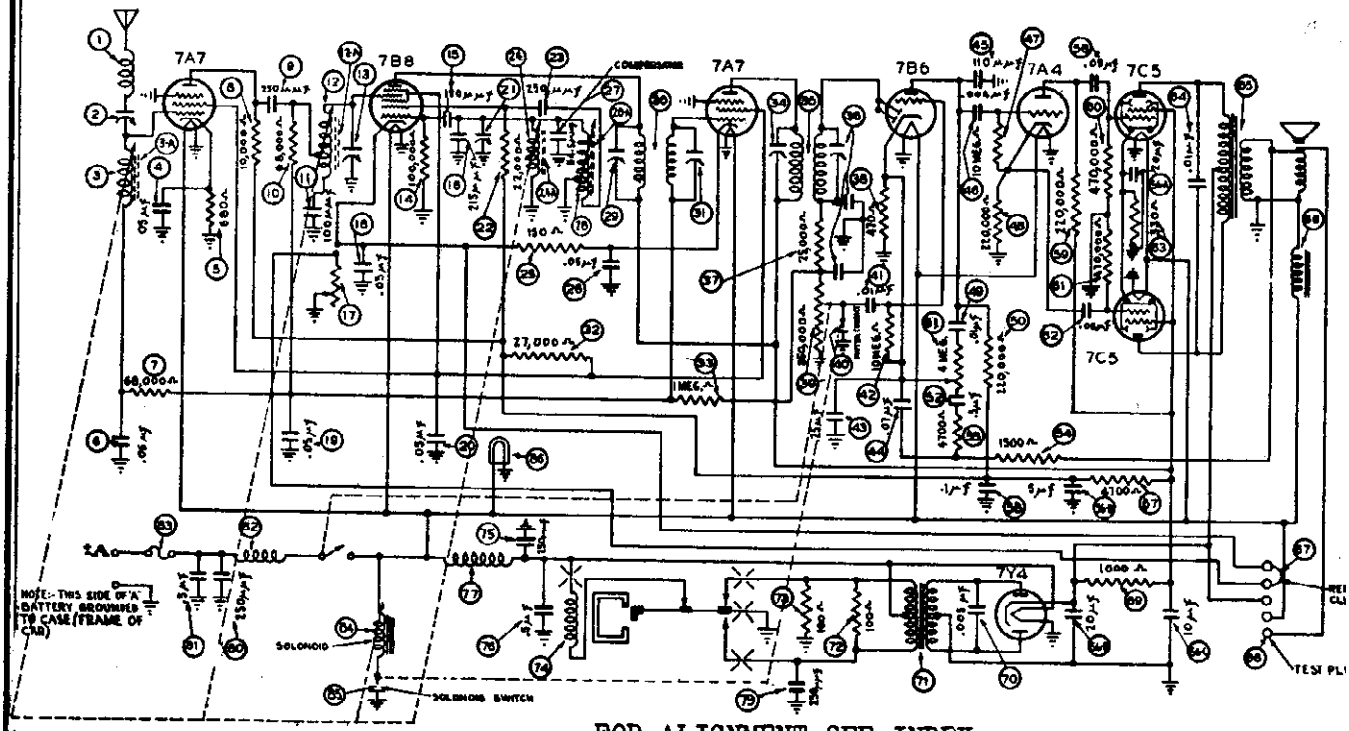


Description	Part No.
Latch Bar Spring	57-1650
Push Bar Spring	57-1651
Pointer Spring	57-1653
Pointer & Cam Assembly	77-0647
Gland Nut Wrench	28-5636FA3
Generator Condenser	30-4007
Distributor Resistor	30-2250

No.	Description	Part No.
	Distributor Condenser	60-125157
	Fuel Gauge Resistor	67-0041
	Ground Strap	77-0336
	Wiring Nut (Radio Mtg.)	97-0048FA3
	Hook Bolt (Radio Mtg.)	97-0135FA3

MODEL S-1826

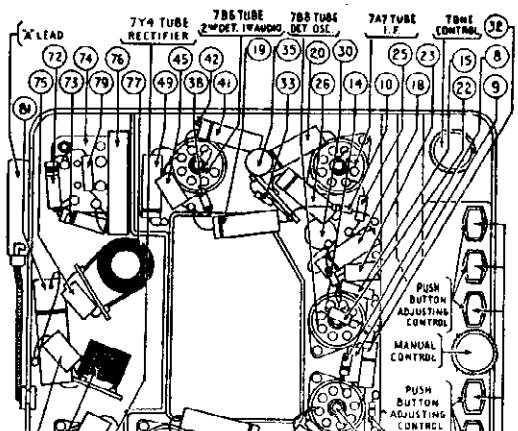
PHILCO RADIO & TELEVISION CORP. Studebaker "Custom"



FOR ALIGNMENT SEE INDEX

PARTS LIST — S-1826

No.	Description	Part No.
①	Antenna Choke	65-0378
②	Antenna Padder	63-0053
③	Antenna Transformer	65-0349
③a	Iron Core	57-1541
④	Condenser (.05 Mfd.)	61-0111
⑤	Resistor (680 ohms)	33-168334
⑥	Condenser (.05 Mfd.)	61-0111
⑦	Resistor (68,000 ohms)	33-368154
⑧	Resistor (10,000 ohms)	33-310334
⑨	Condenser (250 Mmfd.)	60-125157
⑩	Resistor (68,000 ohms)	33-368154
⑪	Condenser (100 Mmfd.)	60-110157
⑫	R. F. Transformer	65-0359
⑫a	Iron Core	57-1541
⑬	Padder	63-0052
⑭	Resistor (100,000 ohms)	33-410154
⑮	Condenser (110 Mmfd.)	60-110157
⑯	Condenser (215 Mmfd.)	61-0148
⑰	Sensitivity Control	67-0036
⑱	Condenser (.05 Mfd.)	61-0111
⑲	Condenser (.05 Mfd.)	61-0111
⑳	Condenser (.05 Mfd.)	61-0101
㉑	Padder	63-0055
㉒	Resistor (22,000 ohms)	33-322334
㉓	Condenser (250 Mmfd.)	60-125157
㉔	Oscillator Transformer	65-0350
㉔a	Iron Core	57-1542
㉕	Resistor (150 ohms)	33-115336
㉖	Condenser (.05 Mfd.)	61-0111
㉗	Condenser (54.5 Mmfd.)	61-0149
㉘	Oscillator Tracking Trans.	65-0351
㉘a	Oscillator Tracking Core	57-1659
㉙	Padder (Pri. 1st I. F. Trans.)	
㉚	First I. F. Transformer	65-0352
㉛	Padder (Sec. 1st I. F. Trans.)	
㉜	Resistor (27,000 ohms)	33-327434
㉝	Resistor (1,000,000 ohms)	33-510154
㉞	Padder (Pri. 2nd I. F. Trans.)	
㉟	Second I. F. Transformer	65-0410
㊱	Padder (Sec. 2nd I. F. Trans.)	
㊲	Resistor (25,000 ohms)	33-325154
㊳	Resistor (470 ohms)	33-147336
㊴	Volume Control (350,000 ohms) & On-Off Switch	67-0037
㊵	Muter Switch	85-0125
㊶	Condenser (.01 Mfd.)	61-0100
㊷	Resistor (10,000,000 ohms)	33-610154
㊸	Condenser (.25 Mfd.)	61-0151
㊹	Condenser (.07 Mfd.)	61-0152
㊺	Condenser (110 Mmfd.)	60-110157
㊻	Condenser (4,000 Mmfd.)	61-0129
㊼	Resistor (10,000,000 ohms)	33-610154
㊽	Resistor (220,000 ohms)	33-422334
㊾	Condenser (.01 Mfd.)	61-0100
㊿	Resistor (220,000 ohms)	33-422334
(51)	Tone Control (4,000,000 ohms)	67-0038
(52)	Condenser (.5 Mfd.)	61-0134
(53)	Resistor (4,700 ohms)	33-247154
(54)	Resistor (1,500 ohms)	33-215154
(55)	Condenser (.1 Mfd.)	61-0113
(56)	Filter Condenser (5-10-20-20 Mfd.)	61-0150
(57)	Resistor (4,700 ohms)	33-247434
(58)	Condenser (.05 Mfd.)	61-0122
(59)	Resistor (220,000 ohms)	33-422334
(60)	Resistor (470,000 ohms)	33-447154
(61)	Resistor (470,000 ohms)	33-447154
(62)	Condenser (.05 Mfd.)	61-0101
(63)	Resistor (330 ohms)	33-133436
(64)	Condenser (.01 Mfd.)	61-0124
(65)	Output Transformer	65-0409
(66)	Field Coil	Not Replaceable
(66a)	Cone & Voice Coil (For 73-0052-2 Speaker)	91-0164
	(For 73-0052-3 Speaker)	91-0165
(67)	Jumper	57-1121
(68)	Test Socket	55-1078
(69)	Resistor (1,000 ohms)	33-210434
(70)	Condenser (5,000 Mmfd.)	61-0153
(71)	Power Transformer	65-0358
(72)	Resistor (100 ohms)	33-110434
(73)	Resistor (100 ohms)	33-110434
(74)	Vibrator	83-0027
(75)	Condenser (250 Mmfd.)	60-125157
(76)	Condenser (.5 Mfd.)	61-0137
(77)	Vibrator Choke	65-0151
(78)	Condenser (250 Mmfd.)	60-125157
(79)	Condenser (250 Mmfd.)	60-125157
(80)	Condenser (.5 Mfd.)	61-0137
(81)	"A" Choke	32-1644
(82)	Fuse	45-2559
(83)	Solenoid	85-0360
(84)	Solenoid Switch	Part of 85-0125
(85)	Pilot Lamp	34-2064



Description	Part No.
Tuning & Volume Knob	77-0633
Hook Bolt (Radio Mtg.)	97-0135FA3
Wing Nut (Radio Mtg.)	97-0048FA3
Gland Nut Wrench	28-5636FA3
Condenser (Generator)	30-4007
Condenser (Distributor)	60-125157
Distributor Suppressor	82-2250
Ground Strap	77-0336
Fuel Gauge Resistor	67-0041
Front Bezel	57-1549FA8
Speed Nut (Bezel Mtg.)	97-0136FB7
Color Disc Assembly	77-0646
Tuning Switch	77-0600
Dial	55-1012
Push Button Knob	77-0812
Speaker Gasket	55-1045
Speaker Cable	95-0161
Speaker Unit	73-0052
Vibrator Socket	27-6153
Tube Socket	27-6151
Manual Knob Spacer	57-1669
Manual Knob	55-1067
Manual Knob Sleeve	57-1623
Manual Knob Spring	57-1628FA3
Manual Knob Skirt	55-1061
Gland Nut	28-6558FA8
R. F. Coil Spring	57-1538
Core Draw Bar Spring	57-1649
Latch Bar Spring	57-1650
Push Button Spring	57-1651
Muter Spring	57-1652

No.	Description	Part No.
	Pointer Spring	57-16
	Pointer & Cam Assembly	77-06
	Screws (Bezel Mtg.)	97-0111FA
	Screw (Cover Mtg.)	W2212FA
	Housing & Bracket Assembly (Ludington Green)	77-0660FC
	Housing & Bracket Assembly (English Grey)	77-0660FC
	Wiring Side Cover (Ludington Green)	57-1548FC
	Wiring Side Cover (English Grey)	57-1548FC
	Tube Side Cover (Ludington Green)	57-1547FC
	Tube Side Cover (English Grey)	57-1547FC

MODEL S-1825
MODEL S-1826 MODEL P-1835

PHILCO RADIO & TELEVISION CORP.

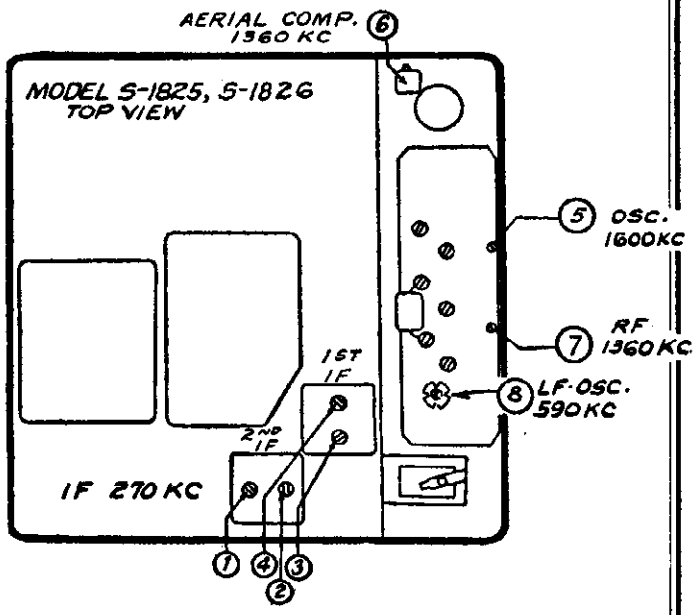
EQUIPMENT — Fully charged heavy duty storage battery or 6 volt power pack, 077 or 177 Philco Signal generator, 027 Philco Vacuum tube voltmeter and set tester or audio output meter, 45-2610 Padding screw driver.

GENERAL — VACUUM TUBE VOLTMETER. The model 027 Vacuum tube voltmeter is an extremely sensitive and accurate test instrument and is recommended for use when aligning and adjusting auto radios. Connect the negative (—) terminal of the Vacuum Tube Voltmeter to the high side (ungrounded side) of the volume control. Connect the positive (+) terminal to the radio housing. Connect the "AC" cord to a 110 volt AC socket. Press the VTVM button and the 10 volt button. Turn the "Set Zero Ohms — VTVM" control clockwise until a click is heard. Allow the tubes to heat up for a few minutes. Short the 150 meg. VTVM terminals and adjust the "Set Zero 150 meg." control until the meter reads zero on the 0-10 range scale (bottom scale). The needle will deflect from left to right.

AUDIO OUTPUT METER. If an audio output meter is used, connect the leads across the voice coil of the speaker. Use the 0-30 volt scale.

With the Radio and signal generator set up for operation at the prescribed frequency, turn the Radio volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the meter. The signal in the speaker should be audible but not loud.

The shielding on the generator output lead must be connected to the Radio housing.



OPERATION	SIGNAL GENERATOR FREQUENCY	SIGNAL GENERATOR CONNECTION	DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
1	PUSH IN THE TUNING CONTROL KNOB UNTIL STATIONS CAN BE TUNED IN BY MANUAL TUNING				
2	270 K.C.	To Aerial Receptacle on Radio	See Note 1	Note 2	㉔ ㉕ ㉖ ㉗ ㉔ ㉕ ㉖ ㉗
3	1600 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Control at 1600 K.C.	㉑
4	1360 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Control at 1360 K.C.	② ⑬ Note 4
5	590 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Control at 590 K.C.	㉘ Note 3
6	1600 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Control at 1600 K.C.	㉑
7	1360 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Control at 1360 K.C.	② ⑬ Note 4
8	1200 to 1400 K.C.	Note 5	Note 5	Note 5	② Note 4

Make all adjustments for maximum reading on the meter.

NOTE 1 — Connect the aerial lead Part No. 95-0111, to the aerial receptacle in the radio. Connect a 35 Mmfd. Condenser in series between the signal gnerator and the aerial lead.

NOTE 2—Turn the tuning control clockwise as far as it will go.

NOTE 3 — Rock the tuning control while adjusting the low frequency screw. Tune the control to the signal and adjust the screw for maximum output. Rotate the tuning control back and forth slightly for maximum output. Then readjust the screw for maximum output. Repeat this procedure until no further improvement is noticed.

NOTE 4 — When the aerial stage adjustment is made with the Radio installed in the car, the Radio aerial lead must be connected to the car aerial in the usual manner. Connect the signal generator output lead to a wire placed near the car aerial but not connected to it.

NOTE 5 — When installing the radio in the car, follow the installation instructions carefully. Tune in a weak broadcast signal between 1200 and 1400 Kilocycles on the control scale. Remove the plug button on the end of the radio and adjust the aerial compensator ② (see Figure 3) for maximum signal.

INSTRUCTIONS FOR SETTING UP THE AUTOMATIC TUNING BUTTONS

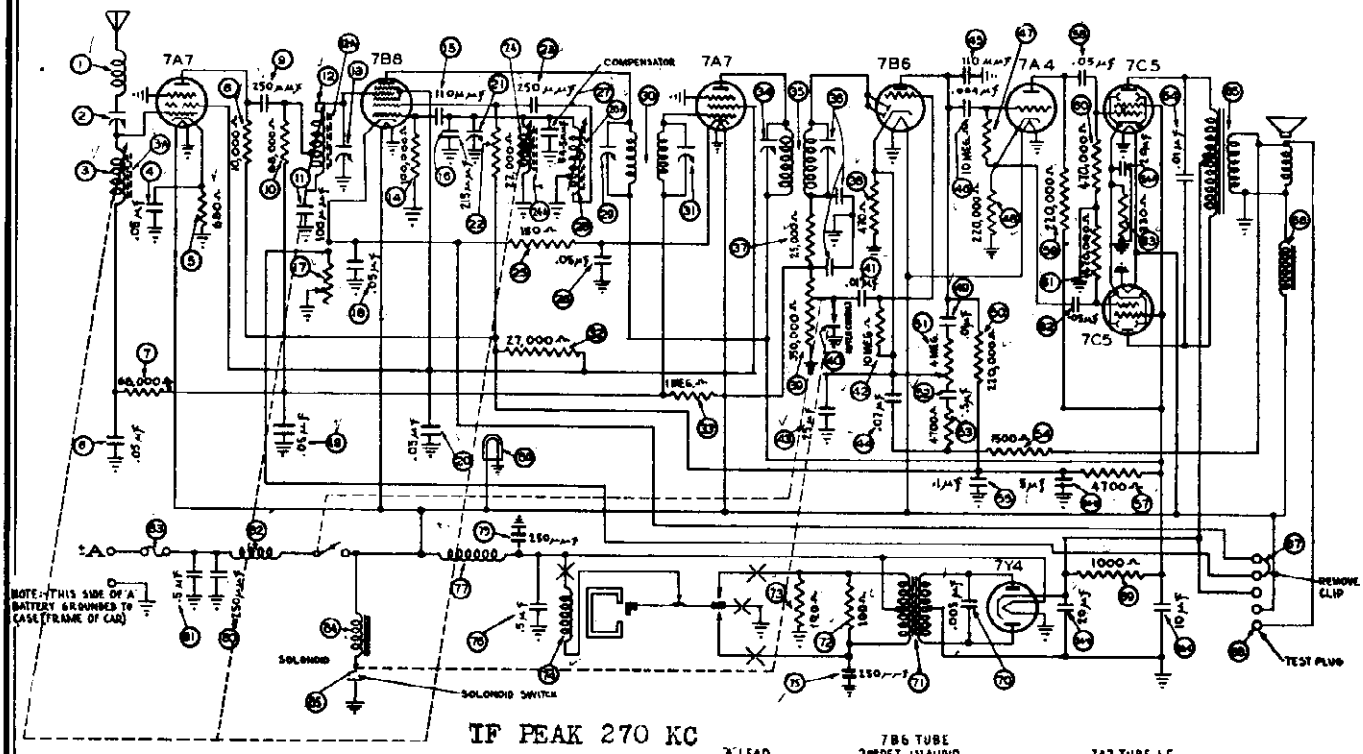
Turn on the radio and allow it to operate for twenty minutes or longer if possible.

Press in any automatic button so that it remains engaged. Then tune in the station desired by turning the small wheel in the button. The station can be identified by the pointer, which indicates the frequency of the station in Kilocycles. The automatic buttons may be readjusted to any station within the range of the broadcast band. The automatic buttons may be readjusted to stations in any sequence desired. However, for convenience in remembering stations, it is recommended that the buttons be set up in the same order that the stations appear across the dial.

CAUTION — All adjustments must be carefully made so that reception can be received best when remote from the broadcasting station. Careless tuning off to one side, even though the signal is heard, will result in distorted reception.

MODEL P-1835
Packard

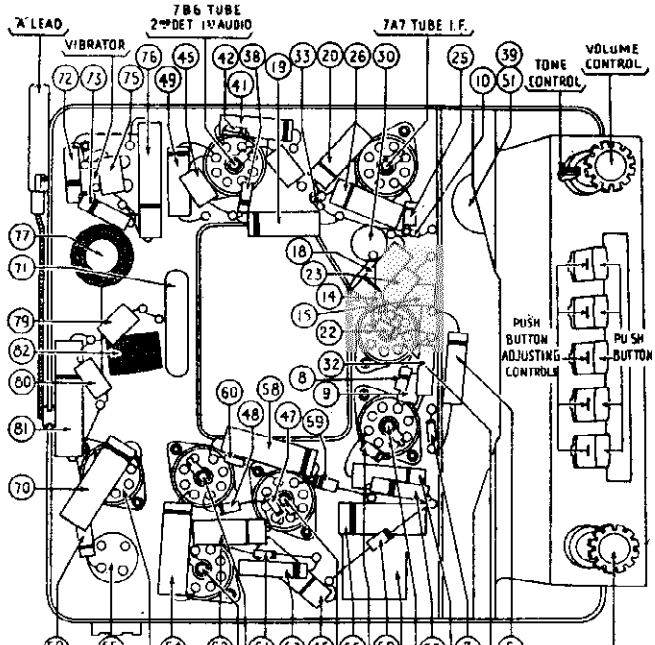
PHILCO RADIO & TELEVISION CORP.



IF PEAK 270 KC

PARTS LIST — P-1835

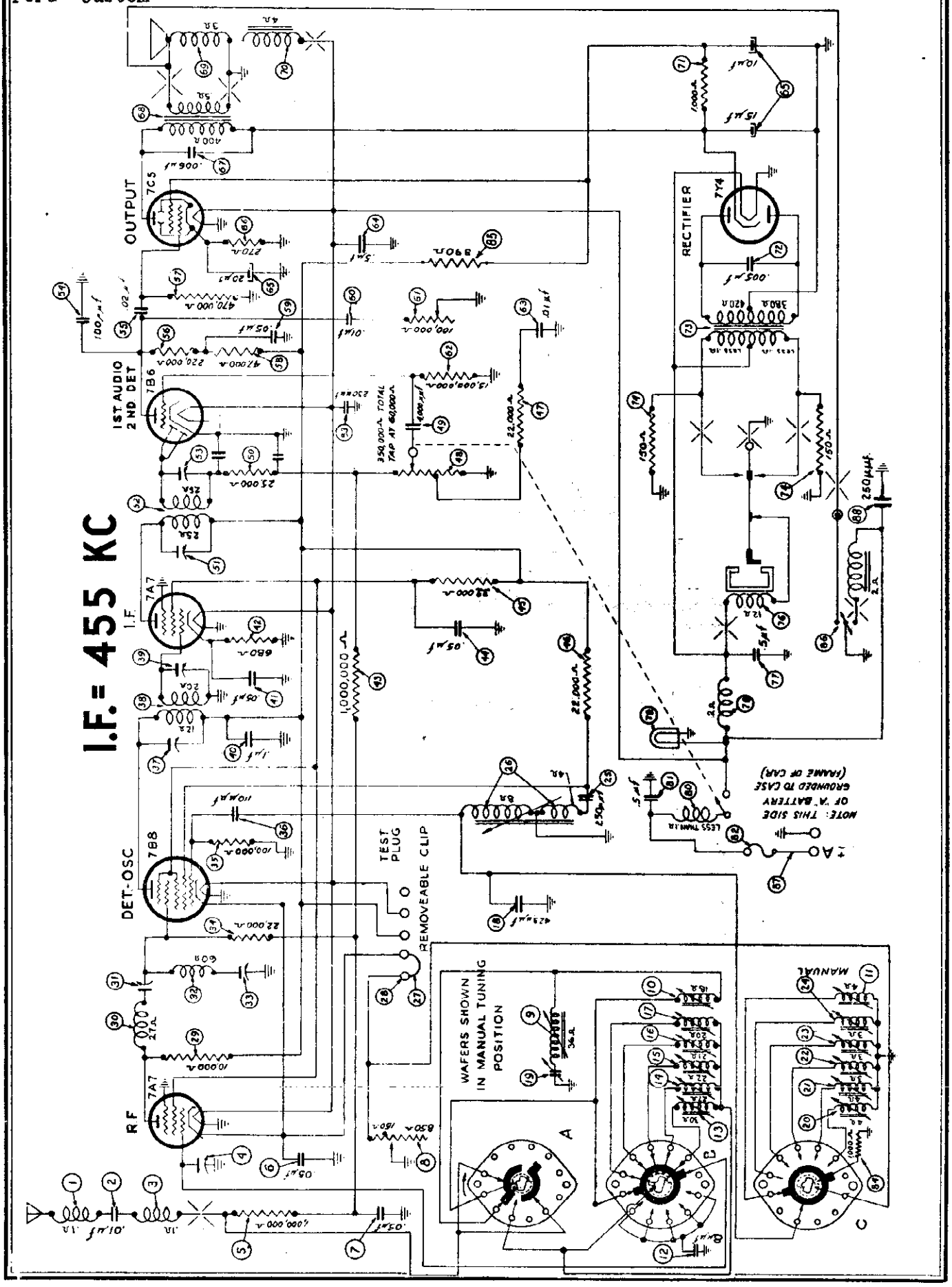
No.	Description	Part No.
(1)	Antenna Choke	65-0378
(2)	Antenna Padder	63-0054
(3)	Antenna Transformer	65-0349
(3)a	Iron Core	57-1541
(4)	Condenser (.05 Mfd.)	61-0111
(5)	Resistor (680 ohms)	33-168334
(6)	Condenser (.05 Mfd.)	61-0111
(7)	Resistor (68,000 ohms)	33-368154
(8)	Resistor (10,000 ohms)	33-310334
(9)	Condenser (250 Mmfd.)	60-125157
(10)	Resistor (68,000 ohms)	33-368154
(11)	Condenser (100 Mmfd.)	60-110327
(12)	R. F. Transformer	65-0359
(12)a	Iron Core	57-1541
(13)	Padder	61-0055
(14)	Resistor (100,000 ohms)	33-410154
(15)	Condenser (110 Mmfd.)	60-110157
(16)	Condenser (215 Mmfd.)	61-0148
(17)	Sensitivity Control	67-0036
(18)	Condenser (.05 Mfd.)	61-0111
(19)	Condenser (.05 Mfd.)	61-0111
(20)	Condenser (.05 Mfd.)	61-0101
(21)	Padder	61-0052
(22)	Resistor (22,000 ohms)	33-322334
(23)	Condenser (250 Mmfd.)	60-125157
(24)	Oscillator Transformer	65-0367
(24)a	Iron Core	57-1542
(25)	Resistor (150 ohms)	33-115336
(26)	Condenser (.05 Mfd.)	61-0111
(27)	Condenser (54.5 Mmfd.)	61-0149
(28)	Oscillator Tracking Transformer	65-0351
(28)a	Oscillator Tracking Core	57-0996
(29)	Padder (Pri. 1st I. F. Trans.)	
(30)	First I. F. Transformer	65-0352
(31)	Padder (Sec. 1st I. F. Trans.)	
(32)	Resistor (27,000 ohms)	33-327434
(33)	Resistor (1,000,000 ohms)	33-510154
(34)	Padder (Pri. 2nd I. F. Trans.)	
(35)	Second I. F. Transformer	65-0353
(36)	Padder (Sec. 2nd I. F. Trans.)	
(37)	Resistor (25,000 ohms)	33-325154
(38)	Resistor (470 ohms)	33-147336
(39)	Volume Control (350,000 ohms) & Tone Control & On-Off Switch	67-0035
(40)	Muter Switch	85-0125
(41)	Condenser (.01 Mfd.)	61-0100
(42)	Resistor (10,000,000 ohms)	33-610154
(43)	Condenser (.25 Mfd.)	61-0151
(44)	Condenser (.07 Mfd.)	61-0152
(45)	Condenser (110 Mmfd.)	60-110157
(46)	Condenser (4,000 Mmfd.)	61-0129
(47)	Resistor (10,000,000 ohms)	33-610154
(48)	Resistor (220,000 ohms)	33-422334
(49)	Condenser (.01 Mfd.)	61-0100
(50)	Resistor (220,000 ohms)	33-422334
(51)	Tone Control (4,000,000 ohms)	Part of (39)
(52)	Condenser (.5 Mfd.)	65-0134
(53)	Resistor (4,700 ohms)	33-247154
(54)	Resistor (1,500 ohms)	33-215154
(55)	Condenser (.1 Mfd.)	61-0113
(56)	Filter Condenser (5-10-20-20 Mfd.)	61-0150
(57)	Resistor (4,700 ohms)	33-247434
(58)	Condenser (.05 Mfd.)	61-0122
(59)	Resistor (220,000 ohms)	33-422334
(60)	Resistor (470,000 ohms)	33-447154
(61)	Resistor (470,000 ohms)	33-447154
(62)	Condenser (.05 Mfd.)	61-0111
(63)	Resistor (330 ohms)	33-133436
(64)	Condenser (.01 Mfd.)	61-0124
(65)	Output Transformer	65-0354
(66)	Field Coil	Not Replaceable
(66)a	Cone & Voice Coil (For 73-0050-2 Speaker)	91-0167
	(For 73-0050-4 Speaker)	91-0168
(67)	Jumper	57-1121
(68)	Test Socket	55-1078
(69)	Resistor (1,000 ohms)	33-210434
(70)	Condenser (5,000 Mmfd.)	61-0153
(71)	Power Transformer	65-0347
(72)	Resistor (100 ohms)	33-110434
(73)	Resistor (100 ohms)	33-110434
(74)	Vibrator	83-0027
(75)	Condenser (250 Mmfd.)	60-125157
(76)	Condenser (.5 Mfd.)	61-0137
(77)	Vibrator Choke	65-0151
(78)	Condenser (250 Mmfd.)	60-125157
(79)	Condenser (250 Mmfd.)	60-125157
(80)	Condenser (.5 Mfd.)	61-0137
(81)	"A" Choke	32-1644
(82)	Fuse	45-2559
(83)	Solenoid	65-0360
(84)	Solenoid Switch	Part of 85-0125
(85)	Pilot Lamp	34-2064
	Front Bezel	57-1550FA8
	Color Disc Assembly	77-0649
	Coupling & Key Assembly	77-0651
	Tuning Switch only	77-0601
	R. F. Transformer Spring	57-1538
	R. F. Transformer Mtg. Screw	97-0126
	Core Draw Bar Spring	57-1649



Description	Part No.	Description	Part No.
Latch Bar Spring	57-1650	Vibrator Socket	27-6153
Push Button Spring	57-1651	Tube Socket	27-6151
Push Button Knob	77-0613	Hook Bolt (Radio Mtg.)	57-1560FA3
Muter Spring	57-1652	Wing Nut (Radio Mtg.)	W805FA3
Pointer Spring	57-1653	Ignition Switch Condenser	30-4007
Pointer & Cam Assembly	77-0650	Generator Condenser	30-4475
Dial	55-1034	Distributor Resistor	33-1196
Tuning & Volume Knob	77-0643	Screw (Bezel Mtg.)	97-0111FA4
Tone Lever	57-1559FA8	Speaker Cover & Bracket	77-0663
Manual Return Spring	57-1620FA3	Tube Side Cover	57-1554FC51
Speaker Gasket	55-1037	Speed Nut (Dial Mtg.)	97-0137FE7
Speaker Unit	73-0050	Housing & Bracket	77-0662FC51
Speaker Cable	95-0161	Screw (Cover Mtg.)	W-2212FA26

MODEL F-1841
Ford "Custom"

PHILCO RADIO & TELEVISION CORP.



PARTS LIST — F-1841

No.	Description	Part No.
①	Antenna Choke	65-0102
②	Condenser (.01 Mfd.)	61-0114
③	Antenna Choke	32-2063
④	Aerial Compensator	63-0063
⑤	Resistor (1,000,000 ohms)	33-510154
⑥	Condenser (.05 Mfd.)	61-0111
⑦	Condenser (.05 Mfd.)	61-0101
⑧	Sensitivity Control	67-0025
⑨	Image Trap Coil	Part of ⑩
⑩	Inductive Tuning Unit	77-0701
⑪	Oscillator Transformer	Part of ⑩
⑫	Condenser (8 Mmfd.)	60-008337
⑬	Push Button Transformer Assembly	77-0815
⑭	Push Button Transformer	Part of ⑬
⑮	Push Button Transformer	Part of ⑬
⑯	Push Button Transformer	Part of ⑬
⑰	Push Button Transformer	Part of ⑬
⑱	Silver Mica Condenser (423 Mmfd.)	61-0066
⑲	Image Trap Padder	63-0071
⑳	Push Button Transformer	Part of ⑬
㉑	Push Button Transformer	Part of ⑬
㉒	Push Button Transformer	Part of ⑬
㉓	Push Button Transformer	Part of ⑬
㉔	Push Button Transformer	Part of ⑬
㉕	Condenser (250 Mmfd.)	60-125157
㉖	Oscillator Tracking Transformer	65-0388
㉗	Test Link	57-1121
㉘	Test Socket	55-1104
㉙	Resistor (10,000 ohms)	33-310334
㉚	R. F. Transformer (Pri.)	65-0415
㉛	Padder	Part of ㉜
㉜	R. F. Transformer (Sec.)	Part of ㉚
㉝	Padder	Part of ㉞
㉞	Resistor (22,000 ohms)	33-322334
㉟	Resistor (100,000 ohms)	33-410154
㊱	Condenser (110 Mmfd.)	60-110157
㊲	Padder (Pri. 1st I. F. Trans.)	
㊳	First I. F. Transformer	65-0386
㊴	Padder (Sec. 1st I. F. Trans.)	
㊵	Condenser (.1 Mfd.)	61-0113
㊶	Condenser (.05 Mfd.)	61-0101
㊷	Resistor (680 ohms)	33-168336
㊸	Resistor (1,000,000 ohms)	33-510154
㊹	Condenser (.05 Mfd.)	61-0101
㊺	Resistor (33,000 ohms)	33-333434
㊻	Resistor (22,000 ohms)	33-322334
㊼	Resistor (22,000 ohms)	33-322154
㊽	Volume Control (350,000 ohms) & On-Off Switch	67-0042
㊾	Condenser (4,000 Mmfd.)	61-0129
㊿	Resistor (25,000 ohms)	33-325154
(51)	Padder (Pri. 2nd I. F. Trans.)	
(52)	Second I. F. Transformer	65-0387
(53)	Padder (Sec. 2nd I. F. Trans.)	
(54)	Condenser (100 Mmfd.)	60-110157
(55)	Condenser (.02 Mfd.)	61-0108
(56)	Resistor (220,000 ohms)	33-422334
(57)	Resistor (470,000 ohms)	33-447154
(58)	Resistor (47,000 ohms)	33-347334
(59)	Condenser (.05 Mfd.)	61-0122
(60)	Condenser (.01 Mfd.)	61-0100
(61)	Tone Control (100,000 ohms)	85-0128
(62)	Resistor (15,000,000 ohms)	33-615154
(63)	Condenser (.01 Mfd.)	61-0110
(64)	Condenser (.5 Mfd.)	61-0106
(65)	Filter Condenser (10-15-20 Mfd.)	61-0089
(66)	Resistor (270 ohms)	33-127436
(67)	Condenser (6,000 Mmfd.)	61-0105
(68)	Output Transformer	65-0391
(69)	Replacement Cone (For 73-0054-3 Speaker)	91-0210
	(For 73-0054-9 Speaker)	91-0211
(70)	Field Coil	Not Replaceable
(71)	Resistor (1,000 ohms)	33-210434
(72)	Condenser (5,000 Mmfd.)	61-0153
(73)	Power Transformer	65-0347-N
(74)	Resistor (150 ohms)	33-115334
(75)	Vibrator	83-0026
(76)	Condenser (.5 Mfd.)	61-0137
(77)	Vibrator Choke	65-0398
(78)	Pilot Lamp	34-2064
(79)	"A" Choke	65-0037
(80)	Condenser (.5 Mfd.)	61-0137
(81)	Fuse	45-2659
(82)	Condenser (250 Mmfd.)	60-125157
(83)	Resistor (1,000 ohms)	33-210334
(84)	Resistor (390 ohms)	33-139334
(85)	Foot Switch Control	77-0808
(86)	Fuse Lead Assy.	77-0824
(87)	Condenser (250 Mmfd.)	60-125157
(88)	Solenoid	
	Selector Switch Knob Assembly	318-2376
	Tuning & Volume Knob	77-0708
	Rubber Baffle Gasket	55-1151
	Speaker Cover Screw	W2212FA4
	Speed Nut (Dial Mtg.)	97-0136

Description	Part No.
Dial	55-1143
Bezel	55-1140
Bezel Spring	57-1769FA3
Bezel Clip	57-1772FA3
Tone Knob	57-1780FA3
Tone Knob Speed Nut	97-0144FB7
Tone Slide Bar	57-1774FA3
Tone Knob Spring	57-1937
Drive Cord	55-1157
Drive Cord Spring	57-1425FA3
Pointer	57-1794FCP
Screw (Wiring Side Cover)	W2212FA4
Housing	318-2411
Wiring Side Cover	57-1718FC1
Speaker Cover	57-1717FC1
Speaker Unit	73-0054
Bolt (Speaker Mtg.)	W1582FA4
Lockwasher (Speaker Mtg.)	W291FE7
Nut (Speaker Mtg.)	W124FA3
Loktal Socket	27-6151
Vibrator Socket	27-6153
Wafer Switch	77-0817
Hook Bolt (Radio Mtg.)	97-0094FA3
Wing Nut (Radio Mtg.)	97-0048FA3
Gland Nut & Sleeve	77-0459
Interference Condenser ("A" & Voltage Regulator)	61-0162
Interference Condenser (Oil Gauge & Dist.)	61-0163
Ground Lead Assembly (Voltage Regulator)	77-0810

MODEL P-1841

Signal Generator Connection	Dummy Antenna	Signal Generator Frequency	Receiver Wave-band Switch	Receiver Dial Setting	Trimmer Number
Ant. recept.	0.1 mf	455 kc	Note 1	Note 2	37
"	"	"	"	"	39
"	"	"	"	"	51
"	"	"	"	"	53
"	"	"	"	"	37
"	"	"	"	"	39
"	"	"	"	"	51
"	"	"	"	"	53
"	"	"	"	"	33 [5]
Note 4	20 mmf	1360 kc	"	1360 kc	4 [5]
"	"	590 kc	"	590 kc	26 *
"	"	1400 kc	"	1400 kc	4 [5]
"	"	590 kc	"	590 kc	26 *

Note 1.—Turn selector switch knob to "D" so that stations can be tuned in by manual tuning.
Note 2.—Turn tuning control clockwise as far as it will go.
Note 3.—Adjust (33) for minimum output response.
Note 4.—Connect antenna lead, Part No. 95-0111, to antenna receptacle in radio. Connect a 20 mmf condenser in series between signal generator and antenna lead.
Note 5.—When antenna stage adjustment is made with radio installed in car, the radio antenna lead must be connected to car antenna in usual manner. Connect signal generator output lead to a wire placed near car antenna but not connected to it.
* While rocking.

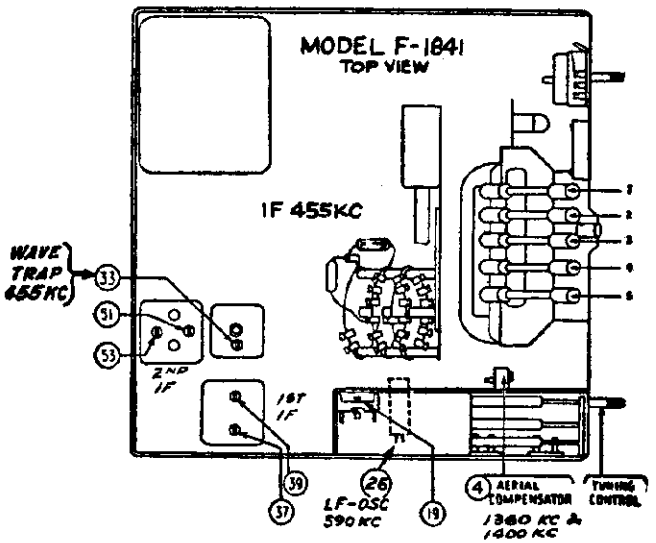


Image trap trimmer (19) adjusted at the factory. Do not disturb adjustment.

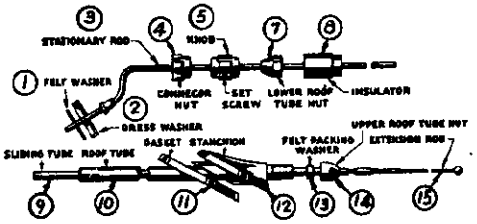


FIGURE 4

CLOSED CAR AERIAL PARTS LIST (Figure 4)

No.	Description	Part No.	List Price
①	Felt Washer (per 100)	55-0811	$1.25
②	Dress Washer	57-1137FA8	.10
③	Stationary Tube	77-0726	.90
④	Connector Nut	55-1166	.15
⑤	Knob	77-0723	.40
⑥	Knob Set Screw	W2105FA4	.10
⑦	Lower Roof Tube Nut	57-1131FA8	.15
⑧	Insulator	55-0783	.10
⑨	Sliding Tube	77-0725	.85
⑩	Roof Tube	77-0724	.50
⑪	Gasket	55-0785	.05
⑫	Stanchion	55-0781	.15
⑬	Felt Washer	55-0786	.02
⑭	Upper Roof Tube Nut	57-1135-FA8	.15
⑮	Part of ⑨		
	Set Screw Wrench	28-4696	.10
	Template	57-1828	.05
	Complete Aerial	91-0178	3.50

Prices subject to change without notice.

OPEN CAR AERIAL PARTS LIST (Figure 5)

No.	Description	Part No.	List Price
①	Aerial Rod	77-0866	$1.25
②	Gasket	55-0285	.03
③	Adjusting Screw	57-1836	.06
④	Aerial Head & Shaft Assy.	91-0182	2.75
⑤	Aerial Insulator Assy.	55-1165	.45
⑥	Insulating Bushing	55-1300	.40
⑦	Control Knob	77-0736	.50
⑧	Rubber Grommet	77-0735	.25
⑨	Lead-in Tip	57-1838	.40
⑩	Lead-in Rod	77-0734	.45
⑪	Connector Nut	55-1166	.15
⑫	Dress Washer	57-1137	.10
	Felt Washer (per 100)	55-0811	1.25
	Lead-in Spring	57-1218	.10
	Set Screw Wrench	28-4696	.10
	Screw (Aerial Rod)	W1944	.10
	Complete Aerial	91-0179	4.50

Prices subject to change without notice.

1941 OPEN CAR AERIAL

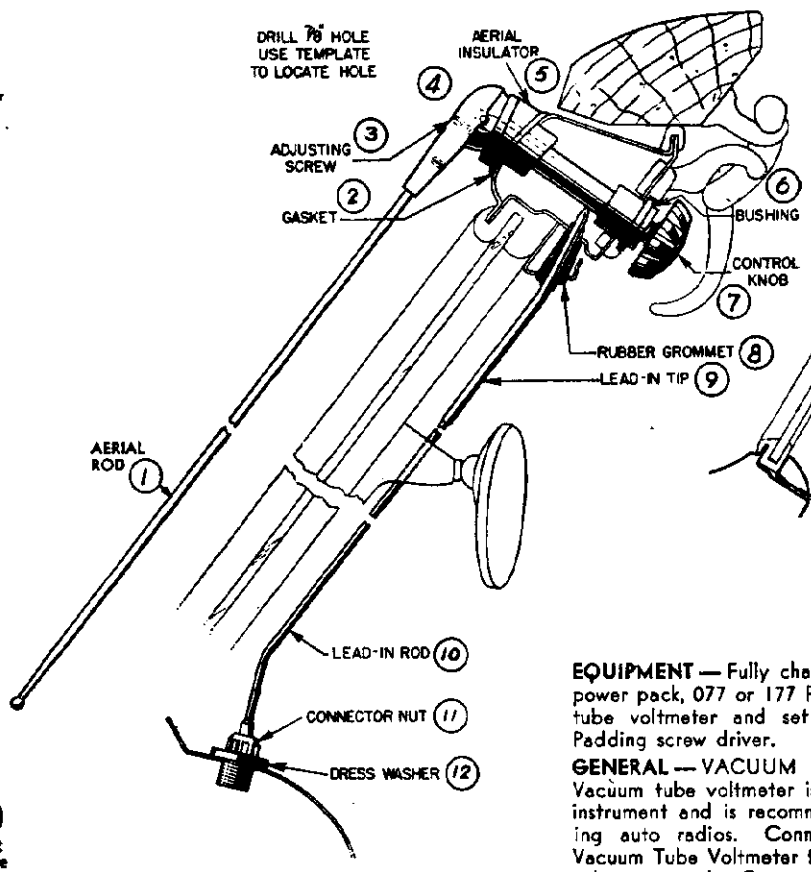
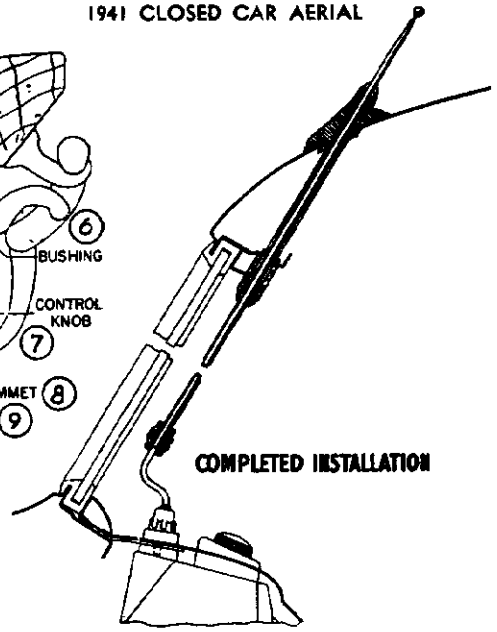


FIGURE 5

1941 CLOSED CAR AERIAL



COMPLETED INSTALLATION

MODEL F-1841

FORD CUSTOM

AUTO RADIO

EQUIPMENT — Fully charged heavy duty storage battery or 6 volt power pack, 077 or 177 Philco Signal generator, 027 Philco Vacuum tube voltmeter and set tester or audio output meter, 45-2610 Padding screw driver.

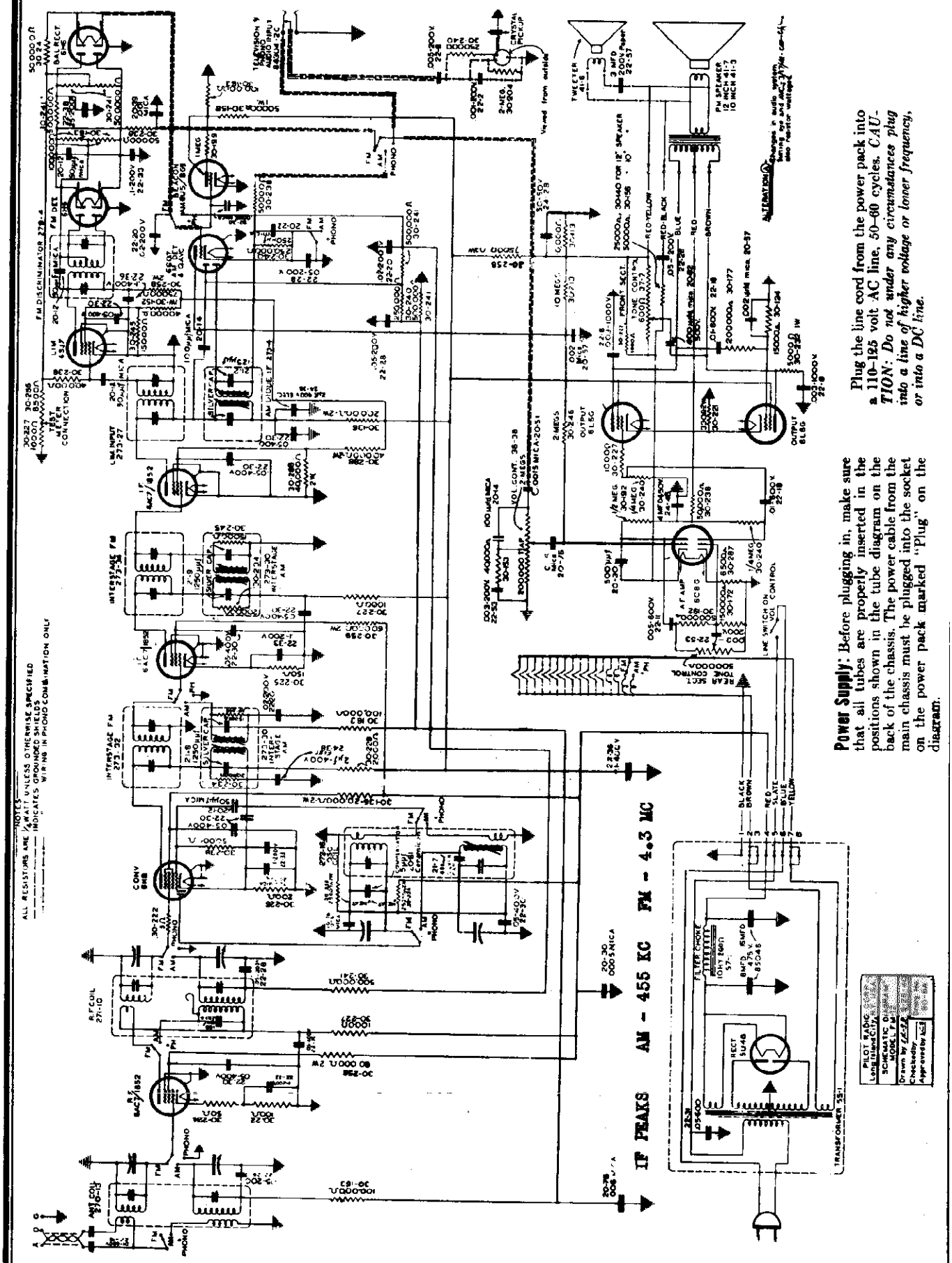
GENERAL — VACUUM TUBE VOLTMETER. The model 027 Vacuum tube voltmeter is an extremely sensitive and accurate test instrument and is recommended for use when aligning and adjusting auto radios. Connect the negative (—) terminal of the Vacuum Tube Voltmeter to the high side (ungrounded side) of the volume control. Connect the positive (+) terminal to the radio housing. Connect the "AC" cord to a 110 volt AC socket. Press the VTVM button and the 10 volt button. Turn the "Set Zero Ohms — VTVM" control clockwise until a click is heard. Allow the tubes to heat up for a few minutes. Short the 150 meg. VTVM terminals and adjust the "Set Zero 150 meg." control until the meter reads zero on the 0-10 range scale (bottom scale). The needle will deflect from left to right.

AUDIO OUTPUT METER. If an audio output meter is used, connect the leads across the voice coil of the speaker. Use the 0-30 volt scale.

With the Radio and signal generator set up for operation at the prescribed frequency, turn the Radio volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the meter. The signal in the speaker should be audible but not loud.

The shielding on the generator output lead must be connected to the Radio housing.

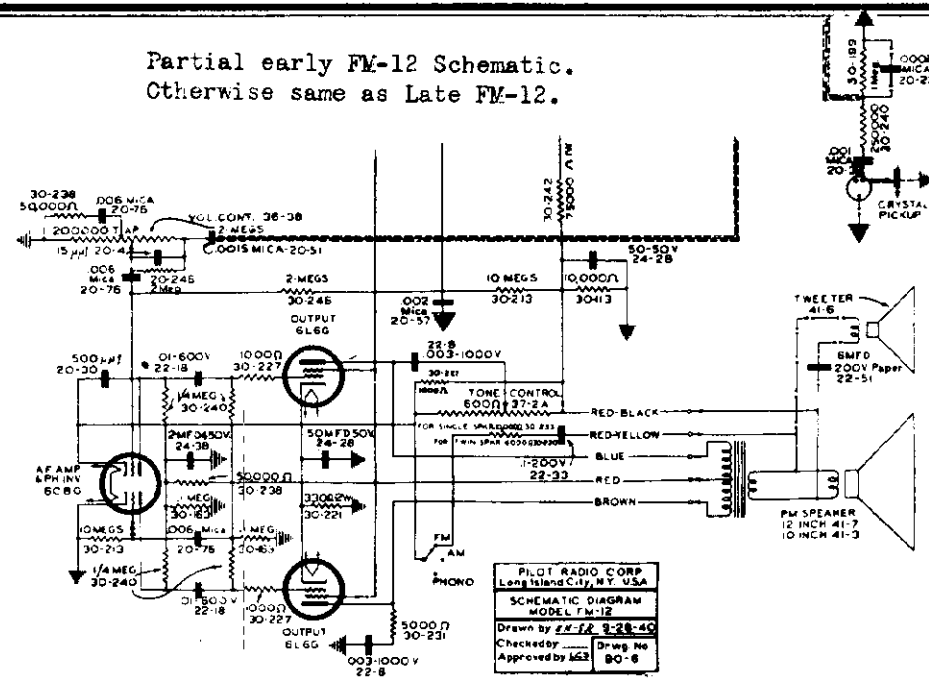
PILOT RADIO CORP.

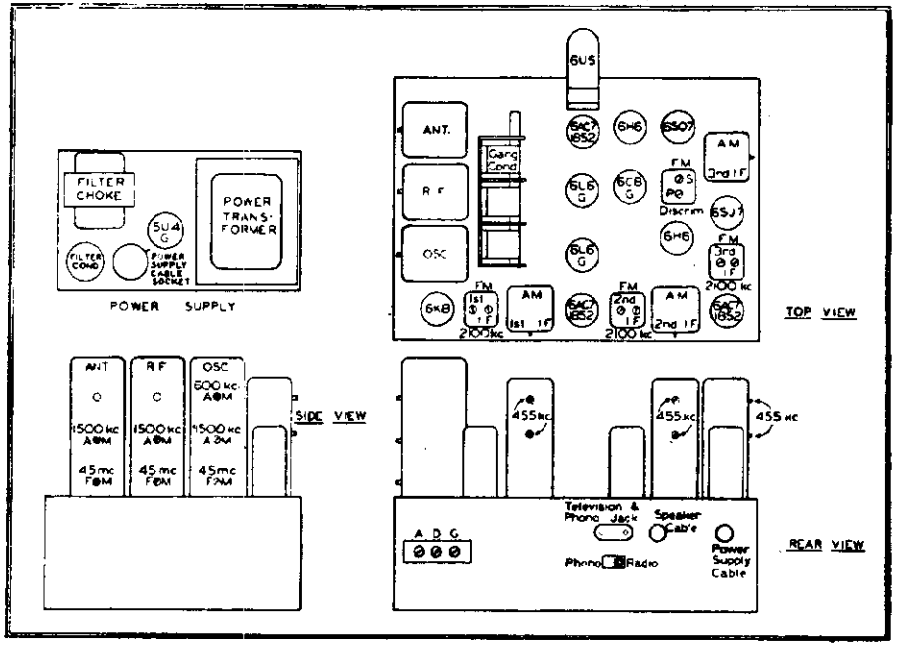


Power Supply: Before plugging in, make sure that all tubes are properly inserted in the positions shown in the tube diagram on the back of the chassis. The power cable from the main chassis must be plugged into the socket on the power pack marked "Plug" on the diagram.

Plug the line cord from the power pack into a 110–125 volt AC line, 50–60 cycles. *CAUTION: Do not under any circumstances plug into a line of higher voltage or lower frequency, or into a DC line.*

Partial early FM-12 Schematic.
Otherwise same as Late FM-12.





LAYOUT OF THE RECEIVER CHASSIS AND POWER SUPPLY, SHOWING TUBE LOCATIONS

SPECIFICATIONS

Voltage Rating: 110–125 volts, 50–60 cycles

Type of Circuit: Frequency modulation, superheterodyne

Tuning Range:
F-M tuning, 42 to 50 mc. — 7.14 to 6 m.
A-M tuning, 540 to 1750 kc. — 555 to 171 m.

Number and types of tubes: 12 plus tuning beacon

RF	— 6AC7/1852
Converter	— 6K8
IF	— 6AC7/1852
IF	— 6AC7/1852
Limiter	— 6SJ7
F-M Det.	— 6H6
Balance Rect.	— 6H6
A-M Det. and QAVC	— 6SQ7
AF Amp. and Phase Inv.	— 6C8G
AF Output	— 6L6G
AF Output	— 6L6G
Rectifier	— 5U4G
Tuning Beacon	— 5U5/6G6

A-M IF Frequency: 455 kc.
F-M IF Frequency: 4300 kc.

Antenna: Pilot F-M, A-M di-pole, No. 110-7

FEATURES

This Pilot Radio receiver provides static-free full-fidelity reception by the Armstrong Wide-Band Frequency Modulation System, with switch-controlled changeover to the standard broadcast band. The following special features are incorporated in the design of this receiver:

1. Interstation silencer (QAVC) for f-m tuning
2. Balance detector for accurate cathode ray beacon tuning indicator on f-m reception.
3. Push-pull audio output with inverse feedback for superior tone quality
4. Inverse feed-back tone control, providing sharper cut-off than conventional types.

Antenna: For noise-free reception it is essential to use a good di-pole antenna, properly installed with down-leads arranged to avoid noise pickup. Under present-day conditions (prior to January 1, 1941), some localities are served by two f-m stations whose frequencies are on adjacent channels (200 kilocycles separation). When this is the case interference from the stronger station may be experienced in reception from the weaker. Such interference may be reduced by loosening the mast clamps and rotating the di-pole until the most favorable position is found.

After January 1, 1941, the new frequencies assigned to f-m stations by the Federal Communications Commission will be in effect, and stations serving the same area will be separated by at least 400 kilocycles. Under these conditions interference between stations will not occur.

(5) TUBE AND VOLTAGE CHART

All voltages taken with 117-volt 60-cycle line. Band switch on FM no signal
Voltmeter resistance = 300,000 ohms for readings above 30 volts; 30,000 ohms for lower readings

Tube	Location	Function	Voltage Between Chassis and Socket Terminal							
			1	2	3	4	5	6	7	8
1852/6AC7	Receiver Chassis	R-f amplifier	0	0	0	0	1.9	138	6(a-c)	292
1852/6AC7	" "	1st i-f amplifier	0	0	0	0	1.9	138	6(a-c)	292
1852/6AC7	" "	2nd i-f amplifier	0	0	0	0	0	106	6(a-c)	140
6K8	" "	Oscillator-converter	0	0	282	120	1.3	81	6(a-c)	3.4
6SQ7	" "	AM-second detector; AM-AVC; Interstation silencer	0	0	0	0	0	0*	0	6(a-c)
6H6	" "	FM-discriminator	0	0	0	0	0	0	6(a-c)	0
6H6	" "	FM-balance rectifier	0	6(a-c)	0	0	0	0	0	0
6C8G	" "	1st audio amplifier; Phase inverter	0	6(a-c)	33	0	0	93	0	35
6L6G	" "	Output	0	0	292	304	0	0	6(a-c)	22
6L6G	" "	Output	0	0	292	304	0	0	6(a-c)	22
6U5	Dial Bracket	Tuning Beacon	6(a-c)	3†	0	112	0	0	—	—
5U4G	Pwr. Supp. Chassis	Rectifier	0	346	0	305(a-c)	0	305(a-c)	0	346

Rectifier heater voltage between terminals 2 and 8 = 5 volts a-c.
*35 volts at 6SQ7 plate supply. †11 volt reading with 300,000-ohm voltmeter.

CONTROLS

The function of each control knob is indicated by lettering on the panel. From left to right the controls are as follows:

(1) Volume Control and POWER SWITCH

To put the set in operation, turn this knob to the right. After the tubes have warmed up, turn the knob further towards the right to increase the volume.

(2) Tone Control: When turned to the right this control increases the treble or high-pitched notes, producing "brilliant" quality. When turned to the left it reduces the treble and thereby emphasizes the bass register, producing "mellow" quality. This control may be adjusted in accordance with individual taste, but in general the best fidelity of reproduction is obtained with maximum brilliancy. This is particularly important on f-m, and it should be noted that a small rotation on the knob away from the extreme right produces a marked reduction in highs on a good f-m broadcast.

Attention is directed to certain differences in tone range among present-day f-m broadcasts. In general the best fidelity may be expected from an f-m broadcast utilizing live studio program material. When the f-m transmitter takes its program material from a distant studio over a wire-line network, or from ordinary phonograph records, there is usually a perceptible loss in reproduction of the extreme highs, such as the overtones of high violin notes, the "S" sounds in speech.

As the commercial use of f-m transmitters expands, in accordance with the plans of the Federal Communications Commission, special broadcasting methods and equipment, now in restricted use, will be more widely introduced. This progress will lead to fuller utilization of the potentialities of f-m, affording at all times the degree of realism and the quality of enjoyment obtainable with these special broadcasting methods and equipment.

(3) Band Switch: Turn to the *left* for f-m (Frequency Modulation) center for a-m (Amplitude Modulation), *right* for phonograph.

(4) Tuning: This control combines fast and slow tuning in a special Pilot drive mechanism, permitting quick transfer from one part of the dial to another, yet providing for fine tuning with great facility.

TUNING BEACON

Accurate tuning is extremely important on both FM and AM; careless adjustment will introduce noise and distortion. The cathode ray tuning beacon in the top center of the dial scale provides visual means to facilitate tuning. As the tuning point is approached the V-shaped shadow of the beacon becomes smaller. On very strong signals the two sides of the V-shaped sector may overlap. For correct tuning adjust to the smallest shadow or the largest overlap.

PHONO-TELEVISION SOUND

Audio Input Jacks: All three models have pin-jack terminals at the rear of the receiver chassis for connection to an external phonograph pickup, a microphone, or the audio channel of a television receiver.

SERVICE INFORMATION

The following sections include:

(1) a brief outline of the principles of frequency modulation, so far as they will assist in servicing this receiver;

(2) a description of the special features of this receiver;

(3) alignment procedure;

(4) trimmer diagram;

(5) tube and voltage chart;

(6) schematic wiring diagram.

(1) FREQUENCY-MODULATION

The Armstrong Wide-Band Frequency-Modulation system has a twofold purpose: (a) to eliminate interference from static, electrical induction, and tube noise; (b) to increase the fidelity of reproduction. To achieve these aims a new kind of signal is used, which is totally different in character from the disturbances, so that the receiver can discriminate between the two.

Under this new system the program material is impressed upon the carrier wave by changing the *frequency* of the carrier in accordance with the sound impulses instead of changing its *strength* or *amplitude*. The departure from carrier frequency, known as the "deviation," depends upon the sound intensity, and the number of times the deviation is applied and removed depends upon the pitch of the sound. The maximum deviation permitted by the Federal Communications Commission is 75 kilocycles, and this deviation corresponds to 100 per cent modulation at the transmitter.

To illustrate: suppose that the carrier frequency is 43,000 kilocycles, and that a 1,000-cycle note of maximum loudness occurs in the musical program; then the frequency of the transmitted wave will vary from 42,925 to 43,075 kilocycles and back again, and will repeat this process 1,000 times per second. Now suppose that the 1,000-cycle note becomes weaker, say 33 per cent modulation; then the transmitted wave will vary from 42,975 to 43,025 kilocycles and back again, and will repeat this process 1,000 times per second.

At the receiver, the frequency-modulated wave is converted, by the standard superheterodyne process, to a lower intermediate frequency with the same frequency modulation. (In the FM-12 receiver the intermediate frequency is 43 00 kilocycles, and a swing from 42 25 to 43 75 kilocycles would represent 100 per cent modulation.) After amplification, this IF signal is then applied to a "limiter" tube, in a circuit which is arranged to deliver *constant output regardless of changes in the amplitude of the input.* Since the static and other disturbances are primarily amplitude changes, the smoothing out of amplitude changes by the "limiter" removes the disturbing effects, but leaves the frequency modulation unaltered.

The output of the limiter is applied to a "frequency discriminator" (or second detector) which converts the frequency deviations into audio-frequency currents. These in turn are amplified and delivered to a loudspeaker.

This system makes possible the reproduction of audio frequencies up to 15,000 cycles per second. Such high-fidelity reproduction has been impracticable hitherto, for two reasons: first, a receiver designed to provide adequate selectivity between 10-kilocycle a-m broadcast channels generally cuts the sidebands representing modulation beyond about 5,000 cycles; and secondly, the noise interference lies mainly in the higher audio-frequency register.

(2) SPECIAL FEATURES OF FM-12 RECEIVER

The FM-12 chassis embodies virtually two complete receivers, utilizing the same audio system and the same RF, converter, and IF tubes for both. The IF transformers for both systems are connected in series and work with the common IF tubes, but separate second detectors are used. A band switch selects the proper antenna, RF, and oscillator tuning components, and transfers the input terminal of the audio system from one second detector to the other. Reference to the schematic diagram will show additional details of the switching arrangements.

Audio System: The audio system comprises a 6C8G twin triode, used as first audio amplifier and self-regulating phase inverter, followed by a pair of 6L6G tubes operating in push-pull, Class AB1.

Inverse Feedback: Inverse feedback is employed to improve tone quality. For this purpose a resistor network is connected across the loudspeaker voice-coil and a suitable proportion of the voice-coil voltage is fed back into the cathode of the first audio triode. This cathode feedback voltage reduces the grid-cathode voltage which is effective in producing output. The action is equivalent to a *large* reduction of amplifier gain at those frequencies at which the gain is *high*, and a *small* reduction where the gain is *low*. The gain is also reduced more on the peaks of harmonics generated in the output stage. The result is the establishment of virtually uniform gain over a wide frequency range and the reduction of harmonics.

Inverse Feedback Tone Control: Continuous tone control is provided by a novel circuit arrangement. A network consisting of a condenser and a variable resistor is connected between the plate of one of the output tubes and ground. The variable resistor forms part of the inverse feedback network described above, so that the voltage across the variable portion is fed back to the cathode of the first audio triode. This reduces the input for all frequencies above a certain value, without affecting lower frequencies. The cutoff frequency is controlled by adjustment of the variable resistor. A moderately sharp cutoff of the high audio frequencies is produced, and the action is much more satisfactory than the gradual cutoff provided by conventional tone controls.

Balance Detector: In tuning an f-m receiver it is most essential to adjust the IF precisely to the "balance frequency" of the discriminator, in order to secure freedom from noise and distortion. It is not sufficient to provide means for tuning to resonance peak, because the resonance is too broad and the peak may be considerably off the balance frequency.

The FM-12 receiver provides means for tuning easily and precisely to the balance frequency. At this frequency there is no DC potential difference between the two cathodes of the discriminator tube, and a slight mistuning in either direction gives rise to a potential difference whose polarity corresponds to the direction of mistuning. In the FM-12 receiver this effect is utilized by a separate 6H6 tube, called the "balance detector," whose cathode becomes *positive* when there is a potential difference *in either direction* between the discriminator cathodes. This *positive* potential is used to neutralize a *negative* potential developed by the signal at the limiter tube, and prevents the negative potential from closing the tuning beacon. At exact tuning, the positive potential disappears, leaving the negative potential to close the beacon. The result is a sharp tuning indication, governed by discriminator balance and not by mere resonance.

Inter-Station Silencer: When signal input is detuned or otherwise removed from an f-m receiver, the limiter ceases to function so that the entire amplifying system up to the second detector operates at full gain. Under these conditions, unless steps are taken to prevent it, the tube noise becomes objectionably loud. In the FM-12 this inter-station noise is completely suppressed by a 6SQ7 squelch tube whose plate current flows in a biasing resistor in circuit with the grid of the first audio triode. The grid of the squelch tube is in turn controlled by the same balance detector system which operates the tuning beacon, so that the squelch tube is biased to cutoff when a signal is correctly tuned in. Under these conditions the 6SQ7 plate current ceases to flow in the grid circuit of the first audio triode, permitting the latter to function normally.

The value of the interstation silencer is readily and forcefully demonstrated by removing the 6SQ7 tube when the receiver is off tune on f-m reception.

While the squelch feature is intended primarily for f-m, it also functions on a-m when a very small aerial is used.

(3) ALIGNMENT PROCEDURE

A-M Alignment: The A-M alignment of this receiver is conventional in every respect. Most skilled radio servicemen have the equipment and experience needed to perform this alignment successfully. A detailed description of the a-m alignment will not, therefore, be given here, but the following information is included:

The locations of all trimmers are shown in the trimmer chart.

The a-m intermediate frequency is 455 kilocycles.

The voice coil terminals are accessible on the speaker frame for output meter connection. The voice coil impedance is approximately 6 ohms at 400 cycles.

Should it be desired temporarily to remove the squelch feature so as to permit a-m alignment on weak inputs, this may be done by grounding the plate supply of the 6SQ7 tube (junction between 75,000-ohm and 10,000-ohm resistors on terminal strip on front apron). Since the diodes of this tube are used for a-m second detector and AVC, the tube cannot be removed as it can on f-m.

Should it be desired temporarily to remove the inverse feedback, this may be done either by shorting the 600-ohm tone control or by opening the resistor-condenser network connected in series with it across the voice coil. The former method will also remove tone control, while the latter will not.

The resistor in the inverse-feedback network above referred to is 10,000 ohms in the table model (with single speaker) and 4,000 ohms in the console and phono combination (for dual speakers). In the phono combination a 10,000-ohm resistor is switched in series with the 4,000-ohm resistor when the front phono-radio switch is thrown to phono position.

Removal of inverse feedback will increase the audio sensitivity about 2.0 times in the 10,000-ohm case, or about 2.5 times in the 4,000-ohm case.

F-M Alignment: The correct alignment of an f-m receiver, while not difficult, is an exact procedure requiring suitable equipment, an understanding of the fundamental principles involved, and some experience. *Alignment operations should not be attempted under any circumstances without these three essentials, and with them only if clearly necessary.*

Equipment for F-M Alignment: The following are the minimum requirements:

(a) Signal generator having the following frequency and output ranges: For IF alignment: Accurate calibration between 2,000 and 2,200 kilocycles; output adjustable at least between 100 and 10,000 microvolts. For RF alignment: Accurate calibration between 40 and 50 megacycles; output adjustable at least between 5 and 1,000 microvolts.

These requirements may be met either by one or by two separate signal generators. Amplitude modulation at 400–1,000 cycles is desirable to facilitate finding, but is not indispensable.

The signal generator output should be brought out through a short concentric transmission line. A .1 mfd. blocking condenser should be at all times inserted at one end of the central or high-potential conductor.

(b) Dummy antenna resistor, approximately 70 ohms, for connection between high-potential output conductor of signal generator and A terminal of receiver.

(c) D. C. milliammeter, 0–0.5 or 0–1.0 milliamperes, for measuring limiter grid current. A shunting resistor capable of increasing the range to about 0–2,000 microamperes is desirable but not essential. This meter should be connected to a pair of leads about two feet long, terminating in spring clips.

(d) D. C. microammeter having zero center with range of 100 microamperes to both right and left of center. As a substitute a single-sided meter with reversing switch may be used, but this will be much less convenient. This meter should be connected to a pair of leads about two feet long, each lead connected to a 250,000-ohm resistor, the free ends of the resistors terminating in spring clips.

(e) Resistor, 500,000 ohms, with clips for insertion between converter grid lead and grid cap.

F-M Meter Connections:

(a) Connect the limiter grid milliammeter across the 1,000-ohm resistor which is connected in series with 40,000-ohm and 16,000-ohm resistors from the grid of the 6SJ7 limiter to chassis. The positive terminal of the meter should be connected to the grounded end of the 1,000-ohm resistor, and the negative terminal to the other end.

(b) Connect the zero-center meter (through its two 250,000-ohm resistors) across the two 100,000-ohm resistors which are connected between the cathodes of the 6H6 discriminator tube. These resistors are readily identified because they are mounted end-to-end on a lug strip between the discriminator tube and the discriminator transformer.

F-M Intermediate-Frequency Alignment:

(a) Remove the converter grid cap and insert 500,000-ohm resistor between grid cap and grid lead. Connect signal generator between grid cap and chassis. Adjust signal generator to exactly 4,300 kilocycles, with IF input (signal generator output) at about 1,000 micro-volts.

(b) Now tune each of the six 2,100 kc. IF trimmers (see trimmer diagram) for maximum response in limiter grid meter. Check sensitivity by adjusting IF input until milliammeter reads 0.20 milliamperes. This should take between 150 and 250 microvolts.

(c) Next increase signal generator output to about 10,000 microvolts and adjust secondary trimmer of discriminator transformer carefully until zero-center meter reads zero.

(d) Next detune signal generator by exactly 100 kilocycles upward and note reading of zero-center meter. Detune by 100 kilocycles downward and note reading. Adjust primary trimmer of discriminator transformer and repeat this test until readings on both sides of zero are equal (approximately 48 microamperes).

F-M Radio-Frequency Alignment:

(a) Restore normal grid lead connection to grid cap of converter tube. Connect low-potential output terminal of signal generator to terminal D of receiver. Connect high-potential terminal to terminal A through a 70-ohm dummy antenna resistor.

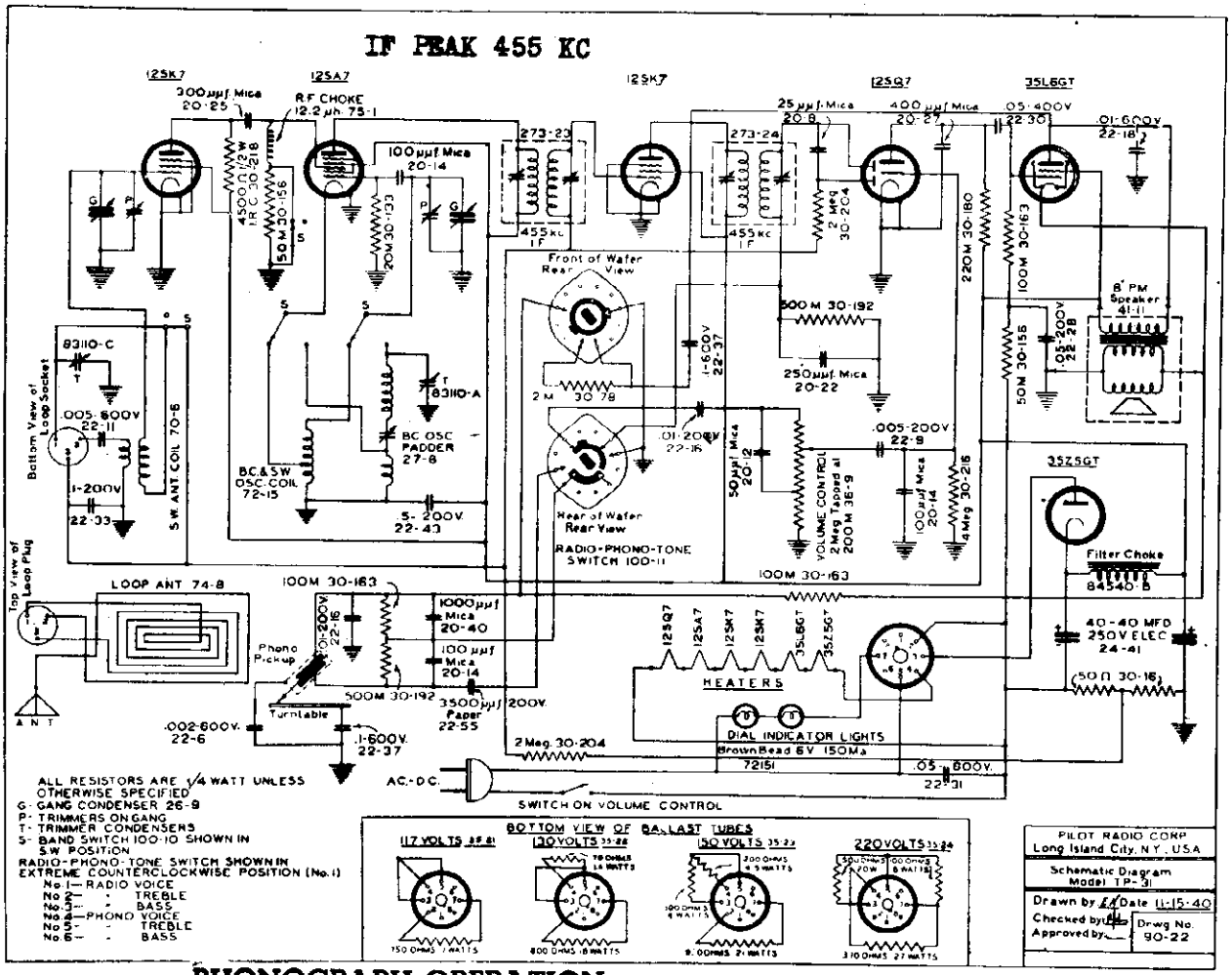
(b) Adjust signal generator to about 1,000 microvolts output at exactly 45 megacycles. Tune receiver dial to exactly 45 megacycles. Tune f-m oscillator trimmer until limiter grid meter responds, then adjust this trimmer very carefully to give zero reading on zero-center meter. Switch signal generator off and on and watch limiter grid meter to make sure that observed signal is coming from signal generator.

Adjust signal generator to vicinity of 40.8 megacycles, and find image frequency, which produces a somewhat weaker response in limiter grid meter. If image cannot be found near 40.8 megacycles, but appears instead near 49.2 megacycles on signal generator, then oscillator trimmer capacity is too low. In this case reset to 45 megacycles and increase oscillator trimmer capacity by turning screw counter-clockwise until a second response is found. Now adjust accurately to zero-center reading and repeat test for image response at 40.8 megacycles.

(c) Reduce signal generator output to about 50 microvolts. Tune f-m RF and antenna trimmers to maximum response on limiter grid meter.

This completes the alignment of the receiver.

PILOT RADIO CORP.



PHONOGRAPH OPERATION

IT IS IMPORTANT THAT THE SWITCH AT THE REAR OF THE CABINET IS IN THE POSITION CORRESPONDING TO THE TYPE OF LINE CURRENT BEING USED.

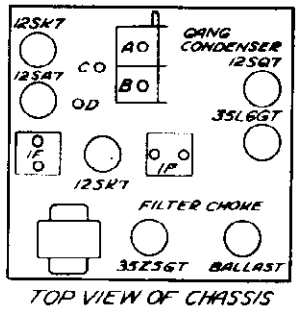
The motor is controlled by the automatic stop lever which is at the rear right side of the turntable. The lever protruding from under the turntable on the front side is the speed control. For true reproduction the speed should be adjusted to 78 revolutions per minute. Volume for both, "Phono" and "Radio" is regulated by the same control on the front of the receiver.

The tone control and phono radio switch must be in either of the three clockwise positions for phonograph operation.

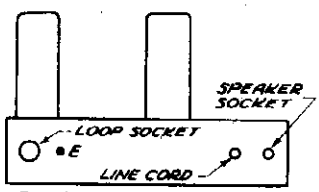
SERVICE NOTES

The screws for adjusting both the R.F. and I.F. amplifiers of this receiver, together with the frequencies at which they should be adjusted, are all pictured on the above diagram. When aligning the I.F. amplifier, the generator must be connected to the grid of the 12SK7 R.F. tube through a .1 mfd condenser. When aligning the receiver, first align the shortwave band connecting the generator to the antenna post with a 400 ohm resistor. Then align the broadcast band using a .0002 mfd. condenser.

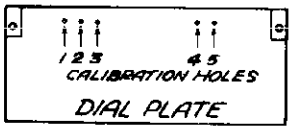
When aligning the loop, the receiver should be in the cabinet with the back in place. The adjusting condenser can be reached through the slot in the lower left hand side of the back.



TOP VIEW OF CHASSIS



REAR VIEW OF CHASSIS



DIAL PLATE

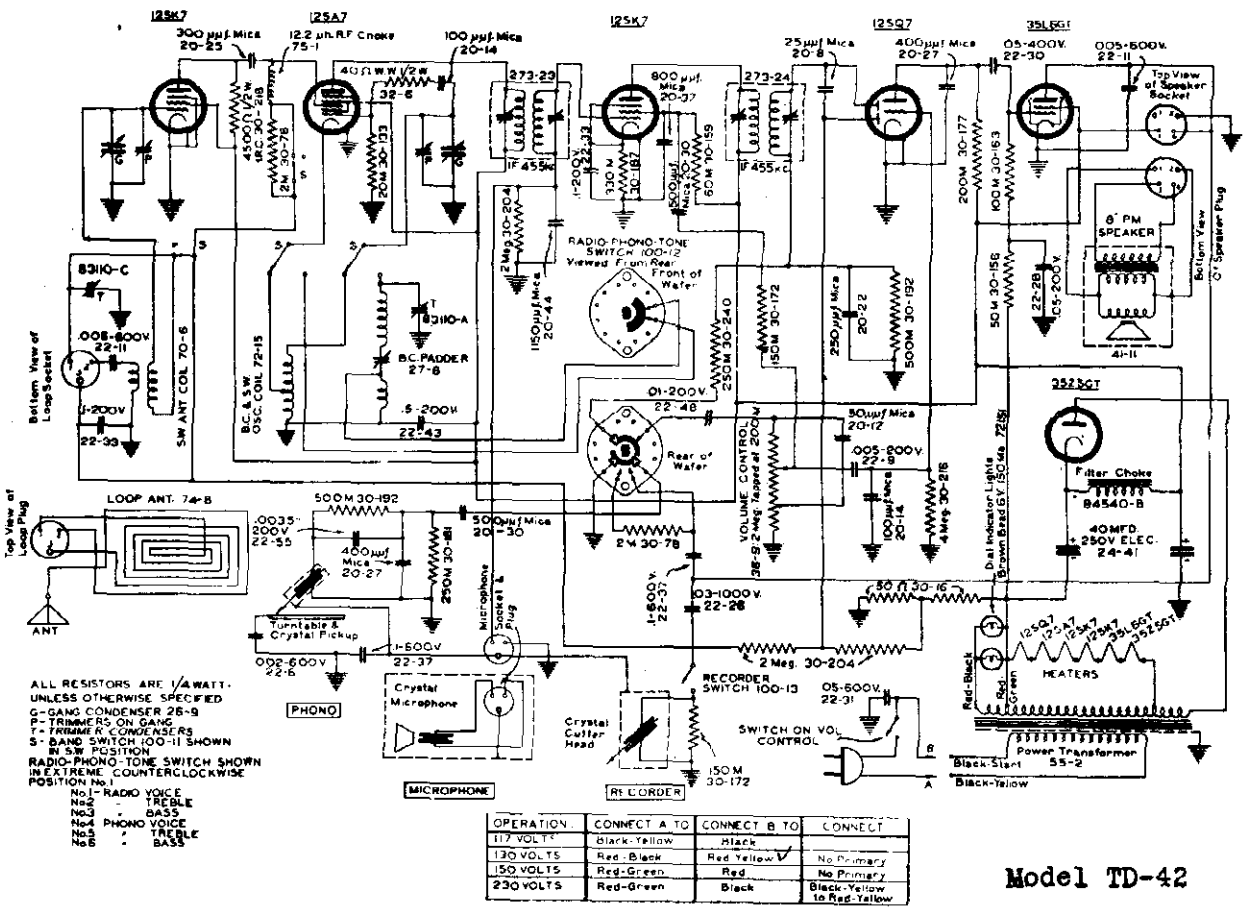
TRIMMERS - 455 KC
A-ANT SW 210 MC
B-OSC SW 240 MC
C-OSC BC 1400 KC
D-OSC PADDER 600 KC
E-LOOP ANT 1400 KC
DIAL PLATE
1-START - 535 KC
2 60 MC
3 600 KC
4 1400 KC
5 210 MC

TUNING RANGE
BROADCAST RANGE
535-1720 KC
OR 561 TO 174
METERS
SHORT WAVE BAND
5.6 TO 24.0 METERS
OR 53.6 TO 240
METERS OR 12.5
METERS

MODEL TD-42
MODEL 1424 Phono

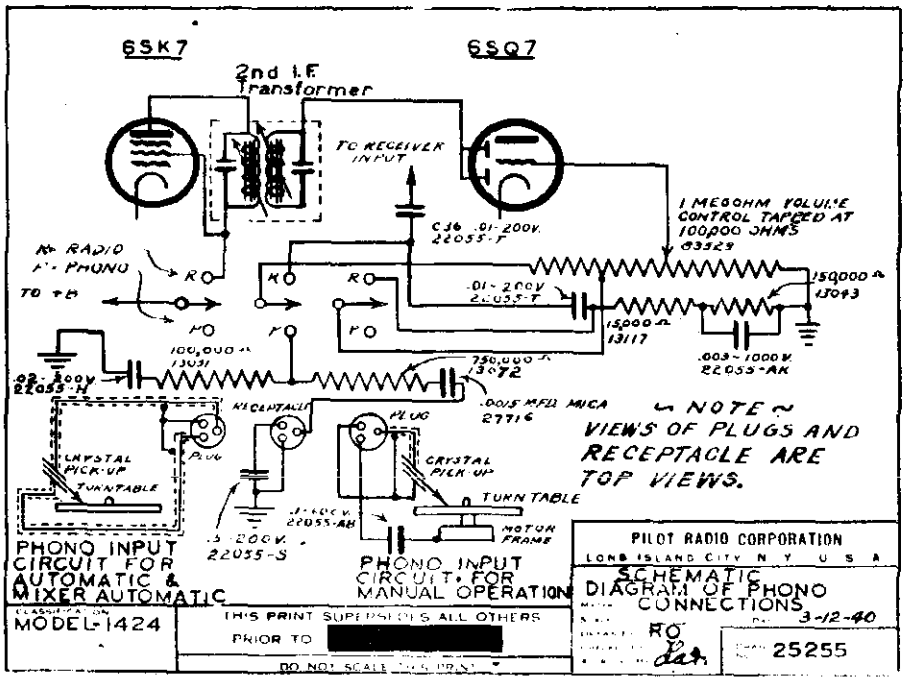
PILOT RADIO CORP.

IF PEAK 455 KC



OPERATION	CONNECT A TO	CONNECT B TO	CONNECT
117 VOLTS	Black-Yellow	Black	
130 VOLTS	Red-Black	Red Yellow	No Primary
150 VOLTS	Red-Green	Red	No Primary
230 VOLTS	Red-Green	Black	Black-Yellow to Red-Yellow

Model TD-42

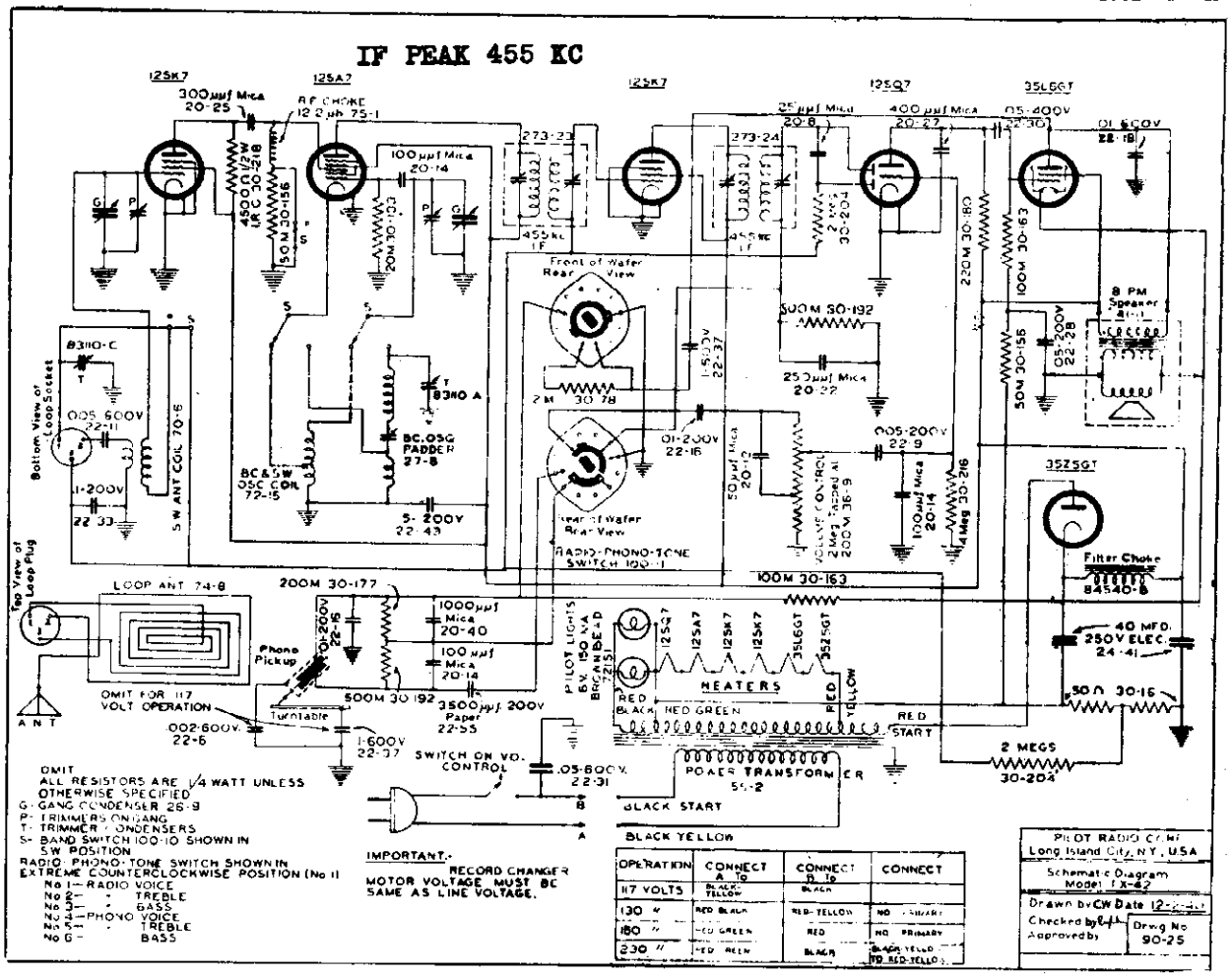


Model 1424 Phono Connection

For other Data see Index.

PILOT RADIO CORP.

MODEL TD-42
MODEL TX-42



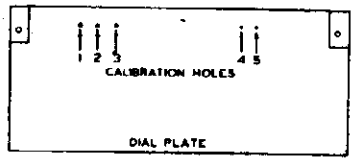
OPERATION	CONNECT A TO	CONNECT N TO	CONNECT
117 VOLTS	BLACK-YELLOW	BLACK	
130 "	RED-BLACK	RED-YELLOW	NO PRIMARY
180 "	RED-GREEN	RED	NO PRIMARY
230 "	RED-RED	BLACK	BLACK-YELLOW TO RED-YELLOW

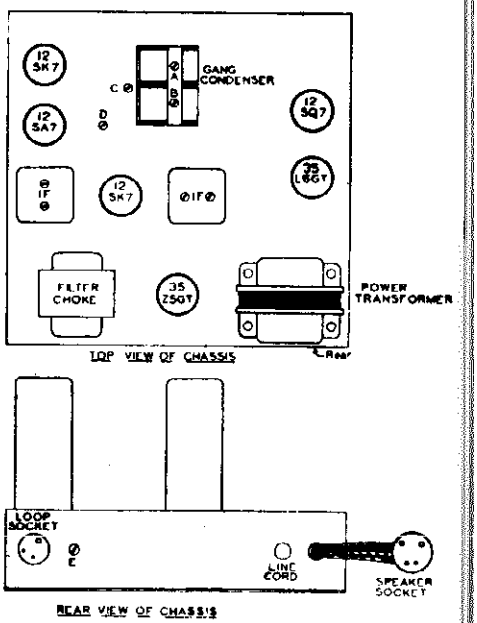
TUNING RANGE

Broadcast Band 535 to 1720 kc.; 561 to 174 meters

Short Wave Band 5.6 to 24.0 mc.; 53.6 to 12.5 meters

DIAL PLATE CALIBRATION HOLES
1-START 535 KC.
2- ------ 6.0MC
3- ------ 600 KC
4- ------ 1400KC
5- ------ 21.0MC





SERVICE NOTES

The screws for adjusting both the R.F. and I.F. amplifiers of this receiver, together with the frequencies at which they should be adjusted, are all pictured on the above diagram. When aligning the I.F. amplifier, the generator must be connected to the grid of the 12SK7 R.F. tube through a .1 mfd condenser. When aligning the receiver, first align the shortwave band connecting the generator to the antenna post with a 400 ohm resistor. Then align the broadcast band using a .0002 mfd. condenser.

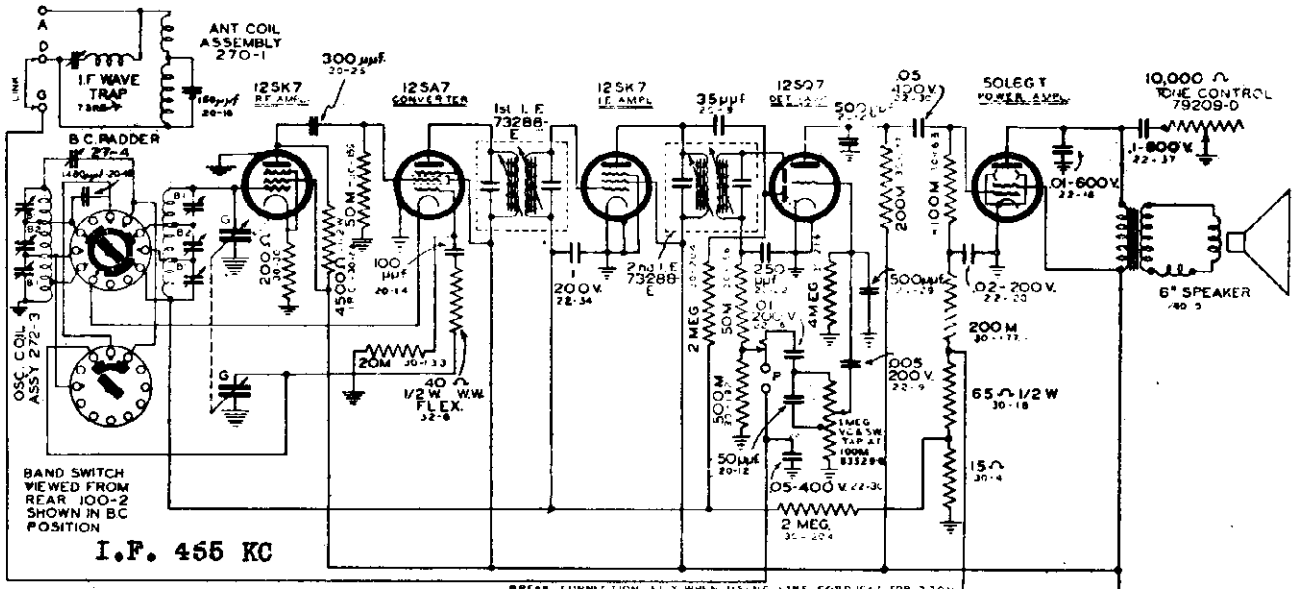
When aligning the loop, the receiver should be in the cabinet with the back in place. The adjusting condenser can be reached through the slot in the lower left hand side of the back.

TRIMMERS
I.F. ADJUSTED AT 455 KC
A - ANTENNA SW 21.0 MC
B - OSCILLATOR SW 24.0 MC
C - OSCILLATOR BC 1400 KC
D - OSCILLATOR PADDER 600 KC
E - LOOP ANTENNA 1400 KC

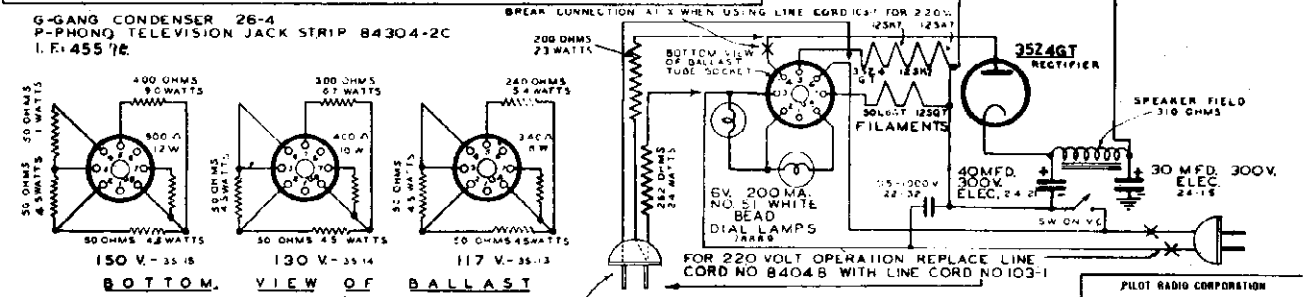
MODELS TD-42, TX-42
FOR GENERAL INSTRUMENTS 101 RECORD CHANGER, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

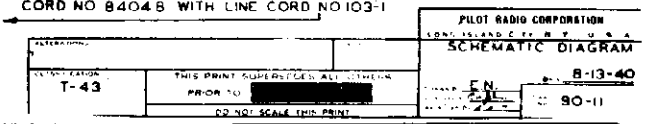
MODELS B1, T1
MODELS B2, T2 MODEL T-43

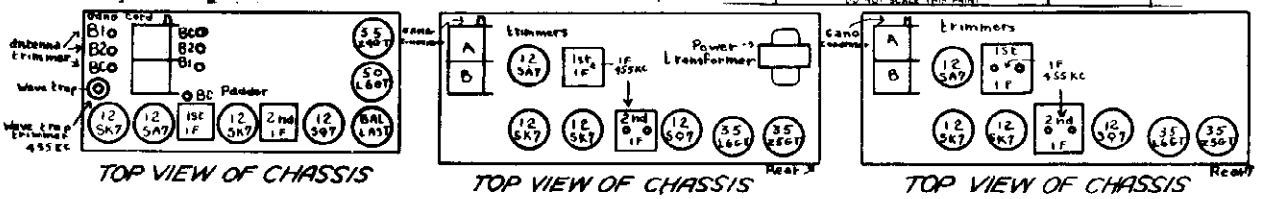
PILOT RADIO CORP.

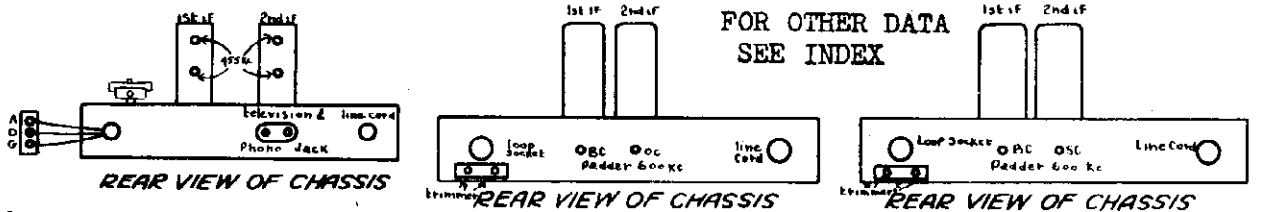


G-GANG CONDENSER 26-4
P-PHONO TELEVISION JACK STRIP 84304-2C
I.F. 455 KC.









FOR OTHER DATA SEE INDEX

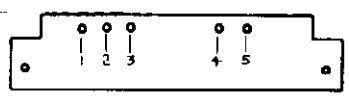
OSC TRIMMERS
BC-1720 KC
B1 24 MC
B2 6 MC

ANT TRIMMERS
BC 1400 KC
B1 18 MC
B2 6 MC

BC PADDER-600 KC

MODEL T-43

TRIMMERS
SAME AS MODEL B1 & T1

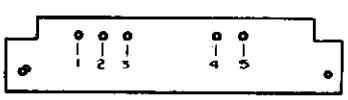


FRONT VIEW DIAL SCALE PAN

CALIBRATION HOLES
SAME AS MODEL B1 & T1

MODELS B2 & T2

TRIMMERS
A-SW-OSC 240 MC
B-SW-ANT 210 MC
C-BC-LOOP 1400 KC

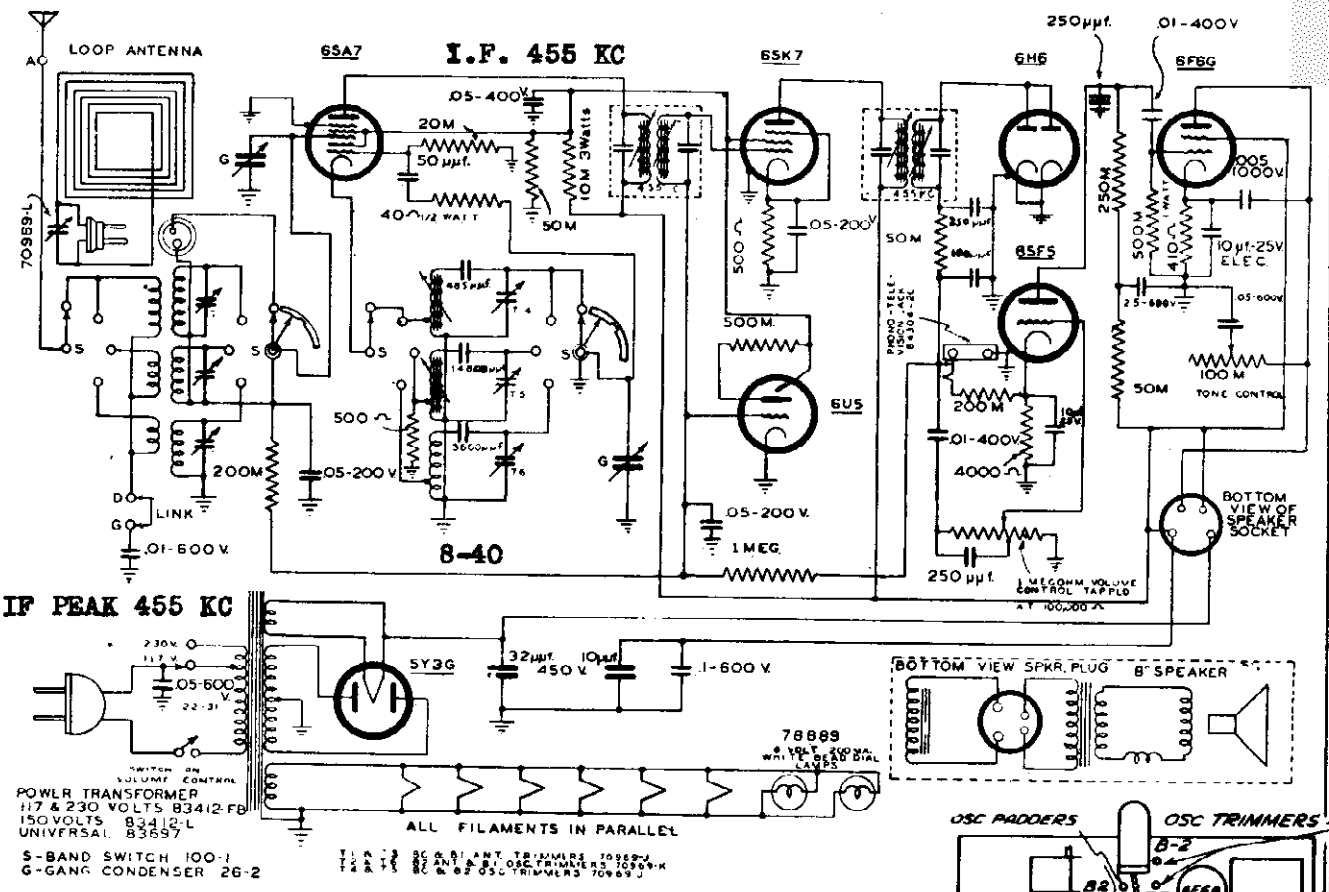


FRONT OF DIAL SCALE PAN.

CALIBRATION HOLES
1-START 535 KC 2-6.0 MC
3-600 KC
4-1400 KC 5-21.0 MC

MODELS B1 & T1

PILOT RADIO CORP.



SERVICE NOTES

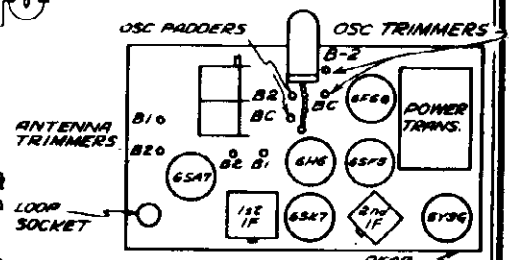
The location of all adjustments used in re-aligning this receiver, and the frequencies at which these adjustments should be made, are shown in the accompanying diagram.

When aligning the I. F. amplifier, the generator must be connected to the grid of the 6SA7 tube through a .1 mfd condenser. When aligning the receiver on the Broadcast Band, connect the generator to the Antenna wire through a .0002 mfd condenser, and on the two short wave bands use a 400 ohm carbon resistor.

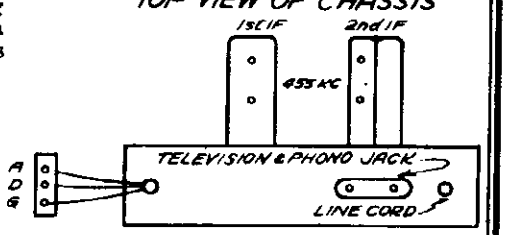
ANTENNA

This receiver contains the latest type of self-contained loop aerial and will give excellent results even in distant localities where the signal from the broadcasting stations are faint. However, it may be necessary to turn the cabinet toward the direction of the incoming signal (since most broadcasting stations use the directional antennas), for the best reception from that particular station. For short wave or distant broadcast band reception, the use of an external antenna is required.

When using a doublet antenna, connect one lead-in wire to terminal "A" at the rear of the chassis, and the other lead-in wire to terminal "D". Remove the connecting link from terminals "D" and "G" and connect terminal "G" to a ground such as a cold water pipe or radiator. If an ordinary single wire antenna is used, connect the lead-in wire to Terminal "A" on the rear of the chassis. Leave the link between "D" and "G" terminals and connect a ground wire under terminal "G". A doublet antenna kit complete with all accessories, can be purchased from your dealer. Ask to see the "Pilot Antenna Kit".



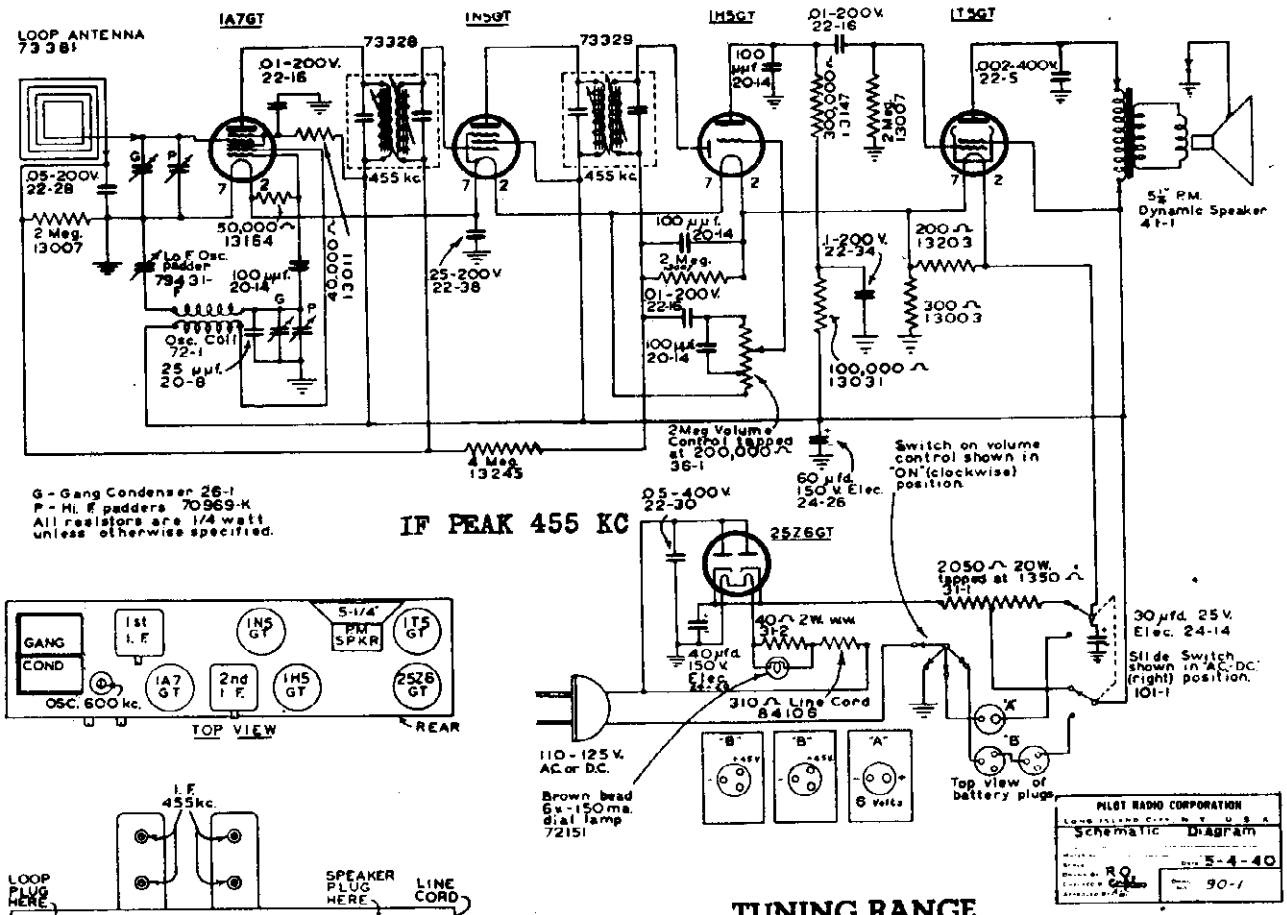
TOP VIEW OF CHASSIS



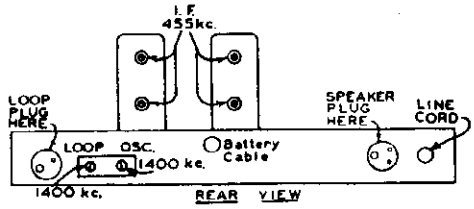
REAR VIEW OF CHASSIS

TUBE LINEUP
6SA7 - CONVERTER
6SK7 - I.F.
6H6 - 2nd Det. - AVC
6SF5 - 1st A.F.
6F6G - OUTPUT
5Y3G - RECTIFIER
6U5 - TUNING INDICATOR
OSC PADDERS
BC - 600 KC
B1 - 2.5 MC
B2 - 6 MC
ANT. TRIMMERS
BC - 1500 KC
B1 - 22 MC
B2 - 6 MC

PILOT RADIO CORP.



IF PEAK 455 KC



TUNING RANGE

Broadcast Band: 561 to 187 meters, or 535 to 1605 kc.

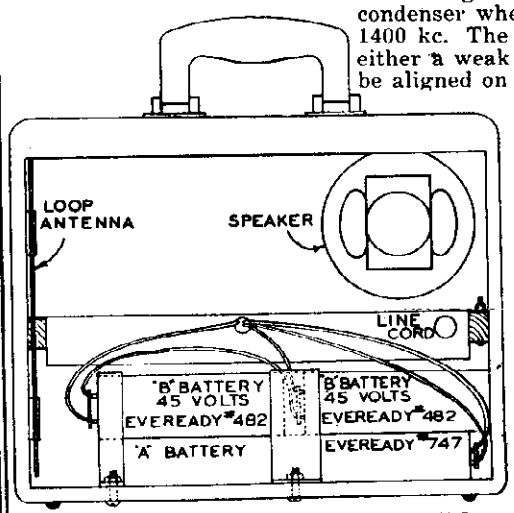
Model T-71

SERVICE NOTES

The location of the screws for adjusting the oscillator, loop and I.F. circuits is indicated above.

When aligning this receiver, the "A" and "B" batteries must be in place, and the set correctly mounted in the cabinet.

The signal generator should be connected to the grid of the 1A7GT through a .1 mfd condenser when aligning the I.F. at 455 kc and when setting the oscillator trimmer at 1400 kc. The loop antenna trimmer and the 600 kc padder should be adjusted, using either a weak station or a radiated signal from a signal generator. This receiver may be aligned on either battery or house current.



REAR VIEW OF CABINET SHOWING BATTERIES IN PLACE

BATTERY INSTALLATION

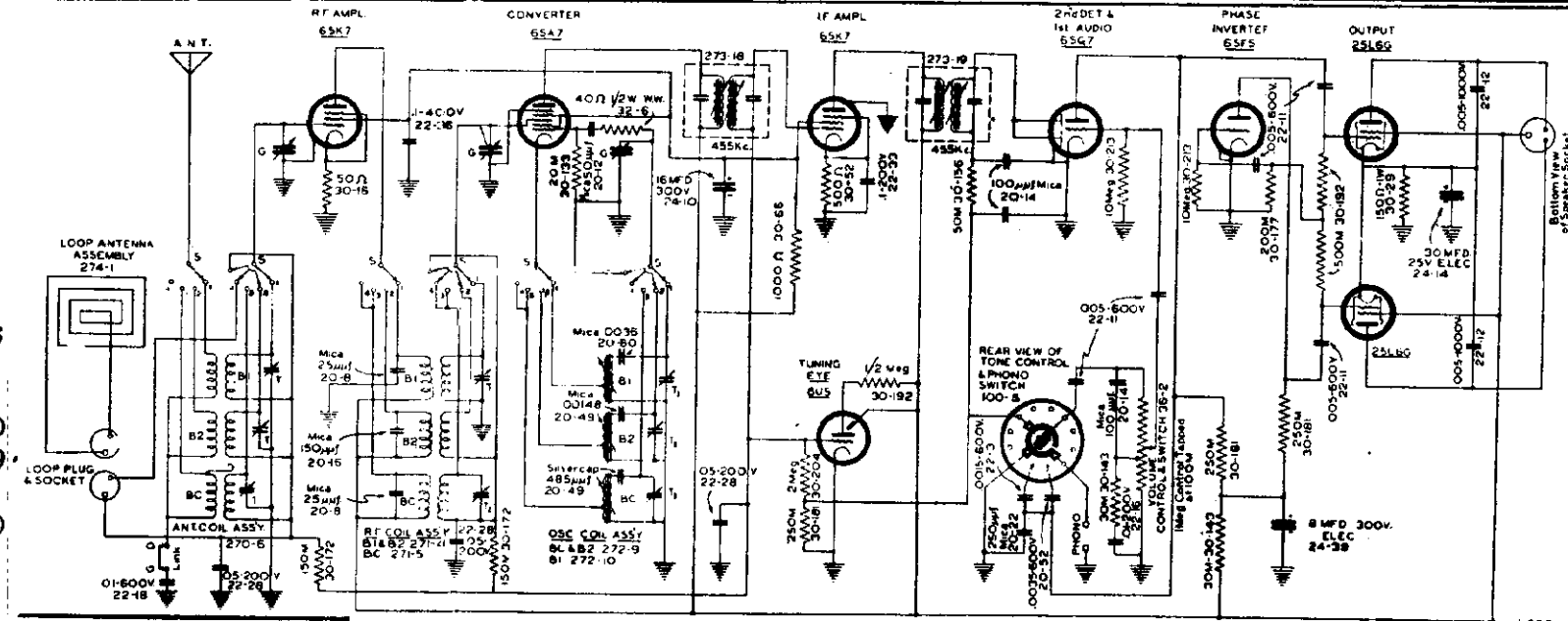
Remove the screws from the back and carefully lift off the back.

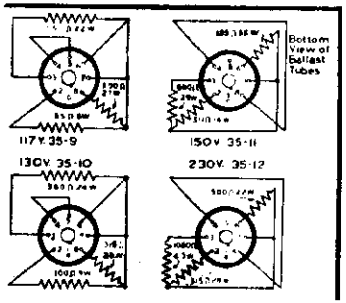
When removing the batteries, first unscrew clamps, and then remove battery plugs. Be sure not to pull on the cables, but on the plugs themselves.

Place the new "A" and "B" batteries in position shown on diagram below and replace clamps in position shown below.

The black and white cable, coming from the chassis, has a 2-prong plug which is then plugged into the double "A" battery. The red and black cable has two 3-prong plugs, both of which are plugged into the "B" batteries. It is optional which plug goes into either "B" battery.

TUNING RANGE
Broadcast band 537 to 1740 KC; or 560 to 172. 3 meters.
SHORT WAVE BAND 2- 1.98 to 7-09 mc;
SHORT WAVE BAND 1- 7.2 to 24.5 mc. or 41.6 to 12.2 meters.

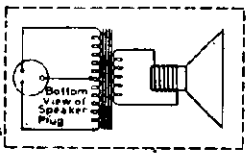


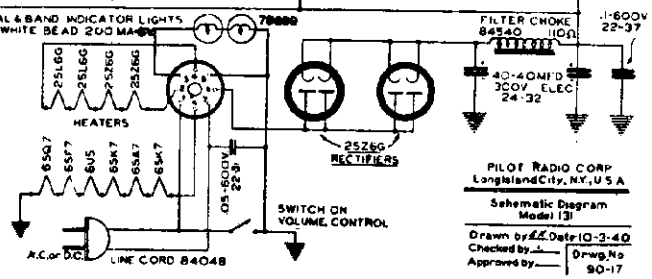


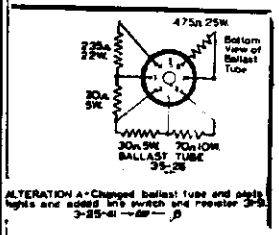
G-GANG CONDENSER 26-7
S-BAND SWITCH 100-6
POSITION 1-SHORT WAVE B1
2-SHORT WAVE B2
3-ANTENNA BC
4-LOOP ANT BC
T_2-TRIMMER CONDENSER 8310-A
T_1-TRIMMER STRIP 227-3
TONE CONTROL SHOWN IN EXTREME COUNTERCLOCKWISE POSITION
1-RADIO VOICE
2-TREBLE
3-BASS
4-PHONO VOICE
5-TREBLE
6-BASS
ALL RESISTORS ARE 1/4 WATT UNLESS OTHERWISE SPECIFIED

IF PEAK 455 KC

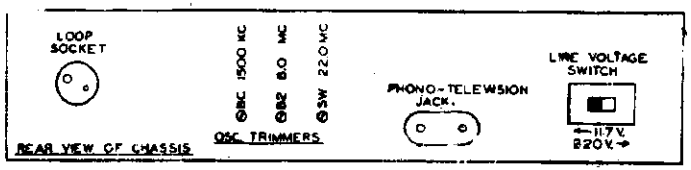
8 inch PM SPEAKER 41-8

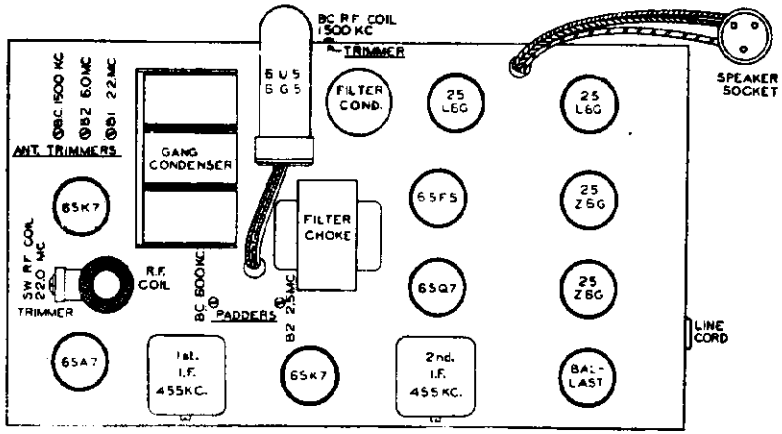






ALTERATION A-Changed ballast tube and pilot lights and added link switch and resistor 3-9-41 —AW— JB



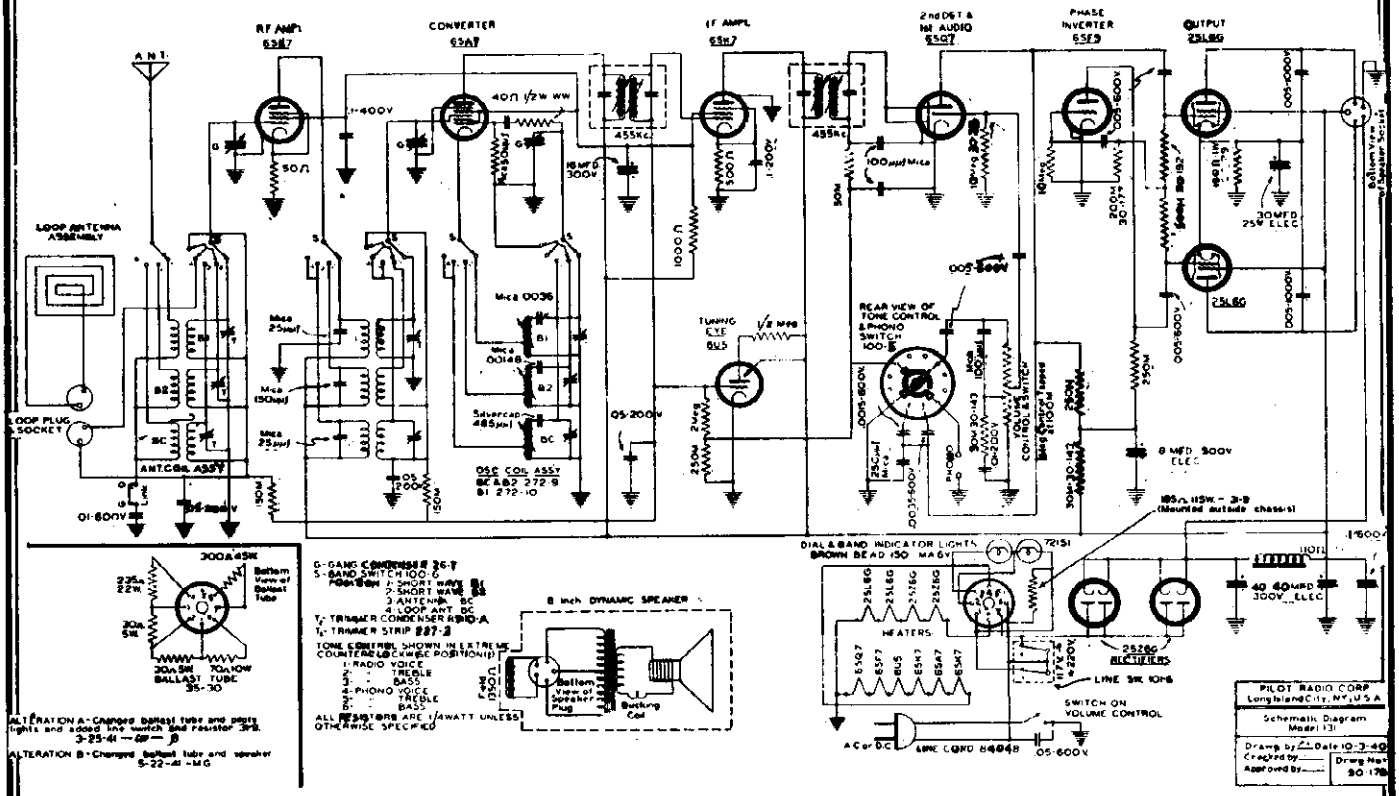


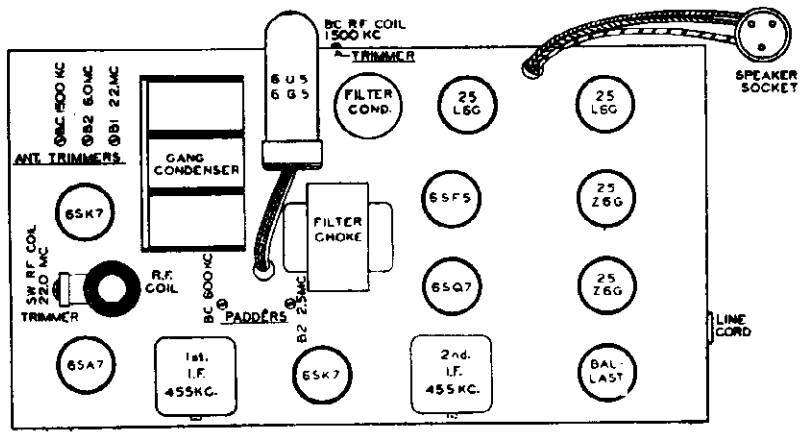
The location of all adjustments used in re-aligning this receiver, and the frequencies at which these adjustments should be made, are shown in the accompanying diagram.

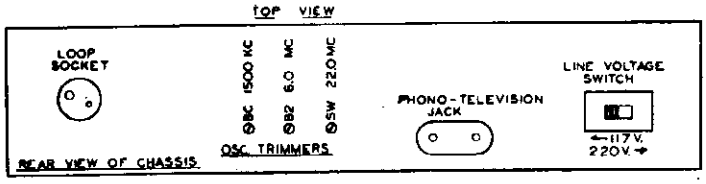
When aligning the I. F. amplifier, the generator must be connected to the grid of the 6SA7 tube through a .1 mfd condenser. When aligning the receiver on the Broadcast Band, connect the generator to the Antenna wire through a .0002 mfd condenser, and on the two short wave bands through a 400 ohm carbon resistor.

MODEL X-131

PILOT RADIO CORP.







ANTENNA

This receiver contains the latest type of self-contained loop aerial and will give excellent results even in distant localities where the signal from the broadcasting stations are faint. However, it may be necessary to turn the cabinet toward the direction of the incoming signal (since most broadcasting stations use the directional antennas), for the best reception from that particular station. For short wave or distant broadcast band reception, the use of an external antenna is required.

When using a doublet antenna, connect one lead-in wire to terminal "A" at the rear of the chassis, and the other lead-in wire to terminal "D". Remove the connecting link from terminals "D" and "G" and connect terminal "G" to a ground such as a cold water pipe or radiator. If an ordinary single wire antenna is used, connect the lead-in wire to Terminal "A" on the rear of the chassis. Leave the link between "D" and "G" terminals and connect a ground wire under terminal "G".

POWER SUPPLY

Rec. will operate on 105-125 v. or 200-240 v. as indicated on the locking plate, move switch to other position & replace plate. When operating on d.c., if rec. does not work 1 min. after turned on, reverse plug in light socket.

SERVICE NOTES

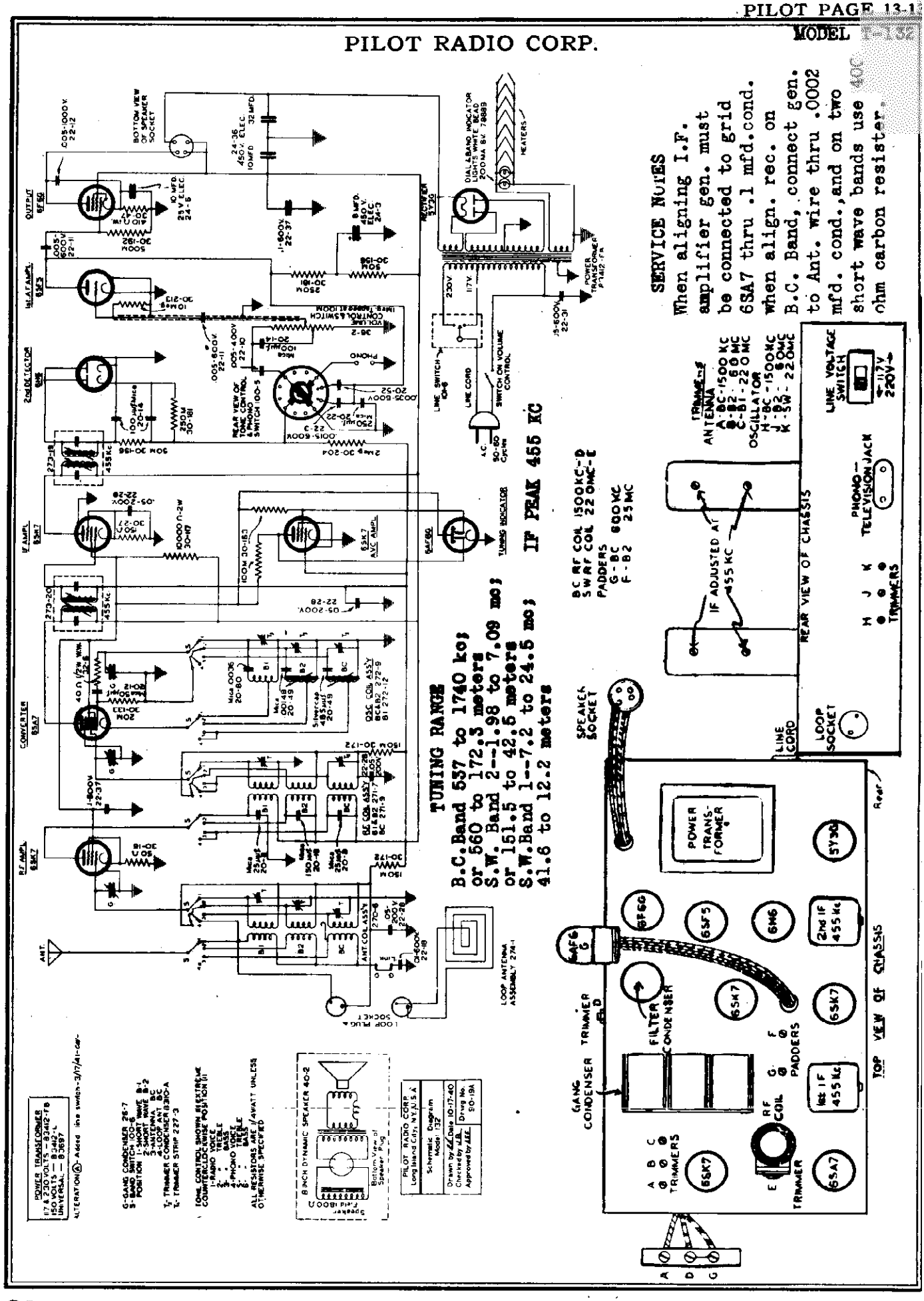
Location of adjustments in realigning receiver, and frequencies at which they are made are shown in accompanying diagram. When aligning I.F. amp. the gen. is connected to the grid of 6SA7 tube thru a .1 mfd cond. When aligning receiver on b.c. band, connect gen. to ant. wire thru a .0002 mfd cond. and on 2 s.w. bands use a 400-ohm carbon resistor.

TUNING RANGE

B.C. Band 537 to 1740 kc; or 560 to 172.3 meters
S.W. Band 2-1.98 to 7.09 mc; or 151.5 to 42.5 meters
S.W. Band 1-7.2 to 24.5 mc; 41.6 to 12.2 meters

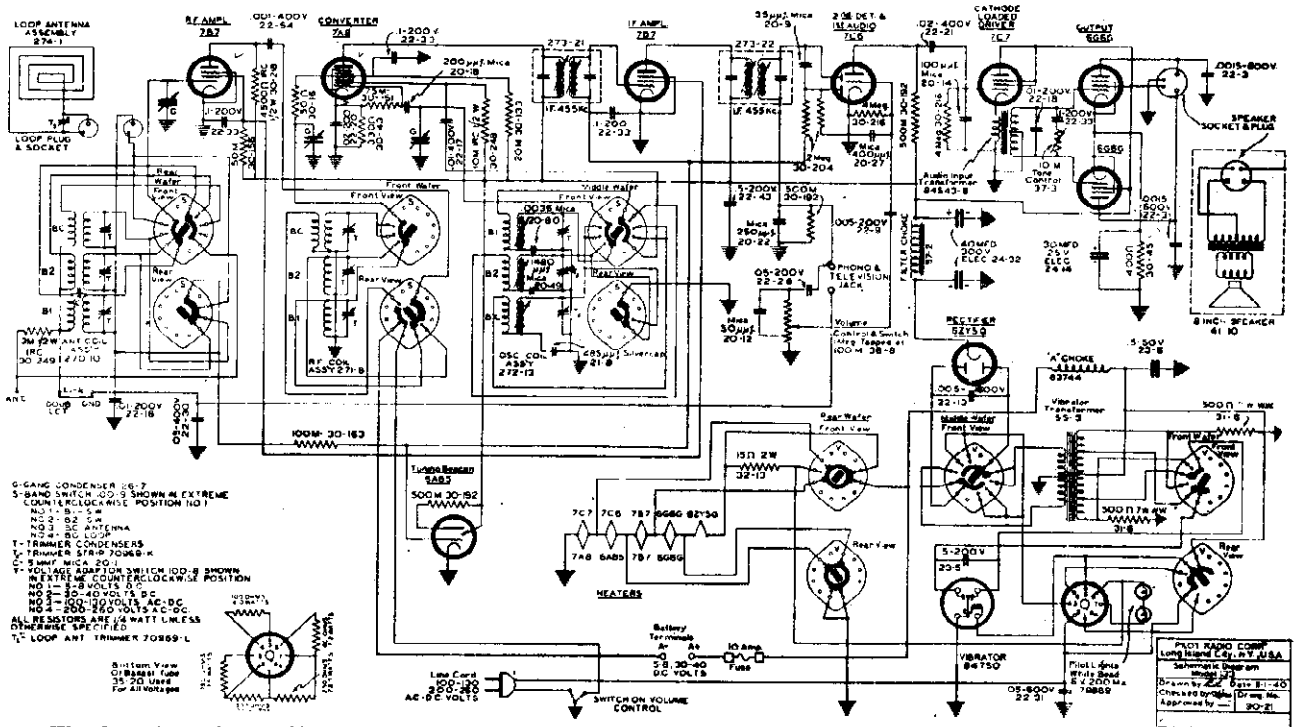
PILOT RADIO CORP.

MODEL 132



MODEL T-133

PILOT RADIO CORP.



The location of all adjustments used in re-aligning this receiver, and the frequencies at which these adjustments should be made, are shown in the accompanying diagram.

When aligning the I. F. amplifier, the generator must be connected to the grid of the 7A8 tube through a .1 mfd condenser. When aligning the receiver on the Broadcast Band, connect the generator to the Antenna wire through a .0002 mfd condenser, and on the two short wave bands through a 400 ohm carbon resistor.

TUNING RANGE

Broadcast Band 537 to 1740 kc; or 560 to 172.3 meters
Short Wave Band 2—1.98 to 7.09 mc; or 151.5 to 42.5 meters
Short Wave Band 1—7.2 to 24.5 mc; 41.6 to 12.2 meters

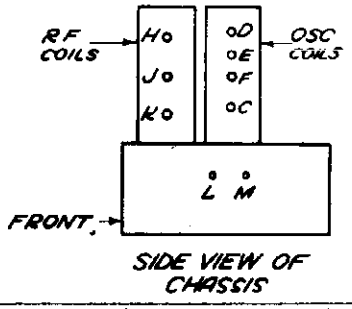
IF PEAK 455 KC

Model T-133

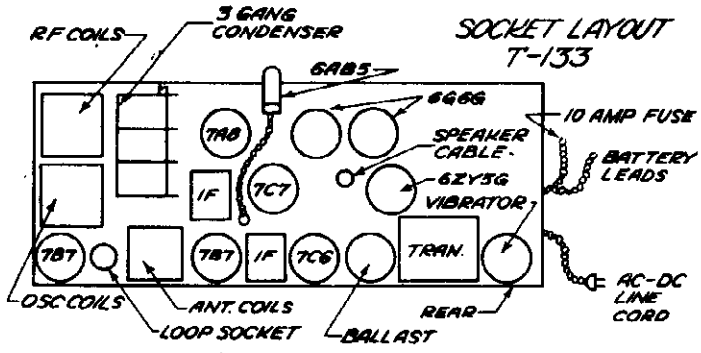
Receiver for

5- 8 Volt D.C.
30- 40 Volt D.C.
100-130 Volt A.C. D.C.
200-260 Volt A.C. D.C.

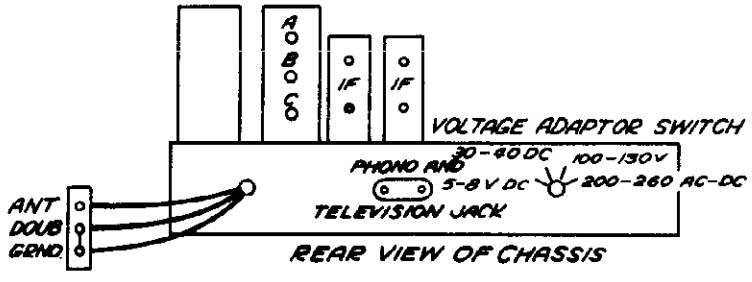
TRIMMERS:
IF ADJUSTED TO 455 KC
ANTENNA:
A- BC 1300 KC
B- SW 60 MC
C- SW 220 MC
RF:
H- BC 1500 KC
J- SW 60 MC
K- SW 220 MC
OSCILLATOR:
D- BC PADDER 600 MC
E- SW PADDER 25 MC
F- SW 240 MC
G- SW 80 MC
L- SW 60 MC
M- BC 1500 KC



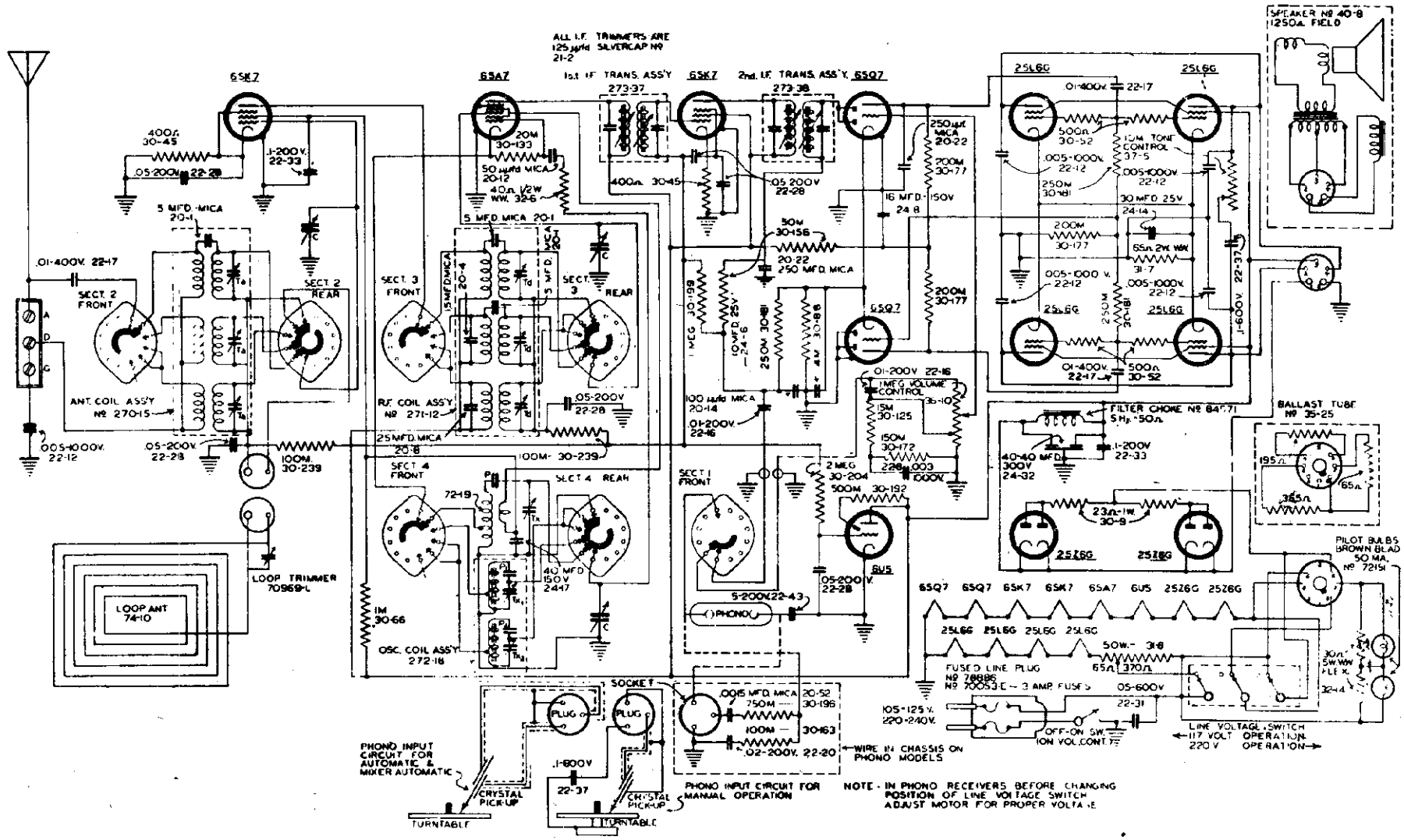
SIDE VIEW OF CHASSIS



TOP VIEW OF CHASSIS



REAR VIEW OF CHASSIS



TUNING RANGE

Broadcast Band 3: 530 to 1770 kc; or 565.7 to 169.4 meters.

Short Wave Band 2: 3.20 to 9.85 mc; or 93.69 to 30.44 meters.

Short Wave Band 1: 8.85 to 29.0 mc; or 33.88 to 10.34 meters.

I.F. PEAK: 455 KC

C- 2810 3 GANG CONDENSER
C1- 20-75 .0038 MFD. MICA PADDER COND
C2- 20-52 .005 " "
C3- 21-7 450 " SILVERCAP "
T1- 72283A ANTENNA TRIMMER
T2- 72283A DETECTOR "
T3- 83108 OSCILLATOR "
T4- 72283A " "
T5- 72283A " "
ALL RESISTORS 1/2 WATT UNLESS OTHERWISE SPECIFIED
M = THOUSANDS

BAND SWITCH VIEWED FROM FRONT OF CHASSIS, SHOWN IN SW.1 POSITION
BAND SWITCH Nº 100-14A
I.F. FREQUENCY IS 455 KC

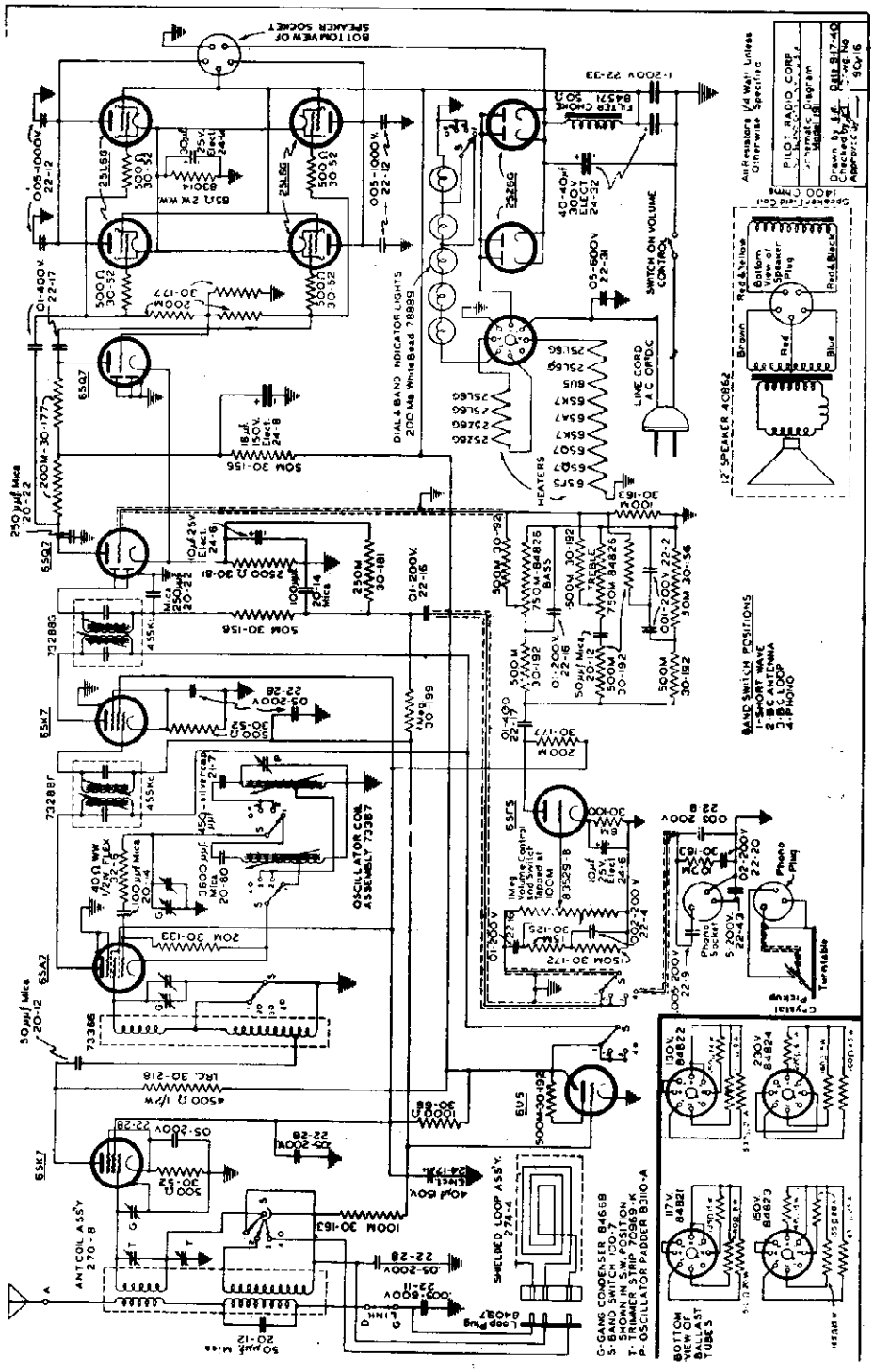
FOR OTHER DATA SEE INDEX SERVICE NOTES

The location of all adjustments used in re-aligning this receiver, and the frequencies at which these adjustments should be made, are shown in the accompanying diagram.

When aligning the I. F. amplifier, the generator must be connected to the grid of the 6SA7 tube through a .1 mfd condenser. When aligning the receiver on the Broadcast Band, connect the generator to the Antenna wire through a .0002 mfd condenser, and on the two short wave bands use a 400 ohm carbon resistor.

MODELS 193,194
Late

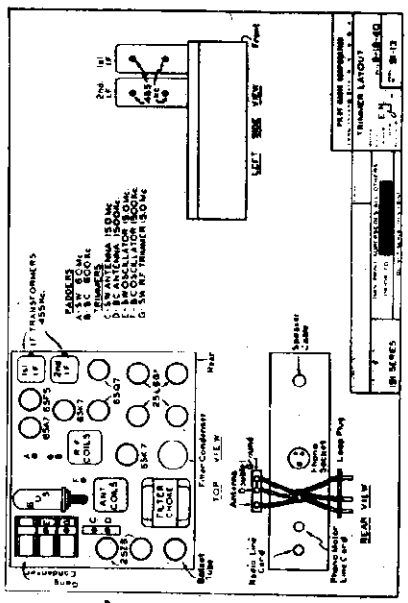
PILOT RADIO CORP.



SERVICE NOTES

The location of all adjustments used in re-aligning this receiver, and the frequencies at which these adjustments should be made, are shown in the accompanying diagram.

When aligning the I. F. amplifier, the generator must be connected to the grid of the 6SA7 tube through a .1 mfd condenser. When aligning the receiver on the Broadcast Band, connect the generator to the Antenna wire through a .002 mfd condenser, and on the two short wave bands use a 400 ohm carbon resistor.



TUNING-RANGE

BROADCAST-BAND

535 to 1720 ko.
or
561 to 174 meters

SHORT WAVE BAND

5-6 to 19.8 ko
or
53.6 to 15.2
meters

- - - - - - - - -

This pilot Super-heterodyne Receiver has 12 tubes and a Cathode Ray Tuning Beacon, and operates on either an alternating or Direct Current power supply.

SPECIFICATIONS

Voltage Rating - 110-125 volts, 50-60 cycles AC

Combination Frequency Modulated and Broadcast and shortwave amplitude modulated receiver - provision for microphone and phono pickup or television converter provided.

NUMBER OF TUBES AND TYPES

FM - RF #1	- 6AC7/1852
FM - RF #2	- 6AC7/1852
FM - detector	- 6SA7
FM - oscillator	- 6J5
AM - RF	- 6SK7
AM - converter	- 6SA7
FM-AM 1st I.F. 4.3 mc - 455 kc	- 6AC7/1852
FM-AM 2nd I.F. 4.3 mc - 455 kc	- 6AC7/1852
FM - 4.3 limiter	- 6SJ7
FM - detector	- 6H6
FM - tuning rectifier	- 6H6
AM - detector & FM QAVC	- 6SQ7
FM-AM Voltage Amplifier	- 6SJ7
FM-AM Cathode loaded driver	- 6J5
FM-AM Push Pull AB2 amp.	- 6L6
FM-AM " " " "	- 6L6
Rectifier	- 5U4G
Tuning Beacon	- 6U5/6G5

FEATURES

This Pilot dual superheterodyne using two tuned R.F. stages for FM and one tuned R.F. for AM, provides static-free full-fidelity reception by the Armstrong wide-band Frequency Modulated system as well as superior reception of the AM broadcast and shortwave bands. One dial and one set of controls are used for all services. Five controls are provided from left to right; they are:

1. The volume control with low-level bass and treble compensation.

2. Tone Color control which provides adjustable bass and treble compensation at higher audio levels. The knob for the tone color control operates a pointer which indicates on the dial scale the tone color positions, which are:

   a. Bass - This position provides a high bass & lowered treble tone
   b. Music - high bass & high treble tone
   c. Voice - lowered bass & lowered treble tone
   d. Treble - lowered bass & high treble tone

The amount of bass and treble compensation increases as the volume is lowered in order to retain the balance of tones so often lost at lower volumes. This is done to compensate for the audio discrimination effect of the average human hearing system which varies with sound intensity and tone.

Individual tastes and programs as well as the location of the receiver will require different settings of the Tone Color Control for maximum pleasantness of reception. This should be used in conjunction with

3. The Harmonic Control & QAVC switch: This control provides a very sharp cut-off of the higher audio frequencies and operates in an inverse feed-back circuit.

It will usually be desirable to keep this control at less than maximum setting when listening to recorded and live programs on AM and phono. It's effect can readily be realized on an FM studio program where maximum setting permits music instruments to be easily recognized. For such service, it will be found that reducing the harmonics will tend to cause, violins and saxaphones, for example, to sound similar - both being capable of making the same fundamental tones. The harmonics which distinguish the various instruments can be regulated by this control.

It must be remembered that unwanted hiss, etc., due to records should be removed with this control, the setting depending upon the quality of the record, the better quality records permitting a wider range of audio frequencies.

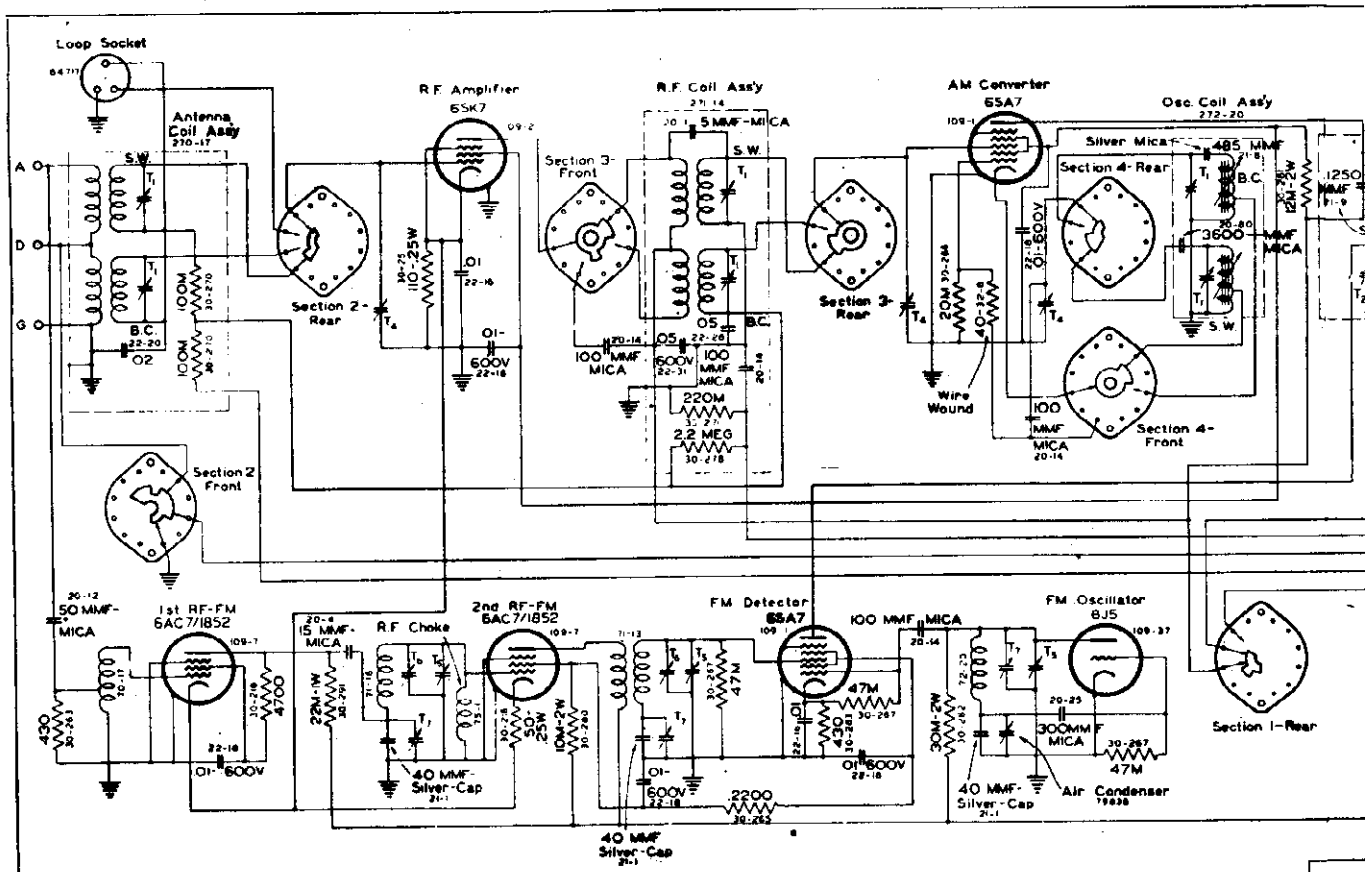
Rotating the harmonic control to the extreme left until a click is heard cuts out the QAVC on F.M. and this position is meant to be used on very weak F.M. signals. These must be tuned very carefully as the tuning beacon cannot function properly on very small signals. The higher harmonics are automatically removed in order to reduce external noises introduced with extremely low signals. The tuning buttons should not be set on any station which can only be received without the QAVC.

4. Band Selector: This control selects the type of service desired. The knob for the Band Selector operates a pointer which indicates on the dial scale the Band Selector positions which are:

   a. Short Wave - A.M.
   b. Broadcast A.M. external Antenna
   c. Broadcast A.M. internal loop antenna
   d. F.M. external antenna
   e. Phono-Television accessories

In the phono-models the phono pickup is built in and connected in this position.

PILOT RAI



All Resistance Values in Ohms Unless Otherwise Stated
All Resistances Rated at 5 Watt Unless Otherwise Stated
M Equals 1000 Ohms

All Capacitance Values in MFD Unless Otherwise Stated
All Capacitances Rated at 200V Unless Otherwise Stated

Small Figures Refer to PILOT RADIO CORP. Part No.

Band-Switch in S.W. Position-Part No. 200-8

I.F. FREQUENCY - AM 455 KC
FM 4.3 MC

Use PILOT FM-AM Antenna Kit No. 80-7

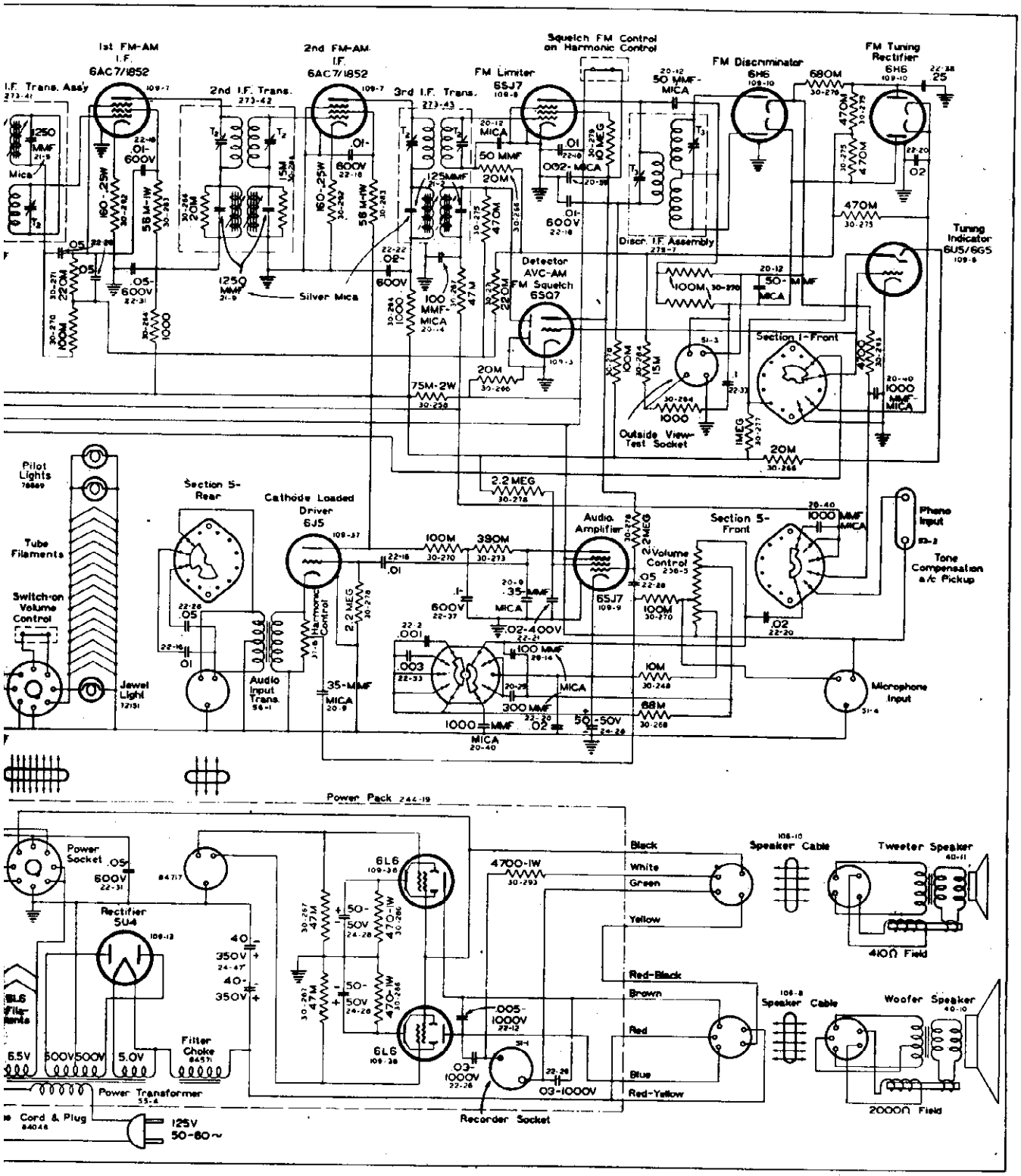
COIL PART LIST	PILOT Part No.
B.C. Antenna Coil	70-18
S.W. Antenna Coil	70-19
B.C. R.F. Coil	71-14
S.W. R.F. Coil	71-15
B.C. Oscillator Coil	72-21
S.W. Oscillator Coil	72-22
I.F. Coil-FM-1st Stage	73-12
I.F. Coil Assembly-AM	73-10
I.F. Coil-FM-2nd Stage	73-11
I.F. Coil Assembly-AM	73-10
I.F. Coil-FM-3rd Stage	73-9
I.F. Coil Assembly-AM	73-8
Discriminator I.F. Coil	73-2

TRIMMER PART LIST		PILOT Part No.
T_1	Trimmer Condenser	12283-8
T_2	Dual Trimmer Condenser	27-9
T_3	Dual Trimmer Condenser	27-2
T_4	Gang Condenser-3 Stages	226-10
T_5	Gang Condenser-3 Stages	ON 226-10
T_6	Trimmer Condenser	27-5
T_7	Trimmer Condenser	8310-A

PILOT RADIO CORP. LONG ISLAND CITY, N.Y., U.S.A.	
SCHEMATIC DIAGRAM MODEL FM200	
DRAWN BY-M.G.	DATE-5/20/41
CHECKED BY-	DRAWING NO. 90-27
APPROVED BY-	

FOR GENERAL INDUSTRIES C 125 L Record Changer, SEE RIDERS "A Record Changer and Recorders".

O CORP.


1st FM-AM I.F.
6AC7/1852
2nd FM-AM I.F.
6AC7/1852
Squelch FM Control on Harmonic Control
FM Limiter
6SJ7
FM Discriminator
6H6
FM Tuning Rectifier
6H6
I.F. Trans. Assy
2nd I.F. Trans.
3rd I.F. Trans.
Silver Mica
Detector AVC-AM FM Squelch
6SQ7
Discr. I.F. Assembly
Tuning Indicator
6U5/6G5
Section 1-Front
Outside View-Test Socket
Pilot Lights
Tube Filaments
Switch-on Volume Control
Jewel Light
Section 5-Rear
Cathode Loaded Driver
6J5
Audio Input Trans.
Audio Amplifier
6SJ7
Section 5-Front
Volume Control
Phono Input
Tone Compensation a/c Pickup
Microphone Input
Power Pack
Power Socket
Rectifier
5U4
Filter Choke
Power Transformer
Cord & Plug
125V 50-60~
6L6
Recorder Socket
Black
White
Green
Yellow
Red-Black
Brown
Red
Blue
Red-Yellow
Speaker Cable
Tweeter Speaker
410Ω Field
Woofer Speaker
2000Ω Field

A Television adapter connected to the pin-jacks provided at the rear of the chassis will permit the user to use the same high quality audio system and dual loudspeakers for Television Sound, and this can be controlled with the Service Selector.

5. Tuning Control: This control operates the FM-AM, broadcast and shortwave, and should be rotated very carefully to provide maximum reception. Careless tuning will not permit the automatic volume control to function properly and distortion and poor tone will result.

OPERATION OF PUSHBUTTONS

This set is provided with eight push buttons which mechanically operate the dual 3-gang tuning condenser. These may be set on AM and FM in any combination, that is, 5 for AM, 3 for FM, etc.

To set up these buttons pull off the bakelite caps and loosen the locking screw. Tune in the stations with the tuning knob and push the flat piece of the control all the way in. Then tighten the locking screw. A careful check with the tuning eye should immediately ascertain the exactness of the setting. An identifying station tab should then be inserted above the button in the space provided. It is easily possible to set up the buttons on AM or FM in this manner and extra care used in their set-up will amply reward the listener.

On very weak signals it may be necessary to retune the station very slightly with the tuning knob - It is recommended, however, that the left buttons be set on AM locals and the right buttons be set on FM locals.

Slight misadjustments due to continuous use will cause little effect on the tone as this FM-AM I.F. system is expressly designed for push-button use.

ANTENNA

A good antenna system cannot be overemphasized and should the receiver be used in the locality of any vertically polarized FM transmitter, best reception from that station at a slight sacrifice of the reception of the usual horizontally polarized transmitters can be secured by tilting the dipole to about a 45° angle. The whole array should then be rotated for best average reception of all the local stations.

Maximum pickup from a given transmitter is usually secured when the broadside of the dipole antenna faces the transmitter and is in line of sight of said transmitter.

The Pilot FM-AM antenna, #110-7, is recommended for use with this receiver. This antenna is shipped in Kit form and consists of a dipole with supporting mast, shielded transmission line, and special couplers at both ends of the transmission line, which provide automatically for operation on either the FM or AM bands. Detailed instructions are furnished with the antenna.

SERVICE NOTES

This receiver has been correctly aligned at the factory and no further adjustments to either the trimmers or iron cores is recommended.

The minimum requirements for satisfactory adjustment of the trimmers, etc. are:

1. 0 to 1 milliampere meter, preferably with an extra 5 milliampere shunt resistor.
2. Zero center. 0 to 200 microamperes galvanometer and two 100,000 ohm resistors.
3. Rectifier type output meter of approximately 0 to 2 volts R.M.S.
4. 65 ohm FM dummy antenna
   400 ohm shortwave dummy antenna
   200 mmfd. AM dummy antenna
   .1 mfd. I.F. dummy

5. Accurately calibrated signal generator capable of supplying 0.5 to 100,000 microvolts at the following frequencies, which constitute the order for adjusting and balancing the receiver:

a.	455 kc	I.F.'s and wave trap
b.	4.3 mc	I.F.'s and discriminator
c.	600 kc	oscillator
d.	1500 kc	antenna, R.F. and osc. and loop
e.	600 kc	osc. rock-in
f.	1500 kc	osc.
g.	6 mc	osc.
h.	18 mc	osc.
i.	15 mc	ant. R.F.
j.	43 mc	osc. 2nd R.F. & 1st R.F.
k.	48 mc	osc. 2nd R.F. & 1st R.F.
L.	repeat 43 & 48 mc adjustments and slightly rock-in variable	

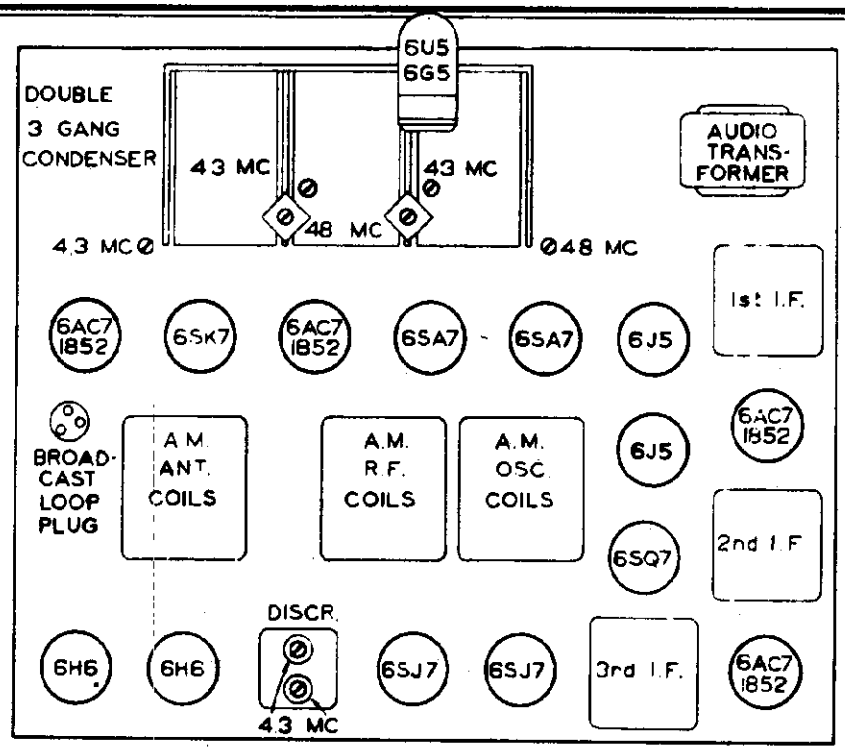
The antenna circuit has no adjustments for FM and is expressly designed for the Pilot FM-AM dipole antenna #110-7.

The zero center galvanometer is used to set the discriminator secondary trimmer and the FM oscillator trimmer and padder.

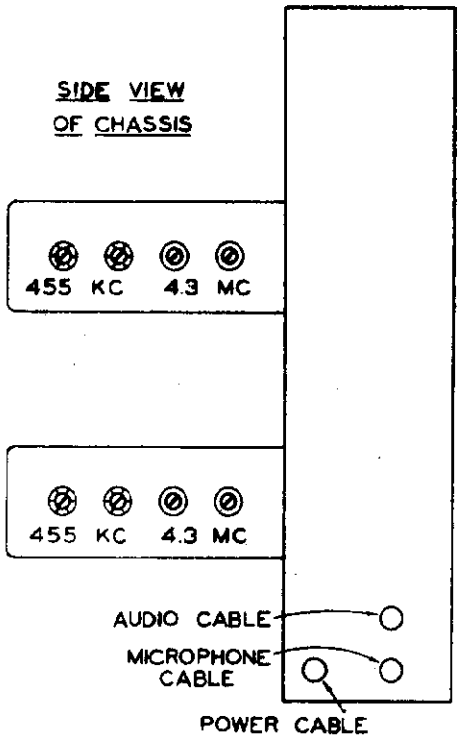
The 0 to 1 milliampere meter for 4.3 mc I.F.& FM R.F. trimmers and padders.

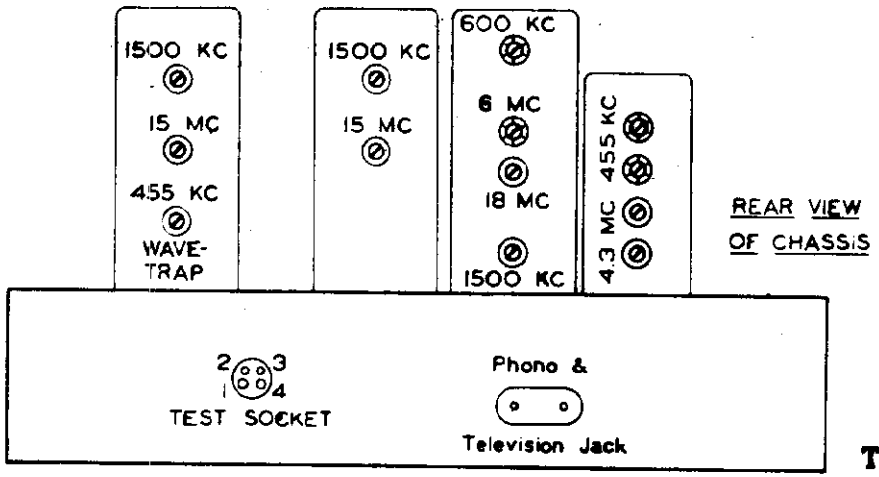
The AC output meter across the voice coil and only for A.M. adjustments.

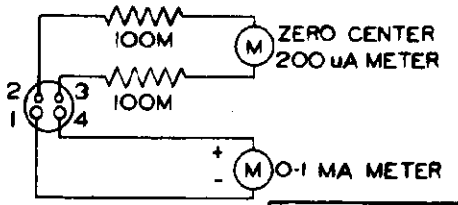
The volume control should be on full for all final AM adjustments.



TOP VIEW OF CHASSIS







TEST CIRCUIT

PILOT RADIO CORPORATION
LONG ISLAND CITY N Y U S A
TRIMMER LAYOUT
Date 4-19-41
Drawn By: M.G.
Dwg. No. 91-22

TUNING RANGE

FM: 41.8 to 50.3 mc

AM: Broadcast - 535 to 1720 kc or 561 to 174 m.
Shortwave - 5.6 to 19.8 mc or 53.6 to 15.2 m.

TUNING RANGE

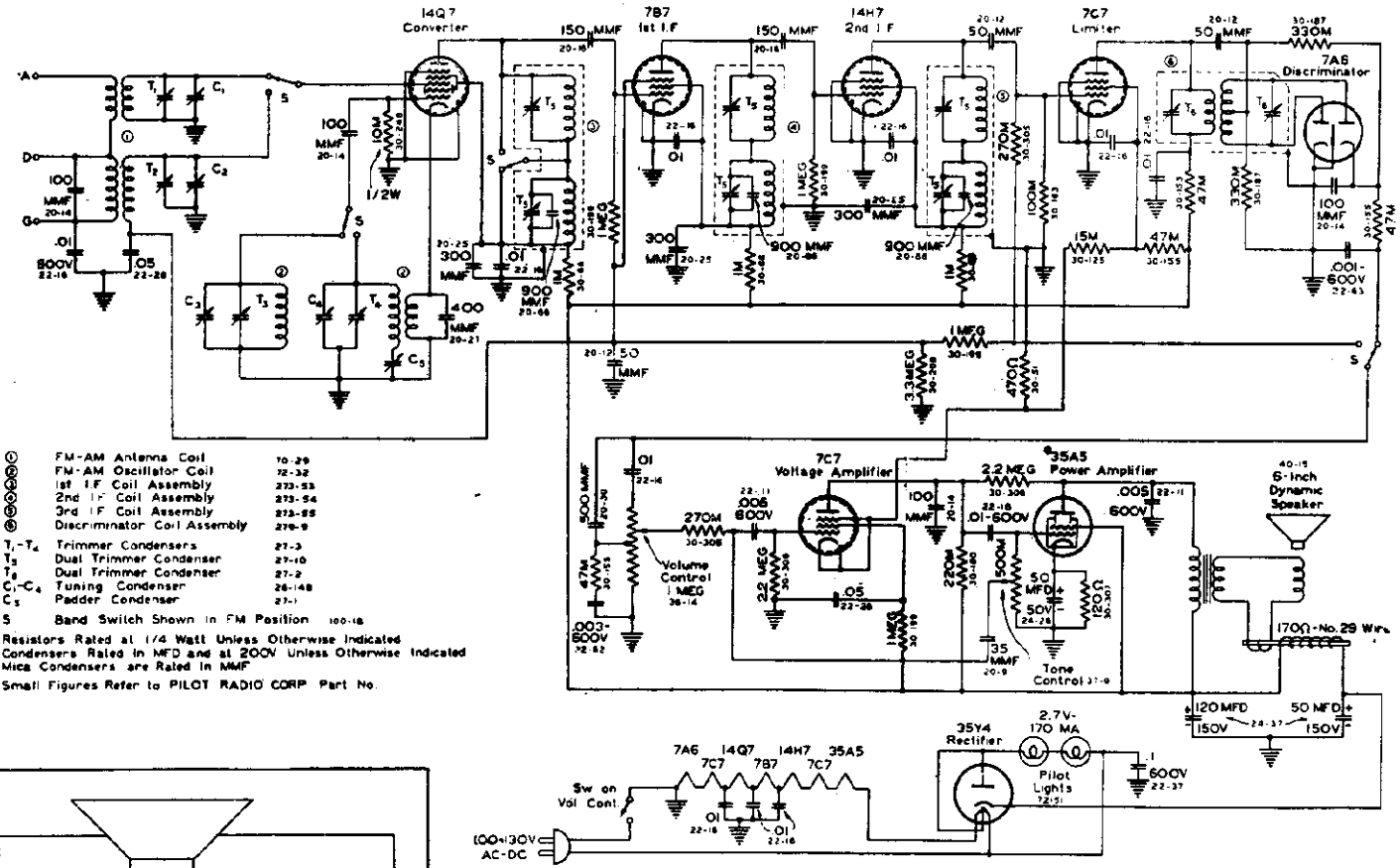
Broadcast Band 535 to 1720 kc.;

or 561 to 174 meters

Frequency Modulation Band

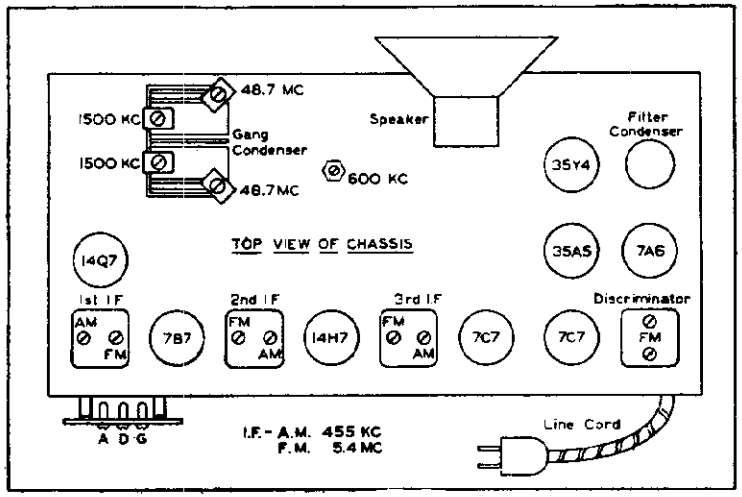
41.4 to 50.4 mc.

PILOT RADIO CORP. LONG ISLAND CITY, N.Y. U.S.A.	
SCHEMATIC DIAGRAM MODEL 300	
DRAWN BY-M.G.	DATE-8-15-41
CHECKED BY-	DRAWING NO.
APPROVED BY-	90-30



①	FM-AM Antenna Coil	70-29
②	FM-AM Oscillator Coil	72-32
③	1st I.F. Coil Assembly	273-53
④	2nd I.F. Coil Assembly	273-54
⑤	3rd I.F. Coil Assembly	273-55
⑥	Discriminator Coil Assembly	276-9
T_1-T_4	Trimmer Condensers	27-3
T_5	Dual Trimmer Condenser	27-10
T_6	Dual Trimmer Condenser	27-2
C_1-C_4	Tuning Condenser	26-148
C_5	Padder Condenser	27-1
S	Band Switch Shown in FM Position	100-18

Resistors Rated at 1/4 Watt Unless Otherwise Indicated
Condensers Rated in MFD and at 200V Unless Otherwise Indicated
Mica Condensers are Rated in MMF
Small Figures Refer to PILOT RADIO CORP. Part No.



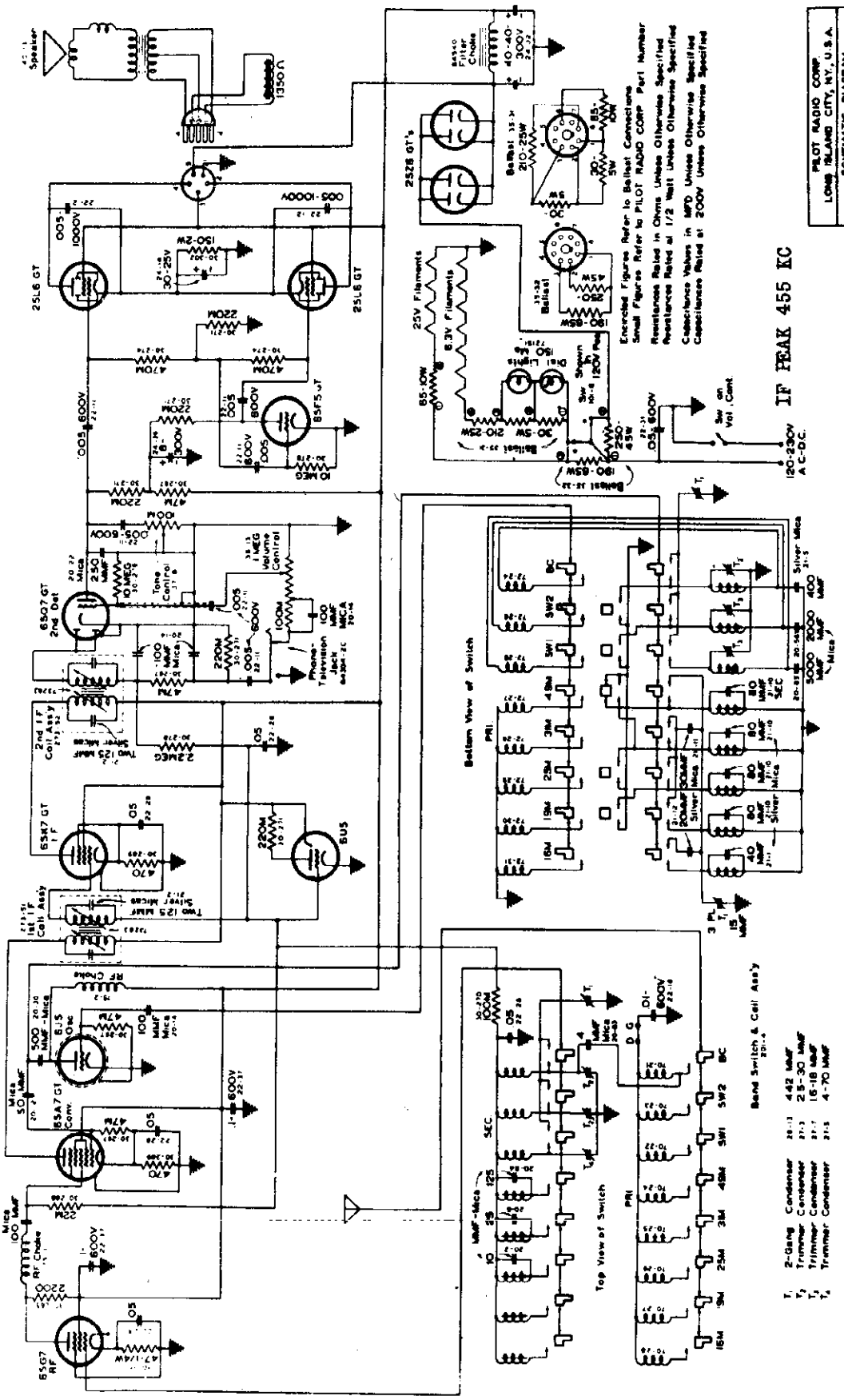
This Pilot FM-AM Superheterodyne Receiver has 8 tubes and operates on either an Alternating or Direct Current power supply.

SERVICE NOTES

The location of all adjustments used in re-aligning this receiver, and the frequencies at which these adjustments should be made, are shown in the accompanying diagram.

When aligning the I. F. amplifier, the generator must be connected to the grid of the 14Q7 tube through a .1 mfd. condenser. When aligning the receiver on the Broadcast Band, connect the generator to the Antenna wire through a .0002 mfd. condenser, and on the F.M. band use a 72 ohm carbon resistor.

PILOT RADIO CORP.

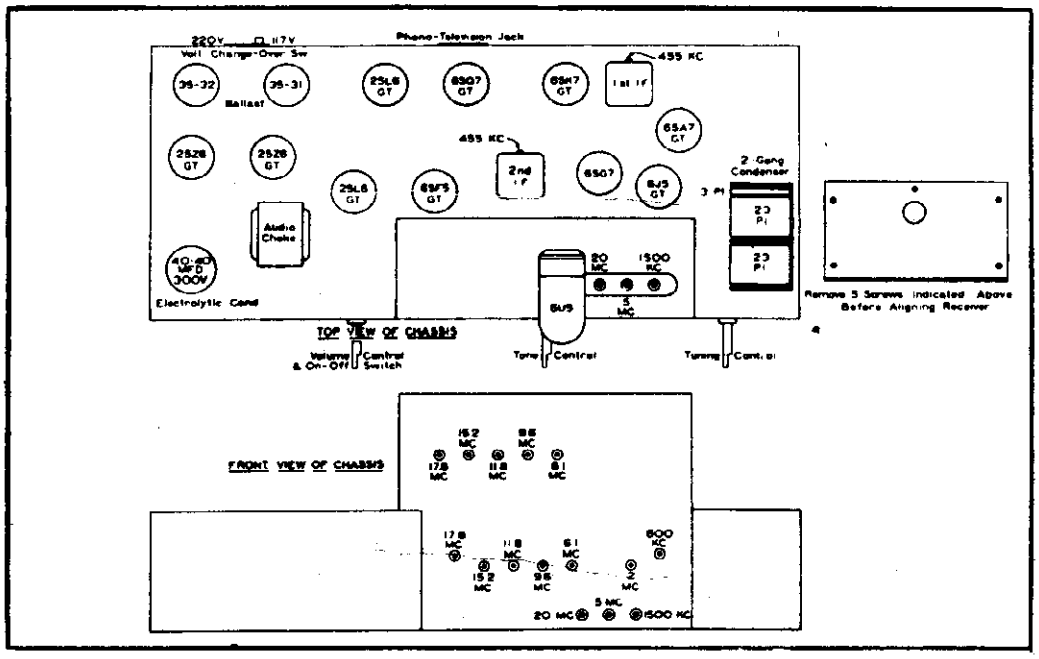


This receiver will operate on 105-125 volts or 200-240 volts as indicated on the locking plate in the rear of the chassis. To change operating voltage, remove locking plate, move switch to other position and replace plate.

When operating on direct current, if the receiver does not work about one minute after being turned on, reverse the plug in the light socket.

MODEL 340

PILOT RADIO CORP.



When aligning the I.F. amplifier, the generator must be connected to the grid of the 6SA7 tube through a .1 mfd condenser. When aligning the receiver on the Broadcast Band, connect the generator to the Antenna wire through a .0002 mfd condenser, and on the seven short wave bands through a 400 ohm carbon resistor.

In general it is not recommended to re-align the bandspread coils unless it is definitely necessary. If re-aligning is found to be necessary, take off the dial pan be removing the five screws, as indicated on the diagram.

First adjust the oscillator iron core to make the pointer correspond with the calibration mark. Then adjust the antenna iron core for maximum output. The signal generator must be accurate within 5 kc on each band, and the use of a calibrating crystal oscillator is recommended. Otherwise a broadcast signal of known frequency may be used.

In this receiver the oscillator frequency is higher than the signal frequency on the broadcast band and lower on the seven other bands.

This Pilot Superheterodyne Receiver has 10 tubes and a Cathode Ray Tuning Beacon, and operates on either an Alternating or Direct Current power supply.

A.C.-D.C. Receiver

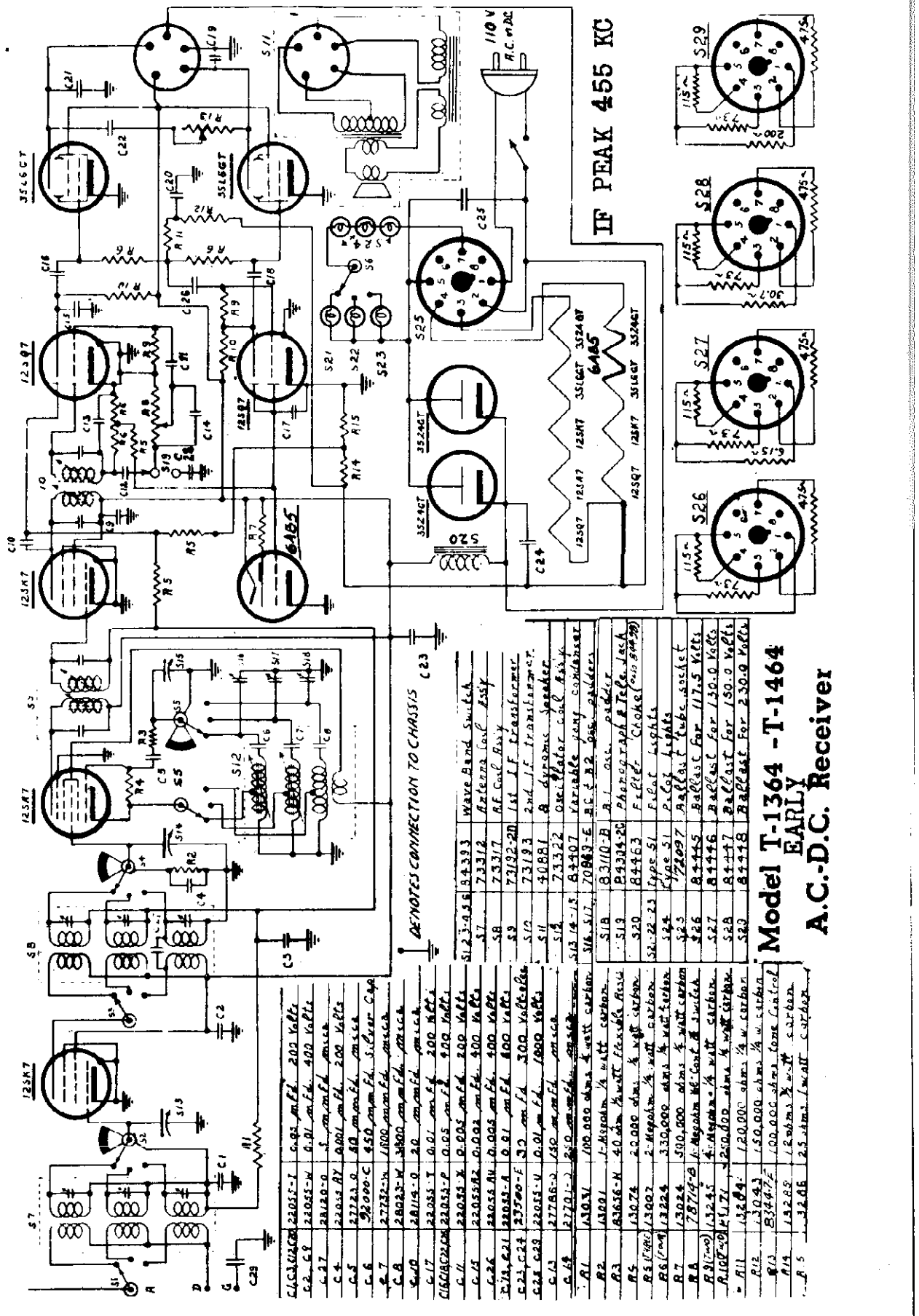
TUNING RANGE

Broadcast Band	-	535 to 1730 kc or 560 to 173 meters
Short Wave Band 2	-	1.75 to 5.85 mc or 171 to 51 meters
Short Wave Band 1	-	7.0 to 22.0 mc or 43 to 13.6 meters
49 meter Band	-	5.9 to 6.22 mc.
31 meter Band	-	9.5 to 9.7 mc.
25 meter Band	-	11.38 to 11.92 mc.
19 meter Band	-	15.06 to 15.38 mc.
16 meter Band	-	17.62 to 17.98 mc.

The location of all adjustments used in re-aligning this receiver, and the frequencies at which these adjustments should be made, are shown in the accompanying diagram.

PILOT RADIO CORP.

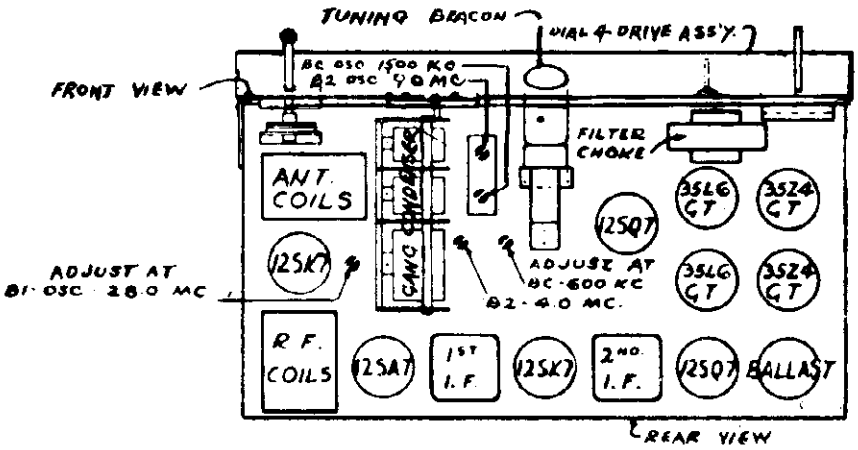
MODELS T-1364, T-1464
Early



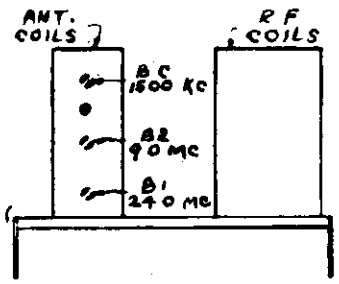
Models 1364, T-1464
Early
Model 1424 Series

PILOT RADIO CORP.

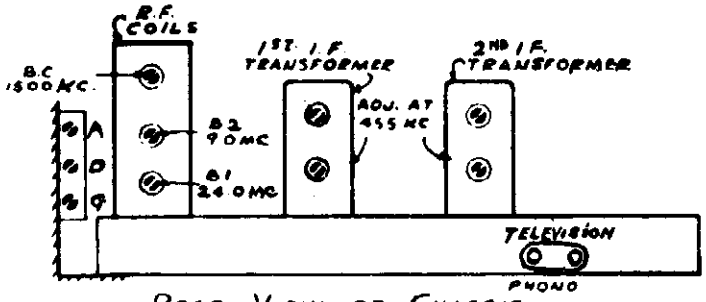
For other data
See index.



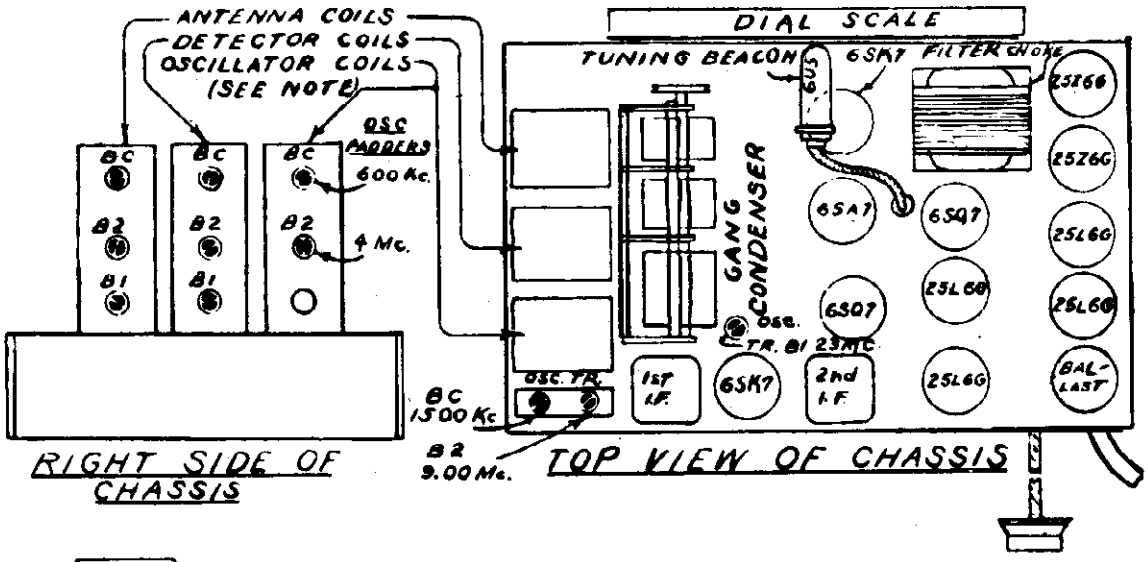
TOP VIEW OF CHASSIS



LEFT SIDE OF CHASSIS



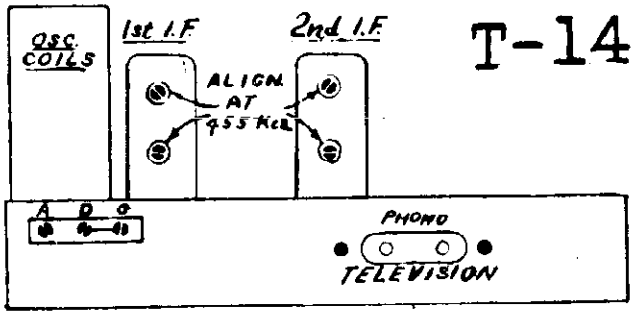
REAR VIEW OF CHASSIS



RIGHT SIDE OF CHASSIS

TOP VIEW OF CHASSIS

SPEAKER PLUG



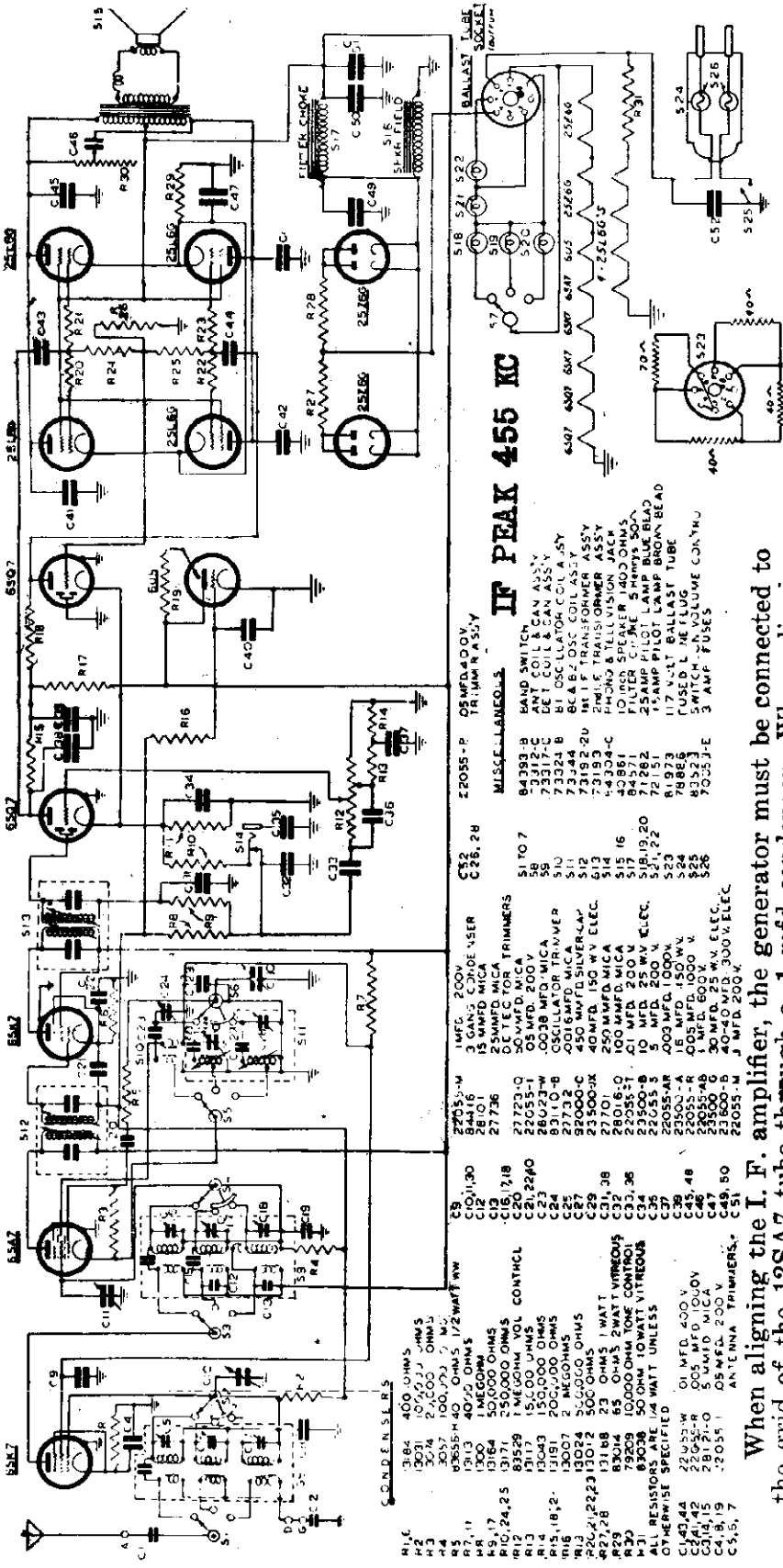
REAR VIEW OF CHASSIS

T-1424

NOTE
ALIGN ON ANT. & DET.
BC at 1500 Kc.
B2 at 9.00 Mc.
B1 at 23.00 Mc.

PILOT RADIO CORP.

MODEL 1424
Series



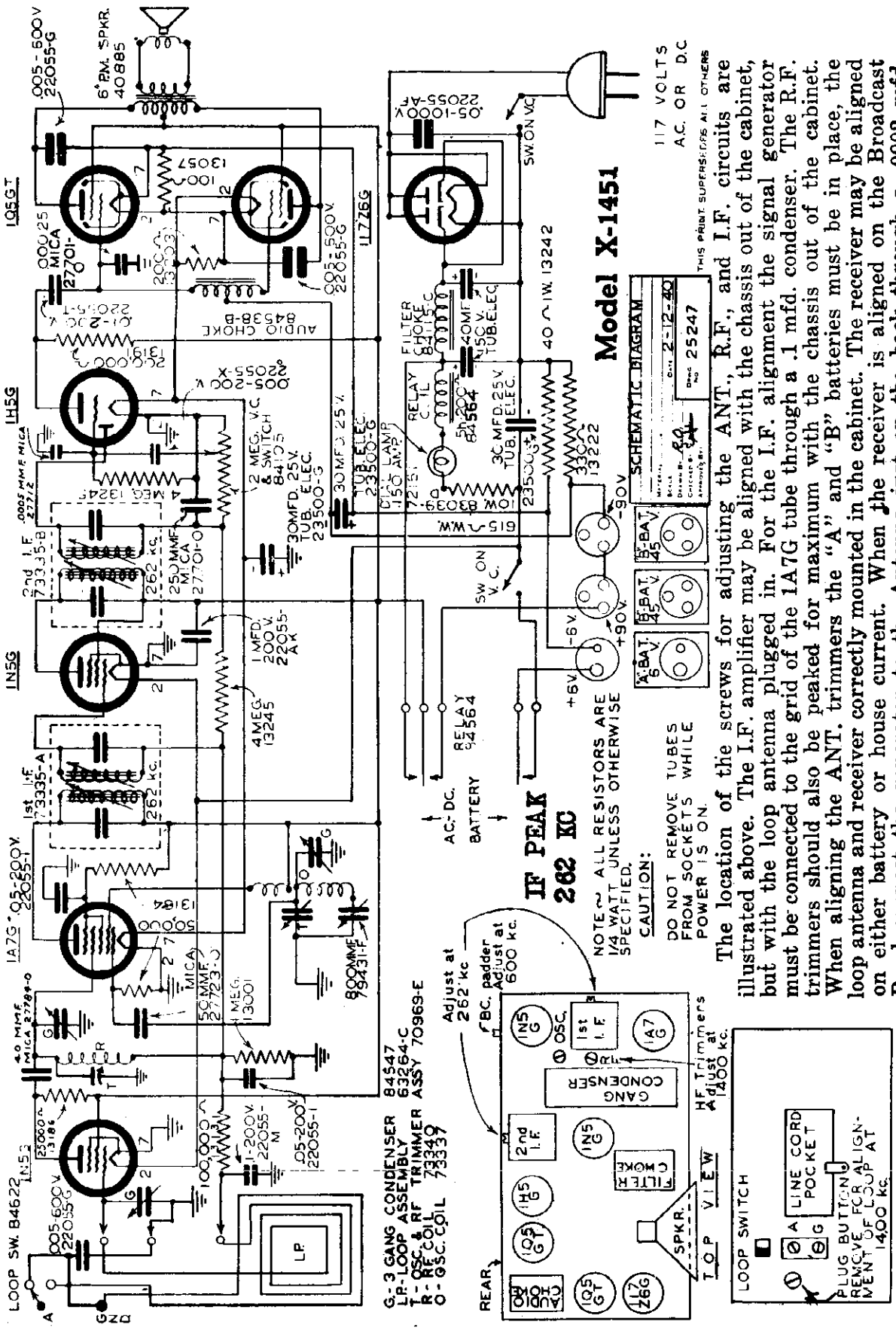
Model T-1424

IF PEAK 455 KC

When aligning the I. F. amplifier, the generator must be connected to the grid of the 12SA7 tube through a .1 mfd condenser. When aligning the receiver on the Broadcast Band, connect the generator to the Antenna wire through a .0002 mfd condenser, and on the two short wave bands use a 400 ohm carbon resistor.

MODEL X-1451

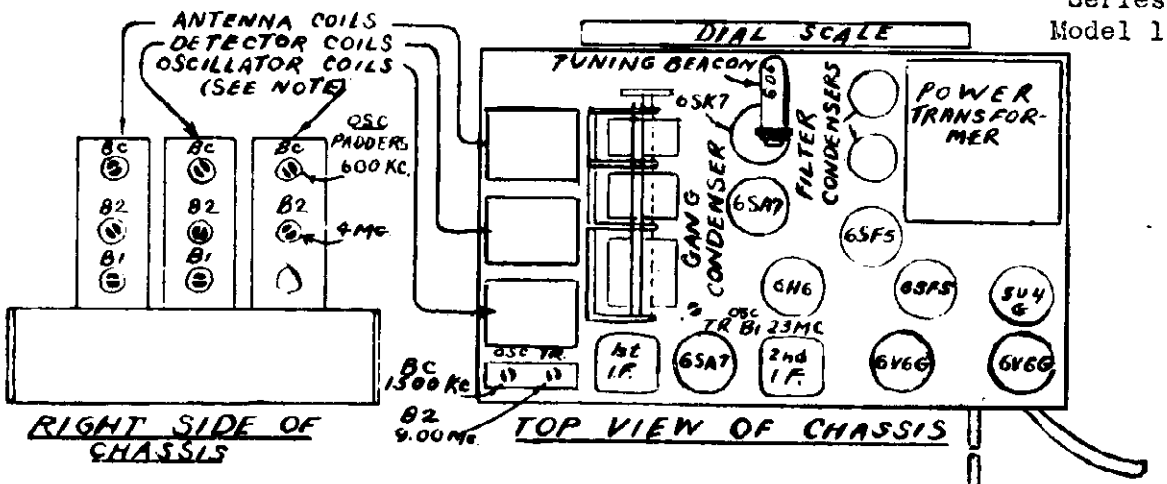
PILOT RADIO CORP



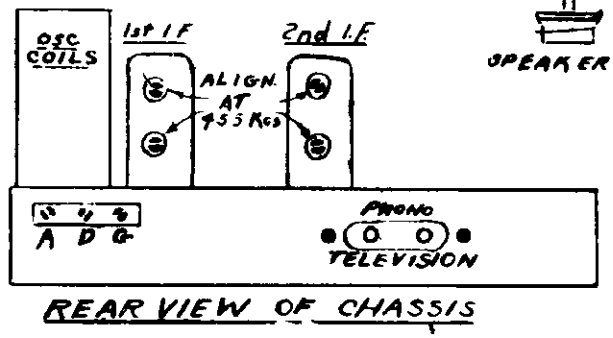
The location of the screws for adjusting the ANT., R.F., and I.F. circuits are illustrated above. The I.F. amplifier may be aligned with the chassis out of the cabinet, but with the loop antenna plugged in. For the I.F. alignment the signal generator must be connected to the grid of the 1A7G tube through a .1 mfd. condenser. The R.F. trimmers should also be peaked for maximum with the chassis out of the cabinet. When aligning the ANT. trimmers the "A" and "B" batteries must be in place, the loop antenna and receiver correctly mounted in the cabinet. The receiver may be aligned on either battery or house current. When the receiver is aligned on the Broadcast Band connect the generator to the Antenna just on the back through a .0002 mfd. condenser.

PILOT RADIO CORP

Model 142
Series
Model 173

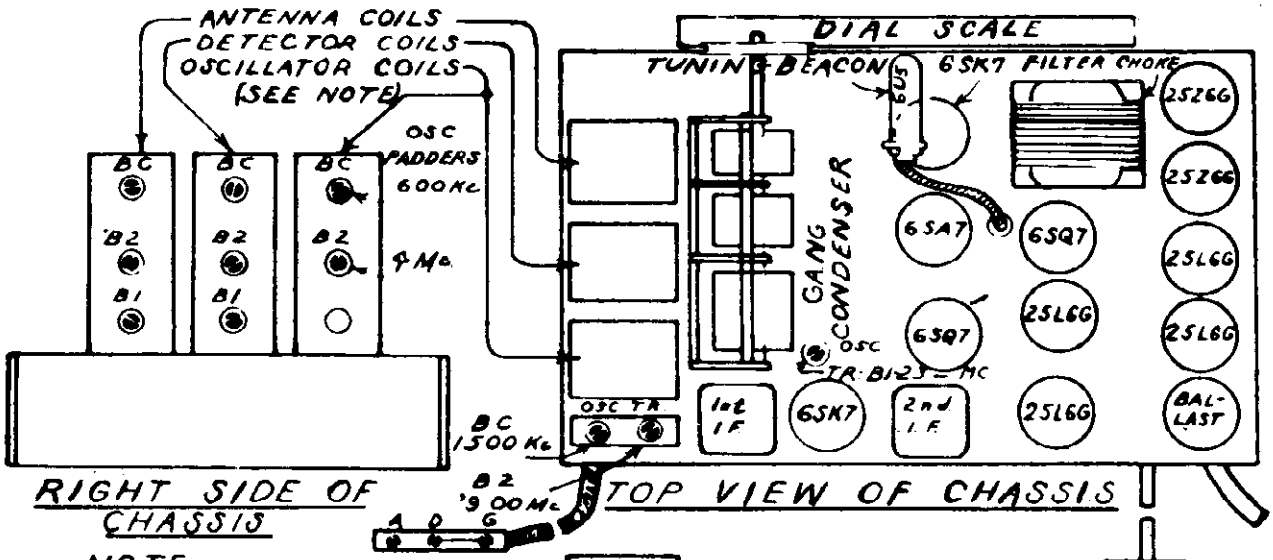


NOTE:
ALIGN ON ANT. & DET.
BC at 1500 Kc.
B2 at 9.00 Mc.
B1 at 23.00 Mc.

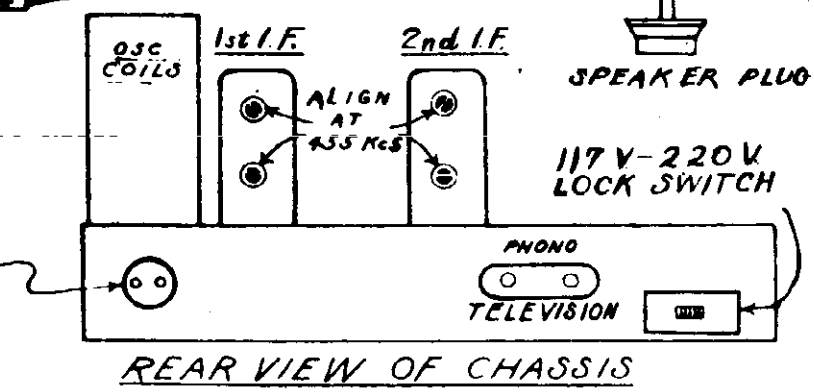


T-1524

FOR OTHER DATA,
SEE INDEX



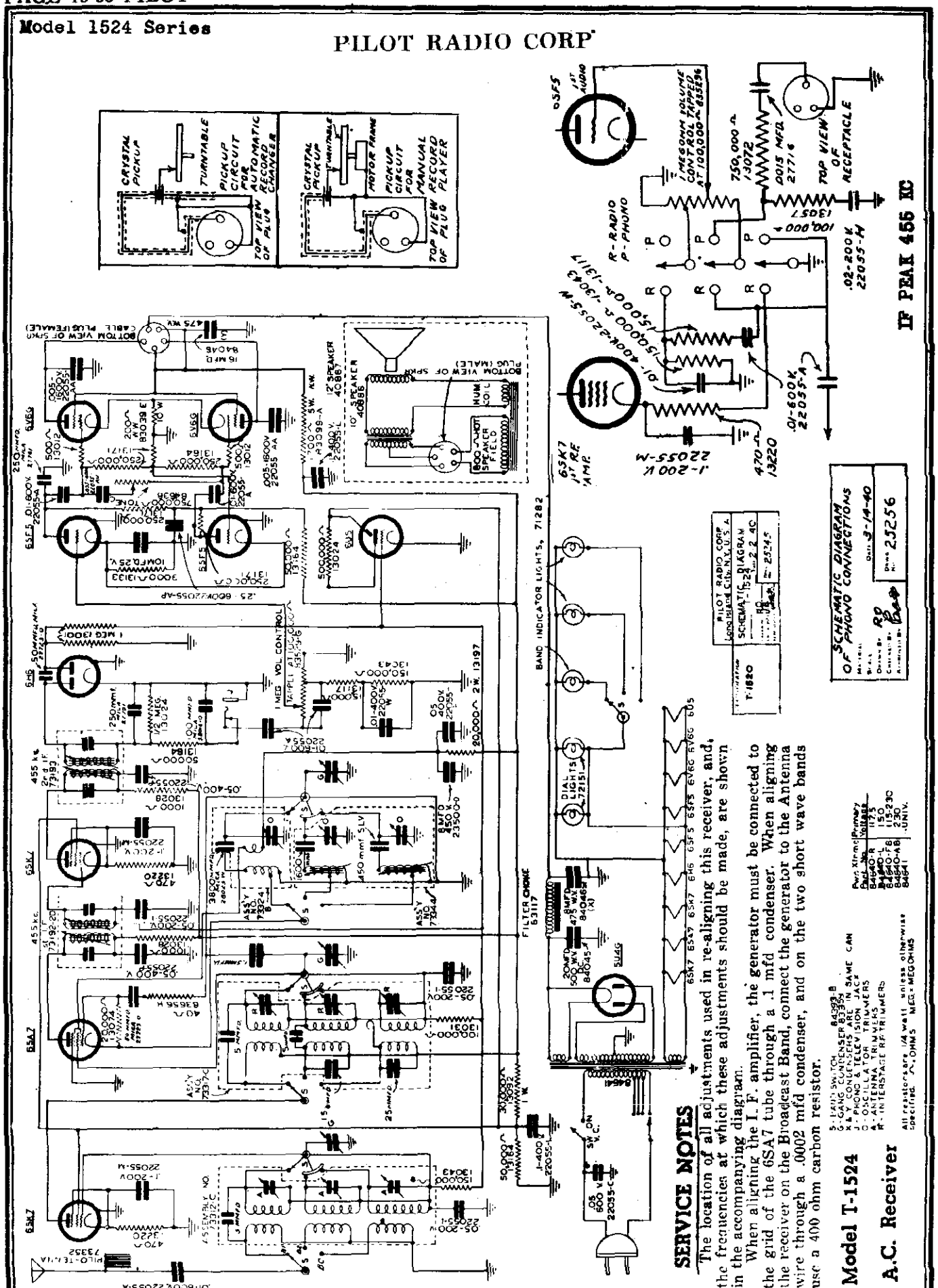
NOTE:
ALIGN ON ANT. & DET.
BC at 1500 Kc
B2 at 9.00 Mc
B1 at 23.00 Mc



MODEL 173

Model 1524 Series

PILOT RADIO CORP.



RCA MFG. CO., INC.

MAGIC WAVE ANTENNA WITH DISTRIBUTION TRANSFORMER

METHOD OF USING THE MAGIC WAVE ANTENNA TO FEED UP TO FOUR RECEIVERS THROUGH A STOCK NO. 9814 DISTRIBUTION TRANSFORMER. IF MORE THAN FOUR RECEIVERS ARE TO BE USED, THE ANTENNA SHOULD BE MODIFIED AS SHOWN IN FIG. 2.

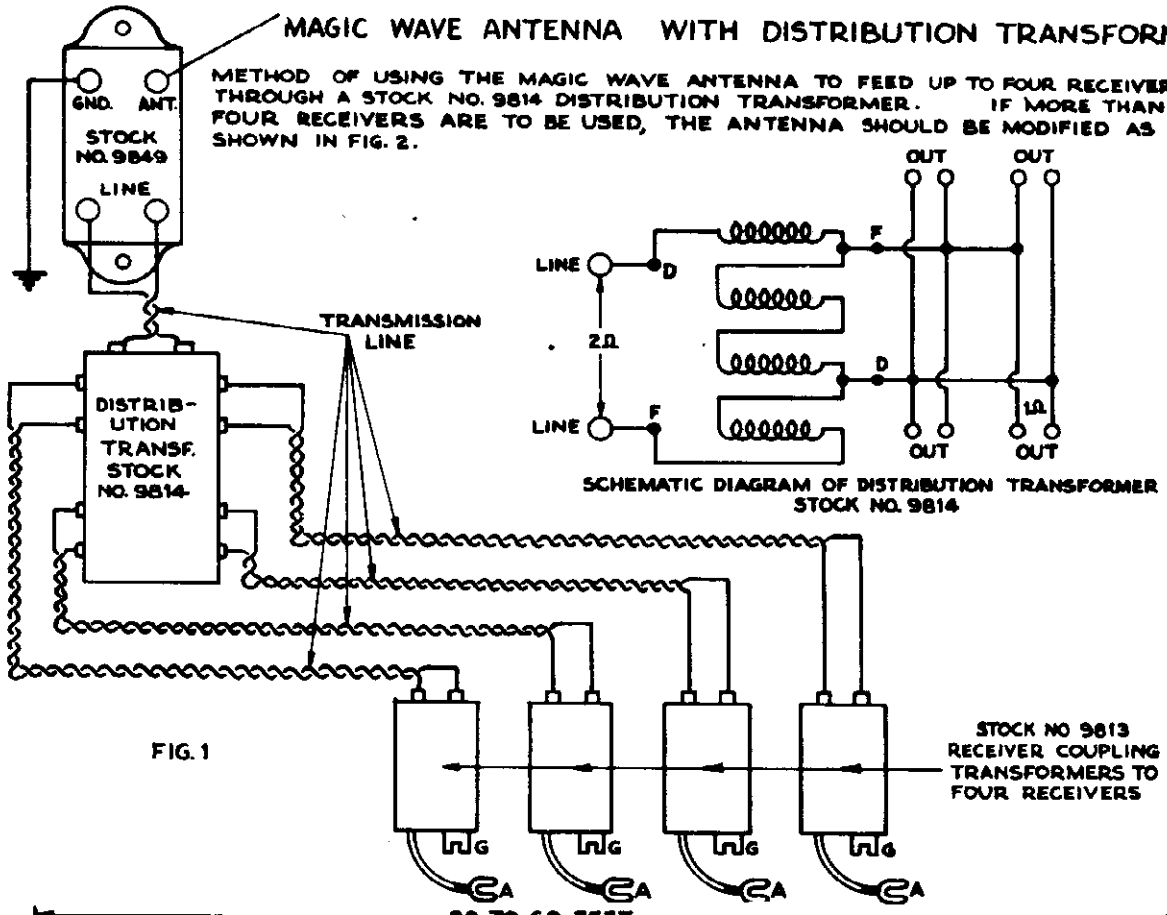
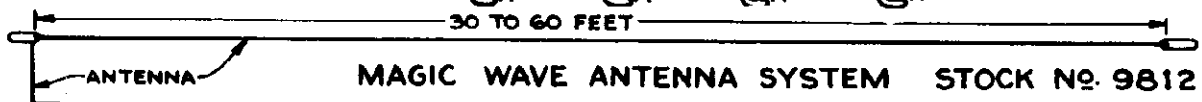
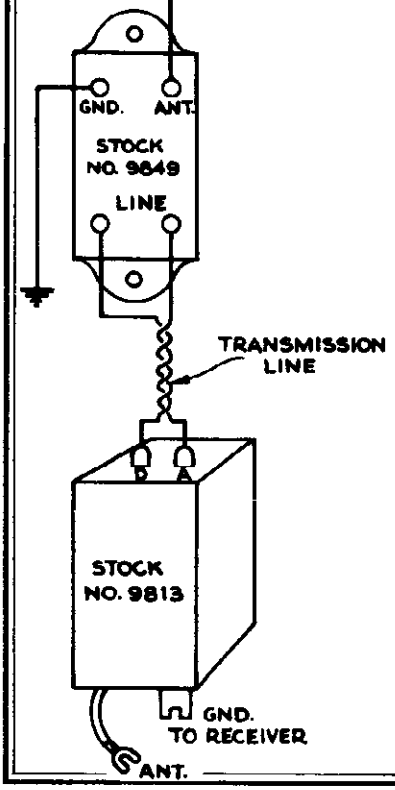
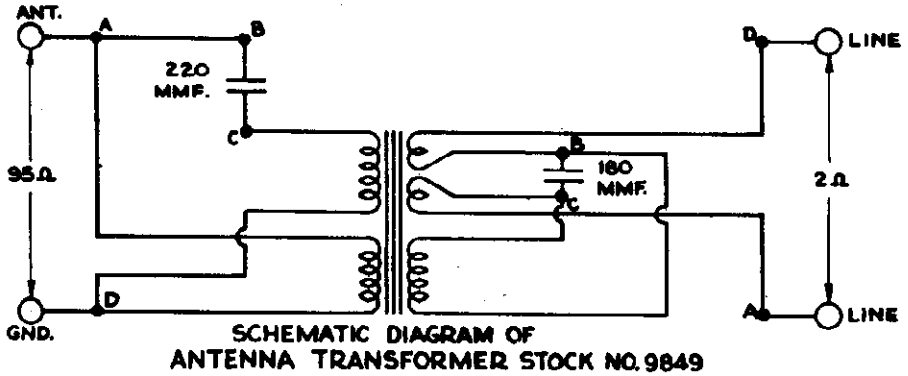


FIG. 1

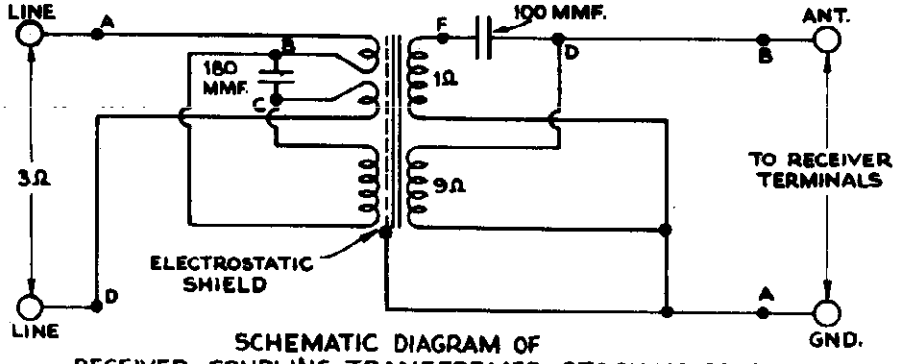


MAGIC WAVE ANTENNA SYSTEM STOCK No. 9812





SCHEMATIC DIAGRAM OF ANTENNA TRANSFORMER STOCK NO. 9849

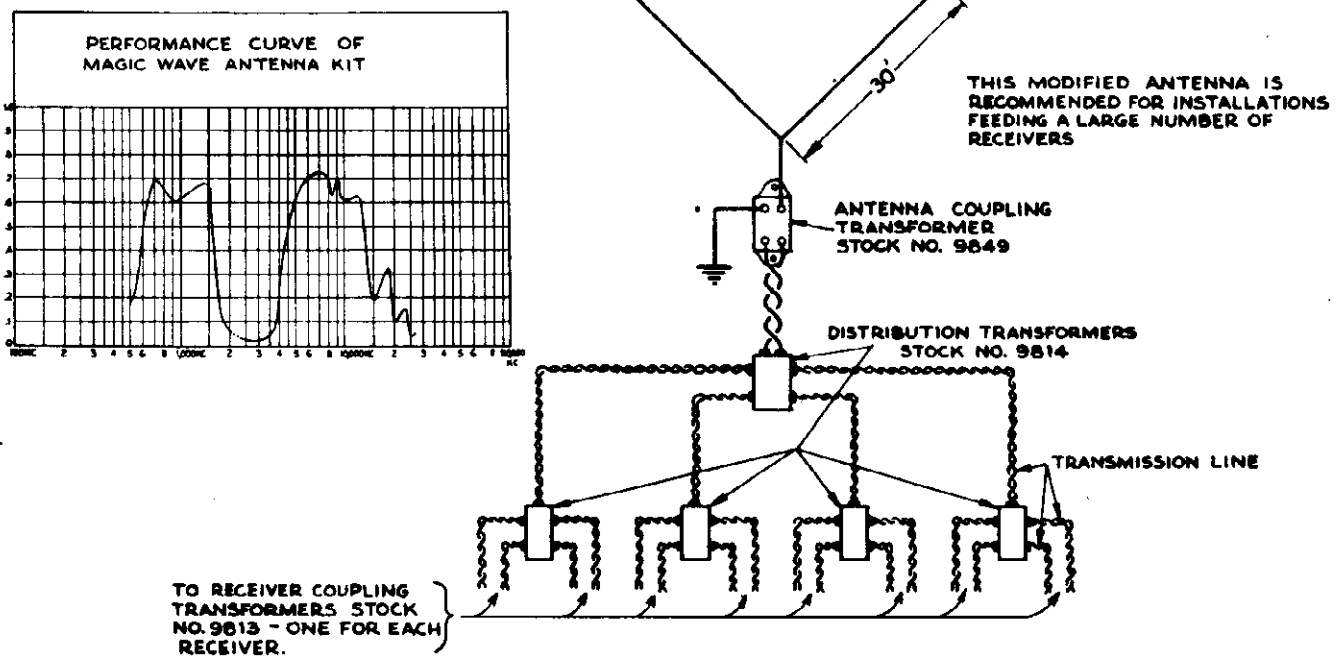


SCHEMATIC DIAGRAM OF RECEIVER COUPLING TRANSFORMER STOCK NO. 9313

MODEL "MAGIC WAVE" ANTENNA

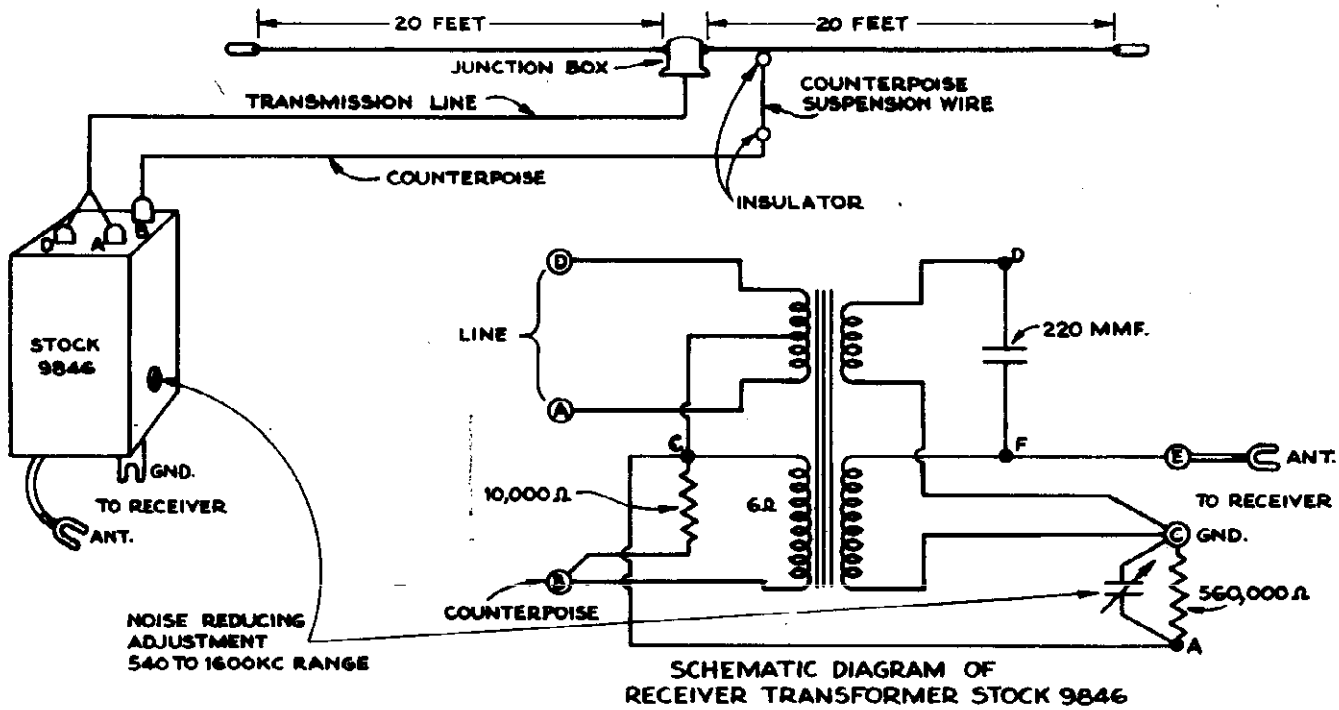
RCA MFG. CO., INC.

FIG. 2 MODIFIED MAGIC WAVE ANTENNA AS USED WITH 2 TO 5 DISTRIBUTION TRANSFORMERS



THE ABOVE DIAGRAM SHOWS THE INSTALLATION OF FIVE DISTRIBUTION TRANSFORMERS PROVIDING FOR THE OPERATION OF UP TO SIXTEEN RECEIVERS. TRANSMISSION LINES MAY BE RUN IN METAL CONDUIT IF DESIRED ALTHOUGH THIS IS NOT NECESSARY. TWO OR MORE LINES MAY BE RUN IN THE SAME CONDUIT BUT NOT WITH OTHER ELECTRICAL WIRING.

MASTER ANTENNA KIT STOCK Nº. 9845



SCHEMATIC DIAGRAM OF RECEIVER TRANSFORMER STOCK 9846

COUNTERPOISE SHOULD BE ONE HALF THE LENGTH OF THE TRANSMISSION LINE PLUS 10 FEET EXAMPLE:- IF THE TRANSMISSION LINE IS 40 FEET LONG, THE COUNTERPOISE WILL BE 20+10 OR 30 FEET LONG.

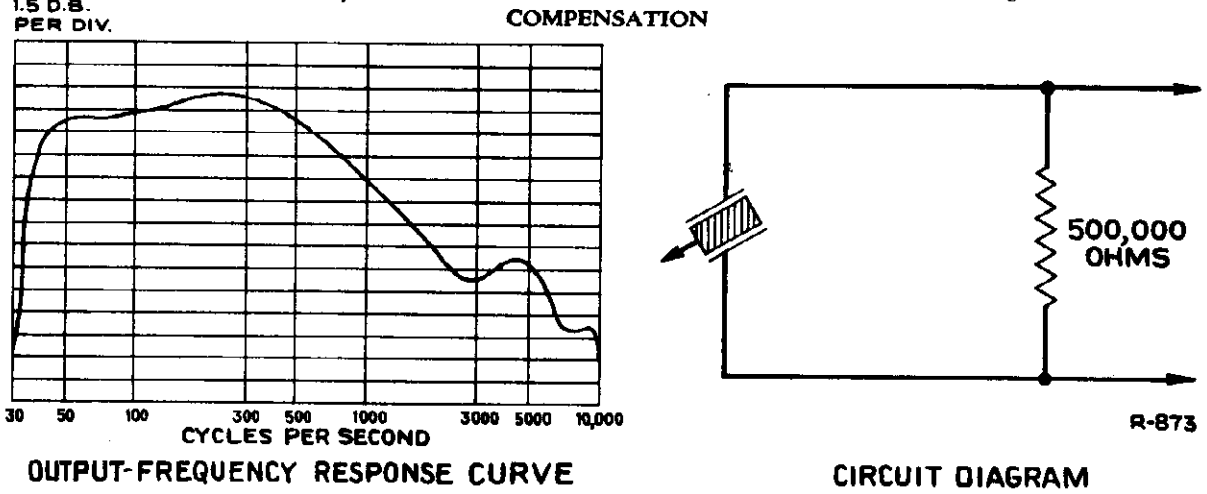
RCA MFG. CO., INC.

MODEL "Magic Ton
Cell Pickup Ki

Installation of the new Magic Tone Cell contained in this kit offers an opportunity for improving record reproduction from radio-phonographs or other record playing devices. Its design provides reduced "needle" chatter and surface noise, plus the additional feature of converting the pickup to a permanent sapphire point type completely eliminating the changing and use of needles, and crystal breakage at the time of needle change. It is particularly designed for installation in RCA Victrolas and Record Players manufactured during 193[illegible] and later, with practically no exceptions and slight changes See Table page 3.

Electrical Characteristics.—

Output 1½ volts at 400 cycles approximately.
Impedance 200,000 ohms at 400 cycles approximately.
Frequency characteristics. See Figure 1.



OUTPUT-FREQUENCY RESPONSE CURVE

CIRCUIT DIAGRAM

Figure 1—Typical Circuit and Curve

The kit consists of:

1 RCA Victor Magic Tone Cell with Flexible Tone Bridge and Jewel-Lite Scanner assembled complete in cartridge form.
4 Mounting Screws.
2 Spacers.
1 Mounting Plate.
4 Washers.
1 Plug Button.

INSTALLATION

The following illustrations show different types of pickup arms with the new Magic Tone Cell installed.

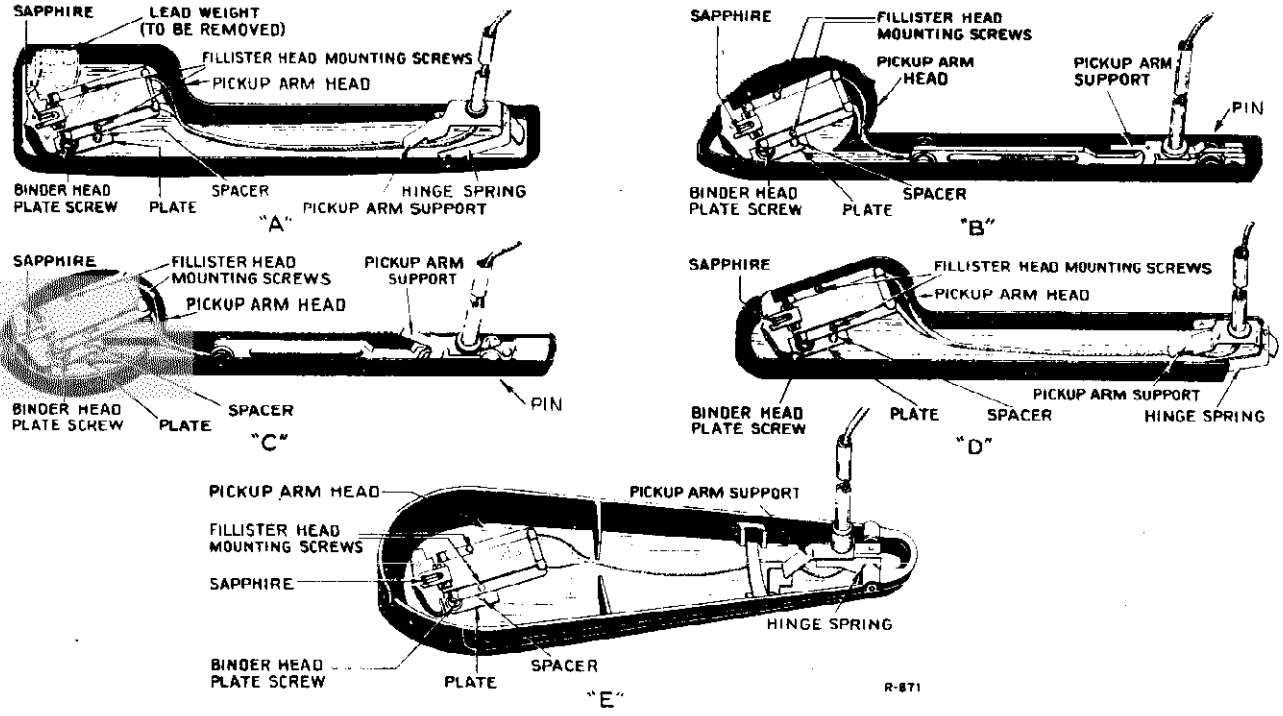


Figure 2—Pickup Arms—Underneath View with Supports

MODEL "Magic Tone Cell Pickup Kit

RCA MFG. CO., INC.

To make the installation:

1. See that the power control on the phonograph is turned off.

2. Loosen the pickup arm at its base mounting so that it can be lifted complete and turned over. The pickup arm may be removed from its location in the cabinet to the extent permitted by the connecting wires. The support remains attached to the motorboard.

   The arms A, D and E, Figure 2, may be disengaged from their supporting pivots by compressing the two hinge springs at the rear of the arms.

   Remove the pickup arms B and C by pushing out the pin at the rear of the arm. Then pull the pickup forward off the pickup arm support.

3. With pickup arm turned over in a convenient position, unsolder the two leads and loosen the two screws holding the present pickup cartridge in the pickup arm head. Then remove the cartridge complete leaving the loose leads clamped in the arm.

   The arm A, Figure 2 may contain a lead weight which will obstruct ready installation of the new pickup cartridge. The weight may be removed by (a) scoring the bracket at its bend with diagonal cutters and bending until it breaks or (b) drilling several small holes in the bracket at the bend and bending until it breaks. **It is preferable and recommended to use a new arm, Stock No. 9951, List Price $0.90.**

4. Place the plate, supplied in the kit, in the pickup arm head with the two irregularly shaped holes in the plate matching with the screw holes in the arm. Attach the plate loosely in position with the two short binder head screws supplied in the kit, placing a washer above and below the plate on each screw.

5. Solder the two leads to the strip terminals on the Magic Tone Cell, being sure that the shield lead is attached to the ground terminal—the one on the right when viewed facing the front end, sapphire downwards—See Figures 2 and 3.

The soldering operation must be performed as quickly as possible so as not to heat the crystal.

6. Place the Magic Tone Cell in position, sapphire outward, with screw holes matched with the correct pair of threaded holes in the plate. Before fastening the Magic Tone Cell to the mounting plate, hold it in position and adjust the plate so as to permit mounting with playing point position, pickup axis and tracking the same as for the cartridge removed.

   Tighten up the plate screws and then assemble the Magic Tone Cell in place using the two long fillister head screws supplied, placing the spacers on the screws between the cartridge and the mounting plate.

   Note: Be careful not to bend the sapphire support wire, and be sure that the lead connections do not short to the arm, spacers or plate.

7. On pickup with a comparatively large hole on top for needle insertion, insert the plug button, supplied in the kit, securely in the hole.

8. Carefully reassemble the pickup arm and check its movement, making any necessary adjustments for correct operation as indicated in later paragraphs.

In case adjustment for "set down" and "height" is necessary it may be advisable to refer to service notes for the particular record player.

It may be necessary to weaken the tension on the feed-in spring on some mechanisms, in order to prevent the pickup from kicking-in too hard at the beginning of each record. Reduce tension by lengthening the spring or in most cases cut and remove the spring.

On certain phonographs it may be desirable to adjust the compensation in the audio circuit for best record reproduction.

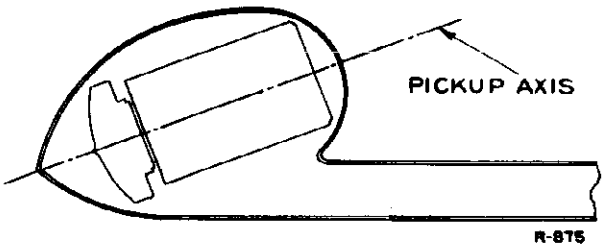


Figure 4—Pickup Axis

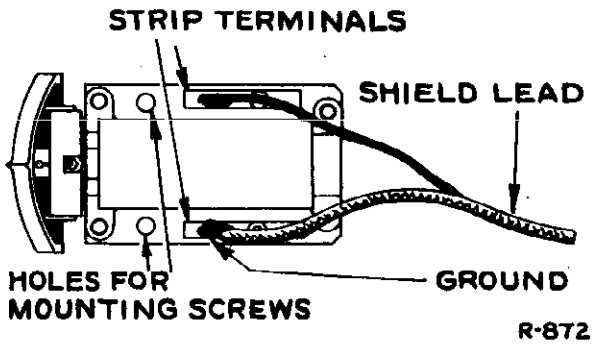


Figure 3—Magic Tone Cell (Sapphire Downwards)

RCA MFG. CO., INC.

COMPENSATION

Table of typical RCA Models with suggested changes for greatest volume and best fidelity

Model	Electrical Adjustments
U-9	Change R14 to 220,000 ohms Change C17 to .005 mfd.
U-25	Remove R9. Short out R10. Connect C13 from high side of phono input to tap on volume control.
U-40	Change R18 to 120,000 ohms Change R16 to 22,000 ohms Change C9 to .005 mfd.
U-42	Change R18 to 68,000 ohms Change R16 to 18,000 ohms Change C9 to .007 mfd.
U-43	Change R18 to 220,000 ohms Change C9 to .005 mfd.
U-44	Change R24 to 15,000 ohms Change R25 to 150,000 ohms Change C49 to .005 nfd.
U-123	No changes required.
U-125	Remove R9. Short out R10. Connect C12 from high side of phono input to tap on volume control.
U-130	Remove R46
R-98	Change R2 to 27,000 ohms Change C1 to .025 mfd.
V-100	Change R14 to 180,000 ohms Change C17 to .005 mfd.
V-170	Change R21 to 220,000 ohms Change C48 to .005 mfd.
V-200	Change R4 to 82,000 ohms Change R5 to 180,000 ohms Change R6 to 270,000 ohms Change C25 to .005 mfd.
V-205 V-405	Change R7 to 120,000 ohms Change R8 to 270,000 ohms Change R9 to 220,000 ohms Change R31 to 15,000 ohms Change C34 to .005 mfd.

Mechanical Adjustments

On all models the sapphire height above the motorboard should be checked. The sapphire point must enter the record groove and bear properly on the record. It must not strike or scrape on the motorboard as it may be damaged.

Swing out the pickup over the motorboard and adjust the sapphire height by carefully bending the pickup arm support bracket so that the sapphire point is 1/8 inch above the motorboard. The pickup should then operate properly throughout the playing cycle for both automatic and manual playing.

Any other necessary mechanical adjustments should be made in accordance with the Service Notes for the particular model.

TESTS."—Page four.

The information on the above key models will serve as a guide to cover the installation on other RCA Models of 1938 and later manufacture.

General Information on Compensation for Pickup Circuits

1. The pickup should be terminated or loaded in accordance with the information given in the preceding table.
2. Decreasing shunt resistance across pickup circuit decreases bass response and increasing shunt resistance across pickup circuit increases bass response.
3. Examples of compensation adjustments.

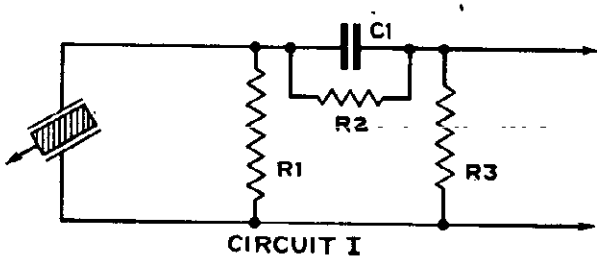


Figure 5—Pickup Circuit

Circuit I—Increasing R1 increases low frequency response. Increasing C1 increases high frequency response. Increasing value of R3 with respect to total value of R2 plus R3 increases the output.

MODEL "Magic Tone Cell Pickup Kit

RCA MFG. CO., INC.

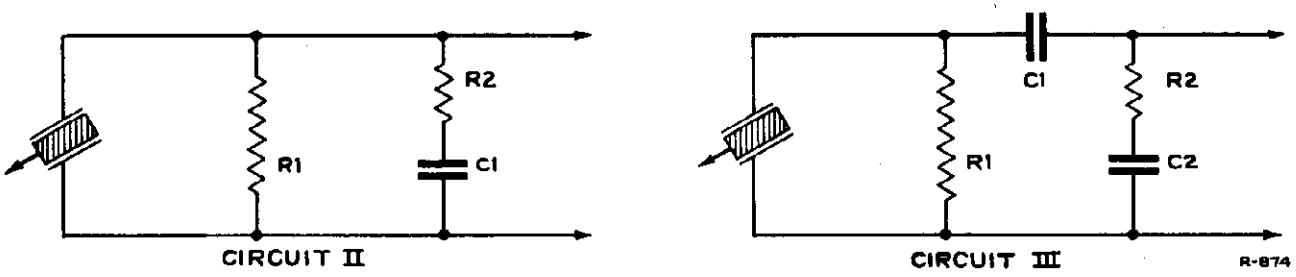


Figure 6—Pickup Circuits

Circuit II—Increasing R1 increases low frequency response.
Increasing R2 increases high frequency response.
Decreasing C1 increases output.

Circuit III—Increasing R1 increases low frequency response.
Increasing R2 increases high frequency response.
Increasing value of C1 with respect to total value of C1 plus C2 increases the output.

Operating Tests

1. **Mechanical**—The pickup should be tested for its complete operating performance. On record changing instruments both a full stack of records and a single record should be used in the test.

   Checks should be made for:—

   a. Correct landing on 10 inch and 12 inch records.

   b. Correct tripping on 10 inch and 12 inch records.

   c. Correct elevation of pickup arm.

   d. See that neither sapphire guard nor rear end of pickup tends to "drag" on the record when a full stock of records is being used. Seat pickup deeper into arm if necessary.

   Refer to the service notes for the particular model in all cases requiring readjustment.

2. **Electrical—It should be remembered that the output of the Magic Tone Cell is inherently lower than that of former crystal pickups, thus involving a lower reserve volume. The volume control on the instrument must therefore be further advanced than before, and the full volume position may occasionally be necessary. The best operating position should be checked on several records.**

   a. **Hum**—In cases of excessive hum, examine to see that shielding is intact and receiver circuits are normal. Make any necessary corrections.

   b. **Rumble or Howl**—Excessive rumble or howl may be remedied by examining motor and motorboard mountings for flexibility and making any necessary corrections or improvements.

Replacement of Sapphire Stock No. 38449

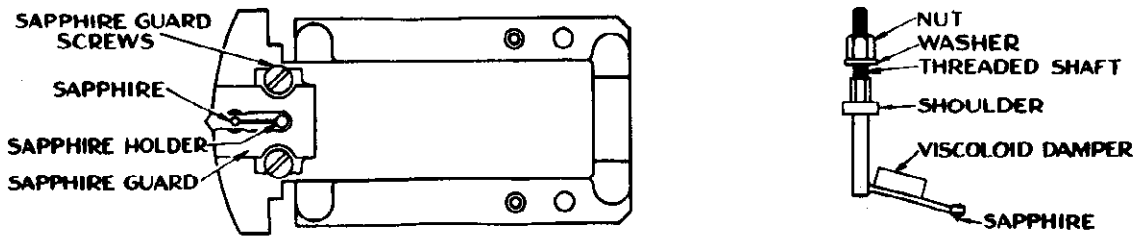


Figure 7—Magic Tone Cell Showing Sapphire

Caution—Never bend the sapphire support wire.

The nut on the sapphire holder assembly is locked by a light cement (such as Glyptal). Extreme care should be used when loosening the nut so that the twisting motion does not break the crystal.

Remove the two screws holding the sapphire guard in place and take the guard off. Remove the small nut and washer on the threaded shaft of the sapphire holder and push the shaft through the hole in the viscoloid until the sapphire holder assembly comes free.

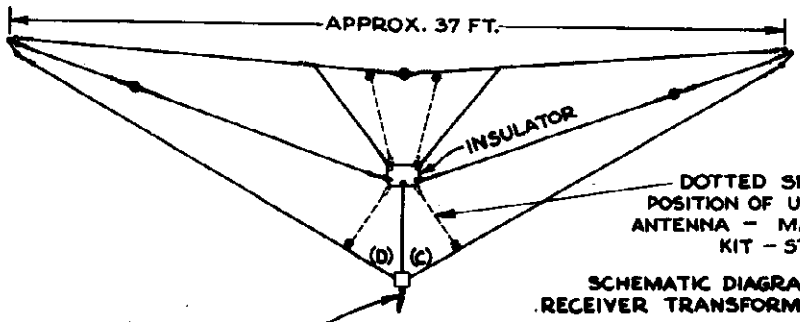
Insert threaded shaft of replacement sapphire holder through viscoloid and replace the washer and nut. Make sure that the flat sides of the shaft are firmly in place in the clamp and then tighten the nut very carefully so as not to strip the threads nor break the crystal. Replace the sapphire guard, positioning it by means of the oversize screw slots. Make certain that the sapphire and its supporting wire are centered in the guard. Tighten the guard screws.

Before using, check to see that the sapphire projects far enough beyond the guard so that the guard will not strike the record. If necessary, bend the guard a little. Apply a drop of light cement (such as Glyptal) to the sapphire nut holder.

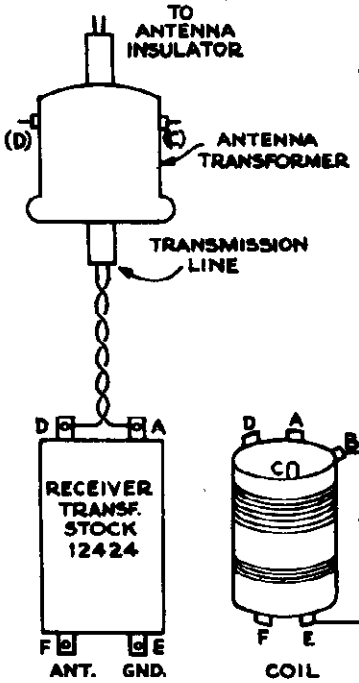
MODEL "Spider-Web" Antenna NOTES, CHANGES

RCA MFG. CO., INC.

SPIDER-WEB ANTENNA STOCK No. 9689



DOTTED SECTION SHOWS POSITION OF ULTRA SHORT-WAVE ANTENNA — MADE UP OF AUXILIARY KIT — STOCK NO. 9689



RP-158, RP-160

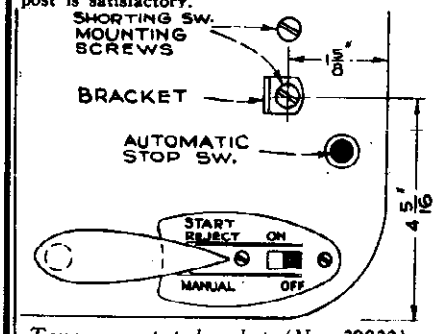
Tone Arm Stop Bracket:

On 2nd production RP-158 and RP-160, a stop bracket has been added to the top of the motorboard to restrain the tone arm. It is mounted by means of the same screw, lockwasher, and nut used to mount the pickup shorting switch. Where difficulty is experienced with excessive movement of the tone arm on 1st production mechanisms, this bracket may be added as shown. The bracket is Stock No. 39832.

RP-158, -160

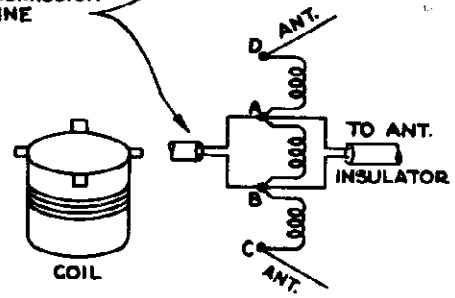
To Repeat One Record:

When checking RP-158 and -160 record changers for landing and tripping action, it is possible to play one record repeatedly by simply placing a weight on the rear record post. A small pipe nipple that fits over the top of the post is satisfactory.



Tone-arm stop bracket (No. 39832) position on RP-158, -160.

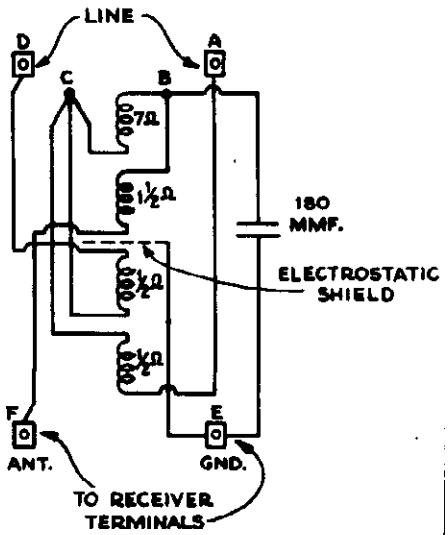
TRANSMISSION LINE



SCHEMATIC DIAGRAM OF ANTENNA TRANSFORMER

THE EFFECTIVE RANGE OF ANTENNA IS FROM 140 TO 23,000 KC (4 BANDS) THE ULTRA HIGH FREQUENCY BAND (23 TO 70 MC) MAY BE COVERED BY THE ADDITION OF AUXILIARY KIT STOCK NO. 9689

SCHEMATIC DIAGRAM OF RECEIVER TRANSFORMER STOCK 12424

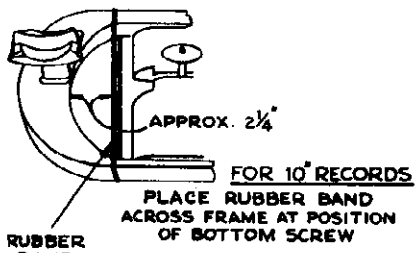


RP-158, RP-162

Change In Reject Lever and Button:

2nd production of RP-158 and RP-162 automatic record changers have a reject lever arrangement as shown in accompanying sketch.

Stock No.	Description	List Price
39755	Button—Reject button	.15
39756	Lever—Reject lever and stud	.25
39757	Lever—Reject button right angle lever	.10



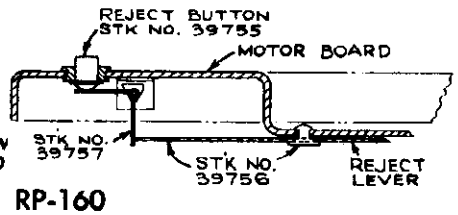
RP-151 RECORD CHANGER

To Play One Record Continuously:

It is possible to play one record continuously on the RP-151 by stretching a 3½-in. or 4-in. rubber band across the mechanism, as shown, to prevent the record dropping through the motorboard.

The continuous playing of a record in this manner is handy when the record changer is being serviced, especially after the separator knives have been checked and tested, and it is desired to allow the changer to run on the shop bench without attention.

Revised reject button and lever in RP-158, -162.



RP-160

Tone Arm Return Lever Spring:

The tone arm return lever spring is listed as Stock No. 39599. The correct number is 39038.

V-215, V-221

Speaker RL-70N-6:

On 2nd Production of V-215 and V-221, the speaker is changed from RL-70M-2 to RL-70N-6. The replacement parts are identical.

A rubber band stretched across the motorboard as shown permits continuous playing of one record on RP-151 record changer during service checking of the mechanism.

CHANGES
NOTES, DATA

RCA MFG. CO., INC.

"KNOCKED-DOWN" VOICE COIL AND CONE

Installation Instructions:

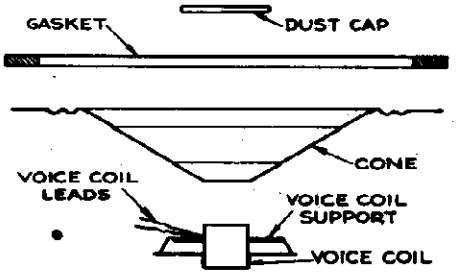
To simplify cone replacement in certain speakers, the cone and voice coil are supplied as two separate units: (1) The voice coil and support, (2) The cone diaphragm.

General Procedure

(a) Cement voice-coil support to the speaker, using centering gauge or speaker shims.
(b) Solder voice-coil leads.
(c) Put cone in place, cementing around rim of speaker frame.
(d) Cement junction of cone and voice coil.

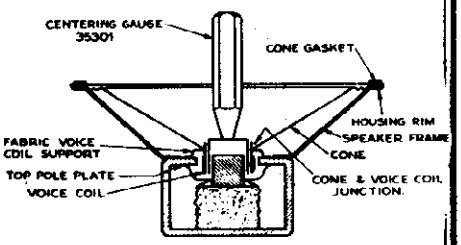
Detailed Instructions

(a) Remove old cone and voice coil. Protect air gap with scotch tape. Clean off all paper and cement.
(b) Apply a ring of cement (Duco Household) on top plate.
(c) Insert centering gauge in new voice coil, handle first, from the winding end.
(d) Remove scotch tape from gap. Insert voice coil and gauge in gap with leads in correct position for soldering. Press rim of voice coil support into the cement.
(e) Solder the voice coil leads to terminals, allowing sufficient slack to permit free motion of the cone. Dress leads in plane of motion, clear of cone and housing.
(f) Apply a ring of cement around the rim of speaker frame. Place cone down over voice coil and press cone rim tight to speaker frame.



Certain replacement cones are supplied "knocked-down" in two pieces—(1) The voice coil and centering support. (2) The cone diaphragm.

(g) Allow cement to dry on cone rim and voice-coil support. Then run a ring of cement around the junction of the cone and voice coil, being careful the cement does not run inside voice coil.
(h) After cement at junction has dried, remove gauge, using a rotary motion.
(i) Cement large cardboard gasket in place. Set the speaker in inverted position on a flat surface until gasket is dry. Cement dust cap on cone center.



When installing "knocked-down" speaker cone, the junction of the cone and the voice coil is cemented last.

ABSORPTION WAVE TRAP

For Loop Receivers:

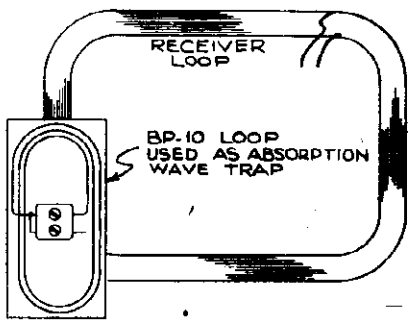
Interference and cross modulation due to the presence of a strong local broadcast station is seldom experienced on loop-type receivers because the signal pickup is much less on a loop than on an antenna.

However in rare cases where such interference is encountered, it can generally be eliminated by using an absorption-type wave trap, loosely coupled to the loop on the receiver, as shown in accompanying sketch, and tuned to the frequency of the interfering station.

A good absorption trap can be made with a small loop like that used in Model BP-10 "Personal" radio. Fasten a two-section mica trimmer (salvaged from a discarded IF transformer) on the small loop. Connect the trimmer across the terminals of the small loop. Use one trimmer, or both in parallel, depending on whether the interfering station is at the high or low end of the broadcast band.

Tune the receiver to the frequency of the interfering station, place the trap near the receiver loop, and adjust the trap trimmer(s) to resonance, indicated by a sharp dip in signal strength. Use smaller or larger capacity trimmers if required to reach resonance.

Check to see if the particular interference effects have been eliminated. Adjust the position of the trap to secure closer coupling if necessary to further increase signal absorption. Avoid over coupling. Fasten the trap in the desired position on the receiver loop.



On a loop receiver, interference from a strong local broadcast station can be reduced by using an absorption loop, tuned to the interfering station, and loosely coupled to the receiver loop.

VOICE COIL IMPEDANCE

And DC Resistance:

In servicing RCA radio loudspeakers, it is helpful to know that the DC resistance of the voice coil is approximately 10 percent less than the impedance at 400 cycles.

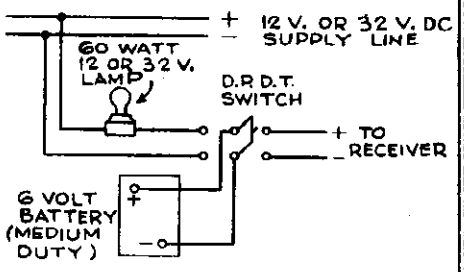
For example, a speaker with a rated voice-coil impedance of 2.2 ohms at 400 cycles will measure about 2 ohms DC resistance.

Radio storage battery can be charged on a DC farm-lighting outfit.

RECHARGING 6V BATTERY

On 12V or 32V DC Supply:

A 12-volt or 32-volt DC farm-lighting supply can be used to recharge a 6-volt radio storage battery. The recommended circuit is shown herewith. The charging rate may be increased or decreased by using a higher or lower wattage lamp.



BATTERY COMPLEMENT

For RCA Portable Models.

MODEL	BATTERIES	EVEREADY No. *
BP-10 (RC-544)	1 1.5 volt "A" 1 67.5 volt "B"	No. 950 No. 467
15BP Series (RC-527, 527-A)	1 1.5 volt "A" 2 45 volt "B"	No. 743 No. 482
25BP (RC-527-D, 1020)	1 1.5 volt "A" 2 45 volt "B"	No. 743 No. 482
26BP (RC-559)	2 4.5 volt "A" 2 45 volt "B"	No. 746 No. 482
BP-55, -56, -85 (RC-455)	1 6 volt "A" 2 45 volt "B"	No. 747 No. 482
94BP (RC-407)	1 1.5 volt "A" 2 45 volt "B"	No. 742 No. 762
94BP (RC-407-B)	1 1.5 volt "A" 2 45 volt "B"	No. 742 No. 762
	1 1.5 volt "A" 2 45 volt "B"	No. 745 No. 482 or 727
	1 1.5 volt "A" 2 45 volt "B"	No. 741, 742, 743 No. 482 or 727
94BP-4 (RC-410)	1 1.5 volt "A" 2 45 volt "B"	No. 742 No. 762

* Or equivalent.

RCA SCHEMATICS

Switch Positions:

Practically all of the larger RCA receivers have decals on the cabinet (or other means) to indicate the function of each position on the more complicated switches. In cases where only the chassis is brought in for service, the corresponding information about controls is given in a knob drawing printed in the Service Note.

For example, the accompanying schematic shows the radio-phono-tone control switch circuit in Model V-135, drawn as usual in the extreme counter-clockwise position. The knob view shows the function of each position:

(1) "Off" (counter-clockwise).

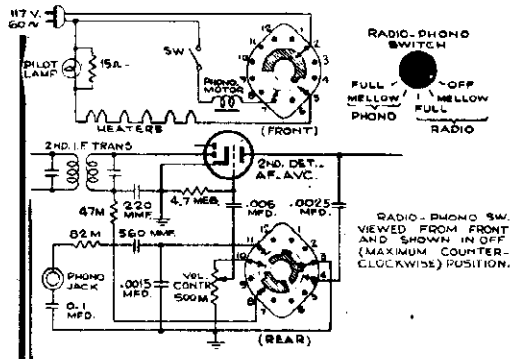
(2) Radio—mellow tone.

(3) Radio—full tone.

(4) Phono—mellow tone.

(5) Phono—full tone (clockwise).

As a general rule, on RCA receivers clockwise rotation of a control produces an increase. Thus on a range switch, the lowest-frequency band is counter-clockwise, and the highest-frequency band is clockwise. On tone controls, the narrowest audio range or deepest tone is counter-clockwise. The widest audio range or highest tone is clockwise.



In RCA Service Note schematics, wafer switches are shown in extreme counter-clockwise position, and the drawing of control knobs gives sequence and function of switch positions.

Installing No. 38204 Antenna Loop in BP-10 Where Loop is Held with Snap Fasteners:

A. Remove the defective loop and its flat molded cover by prying out the two snap fasteners.

B. Spread white paint or ink on the surface of the two bosses in lid.

C. Place the new loop and cover in correct position inside the lid and press down so the paint will transfer on to the loop cover.

D. Drill holes (.242-inch, No. C drill) in the flat loop cover at the exact center of each paint mark. Countersink each hole (approximately 3/64-inch) on loop side, so that the flat cover will set flush with the top of the bosses.

E. Fasten the loop and cover to the lid with the two snap fasteners supplied.

Installing No. 38204 Antenna Loop in BP-10 Where Loop is Riveted in Lid:

A. Drill the riveted ends of the rivets, and knock the rivets out, being careful not to damage the molded lid. Remove the defective loop and its flat molded cover.

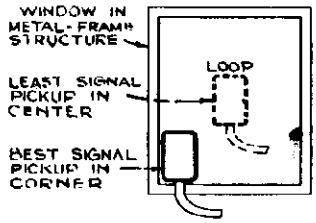
B. Place the new loop and cover in correct position inside the lid. Use the two rivet holes in the lid as a guide to drill corresponding holes in the loop cover.

C. Fasten the loop assembly to the lid with the two rivets supplied.

BEST LOOP PICKUP

In Corner of Window:

In a metal-framed structure, such as a car, train, plane, or steel building, best signal pickup is usually obtained by placing the loop in one corner of the window instead of in the center. The center of the glass space is usually a null for signal. This fact should be kept in mind when using the extension loop on a portable radio, as there is a natural tendency to fasten the loop in the center of the window.

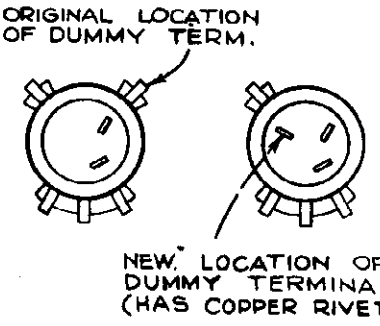


For best signal pickup, the extension loop on a portable set should be placed in corner of window.

DUMMY TERMINAL

On Replacement Volume Controls:

On certain replacement volume controls, the location of the "dummy" terminal is changed as shown in accompanying sketch.

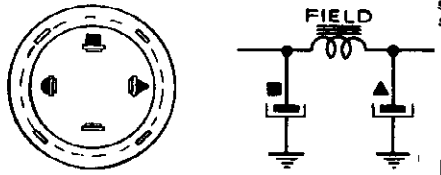


Change in location of dummy terminal on certain replacement volume controls.

ELECTROLYTIC CAPACITORS

Terminal Identification:

On certain types of multiple-section electrolytics, the terminals are identified by small markings (triangle, half-round, or square). The marks are either cut-outs or mouldings in the base. Corresponding marks are shown adjacent to the electrolytic symbols in the schematic diagrams.



In some electrolytic capacitors, the terminals are identified by half-round, triangular, and square markings. Corresponding marks are shown adjacent to the symbols in the schematic.

QU7, QU-51, -52, -55, -56

Tone Arm Pressure Spring:

When replacing the tone arm, or the magnetic pickup head, check the needle pressure which should be approximately 3½ ounces. Alter the counter-balance spring in arm to obtain the correct pressure, or install a new spring. Two springs (65 turns and 75 turns) are supplied under Stock No. 38213. Use the spring that most nearly gives the correct pressure and then remove turns, or stretch the spring, as required, for final adjustment.

BP-10

Loop and Moulded Lid:

Stock No. 38204 antenna loop with undrilled flat molded cover, and/or Stock No. 38211 molded lid with bosses for snap fasteners, can be used in any Model BP-10 where the antenna loop is secured in place with rivets, or with snap fasteners.

Installing Stk. No. 38211 Molded Lid in BP-10 Where Loop is Riveted in Lid:

A. Snip the two hinge pins and pull the pins out of the hinges, to permit removal of the defective lid.

B. Drill the riveted end of the rivets and knock them out, being careful not to damage the flat loop cover. Remove the loop and its cover from the lid.

C. Spread white paint or ink on the surface of the two bosses in the Stock No. 38211 lid.

D. Place the original loop with its flat cover in correct position inside the Stock No. 38211 lid and press down so the paint will transfer to the loop cover.

E. Drill holes (.242 inch, No. C drill) in the flat loop cover at the exact center of each paint mark. Countersink each hole (approximately 3/64-inch) on loop side, so that the flat loop cover will set flush with the top of the bosses.

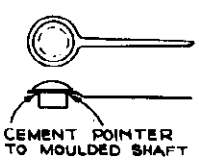
F. Fasten the loop and cover to the No. 38211 lid with the two snap fasteners supplied.

G. Assemble the lid and loop to the chrome panel, using the hinge pins and springs furnished with No. 38211 lid.

6X2, 24BT-1, -2

Loose Dial Pointer:

Expansion and contraction due to temperature changes may cause the metal dial pointer to become loose on the moulded button shaft. This condition has been corrected in production by fastening the pointer with "Du Pont Household Cement" as shown.



Loose dial pointer can be repaired with Du Pont Household Cement.

CHANGES
NOTES, DATA

RCA MFG. CO., INC.

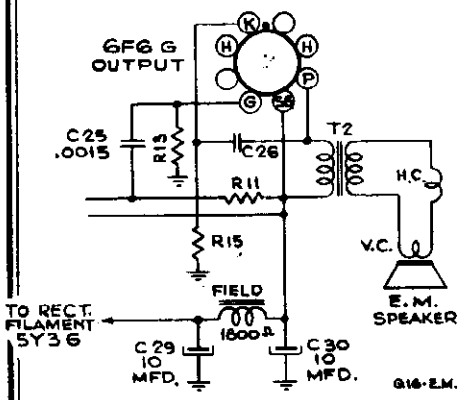
Q16E (RC-561-C)

Service Data:

Model Q16E is similar to Model Q16, except that it has an EM speaker, as shown in accompanying sketch, and the following parts are different:

Stock No.	Description	Unit List Price
12896	Capacitor—15 mmfd., moulded mica	$ .35
33806	Capacitor—.0015 mfd.	.25
32342	Capacitor—Electrolytic, comprising 2 sections of 10 mfd., 450 volts each	1.20
38409	Control—Tone control	1.00
34761	Resistor—10 ohms, ½ watt	.20
30492	Resistor—22,000 ohms, ½ watt	.20
30652	Resistor—1 meg., ½ watt	.20
30649	Resistor—2.2 meg., ½ watt	.20
32911	Transformer—Power transformer—105-120 volts, 50-60 cycle	4.10
32852	Transformer—Power transformer—110-220 volts, 50-60 cycle	4.50
2917	Washer—"C" washer to hold tuning shaft	.03
	SPEAKER ASSEMBLIES (RL-79C-1)	
31825	Cap—Dust cap	.02
32903	Coil—Field coil—1,800 ohms	1.25
38392	Cone—Cone complete with voice coil	1.25
5118	Plug—3-prong male plug for speaker	.25
32905	Transformer—Output transformer	1.35

Note.—If the stamping on speaker in instrument does not agree with above speaker number, order replacement parts by referring to model number of instrument, number stamped on speaker, and full description of part required.



Speaker connections in Model Q16E (RC-561-C).

Q12

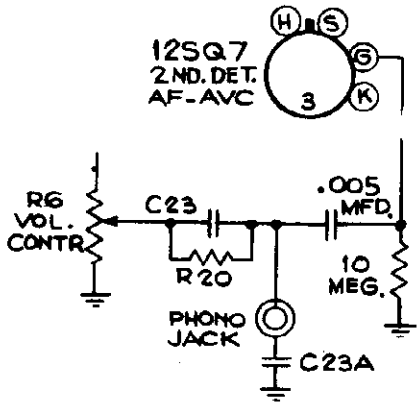
Correction in Service Data:

The RL-86A-3 speaker is incorrectly listed as a PM type. This should be listed as an EM speaker with 450-ohm field coil.

16X4

RF Plate Load Resistor:

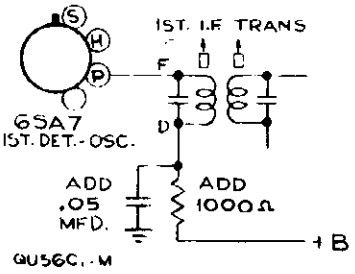
In some production, the load resistor in the plate circuit of the RF tube is changed from 3,900 to 2,200 ohms.



QU56C, QU56M

Instability:

Development of appreciable RF impedance in the electrolytic filter capacitor creates common coupling and may cause IF oscillation. To eliminate this possibility, an RC filter is connected in the +B lead of the 1st-detector plate circuit, as shown in accompanyng sketch.



In Q56-C, -M, an RC filter is added in the 1st-detector plate circuit.

When Model Q17 is used on 110-volt DC supply, the 1st-audio grid circuit should be changed as shown above to prevent distortion due to incorrect bias.

28X5

Insufficient Push-Button Range:

In Model 28X5 if the push-buttons have insufficient range, realign IF at exactly 455 kc. If this does not correct the trouble, replace the main oscillator coil Stock No. 38685 and realign the set. The correct coil has no number stamping; do not use coil stamped 95106-501.

Q44

.05 Mfd. Capacitor:

Change Stock No. 32787 to No. 4886.

QU51C, QU51M, QU55

Voice-Coil Impedence:

The voice-coil impedance of the RL-70N-1, RL-70N-3, and RL-71A-4 is incorrectly listed as 15 ohms in the Service Data. The correct impedance is 2.2 ohms at 400 cycles.

STOCK No. 160 CRO

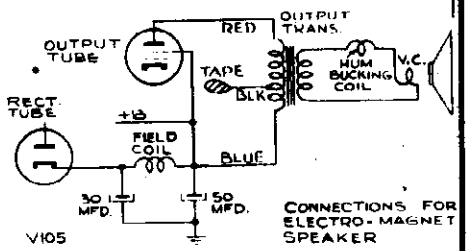
Vertical "Bounce":

The 160 oscillograph has extremely good low-frequency response, passing a 4-cycle square wave with good fidelity. It is possible to encounter instances in which a line-voltage meter, due to its inertia will indicate little or no variation of voltage, whereas the oscillograph will exhibit noticeable vertical "bounce" due to line-voltage fluctuations.

If a customer desires to retain the normal low-frequency response of the 160 and has a power line which varies in voltage appreciably, it is necessary to provide voltage regulation, such as TMV-173 voltage regulator. However, if the extreme response of the 160 is superfluous for the particular application in mind it can readily be reduced, affording a reduction of the "bounce" to an unobjectionable value. This is accomplished by removing the present coupling condenser, C-20, and substituting a 0.05 mfd. 400-volt condenser. The response is then down a few percent with a 15-cycle sine-wave input.

(The 160B incorporates filtering circuits to eliminate vertical "bounce.")

For applications in which it is desired to connect directly to the cathode ray tube deflecting plates, such as the observation of a modulated RF envelope from a transmitter, it is possible to completely eliminate the vertical "bounce" by merely disconnecting either side of the coupling capacitor, C-23.



Connections for RL-86A-3 EM speaker in Model V-105.

V-105

Using EM Speaker Replacement:

RL-86A-3 "EM" speaker can be used as a replacement for RL-81B-4 PM speaker in Model V-105 by wiring in the field coil and output transformer as shown in accompanying diagram. The original output transformer can be used by taping up the black (tap) lead.

In this particular model, it is necessary to solder a jumper across contacts 8 and 9 on the front section of the radio-phono switch. This keeps the 1st-detector and IF tubes in operation when the switch is in "phono" position, and thus maintains sufficient current through the field coil for adequate excitation.

The customer should be instructed to tune the set to a quiet point on the dial to prevent radio break-through on phono.

26BP

Alignment:

The RF, detector, and oscillator adjustments in Model 26BP are easily accessible when the chassis is mounted in the cabinet. Consequently the regular dial may be used for reference during alignment. In the event that only the chassis is brought in for service, the accompanying full-size dial reproduction can be used as a substitute for the regular dial.

Q17

Distortion on 110-V DC Operation:

Distortion at all volume levels when Model Q17 is operated on 110-volt DC supply is caused by incorrect bias on the 12SQ7 control grid. This condition can be eliminated by changing to the circuit shown in accompanying sketch.

55 60 70 80 100 120 140 160

Model 26BP full-size dial reproduction. This can be used for reference during alignment.

CV-112, CV-112X

Electrolytic Capacitor:

These AC power units are described in "Supplementary Information No. 4 and No. 5." The Stock Number of the electrolytic capacitor should be changed from No. 30873 to No. 39846.

STOCK No. 154 BFO

Alignment:

The instruction book for Stock No. 154 beat-frequency oscillator specifies 350 kc for the fixed oscillator frequency. In some production, a frequency of approximately 343 kc is used in order to secure correct dial calibration.

Also, in figure 11 of this instruction book, the trimmer numbers C10 and C3 are reversed. They are shown correctly in figure 9.

158 AND 160-B CRO

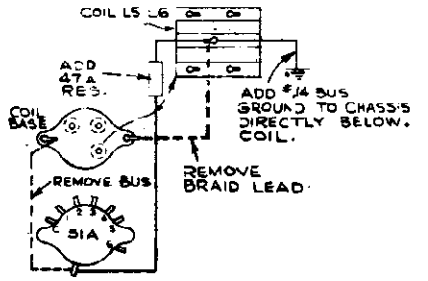
Filter Circuit Change:

In some 1st Production of Stock No. 158 and 160-B cathode ray oscillographs, numbered in the 2,000 series, the .1 mfd 1st-filter capacitor may short due to starting-voltage surge. To prevent recurrence, replace the 27,000 ohm input filter resistor (R38 in 158, R33 in 160) with a 120,000 ohm 1 watt resistor, Stock No. 13483. This change should be made when the shorted .1 mfd capacitor is replaced.

167, 167A TEST OSCILLATOR

Dead Spots on HF Band:

Dead spots or failure to oscillate on the high-frequency band in the Stock No. 167 or 167A test oscillator may be corrected by inserting a 47-ohm ½-watt resistor, and making slight changes as shown in accompanying sketch.



Change in Stock No. 167, 167A test oscillator to eliminate dead spots, or failure to oscillate, on HF band.

MODEL vs "RP" NUMBERS

The automatic record changer mechanism in certain models is designated by an "RP" number, as follows:

RCA Model Number	"RP" Number
QU5	RP-145E
VA-15	RP-152
U-40	RP-139A, 145
U-42	RP-139A, 145
U-43	RP-139A, 145
U-44	RP-139A, 145
U-45	RP-139A, 145
QU51-C	RP-145E
QU51-M	RP-152R
QU52-C	RP-152S
QU52-M	RP-152R
V-135	RP-162

CONVERSION KIT No. 9889

For Television Alignment Oscillator:

This kit is used to convert No. 159 oscillator to include 59-67 mc in place of 43-51 mc.

Parts supplied in this kit consist of: 1 escutcheon; 1 coil complete with core and bracket; 1 switch contact; and necessary screws, nuts, and washers for mounting.

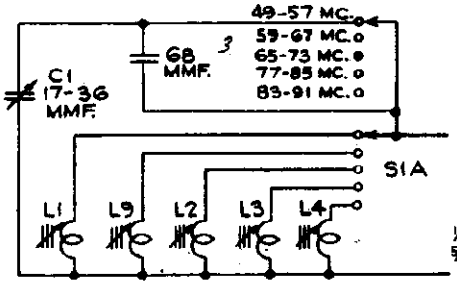
Revision procedure is as follows:

(a) Cut lead from C1 to S1A.
(b) Cut lead from L1 to S1B.
(c) Cut lead between old 44-50 mc and 50-56 mc taps on S1A.
(d) Mount extra contact on S1A preceding old 44-50 mc position.
(e) Connect extra contact lead to L1.
(f) Drill and tap 6-32 hole in center of sweep condenser stator bar nearest front panel.
(g) Mount new 59-67 mc coil L9.
(h) Connect lower L9 lead (nearest bracket end) to common coil bus near L5.
(i) Connect tap L9 lead to former L1 switch contact on S1B.
(j) Connect C1 to former 44-50 mc contact on S1A.
(k) Mount escutcheon.

Make the following changes to the instruction book IB-32011:

Page 8—Delete adjustment No. 5.
Add adjustment 6A, symbol L9, description 60-66 mc band tuning: set the center of the sweep range to 63 mc.

Page 14—Change schematic as shown in accompanying sketch.



To accommodate deletion of the original No. 1 channel (44-50 mc), and addition of the new No. 2 channel (60-66 mc), kit No. 9889 is available to convert Stock No. 159 television alignment oscillator.

RCA VICTROLA MECHANISM DATA

V-170	RP-152
V-175	RP-158
V-200	RP-152A
V-201	RP-152A
VHR-202	RP-155
V-205	RP-152B
V-205A	RP-153
VHR-207	RP-155
V-209	RP-158
V-210	RP-158
V-215	RP-160
V-219	RP-160A
V-221	RP-160B
V-225	RP-151
V-300	RP-152J
V-301	RP-153
V-302	RP-153
VHR-307	RP-155
V-405	RP-152J
VHR-407	RP-155

"RP" vs STOCK NUMBERS

In service data for radio-phono combinations, the automatic record changer mechanism is usually described in a separate service note. In such cases, the mechanism is identified by an "RP" number. Certain of these mechanisms are also marketed under RCA "Stock Numbers." Corresponding "RP" and Stock Numbers are listed below. For service data on any given Stock Number of mechanism, refer to the corresponding "RP" service note.

RP No.	Stock No.
RP-139B	9865
RP-139C	9865
RP-145A	9865A
RP-151	9933
RP-152C	9909
RP-152M	9909D
RP-155A	9910
RP-158	9930
RP-160	9931
RP-162	9932

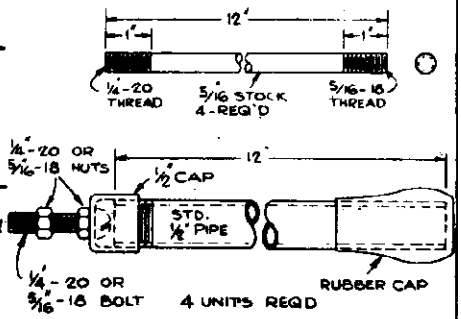
CABINET MUST BE LEVEL

For Correct Landing and Feed-in:

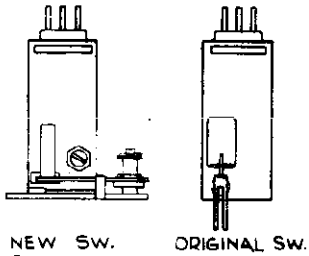
V-215 and V-221 "roll-out" record changers are designed to operate WHEN THE CABINET IS LEVEL. The changer is automatically tilted forward 3 degrees when in the cabinet. Always make landing and feed-in adjustments under these conditions.

In V-215 and -221, an adjustment is located on each of the rear legs to permit fore-and-aft leveling. If the changer does not roll out correctly when the cabinet is level, inspect the rubber-tired rollers and the guides.

V-219, -225, and all other models in which the changer is fastened in cabinet, are designed to operate WHEN THE CHANGER AND CABINET ARE LEVEL. Always make landing and feed-in adjustments under these conditions.



Legs can be used to support a record changer in level position at a convenient height above work table. The legs can be made from threaded rod, or from pipe fittings, as shown above.



Original and new motor switch for automatic shut-off in manual operation on RP-152D and RP-153.

CHANGES
NOTES, DATA

RCA MFG. CO., INC.

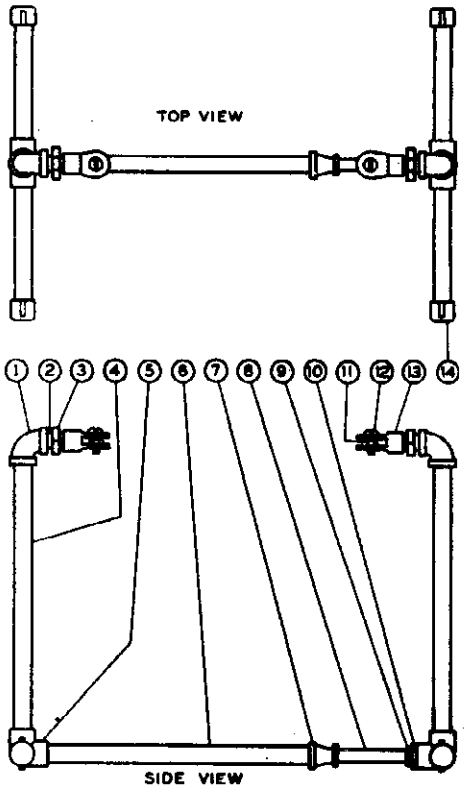
HOLDER FOR RECORD CHANGER

Essential in Servicing:

In servicing an automatic record changer, it is essential to have some kind of a holder or stand to support the mechanism in a level position at a convenient height above the work table to permit easy access to all parts under the motorboard.

Adjustable stands can be purchased, or assembled from pipe fittings as shown in the accompanying sketch.

The simplest and cheapest type of holder is made by using legs that screw into the motorboard-mounting-screw sockets. Such legs can be made from pipe fittings or from threaded rods as shown in the sketches. One end of each leg has a ¼-20 thread to accommodate most RCA changers, and the other end has a 5/16-18 thread to accommodate the RP-151 mechanism.



An adjustable holder for automatic record changer mechanisms can be made from pipe fittings as shown above.

RP-152D, -153, QU7

Automatic Motor Switch:

Some models of RCA automatic record changers incorporate a switch that acts to shut off the motor when the pickup needle is 1⅜ inches from the spindle, and also when the pickup is moved out to its rest position.

The original switch, Stock No. 36529, is superseded by an improved switch, Stock No. 38995. When installing the new switch, remove the angle bracket that is used between the motor board and the original switch.

VHR-202, -207, -307, -407

Crystal Pickup Is No. 37158

In the Service Data for these home-recording models, the pickup cartridge is incorrectly listed as No. 33995. The correct Stock Number is 37158. This correction should also be noted in the tabulation on page 5 of "Supplementary Information No. 5."

DO NOT TOUCH THIS TONE ARM

when playing either one or more records automatically, to avoid possibility of disturbing Automatic Adjustment. Just Push a Button—There's Your Record Program.

The label reproduced above is fastened to the record changer in Models V-215, -219, -221, and -225.

These mechanisms are designed for completely automatic operation on a stack of records or on a single record.

Customers should be instructed to use the START-REJECT button and not to handle the tone arm.

The following parts are required for the record-changer holder shown above. These parts can be obtained in hardware or plumbing shops.

Drawing Number	Description	Quantity
1	¼-in. ell	2
2	¼-in. all-thread nipple	2
3	¼-in. gas-pipe locknut	2
4	¼-in. x 15-in. pipe	2
5	¼-in. 4-way ell on side outlet tee	2
6	¼-in. x 14-in. pipe	1
7 (optional)	¼-in. x ⅜-in. reducer	1
8	¼-in. x 15-in. pipe	1
9-10	¼-in. to ¼-in. bushing	1
11 (optional)	¼-in. std. nut and 5/16-in. std. nut	2 each
12	¼-in. x 1¾-in. std. and 5/16-in. x ¼-in. std. bolt	2 each
13	¼-in. awning eyelet	2
14	¼-in. pipe cap	4

Note: If item 13 is not obtainable, change item 2 to 2¼-in. nipples, and drill 5/16-in. holes close to one end to accommodate the motorboard mounting bolts.

RP-151, -158, -160, -162

Trip Lever and Trip Pawl Spring:

The original bronze trip-pawl spring, Stock No. 38562, is no longer available. When this spring requires replacement, due to loss or irreparable damage, it is necessary to install either a new steel spring, Stock No. 39961, in accordance with instructions given below, or else install a complete new trip lever assembly which employs the steel spring.

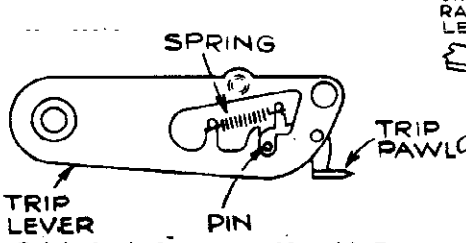
In RP-151, the new trip lever, trip pawl, and steel spring assembly is **Stock No. 38561**

In RP-158, -160, and -162, the new trip lever, trip pawl, and steel spring assembly is **Stock No. 38632.**

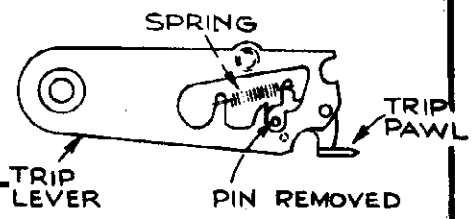
The new lever and spring assemblies will be supplied on orders for the original assemblies.

Installing Steel Spring No. 39961 on Trip Lever:

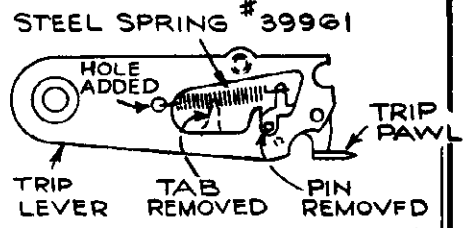
1. Drill a 3/32-inch hole in lever as shown.
2. Cut off the tab that was used to anchor the original bronze spring.
3. Install steel spring as shown.



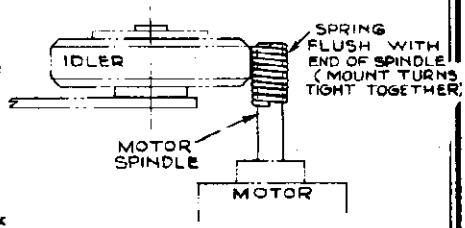
Original trip lever assembly with Bronze spring.



Original trip lever with corner cut off to prevent lever striking the ratchet.



Trip lever with new steel spring. This steel spring can be installed on original lever in place of bronze spring by drilling a 3/32 inch hole and cutting off the tab on original lever.

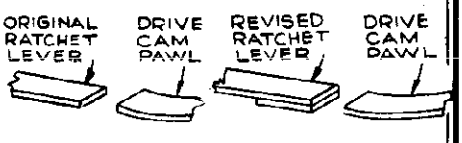


Spring sleeve installed on 60-cycle motor spindle for operation on 50-cycle supply.

REVISED RATCHET LEVER

In RP-158, -160, and -162, continuous tripping can be caused by failure of the ratchet lever to block the drive cam pawl at completion of a change cycle.

This has been corrected by doubling the thickness of the end of the ratchet lever so that it presents a broader face to the edge of the drive cam pawl. The lever with double thickness is carried under the same Stock Number (38656) as the original lever, which it supersedes.



Continuous tripping in RP-158, -160, and -162 can be caused by failure of the rachet lever to block the drive cam pawl. The replacement lever has double thickness at end to present a broader face to the drive cam pawl.

CHANGES
NOTES, DATA

RCA MFG. CO., INC.

RP-151, -158, -160, -162

Crystals and Sapphires:

The following Stock Numbers for crystal-and-sapphire assemblies supersede all previous listings:

Zinc-cased crystals have letters "ZN" cast in the metal.

Use only zinc-cased crystal No. 39550 for RP-160. This can not be used in RP-151.

Do not replace complete pickup where sapphire only requires replacement.

RP	Used in Models	Stock No. of Sapphire and Holder, less nut—	Stock No. of Crystal and Sapphire Assembly—
151	V-225	38449	Top, 39919 (Alum. case) Bottom, 38598 (Alum. case)
158	V-175, V-209, V-210	39564	38610
160	V-215, V-219, V-221	38449	39550 (Zinc case)
162	V-135	39564	38610

RP-160

Sapphire Pressure:

The correct sapphire pressure in RP-160 is approximately 1¼ ounces. The pressure is governed by a spring inside the end of the pickup arm. Owing to the fact that both aluminum and zinc castings (with difference in weight) have been used for the arm and the crystal, and also that only the zinc crystal (Stock No. 39550) is supplied for replacement, **it is necessary to check the sapphire pressure whenever either the crystal or the arm is replaced.**

The zinc arm is identified by the letters "ZN" after the drawing number inside the arm.

The zinc crystal is identified by the letters "ZN" moulded at the rear end of the cartridge.

The various combinations are tabulated below, along with the Stock Numbers of pivot arms and springs involved.

ARM AND CRYSTAL COMBINATIONS	CORRECT ARM AND SPRING
Aluminum arm Stock 38650 Aluminum crystal Stock 38453	Pivot arm Stock 38603 Pivot arm spring Stock 30585
Aluminum arm Stock 38650 Zinc crystal Stock 39550	Pivot arm Stock 38603 Pivot arm spring Stock 30585
Zinc arm Stock 39671 Zinc crystal Stock 39550	Pivot arm Stock 39672 Rivet for arm and spring Stock 39674 Pivot arm spring Stock 39754
Zinc arm Stock 39671 Aluminum crystal Stock 38453	Pivot arm Stock 39672 Rivet for arm and spring Stock 39674 Pivot arm spring Stock 39673

60 TO 50 CYCLE CONVERSION

For Rim-Drive Phono Motors:

(These instructions supersede all past issues, covering the use of shrunk sleeves.)

A spring sleeve is used to increase the diameter of the motor drive spindle, to compensate for the slower speed of the motor when used on a 50 cycle line.

Spring sleeves are available for the following models which comprise most of the motors using spindle drive manufactured to date.

To apply the spring-sleeve to the motor spindle, lock the rotor manually and press spring gently over end of spindle, twisting the free end of spring counter-clockwise (to unwind coil) until following end of spring is flush with end of spindle.

The ends of spring should not protrude, and all coils should be close together, allowing a flat even surface on the motor spindle to contact the rubber drive.

Model No.	MOTOR Dwg. No.	MOTOR Stock No.	RP No.	Spring-Sleeve Stock No.
V-100	91647-3	36404		39681
V-101	"	"		"
V-102	"	"		"
V-105	"	"		"
QU56-C	92127-1	36984		"
QU56-M	"	"		"
V-135	91647-5	39301	RP-162	39750
V-140	"	"	"	"
V-175	91706-1	38612	RP-158	39748
V-209	"	"	"	"
V-210	"	"	"	"
QU51-M	"	"	RP-152R	"
QU52-C	"	"	RP-152S	"
QU52-M	"	"	RP-152R	"
QU55	"	"	RP-152R	"
V-215	91655-1	36254	RP-160	39749
V-219	or 91655-6	36254	RP-160A	"
V-221	"	"	RP-160B	"
V-225	91645-1	38557	RP-151	"
QU-51C	91655-6	36254	RP-145E	"
QU5	91655-6	34864	RP-145E	"

IMPROVED TONE ARM RETURN LEVER

Stock No. 39751

The tone arm return lever in RP-158, -160, -162, has been revised to incorporate two important improvements:

(1) **A cam to adjust landing position on 12-inch records.**

(2) **A positive-acting feed-in lever and spring.** (This pushes the tone arm in toward the music grooves after the sapphire has landed on the record.)

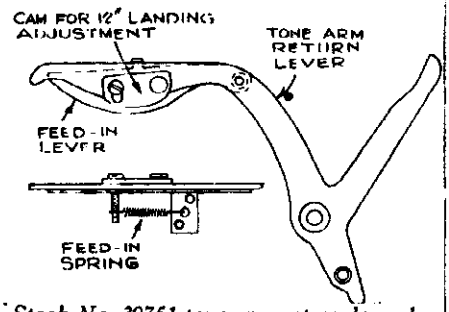
This revised lever, Stock No. 39751, supersedes the original lever, Stock No. 38618.

12-inch Landing Adjustment:

When adjusting a mechanism that has this revised lever, make the 10-inch landing adjustment in the usual manner as specified in the service notes. Then check landing on a 12-inch record and adjust the cam if necessary. The correct landing position for 12-inch records is 5⅝ inches from the sapphire to the nearest side of the spindle.

Feed-in Spring Adjustment:

The feed-in spring (Stock No. 39752) is hooked in one hole on a bracket that has three spaced holes to permit coarse adjustment of feed-in tension. Fine adjustment can be obtained by bending the bracket.

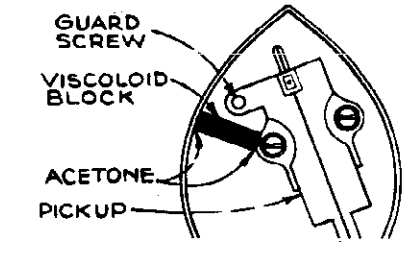


Stock No. 39751 tone arm return lever has a cam to adjust 12-inch landing position, and a positive acting feed-in mechanism. The feed-in tension can be adjusted by hooking the spring in a different hole on the bracket, and by bending the bracket.

RP-158, RP-162

Tone-Arm Resonance:

Chatter at frequencies near 2,500 cycles on some 1st production RP-158 or RP-162 mechanisms is caused by tone-arm resonance which can be eliminated by inserting a block of viscoloid (⅛ in. x ⅛ in. x 3/16 in.) in the arm as shown. The viscoloid block is No. 39949.



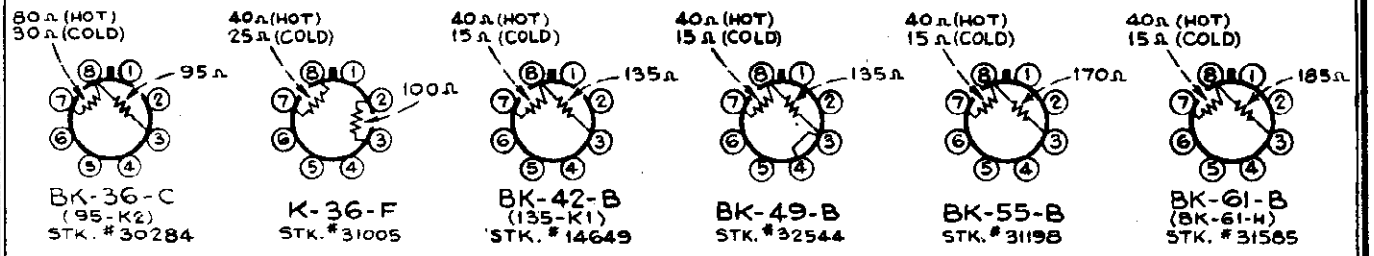
Viscoloid damper (No. 39949) minimizes tone arm resonance in RP-158, -162.

BALLAST TUBES

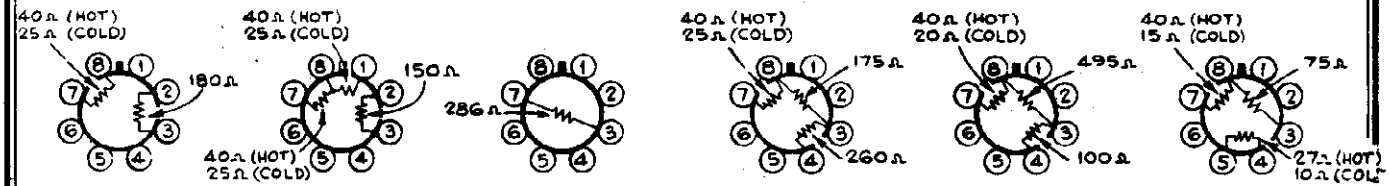
RCA MFG. CO., INC.

RCA Resistor Ballast Tube Data

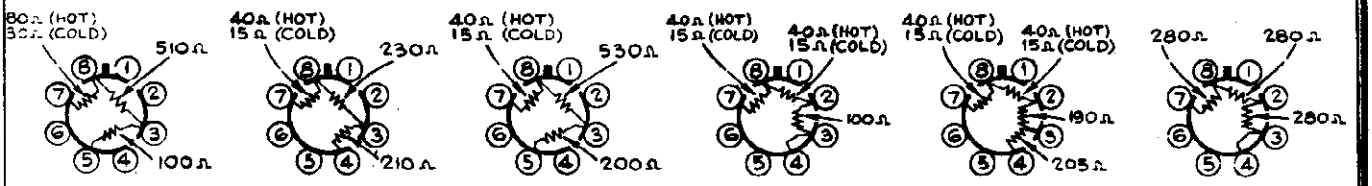
(Nos. in parenthesis are original designations)



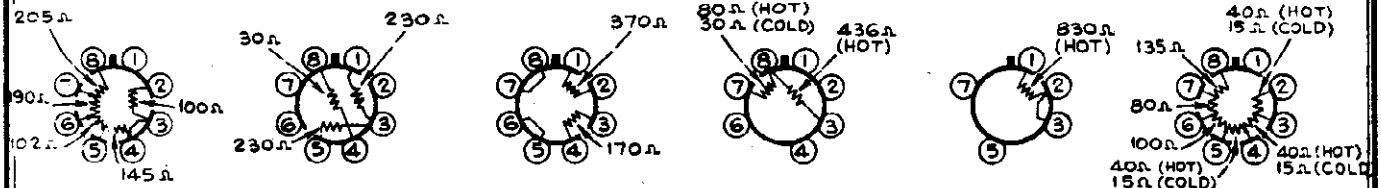
BK-36-C (95-K2) STK. #30284 | K-36-F STK. #31005 | BK-42-B (135-K1) STK. #14649 | BK-49-B STK. #32544 | BK-55-B STK. #31198 | BK-61-B (BK-61-H) STK. #31585



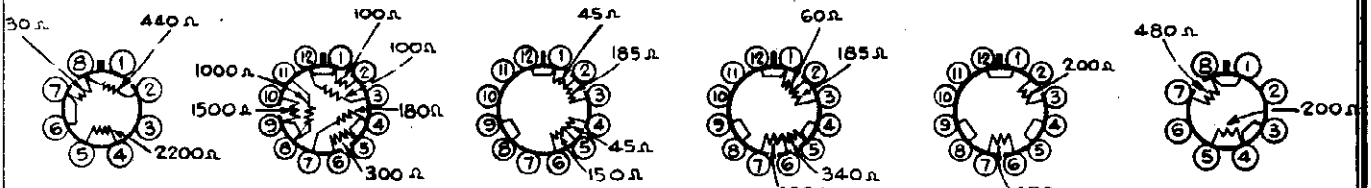
K-61-F STK. #31019 | K-61-H STK. #32109 | B-86-A STK. #33793 | 260-K1 STK. #30300 | 495-K1 STK. #30599 | K-83747-6 (BK-36-B) STK. #31577



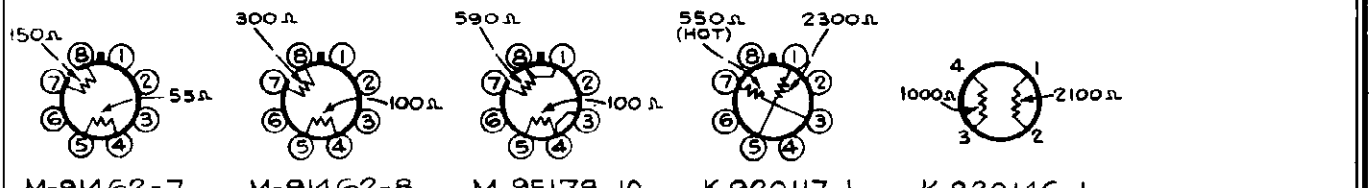
K-85277-3 STK. #32247 | K-85277-4 STK. #32850 | K-85277-5 STK. #32849 | M-86892-1 STK. #33811 | M-86892-2 STK. #33812 | M-86892-3 STK. #33813



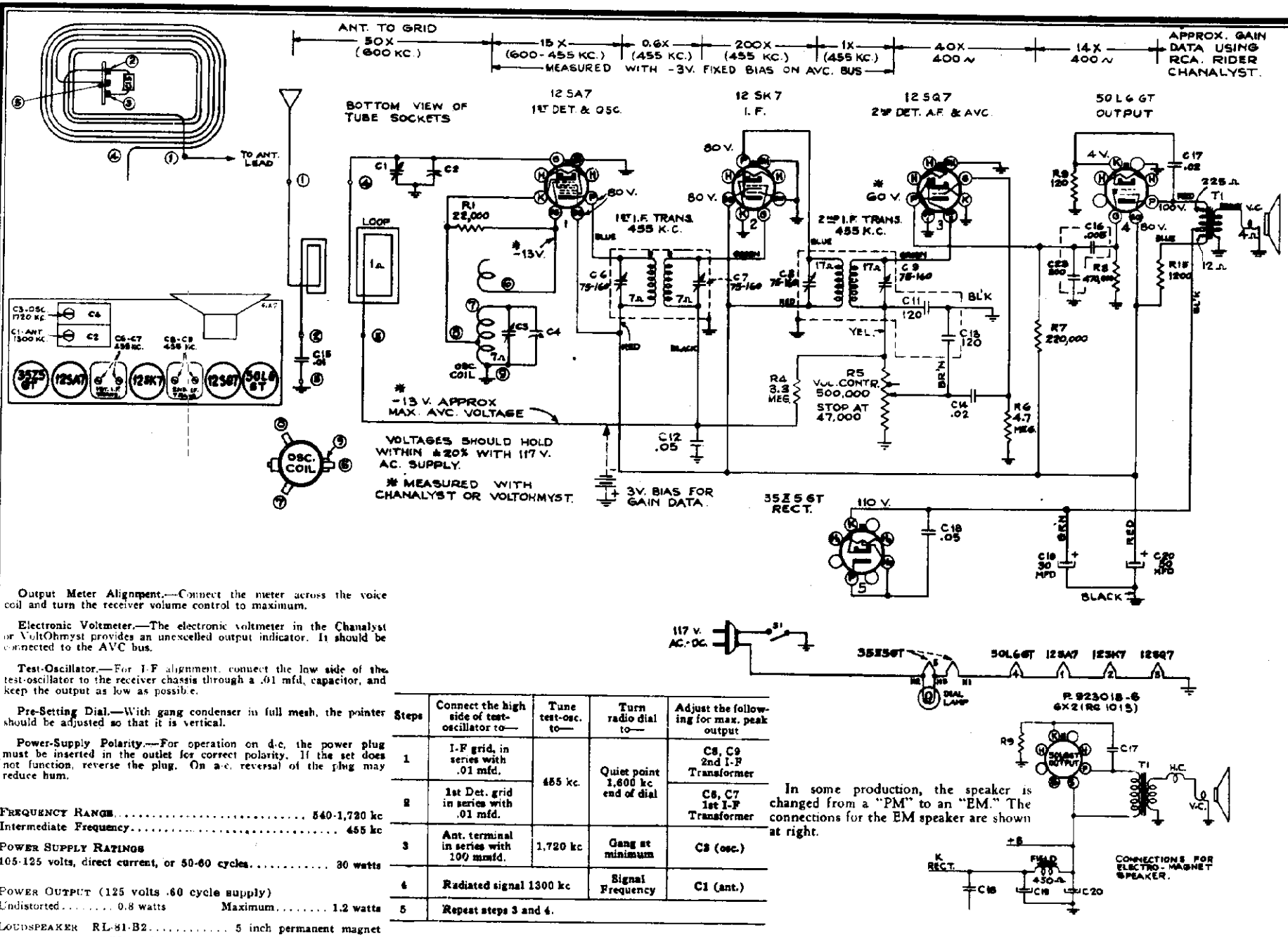
M-86892-4 STK. #33947 | M-86892-6 STK. #34563 | M-86892-7 STK. #34458 | M-86892-8 STK. #34805 | M-86892-9 STK. #35000 | M-86892-10 STK. #35183



M-86892-11 STK. #37847 | M-91462-1 STK. #35748 | M-91462-2 STK. #35635 | M-91462-3 STK. #37891 | M-91462-5 STK. #37985 | M-91462-6 STK. #38289



M-91462-7 MI-8159-1 | M-91462-8 MI-8159-2 | M-95178-10 STK. #39346 | K-920117-1 STK. #38702 | K-920146-1 STK. #39575



Output Meter Alignment.—Connect the meter across the voice coil and turn the receiver volume control to maximum.

Electronic Voltmeter.—The electronic voltmeter in the Chanalyst or VoltOhmyst provides an unexcelled output indicator. It should be connected to the AVC bus.

Test-Oscillator.—For I-F alignment, connect the low side of the test-oscillator to the receiver chassis through a .01 mfd. capacitor, and keep the output as low as possible.

Pre-Setting Dial.—With gang condenser in full mesh, the pointer should be adjusted so that it is vertical.

Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

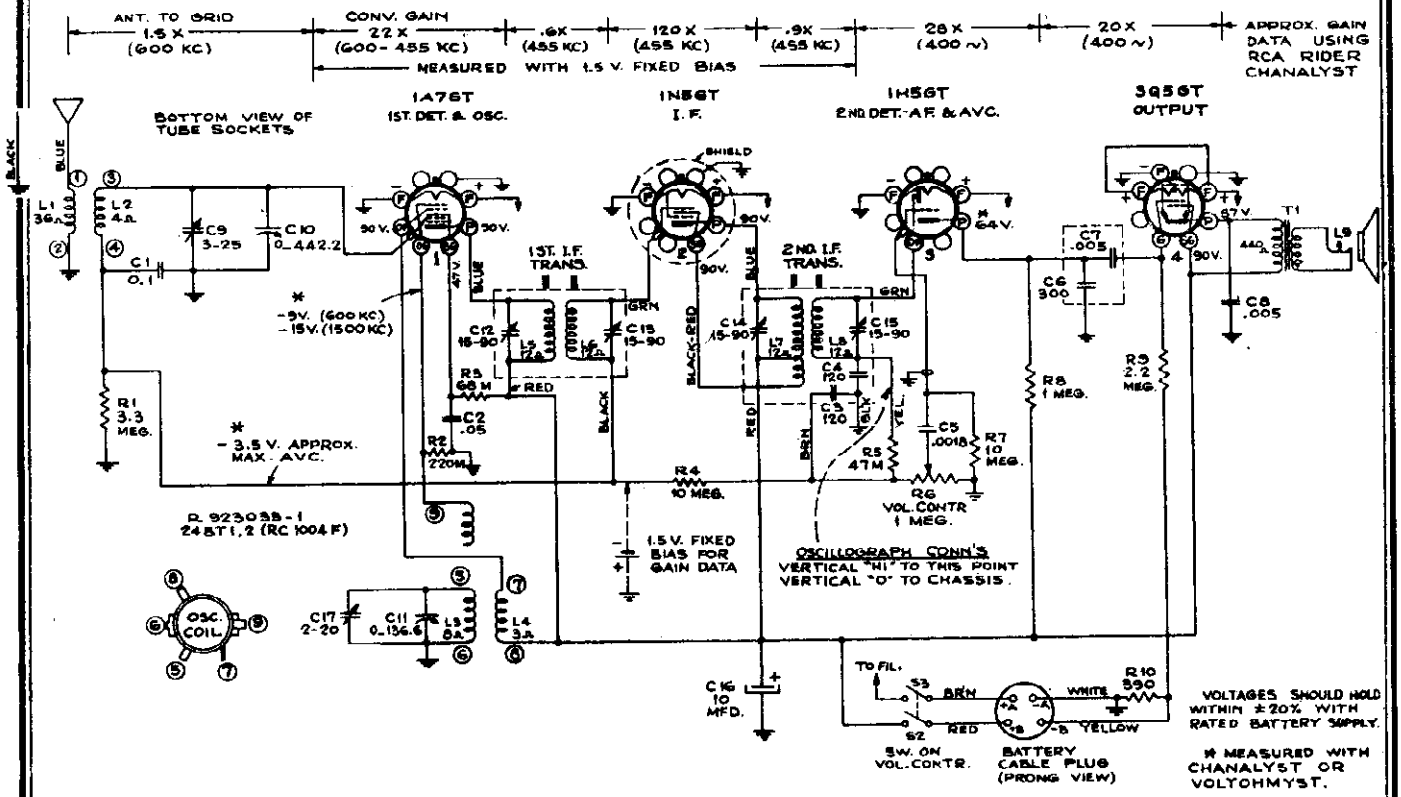
FREQUENCY RANGE	540-1,720 kc
Intermediate Frequency	455 kc
POWER SUPPLY RATINGS	
105-125 volts, direct current, or 50-60 cycles	30 watts
POWER OUTPUT (125 volts 60 cycle supply)	
Undistorted 0.8 watts	Maximum 1.2 watts
LOUDSPEAKER RL-81-B2	5 inch permanent magnet
or RL-86-A3	5 inch electro magnet

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	I-F grid, in series with .01 mfd.	455 kc.	Quiet point 1,600 kc end of dial	C8, C9 2nd I-F Transformer
2	1st Det. grid in series with .01 mfd.			C8, C7 1st I-F Transformer
3	Ant. terminal in series with 100 mmfd.	1,720 kc	Gang at minimum	C3 (osc.)
4	Radiated signal 1300 kc		Signal Frequency	C1 (ant.)
5	Repeat steps 3 and 4.			

In some production, the speaker is changed from a "PM" to an "EM." The connections for the EM speaker are shown at right.

MODELS 24BT-1, 24BT-2
Chassis RC-1004F

RCA MFG. CO., INC.



FREQUENCY RANGE	540-1,720 kc
INTERMEDIATE FREQUENCY	455 kc

BATTERY DRAIN

"A"	.25 amperes
"B"	14 m.a.
MAX. POWER OUTPUT	.3 wat.

LOUDSPEAKER (5-inch PM)

Identification number	RL-85-6	92322-1
Voice coil impedance at 400 cycles	3 ohms	3 ohms

Cathode Ray Alignment is the preferable method. Connections for the oscillograph are shown in the diagram.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil and turn the receiver volume control to maximum.

Test Oscillator.—For all alignment operations, connect the low side of the test oscillator to the receiver chassis, and keep the output as low as possible to avoid AVC action.

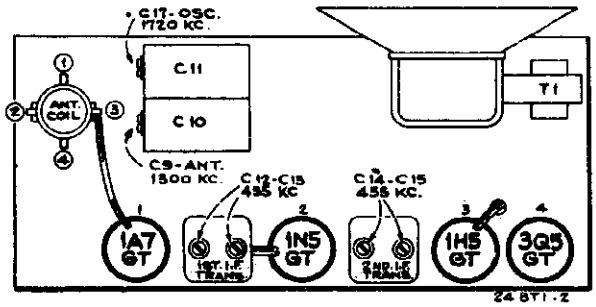
Electronic Voltmeter.—The electronic voltmeter in the Chanalyst or VoltOhmyst provides an unexcelled output indicator. It should be connected to the AVC bus.

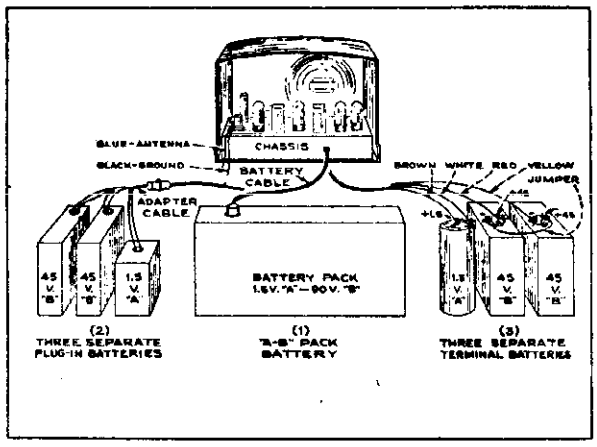
Pre-Setting Dial.—With gang condenser in full mesh, the pointer should be adjusted so that it is horizontal.

Step	Connect high side of test osc. to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	I-F grid in series with .01 mfd.	455 kc	Quiet point between 550 and 750 kc	C14, C15 (2nd I-F Trans.)
2	1st Det. grid in series with .01 mfd.			C12, C13 (1st I-F Trans.)
3	Antenna terminal in series with 220 mmfd.	1,720 kc	Tuning condenser rotor plates all out	C17 (osc.)
4		1,300 kc	1,300 kc signal	C9 (ant.)

Precautionary Lead Dress.—

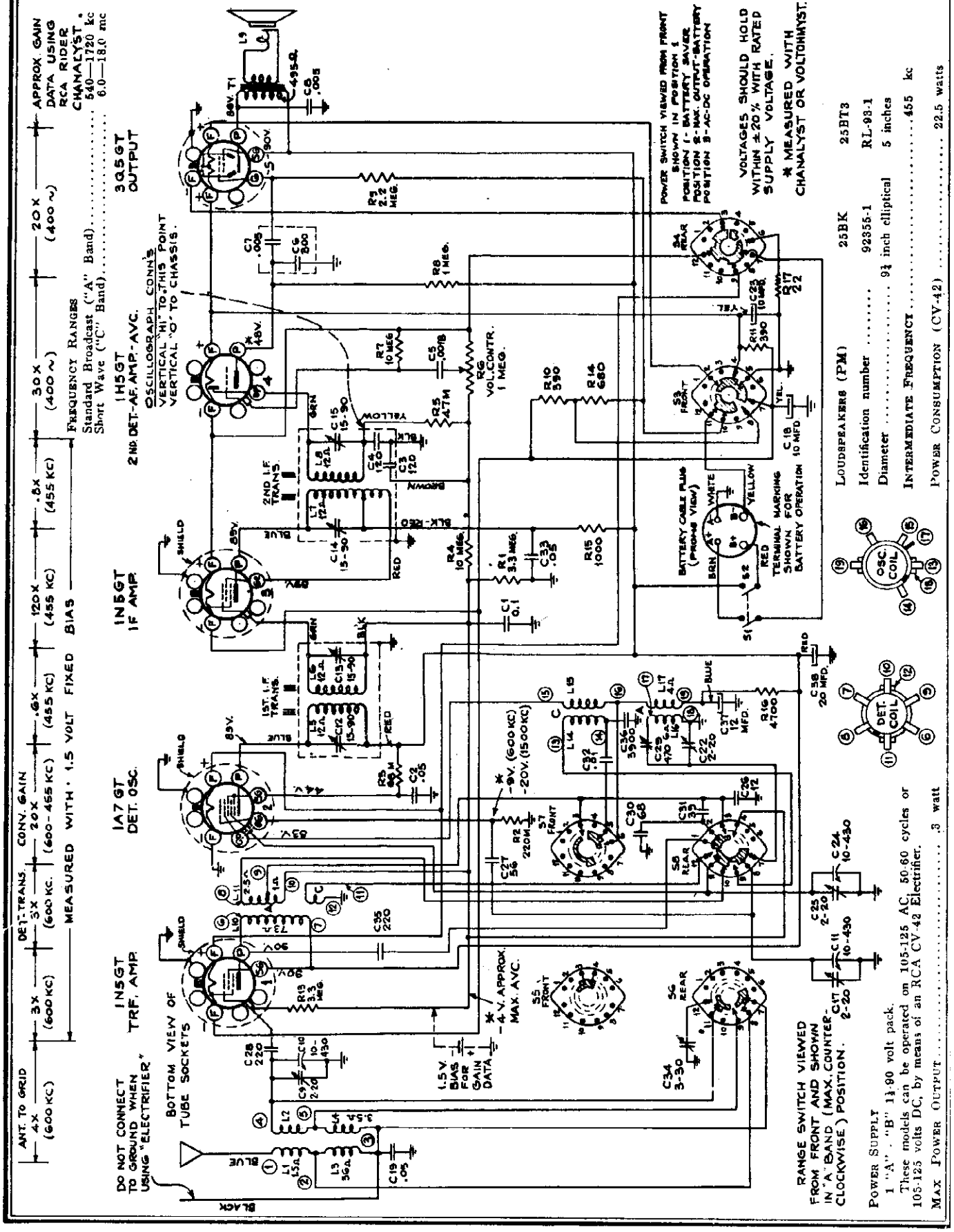
1. The lead from the 3Q5 plate to output transformer should be dressed under clip and away from audio input leads.
2. Keep AVC lead connecting C1 away from the 1A7GT plate.
3. Keep blue plate leads coming from IF transformers short and close to the chassis.
4. All filament wires should be dressed close to chassis.





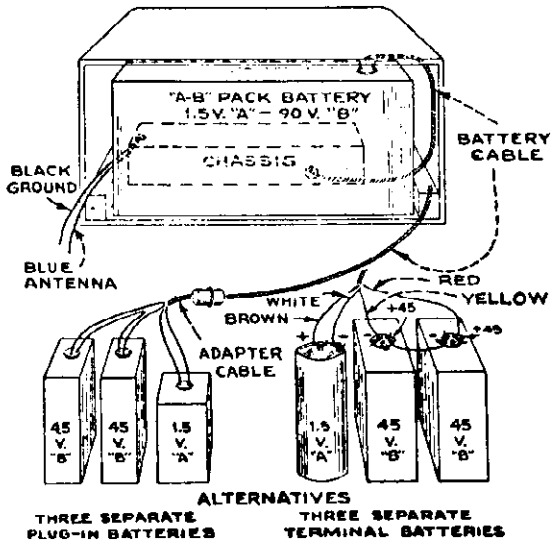
RCA MFG. CO., INC.

MODELS 25BK, 25BT-3
Chassis RC-1004B
CV-42 Electrifier



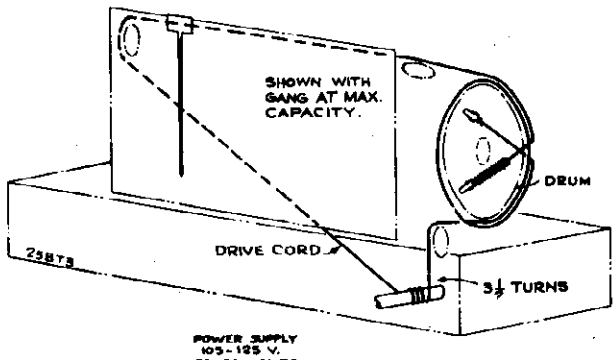
MODELS 25BK,25BT-3
Chassis RC-1004B
Electrifier CV-42

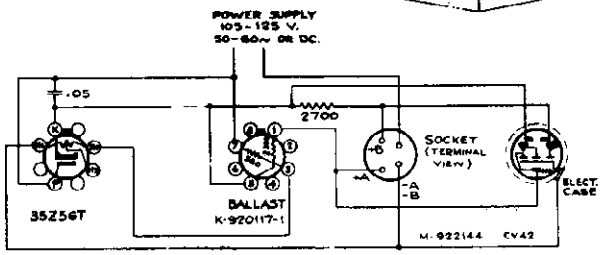
RCA MFG. CO., INC.



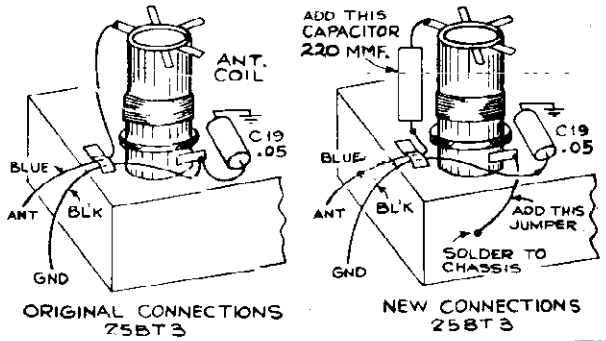
Precautionary Lead Dress:—

1. All filament wires should be dressed close to chassis.
2. Keep AVC lead connecting .1 Mfd. Filter to Ant. Coil away from 1A7GT plate.
3. Keep grid lead coming from first IF transformer short.
4. Keep Blue leads coming from IF transformer short and close to chassis.
5. Keep grid leads of 1N5GT and 1A7GT tubes away from each other.





Circuit of CV-42 Electrifier



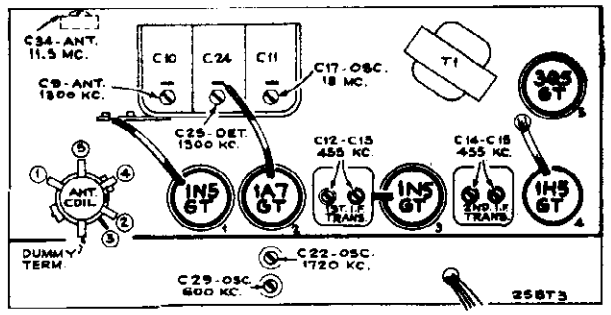
Remove any external ground connections when using the Electrifier.

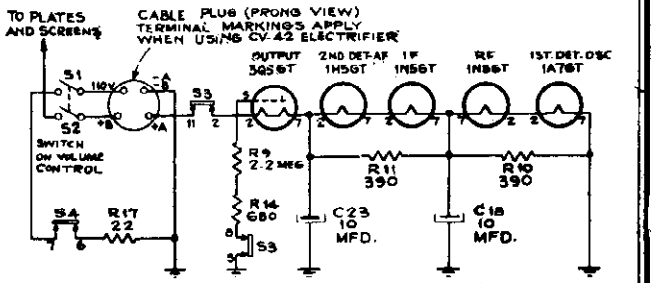
CAUTION: Turn power switch off (counter-clockwise) when installing or replacing tubes or batteries.

DO NOT TURN THE "BATTERY-ELECTRIC" SWITCH TO ELECTRIC POSITION WHILE THE RECEIVER IS CONNECTED TO BATTERIES.

On a DC power supply, if no reception is obtained, reverse the plug in the outlet and retune. On an AC supply, reversal of the plug may reduce hum. CAUTION! Do not touch Radio Chassis unless power plug is removed from socket.

Step	Connect high side of test osc. to—	Tune test-osc. to—	Turn radio-dial to—	Adjust the following for maximum peak output
1	I-F grid, in series with .01 mfd.	455 kc	"A" Band, Quiet point between 550 and 750 kc	C14 and C15 (2nd I-F trans.)
2	1st Det. grid in series with .01 mfd.			C12 and C13 (1st I-F trans.)
3	Antenna terminal in series with 220 mfd.	18 mc	18 mc	C17 (Osc.)
4		1720 kc	Tuning condenser rotor plates all out	C22 (Osc.)
5		600 kc	600 kc	C29 (Rock)
6		1300 kc	1300 kc signal	C9 (Ant.) C25 (Det.)
7	Repeat steps 4, 5, and 6			
8	Antenna terminal in series with 300 ohms	11.5 mc	11.5 mc signal	C34 (Ant.)





Simplified Diagram of Filament Circuit when using CV-42

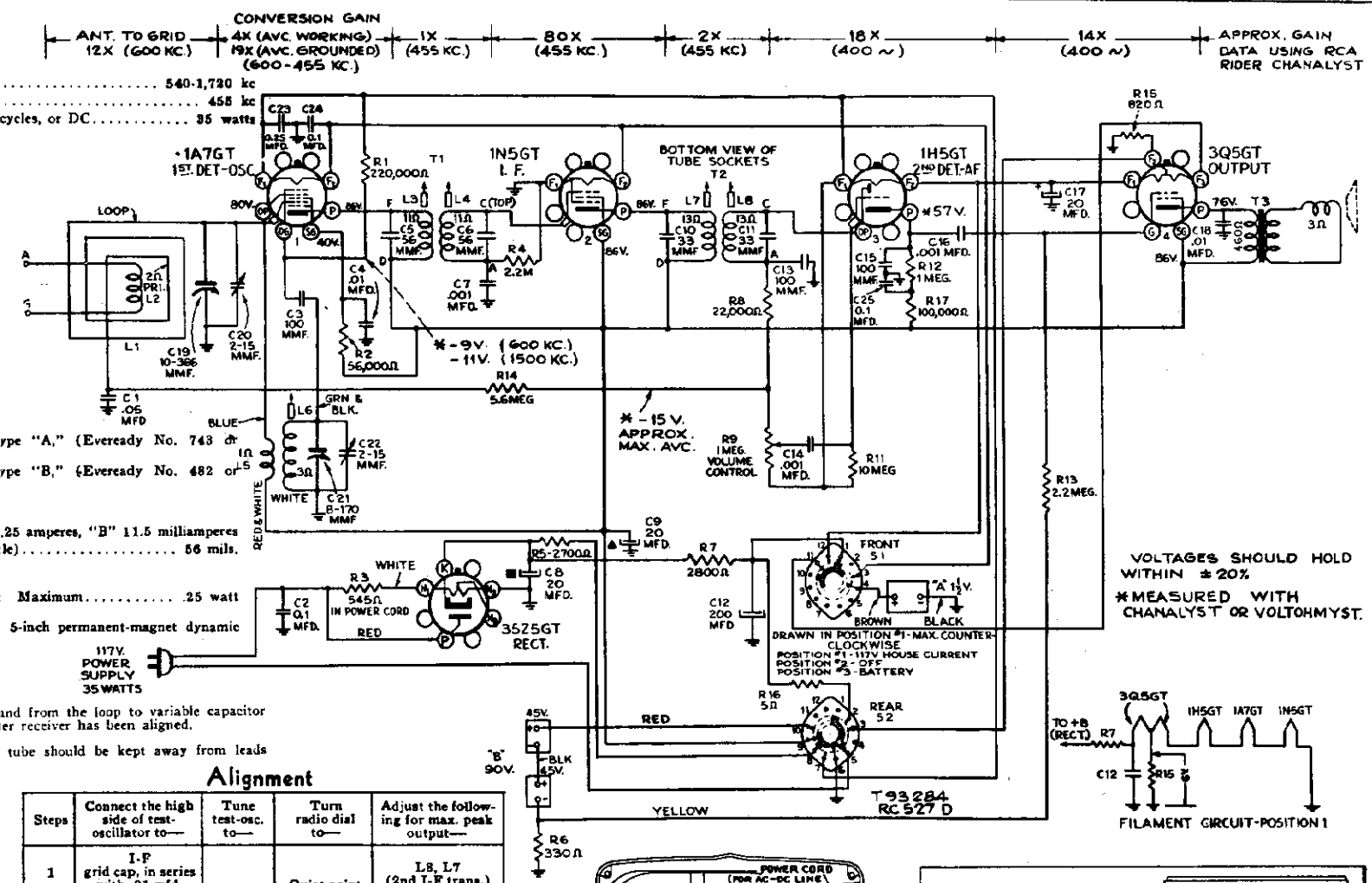
Hum Modulation on Model 25BT3 When Using CV-42 "Electrifier."

The following changes should be made in cases where hum modulation is experienced when operating Model **25BT3** from a CV-42 electrifier power unit. It is *not* necessary to remove the chassis from the cabinet to make these changes.

(1) Connect a 220 mmfd. molded mica capacitor in series with the blue antenna lead as shown.

(2) Disconnect the black ground lead and C19 from the bottom lug on the antenna coil. Connect a jumper from this lug to chassis. Connect the black ground lead to C19 and tape the joint.

The original and revised connections are shown at left.



Frequency Range ..... 540-1,720 kc
Intermediate Frequency ..... 455 kc
110 to 125 volts, AC 50 or 60 cycles, or DC..... 35 watts

Batteries Required

"A" one 1.5 volt dry plug-in type "A," (Eveready No. 743 or equivalent)

"B" two 45 volt dry plug-in type "B," (Eveready No. 482 or equivalent)

Current Consumption

Battery Operation ..... "A" 0.25 amperes, "B" 11.5 milliamperes
Total Rect. "B" (117 volt, 60 cycle)..... 56 mils.

Power Output

Undistorted..... .15 watt Maximum..... .25 watt

Loudspeaker..... 5-inch permanent-magnet dynamic

Precautionary Lead Dress.—

1. Lead from I-F tube grid and from the loop to variable capacitor should not be disturbed after receiver has been aligned.
2. Grid lead to the 1N5-GT tube should be kept away from leads to filament resistors.

Alignment

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	I-F grid cap, in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	L8, L7 (2nd I-F trans.)
2	1st-Det. grid cap, in series with .01 mfd.			L4, L3 (1st I-F trans.)
3	radiated signal 1,720 kc		Gang at min. capacity	C22 (Osc. Trimmer)
4	radiated signal 1,400 kc		signal frequency	C20 (Ant. Trimmer)
5	radiated signal near 600 kc			L6 (Rock in)
6	Repeat steps 3, 4 and 5 until aligned.			

MODEL 25BT-2 RCA MFG. CO., INC.

Chassis RC-1004A CV-42 Electrifier

POWER SUPPLY
1 "A" - "B" 1½-90 volt pack.

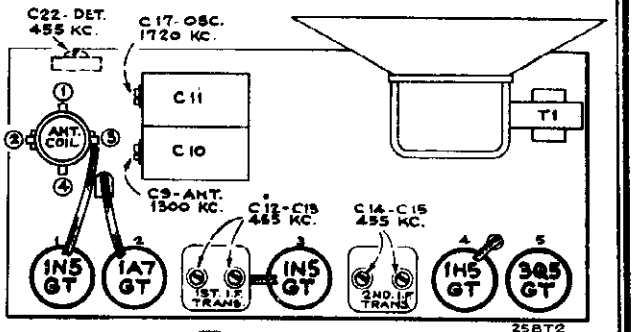
Model 25BT2 can be operated on 105-125 volts AC, 50-60 cycles, or 105-125 volts DC, by means of a RCA CV-42 Electrifier.

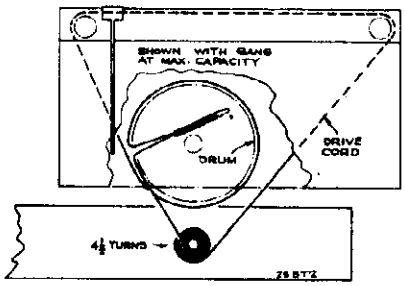
BATTERY DRAIN
MAXIMUM POWER OUTPUT ..... .3 watt
"A" ..... .3 amperes
"B" ..... 10 m.a. (Switch at "Battery Saver" position)
"C" ..... 14 m.a. (Switch at "Maximum Output" position)

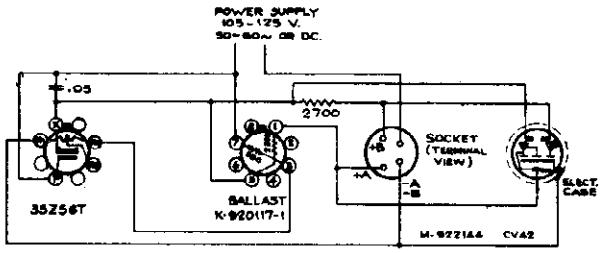
POWER CONSUMPTION
With CV-42 Electrifier Unit ..... 22.5 watts

LOUDSPEAKER (5-inch PM)	RL-85-6	92322-1
Voice coil impedance at 400 cycles	3 ohms	3 ohms

Step	Connect high side of test osc. to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	I-F grid in series with .01 mfd.	455 kc	Quiet point between 550 and 750 kc	C14, C15 (2nd I-F Trans.)
2	1st Det. grid in series with .01 mfd.	"		C12, C13 (1st I-F Trans.)
3	Antenna terminal in series with 200 mmfd.	1,720 kc	Tuning condenser rotor plates all out	C17 (osc.)
4	"	1,300 kc	1,300 kc signal	C9 (ant.)
5	"	455 kc	Quiet point between 550 and 750 kc	Adjust C22 for minimum output on strong 455 kc signal







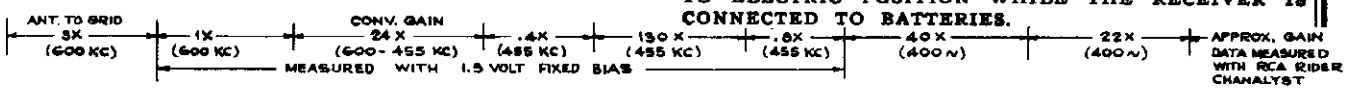
Precautionary Lead Dress.—

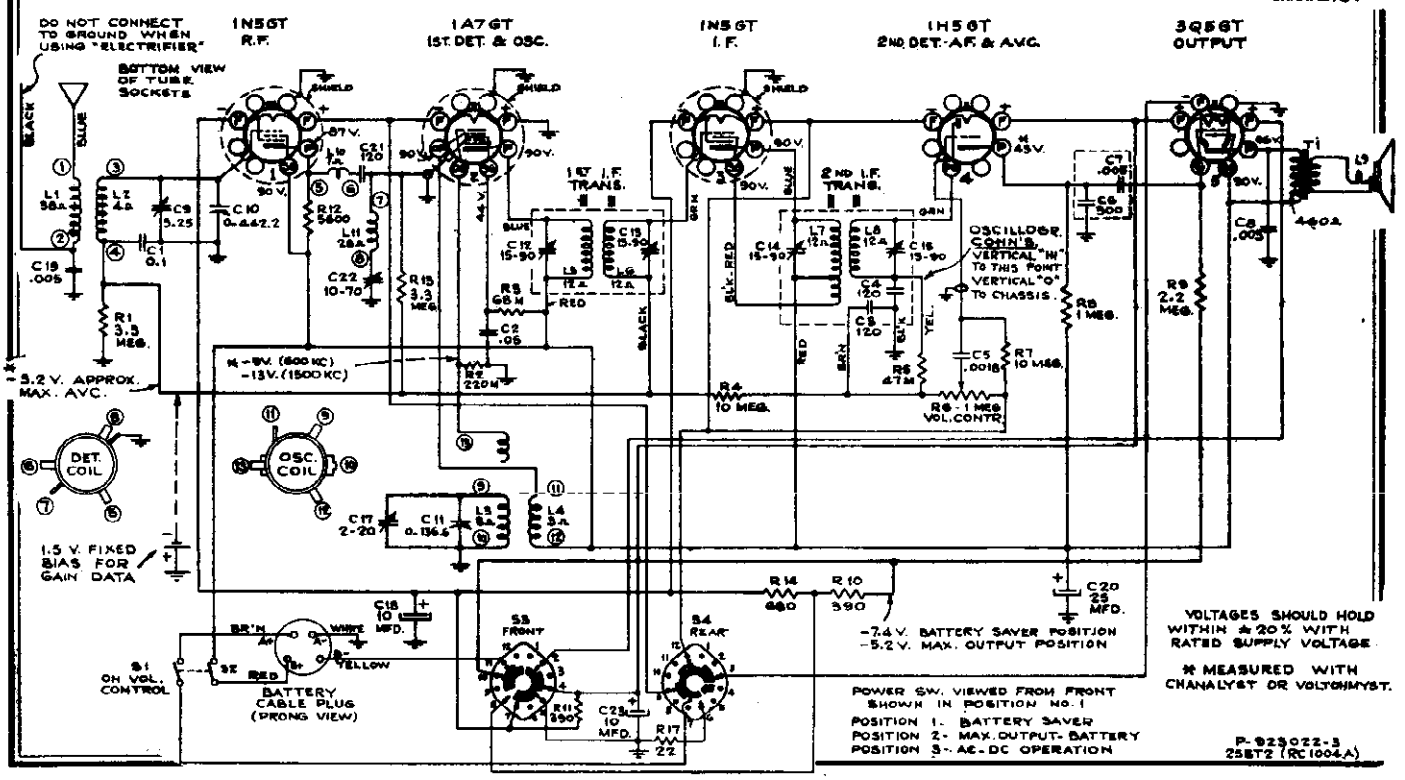
1. The lead from the 3Q5 plate to output transformer should be dressed under clip and away from audio input leads.
2. All filament wires should be dressed close to chassis.
3. Keep AVC lead connecting C1 to antenna coil away from the 1A7GT plate.
4. Keep blue plate leads coming from I.F. transformers short and close to chassis.
5. Keep yellow leads connecting to oscillator coil away from trap coil.
6. Keep grid lead of 1N5GT RF tube away from 1A7GT grid.

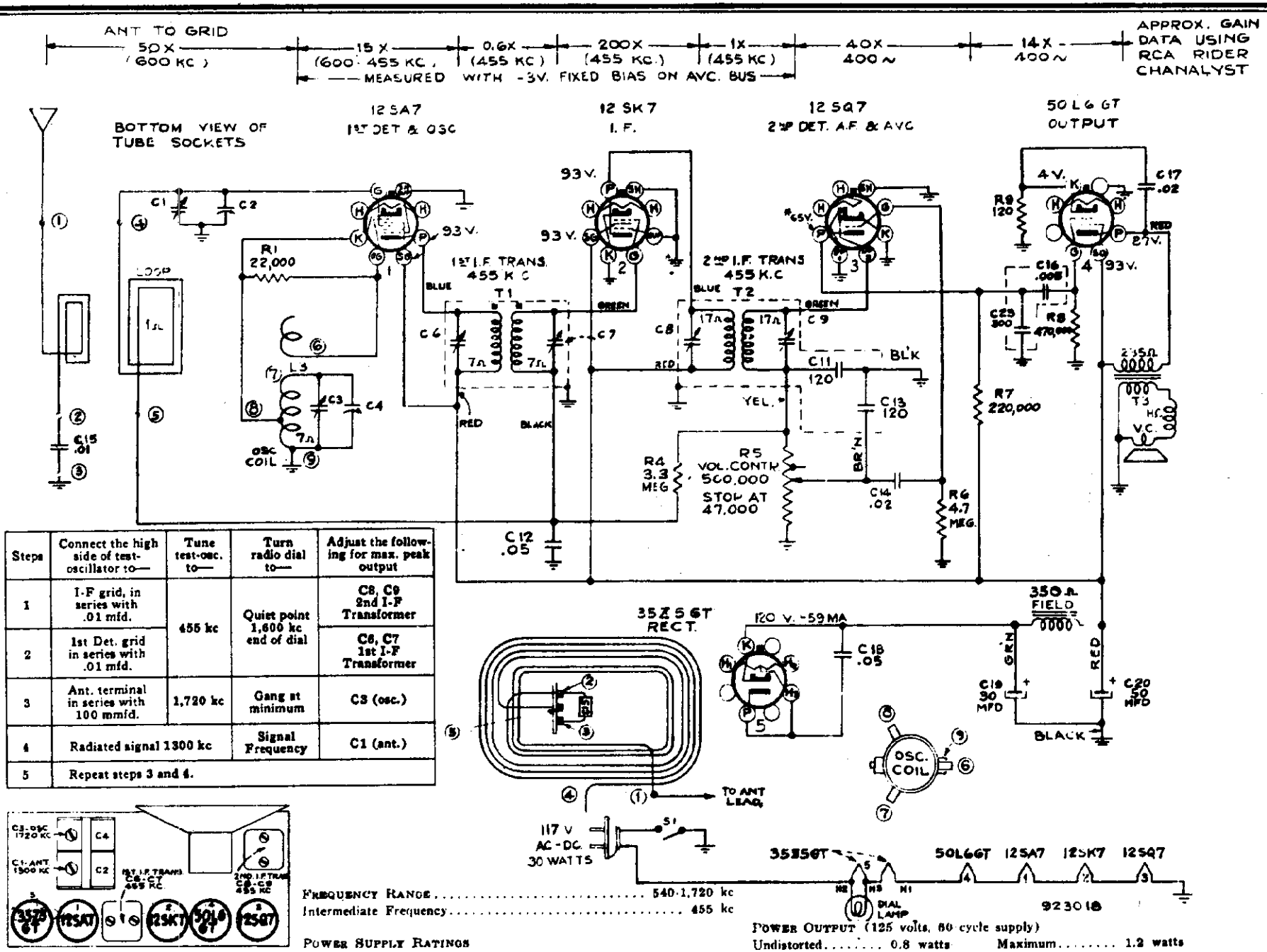
Remove any external ground connections when using the Electrifier.

CAUTION: Turn power switch off (counter-clockwise) when installing or replacing tubes or batteries.

DO NOT TURN THE "BATTERY-ELECTRIC" SWITCH TO ELECTRIC POSITION WHILE THE RECEIVER IS CONNECTED TO BATTERIES.







Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	I-F grid, in series with .01 mfd.	455 kc	Quiet point 1,600 kc end of dial	C8, C9 2nd I-F Transformer
2	1st Det. grid in series with .01 mfd.			C6, C7 1st I-F Transformer
3	Ant. terminal in series with 100 mmfd.	1,720 kc	Gang at minimum	C3 (osc.)
4	Radiated signal 1300 kc		Signal Frequency	C1 (ant.)
5	Repeat steps 3 and 4.			

FREQUENCY RANGE ..... 540-1,720 kc
Intermediate Frequency ..... 455 kc

POWER SUPPLY RATINGS
105-125 volts, direct current, or 50-60 cycles ..... 30 watts

POWER OUTPUT (125 volts, 60 cycle supply)
Undistorted ..... 0.8 watts Maximum ..... 1.2 watts
LOUDSPEAKER (RL-86-B1) ..... 5 inch electro-dynamic

MODELS 26X-1, 26X-3
Chassis RC-1014A

RCA MFG. CO., INC.

FREQUENCY RANGE

Broadcast ..... 540-1,720 kc
Short Wave ..... 8.7-15.6 mc

INTERMEDIATE FREQUENCY ..... 455 kc

PILOT LAMP ..... Mazda No. 51, 6-8 volts, 0.2 amp.

POWER OUTPUT

Undistorted ..... 0.9 watts
Maximum ..... 1.4 watts

LOUDSPEAKER RL-81B2 "PM," or RL-86B1, "EM."

Size 5-inch
V.C. Impedance ..... 4 ohms at 400 cycles

POWER SUPPLY RATING

105-125 volts, AC, 50 or 60 cycles, or DC ..... 80 watts

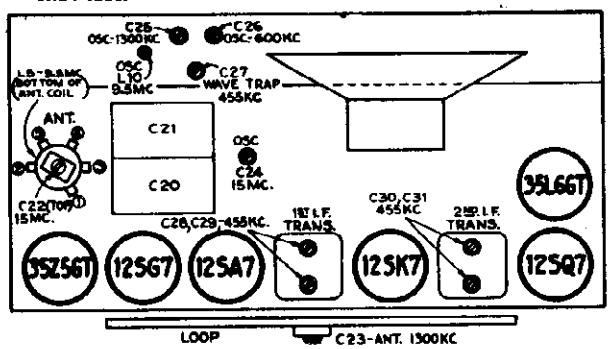
Precautionary Lead Dress

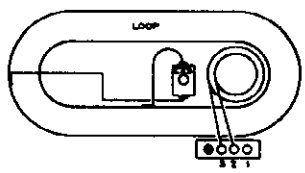
1. Dress output tube plate lead to speaker and output bypass condenser away from terminal board and yellow lead in cable.
2. Dress brown and yellow leads from 2nd I.F. transformer away from output plate and bypass condenser.
3. Dress .02 capacitor C12 away from output capacitor C16.
4. Dress all leads or parts as far as possible away from oscillator coil.
5. Dress lead from C13 to band switch down along front apron of chassis.
6. Dress lead from trimmer condenser on loop to S.W. Ant. coil around outside of rectifier tube. Other leads between rectifier and R.F. tube.

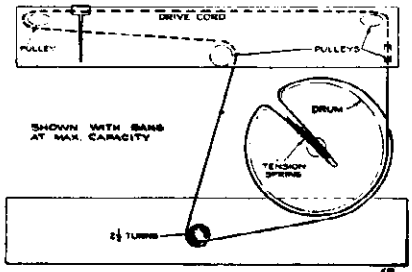
Steps	Connect high side of the test oscillator to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	I.F. grid in series with 0.1 mfd.	455 kc	Quiet Point at 1,700 kc end of dial	C30, C31 2nd I-F trans.
2	1st det. grid in series with 0.1 mfd.			C-28, C-29 1st I-F trans.
3	R.F. grid in series with 0.1 mfd.			C-27** Wave trap
4	Ant. terminal in series with 47 mmf. (link open)	15 mc	15 mc "C" Band	C-24 (osc.)* C-22 (ant.)
5		9.5 mc	9.5 mc "C" Band	L-10 (osc.) L-5 (ant.)
6		Repeat steps 4 and 5.		
7	Ant. terminal in series with 220 mmf. (link open)	1,300 kc	1,300 kc "A" Band	C-25 (osc.) C-23 (ant.)
8		600 kc	600 kc "A" Band	C-26 (osc.)
9		Repeat steps 7 and 8.		

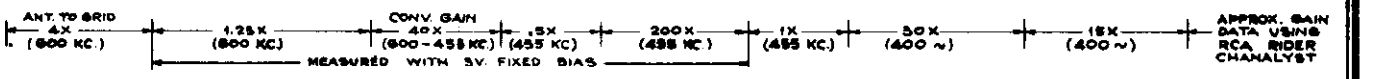
*Use minimum capacity peak if two peaks can be obtained.
**Adjust C-27 for minimum signal with 455 kc applied to R.F. grid.

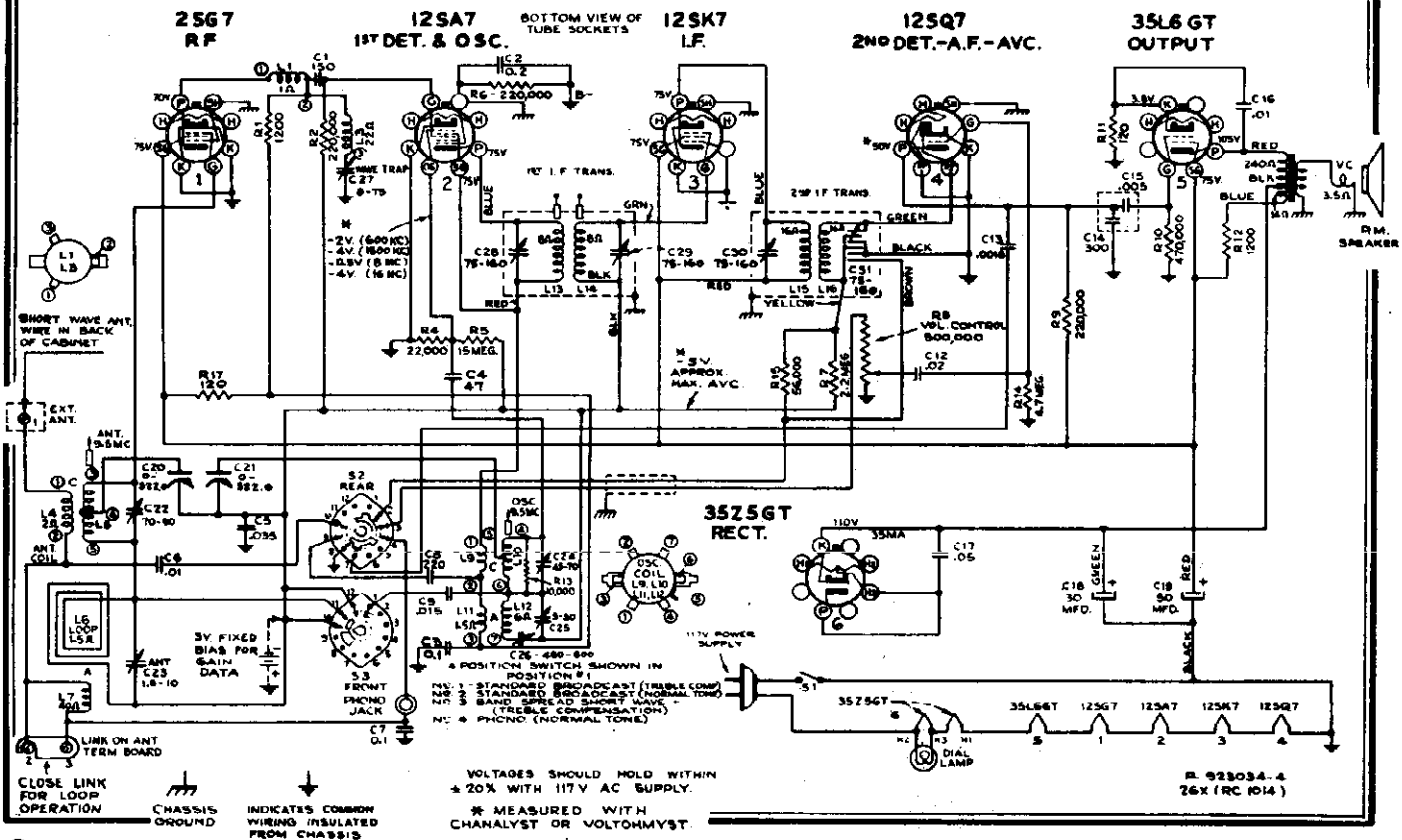
Note.—Oscillator tracks 455 kc above signal on all bands.

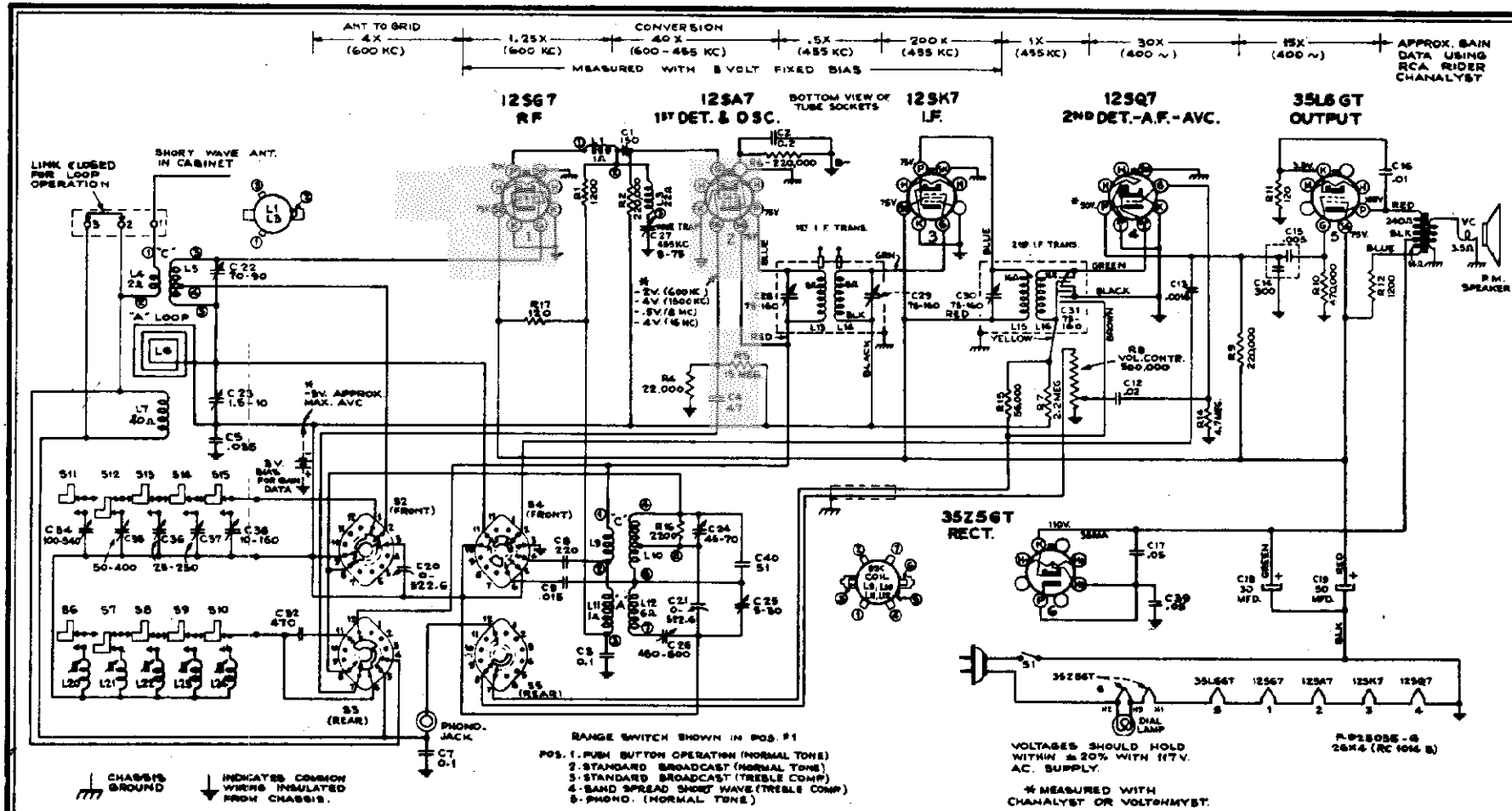


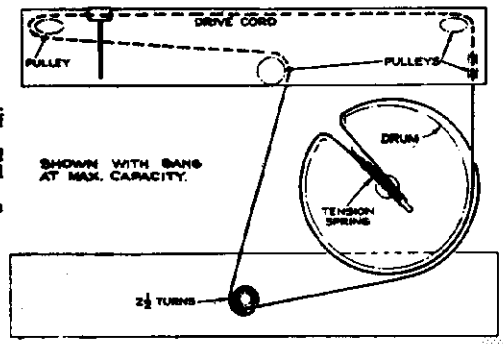












Critical Lead Dress

1. Dress grid lead to 1F amp. tube back into shield can and plate lead from same tube back into shield can to keep exposed length as short as possible.
2. Dress output tube plate lead to speaker and output bypass condenser away from terminal board and yellow lead in cable.
3. Dress brown and yellow leads from 2nd IF transformer away from output plate and bypass condenser.
4. Dress .02 capacitor C12 away from output capacitor C16.
5. Dress all leads or parts as far as possible away from oscillator coil.
6. Dress lead from C13 to band switch down along front apron of chassis.
7. Dress lead from trimmer condenser on loop to S.W. Ant. coil around outside of rectifier tube. Other leads between rectifier and RF tube.
8. Dress lead to contact No. 11 on front wafer of switch away from audio leads.

MODEL 26X-4
Chassis RC-1014B

RCA MFG. CO., INC.

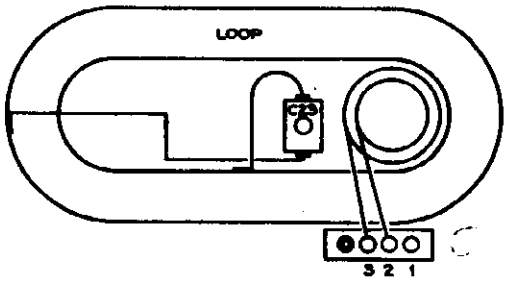
FREQUENCY RANGE
Broadcast ..... 535-1,600 kc
Short Wave ..... 8.7-15.6 mc
Intermediate Frequency ..... 455 kc

PILOT LAMP ..... Mazda No. 51, 6-8 volts, 0.2 amp.

POWER OUTPUT
Undistorted ..... 0.9 watts
Maximum ..... 1.4 watts

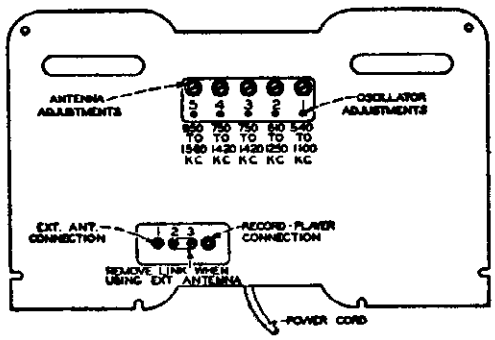
LOUDSPEAKER RL-81B2 "PM," or RL-86-B1 "EM."
Size 5-inch
V.C. Impedance ..... 4 ohms at 400 cycles

POWER SUPPLY RATING
105-125 volts, AC, 50 or 60 cycles, or DC ..... 30 watts



PUSH-BUTTON RANGES
One station between approximately ..... 540-1,100 kc
One station between approximately ..... 610-1,250 kc
Two stations between approximately ..... 750-1,420 kc
One station between approximately ..... 950-1,560 kc

Push Button Adjustment



The station push buttons connect to separate magnetite-core oscillator coils and separate antenna trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool such as RCA Stock No. 31031. Allow at least five minutes warm-up period before making adjustments.

In the event that the receiver is to be used with an external antenna use one or two feet of wire (as an antenna) to ensure sharp peaking during the final adjustment procedure. For loop operation, the link should be strapped across terminals on back of set. In either case the procedure is as follows:

1. Make a list of the desired stations, arranged in order from low to high frequencies.
2. Turn the range selector to "A" band, and manually tune in the first station on the list.
3. Turn range selector to "PB" position, push in station button No. 1 (extreme left). Then adjust the No. 1 oscillator core to receive the station.
4. After oscillator core is set correctly, adjust No. 1 antenna trimmer for maximum output.

   Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.
5. Adjust for each of the remaining stations in the same manner.
6. Make a final careful adjustment of the oscillator cores and antenna trimmers.

On the 950 to 1,560 kc push-button, the higher frequency stations may be received with L24 either in or out (oscillator frequency either 455 kc below or 455 kc above the station frequency). The adjustment with this core in its out position (oscillator frequency 455 kc above the station frequency) is the correct one.

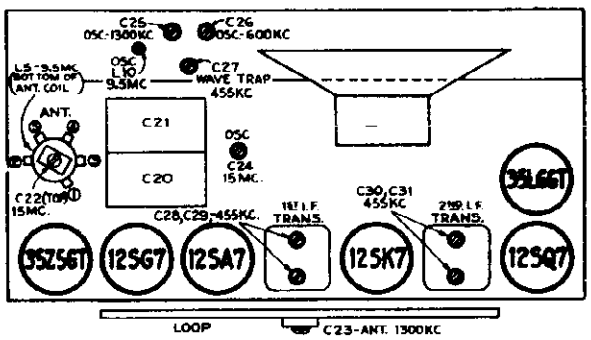
Alignment Procedure

Test Oscillator.—For all alignment operations, keep the output as low as possible to avoid a.v.c. action.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Calibration Scale.—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the dial backing plate for quick reference during alignment.

Power Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.



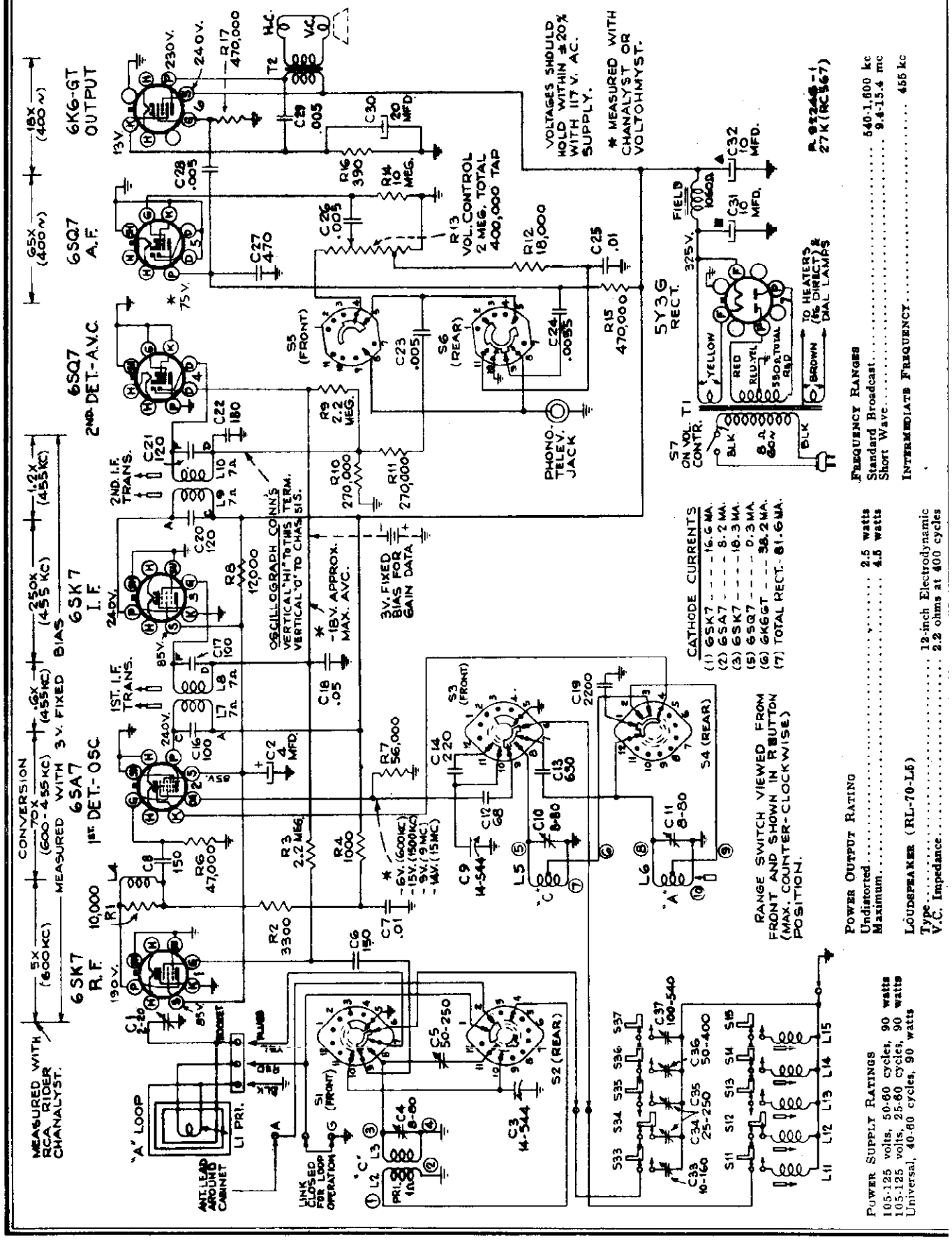
Steps	Connect high side of the test oscillator to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	I.F. grid in series with 0.1 mfd.	455 kc	Quiet Point at 1,700 kc end of dial	C30, C31 2nd I-F trans.
2	1st det. grid in series with 0.1 mfd.			C-28, C-29 1st I-F trans.
3	R.F. grid in series with 0.1 mfd.			C-27** Wave trap
4	Ant. terminal in series with 47 mmf. (link open)	15 mc	15 mc "C" Band	C-24 (osc.)* C-22 (ant.)
5		9.5 mc	9.5 mc "C" Band	L-10 (osc.) L-5 (ant.)
6		Repeat steps 4 and 5.		
7	Ant. terminal in series with 220 mmf. (link open)	1,300 kc	1,300 kc "A" Band	C-25 (osc.) C-23 (ant.)
8		600 kc	600 kc "A" Band	C-26 (osc.)
9		Repeat steps 7 and 8.		

*Use minimum capacity peak if two peaks can be obtained.
**Adjust C-27 for minimum signal with 455 kc applied to R.F. grid.

Note.—Oscillator tracks 455 kc above signal on all bands.

MODEL 27K, Chas. RC-56

RCA MFG. CO., INC.



Power Output Rating

Undistorted ..... 2.5 watts
Maximum ..... 4.5 watts

Frequency Ranges

Standard Broadcast ..... 540-1,600 kc
Short Wave ..... 9.4-15.4 mc

Intermediate Frequency ..... 455 kc

Loudspeaker (RL-70-L6)

Type ..... 12-inch Electrodynamic
V.C. Impedance ..... 2.2 ohms at 400 cycles

Power Supply Ratings

105-125 volts, 50-60 cycles, 90 watts
105-125 volts, 25-60 cycles, 90 watts
Universal, 40-60 cycles, 90 watts

Push Button Adjustment

The station push buttons connect to separate magnetite-core oscillator coils and separate antenna trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool such as RCA Stock No. 31031. Allow at least five minutes warm-up period before making adjustments.

In the event that the receiver is to be used with an external antenna use one or two feet of wire (as an antenna) to ensure sharp peaking during the final adjustment procedure. For loop operation, the link should be strapped across terminals on back of set. In either case the procedure is as follows:

1. Make a list of the desired stations, arranged in order from low to high frequencies.
2. Turn the range selector to "A" band, and manually tune in the first station on the list.
3. After turning range selector to "PB" position, push in station button No. 1 (extreme left). Then adjust the No. 1 oscillator core (L-15) to receive the station.
4. After oscillator core is set correctly, adjust C-37 for maximum output.

   Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.
5. Adjust for each of the remaining stations in the same manner.
6. Make a final careful adjustment of the oscillator cores and antenna trimmers.

On the 880 to 1,600 kc push-button, the higher frequency stations may be received with L-11 either in or out (oscillator frequency either 455 kc below or 455 kc above the station frequency). The adjustment with this core in its out position (oscillator frequency 455 kc above the station frequency) is the correct one.

Steps	Connect high side of test oscillator to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output—
1	6SK7 I-F grid in series with 0.01 mfd.	455 kc	"A" Band Quiet Point between 550 and 750 kc	L-9 and L-10 (2nd I-F Trans.)
2	6SA7 grid in series with 0.01 mfd.			L-7 and L-8 (1st I-F Trans.)
3	Yellow loop lead in series with 200 mmf.	1,500 kc	"A" Band 1,500 kc (20°)	C-11 (osc.)
4		600 kc	"A" Band 600 kc (149.5°)	L-6 (osc.)
5	Antenna terminal in series with 47 mmf. (link open)	15.2 mc	"C" Band 15.2 mc (13.5°)	C-10 (osc.)* C-4 (ant.)
6		9.5 mc	"C" Band 9.5 mc (148°)	C-5 (ant.) (Rock gang)
7	Radiation loop consisting of two turns of wire 18 inches in diameter located 4 to 6 feet from receiver	1,500 kc	"A" Band 1,500 kc	C-1 (on loop)
8		600 kc	600 kc	L-6 (osc.) (Rock gang)
9		Repeat steps 7 and 8.		

*Use minimum capacity peak if two can be obtained.

Note.—Oscillator tracks 455 kc above signal on all bands.

External Antenna.—For best reception on "C" band with an external antenna, peak the trimmer on "C" antenna coil for maximum output on a station in the 31-meter band.

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

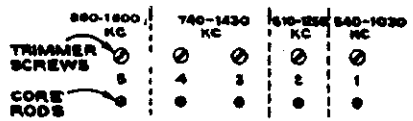
Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the indicator-drive-cord drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

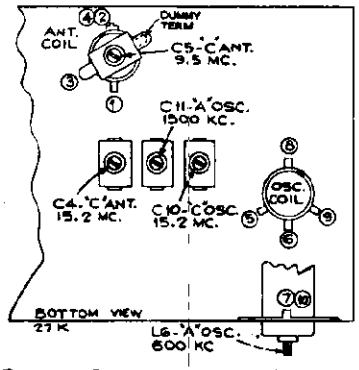
As the first step in r-f alignment, check the position of the drum. The "90°" mark on the drum scale must be vertical, and directly under the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by plastic cement which must be tight when the drum is in the correct position.

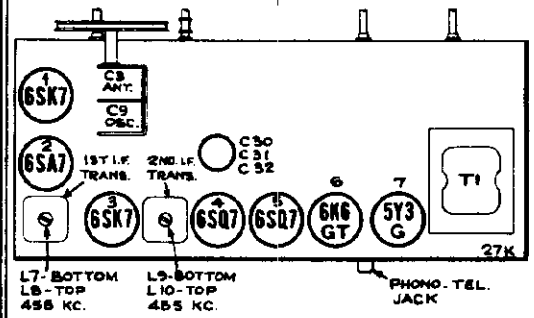
To determine the corresponding frequency for any setting of the calibration scales, refer to the accompanying drawing which shows the dial with 0-180° calibration scales drawn at top and bottom.

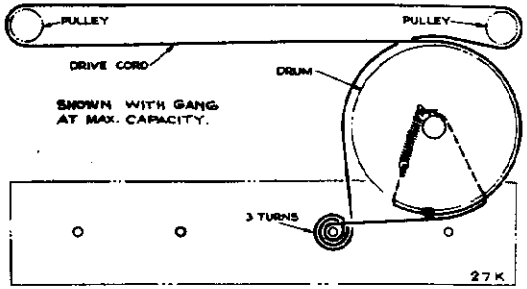
Pointer for Calibration Scale. — Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "180°" mark on the calibration scale when the plates are fully meshed.

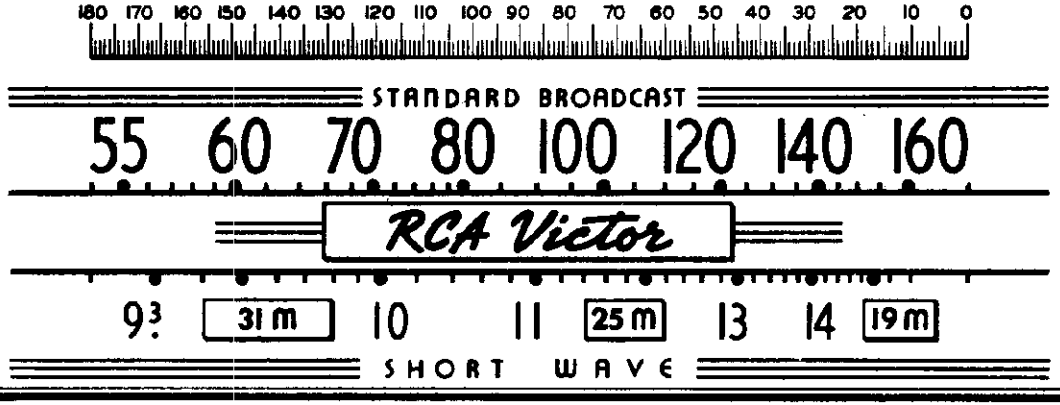
Dial-Indicator Adjustment. — After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 540 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

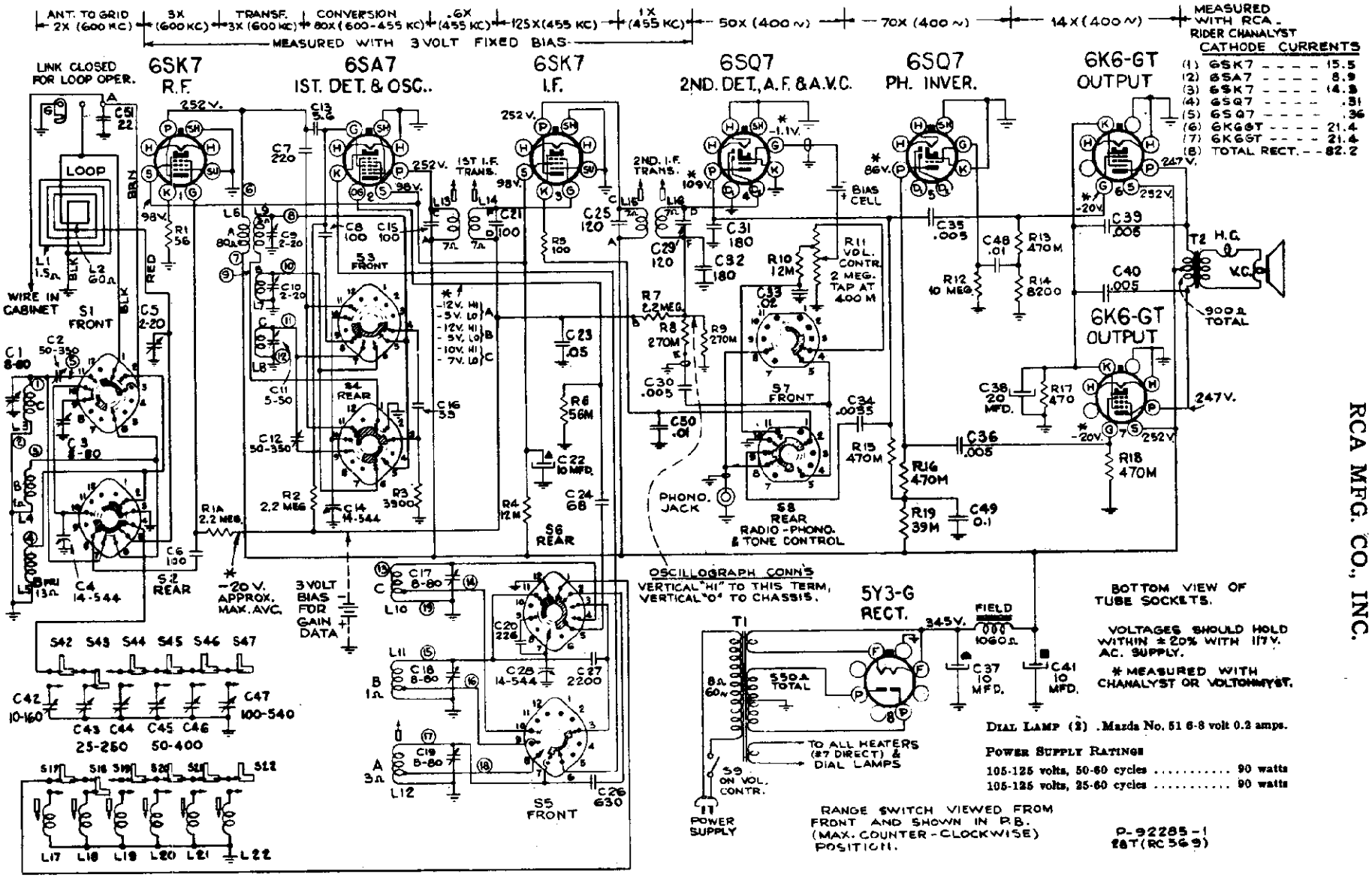












DIAL LAMP (2) .Mazda No. 51 6-8 volt 0.2 amps.

POWER SUPPLY RATINGS

105-125 volts, 50-60 cycles ..... 90 watts
105-125 volts, 25-60 cycles ..... 90 watts

Precautionary Lead Dress.—

1. Dress shielded lead from diode filter to tone control switch away from grid of the 6SQ7 a-f amplifier.
2. Dress shielded lead from grid of 6SQ7 a-f amplifier away from diode output system.
3. Power leads to rear of volume control should be dressed towards side apron.
4. Plate leads on output tubes should be dressed towards chassis.

FREQUENCY RANGES

"A" Standard Broadcast ..... 540-1600 kc
"B" Medium Wave ..... 2,300-6,300 kc
"C" Short Wave ..... 9,400-15,400 kc

INTERMEDIATE FREQUENCY ..... 455 kc

POWER OUTPUT RATING

Undistorted ..... 4.5 watts
Maximum ..... 5.5 watts

LOUDSPEAKER (92196-3)

Type ..... 9x6 inches elliptical, electrodynamic
V.C. Impedance ..... 4.4 ohms at 400 cycles

MODEL 28T, Chas. RC-569

RCA MFG. CO., INC.

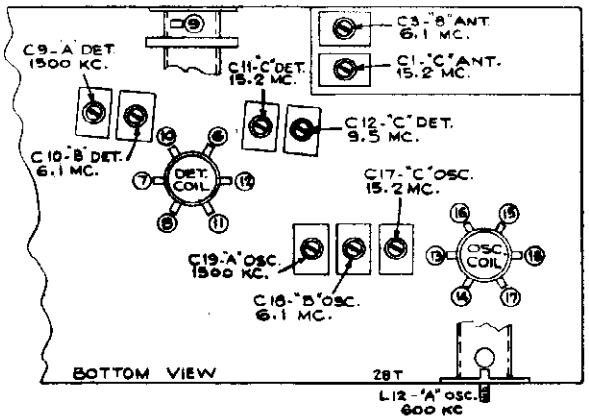
Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

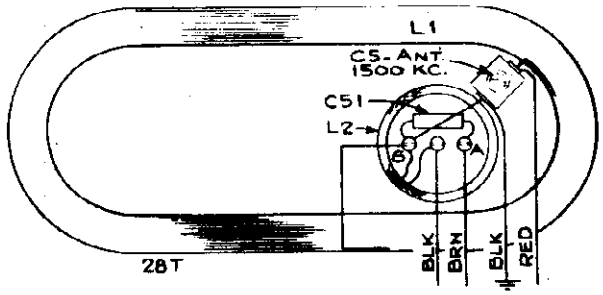
Electronic Voltmeter.—The electronic voltmeter in the Chanalyst or VoltOhmyst provides an unexcelled output indicator. It should be connected to the AVC bus, and the test-oscillator output adjusted to produce several volts of AVC.

Calibration for Alignment.—The dial calibration for alignment purposes can be set up in two ways:

1. The dial may be very easily removed from the cabinet. The condenser plates should then be turned into full mesh, the pointer adjusted to the scratch at the left end of the dial backing plate, and the dial placed on the frame so that its extreme left calibration mark coincides with the pointer. The dial may be held in place with scotch tape. In this manner the actual receiver dial is used for alignment. When alignment is finished, the scale should be replaced.
2. A calibration scale is attached to the tuning drum. The correct setting of the gang, in degrees, for each alignment frequency is given in the alignment table. Check the position of the drum, making sure that the 0 degree scale mark is horizontal with the gang in full mesh.

Pointer for Calibration Scale.—If method (2) is used, improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 0 degree mark on the calibration scale when the plates are fully meshed.





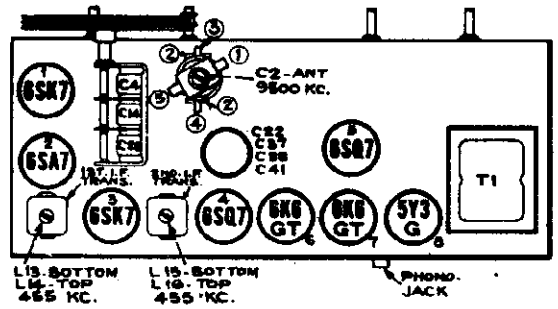
Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic diagram.

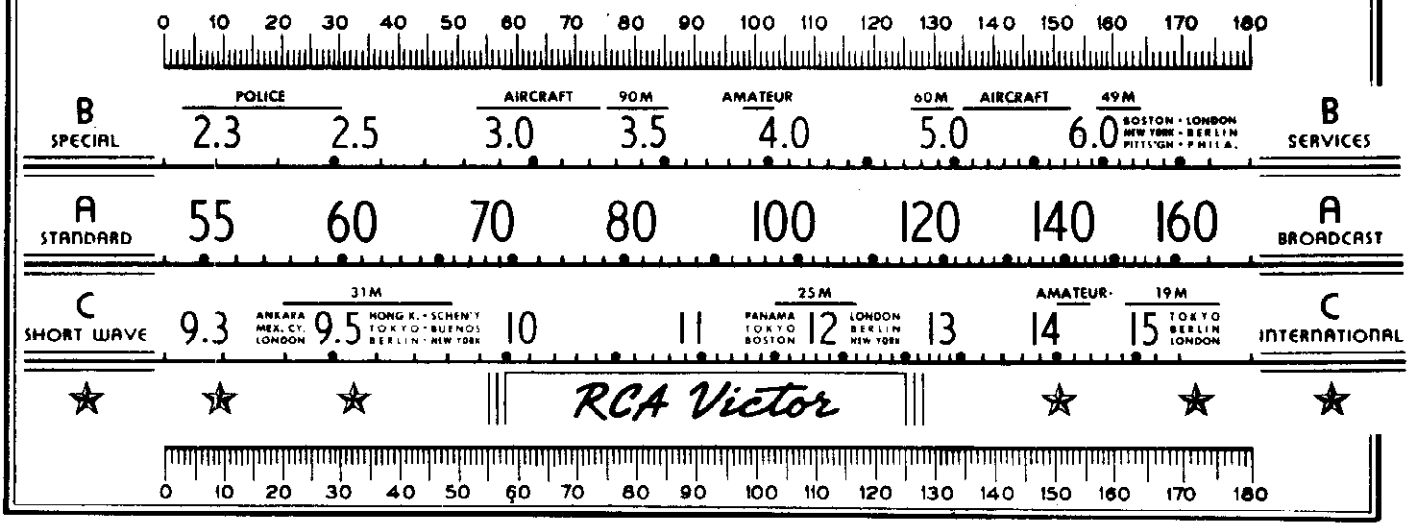
Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

External Antenna.—For best reception on "C" band with an outside antenna, adjust C2 for peak output on a station in the 31-meter band.

Steps	Connect the high side of the test-osc. to—	Tune test osc. to—	Turn radio dial to—	Adj. the following for max. peak output
1	I-F Grid in series with .01 mfd.	455 kc	"A" Band Quiet Point between 550-750 kc	L-15 and L-16 2nd I-F Trans.
2	Det. Grid in series with .01 mfd.			L-13 and L-14 1st I-F Trans.
3	Ant. terminal in series with 200 mmfd. (link open)	1,500 kc	1500 kc (160°) "A" Band	C-19 (osc.) C-9 (Det.) C-5 (on loop)
4		600 kc	600 kc (30.5°)	L-12 Rock Gang
5		Repeat (3) and (4)		
6	Ant. terminal in series with 22 mmfd. (link open)	6,100 kc	6,100 kc (161°) "B" Band	C-18 (osc.)* C-10 (Det.) Rock Gang C-3 (ant.)
7		15,200 kc	15,200 kc (167°) "C" Band	C-17 (osc.)* C-11 (Det.) Rock Gang C-1 (ant.)
8		9,500 kc	9,500 kc (28.8°)	C-2 (ant.) C-12 (Det.) Rock Gang
9		Repeat (7) and (8)		

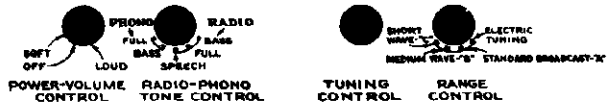
*Use minimum capacity peak if two peaks can be obtained.
Note—Oscillator tracks 455 kc above signal on all bands.

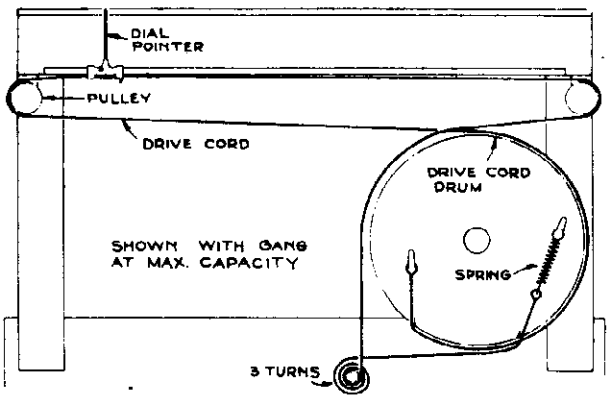


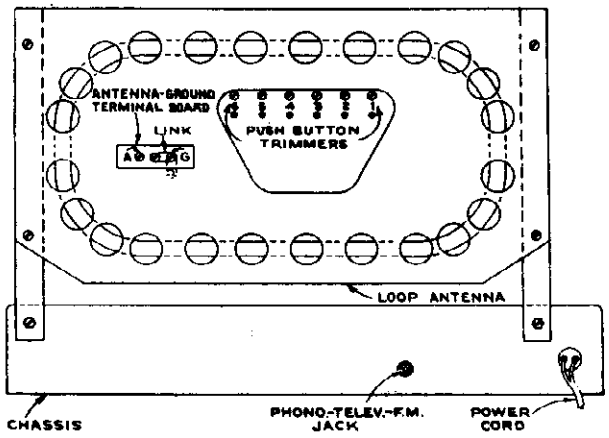


MODEL 28T, Chas. RC-569

RCA MFG. CO., INC.







Replacement Parts

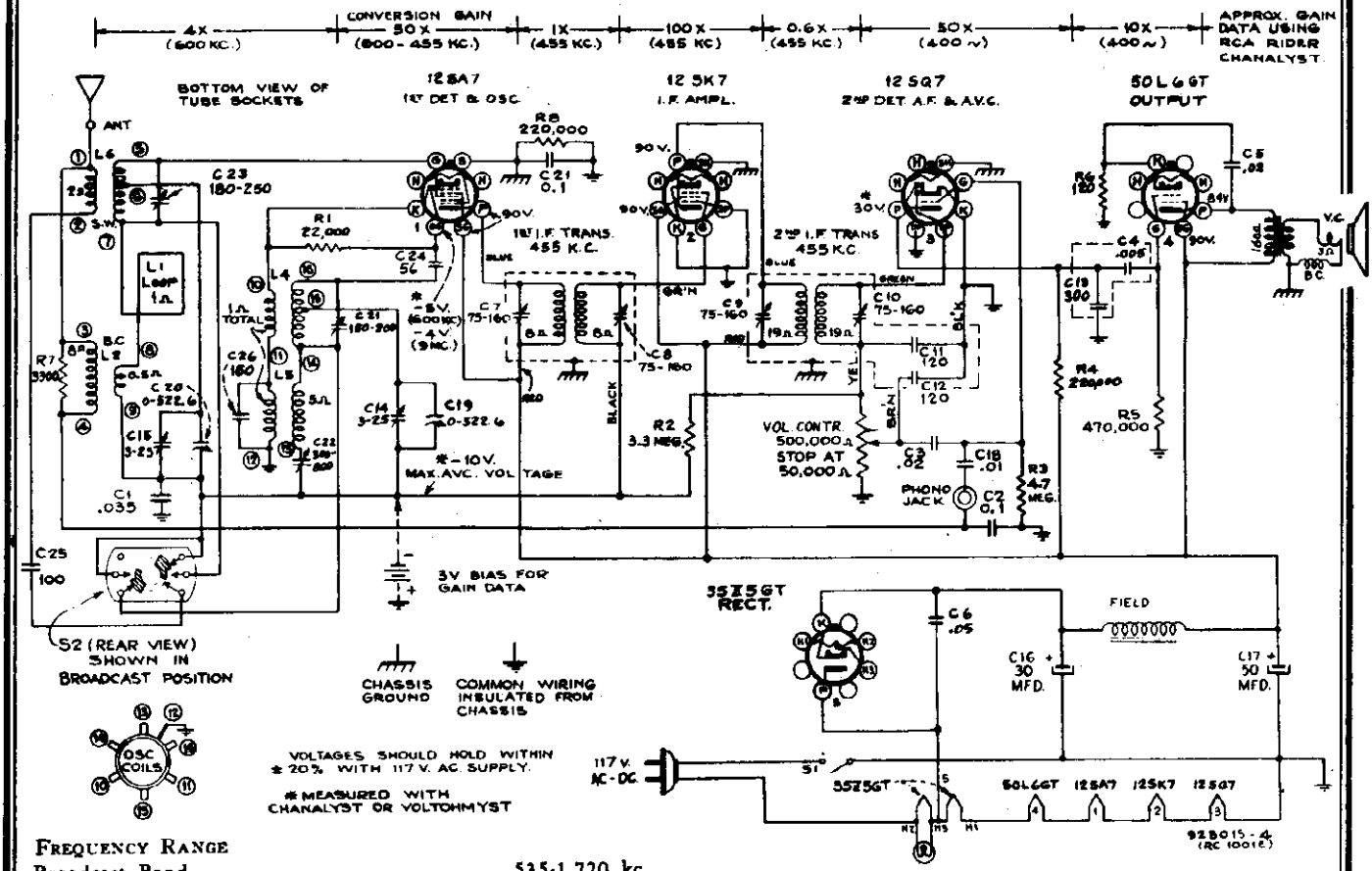
Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-569)	
34025	Board—"Antenna-Ground" board	.25
33014	Capacitor—Electrolytic, comprising 3 sections of 10 mfd., 450 volts, and 1 section of 20 mfd., 25 volts	1.90
38368	Capacitor—Adjustable trimmer (50-350 mmfd.) for antenna coil	.25
38357	Capacitor—Mica trimmer—2-20 mmfd.	.25
38363	Capacitor—Mica trimmer comprising 2 sections of 8-80 mmfd.	.40
35791	Capacitor—Mica trimmer comprising 3 sections of 8-80 mmfd.	.50
36424	Capacitor—Mica trimmer comprising 1 section of 10-160 mmfd., 2 sections of 25-250 mmfd., 2 sections of 50-400 mmfd., and 1 section of 100-540 mmfd.	1.10
38360	Capacitor—Mica trimmer comprising 1 section of 50-350 mmfd., 1 section of 5-50 mmfd., and 2 sections of 2-20 mmfd.	.75
12814	Capacitor—5.6 mmfd.	.35
14021	Capacitor—22 mmfd.	.35
12948	Capacitor—33 mmfd.	.35
13057	Capacitor—68 mmfd.	.35
12720	Capacitor—100 mmfd., moulded	.35
34699	Capacitor—100 mmfd., unmoulded	.30
34700	Capacitor—120 mmfd.	.30
13003	Capacitor—180 mmfd.	.35
12694	Capacitor—220 mmfd.	.35
38830	Capacitor—226 mmfd.	.35
38831	Capacitor—630 mmfd.	.45
30882	Capacitor—2,200 mmfd.	.20
30303	Capacitor—.0035 mfd.	.40
33584	Capacitor—.005 mfd.	.25
4937	Capacitor—.01 mfd.	.25
36248	Capacitor—.02 mfd.	.20
32787	Capacitor—.05 mfd.	.20
4839	Capacitor—0.1 mfd.	.30
31581	Cell—Bias cell	.25
38367	Coil—Antenna coil	1.00
36031	Coil—Loop primary coil	.50
38358	Coil—Oscillator coil	1.00
38315	Coil—Push button oscillator coil—high frequency	.30
37638	Coil—Push button oscillator coil—low frequency	.30
38366	Coil—R.F. coil	1.75
38364	Condenser—3-gang variable tuning condenser	3.65
38404	Control—Volume control and power switch	2.00
34662	Cord—Pointer cord (approx. 60-in. overall length)	.25
35788	Core—Adjustable core and stud for oscillator coil	.15
35871	Core—Adjustable core and stud for push button oscillator coils	.55
38359	Cup—Coil mounting cup and bushing	.20
38361	Drum—Condenser drive drum	.50
38365	Frame—Dial frame complete—less dial	1.75
31580	Holder—Bias cell holder	.15
35798	Indicator—Station selector indicator	.20
38356	Loop—Antenna loop complete—less supports	2.60
5040	Plug—4-contact female plug for speaker cable	.30
31373	Pulley—Drive cord pulley	.08
13220	Resistor—56 ohms, ½ watt	.20
34785	Resistor—100 ohms, ½ watt	.20
35885	Resistor—470 ohms, 2 watt	.25
30694	Resistor—3,900 ohms, ½ watt	.20
14075	Resistor—8,200 ohms, ½ watt	.20
30436	Resistor—12,000 ohms, ½ watt	.20
35875	Resistor—12,000 ohms, 3 watt	.35
12266	Resistor—39,000 ohms, ½ watt	.20
30650	Resistor—56,000 ohms, ½ watt	.20
30651	Resistor—270,000 ohms, ½ watt	.20
30648	Resistor—470,000 ohms, ½ watt	.20
30649	Resistor—2.2 meg., ½ watt	.20
30992	Resistor—10 meg., ½ watt	.20
35797	Shaft—Tuning knob shaft	.30
31364	Socket—Dial lamp socket	.20
35787	Socket—Phono input socket	.15
31251	Socket—Tube socket	.25
31418	Spring—Pointer cord spring	.05
12007	Spring—Retaining spring for oscillator coil core and stud	.02
38362	Switch—Range switch	2.85
38384	Switch—Selector switch	2.90
38369	Switch—Tone switch	1.00
35636	Transformer—First I.F. transformer	1.70
35790	Transformer—Second I.F. transformer	1.60
35588	Transformer—Power transformer—105-120 volts, 25 cycle	6.30
35959	Transformer—Power transformer—105-120 volts, 50-60 cycle—less shields	3.75
35969	Washer—"C" washer for tuning knob shaft	.02
	SPEAKER ASSEMBLIES (92196-3)	
38817	Coil—Field coil—1,060 ohms	2.10
38373	Cone—Cone complete with voice coil	1.75
5039	Plug—4-prong male speaker plug	.30
38374	Transformer—Output transformer	1.65
	MISCELLANEOUS ASSEMBLIES	
38376	Bezel—Push button bezel	.75
38375	Button—Push button	.20
37334	Clip—Dial clip	.15
38378	Decalcomania—Control panel decal—Pkg. 5	.02
38377	Dial—Glass dial scale	1.40
35814	Knob—Control knob	.25
11765	Lamp—Dial lamp	.15
34317	Marker—Station selector marker	.35
33774	Mounting—Speaker mounting hardware	.30
30900	Spring—Retaining spring for control knobs	.05
34053	Spring—Retaining spring for push button	.02

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

MODEL 34X, Ch.RC-1001E

RCA MFG. CO., INC.



Frequency Range

Broadcast Band ..... 535-1,720 kc
Short Wave Band ..... 8.9 mc to 12 mc.

Intermediate Frequency ..... 455 kc

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	12SK7 grid in series with 0.1 mfd.	455 kc	Quiet Point at 1,600 kc end of dial	C10, C9 2nd I-F Transformer
2	12SA7 grid in series with 0.1 mfd.			C8, C7 1st I-F Transformer
3	Antenna term. in series with 47 mmf.	10 mc*	10 mc	C21 (osc.)** C23 (ant.)
4	Antenna term. in series with 200 mmfd.	1,600 kc	1,600 kc	C14 (osc.)
5	Radiation Loop	1,300 kc	Resonance on Signal	C15 (ant.)
6	Radiation Loop	600 kc	600 kc	C22 Osc. Rock in

* It is recommended that this step be repeated using a received station of known frequency.

** Use minimum capacity if two peaks can be obtained.

Pilot Lamp..... Mazda No. 51, 6-8 volts, 0.2 amp.

Power Output

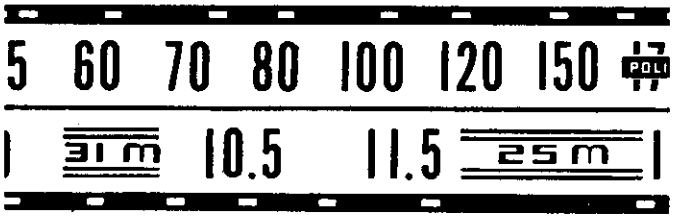
Undistorted ..... .9 watts
Maximum ..... 1.3 watts

Loudspeaker

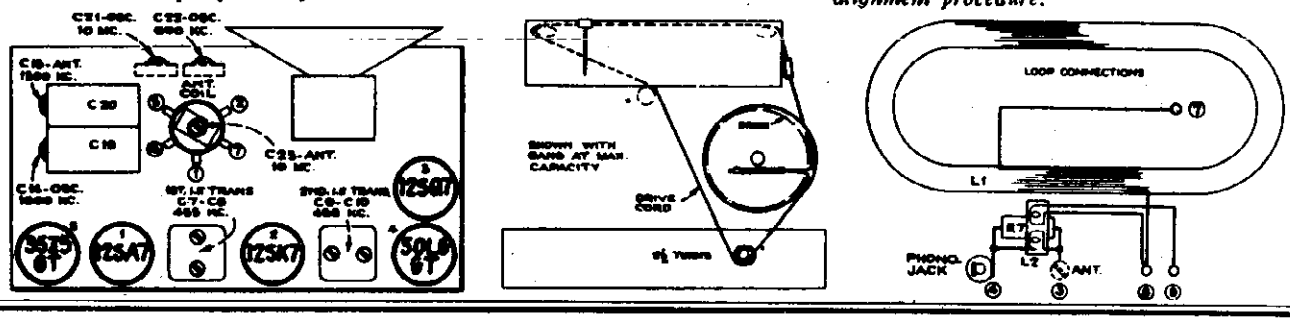
Type..... 5-inch electro dynamic
V.C. Impedance..... 4.0 ohms at 400 cycles

Power Supply Rating

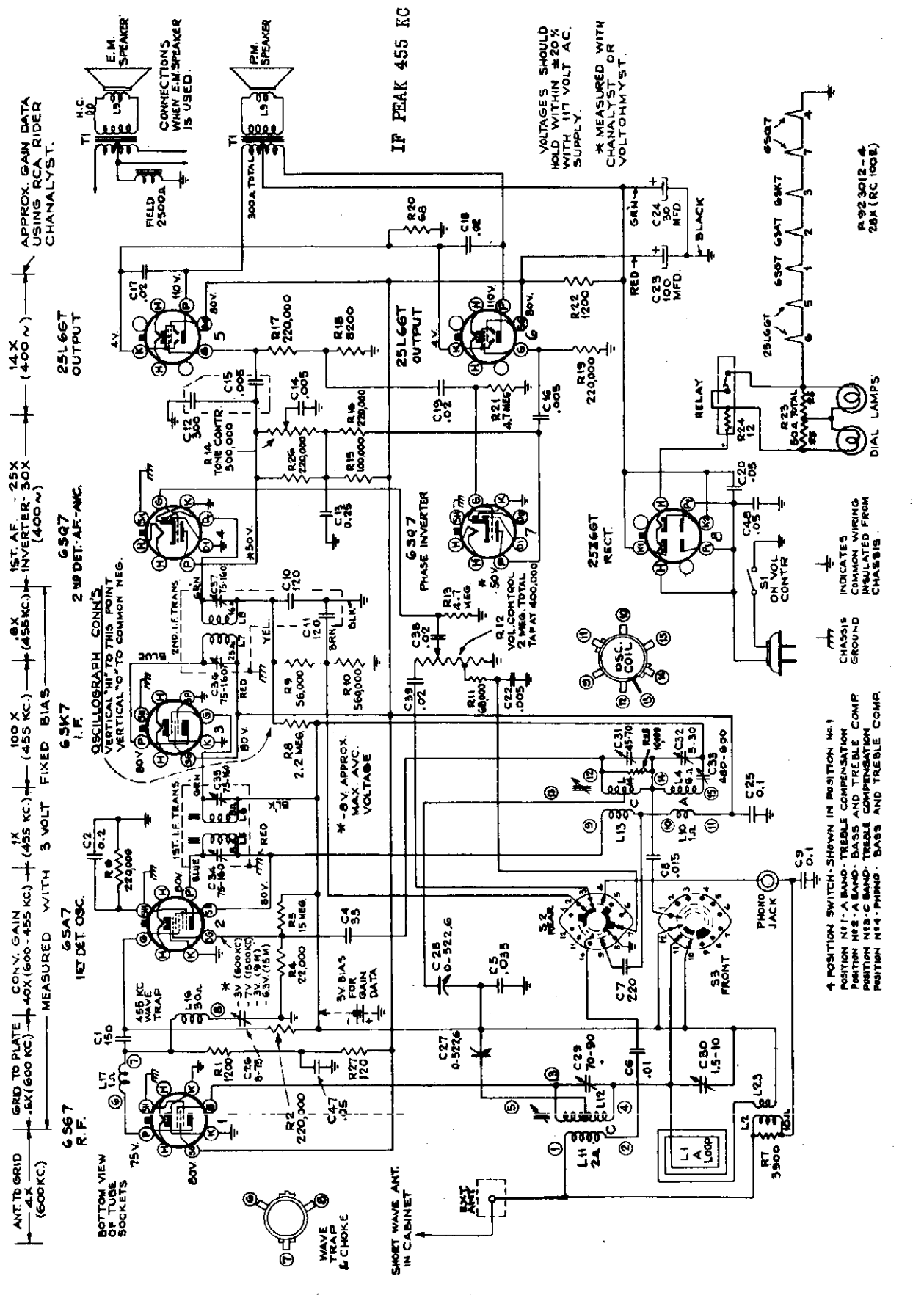
105-125 volts, AC 50 or 60 cycles, or DC..... 25 watts



The dial scale drawing shown is a full size reproduction. It can be used as a direct substitute for regular dial scale in alignment procedure.



RCA MFG. CO., INC.



MODEL 28X, Ch. RC-1002

RCA MFG. CO., INC.

FREQUENCY RANGES

Standard Broadcast	535-1,720 kc
Short Wave	8.7-15.6 mc
Intermediate Frequency	455 kc

Thermal relay cuts in the dial lamps after the set warms up.—This set incorporates a thermal relay to control the dial lamps. When the set is "off," the relay contacts are closed. This shorts out the two lamps. When the set is turned "on," the heater current flows through the relay element R24. This heats up and causes the relay contacts to open, permitting the heater current to flow through the two dial lamps and light them. In normal operation, the lamps light about a half-minute after the set is turned on.

LOUDSPEAKER	92136-2	or	92136-3
Type	PM		EM
Size	9½-inch "Ellipticon"		9½-inch "Ellipticon"
Voice Coil Impedance at 400 cycles	4 ohms		8 ohms

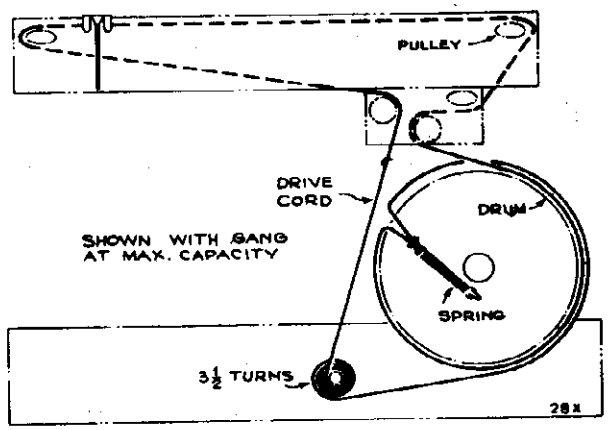
POWER OUTPUT RATING

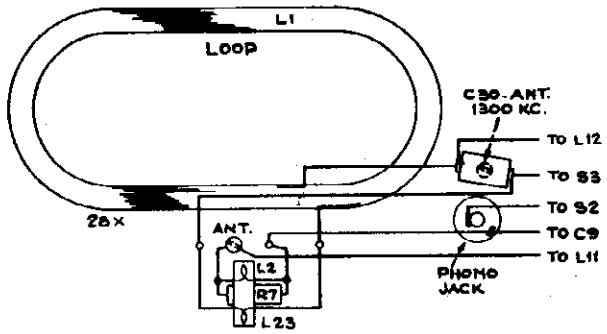
Undistorted	2.5 watt
Maximum	4.0 watt

POWER SUPPLY RATING

105-125 A.C. 50-60 cy. or D.C. ..... 45 watts

	Height	Width	Depth
Cabinet Dimensions (inches)	10¾	15	9½
Chassis Base Dimensions (inches)	2½	12½	6
Overall Chassis Height			9½





Alignment Procedure

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—Connect the low side of the test-oscillator to the receiver chassis, through a .01 mfd. capacitor, and keep the output as low as possible.

Antenna.—The set is equipped with a built-in loop antenna. If an outdoor antenna is used, it may be connected to the "ANT" terminal on rear of cabinet. It should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

Phono Attachment.—A jack is provided on the rear of cabinet for connecting a Phono Attachment into the audio-amplifying circuit. The cable from the Phono Attachment should be terminated in a Stock No. 31048 plug to fit the jack.

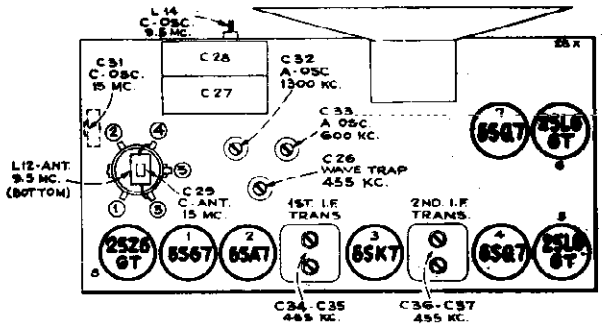
Dial Pointer Adjustment.—The dial pointer should be set at the left hand end dial marks, with the gang in full mesh.

Steps	Connect the high side of test osc. to—	Tune test osc. to—	Range Switch to—	Turn radio dial to—	Adjust the following for max. peak output
1	I-F grid in series with .01 mfd.	455 kc	A	Quiet Point near middle of dial	C36, C37 2nd I.F. Trans.
2	Det. grid in series with .01 mfd.				C34, C35 1st I.F. Trans.
3	Ant. lead in series with 50 mmfd.	15 mc	C	15 mc	C-31 (osc.)* C-29 (ant.)
4		9.5 mc	C	9.5 mc	L14 (osc.) L12 (ant.)
		Repeat steps 3 and 4.			
5	Antenna terminal in series with 200 mmfd.	1,300 kc	A	1,300 kc	C-32 (osc.) C-30 (ant.)
6		600 kc	A	600 kc	C-33 Rock in
7		Repeat steps 5 and 6.			
8	R-F grid in series with .01 mfd.	455 kc	A	low end of dial	C-26**

*Oscillator should track on high frequency side of signal.

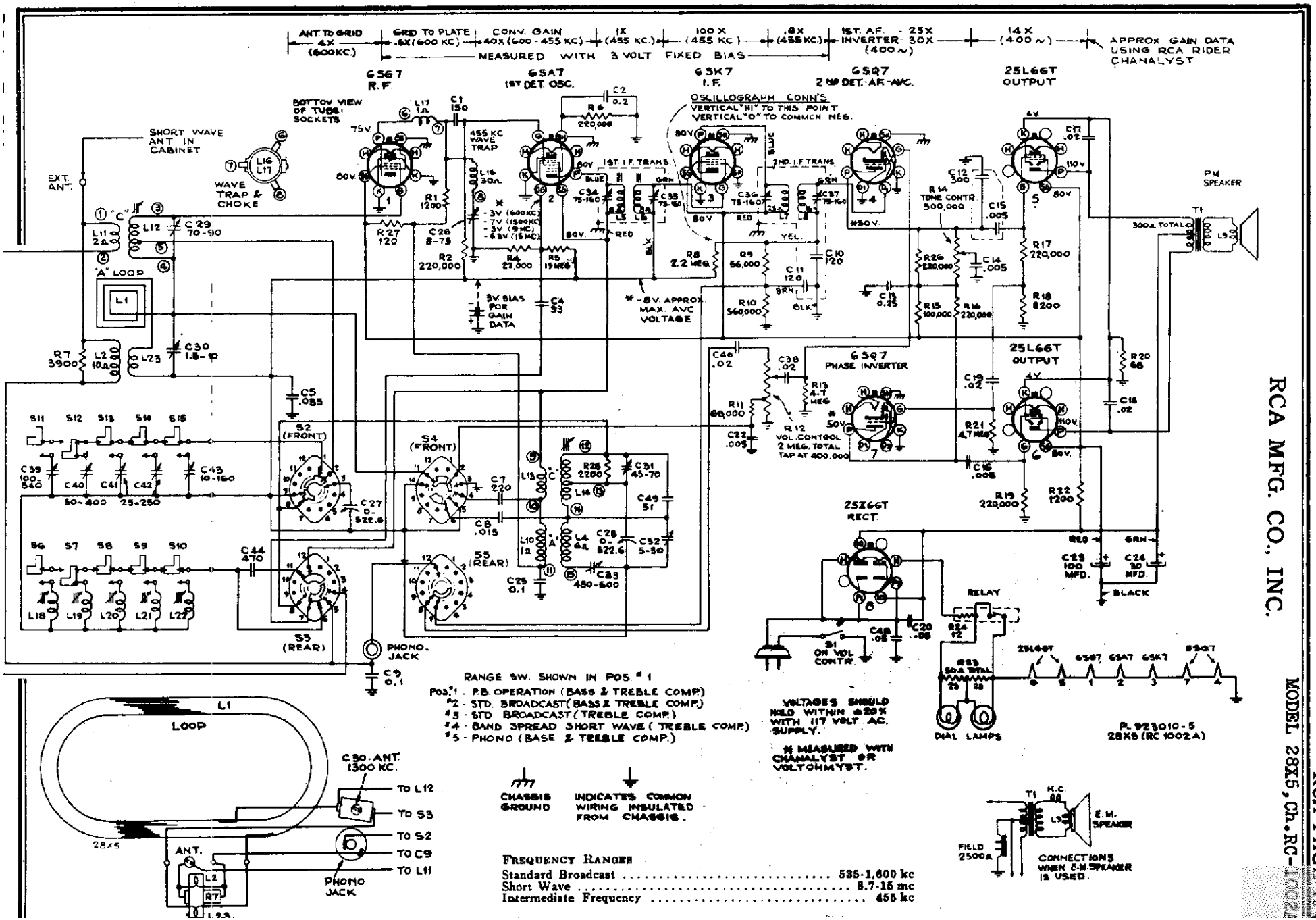
If two peaks are obtained use high frequency (minimum capacity peak).

**Feed a high signal level of 455 kc into R.F. grid and adjust C-26 for minimum signal.



Critical Lead Dress

1. Dress all AC filament and power wiring down close to chassis and as far as possible from all audio grid or plate wiring.
2. Dress all leads or parts as far as possible away from oscillator coil.
3. Dress audio coupling capacitor C38 from volume control to grid of 6SQ7 away from filament wire connecting No. 8 pin socket 5 and No. 8 pin socket 7.
4. Dress lead from trimmer condenser on loop to S.W. ant. coil between rectifier and R.F. tube and away from other coil leads.
5. Dress I-F plate and grid leads back into shield can to keep exposed length as short as possible.



RCA MFG. CO., INC.

MODEL 28X5, Ch. RC-1002

MODEL 28X5, Ch. RC-1002A

RCA MFG CO., INC.

LOUDSPEAKER

Type ..... Elliptical 9x6 inches Perm. Mag.
V.C. Impedance ..... 4 ohms at 400 cycles

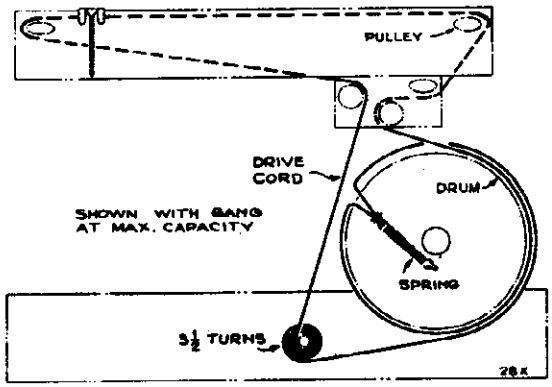
POWER OUTPUT RATING

Undistorted ..... 2.5 watt
Maximum ..... 4.0 watt

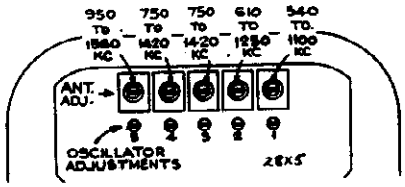
POWER SUPPLY RATING

105-125 A.C. 50-60 cy. or D.C. ..... 45 watts

Thermal relay cuts in the dial lamps after the set warms up.—This set incorporates a thermal relay to control the dial lamps. When the set is "off," the relay contacts are closed. This shorts out the two lamps. When the set is turned "on," the heater current flows through the relay element R24. This heats up and causes the relay contacts to open, permitting the heater current to flow through the two dial lamps and light them. In normal operation, the lamps light about a half-minute after the set is turned on.



Push Button Adjustment



The station push buttons connect to separate magnetite-core oscillator coils and separate antenna trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool such as RCA Stock No. 31031. Allow at least five minutes warm-up period before making adjustments.

In the event that the receiver is to be used with an external antenna use one or two feet of wire (as an antenna) to ensure sharp peaking during the final adjustment procedure.

1. Make a list of the desired stations, arranged in order from low to high frequencies.
2. Turn the range selector to "A" band, and manually tune in the first station on the list.
3. After turning range selector to "PB" position, push in station button No. 1 (extreme left). Then adjust the No. 1 oscillator core to receive the station. It may be necessary to maintain approximate tracking between antenna and oscillator to receive weak stations.
4. After oscillator core is adjusted properly, adjust antenna trimmer No. 1 for maximum output.

   Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.
5. Adjust for each of the five remaining stations in the same manner.
6. Make a final careful adjustment of the oscillator cores and antenna trimmers.

On push-button No. 5, the higher frequency stations may be obtained with the oscillator core No. 5 either in or out. (Oscillator frequency either 455 kc below or above the signal.) The out position should be used so the oscillator is 455 kc above the signal.

Alignment Procedure

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

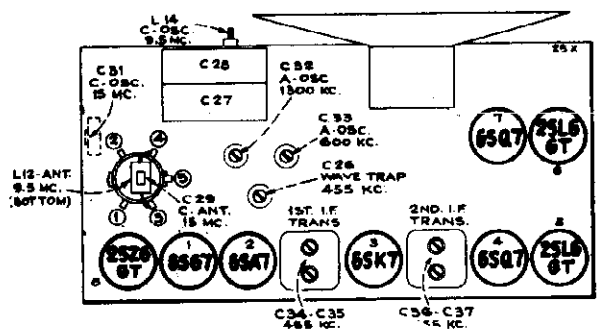
Test-Oscillator.—Connect the low side of the test-oscillator to the receiver chassis, through a .01 mfd., capacitor, and keep the output as low as possible.

Antenna.—The set is equipped with a built-in loop antenna. If an outdoor antenna is used, it may be connected to the "ANT" terminal on rear of cabinet. It should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

Phono Attachment.—A jack is provided on the rear of cabinet for connecting a Phono Attachment into the audio-amplifying circuit. The cable from the Phono Attachment should be terminated in a Stock No. 31048 plug to fit the jack.

Dial Pointer Adjustment.—The dial pointer should be set at the left-hand end dial marks, with the gang in full mesh.



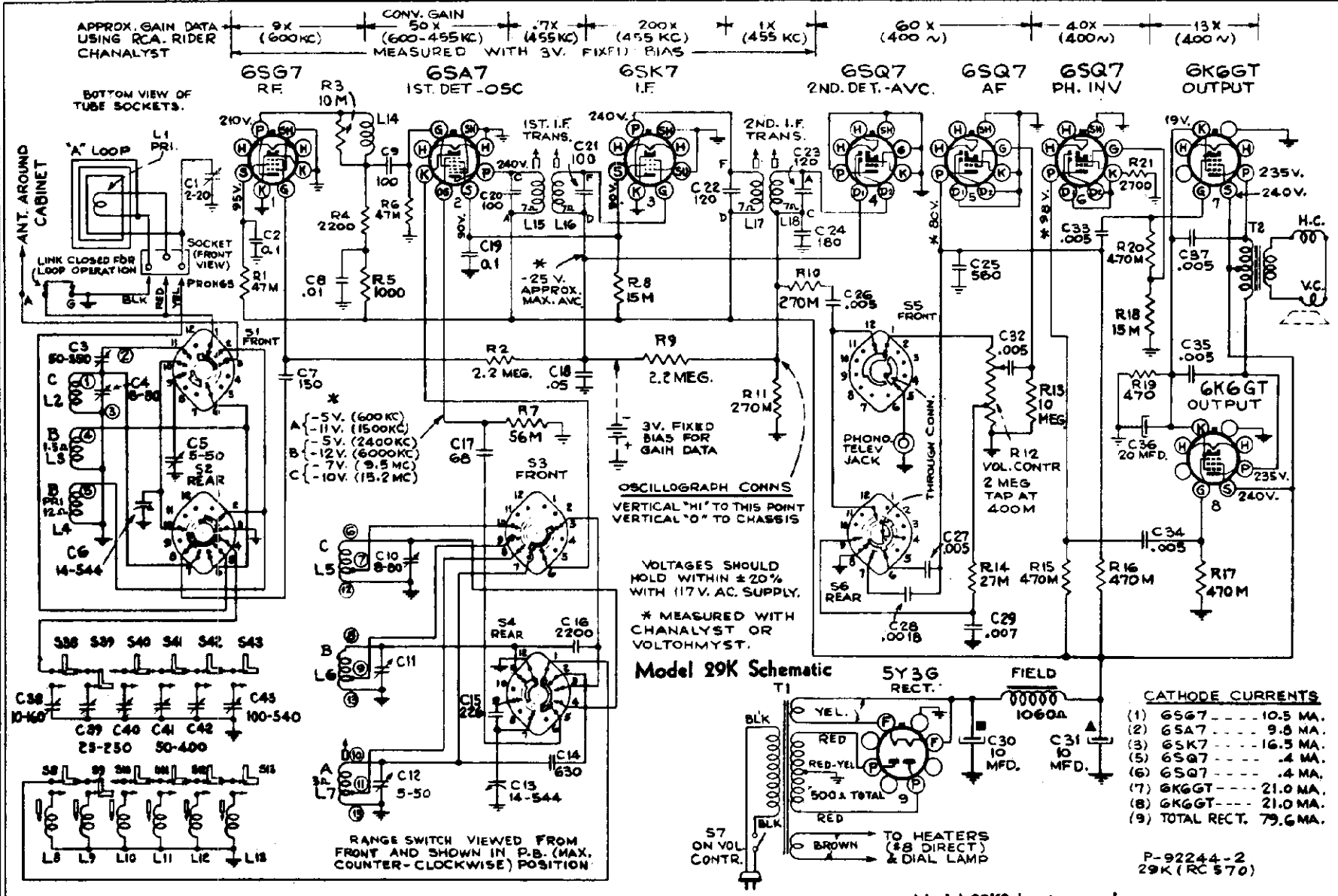
Steps	Connect the high side of test osc. to—	Tune test. osc. to—	Range Switch to—	Turn radio dial to—	Adjust the following for max. peak output
1	I-F grid in series with .01 mfd.	455 kc	A	Quiet Point near middle of dial	C36, C37 2nd I-F trans.
2	Det. grid in series with .01 mfd.				C34, C35 1st I-F trans.
3	Ant. lead in series with 50 mmfd.	15 mc	C	15 mc	C31 (osc.)* C-29 (ant.)
4		9.5 mc	C	9.5 mc	L-14 (osc.) L-12 (ant.)
		Repeat steps 3 and 4.			
5	Antenna terminal in series with 200 mmfd.	1,300 kc	A	1,300 kc	C-32 (osc.) C-30 (ant.)
6		600 kc	A	600 kc	C-33 Rock in
7		Repeat steps 5 and 6.			
8	R-F grid in series with .01 mfd.	455 kc	A	low end of dial	C-26**

*Oscillator should track on high frequency side of signal.
If two peaks are obtained use high frequency (minimum capacity peak).

**Feed a high signal level of 455 kc into R.F. grid and adjust C-26 for minimum signal.

Critical Lead Dress

1. Dress all AC filament and power wiring down close to chassis and as far as possible from all audio grid or plate wiring.
2. Dress all leads or parts as far as possible away from oscillator coil.
3. Dress audio coupling capacitor C38 from volume control to grid of 6SQ7 away from filament wire connecting No. 8 pin socket 5 and No. 8 pin socket 7.
4. Dress lead from trimmer condenser on loop to S.W. ant. coil between rectifier and R.F. tube and away from other coil leads.
5. Dress I.F plate and grid leads back into the shield can to keep exposed length as short as possible.



Model 29K2 has two speakers.

Precautionary Lead Dress.—

1. Dress all filament wiring away from audio and output tube grids.
2. The 226 mmfd. (C15) should be dressed away from all parts and wiring.
3. Leads from 2nd I.F. to tone switch should be dressed under the
4. Speaker leads should be dressed close to chassis base and away from the phono plug.
5. Primary transformer lead should be twisted around A.C. lead to switch and dressed over top of transformer.
6. Dress C7 (150 mmfd. cap.) from range switch to R.F. socket

FREQUENCY RANGES

Standard Broadcast "A" ..... 540-1,600 kc
Medium Wave "B" ..... 2.3-6.3 mc
Short Wave "C" ..... 9.4-15.4 mc

INTERMEDIATE FREQUENCY ..... 455 kc

MODELS 29K, Ch. RC-570; 29K2, Ch. RC-570C

RCA MFG. CO., INC.

Power Supply Ratings

Rating A..... 105-125 volts, 50-60 cycles, 100 watts
Rating B..... 105-125 volts, 25-60 cycles, 100 watts

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the indicator-drive-cord drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in R.F. alignment, check the position of the drum. The 185° mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are in minimum capacity position. The drum is held to the shaft by means of plastic cement which must be securely fastened when the drum is in the correct position.

To determine the corresponding frequency for any setting of the calibration scales, refer to the accompanying drawing which shows the dial with 0-180° calibration scales drawn at top and bottom.

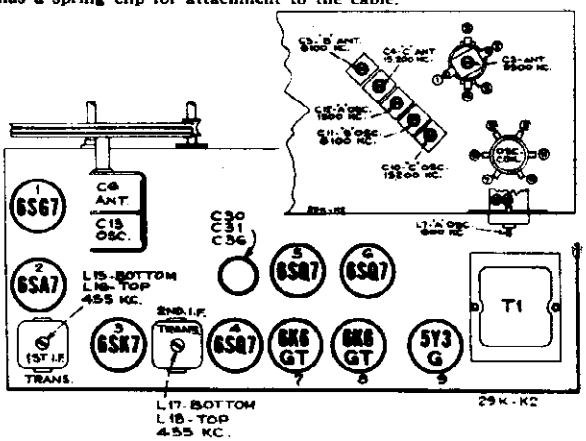
Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "0" mark on the calibration scale when the plates are fully meshed.

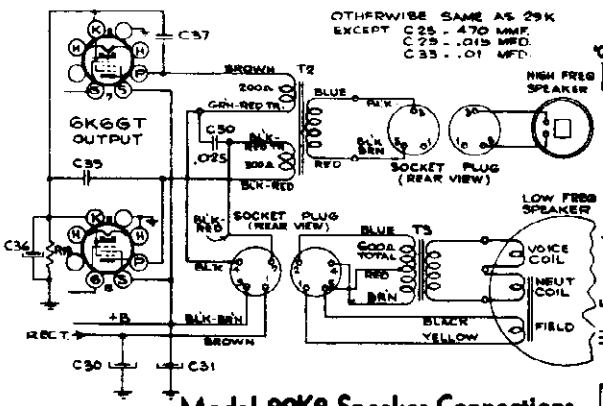
Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 540 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

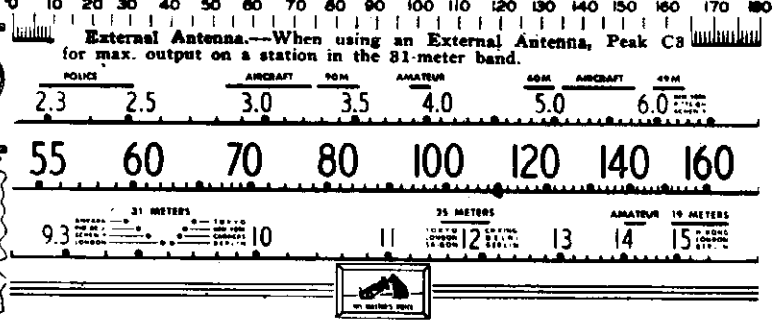
Loudspeakers	(RL 70J-1)	(RL 81B-6)
Models	29K and 29K2	29K2
Type	12-inch electrodynamic	5-inch Perm. Magnet
V.C. Impedance	2.2 ohms at 400 cycles	3 ohms at 400 cycles

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Range Switch	Turn radio dial to—	Adjust the following for max. peak output
1	6SK7 I-F grid in series with .01 mfd.	455 kc	"A"	Quiet Point near 180°	L17 and L18 (2nd I-F Trans.)
2	6SA7 Det. grid in series with .01 mfd.				L-15 and L-16 (1st I-F Trans.)
3	Ant. section of Gang Condenser	1,500 kc	"A"	160°	C-12 (osc.)
4		600 kc		30.5°	L-7 (osc.)
5	Ant. terminal "A" in series with 47 mmf. link open	6,100 kc	"B"	161°	C-11 (osc.)* C-5 (ant.)
6		15,200 kc	"C"	167°	C-10 (osc.)* C-4 (ant.)
7		9,500 kc		32°	C-3 (ant.) (Rock Gang)
8		Repeat steps 6 and 7.			
9	Fasten chassis in cabinet, see that link is closed on antenna terminal board, indicator at left end of dial scales with gang at maximum capacity.				
10	A radiation loop consisting of two turns of wire 18 inches in diameter located 4 to 8 feet from receiver	1,500 kc	"A"	1,500 kc signal	C-1 (ant.) on loop
11		600 kc		600 kc	L-7 (osc.) (Rock Gang)
12		Repeat steps 10 and 11.			

*Use minimum capacity peak if two peaks can be obtained.
Note: Oscillator tracks above signal on all bands.







External Antenna.—When using an External Antenna, Peak C3 for max. output on a station in the 31-meter band.

Model 29K2 Speaker Connections

Phasing Speakers in 29K2

For correct tone, it is ESSENTIAL that the two speakers operate "in phase," so that the two cones move in and out together.

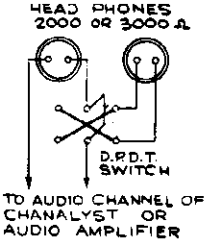
It is necessary to check the phasing whenever a new speaker, cone, field coil, or output transformer is installed, or whenever the speaker connections are altered in any way.

The recommended procedure is as follows:

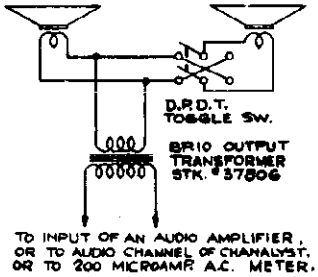
1. Hook up a "phase checker," using headphones or PM speaker units as shown. Connect the checker to an audio amplifier that has an output meter. (The audio channel in the Chanalyst is excellent for this purpose.)

2. Feed a 400-cycle modulated signal into the receiver. Turn volume up to medium. Hold both units of the checker in front of the large speaker in set. Throw the toggle switch to each position and note which position gives maximum output on meter. Mark this position of the switch "in phase." Mark the other position "out of phase."

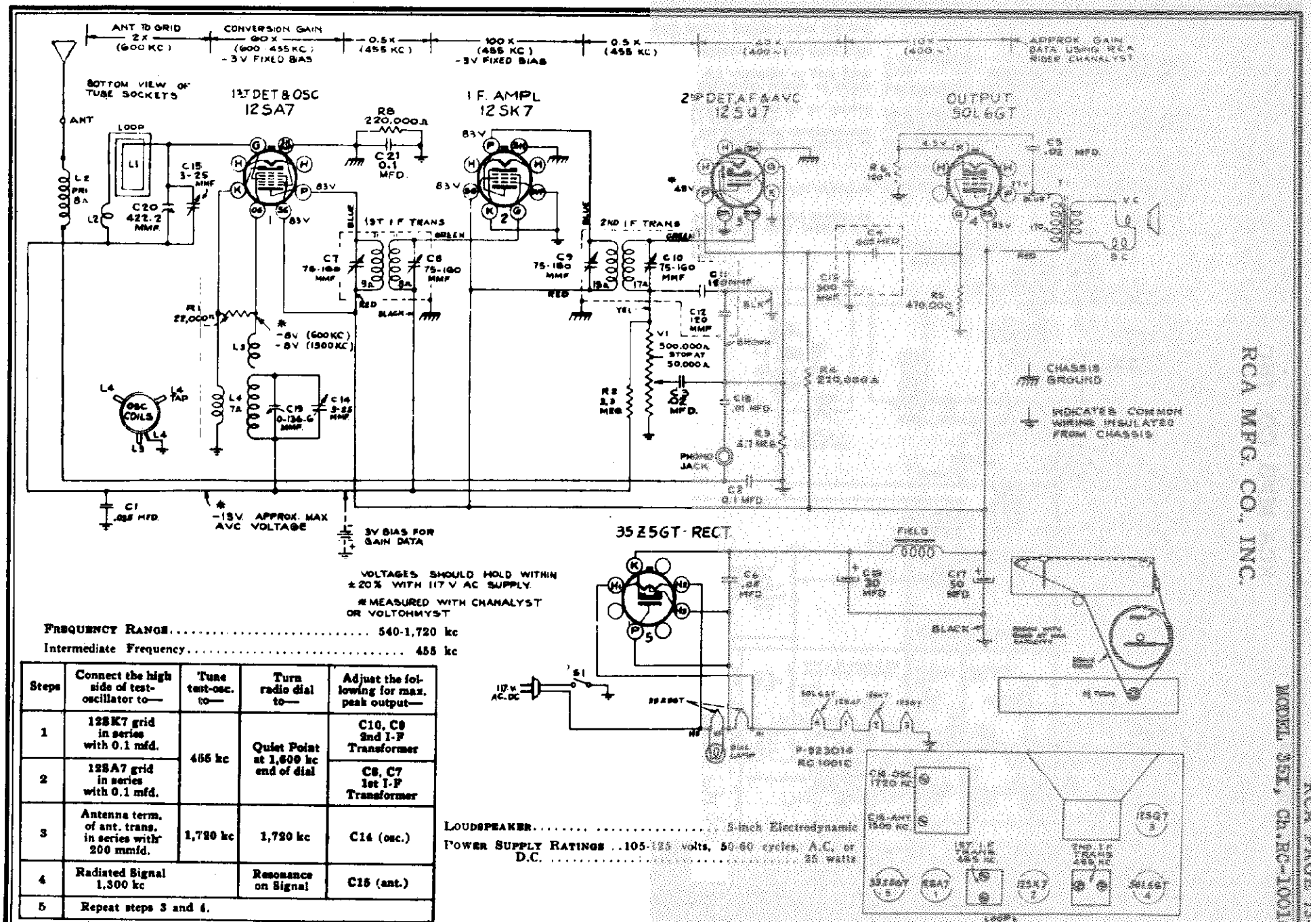
3. Place one unit of the phase checker in front of each speaker in the set. Throw the toggle switch to each position and leave it at the position that gives greatest output on the meter. Note the switch marking for this position. If it says "in phase," the set speakers are correctly phased. If it says "out of phase," reverse the leads to the voice-coil terminals of the small speaker in the receiver.



"Phase Checker," using Headphones.



"Phase Checker," using small PM speakers.



VOLTAGES SHOULD HOLD WITHIN ±20% WITH 117 V AC SUPPLY.

* MEASURED WITH CHANALYST OR VOLTOHMYST

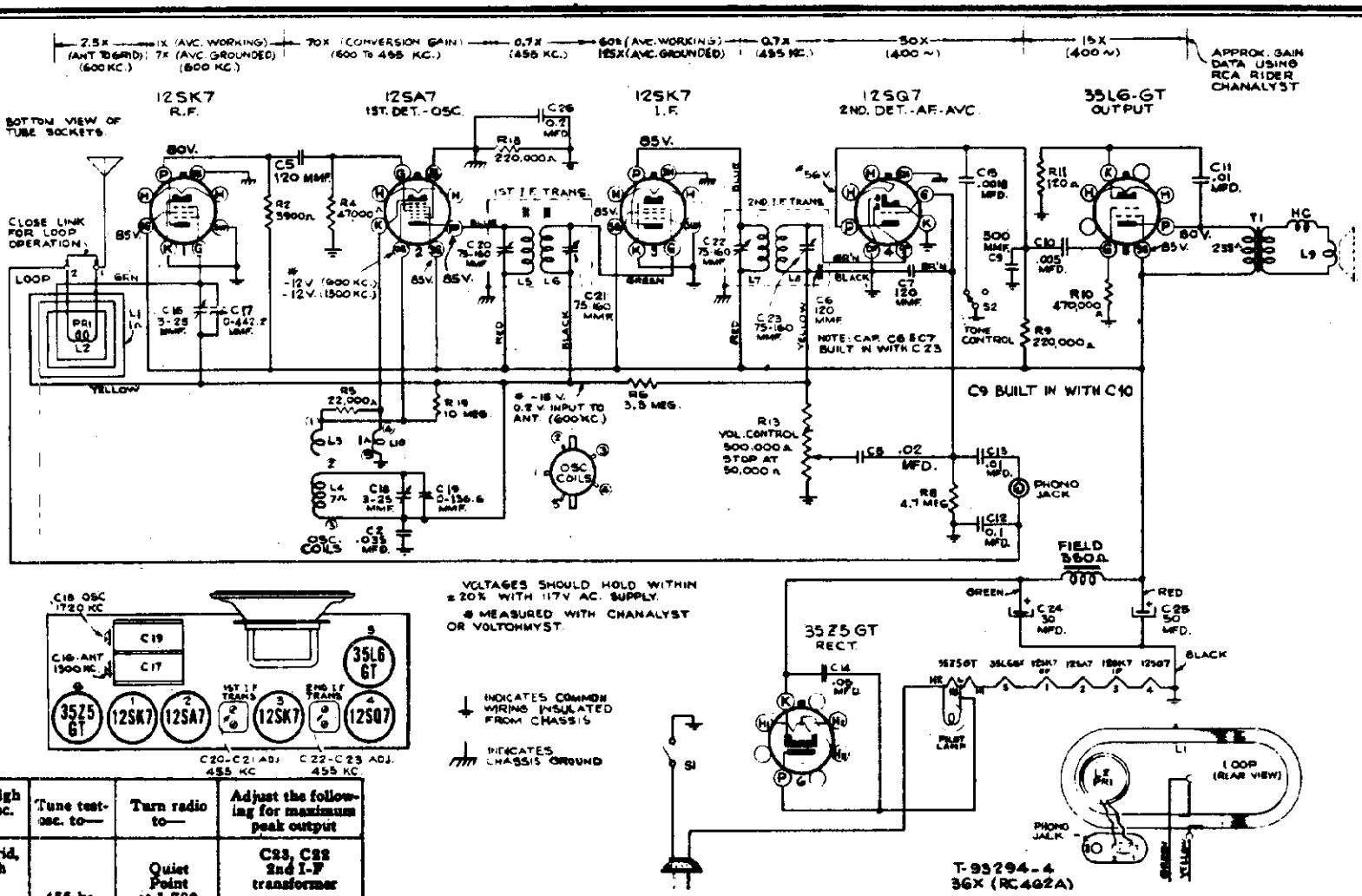
FREQUENCY RANGE ..... 540-1,720 kc

Intermediate Frequency ..... 455 kc

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	12SK7 grid in series with 0.1 mfd.	455 kc	Quiet Point at 1,600 kc end of dial	C10, C9 2nd I-F Transformer
2	12SA7 grid in series with 0.1 mfd.			C8, C7 1st I-F Transformer
3	Antenna term. of ant. trans. in series with 200 mmfd.	1,720 kc	1,720 kc	C14 (osc.)
4	Radiated Signal 1,300 kc		Resonance on Signal	C15 (ant.)
5	Repeat steps 3 and 4.			

LOUDSPEAKER ..... 5-inch Electrodynamic

POWER SUPPLY RATINGS ..105-125 volts, 50-60 cycles, A.C. or D.C. ..... 25 watts



Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio to—	Adjust the following for maximum peak output
1	12SK7 I-F grid, in series with 0.1 mfd.	455 kc	Quiet Point at 1,700 kc end of dial	C23, C22 2nd I-F transformer
2	12SA7 1st det. grid, in series with 0.1 mfd.			C21, C20 1st I-F transformer
3	12SK7 R-F grid, in series with 0.1 mfd.	1,720 kc	1,720 kc	C18 (osc.)
4	Radiated signal 1,300 kc		Signal frequency	C16 (ant.)
5	Repeat steps 3 and 4			

Output Meter Alignment. — If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator. — For all alignment operations, keep the output as low as possible to avoid a-v-c action.

Precautionary Lead Dress:

1. .01 mfd. capacitor from output plate to cathode to be dressed as far as possible away from .015 mfd. 1st audio grid condenser and volume control terminals to eliminate audio howl.
2. Filament lead to pin No. 7 on 35L6-GT socket to be dressed away from 1st audio grid.
3. Dress B+ lead on 12SK7 I.F. socket across bottom of socket between grid and plate contacts to aid reduction of grid plate capacitance.
4. Dress excess lead lengths of I.F. transformer, grid and plate leads into cans to aid shielding.
5. Dress filament leads of 35L6-GT around 12SQ7 socket and into chassis corner to reduce hum.

POWER SUPPLY RATING

105-125 volts, AC, 50 or 60 cycles, or DC..... 30 watts

PILOT LAMP.....Mazda No. 51, 6-8 volts, 0.2 amp.

FREQUENCY RANGE.....535-1,720 kc

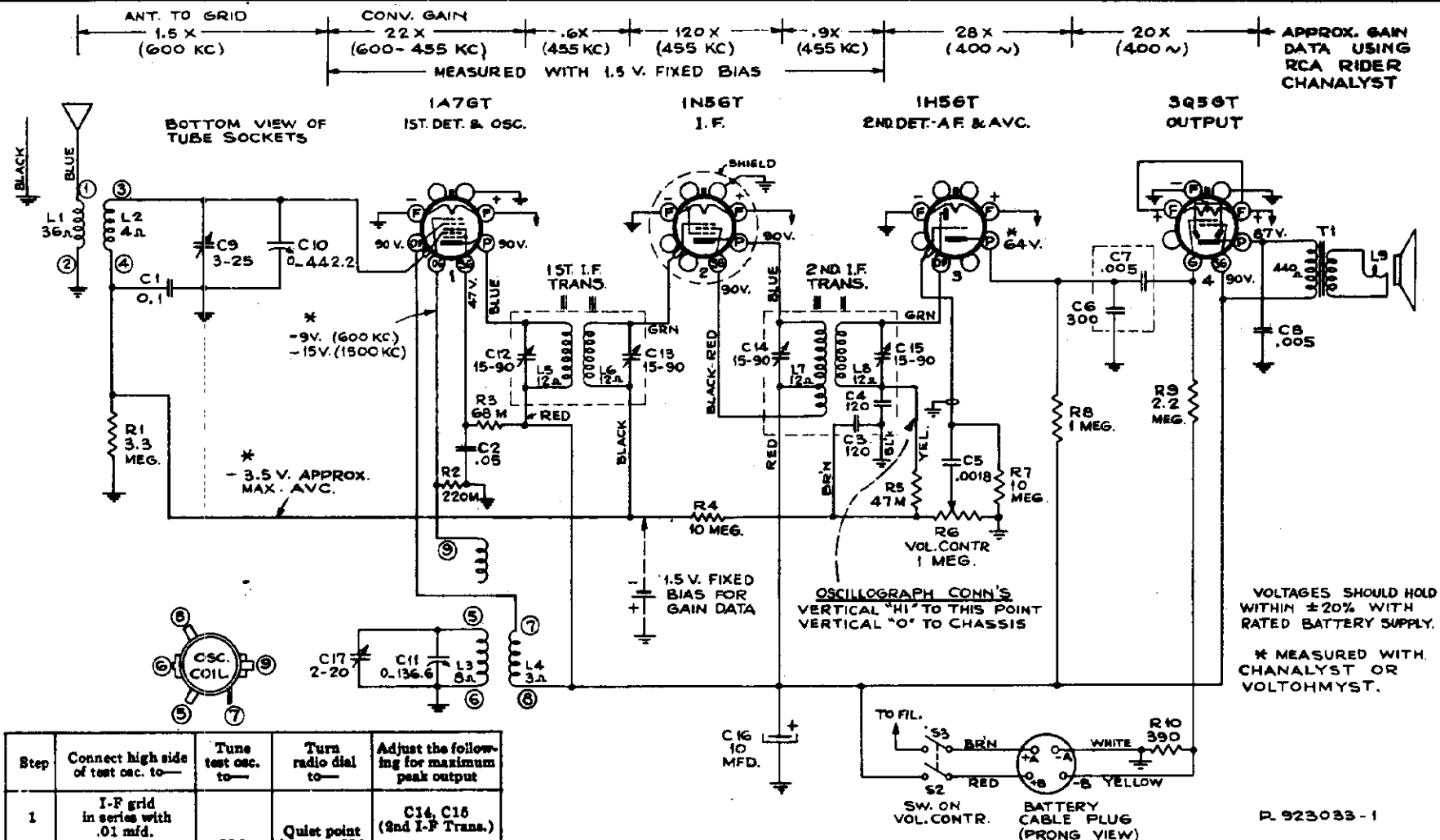
INTERMEDIATE FREQUENCY..... 455 kc

POWER OUTPUT

Undistorted ..... 0.9 watts
Maximum ..... 1.4 watts

LOUDSPEAKER (RL-66-B1).

Type..... 5-inch permanent-magnet dynamic
V.C. Impedance..... 4 ohms at 400 cycles



Step	Connect high side of test osc. to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	I-F grid in series with .01 mfd.	455 kc	Quiet point between 550 and 750 kc	C14, C15 (2nd I-F Trans.)
2	1st Det. grid in series with .01 mfd.			C12, C13 (1st I-F Trans.)
3	Antenna terminal in series with 220 mmfd.	1,720 kc	Tuning condenser rotor plates all out	C17 (osc.)
4		1,300 kc	1,300 kc signal	C9 (ant.)

Precautionary Lead Dress.—

1. The lead from the 3Q5 plate to output transformer should be dressed under clip and away from audio input leads.
2. Keep AVC lead connecting C1 away from the 1A7GT plate.
3. Keep blue plate leads coming from IF transformers short and close to the chassis.
4. All filament wires should be dressed close to chassis.

Frequency Range	540-1,720 kc
Intermediate Frequency	455 kc
Battery Drain	
"A"	.25 amperes
"B"	14 m.a.
Max. Power Output	.3 watt
Loudspeaker (5-inch PM)	
Identification number	RL-85-6 92822-1
Voice coil impedance at 400 cycles	3 ohms .... 3 ohms

MODEL B-52, Ch. RC-1004D

RCA MFG. CO., INC.

BATTERY DRAIN

"A" ..... .3 amperes
"B" ..... 10 m.a. (Switch at "Battery Saver" position)
"B" ..... 14 m.a. (Switch at "Maximum Output" position)

POWER CONSUMPTION

With CV-42 Conversion Unit..... 22.5 watts

LOUDSPEAKER (5-inch PM)	RL-85-6	92322-1
Voice coil impedance at 400 cycles.....	3 ohms	3 ohms

CAUTION: Turn power switch off (counter-clockwise) when installing or replacing tubes or batteries.

DO NOT TURN THE "BATTERY-ELECTRIC" SWITCH TO ELECTRIC POSITION WHILE THE RECEIVER IS CONNECTED TO BATTERIES.

Step	Connect high side of test osc. to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	I-F grid in series with .01 mfd.	455 kc	Quiet point between 550 and 750 kc	C14, C15 (2nd I-F Trans.)
2	1st Det. grid in series with .01 mfd.			C12, C13 (1st I-F Trans.)
3	Antenna terminal in series with 200 mmfd.	1,720 kc	Tuning condenser rotor plates all out	C17 (osc.)
4		1,300 kc	1,300 kc signal	C9 (ant.)
5		455 kc	Quiet point between 550 and 750 kc	Adjust C22 for minimum output on strong 455 kc signal

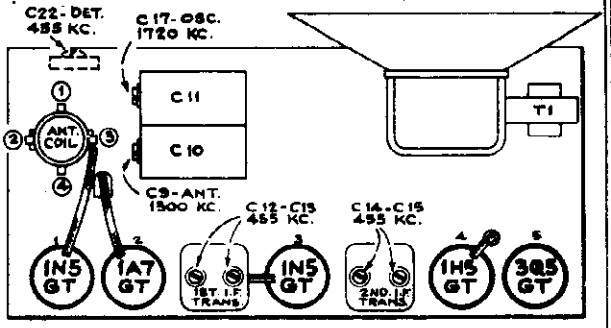
Precautionary Lead Dress.—

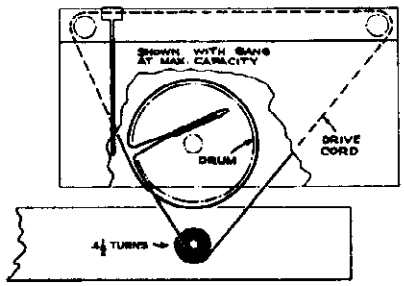
1. The lead from the 3Q5 plate to output transformer should be dressed under clip and away from audio input leads.
2. All filament wires should be dressed close to chassis.
3. Keep AVC lead connecting C1 to antenna coil away from the 1A7GT plate.
4. Keep blue plate leads coming from I.F. transformers short and close to chassis.
5. Keep yellow leads connecting to oscillator coil away from trap coil.
6. Keep grid lead of 1N5GT RF tube away from 1A7GT grid.

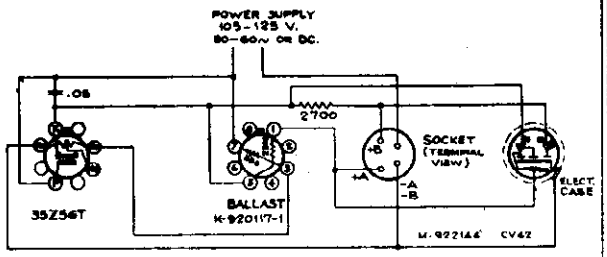
POWER SUPPLY

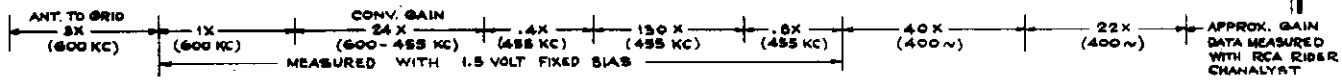
1 "A" - "B" 1½-90 volt pack.

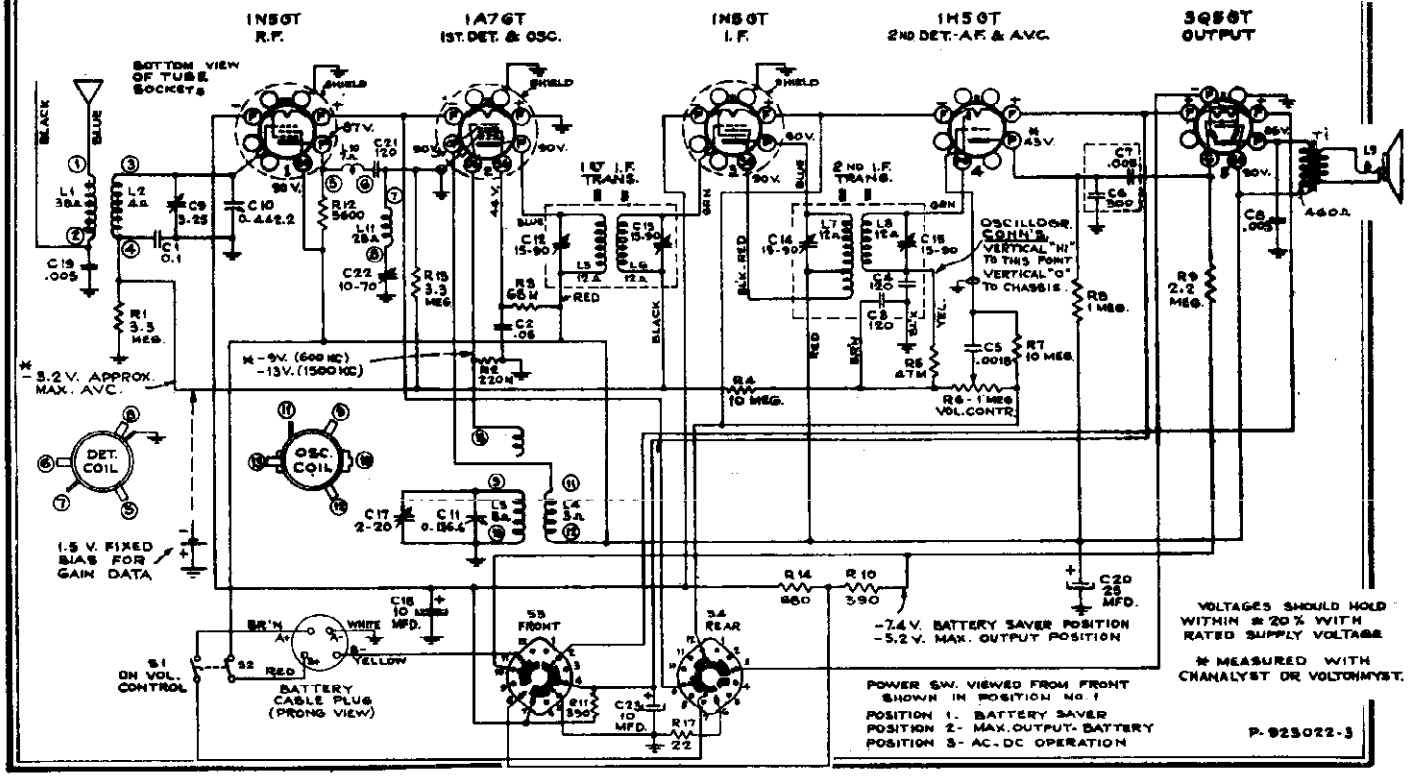
Model B-52 can be operated on 105-125 volts AC, 50-60 cycles, or 105-125 volts DC, by means of CV-42 Conversion Unit.



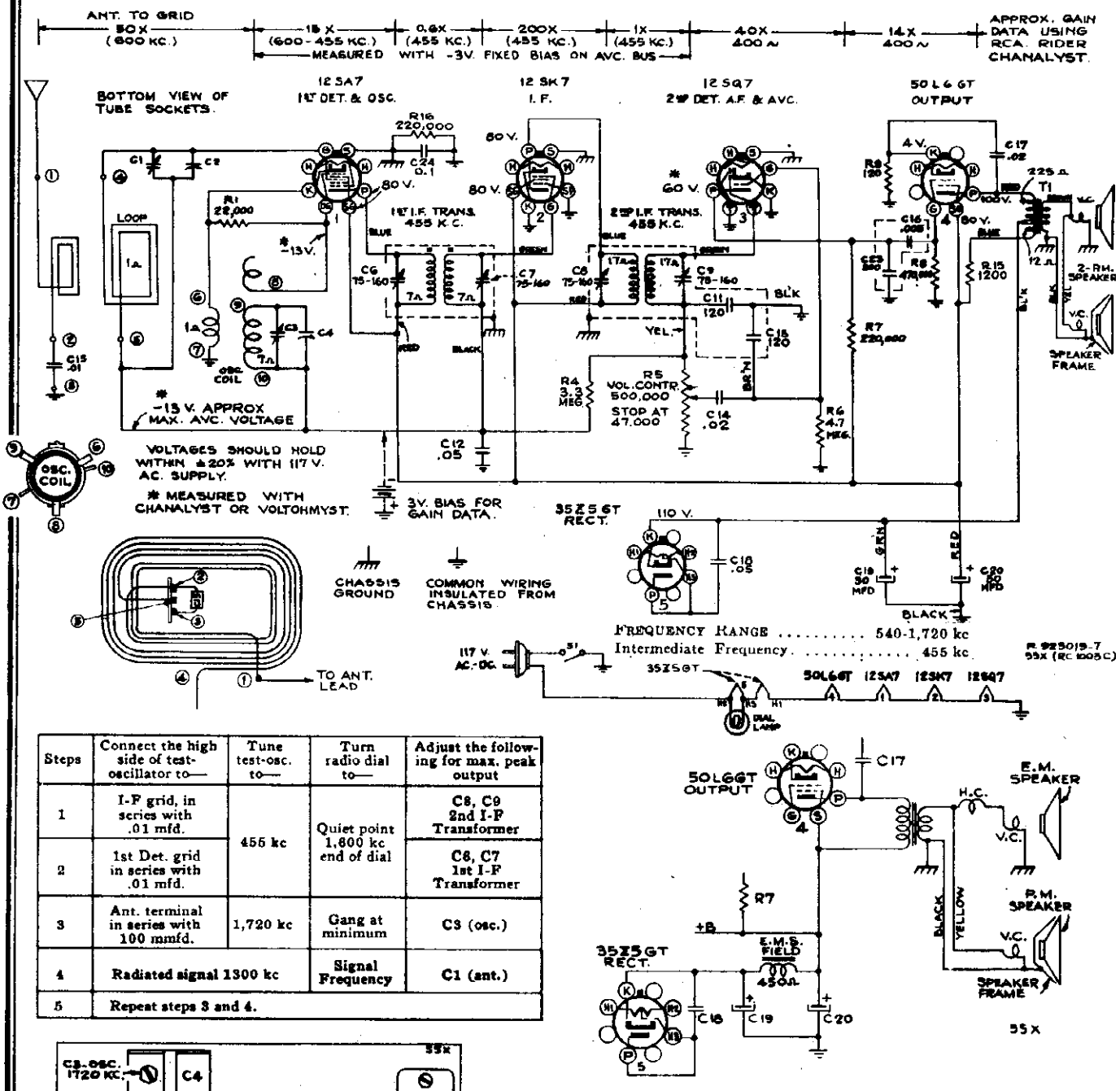




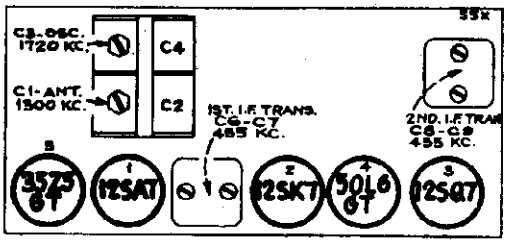




RCA MFG. CO., INC.



Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	I-F grid, in series with .01 mfd.	455 kc	Quiet point 1,600 kc end of dial	C8, C9 2nd I-F Transformer
2	1st Det. grid in series with .01 mfd.			C6, C7 1st I-F Transformer
3	Ant. terminal in series with 100 mmfd.	1,720 kc	Gang at minimum	C3 (osc.)
4	Radiated signal 1300 kc		Signal Frequency	C1 (ant.)
5	Repeat steps 3 and 4.			



Above—Circuit of Model 55X Using one "PM" and one "EM" Speaker.

Phasing Speakers in Model 55X.—

For correct sound quality, it is ESSENTIAL that the cones of the two loudspeakers move in and out together.

To check the phasing, connect a 1½-volt dry cell across the secondary of the output transformer and observe, by sight or feel, whether the two cones move in the same direction. If one moves in while the other moves out, reverse the external connections to the voice coil of the permanent-magnet speaker.

POWER SUPPLY RATINGS

105-125 volts, direct current, or 50-60 cycles..... 80 watts

POWER OUTPUT (125 volts, 60 cycle supply)

Undistorted..... 0.8 watts Maximum..... 1.2 watts

LOUDSPEAKERS

RL-86-A3 5-inch "EM," 4-ohm voice coil
RL-81-B2 5-inch "PM," 4-ohm voice coil

Test-Oscillator.—For I-F alignment, connect the low side of the test-oscillator to the common negative through a .01 mfd. capacitor, and keep the output as low as possible.

Pre-Setting Dial.—With gang condenser in full mesh, the pointer should be adjusted so that it is vertical.

Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

MODEL R-56 Phono.

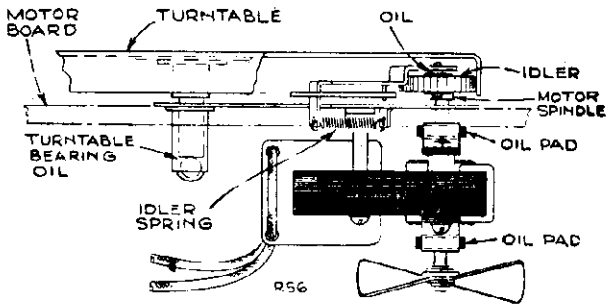
RCA MFG. CO., INC.

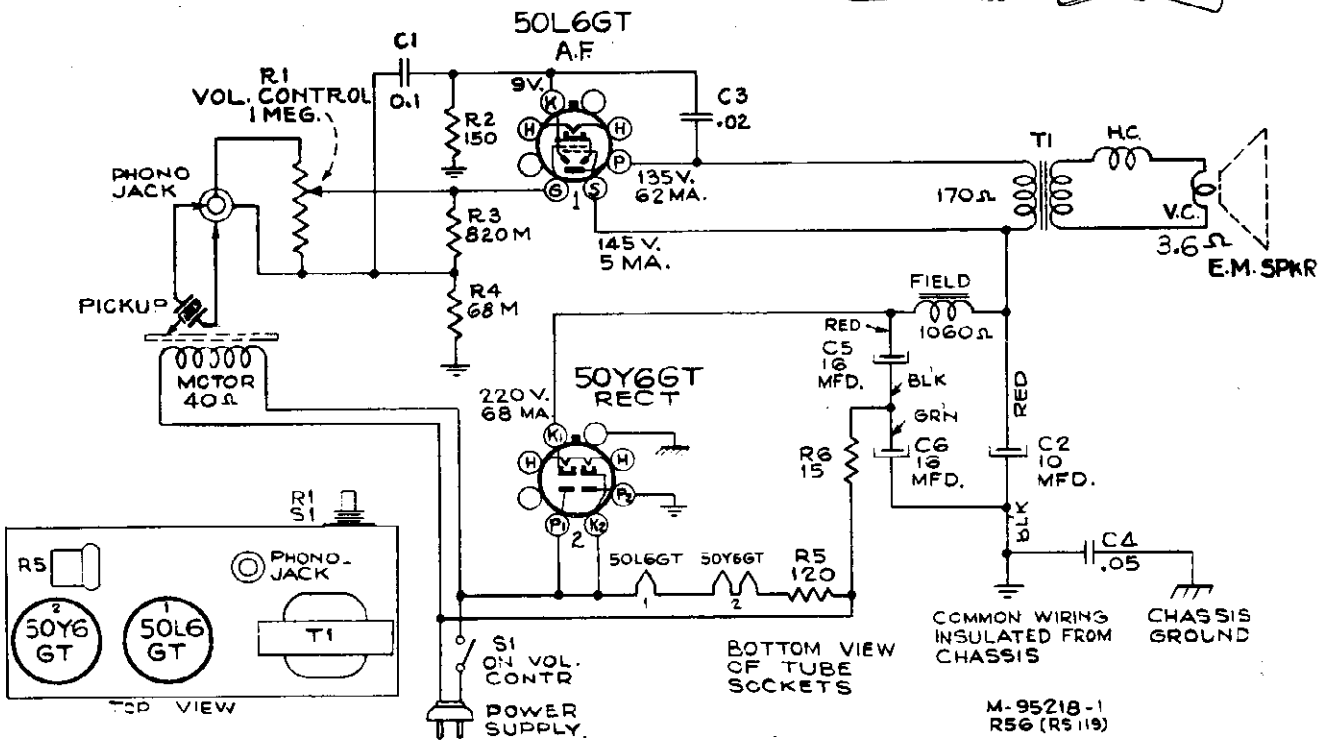
POWER OUTPUT RATING
Undistorted ..... 2.25 watts
Maximum ..... 4.50 watts

LOUDSPEAKER
RL-86-C1 ..... 5-inch Electrodynamic
V. C. Impedance at 400 cycles ..... 4 ohms

PHONOGRAPH
Motor ..... Self-starting Induction
Drive ..... Rim Drive, 78.25 R.P.M.
Pickup ..... Crystal

POWER SUPPLY
105-125 volts, 60 cycles ..... 50 watts





STOCK No.	DESCRIPTION	Unit List Price
	AMPLIFIER ASSEMBLY	
39684	Capacitor—Electrolytic, one section of 10 mfd., 250 volts, and one section of 16 mfd., 150 volts	1.10
36248	Capacitor—.02 mfd., 700 volts	.20
32787	Capacitor—.05 mfd., 400 volts	.20
43763	Capacitor—0.1 mfd., 400 volts	.30
39500	Capacitor—16 mfd., 150 volts	.50
38410	Control—Volume control and power switch	1.50
11565	Resistor—15 ohms, ½ watt	.20
39685	Resistor—120 ohms, 3.1 watt	.45
30785	Resistor—150 ohms, 1 watt	.22
14138	Resistor—68,000 ohms, ½ watt	.20
30161	Resistor—820,000 ohms, ½ watt	.20
33742	Socket—Phono input socket	.20
31251	Socket—Tube socket	.25
39683	Transformer—Output transformer	1.35
	PICKUP AND ARM ASSEMBLY	
33591	Arm—Pickup arm only—less cartridge, and pivot shaft and base assembly	.50
34482	Base—Pickup arm base—less pivot shaft	.30
34758	Bushing—One rubber and one metal bushing for pickup arm	.15
39686	Crystal—Pickup crystal cartridge	4.25
34311	Ring—Retaining ring for pivot shaft	.05
33974	Screw—Needle screw	.10
34481	Shaft—Pickup arm pivot shaft	.70
	SPEAKER ASSEMBLY (RL-86C-1)	
32907	Cap—Cone center dust cap	.02
39688	Coil—Field coil	2.10
39689	Coil—Neutralizing coil	.25
39539	Cone—Cone, voice coil, center suspension, and dust cap	1.20
	MOTOR ASSEMBLY	
36402	Arm—Idler arm and stud for motor	.25
20134	Ball—Steel ball for turntable bearing	.08
36404	Motor—105-125 volts, 60 cycle motor	4.75
36403	Mounting—One set of motor mounting grommets, spacers, and washers	.10
36406	Plate—Idler arm guide plate for motor	.10
36401	Plate—Motor plate complete with bearing and ball	.50
30340	Retainer—Motor fan retainer	.02
30585	Spring—Motor idler arm tension spring	.06
36399	Turntable—Turntable and bushing complete with spindle	1.50
33726	Washer—"C" washer for motor idler wheel	.02
36405	Washer—Flat washer for motor idler wheel	.01
36274	Wheel—Motor idler wheel and bearing	.65
	MISCELLANEOUS ASSEMBLIES	
38990	Foot—Cabinet foot	.20
38710	Knob—Volume control knob	.15
33530	Mounting—Rubber grommet, washers, and nut for mounting pickup arm	.10
39690	Screw—Finish screw and washer for mounting amplifier (1 set)	.05

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

RCA MFG. CO., INC

MODELS TRK-90, Chassis KC-4H, KK-7H; TRK-120, Chassis KC-4F KK-7F

General Description

The TRK-120 consists of a console-type, high-picture-definition, mirror-viewing, five channel, Television Receiver and an eleven-tube, three-band broadcast radio receiver enclosed in a handsomely styled modern cabinet. Features of the Television receiver include: Twelve-inch Kinescope; Styrol (humidity-resisting) r-f and i-f transformer forms; black and white pictures; single station selector switch; temperature compensated condensers; iron core i-f and r-f tuning; double safety switch protection; safety-glass viewing shield; extra large viewing mirror for wide angle viewing; automatic brightness control; and automatic volume control.

The TRK-90 is a direct viewing, high-picture-definition console-type, five channel, Television Receiver and an eleven tube, three-band broadcast radio receiver in a deluxe upright modern cabinet. Television features of this receiver are the same as for the TRK-120, except that a nine-inch Kinescope is used.

General Specifications

Model TRK-90		Model TRK-120	
Height..... 47½ in.;	Depth..... 24 3/16 in.	Height..... 40⅞ in.;	Depth..... 19⅞ in.
Width..... 31½ in.;	Weight..... 200 lb.	Width..... 34⅝ in.;	Weight..... 198 lb.
Shipping Weight..... 283 lb.		Shipping Weight..... 275 lb.	

Power Supply Rating..... 105-125 volts, 60 cycles, 420 watts (Total)
Fuse Rating—T5 and T7 (T7 and T8 in 50 cycle model)..... 3 amperes
Fuse Rating—T6 (T9 in 50 cycle model)..... ¾ ampere

Mechanical Specifications

Video Chassis Base Dimensions.....	17 in. x 16 in	Max. Height.....	8½ in.
SPU Chassis Base Dimensions.....	15 in. x 13¼ in.	Max. Height.....	10 in.

Electrical Specifications

RCA Tube Complement

In KC-4F (TRK-120), and KC-4H (TRK-90) Video Chassis

(1) RCA-6AC7	(5) RCA-6AB7	(9) RCA-6SQ7	(13) RCA-6AB7	(17) RCA-6N7	(21) RCA-6N7
(2) RCA-6J5	(6) RCA-6AB7	(10) RCA-6AC7	(14) RCA-6H6	(18) RCA-6N7	(22) RCA-6J5
(3) RCA-6AB7	(7) RCA-6AC7	(11) Kinescope*	(15) RCA-6N7	(19) RCA-6L6	*RCA-1803-P4 (TRK-120)
(4) RCA-6AB7	(8) RCA-6H6	(12) RCA-6SK7	(16) RCA-6Y6-G	(20) RCA-5V4-G	*RCA-1804-P4 (TRK-90)

In KK-7F (TRK-120), and KK-7H (TRK-90) Socket Power Units

(23) RCA-5U4-G..... Low Voltage Rectifier (24) RCA-2V3-G..... High Voltage Rectifier

Television Channels (Selector Switch Positions)

1	44 to 50 mc.	3	66 to 72 mc.
2	50 to 56 mc.	4	78 to 84 mc.
		5	84 to 90 mc.

Over-all Video Band Width..... 4 mc.
Scanning..... Interlaced, 441 Line
Horizontal (Line) Scanning Frequency (Sawtooth Wave)..... 13,230 cps
Vertical (Field) Scanning Frequency (Sawtooth Wave)..... 60 cps
Frame Frequency (Picture Repetition Rate)..... 30 cps

Picture Size (Approx. Mask Dimensions)

TRK-90..... 5½ x 7¼ in. TRK-120..... 7⅜ x 9¾ in.

Precautions in Handling Kinescopes

The Kinescope bulb encloses a high vacuum and, due to its large surface area, is subjected to considerable air pressure. For these reasons, Kinescopes must be handled with more care than ordinary receiving tubes.

The large end of the Kinescope bulb — particularly that part at the rim of the viewing surface—must not be struck, scratched or subjected to more than moderate pressure at any time. If the tube sticks, or fails to slip into its socket or deflecting yoke smoothly, investigate and remove the cause of trouble. Do not force the tube.

All RCA Kinescopes are shipped in special cartons and should always be left in the cartons until ready for installation in the receiver. Keep the carton for future use.

The RCA-1803-P4 (12-inch) Kinescope is equipped with a protective lid and shield. Do not at any time remove the close-fitting cone-shaped section of the protective shield from the Kinescope. This section should be installed with the tube in the cabinet and is designed to protect the user while handling the glass bulb.

CAUTION: Do not open the shipping carton, install, remove, or handle the Kinescope in any manner, unless shatter-proof goggles and heavy gloves are worn. People not so equipped should be kept away while handling Kinescopes. Keep Kinescope away from the body while handling.

MODELS TRK-90, TRK-120 RCA MFG. CO., INC.

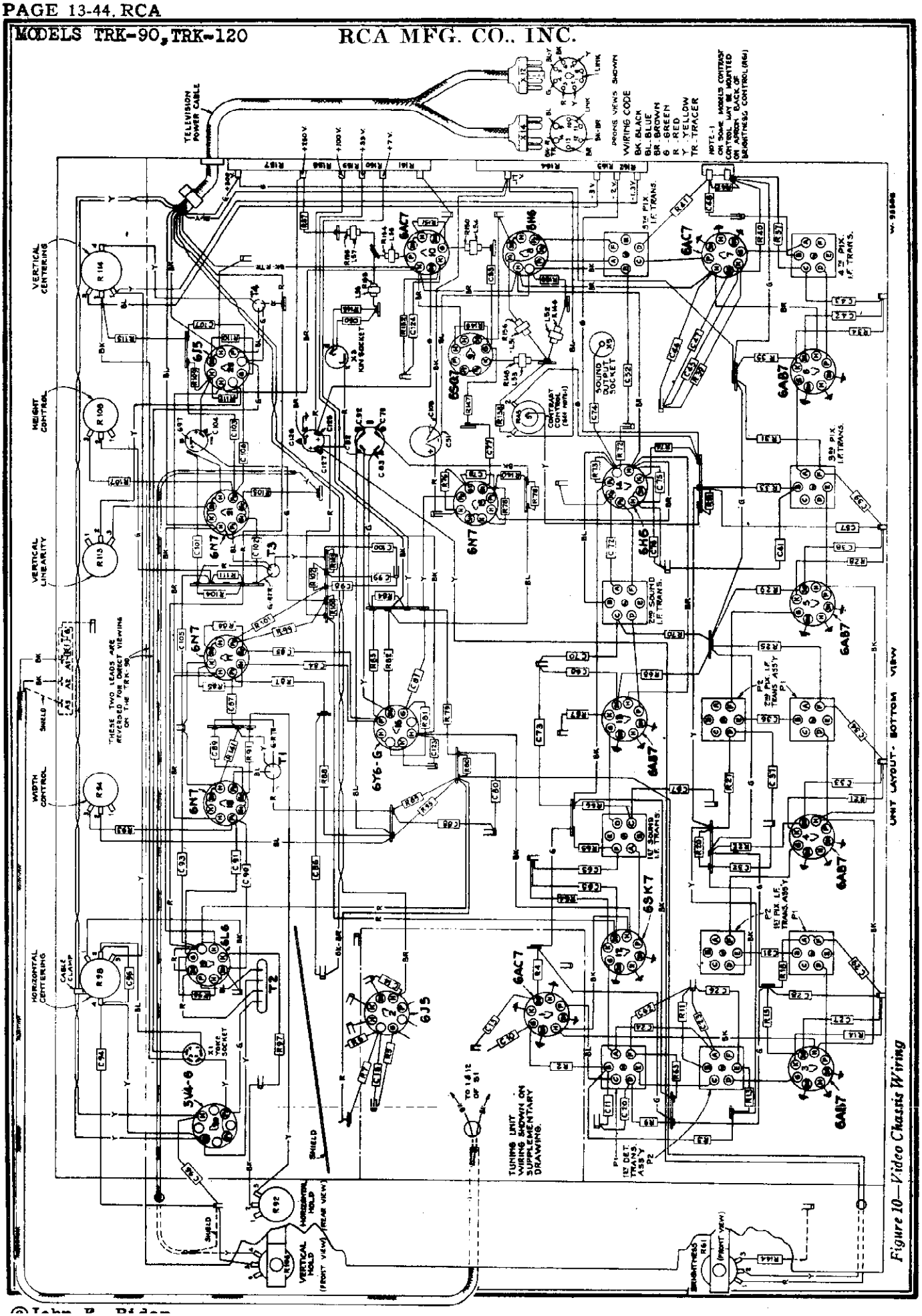
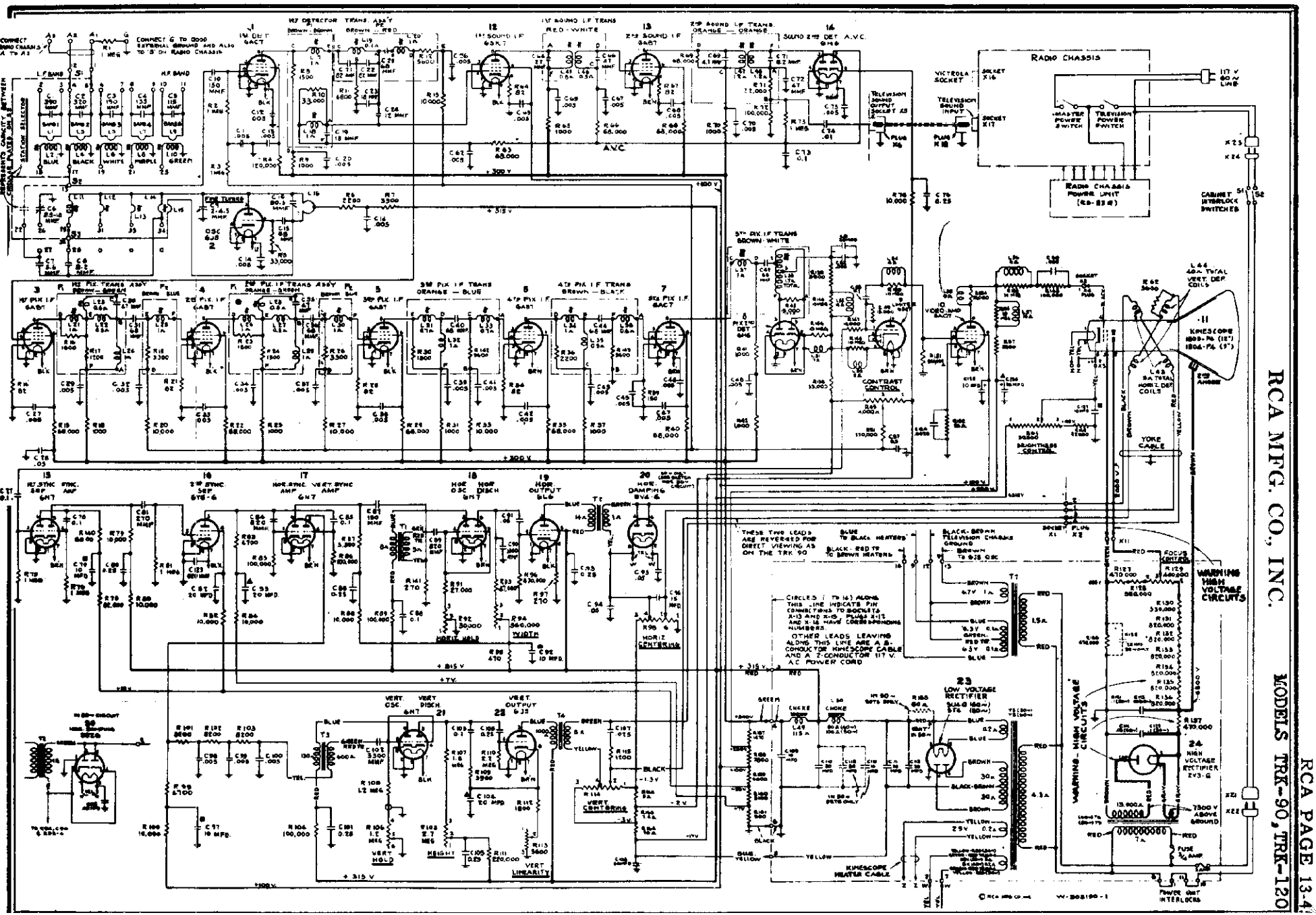


Figure 10—Video Chassis Wiring



RCA MFG. CO., INC.

MODELS TRK-90, TRK-120

RCA PAGE 13-4

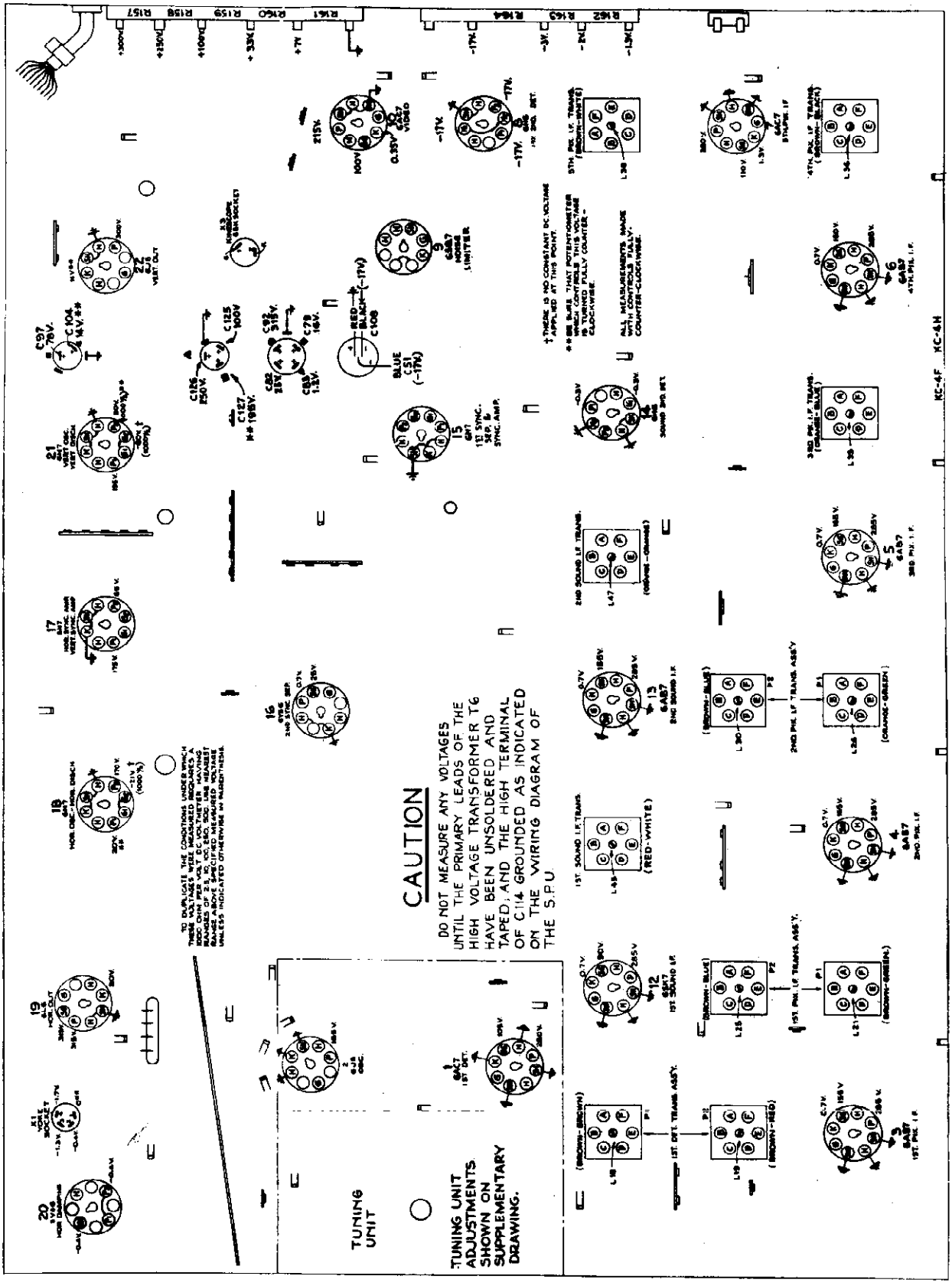


Figure 8—Voltage Diagram

Measurements made to chassis unless otherwise indicated, with set tuned to quiet point and all controls and adjustments full counter-clockwise. Values should hold within ±20% with 117-volt a·c supply.

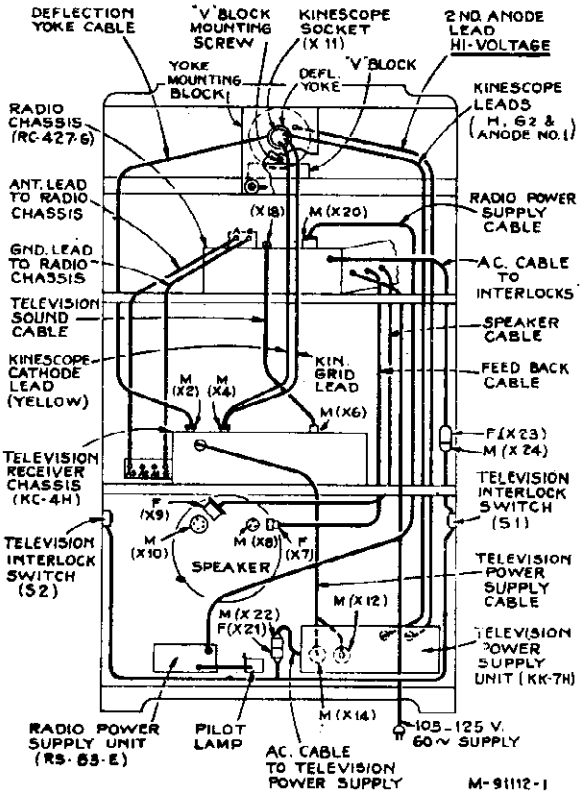


Figure 3—Cabinet Wiring—Model TRK-90

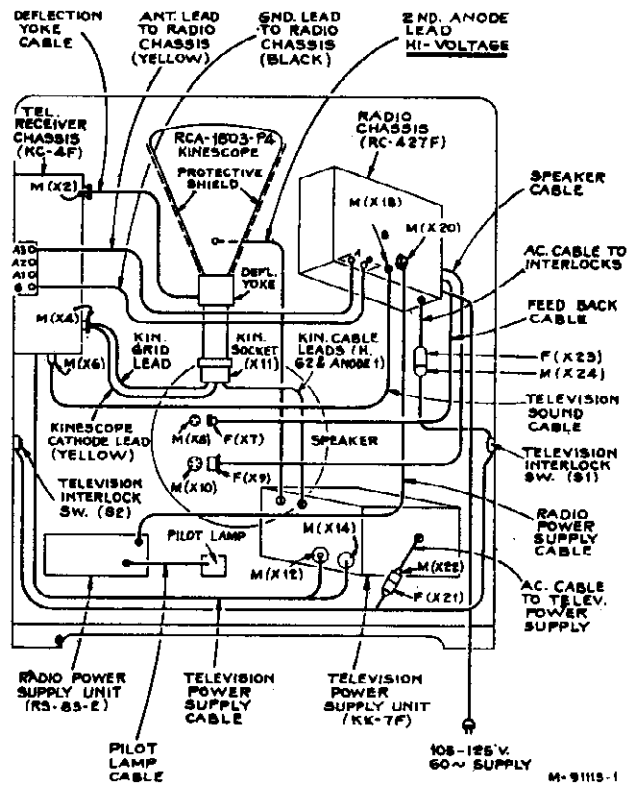
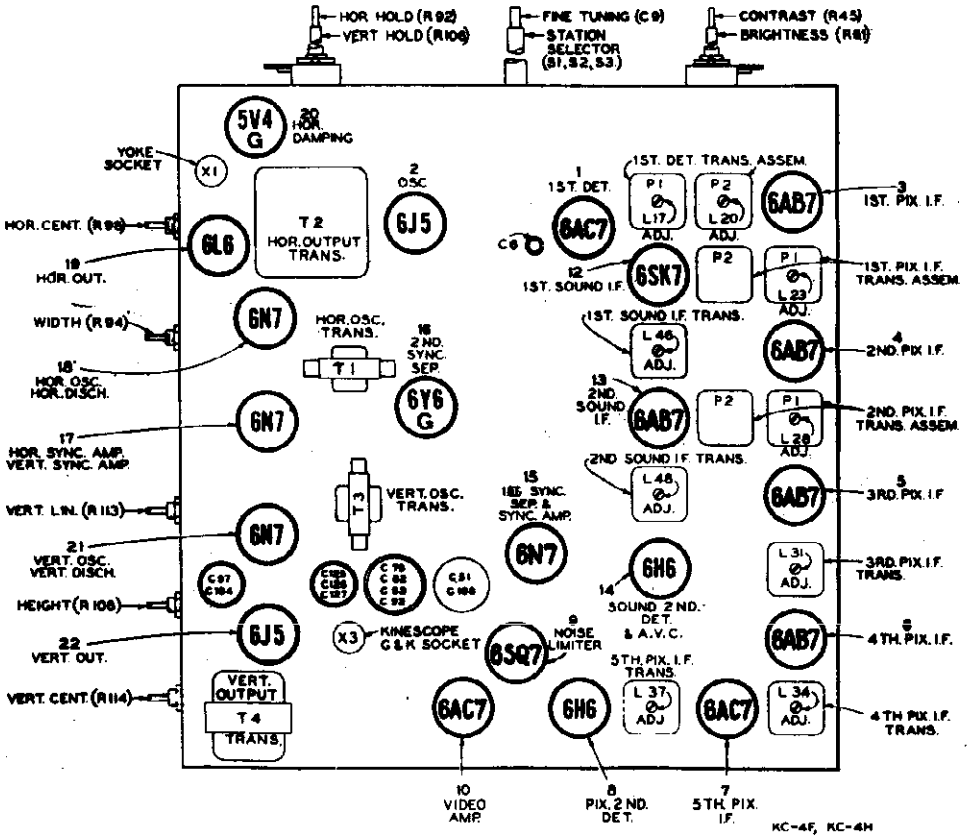
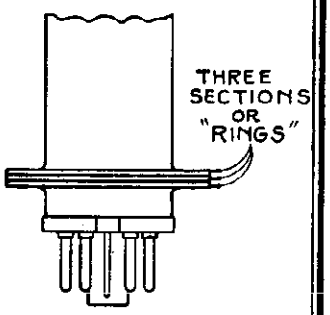


Figure 3a—Cabinet Wiring—Model TRK-120



At Left—Figure 5
Top View Video Chassis



(Above) Figure 6
Recommended Type 6L6 Identification

Socket Power Units KK-7F, KK-7H

The following precautions should be observed when any work is being done on the SPU:

1. Remove power supply cord from the power supply socket.

2. No attempt should ever be made to measure the high (7,500 volts) voltage because of the difficulties and dangers involved. Servicing should be done with an ohm meter.

3 If, at any time it becomes necessary to service the SPU, the suspected parts should be replaced by parts known to be in good operating condition.

4. Use only one hand at a time. It is advisable to keep the other hand in one's pocket.

5. Connect a shorting lead between ground (first) and the high voltage side of C-113 and C-114.

6 Whenever working with the oil-filled capacitors, keep a constant short across the capacitor, as these capacitors do not completely lose their charge after being discharged a single or several subsequent times.

7. Only one person at a time should work on the unit to prevent any misunderstanding which may result in an accident.

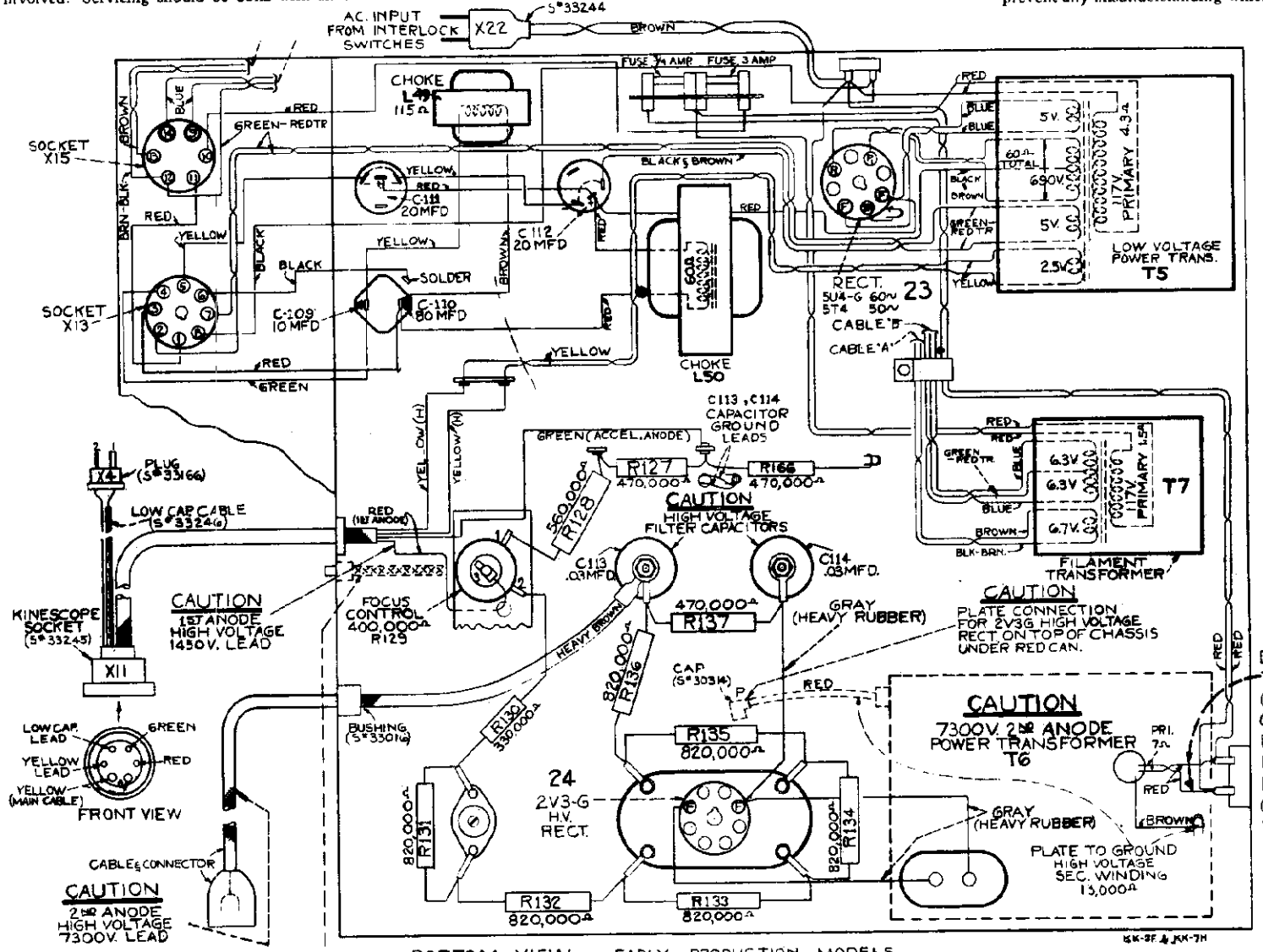


Figure 11—SPU Wiring (60 Cycle Models)

The finest television receiver built may be said to be only as good as the antenna design and installation. It is therefore important to use a correctly designed antenna, and use care in its installation.

The RCA Double Dipole Antenna, Stock No. 9871, is recommended for use with these receivers. Both this antenna and the "V" antenna described below are especially designed for a sufficient broad frequency response to cover the contemplated television spectrum with good efficiency and are therefore superior to a single Dipole type antenna.

When greater signal pickup, or where a shielding effect from noise sources or image reflections are desired, a reflector assembly, Stock No. 9872, may be added to the Stock No. 9871 Antenna to obtain an improved signal-to-noise ratio.

The RCA Double "V" Wire Type Television Antenna is an alternative type of antenna designed for television sight and sound reception. Two points of support are necessary. It serves adequately in suburban areas, but may not be sufficiently flexible in congested city areas where bad reflections and interference are encountered.

Antenna Installation.

In most cases, the antenna should not be installed permanently on the apartment or residence roof until the quality of the picture reception has been observed on a Television receiver. A temporary transmission line can be run between receiver and the antenna allowing sufficient slack to permit moving the antenna. Then, with a telephone system connecting an observer at the receiver and an assistant on the roof to find an antenna location, the antenna can be positioned to give the most satisfactory results on the received signal. A shift of only a few feet in antenna position or direction may effect a tremendous difference in picture reception.

Whenever possible, the antenna location should be chosen or erected so the antenna is not only broadside to the transmitter but removed as far as possible from highways, hospitals and doctors' offices and similar sources of interference. Auto ignition and diathermy apparatus may cause noise interference spoiling the picture.

In mounting any antenna, care must be taken to keep the antenna rods or pickup wires proper at least ¼ wave length (at least 6 feet) away from other antennas, metal roofs and gutters or metal objects. Under certain extremely unusual conditions, it may be possible to rotate or position the antenna so it receives the cleanest picture over a reflected path. If such is the case, the antenna should be so positioned. However, such a position may give variable results as the nature of reflecting surfaces may vary with weather conditions, as a wet surface has been known to have different reflecting characteristics than a dry surface.

In short, a television receiving antenna and its installation must conform to much higher standards than an antenna for reception of International Short Wave and Standard Broadcast signals because:

(1) Intervening obstacles have a pronounced shielding effect on the ultra-high frequency waves producing low intensity signals. Severe trouble with multi-path transmissions may be experienced, especially in congested city areas.

(2) The picture signal is comprised of a very wide band or range of frequencies, all of which must be received with good efficiency.

(3) It must be continually remembered that the discernment for the eye is much more critical than that of the ear.

Transmission Line

RCA Victor has made available two types of exterior transmission lines. One is a special low loss weather-proofed line having the correct surge impedance to match the RCA Victor Television antennas and the RCA Victor Television receivers. It is carried as Stock No. 9882 in 1,000-foot rolls. The second type is a standard weather-proofed line, also having the correct surge impedance for proper antenna and receiver matching. It is carried as Stock No. 12430 in 90-foot rolls, Stock No. 12429 in 45-foot rolls and is available in 1,000-foot spools as Stock No. 9881. Use of improper lines may result in excessive loss or may lead to line reflections, resulting in multiple images or "ghosts," thus marring the reception.

For transmission line runs up to 200 feet, and where the signal strength on the antenna is relatively high, the Stock No. 12430, or Stock No. 12429 transmission line may be used. For all other applications the Stock No. 9882 transmission line is recommended.

In some areas of very high signal intensity, a lead covered transmission line may be advantageous.

Five-Television-Channel, Receiver

Kinescope Installation (TRK-90).

1. Remove back cover of cabinet.
2. Remove the two screws which secure the wooden block, on which the yoke is mounted, to the upper shelf, and drop this block and yoke away from the shelf.
3. Loosen the thumb screw in the center of the slotted block of wood on the top shelf, pull this block of wood towards the rear of the cabinet and turn it so that the "V" slot on the front end of the block is to your right.
4. Wearing gloves and goggles, carefully slide the Kinescope on the "V" in the block, and turn both the block and the Kinescope so that the Kinescope faces the viewing window. Slide the Kinescope up to the mask in the window and fasten loosely in place by sliding the "V" block up to the bottom of the Kinescope face, and fastening it with the thumb screw.
5. Place the yoke and the wooden block on which it is mounted, on the Kinescope neck, rotate the block 90° from its original mounting position in order to have it clear the top of the cabinet and slide it into position on the Kinescope neck. DO NOT FORCE YOKE. In some cases where the yoke lead is too short it may be necessary to loosen the "V" block and swing the Kinescope neck to the left in order to be able to place the yoke on the Kinescope neck without forcing.
6. Fit the upper part of the wooden yoke mounting block into the slot on the underside of the cabinet top and fasten the lower end of the block securely by means of the two screws. The Kinescope should be mounted loosely in place, so that the yoke is not forced on the Kinescope neck at any time.
7. Loosen the wing nuts on the yoke mounting bracket, and move the yoke forward on the neck of the Kinescope so that it pushes the Kinescope against the mask. Tighten the wing nuts to hold the Kinescope and yoke securely in this position.
8. It may be necessary to rotate the Kinescope, within the limits allowed by the high voltage second anode lead, with respect to the mask in order to obtain proper masking of the edges on the Kinescope screen. Before rotating the Kinescope, the screws holding the yoke mounting block should be loosened, so that the Kinescope neck will not be forced.
9. Move the "V" block forward so that it holds the bottom of the Kinescope in place. Tighten the thumb screw.
10. Place the second anode lead on the second anode cap at the side of the Kinescope.
11. After the receiver is operating, and if the picture is not squared with the mask, using a screw driver loosen the clamping screws on the band around the yoke and rotate the yoke until the picture is squared with the mask, then tighten these clamping screws securely.

CAUTION: When removing the back cover of the cabinet, after the screws have been removed do not allow the cover to slide down on the neck of the Kinescope, or the neck of the Kinescope may be snapped off.

Kinescope Installation (TRK-120).—Refer to figure 4.

1. Remove back cabinet cover.
2. Remove the top safety glass cover by removing the three wing nuts "E" at the two front corners and right rear corner of the cover and loosening the wing nut "E" at the left rear corner of the cover.
3. Lift the cover straight upwards, taking care not to scratch the cabinet finish with the protruding screws or the cover itself.
4. Loosen the two wing nuts "F" on the yoke holding frame, and allow the yoke to drop down as far as possible.
5. Using gloves and goggles, open the Kinescope shipping carton and remove the top cover on the Kinescope

6. Remove the Kinescope from the shipping carton (do not remove the close fitting cardboard shield from the Kinescope), and insert the Kinescope into the cabinet, guiding the neck of the Kinescope into the yoke. Do not force the neck of the Kinescope into the yoke, or the tube may break. Let the Kinescope down slowly so that it finally rests on the yoke.

7. Rotate the Kinescope and cardboard container (but not the yoke), so that the second anode cap at the side of the tube is towards the front of the cabinet.

8. Place the white rubber mask on the face of the Kinescope, with the ribs on the mask facing upwards toward the mirror. Line up the mask so that it masks the edges on the Kinescope face. Then, if necessary, lift the Kinescope and rotate it so the mask is approximately squared up with the cover opening. The second anode cap should be kept towards the front of the cabinet.

9. Replace the safety glass cover and wing nuts. Tighten wing nuts to hold the cover securely.

10. Loosen the wing nuts "F" on the yoke mounting bracket and push the two metal brackets, on which the bottom of the yoke rests, upward, until the rubber mask rests against the top cover. If the mask and the cover opening do not line up, rotate the cone-shaped Kinescope shield until they do. Tighten the wing nuts to hold the yoke and tube in this position. In some cases it may be necessary to loosen the four screws holding the yoke support to the wooden frame and shift the yoke support to make the mask and Kinescope line up symmetrically with the cover opening.

11. Place the second anode lead on the second anode cap at the side of the Kinescope.

12. After the receiver is operating, and if the picture is not squared up with the cover opening, the two screws "H" on the band around the yoke should be loosened, and the yoke rotated to square up the picture, then these screws should be tightened with a screw driver.

Focusing Control.—This is a screw driver adjustment located on the right side of the cabinet near the base.

Adjustments.—There are a series of screw driver slot adjustments at the rear of the TRK-120 (at the side of the TRK-90), used to obtain the proper picture size, centering, and vertical distribution. These adjustments are explained fully in the receiver operating instructions

Video Chassis KC-4F, KC-4H

When it is desired to measure any voltages on this chassis, the primary leads of the high voltage transformer T6 should be disconnected and taped together.

When any changes have to be made in the Video chassis, the lead and part locations should be replaced as closely as possible to the original positions.

Because of the special equipment and procedure necessary for the proper alignment of these receivers, the alignment will be covered in a supplementary booklet.

Refer to the booklet: **Practical Television by RCA,** for detailed explanations of circuit operation in a Television receiver.

Service Hints:

1. Poor Horizontal Distribution of the picture elements may be due to a 6L6 tube. RCA-6L6 tubes of known recent manufacture are the only tubes recommended for the Horizontal sweep output circuit. By careful scrutiny, these tubes can be identified by the three "rings" or sections welded together at the base ring of the tube, as shown in Figure 6. If any other 6L6 tube is used in this position it will break down in a very short time.

2. If the picture "tears out" when the receiver is jarred it may be due to microphonic 6AB7, 6AC7 or 6J5 tubes.

3. The 6J5 oscillator tube should be removed without rocking it in its socket to loosen it, as the rocking motion may cause the 80.5 mmf capacitor to break off.

4. The coils in oscillator circuit should not be touched or moved or the alignment of the receiver will be disturbed.

5. The insulator on the filter capacitors may become dirty and break down to short out the high voltage.

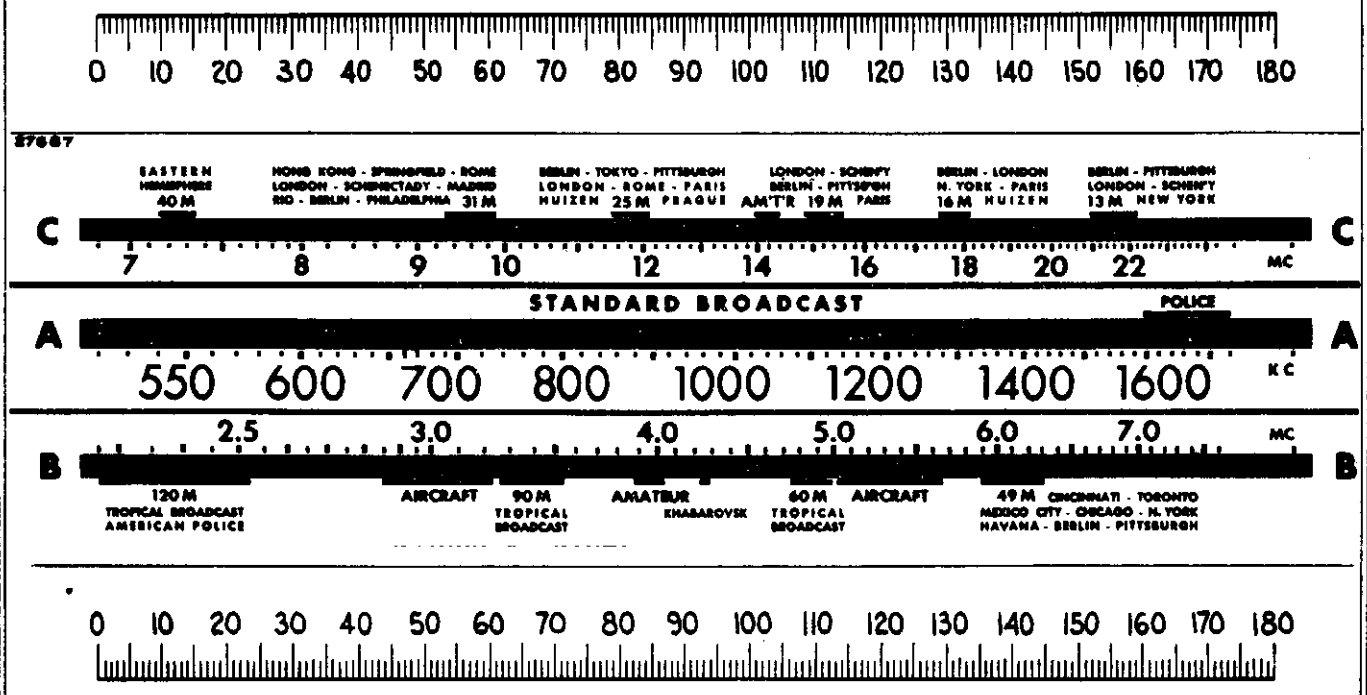
6. The Video coupling capacitors C50, 53, 59 should be kept clear of chassis.

7. A gassy 2V3-G tube may cause resistor R-137 to burn. Replace 2V3-G tube, and resistor, if necessary.

8. Changing the position of the oscillator shield plate will disturb the alignment.

Calibration Scale

Eleven-Tube, Three-Band, Electric Tuning, AC, Superheterodyne Broadcast Receiver



Tuning Dial, and Corresponding 0-180° Calibration Scale

The corresponding dial setting for any reading of the calibration scale can be determined by drawing a line straight up from this point; for example, 151° on the calibration scale corresponds to a dial reading of 1,500 kc on "A" band. Read instructions under "Alignment Procedure."

RCA MFG. CO., INC.

MODELS TRK-90, TRK-120
Ch. RC-427 (Receiver)

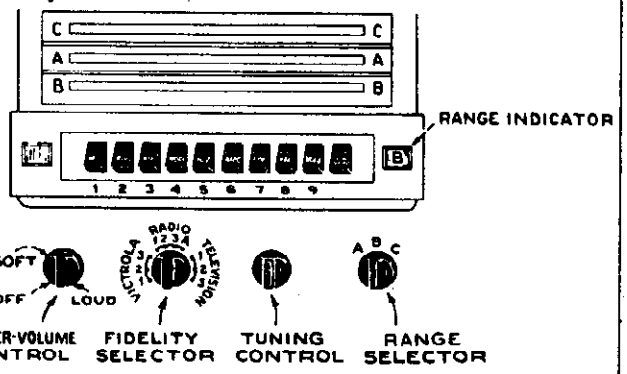
General Description

Radio receiver chassis No. RC-427 is used in RCA Victor Television Console Models TRK-90 and TRK-120.

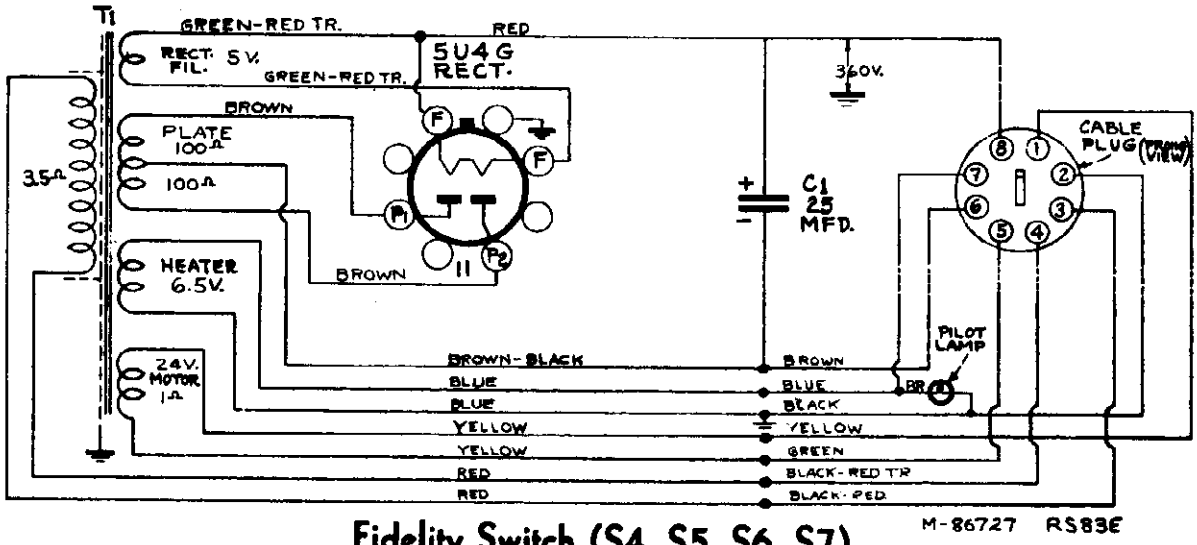
The audio output of the television chassis is connected to the audio input of the radio chassis by means of jack X-17 and section S7 of the fidelity switch. The functions of this switch are tabulated on the following page.

A separate plug-in power unit, RS-83E, is used to supply heater and plate voltages to the radio chassis. Service data and diagram for this power unit are shown below.

At Right—Location of Controls (Radio)



SPU Schematic Diagram, RS-83E



Fidelity Switch (S4, S5, S6, S7)

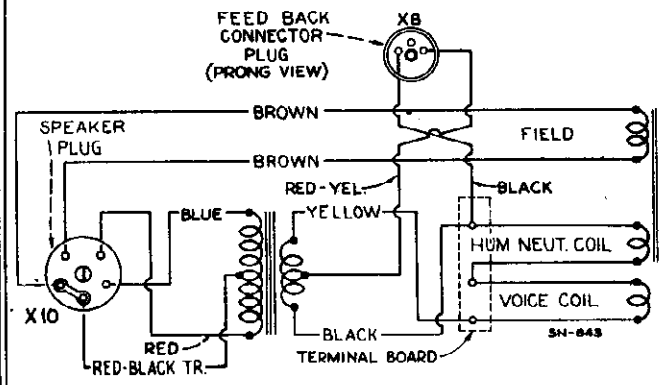
Switch Position	For	I-F Amp.	Audio Amp.	110-V. Supply for Tele. Chassis *	Osc. +B Supply	Dial Lamps **
No. 1 (Counter-clockwise)	Victrola	—	Min. Highs	Off	Off	On
No. 2	Victrola	—	Max. Highs Reduced Lows	Off	Off	On
No. 3	Victrola	—	Full Range	Off	Off	On
No. 1	Radio	Sharp	Min. Highs Max. Lows	Off	On	On
No. 2	Radio	Sharp	Max. Highs Reduced Lows	Off	On	On
No. 3	Radio	Sharp	Max. Highs Full Lows	Off	On	On
No. 4	Radio	Broad	Full Range	Off	On	On
No. 1	Television	—	Min. Highs	On	Off	Off
No. 2	Television	—	Med. Highs Reduced Lows	On	Off	Off
No. 3	Television	—	Full Range	On	Off	Off

* Controlled by switch (S12) on rear of fidelity switch.
** The 1st-I.F. heater is opened on television positions 1, 2 and 3.

MODELS TRK-90, TRK-120
Chas. RC-427

RCA MFG. CO., INC.

Miscellaneous Data for Radio Chassis



Connections and Colors of Loudspeaker and Cable

Precautionary Lead Dress

(1) All A-C leads should be twisted together and dressed away from parts in chassis to prevent hum pickup.

(2) Keep pilot light leads away from 6R7 grid.

(3) Yellow, green, and black leads from fidelity switch to 1st i-f transformer must be twisted together and dressed away from chassis. The same applies to the 2nd i-f transformer leads.

Victrola Attachment

A jack (X-16) is located near the antenna terminal board for convenience in plugging in a Victrola Attachment. The cable from the Victrola Attachment should be terminated in a Stock No. 31048 plug to fit the jack.

TRK-120 for 105-125 Volts—50-60 Cycle Power Supply

General differences are as follows:

Chassis KC-4J

1. Tube No. 21 formerly RCA-5V4G changed to RCA-25Z6 and socket wiring revised.
2. Circuit changes are indicated on the schematic diagram (Fig. 9).

Chassis KK-7J

1. Capacitors C-118 (80 mfd.) and C-119 (10 mfd.) added in parallel with C-110.
2. Capacitor C-128 (0.25 mfd.) added in parallel with resistor R-166.
3. Capacitors C-113 (0.03 mfd.) and C-114 (0.03 mfd.) changed to C-121 (0.1 mfd.) and C-122 (0.1 mfd.)
4. Power transformer (T-5) changed to (T-8) having a 25v. heater winding to supply the RCA-25Z6 horizontal damping tube.
5. High voltage power transformer (T-6) changed to (T-9).
6. Resistor R-165 is added.
7. Inductance L-50 is 100 ohms in this model.
8. An RCA-5T4 replaces the RCA-5U4-G.

In addition Kinescope shielding is provided as follows:

1. A metallic conical section is installed in the cabinet to shield the Kinescope bulb.
2. A double metallic cylindrical section is installed with the deflecting yoke mounting assembly to shield the deflecting yoke proper. The accompanying illustration shows its assembly.

CAUTION: The conical shield is of the proper size to permit installing the 1803P4 Kinescope with its protective cardboard sleeve. The latter should never be removed.

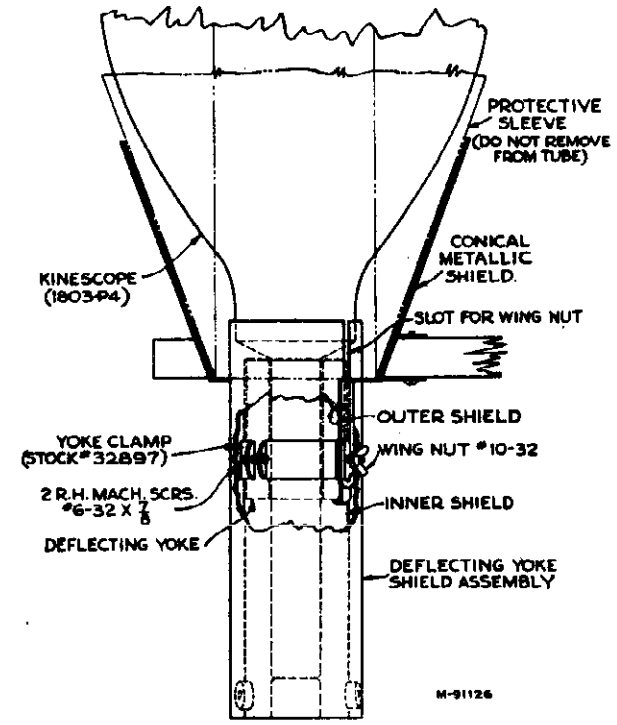
To prevent Kinescope breakage, when installing a Kinescope, the deflecting yoke and shield assembly must be in place. To prevent breakage of Kinescope when removing the deflecting yoke and shield assembly the Kinescope must be removed first.

Replacing or orienting deflecting yoke:

1. Remove Kinescope.
2. Loosen yoke support bracket wing nuts and remove complete yoke and shield assembly.
3. Remove outer shield. Loosen yoke clamp screws to permit removal or orientation of yoke. If it is necessary to orient yoke, pull yoke out so it extends about one inch. Tighten screws just enough to hold yoke but not too tight as it may be necessary to turn it in this extended position. Replace the inner shield and yoke in the yoke mounting brackets.
4. Replace Kinescope and protective glass cover.
5. Move the inner shield and yoke assembly vertically until yoke is gently touching Kinescope bulb. Tighten yoke bracket wing nuts.
6. Rotate yoke carefully with one hand to orient raster or picture.
7. Remove Kinescope.
8. Remove carefully (so as not to disturb yoke adjustment) the inner shield and yoke assembly. Place the latter on a flat surface with the extended yoke end flush to surface. Press inner shield gently down until yoke edge is flush with inner shield edge. Tighten yoke clamp screws evenly by first pulling one up and then the other.
9. Assemble outer shield to inner shield and yoke assembly so bottoms of shields are flush.
10. Replace complete shield and yoke assembly in the yoke support bracket.
11. Replace Kinescope and tighten protective glass cover.
12. Push gently complete assembly up flush against the Kinescope bulb. Tighten wing nuts.

IMPORTANT: 1. The hole in the conical metallic shield must line up with the hole in the protective sleeve to permit connection of the second anode cable.

2. Do not jar or drop the shields and keep away from the loudspeaker field coil to prevent magnetization.



Assembly Details, Showing Kinescope and Deflecting Yoke Shielding

RCA MFG. CO., INC.

IMPORTANT PRECAUTIONS

A good ground should be connected to the receiver at all times.

Always wear gloves and shatter-proof goggles when handling Kinescope tubes.

Do not eliminate the protection afforded by the interlock switches.

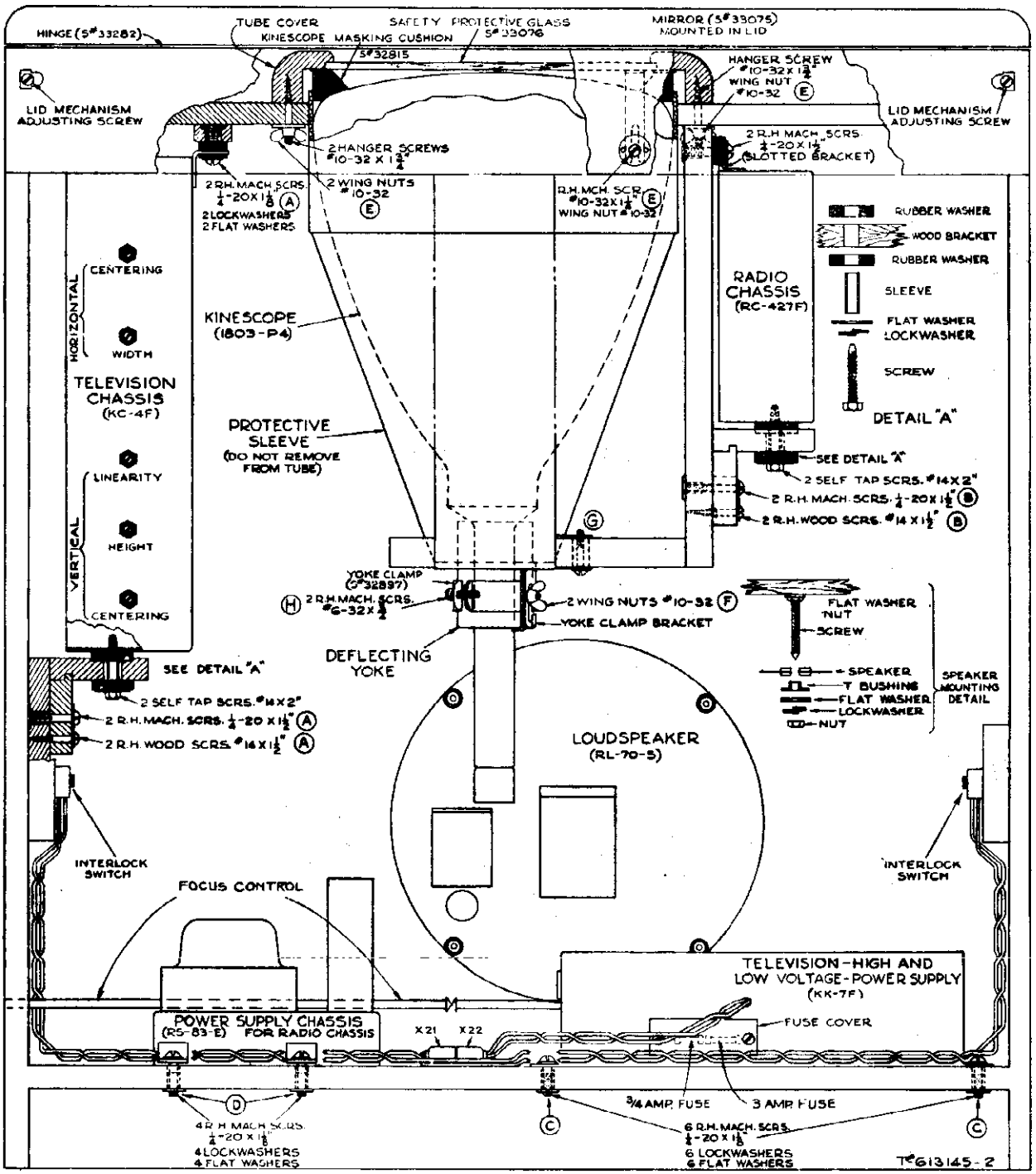
ALWAYS replace the shield can over the 2V3-G high voltage rectifier. The most dangerous portion of the H.V. supply is the plate lead of the 2V3-G tube.

Do not measure any voltages on the video chassis unless the primary leads of the high voltage transformer have been unsoldered from the supply line, and taped.

Use only one hand when working on the video or high voltage SPU chassis, and always connect a shorting lead to ground (first), then to the high side of both high voltage filter capacitors.

Make no voltage measurements on the high voltage (7,300 volts) SPU chassis.

Work on a television receiver should not be attempted by anyone who is not thoroughly familiar with the precautions necessary when working on high voltage equipment.



Operation

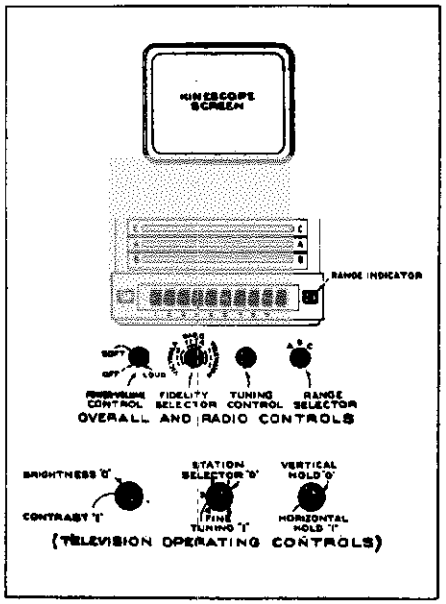


Figure 1—Operating Controls, TRK-90

The "Power Volume" control on the radio receiver turns on the power for the complete receiver. The "Victrola, Radio, Television" control selects the type of operation desired. There are three Victrola fidelity positions, four radio fidelity positions and three Television sound fidelity positions on this switch. The furthermost clockwise position being the highest fidelity position for Television sound.

Television Operation:

Station Selector and Fine Tuning.—The outer ring "O" section of the central dual control knob on the Television panel selects the station from which it is desired to receive television transmissions.

Five television channels are covered as follows:

(1) 44 to 50 mc.
(2) 50 to 56 mc.
(3) 66 to 72 mc.
(4) 78 to 84 mc.
(5) 84 to 90 mc.

Set the station selector to the number corresponding to the frequency of the station from which it is desired to receive Television broadcasts.

The inner section "I" of this knob is used for fine tuning and may eliminate moving ripples or distortion if due to interfering radio signals. A slight downward pressure must be exerted while turning the knob on the TRK-120, and an inward pressure on the TRK-90.

Before the Television portion of the receiver is turned "ON" it is advisable to turn the Brightness and Contrast controls completely counter-clockwise to reduce the illumination of the spot which appears on the Kinescope before the sweep circuits have started functioning.

Contrast and Brightness Controls.—The inner "I" section of the "Contrast" "Brightness" controls is the "Contrast" control and varies the black and white tones of the picture being received. Too much contrast gives blurred details and a lack of half-tones, while too little contrast makes it all half-tones or grays. Turning clockwise increases contrast from grays, to black and white. See Operating Instructions for this receiver.

The outer ring "O" is the Brightness Control and affects the average illumination of the picture. Turning clockwise increases the brightness. See Operating Instructions for this receiver.

An approximate adjustment for proper contrast is to turn the "Contrast" control fully counter-clockwise, then turn the "Brightness" control until the screen is slightly illuminated. Then reduce the Brightness control just sufficient to make the screen dark, then bring up the Contrast Control until the picture appears. A slight further adjustment of the Brightness or Contrast control may be necessary in some cases. A slight readjustment of the contrast control may aid synchronization of the picture.

Hold Controls.—The dual knobs on the Television panel marked "Horizontal" and "Vertical" Hold, control the picture stability. The inner section designated by a "I" is the Horizontal Hold Control and when being set should be turned slowly to the point at which the picture "locks in" horizontally. See Operating Instructions for this receiver.

The outer ring section designated by "O" is the vertical Hold Control and when being set should be turned to the point where the picture "locks in" vertically.

These two controls on this dual knob should not ordinarily require readjustment after good picture reception has once been obtained. An occasional resetting may be necessary due to changing to a different station, and to the gradual aging of the tubes.

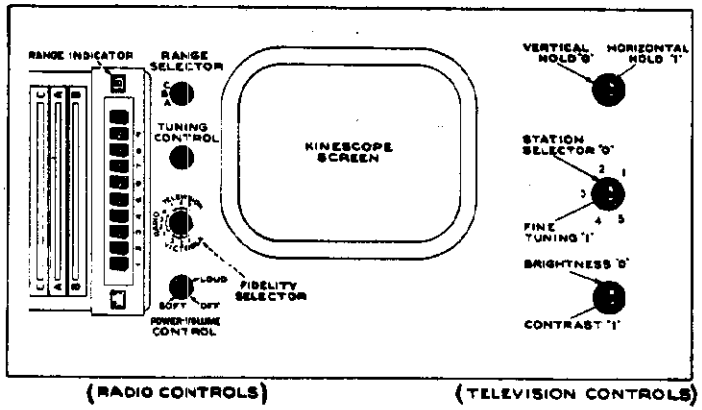


Figure 2—Operating Controls, TRK-120

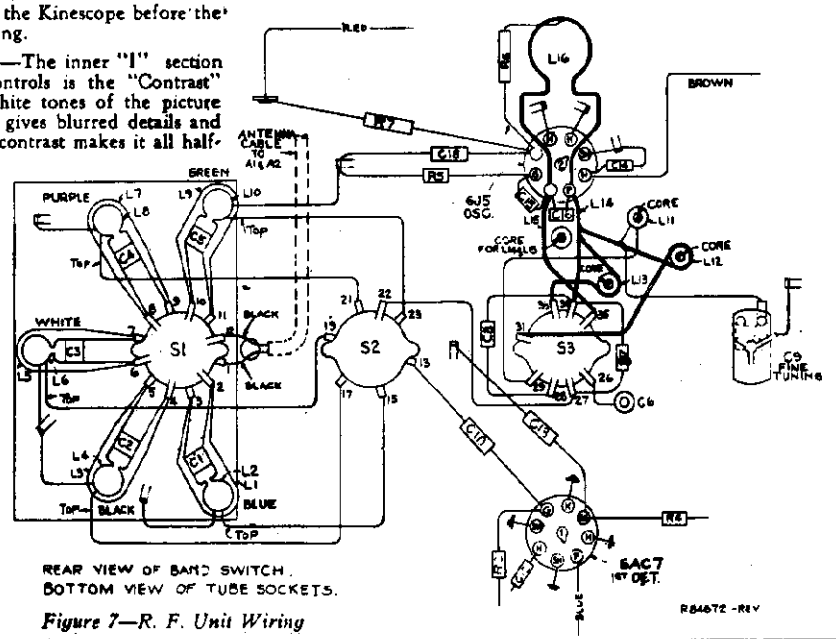
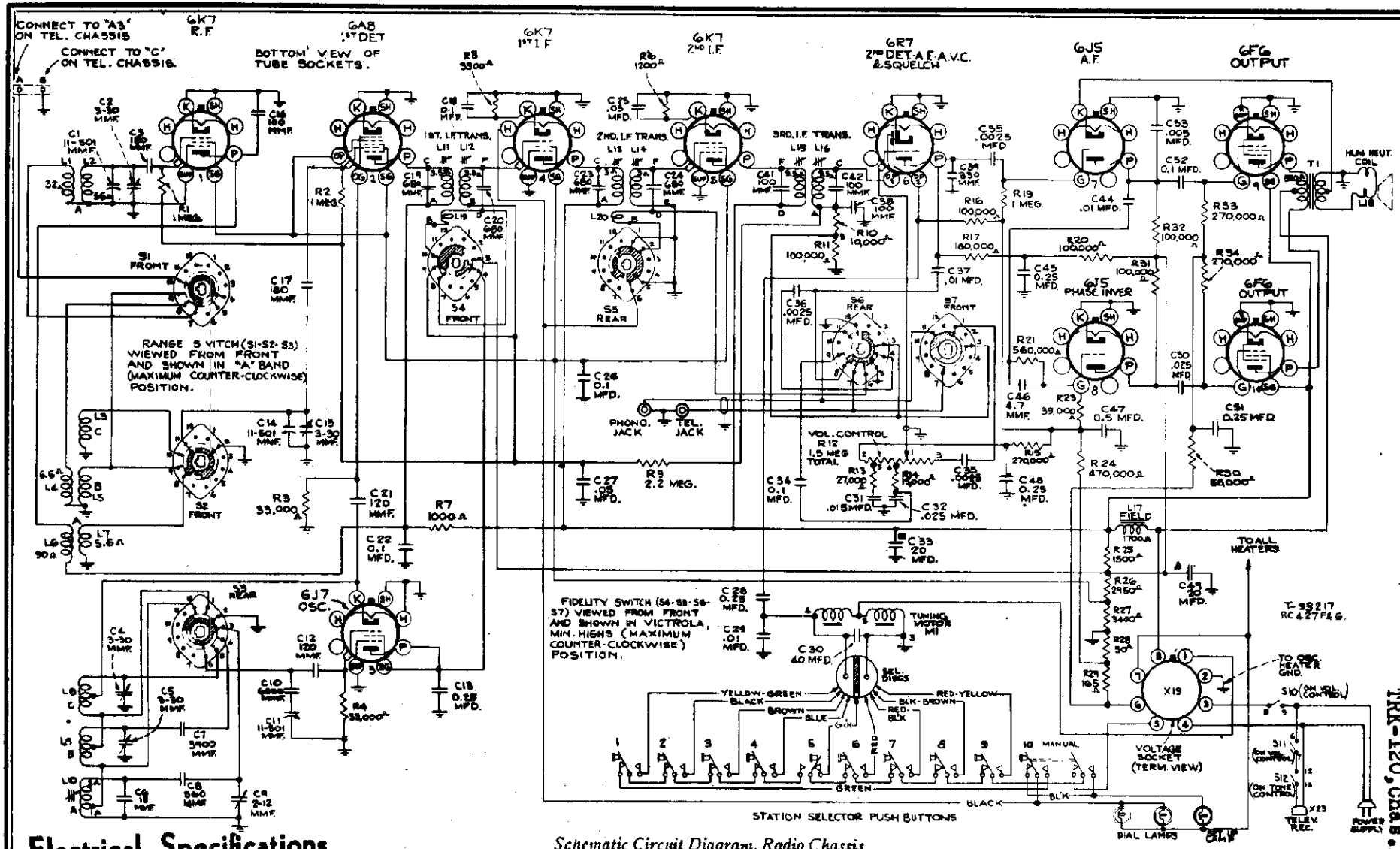


Figure 7—R. F. Unit Wiring

RCA MFG. CO., INC. MODELS TRK-90, Chas. RC-427F; TRK-120, Chas. RC-427F



Schematic Circuit Diagram, Radio Chassis

Electrical Specifications

FREQUENCY RANGES

Standard Broadcast ("A" band)..... 540-1,720 kc
Medium Wave ("B" band)..... 2.3-7.0 mc
Short Wave ("C" band)..... 7.0-22 mc

Intermediate Frequency..... 455 kc

Dial Lamps..... Two Mazda No. 44, 6.3 volts, .25 amp. / One Mazda No. 47, 6.3 volts, .15 amp.

(The Mazda No. 47 is the electric tuning set-up lamp, located at center of dial.)

Power Supply Rating..... 105-125 volts, 60 cycles, 120 watts

POWER OUTPUT

Undistorted..... 10 watts
Maximum..... 12 watts

LOUDSPEAKER (RL-70F-5)

Type..... 12-inch electrodynamic
Voice-Coil Impedance..... 2.2 ohms at 400 cycles

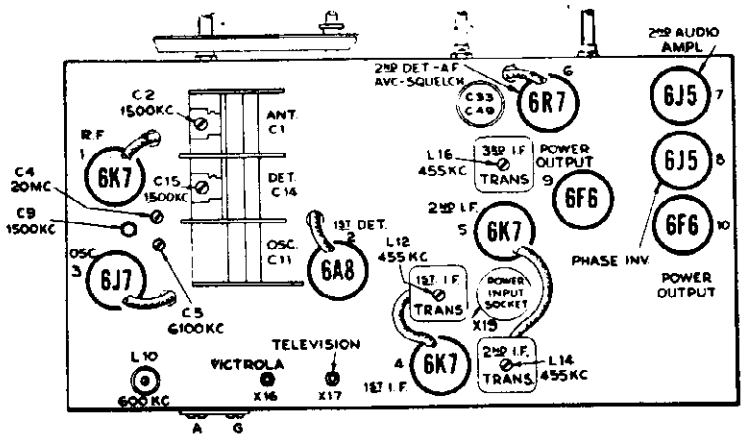
MODELS TRK-90, TRK-120
Chas. RC-427G, 427F

RCA MFG. CO., INC.

Alignment Procedure

(RADIO CHASSIS)

At Right—Tube and Trimmer Locations



Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment. — If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator. — For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the rear of the indicator-drive-cord drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The "O" mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

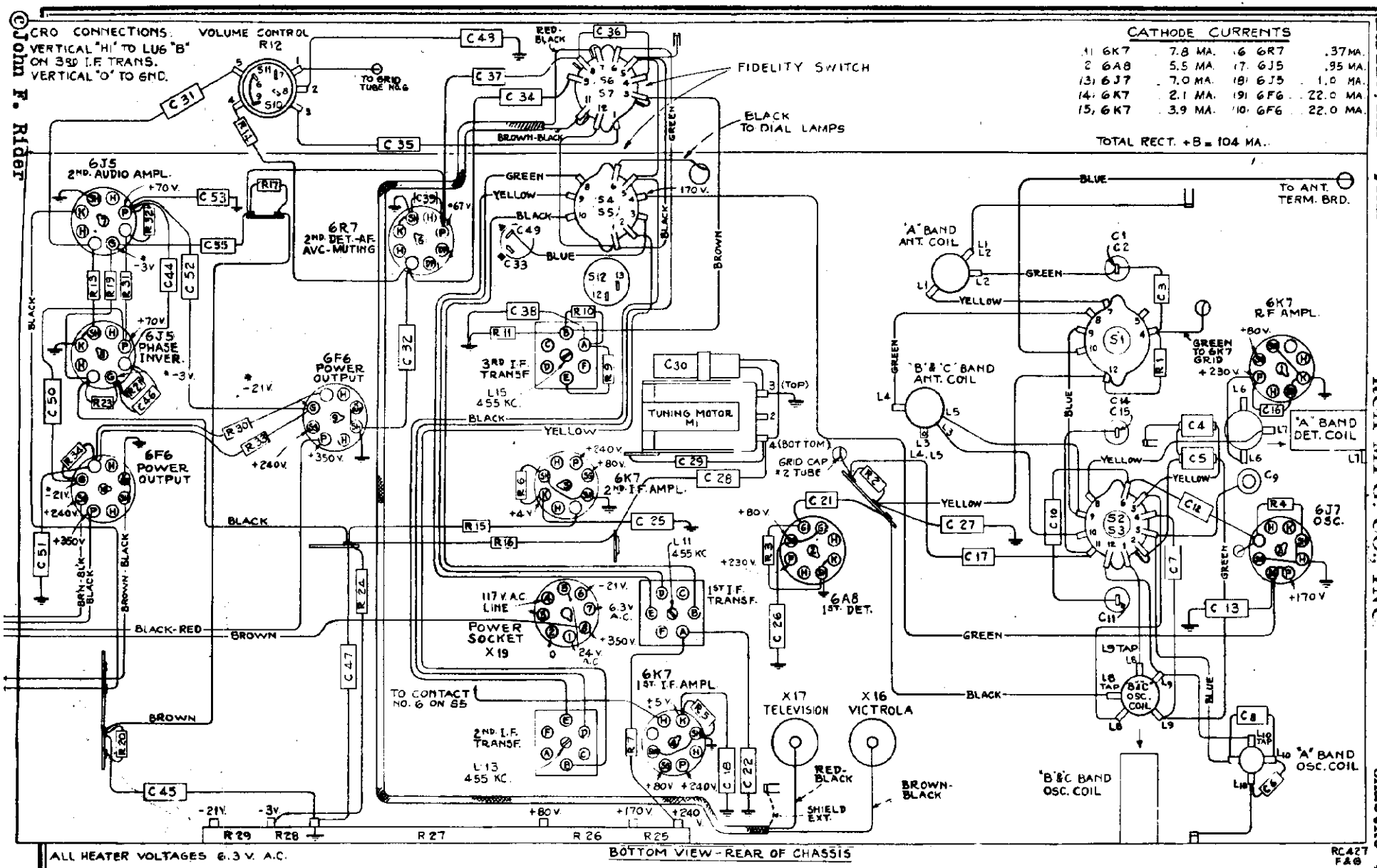
To determine the corresponding frequency for any setting of the calibration scales, refer to the accompanying drawing which shows the dial with O-180° calibration scales drawn at top and bottom.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "O" mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator approximately 1/16-inch above end dots at low-frequency ends of bands with gang condenser fully meshed. See that pointer does not rub background screen or dial face. The indicator has a spring clip for attachment to the cable.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Set tuning gang to—	Adjust the following—	To obtain—
1	Turn fidelity switch to No. 3 radio (sharp).				
2	6K7 2nd I-F grid cap, in series with .01 mfd.	455 kc	Quiet point on "B" band	L15, L16 (3rd I-F Trans.)	Coincidental images on cathode-ray oscillograph, or max. output on output meter.
3	6K7 1st I-F grid cap, in series with .01 mfd.			L13, L14 (2nd I-F Trans.)	
4	6A8 1st Det. grid cap, in series with .01 mfd.			L11, L12 (1st I-F Trans.)	
5	Turn fidelity switch to No. 4 radio (broad). The curve on CRO should broaden out to a double peak and reduce gain nearly 50%.				
6	Turn fidelity switch to No. 3 radio for the following adjustments. Back out the "B" and "C" oscillator trimmers, C5 and C4. Preset "A" band oscillator trimmer, C9, approximately an inch out.				
7	Antenna terminal, in series with 100 mmf.	600 kc	600 kc (31°) "A" band	L10 (osc.)	Max. Output
8		1,500 kc	1,500 kc (151°) "A" band	C9 (osc.) C2 (ant.) C15 (det.)	Max. Output
9		600 kc	600 kc "A" band	L10 (osc.)	Rock in for Max. Output
10	Repeat step No. 6.				
11	Antenna terminal, in series with 300 ohms	6,100 kc	6,100 kc (140°) "B" band	C5 (osc.)	Max. Output *
12		20 mc	20 mc (146°) "C" band	C4 (osc.)	Rock in for Max. Output *
	Follow "Adjustments for Electric Tuning."				

* Use minimum capacitance peak if two peaks can be obtained.
Note: The oscillator tracks 455 kc above the signal on all bands.



R-F Wiring Diagram and Socket Voltages (Radio Chassis)

Measurements made to chassis unless otherwise indicated, with set tuned to quiet point, volume control at minimum. Values should hold within approximately ±20% with 117-volt a-c supply.

***NOTE:** Values with star (*) are operating voltages in circuits with high series-resistance, and when measured will read lower depending on the voltmeter loading.

Electric Tuning Mechanism

When a station button is pushed in, it completes the 24-volt circuit through the corresponding station-setting contact and one-half of the brass selector disc, which is connected to one side of the motor field coil. This energizes the motor, and the rotor is pulled forward, engaging with the gear train that drives the tuning condenser and selector disc. The condenser and disc rotate until the insulation line comes under the particular station-setting contact, and the motor circuit is broken.

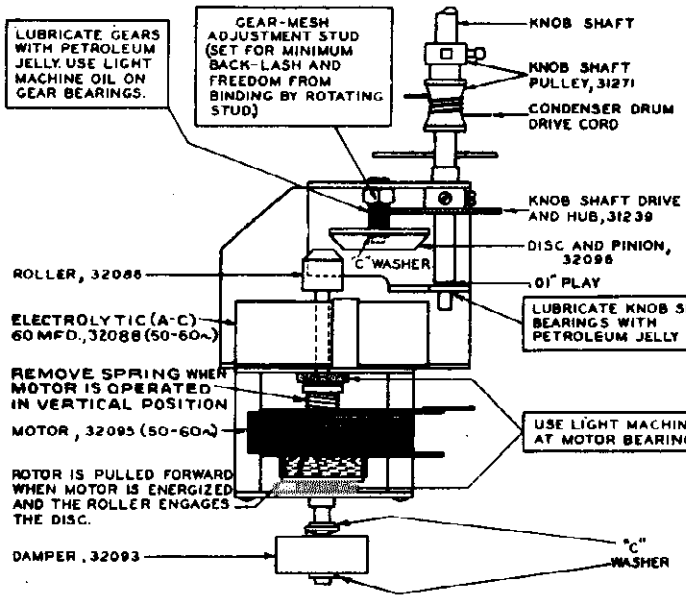
When the electric tuning mechanism is in action, the motor-supply voltage is fed into a diode rectifier circuit which applies a high bias to the first-audio amplifier. This prevents audio amplification and makes the set quiet or "mute" while the mechanism is operating.

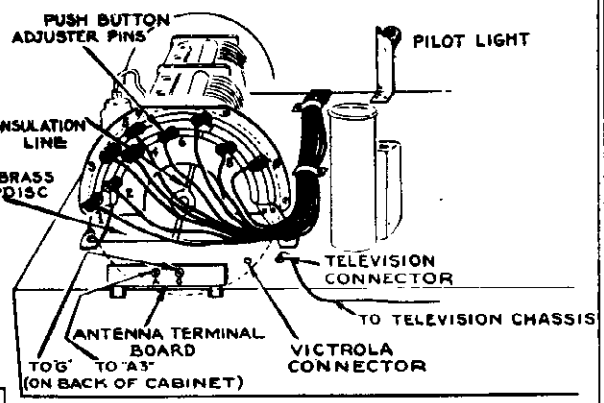
The brass selector disc is fastened to the rear shaft of the tuning condenser by means of two set-screws. When the condenser is at maximum (plates fully meshed) the insulation line should be horizontal, with the operating-end at the left (viewed from rear). The brass is beveled at this end.

The selector disc should be set so that the contact-tip plungers in the station-setting contacts project not more than 1/16-in. from the body of the contacts.

LUBRICATION

Motor bearings and **gear bearings;** use light machine oil.
Gear faces; use "Pure Oil No. 611" or petroleum jelly.
Dial-indicator pulleys and **rails;** use "Castordag" or petroleum jelly.
Selector disc; apply *thin* film of petroleum jelly.



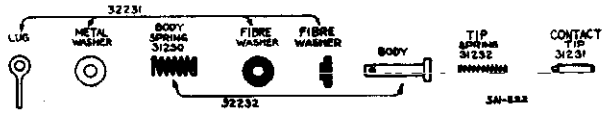


Station Button	Color of Lead To Station-Setting Contact	Station Button	Color of Lead To Station-Setting Contact
No. 1	Yellow-green	No. 6	Red
No. 2	Black	No. 7	Red-black
No. 3	Brown	No. 8	Brown-black
No. 4	Blue	No. 9	Red-yellow
No. 5	Green		

Adjustments for Electric Tuning

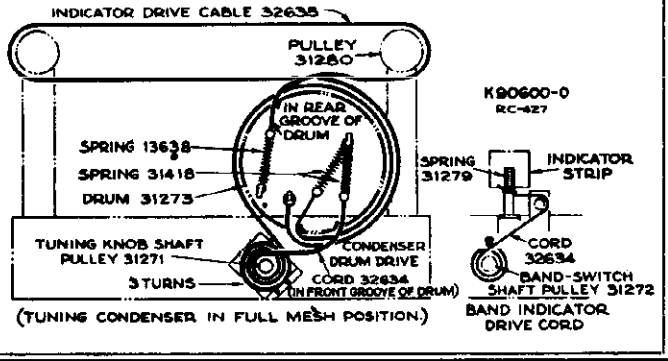
With power turned off, disconnect the antenna transmission line and ground connection, turn fidelity control to radio (3rd radio position—6th position from full counter-clockwise). Remove the back from the cabinet and reconnect the antenna transmission line and ground connection. The two interlock switches on the side panels should not be touched and care should be taken not to press on them when making the push-button set-up. Then turn on power, set range selector to "A," allow a few moments warm-up period and proceed as follows:

1. Make a list of the desired nine stations, arranged in order from low to high frequencies.
2. Turn on power-volume control, turn range selector to "A" band, and allow a few minutes for warming up.
3. Press down the "dial-tuning" (right-hand) button.
4. Manually tune in the first station on the list.
5. Hold down the "dial-tuning" button and press down station button No. 1 (left-hand). Both buttons will stay down. Move station adjuster contact pin No. 1 to the insulating line on the disc at rear of gang. When the pin is correctly centered on the insulating line, the central dial lamp will go out completely.
6. Press down any other button in order to release the dial tuning button and station button No. 1. Tune to some other section on the dial, and then press down station button No. 1 again; the electric tuning mechanism will function to tune in the first station, and the central dial lamp will stay on.
7. Repeat this process for the remaining stations.



Components of Station Setting Contact

At Right—Dial Mechanism



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	Unit List Price
	TELEVISION CHASSIS ASSEMBLIES **KC-4F in TRK 120 (60 cycle)** **KC-4J in TRK 120 (50 cycle)** **KC-4H in TRK 90 (60 cycle)**	
33387	Adjuster—Magnetite core and stud in tube for high frequency oscillator circuit adjustment (Used with L11, L12, L14, L15)	.55
33835	Adjuster—Magnetite core and stud in tube, for high frequency oscillator circuit adjustment (Used with L13)	.55
31253	Board—4 terminal antenna-ground terminal board	.25
12884	Capacitor—Adjustable plunger type air trimmer (C6)	.60
33097	Capacitor—4.7 mmfd. (neg. temp. coeff.) (C69)	.35
33478	Capacitor—5.6 mmfd., 500 volts (C7)	.40
33476	Capacitor—8.2 mmfd., 500 volts (C8)	.40
33381	Capacitor—8.2 mmfd., (neg. temp. coeff.) (C71)	.40
33380	Capacitor—12 mmfd., 500 volts (C24)	.40
33100	Capacitor—18 mmfd., 500 volts (neg. temp. coeff.) (C19, C23)	.40
33101	Capacitor—22 mmfd., (neg. temp. coeff.) (C64)	.40
33102	Capacitor—47 mmfd., (neg. temp. coeff.) (C30, C35, C66, C72)	.45
33103	Capacitor—68 mmfd., 500 volts (C31, C36, C15, C25, C40, C44, C49) (neg. temp. coeff.)	.35
33477	Capacitor—80.5 mmfd., 500 volts (C16)	.45
33104	Capacitor—82 mmfd. (neg. temp. coeff.) (C21, C22)	.45
33106	Capacitor—115 mmfd. (C5)	.30
33107	Capacitor—135 mmfd. (C4)	.30
12725	Capacitor—150 mmfd., 400 volts (C10, C87)	.35
33108	Capacitor—190 mmfd. (C3)	.30
12488	Capacitor—270 mmfd. (C81)	.35
33109	Capacitor—320 mmfd. (C2)	.30
33110	Capacitor—390 mmfd. (C1)	.30
31730	Capacitor—820 mmfd. (C123)	.40
32788	Capacitor—820 mmfd., 400 volts (C84, C89)	.40
12635	Capacitor—1,000 mmfd., 400 volts (C90)	.50
4881	Capacitor—3,300 mmfd., 400 volts (C102)	.60
34459	Capacitor—.0025 mfd., 1,400 volts (C124)	.20
33584	Capacitor—.005 mfd., 1,200 volts (C11, C12, C13, C14, C18, C20, C26, C27, C29, C32, C33, C34, C37, C38, C39, C41, C42, C43, C45, C46, C47, C48, C52, C60, C62, C63, C65, C67, C68, C70, C75, C98, C99, C100)	.25
4937	Capacitor—.01 mfd., 1000 volts (C74)	.25
4870	Capacitor—.025 mfd., 400 volts (C107)	.20
30882	Capacitor—.05 mfd., 200 volts (C94, C95)	.20
32787	Capacitor—.05 mfd., 400 volts (C28)	.20
4886	Capacitor—.05 mfd., 400 volts (C91)	.20
4839	Capacitor—0.1 mfd., 400 volts (C73, C53, C77, C78, C85, C59, C88, C103)	.30
12484	Capacitor—0.25 mfd., 350 volts (C86, C93, C101, C106, C80, C76, C105)	.30
12741	Capacitor—.5 mfd. (C57)	.30
32145	Capacitor—4 mfds., 450 volts—(Used in 50 cycle chassis only)	.70
33158	Capacitor—10 mfd., 150 volts, 20 mfd., 25 volts, (C97, C104)	1.00
33878	Capacitor—10 mfd., 450 volts, 10 mfd., 450 volts, 10 mfd., 150 volts (C125, C126, C127)	1.85
33160	Capacitor—10 mfd., 350 volts, 10 mfd., 150 volts, 20 mfd., 25 volts, 20 mfd., 25 volts (C92, C79, C82, C83)	1.60
32045	Capacitor—15 mfd. (C96)	.70
33161	Capacitor—20-50 mfd., 35 volts (C51, C108)	1.45
33243	Coil—Oscillator coil with core and stud (L11)	.65
35582	Coil—1½ turn antenna coil, core, stud, and capacitor assembly (C5, L9, L10)	1.10
33647	Coil—2 turn antenna coil, core, stud and capacitor assembly (C4, L7, L8) (yellow or purple)	1.10
33646	Coil—3 turn antenna coil, core, stud and capacitor assembly (C3, L5, L6) (orange or white)	1.10
33645	Coil—5½ turn antenna coil, core, stud and capacitor assembly (C2, L3, L4) (red or black)	1.10
33644	Coil—7½ turn antenna coil, core, stud and capacitor assembly (C1, L1, L2) (brown or blue)	1.10
35820	Coil—Peaking coil (L51, R156)	.55
35821	Coil—Peaking coil (L52, R146)	.55
35818	Coil—Peaking coil (L53, R148)	.55
35817	Coil—Peaking coil (L54, R150)	.55
35815	Coil—Peaking coil (L55, R154)	.55
35819	Coil—Peaking coil (L56, R153)	.55
35816	Coil—Peaking coil (L57, R155)	.55
33228	Condenser—Oscillator "Fine tuning" condenser, located on range switch (C9)	2.10
33164	Control—Dual 1.2 meg. and 30,000 ohms "Vertical hold" and "Horizontal hold" controls (R106, R92)	2.00
33206	Control—6 ohm tapped "Horizontal centering" control (R98)	1.50
33210	Control—20 ohm tapped "Vertical centering" control (R114)	1.50
33209	Control—5,600 ohm, "Vertical linearity" control (R113)	1.00
35566	Control—50,000 ohm "Brightness" and 4,000 ohm "Contrast" dual control	2.00
33207	Control—560,000 ohm "Width" control (R94)	1.00
33516	Transformer—"2nd pix P1" I-F transformer (L26, L27, L28, L29) (orange and orange)	2.60
33339	Transformer—"2nd sound" I-F transformer (L47, L48) (orange and orange)	2.60
33333	Transformer—"3rd pix" I-F transformer (L31, L32, L33) (orange and blue)	2.40
33336	Transformer "4th pix" I-F transformer (L34, L35, L36) (brown and black)	2.00
33208	Control—2.7 meg. "Height" control (R108)	1.00
4574	Plug—6-prong male plug for Television chassis power supply cable (X14)	.48
16836	Plug—8-prong male plug for Television chassis power supply cable (X12)	.25
14671	Resistor—33 ohms, ½ watt (R152)	.20
35568	Resistor—Voltage divider comprising a 70, 7.4 and 5 ohm section (R162, R163, R164)	.60
14074	Resistor—82 ohms, ½ watt (R64, R67, R14, R21, R28, R34)	.20
13428	Resistor—150 ohms, ½ watt (R39)	.20
13454	Resistor—270 ohms, ½ watt (R141)	.20
13219	Resistor—270 ohms, 2 watts (R97)	.25
30499	Resistor—470 ohms, ½ watt (R90, R95)	.20
35567	Resistor—Voltage divider comprising a 900-3,100-6,600-7,800 and 1,470 ohm section (R158, R159, R160, R161)	1.00
14720	Resistor—1,000 ohms, ½ watt (R9, R65, R70, R18, R41, R25, R31, R37, R42)	.20
14993	Resistor—1,200 ohms, 1/10 watt (R17)	.15
12267	Resistor—1,200 ohms, ½ watt (R115)	.20
14499	Resistor—1,500 ohms, ½ watt (R8, R24)	.20
31920	Resistor—1,800 ohms, 1/10 watt (R16, R23, R30)	.15
12194	Resistor—1,800 ohms, ½ watt (R112)	.20
11863	Resistor—2,200 ohms, 1/10 watt (R36)	.15
13486	Resistor—2,200 ohms, 1 watt (R6)	.22
13031	Resistor—3,300 ohms, 1/10 watt (R19, R26)	.15
12312	Resistor—3,300 ohms, ½ watt (R77, R87)	.20
30150	Resistor—3,300 ohms, 1 watt (R7, R57)	.22
12955	Resistor—3,900 ohms, ½ watt (R109)	.20
35943	Resistor—3,900 ohms, ½ watt (R139)	.20
30146	Resistor—4,700 ohms, ½ watt (R83, R99)	.20
31789	Resistor—5,600 ohms, 1/10 watt (R12, R142, R143)	.15
12265	Resistor—6,800 ohms, ½ watt (R11, R140)	.20
14075	Resistor—8,200 ohms, ½ watt (R101, R102, R103)	.20
14559	Resistor—10,000 ohms, ½ watt (R20, R27, R33, R13, R82, R84, R88, R100, R74, R147)	.20
13097	Resistor—10,000 ohms, 1 watt (R79, R80)	.22
13594	Resistor—15,000 ohms, 1/10 watt (R43)	.15
35944	Resistor—15,000 ohms, ½ watt (R149)	.20
14284	Resistor—22,000 ohms, 1/10 watt (R71)	.15
13998	Resistor—22,000 ohms, ½ watt (R47, R49)	.20
12738	Resistor—27,000 ohms, ½ watt (R91)	.20
11300	Resistor—33,000 ohms, 1/10 watt (R10) (early production only)	.15
35945	Resistor—33,000 ohms, ½ watt (R5, R138)	.20
12412	Resistor—47,000 ohms, ½ watt (R93) (R10—late production only)	.20
12010	Resistor—68,000 ohms, 1/10 watt (R32, R38, R69)	.15
13715	Resistor—68,000 ohms, ½ watt (R63, R66)	.20
14138	Resistor—68,000 ohms, ½ watt (R15, R22, R29, R35, R40, R68)	.20
14023	Resistor—82,000 ohms, ½ watt (R78)	.20
30435	Resistor—82,000 ohms, 1 watt (R144)	.22
14560	Resistor—100,000 ohms, ½ watt (R72, R85, R86, R89, R104, R145)	.20
30180	Resistor—120,000 ohms, ½ watt (R4)	.20
12364	Resistor—220,000 ohms, ½ watt (R51, R111)	.20
12285	Resistor—470,000 ohms, ½ watt (R46, R59, R96)	.20
12486	Resistor—560,000 ohms, ½ watt (R151)	.20
13730	Resistor—1 meg., ½ watt (R1, R2, R76, R75, R73, R52, R60, R81)	.20
2546	Resistor—1 meg., 1 watt (R3)	.22
30206	Resistor—1.2 meg., ½ watt (R105)	.20
5028	Resistor—1.8 meg., ½ watt (R107)	.20
12679	Resistor—2.2 meg., ½ watt (R110)	.20
33229	Roller—Rubber friction roller for oscillator condenser drive. Part of range switch assembly	.10
33165	Socket—2-prong female socket for Video output to Kinescope (X3)	.25
33011	Socket—4-contact female socket for Kinescope deflecting yoke (X1)	.25
31251	Socket—8-contact octal type socket	.25
18007	Socket—Ceramic octal socket for 6L6 "Hor. out" and 6J5 "Osc."	.65
14278	Socket—Television audio output pin socket (X5)	.15
33227	Switch—Range switch with shield plate and mounting studs—less coils, condenser and friction roller (S1, S2, S3)	4.65
33330	Transformer—"1st det. P1" I-F transformer (L17, L18) (br. and br.)	2.60
33331	Transformer—"1st det. P2" I-F transformer (L19, L20) (brown and red)	2.80
33334	Transformer—"1st pix P1" I-F transformer (L21, L22, L23, L24) (brown and green)	2.50
33335	Transformer—"1st pix P2" (L25) or "2nd pix P2" (L30) I-F transformer (brown and blue)	1.65
33338	Transformer—"1st sound" I-F transformer (L45, L46) (orange and red) (Used in early production)	2.40
33526	Transformer—"1st sound" I-F transformer (L45, L46) (red and white) (Used in late production)	2.50
33337	Transformer—"5th pix" I-F transformer (L37, L38) (brown and white)	1.80
32899	Transformer—Horizontal oscillation transformer (T1)	1.75
9862	Transformer—Horizontal output transformer (T2)	17.50
32900	Transformer—Vertical output transformer (T4)	5.50
32898	Transformer—Vertical oscillation transformer (T3)	1.75

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

MODELS TRK-90, TRK-120

RCA MFG. CO., INC.

STOCK No.	DESCRIPTION	Unit List Price
	3-BAND RADIO RECEIVER CHASSIS RC-427F in TRK-120 (60 cycle) RC-427F in TRK-120 (50 cycle) RC-427G in TRK-90 (60 cycle)	
31863	Board—Antenna-ground terminal board	.20
32232	Body—Station setting contact body and spring	.15
32090	Bracket—Motor mounting bracket	.40
32635	Cable—Indicator pointer drive cable—60-in. length	.24
14392	Capacitor—4.7 mmfd. (C46)	.35
31353	Capacitor—15 mmfd. (C6)	.40
31270	Capacitor—100 mmfd. (C41, C42)	.35
12720	Capacitor—100 mmfd. (C38, C16)	.35
12724	Capacitor—120 mmfd. (C12, C21)	.35
13003	Capacitor—180 mmfd. (C3, C17)	.35
12952	Capacitor—330 mmfd. (C39)	.35
31433	Capacitor—560 mmfd. (C8)	.35
31552	Capacitor—680 mmfd. (C19, C20, C23, C24)	.40
32197	Capacitor—3,900 mmfd., 500 volts (C7)	.55
31405	Capacitor—6,000 mmfd., 500 volts (C10)	.75
5107	Capacitor—.0025 mfd., 700 volts (C35, C36, C55)	.20
33584	Capacitor—.005 mfd., 1,200 volts (C53)	.25
11315	Capacitor—.015 mfd., 400 volts (C31)	.20
4870	Capacitor—.025 mfd., 400 volts (C32, C50)	.20
32787	Capacitor—.05 mfd., 400 volts (C27, C25)	.20
4839	Capacitor—0.1 mfd., 400 volts (C22, C18, C26, C34, C52)	.30
12484	Capacitor—.25 mfd., 350 volts (C13, C28, C48, C45, C51)	.30
12741	Capacitor—0.5 mfd., 150 volts (C47)	.30
18530	Capacitor—20-20 mfd., 350 volts (C33, C49)	2.00
32088	Capacitor—Motor capacitor 60 mfd., 40 volts (C30)	.90
31263	Coil—"A" band antenna coil (L1, L2)	.95
31265	Coil—"A" band detector coil (L6, L7)	1.20
31296	Coil—"A" band oscillator coil (L10)	1.05
31980	Coil—"B" and "C" band antenna coil (L3, L4, L5)	.80
31783	Coil—"B" and "C" band oscillator coil (L8, L9)	1.05
31234	Condenser—3-gang variable condenser (C1, C11, C14, C2, C15)	6.45
12714	Condenser—Air trimmer condenser (C9)	.50
31292	Condenser—Double section trimmer capacitor 3-30 mmfd., each section (C4, C5)	.40
31971	Contact—Push button switch contacts comprising 11 contacts riveted on insulating strip	.65
31972	Contact—Push button switch contacts compriaing 14 contacts riveted on insulating strip	1.25
31231	Contact—Station setting contact tip	.06
33446	Control—"Power-volume control"—1½ meg. (R12, S10, S11)	2.00
32634	Cord—Band indicator and variable condenser drive cord	.10
31269	Core—Core and stud for 1st, 2nd, or 3rd I-F transformer	.15
32093	Damper—Flywheel for rear end of motor shaft	.25
32096	Disc—Friction disc and pinion gear	.35
32091	Drive—Friction drive gear assembly	1.50
31273	Drum—Variable condenser drive drum	.70
31239	Gear—Knob shaft drive gear and hub	.65
31532	Indicator—Band indicating strip (Model TRK-12 only)	.15
31304	Indicator—Band indicating strip (Model TRK-9 only)	.15
31480	Lamp—6.3 volt electric tuning set-up lamp Mazda No. 47	.20
11891	Lamp—6.3 volt dial lamp Mazda No. 44	.17
31969	Lockplate—Push button switch lockplate comprising 10 contact locks in 1 strip	.75
32095	Motor—Electric tuning drive motor complete (M1)	5.25
31228	Plate—Station selector contact plate—less plungers	.45
31227	Plate—Station selector mounting plate—mounts on rear of variable condenser	.50
12493	Plug—Female connector for speaker cable (X9)	.30
31271	Pulley—Drive pulley fastens on station selector knob shaft	.25
31280	Pulley—Indicator pointer drive cord pulley	.10
31272	Pulley—Range switch pulley	.20
14720	Resistor—1,000 ohms, ½ watt (R7)	.20
12267	Resistor—1,200 ohms, ½ watt (R6)	.20
12312	Resistor—3,300 ohms, ½ watt (R5)	.20
14559	Resistor—10,000 ohms, ½ watt (R10)	.20
12695	Resistor—15,000 ohms, ½ watt (R14)	.20
12738	Resistor—27,000 ohms, ½ watt (R13)	.20
12454	Resistor—33,000 ohms, ½ watt (R3, R4)	.20
12266	Resistor—39,000 ohms, ½ watt (R23)	.20
12286	Resistor—56,000 ohms, ½ watt (R30)	.20
14560	Resistor—100,000 ohms, ½ watt (R11, R16, R20, R32, R31)	.20
13698	Resistor—160,000 ohms, ½ watt (R17)	.20
12199	Resistor—270,000 ohms, ½ watt (R15, R33, R34)	.20
18020	Resistor—470,000 ohms, 1 watt (R24)	.22
12486	Resistor—560,000 ohms, ½ watt (R21)	.20
12013	Resistor—1 meg., 1/10 watt (R8)	.15
13730	Resistor—1 meg., ½ watt (R1, R2, R19)	.20
12679	Resistor—2.2 meg., ½ watt (R9)	.20
31548	Resistor—Voltage divider consisting of one 1,500, one 2,950, one 3,400, one 30 and one 3,165 ohm section (R25, R26, R27, R28, R29)	.90
14887	Retainer—Drive cord pulley retainer	.01
32086	Roller—Rubber friction roller for front end of motor shaft	.10
31233	Rotor—Station selector rotor disc—mounts on rear of variable condenser shaft	1.16
5042	Screw—No. 8-32 set screw for drive pulley	.03
14350	Screw—No. 8-32 square head set screw for rotor disc, Stock No. 31233	.03
31681	Shaft—Dial drive knob shaft	.20
31364	Socket—Dial or electric tuning set-up lamp socket	.20
31251	Socket—Octal type Radiotron or power supply socket	.25
14278	Socket—Pin socket for phono or television input with mounting plate (X16) (X17)	.25
31279	Spring—Band indicator tension spring	.03
13638	Spring—Indicator drive cord tension spring	.08
31970	Spring—Push button switch lock bar spring	.05
31232	Spring—Station setting tip spring	.01
12007	Spring—Stud retaining spring for I-F adjuster	.02
31418	Spring—Variable condenser drive cord tension spring	.05
33447	Switch—H. F. tone control phono-radio-television and power switch (S4, S5, S6, S7, S12)	2.65
31979	Switch—Range switch (S1, S2, S3)	1.55
31968	Switch—Station selector push button switch complete	3.95
31565	Transformer—1st I-F transformer complete (L11, L12, C19, C20, L19)	2.40
31551	Transformer—2nd I-F transformer complete (L13, L14, C23, C24, L20)	2.40
31549	Transformer—3rd I-F transformer complete (L15, L16, C41, C42)	2.10
32231	Washers—Comprising one metal washer, two fibre washers and one solder lug or retainer for station setting body	.03
32094	Washers—Assorted washers for mounting damper on motor shaft	.10
	POWER SUPPLY UNIT **TELEVISION AUDIO RECEIVER** RS-83E in TRK-120 (60 cycle) RS-83E in TRK-120 (50 cycle) RS-83E in TRK-90 (60 cycle)	
14531	Capacitor—25 mfd. filter capacitor (C1)	1.55
33606	Plug—8-contact male plug for power supply cable (X20)	.45
31251	Socket—5U4G Radiotron socket	.25
33445	Transformer—110 V. 60 cycle power transformer (T1)	10.30
	7,500 VOLT TELEVISION POWER UNIT KK-7F in TRK-120 (60 cycle) KK-7J in TRK-120 (50 cycle) KK-7H in TRK-90 (60 cycle)	
33016	Bushing—Porcelain bushing and spring	.25
33288	Cable—Insulated connector complete with cable for Kinescope (2nd anode)	2.10
30036	Capacitor—.005-.005 mfd., 1,000 v. (C115, C116)	1.15
33018	Capacitor—0.03 mfd., 7,500 volt (C113, C114)	3.75
34331	Capacitor—0.1 mfd., 7,500 volt (C121, C122) (Used in 50 cycle model only)	7.50
18388	Capacitor—0.25 mfd., 600 volt (C128)	.35
32400	Capacitor—20 mfd., 450 volt (C111, C112)	1.05
33023	Capacitor—80-10 mfd., 400 volt (C109, C110, C118, C119)	2.80
14854	Choke—Filter choke (L49)	1.80
32940	Choke—Filter choke (L50) (Used in TRK-120, 50 cycle only)	3.75
35887	Choke—Filter choke (L50) (Used in TRK-90 and TRK-120, 60 cycle only)	XX
30314	Clip—Plate connector for 2V3G Radiotron	.03
33037	Control—Focus control, 400,000 ohms (R129) (Used in TRK-90 only)	1.00
33971	Control—Focus control, 400,000 ohms (R129) (Used in TRK-120 only)	1.00
33002	Coupling—Flexible bronze coupling	.10

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10907	Fuse—3 ampere, 250 volt	.08
34527	Fuse—¾ ampere glass type fuse	.18
33015	Insulator—Stand-off insulator only — less hardware	.30
32937	Knob—Focus control knob	.20
33244	Plug—2-prong male connector for A.C. power cord (X22)	.45
33166	Plug—2-prong male plug for Kinescope grid-cathode cable (X4)	.20
35897	Resistor—60 ohms, 10 watt (R165)	.30
33501	Resistor—330,000 ohms, 1W (1,000V.) (R126, R130)	.20
33502	Resistor—470,000 ohms, 1W (1,000V.) (R127, R137, R166)	.20
33593	Resistor—560,000 ohms, 1 watt (1,000V.) (R128)	.20
33554	Resistor—820,000 ohms, 1W (1,000V.) (R131, R132, R133, R134, R135, R136)	.20
33024	Shaft—Bakelite shaft for focus control	.50
18007	Socket—Ceramic octal base socket and retaining ring for high voltage rectifier	.65
33245	Socket—Kinescope socket, less cable (X11)	.35
31251	Socket—Octal base 5T4 rectifier, or television power supply socket (X13)	.25
12143	Socket—6-prong television power supply socket (X15)	.50
32909	Support—Rectifier socket, plate, and stand-off insulator assembly	2.00
32939	Transformer—Filament power transformer (T7), 105-125 volts, 60 cycle (Used in TRK-90, TRK-120, 60 cycles and TRK-120 50 cycles)	5.65
32938	Transformer—Low voltage power transformer (T5), 105-125 volt, 60 cycle (Used in TRK-90 and TRK-120, 60 cycles only)	10.00
34302	Transformer—Low voltage power transformer (T5), 105-125 volts, 50 cycle (Used in TRK-120, 50 cycle only)	10.00
9861	Transformer—High voltage power transformer (T6), 105-125 volts, 60 cycle (Used in TRK-90 and TRK-120, 60 cycle only)	22.50
35888	Transformer—High voltage power transformer (T6), 105-125 volts, 50 cycle (Used in TRK-120, 50 cycle only)	XX

SPEAKER ASSEMBLY
RL-70F-5

31825	Cap—Cone center dust cap	.02
11469	Coil—Hum neutralizing coil (L21)	.30
11234	Coil—Speaker field coil (L17)	3.85
31275	Cone—Speaker cone assembly (L18)	1.50
31567	Plug—3-prong male feed back cable plug (X8)	.15
31539	Plug—5-prong speaker plug (X10)	.25
31556	Speaker—Speaker complete (RL-70F-5)	13.45
31557	Transformer—Speaker output transformer (T1)	3.20

MISCELLANEOUS ASSEMBLIES
TRK-120
TRK-90

31358	Button—Station selector push button	.15
33676	Cable—17½-inch shielded audio lead with plugs (X6, X18) (Model TRK-9 only)	.85
33480	Cable—38-inch shielded audio lead with plugs (Model TRK-12 only) (X6, X18)	1.30
34600	Cable—Kinescope cable and socket (TRK-120 only)	2.50
34601	Cable—Kinescope cable and socket (TRK-90 only)	3.25
33246	Cable—Low capacity Kinescope grid cable (Model TRK-120 only)	1.25
33605	Cable—Low capacity Kinescope grid cable (Model TRK-90 only)	1.35
33597	Cap—Blue pilot lamp "Bulls Eye"	.20
32897	Clamp—Deflecting yoke clamp assembly	.65
4573	Connector—2-prong female connector for power supply circuit (X23)	.30

STOCK No.	DESCRIPTION	Unit List Price
33363	Connector—2-prong female connector, used on interlock cable (X21)	¶45
31456	Cover—Eight protective covers for push button markers	.08
32815	Cushion—Kinescope masking cushion (Model TRK-120 only)	2.30
33019	Cushion—Kinescope masking cushion (Model TRK-90 only)	1.90
33643	Cushion—Television chassis mounting cushion with screw, spacer and washer (sufficient for one chassis)	.40
35894	Decalcomania—"1-2-3-4-5" decal	.10
35890	Decalcomania—"Contrast-Brightness" decal	.05
35893	Decalcomania—"Fine Tuning" decal	.05
35891	Decalcomania—"Horizontal and Vertical Holding" decal	.05
35896	Decalcomania—"Power-Volume, tone, tuning, range" decal	.20
35392	Decalcomania—"RCA Victor" decal	.05
35892	Decalcomania—"Station selector" decal	.05
35895	Decalcomania—"Victrola-Radio-Television" decal	.10
33442	Dial—Three-band glass dial scale	1.25
35889	Escutcheon—Dial escutcheon less buttons, button shaft and dial scale	2.60
32083	Frame—Dial frame with screen less pointer, carriage and rod	1.20
33074	Glass—6¾ by 8¾ inch safety protective glass (Model TRK-90 only)	2.40
33076	Glass—8¾ by 11¼ inch safety protective glass (Model TRK-120 only)	3.90
33282	Hinge—Piano type lid hinge and screws	2.50
33468	Knob—Radio tuning, volume or range selector knob	.15
*33470	Knob—Television "Contrast," "Hor. hold" or "Fine Tuning" knob	.20
33471	Knob—Television "Brightness" or "Vert. hold" knob	.25
33472	Knob Television "Station selector" knob	.25
33469	Knob—"Victrola-Radio-Television-Fidelity selection" knob	.20
11891	Lamp—6.3 V. pilot lamp, Mazda No. 44	.17
31589	Marker—Complete set of call letter markers	.35
31458	Marker—"Dial Tuning" push button marker	.01
31457	Marker—"Victrola" push button marker	.01
33075	Mirror—20½ by 14¾ in. viewing mirror	9.00
33225	Nut—Speed nut for mounting high frequency coil assemblies	.01
4577	Plug—2-prong male plug for power supply circuit (X24)	.45
33244	Plug—2-prong male plug, used on interlock cable (X22)	.45
33166	Plug—2-prong male plug for Kinescope grid-cathode cable (X4)	.20
32816	Plug—4-prong male plug for deflecting yoke cable (X2)	.20
12493	Plug—5-prong female speaker cable plug (X9)	.30
4574	Plug—6-prong male plug for Television chassis power supply cable (X14)	.48
16836	Plug—8-prong male plug for Television chassis power supply cable (X12)	.25
31542	Pointer—Station selector pointer with carriage	.35
31287	Rod—Dial frame pointer slide rod	.15
32083	Screen—Dial frame diffusing screen with rivets	1.20
4560	Screw—¼-20 by 1¼ in. long, machine screw, washer and lockwasher for chassis mounting (12 required)	.06
33517	Sleeve—Bell mouth sleeve for screw-driver adjustments (Model TRK-90 only)	.05
14270	Spring—Knob spring for Stock Nos. 33468, 33471, 33472, 33469 knobs	.05
30330	Spring—Knob spring for Stock Nos. 33470, knob	.03
33384	Switch—Interlock switch and cover	.55
31522	Support—Left hand lid support	2.25
31478	Support—Right hand lid support	2.20
9857	Yoke—Deflecting yoke complete with cable and 4-prong plug (L43, L44, R62)	17.50

XX—Price upon application to your RCA Parts Distributor.

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MODEL R-91 Phono.

RCA MFG. CO., INC.

General Description and Service Data

The model R-91 Electric Victrola consists of a crystal pickup, a four tube audio amplifier, a five-inch dust-proof dynamic speaker, and a motor turntable mechanism all combined in a hinged-top, table type walnut veneer cabinet. Any record, up to and including the 12-inch size, may be played on this instrument.

The crystal pickup unit is securely sealed in a metal casing, against extreme changes of climate. If failure occurs due to a defective crystal unit, no attempt should be made to repair it, but a new replacement crystal unit should be installed.

Phonograph Motor

The synchronous motor used in this instrument is designed to be simple and foolproof. The parts that may require attention are plainly shown in figure 2. The motor is started by turning "on" the power switch and giving the turntable a clockwise spin with the hand. Smooth starting and running will be insured by keeping the bearings well cleaned and oiled.

Hum and Vibration.—A small amount of hum when starting, decreasing to a negligible amount when running, is normal. If excessive vibration occurs it may be due to:

1. Insufficient lubrication, or any failure that will cause binding.
2. Leather washer not oiled. (Check to make certain that the leather washer is above the steel washer.)
3. Motor not properly supported from motor board.
4. Burrs on poles of rotor or stator. Remove with fine emery cloth.
5. Stator should be free to rotate between limits of damping assembly.

Removing Rotor.—The rotor and turntable assembly simply rests on the ball bearing at bottom of vertical bearing. Remove by lifting upward.

Rotor Adjustment.—Remove motor from cabinet. Loosen the three screws that hold the rotor to the turntable, insert three 16-mil shims at equal distances around the gap between the rotor and stator, and then carefully tighten the three screws. The top of rotor must be flush with top of stator; add additional steel washers beneath the stator if necessary.

Pilot Lamp.—To replace pilot lamp, remove the screws from the small raised block at the front of the motor board, and remove the wooden block. The pilot lamp compartment is then accessible.

POWER SUPPLY RATING

A-5	105-125 volts, 50 cycles, 65 watts
A-6	105-125 volts, 60 cycles, 65 watts

POWER OUTPUT

Undistorted	1.5 watts
Maximum	2.0 watts

LOUDSPEAKER

Type	Electrodynamic
Voice Coil Impedance	4.9 ohms at 400 cycles

MOTOR BOARD

Motor	Manual Starting Synchronous
Turntable Speed	78 r.p.m.

PICKUP

Type	Crystal
Impedance	80,000 ohms at 1,000 cycles

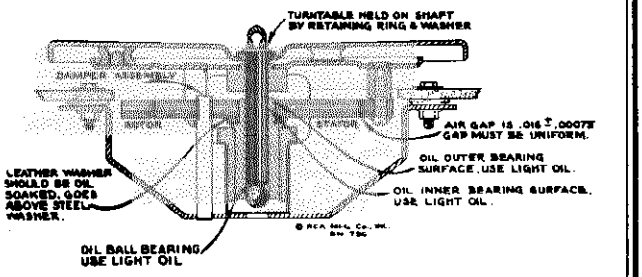


Figure 2—Motor Details

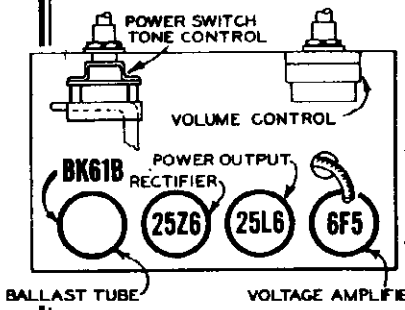


Figure 3—Tube Layout

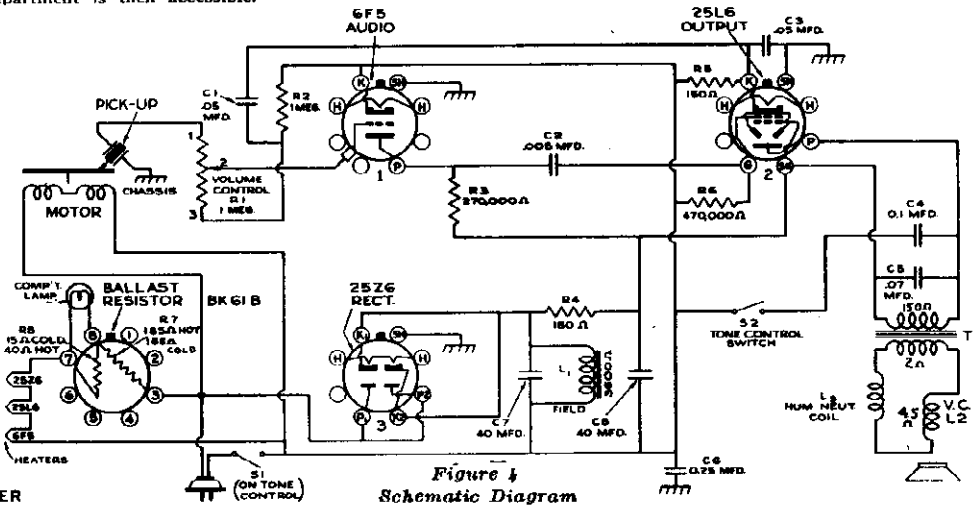


Figure 4
Schematic Diagram

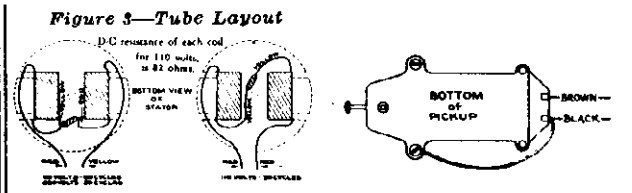


Figure 1—Motor Coil and Pickup Wiring

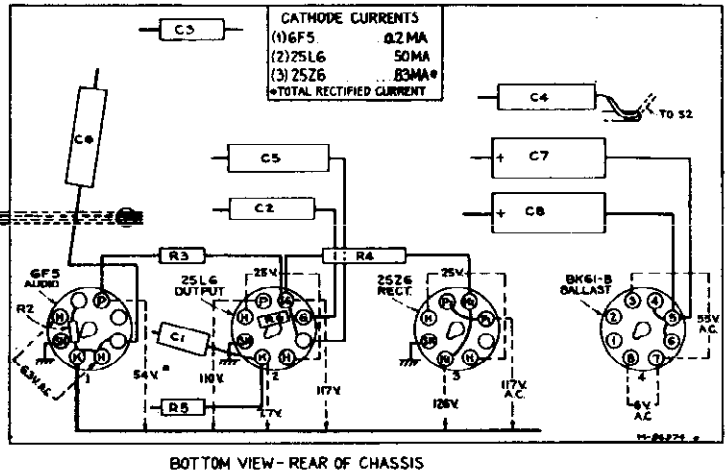
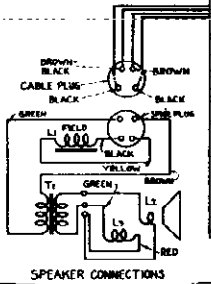


Figure 5
Wiring and Socket Voltages



*** NOTE:** Values with star (*) are operating voltages in circuits with high series-resistance, and when measured will read lower depending on the voltmeter loading.

Measurements made to chassis unless otherwise indicated, volume control at minimum. Values should hold within approximately ± 20% with 117-volt a-c supply.

RCA MFG. CO., INC.

General Description

These instruments employ a crystal pickup unit which depends upon torsional vibration to provide the necessary output voltage. The crystal unit is contained in a metal case, securely sealed against extremes of climate. An offset mounting for the pickup head gives an ideal tracking angle between the needle and record grooves.

The motor is a manual starting, synchronous type, designed to operate with good regularity of speed at the standard 78.26 r.p.m. Mechanically, the motor consists of a laminated stator having a large number of salient poles; a laminated rotor with a corresponding number of poles, which is affixed to the turntable; and two field coils, installed on the stator to furnish the energizing magnetic flux. The rotor, stator, and their bearing assembly are mechanically isolated from the turntable, motor mounting, and cabinet by adequate flexible couplings and supports.

A volume control unit is associated with the record player, and its output is terminated in a twisted-pair cord with a pin-plug connector.

The two models are electrically and mechanically similar; they differ in that Model R-93B has a molded plastic cabinet, whereas Model R-93C has a veneer wood cabinet.

VOLTAGE RATINGS

A-6 ..... 105-125 volts, 60 cycles, 9 watts
A-5 ..... 105-125 volts, 50 cycles, 9 watts
B-2 ..... 105-125 volts, 25 cycles, 9 watts
C-5 ..... 200-250 volts, 50 cycles, 9 watts

MOTOR AND PICKUP

Type of Motor ..... Synchronous (Manual Starting)
Turntable Speed ..... 78 r.p.m.
Type Pickup ..... Crystal
Pickup Impedance ..... 80,000 ohms at 1,000 cycles
Average Output Voltage ..... 1½ volts at 1,000 cycles with 250,000 ohm load
Volume Control Resistance ..... 250,000 ohms

RCA VICTOR RECEIVERS—DETAILS OF LEAD CONNECTIONS

MODEL	METHOD OF CONNECTION	GREEN	YELLOW	RED	BLUE	SHIELD	SWITCH
5BT, 5T, 5T1, 5T4, 5T5, 5T6, 5T7, 5T8, 6K, 6K1, 6T, 6T5, 8BK, 8BK6, 8BT, 8BT6, 8K11, 8T2, 8T11 85T5, 86X4, 86T, 86T4, 86T44, 86BK, 86BT, 85BK, 85BT	Term. Board	1	2	Tape	Tape	3	†
6BK, 6BK6, 6BT, 6BT6	Term. Board	1	2	Tape	Tape	3	††
7K, 7T, 7X, 7X1, 8K, 8K1, 8T, 8T10, 87K1, 88K, 812X, 810T4, 813K, 816K, 811K, 87EY, 87X, 87Y, 810T, 810K, 812K	Term. Board	1	2	Tape	Tape	3	†
6K2, 6K3, 6K10, 6T2, 6T10, 7K1, 7X1, 86T3, 87T1,	Term. Board	2	1	Tape	Tape	3	†
T9-7, T9-8	Term. Board	2	3	Tape	Tape	1	†
9K, 9K1, 9K2, 9K3, 9K10, 9T, 10K, 10K1, 10K11, 10T, 10T11, 13K, 15K	Term. Board	2	1	4	3	3	††
C6-12, C7-14, C8-19, C8-20, T6-11, T7-12, T8-18, T9-10	Grid Clip	Grid Cap Tube	Grid Clip	Tape	Tape	Chassis	†
C11-3, C13-3, C15-4	Adapter	1st Audio Cathode	Cathode Socket Contact	I-F Cathode *	I-F Cathode Socket Contact	Chassis	††
C6-8, T6-7	Adapter	Grid Cap Tube	Grid Clip	Tape	Tape	Both Adapter Cathode Terms.	†
85E	Wired On	R5 §	~~R5?~~ R16 22,000 ω	Tape	Tape	Chassis	†
85BT6	Wired On	R5 §	Junction of R10 & R14 22,000 ω - 2.2 meg	Tape	Tape	Chassis	†
86X	Wired On	R5 §	R11 2.2 meg	Tape	Tape	Chassis	†
85T1	Wired On	R5 §	Junction of R16 & R11 22,000 ω - 2.2 meg.	Tape	Tape	Chassis	†
85T	Wired On	R5 §	R2 2.2 meg	Tape	Tape	Chassis	†

† Add Jumpers J1 and J2 to Phono-Radio Switch if not present.
†† Remove Jumpers J1 and J2 to Phono-Radio Switch if present.
§ Open circuit between R5 and other resistors named, and wire-in cable as instructed. See Figure 4.
* Use a second adapter. * R5 is the volume control.

MODELS R-93B, R-93C

RCA MFG. CO., INC.

CONNECTING RECORD PLAYER TO RADIO RECEIVER—In connecting this player to the radio, care must be exercised to connect it at a point where sufficient gain is between it and the speaker to give normal output. Usually two or more stages of audio amplification are required. The radio part must be thoroughly disconnected or "killed" when playing records, else the radio signals will be heard with the record's music. Attention should be given to the possibility of introducing hum and feedback voltage into the

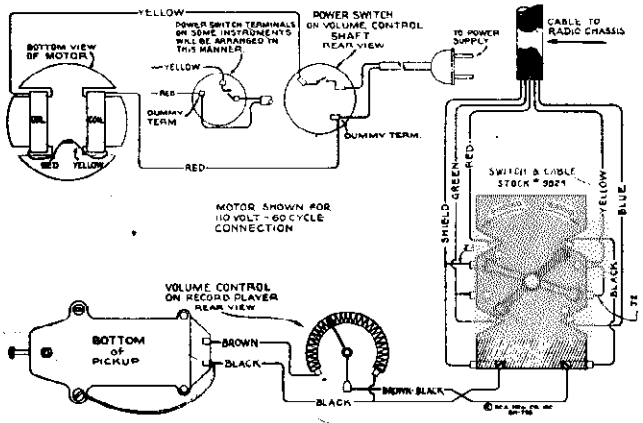


Figure 1—Wiring Diagram

radio when connecting the player. A radio-phonograph switch, Stock No. 9824 is recommended for a switching system. Its connections are shown in Figure 1. With it, radio or phonograph may be selected by simply turning the switch.

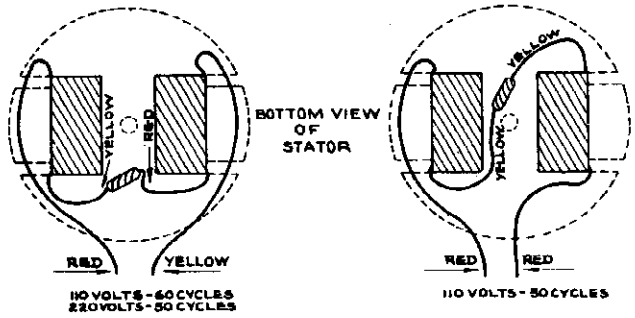


Figure 3—Motor Coil Assembly and Connections

When the radio is equipped with a phonograph terminal board, the player is easily connected. One should follow the instructions pertaining to that particular radio. In general, the player's output should be applied to the grid circuit of the first audio tube in the same manner as the second detector is connected. Use a switching arrangement that grounds the radio as it connects the phonograph.

When using the radio phonograph switch Stock No. 9824 on radios using a 6B7 or some similar tube for second detector, the yellow and green leads are connected in series with the grid cap connections of this tube. The green lead is connected to the grid cap.

RECORD PLAYER SWITCH JUMPERS—Some record player switches do not have jumpers J1 and J2 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.

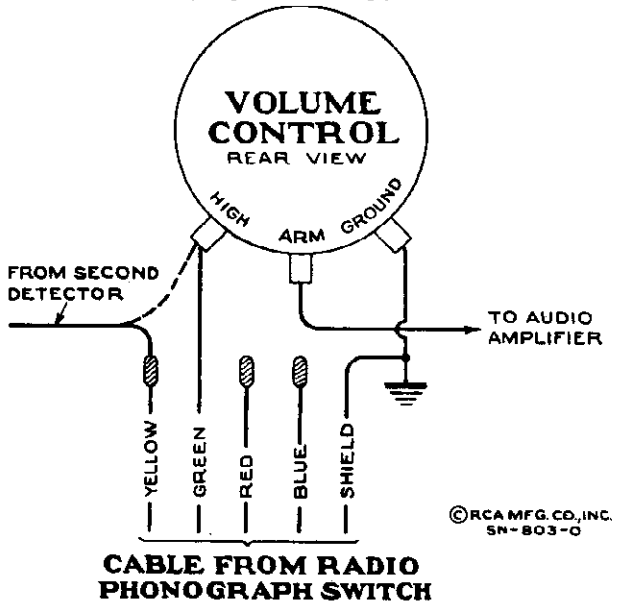


Figure 4—Typical Connections to Radio Receiver Volume Control

STOCK No.	DESCRIPTION	Unit List Price
	MOTOR ASSEMBLIES	
31045	Base—Motor support, damper, and bearing cup assembly	.60
31046	Bearing—Bearing assembly	.70
31041	Cap—Rubber spindle cap	.05
31047	Cushion—Rubber cushion for bearing	.15
31035	Motor—110 volt, 25 cycle—less mounting (M1)	9.50
31034	Motor—110 volt, 50 cycle—less mounting (M1)	8.90
9841	Motor—110 volt, 60 cycle—complete with mounting (M1)	6.50
31040	Mountings—Turntable top rubber mountings sufficient for one turntable	.25
31038	Rotor—Turntable and rotor lamination assembly complete for 25 cycle operation	4.55
31037	Rotor—Turntable and rotor lamination assembly complete for 50 cycle operation	4.55
31036	Rotor—Turntable and rotor lamination assembly complete for 60 cycle operation	4.55
31044	Stator—Stator assembly complete with coils and laminations for 25 cycle operation	3.10
31043	Stator—Stator assembly complete with coils and laminations for 50 cycle operation	2.50
31042	Stator—Stator assembly comprising coils and laminations for 60 cycle operation	2.50
31039	Turntable—Finished turntable top plate only—less rubber mountings	.95
4083	Washer—Leather washer	.02
14231	Washer—Metal spacing washer	.02
	PICKUP AND ARM ASSEMBLIES	
31049	Base—Pickup arm pivot shaft and base assembly	.65
31050	Crystal—Pickup crystal and needle screw	3.75
9842	Pickup crystal and arm complete with mounting	4.95
12539	Screw—Pickup needle screw	.22
	MISCELLANEOUS ASSEMBLIES	
31055	Cabinet—Model R-93B cabinet with bottom cover—less rubber feet	2.05
31051	Foot—Rubber foot for cabinet	.04
3961	Knob—Volume control knob	.10
31054	Mounting—Pickup arm mounting nuts, washer, and rubber spacer	.15
31053	Mounting—Motor mounting screw assembly complete	.30
31048	Plug—2-contact male plug for output cable	.15
31052	Volume Control and on-off switch (R1, S1)	1.50

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

RCA MFG. CO., INC.

Electrical and Mechanical Specifications

MOTOR

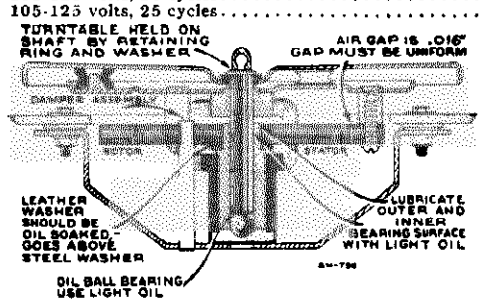
78 r.p.m. ..... Synchronous (Manual Starting)

POWER SUPPLY RATINGS

105-125 volts, 60 cycles	10 watts
105-125 volts, 50 cycles	10 watts
105-125 volts, 25 cycles	10 watts

CRYSTAL PICKUP

Impedance	100,000 ohms at 1,000 cycles
Average Output Voltage	1½ volts, at 1,000 cycles Across 250,000 ohms load
Cabinet Dimensions	3 x 9¾ x 11¾ inches
Weight	6¼ lbs. (net), 8¼ lbs. (shipping)

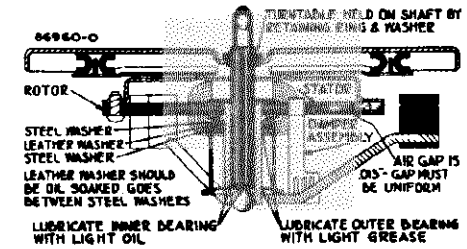


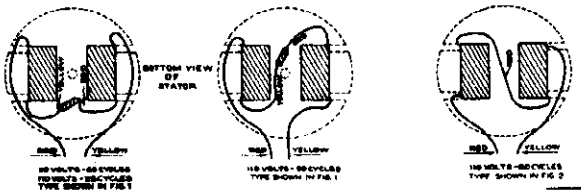
At Left—Fig. 1

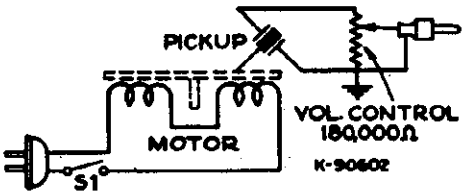
At Right—Fig. 2

Lower Left—Motor Coil Connections

Lower Right—R-93F Schematic Diagram



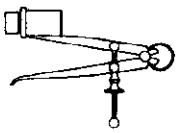




ROTOR CENTERING CALIPERS

A special calipers (Stock No. 36950) is now available for quickly and accurately centering the rotor in these motors.

Exact centering is essential for minimum hum and "wow." The precision of manufacture of these calipers provides checking and centering with an accuracy of .0005 inch.



Rotor Centering Calipers

To use the calipers, lift out the turntable and rotor, slide the caliper onto the rotor shaft, and adjust the calipers to fit the internal radius of the rotor. Rotate the calipers and check for run out, or widening of the radius. Tap the edge of the rotor to move it in the desired direction. Recheck and tap as necessary until rotation of the calipers indicates accurate centering.

Motor Data

Smooth starting and running will be insured by keeping the bearings well cleaned and oiled.

Hum and Vibration—A small amount of hum when starting, decreasing to a negligible amount when running, is normal. If excessive vibration occurs, it may be due to:

1. Insufficient lubrication, or any failure that will cause binding.
2. Leather washer not oiled. (Check to make sure that the leather and steel washers are arranged in proper sequence, as shown in the drawings.)
3. Motor not properly fastened in cabinet.
4. Burrs on poles of motor or stator.
5. Slight eccentricity of rotor or spindle.
6. Loose laminations of the stator.
7. Improper horizontal alignment of the rotor and stator (pertaining only to the type motor shown in Figure 1). Correct horizontal alignment is as shown in the motor assembly drawing. The position of the stator is raised or lowered by adding or removing washers below the leather washer. In the type motor shown in Figure 2, no adjustment is necessary because correct horizontal alignment is provided by the design of the motor.

The damper spring must fit without binding or chattering, in the slot in the stator. The stator must be free to deflect in either direction between the limits of the damper spring. Any binding in the washers or stator bearing which prevents the movement of the stator may cause speed variations in the motor. The damper spring must exert equal force in restoring the stator to its mid-position when the stator is deflected manually in either direction.

Tone Compensation

Because of the widely varying frequency characteristics of various types of audio amplifiers with which the Player may be used, it may be desirable in some cases to make refinements in the pickup circuit of the Player to compensate for the characteristics of the amplifier. The following circuits show means of making such refinements.

In Figure 3, R1 controls the low-frequency response; larger values of R1 give increased lows; For maximum low-frequency response, remove R1. R2 controls pickup output, smaller values of R2 giving increased output. C1 controls high-frequency response; to increase highs, increase C1.

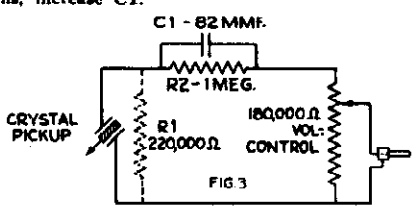


FIG. 3

Where a decrease in high-frequency response may be desired (for example, as an aid in reducing "needle scratch" on worn records), the circuit in Figure 4 is applicable. In this circuit, C2 acts as loading on the pickup and is also a controlling factor on the high-frequency response. Smaller values of C2 give more pickup output and also more highs. R3 gives a sharper high-frequency reduction; increasing R3 decreases highs.

The suggested values shown in Figures 3 and 4 should serve as a basis from which slight alterations may be made to suit individual cases.

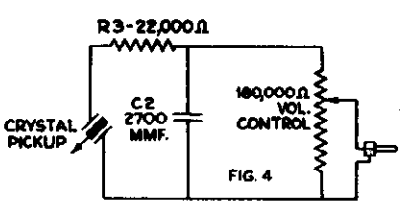


FIG. 4

MODEL R-93FPhono
2nd Edition

RCA MFG. CO., INC.

Connecting Record Player to Radio Receivers

This Record Player consists of a motor-turntable mechanism, a crystal pickup unit and a volume control with motor switch. The player may be connected to the audio amplifier system of practically any type of radio receiver for the reproduction of records.

For convenience in connecting the player to receivers without the conventional phono-jack, a new type switch (Stock No. 9824-A) is recommended.

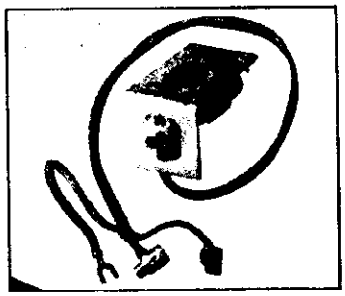
This switch may be used for quickly connecting Record-Players, Television Attachments, Frequency-Modulation Attachments, Microphones, and similar devices into the audio amplifier of the receiver.

The great majority of receivers in use have a grid-cap type 1st-audio tube, and the new switch is **designed for rapid connection to the grid cap, without removing the chassis from the cabinet.** On other receivers, the switch can be readily installed by means of socket adapters or connection into the audio circuit.

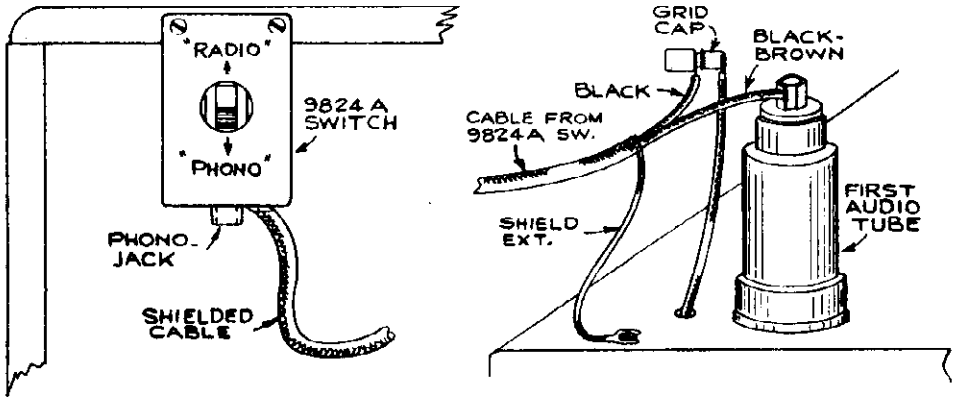
The new switch is designed to provide:

1. Changeover from radio to record player, with retention of the original tone quality, and without introducing hum.
2. Suppression of radio on the "phono" position.
3. Maintenance of all original bias conditions in the radio circuit.

Complete instructions are furnished with the switch.



Stock No. 9824-A
Record-Player Switch



A typical hook-up as used on receivers with a grid-cap 1st-audio tube. *(On a.c.-d.c. sets, a .25 mfd. condenser should be connected in the cable shield lead.)*

Methods of connecting receivers (without the grid-cap 1st-audio tube) thru the use of adapters, etc. are explained in detail in the instructions packed with each switch.

Replacement Parts

Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	Unit List Price
	MOTOR ASSEMBLIES (See Figure 1) (110 volts, 25 cycle) (110 volts, 50 cycle)	
31045	Base—Motor support, damper, and bearing cup assembly	.60
31046	Bearing—Bearing assembly	.70
31041	Cap—Rubber spindle cap	.05
31047	Cushion—Rubber cushion for bearing	.15
32077	Motor—110 volt, 25 cycle—less mounting	14.60
31034	Motor—110 volt, 50 cycle—less mounting	8.90
31040	Mountings—Turntable top rubber mountings sufficient for one turntable	.25
32073	Rotor—Turntable and rotor lamination assembly complete for 25 cycle operation	7.70
31037	Rotor—Turntable and rotor lamination assembly complete for 50 cycle operation	4.55
32072	Stator—Stator coil, laminations, and weights for 105-120 volts, 25 cycles	5.00
31043	Stator—Stator assembly complete with coils and laminations for 50 cycle operation	2.50
31039	Turntable—Finished turntable top plate only—less rubber mountings	.95
4083	Washer—Leather washer	.02
14231	Washer—Metal spacing washer	.02
	MOTOR ASSEMBLIES (See Figure 2) (110 volts, 60 cycle)	
30244	Bushing—Rubber bushing for turntable center	.25
33345	Cap—Rubber cap for turntable spindle	.15
33346	Coil—Motor field coil	.65
33350	Frame—Motor mounting frame and bearing cup assembled	.45
33344	Frame—Rotor frame, spindle shaft and laminations	2.45
34480	Hanger—Rubber hanger for mounting motor	.10
34479	Lamination—Stator laminations and bearing assembled	1.30
33041	Ring—Retaining ring for turntable	.06
31039	Turntable	.95
	PICKUP AND ARM ASSEMBLIES	
33591	Arm—Pickup arm only—less cartridge, base and cable	.50
34481	Arm—Pickup pivot arm and shaft	.70
34482	Base—Pickup mounting base	.30
33122	Crystal—Pickup crystal cartridge and needle screw	3.75
33123	Damper—Viscoloid damper for pickup armature	.15
34311	Ring—Retaining ring for pivot shaft	.05
33529	Screw—Needle screw	.10
	MISCELLANEOUS ASSEMBLIES	
31051	Foot—Rubber foot for cabinet	.04
3961	Knob—Volume control knob	.10
31054	Mounting—Pickup arm mounting nuts, washer, and rubber spacer	.15
31048	Plug—2-contact male plug for output cable	.15
33359	Volume control and switch	1.50

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RCA MFG. CO., INC.

MODEL R-94B

MOTOR

Type	Self-starting Induction
Turntable Speed	78 r.p.m. (Adjustable)
Turntable Diameter	10 inches
D-C Resistance	110 volts, 60 cycles, 96.3 ohms; 110 volts, 50-60 cycles, 72.3 ohms

POWER SUPPLY RATING

A-6	105-125 volts, 60 cycles, 25 watts
A-5-6	105-125 volts, 50-60 cycles, 25 watts

PICKUP

Type	Crystal
Impedance	80,000 ohms at 1,000 cycles
Volume Control Resistance	250,000 ohms
Average Output Voltage	1⅛ volts at 1,000 cycles across 250,000 ohm load

CABINET DIMENSIONS

Height	7-19/16 inches
Depth	12-31/32 inches
Width	15¼ inches
Net Weight	12½ pounds
Shipping Weight	18 pounds

General Description

The RCA Victor Record Player Model R-94B consists of a self-starting motor turntable mechanism, a crystal pickup, an aurally compensated volume control, and a motor switch. This record player can be adapted to play records through the audio amplifier—loudspeaker system of practically every type of radio receiver. The cabinet is of walnut veneer, and has a hinged lid, which locks in the "open" position—but should be closed while records are being played. Any record up to and including the 12-inch diameter size may be played on this instrument. An automatic switch turns the motor "off" when the end of a record has been reached.

Service Data

The crystal pickup unit is thoroughly sealed in a metal casing, against extreme changes of climate. The offset mounting of the crystal unit in the pickup arm insures ideal tracking between needle and record grooves. If failure occurs due to a defective crystal unit, no attempt should be made to repair the unit, but a new replacement crystal unit should be installed.

The turntable drive, is a self-starting, variable-speed, governor-type, induction motor. The motor speed adjusting screw is located under the turntable, which must be removed for speed adjustment. The motor speed should be 78 r.p.m., and may be checked by placing a piece of paper between a record and the turntable, with the paper protruding beyond the edge of the record, and then counting the number of revolutions of the turntable per minute. The motor is designed to be simple and foolproof in operation. Occasionally, however, lubrication and certain adjustments may be required. These are illustrated and explained in figure 1. In addition, an application of oil to the felt pad, which rubs against the governor disc, will insure smooth operation.

The turntable is started by pushing to the rear the motor starting lever, which appears to the right of the turntable. The adjustment on the automatic motor stopping switch should be made so that the switch will snap to the "off" position when the needle in the pickup head is 1⅛ inches away from the center of the turntable. The locking screw and details of the switch mechanism are shown in figure 2.

The volume control is of the potentiometer type, tapped to give aural compensation at low volume settings. The output lead from the volume control is a single shielded wire, terminating in a small, male, pin plug. See figure 3. This pin plug fits into the female jack receptacle on most of the RCA Victor 1939 "90" series of radio receivers.

STOCK No.	DESCRIPTION	Unit List Price
	MOTOR ASSEMBLIES	
11703	Governor—Motor governor complete	3.05
30475	Motor—105-125 volts, 50-60 cycle (M50)	22.75
14800	Motor—105-125 volts, 60 cycle (M50)	19.75
	PICKUP AND ARM ASSEMBLIES	
31212	Base—Pickup arm pivot shaft, trip lever, and base assembly	.95
31050	Crystal—Pickup crystal and needle screw	3.75
31211	Pickup and arm complete—less rubber mounting and nut	7.10
12539	Screw—Pickup needle screw	.22
	MISCELLANEOUS ASSEMBLIES	
14803	Brake—Automatic brake complete	2.95
4870	Capacitor—.025 mfd. (C1)	.20
11704	Damper—Turntable rubber damper and damper plate	.25
31051	Foot—Rubber foot for cabinet	.04
13085	Hinge—Lid hinge	.22
3961	Knob—Volume control knob	.10
31054	Mounting—Pickup mounting nut, washer, and rubber cushion	.15
14559	Resistor—10,000 ohms, ½ watt (R2)	.20
12264	Resistor—220,000 ohms, ½ watt (R3)	.20
13573	Screw—Motor mounting screws, washers and rubber cushions	.30
30100	Spring—Tension springs for automatic brake—one long and one short spring	.08
31213	Support—Lid support	.40
14804	Switch—Motor switch—located on automatic brake (S1)	.60
14801	Turntable	4.35
31108	Volume control (R1)	1.00
	ACCESSORIES	
9824	Switch and cable assembly—for use with receivers requiring a switch for changing from Phonograph to Radio—complete with mounting screws, washers, and knob	1.00
14179	Adapter—Special octal base adapter with grid connection (pin No. 5) split and a 2,700 ohm resistor internally connected from cathode (pin No. 8) to shell (pin No. 1), 3 terminals on side	1.85
14180	Adapter—Special octal base adapter with grid connection (pin No. 5) split, 2 terminals on side	1.60

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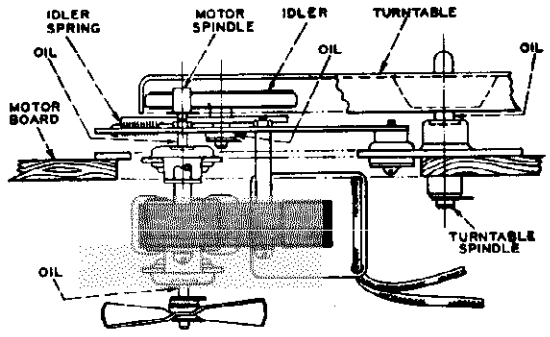
105-125 volts, 60 cycles constant speed motor
Turntable Rim Driven ..... 78 rpm.
Mechanical Reproducer

Lubrication.—Motor drive bearings should be lubricated with a good grade of oil at least twice a year.

Caution.—Keep all rubber drive parts free from oil.



0-3 PHONOGRAPH MOTOR

MODEL O-3

Electric Motor Driven Portable

STOCK No.	DESCRIPTION	Unit List Price
	MOTOR ASSEMBLY	
39526	Motor—Complete motor including mounting plate, spacers, screws, washers, and nuts	5.25
39530	Plate—Idler wheel plate	.90
39531	Retainer—Retaining clip for turntable spindle	.02
39533	Retainer—Retaining clip for idler wheel	.02
39528	Spindle—Turntable spindle	.30
39534	Spring—Idler wheel tension spring	.02
39527	Turntable	1.50
39532	Washer—Fibre washer for turntable spindle	.02
39529	Wheel—Idler wheel and tire	.90
	MISCELLANEOUS ASSEMBLIES	
33691	Arm—Tone arm—less neck, base, washer, ring, screw and lockwasher	1.35
33678	Cover—Needle cup cover	.30
33680	Cup—Needle cup	.15
36574	Foot—Cabinet foot (glide)	.10
36575	Handle—Carrying handle (black)	1.40
36577	Hinge—Cabinet lid hinge	.40
33692	Neck—Tone arm neck	.70
33690	Screw—Screw and lockwasher to fasten neck on tone arm	.10
30868	Sound Box	3.00
39522	Spring—Conical spring to hold turntable	.15
33694	Support—Cabinet lid support	.30
33684	Support—Sound box support	.15
33689	Support—Taper tube support	.35
39523	Switch—Motor switch	.60
33688	Washer—Tone Arm Bearing washer and retaining snap ring	.10

MODLE R-94B Phono

RCA MFG. CO., INC.

Connecting Record Player to Radio Receivers

A table giving methods of connecting the Record Player to various types of audio systems is shown in the following text. Also included are the model numbers of the various RCA Victor Receivers to which the particular method shown applies. The data given in the table requires that an RCA Stock No. 9824 "Radio"-"Phono" switch be used for switching from radio to phonograph, as desired. For ease in connecting the "phono" lead to the Stock No. 9824 switch, the male plug on the end of the shielded lead should be removed by unsoldering, or cutting it off.

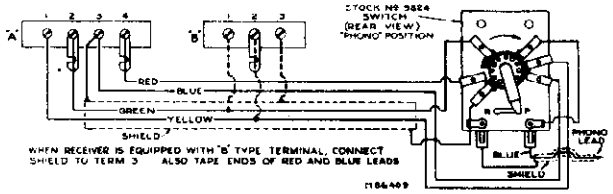
In general, the Record Player must be used with radio receivers having at least two stages of high-gain audio amplification. The Record Player output should be connected to the grid of the first audio tube, and at the same time the output of the radio receiver portion of the chassis should be shorted or opened, to prevent radio signals being heard while the Record Player is in operation.

CONNECTING RECORD PLAYER TO:

1939 RCA RADIO RECEIVERS OF "90" SERIES:

Plug male jack on end of Record Player into female receptacle on receiver chassis. Push or turn "Phono" switch to "Phono" position, and operate Record Player according to instructions.

RADIO RECEIVERS HAVING "PHONO" TERMINAL BOARDS.



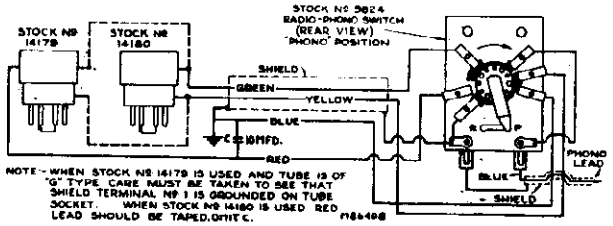
RCA Radio Receivers to which the above illustration applies: 5T1, 5T4, 5T5, 5T6, 5T7, 5T8, 6T5, 8T2, 8T11, 8K11, 85T5, 86E, 86K, 86T, 86T1, 86T4, 86K7, 86T44, 87K, 87T, 87K1, 87K2, 87T2, 88K, 810K, 810K1, 810T, 810T4, 811K, 812K, 818K, 816K, 811T.

For following Receivers, Yellow lead should go on Terminal No. 1, Green lead on Terminal No. 2: 6K2, 6T2, 6K8, 6T10, 7T1, 7K1, 85T8, 86T3, 87T1, 86T2, 86T6, 6K10.

Insulate shield of switch wires from chassis, on following RCA Receivers: 5T, 6T, 6K, 6K1, 7T, 7K, 7X, 8T, 8K, 86X4, 87EY, 87X, 87Y, 8T10, 7X1, 8K1.

Receivers having a Four Terminal Board: 9K, 9T, 9K1, 9K2, 9K3, 9K10, 10T, 10K, 10K1, 13K, 15K. Reverse Red and Blue leads to Terminal Board of C9-6, T9-9, T8-16, C8-17.

RADIO RECEIVERS USING 6C5 OR 6J5, 6C5G OR 6J5G. TUBE FOR FIRST AUDIO AMPLIFIER.



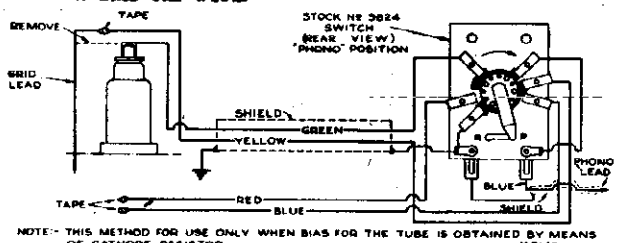
Stock No. 14179 Adaptor opens grid circuit, and inserts 2,700 ohm resistor in cathode of 6C5 or 6J5 tubes, for bias on Phono reproduction.

Stock No. 14180 Adaptor opens grid circuit of 6C5 or 6J5 tube.

Stock No. 14180 Adaptor necessary for RCA: C11-1, C18-2, T10-1, C11-3, C13-3.

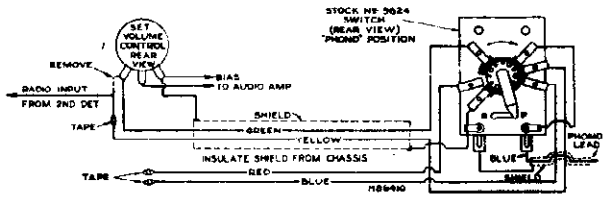
Stock No. 14179 Adaptor necessary for RCA: C15-3, C15-4.

RADIO RECEIVERS WHOSE FIRST AUDIO AMPLIFIER TUBE IS OF THE GRID CAP TYPE.

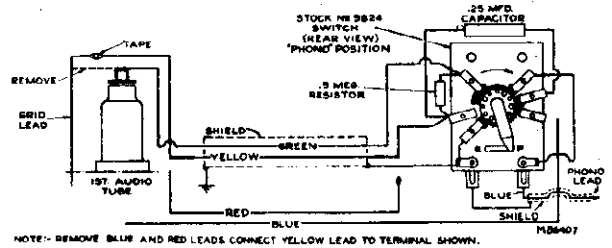


RCA Receivers for which above method applies: 125, 128, 128E, 224E, 225, 226, T6-1, C6-2, T6-9, T7-5, C7-6, T7-12, C7-14, T8-14, C8-15, T8-18, C8-19, C8-20, C9-4, T9-10.

RADIO RECEIVERS WHERE RECEIVER VOLUME CONTROL IS TO BE USED TO ALSO CONTROL "PHONO" VOLUME.



RADIO RECEIVERS WHOSE FIRST AUDIO TUBE IS OF THE GRID CAP TYPE, AND FIXED BIAS FOR TUBE IS OBTAINED THROUGH GRID LEAD.



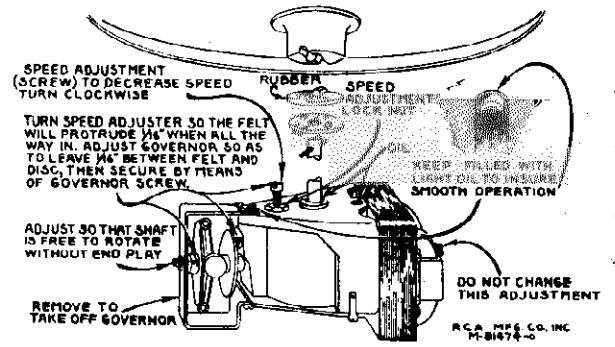


Figure 1—Motor Adjustments

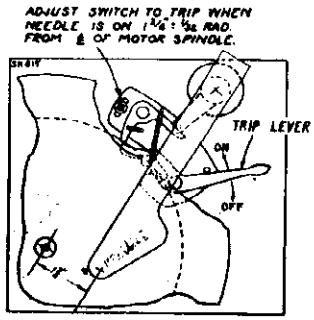


Figure 2—Motor Switch Adjustment

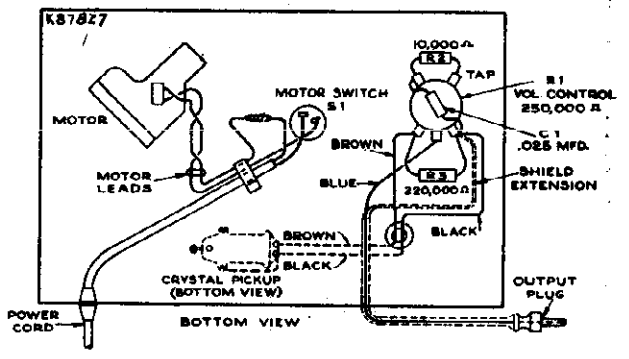


Figure 3—Wiring Diagram

RCA MFG. CO., INC.

MODEL V-105, Ch. RC-517C

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—Connect the low side of the test-oscillator to the receiver chassis, through a .01 mfd. capacitor, and keep the output as low as possible.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	I-F grid, in series with .01 mfd.	455 kc	Quiet point 1,600 kc end of dial	L8 and L9 2nd I-F transformer
2	1st Det. grid in series with .01 mfd.			L6 and L7 1st I-F transformer
3	Ant. terminal in series with 200 mmfd.	1,650 kc	Gang at minimum	C25 (osc.) C31 (osc.)
4	Radiated signal 1300 kc		Signal Frequency	C23 (ant.)
5	Repeat steps 3 and 4.			

FREQUENCY RANGE ..... 540-1,650 kc
INTERMEDIATE FREQUENCY ..... 455 kc

PILOT LAMP ..... 1—Mazda No. 51, 6-8 volts, 0.2 amps.

POWER SUPPLY RATING
105-125 volts, 50 cycles ..... 55 watts
105-125 volts, 60 cycles ..... 55 watts

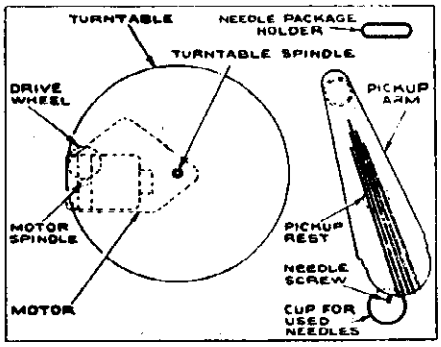
LOUDSPEAKER (RL-81B-4)
Type ..... 8-inch electrodynamic
V_3C. Impedance ..... 4 ohms at 400 cycles

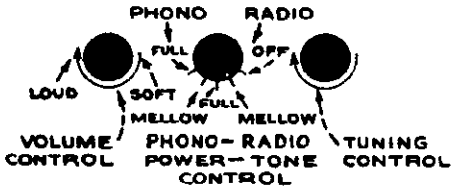
Phonograph Motor Service Data:—

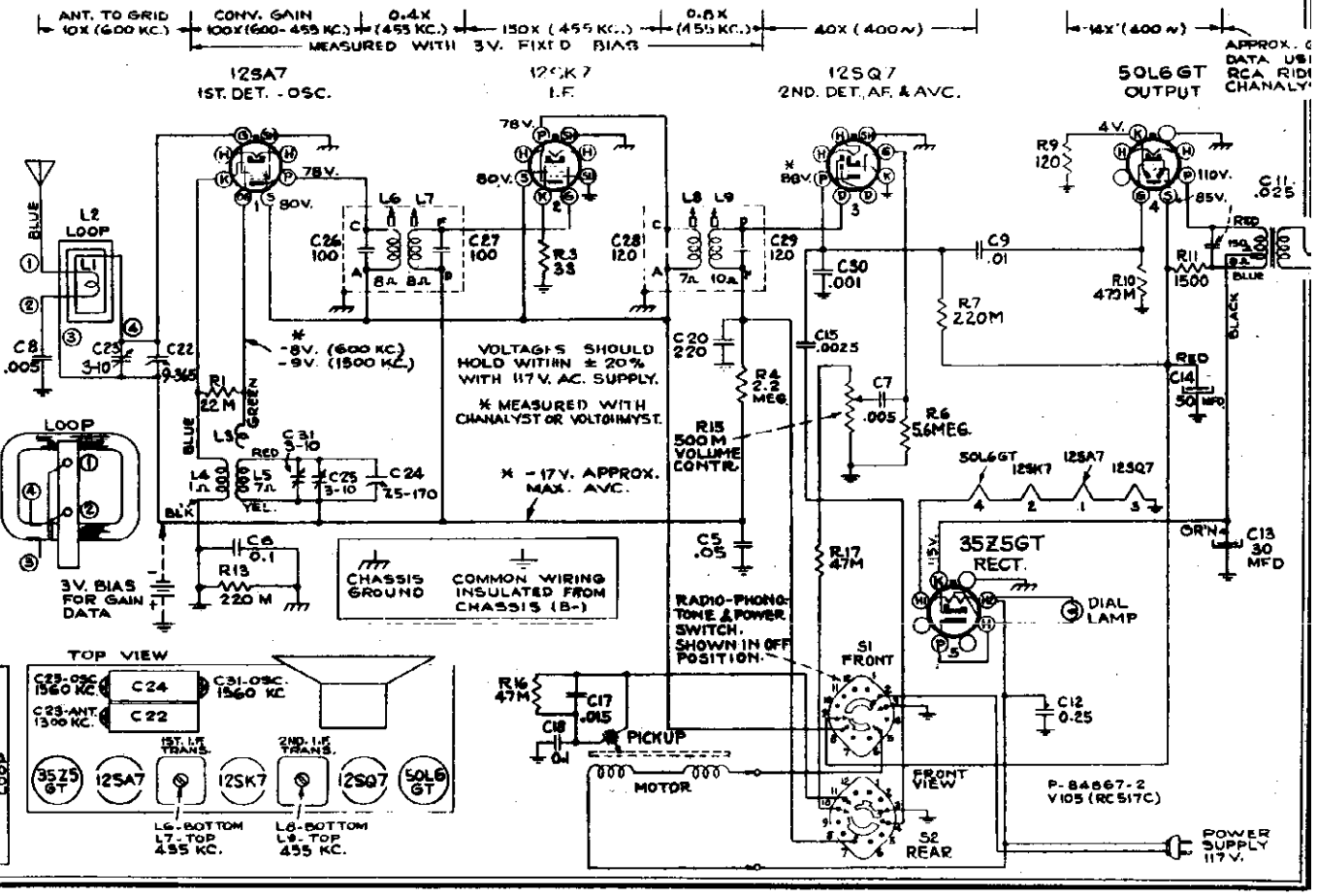
The phonograph motor is of the self starting synchronous type and operates the turntable through friction drive between the motor drive spindle and the rubber tired idler on the rim of the turntable.

The motor should be lubricated once or twice a year by placing a few drops of S. A. E. 20 (or equivalent) on the turntable spindle and saturating the oil retaining felt pads on the motor shaft with S. A. E. 10 oil. **Caution—The motor drive spindle and the rubber tire on the idler must be kept clean and entirely free from oil and grease at all times.**

Power Supply.—Although this model employs an ac-dc chassis, it is not suitable for use on d.c., as this would damage the motor.







MODEL V-135, Ch. RC-517H

RCA MFG. CO., INC.

POWER OUTPUT

Undistorted ..... 1.6 watts
Maximum ..... 3 watts
Pilot Lamp ..... (1) Mazda No. 51, 6.3 volts, 0.20 amps.

POWER SUPPLY RATING

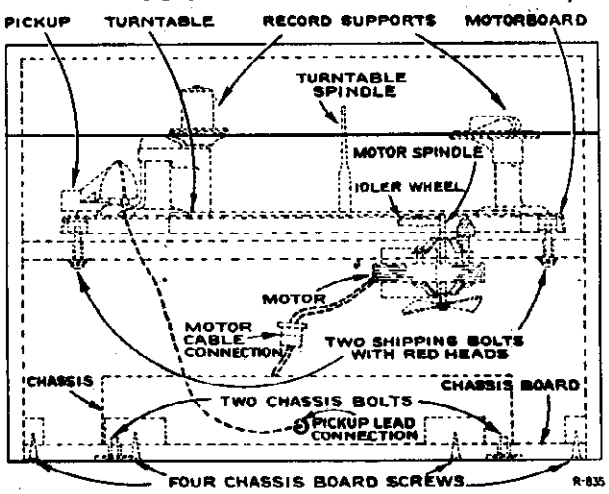
105-125 Volts, 60 Cycles ..... 65 watts

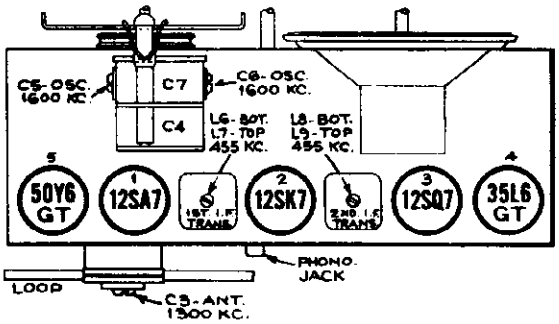
LOUDSPEAKER (RL86B6)

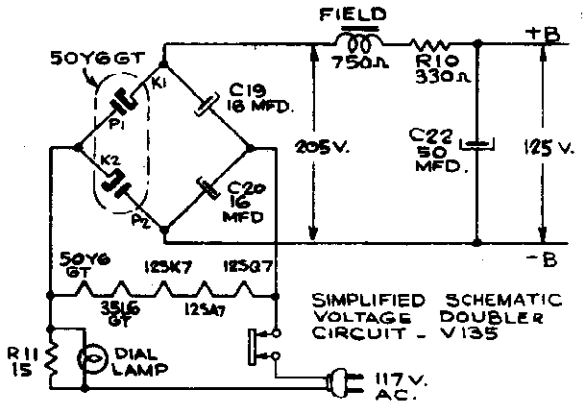
Type ..... 5-inch Electrodynamic
V.C. Impedance ..... 4 ohms at 400 cycles

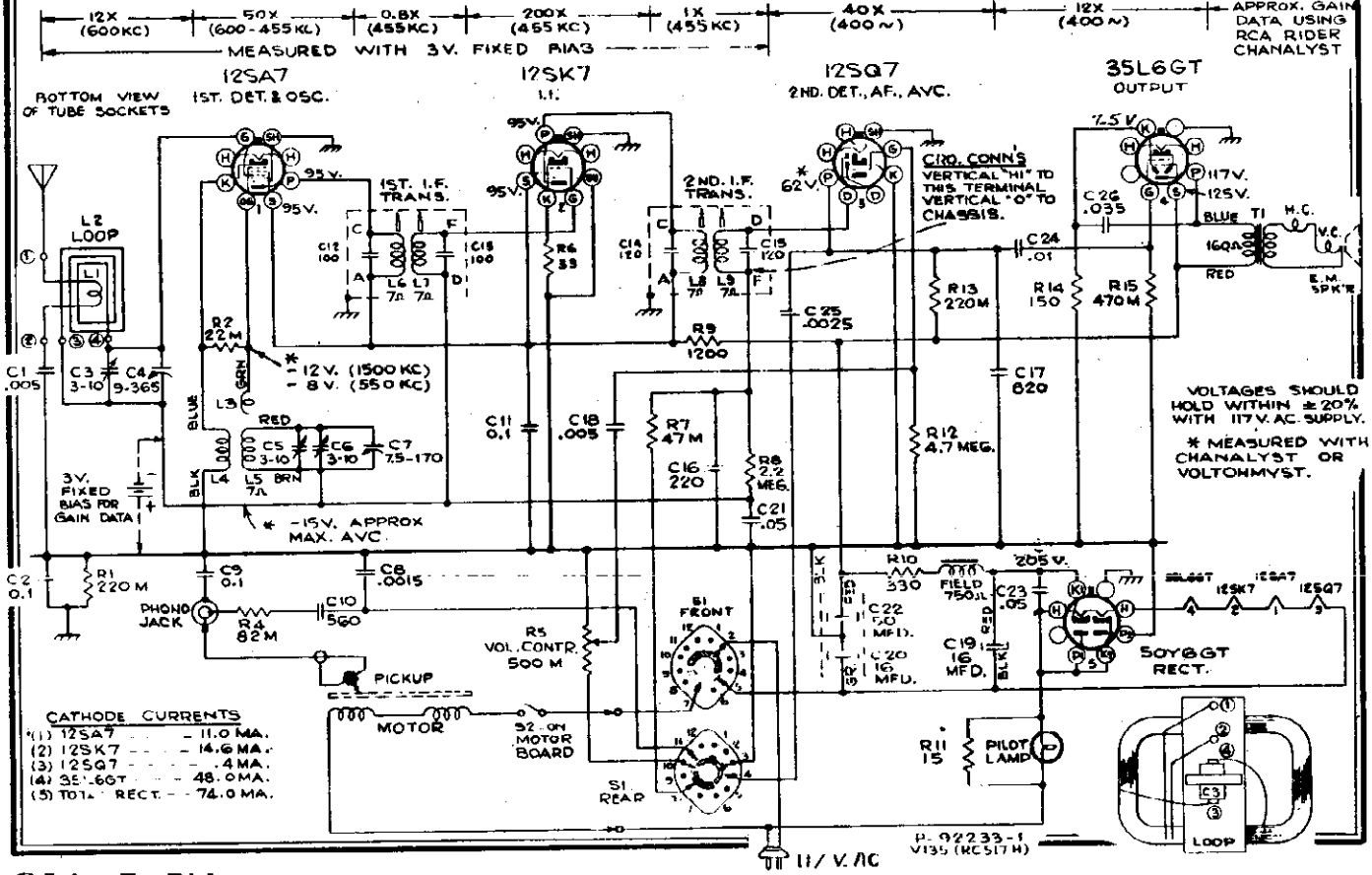
Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	I-F grid, in series with .01 mfd.	455 kc	Quiet point 1,600 kc end of dial	L8 and L9 2nd I-F transformer
2	1st Det. grid in series with .01 mfd.			L6 and L7 1st I-F transformer
3	Ant. terminal in series with 200 mmfd.	1,600 kc	Gang at minimum	C5 (osc.) C6 (osc.)
4	Radiated signal 1,300 kc		Signal Frequency	C3 (ant.)
5	Repeat steps 3 and 4.			

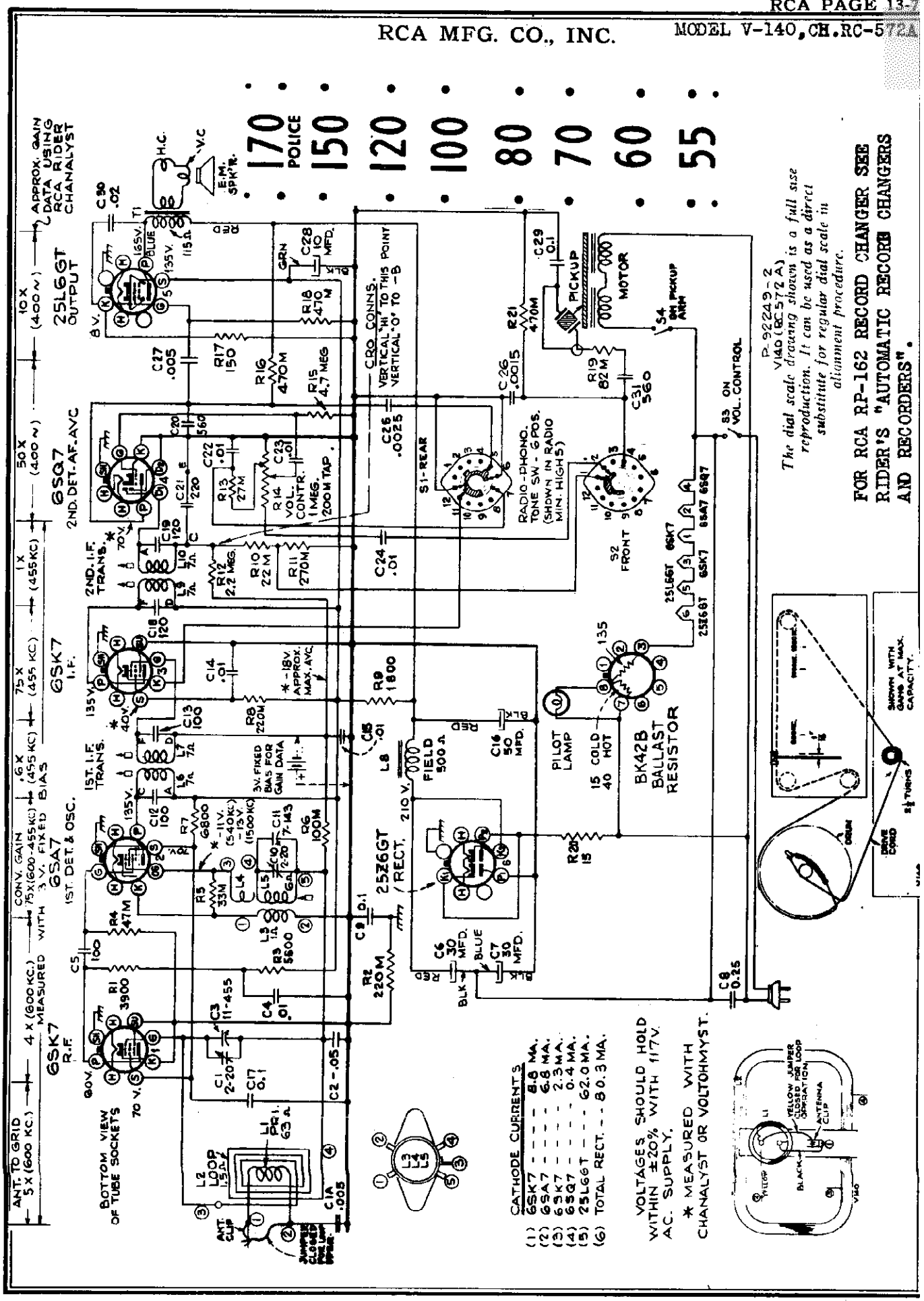
Frequency Range ..... 540-1,600 kc
Intermediate Frequency ..... 455 kc










RCA MFG. CO., INC.
MODEL V-140, CH. RC-572A
170
POLICE
150
120
100
80
70
60
55
6SK7 R.F.
6SA7 1ST. DET. & OSC.
6SK7 I.F.
6SQ7 2ND. DET. AF. AVC
25L6GT OUTPUT
25Z6GT / RECT.
BK42B BALLAST RESISTOR
PILOT LAMP
FIELD 500 Ω
PICKUP
MOTOR
S1 - REAR
S2 FRONT
S3 ON VOL. CONTROL
S4 ON PICKUP ARM
RADIO-PHONO. TONE SW - 6 POS. (SHOWN IN RADIO MIN. HIGHS)
CRO CONNS. VERTICAL "HI" TO THIS POINT VERTICAL "O" TO -B
ANT. TO GRID
CONV. GAIN
1ST. I.F. TRANS.
2ND. I.F. TRANS.
3 V. FIXED BIAS
APPROX. GAIN DATA USING RCA RIDER CHANALYST
BOTTOM VIEW OF TUBE SOCKETS
CATHODE CURRENTS
(1) 6SK7 - - - - 8.8 MA.
(2) 6SA7 - - - - 6.8 MA.
(3) 6SK7 - - - - 2.3 MA.
(4) 6SQ7 - - - - 0.4 MA.
(5) 25L6GT - - - - 62.0 MA.
(6) TOTAL RECT. - - 80.3 MA.
VOLTAGES SHOULD HOLD WITHIN ±20% WITH 117V. A.C. SUPPLY.
* MEASURED WITH CHANALYST OR VOLTOHMYST.
P-92249-2
V140 (RC572A)
The dial scale drawing shown is a full size reproduction. It can be used as a direct substitute for regular dial scale in alignment procedure.
FOR RCA RP-162 RECORD CHANGER SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

MODEL V-140, Ch. RC-572A

RCA MFG. CO., INC.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic diagram.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator. — For all alignment operations, connect the low side of the test oscillator to the common negative, and keep the output as low as possible to avoid a-v-c action.

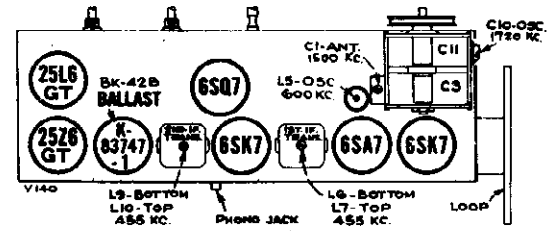
Electronic Voltmeter.—The electronic voltmeter in the Chanalyst or VoltOhmyst provides an unexcelled output indicator. It should be connected to the AVC bus, and the test-oscillator output adjusted to produce several volts of AVC.

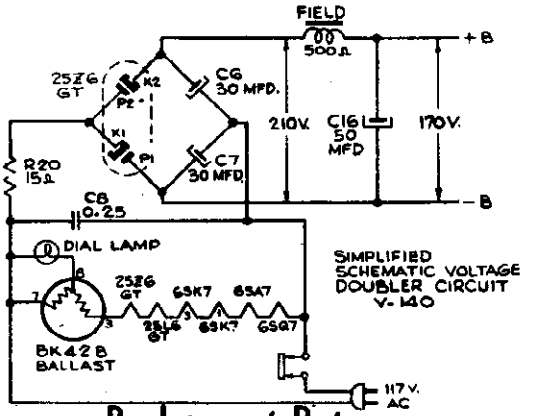
Calibration Scale.—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the chassis for quick reference during alignment. In the event that only the chassis is returned for service, and the cabinet with its tuning dial is left in the customer's home, the scale printed in this service note can be used as an accurate and convenient substitute for the regular dial. With gang in full mesh, move the dial pointer to a point 1/16 inch to left of reference mark at left hand end of the dial backing plate. Place the dial under the pointer so that the extreme left scale graduation coincides with the pointer. Use scotch tape to hold the dial in place.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	I-F grid, in series with .01 mfd.	455 kc	Quiet point 1,600 kc end of dial	L9 and L10 2nd I-F transformer
2	1st Det. grid in series with .01 mfd.			L6 and L7 1st I-F transformer
3	Ant. terminal in series with 200 mmfd.	1,720 kc	Gang at minimum	C10 (osc.)
4	Radiated signal 1,500 kc		Signal Frequency	C1 (ant.)
5	Radiated signal near 600 kc		Signal Frequency	L5 (osc.) (Rock gang)
6	Repeat steps 3, 4 and 5.			

Critical Lead Dress:

1. Lead from 6SK7 i-f plate to last i-f transformer to be dressed close to chassis and under all other leads. Prevents i-f beats.
2. 22,000 ohm R-10 i-f to audio isolating resistor to have end connecting to last i-f transformer as short as possible. Prevents i-f beats.
3. First audio grid coupling capacitor C-23 and C-24 to be dressed close to chassis and away from heater wiring. Prevents hum.
4. Dress phono power leads away from phono socket.

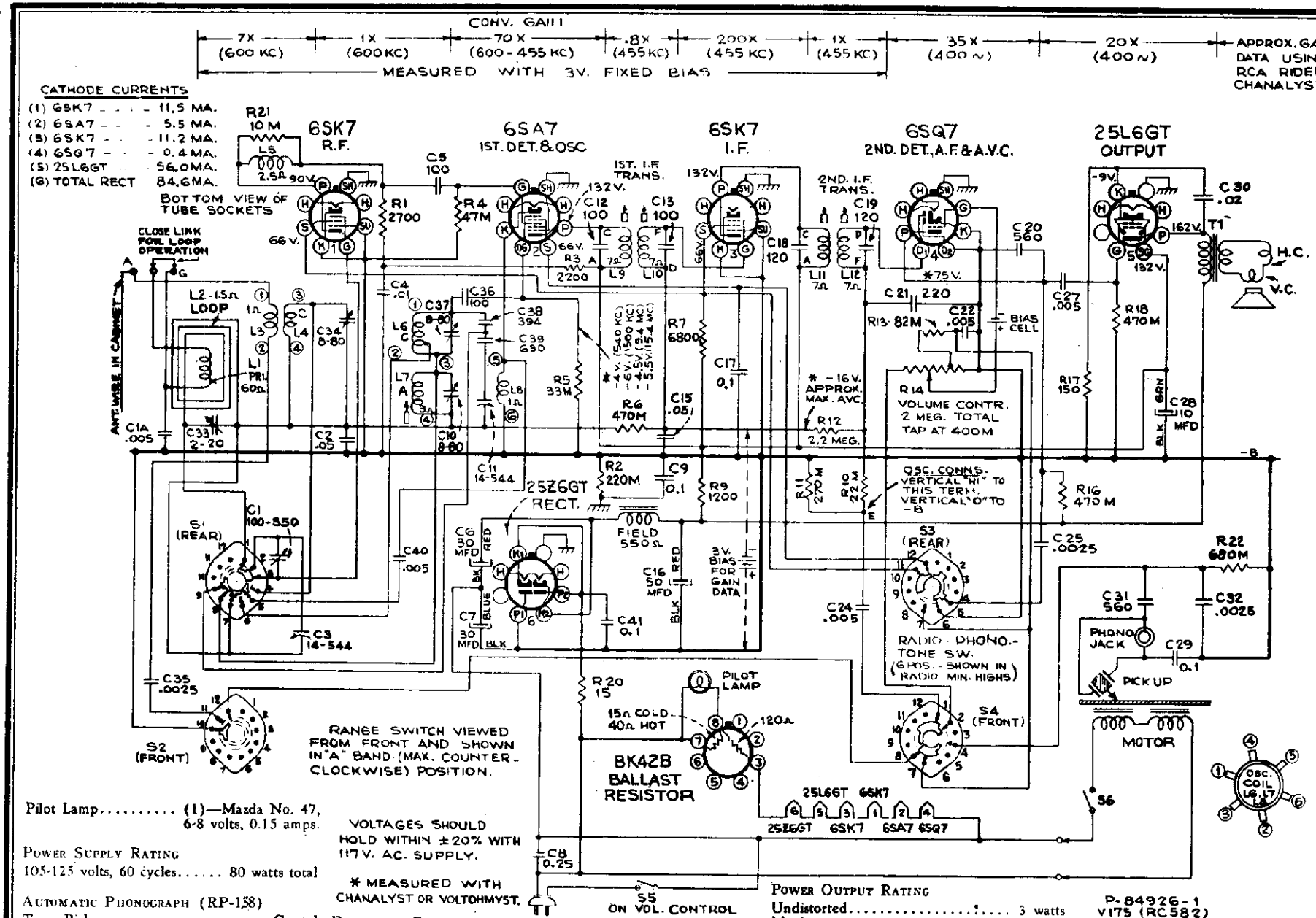




Replacement Parts

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-572-A)	
14649	Ballast—Ballast tube resistor	.80
37846	Capacitor—Electrolytic—30 mfd., 150 volts	.50
37845	Capacitor—Electrolytic comprising 1 section of 50 mfd., 250 volts, 1 section of 10 mfd., 250 volts, and 1 section of 30 mfd., 150 volts	1.00
12720	Capacitor—100 mmfd., moulded	.35
34699	Capacitor—100 mmfd., unmoulded	.30
31813	Capacitor—120 mmfd.	.30
36816	Capacitor—220 mmfd.	.30
12537	Capacitor—560 mmfd.	.35
33806	Capacitor—.0015 mfd.	.25
34459	Capacitor—.0025 mfd.	.20
4838	Capacitor—.005 mfd., 1,000 volts	.25
33584	Capacitor—.005 mfd., 1,200 volts	.25
14393	Capacitor—.01 mfd.	.30
36248	Capacitor—.02 mfd.	.20
32787	Capacitor—.05 mfd.	.20
32786	Capacitor—0.1 mfd., 300 volts	.25
4839	Capacitor—0.1 mfd., 400 volts	.30
30965	Capacitor—0.25 mfd.	.30
39491	Coil—Loop primary coil	.40
39487	Coil—Oscillator coil	.75
39489	Condenser—Variable tuning condenser	3.40
38408	Control—Volume control and power switch	2.00
32634	Cord—Drive cord (approx. 33-in. overall lgth.)	.10
36093	Core—Adjustable core and stud for oscillator coil	.15
39493	Indicator—Station selector indicator	.20
37982	Insulator—Phono socket insulator	.04
39490	Loop—Antenna loop complete	1.80
30868	Plug—2-contact female plug for motor cable	.35
5119	Plug—3-contact female plug for speaker cable	.25
36230	Pulley—Drive cord pulley	.04
14649	Resistor—Ballast tube resistor	.80
38859	Resistor—15 ohms, 1 watt	.22
30785	Resistor—150 ohms, 1 watt	.22
36743	Resistor—1,800 ohms, 2 watt	.25
30694	Resistor—3,900 ohms, ½ watt	.20
30734	Resistor—5,600 ohms, ½ watt	.20
22903	Resistor—6,800 ohms, 1 watt	.22
30492	Resistor—22,000 ohms, ½ watt	.20
30409	Resistor—27,000 ohms, ½ watt	.20
12454	Resistor—33,000 ohms, ½ watt	.20
12412	Resistor—47,000 ohms, ½ watt	.20
14023	Resistor—82,000 ohms, ½ watt	.20
14560	Resistor—100,000 ohms, ½ watt	.20
14583	Resistor—220,000 ohms, ½ watt	.20
30651	Resistor—270,000 ohms, ½ watt	.20
30648	Resistor—470,000 ohms, ½ watt	.20
30649	Resistor—2.2 meg., ½ watt	.20
30931	Resistor—4.7 meg., ½ watt	.20
35862	Shaft—Tuning knob shaft	.20
31365	Socket—Dial lamp socket	.30
33742	Socket—Phono input socket	.20
31251	Socket—Tube socket	.25
31418	Spring—Drive cord spring	.05
31261	Spring—Retaining spring for oscillator coil core and stud	.01
39492	Switch—Tone switch	1.30
35636	Transformer—First I.F. transformer	1.70
36615	Transformer—Second I.F. transformer	1.60
14649	Tube—Ballast tube resistor	.80
33726	Washer—"C" washer for tuning knob shaft	.02
	AUTOMATIC RECORD CHANGER	
	See separate Service Bulletin RP-162 Record Changer.	
	SPEAKER ASSEMBLIES (RL-79B-6)	
31825	Cap—Dust cap	.02
37850	Coil—Field coil—500 ohms	1.70
39495	Cone—Cone complete with voice coil	1.10
5118	Plug—3-prong male plug for speaker	.25
37844	Transformer—Output transformer	1.70
	MISCELLANEOUS ASSEMBLIES	
38354	Clamp—Dial clamp	.15
39497	Deca comania—Control panel decal	.15
36386	Decalcomania—Trade mark decal (His Master's Voice)	.25
35467	Decalcomania—Trade mark decal (RCA Victrola)	.05
39496	Dial—Glass dial scale	.90
13085	Hinge—Cabinet lid hinge	.22
35814	Knob—Control knobs	.25
31480	Lamp—Dial lamp	.20
39351	Mounting—Spring mounting hardware for motorboard (2 required)	.25
38873	Spring—Conical mounting spring for motorboard	.05
30900	Spring—Retaining spring for knobs	.05
39545	Support—Lid support	.40

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.



Pilot Lamp..... (1)—Mazda No. 47, 6-8 volts, 0.15 amps.

Power Supply Rating
105-125 volts, 60 cycles..... 80 watts total

Automatic Phonograph (RP-158)
Type Pickup..... Crystal
Record capacity..... Twelve 10-inch or ten 12-inch records
Constant speed motor..... 17 watts

Frequency Range
Standard Broadcast (A)..... 540-1,600 kc
Short Wave (C)..... 9.4-15.4 mc
Intermediate Frequency..... 455 kc

Power Output Rating
Undistorted..... 3 watts
Maximum..... 5 watts

Loudspeaker (RL-70-N2)
Type..... 12 inch electrodynamic
V.C. Impedance..... 2.2 ohms at 400 cycles

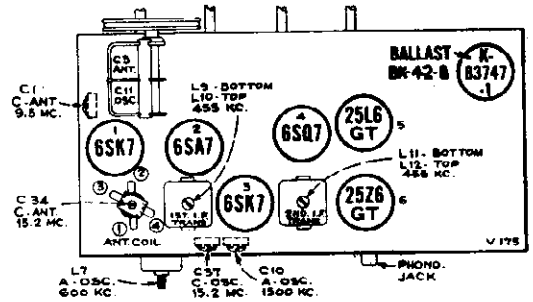
MODEL V-175, Ch. RC-582

RCA MFG. CO., INC.

Output Meter **Alignment.**—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the common negative wiring, and keep the output as low as possible to avoid a-v-c action.

Electronic Voltmeter.—The electronic voltmeter in the Chanalyst or VoltOhmyst provides an unexcelled output indicator. It should be connected to the AVC bus, and the test-oscillator output adjusted to produce several volts of AVC.



Calibration Scale.—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the chassis for quick reference during alignment. In the event that only the chassis is returned for service, and the cabinet with its tuning dial is left in the customer's home, the calibration scale printed full size in this service note can be used as an accurate and convenient substitute for the regular dial.

Each method is described below.

Using Tuning Dial.—

1. Remove the glass dial from the cabinet.
2. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.
3. Place the glass dial under the pointer so that the extreme left scale graduations coincide with the pointer. Use scotch tape to hold the glass dial in this position.
4. After completion of alignment, replace the glass dial in cabinet.

Using Calibration Scale.—

1. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.
2. Temporarily fasten the dial scale drawing in this service note, to the dial backing plate with scotch tape, so that the extreme left scale graduation coincides with the pointer.

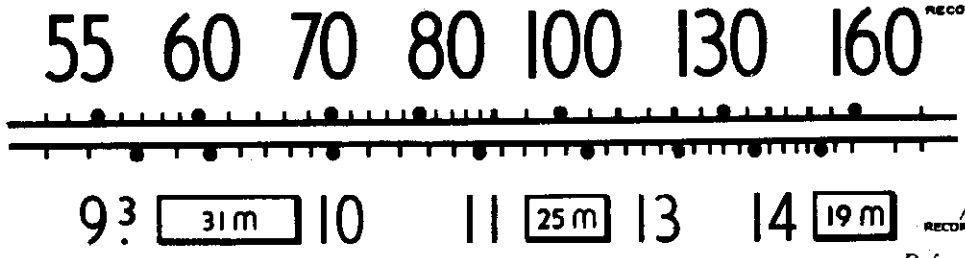
Dial Pointer Adjustment.—After the chassis is replaced in cabinet move the dial pointer (if necessary) so that it is at the left-hand graduation on the dial with the gang in full mesh.

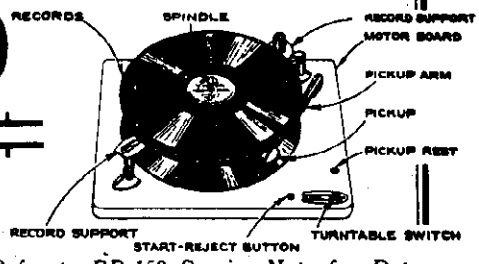
Critical Lead Dress

(1) Dress bias cell up from chassis and away from A.C. switch.
(2) Dress R13 (volume control compensation circuit) close to front apron.
(3) Dress C9 between osc. coil and side apron.
(4) Black lead from AC switch should be kept away from tone control leads and switch.
(5) Dress R22, C32 (pickup compensation circuit) close to front apron.
(6) Keep R4 and C5 bus (1st det. grid circuit) (socket end) as short as possible.
(7) Blue lead to antenna terminal board should be dressed in back of I-F'S.
(8) Dress brown lead from volume control to tone switch close to front apron.
(9) Dress R18 (output grid cricuit) away from A.C. switch and A.C. leads.
(10) Dress lead to phono. socket up from chassis.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output—
1	I-F Grid in series with .01 mfd.	455 kc	"A" Band 540 kc	L11, L12 (2nd I-F Trans.)
2	1st-Det. Grid in series with .01 mfd.			L9, L10 (1st I-F Trans.)
3	"A" terminal on ant. terminal board in series with 47 mmf. (link open)	15.2 mc	"C" Band 15.2 mc	C37 (osc.)* C34 (ant.)
4		9.5 mc	"C" Band 9.5 mc	C1 (ant.) (Rock Gang)
5		Repeat steps 3 and 4.		
6	Middle terminal on ant. terminal board in series with 200 mmf. (link open)	1,500 kc	"A" Band 1,500 kc	C10 (osc.) C33 (ant.) (on loop)
7		600 kc	"A" Band 600 kc	L7 (Rock Gang)
8		Repeat steps 6 and 7.		

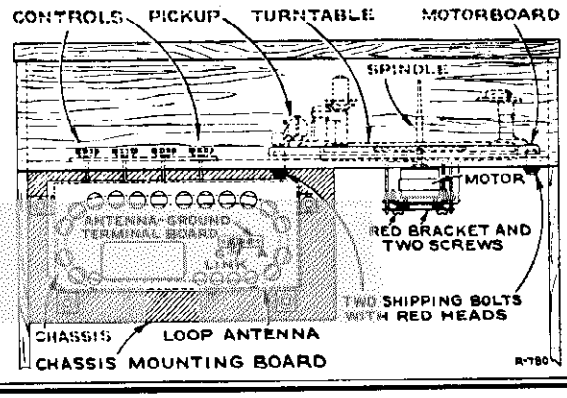
* Use minimum capacity peak.
Oscillator tracks 455 kc above signal on both bands.

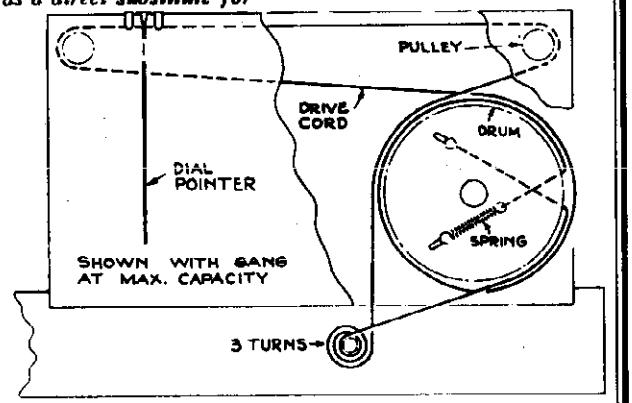


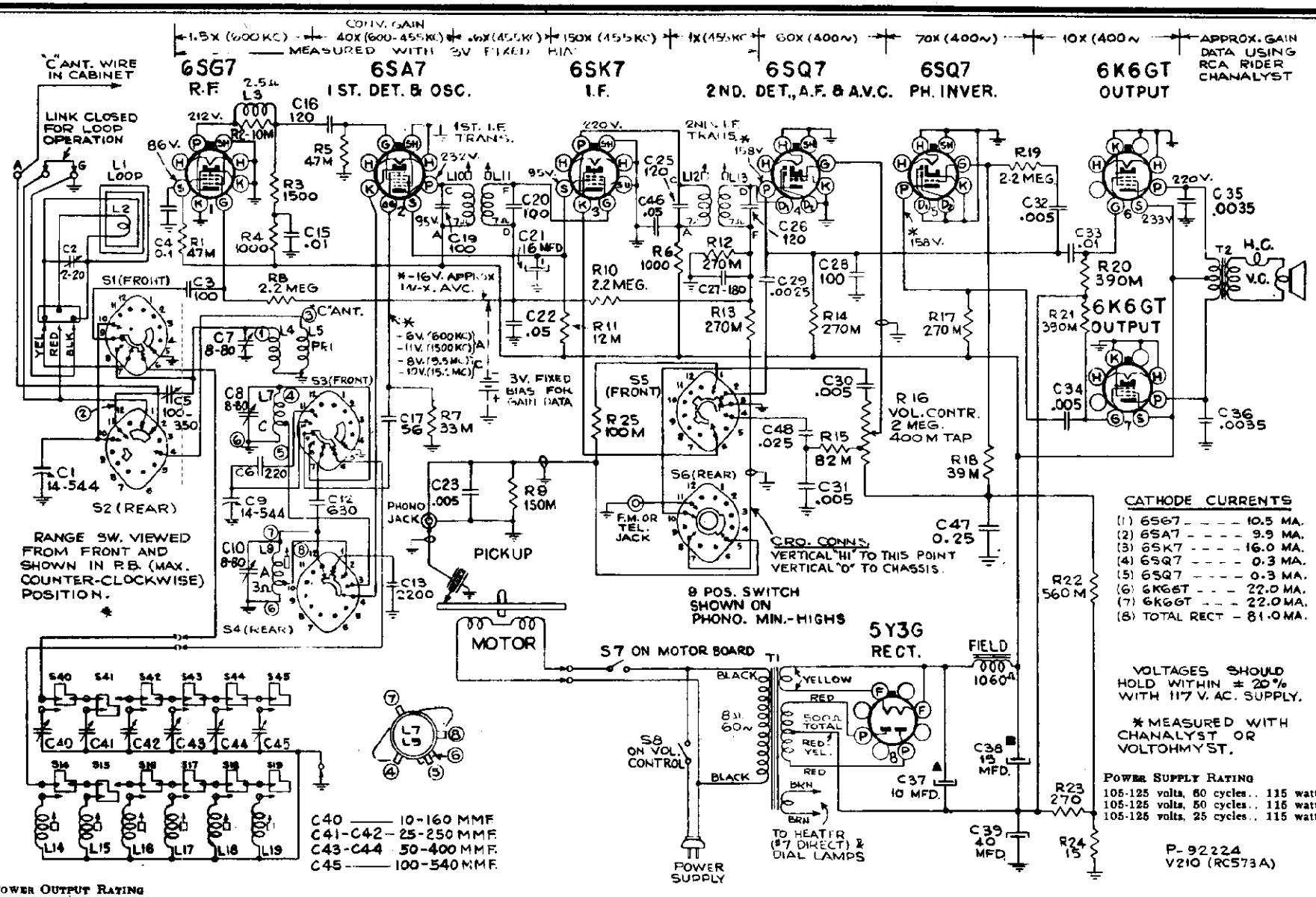


Refer to RP-158 Service Note for Data on Automatic Mechanism.

The dial scale drawing shown is a full size reproduction. It can be used as a direct substitute for regular dial scale in alignment procedure.







RCA MFG. CO., INC.

MODELS V-209, C[illegible]
V-210, Ch. RC-573A

RCA PAGE 13

Schematic for Model V-210

POWER OUTPUT RATING

Undistorted	5 watts
Maximum	5.5 watts

PHONOGRAPH

Type	Automatic (RP-158)
Record Capacity	Twelve 10-in., Ten 12-in.
Turntable Speed	78 r.p.m.
Type Pickup	Crystal
Motor Power Consumption	17 watts

PILOT LAMPS ..... (2) Mazda No. 51, 6-8 volts, 0.2 amps.

COMPARTMENT LAMPS ..... (2) Mazda No. 55, 6-8 volts, 0.4 amps.

LOUDSPEAKER

Electrodynamic	(RL-701L6)
Size	12-inch
V.C. impedance at 400 cycles	2.2 ohms

FREQUENCY RANGES

Standard Broadcast "A"	540-1,600 kc
Short Wave "C"	9.4-15.4 mc

INTERMEDIATE FREQUENCY ..... 455 kc

MODELS V-209, V-210

RCA MFG. CO., INC.

Push Button Adjustments

The push buttons connect to separate magnetite-core oscillator coils and separate ant. circuit trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool such as RCA Stock No. 81031. Allow about five minutes warm-up period before making adjustments.

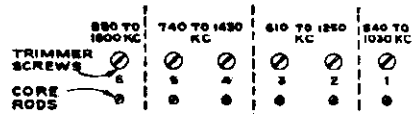
The procedure is as follows:

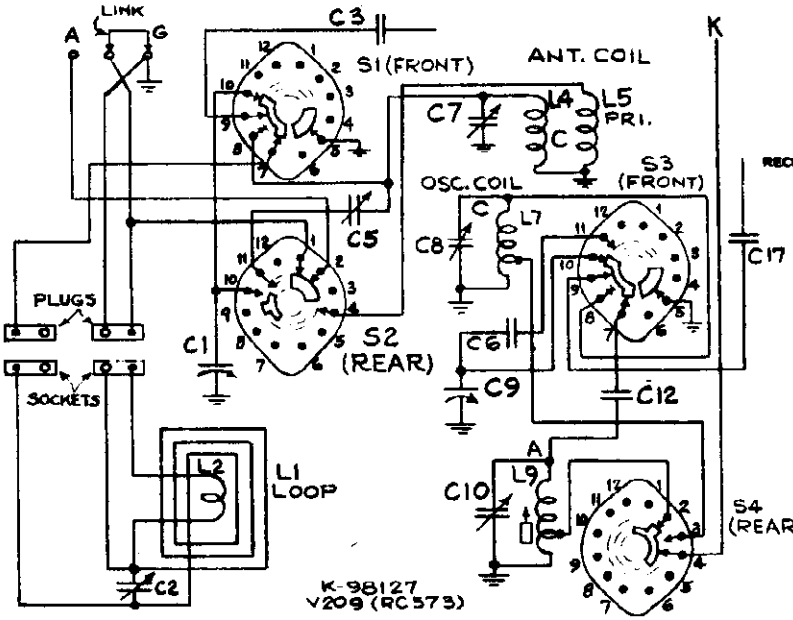
1. Make a list of the desired stations, arranged in order from low to high frequencies.
2. Turn the range switch to the broadcast position and manually tune in the first station on the list.
3. Turn range switch to push-button position and press in the left-hand button.
4. Adjust No. 1 oscillator core to receive the first station. To secure the best adjustment, rotate the set for least pickup, and adjust core for peak output.
5. Adjust No. 1 antenna trimmer capacitor for peak output on the first station.
6. Proceed in the same manner to adjust for the remaining stations.

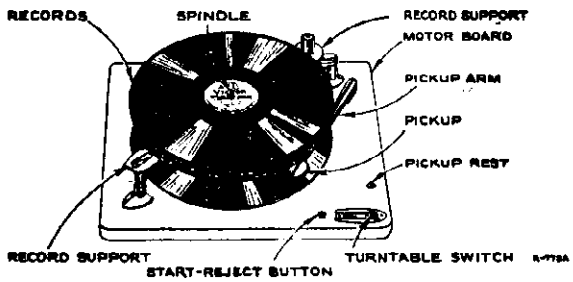
On the 880 to 1,600 kc push-button, the higher frequency stations may be received with osc. core either in or out (oscillator frequency either 455 kc below or 455 kc above the station frequency). The adjustment with this core in its out position (oscillator frequency 455 kc above the station frequency) is the correct one.

NOTE: Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.

FOR CHANGE IN MODEL V-209 SEE NEXT PAGE

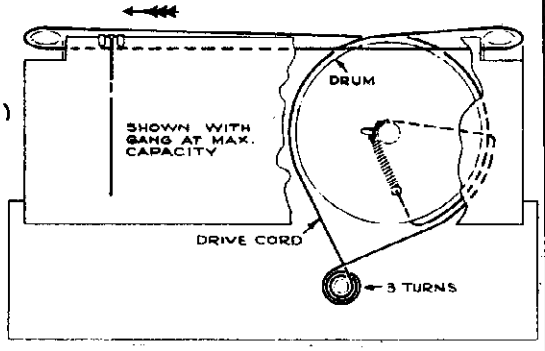


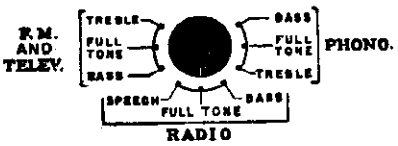


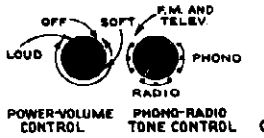


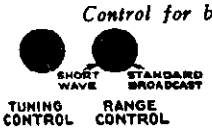
Refer to RP-158 Service Note for Data on Automatic Mechanism

Schematic diagram of antenna and oscillator switch connections for Model V-209. This model does not include push-button tuning. Otherwise the same as schematic of V-210.



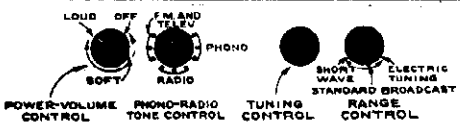




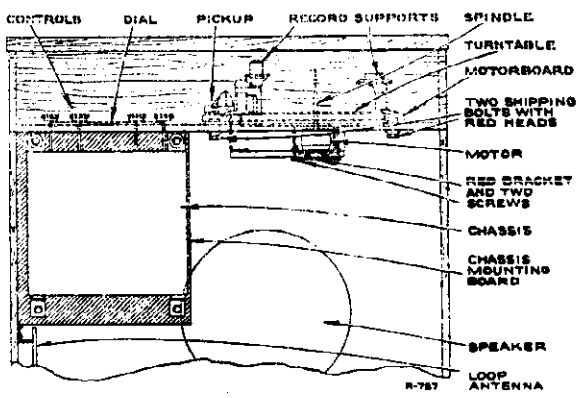


Control for both Models

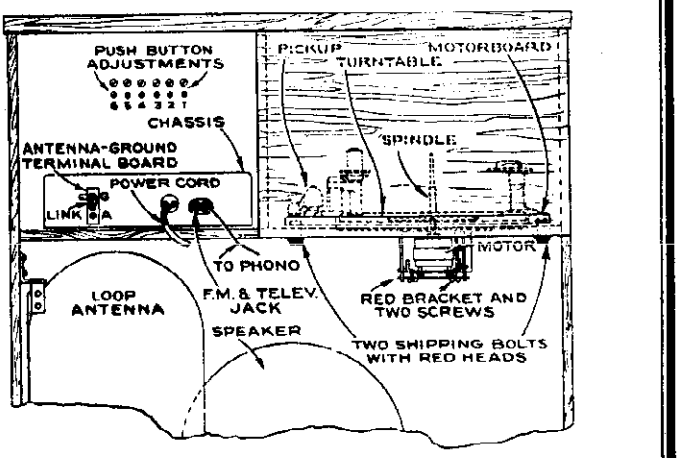
Controls for Model V-209



Controls for Model V-210

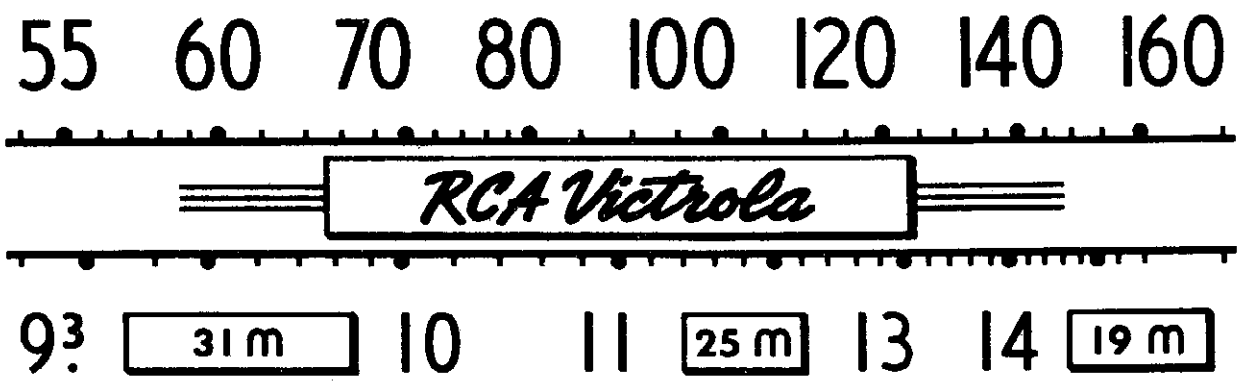


Model V-209



Model V-210

RCA MFG. CO., INC.



The dial scale drawing shown is a full size reproduction. It can be used as a direct substitute for regular dial scale in alignment procedure.

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic diagram.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

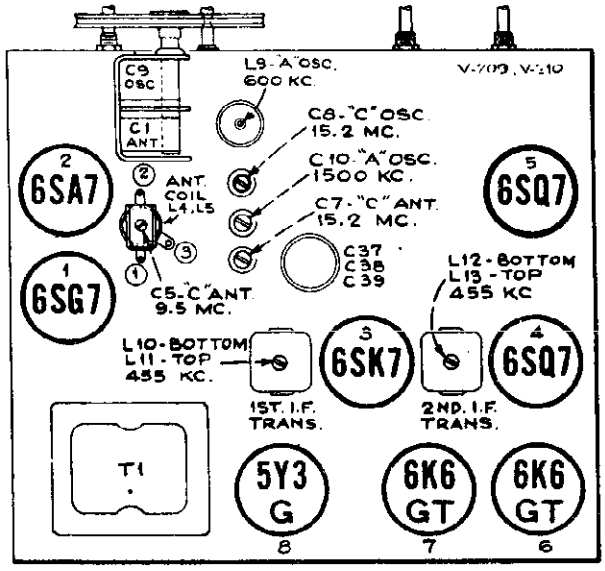
Electronic Voltmeter.—The electronic voltmeter in the Chanalyst or VoltOhmyst provides an unexcelled output indicator. It should be connected to the AVC bus, and the test-oscillator output adjusted to produce several volts of AVC.

Calibration Scale.—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the chassis for quick reference during alignment. In the event that only the chassis is returned for service, and the cabinet with its tuning dial is left in the customer's home, the scale printed in this service note can be used as an accurate and convenient substitute for the regular dial.

Using Tuning Dial.—

1. Remove glass dial from the cabinet.
2. With gang in full mesh, move the dial pointer to a point 1/16 inch to left of reference mark at left hand end of the dial backing plate.
3. Place the glass dial under the pointer so that the extreme left scale graduation coincides with the pointer. Use scotch tape to hold the glass dial in place.

"C" Band Reception.—For best reception on "C" band with an outside antenna, adjust the trimmer screw on the RF coil on the chassis. Turn screw carefully with a special screwdriver (RCA Stock No. 31081) while the receiver is tuned to a station in the 31-meter band, and make setting for best reception. If returning to internal antenna at any time, close the link on the center terminal and adjust "C" band antenna trimmer for best reception on 31-meter band.

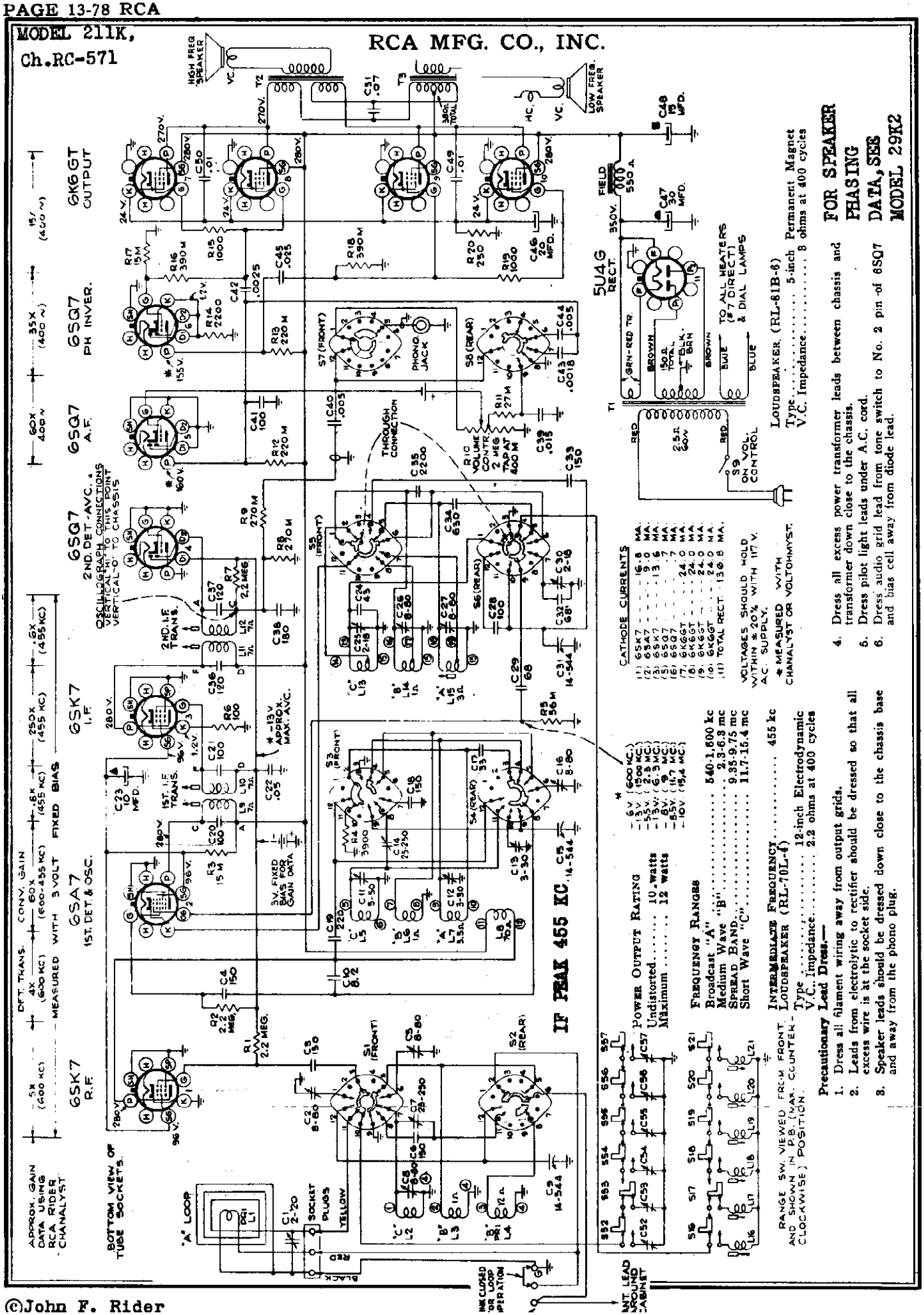


Steps	Connect test-osc. output to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output—
1	I-F grid in series with .01 mfd.	455 kc	"A" band 540 kc	L12 and L13 (2nd I-F trans.)
2	1st Det. grid in series with .01 mfd.			L10 and L11 (1st I-F trans.)
3	A-Terminal in series with 47 mmfd. (link closed)	15.2 mc	"C" band 15.2 mc	C8 (osc.)* C7 (ant.)
4		9.5 mc	"C" band 9.5 mc	C5 (ant.) (Rock gang)
5		Repeat steps 3 and 4		
6	Yellow loop lead in series with 200 mmfd. (link closed)	1,500 kc	"A" band 1,500 kc	C10 (osc.)
7		600 kc	"A" band 600 kc	L9 (osc.)
8		Repeat steps 6 and 7		
9	Install and connect chassis in cabinet with antenna link closed. Tune in a radiated oscillator signal at 1,500 kc. and peak the "A" band trimmer C2 (on loop). Rock in L9 for peak output at 600 kc.			

*Use minimum capacity peak if two peaks can be obtained. Oscillator tracks 455 kc. above signal on all bands.

Critical Lead Dress:

1. Bus from "C" oscillator coil to range switch must be held to length and dressed close to coil.
2. C30 (audio coupling capacitor to volume control) should be dressed close to front apron.
3. A.C. cord and motor leads must be dressed away from phono and F.M. jack.
4. Excess trans. leads to be dressed between trans. and rectifier socket.
5. Keep R5, C16 bus (in grid circuit of 6SA7 tube) as short as possible.
6. Dress C28 (in plate circuit of 1st A.F.) close to socket.
7. Keep R15 (grid resister) C34 (coupling capacitor of output tube) close to socket.
8. Keep C23 (tone compensating capacitor) close to back apron.
9. Keep R15, C48 (in tone compensating circuit) close to front apron.
10. Dress green lead from osc. coil to trimmer close to oscillator coil.
11. Dress cable from phono. socket to phono. switch up away from base.
12. Dress red A.C. leads away from I.F. trans. and 6SQ7 socket.
13. RF choke in plate of 6SG7 must be dressed toward back apron.


MODEL 211K,
Ch.RC-571
RCA MFG. CO., INC.
6K6GT OUTPUT
6SQ7 PH INVER.
6SQ7 A.F.
6SQ7 2ND. DET.-AVC.
6SK7 I.F.
6SA7 1ST. DET. & OSC.
6SK7 R.F.
5U4G RECT.
IF PEAK 455 KC.
FOR SPEAKER PHASING DATA, SEE MODEL 29K2
Power Output Rating
Undistorted ..... 10 watts
Maximum ..... 12 watts
Frequency Ranges
Broadcast "A" ..... 540-1,600 kc
Medium Wave "B" ..... 2.3-6.8 mc
Spread Band ..... 9.35-9.75 mc
Short Wave "C" ..... 11.7-15.4 mc
Intermediate Frequency ..... 455 kc
Loudspeaker (RL-70L-4)
Type ..... 12-inch Electrodynamic
V.C. Impedance ..... 2.2 ohms at 400 cycles
Loudspeaker (RL-81B-6)
Type ..... 5-inch Permanent Magnet
V.C. Impedance ..... 8 ohms at 400 cycles
Precautionary Lead Dress.—
1. Dress all filament wiring away from output grids.
2. Leads from electrolytic to rectifier should be dressed so that all excess wire is at the socket side.
3. Speaker leads should be dressed down close to the chassis base and away from the phono plug.
4. Dress all excess power transformer leads between chassis and transformer down close to the chassis.
5. Dress pilot light leads under A.C. cord.
6. Dress audio grid lead from tone switch to No. 2 pin of 6SQ7 and bias cell away from diode lead.
Cathode Currents
Voltages should hold within ±20% with 117 V. A.C. supply.
* Measured with Chanalyst or Voltohmyst.
Bottom View of Tube Sockets.
Approx. Gain Data Using RCA Rider Chanalyst
Range Sw. viewed from front and shown in P.B. (max. counter-clockwise) position.

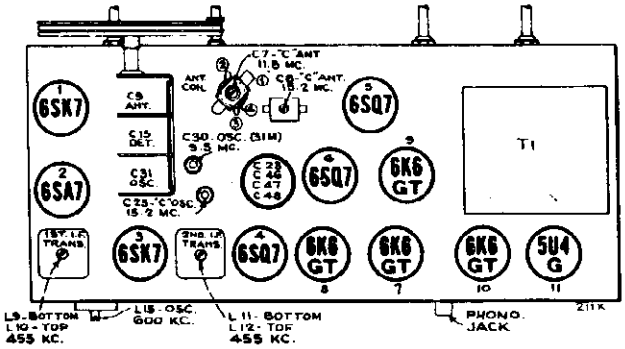
RCA MFG. CO., INC.

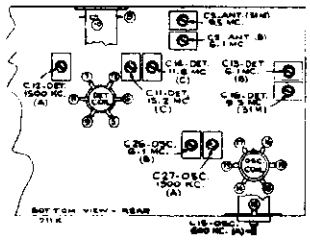
Calibration for Alignment.—

A calibration scale is attached to the tuning drum. The correct setting of the gang, in degrees, for each alignment frequency is given in the alignment table. Check the position of the drum, making sure that the 140 degree scale mark is directly above condenser shaft when the gang is at minimum setting.

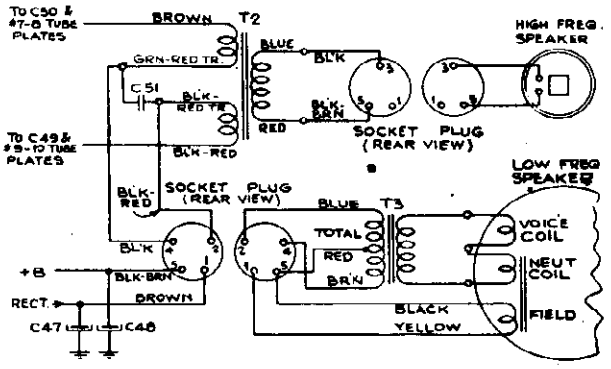
Pointer for Calibration Scale.—

Improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to 0 degree mark on the calibration scale when the plates are fully meshed.





Below.—Speaker Wiring Diagram.

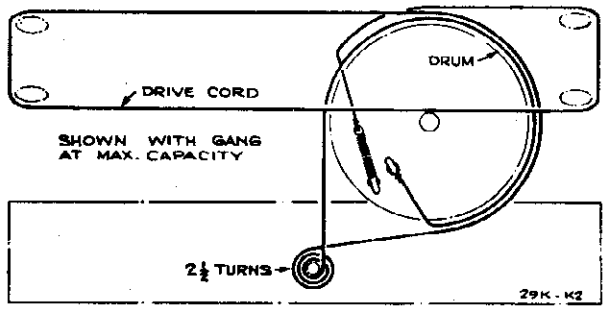


Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Electronic Voltmeter.—The electronic voltmeter in the Chanalyst or VoltOhmyst provides an unexcelled output indicator. It should be connected to the AVC bus, and the test-oscillator output adjusted to produce several volts of AVC.

POWER SUPPLY RATINGS

105-125 volts, 50-60 cycles ..... 140 watts
105-125 volts, 25-60 cycles ..... 140 watts



External Antenna.—When using an External Antenna, Peak C7 for max. output on a station in the 31-meter band.

Steps	Connect the high side of the test oscillator to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output—
1	I-F grid in series with .01 mfd.	455 kc	Quiet Point on "A" Band	L-11 and L-12 (2nd I-F Trans.)
2	1st Det. grid in series with .01 mfd.			L-9 and L-10 (1st I-F Trans.)
3	Yellow loop lead in series with 200 mmf.	1,500 kc	1,500 kc (160°) "A" Band	C-27 (osc.) C-12 (det.)
4		600 kc	600 kc (30.5°)	L-15 (osc.) Rock
5		Repeat steps 3 and 4.		
6	Antenna terminal (A) in series with 47 mmfd. (link open)	6,100 kc	6,100 kc (161°) "B" Band	C-26 (osc.)* C-13 (det.) Rock C-2 (ant.) Gang
7		15.2 mc	15.2 mc (185°) "C" Band	C-25 (osc.)* C-11 (det.) Rock C-8 (ant.) Gang
8		11.8 mc	11.8 mc (52°) "C" Band	C-7 (ant.) C-14 (det.) Rock Gang
9		Repeat steps 7 and 8.		
10		9.5 mc	9.5 mc (87.5°) 31M-Band	C-30 (osc.)* C-5 (ant.) Rock C-16 (det.) Gang
11	Fasten chassis in cabinet, close ant. link, adjust indicator to left-hand end of dial scales with gang closed.			
12	Radiation loop consisting of two turns of wire 18 inches in diameter located 4 to 6 feet from receiver	1,500 kc	1,500 kc signal "A" Band	C-1 (ant.) on loop
13		600 kc	600 kc signal "A" Band	L-15 (osc.) Rock Gang
14	Repeat steps 12 and 13.			

* Use minimum capacity peak if two peaks can be obtained.

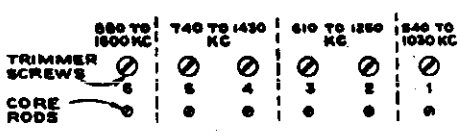
Note: Oscillator tracks 455 kc above signal on all bands.

Push Button Adjustment.

The station push buttons connect to separate magnetite-core oscillator coils and separate antenna trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool such as RCA Stock No. 31031. Allow at least five minutes warm-up period before making adjustments.

In the event that the receiver is to be used with an external antenna use one or two feet of wire (as an antenna) to ensure sharp peaking during the final adjustment procedure. For loop operation, the link should be strapped across terminals on back of set. In either case the procedure is as follows:

1. Make a list of the desired stations, arranged in order from low to high frequencies.
2. Turn the range selector to "A" band, and manually tune in the first station on the list.
3. Turn range selector to "PB" position, push in station button No. 1 (extreme left). Then adjust the No. 1 oscillator core to receive the station.
4. After oscillator core is set correctly, adjust No. 1 antenna trimmer for maximum output.



Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.

5. Adjust for each of the remaining stations in the same manner.
6. Make a final careful adjustment of the oscillator cores and antenna trimmers.

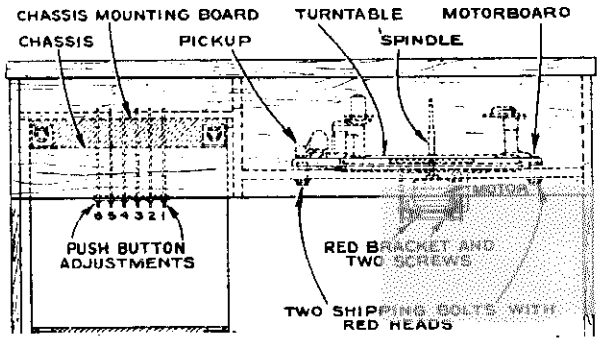
On the 880 to 1,600 kc push-button, the higher frequency stations may be received with No. 1 oscillator core either in or out (oscillator frequency either 455 kc below or 455 kc above the station frequency). The adjustment with this core in its out position (oscillator frequency 455 kc above the station frequency) is the correct one.

MODELS V-215, V-221, Ch. RC-564; V-219, Ch. RC-564A; V-225, Ch. RC-564B

RCA MFG. CO., INC.

FOR PUSH-BUTTON DATA SEE MODEL V-210

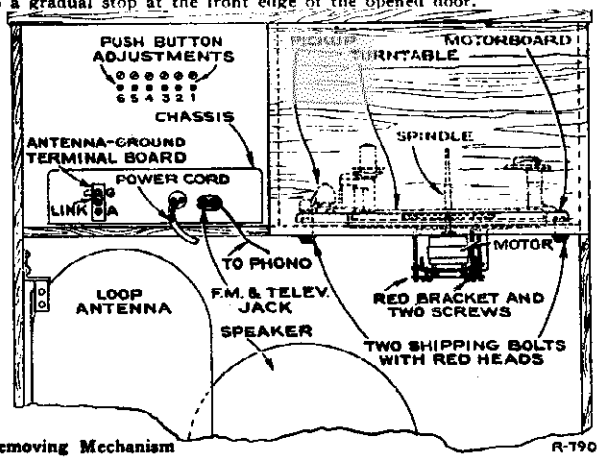
MODEL V-219



RECORD CHANGER SLIDE MECHANISM

(Models V-215, V-221)

An adjustment is located on each of the rear legs so that the angle of the cabinet may be adjusted to allow the record changer to slide out easily. Adjust so that the changer rolls out of the cabinet to a gradual stop at the front edge of the opened door.



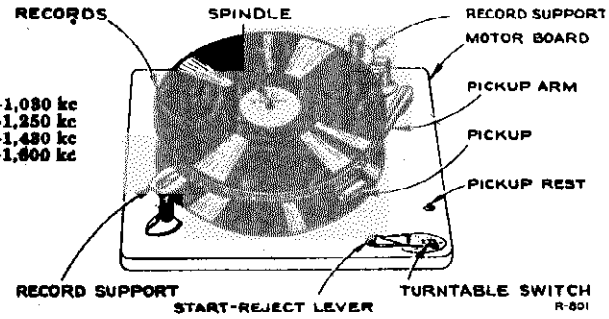
Removing Mechanism

(a) Unplug the power cord and pickup cord.

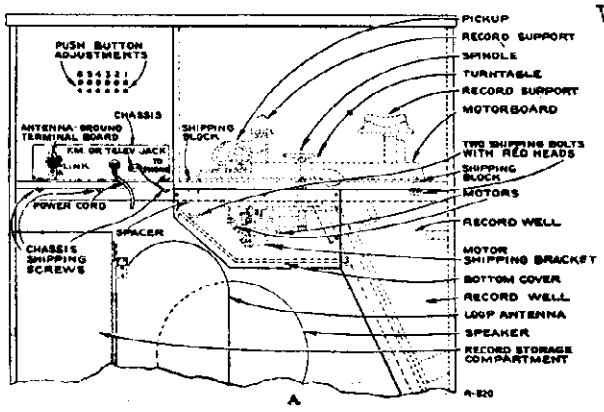
(b) Reach in behind the motor board and lift up the two metal tabs which act as stops and prevent the record changer from sliding out.

(c) Loosen the cable clamp holding the two cables in place.

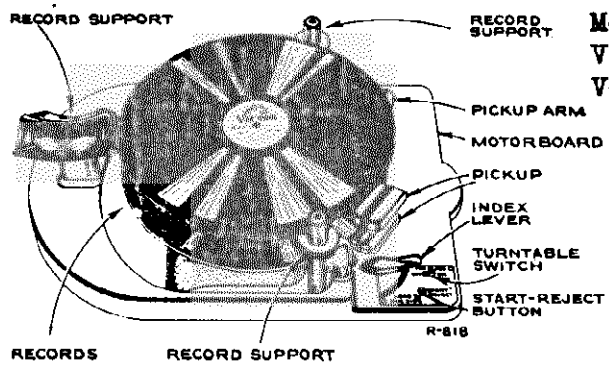
(d) Pull the record changer out of the instrument.



Model V-225

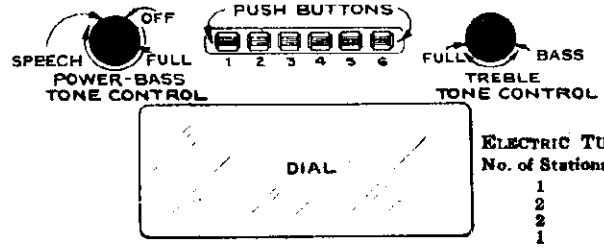


MODELS V-215 V-221



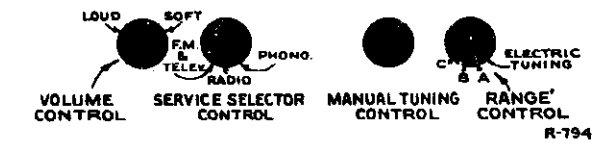
AUTOMATIC PHONOGRAPH RP-151 for V-225

Type Pickups..... (2) Crystal
Record Capacity..... Fifteen 10-in or Twelve 12-in.
Power consumption turntable drive motor.. (14) watts
Power consumption cycle motor..... (38) watts

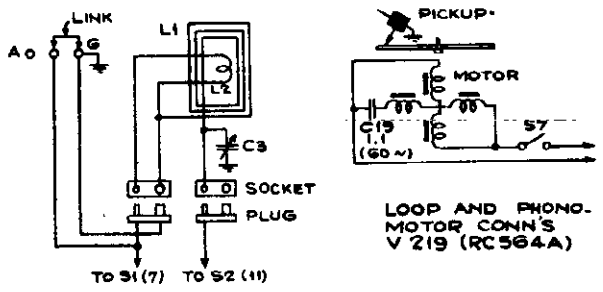


ELECTRIC TUNING

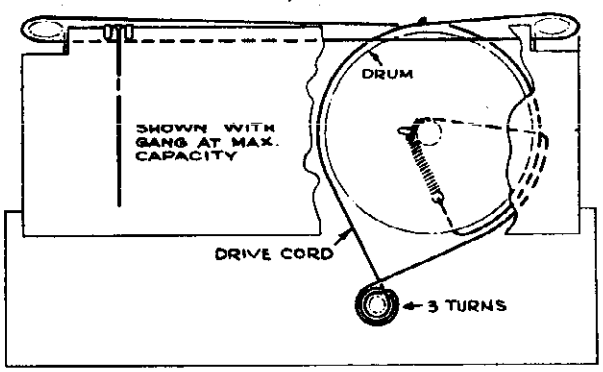
No. of Stations	
1	.. 540-1,080 kc
2	.. 610-1,250 kc
2	.. 740-1,480 kc
1	.. 880-1,600 kc



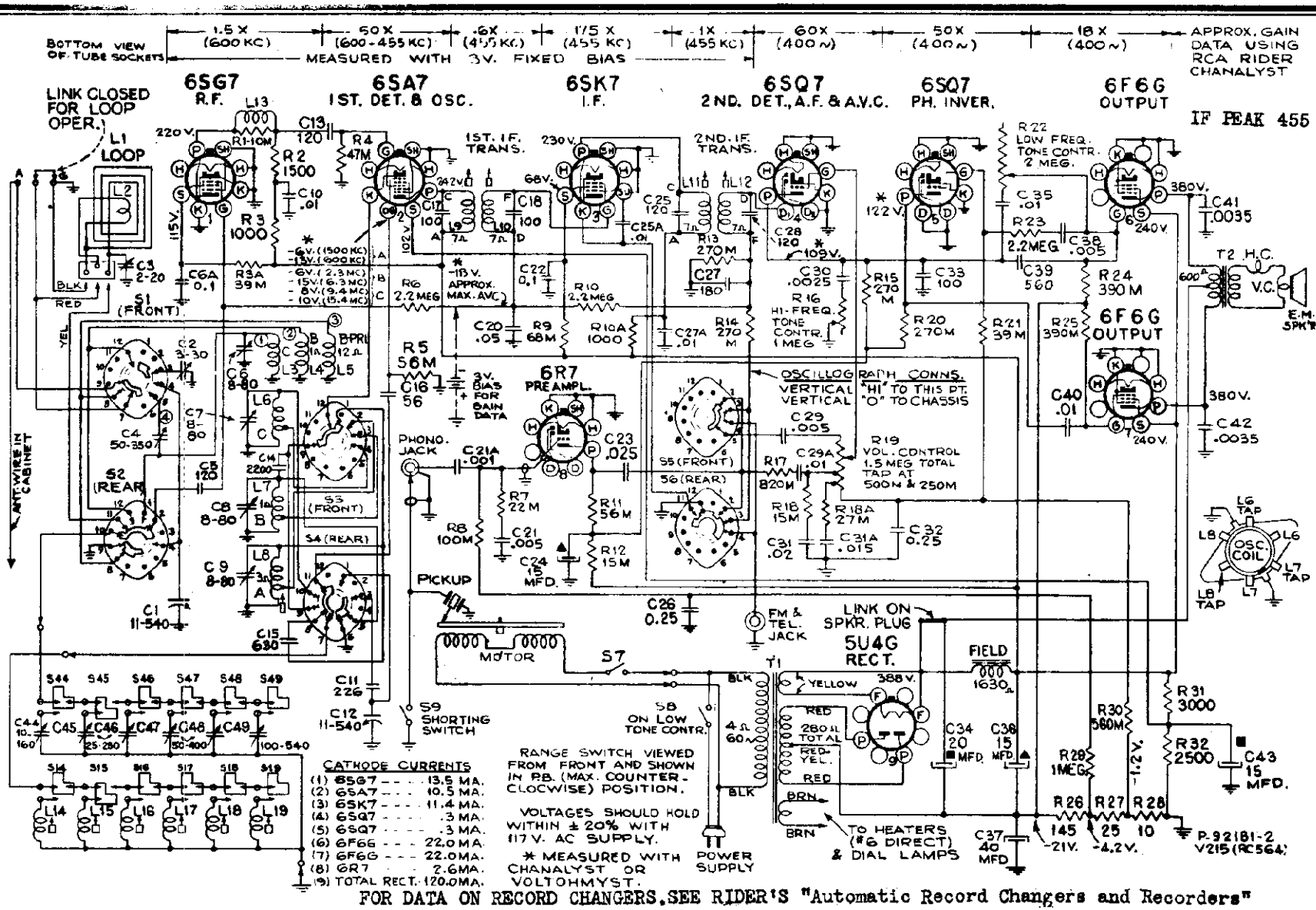
For all Models



Models V-215, V-219 and V-221



External Antenna.—For best reception on "C" band with an external antenna, peak the trimmer on "C" antenna coil for maximum output on a station in the 31-meter band.



FOR DATA ON RECORD CHANGERS, SEE RIDER'S "Automatic Record Changers and Recorders"

In Model V-219, the loop and phono motor connections are different, as shown in separate diagram on a following page. In Model V-225, R-8 is 220,000 ohms, R-17 is 1.8 Meg., and C-21 is .0035 mfd.

Power Output Rating

Undistorted ..... 10 watts
Maximum ..... 12 watts

Loudspeaker

Type ..... 12-inch electrodynamic
Voice Coil Impedance ..... 2.3 ohms at 400 cycles

Power Supply Ratings (V-219, V-225)

105-125 volts, 50-60 cycles ..... 145 watts total

Power Supply Rating (V-215, V-221)

105-125 volts, 50-60 cycles ..... 145 watts total

Automatic Phonograph RP-160 for V-215, RP-160A for V-219, RP-160B for V-221

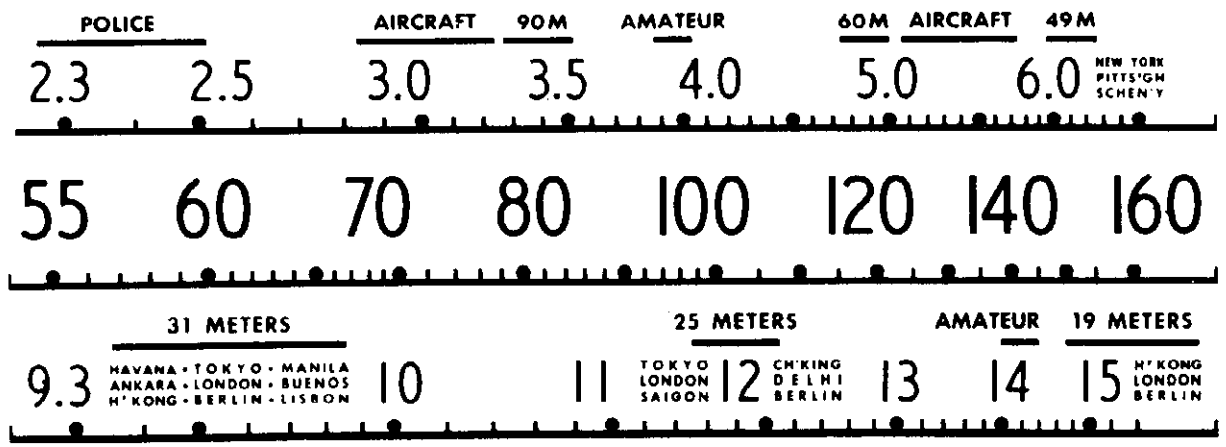
Type Pickup ..... Crystal
Record Capacity ..... Twelve 10-in., Ten 12-in. records
Power Consumption 160 ..... 17 watts
Power Consumption 160A ..... 14 watts

Frequency Ranges

Standard Broadcast (A) .... 540-1,600 kc
Medium Wave (B) ..... 2,300-6,300 kc
Short Wave (C) ..... 9,400-15,400 kc
Intermediate Frequency ..... 455 kc

MODELS V-215, V-219, V-221, V-225

RCA MFG. CO., INC.



The dial scale drawing shown is a full size reproduction. It can be used as a direct substitute for regular dial scale in alignment procedure.

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic diagram.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Electronic Voltmeter.—The electronic voltmeter in the Chanalyst or VoltOhmyst provides an unexcelled output indicator. It should be connected to the AVC bus, and the test-oscillator output adjusted to produce several volts of AVC.

Calibration Scale.—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the chassis for quick reference during alignment. In the event that only the chassis is returned for service, and the cabinet with its tuning dial is left in the customer's home, the full size calibration scale printed in this service note can be used as an accurate and convenient substitute for the regular dial.

Using Tuning Dial.—

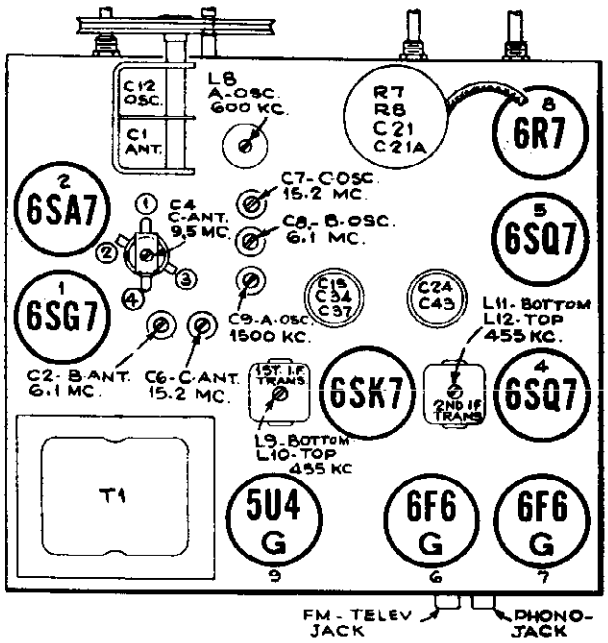
1. Remove the dial glass from the cabinet.
2. With gang at full mesh move the pointer to a point (1/16) inch to the left of the reference mark at the left hand end of the dial backing plate.
3. Place the glass dial under the pointer so that the extreme left scale graduations coincide with the pointer. Use scotch tape to hold the glass dial in place.

Using Dial Scale Printed In This Service Note.—

Follow the procedure above, substituting the dial scale printed in this service note for the glass dial in the cabinet.

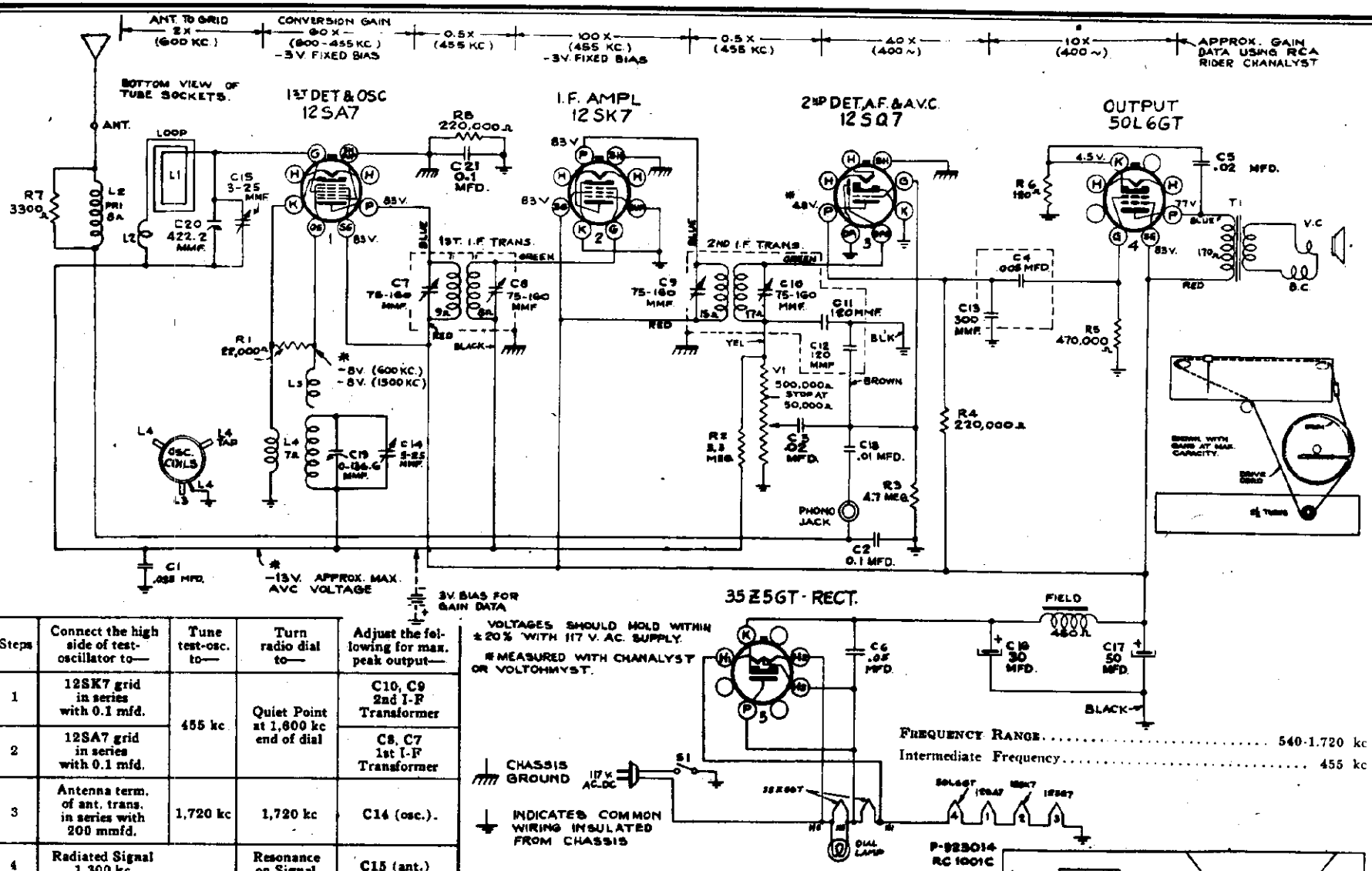
Steps	Connect high side of test osc. to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output—
1	I-F grid in series with .01 mfd.	455 kc	"A" Band 540 kc	L12, L11 (2nd I-F Trans.)
2	1st Det. grid in series with .01 mfd.			L10, L9 (1st I-F Trans.)
3	Yellow loop lead in series with 200 mmf. (link closed)	1,500 kc	"A" Band 1,500 kc	C9 (osc.)
4		600 kc	"A" Band 600 kc	L8 (osc.)
5		Repeat steps 3 and 4		
6	Ant. terminal in series with 47 mmf. (link closed)	6.1 mc	"B" Band 6.1 mc	C8 (osc.)* C2 (ant.)
7		15.2 mc	"C" Band 15.2 mc	C7 (osc.)* C6 (ant.)
8		9.5 mc	"C" Band 9.5 mc	C4 (ant.)
9		Repeat steps 7 and 8		
10	Install and connect chassis in cabinet, with link closed. Tune in a radiated oscillator signal at 1,500 kc and peak the "A" band ant. trimmer C3 (on loop). Rock in L8 for peak output at 600 kc.			

* Use minimum capacity peak if two peaks can be obtained. Oscillator tracks 455 kc above signal on all bands.



Critical Lead Dress

1. Push button, R.F. and oscillator leads should be separated as much as possible to reduce degeneration on push button reception.
2. R.F. choke in plate circuit of 6SG7 should be dressed towards the back apron.
3. Dress green push button lead under clamp and away from "C" band series capacitor.
4. Dress heater leads away from grids and diodes.
5. Dress phono. cables up and away from all wiring.
6. Dress all excess leads from transformer towards back towards transformer.
7. Keep output plate leads short and dressed close to chassis.
8. Dress green lead from 6SA7 screen to electrolytic down close to chassis.
9. Dress "C" band coil lead from oscillator coil to range switch down towards green lead.
10. Keep yellow loop lead clear of all wiring.
11. Dress ground bus of large electrolytic away from mounting lug.
12. Remove all excess slack from pilot light assembly and dress it close to chassis base away from volume control.
13. Dress oscillator grid capacitor (56 mmfd.) up and away from the screen and plate of 6SA7 socket.
14. A-C leads to "off-on" switch should be kept away from tone control cable to reduce hum.
15. Peaking coil should be dressed away from R-F grid resistor to reduce degeneration in R-F stage.
16. Dress oscillator push button lead in weld clamp on front apron away from 220 mmf. series condenser.
17. Keep all leads away from Phono.-FM jack to prevent audio oscillation and hum. Dress underneath the shield provided.



Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	12SK7 grid in series with 0.1 mfd.	455 kc	Quiet Point at 1,600 kc end of dial	C10, C9 2nd I-F Transformer
2	12SA7 grid in series with 0.1 mfd.			C8, C7 1st I-F Transformer
3	Antenna term. of ant. trans. in series with 200 mmfd.	1,720 kc	1,720 kc	C14 (osc.).
4	Radiated Signal 1,300 kc		Resonance on Signal	C15 (ant.)
5	Repeat steps 3 and 4.			

Precautionary Lead Dress.—

1. Dress the power cable to switch on the volume control close to the chassis and away from all grid and diode leads and condensers.
2. Dress capacitors in the 12SQ7 grid circuit away from all wiring.
3. Green and black phono wires should be twisted and dressed away from other parts and leads.
4. 50L6-GT filament wires should be dressed to rear of chassis and away from the second I-F transformer leads.
5. Dress brown lead from second I-F transformer to 12SQ7 away from power cable.
6. Dress wire to No. 1 grid of the 12SA7 away from pilot lamp leads.
7. Dress wire from loop to variable condenser away from chassis.
8. Dress all capacitors, leads, etc. which come close to oscillator coil rigidly and as far as possible from it.

FREQUENCY RANGE ..... 540-1,720 kc
Intermediate Frequency ..... 455 kc

LOUDSPEAKER ..... 5-inch Electrodynamic
POWER SUPPLY RATINGS ..105-125 volts, 50-60 cycles, A.C. or D.C. ..... 25 watts

RCA MFG. CO., INC.

MODELS 526,527
Chassis RC-1001E

RCA MFG. CO., INC.

LOUDSPEAKER (RL-86-A3)
Type ..... 5-inch electro dynamic
V.C. Impedance ..... 4.0 ohms at 400 cycles

POWER SUPPLY RATING
105-125 volts, AC 50 or 60 cycles, or DC ..... 25 watts

PRECAUTIONARY LEAD DRESS.—

1. Dress the power cable to switch on the volume control close to the chassis and away from all grid and diode leads and condensers.
2. Dress capacitors in the 12SQ7 grid circuit away from all wiring.
3. Green and black phono wires should be twisted and dressed away from other parts and leads.
4. 50L6-GT filament wires should be dressed to rear of chassis and away from the second I-F transformer leads.
5. Dress brown lead from second I-F transformer to 12SQ7 away from power cable.
6. Dress wire to No. 1 grid of the 12SA7 away from pilot lamp leads.
7. Dress wire from loop to variable condenser away from chassis.
8. Dress all capacitors, leads, etc. which come close to oscillator coil rigidly and as far as possible from it.

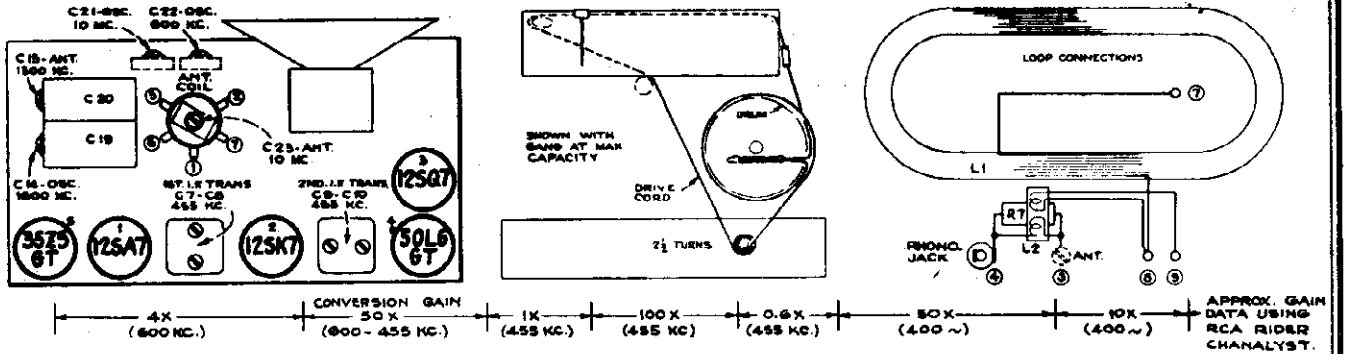
FREQUENCY RANGE
Broadcast Band ..... 535-1,720 kc
Short Wave Band ..... 8.9 mc to 12 mc.

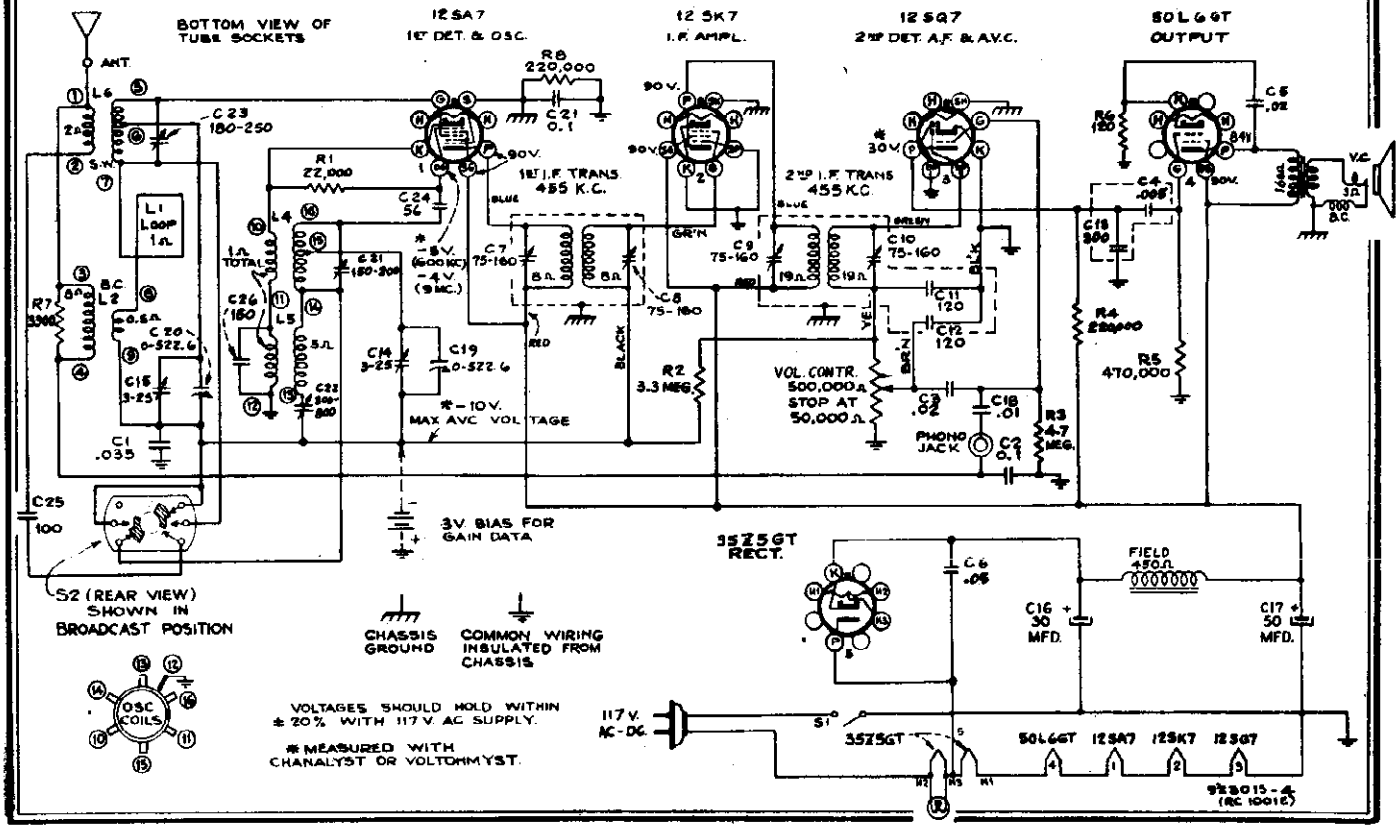
INTERMEDIATE FREQUENCY ..... 455 kc

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	12SK7 grid in series with 0.1 mfd.	455 kc	Quiet Point at 1,600 kc end of dial	C10, C9 2nd I-F Transformer
2	12SA7 grid in series with 0.1 mfd.			C8, C7 1st I-F Transformer
3	Antenna term. in series with 47 mmf.	10 mc*	10 mc	C21 (osc.)** C23 (ant.)
4	Antenna term. in series with 200 mmfd.	1,600 kc	1,600 kc	C14 (osc.)
5	Radiation Loop	1,500 kc	Resonance on Signal	C15 (ant.)
6	Radiation Loop	600 kc	600 kc	C22 Osc. Rock in

* It is recommended that this step be repeated using a received station of known frequency.

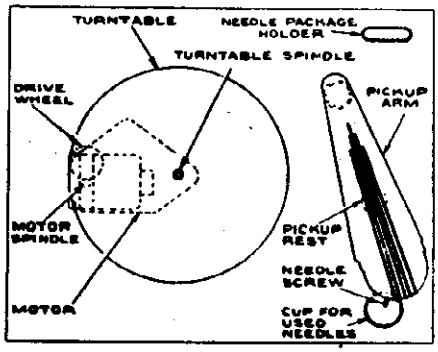
** Use minimum capacity if two peaks can be obtained.





RCA MFG. CO., INC.

MODEL R-560-P
Chassis RC-517F



Power Output

Undistorted	0.9 watts
Maximum	1.2 watts

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—Connect the low side of the test-oscillator to the receiver chassis, through a .01 mfd. capacitor, and keep the output as low as possible.

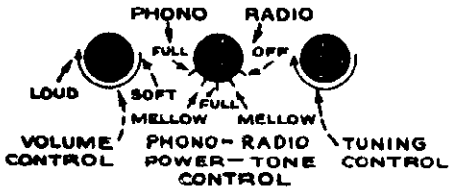
Phonograph Motor Service Data:—

The phonograph motor is of the self starting synchronous type and operates the turntable through friction drive between the motor drive spindle and the rubber tired idler on the rim of the turntable.

The motor should be lubricated once or twice a year by placing a few drops of S. A. E. 20 (or equivalent) on the turntable spindle and saturating the oil retaining felt pads on the motor shaft with S. A. E. 10 oil. **Caution—The motor drive spindle and the rubber tire on the idler must be kept clean and entirely free from oil and grease at all times.**

Power Supply.—Although this model employs an ac-dc chassis, it is not suitable for use on d.c., as this would damage the motor.

Frequency Range	540-1,650 kc
Intermediate Frequency	455 kc



Pilot Lamp ..... 1—Mazda No. 51, 6-8 volts, 0.2 amps.

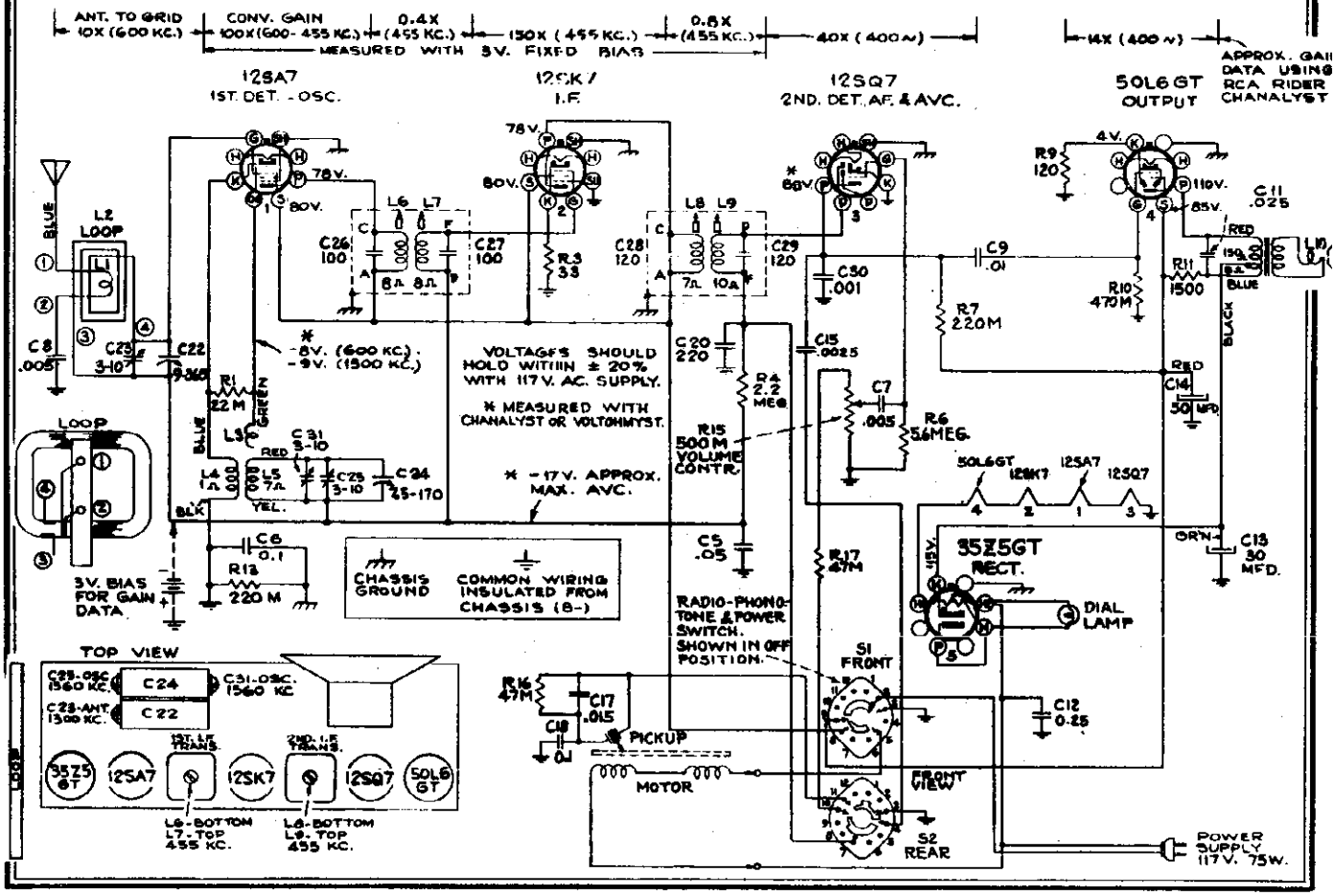
Power Supply Rating

105-125 volts, 50 cycles	55 watts
105-125 volts, 60 cycles	55 watts

Loudspeaker (RL-81B-4)

Type	5-inch P.M.
V.C. Impedance	4 ohms at 400 cycles

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	I-F grid, in series with .01 mfd.	455 kc	Quiet point 1,600 kc end of dial	L8 and L9 2nd I-F transformer
2	1st Det. grid in series with .01 mfd.			L6 and L7 1st I-F transformer
3	Ant. terminal in series with 200 mmfd.	1,650 kc	Gang at minimum	C25 (osc.) C31 (osc.)
4	Radiated signal 1300 kc		Signal Frequency	C23 (ant.)
5	Repeat steps 3 and 4.			



MODEL R-566-P

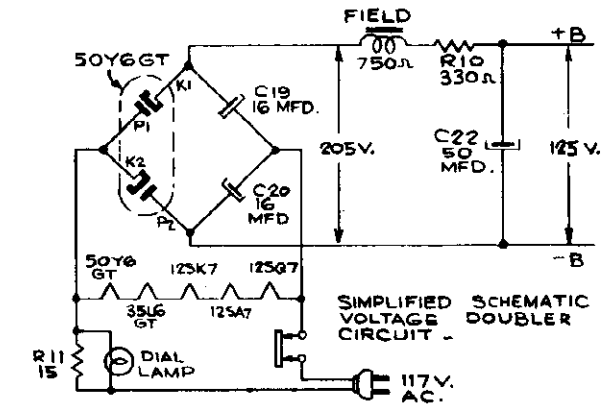
RCA MFG. CO., INC.

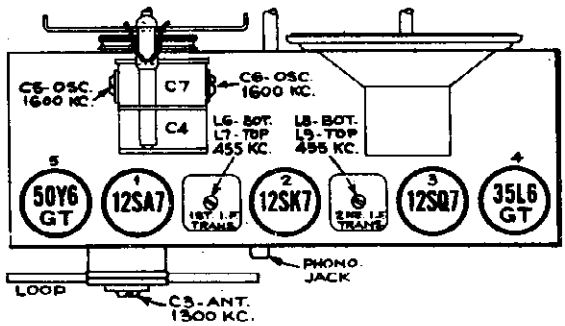
Frequency Range..... 540-1,600 kc
Intermediate Frequency..... 455 kc

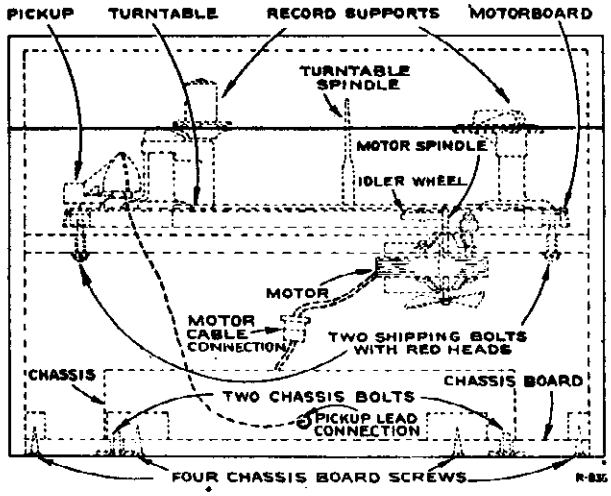
POWER OUTPUT
Undistorted..... 1.6 watts
Maximum..... 3 watts
Pilot Lamp..... (1) Mazda No. 51, 6.3 volts, 0.20 amps.

POWER SUPPLY RATING
105-125 Volts, 60 Cycles..... 65 watts

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	I-F grid, in series with .01 mfd.	455 kc	Quiet point 1,600 kc end of dial	L8 and L9 2nd I-F transformer.
2	1st Det. grid in series with .01 mfd.			L6 and L7 1st I-F transformer
3	Ant. terminal in series with 200 mmfd.	1,600 kc	Gang at minimum	C5 (osc.) C6 (osc.)
4	Radiated signal 1,300 kc		Signal Frequency	C3 (ant.)
5	Repeat steps 3 and 4.			





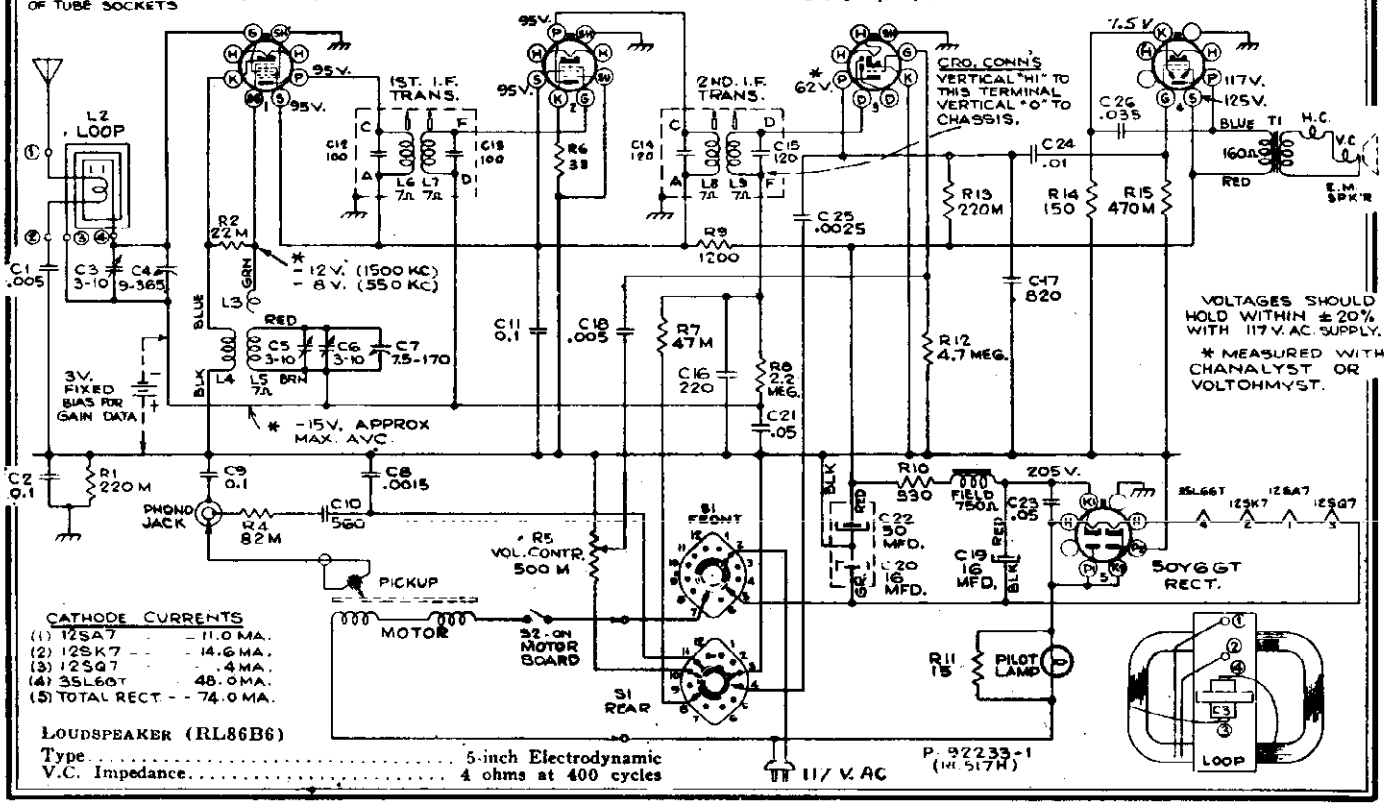


12X (600KC) | 50X (600-455KC) | 0.8X (455KC) | 200X (455 KC) | 1X (455 KC) | 40X (400 ~) | 12X (400 ~) — APPROX. GAIN DATA USING RCA RIDER CHANALYST

MEASURED WITH 3V. FIXED BIAS

BOTTOM VIEW OF TUBE SOCKETS

12SA7 — 1ST. DET. & OSC.
12SK7 — I.F.
12SQ7 — 2ND. DET., AF., AVC.
35L6GT — OUTPUT



CATHODE CURRENTS
(1) 12SA7 - - 11.0 MA.
(2) 12SK7 - - 14.6 MA.
(3) 12SQ7 - - .4 MA.
(4) 35L6GT - 48.0 MA.
(5) TOTAL RECT. - - 74.0 MA.

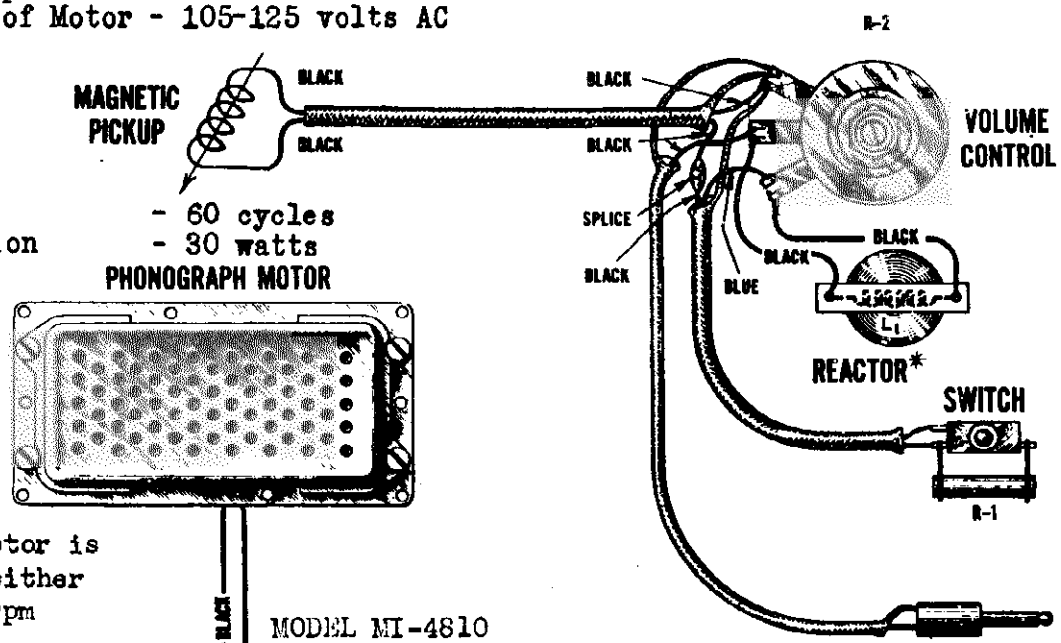
LOUDSPEAKER (RL86B6)
Type..... 5-inch Electrodynamic
V.C. Impedance..... 4 ohms at 400 cycles

117 V. AC

P. 92233-1 (RC-517H)

RCA MFG. CO., INC.

Model MI-4803 Type Pt-16
Pickup - Low Impedance
Voltage Rating of Motor - 105-125 volts AC

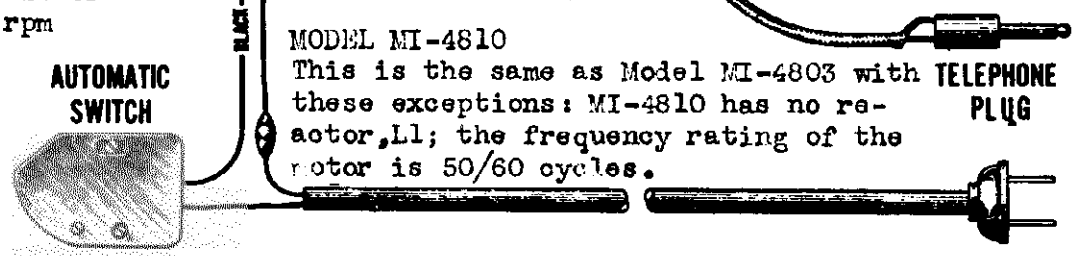


Frequency - 60 cycles
Power Consumption - 30 watts

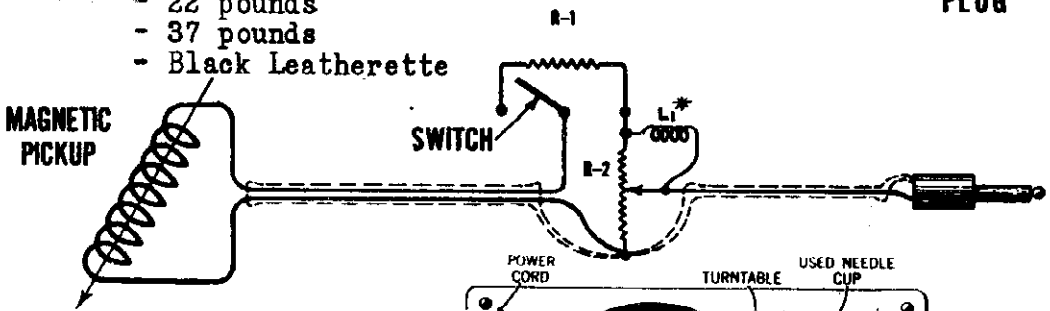
PHONOGRAPH MOTOR

Synchronous motor is adjusted for either 33 1/3 or 78 rpm

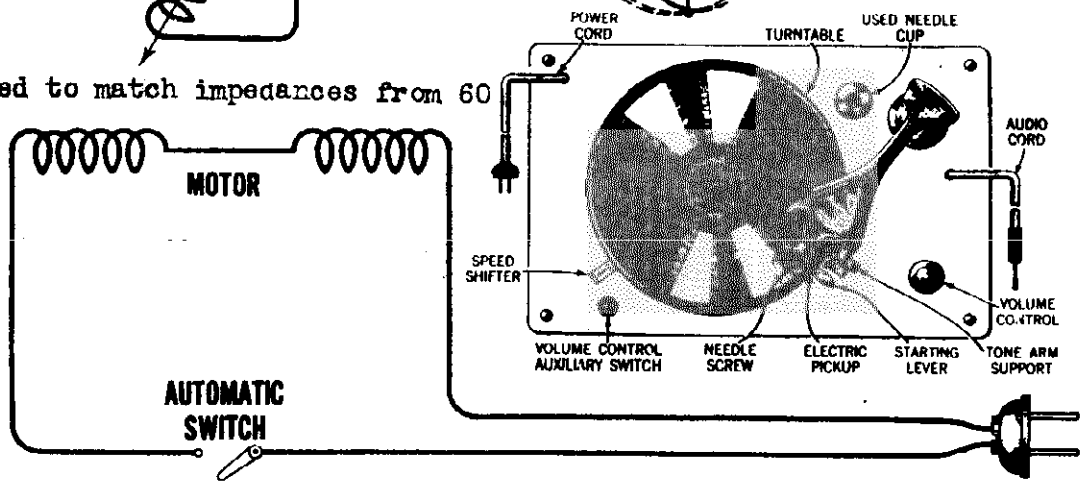
MODEL MI-4810
This is the same as Model MI-4803 with these exceptions: MI-4810 has no reactor, L1; the frequency rating of the motor is 50/60 cycles.



Dimensions: - 18" x 15" x 9" high
Weight - 22 pounds
Shipping Weight - 37 pounds
Finish - Black Leatherette



Pickup designed to match impedances from 60 to 500 ohms.

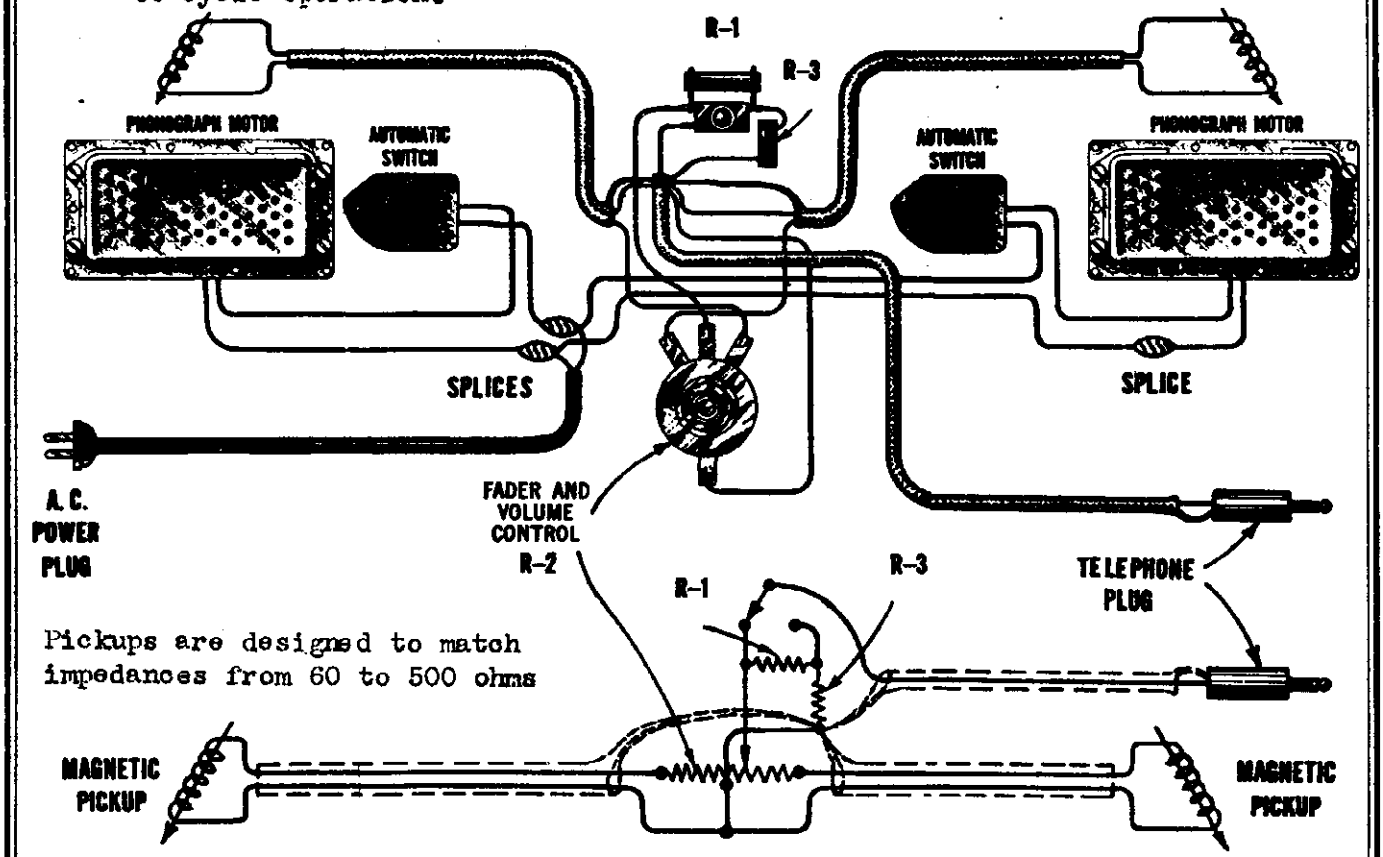


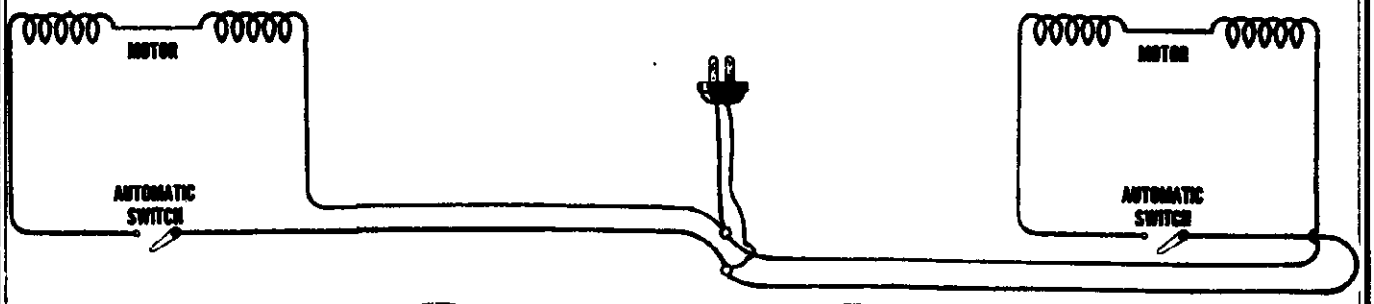
MODEL MI-4804
MODEL MI-4811

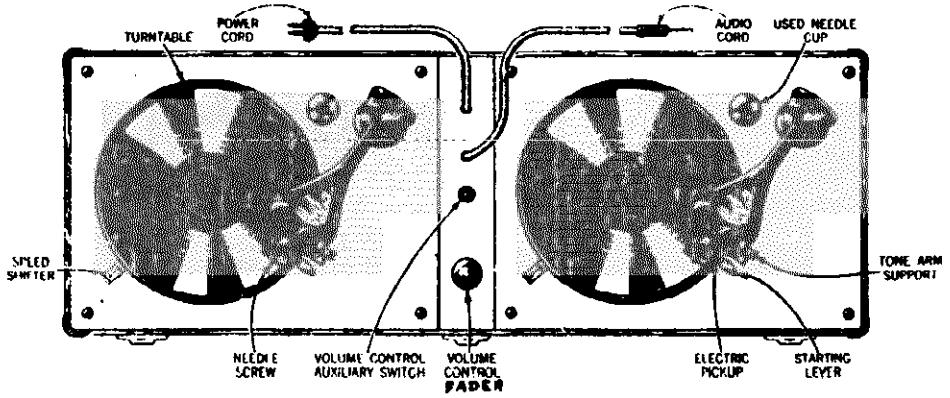
RCA MFG. CO., INC.

MODEL MI-4804 MODEL MI-4811
Type- PT-17

These two Double Turntable Phonographs are the same except that Model MI-4804 is for 60-cycle operation only and Model MI-4811 is for 50 or 60-cycle operation.







MODELS MI-4816, MI-4817, MI-4818

RCA MFG. CO., INC.

The MI-4816, 4818 equipments are designed for regular Public Address use, while the MI-4817 is designed for Sound Truck (6 volt) operation. Standard, 78 rpm, records may be played on the MI-4816 and MI-4818. The MI-4817 has provision for changing the speed of the turntable to enable both 78 rpm and 33-1/3 rpm records to be played. A low-impedance (125 ohm) magnetic pickup is used, designed primarily to use chromium (RCA orange or green shank) needles. The output of the pickup is fed through a volume control into a standard phone plug, or, for permanent connection, the plug may be removed, and the wires soldered directly to the amplifier input. *CAUTION: Connect only to the type power supply specified on name plate.*

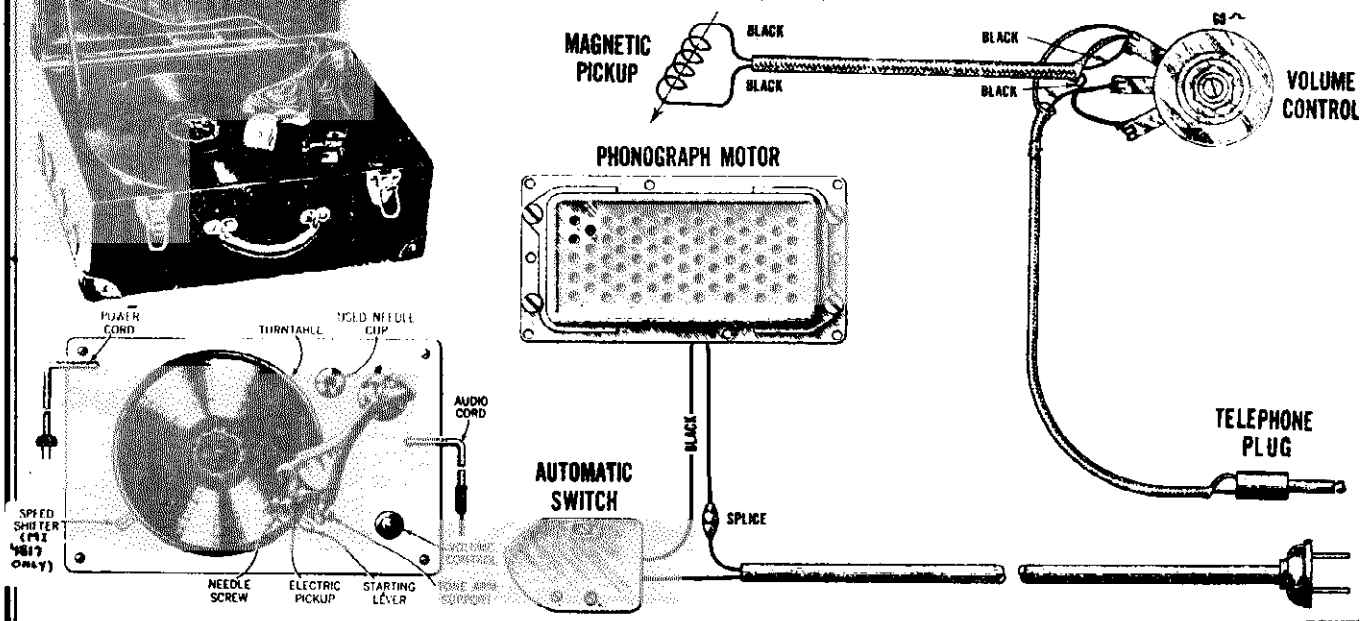
POWER RATINGS

MI-4816	105-125 volts, 60 cycles .... 30 watts
MI-4817	6 volts, d.c. ..... 35 watts
MI-4818	105-125 volts, 50 cycles .... 30 watts
Pickup Impedance	125 ohms
Turntable Speeds	... MI-4816, 4818 ..... 78 rpm
	... MI-4817...78 rpm and 33-1/3 rpm
Dimensions(lid closed)	20" x 15" x 9" high
Weight(Net)....22 lbs.;	Weight(Shipping)....37 lbs.
Finish	Gray Wrinkle

For adjustments of magnetic pickup, see data on Model MI-12700.

Operation

To operate turntable - connect to proper power supply, place phono. plug into amplifier input, place record on turntable, set the speed selecting mechanism to the proper position to correspond to the type record used (MI-4817 only), then pull starting lever toward the front of the case, place pickup on record, and regulate volume as desired. To stop turntable, lift pickup arm, place it on the pickup rest, and the automatic switch turns the motor off. When transporting equipment, be sure the pickup arm is on the pickup arm rest.



REPLACEMENT PARTS

DESCRIPTION	STOCK NO.
Pickup and Arm Assemblies	
ARM - Pickup arm only	9811
BACK - Pickup back	11548
COIL - Pickup coil	12541
MECHANISM - Comprising an armature and spring assembly, one armature clamp and one damper	14115
SCREW - Needle screw	12539
Motor Assemblies (MI-4816 & 4818 only)	
MOTOR - 60 cycle motor for MI-4816	8989
MOTOR - 50 cycle motor for MI-4818	8990
TURNTABLE	11696
DAMPER - Turntable rubber damper and damper plate	11704
MOTOR MOUNTING - Comprising 2 cup washers, 4 springs and 1 "C" washer	3398
STUDS - 3 motor studs	3817
Motor Assemblies (MI-4817 only)	
ARMATURE - Motor armature	26188
BRUSH - Set of 2 brushes for motor	23515

DESCRIPTION	STOCK NO.
DIAL - Speed indicator dial	23512
ESCUTCHEON - Speed shift lever escutcheon	23514
GOVERNOR - Motor governor complete	26189
LEVER - Speed shift lever	23513
MOTOR - 6 volt d-c motor	27684
POINTER - Speed indicator pointer	26187
TURNTABLE	27685
Motor Board Assemblies	
BRAKE - Automatic brake complete with cover	9809
BOX - Needle box	4391
KNOB - Volume control knob	4085
VOLUME CONTROL	12392
REST - Pickup rest	11551
SCALE - Volume control knob scale	3986
MOTOR BOARD MOUNTING - Comprising 1 bolt, 1 top spring, 1 bottom spring, 2 cup washers, 1 "C" washer and 1 nut (MI-4816-4818 only)	32069
CABLE - Power cord and plug	13524

MODELS MI-4829, MI-4829A

RCA MFG. CO., INC.

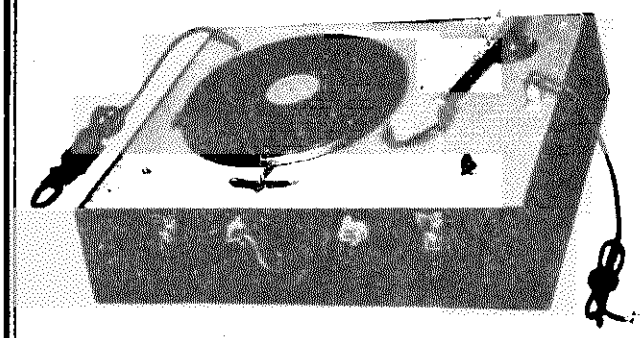


Figure 1—MI-4829

Height (with cover)	8½ inches
Length	21⅜ inches
Depth	18 inches
Weight—net	32 pounds

General Description

The MI-4829 and MI-4829A are portable turntables for playing of laterally cut records up to 16 inches in diameter, at either 78 or 33⅓ r.p.m. They use a governor type motor which is adjustable over a wide range of speed, and operate on 105/125 volts 50 to 60 cycles. An output jack and shielded cable is provided for connection to an external amplifier. The MI-4829 is equipped with a high impedance crystal pickup. The MI-4829A uses a low impedance magnetic pickup for connection to 250-ohm amplifier inputs. Both have an integral volume control for controlling the input level to an external amplifier.

MI	PICKUP	R-1	R-2	C-1
4829	Crystal	500,000	100,000	0.0025
4829A	Magnetic	600	—	—

Operation

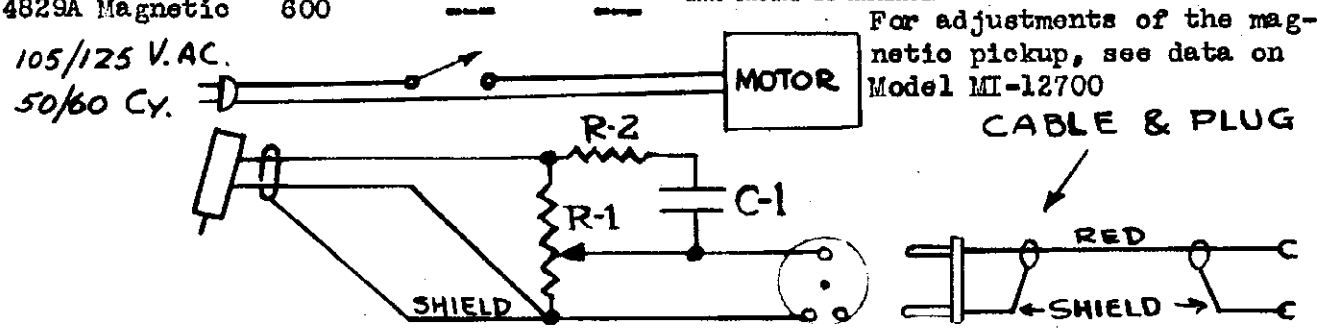
1. Plug pickup cable into motor board receptacle.
2. Connect shield lead to ground on the proper amplifier, and red lead to "high" side of amplifier input. (To sleeve and tip of telephone plug respectively, if used.)
3. Set speed selecting mechanism to the proper position, corresponding to type of record used.
4. If 16-inch records are to be played, first place special 16-inch flocked disc on the turntable.
5. When carrying records in cover, place 16-inch flocked disc between records and clamping disc to prevent records from warping.

Speed regulation:—Check speed in the 78 r.p.m. position by placing a piece of paper between a record and the turntable with the paper protruding beyond the edge of the record, and counting the number of revolutions of the turntable per minute while playing the record.

Should it be necessary to reset the pointer such that 78 r.p.m. can be obtained near the center of the "F-S" scale, remove motorboard from cabinet and take off the turntable first removing the "C" washer from the turntable spindle. Set pointer off scale approximately ½ inch beyond the "F" mark. Loosen slightly the pointer arm screw and nut that clamps it to the slotted cam shaft. Then with a screw driver, adjust the cam such that the minimum radius of the cam is against the governor adjustment ball bearing. Tighten the pointer arm screw and nut in this position.

No separate adjustment is provided for 33⅓ r.p.m. since with the speed properly adjusted for 78 r.p.m. records, the speed for long playing records will be 33⅓ r.p.m. when the control lever is set at 33⅓.

The crystal pickup:—If failure occurs, no attempt should be made to repair the unit, but a new replacement crystal unit should be installed.

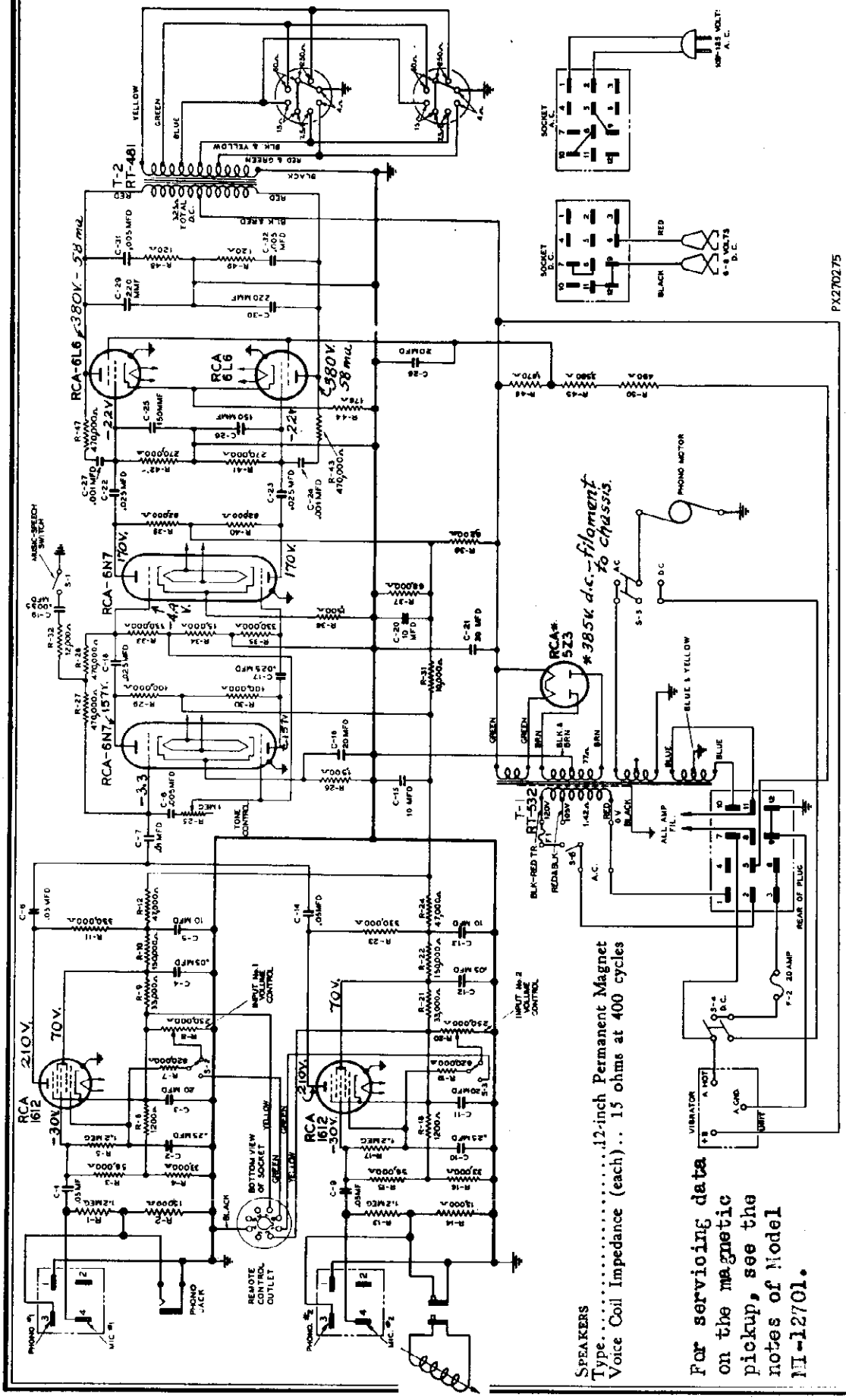


DESCRIPTION	STOCK No.
MOTORBOARD ASSEMBLIES MI-4829 AND MI-4829A	
Capacitor—.0025 mfd. (MI-4829 only)	34459
Connector—3-prong female for input cable	36183
Control—Volume control (MI-4829 only)	36182
Control—Volume control (MI-4829A only)	37047
Cord—A.C. power cord	32098
Disc—Disc for 16-inch records	371'6
Escutcheon—Speed change escutcheon	23514
Escutcheon—Speed indicator escutcheon	23512
Knob—Volume control knob	7960
Motor—Turntable drive motor	36180
Pointer—Speed change pointer	23513
Pointer—Speed indicator pointer	26187
Resistor—100,000 ohms—½ watt (MI-4829 only)	3252
Switch—Motor switch	28322
Turntable—Turntable complete	36181
CARRYING CASE	
Case—Carrying case complete	36184
Catch—Carrying case catch	36119
Foot—Felt foot for carrying case	36118
Handle—Carrying case handle	36199
Hinge—Carrying case hinge complete	36200

DESCRIPTION	STOCK No.
PICKUP ARM ASSEMBLY MI-4829	
Base—Pickup arm base only	36139
Cable—Pickup cable	36141
Nut—Nut and washer for pickup arm base	33122
Pickup Unit Cartridge	36427
Ring—Retaining spring for pickup arm shaft	34311
Screw—Needle screw only	33529
Shaft—Pivot arm and shaft	36140
Shell—Tone arm shell	36137
Spring—Pickup arm spring	36138
PICKUP ARM ASSEMBLY MI-4829A	
Arm—Pickup arm with pivot arm and pickup spacer—less pickup unit, collar, pivot shaft and bearing, and base assembly	33577
Base—Base assembly with bottom bearing	33578
Collar—Pivot shaft collar	34679
Pickup—Pickup unit complete	32357
Shaft—Pivot shaft and bearing	33579

MODEL MI-12754
P-A Equipment

RCA MFG. CO., INC.



For servicing data on the magnetic pickup, see the notes of Model MI-12701.

SPEAKERS
Type.....12-inch Permanent Magnet
Voice Coil Impedance (each).. 15 ohms at 400 cycles

Voltage Ratings..... 105/125 volts, 50/60 cycles
..... 6-8 volts d.c.
Power Consumption, A.C..... 195 watts
D.C..... 120 watts
Fuses, A.C..... 3 amperes
D.C..... 20 amperes
Input Impedance..... Microphone, 40,000 ohms
..... Phonograph, 15,000 ohms
Load Impedances..... 4; 7.5; 15; 60; 250 ohms
Frequency Response..... ± 2 db 70 to 10,000 cycles

POWER OUTPUT
8% Harmonic Distortion (A.C. Operation)..... 25 watts
Maximum Output (A.C. Operation)..... 30 watts
8% Harmonic Distortion (D.C. Operation)..... 20 watts
Output Level (.006 watt Zero Reference Level)..... + 35 db

Input Level-Max. permissible (.006 watt Zero Reference)..... - 40 db
Min. for normal power output..... - 80 db
Hum Level (max.)..... - 10 db
Average Over-all Gain..... Microphone Input, 116 db
..... Phonograph Input, 77 db

MODEL MI-12754

RCA MFG. CO., INC.

General Description

The MI-12754 Sound Truck Equipment consists of a combined 25 watt amplifier-turntable assembly, two permanent magnet speakers and an MI-6228A microphone. This equipment may be used on a 6-volt D-C supply, or 110-volt A-C supply by merely changing the power supply cord and associated plugs. The A-C and D-C cords are supplied with the equipment. This equipment may be used for permanent or mobile installations.

Input.—There are two input channels with separate volume controls. Each channel has provision for high impedance phonograph or microphone input, and both channels may be used simultaneously.

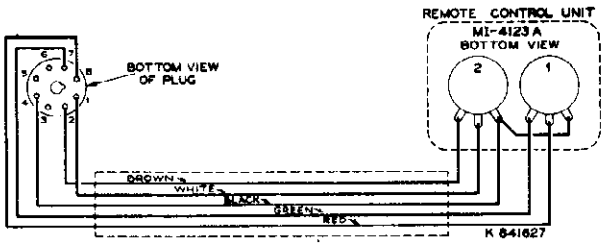
Channel No. 1 has provision for either microphone or phonograph input. Microphone input to this channel is through the receptacle at the rear of cabinet marked "MIC. 1." Phono. input is either through the jack at the rear of the cabinet marked "PHONO." or through the receptacle marked "MIC. 1." Proper connections to the input plug can be determined from the schematic diagram. Both microphone and phono. pickup may be used simultaneously on this channel if provision is made for controlling the volume of the pickup separately.

The phono. pickup located on the cabinet is permanently connected to channel No. 2. If it is desired to use channel No. 2 for a microphone, then the microphone should be connected to the receptacle marked "MIC. 2," located at the rear of the cabinet. Both microphone and phono. cannot be used simultaneously, due to a possible difference in sound level, because no provision is made for controlling the volume of either one separately.

If additional phono. pickup is desired, for a-c operation the RCA R-93 or MI-4816 portable turntable phono. pickup may be used. For 6-volt d-c operation, the MI-4817 portable turntable may be used. For additional microphones, an RCA MI-4036 or an additional MI-6228A microphone may be used.

Due to the fact that the signal level of each channel is controlled electrically and not in the signal circuit, remote control is possible at any point removed from the amplifier at a distance not exceeding 2,000 ft. The remote control unit is available as a separate unit and is connected to the amplifier by a cable and plug which fits into a socket provided on the rear of the main amplifier case. The remote mixing controls available are: **MI-4123** which comes without cord or plug for use where the amplifier and wiring are permanently installed. **MI-4123A** which is identical to the MI-4123 except that a 30 ft. five conductor cable with plug attached, is included in this assembly. A 50 ft. extension cable with male and female plugs is stocked as **MI-4685. MI-45**, five conductor cable, is recommended for connecting the remote control to the amplifier. No. 18 R.C. wire may be used.

Two output receptacles are provided at the rear of the amplifier case. Output impedances of 4, 7½, 15, 60 and 250 ohms are available.



Remote Control Wiring

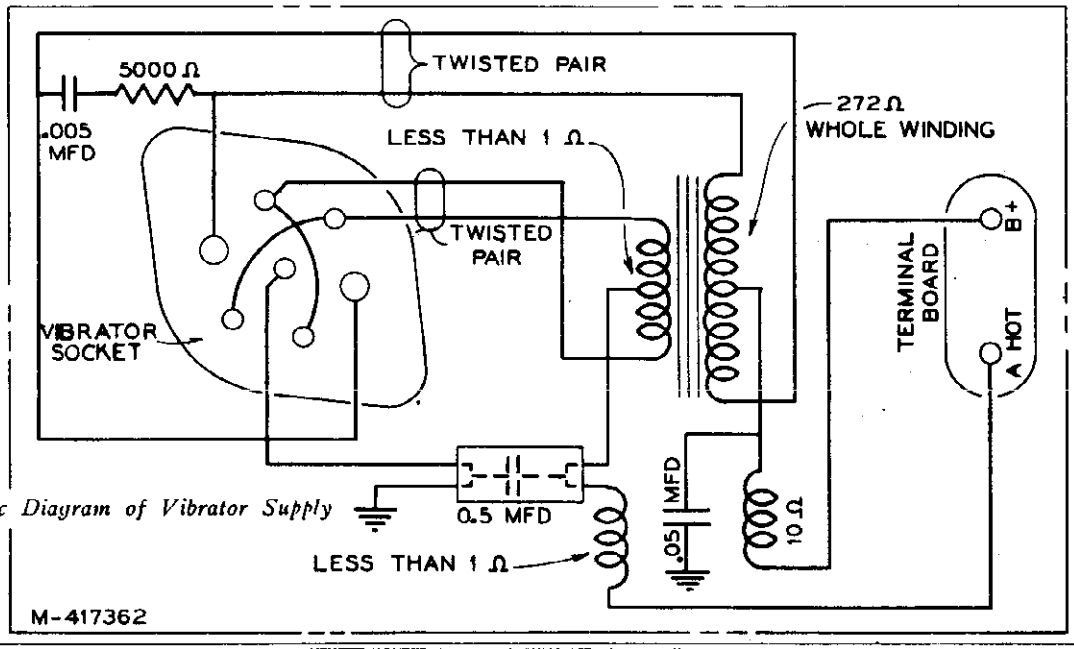
Microphones

Two recommended types of microphones are available for use with the MI-12754 amplifier. For orchestrations, and where close talking is not necessary, the RCA type **MI-4036** junior velocity microphone will give excellent results. The MI-4036 will operate into inputs of either 50, 250 or 15,000 ohms impedance, and therefore, by making the proper connections to the microphone transformer, the microphone can be used for the High Impedance input. For average announcing purposes the **MI-6228A Aerodynamic Microphone** is excellent. The output impedance of this microphone is 40,000 ohms. Thus it may be directly plugged into the microphone input jack on the amplifier.

Stands for the MI-4036 microphone are available as follows:

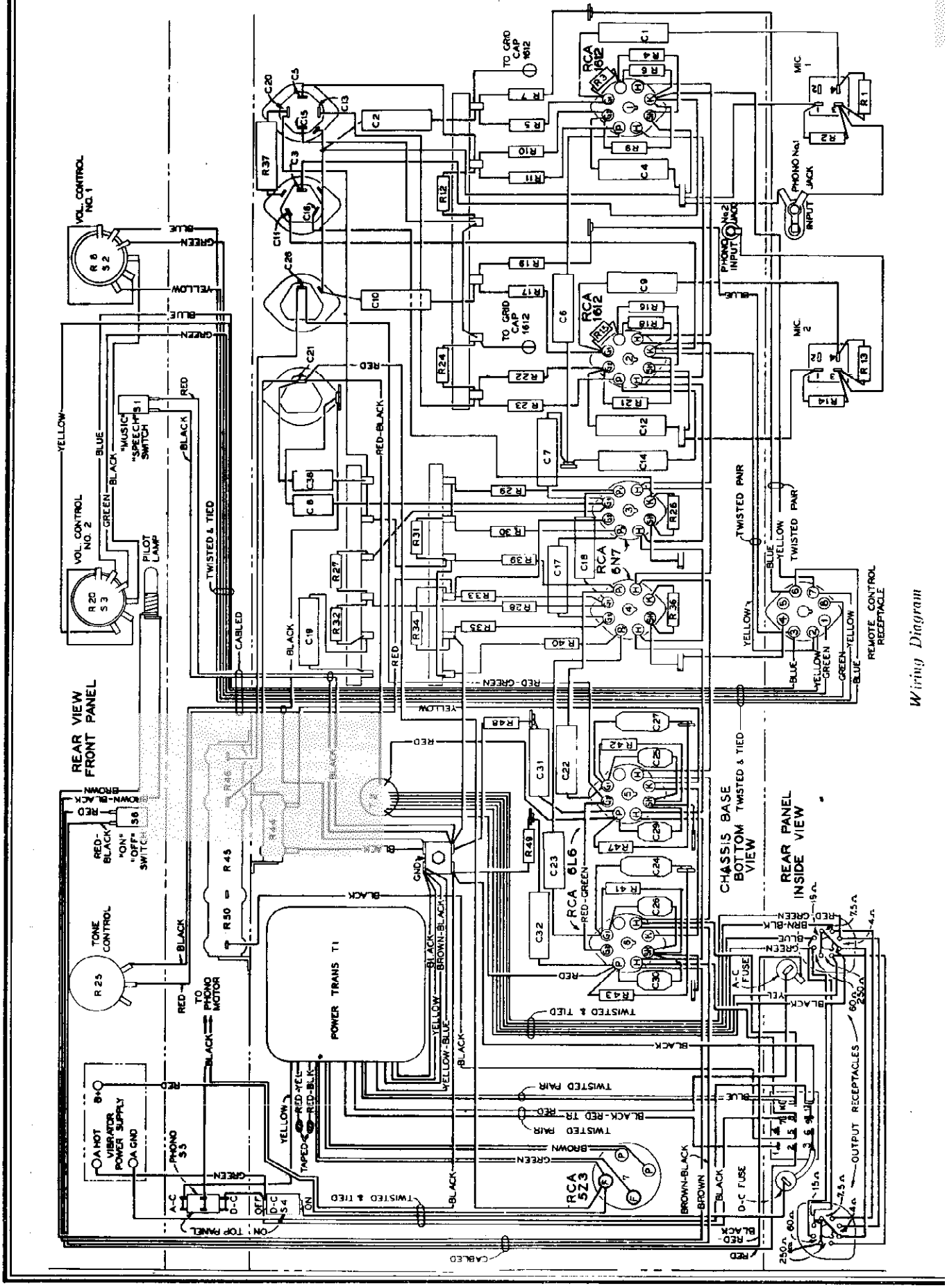
Floor Stand..... **MI-4068-A**
Table Stand..... **MI-4065-A**

Stands for the MI-6228-A are available as follows:
Table Stand..... **MI-6227**



Schematic Diagram of Vibrator Supply

RCA MFG. CO., INC.



Wiring Diagram

MODEL MI-12754

RCA MFG. CO., INC.

The phono. motor should be oiled occasionally with a light grade of high quality oil, a few drops each month being sufficient. The oil wick is located near the turntable spindle, and is accessible through an opening in the top of the cabinet located under the turntable.

The motor speed should be 78 r.p.m. and may be checked by placing a piece of paper between a record and the turntable, with the paper protruding slightly beyond the edge of the record, then counting the number of revolutions of the record per minute. The correct speed may be obtained by adjusting the speed regulating lever.

Operating Instructions

No. 1.—Set up amplifier assembly and speakers in location desired.

No. 2.—Plug a-c or d-c female plug into receptacle on rear of cabinet. If power supply is to be d-c, the switch at front left of cabinet should be thrown to the d-c position.

No. 3.—If remote control is to be used, plug in remote control at the rear center of the cabinet. If no remote control is to be used, plug in dummy plug supplied with equipment.

No. 4.—Plug in microphone No. 1 or microphone No. 2 as desired.

No. 5.—Turn "ON-OFF" switch to the "ON" position. A pilot light on the control panel shows when the amplifier is "ON."

No. 6.—Turn both volume controls to the complete counter-clockwise position, but do not snap to the remote position, unless remote control is to be used.

No. 7.—Turn tone control completely clockwise.

No. 8.—Bring volume up on the channel desired by turning the volume control slowly clockwise until the desired volume level is obtained. If microphone is to be used on "SPEECH," snap "MUSIC-SPEECH" switch to the "SPEECH" position. If phonograph is to be used, snap "MUSIC-SPEECH" switch to the "MUSIC" position.

No. 9.—Turn tone control slowly counter-clockwise until the desired tonal quality is obtained. For phonograph reproduction, the tone control should be turned until needle scratch is not objectionable.

No. 10.—To use turntable, when equipment is connected to d-c supply, snap phono. switch to "DC" position. To stop turntable, snap switch to "AC" position. A-C operation is the opposite.

The input receptacle marked "Microphone No. 1" may be used for either microphone or additional phonograph input if the input plug is connected as shown in the schematic diagram.

Care must be taken when plugging the speakers in, to match the correct speaker impedance to the correct output impedance. Each speaker supplied with this unit has 15 ohms impedance, and should be plugged into the 7.5 ohm terminals of the receptacles marked on the rear of the amplifier case when both speakers are used. The assembly screw on the speaker plug shows the proper indexing point for speaker impedance.

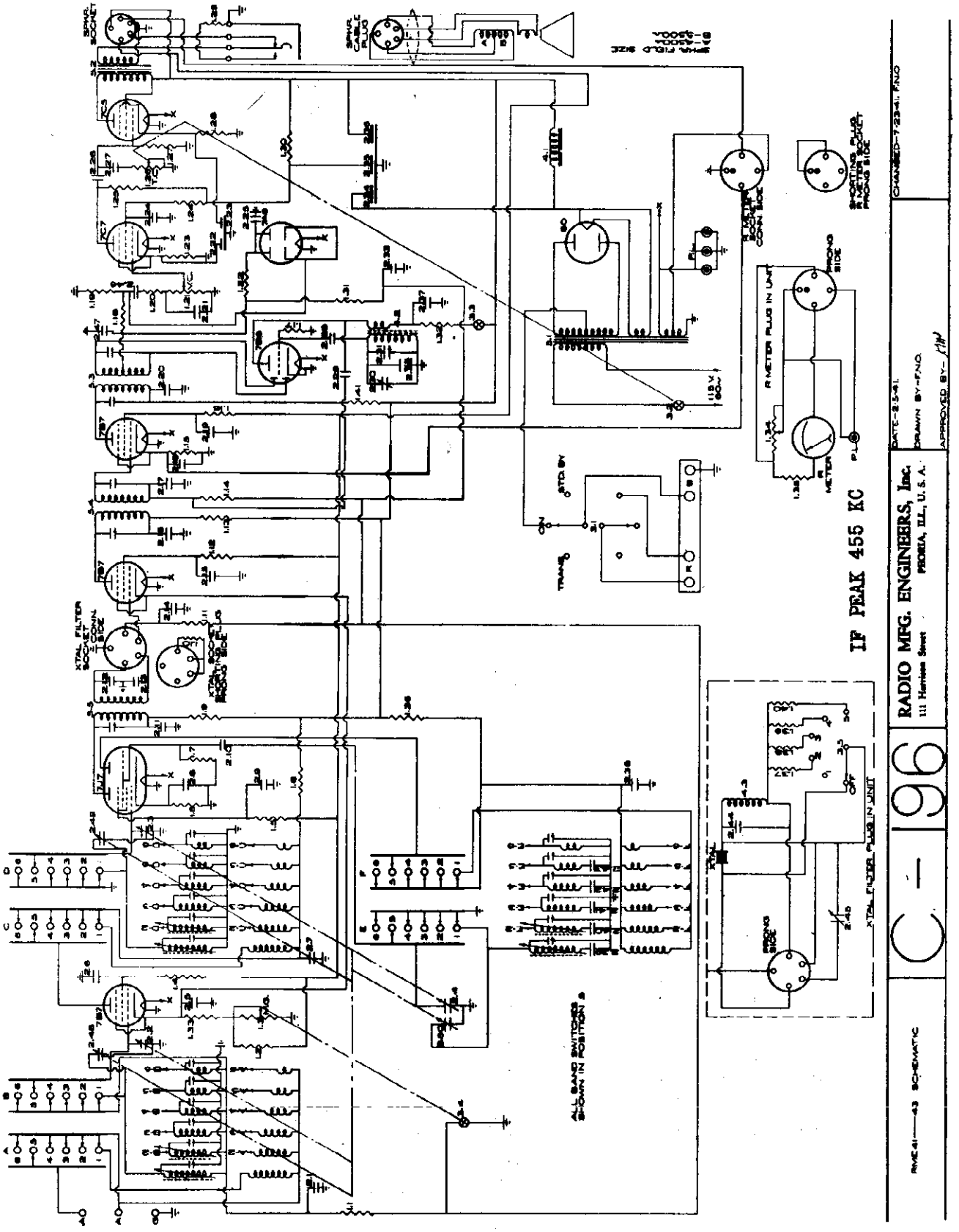
Other speakers than those supplied may be used with this equipment. However, care must be taken that the proper impedance match is kept between the speaker and the amplifier output. If only one speaker is desired to take the full output of the amplifier, an RCA MI-6260 speaker may be used. This speaker provides large coverage with high efficiency, and is ideally suited for outdoor mobile or permanent installations.

IMPORTANT: The clip of the d-c black power lead must always be connected to the GROUND side of the battery, irregardless of whether (+) or (-) side of battery is grounded. The vibrator should be inserted in its socket so that the (+) sign marked on the vibrator is toward the arrow on the metal cover if the (+) side of the battery is grounded to chassis. The (-) sign on vibrator should be toward the arrow on the cover if the (-) side of the battery is grounded to the chassis.

STOCK No.	DESCRIPTION
	AMPLIFIER ASSEMBLIES
30314	Cap—Grid cap for Radiotron
12725	Capacitor—150 mmfd. (C-25, C-26)
12694	Capacitor—220 mmfd. (C-29, C-30)
12635	Capacitor—.001 mfd. (C-24, C-27)
30303	Capacitor—.0035 mfd. (C-19)
4838	Capacitor—.005 mfd. (C-8)
30852	Capacitor—.005 mfd. (C-31, C-32)
4858	Capacitor—.01 mfd. (C-7)
4870	Capacitor—.025 mfd. (C-17, C-18, C-22, C-23)
4886	Capacitor—.05 mfd. (C-1, C-4, C-6, C-9, C-12, C-14)
12484	Capacitor—.25 mfd. (C-2, C-10)
32019	Capacitor Pack—10-10-10-10 mfd., 450 volts each (C-5, C-13, C-15, C-20)
32021	Capacitor—20 mfd. (C-28)
32018	Capacitor Pack—20-20-20 mfd., 25 volts each (C-3, C-11, C-16)
32020	Capacitor—30 mfd. (C-21)
4358	Clamp—Remote control plug locking clamp
10907	Fuse—3 amp. (F-1)
3646	Fuse—20 amp. (F-2)
30187	Jack—Phonograph input jack
32058	Plug—8-contact male remote control plug
32057	Plug—12-contact male power plug
32059	Post—Extraction fuse post
30189	Resistor—120 ohms, ½ watt (R-48, R-49)
30197	Resistor—176 ohms, 25 watt (R-44)
30731	Resistor—1,200 ohms, ½ watt (R-5, R-15)
30654	Resistor—1,500 ohms, ½ watt (R-26, R-36)
30196	Resistor—6,200 ohms, tapped at 1,670, 3,690, 940 ohms (R-45, R-46, R-50)
13204	Resistor—8,200 ohms, 2 watt (R-38)
3078	Resistor—10,000 ohms, ½ watt (R-31)
30436	Resistor—12,000 ohms, ½ watt (R-32)
12759	Resistor—15,000 ohms, ½ watt (R-2, R-14, R-34)
30685	Resistor—33,000 ohms, ½ watt (R-4, R-9, R-16, R-21)
30787	Resistor—47,000 ohms, ½ watt (R-12, R-24)
30650	Resistor—56,000 ohms, ½ watt (R-3, R-15)
30325	Resistor—68,000 ohms, 2 watt (R-37)
8064	Resistor—82,000 ohms, ½ watt (R-39, R-40)
3252	Resistor—100,000 ohms, ½ watt (R-29, R-30)
30493	Resistor—150,000 ohms, ½ watt (R-10, R-22)
30651	Resistor—270,000 ohms, ½ watt (R-41, R-42)
30784	Resistor—330,000 ohms, ½ watt (R-11, R-23, R-33, R-35)
30648	Resistor—470,000 ohms, ½ watt (R-27, R-28, R-43, R-47)
30181	Resistor—820,000 ohms, ½ watt (R-7, R-19)
30162	Resistor—1.2 megohm, ½ watt (R-1, R-5, R-13, R-17)
32055	Socket—4-contact socket for microphone plug
13318	Socket—4-contact insulated rectifier tube socket
31251	Socket—Octal base tube, output, or remote control socket
14274	Socket—Pickup cable socket and ground plate
30195	Transformer—Output transformer (T-2)
32024	Transformer—Power transformer (T-1)
	CONTROL PANEL ASSEMBLIES
	Jewel—Pilot lamp jewel bracket and socket. Yaxley Mfg. Co. Cat. No. 310-R or equivalent; with red jewel.
30247	Knob—Volume control or tone control knob
5226	Lamp—6.3 volt pilot lamp
30198	Panel—Control panel only, less mounting

STOCK No.	DESCRIPTION
7900	Switch—"On-Off" power or "Music-Speech" switch (S-1, S-6)
30452	Tone Control—1 megohm (R-25)
30164	Volume Control and Switch—250,000 ohms (R-8, R-20, S-2, S-3)
	MICROPHONE ASSEMBLY
MI-6228A	Microphone
MI-6227	Stand—Microphone stand
12035	Cable—30 ft. 2-conductor shielded cable
30052	Transformer—Microphone transformer
	MOTOR ASSEMBLIES
32036	Motor—A.C.-D.C. phonograph motor
32041	Plate—Metal support plate
32042	Plate—Rubber support plate
32038	Pointer—Speed indicator pointer
32040	Tip—Turntable shaft tip
32037	Turntable—10-inch turntable
	MOTOR BOARD ASSEMBLIES
11762	Box—Needle box and lid
32039	Dial—Speed indicator dial
32034	Rest—Pickup arm rest position bracket and spring
17507	Switch—D.P.D.T. Phonograph switch (S-5)
32070	Switch—D.P.S.T. Power switch (S-4)
	PICKUP AND ARM ASSEMBLIES
14281	Armature—Pickup armature assembly
11732	Coil—Pickup coil
14292	Damper—Pickup damper block with clamp and screw
32044	Pickup and Arm
31100	Pickup Unit only
3811	Screw—Needle holding screw
	SPEAKER ASSEMBLY
32201	Cone—Speaker cone and voice coil, complete with dust cap
32202	Dust Cap—Dust cap for speaker cone
32200	Speaker—Complete
	VIBRATOR POWER SUPPLY
18075	Capacitor—.005 mfd., 1,600 volts
18077	Capacitor—.05 mfd., 600 volts
18050	Capacitor—0.5 mfd., 50 volts
18078	Choke—"A" choke coil
18079	Choke—R.F. choke coil
4438	Resistor—5,000 ohms, ½ watt
18076	Transformer—Power transformer
18010	Vibrator—Plug-in unit
	MISCELLANEOUS, CABLES & PLUGS, ETC.
32098	Cable—A.C. power cable and plug
32101	Cable—D.C. power cable—less battery clips and socket
32100	Cable—Speaker cable, less plug
14289	Clip—1 set battery clips
32054	Plug—Microphone plug
25941	Plug—Power cord plug, 12 contact
30188	Plug—Speaker cable plug, 8 contact
30278	Screw—Cabinet thumb screw
32056	Socket—Power cable or battery cable socket

RADIO MFG. ENGINEERS, INC.



RME-41/43 PARTS LIST CONTINUED

CONDENSERS CONTINUED

2.29	100 μμfd., Mica
2.30	50 μμfd., Variable
2.31	100 μμfd., Mica Padder
2.32	100 μμfd., Mica Padder
2.33	.01 μfd., 400 volt paper
2.34	10 μfd., ┐
2.35	15 μfd., ├ 3 Section Filter Condenser
2.36	15 μfd., ┘
2.37	.01 μfd., 400 volt paper
2.38	.01 μfd., 400 volt paper
2.39	550 μμfd., Mica
2.40	600 μμfd., Mica
2.41	1300 μμfd., Mica
2.42	1700 μμfd., Mica
2.43	3900 μμfd., Mica
2.44	100 μμfd., Mica Padder
2.45	30 μμfd., Variable
2.46	.1 μfd., 400 volt paper
2.47	.01 μfd., 400 volt paper
2.48	┐
2.49	├ L.F. Sections of Tuning Condenser
2.50	┘
2.51	1 μfd. 200 volt paper

SWITCHES:

3.1	3 Position, 2 Pole, Stand-by Switch
3.2	S.P.S.T. Line Switch on Tone Control
3.3	S.P.S.T. Beat Oscillator Switch
3.4	S.P.S.T. AVC Switch on Manual Gain Control
3.5	5 Position, 1 Pole, Xtal Switch

INDUCTANCES

4.1	Filter Choke
4.2	B.O. Coil
4.3	Xtal Filter Coil

TRANSFORMERS

5.1	Power Transformer
5.2	Output Transformer
5.3	#3 I.F. Transformer
5.4	#2 I.F. Transformer
5.5	#1 I.F. Transformer

RME-41/43 PARTS LIST

Drawing: C-196
073041

RESISTORS

1.1	100,000 ohms, 1/3 watt
1.2	50,000 ohms, 1 watt
1.3	30,000 ohms, Variable
1.4	2,000 ohms, 1/3 watt
1.5	2,000 ohms, 1/3 watt
1.6	300 ohms, 1/3 watt
1.7	50,000 ohms, 1/3 watt
1.8	2,000 ohms, 1/3 watt
1.9	2,000 ohms, 1/3 watt
1.10	100,000 ohms, 1/3 watt
1.11	100,000 ohms, 1/3 watt
1.12	2,000 ohms, 1/3 watt
1.13	2,000 ohms, 1/3 watt
1.14	100,000 ohms, 1/3 watt
1.15	300 ohms, 1/3 watt
1.16	2,000 ohms, 1/3 watt
1.17	100,000 ohms, 1/3 watt
1.18	50,000 ohms, 1/3 watt
1.19	50,000 ohms, 1/3 watt
1.20	50,000 ohms, 1/3 watt
1.21	250,000 ohms, Variable

RESISTORS CONTINUED

1.22	250,000 ohm, 1/3 watt
1.23	1,000 ohm, 1/3 watt
1.24	1 Megohm, 1/3 watt
1.25	100,000 ohm, 1/3 watt
1.26	1 Megohm , Variable
1.27	250,000 ohm, 1/3 watt
1.28	240 ohm, 1 watt
1.29	35 ohm, 1/3 watt
1.30	20,000 ohm, 1/3 watt
1.31	1 Megohm, 1/3 watt
1.32	250,000 ohm, 1/3 watt
1.33	150 ohm, 1/3 watt
1.34	200 ohm, Variable
1.35	1,500 ohm, 1/3 watt
1.36	2,000 ohm, 1/3 watt
1.37	250,000 ohm, 1/3 watt
1.38	100,000 ohm, 1/3 watt
1.39	50,000 ohm, 1/3 watt
1.40	5,000 ohm, 1/3 watt
1.41	2,000 ohm, 1/3 watt

CONDENSERS

2.1	.1 μfd., 400 volt paper
2.2	R.F. Section Tuning Condenser
2.3	Det. Section Tuning Condenser
2.4	Osc. Section Tuning Condenser
2.5	.01 μfd., 400 volt paper
2.6	.01 μfd., 400 volt paper
2.7	.01 μfd., 400 volt paper
2.8	.01 μfd., 400 volt paper
2.9	.01 μfd., 400 volt paper
2.10	100 μμfd., Mica
2.11	.01 μfd., 400 volt paper
2.12	50 μμfd., Mica
2.13	50 μμfd., Mica
2.14	.01 μfd., 400 volt paper
2.15	.01 μfd., 400 volt paper
2.16	.01 μfd., 400 volt paper
2.17	.01 μfd., 400 volt paper
2.18	.01 μfd., 400 volt paper
2.19	.01 μfd., 400 volt paper
2.20	.01 μfd., 400 volt paper
2.21	250 μμfd., Mica
2.22	20 μfd., 25 v. electrolytic
2.23	20 μfd., 25 v. electrolytic
2.24	.1 μfd., 400 volt paper
2.25	1.0 μfd., 200 volt paper
2.26	.1 μfd., 400 volt paper
2.27	.1 μfd., 400 volt paper
2.28	100 μμfd., Mica

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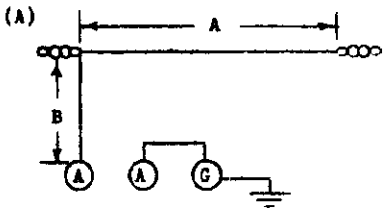
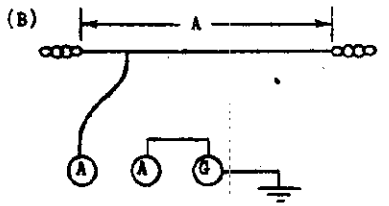
ALIGNING ADJUSTMENTS

(A)



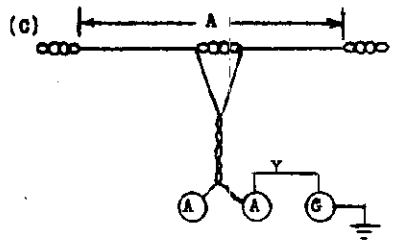
General Marconi connection. Optimum condition exists when A + B = $\frac{\lambda}{4}, \frac{3\lambda}{4}, \frac{5\lambda}{4}$, etc.

(B)



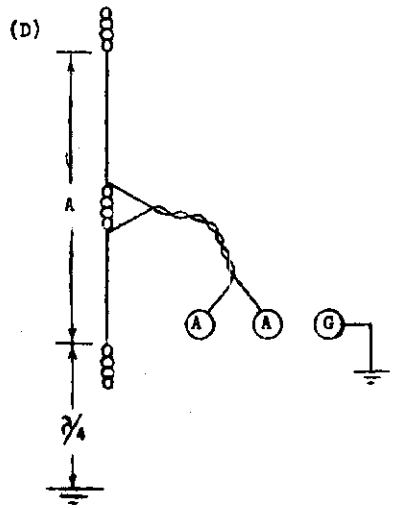
Optimum signal input to receiver when A = $\frac{\lambda}{2}$, and feeder is tapped at proper distance from center. This antenna works quite well usually on even harmonics also.

(C)



Optimum condition when A = $\frac{\lambda}{2}$. Not satisfactory for wide range frequency. Excellent for any amateur band if A = $\frac{\lambda}{2}$ is in the middle of the band. For example: For 20 meter band antenna should be designed for 14,200 KC. A = Approximately 33 feet, directionat at right angle from line of wire. Jumper "Y" can usually be omitted.

(D)

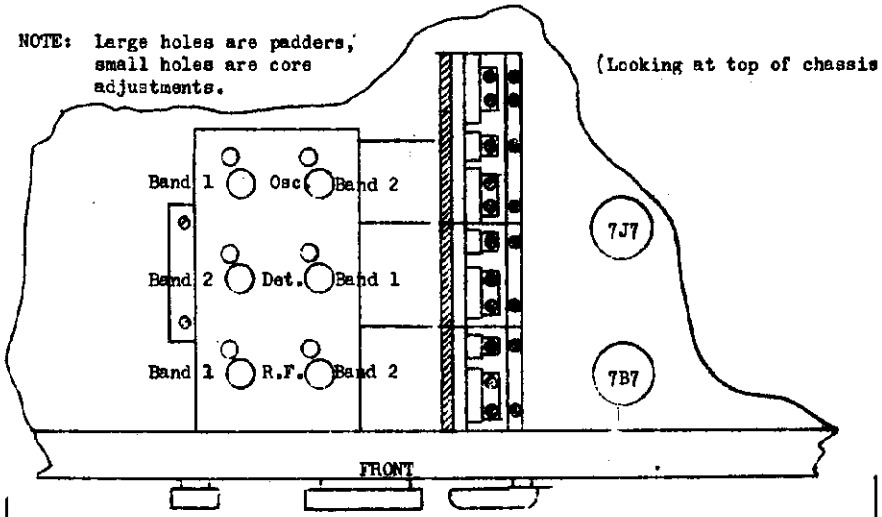


Dimensions same as those of C. Antenna good for one narrow band. (For example amateur band) Is not directional.

Low Frequency (Bands 1 and 2)

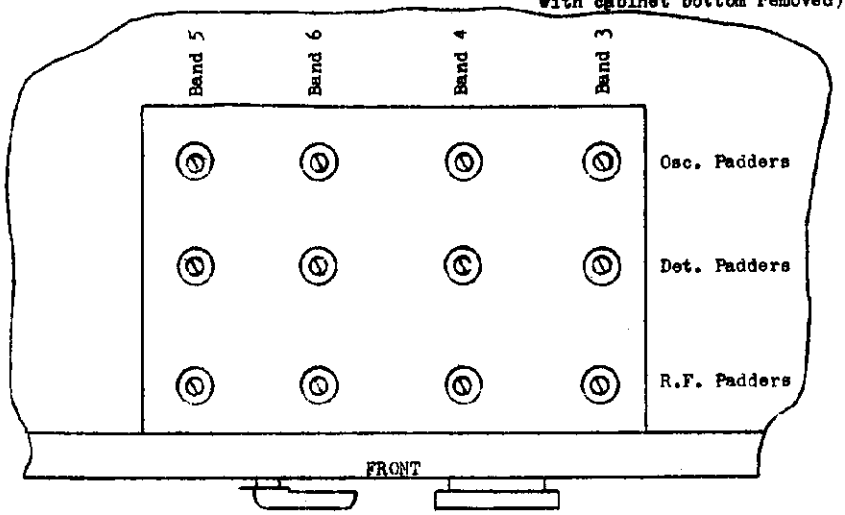
NOTE: Large holes are padders, small holes are core adjustments.

(Looking at top of chassis)



High Frequency (Bands 3,4,5 and 6)

(Looking at bottom of set with cabinet bottom removed)



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MODEL 41-43

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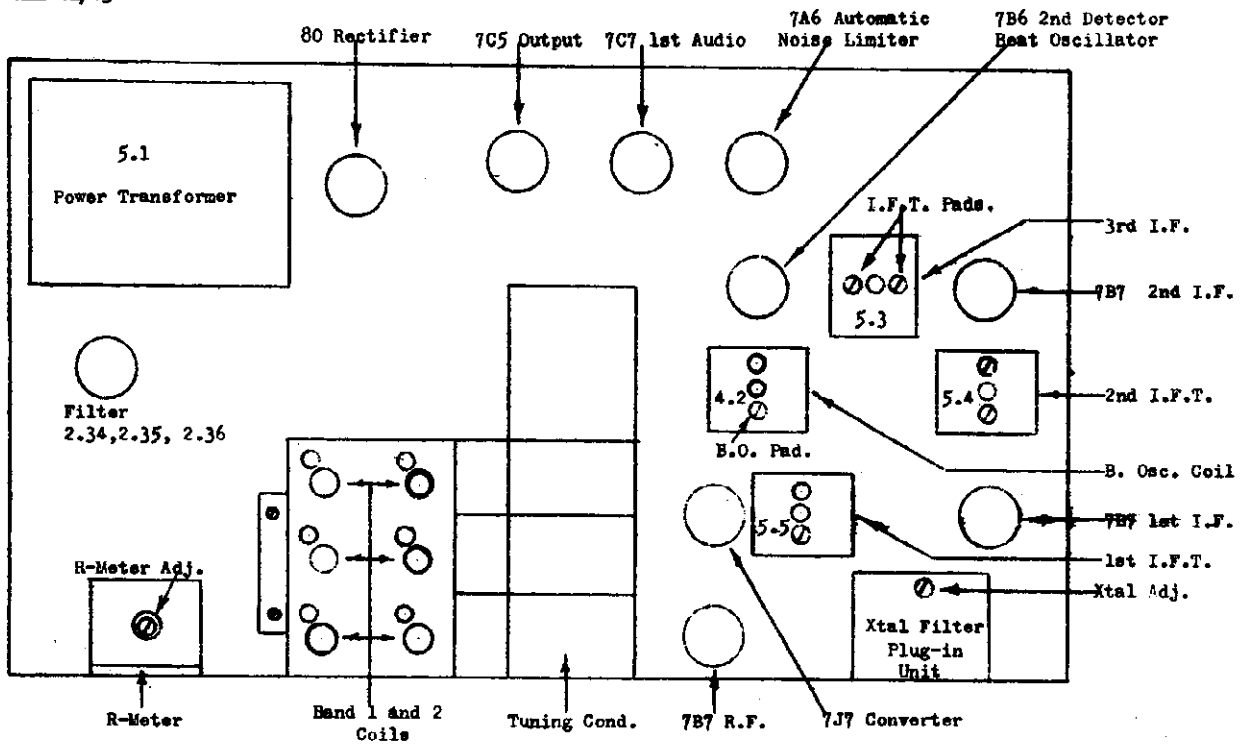
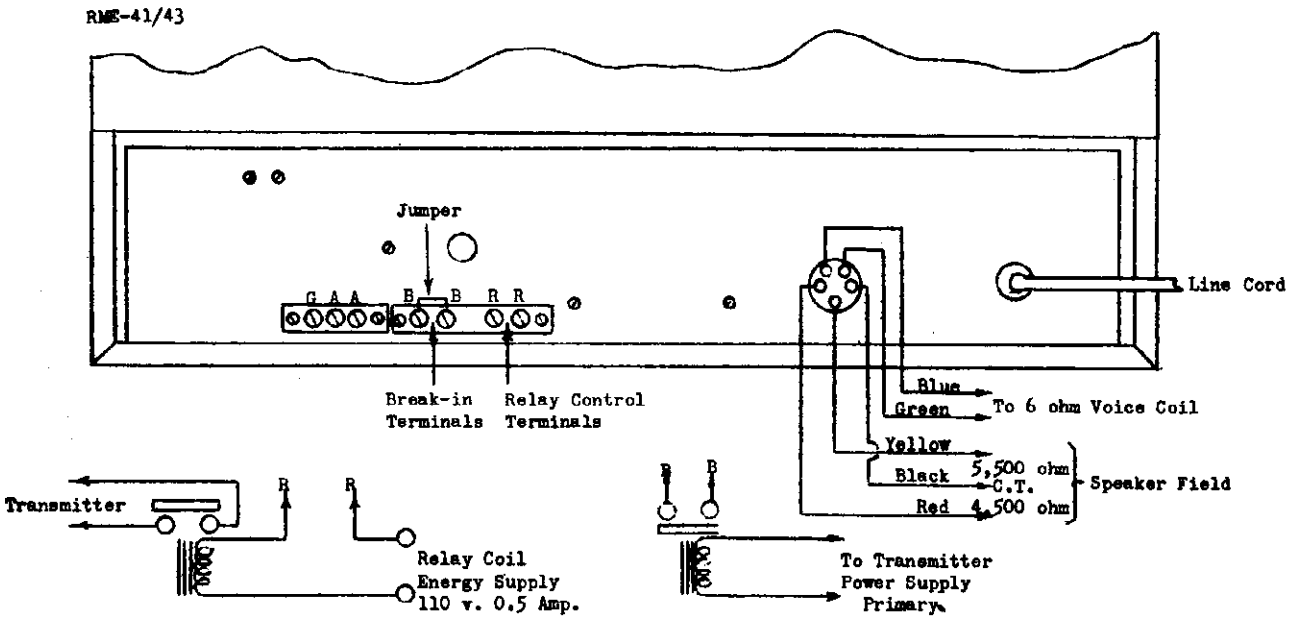
RME-41/43



RME-41/43



Relay to Control transmitter typical circuit diagram for connecting of relay control. Connect to terminal pair marked "R" on receiver. Relay closes when Stand-by Switch is turned to "Trans".

Typical circuit for remote break-in control of receiver. Terminal pair marked "B" on receiver connect to "B - B". Circuit between "B" pair is closed when relay or remote switch is closed during transmitter stand-by periods. Break-in terminals must be shorted if above circuit is not used.

PLACE TEST PRODS BETWEEN	CORRECT VOLTAGE
80 Rectifier filament and ground	325 volts
B.O. plate supply and ground (B.O. turned on)	125 volts

These voltages are subject to a fluctuation of ±15% without indication of material difficulties.

CONTINUITY CHECKS

Receiver turned off. No jumper between "A" and "G" on antenna terminal strip.

PLACE TEST PRODS BETWEEN		RESISTANCE
A-1 and ground		Infinite
A-2 and ground		Infinite
"G" and ground		Short
RF amp. grid and ground		1.1 Megohms ±20%
Converter grid and ground	Band 1	3.5 ohms
	Band 2	1.5 ohms
	Band 3	.3 ohm
	Band 4	.2 ohm
	Band 5	.1 ohm
	Band 6	.1 ohm
First I.F. grid and ground		1.5 Megohms ±20%
Second I.F. grid and ground		1.5 Megohms ±20%
Oscillator grid and ground		50,000 ohms ±20%
B.O. grid and ground		100,000 ohms ±20%
7C7 grid and ground		250,000 ohms to 0 ohm as audio gain control is rotated.
7C5 grid and ground		250,000 ohms ±20%
Oscillator section of tuning condenser and ground.		Bands 1,2,3,4,5 Infinite Band 6 .1 ohm

SPECIFICATIONS

TUBES:	Type	Use
1.	7B7	R.F. Amplifier
2.	7J7	Converter
3.	7B7	1st I.F. Amplifier
4.	7B7	2nd I.F. Amplifier
5.	7B6	Detector and Beat Oscillator
6.	7C7	1st A.F. Amplifier
7.	7C5	Output Amplifier
8.	7A6	Automatic Noise Limiter
9.	80	Rectifier

I. F. Frequency: 455 Kilocycles
Power Consumption: At 115 volts, 90 watts
Audio Output: 3 Watts
Audio Frequency Response: 100 to 5,000 cycles per second ±2.5 db.
Cabinet Dimensions: Length 19 inches. Depth 10-1/2 inches. Height 10-1/4 inches.
Weight (Unpacked): 36 pounds
Voice Coil impedance: 6 ohms
Speaker Field Coil Resistance: 10,000 ohms
Tapped at: 4,500 ohms

High frequency beat is used on all bands. That is to say, that the oscillator is 455 KC higher in frequency than the signal received.

If sufficient input is used each signal can be received at two points, differing by 910 kilocycles. The other signal is the image or "low beat" signal. The higher frequency signal received, according to the receiver dial, is the proper one and the circuits should be aligned to it.

When using a signal generator or test oscillator to align the set a resistor of about 150 or 200 ohms should be inserted between the signal generator and the antenna connection. This will prevent misaligning of the RF stage caused by the connection of the low impedance of the signal generators output circuit across the receiver input.

CRYSTAL FILTER ADJUSTMENT

In order that the full capabilities of the crystal filter in the model 43 be realized the following procedure in tuning it is recommended:

> On the top of the crystal filter box is a trimmer (Figure 1). The easiest way to adjust this trimmer is to tune in a station in the broadcast band that is broadcasting music, preferably an orchestra. The XTAL SELECTIVITY switch should be turned to Position 5 and the signal tuned in accurately on the crystal. The XTAL PHASING control should be adjusted to give minimum background noise. The SELECTIVITY control is then turned to Position 1. The trimmer should then be carefully adjusted. As the trimmer is turned it will be found that the character of the music changes. The trimmer should be set to a point that sounds the most natural. If the adjustment is made carefully there will be a regular sharpening of the receiver as the SELECTIVITY switch is turned from "OFF" to Position 5.

****

TEST VOLTAGES OBTAINED AT VARIOUS POINTS IN RECEIVER CIRCUIT

Measurements made with a voltmeter having internal resistance of 1000 ohms per volt. Instruments with lower internal resistance may give entirely different readings.
NOTE: Line voltage should be 115 volts, Stand-by Switch on.

PLACE TEST PRODS BETWEEN	CORRECT VOLTAGE
Radio frequency amplifier plate and ground	290 volts
Radio frequency amplifier screen and ground	107.5 volts
Radio frequency amplifier cathode and ground	3 volts
Converter plate (pentode section) and ground	310 volts
Converter screen (pentode section) and ground	107.5 volts
Oscillator supply and ground	168 volts
First I.F. amplifier plate and ground	290 volts
First I.F. amplifier screen and ground	107.5 volts
First I.F. amplifier cathode and ground (The same voltages apply to the 2nd I.F. stage)	3 volts
7C7 plate and ground	43 volts
7C7 screen and ground	112.5 volts
7C7 cathode and ground	3.1 volts
7C5 plate and ground	290 volts
7C5 screen and ground	305 volts
7C5 cathode and ground	13.5 volts

OPERATION

Each control on the RME-41/43 receiver has a definite function and the operator should familiarize himself with their purpose and operation in order to obtain the best results.

The MAIN TUNING DIAL is somewhat novel in design. Continuous mechanical band spread is utilized. Mechanical band spread has been somewhat frowned upon in the past due to the difficulty of obtaining a mechanical arrangement free of backlash. This is accomplished in the 41/43 by using a preloaded gear train instead of the more conventional belt system. Illumination of the bandspread condenser lowers the loss in the RF circuits resulting in greater gain and greater stability.

The band spread scale makes 5 complete revolutions for 180° of main tuning pointer travel. As the main pointer reaches an amateur band these frequencies may be read off the band spread dial with greater accuracy. In addition to the amateur band calibrations an arbitrary calibration is also included. This scale is the outermost one on the bandspread dial. It is divided into 100 divisions. For any position of the main pointer this calibration may be read off by placing in front of the figure read, the figure indicated by the main tuning pointer. Thus when the main pointer is at the extreme left the arbitrary calibration will be read from 0 to 99. For the next revolution of the band spread scale the calibration will be read from 100 to 199, etc. Thus the arbitrary calibration will consist of 500 divisions for each range. As an example: 2 megacycles may also be read as 190 (or more accurately 189.8) on the arbitrary scale.

The BAND SELECTOR SWITCH selects the frequency range desired. The range of the receiver is divided into 6 bands. The range covered by each band is as follows:

Band I	.540	to	1.6	MC.	American Broadcast
Band II	1.6	to	2.9	MC.	Includes 160 M. Amateur Band
Band III	2.9	to	5.4	MC.	Includes 80 M. Amateur Band
Band IV	5.4	to	9.8	MC.	Includes 40 M. Amateur Band
Band V	9.8	to	18.0	MC.	Includes 20 M. Amateur Band
Band VI	18.0	to	33.0	MC.	Includes 10 M. Amateur Band

Actually these figures do not represent the full range of each band since there is considerable overlap between the end of one band and the start of the next.

The LINE TONE control turns the receiver on and off. As the control is turned clockwise the line switch will close. Continued turning of the knob controls the audio response.

The STAND-BY SWITCH on the extreme right end of the control panel is used to make the receiver inoperative without turning off the line switch. When the control is in the center at "on" the receiver will operate, when it turned to the right to "Stand-by" it will be dead. The third position labeled "Trans" also makes the receiver inoperative and, in addition, closes the relay circuit as mentioned previously.

The AUDIO GAIN control to the left of the stand-by switch is used to adjust the audio volume to the desired level.

Below the control panel is a toggle switch labeled B. O. SWITCH turning on the beat oscillator. The beat oscillator is indespensible in the reception of CW signals and is an aid in locating weak phone carriers.

The pitch of the beat frequency may be varied by means of the control labeled B. O. PITCH.

SERVICE NOTES FOR THE RME-41/43 RECEIVERS

If the owner has available an accurate signal generator he may, by following the steps outlined in succeeding paragraphs, realign and recalibrate his receiver. If a signal generator is not available he may take the receiver to a reputable service man to have the work done. In addition to the signal generator an insulated screw driver will be required and if the receiver is a Model 41 an output meter will be needed.

NOTE: If the receiver is a Model 43 the "R" meter makes an excellent resonance indicating device. All adjustments are made with the AVC on.

If the receiver is a Model 41 the output meter is used and is connected across the voice coil leads of the speaker. It may also be connected to a plug and inserted into the phone jack. When an output meter is used the AVC should be turned off by turning the RF GAIN control slightly to the left. The signal generator must be modulated.

I.F. ALIGNMENT

The I.F. frequency of the RME-41/43 is 455 Kc. The band switch should be turned to Band 1. The tuning dial should be turned to the low frequency end (.55 Mc). The hot lead from the signal generator is clipped to the lug on the detector section (middle) of the tuning condenser. With the signal generator set to 455 Kc., each padder on the 1st, 2nd and 3rd I.F. transformers (see Fig. 1) are carefully adjusted for maximum response as indicated on the meter.

NOTE: If the receiver is a Model 43 the frequency of the signal generator must be set accurately to that of the crystal. This is done in the following manner:

Turn the crystal selectivity switch to Position 5. Carefully adjust the signal generator frequency until the carrier meter rises sharply. The signal generator is now accurately on the crystal frequency. The crystal selectivity switch is turned to "OFF" and the three I.F. transformers are aligned as before.

BEAT OSCILLATOR ADJUSTMENT

With the signal generator connected as for aligning I.F. circuits, turn "B.O.SWITCH" on and set "B.O. PITCH" control pointer vertical. With an insulated screw driver adjust B.O. padder (See Fig. 1) until zero beat is obtained.

ALIGNMENT OF THE RADIO FREQUENCY SECTION

Alignment of the radio frequency section of the receiver will affect, principally, the calibration of the receiver. Within certain limits this, of course, will also affect the sensitivity. Small variations in frequency (up to 2%) will not materially reduce the sensitivity of thereceiver, although they will, of course, show up as variations in the calibration as indicated by the setting of the MAIN TUNING DIAL. Correction of any variation of calibration can be made by following the suggestions outlined in the following paragraphs.

Band 1 includes frequencies between 540 and 1600 Kc. For Band 1 there are two frequency adjustments for adjusting the dial to the proper calibration. The adjustments are made on the top of the chassis through the dust cover over the Band 1 and 2 coils. The proper holes for making the adjustments are indicated on the top sketch on Figure 3. There are 6 sets of large and small holes each. The two sets toward the rear of the chassis are the oscillator adjustments. The set toward the front are the RF stage adjustments; and the center set are for the detector. Under the large hole is a padder for adjusting the high frequency end of the scale. Under the small hole is a screw which moves the core in the coil and adjusts the low frequency end.

The next step is to choose a station or a signal of accurately known frequency on the low frequency end of the range (for example 600 Kc.) and set the main tuning scale to read this frequency. If the station is not tuned in which the scale indicates its frequency it may be brought in by adjusting the oscillator coil core. This may be done with a small screw driver through the small hole marked "BAND 1 OSC" on Figure 3. Another station or signal is now selected near the high frequency end of the range (for example 1400 Kc.). If this signal is not heard when the dial is accurately set to its frequency it may be brought in by adjusting the padder under the large hole marked "BAND 1 OSC" by means of an insulated trimmer tool. When this signal is accurately brought in as indicated by a maximum reading on the carrier meter one should go back to the low frequency test point and readjust it if it has changed. It may be necessary to go back and forth several times until both frequencies are accurately calibrated.

The accuracy of most service signal generators is not very great, especially on the higher frequencies. The owner of an RME-41/43 should hesitate in using one to calibrate his receiver unless he is sure that it is accurately calibrated.

The procedure in calibrating and aligning Band 2 is the same for Band 1. On this band two frequencies, such as 1800 and 2800 KC, may be used. For the low frequency point the band spread dial should be set accurately to 1800 KC for calibration.

The four high frequency bands are calibrated and aligned by removing the bottom plate from the receiver. The screws holding the four rubber feet and the four small screws between them are removed. This allows the bottom plate to be removed. It will be found that an aluminum plate covers the coils. This plate has holes over the 12 padders and all adjustments should be made with this plate in position.

Since the industance of the coils are accurately adjusted and set at the factory it is necessary only to calibrate one frequency on each band. The same applies to the alignment of the RF and detector padders. This calibration and alignment should preferably be made at a point which is on the calibrated band spread scale. Suggested calibration points for each band are as follows:

Band 3	4 MC.
Band 4	7 MC.
Band 5	14 MC.
Band 6	30 MC.

From the bottom sketch on Figure 3 the location of each of the 3 padders for each band may be readily located. Note in particular the location of Band 5 and 6 padders. Adjustments should be made with insulated screw driver type of trimmer tool.

The beat oscillator may be used either with or without the automatic volume control (AVC). It is usually more satisfactory to receive CW signals with the AVC off. This may be accomplished by turning the control labeled "R.F.GAIN" slightly to the left. Continued rotation of this control varies the gain of the receiver manually.

Below the control panel on the left is a jack marked "PHONES". Any pair of good headphones may be plugged into this jack for headphone reception. When the phones are plugged in the speaker is automatically cut out.

The CARRIER LEVEL METER is supplied only with the model 43. It may also be purchased separately for installation in the Model 41. This meter indicates the average value of the carrier being received. The meter is calibrated in db as well as in conventional numbers. As in previous RME models a signal difference of 1-R is equivalent to 6 db., and R-9 is equivalent to 200 microvolts input to the receiver. A signal is always tuned so as to give a maximum reading on the meter. The meter should be adjusted to zero with the antenna disconnected by means of the screw on the bracket behind the meter.

The CRYSTAL FILTER, also supplied with the 43 only, has two controls. The top control, marked "XTAL SELECTIVITY", makes it possible to select the desired amount of selectivity for best results. Turning the control to "OFF" removes the crystal from the circuit. Rotating the control to the right changes the selectivity from a broad crystal characteristic at "1" suitable for phone reception to a razor-sharp characteristic at "5" for CW reception.

The CRYSTAL PHASING control should be adjusted to give minimum background noise. This setting will depend somewhat on particular conditions. This control may also be used to wipe out an interfering signal. Expert manipulation of the crystal filter usually comes only after a certain amount of practice.

The AUTOMATIC NOISE LIMITER is always in the circuit on the 41 and 43. No adjustment is required. The circuit is of a type that automatically adjusts itself to maximum effectiveness.

INSTRUCTIONS FOR INSTALLATION AND OPERATION OF THE RME-41/43 RECEIVERS

The RME-43 is a 9 tube superheterodyne communication type receiver. This receiver incorporates several revolutionary features, notably the tuning arrangement which provides accurate calibration on all amateur bands and a continuous arbitrary calibration of 500 divisions on each range. The 43 is supplied complete with a variable selectivity type crystal filter and a calibrated carrier level meter. The crystal filter and meter are both plugged in so that the receiver may be purchased without them and added later. The two units may be installed in a few minutes. The only tool required is a screw driver. No soldering is necessary and the receiver need not be removed from the cabinet. A receiver purchased without these two features is designated as a model RME-41.

ANTENNA

The terminals on the rear apron (Figure 2) marked "A-A-G" are for the antenna connection. When the receiver leaves the factory there is a jumper between one of the "A" posts and the "G" post. Good results may be obtained by connecting a wire 50 to 75 feet long to the other "A" post. If a 2 wire feeder system is used the jumper is removed and the two feeders are connected to "A" and "A". A sketch (Figure 4) of several suggested antennas is included in this booklet. A ground may be connected to the "G" post if it improves reception.

RELAY AND BREAK-IN TERMINALS

On the rear apron are 2 sets of contacts marked "R" and "B" (See Fig. 2). The pair marked "B" are in series with the plate supply. This pair must always be shorted when the receiver is being used, either by a relay, as suggested in Fig. 3, or by a jumper if the remote control feature is not used. This jumper is in place when the set leaves the factory.

The pair marked "R" are relay control terminals. This pair is shorted when the receiver stand-by switch is turned to "Trans". It may be used to control an external relay in conjunction with a suitable external voltage.

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FIG-1

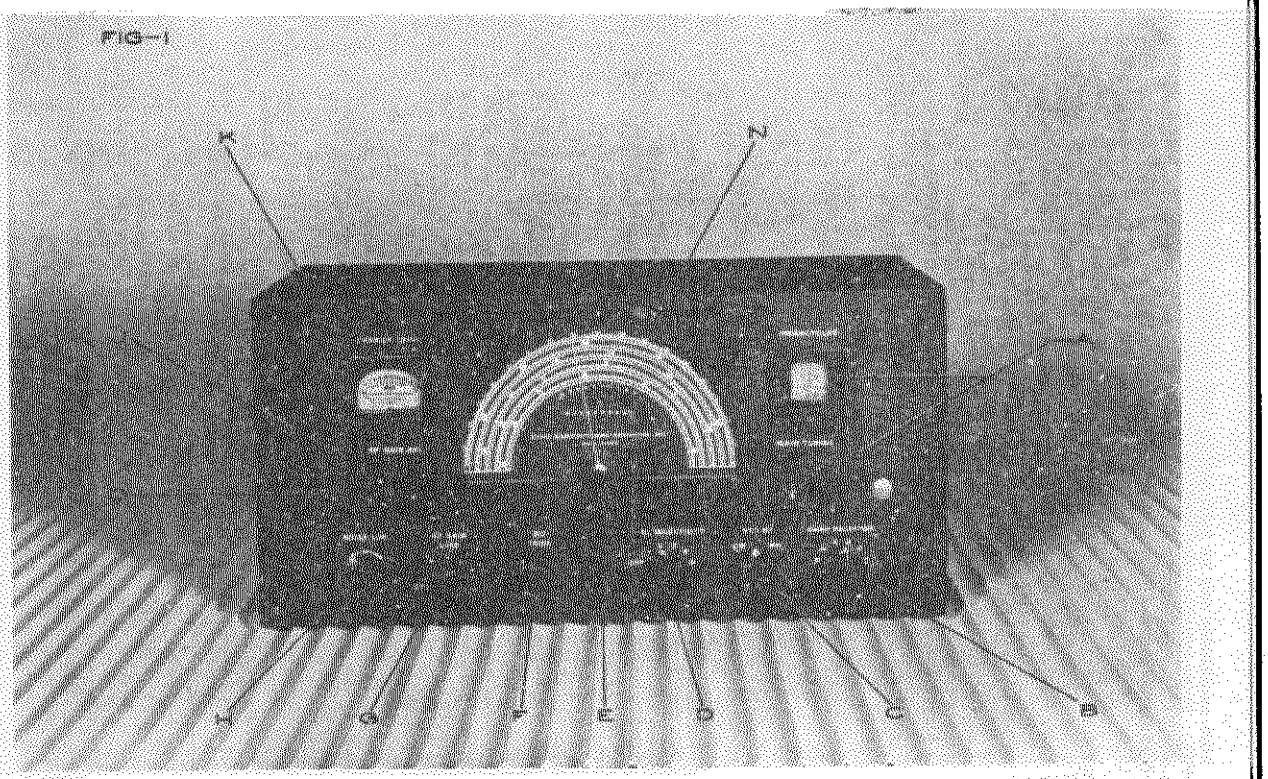
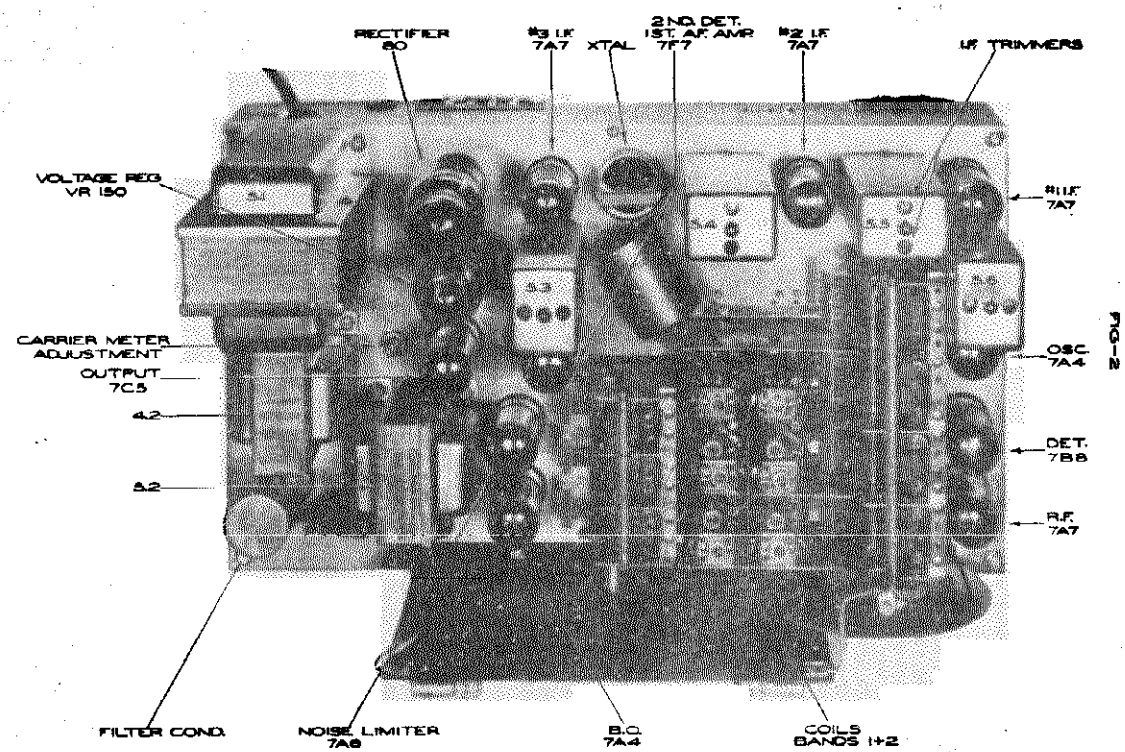


Fig. 1 — Front View

Late Model 99 same as Early Model 99 in Vol. XII except that 7A7 tubes were replaced by 7B7 tubes. For Early Schematic, see RME pgs. 12-13.



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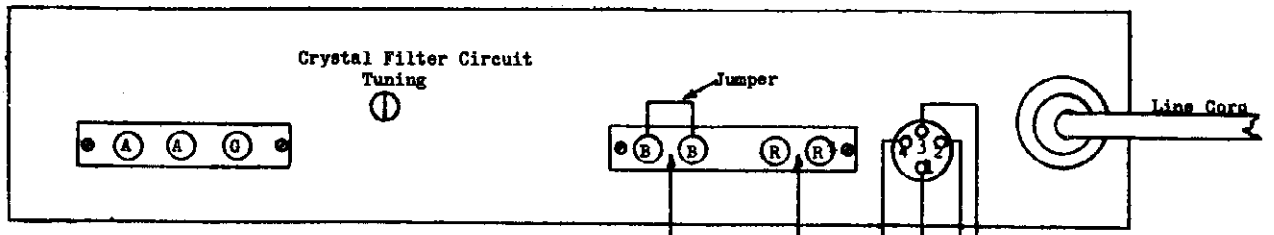
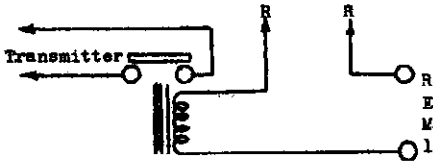
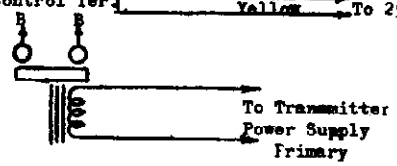
MODEL RME-99, Late



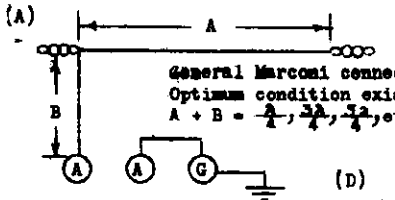


Relay to Control Transmitter. Typical Circuit diagram for connecting of relay control. Connect to terminal pair marked "R" on receiver. Relay closes when receiver is on stand-by.

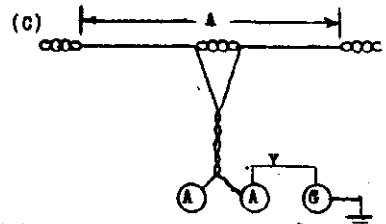
For other data see Volume XII



Typical circuit for remote break-in control of receiver. Terminal pair marked "B" on receiver connect to "B - B". Circuit between "B" pair closed when relay or remote switch is closed during transmitter stand-by periods. Break-in terminal must be shorted if above circuit is not used.

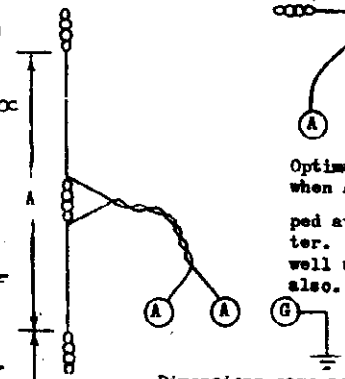


General Marconi connection. Optimum condition exists when A + B = $\frac{\lambda}{4}, \frac{3\lambda}{4}, \frac{5\lambda}{4}$, etc.

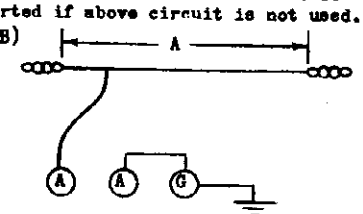


Optimum condition when A = $\frac{\lambda}{2}$.

Not satisfactory for wide range frequency. Excellent for any amateur band if A = $\frac{\lambda}{2}$ is in the middle of the band. For example: For 20 meter band antenna should be designed for 14,200 KC. A = Approximately 33 feet, directional at right angle from line of wire. Jumper "Y" can usually be omitted



Dimensions same as those of C. Antenna good for one narrow band. (For example amateur band) Is not directional.



Optimum signal input to receiver when A = $\frac{\lambda}{2}$, and feeder is tapped at proper distance from center. This antenna works quite well usually on even harmonics also.

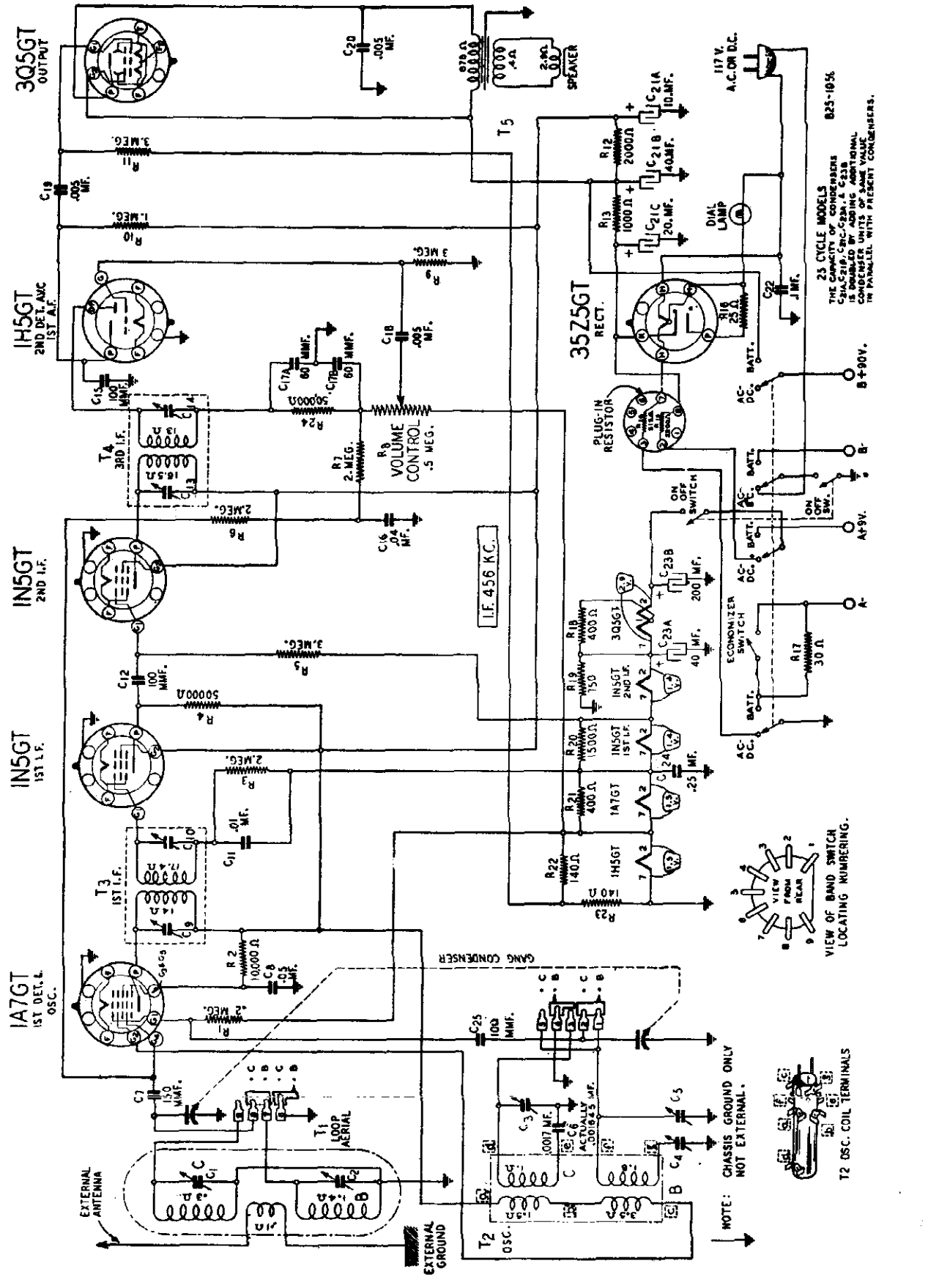
Late Model RME99 is the same as the Early model (see Rider's Vol.XII) except that 7A7 tubes were replaced by 7B7 tubes.

TEST VOLTAGES OBTAINED AT VARIOUS POINTS IN RECEIVER CIRCUIT

Measurements made with voltmeter having internal resistance of 1000 ohms per volt. Instruments with other internal resistances give entirely different readings.
NOTE: Line voltage should be 115 volts, Stand-by Switch on.

PLACE TEST PROBS BETWEEN	CORRECT VOLTAGE
Radio frequency amplifier plate and ground	225 volts
Radio frequency amplifier screen and ground	130 volts
Radio frequency amplifier cathode and ground	3.5 volts
First detector plate and ground	2.45 volts
First detector cathode and ground	4.2 volts
First I.F. amplifier plate and ground	225 volts
First I.F. amplifier screen and ground	130 volts
First I.F. amplifier cathode and ground	3.5 volts
The same voltages apply to the 2nd and 3rd I.F. Amplifier stages)	
First detector screen and ground	45 volts
First audio amplifier plate and ground	130 volts
First audio amplifier cathode and ground	1.75 volts
7C5 plate and ground	195 volts
7C5 screen and ground	210 volts
7C5 cathode and ground	10 volts
80 rectifier filament and ground	310 volts

SEA PAL RADIO CO.



MODEL Marine Portable

SEA PAL RADIO CO.

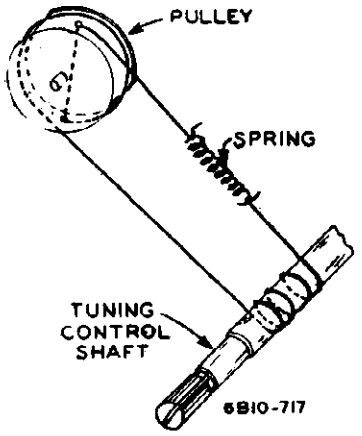
ALIGNMENT PROCEDURE

Volume Control—Maximum 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 equipment in column at right 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., 100 mmf., and 400 ohms.

	SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
Remove chassis. Do not disconnect loop leads.						
I.F.	456 KC	Top Grid 1A7GT 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	3rd I.F. (C13) & (C14) 1st I.F. (C9) & (C10)
RANGE B	1610 KC	Same as Above	.1 mf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C5)
RANGE C	6700 KC	Same as Above	.1 mf.	C Range	Turn Rotor to Full Open	Oscillator Range C (C3)
Replace chassis in cabinet. Close cabinet back.						
LOOP RANGE C	6000 KC	External Ant. Clip	400 Ohm	C Range	Turn Rotor to Max. Output	Ant. Range C (C1)
LOOP RANGE B	1400 KC	External Ant. Clip	100 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC See Note	Ant. Range B (C2)

NOTE—If the pointer is not at 1400 KC set it at the 1400 KC mark on the dial scale.

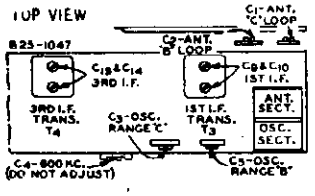


GANG CONDENSER IN CLOSED POSITION

SPECIFICATIONS

Input Voltages and Currents—Battery Operation
"A" Battery .....9 Volts—50 Ma.
"B" Battery .....90 Volts—11.5 Ma.
Power Consumption
(At 117 volts AC Supply).....28 Watts
Power Output
Battery Operation - 150 Mw. Undistorted
350 Mw. Maximum
AC Operation - - 200 Mw. Undistorted
400 Mw. Maximum

Selectivity - 50 KC Broad at 1000 Times Signal
Intermediate Frequency - - - - - - 456 KC
Speaker - - - - - - - - 6" P.M. Dynamic
Tuning Frequency Range
B Range - - - - - - 535 to 1610 KC
C Range - - - - - - 2.1 to 6.7 MC
Sensitivity—External Antenna—(For .05 Watt output)
B Range - - - 20 Microvolts Average
C Range - - - 20 Microvolts Average



REPLACEMENT PARTS LIST

CONDENSERS

17A123	C1	1-12 mmf.	Loop "C" Range Trimmer	$0.15	
17A123	C2	1-12 mmf.	Loop "B" Range Trimmer	.15	
17A115	C3	2.5-35 mmf.	Oscillator "C" Range Trimmer	.15	
17A168	C4	411-505 mmf.	600 K.C. Padder	.30	
17A115	C5	2.5-35 mmf.	Oscillator "B" Range Trimmer	.15	
46X281	C6	1700 mmf.	180 V. Polystyrene	.20	
47X142	C7	150 mmf.	Molded	.10	
B66503	C8	.05 mf.	200 V. Tubular	.10	
17A165	(C9 (C10	50-120 mmf.) 50-120 mmf.)	1st I.F. Trimmer	.30	
B66103	C11	.01 mf.	200 V. Tubular	.10	
47X57	C12,C15,C25	100 mmf.	Molded	.10	
17A167	(C13 (C14	50-120 mmf.) 85-185 mmf.)	3rd I.F. Trimmer	.30	
B66403	C16	.04 mf.	200 V. Tubular	.10	
47X172	(C17A (C17B	60 mmf.) 60 mmf.)	Dual Mica	.15	
B66502	C18,C19	.005 mf.	200 V. Tubular	.10	
D66502	C20	.005 mf.	400 V. Tubular	.10	
45X297	(C21A (C21B (C21C	10 mf. 40 mf. 20 mf.	150 V.) 150 V.) 150 V.) Dry Electrolytic	.70	
D66104	C22	.10 mf.	400 V. Tubular	.15	
45X301	(C23A (C23B	40 mf. 200 mf.	35 V.) Dry 35 V.) Electrolytic	.80	
B66254	C24	.25 mf.	200 V. Tubular	.15	
14A159	2 Section Gang Condenser			2.60	

RESISTORS

B95204	R1	200,000 Ohm	0.5 W. Carbon	$0.10

DIAL AND DRIVE ASSEMBLY

26A339	Dial Mounting Plate Assembly complete with Drive Cord Pulley and Bracket, less Dial Scale, Pointer for Dial Scale and Celluloid Crystal				$0.85
17X86	Celluloid Crystal				.20
58X550	Dial Scale				.65
15X197	Pointer for Dial Scale				.10
28X56	Snap Buttons (To hold Dial Scale and Celluloid Crystal to Dial Mounting Plate) Doz.				.10
	Drive Cord (12 Lb. Test)				.20
104X650	Escutcheon for Dial				1.05
7A115	Dial Lamp Socket and Cable Assembly				.20
7A32	Dial Lamp (No. 51)				.15
B95103	R2	10,000 Ohm	0.5 W.	Carbon	.10
B95205	R3,R6,R7	2.0 Megohm	0.5 W.	Carbon	.10
B95503	R4	50,000 Ohm	0.5 W.	Carbon	.10
B95305	R5,R9,R11	3.0 Megohm	0.5 W.	Carbon	.10
36X289	R8	0.5 Megohm	Volume Control and On-Off Switch		.75
B95105	R10	1.0 Megohm	0.5 W.	Carbon	.10
B95202	R12	2000 Ohm	0.5 W.	Carbon	.10
B95102	R13	1000 Ohm	0.5 W.	Carbon	.10
43X106	(R14 (R15	515 Ohm 2200 Ohm	12 W.) 5 W.)	Plug-In Resistor	.55
B95250	R16	25 Ohm	0.5 W.	Carbon	.10
B94300	R17	30 Ohm	0.5 W.	Carbon	.15
B94401	R18,R21	400 Ohm	0.5 W.	Carbon	.15
B94751	R19	750 Ohm	0.5 W.	Carbon	.15
B94152	R20	1500 Ohm	0.5 W.	Carbon	.15
B94141	R22,R23	140 Ohm	0.5 W.	Carbon	.15
B95503	R24	50,000 Ohm	0.5 W.	Carbon	.10

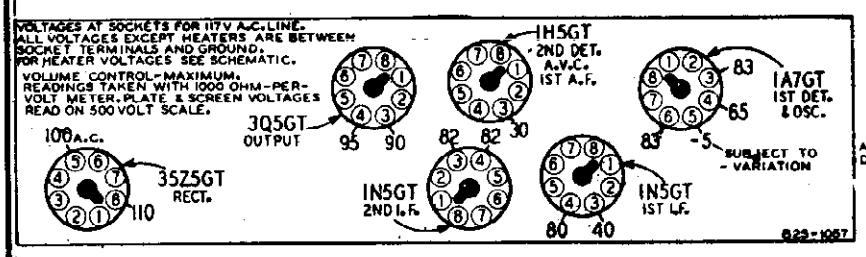
NOTICE: There is a chassis number label on the chassis. The chassis number identifies the radio as to chassis, dial, and issue letter. When ordering parts or writing, be sure to mention the chassis number.

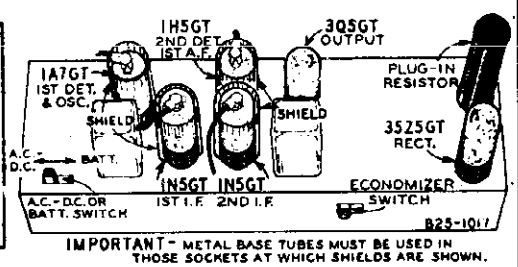
MISCELLANEOUS

Part No.	Description	List Price
12A358	6" P.M. Dynamic Speaker complete with Output Transformer	$6.10
	Cone and Voice Coil Assembly (Specify part number and letters stamped on Speaker)	1.20
	Output Transformer (Specify part number and letters stamped on Speaker)	1.50
14X301	Speaker Grille	1.45
3A303	Tube or Resistor Socket—Octal (8 prong)	.10
32X174	Tube Shield	.10
30X44	Grid Clips .....Doz.	.10
10A418	Knob (Tuning or Volume Control)	.10
10A421	Knob (Band Switch)	.10
2A217	AC-DC—Battery Switch	.50
2A175	Economizer Switch	.15
2A215	Band Change Switch	.60
13X328	Line Cord and Plug Assembly	.40
13X444	"A" Battery Cable and Plug Assembly	.30
13X445	"B" Battery Cable and Plug Assembly	.35
28X265	Phosphor Bronze Ground Plate (Under 3rd I.F. Can)	.10

TRANSFORMERS AND COILS

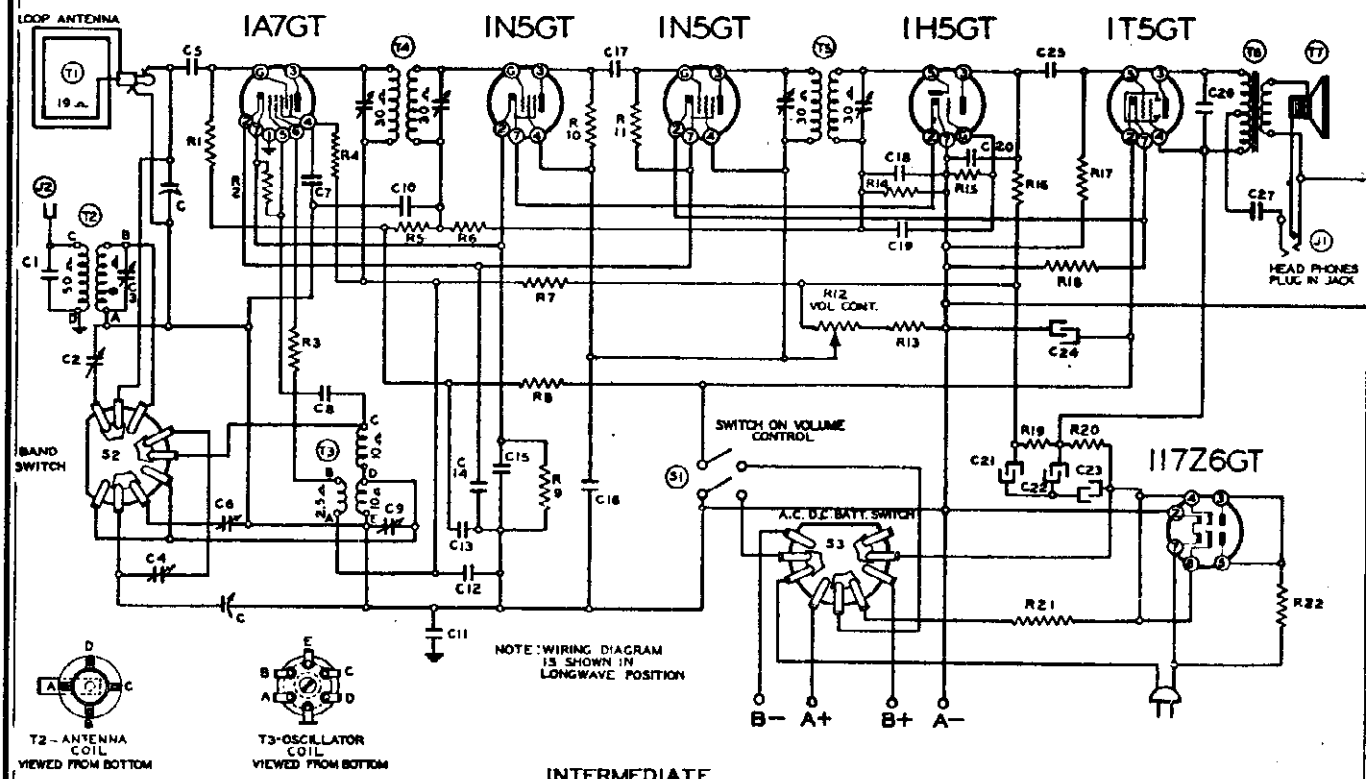
.159A1511	T1	Loop Aerial Assembly less Trimmer Condensers	$2.00
.159A1513	T2	Oscillator Coil Assembly	1.20
.109A1514	T3	1st I.F. Transformer and Can Assembly	1.30
9A1515	T4	3rd I.F. Transformer and Can Assembly	1.30
	T5	Output Transformer (See "Miscellaneous")	





IMPORTANT - METAL BASE TUBES MUST BE USED IN THOSE SOCKETS AT WHICH SHIELDS ARE SHOWN.

SEA PAL RADIO CO.



INTERMEDIATE FREQUENCY 455 K.C.

Code No.	Part No.	Description
		RESISTORS
R1	1304	3 megohm—½ w.
R2	1309	200M ohm—⅓ w.
R3	13022	5M ohm—½ w.
R4	1307	40M ohm—½ w.
R5	13038	8 megohm—½ w.
R6	1304	3 megohm—½ w.
R7	13017	10M ohm—½ w.
R8	130257	5 megohm—½ w.
R9	130222	350 ohm—½ w.
R10	130176	20M ohm—¼ w.
R11	13068	1 megohm—½ w.
R12	101256	1 megohm—volume control
R13	13020	100M ohm—½ w.
R14	13068	1 megohm—½ w.
R15	130257	5 megohm—½ w.
R16	13068	1 megohm—½ w.
R17	13038	2 megohm—½ w.
R18	130192	2M ohm—½ w.
R19	130192	2M ohm—½ w.
R20	130192	2M ohm—½ w.
R21	10666	2500 ohm—6 w.
R22	130215	25 ohm—½ w.

PARTS

T1	111243	Loop antenna in cover
T2	111242	Antenna coil
T3	110180	Oscillator coil
T4	108174B	Input I. F. 455 kc. coil
T5	108175B	Output I.F. 455 kc. coil
T6	105129	Output transformer
T7	114244	5" PM speaker
S1		Switch on volume control
S2	125158	Band switch
S3	125158	AC-DC battery switch
J1	121255	Head phones jack
J2	121322	Ant. jack

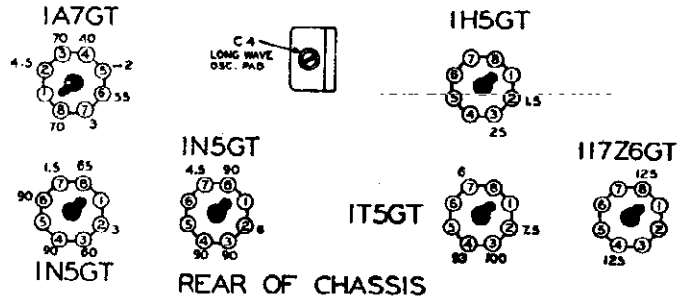
CONDENSERS

C	102144	2 gang variable condenser
C1	129177	.000045 ceramicon
C2	124168	Long wave (ant. trimmer)
C3	124168	B.C. (ant. trimmer)
C4	124167	Long wave pad
C5	12938	50 mmf. .00005 mica
C6	124128	Long wave (osc. trimmer)
C7	1006	.25 x 200
C8	12921	.0002 mica
C9	124128	B.C. (osc. trimmer)
C10	1009	.05 x 200
C11	10026	.20 mf. x 400
C12	100135	.25 mf. 200
C13	10026	.02 x 400 v.
C14	1006	.25 x 120
C15	10017	.5 x 120
C16	100135	.25 mf. 200
C17	12940	.0001 mica
C18	12912	.00025 mica
C19	10047	.002 x 600
C20	1295	.0001 mica
C21	119125	10 mfd. lytic—150 v.
C22	119125	20 mfd. lytic—150 v.
C23	119125	40 mfd. lytic—150 v.
C24	119125	200 mf. lytic—10 v.
C25	10011	.01 x 400
C26	10047	.002 x 600
C27	1006	.25 x 120

C2 and C3 are in same unit.
C6 and C9 are in same unit
C21, C22, C23, C24 are in same unit

BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH A HIGH RESISTANCE VOLTMETER BETWEEN SOCKET TERMINALS AND B—



DESCRIPTION:

TUBES—

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

The type and function of each tube is as follows:

1—Type 1A7GT Mixer, First Detector-oscillator.

2—Type 1N5GT Remote Cut-Off Pentode, 1st and 2nd I. F. Amplifiers.

1—Type 1H5GT Second Detector, A.V.C. 1st Audio.

1—Type 1TSGT Output Amplifier.

1—Type 117Z6GT Rectifier.

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect generator ground to B—.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- 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 Mfd., 50 Mmfd.

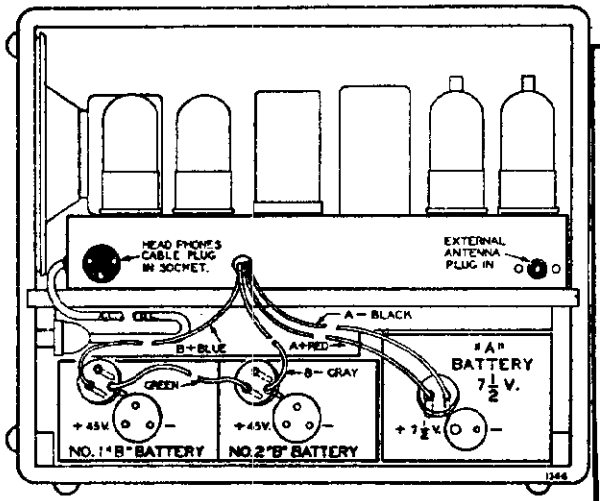
BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Grid of 1A7GT	Rotor full open (Plates out of mesh)	Four trimmers on top	Output and input I. F.	(See Note "A") Adjust to maximum output
BROADCAST BAND	1560 Kc.	.1 MFD.	Grid of 1A7GT	Rotor full open (Plates out of mesh)	Trimmer C9	Broadcast Oscillator	(See Note "A") Adjust to maximum output
(Band Switch in Broadcast Position)	1400 Kc.	50 MMFD.	Antenna and Ground Terminals	Set dial at 1400	Trimmer C3—Front section of gang	Broadcast Antenna	Adjust to maximum output
LONG WAVE BAND	410 Kc.	See Note B	Grid of 1A7GT	Set dial at 410 (Rotor plates full open)	Trimmer C6	Long Wave Oscillator	Adjust to maximum output
(Band Switch in Long Wave Position)	375 Kc.	See Note B	Std. Loop	Set dial at 375 Kc.	Trimmer C2—Rear Section of gang	Long Wave Antenna	(See Note "B") Adjust to maximum output
	225 Kc.	See Note B	Std. Loop	Set dial at 225 Kc.	Padder C4	Long Wave Oscillator Series Padder	(See Note "B") Adjust to maximum output

NOTE "A"—The loop may be connected to the radio when making these adjustments. The ground of the signal generator is connected to the B— and the other lead from the signal generator in series with the proper dummy to the grid of the 1A7GT tube.

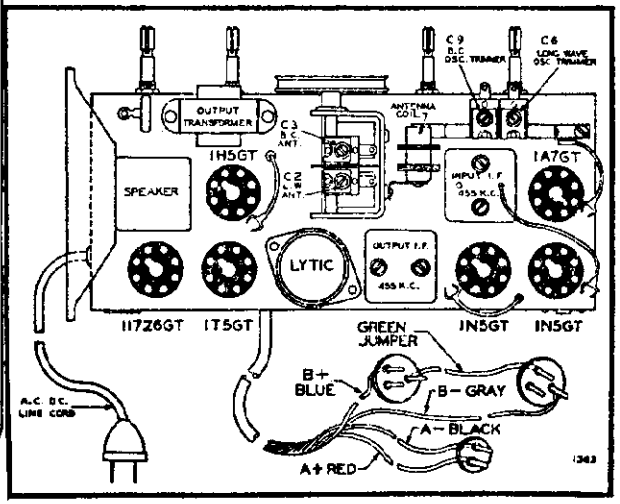
NOTE "B"—For aligning long wave band, connect a radiating loop consisting of 4 turns of wire 10" Dia. in series with .1 MFD. of condenser to terminals of signal generator. Place radiating loop 2 feet away from loop on receiver. The plane of both loop must be parallel.

FREQUENCY RANGES
535 to 1560 KC.
190 to 410 KC.

Power Consumption.....(On A.C. or D.C.) 35 Watts
Power Output.....140 Milliwatts Undistorted, 280 Milliwatts Maximum
Intermediate Frequency.....455 K.C.



View showing method of connecting batteries and the external antenna jack—An external antenna will give maximum reception on distant stations but should be disconnected for direction finding operation.



View Showing Tube Layout

In any radio compass there may be a deviation from a true reading due to the motor or other metal parts around the boat just as there is with a magnetic compass. The simplest method to determine the amount of deviation is to select a broadcast or beacon station which you can see from the ship—Point your ship directly at the station and then tune the loop to the "Null" point. If there is no error the loop pointer should point to the station straight ahead, parallel with a line from bow to stern. If there is a deviation the pointer will not point exactly straight ahead. You can either note how many degrees the variation is and allow for it in future readings or you can turn the radio case so the loop pointer points straight ahead. This will correct for the error and you won't need to make any future allowance.

Check for deviation on several stations and also with the boat turned 180 Degrees from the stations.

SEARS, ROEBUCK & CO.

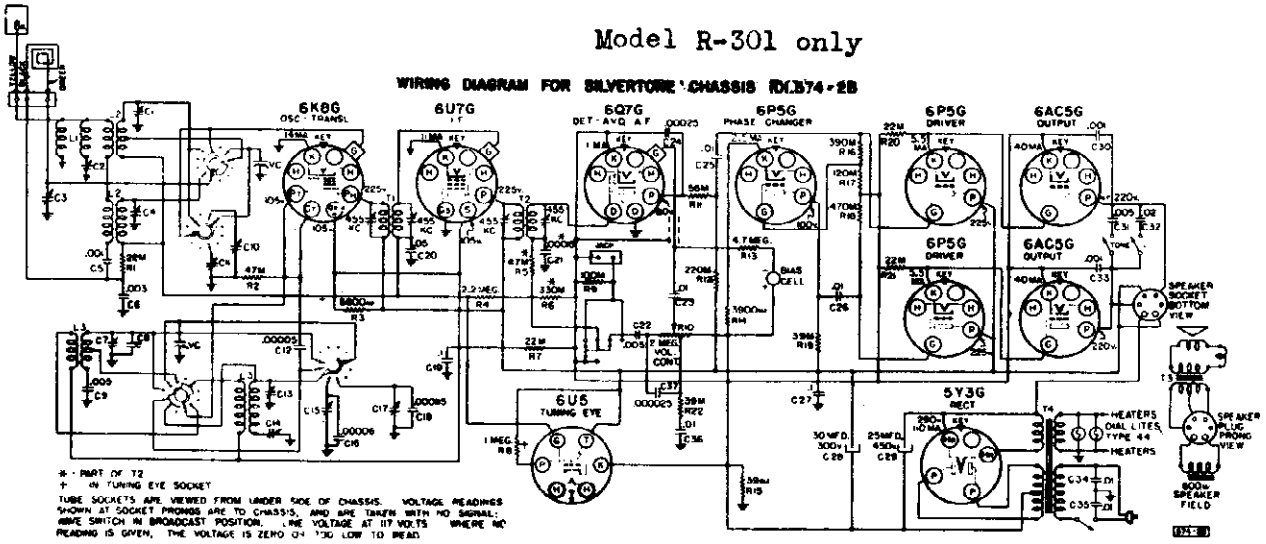
MODEL R301,Ch.101.574-2B
MODEL 701,Ch.101.574-1A

SUBJECT: ADDITION OF SUFFIX -1A AND -2B TO 101.574:

Chassis identified by 101.574-1A have been revised to include a built-in loop antenna. There are also differences in knobs, dial, escutcheon and other appearance items because of the difference in cabinets.

Chassis identified by 101.574-2B are similar to 101.574-1A except for changes in the circuit, affecting tone, and for appearance items changes.

Model R-301 only



ALIGNMENT PROCEDURE

Models R-301,701

PRELIMINARY:

Output meter connection . . . . . Across loudspeaker voice coil
Output meter reading to indicate 500 milliwatts . . . . . 1.6 volts
Approximate microvolts input for 500 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 clockwise
Position of Tone Control . . . . . Both buttons out
Position of Dial Pointer with variable fully closed . . . . . On first mark to left of 550 kc calibration mark

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"A"	Closed	455 kc	.1 mfd.	6K8G Grid	T2,T1	IF	--
"A"	600 kc	455 kc*	.0002 mfd.	Ant. Term.	C2*	Wave Trap	--
"A"	Fully open	1630 kc	.0002 mfd.	Ant. Term.	C13	Oscillator	--
"A"	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C3	Translator	410
"A"	600 kc(rock)	600 kc	.0002 mfd.	Ant. Term.	C14	Padder	150
"B"	2.4 mc	2.4 mc	400 ohms	Ant. Term.	C4	Translator	110
"C"	18 mc	18 mc	400 ohms	Ant. Term.	C7**	Oscillator	--
"C"	15 mc(rock)	15 mc	400 ohms	Ant. Term.	C1	Translator	30
"D"	9.55 mc	9.55 mc	400 ohms	Ant. Term.	C17**	Oscillator	--
"D"	9.55 mc(rock)	9.55 mc	400 ohms	Ant. Term.	C11	Translator	75
"E"	11.71 mc	11.71 mc	400 ohms	Ant. Term.	C15**	Oscillator	--
"E"	11.71 mc(rock)	11.71 mc	400 ohms	Ant. Term.	C10	Translator	55

IMPORTANT ALIGNMENT NOTES

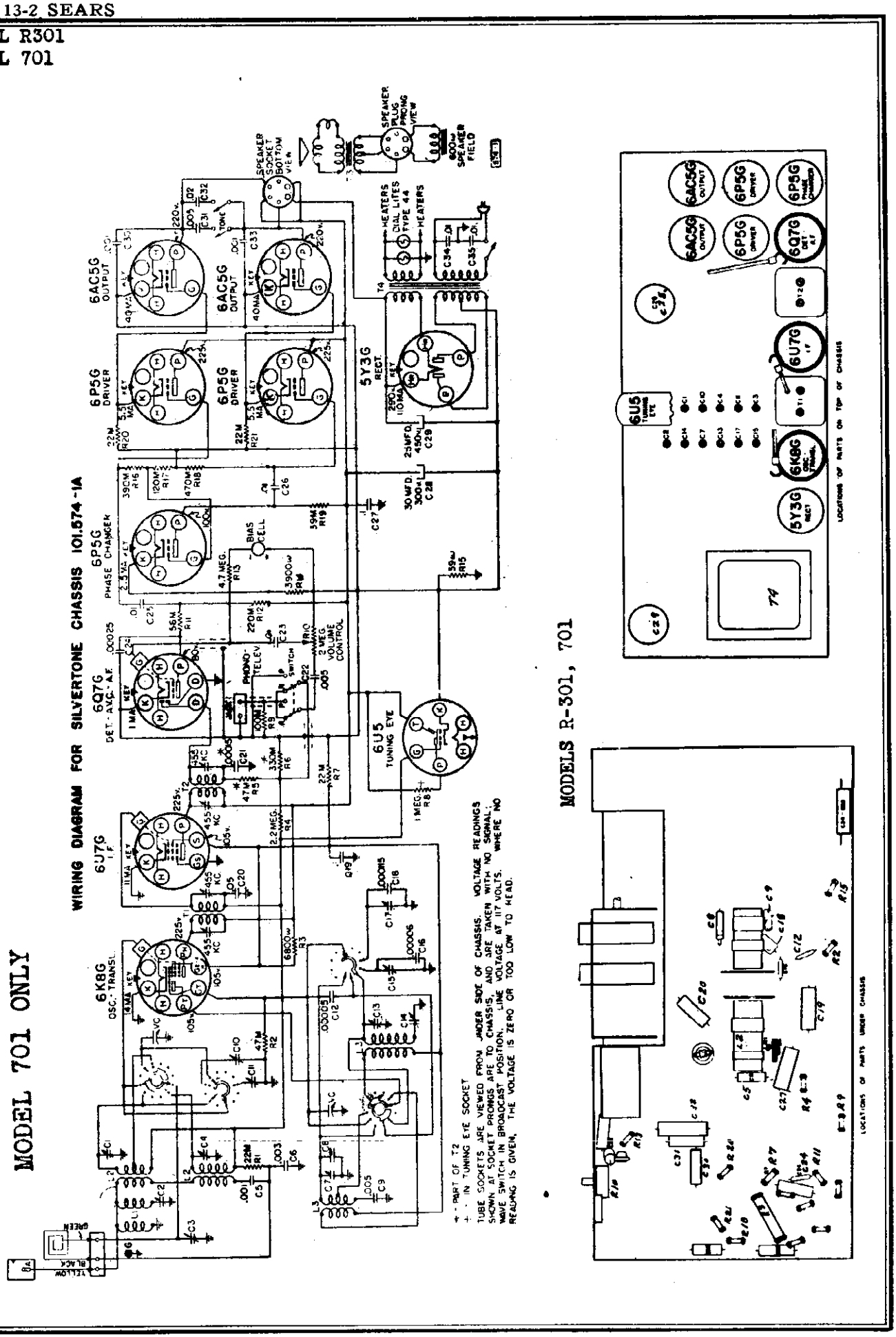
* The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 455 kc is known, the generator should be adjusted to the frequency of that station instead of to 455 kc.

** If two peaks can be had, the correct one is with the trimmer screw further out: the other peak is the image.

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

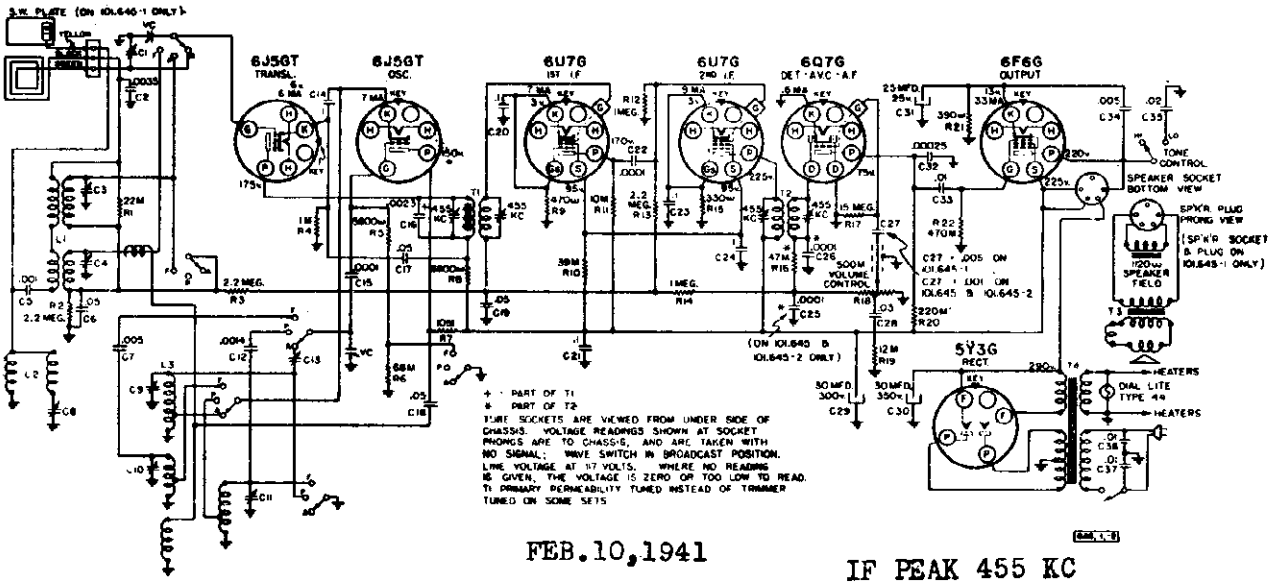
The alignment procedure should be repeated stage by stage, in the original order, for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.

MODEL R301
MODEL 701



MODEL 1771, Ch. 101.645
101.645-1, 101.645-2

SEARS, ROEBUCK & CO.



FEB. 10, 1941

IF PEAK 455 KC

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection . . . . . Across loudspeaker voice coil
Output meter reading to indicate 500 milliwatts . . . . . 1.6 volts
Approximate microvolts input to indicate 500 milliwatts 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
Connection of generator ground lead . . . . . External ground
Generator modulation . . . . . 30%, 400 cycles
Position of Volume Control . . . . . Fully clockwise
Position of Tone Control . . . . . HI
Position of Dial Pointer with variable fully closed . . . . . On mark to left of 540 kc calibration mark

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"AM"	Closed	455 kc	.1 mfd.	6K8G Grid	T2,T1	IF	--
"AM"	600 kc	455 kc	.00005 mfd.	Ant. Clip	C8*	Wave Trap	--
"AM"	Fully open	1620 kc	.00005 mfd.	Ant. Clip	C9	Oscillator	--
"AM"	1400 kc	1400 kc	.00005 mfd.	Ant. Clip	C1	Translator	200
"AM"	600 kc (rock)	600 kc	.00005 mfd.	Ant. Clip	C13	Padder	65
"POL"	6 mc	6 mc	400 ohms	Ant. Clip	C11	Oscillator	--
"POL"	5 mc	5 mc	400 ohms	Ant. Clip	C3	Translator	85
"FOR"	18 mc	18 mc	400 ohms	Ant. Clip	C10	Oscillator	--
"FOR"	15 mc (rock)	15 mc	400 ohms	Ant. Clip	C4	Translator	10

IMPORTANT ALIGNMENT NOTES

* The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 455 kc is known, the generator should be adjusted to the frequency of that station instead of to 455 kc.

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

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.

FREQUENCY RANGES:

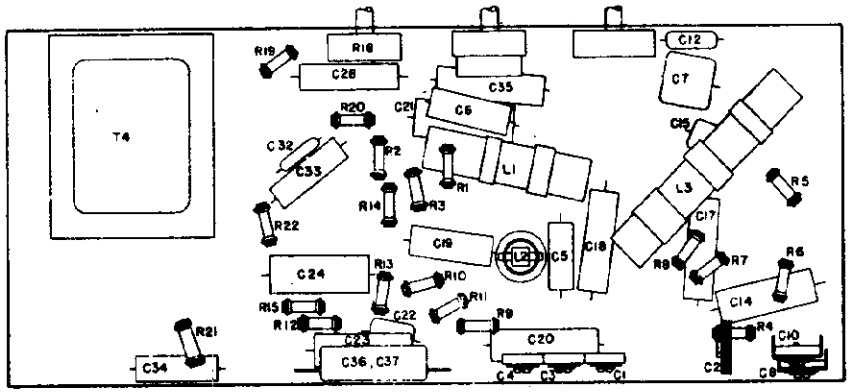
Band "AM"	540-1600 kc
Band "POL"	2-6 mc
Band "FOR"	6-18 mc

ALIGNMENT FREQUENCIES:

Oscillator Trimmer	Ant-Transl. Trimmer	Padder
1620 kc	1400 kc	600 kc
5 mc	5 mc	None
18 mc	15 mc	Fixed

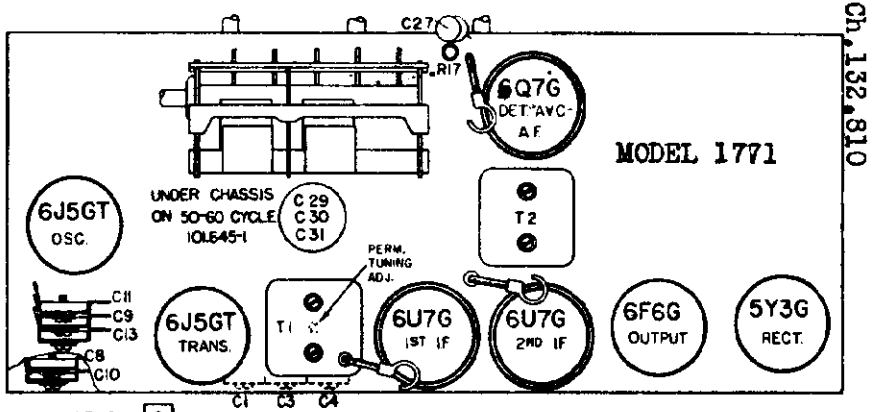
FOR ADDITIONAL DATA SEE INDEX.

MODEL 1771, Ch. 101.645, 101.645-1, 101.645-2
MODELS 3011, 3111, 3211 Ch. 132.810



LOCATIONS OF PARTS UNDER CHASSIS - 101.645,-1

MODEL 1771



YELLOW
BLACK
GREEN

LOCATIONS OF PARTS ON TOP OF CHASSIS 101.645,-1.

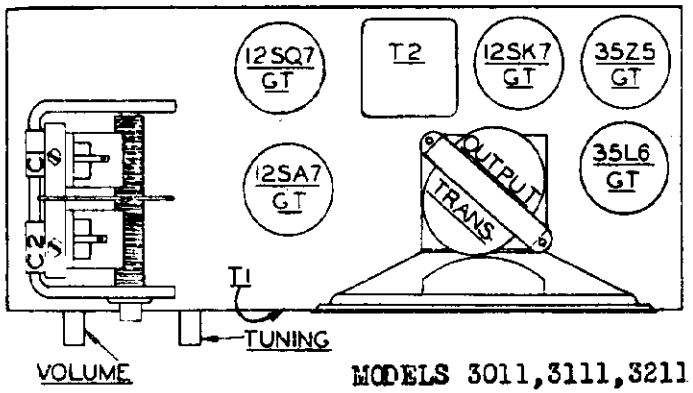
ALIGNMENT PROCEDURE

MODELS 3011, 3111, 3211

PRELIMINARY:

Output meter connection . . . . . Across loud speaker voice coil
Output meter reading to indicate 50 milliwatts . . . . . 0.38 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 . . . . . See chart below
Generator modulation . . . . . 30%, 400 cycles
Position of Volume Control . . . . . Fully clockwise
Position of Dial Pointer with variable fully closed . . . . . See note below

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION (high)	GENERATOR CONNECTION (low)	TRIMMERS ADJUSTED (in order shown)	TRIMMER FUNCTION
Open	455 kc	.1 mfd.	12SA7 grid	Var. cond. frame	T2, T1	IF
1400 kc	1400 kc	.00005 mfd.	Ant. clip	Ch. base	C2, C1	Translator
600 kc	600 kc	.00005 mfd.	Ant. clip	Ch. base	Check point	----



MODELS 3011, 3111, 3211

LOCATION OF PARTS ON TOP OF CHASSIS

TUBES AND FUNCTIONS:
12SA7GT . . . . Oscillator Translator
12SK7GT . . . . . IF
35Z5GT . . . Rectifier

POWER SUPPLY:
All models available . . . . . 105-125 volts, 50-60 cycle, AC-DC, 30 watts
12SQ7GT. . . . . Detector-AVC-AF
35L6GT . . . . . Output

ALIGNMENT FREQUENCIES: Osc. - 1400 kc.
Transl. - 1400 kc.

FREQUENCY RANGE . . . . 540 - 1750 kc.

IMPORTANT ALIGNMENT NOTES

With the variable condenser closed the pointer should be in a horizontal position matching the horizontal line across the face of the dial.

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.

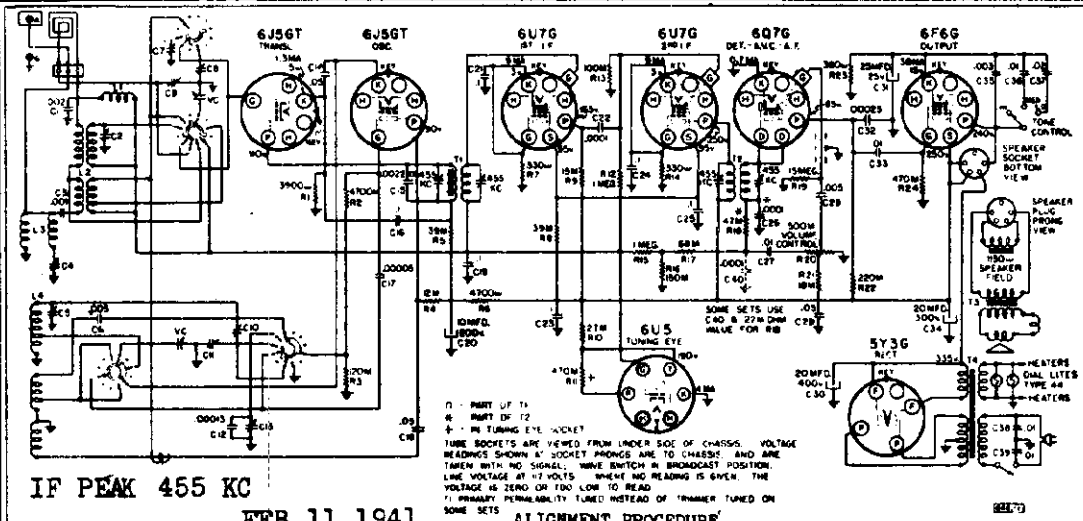
INTERMEDIATE FREQUENCY . . . . . 455 kc.

POWER OUTPUT:
Type . . . . . Beam Tube
Undistorted . .(.8 watts)
Maximum. . . .(1.6 watts)

LOUD SPEAKER:
Type. . . . . E.M.
Size . . . . . 4 inch

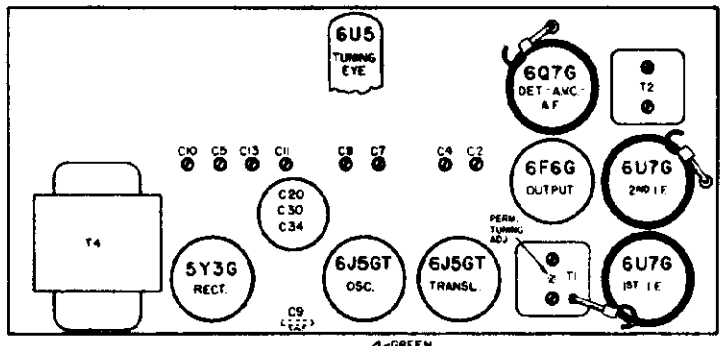
FOR ADDITIONAL DATA SEE INDEX.

SEARS, ROEBUCK & CO.

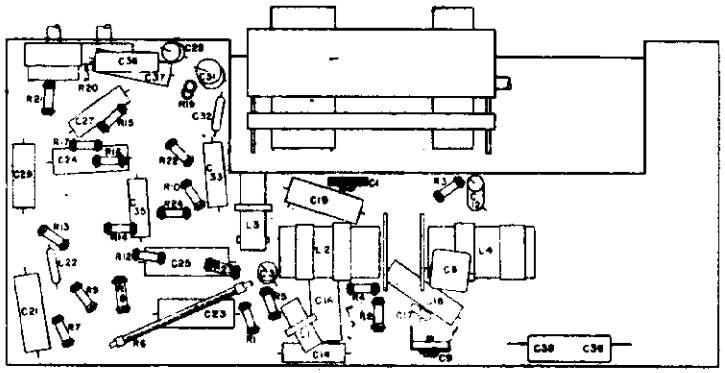


IF PEAK 455 KC

FEB.11,1941



LOCATIONS OF PARTS ON TOP OF CHASSIS 101.646,-1



LOCATIONS OF PARTS UNDER CHASSIS 101.646

ALIGNMENT PROCEDURE

Output meter connection . . . . . Across loudspeaker voice coil
Output meter reading to indicate 500 milliwatts . . . . . 1.25 volts
Approximate microvolts input to indicate 500 milliwatts output . . . . . See chart below
Generator ground lead connection . . . . . To external ground
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 . . . . . HI
Position of Dial Pointer with variable fully closed . . . . . At block to left of 540 kc calibration mark

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	FUNCTION	APPROXIMATE MICROVOLTS
"A"	Closed	455 kc	.1 mfd.	6K8G Grid	T2,T1	IF	--
"A"	600 kc	455 kc	.0002 mfd.	Ant. Term.	C4*	Wave Trap	--
"A"	Open	1620 kc	.0002 mfd.	Ant. Term.	C5	Oscillator	--
"A"	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C9	Translator	75
"A"	600 kc (rock)	600 kc	.0002 mfd.	Ant. Term.	C10	Padder	45
"B"	2.4 mc	2.4 mc	400 ohms	Ant. Term.	C2	Translator	35
"C"	Open	18.2 mc	400 ohms	Ant. Term.	C11	Oscillator	--
"C"	15 mc (rock)	15 mc	400 ohms	Ant. Term.	C7	Translator	10
"D"	9.55 mc (rock)	9.55 mc	400 ohms	Ant. Term.	C13**,C8	Osc,Transl.	30

IMPORTANT ALIGNMENT NOTES

* The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 455 kc is known, the generator should be adjusted to the frequency of that station instead of to 455 kc.

** If two peaks can be had, the correct one is with the trimmer screw further out. The other peak is the image.

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

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.

POWER SUPPLY:

All models available . . . . . .
105-125 v., 50-60 cycles AC; 75 watts
105-125 v., 25-60 cycles AC; 80 watts

ALIGNMENT FREQUENCIES:

Oscillator Trimmer	Antenna-Transl. Trimmer	Padder
1610 kc	1400 kc	600 kc
None	2.4 mc	Fixed
18.2 mc	15 mc	Fixed
9.55 mc	9.55 mc	Fixed

FREQUENCY RANGES:

Band "A" . . . . . 540-1600 kc
Band "B" . . . . . 1.5-2.5 kc
Band "C" . . . . . 6-18 mc
Band "D" . . . . . 9.4-9.85 mc

POWER OUTPUT:

Type . . . . . Pentode
Undistorted . . . . . 2.5 watts
Maximum . . . . . 4.5 watts

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection . . . . . Across loud speaker voice coil
Output meter reading to indicate 50 milliwatts . . . . . 0.7 volts
Approximate microvolts input 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 clockwise
Position of Tone Control . . . . . HI
Position of Dial Pointer with variable fully closed . . . . . Horizontal

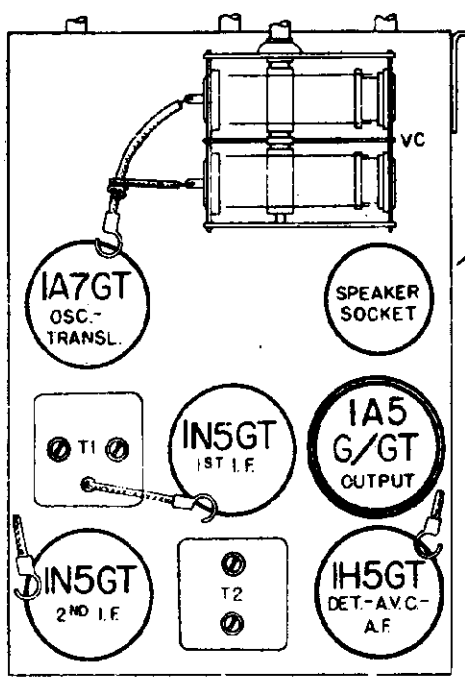
IMPORTANT ALIGNMENT NOTES

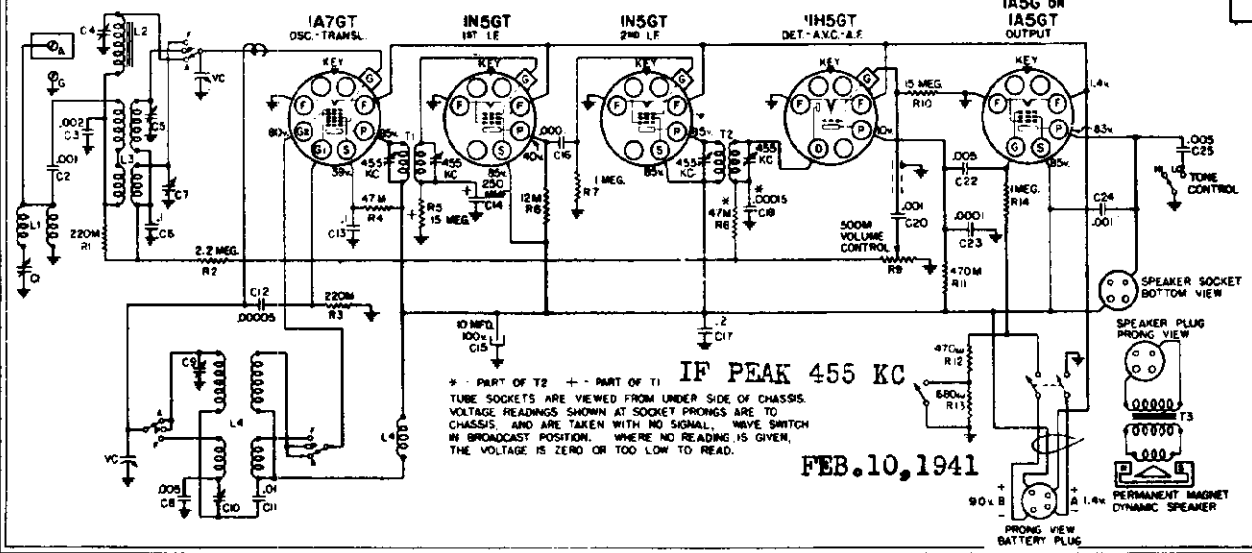
* The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 455 kc is known, the generator should be adjusted to the frequency of that station instead of to 455 kc.

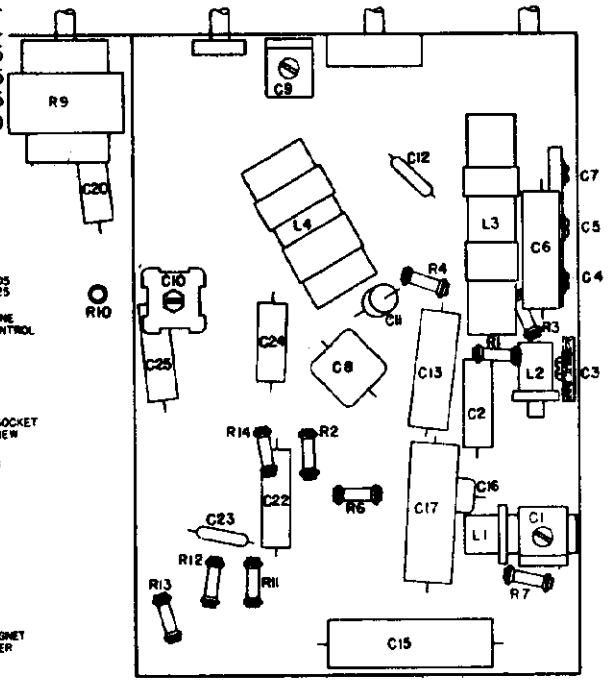
Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

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.

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"AM"	Closed	455 kc	.1 mfd.	1A7G Grid	T2,T1	IF Output IF Input	--
"AM"	600 kc	455 kc*	.0003 mfd.	Ant. Term.	C1*	Wave Trap	--
"AM"	Fully open	1750 kc	.0003 mfd.	Ant. Term.	C9	Oscillator	--
"AM"	1400 kc	1400 kc	.0003 mfd.	Ant. Term.	C4	Translator	15
"AM"	600 kc(rock)	600 kc	.0003 mfd.	Ant. Term.	C10	Padder	15
"POL"	2.4 mc	2.4 mc	400 ohms	Ant. Term.	C5	Translator	25
"FOR"	15 mc(rock)	15 mc	400 ohms	Ant. Term.	C7	Translator	10

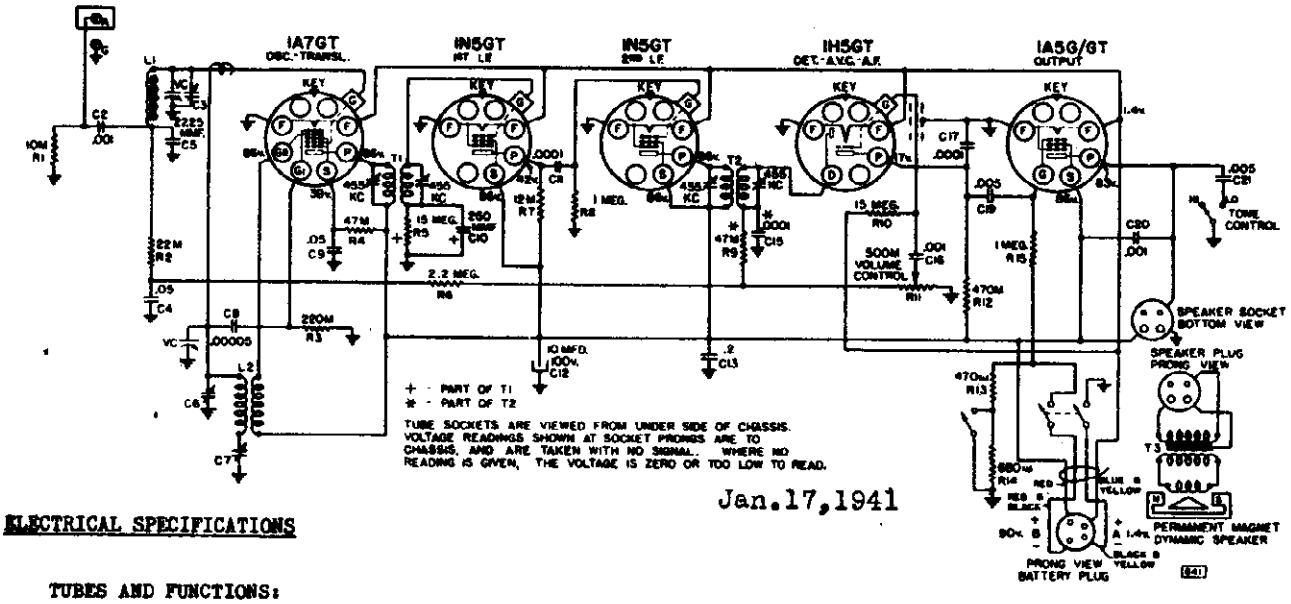






SEARS, ROEBUCK & CO.

MODEL 2451, Ch. 101.641



Jan. 17, 1941

ELECTRICAL SPECIFICATIONS

TUBES AND FUNCTIONS:

1A7G	Oscillator, Translator
1N5G	1st IF
1N5G	2nd IF
1H5G	Detector-AVC-AF
1A5G/GT	Output

POWER SUPPLY:

#5170 A-B block (1.5v. "A", 90V. "B")	"A" Drain . . . . . 0.25 Amperes
or	"B" Drain . . . . . 10.5 ma.
#5200 . . . . . 2v. Storage "A"	
2 - #5150 . . . . . 45v. "B" battery	
#5305 . . . . . Adapter necessary with 2v. Storage "A"	

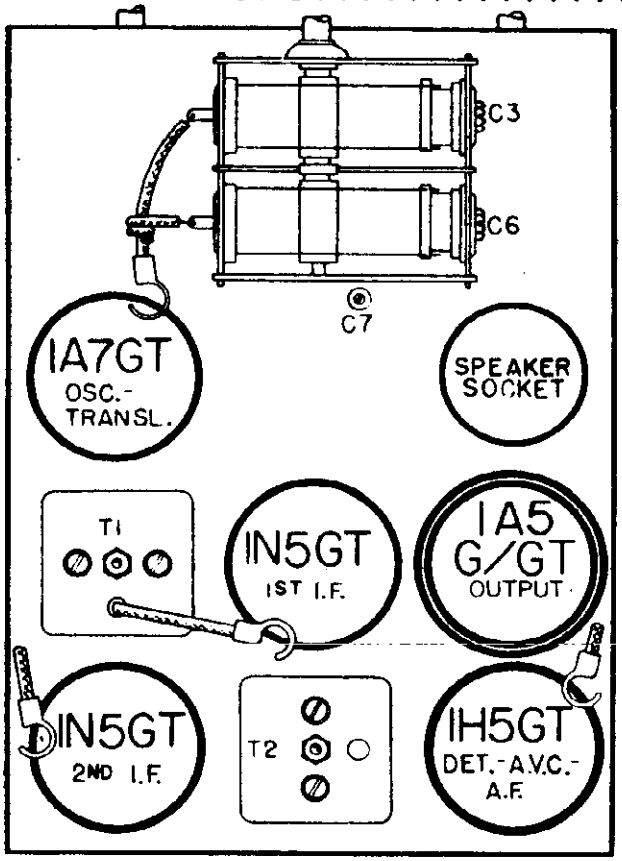
FREQUENCY RANGE:

Broadcast . . . . . 530-1750 kc

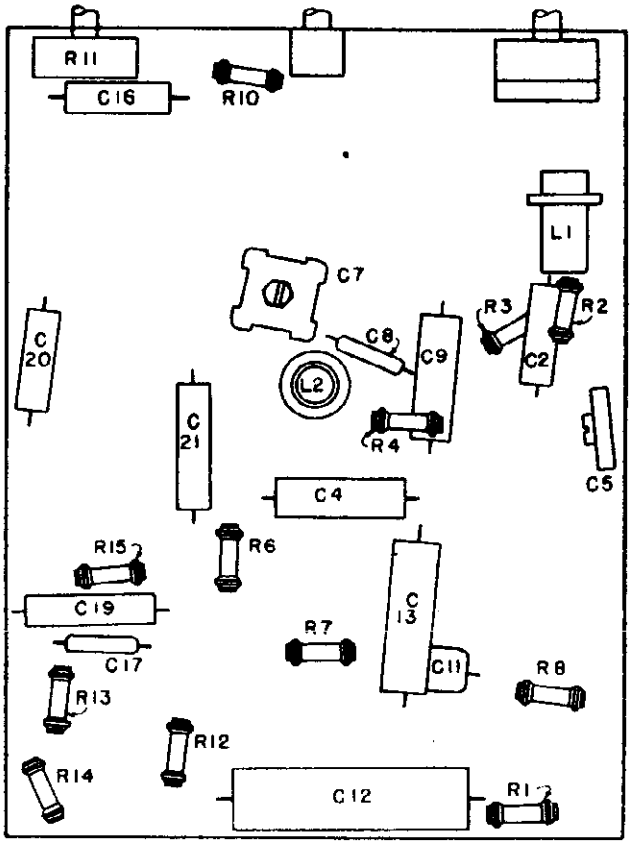
ALIGNMENT FREQUENCIES:

Oscillator Trimmer	Antenna-Transl. Trimmer	Padder
1750 kc	1400 kc	600 kc

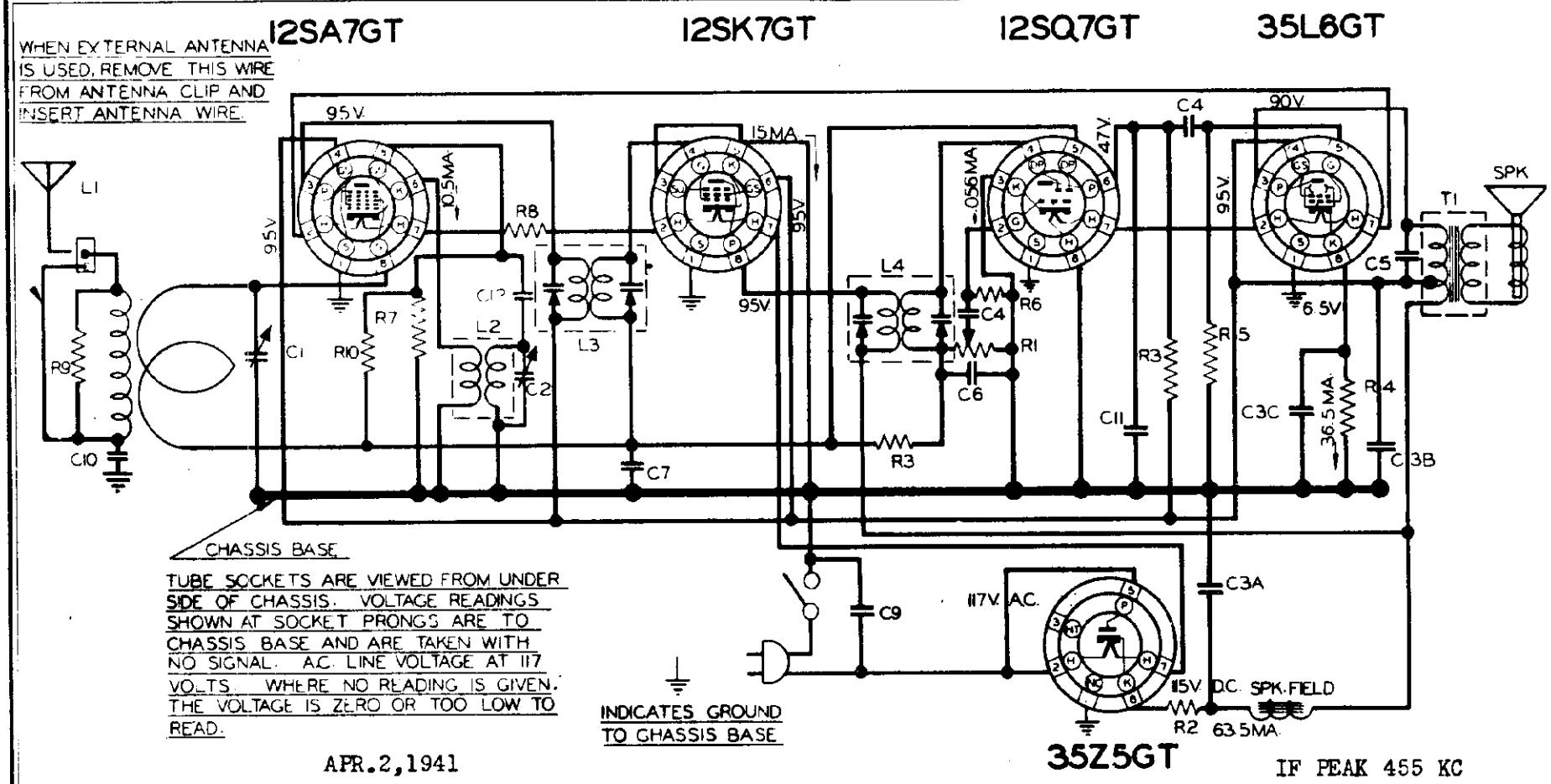
INTERMEDIATE FREQUENCY . . . . . 455 kc



LOCATIONS OF PARTS ON TOP OF CHASSIS



LOCATION OF PARTS UNDER CHASSIS 101.641



APR. 2, 1941

IF PEAK 455 KC

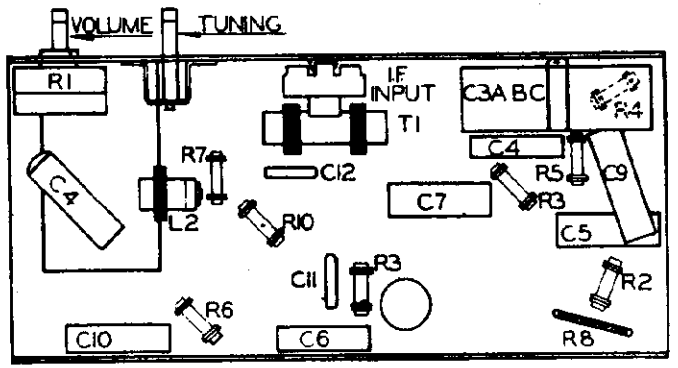
MECHANICAL & ELECTRICAL CHANGES SINCE START OF FIRST PRODUCTION:

Soon after the start of the first production of these models, certain minor mechanical and electrical changes were made to make these receivers more uniform in their characteristics.

The coupling turns used to couple the oscillator tank to the 12SA7GT tube were dropped in favor of a .00005 mfd. mica condenser (C-12). The plate bypass on the 12SQ7GT tube was reduced from .0005 mfd. to .00025 mfd. and redesignated (C-11) on the Circuit Diagram. This was done to make the tone somewhat more brilliant and increase the apparent power output.

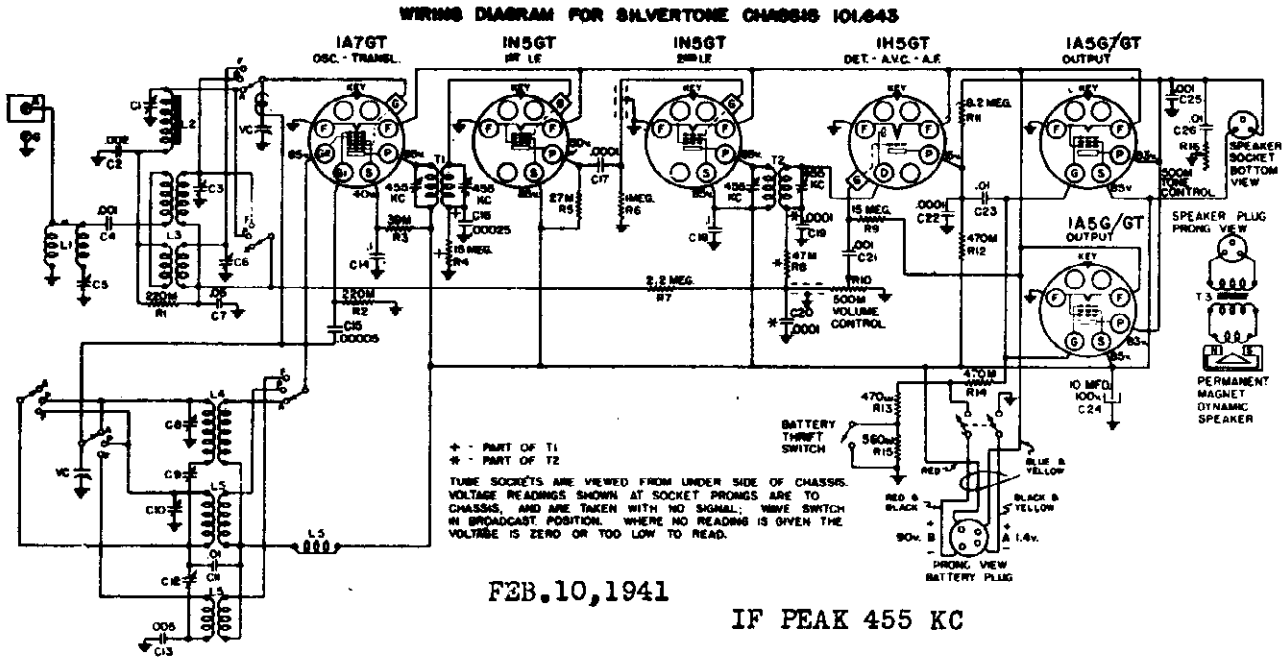
The mechanical changes consisted in reversing the positions of the two I.F. coils-- practically all production having the I.F. Output in the shield can with the I.F. Input unshielded. The I.F. Input was also moved to mount on the front chassis flange instead of on the top of the chassis base.

FOR ADDITIONAL DATA SEE INDEX



LOCATION OF PARTS UNDER CHASSIS

SEARS, ROEBUCK & CO.



FEB.10,1941

IF PEAK 455 KC

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection . . . . . Across loudspeaker voice coil
Output meter reading to indicate 50 milliwatts . . . . . 0.36 volts
Approximate microvolts input 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 clockwise
Position of Tone Control . . . . . HI
Position of Dial Pointer with variable fully closed . . . . . On mark past 540 kc
Position of Battery Thrift Switch . . . . . Right

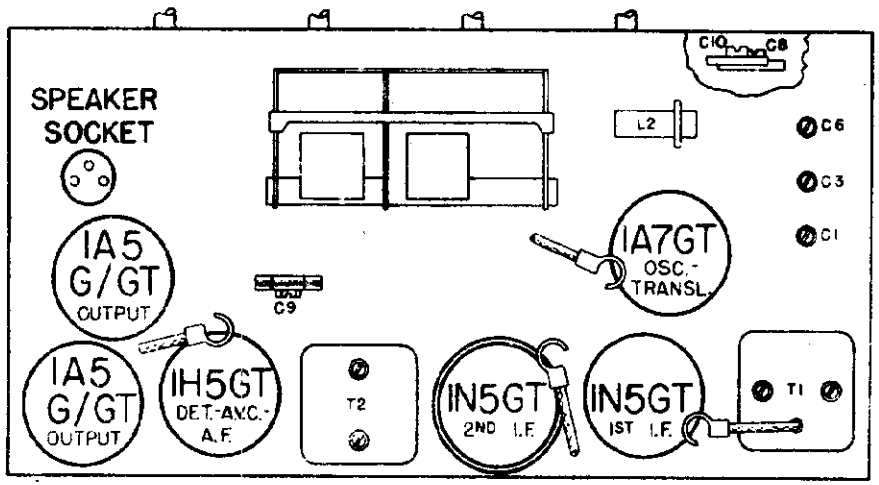
WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"AM"	Closed	455 kc	.1 mfd.	1A7G Grid	T2,T1	IF	75
"AM"	600 kc	455 kc*	.0002 mfd.	Ant. Term.	C5*	Wave Trap	--
"AM"	Fully open	1725 kc	.0002 mfd.	Ant. Term.	C8	Oscillator	--
"AM"	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C1	Translator	15
"AM"	600 kc(rock)	600 kc	.0002 mfd.	Ant. Term.	C9	Padder	15
"POL"	4.5 mc	4.5 mc	400 ohms	Ant. Term.	C10,C3	Osc.,Transl.	15
"FOR"	15 mc(rock)	15 mc	400 ohms	Ant. Term.	C6	Translator	10

IMPORTANT ALIGNMENT NOTES

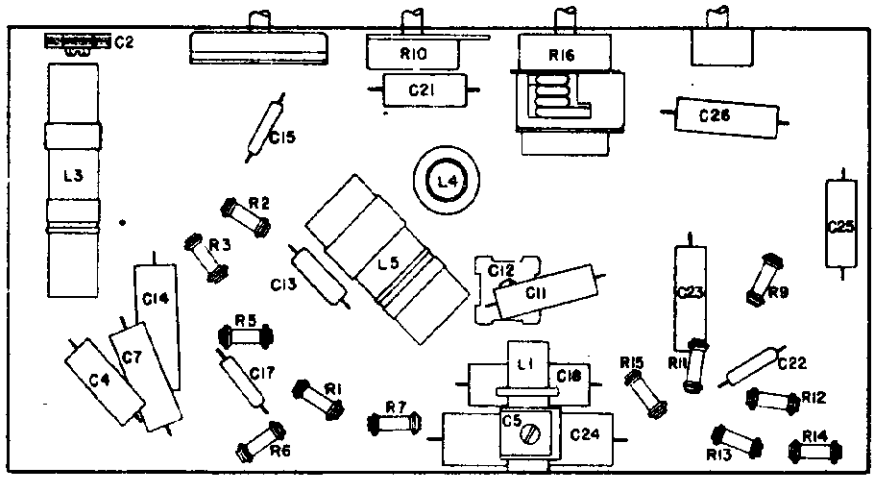
* The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 455 kc is known, the generator should be adjusted to the frequency of that station instead of to 455 kc.

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

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.



LOCATIONS OF PARTS ON TOP OF CHASSIS 101.643



LOCATIONS OF PARTS UNDER CHASSIS-101.643

ELECTRICAL SPECIFICATIONS

TUBES AND FUNCTIONS:

1A7GT . . . . . Oscillator, Translator	1N5GT . . . . . 2nd IF
1N5GT . . . . . 1st IF	1H5GT . . . . . Detector-AVC-AF
2 - 1A5G/GT . . . . . Output	

POWER SUPPLY:

#5172 . . . . A-B block (1.5v. "A", 90v. "B") or	"A" Drain . . . . . 0.3 Amperes
#5200 . . . . . 2v. Storage "A"	"B" Drain . . . . . 12 ma.
2 - #5152 . . . . . 45v. "B" battery	
#5300 . . . . . Adapter necessary with 2 volt Storage "A"	

FREQUENCY RANGES:

Broadcast	532-1725 kc
Police	1.65-5.2 mc
Short Wave	5.75-18.5 mc

ALIGNMENT FREQUENCIES:

	Oscillator Trimmer	Antenna-Transl. Trimmer	Padder
Broadcast	1725 kc	1400 kc	600 kc
Police	None	4.5 mc	None
Short Wave	None	15 mc	Fixed

INTERMEDIATE FREQUENCY . . . . . 455 kc

POWER OUTPUT:

Type	Pentodes
Undistorted	0.155 watts
Maximum	0.25 watts

LOUDSPEAKER:

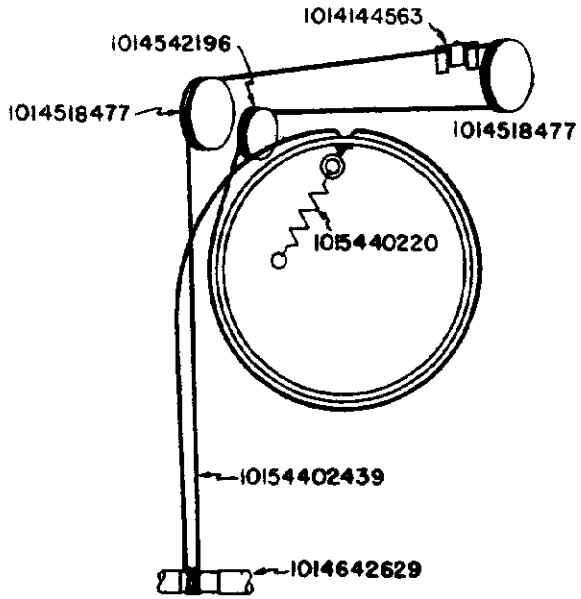
Type	PM Dynamic
Size	6 inch

OPERATING FEATURES:

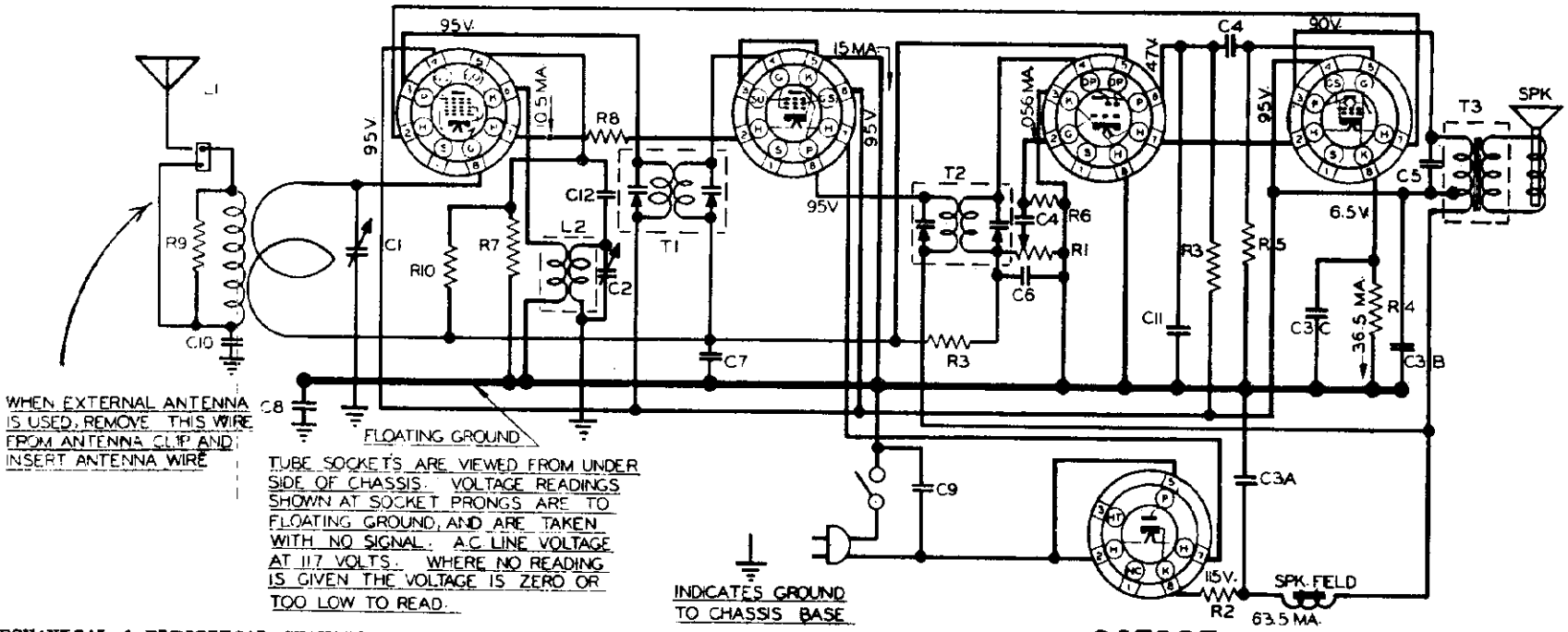
- Tone Control . . . . . Variable
- Automatic Volume Control
- Battery Thrift Switch
- Monitor switch

CHASSIS FEATURES:

- Number IF stages . . . . . Two
- Built-in Wave Trap



12SA7GT 12SK7GT 12SQ7GT 35L6GT



35Z5GT

APR. 2,1941

MECHANICAL & ELECTRICAL CHANGES SINCE START OF FIRST PRODUCTION:

Soon after the start of the first production of these models certain minor mechanical and electrical changes were made to make the receivers more uniform in their characteristics.

The coupling turns used to couple the Oscillator tank to the 12SA7GT tube were dropped in favor of a .00005 mfd. mica condenser (C-12). The plate bypass on the 12SQ7GT tube was reduced from .0005 mfd. to .00025 mfd. and redesignated (C-11) on the Circuit Diagram. This was done to make the tone somewhat more brilliant and increase the apparent power output.

The mechanical changes consisted in reversing the positions of the two I.F. coils-- practically all production having the I.F. Output in the shield can with the I.F. Input unshielded. The I.F. Input was also moved to mount on the front chassis flange instead of on the top of the chassis base.

INTERMEDIATE FREQUENCY . . . . . 455 kc.

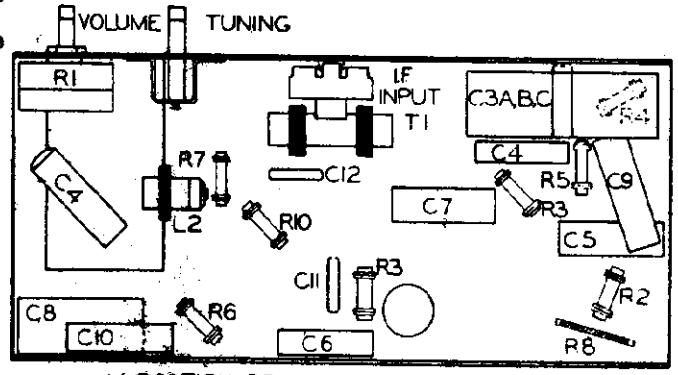
POWER OUTPUT:
Type . . . . . Beam Tube
Undistorted . .8 watts
Maximum . . . 1.6 watts

LOUD SPEAKER:
Type . . . . . EM.
Size . . . . . 4 inch

POWER SUPPLY:
All models available . . . . . 105-125 volts, 25-60 cycle, AC-DC, 30 watts

FREQUENCY RANGE . . . 540 - 1750 kc.

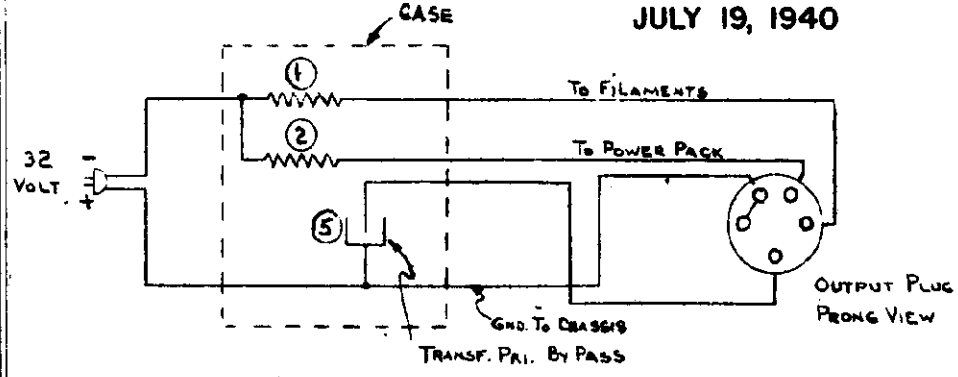
ALIGNMENT FREQUENCIES: Osc. - 1400 kc.
Transl. - 1400 kc.



LOCATION OF PARTS UNDER CHASSIS

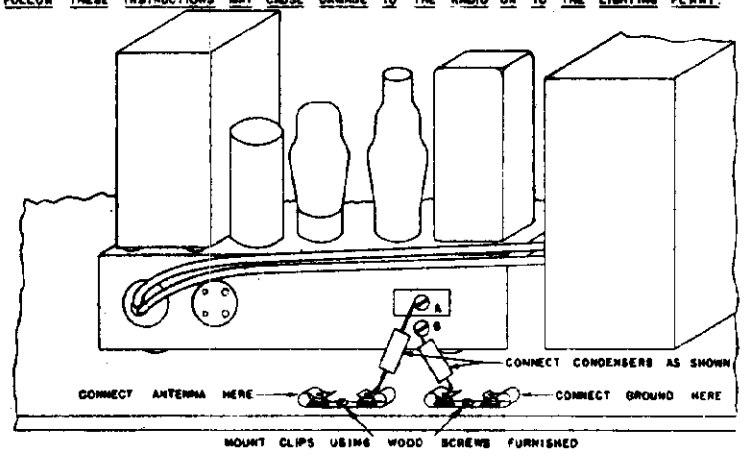
FOR ADDITIONAL DATA SEE INDEX

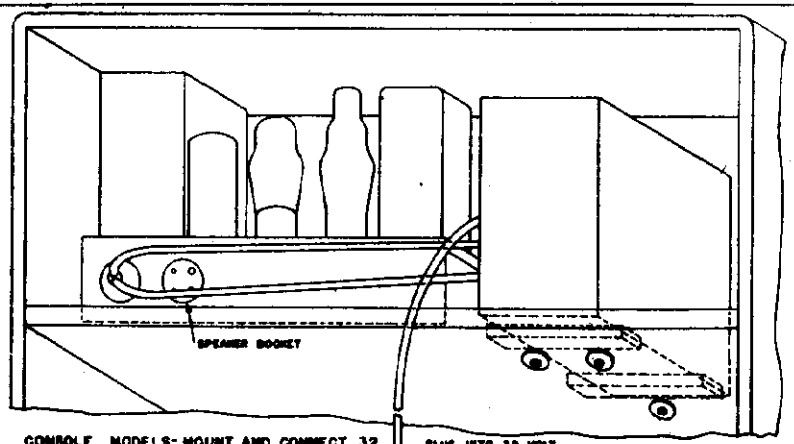
JULY 19, 1940



CAUTION

DO NOT CONNECT THE ANTENNA AND GROUND WIRES DIRECTLY TO THE TERMINALS ON THE RADIO. INSTEAD, CONNECT THEM THROUGH THE CONDENSERS SUPPLIED HEREWITH, AS ILLUSTRATED. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY CAUSE DAMAGE TO THE RADIO OR TO THE LIGHTING PLANT.





CONSOLE MODELS- MOUNT AND CONNECT 32 VOLT ADAPTER AS SHOWN.

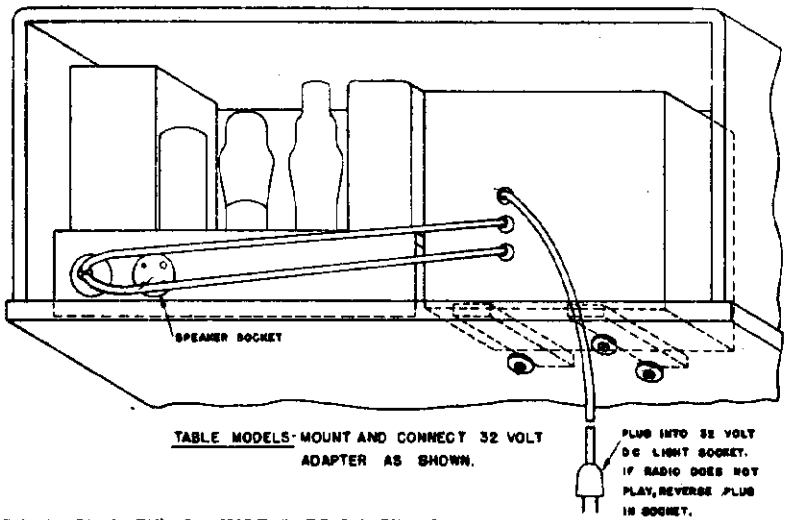


TABLE MODELS- MOUNT AND CONNECT 32 VOLT ADAPTER AS SHOWN.

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION	SELLING PRICE EACH
	1015441936	Clip - Fahnestock, double	.04
5	1013043080	Condenser - Elect., 2000 mfd., 18 v.	2.96
		Condenser - .01 mfd., 400 v.	.08
	1015519280	Cord - Power	.30
	1015443083	Deflector - Heat	.43
	1015543133	Lead with plug, adapter to radio	.54
1		Resistor - 53 ohms, 20 w.	.36
2		Resistor - 26 ohms, 40 w.	.53
	1015943506	Sheet - Instruction	.10
	1015944014	Sheet - Instruction, condenser installation	.10

ADAPTER FOR OPERATING 6 VOLT, 1.5 AMPERE RECEIVERS FROM 32 VOLT DC SUPPLY

ELIMINATING INTERFERENCE FROM THE 32 VOLT BATTERY CHARGER:

In single cylinder plants connect a spark plug suppressor to the spark plug. In four cylinder plants connect a distributor suppressor in the center socket of the distributor cap.

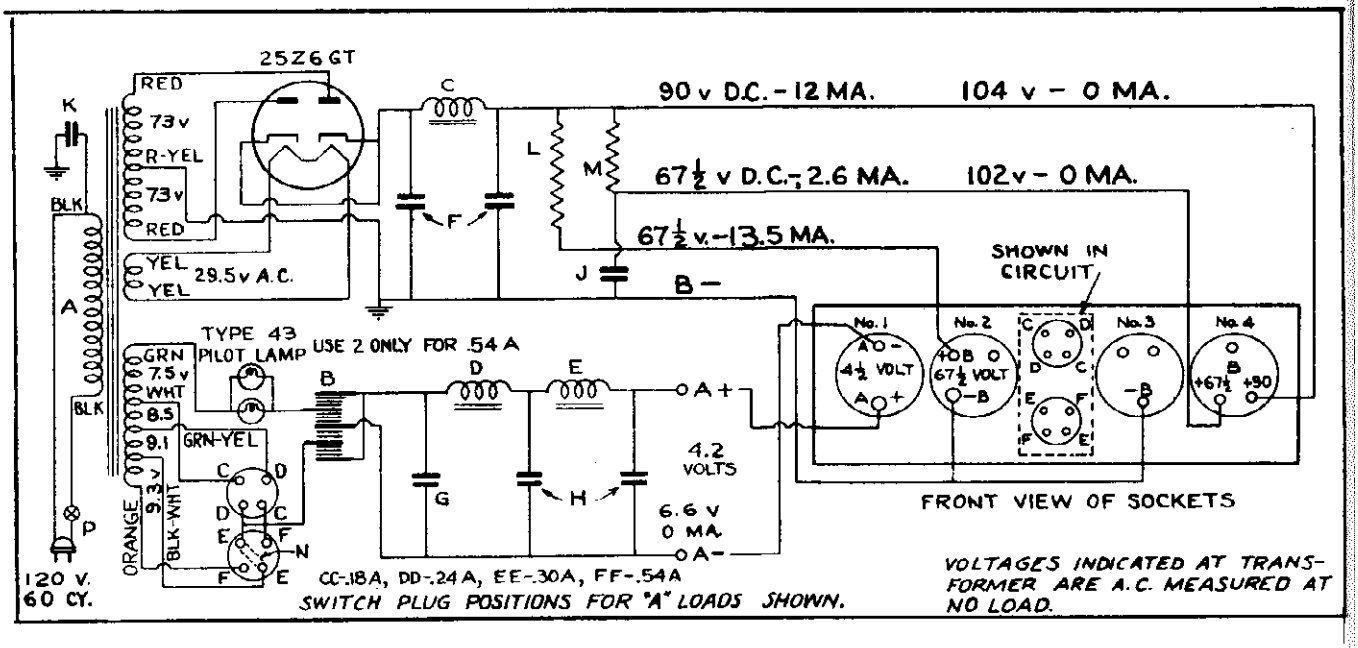
Connect a .5 mfd., 200 volt generator condenser from the negative brush of the generator to the frame. If this is not sufficiently effective, connect an additional condenser from the positive brush to the frame.

Connect a .5 mfd., 200 volt generator condenser from the generator frame to the positive or negative line terminal, whichever is more effective, on the plant switchboard. Keep all condenser leads as short as possible.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

SEARS, ROEBUCK & CO.

MODEL 4701 Power Shifter
Chas. 139.450



WIRING DIAGRAM FOR SILVERTONE MODEL 4701 POWR SHIFTR

"A" SUPPLY

The "A" Supply is obtained from a full wave copper sulfide rectifier filtered by a condenser input filter consisting of three high capacity condensers and two low resistance chokes. Four taps on the power transformer rectifier winding in connection with two pilot lamp ballasts as regulators allow a fairly constant output voltage to be obtained with various "A" loads and line voltages. Terminal voltages for various loads are indicated on the wiring diagram.

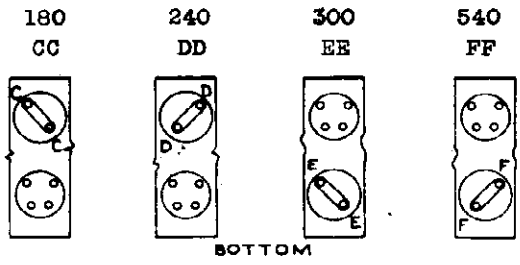
"B" SUPPLY

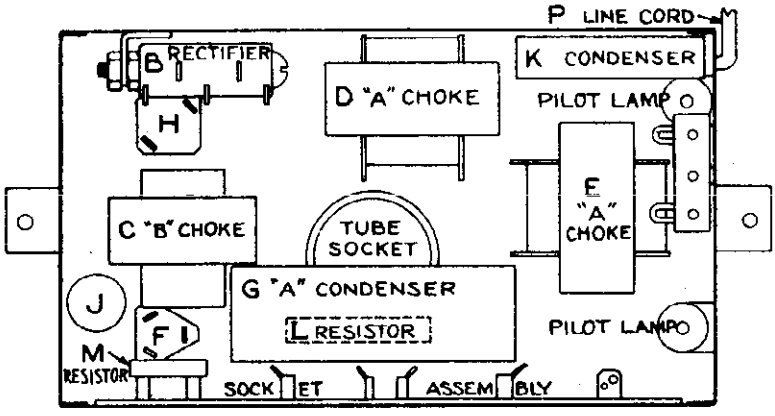
The "B" supply employs a 25Z6GT rectifier tube operated as a full wave rectifier feeding into a condenser input filter followed by a choke and another condenser. Voltage dropping resistors supply 67½ volts at two load ratings and a 90 volts D. C. tap. The "A" and "B" circuits are not common to each other or to the chassis.

POWER DRAIN

The primary input is 22 watts when the "A" circuit is loaded to 540 MA. with switch plug in proper position and both pilot lamps in the circuit, and the "B" circuit is loaded to 12 MA. The input watts under no-load should be approximately 12 watts and the primary current without load, not more than 160 MA. at 120 volts, 60 cycles.

SWITCH PLUG POSITION FOR "A" CURRENTS IN MA.





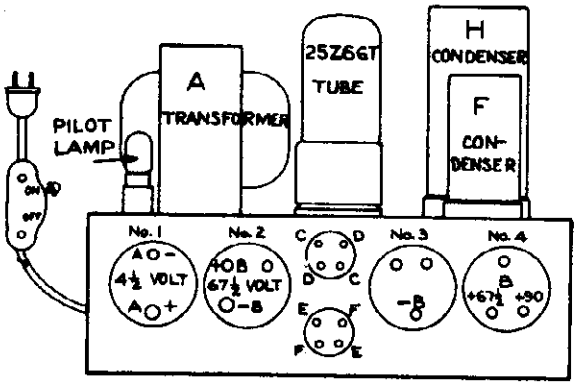
LOCATION OF PARTS IN CHASSIS

MAY 8, 1940

FOR 4-1/2 VOLT BATTERY RADIOS

MODEL 4701

SEARS, ROEBUCK & CO.



LOCATION OF PARTS ON CHASSIS (Cover Off)

CHASSIS	SWITCH PLUG POSITION	SOCKET NUMBER
443	CC	1, 3 & 4
447	EE	1, 3 & 4
448	FF *	1, 3 & 4
464	CC	1, 3 & 4
465	EE	1, 3 & 4
472	FF *	1, 3 & 4
472 X	EE	1, 3 & 4
473	EE	1, 3 & 4
474	EE	1, 3 & 4
475	CC	1 & 2
503	CC	1 & 2
503-1	CC	1 & 2
504	DD	1, 3 & 4
505	DD	1, 3 & 4
505 X	DD	1, 3 & 4
505-1	DD	1, 3 & 4
505-1X	DD	1, 3 & 4
512	DD	1, 3 & 4
512 A	DD	1, 3 & 4
519	CC	1 & 2
524	EE	1, 3 & 4
525	DD	1, 3 & 4
532	CC	1 & 2
548	DD	1, 3 & 4
554	DD	1, 3 & 4

* Use two pilot lamps (#43)

TO OPEN CHASSIS

The chassis bottom cover is held firmly to the chassis by four snap-on indentations in the sides. To remove this bottom cover, insert a thin screw driver between cover and chassis and pry open. With a little pressure the cover will snap back in place easily.

The top cover is fixed to the chassis by two screws on each end. To remove this cover it is only necessary to loosen the screws one turn.

"A" SUPPLY FAILS

When the "A" voltage is excessively low the rectifier, condensers or transformer may be defective. Check the switch plug position carefully for correct location for load connected to "A", and also make sure one pilot lamp only is used when in the CC, DD, or EE position and two pilot lamps when in the FF position. These must be Type 43 pilot lamps.

To check the transformer remove one transformer lead from the rectifier and measure for A.C. voltage indicated on the wiring diagram. To check the rectifier remove wires from choke "D" and condenser "G", -- also disconnect one side of jumper wire and measure D.C. voltage across each side of rectifier. This should be 1.9 to 2.1 volts, D.C. with the switch plug in position CC and only one pilot lamp in the circuit.

IMPORTANT: The copper sulfide rectifier is designed to give the voltages indicated on the wiring diagram when the unit is warmed up to normal operating temperatures. This heating up period is usually about 20 minutes with the Powr Shiftr "A" circuit loaded. The rectifier's characteristics are peculiar and for an accurate check the unit must be tested when hot.

When the Powr Shiftr has been out of service for a long time (4 months or more) the "A" voltage may test low due to the inactive life of the rectifier. This is an inherent characteristic of the copper sulphide rectifier. The unit may be reactivated by placing a direct short for 3 to 4 minutes across the rectifier from the center lug to either outside lug of the rectifier. WARNING! Two pilot lamps must be in the circuit and the switch plug should be in position CC, otherwise the pilot lamps will be burnt out.

Low "A" voltage may also be caused by a dropping in capacity of the input condenser "G". To check this another condenser of 500 to 1000 MFD. can be connected across this condenser and if an appreciable rise is observed in the output voltage it is obvious that the input condenser is low in capacity.

"B" SUPPLY FAILS

The 25Z6GT tube should be tested with a standard tube tester. The transformer may be tested by measuring the A.C. voltage across each half of the plate winding with the red leads disconnected. The carbon resistors should be checked for their resistance values.

SUBJECT: DIFFERENCES BETWEEN 101.503 AND 101.503-1:

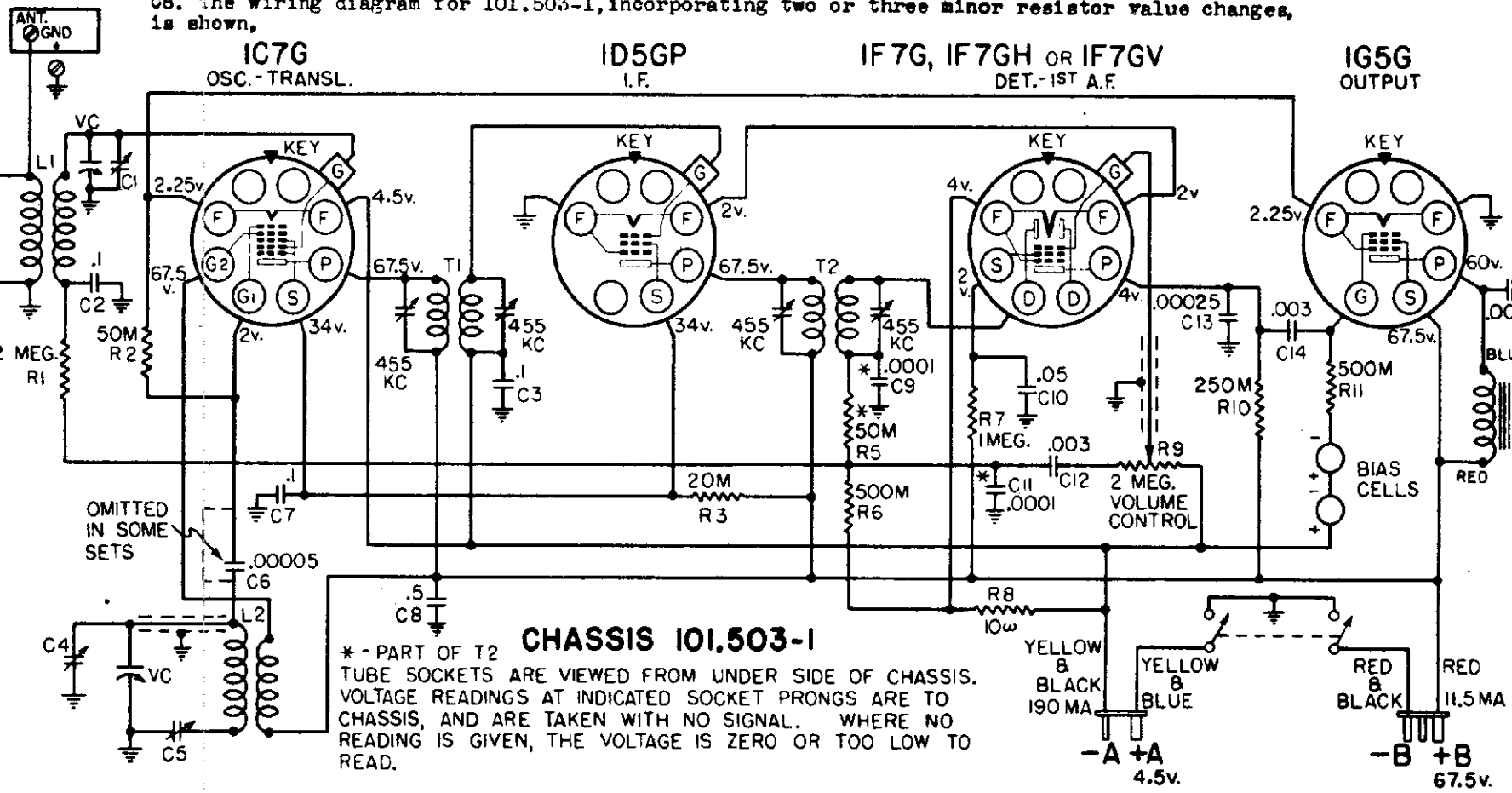
Chassis identified by 101.503-1 use 455 kc IF instead of 465 kc as used in 101.503. Different knobs and a different volume control also are used.

PART NUMBER	DESCRIPTION	SELLING PRICE EACH
1012418877	Control - Volume, with switch	.66
1013918804	Knob - Tuning	.08
1013918803	Knob - Volume	.08
1015920102	Leaflet - Instruction	.20

JAN. 11, 1939

IF PEAK 455 KC

The .5 mfd. condenser, listed as C5 in the original Manual should have been listed as C8. The wiring diagram for 101.503-1, incorporating two or three minor resistor value changes, is shown,



* - PART OF T2

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

CHASSIS 101.503-1

SEARS, ROEBUCK & CO. MODELS 4620A, 4621A, 4641A, 4642A, 6050, 6051, 6150
Chas. 101.503-1

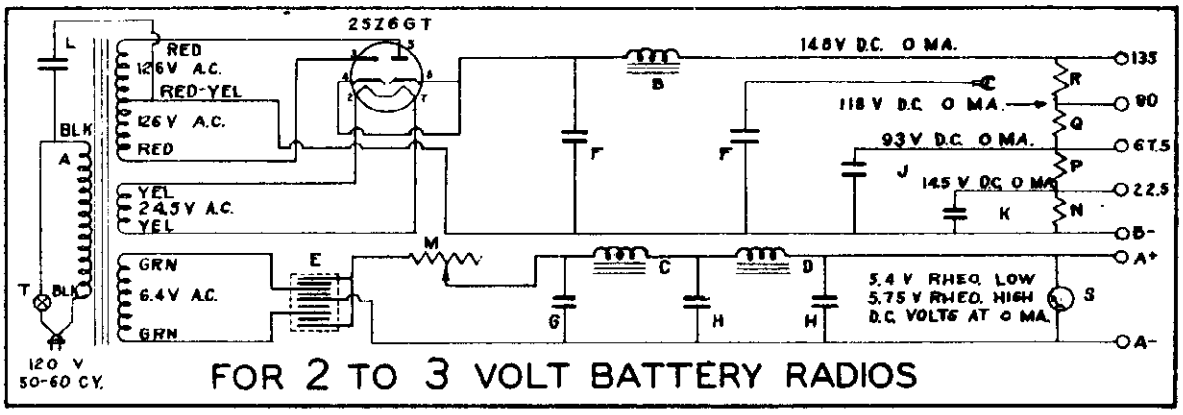
MODEL 4708 Power Shifter
Ch.139.200

SEARS,ROEBUCK & CO.

OUTPUT RATINGS:

"B" 135 V tap - 14MA. (28 MA. max.) - (148V no load)
90 V tap - 14MA. (118V no load)
67.5V tap - 2MA. load and 21 MA. on 135V tap - (93V no load)
22.5V tap - with 19 MA. load on 22.5 to 135V tap - (16V no load)

"A" 2 or 3 volts at 365 MA. to 670 MA.
Adjust voltage by turning slotted shaft.



WIRING DIAGRAM FOR SILVERTONE MODEL 4708 POWR SHIFTR

"A" SUPPLY

The "A" supply is obtained from a full wave copper sulfide rectifier filtered by a condenser input filter consisting of three high capacity condensers and two low resistance chokes. A rheostat after the rectifier allows the voltage to be controlled over a wide range which is indicated by a voltmeter across the output.

"B" SUPPLY

The "B" supply employs a 25Z6GT rectifier tube operated as a full wave rectifier feeding into a condenser input filter followed by a choke and another condenser. A lead with spade lug from the second condenser is brought thru the chassis for proper filtering by connecting this to the highest B plus voltage tap used. Voltage dropping resistors supply 22½, 67½, 90 and 135 volts.

"A" SUPPLY FAILS

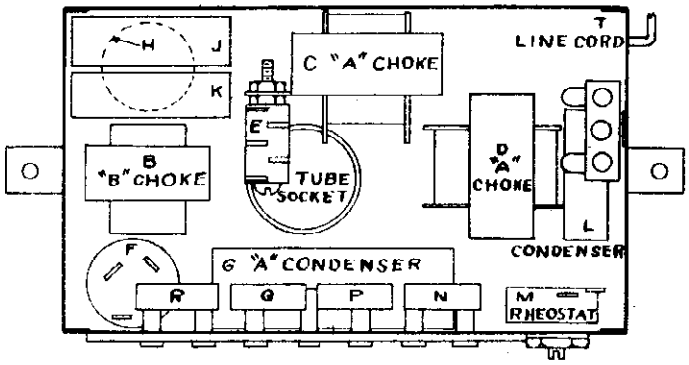
When the "A" voltage is excessively low the transformer, condensers or rectifier may be defective.

To check the transformer remove one green lead from the rectifier and measure for AC voltage indicated on the wiring diagram.

Low "A" voltage may be caused by a dropping in capacity of the input condenser "G". To test for this condition, another condenser of 500 to 1000 MFD. may be connected across this condenser, and if an appreciable rise in the output voltage is observed it is obvious that the input condenser is low in capacity.

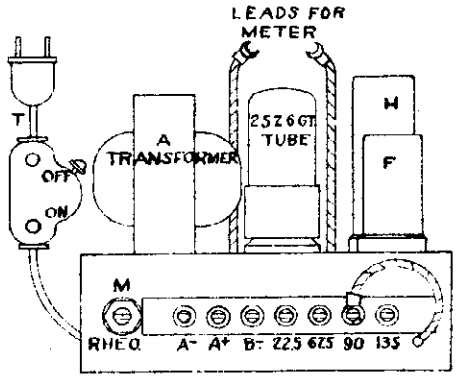
IMPORTANT: The copper sulfide rectifier is designed to give the voltages indicated on the wiring diagram when the unit is warmed up to normal operating temperatures. This heating up period is usually about 20 minutes with the Powr Shiftr "A" circuit loaded. The rectifier's characteristics are peculiar and for an accurate check the unit must be tested when hot.

When the Powr Shiftr has been out of service for some length of time (4 months or more) the "A" voltage may test low due to the inactive life of the rectifier. This is an inherent characteristic of the copper sulfide rectifier. To reactivate the rectifier it is only necessary to short the "A" plus and "A" minus terminals for a period of 4 to 5 minutes. The high temperature developed in the rectifier during this period has the tendency to restore the discs to their normal rectifying capacity. The unit will not be harmed by this process.



LOCATION OF PARTS IN CHASSIS

SEPTEMBER 16, 1940



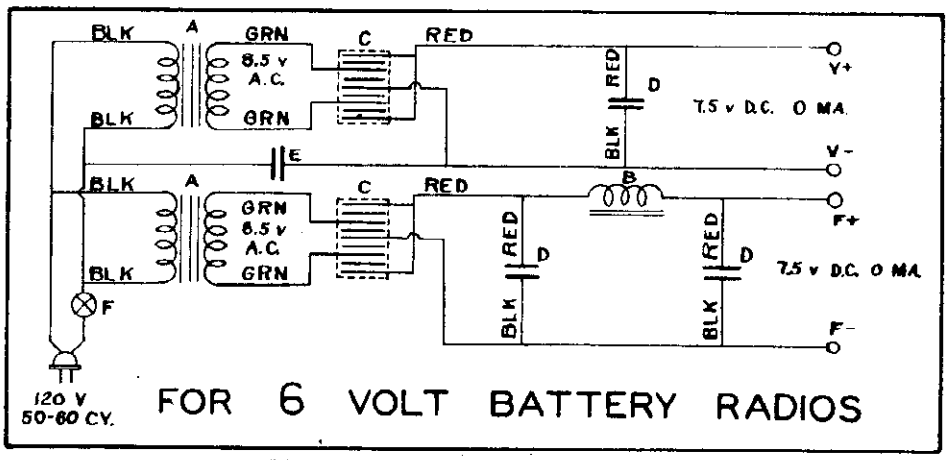
LOCATION OF PARTS ON CHASSIS

POWER DRAIN

The primary input at 120 volts 60 cycles is 26 watts when the "A" and "B" supplies have maximum rated loads. The input watts under no-load should be 12.5 watts and the primary current without load not more than 215 MA.

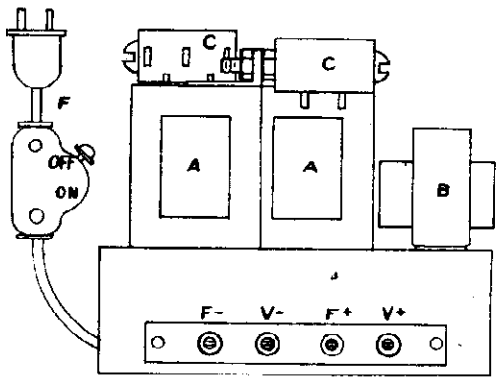
SEARS, ROEBUCK & CO.

MODEL 4709 Power Shifte
Chas. 139.600

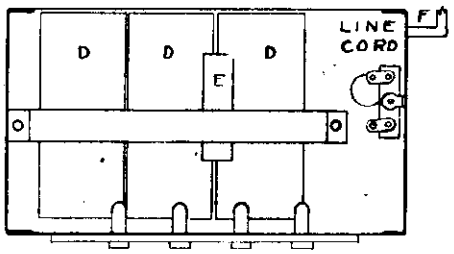


LOCATION OF PARTS IN CHASSIS

WIRING DIAGRAM FOR SILVERTONE MODEL 4709 POWR SHIFTR



LOCATION OF PARTS ON CHASSIS



CHARTS SHOWING OUTPUT OF POWR SHIFTR WITH 120V-60 CYCLE LINE INPUT

SINGLE "P" OR "V" SUPPLY	
AMPERES	VOLTS D.C.
0	7.54
.25	6.91
.50	6.62
.75	6.35
1.00	6.08
1.25	5.80
1.50	5.60

"P" AND "V" IN PARALLEL	
AMPERES	VOLTS D.C.
0	7.50
1.00	6.80
1.50	6.30
1.75	6.20
2.00	6.02
2.50	5.81
3.00	5.55

FILAMENT SUPPLY

The filament supply, marked "F" on the terminal strip, is obtained from a full wave copper sulfide rectifier feeding into a high capacity condenser input filter followed by a low resistance choke and another high capacity condenser.

RETAIL SELLING PRICES PREPAID
PRICES SUBJECT TO CHANGE WITHOUT NOTICE

KEY	PARTS NO.	DESCRIPTION	SELLING PRICE EACH
A	1391018	POWER TRANSFORMER	$1.80
B	1391019	FILTER CHOKE	1.35
C	1391020	RECTIFIER	4.20
D	1391017	CONDENSER 3000 MFD-6V	1.80
E	1391912	LINE CONDENSER .05 MFD 400V	.35
F	1391009	LINE CORD, SWITCH & PLUG	1.00
	1391021	TERMINAL STRIP	.40
	13920333	CHASSIS	.75
	13920326	CHASSIS BOTTOM COVER	.25
	13920330	CHASSIS TOP COVER WITH NAME PLATE	2.15
	13920337	MOUNTING BRACKETS	.15
	1391022	INSTRUCTION SHEET	

VIBRATOR SUPPLY

The vibrator supply, marked "V" on the terminal strip, is obtained from a full wave copper sulfide rectifier filtered by a single high capacity condenser. Terminal voltages for various loads are indicated on the load charts.

POWER DRAIN

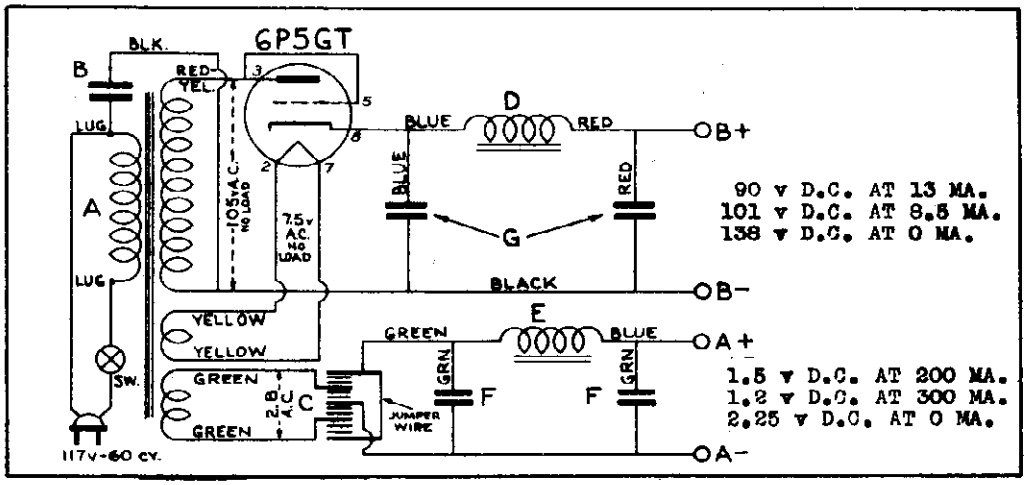
The primary input with a single "V" or "P" supply loaded to 0.75 amperes is 17 watts, and with the two supplies in parallel and a 2.00 amp load the input watts are 30. At rated load of 3.0 amperes the primary drain is 43 watts.

TWO SEPARATE SUPPLIES

Several different basic designs in six volt single battery radios have made it necessary to provide separate supplies for the vibrator and for the filaments. This special design provides hum-free operation with proper installation of the Powr Shiftr. The two separate sources of D.C. power labeled "P" and "V" may be considered the equivalent of two separate six volt batteries.

SEPTEMBER 16, 1940

MODEL 5302 Power Shifter
Chas. 139.210 SEARS, ROEBUCK & CO.



WIRING DIAGRAM FOR SILVERTONE MODEL 5302 POWER SHIFTER

FOR 1 1/2 VOLT BATTERY RADIOS OF 4 OR 5 TUBES

"A" SUPPLY

The "A" supply is obtained from a full wave copper sulfide rectifier filtered by a condenser input filter consisting of two condensers and a low resistance choke. Terminal voltages with and without loads are indicated on wiring diagram.

"B" SUPPLY

The "B" supply employs a 6P5GT tube operated as a half wave rectifier operating into a condenser input filter of one choke followed by another condenser.

The "A" and "B" circuits are not common to each other or to the chassis. Different tube biasing methods make this necessary.

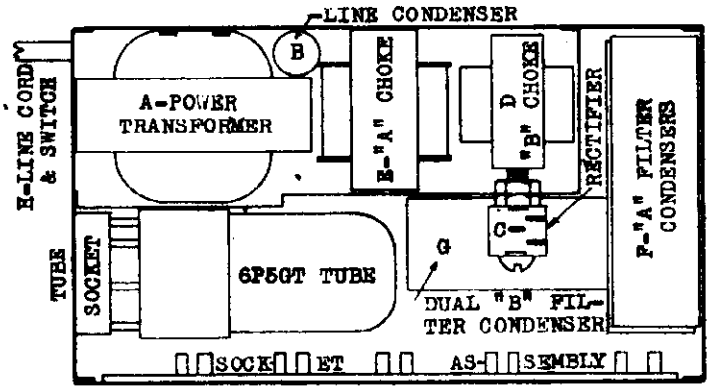
POWER DRAIN

The primary input is 7 watts when the "A" and "B" circuits are loaded as indicated on wiring diagram. The input watts under no-load should not be more than 4.5 watts and the primary current without load not more than 110 MA at 117 volts, 60 cycles.

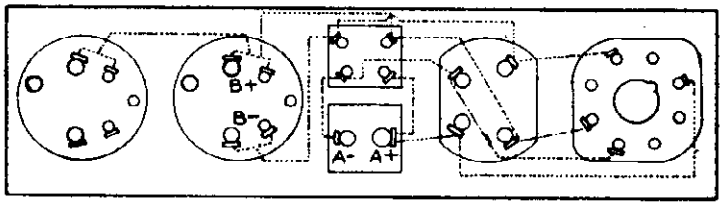
"A" SUPPLY FAILS

When the "A" voltage is excessively low the rectifier, condensers or transformer may be defective. To check the transformer remove one green lead of transformer winding from the rectifier and measure for A.C. voltage indicated on wiring diagram. To check the rectifier remove green lead from choke "E" and condenser "F", -- also

disconnect one side of jumper wire and measure D.C. voltage across rectifier. This should be 1.4 to 1.5 volts.



LOCATION OF PARTS IN CHASSIS



WIRING DIAGRAM OF SOCKET ASSEMBLY (Back)

"B" SUPPLY FAILS

The 6P5GT tube should be checked with a standard tube tester. Care should be exercised in removing this tube as all parts fit closely in chassis. A small screw driver may be used as a light pry behind the base of the tube to assist in removal. Be sure the tube is inserted with proper key alignment to tube socket. Also if a metal base tube, make certain the insulating sleeve of fibre is replaced on the tube base to prevent it from touching or contacting other parts in the chassis.

The transformer may be tested by measuring the secondary plate winding with the red-yellow lead disconnected.

NOVEMBER 15, 1939

SEARS, ROEBUCK & CO. MODEL 5215, Ch. 127.6150
MODEL 5252, Ch. 127.630
THIS CHARGER AND WHAT IT WILL DO MODEL 5253, Ch. 127.620, -1, -
Gas-O-Power Battery Charger

This engine generator has been principally designed as a battery charger and is rated, electrically, at 240 watts, 6 volts.

The engine of this charger is a single cylinder, four cycle "L" head, internal combustion engine air cooled. A ventilating fan, rotating on the crankshaft, drives off engine heat and circulates fresh air to engine and generator.

Engine lubrication is by the splash system from the crankcase, with a splash arm on the connecting rod.

Crankcase capacity is ¾ pint. Gasoline tank capacity is two (2) quarts.

The generator of this charger is of four pole design with four brushes, and supplies Direct Current.

The generator of the charger is directly coupled to the engine (no belts). The armature is keyed to the engine crankshaft which extends through the generator and serves as the generator shaft.

Because the engine of this charger operates constantly at one speed, the charging rate is permanent at approximately 25 amperes. The actual voltage development of this charger is approximately 8 volts, with the battery fully charged, and 6½ volts, when the battery is low in charge.

THE GENERATOR REQUIRES NO LUBRICANT.

The generator will charge from one to three 6 volt batteries of standard automotive and radio size at one time. The time required to charge the batteries depends upon the number of batteries being charged.

The generator is air cooled.

THIS CHARGER CANNOT BE OPERATED WITHOUT A BATTERY AND NO ATTEMPT SHOULD BE MADE TO DRAW ELECTRIC ENERGY DIRECTLY FROM THE GENERATOR.

A maximum of 240 watts of lamp load may be used at one time to incorporate a light line with the charger. Any combination of wattage bulbs may be used as long as the total wattage is not in excess of 240 watts.

The generator will charge the battery at the same time a lamp load is used, if the load does not exceed the rating of the charger.

THE ENGINE OF THIS CHARGER IS NOT INTENDED OR CLAIMED TO BE LARGE ENOUGH TO OPERATE POWER APPLIANCES, EITHER DIRECTLY OR INDIRECTLY, AS THE HORSEPOWER RATING OF THE ENGINE IS APPROXIMATELY 4/10 OR ONE HORSEPOWER.

INSTALLATION AND LOCATION OF CHARGER

The proper location of this charger is of vital importance to insure proper operation and long life.

The motor of the engine and generator of the unit incorporate air cooling. The unit should be operated in a location which permits the proper circulation of cool air. The unit should not be operated in a small closed room, nor should any cover be placed over the unit while operating. A cover may be placed over the unit when not operating to protect it from dirt and dust. The charger must also receive protection from climatic conditions.

Care should also be taken to make sure that the unit is not operating in a location where the circulation of dust and dirt would clog the cooling system, and the charger should not be installed in a hen house or barn.

The unit may be located in a garage, basement (if dry), tool shed, or similar shelter with good ventilation. Do not locate the charger near gasoline or oil storage tanks.

The charger must be in a level and secure position at all times while in operation.

For permanent installation, a concrete mounting base may be formed to fit the base measurements.

DO NOT INSTALL THE UNIT IN LIVING QUARTERS. EXHAUST GASES ARE DEADLY. UNLESS THERE IS AMPLE VENTILATION, OR FACILITIES TO PIPE THE EXHAUST OUTSIDE, THE CHARGER MUST BE LOCATED ELSEWHERE.

If the exhaust extension runs upward from the engine, a water condensation trap should be inserted in the pipe near the engine to prevent condensed moisture in the exhaust line from seeping down into the engine. Water in the engine would cause considerable damage. Empty the water trap frequently.

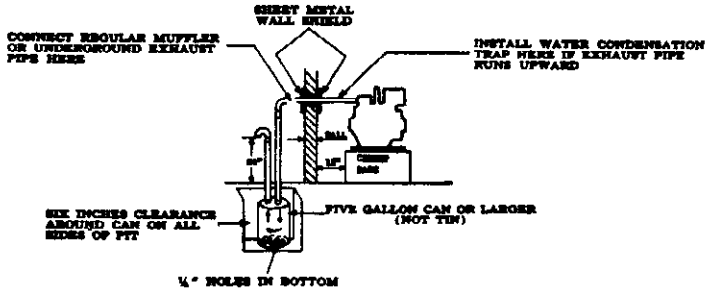
The exhaust line may be piped into a galvanized can, or barrel, buried in the ground for a more quiet muffler. The can or barrel must have holes drilled in its bottom to allow an outlet for condensation. The barrel should rest on a bed of stones or loose gravel. There must also be an extension pipe opening at top of barrel to relieve pressure. It is desirable to fill this underground muffler with course stones.

When piping the exhaust outside through the wall, a sheet metal guard should be placed in opening to prevent direct contact of the pipe to the wall.

One inch diameter flexible tubing is recommended as an exhaust extension, and the exhaust line should be installed as short as possible. Joints and elbows should be eliminated, and the exhaust line should not leak.

Check exhaust back-pressure upon installation. If the engine's operation improves when the exhaust line is disconnected, then the exhaust extension is too long.

Keep the exhaust line clean. Tapping it with a wooden mallet will loosen carbon formation so that it may be cleaned out.



BATTERY CHARGING AND ELECTRICAL INFORMATION

A battery, or batteries of correct voltage must be chosen for operation with this plant (6 volt)

Standard automotive batteries may be used and charged with this plant (6 volt) as well as radio batteries (6 volt), and if a permanent installation hook-up is used, a battery of not less than 145 ampere hour capacity is advisable.

The glass jar farm light batteries are very efficient and dependable, if the proper size is chosen. High capacity batteries will allow a load to be carried at greater length without the necessity of frequent recharging. If a heavy load is used, it is advisable to operate the plant while the load is connected.

If batteries of smaller capacities are attached to the charger for recharging, it is advisable to attach one or two lights on a line taken from the battery to eliminate too rapid a voltage rise. Battery connection must be made parallel to the lamp or line load.

An automobile battery may be charged without removing it from the vehicle. However, be certain to disconnect the automotive terminals from the battery before connecting the charger leads.

DO NOT ATTEMPT TO OPERATE THIS PLANT AT ANY TIME WITHOUT A BATTERY.

No. 4 cable, or heavier, should be used as leads from the plant to the battery to insure proper voltage relay. These leads should be as short as possible.

For better radio reception, this charger should be operated as far away as possible from the set and antenna, as most radios are susceptible to a certain amount of engine noise.

The radio should be operated with a separate battery and removed to the charger when recharging becomes necessary.

It is not advisable to operate the radio if the charger is operating on the radio battery and at the same time.

The radio battery should be at least within three feet of the radio to minimize electrical annoyances. Noise suppressors may be used on the engine of the charger if necessary.

If a connected load is installed to utilize the 240 watt capacity of the charger, the line leads of the charger must be connected to the battery terminals. A fuse block is recommended to be installed between the line lead and battery.

A 30 ampere main line fuse should be used if all the load is carried on one line. If the two circuit distribution system is incorporated, use fuses with a rating proportioned to the number of connected lamps; 5 ampere fuse capacity for each 25 watt lamp.

MODEL 5253, Ch. 127.620, -1, -2 MODEL 5215, Ch. 127.6150
Gas-O-Power Battery Charger SEARS, ROEBUCK & CO. MODEL 5252, Ch. 127.630

NOT LESS THAN NO. 10 WIRE SHOULD BE USED FOR AN EFFECTIVE LIGHT LINE, IF THE LINE IS VERY SHORT, AND NO. 8 IS THE AVERAGE DESIRABLE SIZE.

Line connections should be very securely fastened, and it is advisable to study the individual lighting problem to obtain the greatest efficiency from 240 watts. The use of a group of low wattage lamps is more effective than two or three of greater wattage. The line should not be carried over one hundred and twenty-five feet so as to eliminate voltage drop and dim lights.

DO NOT ATTEMPT TO HANDLE WATTAGE GREATER THAN THE CHARGER'S CAPACITY.

All electrical wiring should be done in a dry location, and it should be made certain that all materials used in the construction of a light line are of good quality.

HOW TO CONNECT GAS-O-POWER FOR BATTERY CHARGING ONLY

The battery should be located as close as possible to the charger. Long leads cause voltage drop and loss of power.

Terminal leads must be of the proper size. Standard automotive cables are very desirable.

Use No. 4 wire or larger.

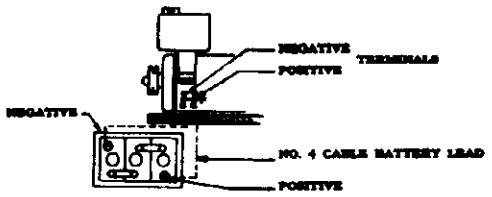
Use heavy screw clamp battery terminals on connections. X-clips are not recommended.

The charger terminals are wing nut connections.

Connect the charger positive (+) post, and the charger negative terminal (-) to the battery negative (-) post.

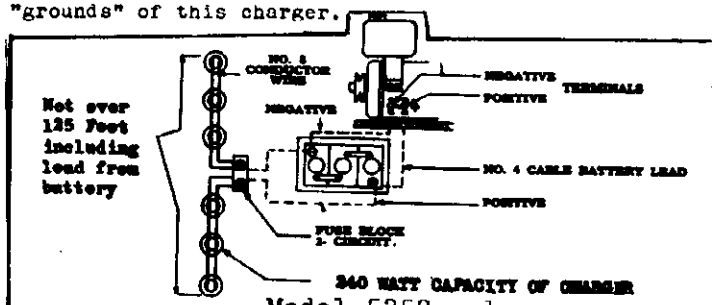
THE NEGATIVE TERMINAL OF THIS CHARGER IS GROUNDED.

Do not attempt at any time, to reverse the "grounds" of this charger.



FOR USE WITH A LIGHTING SYSTEM

HOW TO CONNECT GAS-O-POWER



Model 5252 only

HOW TO START AND STOP THE GAS-O-POWER

1. Fill the crankcase with ⅝ pint of the correct grade of good oil.

   Use S.A.E. No. 20 oil all year around, if average climatic conditions prevail.
   Use S.A.E. No. 30 oil under extreme heat conditions.
   Use S.A.E. No. 10 oil under extreme cold conditions.

   THE CRANKCASE SHOULD BE DRAINED EVERY 50-75 HOURS OF OPERATION.

2. Fill the gasoline tank within ½ inch of top. Use a good grade of white gasoline. It is not necessary to use high-test or colored fluids.

   DO NOT MIX OIL WITH GASOLINE

   Tighten gas tank cap and oil filler plug securely. Make certain that oil drain plug is tight. This unit will not operate satisfactorily with the gas tank cap off.

3. Connect battery.

4. Place choke shutter in a nearly-closed position.

5. Press starting button.

6. Proceed to open choke shutter gradually after engine is operating. (Usual choking can be accomplished by merely holding the thumb and forefinger over choke opening).

7. Adjust the carburetor needle valve after the warm-up period, if engine is not operating smoothly. This adjustment very slightly governs the engine speed until the best operating point is reached for maximum economy.

MODEL 5215, Ch. 127.6150 MODEL 5253, Ch. 127.620, -1, -2
MODEL 5252, Ch. 127.630 SEARS, ROEBUCK & CO. Gas-O-Power Battery Charger

Turn the needle valve to the right (clockwise) to make the mixture leaner, and left (counter-clockwise) to render the mixture richer.

ALWAYS OPEN CHOKE FULLY AFTER WARM-UP PERIOD.

A check valve in the tube, extending into the gasoline tank, prevents engine stalling by not allowing gasoline to flow back into the tank after the piston intake stroke.

MANUAL STARTING may become necessary when the battery does not retain sufficient charge to crank the engine. Wind a rope counter-clockwise (outboard motor principle) around pulley, catching the end in pulley slot Adjust choke then press starting button and pull the rope at the same time. Then release starting button until the engine fires and operates.

Four (4) dry cell batteries will supply electric energy for ignition only, if the regular battery does not retain sufficient electric energy.

TO STOP THIS CHARGER.

Press and hold down the "Stop" button, located on the top of the ignition breaker assembly. Hold the button down until the charger comes to a complete rest.

SYMPTON CHART TO LOCATE DIFFICULTIES

WHEN PLANT WILL NOT CRANK

1. Loose or improper battery connection.
2. Discharged battery.
3. Generator brushes worn or dirty - poor contact.
4. Battery lead cables too small or too long.
5. Starter button - dirty contact.

WHEN PLANT WILL NOT START

1. Empty gasoline tank.
2. Check spark plug for break, dirt or loose Connection.
3. Compression leak. Blown gasket, loose spark plug, improper valve seating.
4. Clogged fuel system. Check strainer valve in gas tank.
5. Poor ignition contacts. Dirty or gap too wide.
6. Flooded spark plug.
7. Defective condenser.
8. Poor grade of gasoline.

WHEN PLANT DOES NOT GENERATE OR CARRY FULL LOAD

1. Generator brushes worn - poor contact.
2. Low engine compression.
3. Shorted armature.
4. Dirty or rough commutator.
5. Reduced engine speed - check ignition and piston assembly, also valves.
6. Adjust carburetor for maximum power.

WHEN ENGINE RUNS HOT

1. Exhaust back-up. Improper discharge.
2. Check ventilation. Is plant installed in surroundings with good air circulation?
3. Check crankcase breather for dirt.
4. Poor grade of gasoline - do not use Naphtha, or natural gasoline, or colored fluids.
5. Low oil level or improper grade for climatic temperature.

WHEN PLANT USES EXCESSIVE AMOUNTS OF OIL

1. Oil should be changed every 50 to 75 hours of operation to prevent stale oil. (depends on hours of continuous operation).
2. Too rich mixture.
3. Piston rings stuck in piston grooves because of improper lubrication, overheating or defective rings.

WHEN ENGINE OPERATES PLANT GENERATOR BUT CURRENT IS NOT AVAILABLE ON A LIGHT LINE

1. Blown fuses.
2. Open line wire.
3. Open line switch.
4. Burned out bulbs.
5. Improper wire size.
6. Carrying lights too great a distance.

IMPROPER LIGHT EFFECTS OR FLICKERING LIGHTS

1. Low battery voltage.
2. Break in line.
3. Loose connection.
4. Shorted battery cell.
5. Battery old or in poor condition.

CARE OF GAS-O-POWER AND BATTERIES

Check oil and fuel before each period of operation.

Clean the charger periodically. Do not allow the fuel lines gas tank, or crankcase to become congested with dirt or sediment. Wipe the charger free of any oil and gasoline if same is spilled when the operating liquids are being replenished.

MODEL 5253, Ch. 127.620, -1, -2 MODEL 5215, Ch. 127.6150
Gas-O-Power Battery Charger SEARS, ROEBUCK & CO. MODEL 5252, Ch. 127.630

All plant and battery connections should be maintained tight. Do not cause an electrical short by allowing the lead wires to make contact with any other wire or metal part. Considerable damage to the generator can be caused if a short occurs.

Use good grades of fuel and lubricant. Change crankcase oil every 50 to 75 hours (depending upon periods of continuous operation).

Keep your batteries filled with Electrolyte (liquid) ½ inch above top of battery plates. Keep the battery terminals clean and tight. Grease them (vaseline) to prevent corrosion.

Keep the batteries clean and dry.

Keep the batteries charged to a certain point. Do not allow them to remain discharged for long periods of time. By keeping the batteries in good condition, their life increases. Old batteries are not efficient and will not take a full charge. Do not overcharge the batteries. However, if the battery has not been used for several weeks, it may be necessary to over charge the battery for a few hours in order to restore the battery to proper condition.

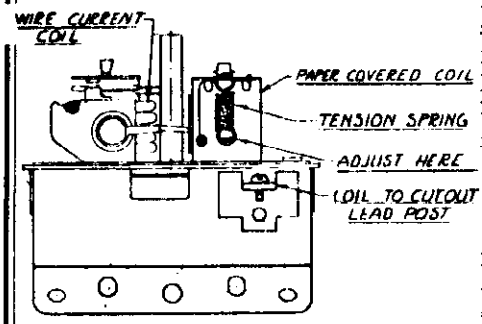
Keep the batteries fully charged in cold weather.

AUTOMATIC VOLTAGE RELAY CUTOUT

The Gas-O-Power Charger Model #127.630 is equipped with the Automatic Voltage Relay Cutout. This cutout is located on the generator housing on the starter button side of the charger. (See Photograph.) The mechanism of the cutout is covered by a metal box-like top which occasionally should be removed to inspect the parts underneath for dirt and dust which will retard operation.

The batteries must be disconnected from the charger while inspecting or adjusting the cutout.

If it has been determined that the charger is stopping before the batteries are receiving a full charge, it may be necessary to make a minor adjustment of the cutout. Remove the cutout cover and study the mechanism carefully. (Identify the correct adjusting position of the cutout as appearing in diagram.) Note the tension spring hooked between the two lugs or spring holder arms which are located directly in front of the paper covered voltage cutout coil. Its position will be further noted in that it is behind the lead post for the connection of the lead wire from the ignition coil to the cutout. (The heavy wire coil at the left-hand side is the current cutout and no attempt at any time should be made to make adjustments for any purposes whatever.)



PROPER VIEW OF CUTOUT FOR ADJUSTMENT

The tension of the spring must be very slightly increased if the charger is stopping before a full battery charge is reached. Place a blunt instrument on the edge of the lower lug or spring holder arm and exert downward pressure bending the lug slightly. Extreme Caution should be exercised when attemtping this adjustment and it may be necessary that the adjustment be made several times until the correct cutout point is reached. The correct cutting out point may be determined by testing the batteries with a hydrometer. The correct gravity reading should be between 1275 and 1300.

If it is determined that the charger continues to operate after a full battery charge has been reached, then the same blunt instruments should be placed under the bottom lug or spring arm exerting pressure slightly upward to decrease the spring tension.

Study the chargers reaction carefully if the cutout adjustment is made. Do not attempt any further adjustment of the cutout than described and if necessary request further information from the Sears store from which you purchased the charger.

SERVICE

NOTE: Because of the compact design and close fitted parts, the operator of this charger should carefully and thoroughly study the construction of both the engine and the generator before service or disassembly is undertaken.

THE CARBURETOR may be unscrewed from position on the gas tank. The needle valve, as well as the check valve in the tank, should be inspected. The gas tank can be removed by unscrewing it from its position on top of generator.

THE IGNITION may be tested by disconnecting and holding the terminal lead to spark plug 1/8 inch from engine frame. Note a hot thick spark when starter button is pressed. Check coil condenser and ignition breaker plunger (spring and point). The spark plug clearance should be between .020 and .030 Breaker point contact should be .022.

MODEL 5215
MODEL 5252
MODEL 5253

SEARS, ROEBUCK & CO.

TIMING of the plant is correct when the line mark (/) on the crankshaft counterweight is directly in line between the camshaft gear teeth marked (O). Timing can be set and checked through the front of engine with the crankcase breather removed, and the charger at eye level.

THE VALVES may be ground by removing from the engine the exhaust line, carburetor, cylinder head and breaker box (interrupter assembly). Force valve spring up, remove stem key and retainers, then remove valves. Place a good valve grinding compound on the bevel edge of the valve and insert back into cylinder. Use a screw driver for grinding and DO NOT USE A VALVE GRINDING TOOL. A valve tool is too heavy, for a great amount of pressure should not be exerted when grinding. The valves do not require frequent grinding. The valve seats should be cleaned before reassembly (wash in gasoline or kerosene.)

VALVE TIMING is correct when the gap between valve stem and tappet is between .010 and .012. After a valve grinding operation, the operator may find it necessary to grind off the valve stem to adjust and obtain the proper clearance.

COMPRESSION may be checked by inspecting the piston rings, gaskets and valve and tappet clearance. Compression loss at the valve seat may be adjusted by grinding the valves and correctly setting the valve and tappet clearance by grinding off the stem to proper clearance.

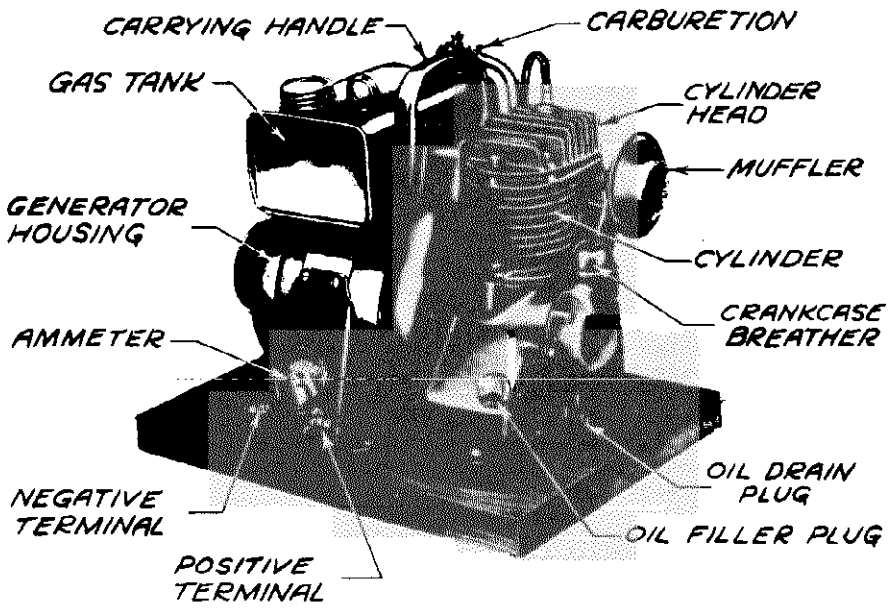
THE STARTER SWITCH should be periodically inspected and disassembled for cleaning, to insure good contact.

THE PISTONS AND PISTON RINGS may be removed from the engine for inspection after the cylinder has first been removed. If the piston rings are worn excessively or broken, they should be replaced. Clean the ring grooves of any foreign deposits. Piston clearance is .004 to .005 with a clearance feeler 3/8 inches wide, and ring openings should be spaced thirty degrees (30°) apart.

CARBON DEPOSITS in the engine should be removed periodically by cleaning with a carbon solvent to prevent valve pitting, overheating, loss of oil and mechanical failure.

THE CRANKCASE BREATHER AND EXHAUST MUFFLER should be periodically inspected and cleaned. A clean muffler eliminates exhaust back-pressure. The crankcase breather can be washed in gasoline. A clogged breather retards cooling which will result in harm to the engine.

THE GENERATOR may be inspected by removing the end housing plate, held by two screws. Note brush condition. They should not stick in the brushholders, but run free on commutator with smooth contact. The brush faces should fit the commutator in a curved arc, as they are designed in this manner. Check the brushholder spring tension for weakness. Replace worn brushes. Brush faces may be smoothed with a piece of "00" sandpaper to improve contact, if roughened. Charging rate of the generator is dependent upon good brush condition. DO NOT OIL ANY PART OF THE GENERATOR. When servicing the generator, extreme care should be exercised to insure against shorting injury to, or dislocation of, any part or wire. The correct position of all parts and connections in the generator should be carefully noted before reassembly. Do not allow any wire or metal part to touch, causing an electrical short.



SEARS, ROEBUCK & CO.

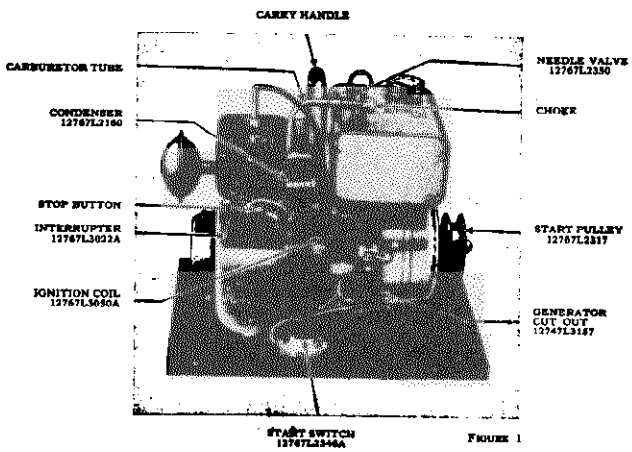


FIGURE 1

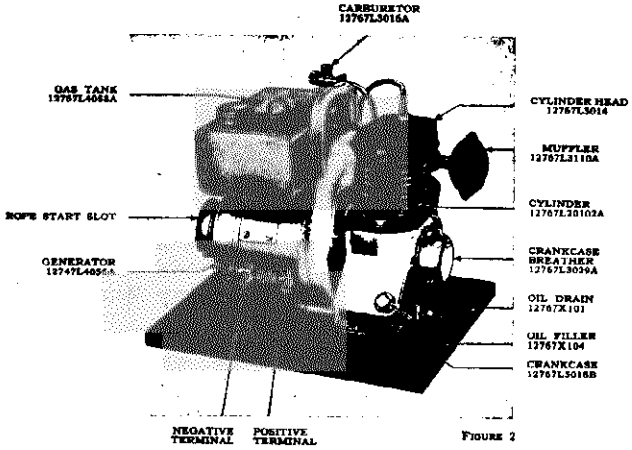


FIGURE 2

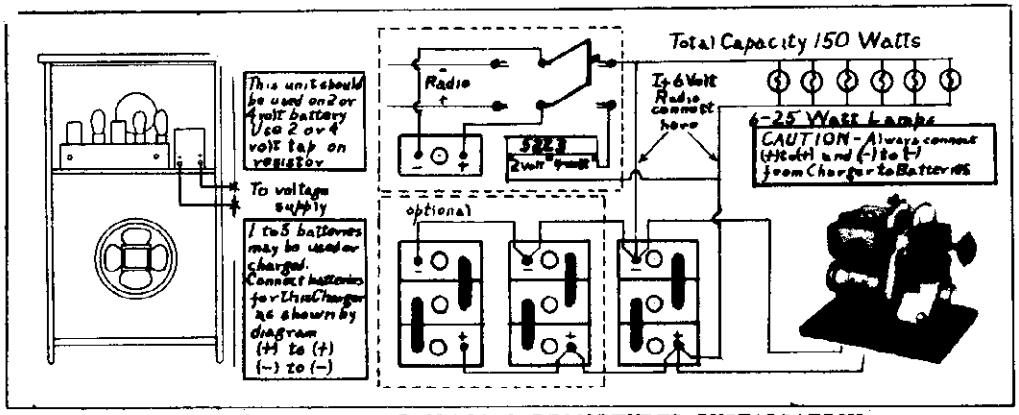


Fig. 1. ILLUSTRATION OF TYPICAL RECOMMENDED INSTALLATION

The above diagram shows connections for charging the radio battery and for six 6 volt 25 watt electric lights. Unless you wish to charge a 2 volt storage battery the extra 6 volt storage battery will not be needed if it is not intended to wire for lights. If a 2 volt storage battery is used a 6 volt battery will be necessary at this point in the circuit for furnishing ignition current to start the engine. It will also be necessary to use the Resistor shown (catalog No. 5223) for charging a 2 volt storage battery or a 4 volt storage battery.

GENERAL INFORMATION AND SERVICE HINTS

1. Handle the charger with care. Do not drop the charger, and keep it in an upright position when filled with fuel and lubricant.

2. WHERE TO INSTALL THE PLANT:

A. LENGTH OF WIRE: The plant should be installed in such a manner that the wires to the lights, batteries and radio will be as short as possible. As the wire offers a resistance to the flow of electricity, the more wire used the lower the voltage will be at the point of use. Similarly, the smaller the wire size the lower the voltage will be at the point of use. This is particularly important in the connection between the plant and the batteries, for the larger the wire size the higher the voltage at the batteries, and the result is a higher charging rate. SEE THE WIRE EXTENSION TABLE BELOW:

WIRE EXTENSION TABLE

IF THE DISTANCE BETWEEN PLANT AND RADIO BATTERY IS:

20 feet use	No. 12 wire
40 feet use	No. 10 wire
60 feet use	No. 8 wire
100 feet use	No. 6 wire
140 feet use	No. 4 wire

MODEL 5215
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SEARS, ROEBUCK & CO.

MODEL 5215

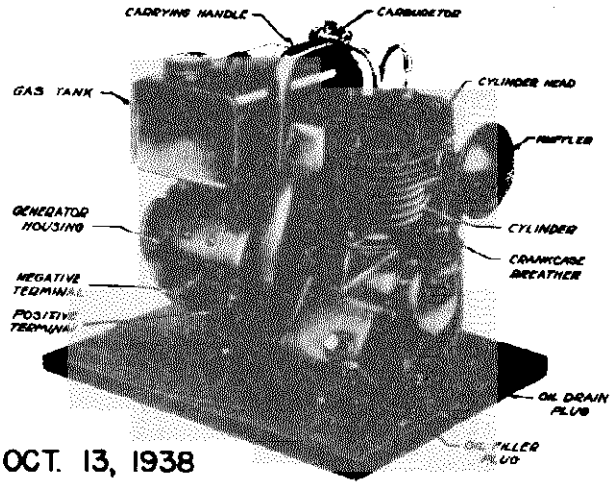
Part No.	Description	No. Req'd.	Shipping Weight	Price Each
12747L3143	ARMATURE	1	4 lb.	7.95
12747L3144	Brushholder,Gene.(with fibre insul. post)	1	11 oz.	1.02
12747L3144	Brushholder,Gene.(with non-insulated grounded post)	1	11 oz.	.90
12747L20124	Cable, Cutout to Starter	1		.14
12767L20160	Carburetor Tube	1	1 ¼ oz.	.10
12767L20161	Carburetor Tube Bushing	2	4 ⅛ oz.	.05
12767L2160	Condenser	1	1 oz.	.24
12767L3001	Connecting Rod	1	1 3/8 oz.	.60
12767L2511A	CUTOUT TO COIL WIRE ASSEMBLY	1	1/4 oz.	.06
12759L20156	Customers Instruction Book	1		.20
12747L3157	Cutout, Voltage Relay Generator	1	6 oz.	.60
12767L4055	Cylinder	1	4 lb. 4 oz.	3.10
12767L20120A	CYLINDER ASSEMBLY-Includes cylinder, exhaust and intake valves, valve springs, lock and retainers, and expansion plug	1	4 lb. 5 oz.	6.00
12747L3142A	FIELD RING ASSEMBLY (6 volt) includes poles and windings.	1	12 lb. 11 oz.	7.20
12767L4058A	GASOLINE TANK ASSEMBLY-Includes tank, mounting bracket, cap & air vent	1	2 lb.	1.40
12747L4056A	GENERATOR ASSEMBLY-Includes generator main body, armature, brushes, brushholder and field ring assembly	1	19 lb.	15.00
12747L2599	Generator to Base Screw Spacer	1	3/8 oz.	.02
12767L20100	Ignition Coil Mounting Spacer	1	1/8 oz.	.04
12767X202	Lockwasher - Cylinder to Crankcase	3		.01
12767X201	Lockwasher - Gas Tank to Generator	4		.01
12767X201	Lockwasher - Generator to Crankcase	2		.01
12767L2313	Lockwasher - Interrupter to Crankcase	2		.01
12767L3110A	MUFFLER ASSEMBLY	1	6¼ oz.	.25
12767X1897	Nut - Coil Bracket Screw	1	1 1/6 oz.	.01
12767L20122	Plug, Crankcase Stud Hole	1	1/8 gram	.06
12767X2211	Plug, Cylinder Expansion	1	1/4 gram	.01
12767X101	Plug 1/4" Oil Drain	1	1/2 oz.	.02
12767X104	Plug 3/4" Oil Filler	1	2 oz.	.04
12767X3009	Screw-Coil Bracket to Tank Bracket	1	1/8 oz.	.01
12767X3107	Screw-Generator to Crankcase	2	2 gram	.02
12767L20108	Valve Spring	2	3/8 oz.	.05

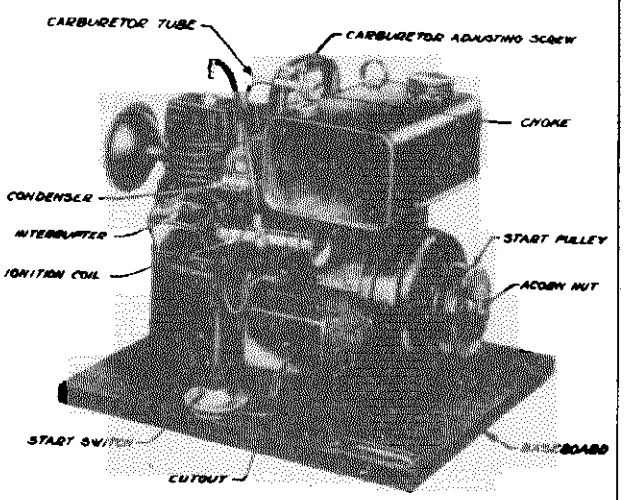
Model 5253

Part No.	Name	No. Req'd	Price Each
12767L3029A	CRANKCASE BREATHER ASSEMBLY. (Below Engine Serial Number 21008)	1	.45
12767L20529A	CRANKCASE BREATHER ASSEMBLY. (Above Engine Serial Number 21007)	1	1.80
12767L20494	Crankcase Breather Stud to Crankcase. (Used with 12767L20529A Breather Assembly	2	.03
12767L20151	Crankcase Breather Stud Lockwasher	2	.01
12747L3157	Cutout, Voltage Relay Generator. (Used Charger 127.6150)	1	.60
12747L3148	Cutout, Automatic, Voltage Relay Generator. (Used Charger 127.620)	1	2.40
12767L4062	Cylinder	1	3.10
12767L20174A	CYLINDER ASSEMBLY--Includes cylinder, exhaust and intake valves, valve springs, lock and retainers, and expansion plug	1	5.00
12747L3189A	FIELD RING ASSEMBLY (6 volt) Includes poles and windings	1	7.20
12767L4058A	GASOLINE TANK ASSEMBLY--Includes tank, mounting bracket, cap and air vent	1	1.40
12747L4079A	GENERATOR ASSEMBLY--Includes generator main body, armature, brushes, brushholder and field ring assembly	1	15.00
12767X3279	Screw--Cutout to Generator	1	.01

MODEL 5253

SEARS, ROEBUCK & CO.





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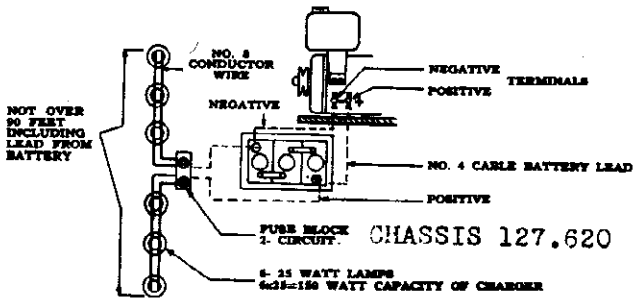

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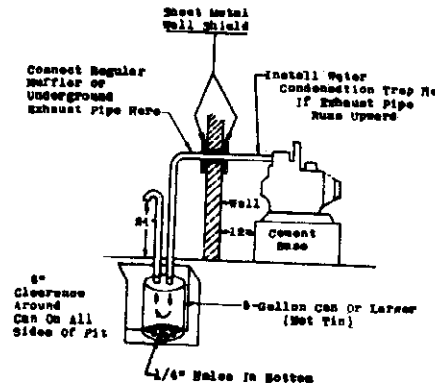


HOW TO START AND STOP THE GAS-O-POWER

SUBJECT: REVISION OF 127.620 GAS-O-POWER BATTERY CHARGER

The following changes are now in production and will be effective on all GAS-O-POWER plants numbered A-15000, upward. There has been a change in the design of the unit. The generator housing has been slotted to allow the free passage of air, and the installation of the larger fan, L3416, greatly improves the cooling of the plant.

The cylinder is interchangeable as an assembly and is to be supplied for all service replacements, but the valves, springs, retainers, and locks are not interchangeable with the old parts which must be supplied for service on all 127.620 plants, the engine number of which is not prefixed with the letter (A). The cylinder head is not interchangeable unless the spark plug is also changed. The 14 m.m. spark plug cannot be supplied for service, its use being restricted to production. The new piston is interchangeable with the old and will be furnished for all service replacements. The piston rings are also interchangeable. The new crankcase is interchangeable with the old.

The difference between 127.620-1 and 127.620-2 is the change of the fan, #L3416 superseding L3124. These parts are not interchangeable and L3124 must be supplied for service on all 127.620 and 127.620-1 plants.

SUPPLEMENT #1
FEBRUARY 20, 1940

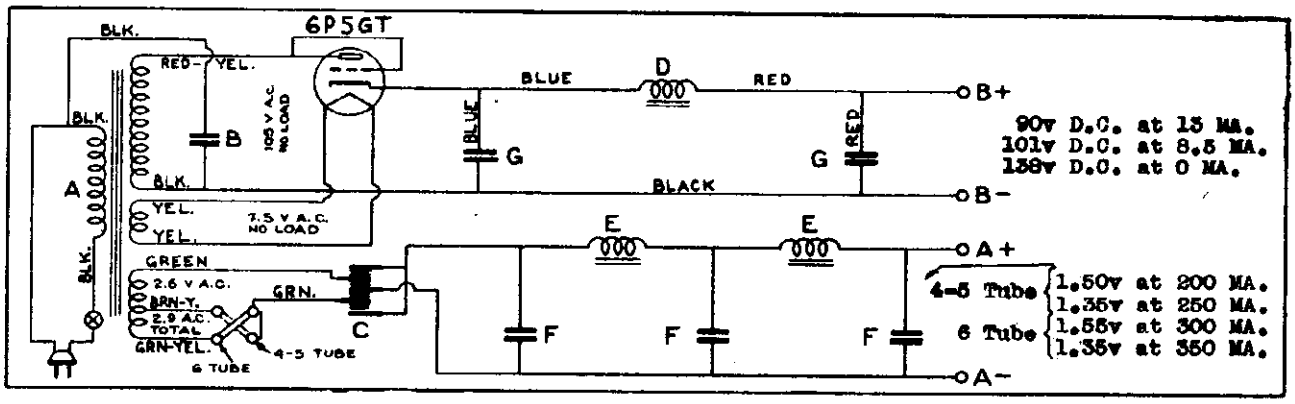
PART NO.	DESCRIPTION	SELLING PRICE EACH
12767L20594A-1	Cylinder Assembly	5.00
12767L20551	Insert - Ex. Valve Seat	.12
12767L20549	Valve Exhaust & Intake	.44
12767L2014	Valve Spring	.02
12767L20592	Valve Spring Retainer	.05
12767L20552	Valve Spring Retainer Pin	.01
12767L3419	Piston	.86
12767L20546	Piston Ring	.15
12767L20547	Piston Ring	.20
12767L20548	Piston Ring	.24
12767L4089	Cylinder Head	1.00
12767L3411A	Cylinder Head Baffle Assembly	.50
12767L3417A	Cylinder Head Baffle Assembly	.50
12767K4085A	Crankcase Assembly	6.40
12767L3416	Fan and flywheel, for 127.620-2	1.00
12767L3124	Fan and flywheel, for 127.620 and 127.620-1	1.00
	Spark Plug 14 m. m. - (Cross Country type C-14, Source - Dept. 28)	

PARTS LIST

Prices subject to change without notice.

Part No.	Name	No. Req'd	Price Each
12747L2304	Ammeter	1	.78
12747L3102	Ammeter Mounting Bracket	1	.13
12747L3108	Armature	1	12.00
12747L2034	Armature Support	1	.70
12767L4084	Baseboard	1	1.00
12747L2347	Brush, Generator	4	.50
12747L3109	Brushholder Generator (less brushes)	1	1.80
12767L2008A	CAMSHAFT ASSEMBLY--Includes the gear	1	1.55
12767L2006	Camshaft Idler Shaft	1	.14
12767L3016A	CARBURETOR AND CHECK VALVE ASSEMBLY	1	1.00
12767L2350	Carburetor Adjusting Screw, needle valve	1	.18
12767L2349	Carburetor Check Valve	1	.63
12767L2024	Carburetor Gasket	1	.01
12767L2083	Carburetor Tube to Cylinder	1	.10
12767L2160	Condenser	1	.24
12767L3001	Connecting Rod	1	.60
12767X601	Cotter Pin, Connecting Rod Washer	1	.01
12767L5029A	CRANKCASE ASSEMBLY--Includes oil drain plug, oil filler plug, crankshaft oil seal, bushing engine end, studs cylinder to crankcase, and screws, generator to crankcase	1	6.40
12767L20529A	CRANKCASE BREATHER ASSEMBLY	1	1.80
12767L20466	Crankcase Breather Gasket	1	.05
12767L3128A	CRANKSHAFT ASSEMBLY--Includes crankshaft, crankpin and counter balance, crankshaft gear, crankshaft gear drive pin and counterweight pin	1	2.70
12767L2004	Crankshaft Ball Bearing--Generator End	1	1.20
12767L2016	Crankshaft Bearing Lock Ring	1	.01
12767L2310	Crankshaft Bushing--Engine End	1	.20
12767L2031	Crankshaft Oil Seal	1	.20
12767L2317	Crankshaft Pulley	1	.40
12767L2305	Crankshaft Shim	1	.01
12759L20531	Customers Instruction Book	1	.20
12747L3103	Cutout, Automatic Voltage Relay--Generator	1	2.40
12767L20445A	CYLINDER ASSEMBLY--Includes cylinder, exhaust and intake valves, valve springs, lock and retainers and expansion plug	1	5.00
12767L4083	Cylinder head	1	1.00
12767L2023	Cylinder Head Gasket	1	.05
12767L2040	Cylinder to Crankcase Gasket	1	.05
12767L3211A	CUTOUT TO COIL WIRE ASSEMBLY	1	.05
12767L3124	Fan and Flywheel	1	1.00
12767L3119	Fan Air Intake Plate	1	.10
12747L3178A	FIELD RING ASSEMBLY (6 Volt) Includes poles and windings	1	9.00
12767L4003A	GASOLINE TANK ASSEMBLY--Includes tank, mounting bracket, cap and air vent	1	1.90
12747L4066A	GENERATOR ASSEMBLY--Includes generator main body, armature, brushes, brushholder and field ring assembly	1	21.00
12747L4050A	GENERATOR END HOUSING ASSEMBLY	1	2.30
12767L2017	Ignition Breaker Plunger	1	.14
12767L2018	Ignition Breaker Plunger Spring	1	.01
12747L2050A	IGNITION COIL ASSEMBLY (6 Volt)	1	1.80
12767L2158	IGNITION COIL MOUNTING BRACKET	2	.05
12747L2086A	IGNITION COIL TO BREAKER BOX WIRE ASSEMBLY	1	.05
12747L2084A	IGNITION COIL TO SPARK PLUG WIRE ASSEMBLY	1	.08
12747L3022A	INTERRUPTER ASSEMBLY	1	1.20
12747L2376	Key, Woodruff--Armature	1	.02
12767X508	Key, Woodruff--Crankshaft Pulley	1	.01
12767X508	Key, Woodruff--Fan	1	.01
12767L2313	Lockwasher, Carburetor to Bracket	2	.01
12767L2313	Lockwasher, Interrupter to Crankcase	2	.01
12767L2313	Lockwasher, Start Switch Bolts	2	.01
12767L20150	Lockwasher, Crankshaft Pulley	1	.01
12747X203A	Lockwasher, Shakeproof, Battery and Line Terminal	2	.01
12767L20151	Lockwasher, Crankcase Breather Stud	2	.01
12767L20151	Lockwasher, Miscellaneous other than listed	6	.01
12767L3110A	MUFFLER ASSEMBLY	1	.30
12767X1896	Nut, Coil Bracket Screw	1	.01
12767X18171	Nut, Acorn--Crankshaft Generator End	1	.04
12767X1801E	Nut, Cylinder to Crankcase	3	.01
12767X1800C	Nut, Generator, Breather to Crankcase	6	.01
12747L2306	Nut, Hex--Battery Terminals	3	.02
12767L3000	Piston (Standard)	1	.86
12767L2357	Piston (.005 O/S)		.88
12767L2358	Piston (.010 O/S)		.86
12767L3000A	PISTON ASSEMBLY--Includes piston, piston pin, piston rings, retainer rings	1	1.52
12767L2010	Piston Pin	1	.05
12767L2012	Piston Pin Retaining Ring	2	.01
12767L20125	Piston Ring--Standard Plain Compression	1	.15
12767L20145	Piston Ring--.005 O/S Plain Compression	1	.20
12767L20163	Piston Ring--.010 O/S Plain Compression		.20
12767L20111	Piston Ring--Standard Corner Grooved Compression	1	.20
12767L20143	Piston Ring--.005 O/S Corner Grooved Compression		.25
12767L20164	Piston Ring--.010 O/S Corner Grooved Compression		.25
12767L20112	Piston Ring--Standard Oil Control	1	.24
12767L20144	Piston Ring--.005 O/S Oil Control		.30
12767L20165	Piston Ring--.010 O/S Oil Control		.30
12767L2025	Plug Camshaft Idler Shaft Hole	1	.06
12767X101	Plug 1/4" Oil Drain	1	.02
12767X3279	Screw--Breaker Box to Crankcase	2	.01
12767X3804	Screw--Carburetor to Bracket	2	.01
12767X3804	Screw--Carburetor to Gas Tank	2	.01
12767X3307	Screw--Coil Bracket to Crankcase	1	.01
12767X3804	Screw--Condenser to Crankcase	1	.01
12767X3233	Screw--5/16--18 x 1-1/4 Cylinder Head to Cylinder	3	.02
12767X3153	Screw--5/16--18 x 3/4 Cylinder Head to Cylinder	3	.02
12767X3109	Screw--Gas Tank to Generator	4	.02
12767X3209	Screw--Engine end Generator to Baseboard	3	.02
12767L2314	Screw--Starting Switch to Baseboard	2	.01
12747L20431	Screw--Hex Head, Battery and Line Terminals (Positive)	2	.01
12747L20430	Screw--Hex Head, Battery Terminal (Negative)	1	.01
12767L2309	Screw--Cutout Mounting	2	.02
12767L2309	Screw--Ammeter Bracket to Baseboard	2	.02
12767L2348	Spark Plug	1	.35
12747L2346A	Starter Switch Assembly	1	1.14
12767X1950A	Stud, Cylinder to Crankcase	3	.03
12767X4027	Stud, Generator to Crankcase	2	.07
12767L20494	Stud, Breather to Crankcase	2	.03
12767L2013	Valve, Exhaust and Intake	2	.40
12767L20178	Valve Spring	2	.05
12767L2019	Valve Spring Retainer	2	.02
12767L2020	Valve Spring Retainer Lock	2	.01
12767L2015	Valve Tappet	2	.06
12767L2253	Washer--Connecting Rod Thrust	1	.01
12767X1469	Washer--Engine to Base	6	.01
12747L2307	Washer, Insulating--Positive Terminals	2	.02
12747L2308	Washer, Insulating--Negative Terminals	2	.02
12747L2397	Washer, Plain--Battery Terminal (Negative)	1	.01
12747X1409	Wing Nut--Battery Terminals	3	.03
12747L2316	Wire, Ground--Generator to Cutout	1	.05
12747L20499A	WIRE ASSEMBLY--Ammeter (Negative) to Start Switch	1	.05
12747L20526A	WIRE ASSEMBLY--Ammeter (Negative) to Battery Positive Terminal	1	.05
12747L20463A	WIRE ASSEMBLY--Cutout to Ammeter (Positive)	1	.18
12747L20440A	WIRE ASSEMBLY--Ammeter (Negative) to Start Switch	1	.14
12747L2312A	WIRE ASSEMBLY--Ammeter (Negative) to Battery Positive Terminal	1	.14

SEARS, ROEBUCK & CO.



WIRING DIAGRAM FOR SILVERTONE MODEL 5303 POWER SHIFTER

"A" SUPPLY

The "A" Supply is obtained from a full wave copper sulfide rectifier filtered by a condenser input filter consisting of three condensers and two low resistance chokes. A tap on the power transformer allows the voltage on the rectifier to be changed giving two "A" load voltages. Terminal voltages for various loads are indicated on the wiring diagram.

"B" SUPPLY

The "B" supply employs a 6P5GT tube operated as a half wave rectifier operating into a condenser input filter of one choke followed by another condenser.

The "A" and "B" circuits are not common to each other or to the chassis. Different tube biasing methods make this necessary.

POWER DRAIN

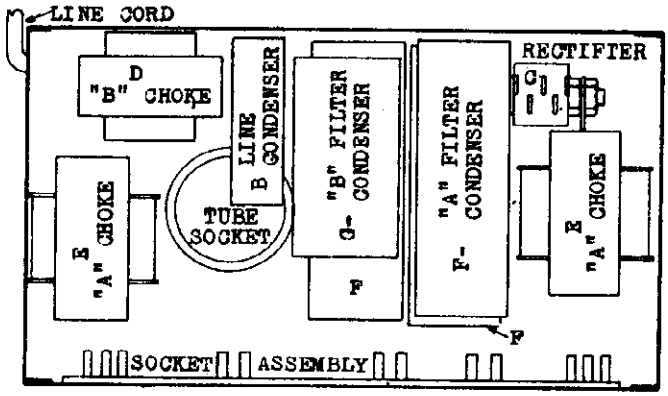
The primary input is 8 watts when the "A" and "B" circuits are loaded. The input watts under no-load should not be more than 4.5 watts and the primary current without load not more than 115 MA at 117 volts, 60 cycles.

"A" SUPPLY FAILS

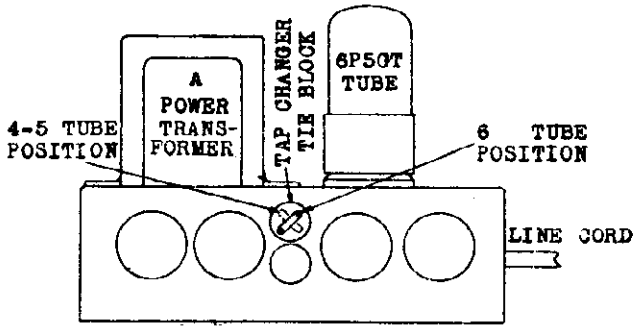
When the "A" voltage is excessively low the rectifier, condensers or transformer may be defective. To check the transformer remove one green lead of transformer winding from the rectifier and measure for A.C. voltage indicated on wiring diagram. To check the rectifier remove green lead from choke "E" and condenser "F", -- also disconnect one side of jumper wire and measure D.C. voltage across rectifier. This should be 1.4 to 1.5 volts with the tap changer tie block in the 4-5 tube position.

"B" SUPPLY FAILS

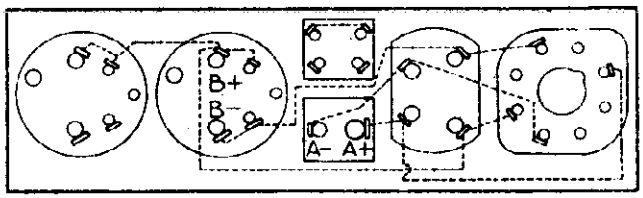
The 6P5GT tube should be tested with a standard tube tester. The transformer may be tested by measuring the A.C. voltage across the secondary plate winding with the red-yellow lead disconnected.



LOCATION OF PARTS IN CHASSIS



LOCATION OF PARTS ON CHASSIS



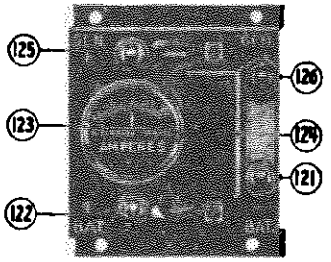
WIRING DIAGRAM OF SOCKET ASSEMBLY (Back)

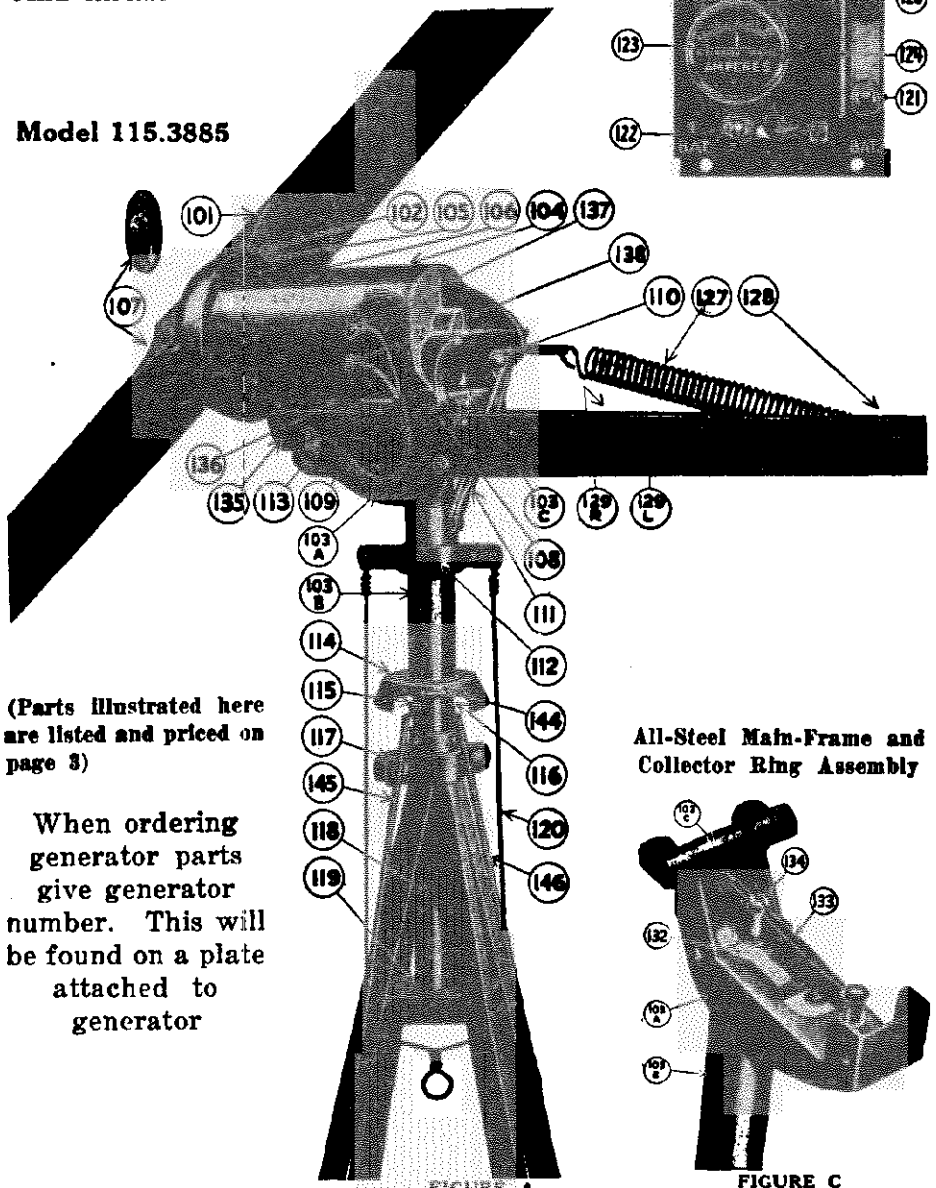
NOVEMBER 15, 1939

KEY TO PARTS PRICE LIST
And Installation Instructions

Model 115.3885

Fig. B. Complete Instrument Panel





(Parts illustrated here are listed and priced on page 3)

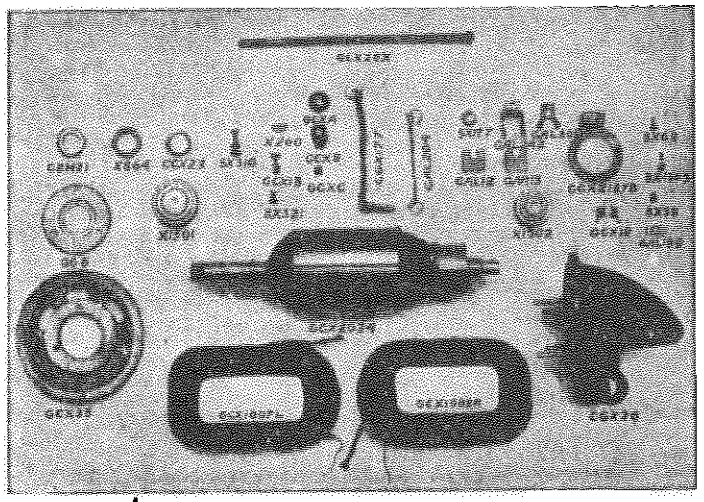
When ordering generator parts give generator number. This will be found on a plate attached to generator

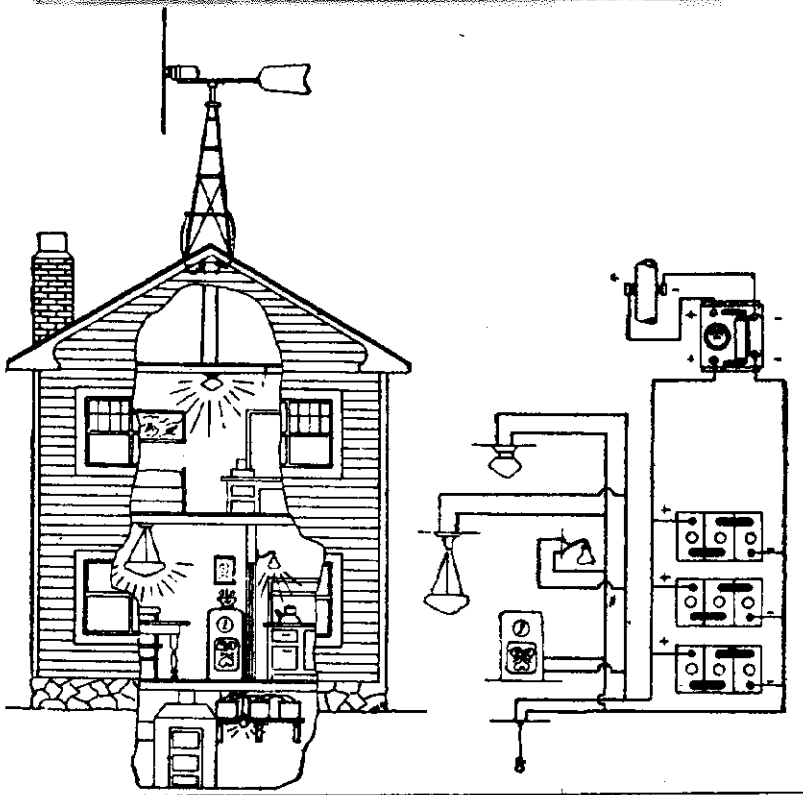
FIGURE A

All-Steel Main-Frame and Collector Ring Assembly

FIGURE C

GENERATOR PARTS





SIX VOLT 15 AMPERE AIR-CHARGER

ASSEMBLING MAIN-FRAME

Note from Fig A, that the main frame head assembly consists of three integral parts. (No. 103A) the pressed steel main frame proper, (103B), the Turntable pipe, and (103C) the trunnion pin clamp. These are all electrically welded together and listed as part No. 103. In this, is mounted the collector ring assembly, which consists of the positive contact brush (133) and the negative brush assembly (132). To assemble the charger, bolt tail arms 129R and 129L to main frame as illustrated in Fig. A, using ½" x5/16" square head bolts, nuts and lockwashers having the nuts on the outside. Leave these bolts loose until trunnion pin clamp bolts are in place and tightened around trunnion pin. Then tighten the other bolts. Place cable clamps (113) over the front bolt on right hand side as you face the charger. Place distributor box cover (135) in position as shown in Fig. A, page 8. Set generator in place and slide trunnion pin (108) through the generator hinge lugs, distributor box cover ears, and trunnion pin clamp (103C). Insert 5/16x¾" square head bolts through holes in tail arms (129R and 129L) and up through holes in trunnion pin clamp (103C) and tighten down nuts over lockwashers. Then tighten other bolts. Slide throwout collar (112) and throwout bale (111) up on to turntable pipe (103B) and connect throwout bale (111) to fin on rear of generator using throwout bale pin, (No. 110), washer and cotter key, which also attaches clevis to fin. Place governor spring tail arm clip and spacer (128) in position between tail arms and bolt loosely. Hook one end of governor spring in hole in tail arm clip and spacer (128) and attach other end to clevis on generator tail fin. The tail vane comes in two sections and is bolted between the tail arms using three ½x¼" bolts, nuts and lockwashers. Now tighten all bolts carefully.

ATTACHING CABLE

After main frame assembly is completed refer to illustration and note carefully position of generator cable No. 109. Connect the red positive wire to positive generator post No. 138 between the two hexagon nuts. Connect the black negative wire to the negative screw No. 137 which is just above the positive post. Fasten cable in position under cable clamp No. 113 as shown.

PLACING MAIN-FRAME ON TOWER

Before you proceed to mount main frame on tower mast head, place the turntable ball bearing (No. 144) on mast head with the name and figures on bearing, up. Now, place small weather cap (No. 114) over the top of bearing with flange down. Before you climb tower to install head let us caution you to use some kind of a safety belt device, just in case you should slip or become over balanced. It is advisable to tie a rope around generator and main-frame assembly and pull them up in that manner. Slide main-frame pipe (103B) down over mast head (118) being sure that you do not allow machine to drop as to do so might injure the ball thrust bearing.

PROPELLER MOUNTING

Insert two 5/16x1½" machine bolts through propeller front plate (No. 107) and through holes in propeller. Place propeller hub spinner cap (102) in position over generator hub with flange toward generator. See Fig. 9 below. This part of the propeller assembly can be done before propeller is taken up on tower for mounting on the generator. In attaching the propeller to the propeller hub (No. 105), screw bolts into the threaded holes of the hub. BE SURE THE FLAT SURFACE OF THE PROPELLER FACES WIND, as stated on small sticker. Make sure to tighten down propeller bolts evenly.

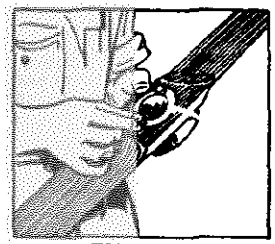


FIGURE 9

JUNE 20, 1938

RETAIL SELLING PRICES PREPAID
PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Part No.	Part Name	Shipping Weight Lb	Oz	Selling Price (each)
101	Propeller	4		$ 1.87
102	Propeller Hub Spinner		10	.15
103	Main Frame (103 A, B and C Assembly)	4		.70
104	Generator Brush Cover		7	.20
105	Propeller Hub (Concealed)	1		.35
106	Generator	25		10.85
	Generator Exchange			7.00
107	Propeller Plate		5	.09
108	Trunnion Pin		6	.10
109	Generator Cable Assembly		2	.25
110	Throwout Bale Pin & Clevis		3	.10
111	Throwout Bale		3	.10
112	Throwout Swivel Yoke Assem.	1		.17
113	Generator Cord Clamp		1	.03
114	Tower Terminal Weather Cap		5	.10
115	Positive Mast Head Terminal (Order 118)			
116	Negative Mast Head Terminal (Order 118)			
117	Tower Leg Top Clamp, Pr.		11	.12
118	Tower Mast Head Complete	4		1.00
	(Exchange Price)			.50
119	Inner Tower Bracket		8	.10
120	Throwout Loop (Not Furn.)			
121	Negative Battery Lead Post		2	.04
122	Positive Battery Lead Post		2	.04
123	Ammeter		3	.42
124	Relay Cutout		10	.67

Part No.	Part Name	Shipping Weight Lb	Oz	Selling Price (each)
125	Positive "Gen" Post		2	.04
126	Negative "Gen" Post		2	.04
127	Governor Spring		6	.10
128	Governor Spring Clip & Spacer		2	.05
129R	Tail Arm (Right)	3		.30
129L	Tail Arm (Left)	3		.30
130	Tail Vane	3	8	.79
131	Negative Mast Head Collector Plate		1	.09
132	Negative Collector Brush Assembly		2	.15
133	Positive Collector Brush		3	.15
134	Positive Collector Electrode		1	
135	Distributor Box Cover	1	1	.15
136	Generator Cushion Rest		2	.10
137	Negative Generator Terminal		2	.04
138	Positive General Terminal		2	.04
139	Short Tower Girt		5	.08
140	Upper Tower Leg	3		.30
141	Medium Tower Girt		12	.10
142	Wire Tower Brace		8	.17
143	Tower Foot		5	.09
144	Turntable Ball Bearing		4	.25
145	Pos. Wire to Inst. Panel			
146	Neg. Wire to Inst. Panel			
147	6-Volt Inst. Panel Complete	1	6	1.35
151	4-Volt Inst. Panel Complete	1	5	1.50
148	2-Volt Inst. Panel Complete	1	5	1.50
149	Long Tower Girt	1	1	.14
150	Lower Tower Leg	3		.30

GENERATOR PARTS

Part No.	Generator Part	Shipping Weight Lb	Oz	Selling Price (each)
GCX20X	Frame Screw		4	$ .17
GCX1007	Field Coil, Right	1	1	1.05
GCX1008	Field Coil, Left	1	1	1.05
GCX36	Commutator End Plate	3		3.15
GAL12	Brush (Main)		1	.10
GAR13	Brush (Third)		1	.10
GAL2012A	Set of Three Brushes (Not Illustrated)		4	.28
GCX19	Brush Spring		1	.08
8X59	No. 8 3/32x3/16 Round Head Screw		1	.05
8X	No. 8/32x3/8 Flat Head Screw		1	.05
GAL199	Brush Screw Block		1	.05
GAL204	Ground Connector Assembly		2	.14
GAL205	Third Brush Plate Retaining Spring		1	.04
GAL242	Brush Holder		3	.08
GAL2167B	3rd Brush Holder Plate		2	.29

Part No.	Generator Part	Shipping Weight Lb	Oz	Selling Price (each)
X1052	Commutator End Bear'g		5	1.90
GBM21	Armature Shaft Nut		2	.07
GCX23	Hub Spacer		2	.06
X864	.669 Lock Washer		1	.07
X260	No. 5 Woodruff Key		1	.07
GCX2034	Armature	7	8	4.50
	Armature Exchange			3.50
GCX35	Drive End Head	1	0	1.60
GG6	Bearing Retainer		2	.07
8X316	Nut, Washer & Bolt		2	.15
X1501	Front Bearing		6	2.10
8X321	Ground Screw		1	.06
8X177	Positive Nut		2	.06
GCX177	Pos. Term. & Lead		2	.15
GCX-A-B-C	Pos. Term. Insul. Wash		3	.10
8X1505	No. 8—32x9/16 Bdg. Head Screw		1	.06
GCX1B	Field Ground Screw & Nut		1	.10

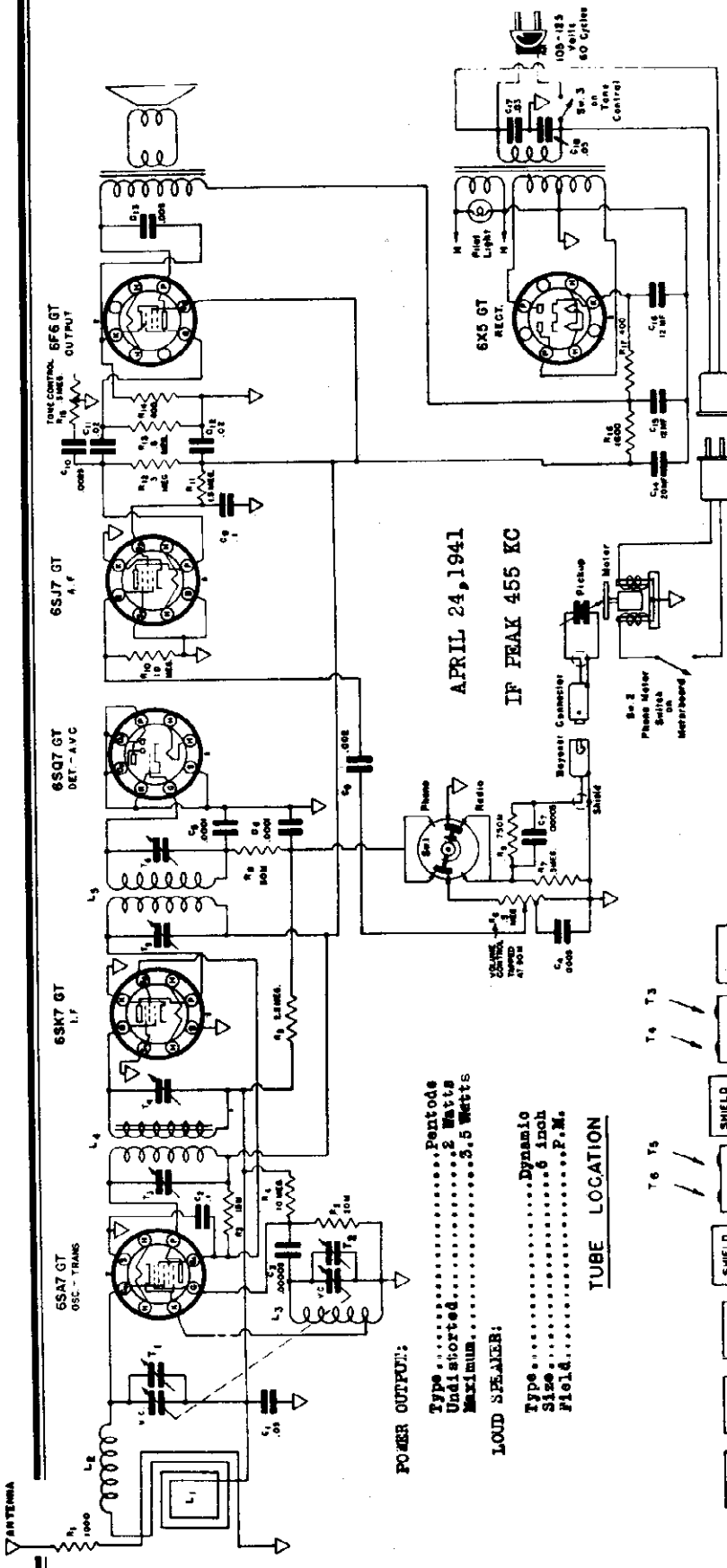
FIGURE 10

PROPELLER TRACK

After propeller has been placed on charger, take a ruler and measure the distance from the propeller tip to the tower as shown in Figure 10. Now turn the propeller half over and measure the distance between the tower and other tip. The measurements should be same. Should there be a difference the bolt on the side which the tip is closest to the tower should be loosened and the other bolt should be tightened more. Should you still be unable to make propeller track, you will have to loosen both bolts and place a broad tin shim between propeller and hub.

MODEL 5721
Chassis 110.418

SEARS, ROEBUCK & CO.



POWER OUTPUT:

Type.....Pentode
Undistorted.....2 Watts
Maximum.....3.5 Watts

LOUD SPEAKER:

Type.....Dynamic
Size.....6 inch
Field.....P.M.

TUBE LOCATION

ALIGNMENT PROCEDURE

Output meter connection.....Across primary output transformer

Connection of generator ground.....To chassis

Generator modulation.....App. 30% @ 400 cycles

Position of volume control.....Fully clockwise

POSITION OF DIAL POINTER	GENERATOR FREQUENCY	GENERATOR CONNECTION	TRIMMERS ADJUSTED	TRIMMER FUNCTION
535 Ko	455 ko	Stator R.F.Section	T6,T4	I.F.
			T5,T3	
1500 ko	1500 ko	" " "	T2,T1	Osc, R. F.

See Note below

It is advisable to repeat the entire alignment procedure in the original order to insure greater accuracy.

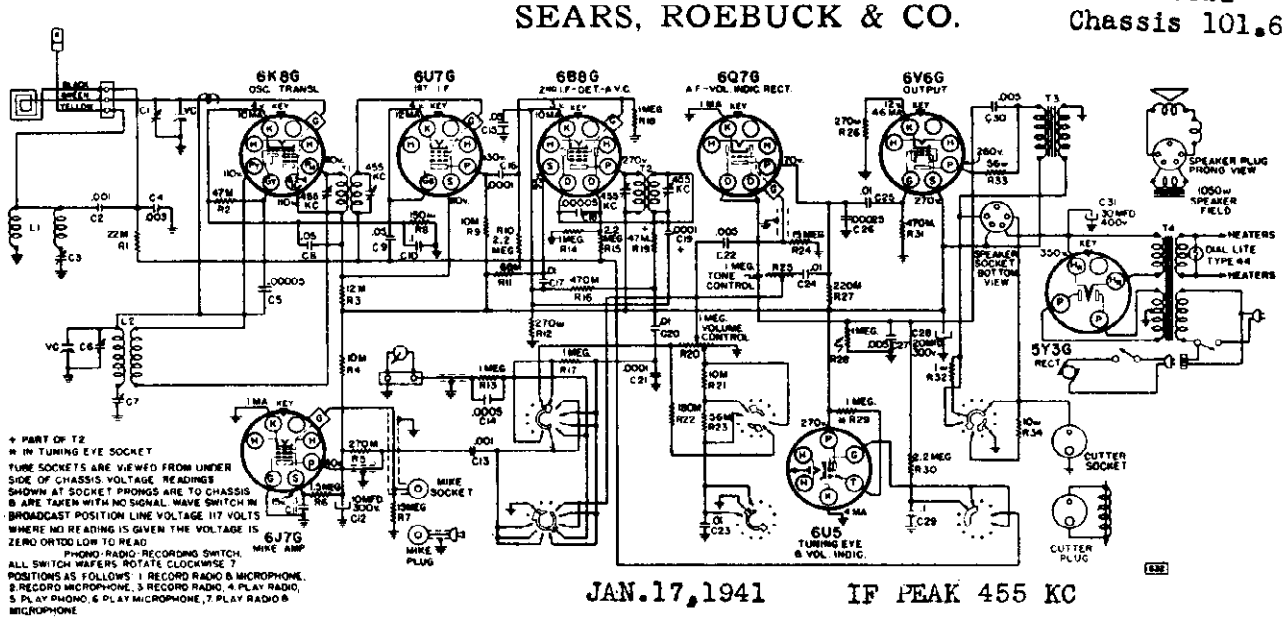
Always keep the output from the test oscillator at its lowest possible value. As the sensitivity is increased by alignment, the generator output should be reduced correspondingly.

***Run a wire from the output terminal of the generator, having it come near the receiver. However, no metallic connection is made between the signal generator and the receiver.

FOR (ERWOOD) NEW PRODUCTS 220-320 SERIES RECORD CHANGER, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

SEARS, ROEBUCK & CO.

MODEL 5621
Chassis 101.632



JAN.17,1941 IF PEAK 455 KC

PRELIMINARY: **ALIGNMENT PROCEDURE**

Output meter connection . . . . . Across loudspeaker voice coil
Output meter reading to indicate 500 milliwatts . . . . . 1.9 volts
Approximate microvolts input for 500 milliwatts 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
Connection of generator ground lead . . . . . Receiver chassis
Generator modulation . . . . . 30%, 400 cycles
Position of Volume Control . . . . . Fully clockwise
Position of Tone Control . . . . . Counter-clockwise (HI)
Position of Dial Pointer with variable fully closed . . . . . On mark to left of 540 kc calibration mark

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
Closed	455 kc	.1 mfd.	6K8G Grid	T2,T1	IF	—
600 kc	455 kc	.00005 mfd.	Ant. Clip	C3*	Wave Trap	--
Fully open	1620 kc	.00005 mfd.	Ant. Clip	C6	Oscillator	--
1400 kc	1400 kc	.00005 mfd.	Ant. Clip	C1	Translator	125
600 kc (rock)	600 kc	.00005 mfd.	Ant. Clip	C7	Padder	55

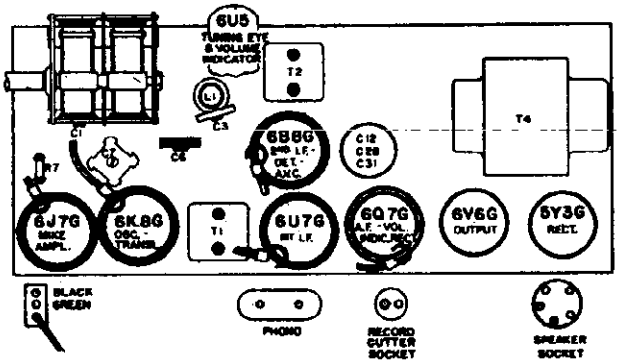
IMPORTANT ALIGNMENT NOTES

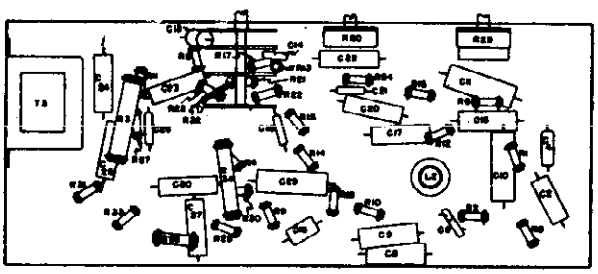
* The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 455 kc is known, the generator should be adjusted to the frequency of that station instead of to 455 kc.

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

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.

LOCATIONS OF PARTS ON TOP OF CHASSIS 101.632





FOR (ERWOOD) NEW PRODUCTS 220-320 RECORD CHANGER, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

MODEL 2451
MODEL 5621

SEARS, ROEBUCK & CO.

ELECTRICAL SPECIFICATIONS

MODEL 5621

TUBES AND FUNCTIONS:

6K8G . . . . . Oscillator-Translator	6J7G . . . . . Mike Ampl.
6U7G . . . . . 1st IF	6U5 . . . . . Tuning eye & Vol. Indic.
6B8G . . . . . 2nd IF-Det-AVC	6V6G . . . . . Output
6Q7G . . . . . AF-Vol. Indicator Rect.	5Y3G . . . . . Rectifier

POWER SUPPLY:

All models available . . . . . 105-125 v. 60 cycle AC, 95 watt
All models available . . . . . 105-125 v. 50 cycle AC, 95 watt
All models available . . . . . 105-125 v. 25 cycle AC, 100 watt

ALIGNMENT FREQUENCIES:

	Oscillator Trimmer	Translator Trimmer	Padder
FREQUENCY RANGE: . . . . . 540-1620 kc	1620 kc	1400 kc	600 kc

INTERMEDIATE FREQUENCY . . . . . 455 kc

POWER OUTPUT:
- Type . . . . . Beam tube
- Undistorted . . . . . 3.5 watts
- Maximum . . . . . 6 watts

LOUDSPEAKER:
- Type . . . . . Dynamic
- Size . . . . . 8 inch
- Field coil resistance . . . . . 1050 ohms
- Approx. field coil voltage drop. . . 80 volts

OPERATING FEATURES:
- Tone Control . . . . . Continuously variable
- Automatic Volume Control
- Combined with Automatic Record Changer and Recorder
- Tuning Eye & Recorder Vol. Indicator

CHASSIS FEATURES:
- Number IF stages . . . . . Two
- Number condensers in gang . . . . . Two
- Antenna . . . . Built-in loop with provision for external antenna
- Built-in Wave Trap
- Underwriters Approved

MECHANICAL SPECIFICATIONS

OPERATING CONTROLS:
1. Left knob . . . . . Radio-Phono-Record
2. Next to left knob . . . . . Volume
3. Next to right knob. . On-Off Switch & Tone
4. Right knob . . . . . Station Selector

CONTROL OPERATION:
1. See illustration below.
2. Turning right: . . . . . Volume increase
3. Turning right: . . . . On, Treble to Bass
4. Tuning ratio: 6:1

ALIGNMENT PROCEDURE

MODEL 2451

PRELIMINARY:

Output meter connections . . . . . Across loud speaker voice coil
Output meter reading to indicate 50 milliwatts . . . . . 0.3 volts
Approximate microvolts input to indicate 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 . . . . . HI
Position of pointer with variable fully closed . . . . . Horizontal (To fall on block below 540 kc calibration mark.)

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER ADJUSTMENTS (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
Closed	455 kc	.1 mfd.	1A7G Translator Grid	T2,T1	IF	--
Fully open	1750 kc	.0002 mfd.	Ant. Term.	C6	Oscillator	--
1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C3	Translator	15
600 kc(rock)	600 kc	.0002 mfd.	Ant. Term.	C7	Padder	15

IMPORTANT ALIGNMENT NOTES

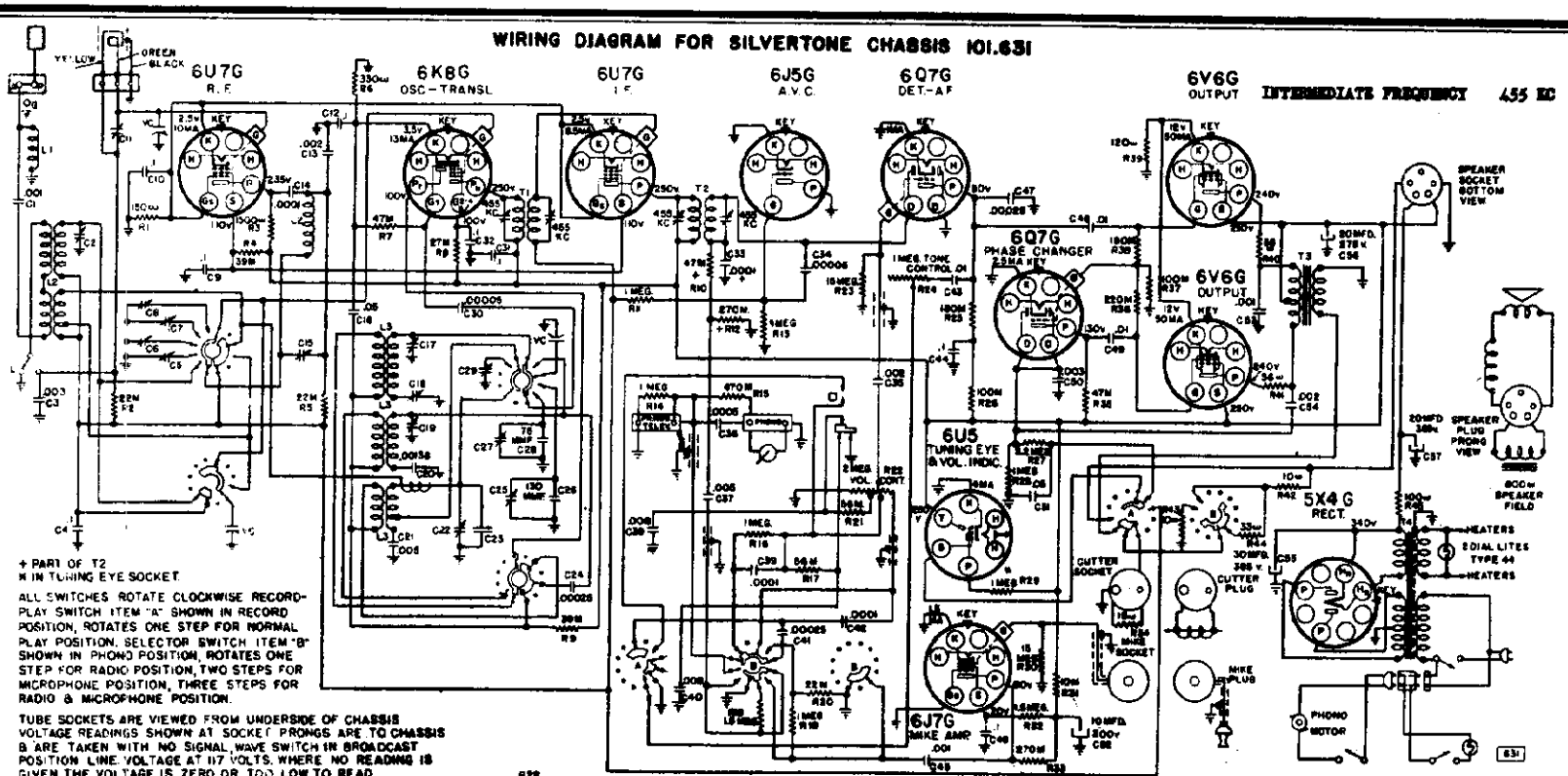
The variable should be rocked back and forth a degree or two while making the 600 kc adjustment.

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.

FOR ADDITIONAL DATA SEE INDEX.

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.631



+ PART OF T2
# IN TUNING EYE SOCKET.

ALL SWITCHES ROTATE CLOCKWISE RECORD-PLAY SWITCH ITEM "A" SHOWN IN RECORD POSITION, ROTATES ONE STEP FOR NORMAL PLAY POSITION. SELECTOR SWITCH ITEM "B" SHOWN IN PHONO POSITION, ROTATES ONE STEP FOR RADIO POSITION, TWO STEPS FOR MICROPHONE POSITION, THREE STEPS FOR RADIO & MICROPHONE POSITION.

TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS
VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS
B ARE TAKEN WITH NO SIGNAL, WAVE SWITCH IN BROADCAST POSITION LINE. VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN THE VOLTAGE IS ZERO OR TOO LOW TO READ

POWER OUTPUT:

Type	Push-Pull Beam
Undistorted	8 watts
Maximum	15 watts

FREQUENCY RANGES:

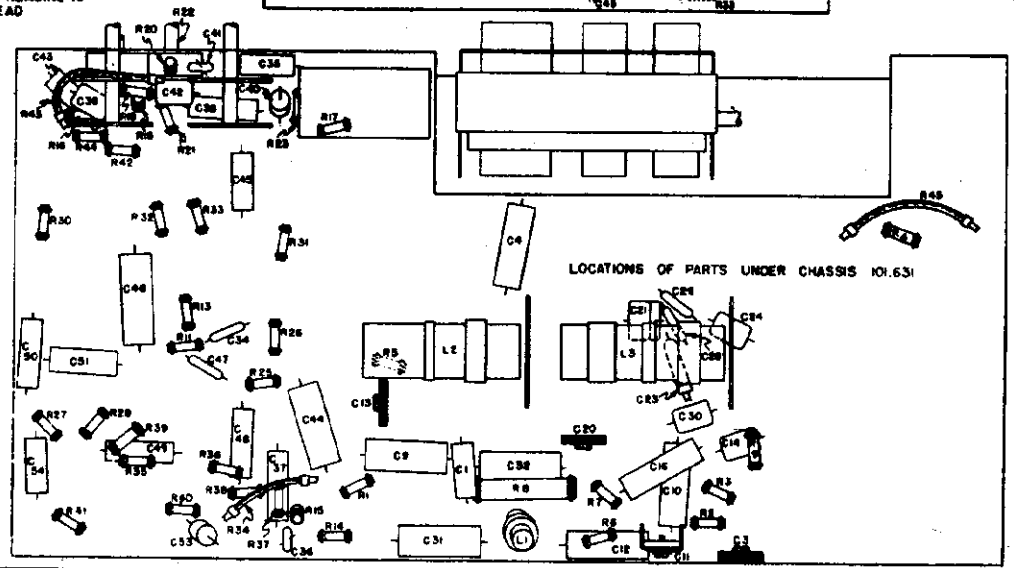
Band "A"	538–1620 kc
Band "B"	1.66–5.2 mc
Band "C"	5.88–18.2 mc
Band "D"	9.36–9.87 mc
Band "E"	10.93–12.1 mc
Band "F"	12.72–16 mc

ALIGNMENT FREQUENCIES:

Oscillator Trimmer	Antenna-Transl. Trimmer	Padder
1620 kc	1400 kc	600 kc
5.2 mc	4 mc	Fixed
18.265 mc	15 mc	Fixed
9.55 mc	9.55 mc	Fixed
11.71 mc	11.71 mc	Fixed
15.5 mc	15.5 mc	Fixed

LOUDSPEAKER:

Type	Dynamic
Size	12 inch
Approx. field coil resistance	600 ohms
Approx. field coil voltage drop	75 volts



LOCATIONS OF PARTS UNDER CHASSIS 101.631

NOV. 19, 1940

FOR DATA ON ERWOOD-NEW PRODUCTS 220, 320 RECORD CHANGER, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

SEARS, ROEBUCK & CO.

MODEL 5571
Chassis 101.631

MODEL 5571

SEARS, ROEBUCK & CO.

POWER SUPPLY:
All models available 105-125 volts, 50-60 cycles; 180 watts
All models available 105-125 volts, 25-60 cycles; 200 watts

PUSH BUTTON TUNING MECHANISM: The adjustment for each push button is locked or unlocked by tightening or loosening the slotted screwhead made accessible when the push button knob is pulled off of its plunger. Stations are set up by unlocking the mechanism, tuning in the station, pushing in the plunger (being careful not to detune the station), releasing the plunger, then securely locking the adjustment.

PRELIMINARY:

ALIGNMENT PROCEDURE

Output meter connection . . . . . Across loudspeaker voice coil
Output meter reading to indicate 500 milliwatts . . . . . 1.6 volts
Approximate microvolts input for 500 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 clockwise
Position of Tone Control . . . . . HI
Position of Tone Buttons . . . . . Out
Position of Dial Pointer with variable fully closed . . . . . On first mark to left of 550 kc calibration mark
Position of Antenna Switch . . . . . Antenna position

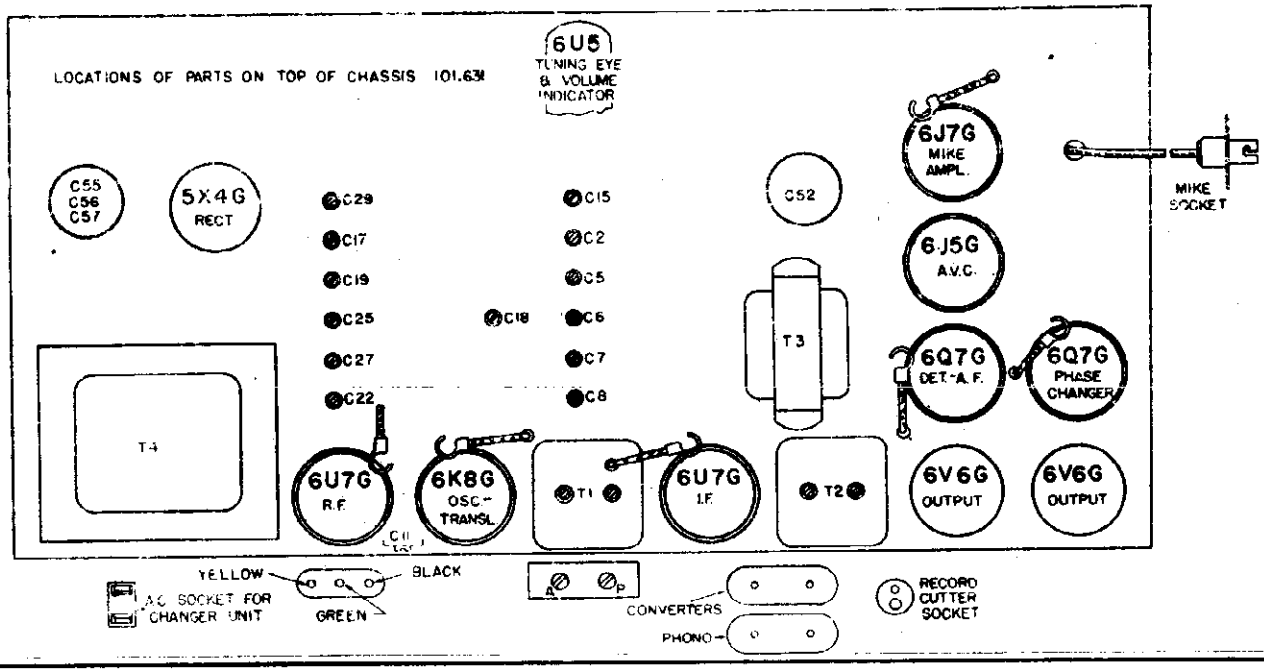
WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"A"	Closed	455 kc	.1 mfd.	6K8G Grid	T2,T1	IF	--
"A"	Fully open	1620 kc	.00005 mfd.	Ant. Term.	C17	Oscillator	--
"A"	1400 kc	1400 kc	.00005 mfd.	Ant. Term.	C11,C15	Loop,Transl.	150
"A"	600 kc (rock)	600 kc	.00005 mfd.	Ant. Term.	C18	Padder	60
"B"	5.2 mc	5.2 mc	400 ohms	Ant. Term.	C19	Oscillator	--
"B"	4 mc	4 mc	400 ohms	Ant. Term.	C2	Translator	90
"C"	Open	18.3 mc	400 ohms	Ant. Term.	C22*	Oscillator	--
"C"	15 mc (rock)	15 mc	400 ohms	Ant. Term.	C5	Translator	35
"D"	9.55 mc	9.55 mc	400 ohms	Ant. Term.	C25*	Oscillator	--
"D"	9.55 mc (rock)	9.55 mc	400 ohms	Ant. Term.	C6	Translator	70
"E"	11.71 mc	11.71 mc	400 ohms	Ant. Term.	C27*	Oscillator	--
"E"	11.71 mc (rock)	11.71 mc	400 ohms	Ant. Term.	C7	Translator	60
"F"	15.5 mc	15.5 mc	400 ohms	Ant. Term.	C29*	Oscillator	--
"F"	15.5 mc (rock)	15.5 mc	400 ohms	Ant. Term.	C8	Translator	40

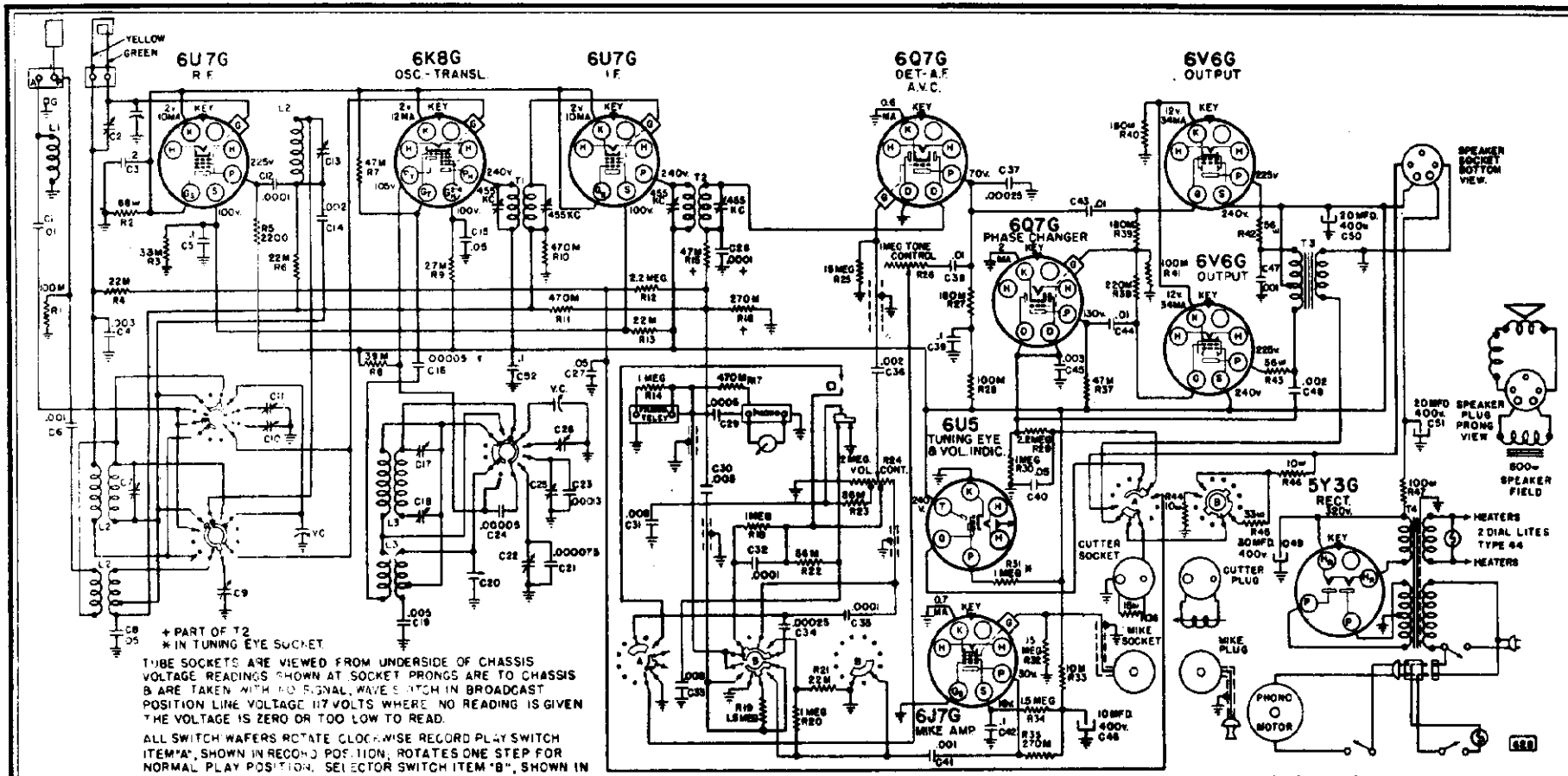
IMPORTANT ALIGNMENT NOTES

* If two peaks can be had, the correct one is with the trimmer screw further out; the other peak is the image.

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

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.





TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS & ARE TAKEN WITH NO SIGNAL, WAVE SWITCH IN BROADCAST POSITION LINE VOLTAGE 117 VOLTS WHERE NO READING IS GIVEN THE VOLTAGE IS ZERO OR TOO LOW TO READ.

ALL SWITCH WAFERS ROTATE CLOCKWISE RECORD PLAY SWITCH ITEM "A", SHOWN IN RECORD POSITION, ROTATES ONE STEP FOR NORMAL PLAY POSITION. SELECTOR SWITCH ITEM "B", SHOWN IN PHONO POSITION, ROTATES ONE STEP FOR RADIO POSITION; TWO STEPS FOR MICROPHONE POSITION; THREE STEPS FOR RADIO & MICROPHONE POSITION.

ALIGNMENT FREQUENCIES:

	Oscillator Trimmer	Antenna-Transl. Trimmer	Padder
Band "A"	1650 kc	1500 kc	600 kc
Band "B"	2.4 mc	2.4 mc	Fixed
Band "C"	18.3 mc	15 mc	Fixed
Band "D"	9.55 mc	9.55 mc	Fixed
Band "E"	11.71 mc	11.71 mc	Fixed

FREQUENCY RANGES:

Band "A"	538-1650 kc
Band "B"	1.45-2.56 mc
Band "C"	5.82-18.3 mc
Band "D"	9.35-9.86 mc
Band "E"	10.89-12.02 mc

INTERMEDIATE FREQUENCY . . . . . 455 kc

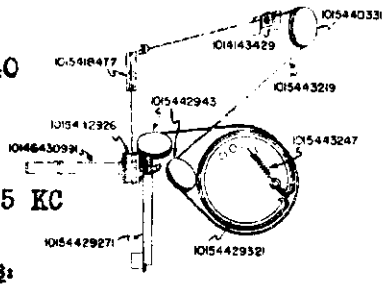
POWER OUTPUT:

Type	Push-Pull beam
Undistorted	6 watts
Maximum	11 watts

NOV.12,1940

IF PEAK 455 KC

Dial Drive System



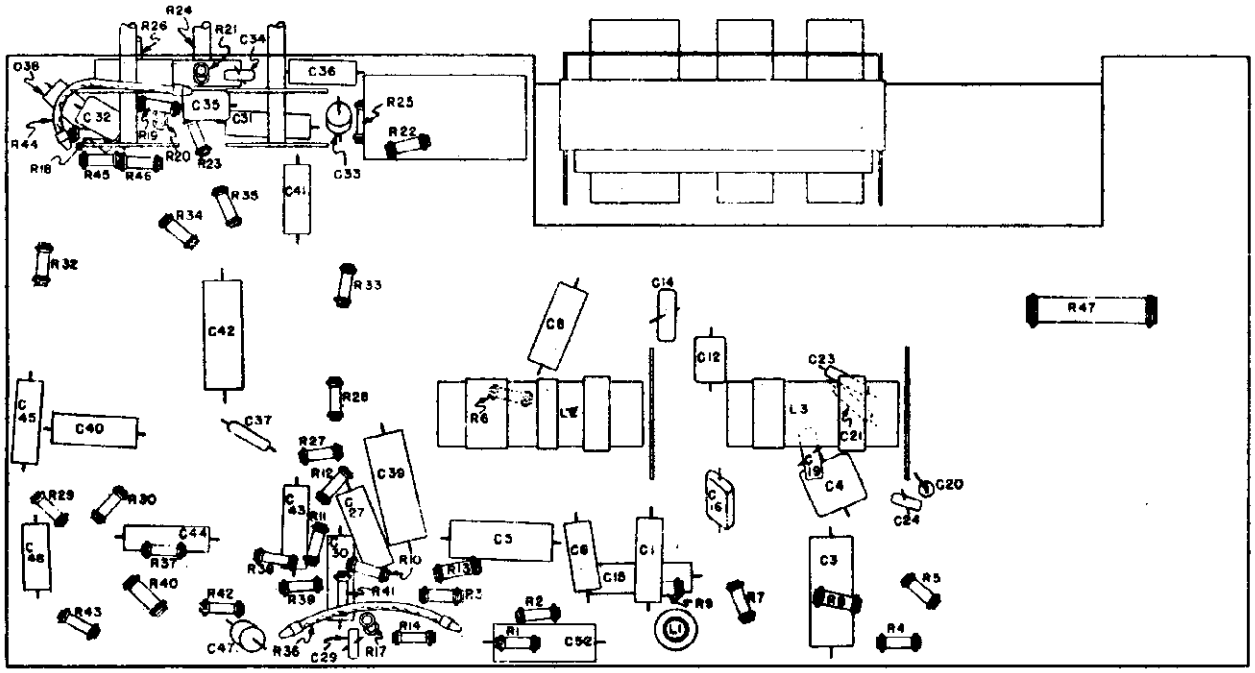
SUBJECT: ADDITION OF SUFFIX -1A TO CHASSIS IDENTIFICATION NO. 101.628:

Chassis identified by 101.628-1A are the same as 101.628 except for differences in the escutcheon, knobs, and control shaft lengths. Additions to the Parts List for 101.628-1A are:

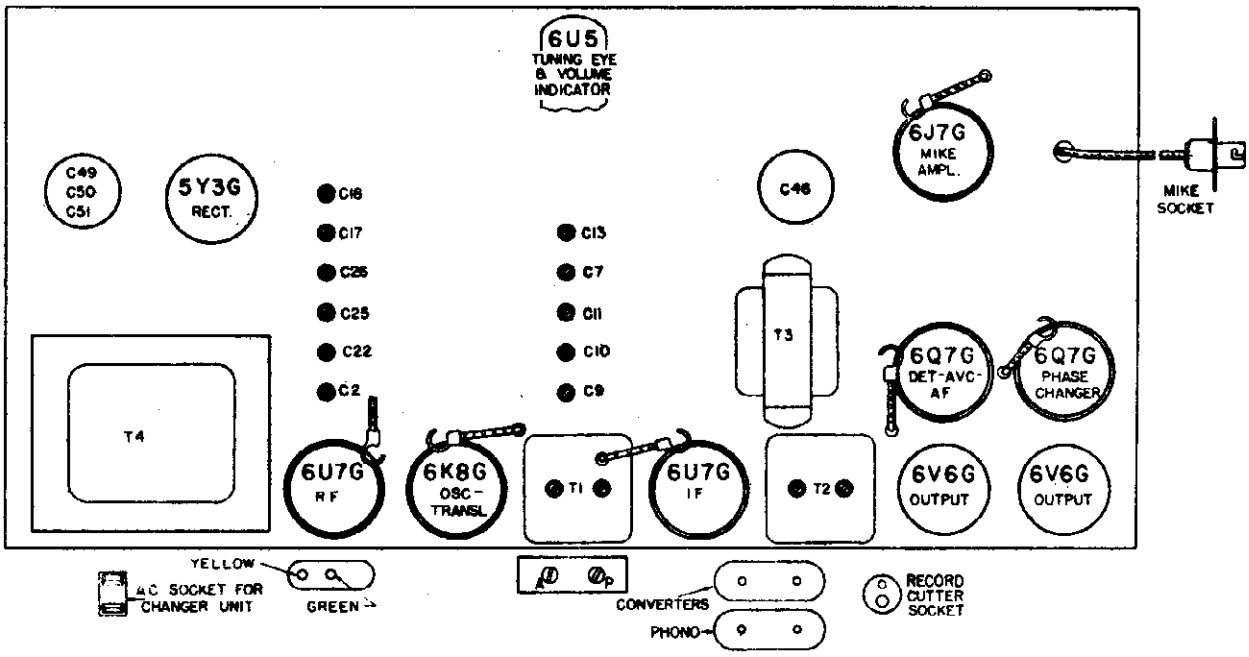
FOR (ERWOOD) NEW PRODUCTS 220,320 RECORD CHANGER, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

MODELS 5601A, 6449

SEARS, ROEBUCK & CO.



LOCATIONS OF PARTS UNDER CHASSIS 101.628



LOCATIONS OF PARTS ON TOP OF CHASSIS 101.628

PUSH BUTTON TUNING MECHANISM:

The adjustment for each push button is locked or unlocked by tightening or loosening the slotted screwhead made accessible when the push button knob is pulled off of its plunger. Stations are set up by unlocking the mechanism, tuning in the station, pushing in the plunger (being careful not to detune the station), releasing the plunger, then securely locking the adjustment.

RECOMMENDED ANTENNA EQUIPMENT:

Catalog #4704: Greatest pickup and noise reduction.
Catalog #4703: Less effective pickup and noise reduction than Catalog #4704.
Catalog #4702: Conventional antenna.

MODELS 5601A,6449
MODEL 7320

SEARS, ROEBUCK & CO.

PRELIMINARY:

MODELS 5601A,6449

Output meter connection . . . . . Across loudspeaker voice coil
Output meter reading to indicate 500 milliwatts . . . . . 1.6 volts
Approximate microvolts input for 500 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 clockwise
Position of Tone Control . . . . . High
Position of Tone Buttons . . . . . Out
Position of Dial Pointer with variable fully closed . . . . . On first mark to left of 550 kc calibration mark

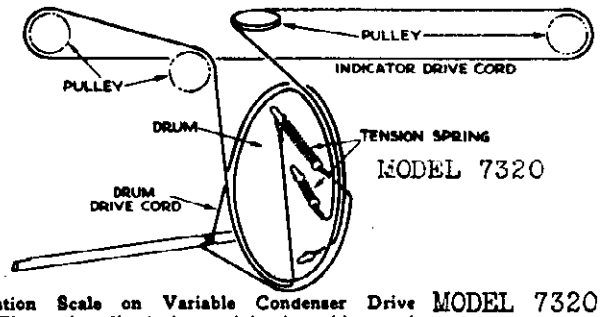
WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"A"	Closed	455 kc	.1 mfd.	6K8G Grid	T2,T1	IF	--
"A"	Fully open	1650 kc	.00005 mfd.	Ant. Term.	C17	Oscillator	--
"A"	1500 kc	1500 kc	.00005 mfd.	Ant. Term.	C2,C13	Ant,Transl.	180
"A"	600 kc (rock)	600 kc	.00005 mfd.	Ant. Term.	C18	Padder	55
"B"	2.4 mc	2.4 mc	400 ohms	Ant. Term.	C7	Translator	120
"C"	Open	18.3 mc	400 ohms	Ant. Term.	C26*	Oscillator	--
"C"	15 mc (rock)	15 mc	400 ohms	Ant. Term.	C11	Translator	35
"D"	9.55 mc	9.55 mc	400 ohms	Ant. Term.	C25*	Oscillator	--
"D"	9.55 mc (rock)	9.55 mc	400 ohms	Ant. Term.	C10	Translator	75
"E"	11.71 mc	11.71 mc	400 ohms	Ant. Term.	C22*	Oscillator	--
"E"	11.71 mc (rock)	11.71 mc	400 ohms	Ant. Term.	C9	Translator	75

IMPORTANT ALIGNMENT NOTES

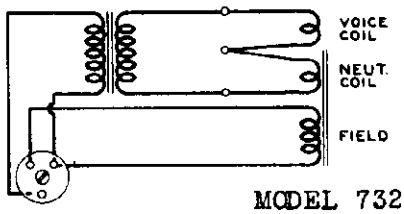
* If two peaks can be had, the correct one is with the trimmer screw further out; the other peak is the image.

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

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.

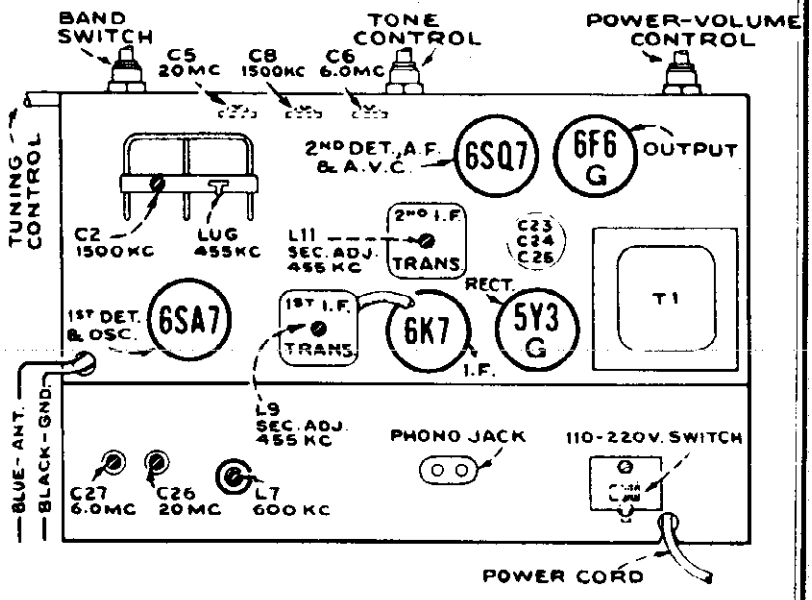


MODEL 7320



MODEL 7320

MODEL 7320



Calibration Scale on Variable Condenser Drive Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment when chassis is out of cabinet; therefore, a calibration scale is attached to the rear of the drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

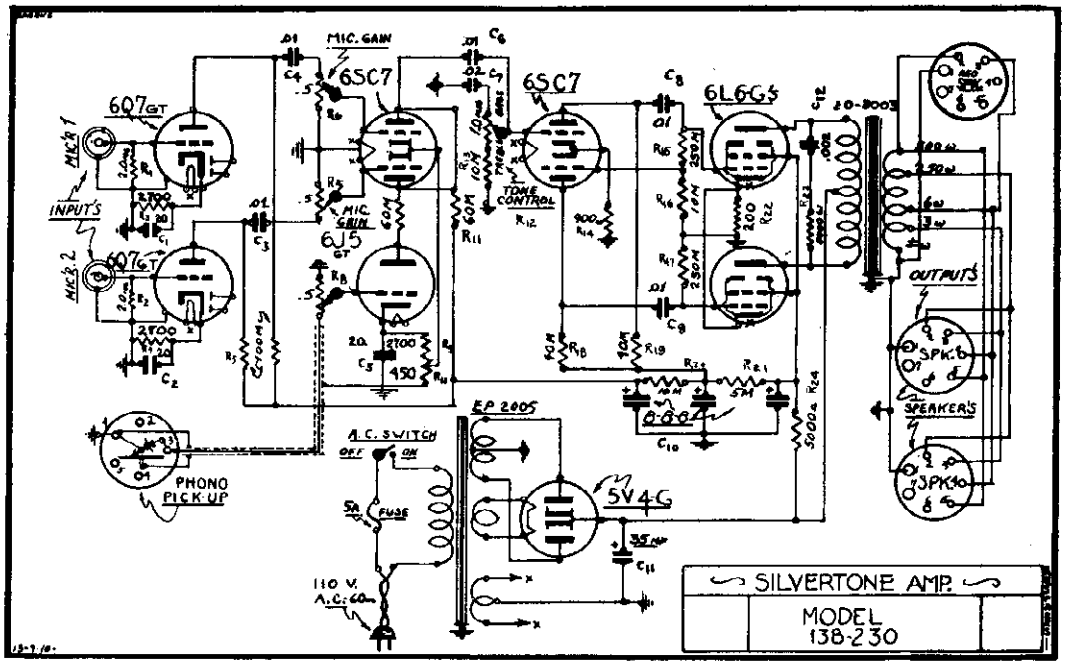
As the first step in r-f alignment, check the position of the drum. The 45° mark on the drum scale (see "Dial Drive Drawing") must be in a horizontal position when the plates are fully meshed. The distance from the edge of the chassis to the drum must not exceed ⅛-inch. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "0°" mark on the calibration scale when the plates are fully meshed.

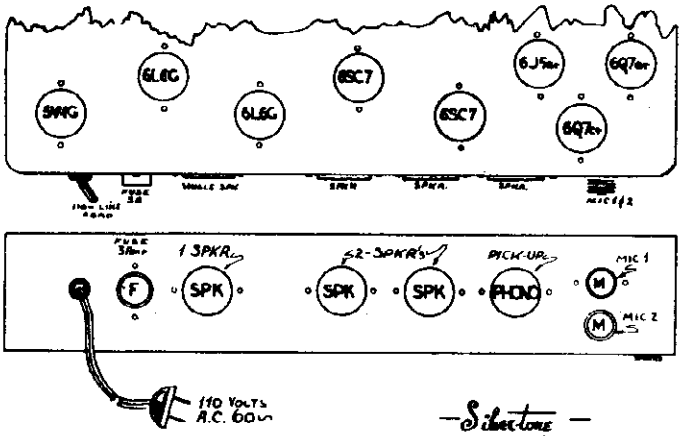
Dial - Indicator Adjustment. — After fastening the chassis in the cabinet, attach the dial pointer to the drive cable with variable condenser fully closed and pointer on last calibration mark at 550 kc end of Broadcast "A" band. The dial pointer has a spring clip for attachment to the cable.

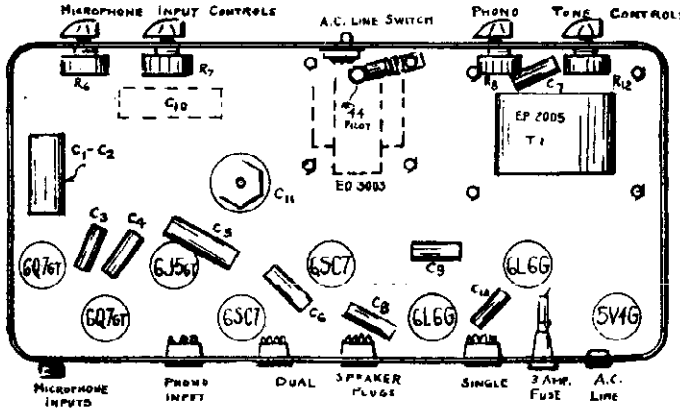
MODEL 8904 Amplifier
Chassis 138.230

SEARS, ROEBUCK & CO.



35 WATT, 8 TUBE, 4 STAGE, HIGH GAIN AMPLIFIER





INPUTS:
2 inputs to accommodate high impedance microphone.
1 input to accommodate crystal phonograph pickup.

OUTPUT IMPEDANCE:
3 - 6 - 250 - 500 ohms.

SPEAKERS: 12 inch permanent magnet type, 6 ohm voice coils. Similar to Jensen PM12H.

TUBE COMPLEMENT:

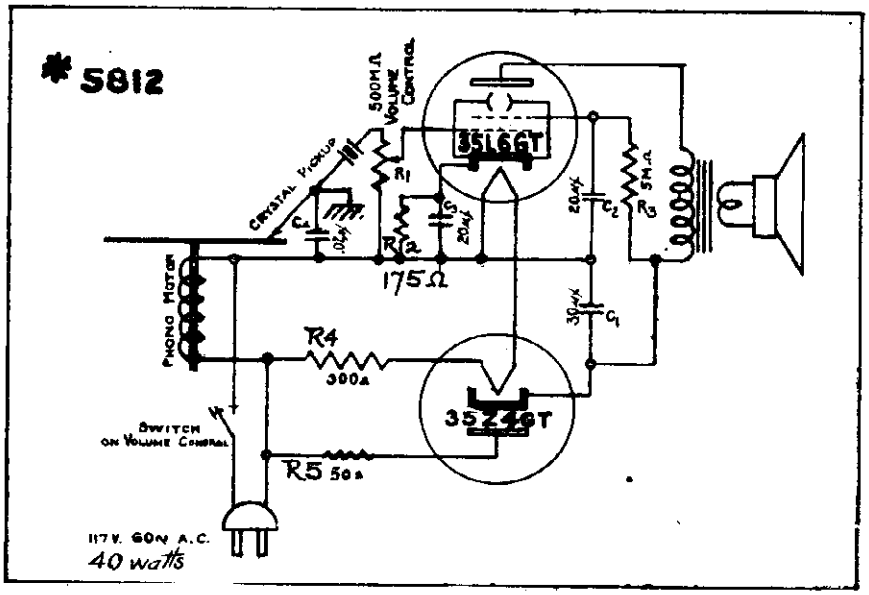
2	6Q7GT	Microphone Input
1	6SC7	Mixer
1	6J5GT	Phonograph Input
1	6SC7.	Driver Inverter
2	6L6G.	Output
1	5V4G.	Rectifier

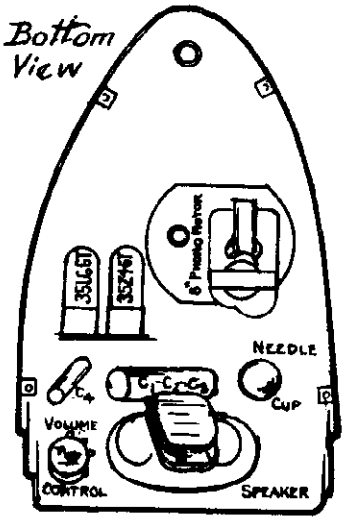
POWER SUPPLY: . . . . . 110-125 volts, 50-60 cycle, AC only, 136 watts

FREQUENCY CHARACTERISTICS: . . . . . , Substantially flat from 50 to 10,000 cycles per second

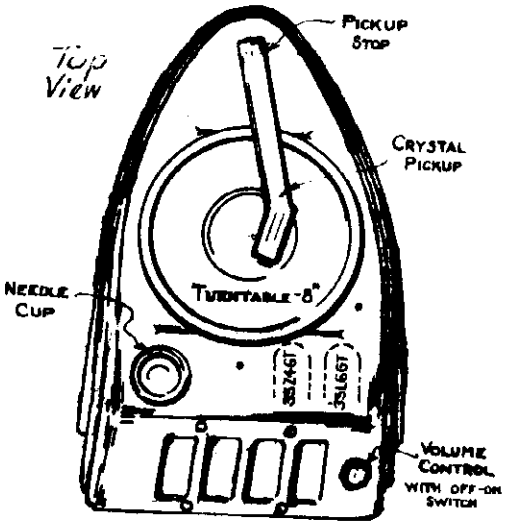
MODEL 5812 Phono
Ch.138.905

SEARS-ROEBUCK & CO.





SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION
	13863100	Pickup, complete
	13864110	Phono motor complete
	13858066	Permanent Magnet Speaker, complete
R1	138242014	Volume control 500M ohms & switch
	13839100	Volume control knob
	13864101	Needle cup
R2		175 ohm - ½ watt resistor
R3		5000 ohm - 1/2 watt resistor
R4		300 ohm - 10 watt resistor
R5		50 ohm - ½ watt resistor
C1-C2-C3		30-30/450 - 20/25 condenser
C4		.05 mfds. 600 volt condenser
	13855258	Line Cord
	1385421813	8" Turntable
	1385421839	Idler Wheel (60 cycle)
	1385412531	Motor Field Coil (60 cycle)
	138631027	Pickup Cartridge
	138631028	Pickup Arm



SERVICE INFORMATION

The Model Number 5812, carrying identification number 138.905 is an alternating current electrical phonograph designed for the transcription of all laterally modulated records.

In first placing the equipment into operation, it should be carefully unpacked and all packing removed from the various parts associated with the operation of the equipment.

To place the equipment in operation, the attachment cord which is seen to come out of the base of the equipment, should be attached to an electrical power outlet giving power of the correct voltage and frequency as shown above. This information can be ascertained by looking at the specification on the light meter or by calling the local power company and asking for the information.

A record should be placed on the turntable. The pickup arm should be equipped with a new needle and placed in the outside groove of the record. The motor switch should be turned on causing the turntable to rotate.

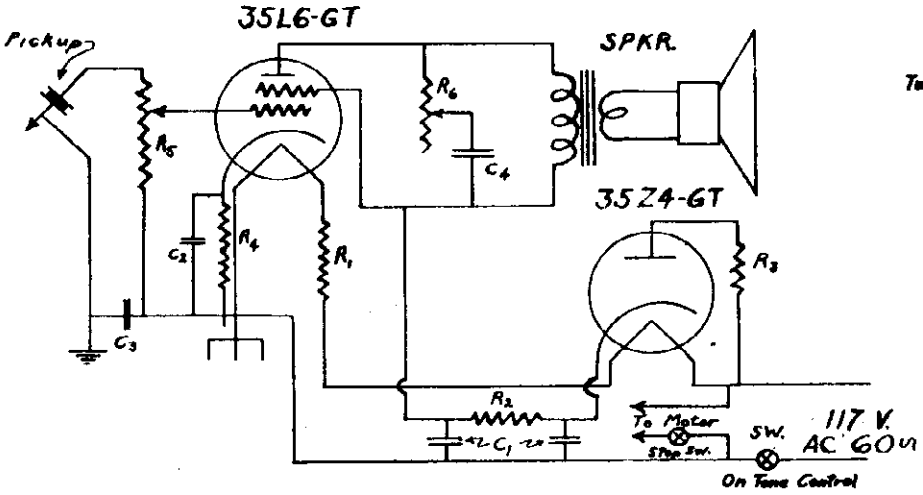
When it is desired to replace the tubes in this equipment, remove the base plate by unscrewing the four screws that hold the rubber feet on the bottom. This will expose not only the tubes but the turntable motor as well.

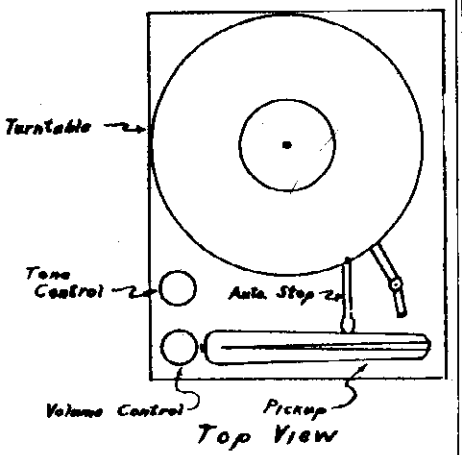
The cartridge used in the pickup of this equipment is a crystal cartridge and will yield some distortion if used when extremely cold. The equipment should be at a temperature of approximately 70 degrees for good operation.

Unless long playing needles are used, the needle should be replaced regularly, at least every two records and preferably each time a record is played.

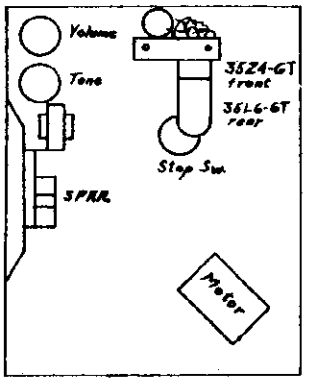
MODEL 5815 Phono.
Ch. 145.815

SEARS-ROEBUCK & CO.





SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION	SELLING PRICE EACH
	B589	Pickup, complete	4.50
	B590	Phono Motor complete	5.50
	B591	Permanent Magnet Speaker, complete	3.30
	B591-A	Dynamic Speaker, complete	3.75
R-5	B301	500M ohm Volume Control	.50
R-5	B300	500M ohm Tone Control & Switch	.75
	B594	Volume Control Knob	.15
	B595	Tone Control Knob	.15
	B596	Automatic Stop, complete	.90
	B597	Line Cord	.50
	B598	Pickup Cartridge	3.15
C-1	B259	Filter Condenser 40-20 mfd. 150 V.	1.10
C-2	B208	By-Pass Condenser 10 mfd. 25 V.	.45
R-1	B315	10 Watt Wirewound Resistor	.45
R-2	B592	400 ohm 1 Watt Resistor	.20
R-3	B593	50 ohm ½ Watt Resistor	.15
R-4	B599	150 ohm Flexible Resistor	.20
C-3 C-4	B500	.05 mfd. 400 V. Condenser	.25



Bottom View

RETAIL SELLING PRICES PREPAID
PRICES SUBJECT TO CHANGE WITHOUT NOTICE

When it is desired to replace the tubes in this equipment, remove the base plate by unscrewing the four screws that hold the rubber feet on the bottom. This will expose not only the tubes but the turntable motor as well.

The cartridge used in the pickup of this equipment is a crystal cartridge and will yield some distortion if used when extremely cold. The equipment should be at a temperature of approximately 70 degrees for good operation.

Unless long playing needles are used, the needle should be replaced regularly, at least every two records and preferably each time a record is played.

HOW TO ORDER PARTS FOR THIS PORTABLE ELECTRIC PHONOGRAPH-IDENTIFICATION NO. 145.815

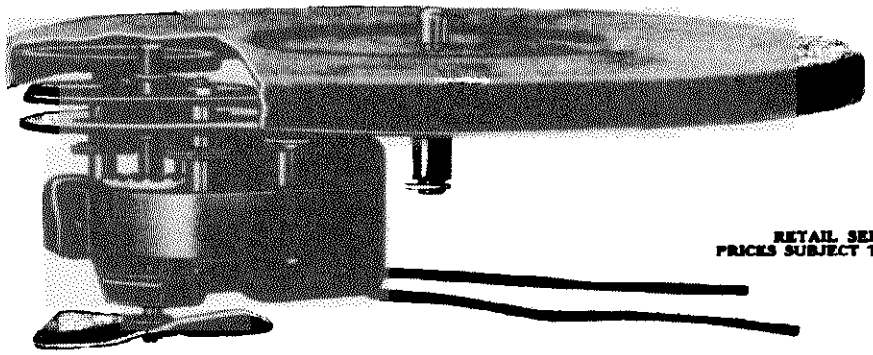
On the Purchase Order always give the following information:

(1) PART NUMBER and DESCRIPTION for each part ordered. When no part number is assigned order by description and rating. Also give PRICE of part number.

(2) The IDENTIFICATION NUMBER is 145.815. This number will be found on a plate immediately underneath the turntable.

MODEL 5831 Phono
Ch. 137.394

SEARS, ROEBUCK & CO.



DECEMBER 17, 1941

RETAIL SELLING PRICES PREPAID
PRICES SUBJECT TO CHANGE WITHOUT NOTICE

ELECTRICAL SPECIFICATIONS

POWER SUPPLY . . . . . 115 volts, 60 cycle AC, 17 watts

TURNTABLE SPEED - Constant . . . . . 78 r.p.m.

GENERAL INFORMATION AND SERVICE HINTS

Before starting the motor, see that the rubber edged driving pulley is completely under the turntable as this motor is a rim drive type, and this pulley must be in place for proper operation. This is a constant speed motor and no adjustment is necessary to obtain the proper number of revolutions per minute for correct reproductions. Be sure the electric supply is of the same voltage and frequency as that of the phonograph motor shown on a tag attached to the cord.

To play a record, insert the cord in an electrical receptor and turn on the post type switch on the side of the case near the cord. Be sure the reproducer is started on the record on the right hand side of the turntable at the very edge of the record. Needles should be changed often to preserve the life of the record. Ten selections of a 10" record may be played with each of the needles accompanying this machine.

Servicing Instructions - All parts of this phonograph have been completely serviced previous to shipment. It is recommended when servicing is necessary on the motor itself, that the entire motor be returned to the factory for the most satisfactory adjustment or replacement. However, parts can be purchased as listed for self servicing or servicing by a competent service man.

To remove the motor from the case, first be sure that the connections of the phonograph to any electrical supply is disconnected. Remove the bottom of the case and break the wiring connections from motor to switch and motor to cord. Remove the turntable and remove the three rivets that hold the motor to the case.

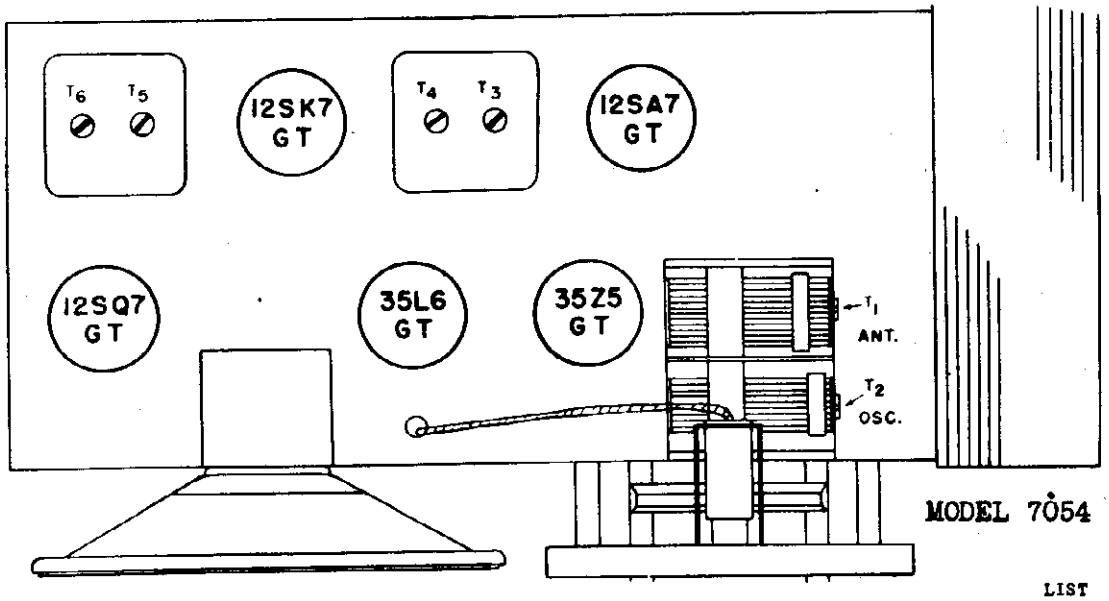
Caution - 1. Do not use extreme force in removing the turntable from the shaft. 2. Be sure the voltage and frequency of the power supply is the same as that of the motor. 3. Avoid hitting the reproducer or the arm on the reproducer against the side of the case, turntable or other rigid parts as this is a delicate instrument and undue movement or pressure against the small arm near the needle may damage it or subtract considerably from good reproduction.

Motor and Motor Parts and Miscellaneous Hardware

Part No.	Schematic Location		Selling Price Ea.
137542714	2714	Washer	.07
137546569	6569	Motor Mounting Washer	.07
137546654	6654	Mounting Screw	.07
137549536	9536	Clip for Lead Wire	.11
137549727	9727	Insulator Tube Used on Coil Lead	.11
1375411714	11714	Bracket	.11
1375411719	11719	Motor Complete	2.95
1375411720	11720	End Thrust Pad	.07
1375411724	11724	Bearing Bracket with Bearing Assemb. - Shaft End	.52
1375411725	11725	Bearing Bracket with Bearing Assemb. - Closed End	.52
1375411728	11728	Washer	.14
1375411729	11729	Stud and Plate Assembly	.31
1375411732	11732	Mounting Plate for 8" Turntable	1.40
1375411738	11738	Grommet Sleeve	.11
1375411740	11740	Screw	.07
1375411747	11747	Spacer - Short	.11
1375411748	11748	Spacer - Long	.11
1375411749	11749	Tension Spring	.17
1375411754	11754	Screw	.11
1375411766	11766	Felt Washer	.07
1375411798	11798	Pulley for 8" Turntable 60 cycle	.35
1375411772		Pulley for 8" Turntable 50 cycle	.35
1371511799	11799	Field Lamination Assembly	.24
1371512531	12531	Coil Complete, 60 cycle	.23
1371512532		Coil Complete, 50 cycle	.23
1375421112	21112	Rubber Grommet	.11
1375421119	21119	Field Coil Support	.07
1375421184	21184	Lock Nut	.07
1375421817	21817	8" Turntable Complete-Flock Covered	3.95
1375421831	21831	Turntable Shaft	.52
1375421839	21839	Turntable Drive Wheel Complete	.90
1375421841	21841	Spring Clip used on Turntable Shaft	.11
1375421844	21844	Thrust Washer used on Turntable Drive Wheel	.07
1375421846	21846	Thrust Washer used on Turntable Shaft	.07
1375421874	21874	Set Screw used on Motor Pulley	.07
1375421914	21914	Spring Clip used on Turntable Drive Disc	.11
137544048		Motor Complete with Turntable	4.40
13754574		Tone Arm, Ivory	.85
13754110		Reproducer, Ivory	.90
137541		Case Complete - Tan or Maroon (Specify)	2.25
13754615		Case Only	1.60
137542		Bottom Only	.40

MODEL 5844 Phono.
Ch.100.355
MODEL 7054

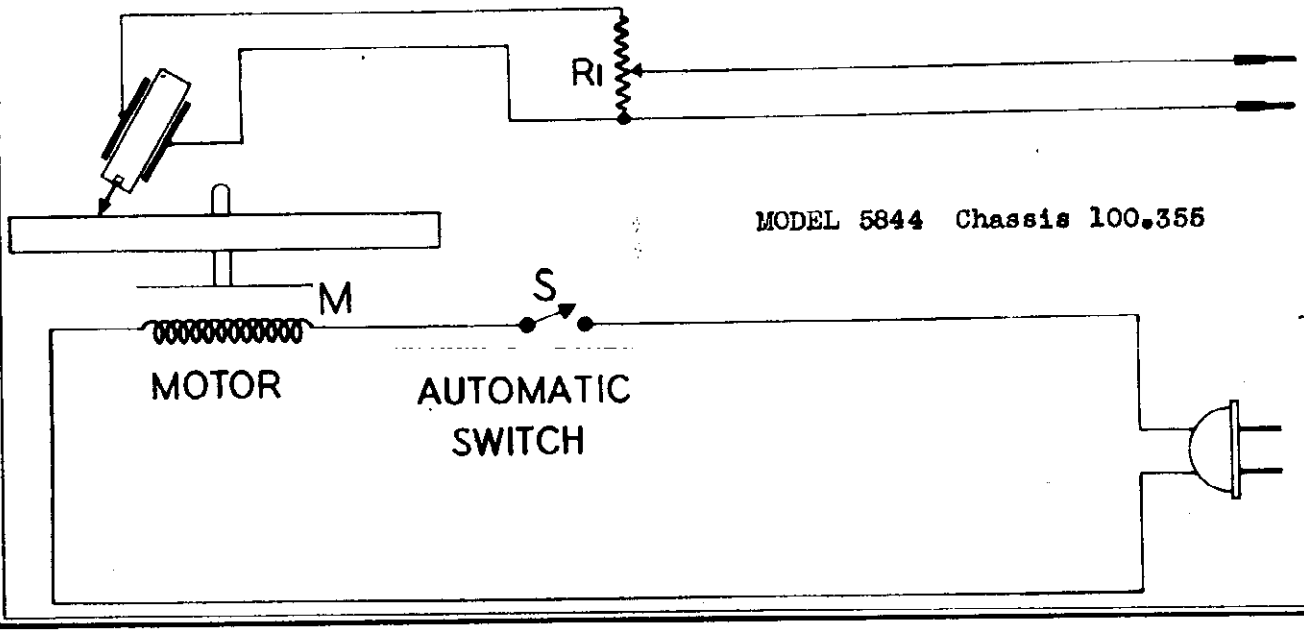
SEARS ROEBUCK & CO.



MODEL 7054

PART NUMBER	SCHEMATIC LOCATION	DESCRIPTION	LIST PRICE
10063180617		Crystal Cartridge	4.50
10025160693	S	Switch - on & off	.42
10023170788	R1	Volume control 1/4 meg.	1.00
10064160745	M	Motor - 60 cycle - less turntable	5.00
10064160788	M	Motor - 25 cycle - less turntable	13.00
10064160791	M	Motor - 50 cycle - less turntable	6.90
1005412349		Nut - 8-32 for mtg.	Per C .45
1005437484		Lockwasher - for mounting motor	Per C .50
1005485827		Set Screw - 8-32 square head	.02
10054113657		Screw 8-32 X 3/8" R.H.M.S. for bottom	.01
10054160690		Trip - lever	.05
10053160714		Bottom for cabinet (without serial numbers)	.16
10063160741		Pick up (phono)	8.00
10039160744		Knob - (volume control)	.12
10054160747		Rubber foot	.05
10060160755		Cabinet complete with decals	2.75
10054160757		Decal - silvertone	.04
10055160769		Cable - pickup	.30
10064160746		Turntable - 8" for 10064160745 motor	1.50
10064160789		Turntable - 8" for 10064160788 motor	1.50
10064160792		Turntable - 8" for 10064160791 motor	2.00
10064161104		Idler wheel for 10064150745 and 10064160791 motors	.85
10064117806		Idler wheel for 10064160788 motor	.60

WIRING DIAGRAM



MODEL 5844 Chassis 100.355

MODEL 5832 Phono.
Ch. 137.542

SEARS-ROEBUCK & CO.

ELECTRICAL SPECIFICATIONS

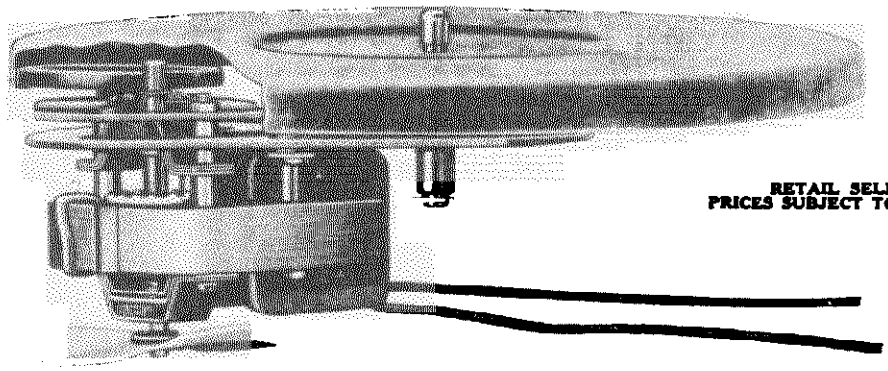
POWER SUPPLY: . . . . . .115 volts, 60 cycle AC, 17 watts

TURNTABLE SPEED - Constant: . . . . . 78 r.p.m.

Servicing Instructions - All parts of this phonograph have been completely serviced previous to shipment. It is recommended when servicing is necessary on the motor itself, that the entire motor be returned to the factory for the most satisfactory adjustment or replacement. However parts can be purchased as listed for self servicing or servicing by a competent service man.

To remove the motor from the case, first be sure that the connections of the phonograph to any electrical supply is disconnected. Remove the bottom of the case and break the wiring connections from motor to switch and motor to cord. Remove the turntable and take out the three machine screws that hold the motor to the metal mounting plate. Be carefil not to lose the metal washers and rubber grommets used in holding the motor in place.

Caution - 1. Do not use extreme force in removing the turntable from the shaft. 2. Be sure the voltage and frequency of the power supply is the same as that of the motor. 3. Never attempt to close the lid while a record is playing. 4. Avoid hitting the reproducer or the arm on the reproducer against the side of the case, turntable or other rigid parts as this is a delicate instrument and undue movement or pressure against the small arm may damage it or subtract considerably from good reproduction.

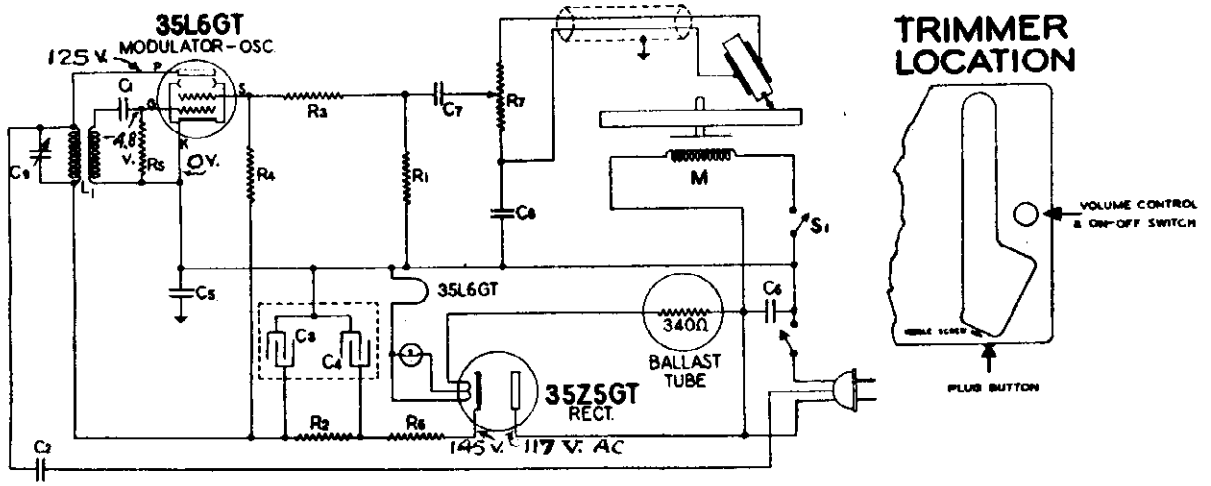


RETAIL SELLING PRICES PREPAID
PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Part No.	Description	Selling Price Ea.	Part No.	Description	Selling Price Ea.
		Motor and Motor Parts			
13715585	Field and Winding Assembly	2.00	137546001	Motor Assembly - 6/32 x 1 5/8 R. H. Screw	.10
13754561	Rotor Assembly	1.40			
13754626	Cabinet Mounting Plate Assemb.	.70	137541121	Motor Assembly Spacer .825	.11
13754628	Idler Plate Assembly	.58	137541122	Motor Assembly Spacer .265	.10
13754643	Tire and disc Assembly	1.15	137541123	Motor Assembly Spacer .503	.10
13754587	Rotor Shaft Pulley	.17	1375411	Cabinet Mounting Plate Grommet (Black)	.10
1375440	Rotor Shaft Oil Throw	.10			
13754326	Rotor Shaft Steel Oil Throw	.10	13754112	Cab. Mount.Plate Grommed(Gum)	.10
13754544	Rotor Shaft Spacer	.10	13754634	Cabinet Mounting Plate Spacer	.10
1375432	Rotor Shaft Felt Washer	.10	13754326	Cabinet Mounting Plate Washer	.10
1375440	Rotor Shaft Fibre Washer	.10	137546002	Cabinet Mounting Plate Screw	.10
13754326	Rotor Shaft Steel Washer	.10	13754627	Motor Mounting Plate	.30
13754737	Rotor Shaft Thrust Felt Cup	.10	137543261	Idler Plate Washer	.10
13754558	Fan Blade	.20	137541124	Idler Plate Spacer	.10
13754604	Fan Blade Cotter	.10	13754608	Idler Plate Screw	.10
13754321	Felt Washer on Fan Blade	.10	13754632	Idler Plate Spring	.11
13754326	Fan Blade Steel Washer	.10	1375432	Idler Bearing Felt Oiler	.10
13754402	Fan Blade Fibre Washer	.10	13754402	Idler Bearing Top Fibre	.10
13754655	Brg. Bracket Assemb.- Motor	.20	13754403	Idler Bearing Bottom Fibre	.10
13754600	Motor Assembly - 6/32 x 1 3/4 R. H. Screw	.10	137546041	Idler Bearing Cotter	.10
			13764630	Idler Bearing Vertical Shaft	.30
13754601	6/32 nut	.10	13754403	Vertical Shaft Fibre	.10
13754602	Lock Washer	.10	137546042	Vertical Shaft Cotter	.10
		Hardware and Miscellaneous Parts			
137541927	Needle Cup	.50	137542041	Bracket at Record Holder	.20
13754574	Tone Arm	.85	137541885	Reproducer Rest	.20
137542521	Lid Support	.35	137541	Record Holder Complete	.75
137541797	Leather Carrying Handle	.30	137542560	Handle Loop	.10
137541799	Cupped Washer on Motor Board	.02	137542031	Sliding Catch at Record Holder	.10
137524048	Electric Motor Complete	3.95	137542032	Sliding Arm on Record Holder	.10
13754110	Reproducer	1.20	137542567	Hinge on Record Holder	.10

MODEL 5849
Ch. 100.356
Wireless Record Player

SEARS-ROEBUCK & CO.



POWER SUPPLY
105-125 V. 60 cycle AC.....35 watts
105-125 V. 50 cycle AC.....35 watts
105-125 V. 25 cycle AC.....35 watts

OPERATING CONTROLS
Switch for Turntable.....Automatic

Knob......"OFF-ON" Volume

CONTROL OPERATION
"OFF" when pickup arm is on rest.
"ON" when pickup arm is moved to playing position
Turning clockwise.....turns power on
Continuing to turn increases volume.

ADJUSTMENT OF MODEL 5848 WIRELESS RECORD PLAYER

1. Carefully tune your radio receiver from 540 to 700 KC. to find a dial setting where no station is heard during either the day or night. If there is no dial position where no station is heard, pick a spot where stations come in the weakest.

2. Place the record player in operation.

3. Remove the plug button on front of the record player and by means of a small screwdriver adjust the screw located beneath the plug button until the record player is heard on the radio receiver. It is suggested that you turn the screw all of the way out (counter-clockwise) very slowly, then if the record player still is not heard, turn the screw inward (clockwise) as far as necessary. After you hear the player, turn the screw back and forth slowly until the record is heard with deepest tone and minumum noise. If you find that there is a howl or whistle while records are being played, it may be necessary for you to set the receiver dial to a different position and readjust the record player for this new setting.

If the radio receiver has push button tuning, you can tune a push button to the signal of the record player in the same manner as you would adjust a button for a radio station.

ELECTRICAL PARTS

PART NUMBER	SCHEMATIC LOCATION	DESCRIPTION	LIST PRICE
10028160499	L1	Coil - oscillator	.26
1001983539	C1	Condenser - mica 260 mmfd.	.20
1001983783	C2	Condenser - mica 110 mmfd.	.20
10020116470	C3-C4	Condenser - electrolytic 20-20 mfd. 150 volt	.95
10019116625	C5-C6	Condenser - .1 mfd. 600 volt	.25
10019116819	C7-C8	Condenser - .05 mfd. 600 volt	.20
10017160501	C9	Condenser - padder	.22
10063160617		Crystal cartridge	4.50
10023110559	R1	Resistor - carbon 470,000 ohms 1/4 watt	.12
10023110569	R2	Resistor - carbon 10,000 ohms 1/4 watt	.12
10023110578	R3	Resistor - carbon 68,000 ohms 1/4 watt	.12
10023110580	R4	Resistor - carbon 3.3 meg. 1/4 watt	.12
10023116051	R5	Resistor - insulated 33,000 ohms 1/4 watt	.15
10023118823	R6	Resistor - 1,000 ohms 1 watt wire wound	.15
1004985296		Lamp - bull's eye 6 to 8 volt (Mazda 51)	.16
10021160540		Ballast tube	.60
10038160693	S1	Switch - "on" "off" for motor	.42
10024160743	R7	Volume control with switch (1/4 meg.)	1.60
10065160754		Line cord (special 3 wire)	.72
10064160745	M	Motor - 60 cycle - less turntable	5.00
10064160788	M	Motor - 25 cycle - less turntable	13.00
10064160791	M	Motor - 50 cycle - less turntable	6.90

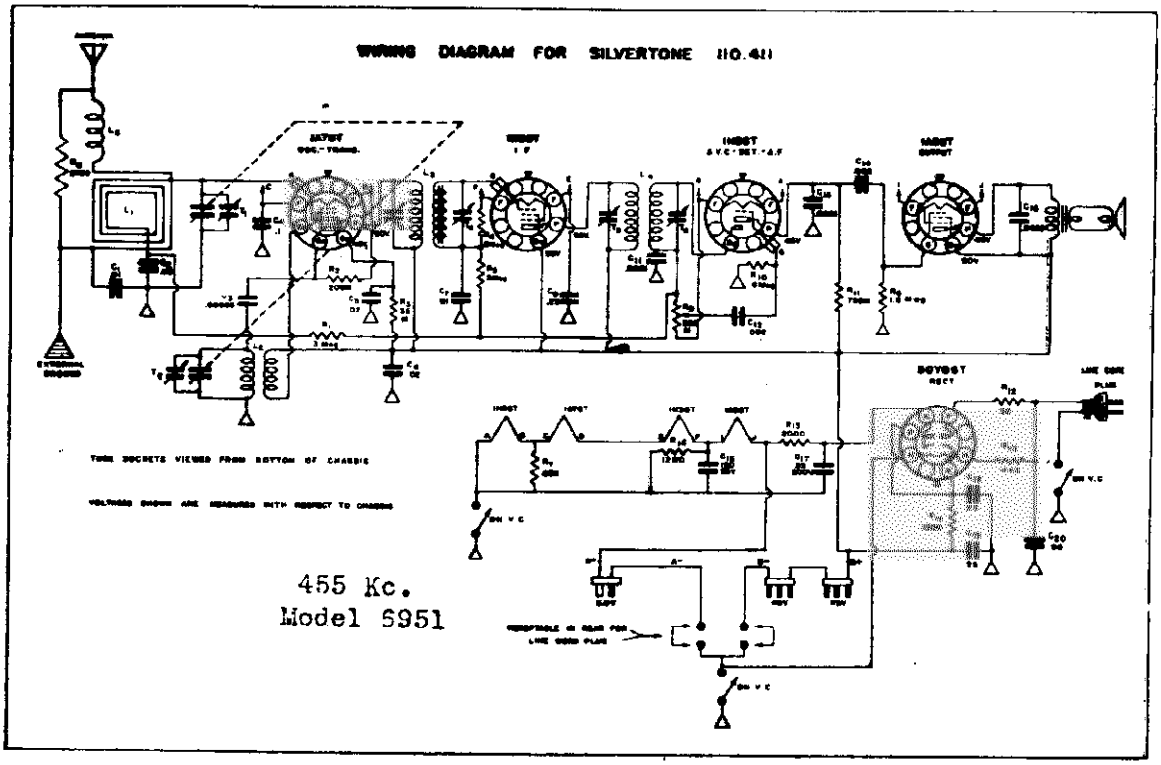
MISCELLANEOUS PARTS

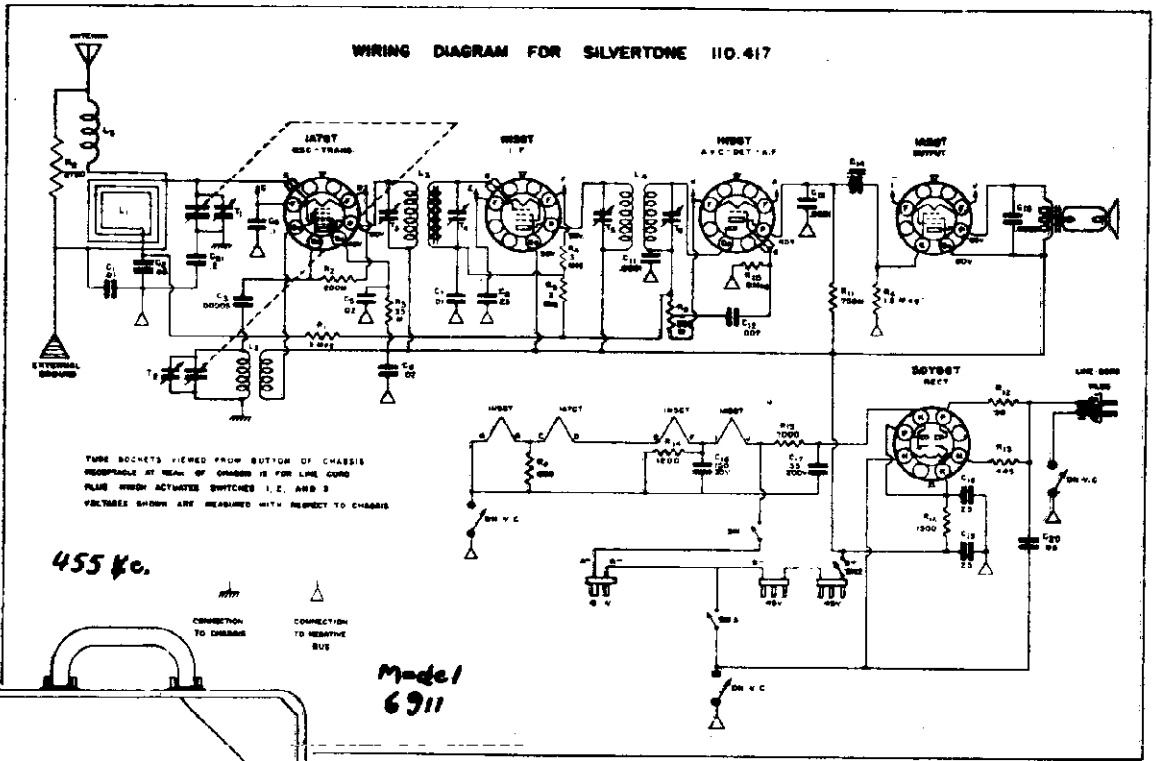
PART NUMBER	DESCRIPTION	LIST PRICE
10018116467	Base for mtg. electrolytic condenser	.04
10053160714	Bottom for cabinet (without serial numbers)	.16
10054160748	Bull's eye	.24
10060160766	Cabinet complete with bulls eye & decal	3.00
10054112798	Clip - for mtg. wave trap coil	.01
10053116471	Cover for electrolytic condenser	.05
10054160757	Decal - "Silvertone"	.04
1005477208	Flat steel washer, chassis mtg.	.01
10039160744	Knob (volume control)	.12
1005437484	Lockwasher - for mtg. motor----------Per C	.50
1005412849	Nut - 8-32 for mtg.----------Per C	.45
10063160741	Pick up (phono)	8.00
10054160747	Rubber foot	.05
1005485827	Set Screw - 8-32 square head	.02
10054113657	Screw - 8-32 X 3/8" R.H.M.S for bottom	.01
10054160690	Trip - lever	.05
10018114876	Socket - octal	.15
10018119791	Socket - 8 prong	.12
10018160749	Socket - pilot lamp	.21
10064160746	Turntable - 8" for 10064160745 motor	1.50
10064160789	Turntable - 8" for 10064160788 motor	1.50
10064160792	Turntable - 8" for 10064160791 motor	2.00
10064161104	Idler wheel for 10064160745 & 10064160791 motors	.85
10064117606	Idler wheel for 10064160788 motor	.60

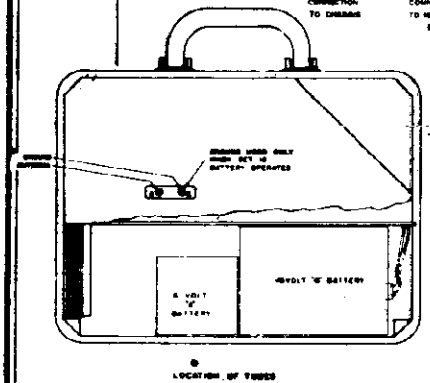
RETAIL SELLING PRICES PREPAID
PRICES SUBJECT TO CHANGE WITHOUT NOTICE

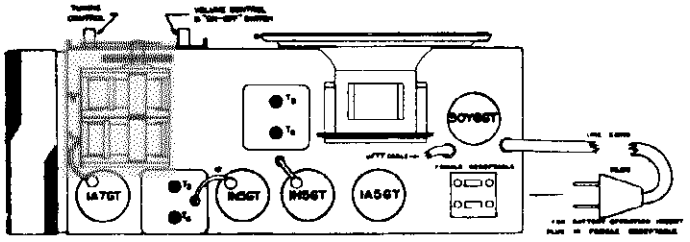
MODEL 6911,Ch.110.417
MODEL 6951.Ch.110.411

SEARS, ROEBUCK & CO.









MODEL 6911
MODEL 6951

SEARS, ROEBUCK & CO.

ALIGNMENT PROCEDURE

Output meter connections.....Across primary of output transformer

Connection of output generator lead.....See Chart below

Generator modulation.....30%, 400 cycles

Position of volume control.....Fully on

POSITION OF VARIABLE	GENERATOR FREQUENCY	GENERATOR CONNECTION	TRIMMER ADJUSTMENTS	TRIMMER FUNCTION
Closed	455 KC	1A7GT Grid	T3, T4 T5, T6	I.F.
1500 KC	1500 KC	*See note below	T2, T1	Osc., R.F.

The complete assembly of loop mounting and chassis shelf should be removed as a unit in order to align the receiver

The batteries should be in the proper position when aligning the receiver.

Always keep the output power from the generator at its lowest possible value to prevent the AVC of the receiver from interfereing with accurate alignment.

*Run a wire from the output terminal of the generator, having it come near the receiver. However, no electrical connection is made between the signal generator and the receiver.

ELECTRICAL SPECIFICATIONS

TUBES AND FUNCTIONS
1A7GT.....Transl.Oscill. 1H5GT.....A.V.C., Detector, 1st Audio
1N5GT..... IF 1A5GT..... Output
50Y6GT..... Rectifier

POWER SUPPLY - BATTERY OPERATION
(1)#5086..... 6.0V "A" Battery "A" Drain..... 50 MA.
(2)#5079..... 45V "B" Batteries "B" Drain..... 8.5 MA.

POWER SUPPLY - POWER LINE OPERATION
50-60 cycle.....110-125 volts A.C.-D.C. 30 Watts.

POWER OUTPUT
Type..... Pentode
Undistorted..... 100 MW
Maximum..... 260 MW

LOUD SPEAKER
Type..... Dynamic
Size..... 5"
Field..... P.M.

MECHANICAL SPECIFICATIONS

OPERATING CONTROLS
Left Knob....."On-Off" switch & volume control
Right knob..... Tuning

CONTROL OPERATION
Turn right: Power on, volume increase

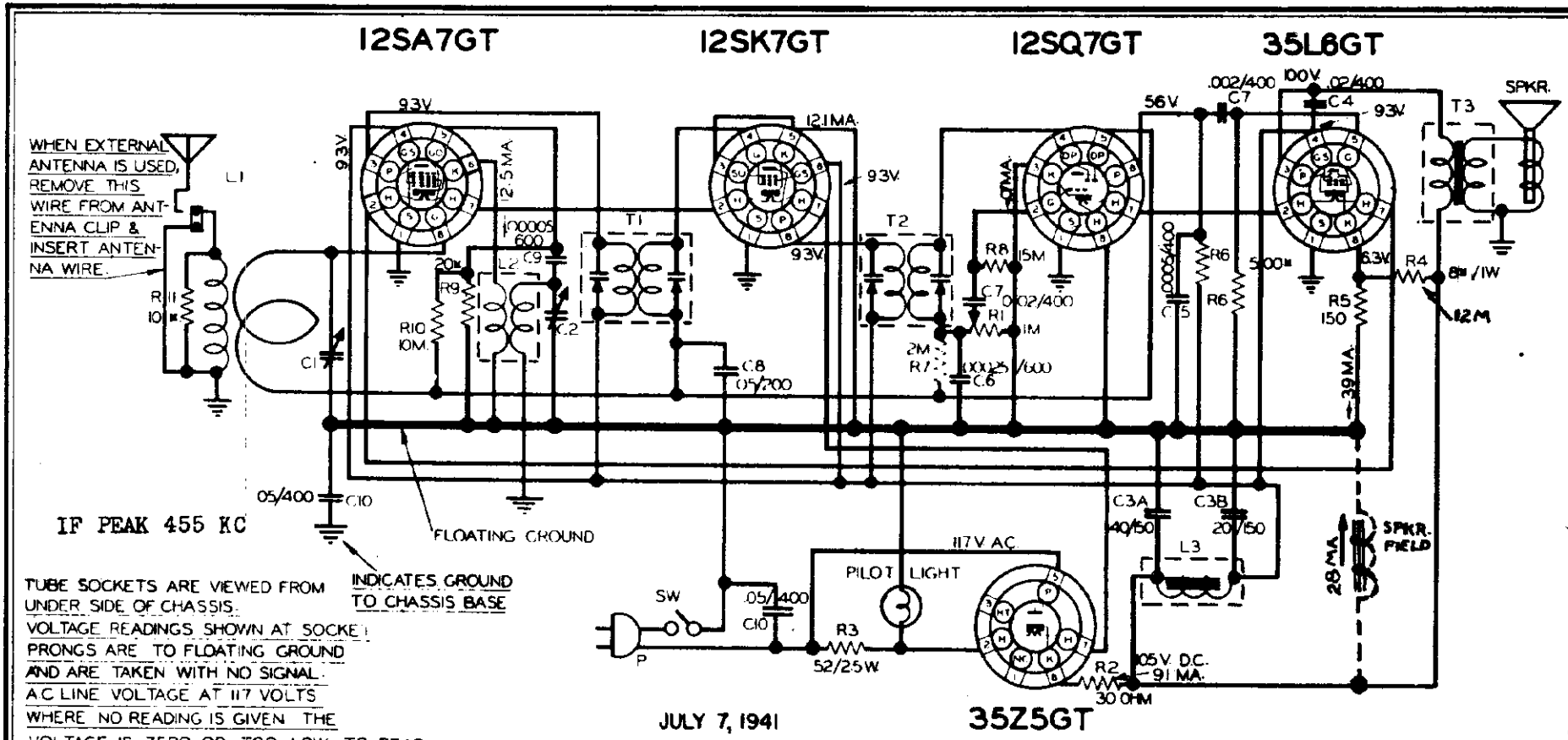
GENERAL INFORMATION AND SERVICE HINTS

THE 417 IS ALMOST IDENTICAL TO THE 411 WITH BUT A FEW MINOR CHANGES AS FOLLOWS:
1 - A TRIPLE POLE DOUBLE THROW SWITCH IS USED TO ISOLATE "A" AND "B" BATTERY PLUGS WHEN THE RECEIVER IS OPERATED FROM 110-125 VOLT SOURCE.
2 - THE PAPER CONDENSER (C20-.05MF) IS REPLACED BY A MICA MOULDED CONDENSER OF THE SAME VALUE.
3 - A NEGATIVE BUS IS USED AND IS CONNECTED TO THE CHASSIS THROUGH A .2MF CONDENSER C21

THE ANTENNA
The receiver contains a built-in "loop" antenna which will give entirely satisfactory reception from local and moderately distant stations. Additional range can be had by connecting to a conventional outdoor antenna. If such an external antenna is used, connection should also be made to a ground. A ground should never be used, however, in 110-125 volt (AC)(DC) operation.

AC-DC OPERATION
For (AC) alternating current (DC) direct current operation, the male plug is withdrawn from its receptacle at the rear of the chassis and inserted into the 110-125 volt source. The receiver may then be operated normally. This is illustrated by diagram on the following page.

MODELS 7004,7006,7007
Ch.132.812,-A,-B
132.812-1,-1A,-1B
132.812-2,-2A,-2B
132.812-3,-3A,-3B



JULY 7, 1941

SUBJECT: ADDITION OF SUFFIX NUMBER -2 TO CHASSIS IDENTIFICATION NUMBER

The Pilot Lamp Shield and Snubber Assembly has been improved and simplified. This assembly which was identified by Part Number N17225 is superceded by Part Numbers N17308- Pilot Lamp Snubber and N17307- Pilot Lamp Shield.

When ordering parts for Chassis marked 132.812-2, -2A, -2B, use the parts list included in this Supplement.

SUBJECT: ADDITION OF SUFFIX NUMBER "-3" TO CHASSIS IDENTIFICATION NUMBER 132.812 AND PARTS LIST AND CIRCUIT DIAGRAM CHANGES FOR ALL MODELS.

The Oscillator Coil Pt. No. N17233 was supplanted by Pt. No. N17320.

The new coil Pt. No. N17320 may be identified by the fact that lug no. 1 is blank whereas the start of the white winding of coil no. N17233 was connected to lug no. 1. (See fig. 1)

The hookup of the coil in the circuit remains unchanged and is as follows:

Lug no. 1 - To chassis
Lug no. 2 - To Variable Condenser
Lug no. 3 - To Flt. ground
Lug no. 4 - To cathode 12SA7GT

SPEAKER FIELD (dotted position) in Chassis 132.812-1,-1A,-1B and 132.812-3,-3A,-3B only.
R4 changed to 12,000 ohms

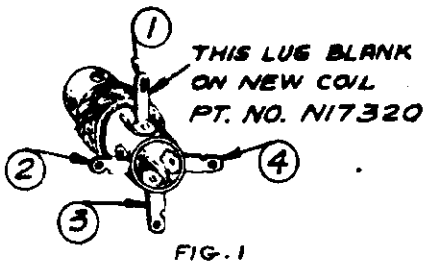


FIG. 1

SEARS, ROEBUCK & CO.

TUBES AND FUNCTIONS:
12SA7GT . . Oscillator Translator
12SK7GT . . . . . IF
12SQ7GT . . . . . Detector-AVC-AF
35L6GT . . . . . Output
35Z5GT . . Rectifier

POWER SUPPLY:
All models available . . . . . 105-125 volts, AC-DC, 35 watts

FREQUENCY RANGE . . . . . 540 - 1600 kc.

ALIGNMENT FREQUENCIES: Osc. - 1400 kc;
Transl. - 1400 kc;

INTERMEDIATE FREQUENCY . . . . . 455 kc.

POWER OUTPUT:
Type . . . Beam Tube
Undistorted 1.0 watts
Maximum . . 2.6 watts

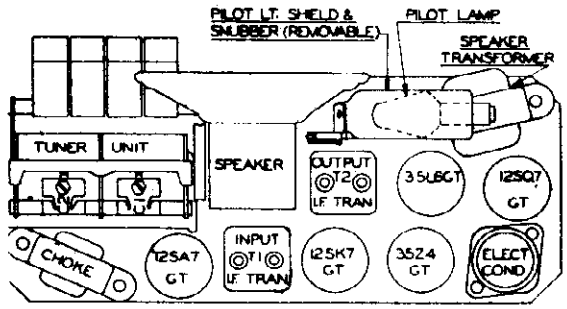
LOUD SPEAKER:
Type . . . . . Permanent Magnet
Size . . . . . 4 inch

OPERATING FEATURES:
Automatic Volume Control
AC-DC
Push Button Tuning (4 button)

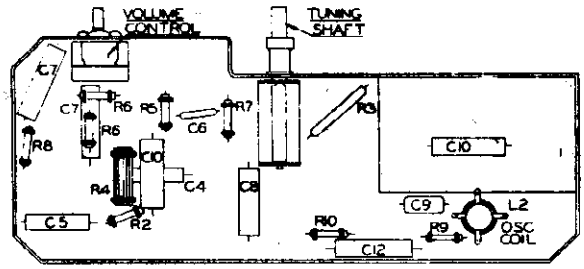
CHASSIS FEATURES:
Number IF stages . . . . . One
Built-in loop with provision for external antenna.

OPERATING CONTROLS:
1. Left knob . . . On-Off switch & volume
2. Right knob . . . . . Tuning

CONTROL OPERATION:
Turning right: ON; Volume increase
Tuning ratio: . . . . 3.3 ; 1



LOCATION OF PARTS ON TOP OF CHASSIS



LOCATION OF PARTS UNDER CHASSIS
132 812

ALIGNMENT PROCEDURE

PRELIMINARY:

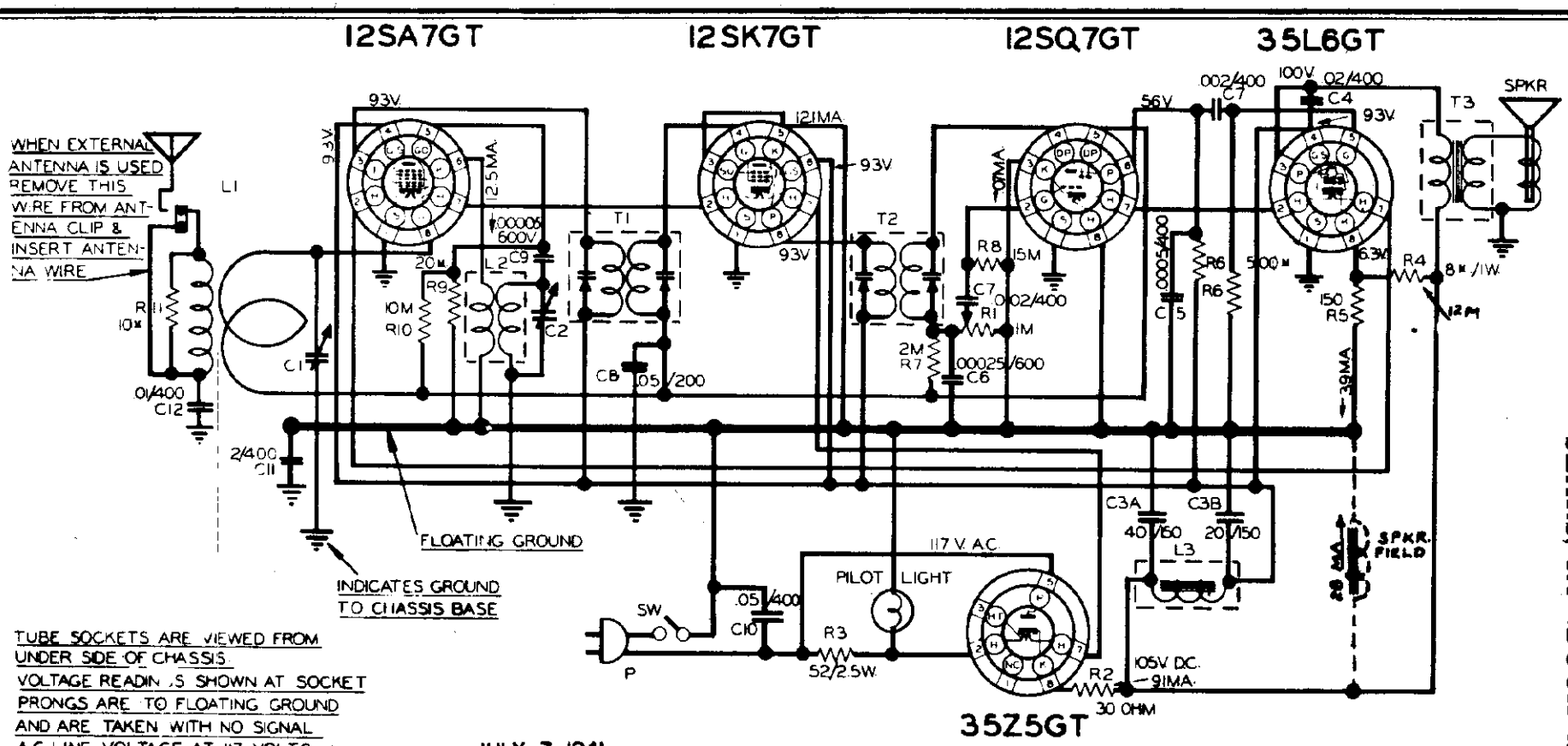
Output meter connection	Across loud speaker voice coil
Output meter reading to indicate 50 milliwatts	0.38 volts
Dummy antenna value to be in series with generator output	See chart below
Connection of generator output lead	See chart below
Connection of generator ground lead	See chart below
Generator modulation	30%, 400 cycles
Position of Volume Control	Fully clockwise
Position of Dial Pointer with Variable fully closed	See note below

POSITION OF VARIABLE	FREQUENCY GENERATOR	DUMMY ANTENNA	GENERATOR CONNECTION (High)	GENERATOR CONNECTION (Low)	TRIMMERS ADJUSTED (In order shown)	TRIMMER FUNCTION	UV INPUT TO STD. LOOP TO GIVE ½ W. OUTPUT
Open	455 kc	.1 mfd.	12SA7GT Grid	Var. cond. frame	T2,T1	IF	-----
1400 kc	1400 kc.	.00005 mfd.	Ant. clip	Ch. base	C2,C1	Translator	1600 uv.
600 kc	600 kc	.00005 mfd.	Ant. clip	Ch. Base	Check point	---	1000 uv.

IMPORTANT ALIGNMENT NOTES

With the variable condenser closed the pointer should point vertically upward. When properly set with the variable condenser closed the pointer will point just to the right of the "54" calibration mark.

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 inaffective.

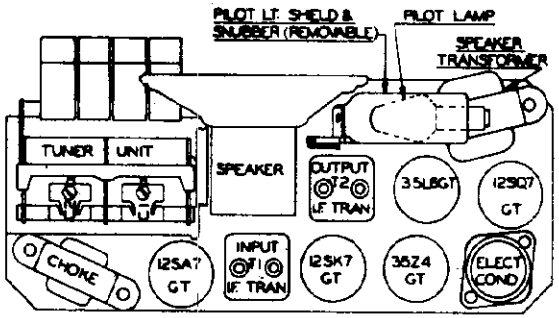


TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS
VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO FLOATING GROUND AND ARE TAKEN WITH NO SIGNAL A.C. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

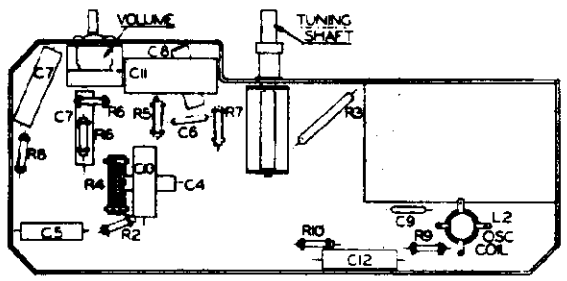
JULY 7, 1941

132.813

IF PEAK 455 KC



LOCATION OF PARTS ON TOP OF CHASSIS



LOCATION OF PARTS UNDER CHASSIS

SPEAKER FIELD (dotted position) in Chassis 132.813-1,-1A,-1B only.
R4 changed to 12,000 ohms.
Aug. 13, 1941

SEARS, ROEBUCK & CO.
MODELS 7005, 7007, 700
Ch. 132.813,-A,-B
132.813-1,-1A,-1B
132.813-3

MODELS 7005,7007,7009

SEARS, ROEBUCK & CO.

TUBES AND FUNCTIONS:
12SA7GT . . . Oscillator-Translator
12SK7GT . . . . . IF
12SQ7GT . . . . . Detector-AVC-AF
35L6GT . . . . . Output
35Z5GT . . . . Rectifier

POWER SUPPLY:
All models available . . . . . 105-125 volts, AC-DC, 35 Watts

FREQUENCY RANGE: 540-1600 kc.

ALIGNMENT FREQUENCIES. . . Osc. - 1400 kc.
Transl. - 1400 kc.

INTERMEDIATE FREQUENCY: . . . . . 455 kc.

POWER OUTPUT:
Type: Beam Tube
Undistorted: 1.0 watts
Maximum: 2.6 watts

LOUD SPEAKER:
Type: Permanent Magnet
Size: 4 inch

OPERATING FEATURES:
Automatic Volume control
AC-DC
P.B. Tuning (4 button)

CHASSIS FEATURES:
Number IF stages . . . . . One
Built-in loop with provision for external antenna.
Underwriters Approved

MECHANICAL SPECIFICATIONS

OPERATING CONTROLS:
1. Left knob . . On-Off Sw. & Volume
2. Right knob . . . . . Tuning

CONTROL OPERATION:
Turning Right. . . On; Volume Increas.
Tuning Ratio 3.3:1

GENERAL INFORMATION & SERVICE HINTS

ADDITION OF SUFFIX LETTERS:

Chassis identified by 132.813 are used in Catalog number 7005, walnut cabinet. Suffix letter "-A" has been added when the chassis is used in Catalog number 7007, ivory cabinet. Suffix letter "-B" is added when the chassis is used in Catalog number 7009, onyx cabinet.

THE HEATER CIRCUIT:

The heaters 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 burnt out tube; the others then will light. The burnt out tube can be located through the fact that the full line voltage will appear across its heater prongs.

POSITION OF POWER CORD PLUG:

On AC, the power cord plug should be tried in both its possible positions in the receptacle and left in the position that gives least hum. On DC, the receiver will work at only one position of the plug in its receptacle.

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection . . . . . Across loud speaker voice coil
Output meter reading to indicate 50 milliwatts . . . . . 0.38 volts
Dummy antenna value to be inseries with generator output . . . . . See chart below
Connection of generator output l ead . . . . . See chart below
Connection of generator ground lead . . . . . See chart below
Generator modulation . . . . . 30%, 400 cycles
Position of Volume Control . . . . . Fully clockwise
Position of Dial Pointer with Variable fully closed . . . . . See note below

POSITION OF VARIABLE	FREQUENCY GENERATOR	DUMMY ANTENNA	GENERATOR CONNECTION (high)	GENERATOR CONNECTION (low)	TRIMMERS ADJUSTED (In order shown)	TRIMMER FUNCTION	Uv. Input To Haz. Std. Loop to Give ½ Watt Output
Open	455 kc.	.1 mfd.	12SA7GT Grid	Flt. Grnd.	T2,T1	IF	--------
1400 kc	1400 kc	.00005 mfd.	Ant. clip	Ch. base	C2,C1	Translator	1600 uv.
600 kc	600 kc	.00005 mfd.	Ant. clip	Ch. base	Check point	----	1000 uv.

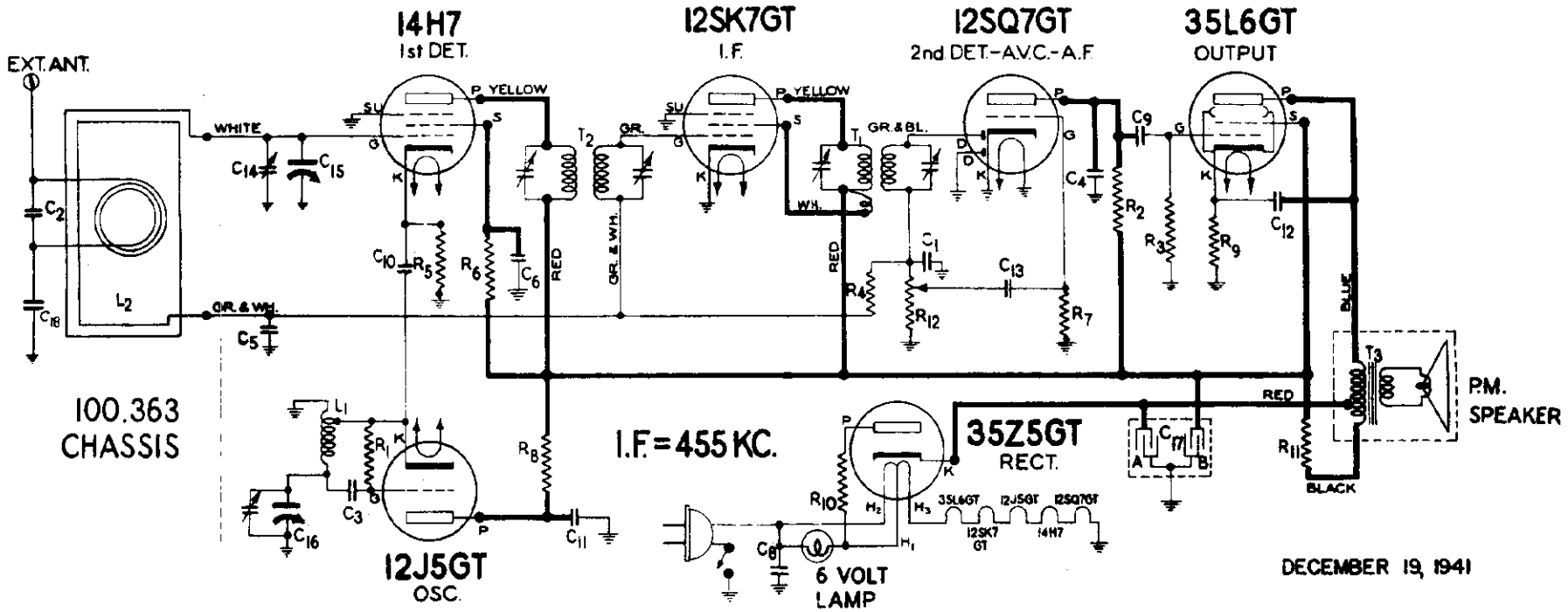
IMPORTANT ALIGNMENT NOTES

With the variable condenser closed the pointer should point vertically upward. When properly set with the variable condenser closed the pointer will point just to the right of the "54" calibration mark.

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.

SEARS, ROEBUCK & CO.

MODELS 7010, 7034
Chassis 100.363
Chassis 100.363-1



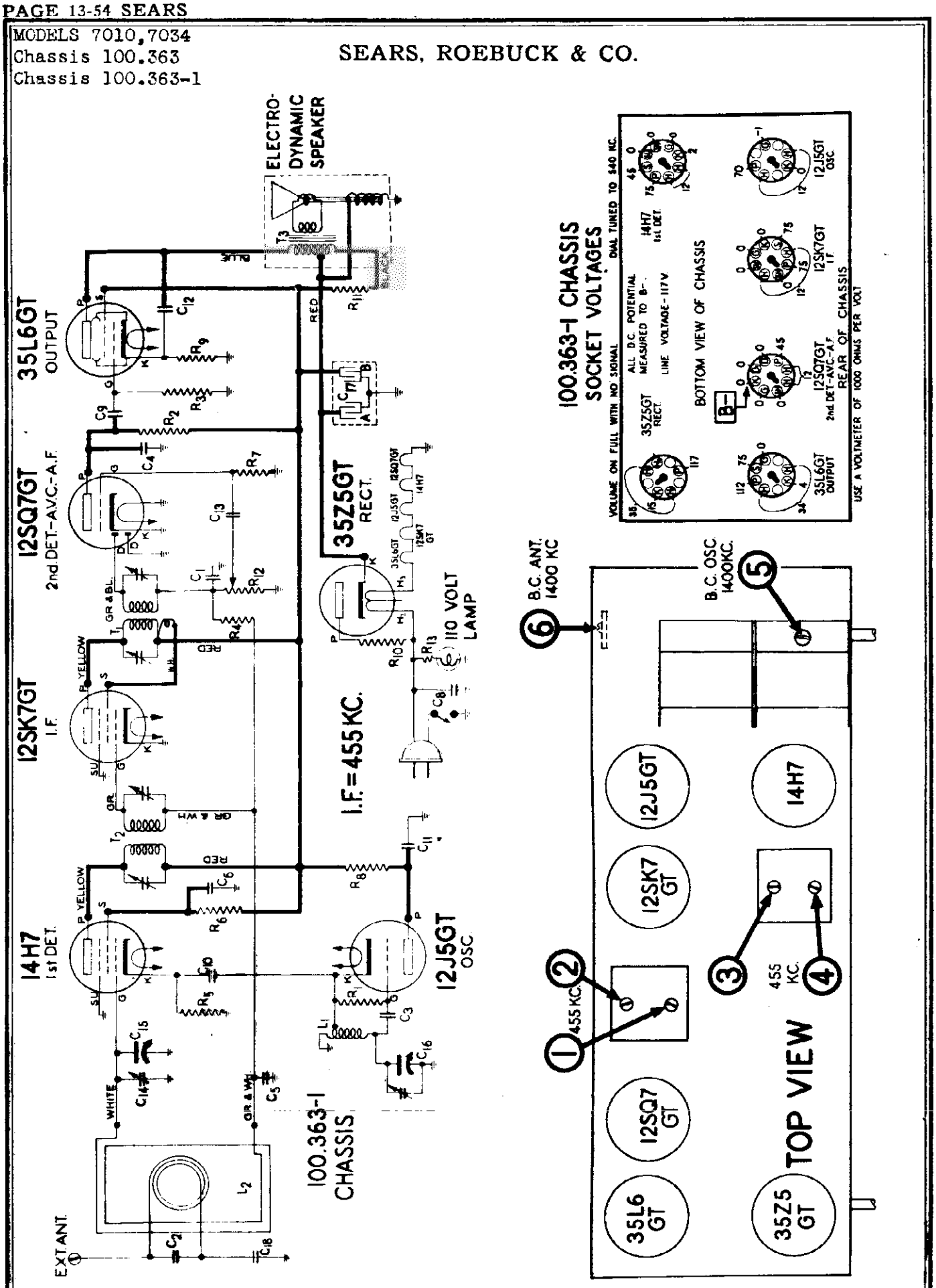
PART NUMBER	DIAGRAM NUMBER	DESCRIPTION	LIST PRICE
W 83539	C1	Condenser-Mica. 260 Mmfd.	.20
W 83763	C2,C3	Condenser-Mica. 110 Mmfd.	.20
W 85394	C4	Condenser-Mica. 510 Mmfd.	.25
W 116819	C5, -, C8	Condenser-.05 Mfd. 600 Volt	.20
W 119193	C6,C9, C10,C11	Condenser-.01 Mfd. 600 Volt	.15
W 119414	C12	Condenser-.02 Mfd. 600 Volt	.15
W 119817	C13	Condenser-.004 Mfd. 600 Volt	.15
W 119345	C14	Condenser-Trimmer (Loop)	.20
W 500443	C15,C16	Condenser-Variable Tuning with Drum	2.60
W 500256	C17	Condenser-Electrolytic (50-60 Cycle)A-40 Mfd. 150 Volt) (Models only)B-20 Mfd. 150 Volt)	1.00
W 500744	C17	Condenser-Electrolytic A-80 Mfd. 150 Volt B-20 Mfd. 150 Volt (25 Cycle Models Only)	1.80
W 119193	C18	Condenser-.01 Mfd. 600 Volt	.15
W 110552	R1	Resistor-Carbon, 47000 Ohms ½ Watt	.12
W 110553	R2	Resistor-Carbon, 220000 Ohms ½ Watt	.12
W 110559	R3	Resistor-Carbon, 470000 Ohms ½ Watt	.12
W 110570	R4	Resistor-Carbon, 2.2 Meg. ½ Watt	.15
W 116079	R5	Resistor-Carbon, 1200 Ohms ½ Watt	.12
W 110578	R6	Resistor-Carbon, 68000 Ohms ½ Watt	.12
W 112975	R7	Resistor-Carbon, 10 Meg. ½ Watt	.12
W 116068	R8	Resistor-Carbon, 680 Ohms ½ Watt	.10
W 116092	R9	Resistor-140 Ohms 1 Watt Wire-Wound	.14
W 116752	R10	Resistor-33 Ohms 1 Watt Wire-Wound (50-60 Cycle Models Only)	.12
W 116013	R10	Resistor-50 Ohms 1 Watt Wire-Wound (25 Cycle Models Only)	.18
W 118824) W 500306)	R11	(Resistor-Carbon, 1500 Ohms ½ Watt (100.363 Only) (Resistor-2000 Ohms 1 Watt (100.363-1 Only)	.12 .25
W 500422	R12	Volume Control-1 Meg. (With Switch)	1.25
W 160078	R13	Resistor-220 Ohms 1 Watt	.20
W 500408	L1	Coil-Oscillator	.42
W 500637) W 500644)	L2	(Loop Antenna & Cab. Back)(Plastic Cab) (Loop Antenna & Cab. Back)(Wood Cab.)	1.60 1.70
W 500835	T1	Transformer-2nd I.F.	1.10
W 500801	T2	Transformer-1st I.F.	1.20
W 500617R	T3	Transformer-Output for Spkrs.	1.50
W 500577R		Speaker-P.M. Dynamic (100.363 Only)	5.65
W 500973R		Speaker-Electro-Dynamic (5") (100.363-1 Only)	5.85
W 500587R		Cone & Voice Coil for Spkrs.	1.50
W 500897		Lamp-Dial (Mazda C7)(100.363-1 Only)	.28
W 118921		Lamp-Dial (Mazda #47)(100.363 Only)	.15

MISCELLANEOUS PARTS

PART NUMBER	DESCRIPTION	LIST PRICE
W-160026	Base-for Mtg. Electrolytic Condenser	.04
W 117057	Cord-Drive Supplied in 3' Lengths	.15
W 500569	Dial Scale-for Plastic Cabinets	.54
W 500696	Dial Scale-for Wood cabinets	.60
W 500732	Pointer	.10
W 117716	Shield-Tube	.07
W 116690	Socket-Octal Base	.12
W 160392	Socket-Octal (Rectifier)	.12
W 160294	Socket-8 Prong for 14H7	.12
W 500896	Socket-Pilot Lamp (with Leads)(100.363-1 only)	.26
W 500499	Socket-Pilot Lamp (with Leads)(100.363 only)	.18

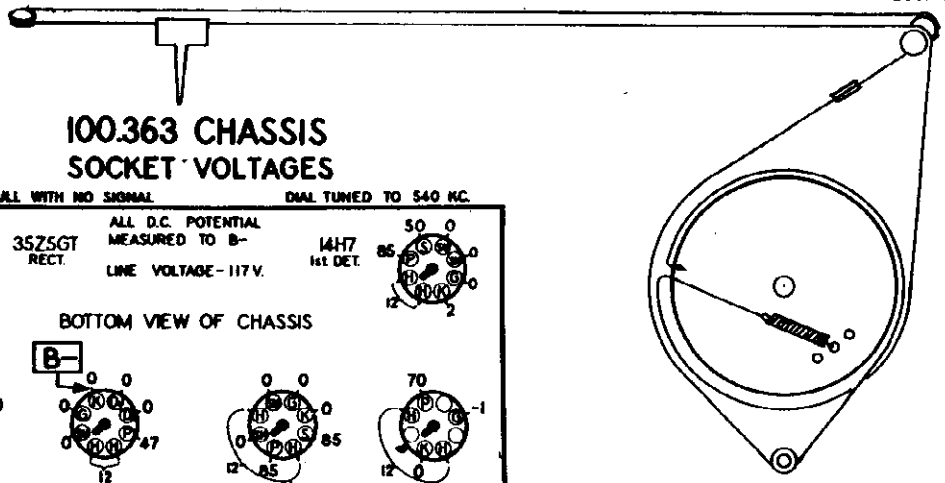
MODELS 7010,7034
Chassis 100.363
Chassis 100.363-1

SEARS, ROEBUCK & CO.

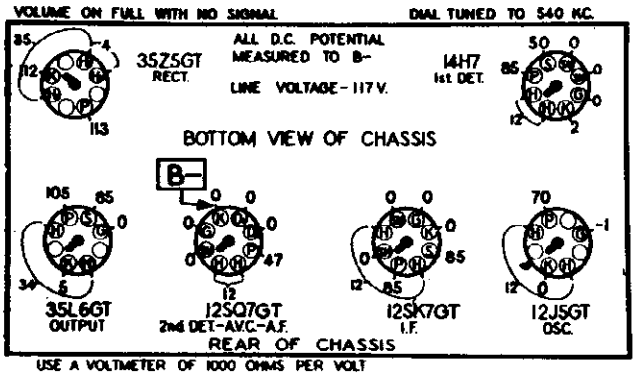


SEARS, ROEBUCK & CO.

MODELS 7010,7034
Chassis 100.363
Chassis 100.363-



100.363 CHASSIS
SOCKET VOLTAGES



DIAL DRIVE MECHANISM AS VIEWED FROM THE FRONT

POWER SUPPLY
363 or 363-1 chassis is supplied for either 25 or 50-60 cycle power supplies

363..105-125 V. (50-60 or 25) cycles..30 watts

363-1..105-125V. (50-60 or 25) cycles .42 watts

FREQUENCY RANGE.....535 to 1725 KC.
ALIGNMENT FREQUENCIES.....455 KC, 1400 KC.

INTERMEDIATE FREQUENCY..... ..... 455 KC.

POWER OUTPUT
Type.....Pentode
Undistorted..... .9 Watts
Maximum..... 1.7 Watts

LOUD SPEAKER
Type (P.M. dynamic (363 chassis) / Electro dynamic (363-1 chassis)
Size..... 5"
Field resistance....(363-1) 3800 ohms

Before starting the alignment procedure check to see if the pointer is set to the last mark on the 550 KC. end of the dial scal with the gang condenser in full mesh.

Output meter connection----Across speaker voice coi
Output meter reading to indicate 500 milliwatts---- 1.32 volt
Dummy antenna value to be in series with generator output----See chart belo
Connection of generator output lead----See chart belo
Connection of generator ground lead----To 12SQ7 cathod
Generator modulation----30%, 400 cycle
Position of Volume Control----Fully clockwis
Position of Dial Pointer with gang fully closed----On mark to left of 550 KC. calibration mar
Approximate input to standard loop giving 500 MW @ 400 cycles, 30% mod.---- 1200 uv. averag

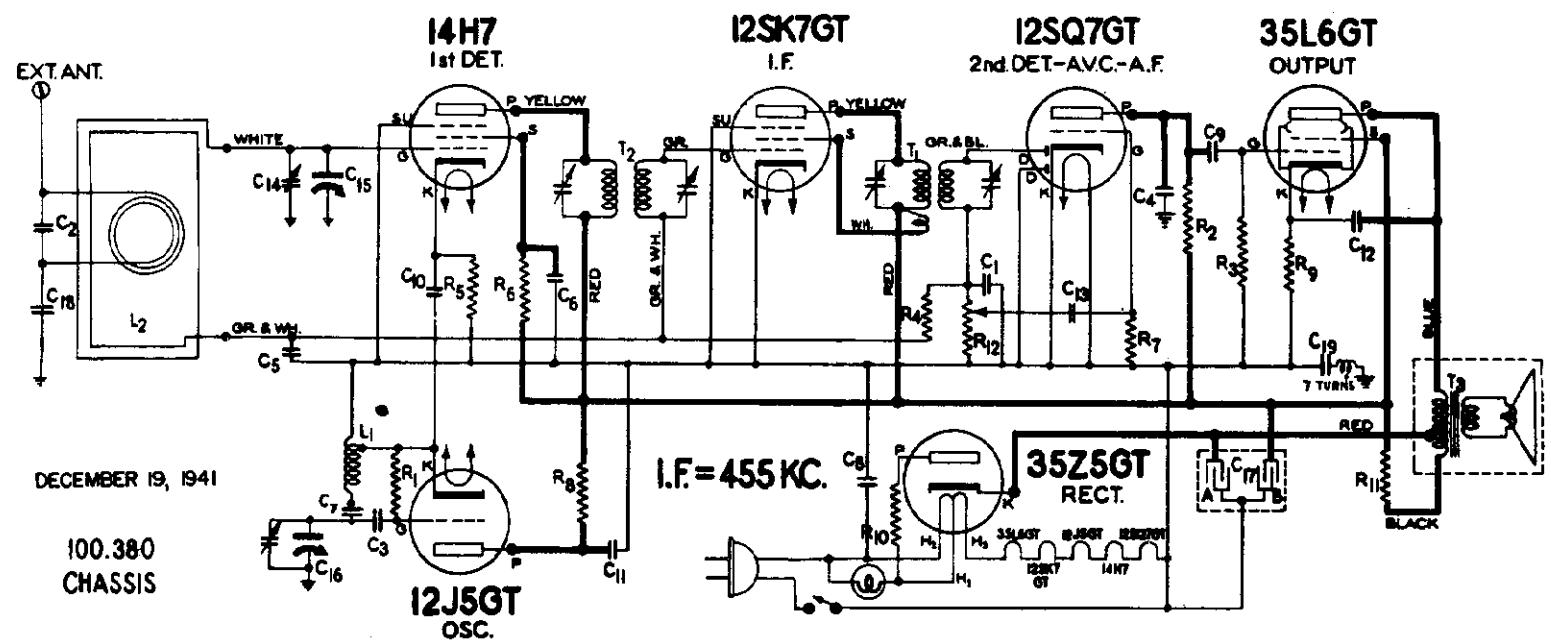
DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR	CONNECTION SIGNAL GENERATOR OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
.1 MFD. CONDENSER	STATOR ON REAR SECTION OF GANG.	455 KC	600 KC	1 - 2 3 - 4	2ND I. F. 1ST I. F.	ADJUST FOR MAXIMUM OUTPUT. THE REPEAT ADJUSTMENT.
STANDARD ALIGNING LOOP	*STANDARD LOOP PLACED 24" FROM RECEIVER LOOP	1400 KC	1400 KC	5	BROADCAST OSCILLATOR (SHUNT)	ADJUST FOR MAXIMUM OUTPUT.
STANDARD ALIGNING LOOP	*STANDARD LOOP PLACED 24" FROM RECEIVER LOOP	1400 KC	1400 KC	6	BROADCAST DETECTOR	ADJUST FOR MAXIMUM OUTPUT.

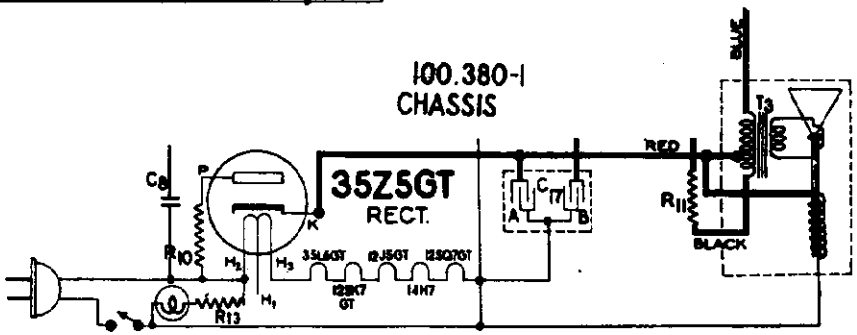
* A 50 MMFD. MICA CONDENSER CONNECTED TO THE ANTENNA TERMINAL MAY BE USED IN PLACE OF THE STANDARD LOOP.

ELECTRICAL CHANGES IN 100.363 CHASSIS

The first group of 100.363 chassis produced were equipped with a Permanent Magnet speaker and a six volt pilot lamp. Later chassis were produced with electro-magnetic speakers and 110 volt pilot lights. These later chassis are identified by 100.363-1 stamped on the identification plate.

WHEN ORDERING PARTS OR REFERRING TO A CIRCUIT DIAGRAM, BE SURE TO SPECIFY OR REFER TO THE PROPER AND COMPLETE CHASSIS NUMBER AS SHOWN ON THE IDENTIFICATION PLATE.





ELECTRICAL PARTS

(Parts different from 100.363 & 100.363-1)

W-116819	C7 Condenser-.05 mfd. 600 volt.....	.20
W-116706	C19 Condenser-.2 mfd. 600 volt.....	.35
W-500616R	Speaker-P.M. dynamic (5") (100.380 only).....	5.65
W-500973R	Speaker-Electro-dynamic (5") (100.380-1 only).....	5.85

MISCELLANEOUS PARTS

W-116467	Base-for mtg. electrolytic condenser.....	.04

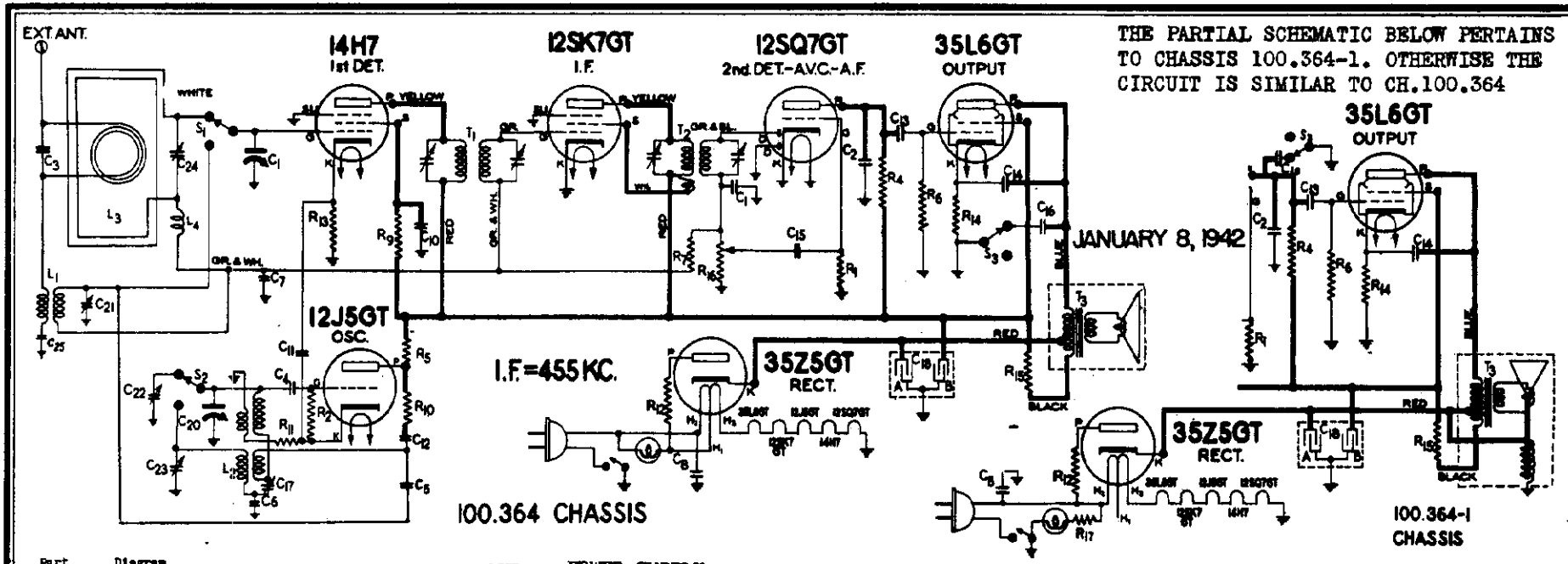
ELECTRICAL & MECHANICAL SPECIFICATIONS

The 100.380 & 100.380-1 chassis are the Underwriters' listed versions of the 100.363 & 100.363-1 chassis respectively. The electrical and mechanical specifications are the same as those for the 100.363 & 100.363-1 chassis and may be obtained from the RL issued for these chassis. The 100.363 & 100.363-1 chassis use the metal chassis pan as the B- return. The Underwriters' listed chassis (100.380 & 100.380-1) use a separate B- return which is by-passed to the metal chassis pan through condenser C19.

The parts listed for 100.363 & 100.363-1 diagrams applies to the 100.380 & 100.380-1 diagrams

WITH THE DIFFERENCES SHOWN IN THE ABOVE PARTIAL SCHEMATIC, CHASSIS 100.380-1 IS IDENTICAL TO CHASSIS 100.380

SEE SEARS PAGE 13-53 FOR PARTS



THE PARTIAL SCHEMATIC BELOW PERTAINS TO CHASSIS 100.364-1. OTHERWISE THE CIRCUIT IS SIMILAR TO CH.100.364

Part Number	Diagram Number	Description	LIST PRICE
W83539	C1-C2	Condenser-Mica 260 Mmfd.	.20
W83783	C3-C4	Condenser-Mica 110 Mmfd.	.20
W110510	C-5	Condenser- 3 Mmfd.	.12
W88587	C-6	Condenser-Mica .0042 Mfd.	.35
W116819	C7-C8	Condenser- .05 Mfd. 600 Volts	.20
W119193	C10-C13	Condenser- .01 Mfd. 600 Volts	.15
W119414	C-14	Condenser- .02 Mfd. 600 Volts	.15
W119817	C-15	Condenser- .004 Mfd. 600 Volts	.15
W119880	C-16	Condenser- .04 Mfd. 600 Volts (100.364 Only)	.20
W119817	C-16	Condenser- .004 Mfd. 600 Volts (100.364-1 Only)	.15
W119934	C-17	Condenser-Padder	.38
W500256		Condenser-Electrolytic, A-40 Mfd. 150 Volt; B-20 Mfd. 150 Volt (50-60 Cycle Models Only)	1.00
W500744	C-18	Condenser-Electrolytic A-80 Mfd. 150 Volt; B-20 Mfd. 150 Volt (25 Cycle Models Only)	1.80
W500442	C19-C20	Condenser-Variable tuning with drum	2.80
W500647	C21-C22 C23	Condenser-Trimmer, 3 section	.48
W119345	C24	Condenser-Trimmer (loop)	.20
W119193	C25	Condenser-.01 Mfd. 600 Volts	.15
W112976	R1	Resistor-Carbon, 10 Meg. 1/4 Watt	.12
W110652	R2	Resistor-Carbon, 47,000 Ohms 1/4 Watt	.12
W110653	R4	Resistor-Carbon, 220,000 Ohm 1/4 Watt	.12
W110657	R5	Resistor-Carbon 4700 Ohm 1/4 Watt	.12
W110659	R6	Resistor-Carbon, 470,000 Ohm 1/4 Watt	.12
W110670	R7	Resistor-Carbon, 2.2 Meg. 1/4 Watt	.15
W110678	R9	Resistor-Carbon, 68,000 Ohm 1/4 Watt	.12
W110690	R10-R11	Resistor-Carbon, 180 Ohm 1/4 Watt	.12
W116752		Resistor-33 Ohm 1 Watt, Wire Wound (60-60 Cycle Models Only)	.15
W116013	R12	Resistor-50 Ohm 1 Watt, Wire Wound (25 Cycle Models Only)	.18
W116079	R13	Resistor-Insulated, 1200 Ohm 1/4 Watt.	.12
W116092	R14	Resistor-140 Ohm 1 Watt, Wire Wound	.14
W118824	R15	Resistor-Carbon, 1500 Ohm 1/2 Watt (100.364 Only)	.12
W500308	R16	Resistor-2,000 Ohm 1 Watt (100.364-1 Only)	.16
W500482	R16	Volume control- 1 Meg. (with switch)	1.25
W160078	R17	Resistor, 220 Ohms 1 Watt (100.364-1 Only)	.20
W500645	L1	Coil-Short Wave Antenna	.80
W500646	L2	Coil-Oscillator (B.C. & S.W.)	1.00
W500648 W501331	L3	Loop Antenna & Cabinet Back for Plastic Cabinets; Loop Antenna & Cabinet Back for Wood Cabinets	1.70; 2.85
W500911	L4	Loading Coil	.85

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

POWER SUPPLY

100.364 & 100.364-1 chassis are supplied for either 25 or 50-60 cycle power supplies.

FREQUENCY RANGES

American ..... 535 to 1735 KC.
Foreign ..... 5.6 to 16.1 MC.

INTERMEDIATE FREQUENCY ..... 455 KC.

POWER OUTPUT

Type ..... Pentode
Undistorted ..... .9 Watts
Maximum ..... 1.7 Watts

105-125 V {50-60 / 25} cycle 30 W.(100.364)
105-125 V {50-60 / 25} cycle 42 W(100.364-1)

ALIGNMENT FREQUENCIES

1400 KC, 600 KC.
14 MC.

LOUD SPEAKER

Type ... {P.M. Dynamic (100.364) / Electro Dynamic (100.364-1)}
Size ..... 5"
Field Resistance-3600 ohms(100.364-1)

ELECTRICAL CHANGES IN 100.364 CHASSIS

The 100.364 chassis as first produced used a P.M. dynamic speaker and a 6 volt pilot light. Later versions use an electro-dynamic speaker whose field is connected across the B supply in order to obtain the required excitation. These later models, which are identified by 100.364-1, also use a 110 volt pilot light. The later models have the tone control connected in the 12SQ7 plate instead of the 35L6GT plate as in the earlier models.

MODELS 7016,7031A
Chassis 100.364,
100.364-1

SEARS, ROEBUCK & CO.

ALIGNMENT PROCEDURE

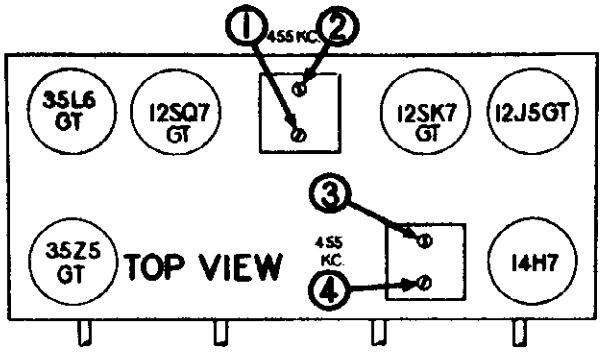
Before starting the alignment procedure check to see if the pointer is set to the last mark on the 550 KC. end of the dial scale with the gang condenser in full mesh.

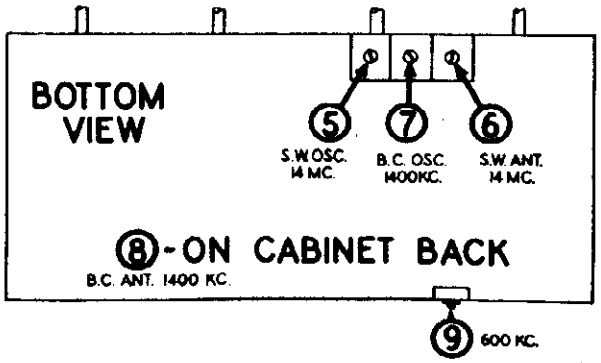
Output meter connection ---------- Across speaker voice coil
Output meter reading to indicate 500 milliwatts ---------- 1.32 volts
Dummy antenna value to be in series with generator output ---------- See chart below
Connection of generator output lead ---------- See chart below
Connection of generator ground lead ---------- To chassis
Generator modulation ---------- 30%, 400 cycles
Position of Volume Control ---------- Fully clockwise
Position of Tone Control ---------- "HI" position
Position of Dial Pointer with gang fully closed ---------- On mark to left of 550 KC. calibration mark
Approximate input to standard loop giving 500 MW @ 400 cycles, 30% mod. ---------- 1200uv.

DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR	CONNECTION SIGNAL GENERATOR OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POSITION	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
.1 MFD. CONDENSER	STATOR ON REAR SECTION OF GANG	455 KC	"AM" POSITION	600 KC	1 - 2 3 - 4	2ND I. F. 1ST I. F.	ADJUST FOR MAXIMUM OUTPUT THEN REPEAT ADJUSTMENT.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	14 MC	"FOR" POSITION	14 MC.	5	SHORT WAVE OSCILLATOR	ADJUST FOR MAXIMUM OUTPUT. CHECK TO SEE IF PROPER PEAK WAS OBTAINED BY TUNING IN IMAGE AT APPROX. 13.1 MC. IF IMAGE DOES NOT APPEAR, REALIGN AT 14 MC. WITH TRIMMER SCREW FARTHER OUT.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	14 MC	"FOR" POSITION	14 MC	6	SHORT WAVE ANTENNA	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DSTUNING TRIMMER AND RE-TUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED
STANDARD ALIGNING LOOP	*STANDARD LOOP PLACED 24" FROM RECEIVER LOOP	1400 KC	"AM" POSITION	1400 KC	7	BROADCAST OSCILLATOR (SHUNT)	ADJUST FOR MAXIMUM OUTPUT.
STANDARD ALIGNING LOOP	*STANDARD LOOP PLACED 24" FROM RECEIVER LOOP	1400 KC	"AM" POSITION	1400 KC	8	BROADCAST DETECTOR	ADJUST FOR MAXIMUM OUTPUT.
STANDARD ALIGNING LOOP	*STANDARD LOOP PLACED 24" FROM RECEIVER LOOP	600 KC	"AM" POSITION	600 KC	9	BROADCAST OSCILLATOR (SERIES)	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DSTUNING TRIMMER AND RE-TUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED

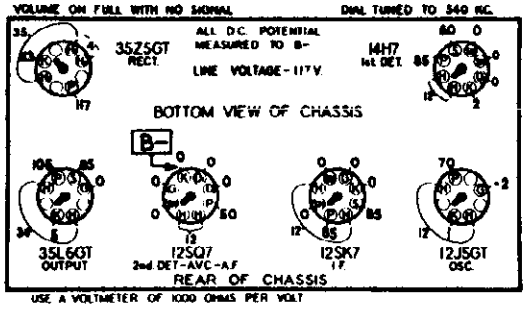
* A 50 mmfd. mica condenser connected to the Antenna Terminal may be used in place of the standard loop.

NOTE: After alignment is completed, place chassis and cabinet in their final position and repeat adjustments #8 & 9.

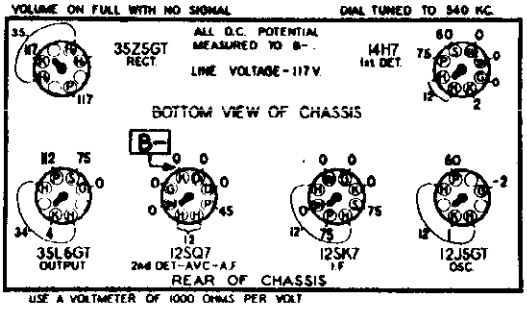




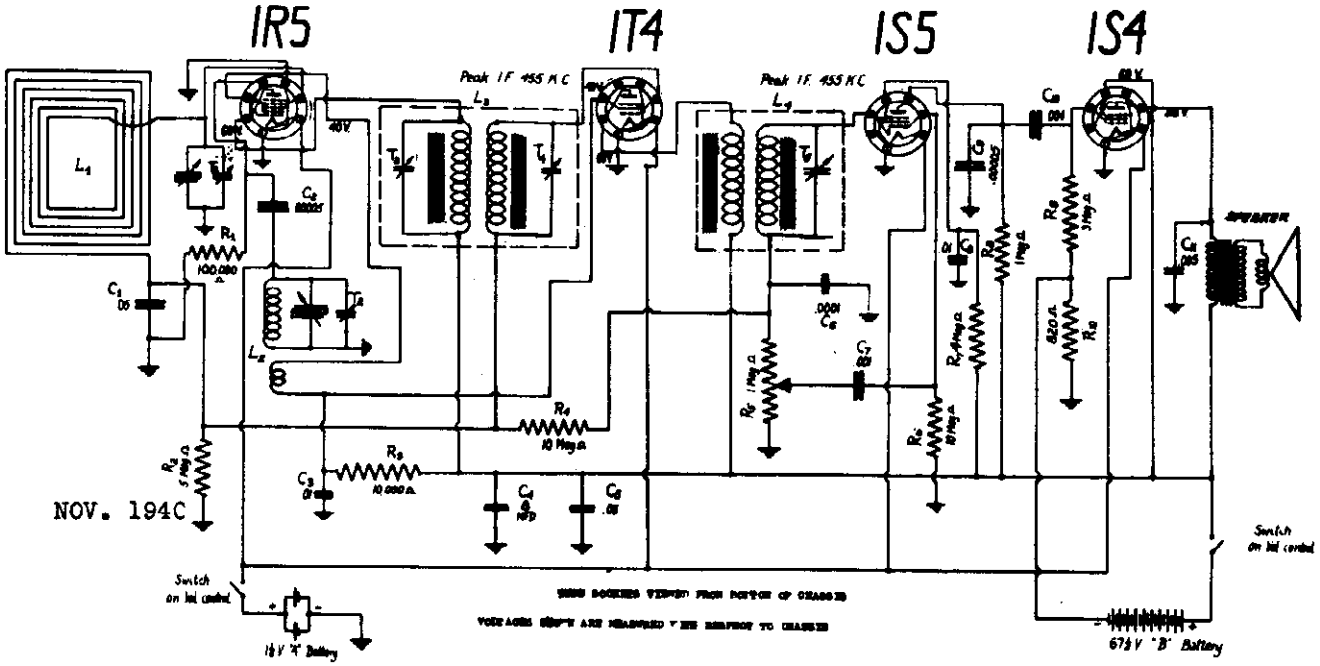
100.364
SOCKET VOLTAGES



100.364-1
SOCKET VOLTAGES



SEARS, ROEBUCK & CO.



ALIGNMENT PROCEDURE

Output meter connections.....Across primary of output transformer

Connection of generator output lead.....See Chart below

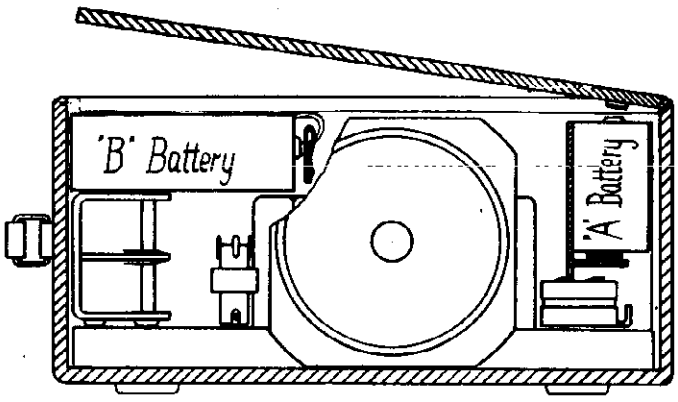
Generator modulation.....30%, 400 cycles

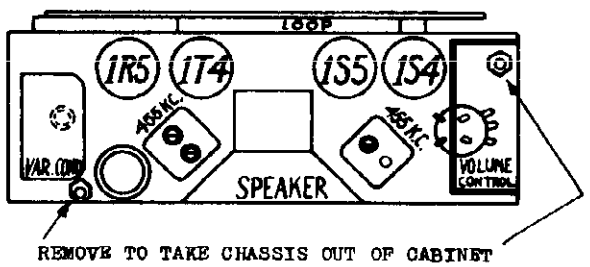
Position of Volume Control.....Fully on

POSITION OF VARIABLE	GENERATOR FREQUENCY	GENERATOR CONNECTION	TRIMMER ADJUSTMENTS	TRIMMER FUNCTION
Closed	455 KC	1R5 Grid (var.cond.section)	T3,T4 T5	I.F.
1500 KC	1500 KC	*	T2,T1	Osc. R.F.

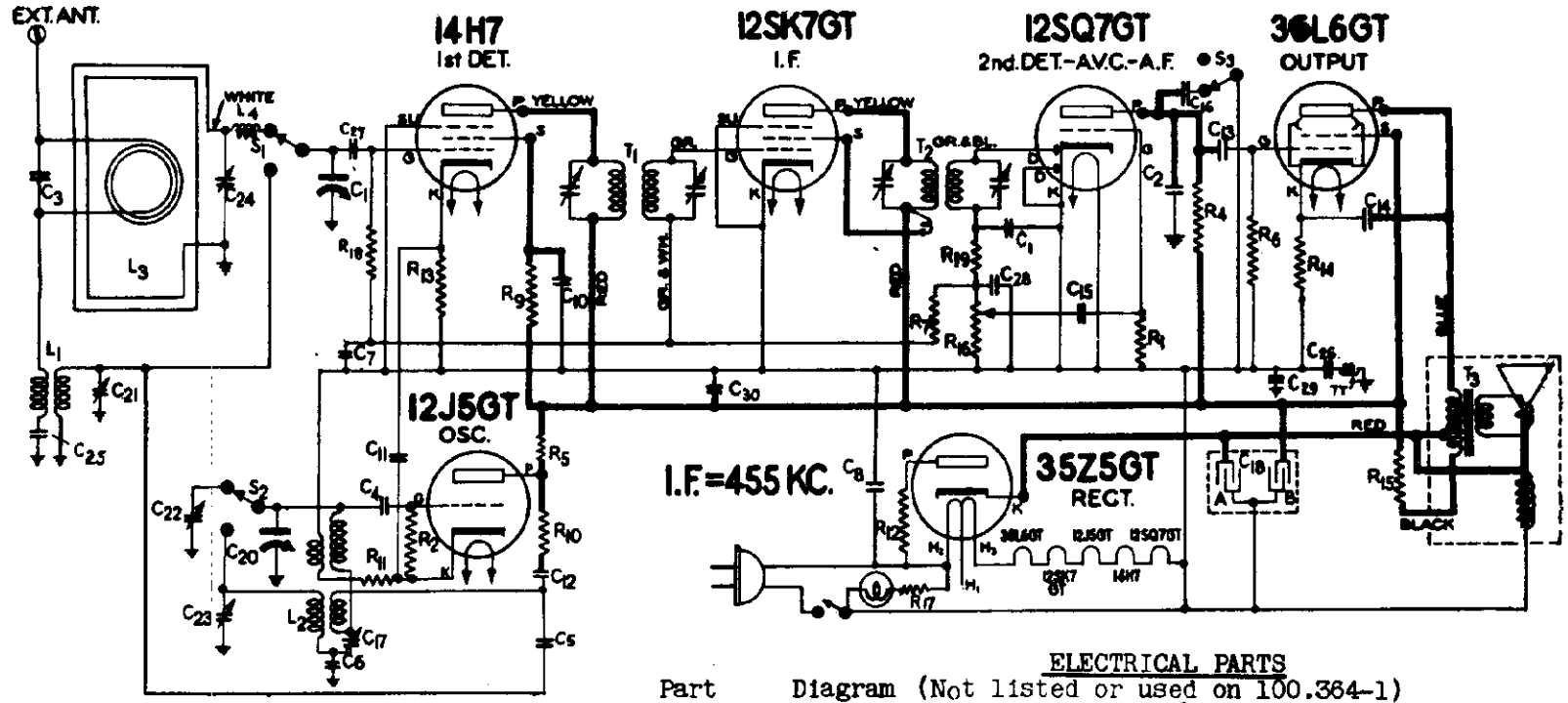
* Run a wire from the output terminal of the generator, having it come near the receiver. However, no electrical connection is made between the signal generator and the receiver.

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.





REMOVE TO TAKE CHASSIS OUT OF CABINET



JANUARY 8, 1942

REFER TO 100.364-1
FOR PARTS NOT LISTED

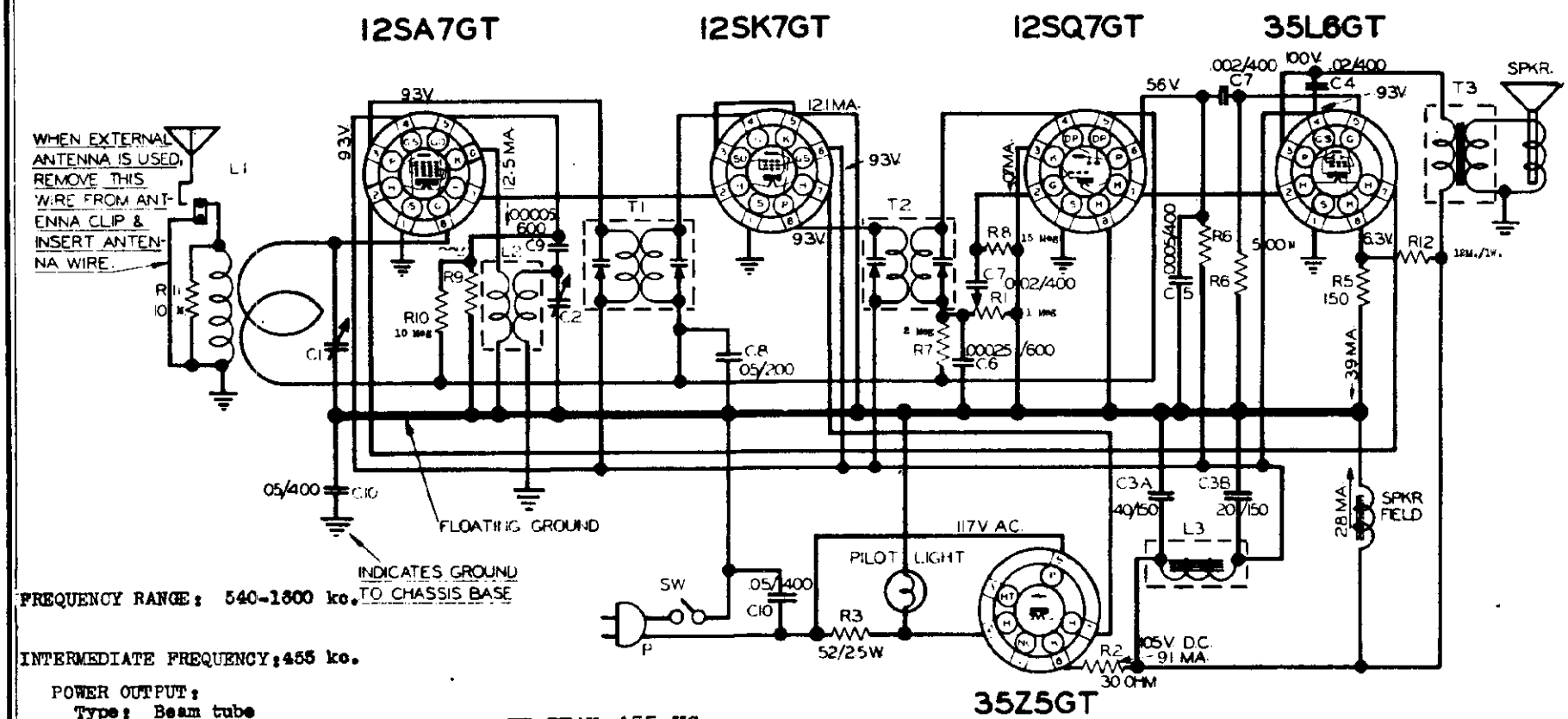
SEE SEARS PAGE 13-57

ELECTRICAL PARTS
(Not listed or used on 100.364-1)

Part Number	Diagram Number	Description	
W116706	C26	Condenser- .2 Mfd. 600 Volts	.35
W83539	C27	Condenser-Mica, 260 Mmfd.	.20
W83783	C28	Condenser-Mica 110 Mmfd.	.20
W160430	C29	Condenser- .001 Mfd. 600 Volts...	.15
W116819	C30	Condenser- .05 Mfd. 600 Volts ...	.20
W110570	R18	Resistor-Carbon 2.2 Meg. 1/4 Watt	.12
W110578	R19	Resistor-Carbon, 68,000 Ohms ½ W.	.12

ELECTRICAL & MECHANICAL SPECIFICATIONS

The 100.381-1 chassis is the Underwriter's Listed version of the 100.364-1 chassis for which an R.L. has been issued. The electrical & mechanical specifications are the same as those for the 100.364-1 and can be obtained from the R.L. for that chassis. The 100.364-1 chassis uses the metal chassis pan as the B-return. The 100.381-1 chassis has a separate B-return but this return is by-passed to the chassis thru C26 & C29. On the 100.381-1 chassis the A.V.C. is shunt-fed to the grid of the 14H7 thru R18 instead of thru the loop as on the 100.364-1. This means that the loop now connects to the chassis instead of the A.V.C. line. L4 has been moved to the other side of the loop. 100.381-1 has seven parts not used on the 100.364-1; they are; C26,C27,C28,C29, C30,R18, & R19. REFER TO 57 RL 383 FOR 100.364-1 CHASSIS FOR SOCKET VOLTAGES AND ALIGNMENT DATA.



FREQUENCY RANGE: 540-1600 kc.

INTERMEDIATE FREQUENCY: 455 kc.

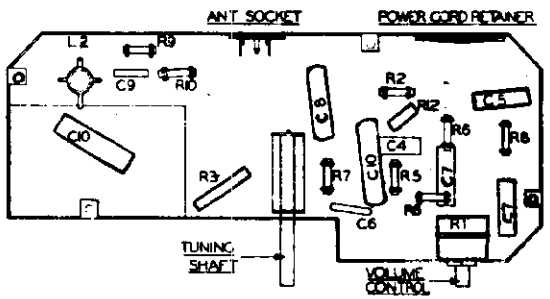
POWER OUTPUT:
Type; Beam tube
Undistorted; 1.0 watts
Maximum: 2.5 watts

LOUD SPEAKER:
Type; E.M.
Size: 4 inch

IF PEAK 455 KC

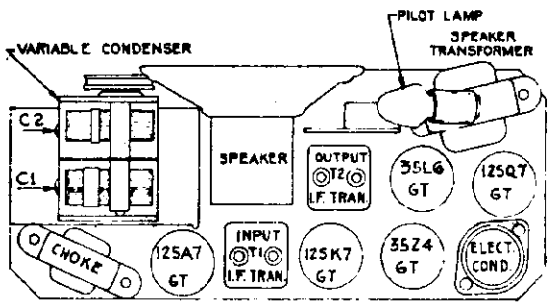
AUGUST 1941

132.806



LOCATION OF PARTS UNDER CHASSIS - 132.806

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO FLOATING GROUND AND ARE TAKEN WITH NO SIGNAL. A.C. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN THE VOLTAGE IS ZERO OR TOO LOW TO READ.



LOCATION OF PARTS ON TOP OF CHASSIS

MODELS 7024,7026
Chassis 132.806
Chassis 132.806-1

SEARS, ROEBUCK & CO.

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection . . . . . Across loud speaker voice coil
Output meter reading to indicate 50 milliwatts . . . . . 0.38 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 . . . . . See chart below
Generator Modulation . . . . . 30%, 400 cycles
Position of Volume Control . . . . . Fully clockwise
Position of Dial Pointer with Variable fully closed . . . . . See note below

POSITION OF Variable	FREQUENCY GENERATOR	DUMMY ANTENNA	GENERATOR CONNECTION (high)	GENERATOR CONNECTION (low)	TRIMMERS ADJUSTED (In order shown)	TRIMMER FUNCTION	Uv. Input to Haz. Std. Loop to give ½ watt output.
Open	455 kc.	.1 mfd.	12SA7GT grid	Cond. frame	T2, T1	IF	-------
1400 kc.	1400 kc.	.00005 mfd.	Ant. clip	Chassis	C2, C1	Osc-Trans	1600 uv.
600 kc.	600 kc.	.00005 mfd.	Ant. clip	Chassis	Check point	----	1000 uv.

IMPORTANT ALIGNMENT NOTES

With the variable condenser closed the pointer should point vertically upward. When properly set with the variable condenser closed the pointer will point just to the right of the "54" calibration mark.

Ths 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.

SUBJECT: ADDITION OF SUFFIX NUMBER "-1" TO CHASSIS IDENTIFICATION NUMBER 132.806 AND PARTS LIST AND CIRCUIT CHANGES FOR ALL MODELS.

THIS SUPPLEMENT COVERS THE FOLLOWING CHANGES:

(1) Soon after start of Production on 132,806 the Oscillator coil Pt. No. N17233 was supplanted by Pt. No. N17320.
The new coil Pt. No. N17320 may be identified by the fact that lug No. 1 is blank whereas the start of the white winding of coil No. N17233 was connected to lug No. 1. (See fig. 1)
The hookup of the coil in the circuit remains unchanged and is as follows:
Lug No. 1 - To chassis
Lug No. 2 - To Var. condenser
Lug No. 3 - To Flt. Ground
Lug No. 4 - To cathode 12SA7GT

(2) The Pilot Lamp Shield and Snubber Assembly has been improved and simplified. This assembly which was identified by Pt. No. N17225 is superceded by Pt. No. N17308- Pilot Lamp Snubber and N17307- Pilot Lamp Shield.

OCTOBER 1941

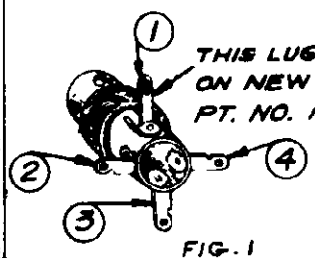
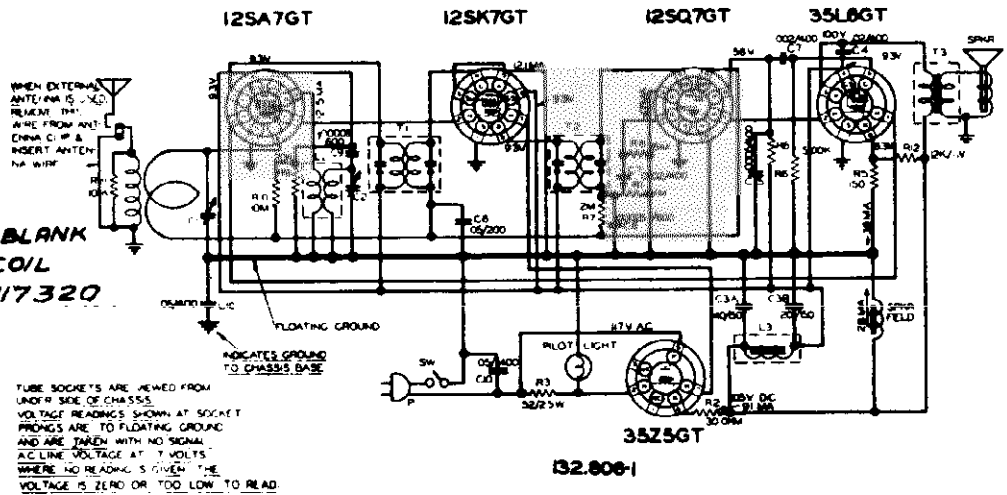


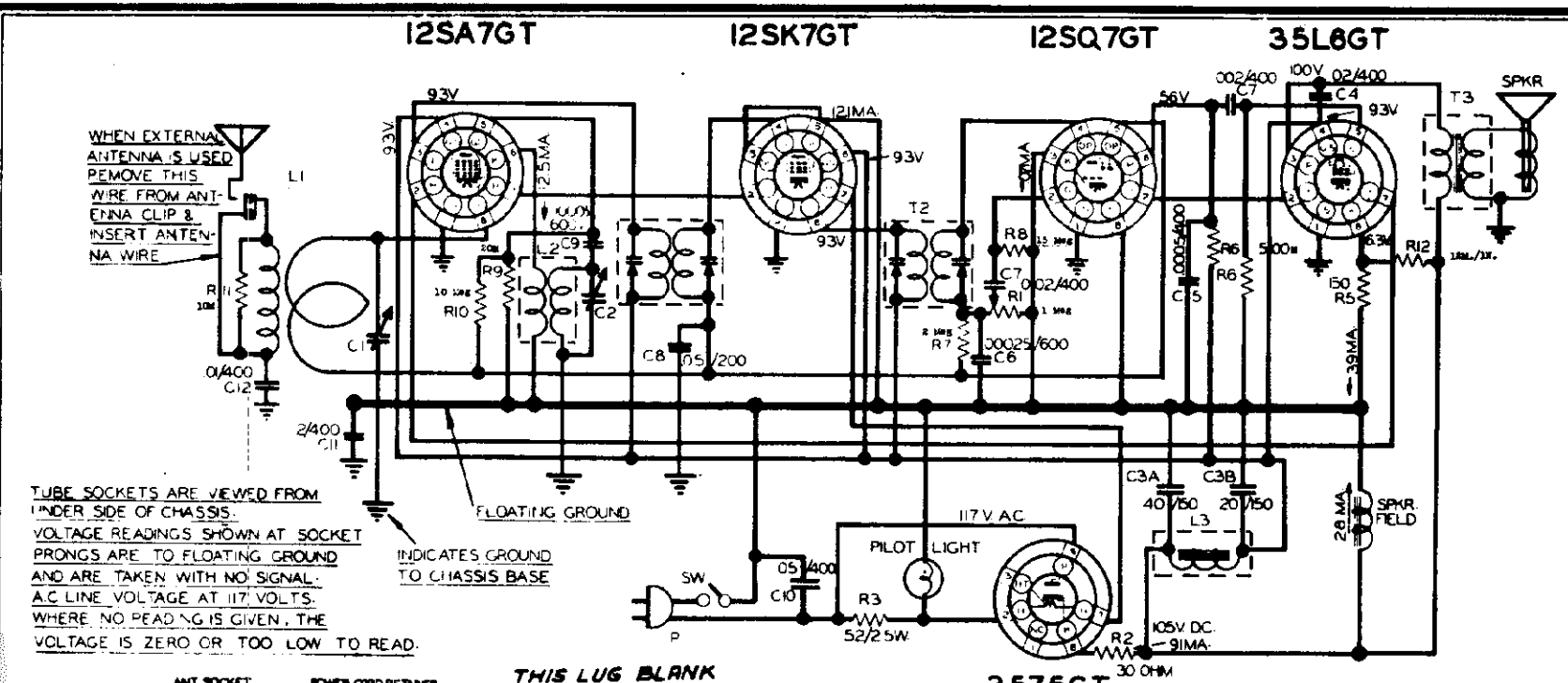
FIG. 1

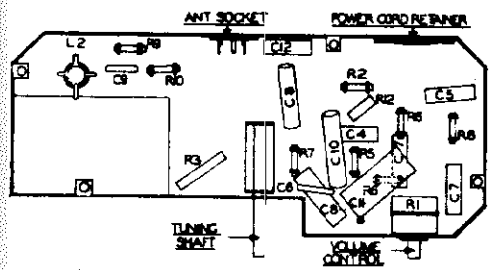


132.806-1

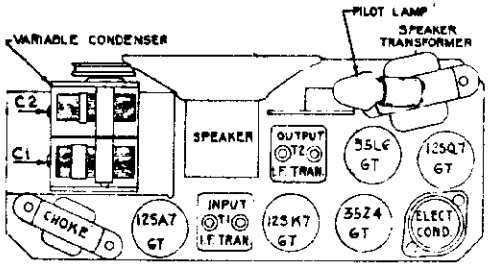
POWER SUPPLY:
All models available

105-125 volts, AC-DC, 35 watts





LOCATION OF PARTS UNDER CHASSIS - B2-807



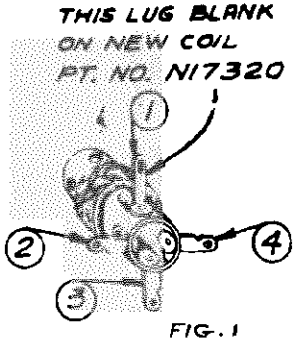


FIG. 1

CHASSIS 132.807-1
OCT.15,1941

AUGUST 1941

PRELIMINARY:

Output meter connection	Across loud speaker voice coil
Output meter reading to indicate 50 milliwatts	0.38 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	See chart below
Generator modulation	30%, 400 cycles
Position of Volume Control	Fully clockwise
Position of Dial Pointer with Variable fully closed	See note below

POSITION OF VARIABLE	FREQUENCY GENERATOR	DUMMY ANTENNA	GENERATOR CONNECTION (high)	GENERATOR CONNECTION (low)	TRIMMERS ADJUSTED (In order shown)	TRIMMER FUNCTION	Uv. Input to Has. Std. Loop to give ½ Watt Output.
Open	455 kc.	.1 mfd.	12SA7GT grid	Minus "B"	T2, T1	IF	- - - - -
1400 kc.	1400 kc.	.00005 mfd.	Ant. clip	Chassis	C2, C1	Osc-Trans	1600 uv.
600 kc.	600 kc.	.00005 mfd.	Ant. clip	Chassis	Check point	---	1000 uv.

IMPORTANT ALIGNMENT NOTES

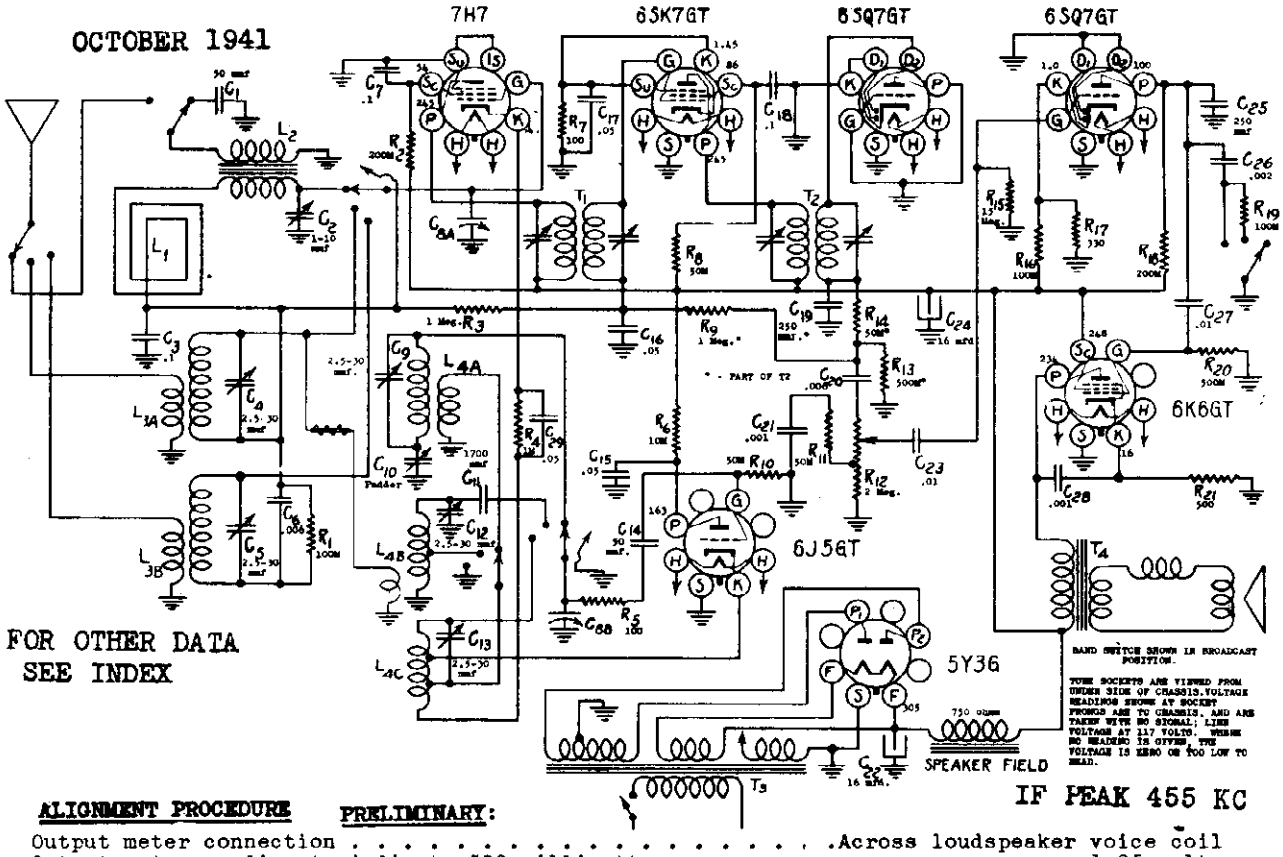
With the variable condenser closed the pointer should point vertically upward. When properly set with the variable condenser closed the pointer will point just to the right of the "54" calibration mark.

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.

MODEL 7037
Chassis 141.415

SEARS, ROEBUCK & CO.

OCTOBER 1941



ALIGNMENT PROCEDURE **PRELIMINARY:**

Output meter connection . . . . . .Across loudspeaker voice coil
Output meter reading to indicate 500 milliwatts . . . . . 1.25 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
Position of Volume Control . . . . . Fully clockwise
Position of Tone Control . . . . . .HI
Position of Dial Pointer with variable fully closed . . . . . .On first mark to left of 550 kc calibration mark.

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	ANT. COUPLED APPROXIMATE MICROVOLTS
"BC"	Open	455 kc	.1 mfd.	7H7 Grid	T2,T1	IF	--
"BC"	Fully open	1720 kc	.00005 mfd.	Ant. Term.	C9	Oscillator	--
"BC"	1400 kc	1400 kc	.00005 mfd.	Ant. Term.	C2*	Antenna	75***
"BC"	600 kc(rock)	600 kc	.00005 mfd.	Ant. Term.	C10	Padder	40***
"INT"	Open	6.2 mc	400 ohms	Ant. Term.	C12	Oscillator	--
"INT"	5.0 mc	5.0 mc	400 ohms	Ant. Term.	C4	Antenna	40
"SW"	Open	18.2 mc	400 ohms	Ant. Term.	C13**	Oscillator	--
"SW"	17 mc(rock)	17 mc	400 ohms	Ant. Term.	C5	Antenna	40

IMPORTANT ALIGNMENT NOTES

* C2 should be adjusted after the receiver is in the cabinet, through a hole in the receiver back, with the loop in position.

** Two peaks can be had; the correct one is with the trimmer screw further in. This band is aligned so that the oscillator is at a lower frequency than the signal. The Broadcast and Intermediate bands are aligned with the oscillator at a higher frequency than the signal, in the normal manner.

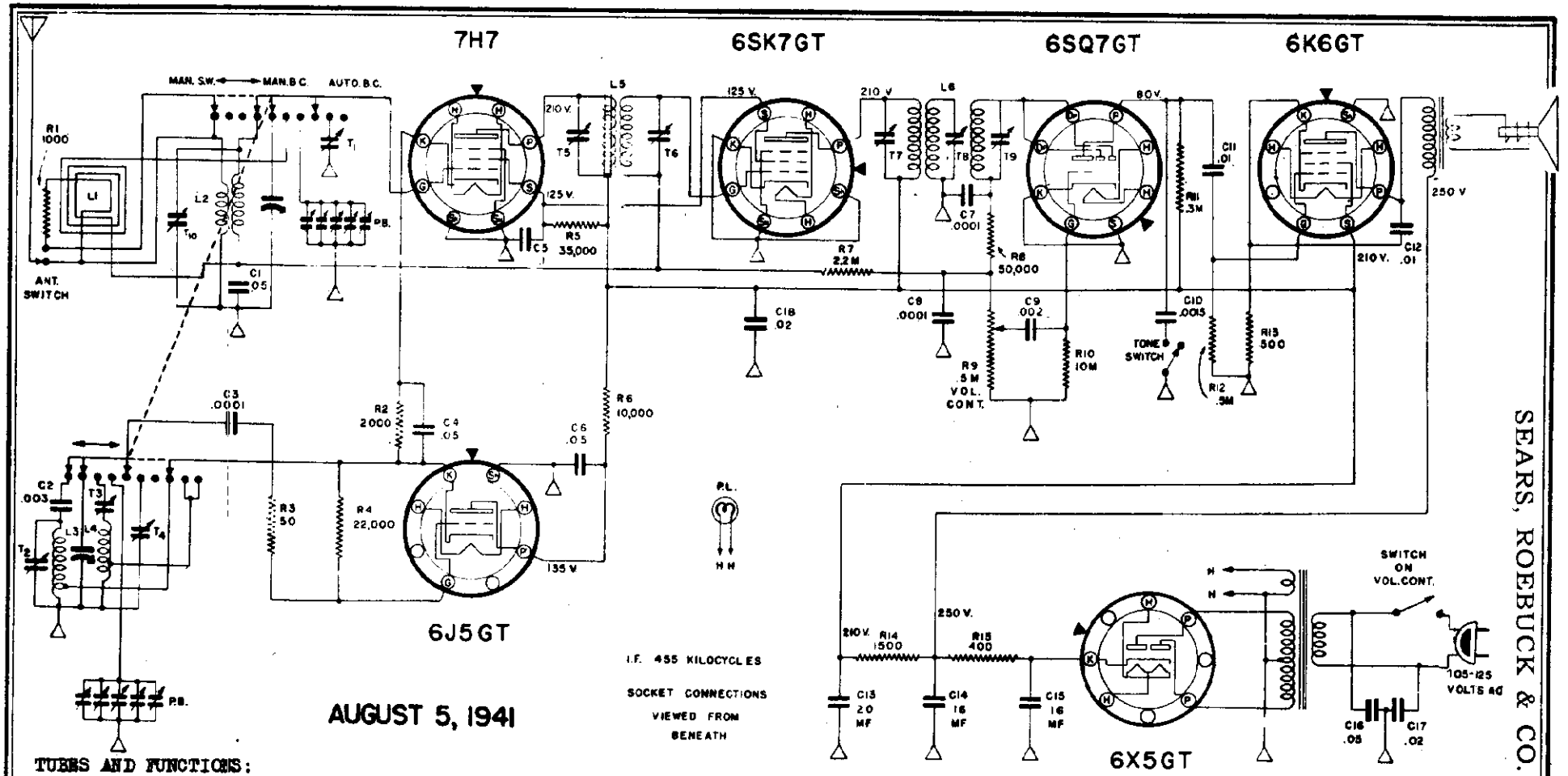
*** 120 microvolts per meter using standard Hazeltine alignment loop 24 inches from receiver loop.

Where indicated by the word, "rock", the variable should be rocked back and forth a degree or two while making the adjustment.

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.

SEARS, ROEBUCK & CO.

MODEL 7036
Chassis 110.421



AUGUST 5, 1941

I.F. 455 KILOCYCLES

SOCKET CONNECTIONS VIEWED FROM BENEATH

TUBES AND FUNCTIONS:

7H7.....Translator	6J5GT.....Oscillator
6SK7GT.....IF	6K6GT.....Output
6SQ7GT.....A.V.C. detector, 1st Audio	6X5GT.....Rectifier

FREQUENCY RANGES:

Broadcast.....	535 - 1610 KC
Short Wave.....	5.7 - 18.2 MC

INTERMEDIATE FREQUENCY.....455 KC

POWER SUPPLY:
This unit uses 105-125 volts A.C. 50 watts. The frequency (cycles) is specified on the bottom ofthe cabinet.

POWER OUTPUT:

Type.....	Pentode
Undistorted.....	2 Watts
Maximum.....	3.3Watts

OPERATING CONTROLS:

Left Knob.....	"On-Off" Volume
Center Knob.....	Tuning
Right Knob.....	"P.B." "A" "B".

LOUD SPEAKER

Type.....	Dynamic
Size.....	6 Inch
Field.....	P.M.

CONTROL OPERATION:
Turning right: power on; volume increases
Tuning ratio 12:1
The letter appearing in the vertical position indicates the position of the switch. "P.B." push-buttons, "A"-Broadcast, "B"-Short wave.

MODEL 7036

SEARS, ROEBUCK & CO.

ALIGNMENT PROCEDURE

OUTPUT METER CONNECTION.....Across voice coil.
Output meter reading to indicate 1/2 watt output 1.25 volts for 3.1 ohm voice coil.
Connection of generator ground.....Receiver chassis.
Generator modulation.....Approximately 30% @ 400 cycles.
Position of volume control.....Fully clockwise
Position of tone control switch (at rear of chassis).....High position.

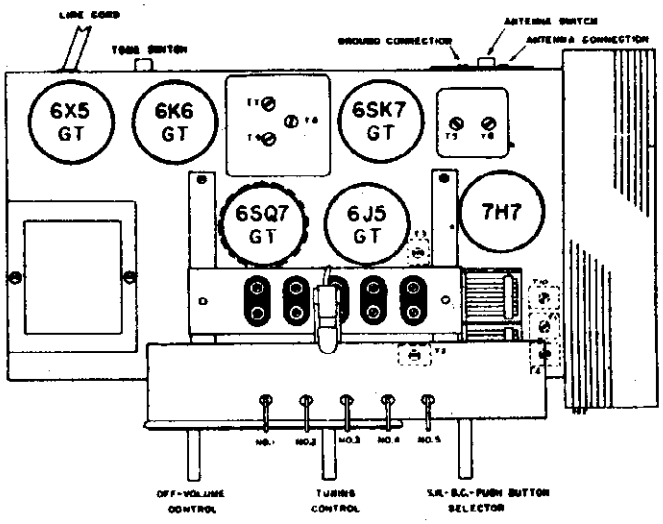
SELECTOR POSITION	POSITION OF DIAL POINTER	GENERATOR FREQUENCY	GENERATOR CONNECTION	DUMMY ANTENNA	TRIMMERS ADJUSTED IN ORDER SHOWN.	TRIMMER FUNCTION.
"A"	540 KC	455 KC	7H7 Grid	.1 mfd	T5,T6,T8,T7,T9	I.F.
"A"	1400 KC	1400 KC	*Standard		T4, T1	Osc.-antenna
"A"	600 KC	600 KC	Radiating		T3,rock var.	Osc.-padder
"A"	1400 KC	1400 KC	Loop		Readjust T4	Osc.
"B"	18 mc	18mc	Antenna post	400 ohms	T2***	Osc.
"B"	16 mc	16 mc	**ant.post	400 ohms	T10	Ant.

IMPORTANT ALIGNMENT NOTES

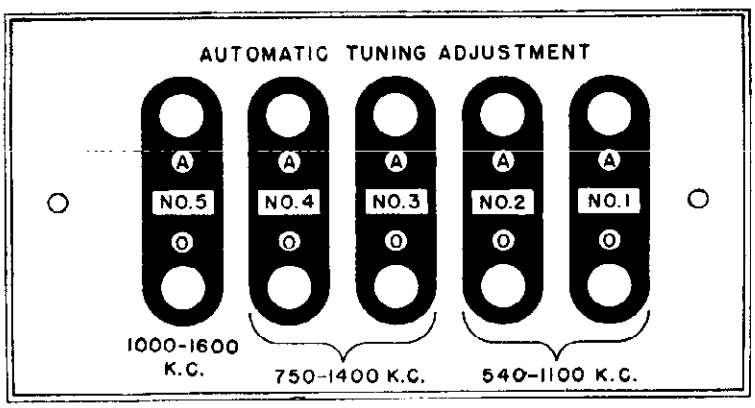
*Approx. 125 mv. per meter when using a standard Hazeltine loop at 24 inches from set loop for 1/2 watt output.
**60 microvolts approximately for 1/2 watt.
***If two peaks can be had, the correct one is with trimmer screws further out; the other peak is the image.

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 A.V.C. action of the receiver ineffective.

TUBE LOCATION

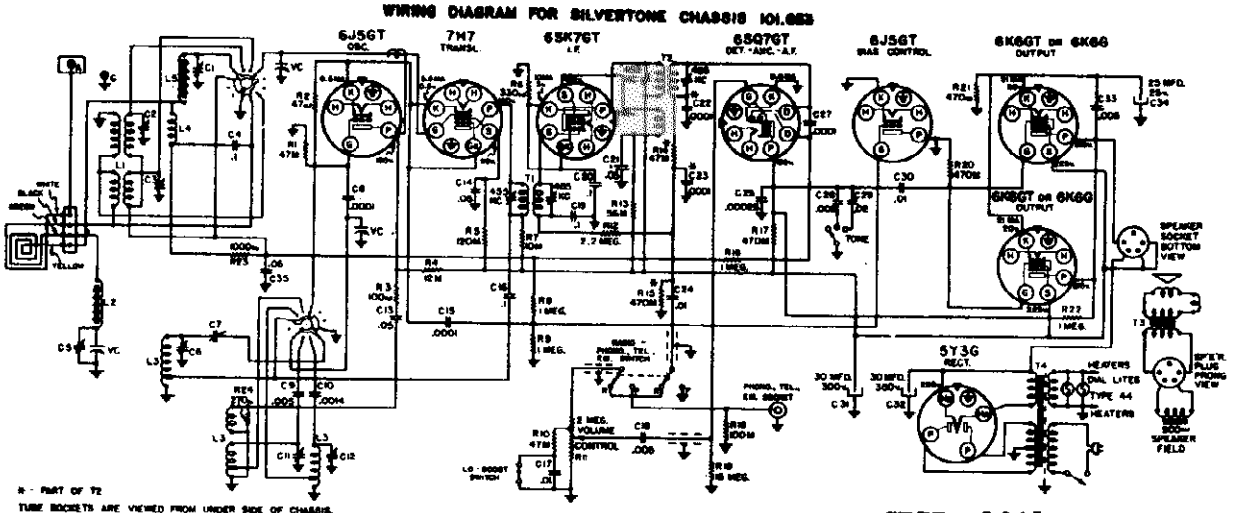


PUSH BUTTON TUNING



MODEL 7038
Chassis 101.653

SEARS, ROEBUCK & CO.



IF PEAK 455 KC SEPT. 1941

ALIGNMENT PROCEDURE

PRELIMINARY

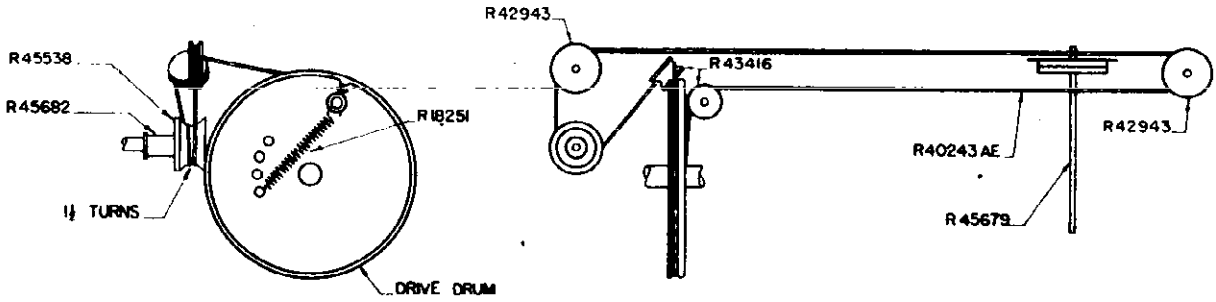
Output meter connections . . . . . Across loud speaker voice coil
Output meter reading to indicate 500 milliwatts . . . . . 1.3 volts
Approximate microvolts input to indicate 500 milliwatts output . . . . . See chart below
Generator ground lead connection . . . . . Receiver chassis
Dummy antenna value 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 . . . . . HI
Position of right edge of pointer with condenser fully opened . . . . . On line scribed on top of pointer guide rail

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
A	Closed	455 kc	.1 mfd.	7H7 Transl.Grid	T2, T1	IF	—
A	Open	1750 kc	.00005 mfd.	Ant. Terminal	C6	Oscillator	—
A	1410	1410 kc	.00005 mfd.	Ant. Terminal	C5, C1	Ant. Transla.	25
A	600 (rock)	600 kc	.00005 mfd.	Ant. Terminal	C7	Padder	100
B	Open	5.5 mc	400 ohms	Ant. Terminal	C12	Oscillator	—
B	4 (rock)	4 mc	400 ohms	Ant. Terminal	C2	Transla.	35
C	Open	18.3 mc	400 ohms	Ant. Terminal	C11	Oscillator	—
C	15 (rock)	15 mc	400 ohms	Ant. Terminal	C3	Transla.	25

IMPORTANT ALIGNMENT NOTES

The alignment must be done in the order given.

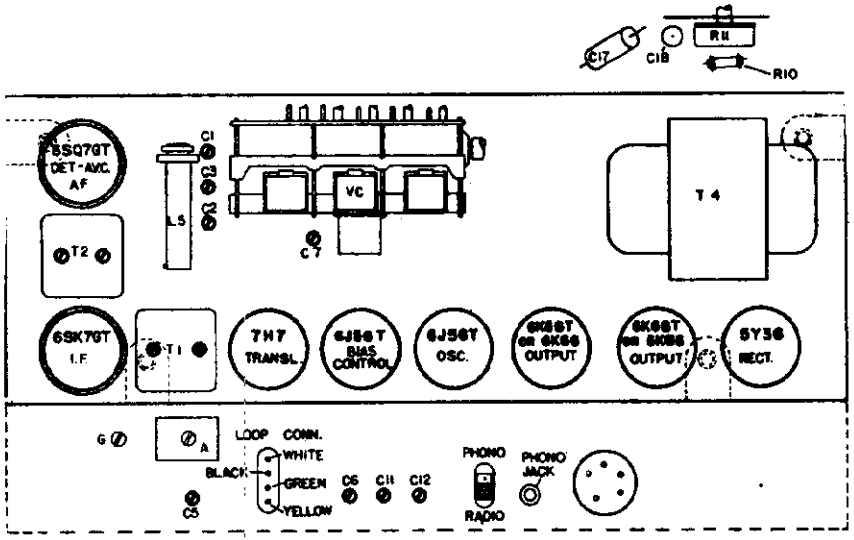
Always keep the output power from the generator at its lowest possible value to prevent the AVC of the receiver from interfering with accurate alignment.



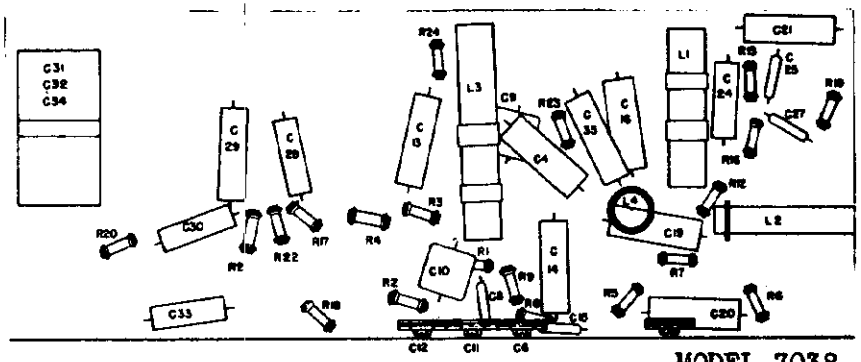
FOR ADDITIONAL DATA SEE INDEX.

MODEL 7038
MODEL 7048

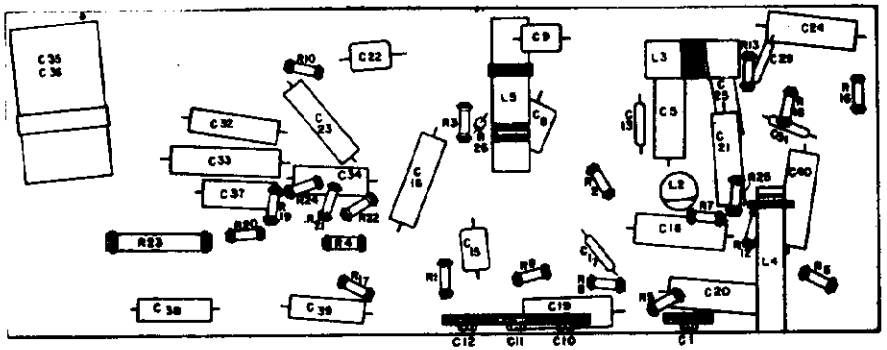
SEARS, ROEBUCK & CO.



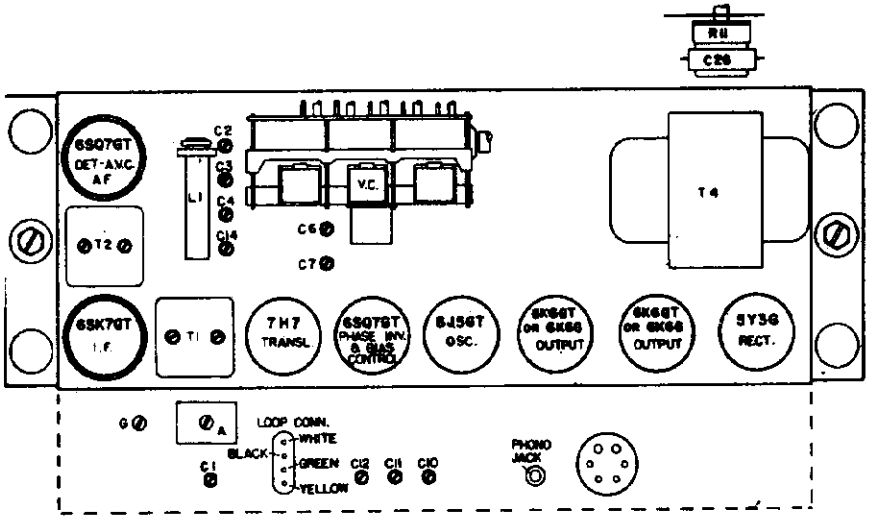
LOCATIONS OF PARTS ON TOP OF CHASSIS 101.653 MODEL 7038



LOCATION OF PARTS UNDER CHASSIS — 101.653 MODEL 7038



LOCATION OF PARTS UNDER CHASSIS — 101.657 MODEL 7048



LOCATIONS OF PARTS ON TOP OF CHASSIS 101.657

FREQUENCY RANGES:

Band "A"	540–1700 kc
Band "B"	1.8–5 mc
Band "C"	5.5–18 mc

ALIGNMENT FREQUENCIES:

Oscillator Trimmer	Ant-Transl. Trimmer	Padder
1750 kc	1410 kc	600 kc
5.5 mc	4 mc	Fixed
18.3 mc	15 mc	Fixed

POWER OUTPUT:

Type	(Parallel) Pentode
Undistorted	2.5 watts
Maximum	4 watts

LOUDSPEAKER:

Type	Dynamic
Size	9"x6" elliptical
Field coil resistance	900 ohms
Approximate field coil voltage drop	65

ALIGNMENT FREQUENCIES: MODEL 7048

Oscillator Trimmer	Antenna-Transl. Trimmer	Padder
1720 kc	1410 kc	600 kc
18.3 mc	15 mc	Fixed
9.55 mc	9.55 mc	Fixed
11.8 mc	11.8 mc	Fixed

POWER OUTPUT:

Type	Push-pull pentodes
Undistorted	3.5 watts
Maximum	7 watts

FREQUENCY RANGES:

Band "A"	540–1700 kc
Band "B"	6–18 mc
Band "C"	9.4–9.84 mc
Band "D"	11–12 mc

LOUDSPEAKER:

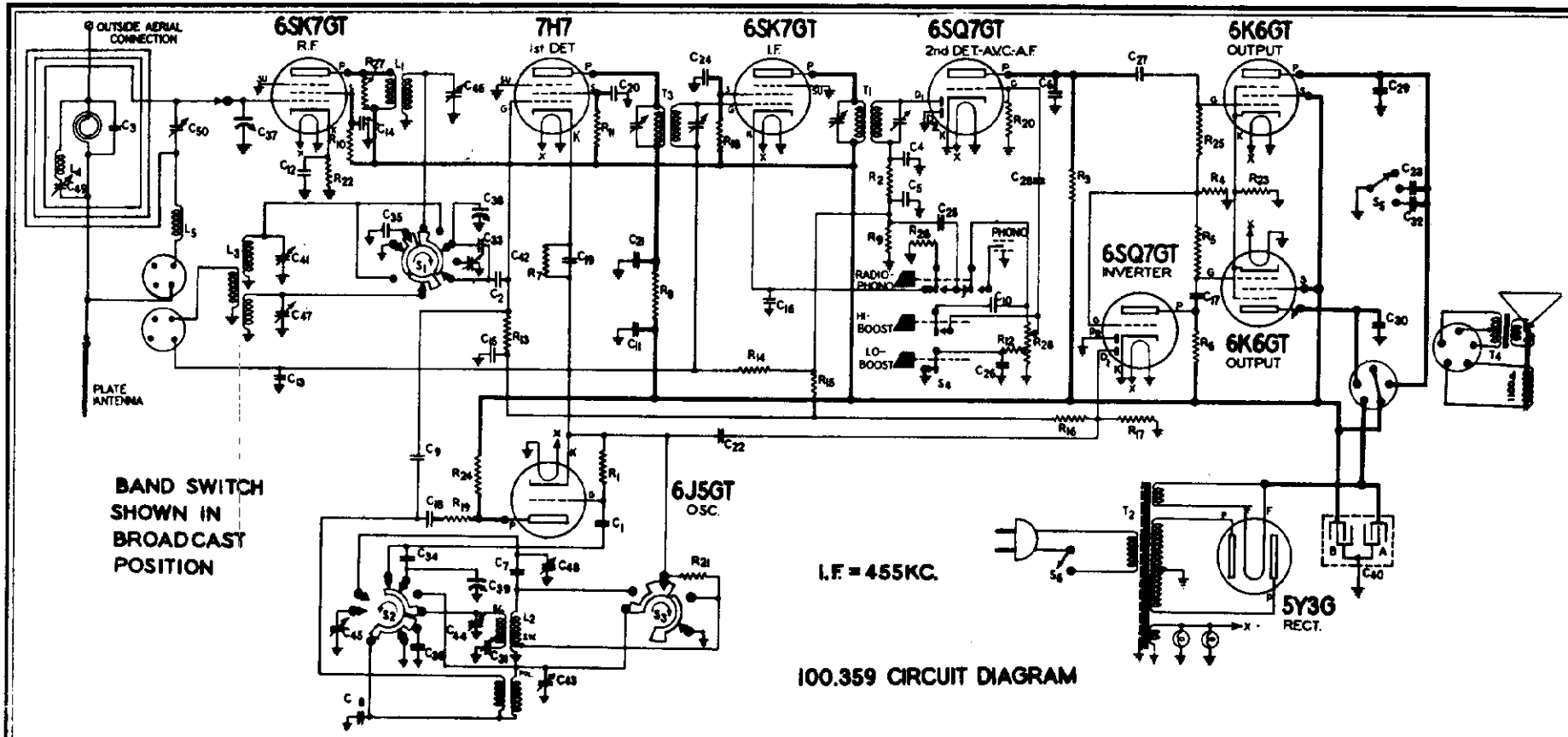
Type	Dynamic
Size	10 inch
Field coil resistance	1000 ohms
Approx. field coil voltage drop	90 V.

FOR ADDITIONAL DATA SEE INDEX.

SEARS ROEBUCK & CO.

MODEL 7039

Chassis 100.35



100.359 CIRCUIT DIAGRAM

OCT.15,1941

PART NUMBER	DIAGRAM NUMBER	DESCRIPTION
W-500803	L1	Coil, B.C. Det.
W500804	L2	Coil, oscillator (B.C.-INT.-S.W.)
W-500805	L3	Coil, short wave antenna
W-500809	L4	Coil, wave trap
W-500947	L5	Coil, loading
W-85061	C1	Condenser, mica. 51 mmfd.
W-83539	C2	Condenser, mica. 260 mmfd.
W-83783	C3 to C6	Condenser, mica. 110 mmfd.
W-88587	C7	Condenser, mica. .0042 mfd.
W-88681	C8	Condenser, mica. .00255 mfd.
W-110510	C9	Condenser, wire 3 mmfd.
W-114969	C10	Condenser, mica. 15 mmfd.
W-116625	C11	Condenser, .1 mfd. 600 volt
W-116819	C12 to C17	Condenser, .05 mfd. 600 volt.
W-119193	C18 to C23	Condenser, .01 mfd. 600 volt.
W119414	C24 to C27	Condenser, .02 mfd. 600 volt.
W119817	C28	Condenser, .004 mfd. 600 volt
W119875	C29-C30	Condenser, .002 mfd. 600 volt
W-119934	C31	Condenser, padder
W161000	C32	Condenser, .03 mfd. 600 volt
W-500041	C33-C34	Condenser, Silver mica, 160 mmfd.
W-500213	C35-C36	Condenser, Silver mica, 350 mmfd.
W-500780	C37-C38-C39	Condenser, tuning with push button tuner
W-500807	C40	Condenser, Electrolytic (A=20 mfd. - 400 volt) (B=15 mfd. - 400 volt)
W-500806	C41 to C45	Condenser, trimmer (5 section)
W-500837	C46 to C48	Condenser, trimmer (3 section)
W-500838	C49-C50	Condenser, trimmer (2 section)
W-500650M		Cone & Voice coil for W-500650M Spkr
W-500809		Loop Antenna & cabinet back complete
W-160733		Plate antenna
W-110562	R1-R2	Resistor, carbon, 47,000 ohm ½ watt
W-110563	R3 to R6	Resistor, carbon, 220,000 ohm ½ watt
W-110566	R7	Resistor, carbon, 330 ohm ½ watt.
W-110567	R8	Resistor, carbon, 4700 ohm ½ watt
W-110569	R9	Resistor, carbon, 470,000 ohm ½ watt
W-110564	R10-R11	Resistor, carbon, 100,000 ohm ½ watt
W-110565	R12	Resistor, carbon, 22,000 ohm ½ watt
W-110570	R13 to R15	Resistor, carbon, 2.2 meg. ½ watt
W-110568	R17	Resistor, carbon, 470,000 ohm ½ watt
W-110578	R18	Resistor, carbon, 68,000 ohm ½ watt
W-110580	R19	Resistor, carbon, 180 ohm ½ watt.
W-116575	R20	Resistor, carbon, 10 meg. ½ watt.
W-116580	R21	Resistor, insulated, 1000 ohm ½ watt
W-116578	R22	Resistor, 560 ohm ½ watt.
W-117575	R23	Resistor, 300 ohm, 1 watt wire wound

PART NUMBER	DIAGRAM NUMBER	DESCRIPTION
W-116805	R24	Resistor, carbon, 10,000 ohm 1 watt
W-116825	R25	Resistor, carbon, 180,000 ohm ½ watt
W-116827	R26	Resistor, carbon, 270 ohm ½ watt
W-110557	R27	Resistor, carbon, 4700 ohm ½ watt
W-116558	R28	Volume control, 1 meg.
W-500650M		Speaker, (9" oval)
W-500793	S1-S2-S3	Switch, band
W-500830	S4	Switch, Phono-Tone
W-160557	S5-S6	Tone control, with on-off switch
W-119024	T1	Transformer, 2nd I.F.
W-160780	T2	(Transformer, power (25 cycles)
W-500116		(Transformer, power (60 cycles)
W-500801	T3	Transformer, 1st. I.F.
W-500857M	T4	Transformer, output for W-500650M Spkr

MODEL 7039

SEARS, ROEBUCK & CO.

1. VOLTAGES MEASURED WITH NO SIGNAL INPUT
2. VOLUME CONTROL ON FULL.
3. ALL VOLTAGES ARE D.C. UNLESS OTHERWISE INDICATED.

TUBE	FUNCTION	Fil.	K	G	SG	S	P	D_1	D_2
6SE7GT	R. F. Amp.	6.3 A.C.	2.2	NOTE A	0	80	224	-	-
7H7	1st. Det.	6.3 A.C.	1.5	NOTE A	0	95	210	-	-
6J5GT	Osc.	6.3 A.C.	0	-5	-	-	140	-	-
6SE7GT	I. F. Amp.	6.3 A.C.	2.5	NOTE A	0	95	225	-	-
6SQ7GT	2nd. Det.-A.V.C.-A.F.	6.3 A.C.	0	0	-	-	80	0	0
6SQ7GT	Phase Inverter	6.3 A.C.	0	0	-	-	70	NOTE A	0 *
6K6GT*	Output	6.3 A.C.	17	0	-	225	310	-	-
5Y3G	Rectifier	5.0 A.C.	Voltage on each plate 350 volts A.C. to center tap.						

* Readings identical on both tubes in push pull stage.

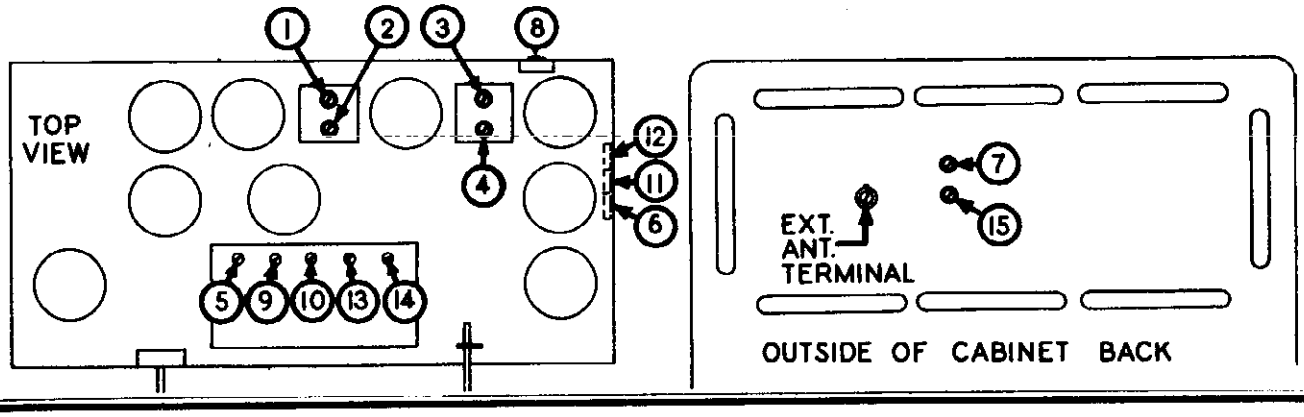
NOTE A: Voltage on the grids of the 6SE7GT R.F., 7H7 1st. Det. and 6SE7GT I.F. is variable and cannot be measured by an ordinary voltmeter.

USE A VOLTMETER OF 1000 OHMS PER VOLT.

DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR	CONNECTION SIGNAL GENERATOR OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POSITION	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
.1 MFD. CONDENSER	STATOR ON MIDDLE SECTION OF GANG.	455 KC	"A" POSITION	600 KC	1 - 2	2ND I. F.	* ADJUST FOR MAXIMUM OUTPUT THEN REPEAT ADJUSTMENT.
					3 - 4	1ST I. F.	
STANDARD ALIGNING LOOP	⚷ STANDARD LOOP PLACED 24" FROM RECEIVER LOOP	1400 KC	"A" POSITION	1400 KC	5	BROADCAST OSCILLATOR (SHUNT)	ADJUST FOR MAXIMUM OUTPUT.
STANDARD ALIGNING LOOP	⚷ STANDARD LOOP PLACED 24" FROM RECEIVER LOOP	1400 KC	"A" POSITION	1400 KC	6	BROADCAST DETECTOR	ADJUST FOR MAXIMUM OUTPUT.
					7★	BROADCAST ANTENNA	
STANDARD ALIGNING LOOP	⚷ STANDARD LOOP PLACED 24" FROM RECEIVER LOOP	600 KC	"A" POSITION	600 KC	8	BROADCAST OSCILLATOR (SERIES)	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RE-TUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	5 MC	"B" POSITION	5 MC	9	POLICE BAND OSCILLATOR	ADJUST FOR MAXIMUM OUTPUT. CHECK TO SEE IF PROPER PEAK WAS OBTAINED BY TUNING IN IMAGE AT APPROX. 4.1 MC. IF IMAGE DOES NOT APPEAR, REALIGN AT 5 MC WITH TRIMMER SCREW FARTHER OUT.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	5 MC	"B" POSITION	5 MC	10	POLICE BAND ANTENNA	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RE-TUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	16 MC	"C" POSITION	16 MC	11	SHORT WAVE OSCILLATOR	ADJUST FOR MAXIMUM OUTPUT. CHECK TO SEE IF PROPER PEAK WAS OBTAINED BY TUNING IN IMAGE AT APPROX. 15.1 MC. IF IMAGE DOES NOT APPEAR, REALIGN AT 16 MC. WITH TRIMMER SCREW FARTHER OUT.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	16 MC	"C" POSITION	16 MC	12	SHORT WAVE ANTENNA	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RE-TUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	9.5 MC	"D" POSITION	9.5 MC	13	BAND SPREAD OSCILLATOR	ADJUST FOR MAXIMUM OUTPUT.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	9.5 MC	"D" POSITION	9.5 MC	14	BAND SPREAD ANTENNA	ADJUST FOR MAXIMUM OUTPUT.
50 MMFD MICA CONDENSER	ANTENNA TERMINAL	455 KC	"A" POSITION	600 KC	15 ★	WAVE TRAP	ADJUST FOR MINIMUM OUTPUT USING A STRONG GENERATOR SIGNAL.

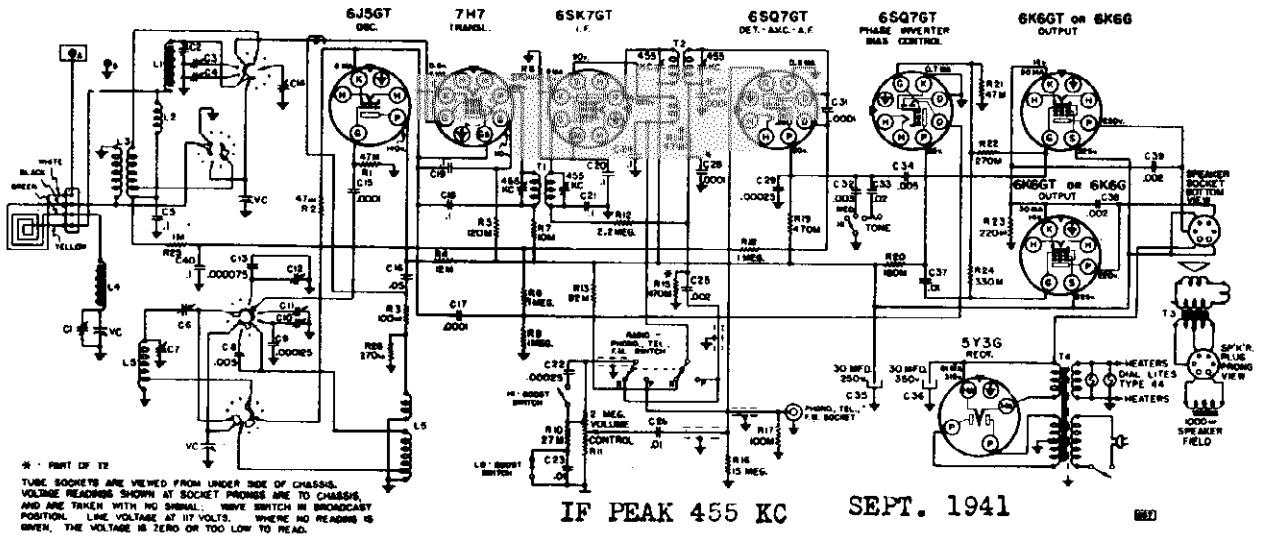
★ After alignment is completed, place chassis and cabinet back in their final position and repeat adjustments #7 and 15.

⚷ - A 50 mmfd. mica condenser connected to the Antenna Terminal may be used in place of the standard loop indicated in steps 5, 6, 7, 8.



SEARS, ROEBUCK & CO.

MODEL 7048
Chassis 101.657



Output meter connection	Across loudspeaker voice coil
Output meter reading to indicate 500 milliwatts	1.5 volts
Approximate microvolts input for 500 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 clockwise
Position of right edge of Dial Pointer with receiver tuned to 600 kc	On line scribed on top of pointer guide rail

PRELIMINARY — ALIGNMENT PROCEDURE — TRIMMERS ADJUSTED

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	(IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"A"	Closed	455 kc	.1 mfd.	6K8G Grid	T2, T1	IF	—
"A"	Fully Open	1720 kc	.00005 mfd.	Ant. Term.	C7	Oscillator	—
"A"	1410 kc	1410 kc	.00005 mfd.	Ant. Term.	C1, C2	Loop, Transl	25
"A"	600 kc (rock)	600 kc	.00005 mfd.	Ant. Term.	C6	Padder	70
"B"	Fully Open	18.3 mc	400 ohms	Ant. Term.	C11*	Oscillator	—
"B"	15 mc (rock)	15 mc	400 ohms	Ant. Term.	C4	Translator	12
"C"	9.6 mc	9.6 mc	400 ohms	Ant. Term.	C10*	Oscillator	—
"C"	9.6 mc (rock)	9.6 mc	400 ohms	Ant. Term.	C3	Translator	15
"D"	11.8 mc	11.8 mc	400 ohms	Ant. Term.	C12*	Oscillator	—
"D"	11.8 mc (rock)	11.8 mc	400 ohms	Ant. Term.	C14	Translator	15

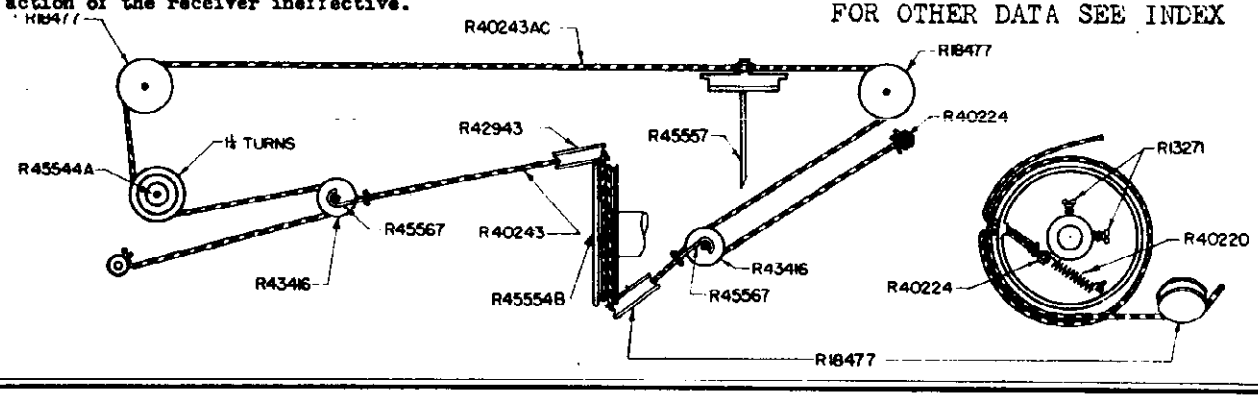
IMPORTANT ALIGNMENT NOTES

* If two peaks can be had, the correct one is with the trimmer screw further out; the other peak is the image.

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

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.

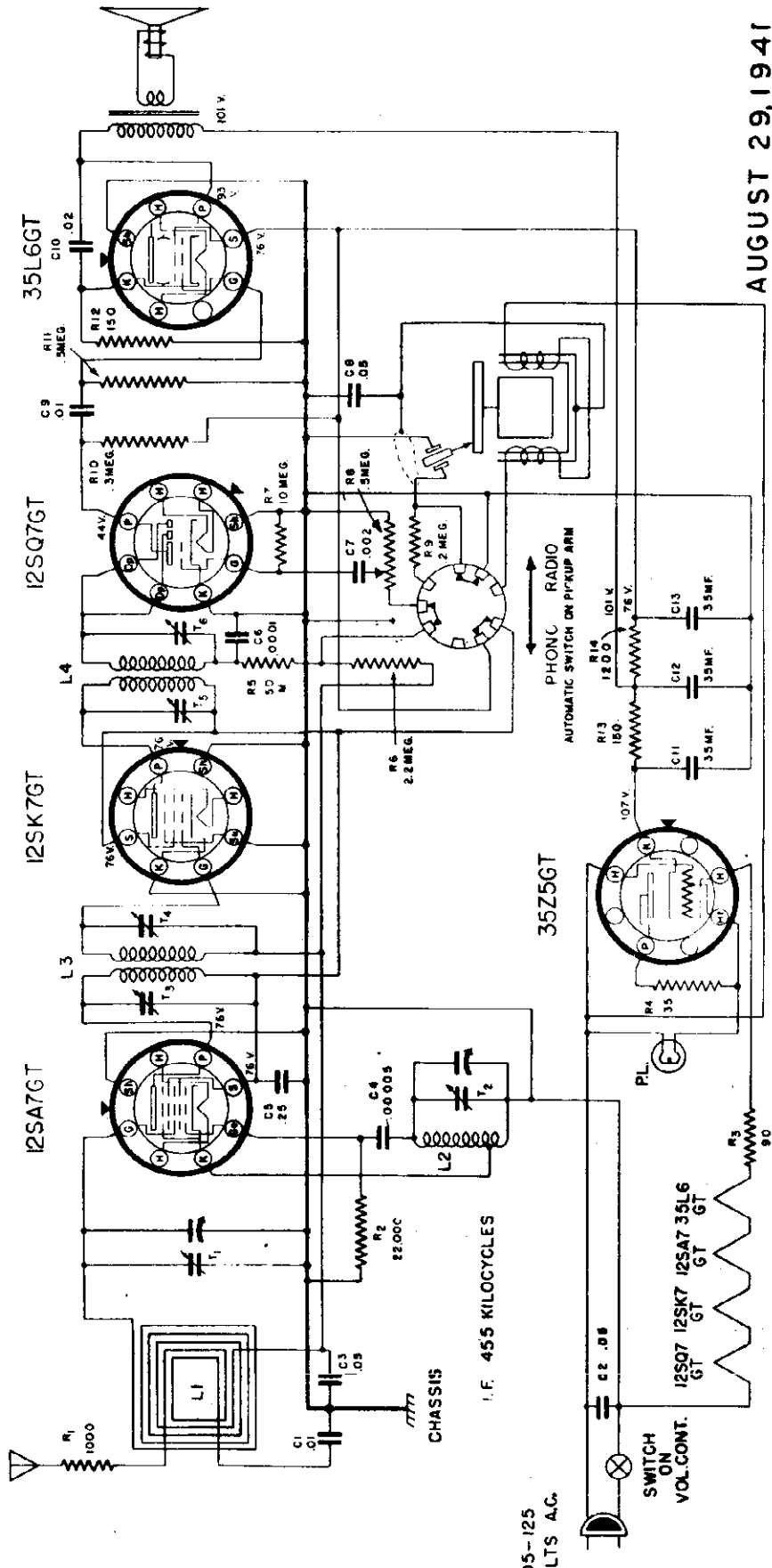
FOR OTHER DATA SEE INDEX



MODEL 7054
Chassis 110.426
MODEL 7055, Ch. 110.427

SEARS, ROEBUCK & CO.

AUGUST 29, 1941



ALIGNMENT - MODELS 7054 and 7055

POSITION OF DIAL POINTER	GENERATOR FREQUENCY	GENERATOR CONNECTION	TRIMMERS ADJUSTED	TRIMMER FUNCTION
540 KC	455 KC	Stator R.F. Section	T3,T4 T5,T6	I.F.
1500 KC	1500 KC	Standard Radiating Loop	T2,T1	Osc.,R.F.

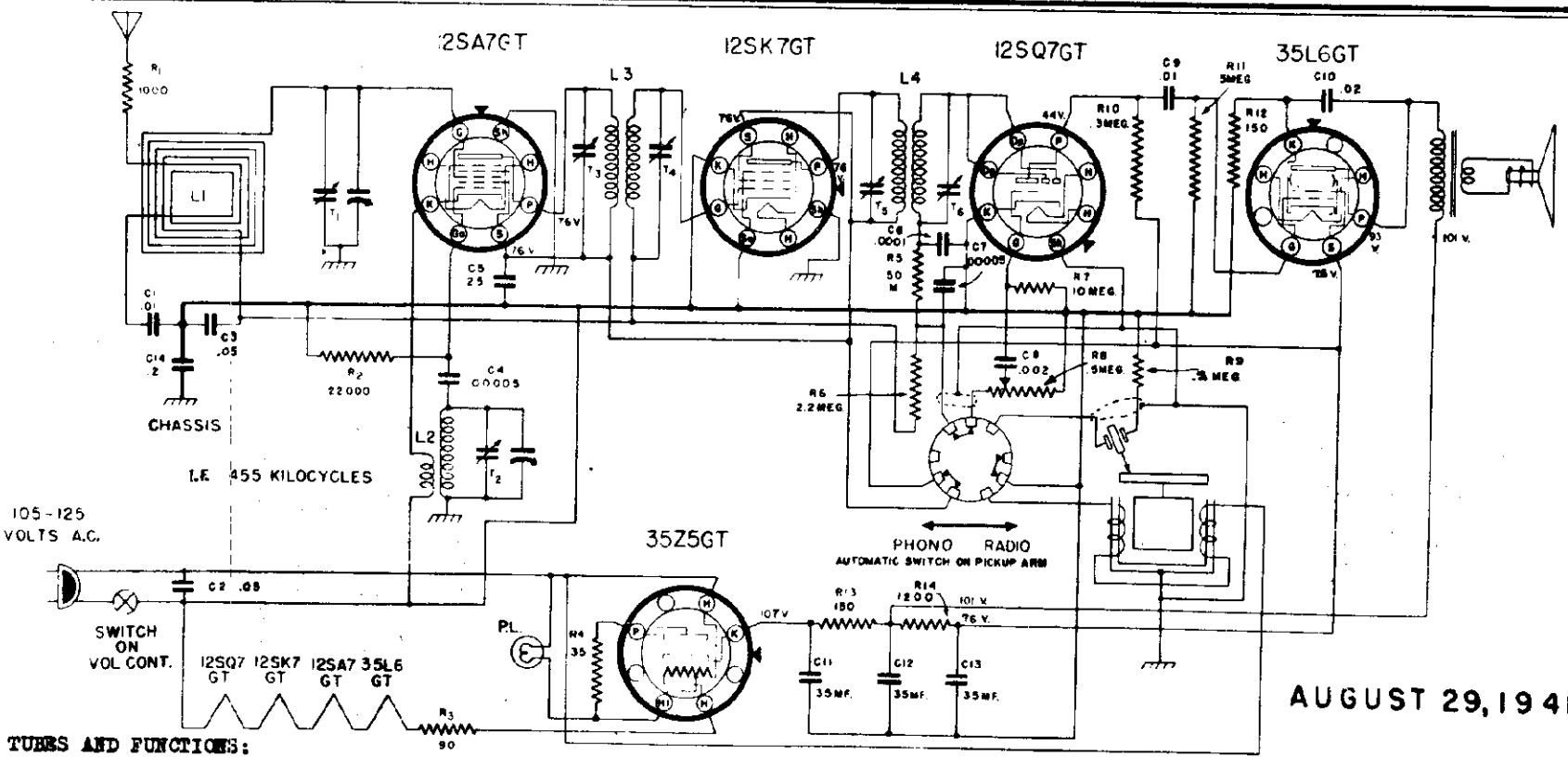
It is advisable to repeat the entire alignment procedure in the original order to insure greater accuracy.

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.

Approx. 250 microvolts per meter input using standard Hazeltine alignment loop 24" from set loop for ½ watt output.

ALIGNMENT PROCEDURE

Output meter connection.....
Across Voice Coil.
Meter reading for 1/2 watt output.....1.25 volts.
Connection of generator ground.
.....To chassis.
Connection of generator ground.
.....Model 7054 (110.426)B-Bus
Generator modulation.....App.
30% @400/cycles.
Position of volume control.....
Fully clockwise.



AUGUST 29, 1941

TUBES AND FUNCTIONS:

12SA7GT.....Transl. Oscill.
12SK7GT.....IF
12SQ7GT.....A.V.C., detector, 1st. audio
35L6GT.....Output
35Z5GT.....Rectifier

POWER SUPPLY:

This unit uses 105-125 volts A.C. 50 watts. The frequency (cycles) is specified on the bottom of the cabinet.

GENERAL INFORMATION AND SERVICE HINTS

ANTENNA AND GROUND:

This model has a self-contained antenna loop for the reception of local broadcasting stations. If it is desired to improve the reception of weak or distant stations, an additional outdoor antenna must be used. For this purpose, a wire lead extending from the rear of the Radionet is provided.

The automatic phono-switch of this receiver starts the turntable and switches from radio to phono when the pickup is placed on the record to be played. The pickup arm must be replaced on its rest in order to operate the radio portion of this receiver.

FREQUENCY RANGE:

Broadcast.....535 - 1720 K.C.

INTERMEDIATE FREQUENCY.....455 K.C.

POWER OUTPUT:
Type.....Beam Tetrode
Undistorted..... .83 Watts
Maximum..... 1.5 Watts

LOUD SPEAKER:
Type.....Dynamic
Size.....5 inch
Field.....P.M.

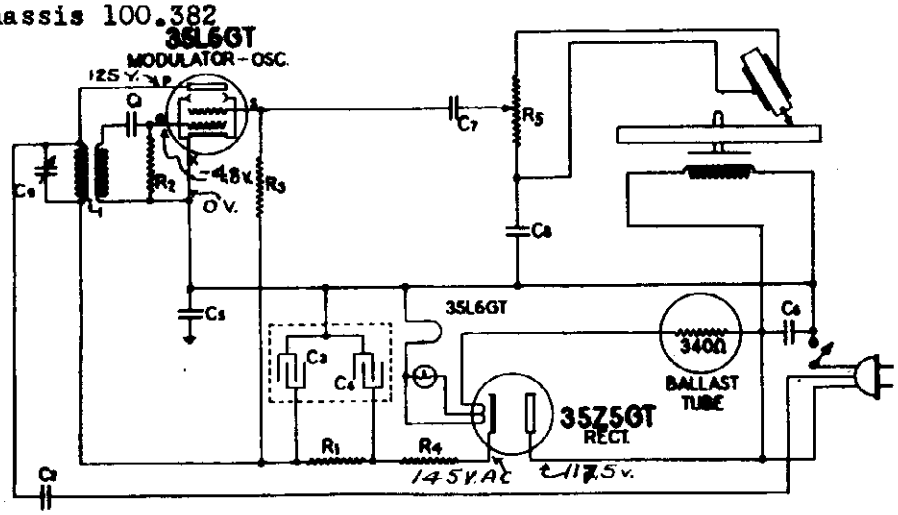
OPERATING CONTROLS:
Left knob....."Off" Volume
Right knob.....Station Selector

CONTROL OPERATION:
Turning right; power on; volume increases
Drive Ratio 8:1

FOR OTHER DATA SEE INDEX

MODEL 7061,Ch.100.383
Wireless Record Player
MODEL 7059 Phono
Chassis 100.382

SEARS-ROEBUCK & CO.



MODEL 7061

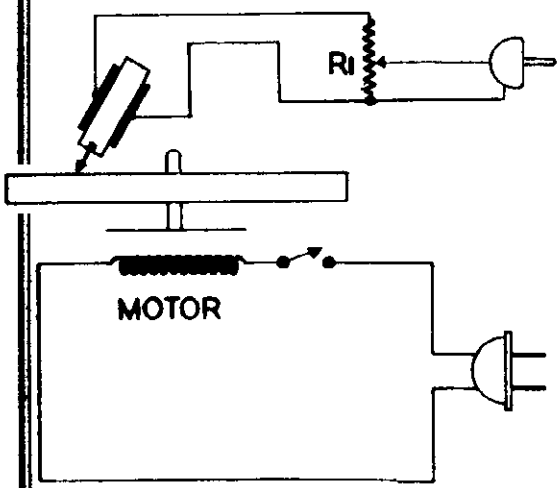
For Adjustments on this Wireless Record Player, see Model 5849.

ELECTRICAL PARTS

PART NUMBER	DIAGRAM NUMBER	DESCRIPTION	LIST PRICE
W83783	C1, C2	Condenser, Mica 110 Mmfd.	.20
W116470	C3, C4	Condenser, Electrolytic 20-20 Mfd. 150 V	.95
W116625	C5, C6	Condenser, .1 Mfd. 600 Volt	.25
W116819	C7, C8	Condenser, .05 Mfd. 600 Volt	.20
W160501	C9	Condenser, Tuning	.22
W85296		Lamp, Dial 6 to 8 Volt (Mazda 51)	.16
W110569	R1	Resistor, carbon 10,000 ohms ½ Watt	.12
W116051	R2	Resistor, insulated 33,000 Ohms ½ Watt	.15
W118809	R3	Resistor, carbon 680,000 Ohms ½ Watt	.10
W118823	R4	Resistor, 1000 Ohms 1 Watt W.W.	.15
W500723	R5	Volume control, 1 Meg. (With Switch)	1.25
W160540		Ballast Tube	.60
W160499	L1	Coil, Oscillator	.26
W160745		Motor, 60 cycle, less turntable	5.00
W160788		Motor, 25 cycle, less turntable	13.00
W160791		Motor, 50 cycle, less turntable	6.90
W160754		Line Cord	.72
W500910		Pickup Arm complete with crystal	8.40
W160617		Crystal cartridge	4.50

PART NUMBER	DESCRIPTION	LIST PRICE
W160714	Bottom for cabinet	.16
W160748	Bull's eye	.24
W500908	Cabinet, complete	3.50
W112798	Clip, for mtg. coil	.01
W161104	Idler Wheel, for W160745 & W160791 Motor	.85
W117806	Idler Wheel, for W160788 Motor	.60
W10332	Instruction Book	.30
W160744	Knob, (Volume control)	.12
W160747	Rubber foot	.05
W119791	Socket, Octal	.12
W114876	Socket, Octal (Rectifier)	.15
W116467	Socket, Condenser Mtg.	.04
W160792	Turntable, 8" for W160791 motor	2.00
W160789	Turntable, 8" for W160788 motor	1.50
W160746	Turntable, 8" for W160745 motor	1.50

RETAIL SELLING PRICES PREPAID
PRICES SUBJECT TO CHANGE WITHOUT NOTICE



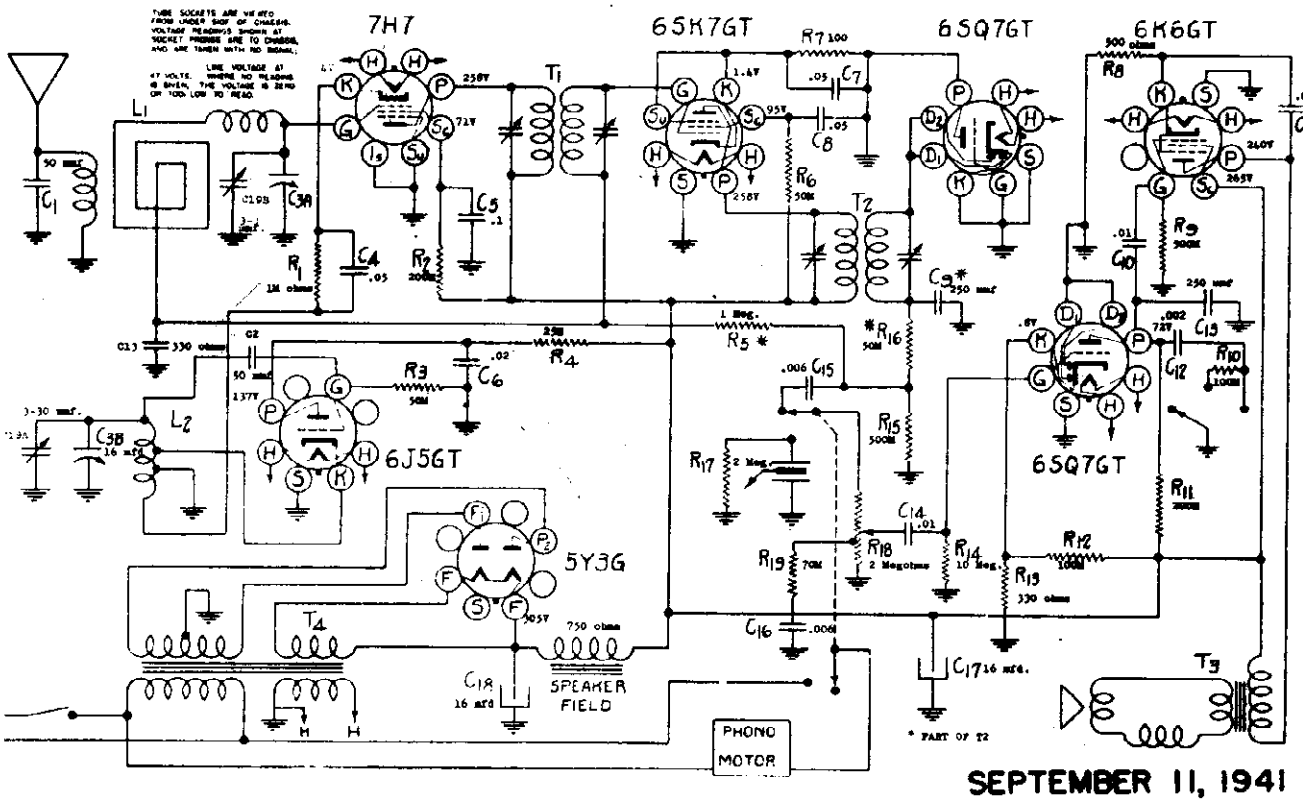
Part Number	Description	List Price
W160714	Bottom for cabinet	.16
W500719	Cabinet complete (with carton)	2.75
W500718	Cable - connection to radio	.40
W10278	Instruction book	.30
W160744	Knob (volume control)	.12
W160746	Turntable - 8" for 160745 Motor	1.50
W160789	Turntable - 8" for 160788 Motor	1.50
W160792	Turntable - 8" for 160791 Motor	2.00
W161104	Idler Wheel (W160745 & 160791	.85
W117806	Idler Wheel (W160788 motor)	.60

MODEL 7059

Part Number	Description	List Price
W500722	Pickup arm complete with crystal	8.30
W500723 R1	Volume control - 1 Meg. (with switch)	1.25
W500725	Crystal cartridge	6.00
W160745	Motor - 60 cycle - less turntable	5.00
W160788	Motor - 25 cycle - less turntable	13.00
W160791	Motor - 50 cycle - less turntable	6.90

SEARS, ROEBUCK & CO.

MODEL 7056
Chassis 141.417



SEPTEMBER 11, 1941

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection . . . . . Across loudspeaker voice coil
Output meter reading to indicate 500 milliwatts . . . . . 1.25 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
Position of Volume Control . . . . . Fully clockwise
Position of Tone Control . . . . . HI
Position of Dial Pointer with variable fully closed . . . . . On first mark to left of 540 kc calibration mark.

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	ANT. COUPLED APPROXIMATE MICROVOLTS
Open	455 kc	.1 mfd.	7H7 Grid	T2,T1	IF	--
Fully open	1720 kc	.00005 mfd.	Ant. Lead	C19B*	Oscillator	--
1400 kc	1400 kc	.00005 mfd.	Ant. Lead	C19A*	Antenna	80**

IMPORTANT ALIGNMENT NOTES

* C19 A and B are best adjusted when the receiver is in the cabinet, through holes provided in the back cover.

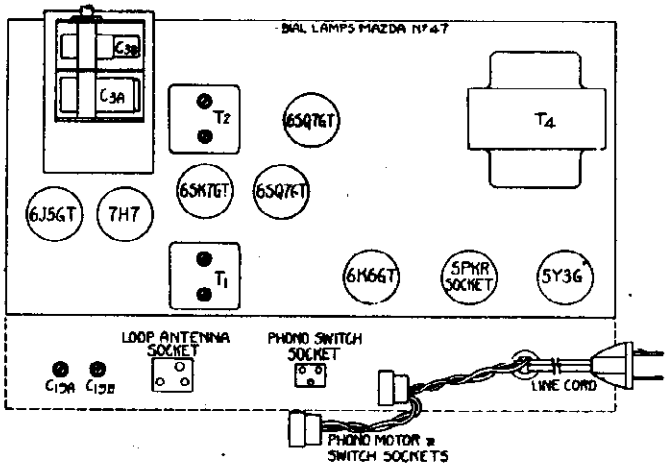
** 120 microvolts per meter using standard Hazeltine alignment loop 24 inches from receiver loop.

For operation of the chassis outside the cabinet with the phonograph plug disconnected, connect a jumper wire across the two top terminals of the phono socket.

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.

MODEL 7056

SEARS, ROEBUCK & CO.



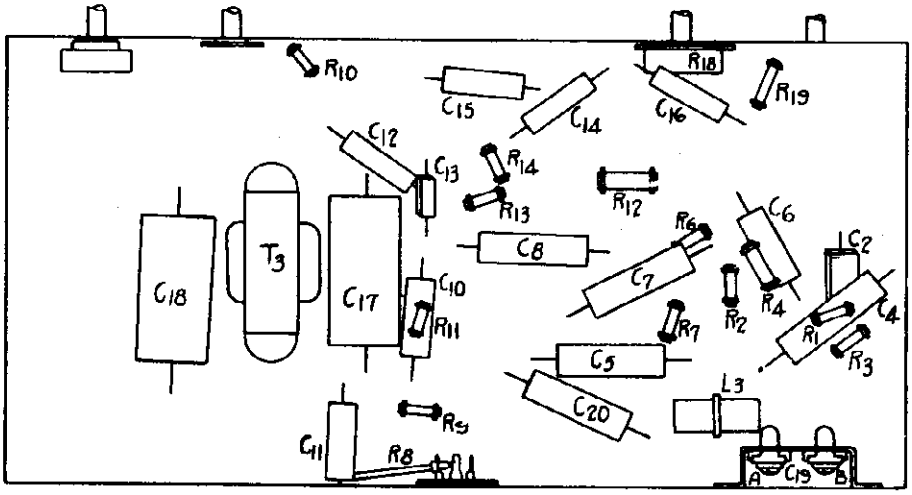
LOCATIONS OF PARTS ON TOP OF CHASSIS

OPERATING FEATURES:
Automatic Volume Control
Automatic Radio/Phono Switch, operated by Phono Pickup Arm.
Three Position Switch Tone Control
Lo-Noise Converter Circuit

CHASSIS FEATURES:
Number IF stages . . . . . .One
Number of condensers in gang . . .Two
Underwriters Approved
Built-in Loop (RADIONET Antenna System)
Provision for external Ant. Connection

POWER OUTPUT:
Type . . . . . Single Pentode
Undistorted . . . . . 2.5 watts
Maximum . . . . . 4.5 watts

LOUD SPEAKER:
Type . . . . . .Dynamic
Size . . . . . 6.5 inch
Approx.field coil res. . . . 750 ohms
Approx.field coil voltage drop . 40 V.



LOCATIONS OF PARTS UNDER CHASSIS

FREQUENCY RANGES:
Broadcast Band 540-1720 kc

INTERMEDIATE FREQUENCY 455 kc

ALIGNMENT FREQUENCIES:

Oscillator Trimmer	Antenna-Transl. Trimmer
1720 kc	1400 kc

TUBES AND FUNCTIONS

6J5GT . . . . . .Oscillator
7H7 . . . . . .Translator
6SK7GT . . . . . IF
6SQ7GT . . . . . Detector-AVC
6SQ7GT . . . . . Driver
6K6GT . . . . . .Output
5Y3G . . . . . Rectifier

POWER SUPPLY:
All models available . . . . . 105-125 volts, 50-60 cycles; 80 watts
All models available . . . . . 105-125 volts, 25-60 cycles; 85 watts

MECHANICAL SPECIFICATIONS

OPERATING CONTROLS:(LEFT TO RIGHT)
1. First Knob . . . . . .On-Off
2. Second Knob . . . . . Tone
3. Third Knob . . . . . .Volume
4. Fourth Knob . . . . . Tuning

CONTROL OPERATION:
1. Turning Clockwise . . . . . On
2. Turning Clockwise . . .HI, MED, LO
3. Turning Clockwise . . . . Increase
4. Tuning Ratio 3:1

GENERAL INFORMATION & SERVICE HINTS

RADIO-PHONO AUTOMATIC SWITCH:

With the power switch on, the receiver is automatically switched for record playing and the phonograph motor will start when the pick-up arm is moved in toward the turntable. Return of the pick-up arm to its rest automatically switches the receiver to resume radio reception and stops the motor.

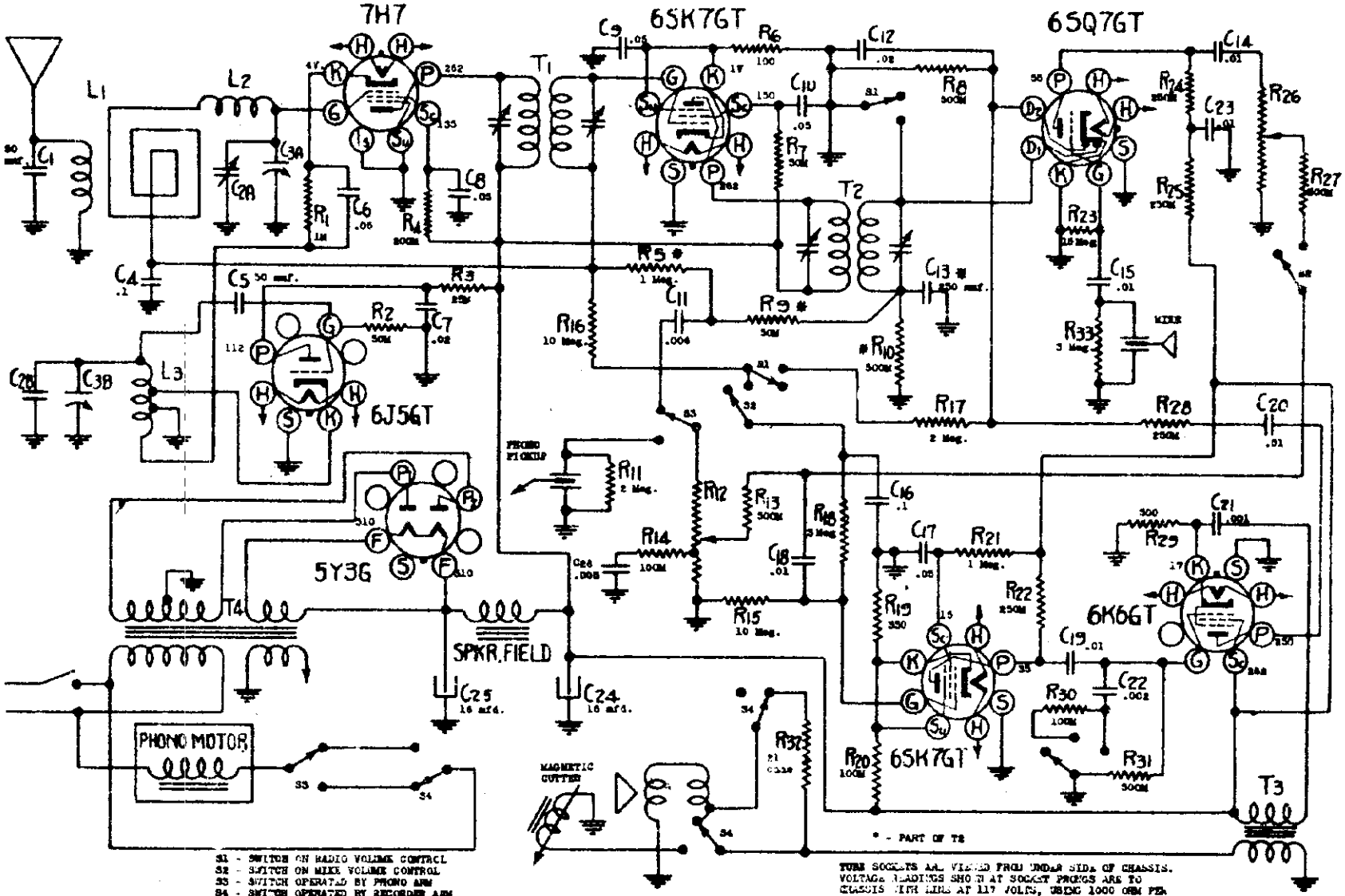
NOTE: To obtain full switching leverage when returning the pick-up arm to its rest for radio reception, move the arm slightly to the right of the rest before lowering it.

TO SERVICE THE CHASSIS:

For operation of the chassis outside the cabinet with the phonograph plug disconnected, connect a jumper wire across the two top terminals of the phono socket.

SEARS, ROEBUCK & CO.

MODEL 7057
Chassis 141.418



S1 - SWITCH ON RADIO VOLUME CONTROL
S2 - SWITCH ON MIKE VOLUME CONTROL
S3 - SWITCH OPERATED BY PHONO ARM
S4 - SWITCH OPERATED BY RECORDER ARM

ALL SWITCHES SHOWN IN RADIO POSITION

* - PART OF T2

TUBE SOCKETS AS VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS WITH LINE AT 117 VOLTS, USING 1000 OHM PER VOLT VOLTMETER. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ

POWER SUPPLY:
All models available.....105-125 volts, 50-60 cycles; 90 watts.

INTERMEDIATE FREQUENCY.....455Kc.

POWER OUTPUT:
Type.....Single Pentode
Undistorted.....2.5 Watts
Maximum.....4.5 Watts

LOUD SPEAKER:
Type.....Dynamic
Size.....6.5 inch
Approx. field coil res. 750 ohms
Approx. field coil vol. drop 40V.

ALIGNMENT FREQUENCIES:

Oscillator	Antenna-Transl.
Trimmer	Trimmer
1720 Kc.	1400 Kc.

MODEL 7057

SEARS, ROEBUCK & CO.

ALIGNMENT PROCEDURE

Output meter connection . . . . . Across loudspeaker voice coil
Output meter reading to indicate 500 milliwatts . . . . . 1.25 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
Position of Volume Control . . . . . Fully clockwise
Position of Tone Control . . . . . HI
Position of Dial Pointer with variable fully closed . . . . . On first mark to left of 540 kc calibration mark.

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	ANT.COUPLED APPROXIMATE MICROVOLTS
Open	455 kc	.1 mfd.	7H7 Grid	T2,T1	IF	--
Fully open	1720 kc	.00005 mfd.	Ant. Lead	C2B*	Oscillator	--
1400 kc	1400 kc	.00005 mfd.	Ant. Lead	C2A*	Antenna	80**

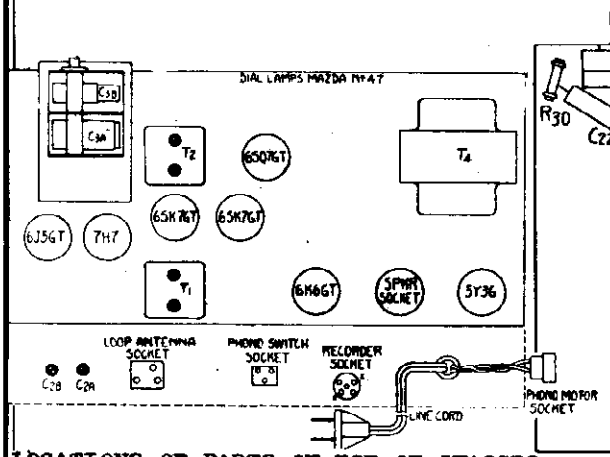
IMPORTANT ALIGNMENT NOTES

* C2 A and B are best adjusted when the receiver is in the cabinet, through vided in the back cover.

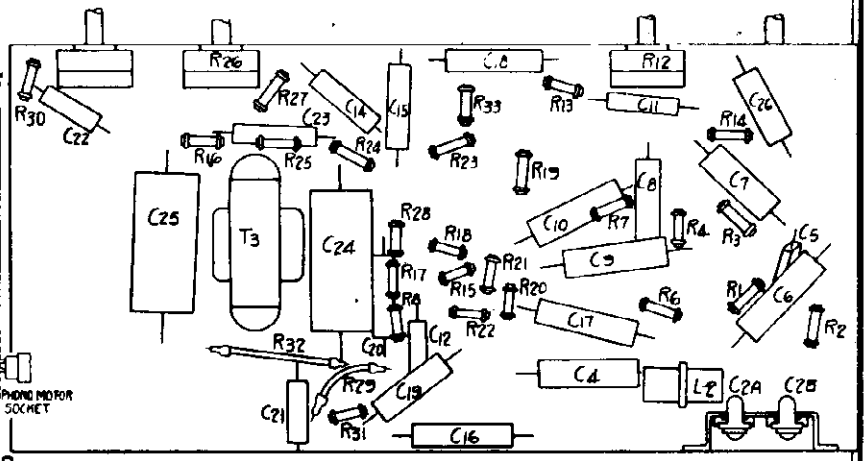
** 120 microvolts per meter using standard Hazeltine alignment loop 24 inches from receiver loop.

For operation of the chassis outside the cabinet with the phonograph plug disconnected, connect a jumper wire across the two top terminals of the phono socket, and between the two terminals marked "X" on the Recorder socket shown below.

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.



LOCATIONS OF PARTS ON TOP OF CHASSIS



LOCATIONS OF PARTS UNDER CHASSIS

RADIO-PHONO AUTOMATIC SWITCH:

With the power switch on, the receiver is automatically switched for record playing and the phonograph motor will start when the pick-up arm is moved in toward the turntable. Return of the pick-up arm to its rest automatically switches the receiver to resume radio reception and stops the motor.

Switching for Recording is also controlled by the Recorder Arm, in the manner described above.

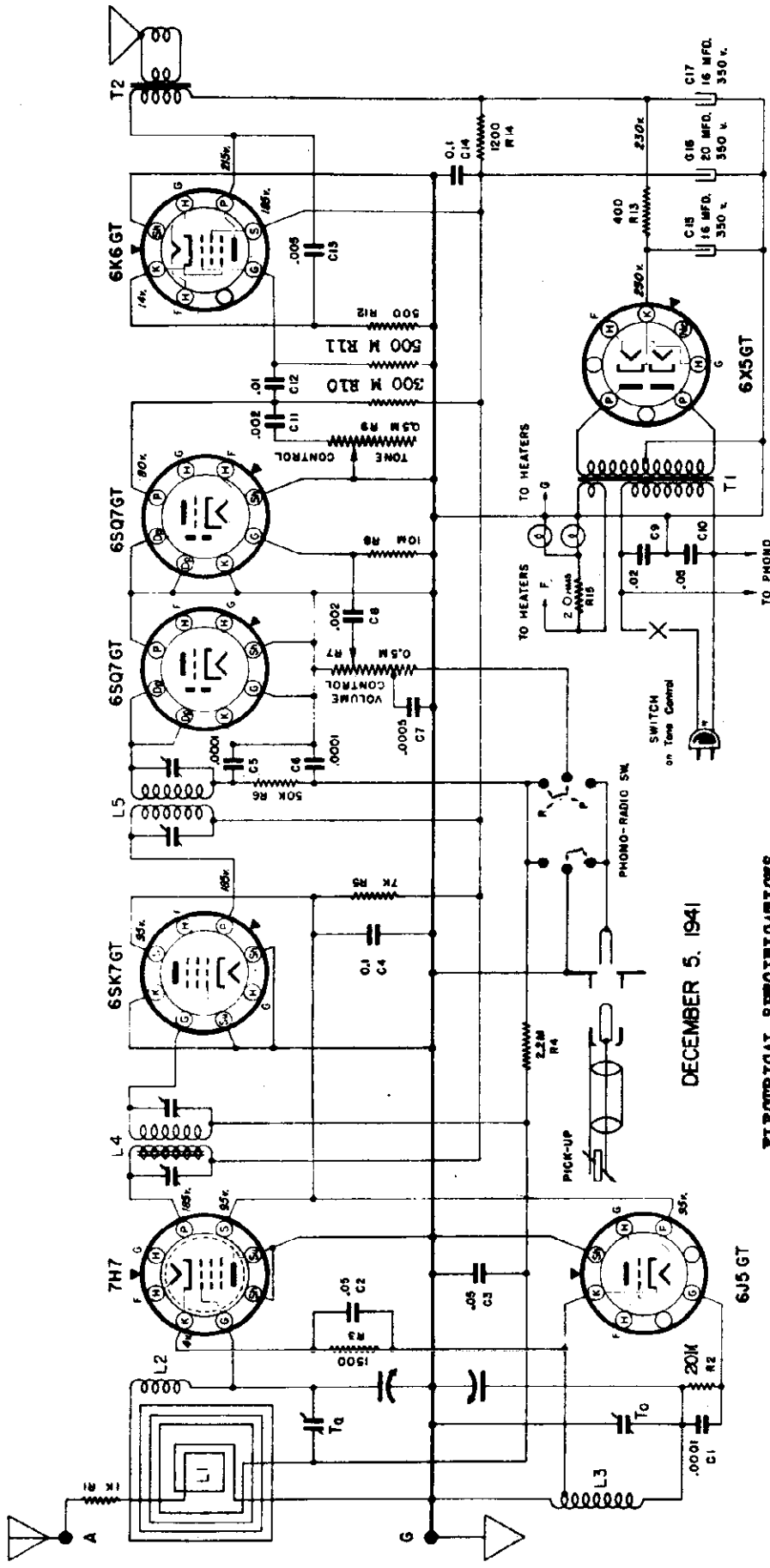
When the pick-up and Recorder Arms are both off their rests, the motor will not revolve.

TO SERVICE THE CHASSIS:

For operation of the chassis outside the cabinet with the phonograph plug disconnected, connect a jumper wire across the two terminals of the phono socket, and between the two terminals marked "X" on the Recorder socket shown.

SEARS, ROEBUCK & CO.

MODEL 7058
Chassis 110.428



ELECTRICAL SPECIFICATIONS

TUBES AND FUNCTIONS:

7H7	Translator	6SQ7GT . . . . . Detector - A. V. C.
6J5GT	Oscillator	6SQ7GT . . . . . 1st Audio
6SK7GT	I. F. Amp.	6K6GT . . . . . Output
	6X5GT	. . . . . Rectifier

POWER SUPPLY:

This unit uses 105-125 A. C. 75 watts. The frequency (cycles) is specified on the label found on the bottom of the cabinet.

FREQUENCY RANGE:

Broadcast . . . . . 550-1750 K. C.

INTERMEDIATE FREQUENCY . . . . . 465 K. C.

POWER OUTPUT:

Type . . . . . Pentode
Undistorted . . . . . 2.1 Watts
Maximum . . . . . 5.0 Watts

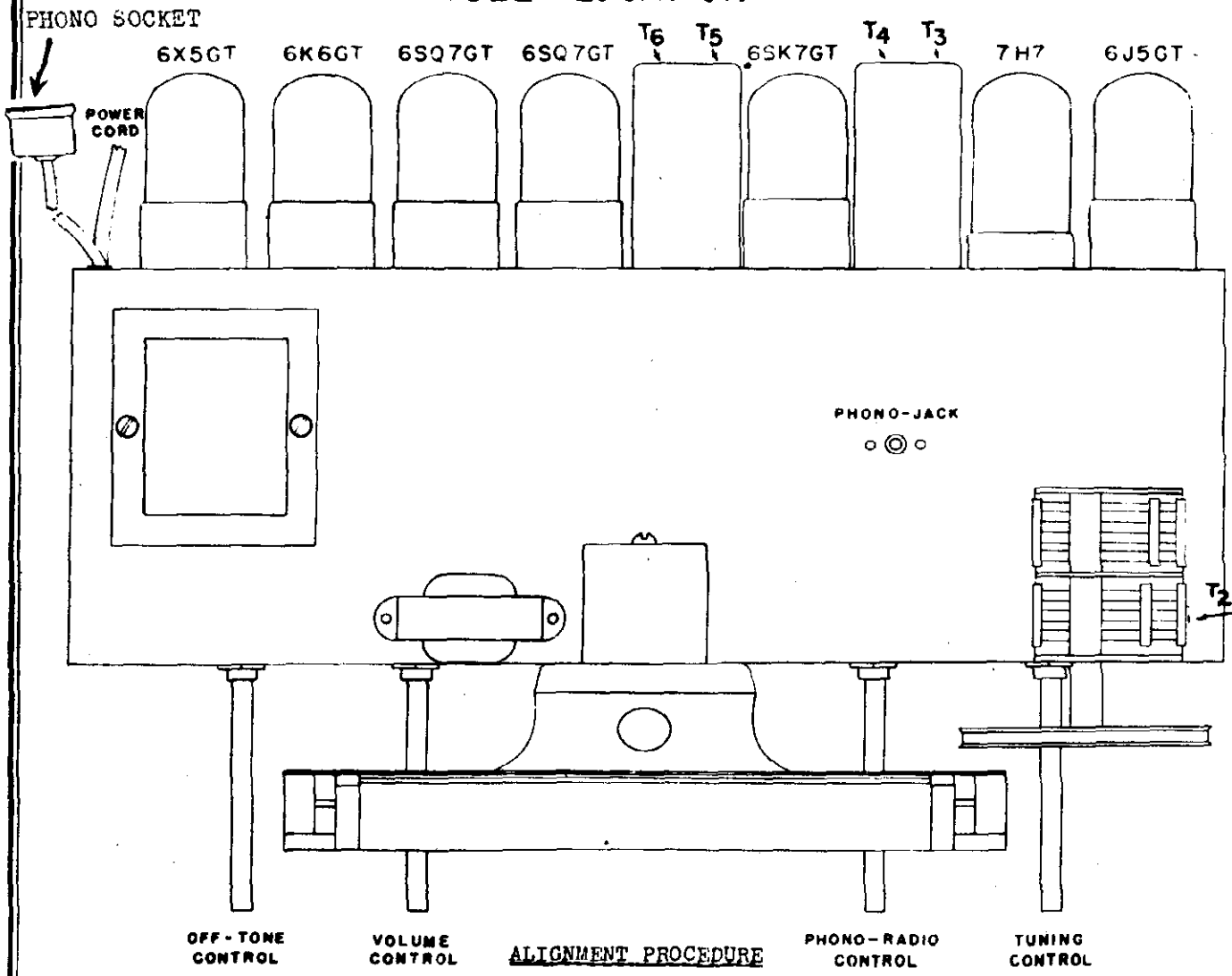
LOUDSPEAKER:

Type . . . . . Dynamic
Size . . . . . 6 Inch
Field . . . . . P. M.

MODEL 7058

SEARS, ROEBUCK & CO.

TUBE LOCATION



ALIGNMENT PROCEDURE

Output meter connection. . . . . .Across voice coil (3.1 ohms)
Output meter reading for ½ watt output . . . . . .1.25 volts
Connection of generator ground . . . . . .To chassis
Generator Modulation . . . . . Approx. 30% at 400 cycles
Position of Volume Control . . . . . Fully clockwise
Position of Tone Control . . . . . Fully clockwise

POSITION OF DIAL POINTER	GENERATOR FREQUENCY	GENERATOR CONNECTION	DUMMY ANTENNA	TRIMMERS ADJUSTED IN ORDER SHOWN	TRIMMER FUNCTION
540 K. C.	455 K. C.	7H7 Grid.	.1 mfd.	T5, T6, T3, T4	I.F.
1720	1720	Standard Radiating Loop		To	Osc.
*1400	1400			Ta**	Ant.

* Approximately 100 microvolts per meter using a standard Hazeltine loop at 24 inches distance from the receiver loop for 1/2 watt output.

** On Loop Board.

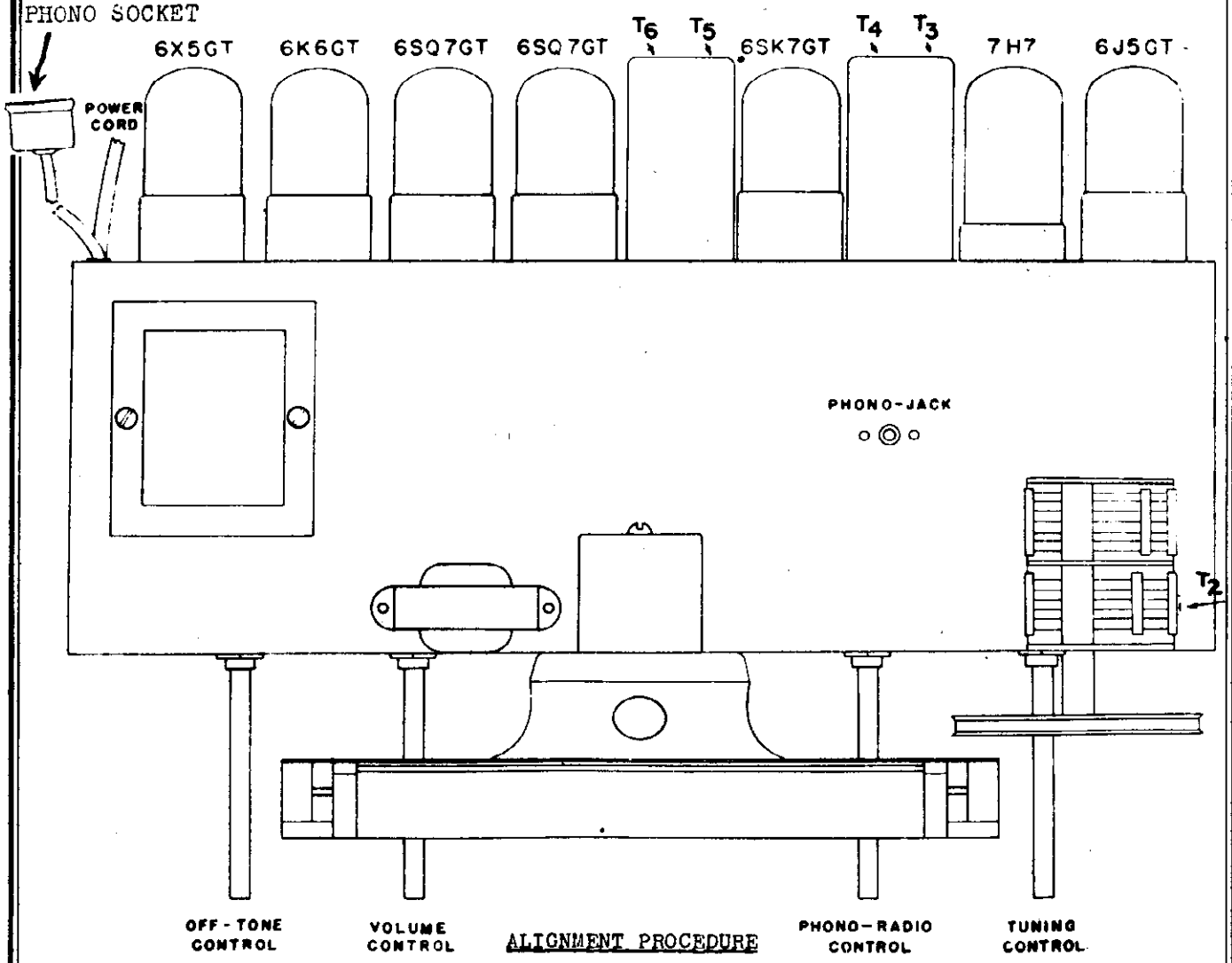
The alignment procedure should be repeated stage by stage to obtain greatest accuracy. Always keep the output from the test oscillator at its lowest possible value. As the sensitivity is increased by alignment, the generator output should be reduced correspondingly so as to minimize the effect of the Automatic Volume Control.

Check alignment at 600 K. C. Tracking may be corrected by adjusting the spacing of the two pies of the loading coil found on the loop board assembly.

MODEL 7058

SEARS, ROEBUCK & CO.

TUBE LOCATION



ALIGNMENT PROCEDURE

Output meter connection. . . . . .Across voice coil (3.1 ohms)
Output meter reading for ½ watt output . . . . . .1.25 volts
Connection of generator ground . . . . . .To chassis
Generator Modulation . . . . . Approx. 30% at 400 cycles
Position of Volume Control . . . . . Fully clockwise
Position of Tone Control . . . . . Fully clockwise

POSITION OF DIAL POINTER	GENERATOR FREQUENCY	GENERATOR CONNECTION	DUMMY ANTENNA	TRIMMERS ADJUSTED IN ORDER SHOWN	TRIMMER FUNCTION
540 K. C.	455 K. C.	7H7 Grid.	.1 mfd.	T5, T6, T3, T4	I.F.
1720	1720	Standard Radiating Loop		To	Osc.
*1400	1400			Ta**	Ant.

* Approximately 100 microvolts per meter using a standard Hazeltine loop at 24 inches distance from the receiver loop for 1/2 watt output.

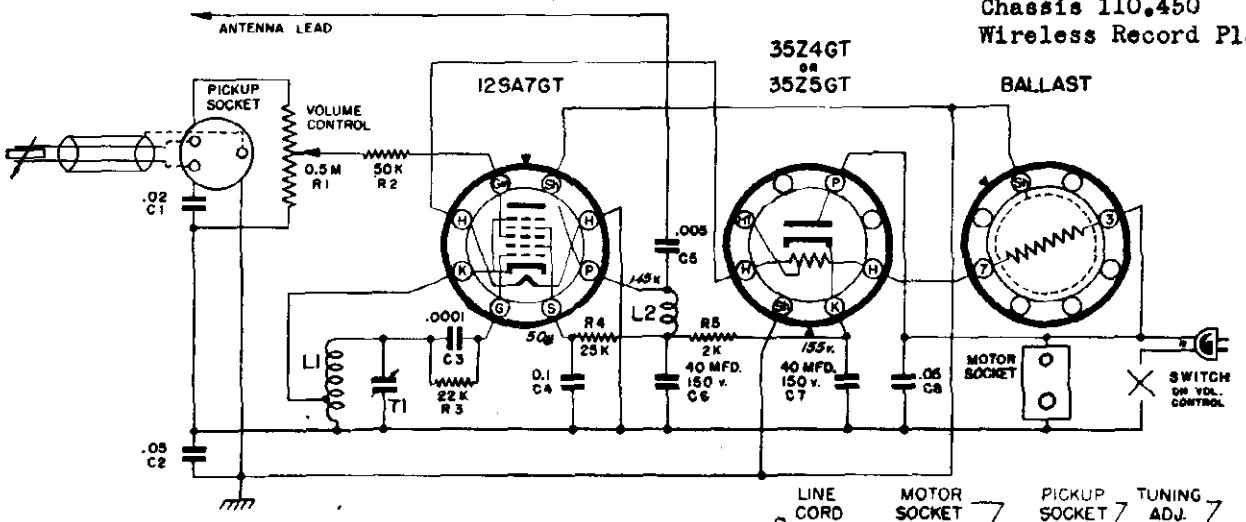
** On Loop Board.

The alignment procedure should be repeated stage by stage to obtain greatest 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 so as to minimize the effect of the Automatic Volume Control.

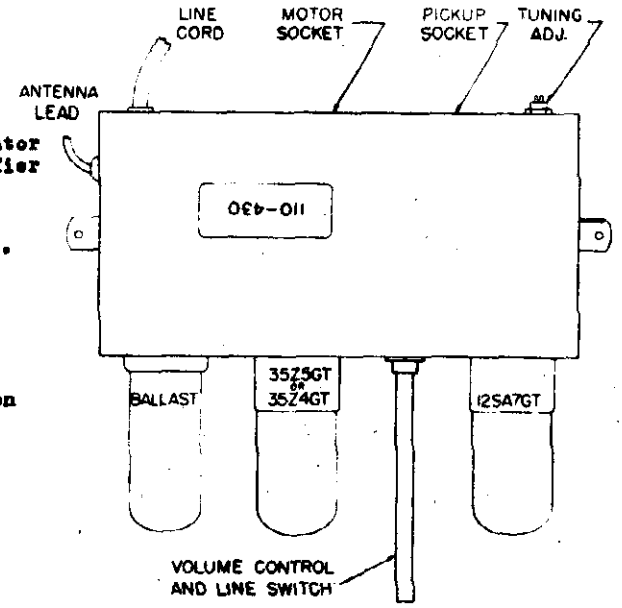
Check alignment at 600 K. C. Tracking may be corrected by adjusting the spacing of the two pies of the loading coil found on the loop board assembly.

SEARS, ROEBUCK & CO.

MODEL 7063
Chassis 110.450
Wireless Record Playe



DECEMBER 5, 1941



TUBES AND FUNCTIONS:

12SA7GT . . . . . Modulated Oscillator
35Z4GT or 35Z5GT . . . . . Rectifier

POWER SUPPLY:

This unit uses 105-125 volts A. C. 75 watts. The frequency (cycles) is specified on the bottom of the cabinet.

FREQUENCY RANGE:

The carrier frequency may be adjusted between the limits of 540 and 1100 kilocycles.

OPERATING CONTROL:

A single knob operates the power switch and controls the modulation level.

GENERAL INFORMATION AND SERVICE HINTS.

This wireless record player uses a 12SA7GT tube in which the screen, cathode and oscillator grid are used in a Hartley oscillator circuit which may be tuned from 540 to 1100 K. C. by means of a trimmer. The output of this oscillator is electronically coupled to the plate circuit of the 12SA7GT which is loaded with a two millihenry choke. Amplitude modulation is effected by means of an audio signal impressed on the control grid. This signal serves to control the space current and the oscillator strength is not dependant upon modulation. Thus it may be seen that any energy radiated from the oscillator coil is not modulated. The modulated signal is radiated from an antenna capacitatively coupled to the plate of the 12SA7GT.

The signal from this wireles record player may be received by any broadcast receiver. The tone and volume should be controlled at the receiver as would be done when listening to a regular broadcast station.

For normal use the control on the wireless record player is advanced to the maximum clockwise position. If exceptionally loud recordings are used, the volume control may be retarded slightly to prevent distortion in the transmitter unit.

ADJUSTMENT PROCEDURE.

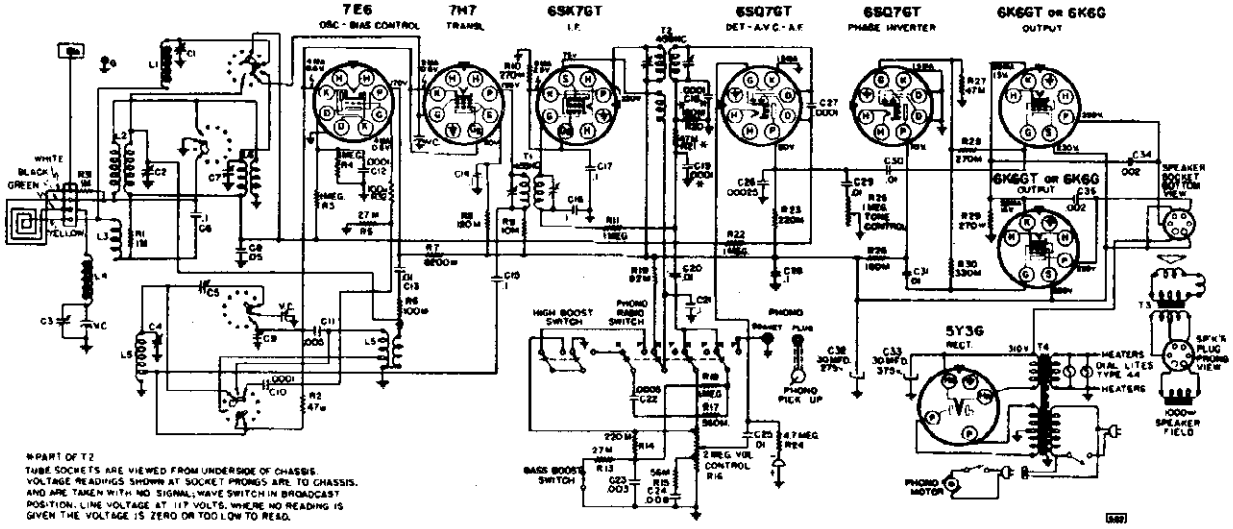
The radio receiver is tuned to a frequency between 540 and 1100 K. C. where there is as little interference as possible. With the record changer in operation, the adjusting screw found on the back of the chassis is turned until the wireless record player is heard through the receiver.

SPURIOUS RESPONSES.

Spurious responses may be obtained in some localities where broadcast signals are quite strong, if the wireless record player is placed too close to the receiver (e.g. on top of the cabinet). This manifests itself in the form of numerous signals in the receiver for a given setting of the wireless record player tuning adjustment, or numerous settings of the wireless record player tuning adjustment for a given receiver setting. This difficulty may be remedied by moving the wireless record player a little farther away from the radio during the set-up procedure.

MODEL 7067
Chassis 101.662

SEARS, ROEBUCK & CO.



BAND SWITCH POSITION	POSITION OF TUNER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
A	Closed	455 Kc	.1 mfd.	7H7 Transl. grid	T2, T1	IF	—
A	Open	1720 Kc	.00005 mfd.	Ant. Terminal	C4	Oscillator	--
A	1410	1410 Kc	.00005 mfd.	Ant. Terminal	C3, C1	Ant. Transla.	30
A	600 (rock)	600 Kc	.00005 mfd.	Ant. Terminal	C5	Padder	125
POL	2.4	2.4 Mc	400 ohms	Ant. Terminal	C7	Transla.	35
B	Open	18.3 Mc	400 ohms	Ant. Terminal	C9	Oscillator	--
C	15 (rock)	15 Mc	400 ohms	Ant. Terminal	C2	Transla.	20

IMPORTANT ALIGNMENT NOTES

The alignment must be done in the order given.

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.

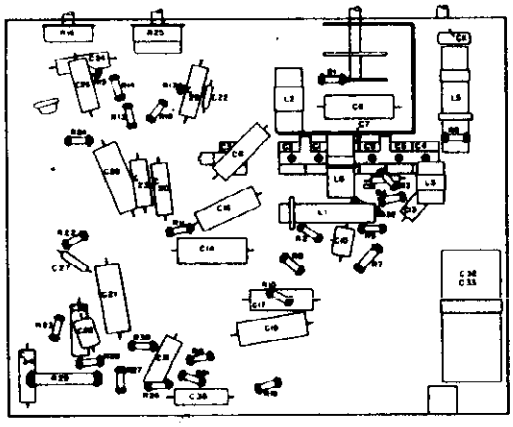
POWER SUPPLY:
All models available . . . . . 105-125 volt, 60 cycles AC: 100 watts
All models available . . . . . 105-125 volt, 25 cycles AC: 110 watts

INTERMEDIATE FREQUENCY . . . . . 455 kc

FREQUENCY RANGES:

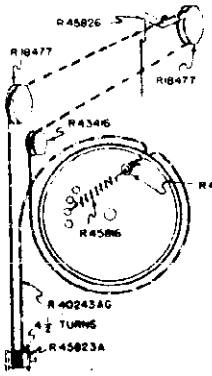
	Band	Oscillator Trimmer	Antenna-Transl. Trimmer	Padder
Band "A" . . . . . 540-1700 kc		1720 kc	1410 kc	600 kc
Band "POLICE" . . . . . 1.5-2.5 kc		None	2.4 mc	Fixed
Band "B" . . . . . 6-18 mc		18.3 mc	15 mc	Fixed

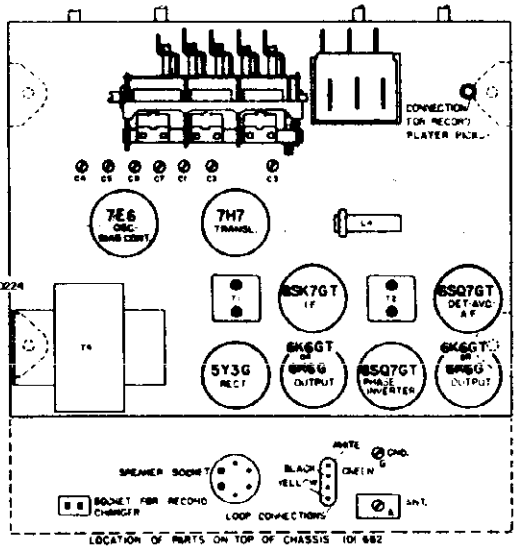
POWER OUTPUT:
Type . . . . . Push Pull Pentode
Undistorted . . . . . 3.5 watts
Maximum . . . . . 7 watts



LOCATIONS OF PARTS UNDER CHASSIS 101.662

Dial Drive System.





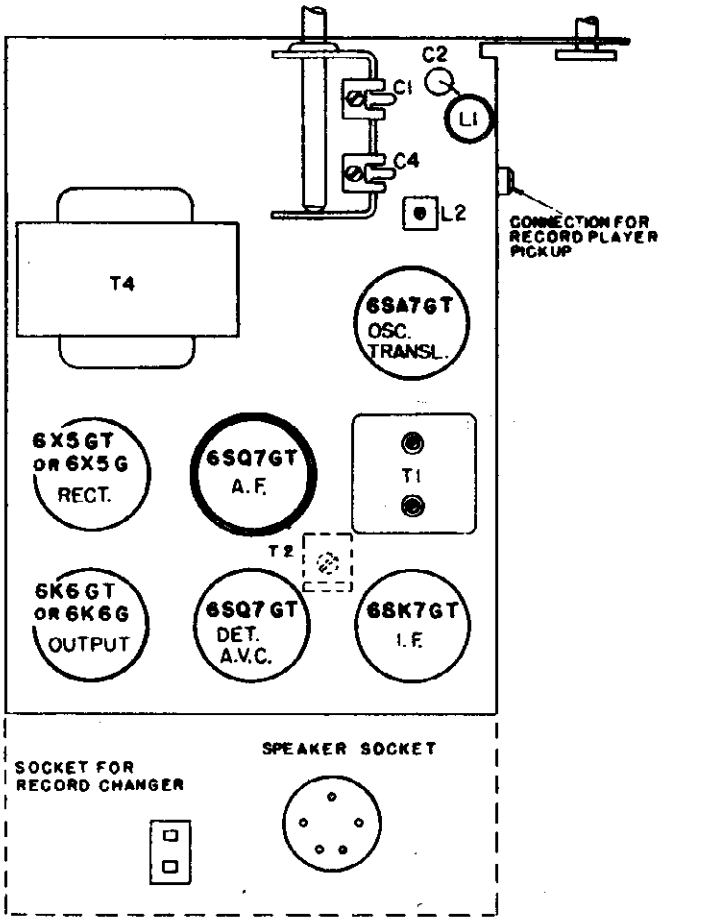
LOCATION OF PARTS ON TOP OF CHASSIS 101.662

PUSH BUTTON TUNING MECHANISM

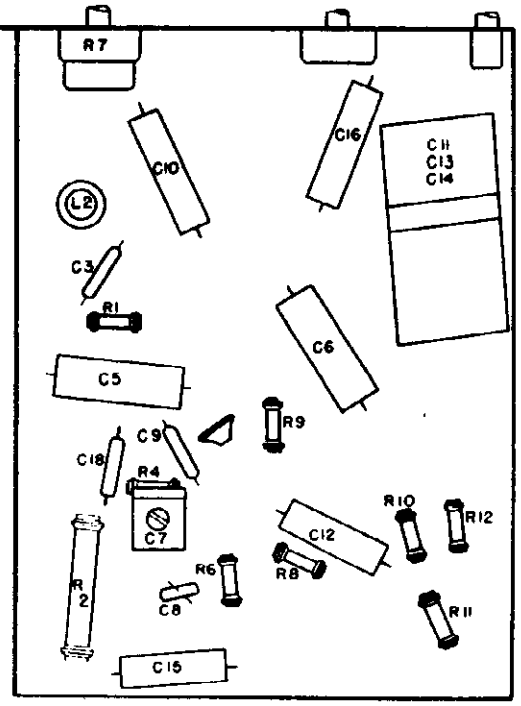
The adjustment for each push button is locked or unlocked by tightening or loosening the slotted screwhead made accessible when the push button knob is pulled off of its plunger. Stations are set up by unlocking the mechanism, tuning in the station, pushing in the plunger (being careful not to detune the station), and securely locking the adjustment.

SEARS, ROEBUCK & CO.

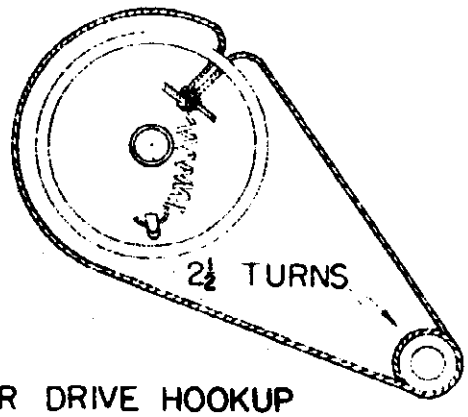
MODEL 7065
Chassis 101.660



LOCATIONS OF PARTS ON TOP OF CHASSIS 101.660

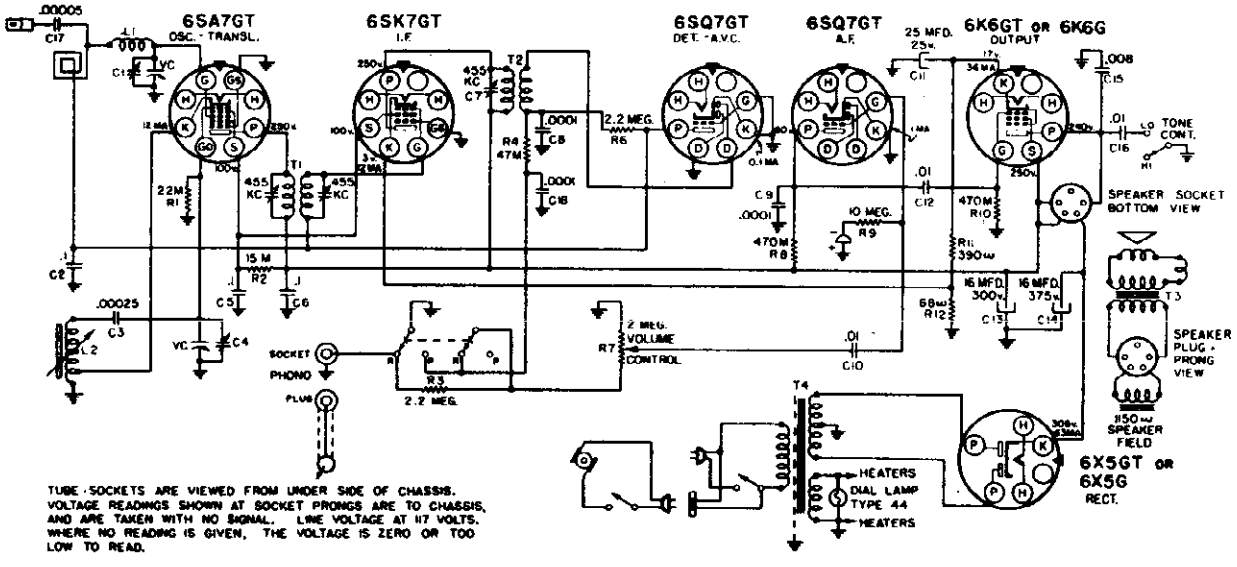


LOCATIONS OF PARTS UNDER CHASSIS 101.660



CONDENSER DRIVE HOOKUP

IF PEAK 455 KC



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

MODEL 7065

SEARS, ROEBUCK & CO.

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection . . . . . Across loudspeaker voice coil
Output meter reading to indicate 500 milliwatts . . . . . 1.25 volts
Approximate microvolts input for 500 milliwatts 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
Connection of generator ground lead . . . . . Receiver chassis
Generator modulation . . . . . 30%, 400 cycles
Position of Volume Control. . . . . Fully clockwise
Position of Tone Control. . . . . Counter-clockwise (HI)
Position of Dial Pointer with variable fully closed . . . . . On mark below 540 kc calibration mark

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
Closed	455 kc	.1 mfd.	6SA7 Grid	T2,T1	IF	---
Fully Open	1620 kc	.00005 mfd.	Ant. Clip	C4	Oscillator	---
1410 kc	1410 kc	.00005 mfd.	Ant. Clip	C1	Translator	125
600 kc (rock)	600 kc	.00005 mfd.	Ant. Clip	L2	Padder	425

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 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.

POWER SUPPLY:

All models available . . . . . 105-125 v. 60 cycle AC, 95 watts
All models available . . . . . 105-125 v. 25 cycle AC, 105 watts

FREQUENCY RANGE: . . . . . 540-1600 kc

ALIGNMENT FREQUENCIES:

Oscillator Trimmer	Translator Trimmer	Padder
1620 kc	1410 kc	600 kc

INTERMEDIATE FREQUENCY . . . . . 455 kc

POWER OUTPUT:

Type . . . . . Pentode
Undistorted. . . . . 2.5 watts
Maximum. . . . . 6 watts

LOUDSPEAKER:

Type . . . . . Dynamic
Size . . . . . 8 inch
Field coil resistance. . . . . 1150 ohms
Approx. field coil voltage drop . . . 55 v.

OPERATING FEATURES:

Tone Control . . . . . Two position
Automatic Volume Control
Combined with Automatic Record Changer

CHASSIS FEATURES:

Number IF stages . . . . . One
Number condensers in gang. . . . . Two
Antenna. . . . .Built-in loop with provision for external antenna
Underwriters Approved

MECHANICAL SPECIFICATIONS

OPERATING CONTROLS:

1. Left knob . . . . . Phono-Radio
2. Next to left knob...On-Off Switch & Volume
3. Next to right knob . . . . . Tone
4. Right knob. . . . . Station Selector

CONTROL OPERATION:

Turning right: . . . . . Radio to phono
Turning right: . . . . . On; Volume increase
Turning right: . . . . . .Treble to bass
Tuning ratio: 3:1

GENERAL INFORMATION & SERVICE HINTS

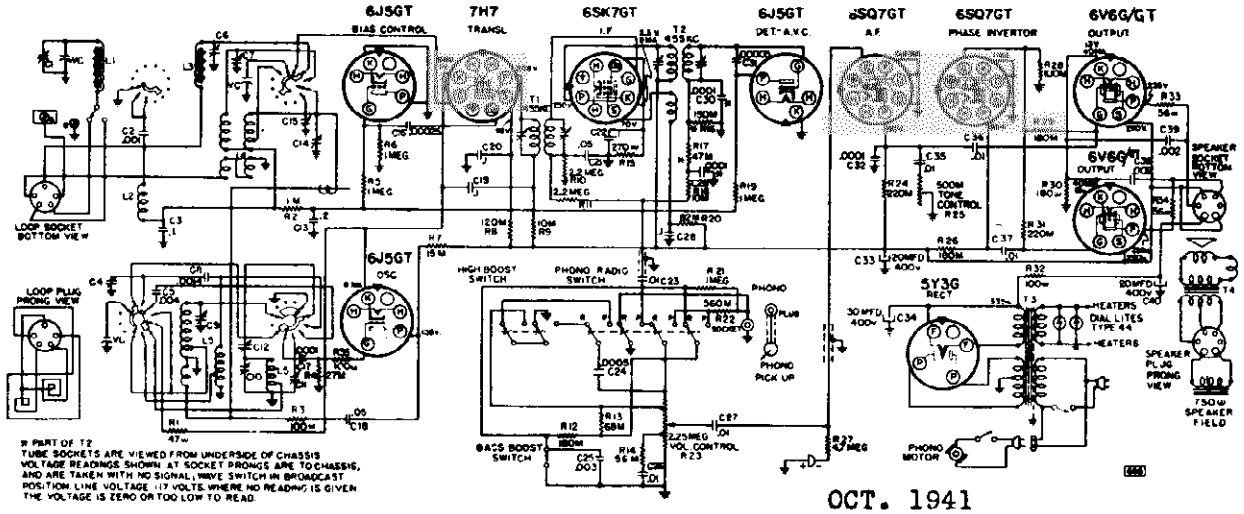
RECOMMENDED ANTENNA EQUIPMENT:

Catalog #4704: Greatest pickup and noise reduction.
Catalog #4703: Less effective pickup and noise reduction than Catalog #4704.
Catalog #4702: Conventional antenna.

MODEL 7069
Chassis 101.658

SEARS, ROEBUCK & CO.

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.658



OCT. 1941

PRELIMINARY:

ALIGNMENT PROCEDURE

FOR ADDITIONAL DATA SEE INDEX.

Output meter connection . . . . . Across loudspeaker voice coil
Output meter reading to indicate 500 milliwatts . . . . . 1.4 volts
Approximate microvolts input for 500 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
Position of Volume Control. . . . . Fully clockwise
Position of Dial Pointer with variable fully opened . . . . . On first mark to right of 1700 kc calibration mark

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	TRIMMERS ADJUSTED GENERATOR CONNECTION	(IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"A"	Closed	455 kc	.1 mfd.	7H7 Grid	T2, T1	IF	—
"A"	Fully open	1720 kc	.00005 mfd.	Ant. Term.	C10	Oscillator	—
"A"	1410 kc	1410 kc	.00005 mfd.	Ant. Term.	C1, C6	Loop,Transl	25
"A"	600 kc (rock)	600 kc	.00005 mfd.	Ant. Term.	C12	Padder	80
"B"	Fully open	5.3 mc	400 ohms	Ant. Term.	C4*	Oscillator	—
"B"	4.5 mc (rock)	4.5 mc	400 ohms	Ant. Term.	C7	Translator	35
"C"	Fully open	18.3 mc	400 ohms	Ant. Term.	C9*	Oscillator	—
"C"	16 mc (rock)	16 mc	400 ohms	Ant. Term.	C14	Translator	15
"D"	9.6 mc	9.6 mc	400 ohms	Ant. Term.	C11*	Oscillator	—
"D"	9.6 mc (rock)	9.6 mc	400 ohms	Ant. Term.	C15	Translator	25

IMPORTANT ALIGNMENT NOTES

* If two peaks can be had, the correct one is with the trimmer screw further out; the other peak is the image.

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

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.

When aligning the receiver be sure that the Loop Button is in the OUT position as this connects the loop which has the outside antenna coupling turn.

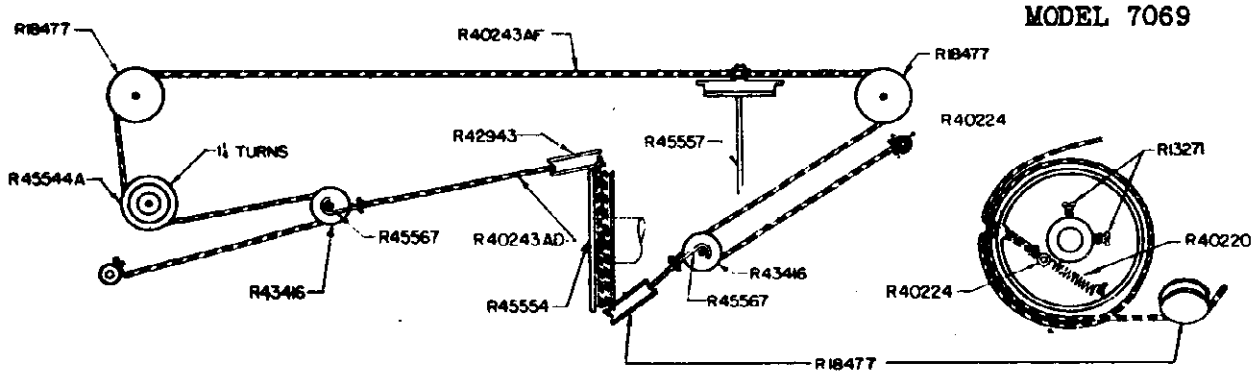
FREQUENCY RANGES:		ALIGNMENT FREQUENCIES: Oscillator Trimmer	Antenna-Transl. Trimmer	Padder
Band "A"	540-1700 kc	1720 kc	1410 kc	600 kc
Band "B"	1.3-5 mc	5.32 mc	4.5 mc	Fixed
Band "C"	5.5-18 mc	18.3 mc	16 mc	Fixed
Band "D"	9.4-9.8 mc	9.6 mc	9.6 mc	Fixed

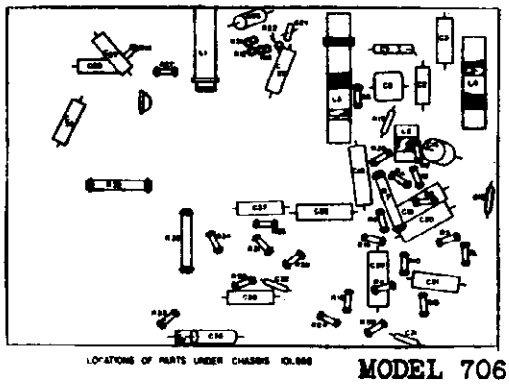
INTERMEDIATE FREQUENCY . . . . . 455 kc

MODEL 7037
MODEL 7069

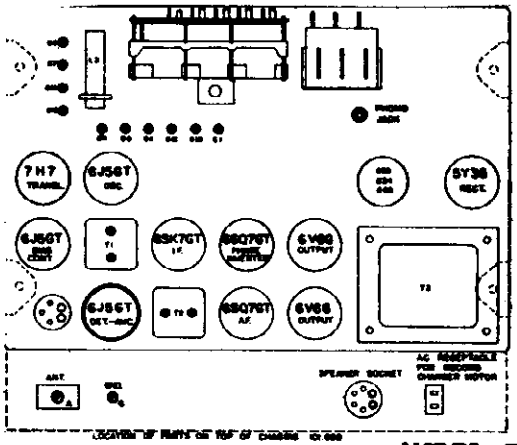
SEARS, ROEBUCK & CO.

MODEL 7069





MODEL 7069



MODEL 7069

ALIGNMENT FREQUENCIES:

Oscillator Trimmer	Antenna-Transl. Trimmer	Padder
1720 kc	1400 kc	600 kc
6.2 mc	5 mc	Fixed
18.2 mc	17 mc	Fixed

LOUD SPEAKER:

Type . . . . . Dynamic
Size . . . . . 6.5 inch
Approx.field coil res. . . . 750 ohms
Approx.field coil voltage drop ..57 V.

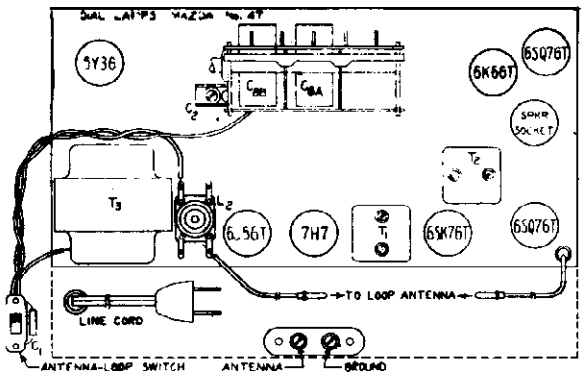
FREQUENCY RANGES:

Band "A" . . . . . 540-1720 kc
Band "B" . . . . . 1700-6000 kc
Band "C" . . . . . .6.0-18.1 mc

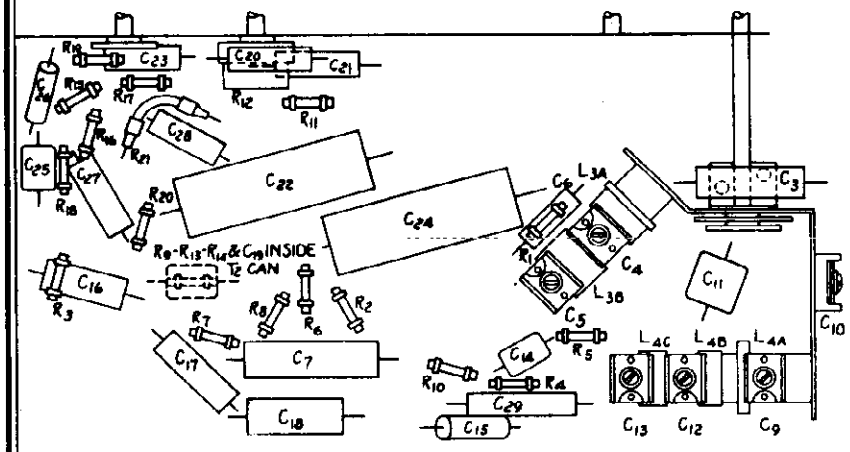
POWER OUTPUT:

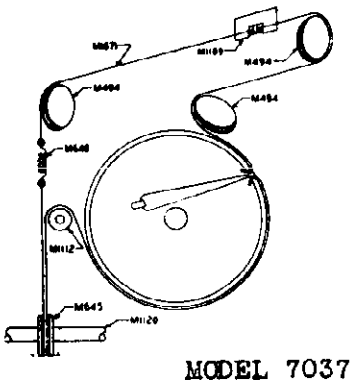
Type . . . . . Single Pentode
Undistorted . . . . . 2.5 watts
Maximum . . . . . 3.7 watts

MODEL 7037

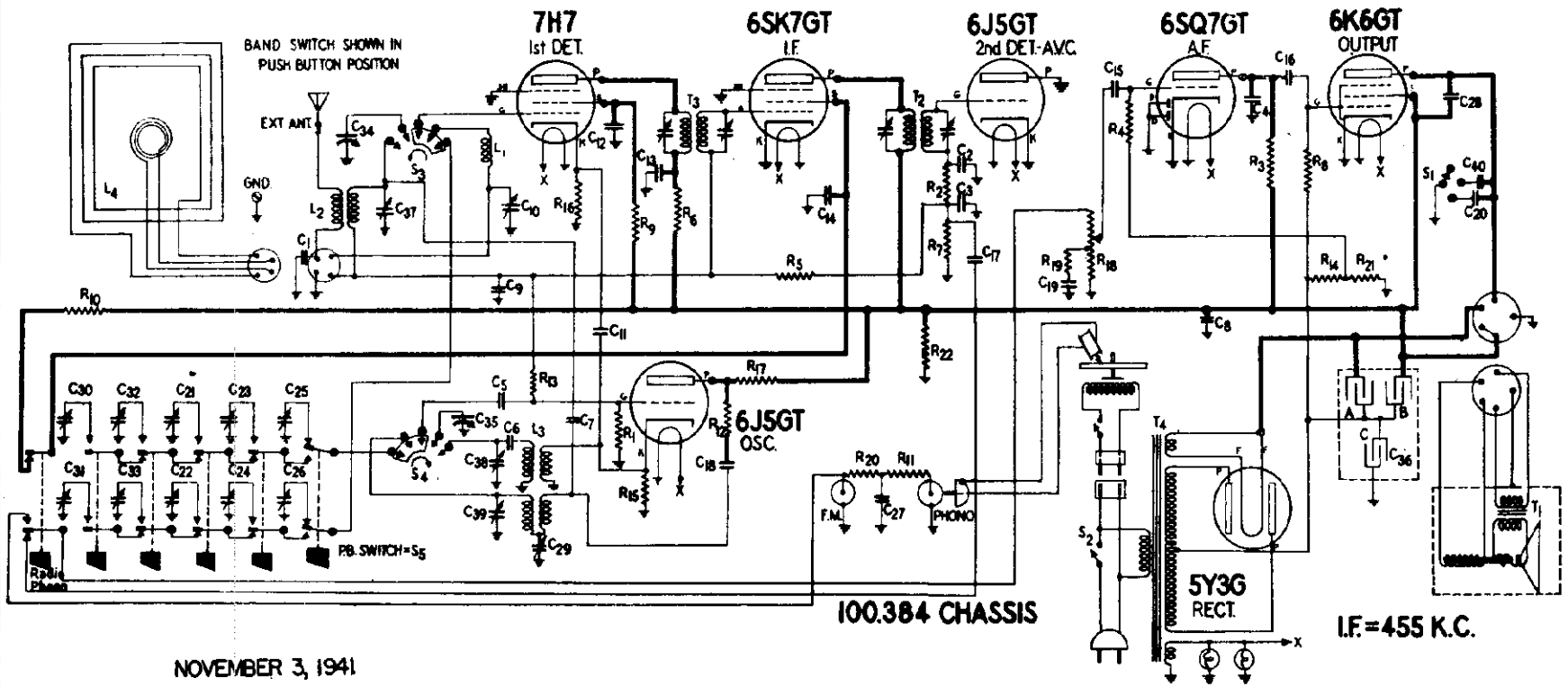


MODEL 7037





MODEL 7037



NOVEMBER 3, 1941

ELECTRICAL PARTS

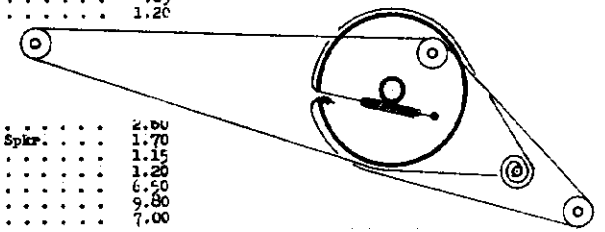
PART NUMBER	DIAGRAM NUMBER	DESCRIPTION	
W500911	L1	Coil, Loading	.25
W501042	L2	Coil, Short Wave Antenna	.50
W501043	L3	Coil, Oscillator (B.C. & S.W.)	1.00
W501153	L4	Loop Antenna	2.80
W110629		Dial Light Bulb, 6.3 Volt (mazda #44)	.15
W03783	C1 to C4	Condenser, Mica. 110 Mmfd.	.20
W65061	C5	Condenser, Mica. 51 Mmfd.	.15
W88587	C6	Condenser, Mica. .0042 Mfd.	.35
W110510	C7	Condenser, Wire 3 Mmfd.	.12
W116625	C8	Condenser, .1 Mfd. 600 Volt	.25
W116819	C9	Condenser, .05 Mfd. 600 Volt.	.20
W119132	C10	Condenser, Trimmer	.20
W119193	C11 to C18	Condenser, .01 Mfd. 600 Volt.	.15
W119414	C19 to C20	Condenser, .02 Mfd. 600 Volt.	.15
W119663	C21 to C24	Condenser, Push Button Trimmer (750-1375 KC).	.24
W119664	C25 to C26	Condenser, Push Button Trimmer (980-1600 KC).	.24
W119875	C27 to C28	Condenser, .002 Mfd. 600 Volt	.15
W119934	C29	Condenser, Padder	.36
W500127	C30 to C33	Condenser, Push Button Trimmer (540-1000 KC).	.24
W501057	C34 to C35	Condenser, Variable Tuning	1.20
W501060	C36	Condenser, Electrolytic A=20 Mfd. 400 Volt) B=15 Mfd. 400 Volt). C=20 Mfd. 25 Volt)	1.70
W501067	C37 to C39	Condenser, 3 Section Trimmer	.55
W119417	C40	Condenser, .006 Mfd. 600 Volt	.15
W110552	R1 to R2	Resistor, Carbon 47,000 Ohm ½ Watt.	.12
W110553	R3	Resistor, Carbon 220,000 Ohm ½ Watt	.12
W110554	R4 to R5	Resistor, Carbon 1 Megohm ½ Watt.	.12
W110562	R6	Resistor, Carbon 4700 Ohm ½ Watt.	.12

PART NUMBER	DIAGRAM NUMBER	DESCRIPTION	
W110559	R7 to R8	Resistor, Carbon 470,000 Ohm ½ Watt	.12
W110564	R9 to R11	Resistor, Carbon 100,000 Ohm ½ Watt	.12
W110590	R12	Resistor, Carbon 180 Ohm ½ Watt	.12
W112975	R13	Resistor, Carbon 10 Meg. ½ Watt	.12
W09762	R14	Resistor, Wire Wound, 220 Ohm 1 Watt.	.16
W116078	R15	Resistor, 560 Ohm ½ Watt.	.12
W116080	R16	Resistor, Insulated 680 Ohm ½ Watt.	.15
W118805	R17	Resistor, Carbon 10,000 Ohm 1 Watt.	.12
W119634	R18	Volume Control, 1 Megohm	.90
W110569	R19	Resistor, Carbon 10,000 Ohm ½ Watt	.12
W110564	R20	Resistor, Carbon 100,000 Ohm ½ Watt.	.12
W501196	R21	Resistor, Carbon 20 Ohm ½ Watt	.10
W116076	R22	Resistor, 33,000 Ohm 2 Watt.	.30
W501170M		Speaker, Dynamic 10 Inch	8.20
W501184M		Cone & Voice Coil for W501170M Spkr.	1.70
W119640	S1 to S2	Off-On Switch & Tone Control	.85
W501059	S3 to S4	Switch, Band	1.20
W501068	S5	Switch, Push Button	2.80
W501183M	T1	Transformer, Output for W501170M Spkr.	1.70
W119024	T2	Transformer, 2nd I.F.	1.15
W500801	T3	Transformer, 1st I.F.	1.20
W501044	T4	(Transformer, Power 60 Cycles	6.60
W501301		(Transformer, Power 25 Cycles	9.80
W501238		Crystal Cartridge for Tone Arm	7.00

DIAL CORD

CHASSIS VIEWED FROM FRONT

SET POINTER TO LOW FREQUENCY END OF DIAL SCALE WITH GANG IN FULL MESH (DRUM IN POSITION SHOWN).



MODEL 7071

SEARS, ROEBUCK & CO.

FOR GENERAL INSTRUMENT 201 RECORD CHANGER, SEE RIDERS "AUTOMATIC RECORD CHANGERS AND RECORDERS".

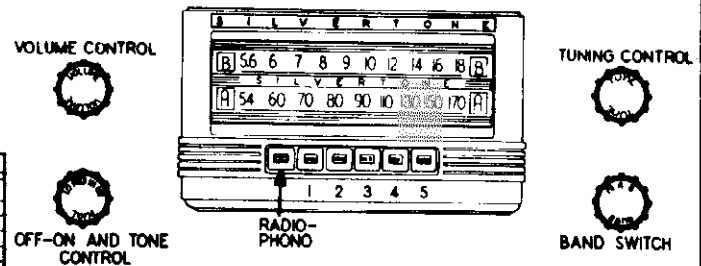
SOCKET VOLTAGES

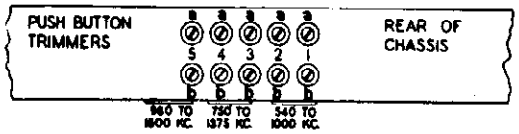
(1) VOLUME CONTROL ON FULL.
(2) SET TUNED TO APPROX. 540 KC., NO SIGNAL INPUT.

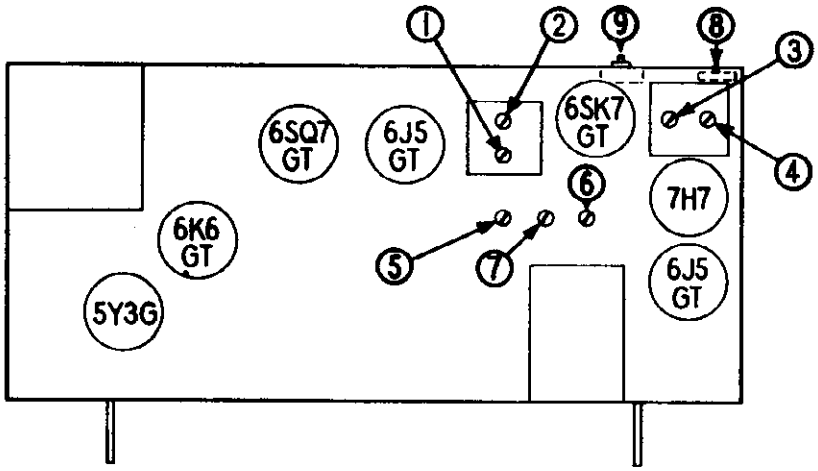
TUBE	FUNCTION	FILAMENT	K	G	SU	S	P	D1	D2
7H7	1st. Det.	6.3 A.C.	2.5	NOTE A	0	125	230	-	-
6J5GT	Osc.	6.3 A.C.	0	-5	-	-	150	-	-
6SK7GT	I.F. Amp.	6.3 A.C.	0	NOTE A	0	85	250	-	-
6J5GT	2nd. Det.	6.3 A.C.	0	0	-	-	0	-	-
	A.F. Amp.	6.3 A.C.	0	NOTE B	-	-	115	0	0
	Output	6.3 A.C.	0	NOTE C	-	250	235	-	-
	Rectifier	5.0 A.C.	VOLTAGE ON PLATES = 320 A.C. TO C.T.						

NOTE A: Volts e on the grids of the 7H7 1st. Det. and 6SK7GT I. F. Amp. is variable and cannot be measured with a standard voltmeter.
NOTE B: Voltage on the grid of the 6SQ7GT A. F. Amp. is - 1.2 volts measured across R21.
NOTE C: Voltage on the grid of the 6K6GT output tube is -18 volts measured across resistors R21 and R14.

USE A VOLTMETER OF 1000 OHMS PER VOLT.







SETTING UP THE PUSH BUTTONS

1. Turn the Band Switch to the "A" position and tune in the desired station by means of the Tuning Control.
2. Push in a button of the proper frequency range and turn the Band Switch to the "PB" position.
3. Adjust the "a" screw with the same number as that of the button you have pushed in, until you again hear the desired station.
4. Adjust the "b" screw (below the "a" screw) for deepest tone.
5. Readjust both "a" and "b" screws for deepest tone.

POWER SUPPLY
Model 7071 is supplied for either 25 or 60 cycle power supplies.

105-125 Volts A.C. . (RADIO-65 Watts (PHONO-85 Watts

FREQUENCY RANGES
(A) Broadcast . . . . 540 to 1700 KC
(B) Short Wave . . . . 5.6 to 18 MC

ALIGNMENT FREQUENCIES
1400 KC, 600 KC
16 MC

INTERMEDIATE FREQUENCY . . . . . 455 KC

POWER OUTPUT
Type . . . . . Pentode
Undistorted . . . . . 2.8 Watts
Maximum. . . . . 5 Watts

LOUD SPEAKER
Type. . . . . Electro Dynamic
Size. . . . . 10"
Field resistance (cold) . . 900 Ohms

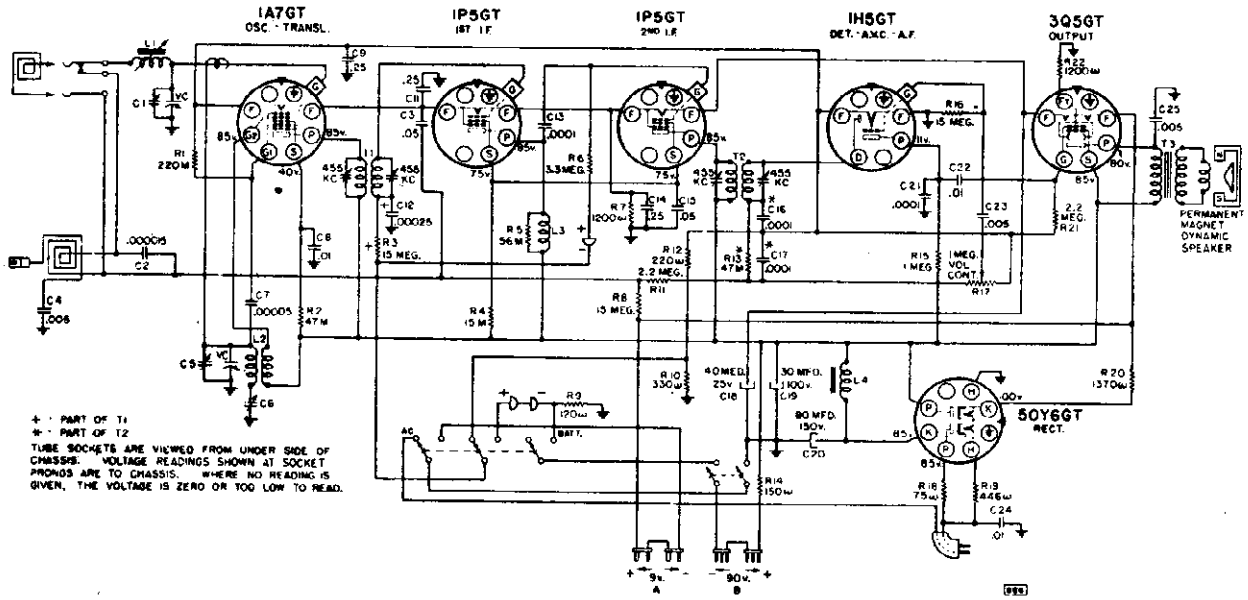
ALIGNMENT PROCEDURE

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD. Mica Condenser	Lug on Rear Section of Gang Cond.	455 KC	Broadcast	Any Point Where it Does Not Affect the Signal	1-2 3-4	2nd I.F. 1st. I.F.	Adjust for Maximum Output. Then repeat adjustment.
400 Ohm Carbon Resistor	Terminal Marked "Antenna"	16 MC	Short Wave	16 MC	5	Short Wave Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at approx. 15.1 MC. If Image does not appear, Realign at 18 MC, with Trimmer Screw farther out. Recheck Image.
400 Ohm Carbon Resistor	Terminal Marked "Antenna"	16 MC	Short Wave	Tune to 16 MC Gen. Sig.	6	Short Wave Antenna	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.
Standard Loop placed 24" from Rec. Loop	Aligning Loop	1400 KC	Broadcast	1400 KC	7	Broadcast Oscillator	Adjust for maximum output.
Standard Loop placed 24" from Rec.Loop	Aligning Loop	1400 KC	Broadcast	Tune to 1400 KC Gen. Sig.	8*	Broadcast Antenna	Adjust for maximum output.
Standard Loop placed 24" from Rec.Loop	Aligning Loop	600 KC	Broadcast	Tune to 600 KC Gen. Sig.	9*	Broadcast Oscillator (Series)	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.

*NOTE: ADJUSTMENTS NO. 8 AND NO. 9 SHOULD BE MADE WITH THE SET IN THE CABINET AND WITH LOOP LEADS AND LOOP IN FINAL POSITION. A 50 mmfd. mica condenser in series to the antenna terminal may be used in place of the aligning loop.

SEARS, ROEBUCK & CO.

MODELS 7083,Ch.101.686
7087,Ch.101.686-B,
7089,Ch.101.686-A



ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection . . . . . Across loudspeaker voice coil
Output meter reading to indicate 50 milliwatts. . . . . 0.37 volts
Approximate input to standard Hazeltine alignment loop for 50 milliwatt output . . . . See chart below
Generator ground lead connection . . . . . To chassis through 0.1 mfd. cond.
Connection of generator output lead . . . . . See chart below
Generator modulation . . . . . 30%, 400 cycles
Position of Volume Control. . . . . Fully on
Position of Pointer with variable fully closed. . . . . On mark to left of 540 kc calibration mark.

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER ADJUSTMENT (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS PER METER
Closed	455 Kc	.1 mfd.	1A7GT Translator Grid	T2, T1	IF	
Open	1620 Kc	-	Radiating Loop	C5	Oscillator	70
1410 Kc	1410 Kc	-	Radiating Loop	C1	Translator	75
600 Kc (rock)	600 Kc	-	Radiating Loop	C6, L1	Padder	75

IMPORTANT ALIGNMENT NOTES

The chassis is removed from the case in order to align the IF but the loop antenna must be left connected.

The trimmer and padder condensers are accessible by removing the back cover.

The chassis must be in place in the cabinet during alignment. If battery supply is used, the batteries must be in place in the cabinet.

The variable should be rocked back and forth a degree or two while making the 600 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.

MODELS 7083, 7087, 7089

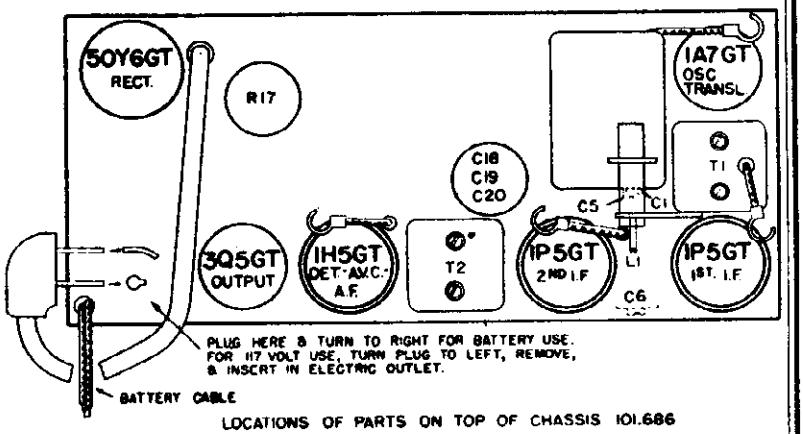
SEARS, ROEBUCK & CO.

POWER SUPPLY:
"A" Battery (4-1/2 volt). . . . . 2 - #5085
Service rating - 250 Hours,
Drain: 50 ma.
105-125 volts, AC-DC - 25 watts

"B" Batteries . . . . . 2 - #5090
Service rating - 250 Hours,
Drain: 12.5 ma.

ALIGNMENT FREQUENCIES:

Oscillator Trimmer	Antenna-Transl. Trimmer	Padder
1620 kc	1410 kc	600 kc

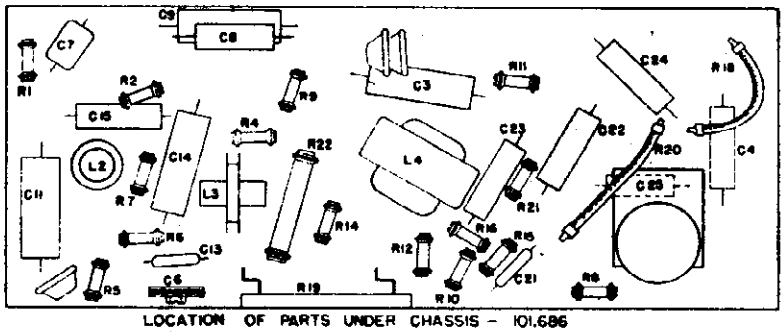


LOCATIONS OF PARTS ON TOP OF CHASSIS 101.686

OCTOBER 15, 1941

FREQUENCY RANGE:
Broadcast . . . . . 540-1600 kc

INTERMEDIATE FREQUENCY . . . . . 455 kc



LOCATION OF PARTS UNDER CHASSIS - 101.686

POWER OUTPUT:

Type	Beam
Undistorted	0.155 watts
Maximum	0.3 watts

LOUDSPEAKER:

Type	PM Dynamic
Size	5 inch

OPERATING FEATURES:
Automatic Volume Control
Battery - AC Powered
Jack for connection of external loop

CHASSIS FEATURES:
Number IF stages . . . . . Two
Self-contained loop antenna and separate external loop
Special sensitivity compensating circuit for low battery operation

MECHANICAL SPECIFICATIONS

OPERATING CONTROLS:
1. Left knob . . . . . On-Off Switch and Volume
2. Right knob . . . . . Station Selector

CONTROL OPERATION:
Turning right: . . . . . On; Volume increase
Tuning ratio: . . . . . Direct

GENERAL INFORMATION & SERVICE HINTS

The receiver contains a built-in "loop" antenna which will give entirely satisfactory reception from local and moderately distant stations. Because this antenna is directional, it will often be found that turning the receiver case to a particular position will considerably improve reception. An external loop is provided for attachment to window of an automobile, train, or other shielded location.

Additional range can be had by connecting to a conventional outdoor antenna or even to a 20 or 30 foot length of wire, run along the floor. The connection is made to the clip on the right side of the cabinet, accessible when the backcover is opened.

If the receiver is used inside a shielded building(a building having a large amount of steel in its structure), reception may be poor even with the external loop. Under such conditions, connection to an external antenna or even to a piece of wire hung outside the window will improve reception.

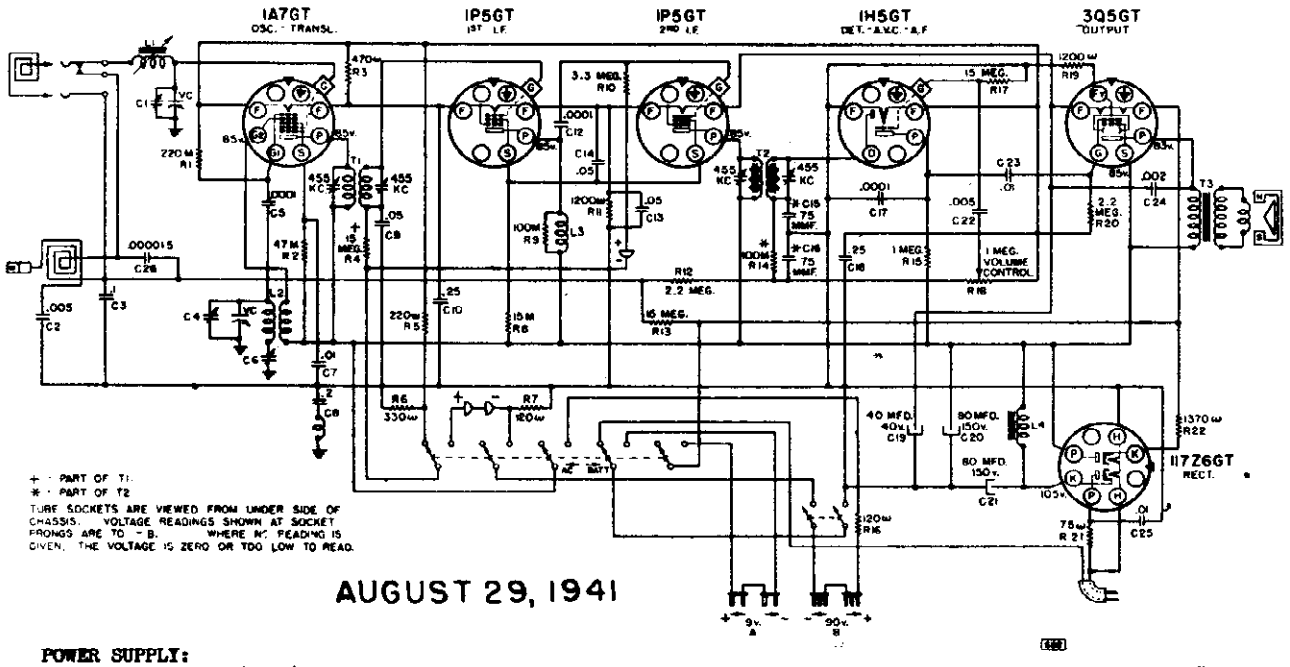
When electric power supply is used, the battery cable plugs must either be in place in the batteries, or else must be inserted in the holder provided if "B" batteries are not installed in the cabinet. They must not be allowed loose in the cabinet with possibility of touching each other. Failure to observe this instruction may result in shorting of the plugs and burning out of the tubes.

DIFFERENCE BETWEEN 101.686, 101.686-A AND 101.686-B

101.686-A (Catalog 7039) is the same as 101.686 (Catalog 7033) except the case is covered in blue and tan. 101.686-B (Catalog 7037) is the same except that the case is covered in maroon and tan.

MODELS 7085, Ch. 101.688
7090, Ch. 101.688-A

SEARS, ROEBUCK & CO.



AUGUST 29, 1941

POWER SUPPLY:

"A" Battery (4-1/2 volt). . . . . 2 - #5085
Service rating - 250 Hours,
Drain: 50 ma.

105-125 volts, AC-DC - 25 watts

"B" Batteries . . . . . 2 - #5090
Service rating - 250 Hours,
Drain: 12.5 ma.

ALIGNMENT FREQUENCIES:

	Oscillator Trimmer	Antenna-Transl. Trimmer	Padder
FREQUENCY RANGE: Broadcast . . . . . 540-1600 kc	1620 kc	1410 kc	600 kc

INTERMEDIATE FREQUENCY . . . . . 455 kc

POWER OUTPUT:

Type . . . . . Beam
Undistorted . . . . . 0.145 watts
Maximum . . . . . 0.3 watts

LOUDSPEAKER:

Type . . . . . PM Dynamic
Size . . . . . 5 inch

OPERATING FEATURES:

Automatic Volume Control
Battery - AC Powered
Jack for connection of external loop

CHASSIS FEATURES:

Number IF stages . . . . . Two
Self-contained loop antenna and separate external loop
Special sensitivity compensation for low battery operation

MECHANICAL SPECIFICATIONS

OPERATING CONTROLS:

1. Left knob . . . . . On-Off Switch and Volume
2. Right knob . . . . . Station Selector

CONTROL OPERATION:

Turning right: . . . . . On; Volume increase
Tuning ratio: . . . . . Direct

GENERAL INFORMATION & SERVICE HINTS

The receiver contains a built-in "loop" antenna which will give entirely satisfactory reception from local and moderately distant stations. Because this antenna is directional, it will often be found that turning the receiver case to a particular position will considerably improve reception. An external loop is provided for attachment to window of an automobile, train, or other shielded location.

Additional range can be had by connecting to a conventional outdoor antenna or even to a 20 or 30 foot length of wire, run along the floor. The connection is made to the clip on the right side of the cabinet, accessible when the backcover is opened.

If the receiver is used inside a shielded building(a building having a large amount of steel in its structure), reception may be poor even with the external loop. Under such conditions, connection to an external antenna or even to a piece of wire hung outside the window will improve reception.

When electric power supply is used, the battery cable plugs must either be in place in the batteries, or else must be inserted in the holder provided if "B" batteries are not installed in the cabinet. They must not be allowed loose in the cabinet with possibility of touching each other. Failure to observe this instruction may result in shorting of the plugs and burning out of the tubes.

MODELS 7085, 7090

SEARS, ROEBUCK & CO.

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection . . . . . Across loudspeaker voice coil
Output meter reading to indicate 50 milliwatts. . . . . 0.37 volts
Approximate input to standard Hazeltine alignment loop for 50 milliwatt output . . . . See chart below
Generator ground lead connection . . . . . To chassis through 0.1 mfd. cond.
Connection of generator output lead . . . . . See chart below
Generator modulation . . . . . 30%, 400 cycles
Position of Volume Control. . . . . Fully on
Position of Pointer with variable fully closed. . . . . On mark to left of 540 kc calibration mark.

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER ADJUSTMENT (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS PER METER
Closed	455 Kc	.1 mfd.	1A7GT Translator Grid	T2, T1	IF	
Open	1620 Kc	-	Radiating Loop	C4	Oscillator	55
1410 Kc	1410 Kc	-	Radiating Loop	C1	Translator	55
600 Kc (rock)	600 Kc	-	Radiating Loop	C6, L1	Padder	55

IMPORTANT ALIGNMENT NOTES

The chassis is removed from the case in order to align the IF but the loop antenna must be left connected.

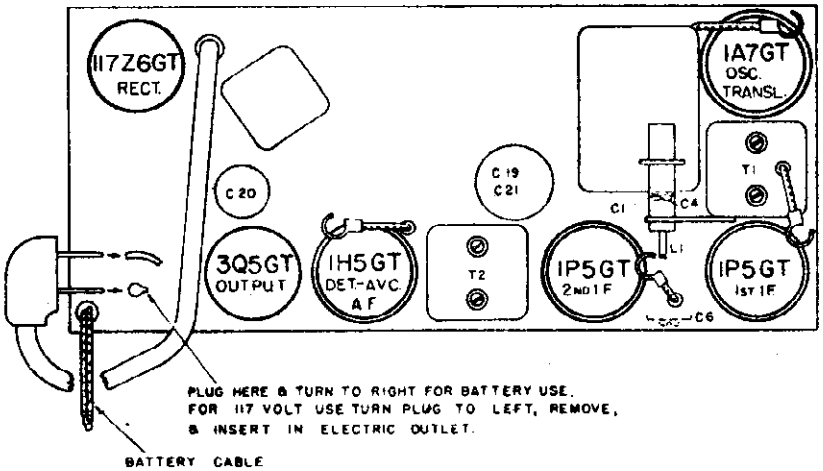
The trimmer and padder condensers are accessible by removing the back cover.

The chassis must be in place in the cabinet during alignment. If battery supply is used, the batteries must be in place in the cabinet.

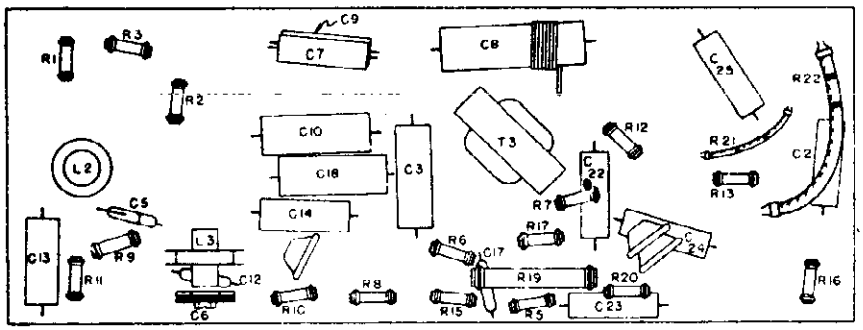
The variable should be rocked back and forth a degree or two while making the 600 Kc adjustment.

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.

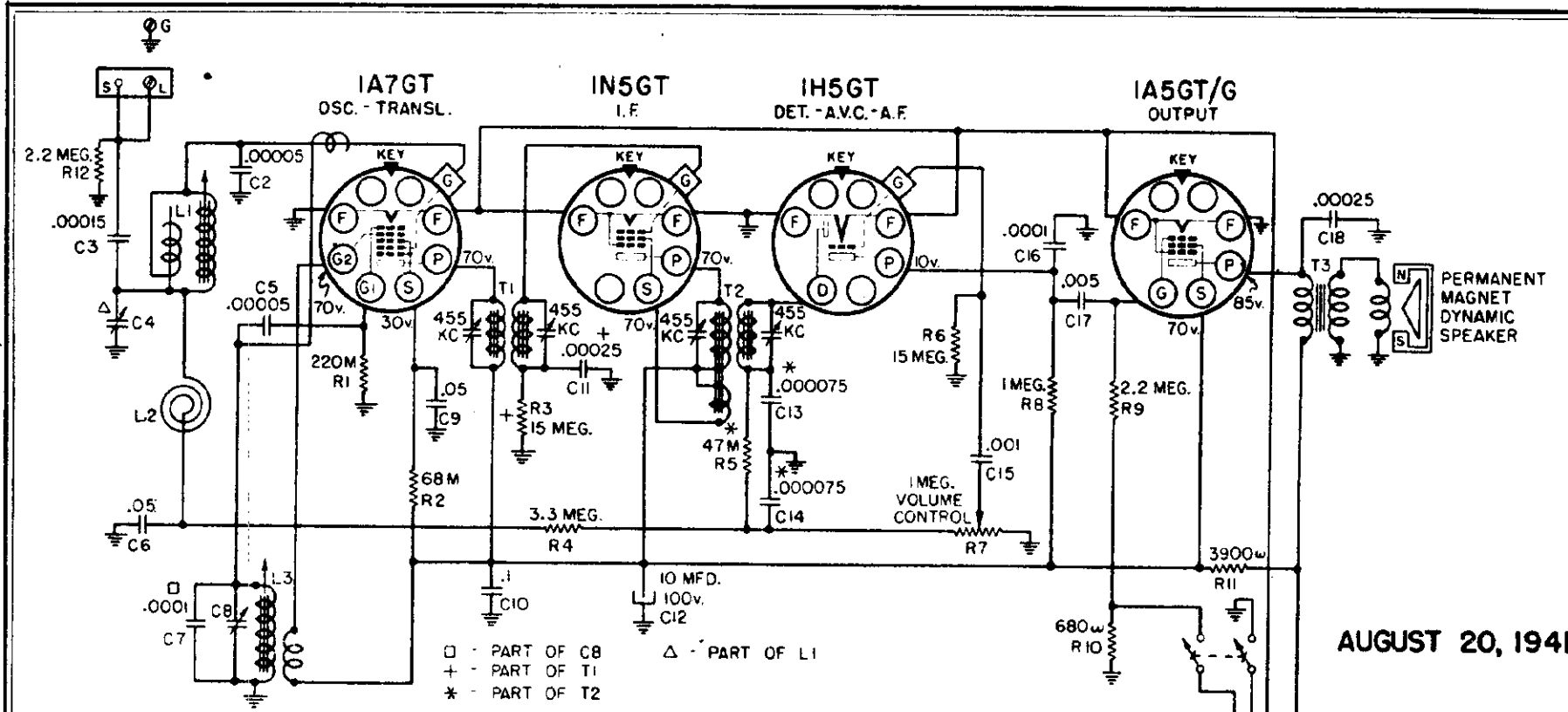


LOCATION OF PARTS ON TOP OF CHASSIS 101.688



LOCATION OF PARTS UNDER CHASSIS 101.688

MODELS 7100, 7110
Chassis 101, 661



AUGUST 20, 1941

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

POWER SUPPLY:

#5178 . A-B block (1.5v. "A", 90 v. "B")

or #5174 A-B block
#5200 . . . . . 2v. Storage "A"
2 - #6150 . . . . . 45v. "B" battery

"A" Drain . . . . . 0.2 amperes
"B" Drain . . . . . 0.006 amperes
#5304 . . . . . Adaptor necessary with 2v. Storage "A"

FREQUENCY RANGE:

Broadcast. . . . . .540-1700 Kc

ALIGNMENT FREQUENCIES

Oscillator	Antenna-Transl.
Trimmer	Trimmer
1700 Kc	1725 Kc

INTERMEDIATE FREQUENCY. . . . . .455 Kc

POWER OUTPUT:

Type . . . . . .Pentode
Undistorted . . . . . 0.07 watts.
Maximum . . . . . 0.135 watts.

LOUD SPEAKER:

Type . . . . . .PM Dynamic
Size . . . . . 5 inch

OPERATING FEATURES:

Automatic Volume Control
On-Off Indicator in Knob

CHASSIS FEATURES:

Number IF stages. . . . . .One
Plugs attached to battery cable
Two gang permeability tuned

OPERATING CONTROLS:

1. Left knob . . . . . On-Off and Volume
2. Right knob . . . . Station Selector

CONTROL OPERATION:

Turning right: . . . On; Volume increase
Tuning ratio: 3:1

RECOMMENDED ANTENNA EQUIPMENT:

Catalog #4713 Stratobeam Receptor

MODELS 7100,7114

SEARS, ROEBUCK & CO.

ALIGNMENT PROCEDURE

PRELIMINARY:

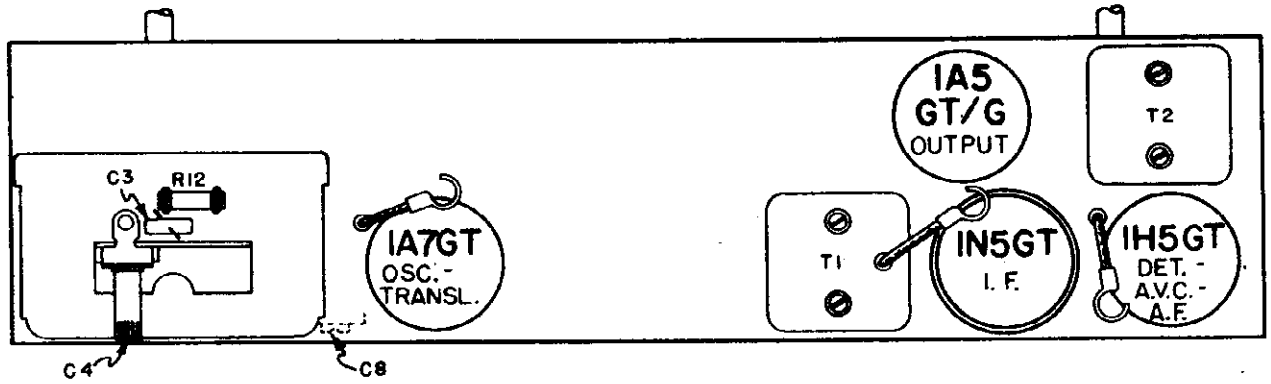
Output meter connections . . . . . Across loudspeaker voice coil
Output meter reading to indicate 50 milliwatts output. . . . . 0.37 volts
Approximately microvolts input to indicate 50 milliwatts output. . . . . .See chart below
Generator ground lead connection . . . . . Receiver chassis
Dummy antenna 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 pointer with tuner fully closed . . . . . To left of 540 kc calibration mark.

POSITION OF TUNER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER ADJUSTMENTS (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
Closed	455 Kc	.1 mfd.	1A7GT Translator Grid	T2, T1	IF	-
1700	1700 Kc	.00005 mfd.	Antenna Terminal	C8	Oscillator	-
1725	1725 Kc	.00005 mfd.	Antenna Terminal	C4	Translator	50

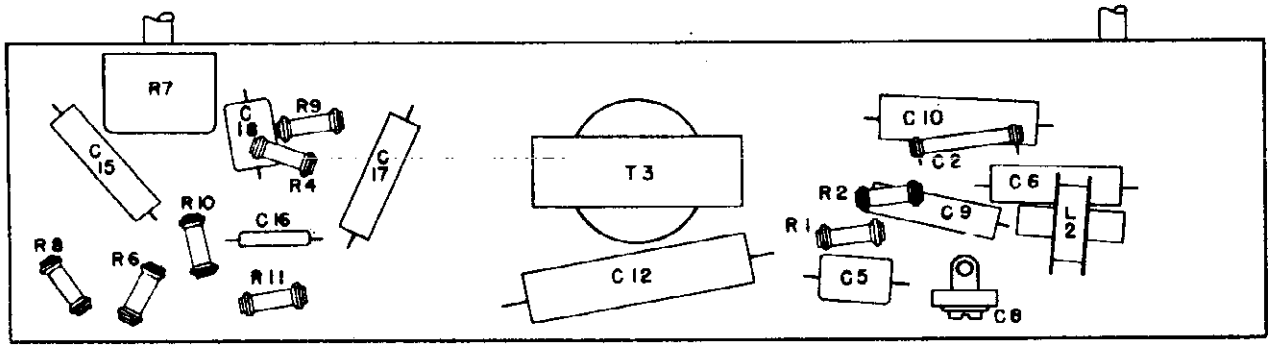
IMPORTANT ALIGNMENT NOTES

After setting the oscillator at 1700 kc, do not charge it when making the 1725 kc translator adjustment.

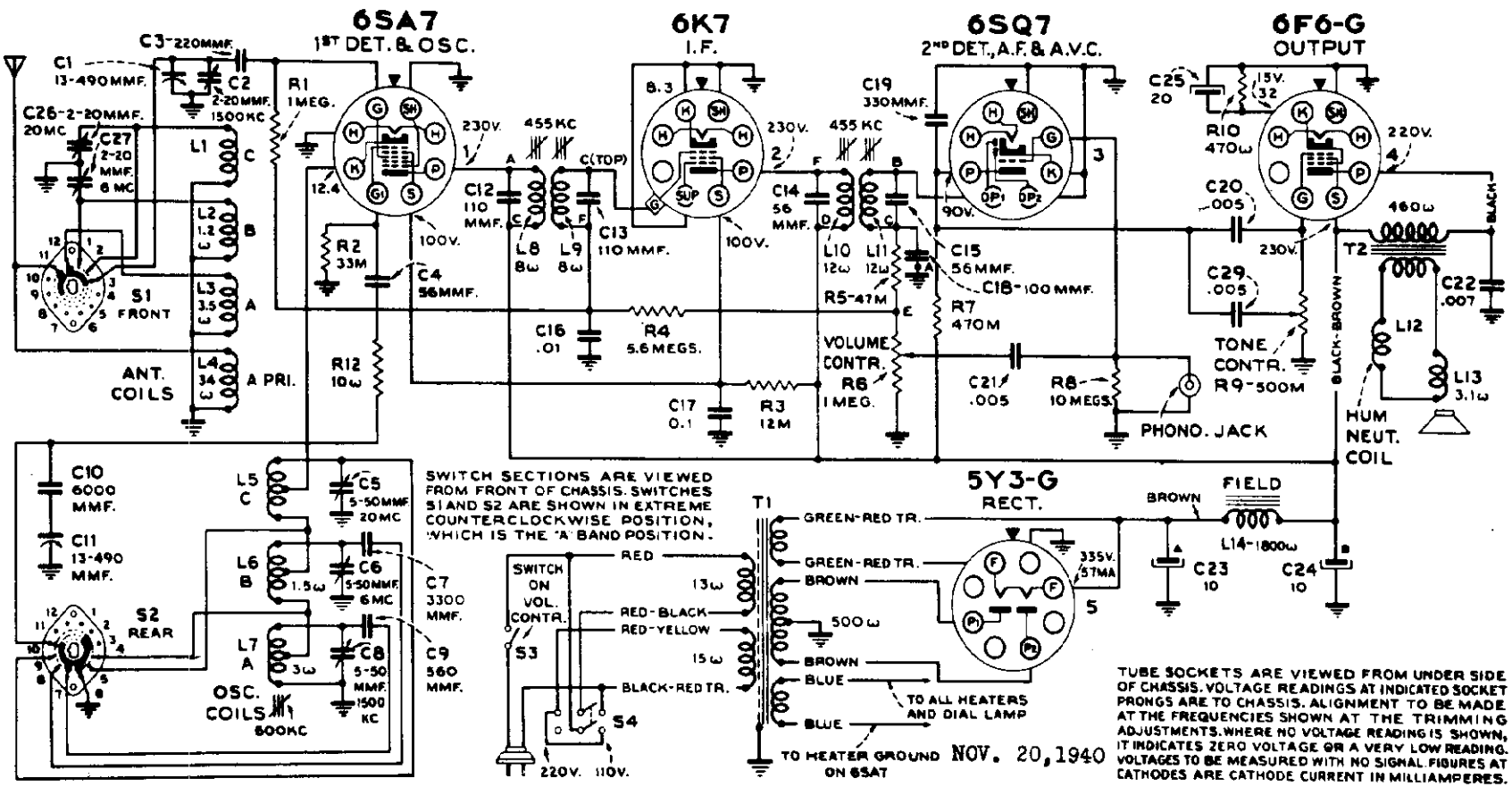
Always keep the output power from the generator at its lowest possible value to prevent the AVC of the receiver from interfering with accurate alignment.



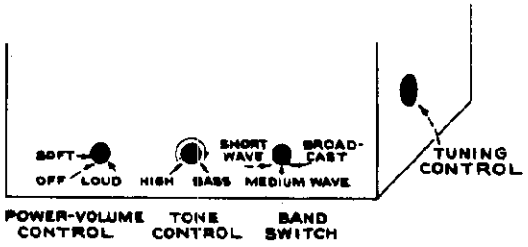
LOCATIONS OF PARTS ON TOP OF CHASSIS 101.661



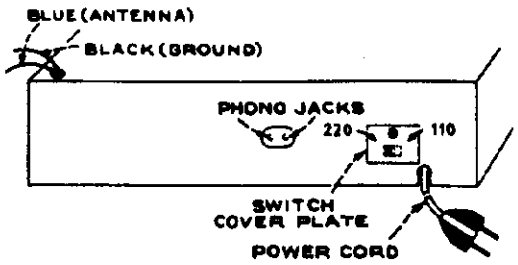
LOCATION OF PARTS UNDER CHASSIS-101.661



NOV. 20, 1940



CONTROLS



REAR OF CHASSIS

FREQUENCY RANGES:
- (A) Standard Broadcast.. 540-1,720 kc (550-174 m)
- (B) Medium Wave..... 2.3-7.0 mc (130-42.8 m)
- (C) Short Wave..... 7.0-22.0 mc (42.0-13.6 m)

INTERMEDIATE FREQUENCY..... 455 kc

ALIGNMENT FREQUENCIES:
- Band "A"..... 600 kc (osc.) 1,500 kc (ant., osc.)
- Band "B"..... 6 mc (osc., ant.)
- Band "C"..... 20 mc (osc., ant.)

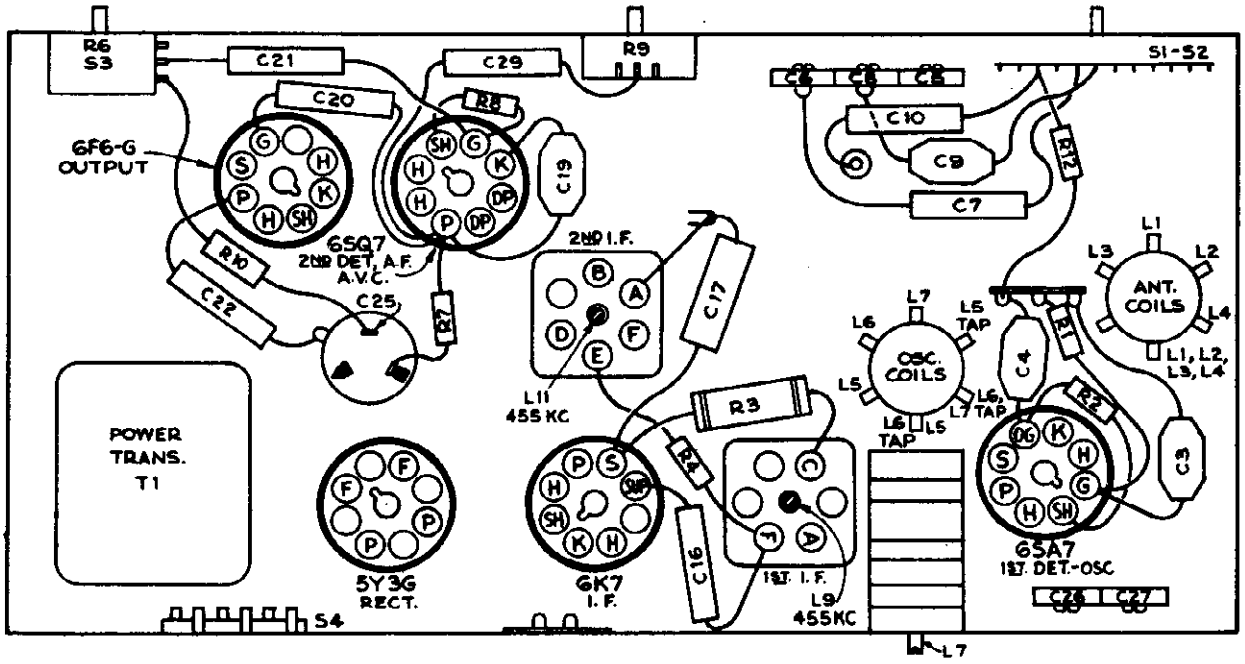
POWER SUPPLY RATING AVAILABLE:
- 105-125 volts, 25 cycles, 70 watts
- 105-125/200-250 volts, 50-60 cycles, 70 watts

POWER OUTPUT:
- Type..... Pentode
- Undistorted..... 1.5 watts
- Maximum..... 3.3 watts

FOR ADDITIONAL DATA SEE INDEX.

MODEL 7320

SEARS, ROEBUCK & CO.



ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connections..... Across speaker voice coil
Output meter reading to indicate 1.0 watt output..... 1.6 volts
Approximate average sensitivity in microvolts for 1.0 watt output..... See chart below
Dummy antenna value to be inserted in series with generator output..... See chart below
Connection of generator output lead..... See chart below
Connection of generator ground lead..... To chassis
Generator modulation..... 30%, 400 cycles
Position of Volume Control..... Fully Clockwise
Position of Tone Control..... Fully Clockwise

Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Dummy Antenna	Generator Connection	Trimmers Adjusted (In order shown)	Trimmer Function	Approximate Microvolts
"A"	Low End	455 kc	.001 mfd.	6K7 I-F Grid	L10, L11	2nd I-F Trans.	3,500
"A"	Low End	455 kc	.001 mfd.	Tuning Condenser Stator (osc.)	L8, L9	1st I-F Trans.	85
"A"	600 kc (33°) (rock)	600 kc	.0002 mfd.	Ant.	L7	Osc.	15
"A"	1,500 kc (152.4°)	1,500 kc	.0002 mfd.	Ant.	C8, C2	Osc., Ant.	——
"C"	20 mc (155.4°)	20 mc	300 ohms	Ant.	C5	Osc.*	——
"C"	20 mc (155.4°) (rock)	20 mc	300 ohms	Ant.	C26	Ant.	95
"B"	6.0 mc (149°)	6.0 mc	300 ohms	Ant.	C6	Osc.*	15
"B"	6.0 mc (149°)	6.0 mc	300 ohms	Ant.	C27	Ant.	——
"A"	1,500 kc (152.4°)	1,500 kc	.0002 mfd.	Ant.	C8, C2	Osc., Ant.	15

IMPORTANT ALIGNMENT NOTES

*Use minimum capacity peak if two peaks can be obtained.

Where indicated by the word "Rock," the variable tuning condenser should be rocked back and forth a degree or two while making this adjustment.

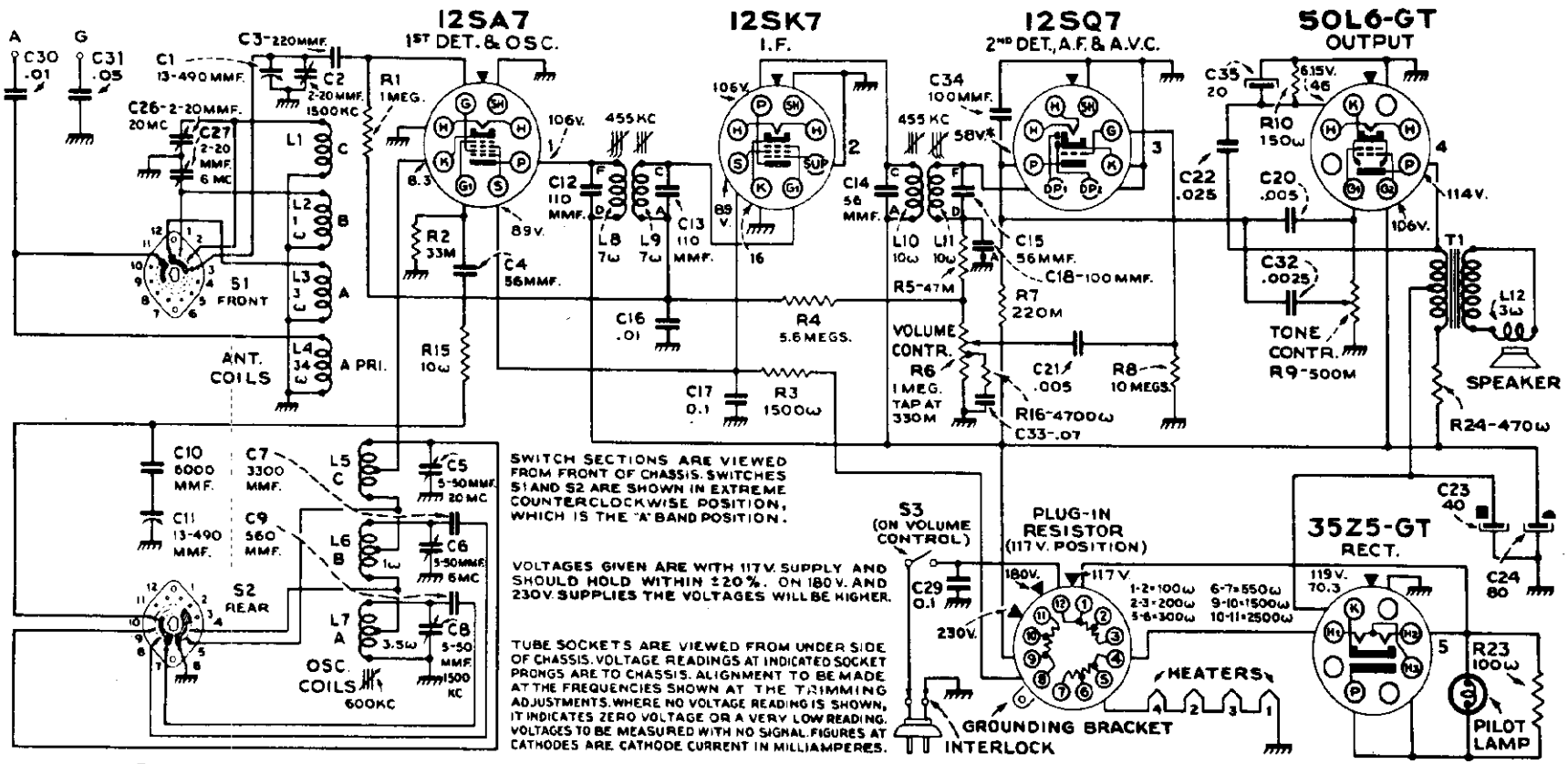
Each step of the alignment should be repeated in its original order for greater accuracy. Always keep the output from the generator at its lowest possible value to prevent the a-v-c action of the set interfering with accurate alignment.

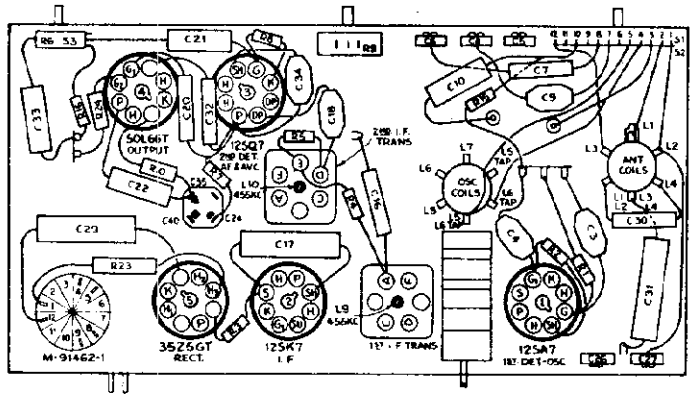
Adjustment locations are shown on the top and bottom parts location views of chassis.

Only the dummy antenna indicated in the chart for any particular band should be used. Remove the dummy used for alignment in any other band. Grid cap leads should remain in place during alignment.

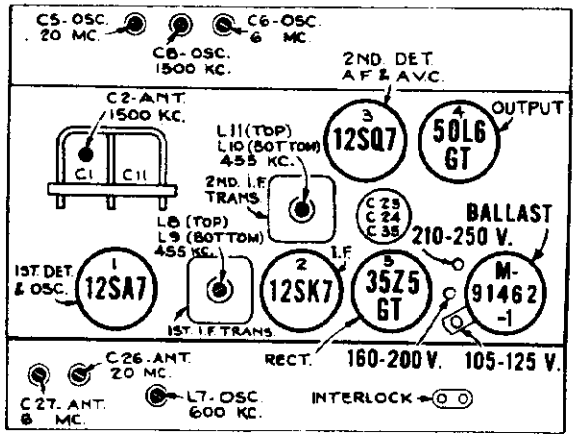
Note.—Oscillator tracks 455 kc above signal on all bands.

Values shown under, "Microvolts," are only approximate.





TUBE, TRIMMER AND PARTS LOCATION—BOTTOM VIEW



TUBE, TRIMMER AND PARTS LOCATION

DEC. 9, 1941

MODEL 7322

SEARS, ROEBUCK & CO.

IMPORTANT ALIGNMENT NOTES

Use minimum capacity peak if two peaks can be obtained.
Where indicated by the word "Rock," the variable tuning condenser should be rocked back and forth a degree or two while making this adjustment
Each step of the alignment should be repeated in its original order for greater accuracy. Always keep the output of the generator at its lowest possible value to prevent the AVC action of the set from interfering with accurate alignment.
Adjustment locations are shown on the top and bottom parts location views of chassis.
Only the dummy antenna indicated in the chart for any particular band should be used. Remove the dummy used for alignment in any other band.
Values shown under "Microvolts" are only approximate.

Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Dummy Antenna	Generator Connection	Trimmers Adjusted (In order shown)	Trimmer Function	Approximate Microvolts
Broadcast	Low End	455 kc	.01 mfd.	12SK7 1-F Grid	L10, L11	2nd I-F Transformer	3,500
Broadcast	Low End	455 kc	.01 mfd.	12SA7 Grid	L8, L9	1st I-F Transformer	84
Broadcast	600 kc (33°) (Rock)	600 kc	0.0002 mfd.	Ant.	L7	Osc.	14
Broadcast	1,500 kc (152.4°)	1,500 kc	0.0002 mfd.	Ant.	C8, C2	Osc., Ant.	18
Short Wave	20 mc (155.4°)	20 mc	400 ohms	Ant.	C5, C26	Osc.,* Ant.	63
"Medium Wave"	6 mc (148°)	6 mc	400 ohms	Ant.	C6, C27	Osc.,* Ant.	25
Broadcast	1,500 kc (152.4°)	1,500 kc	0.0002 mfd.	Ant.	C8	Osc.	18

Calibration Scale on Variable Condenser Drive Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment when chassis is out of cabinet; therefore, a calibration scale is attached to the rear of the drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 45° mark on the drum scale (see "Dial Drive Drawing") must be in a horizontal position when the plates are fully meshed. The distance from the edge of the chassis to the drum must not exceed ⅜-inch. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "0°" mark on the calibration scale when the plates are fully meshed.

Power Output:

Type	Beam Power
Undistorted (210-250 volt operation)	3.8 watts
Maximum	4.5 watts

Tuning Drive Ratio ..... 17 to 1

Power Supply Ratings:

105-125 volts	30 watts
160-180 volts	45 watts
210-250 volts	60 watts

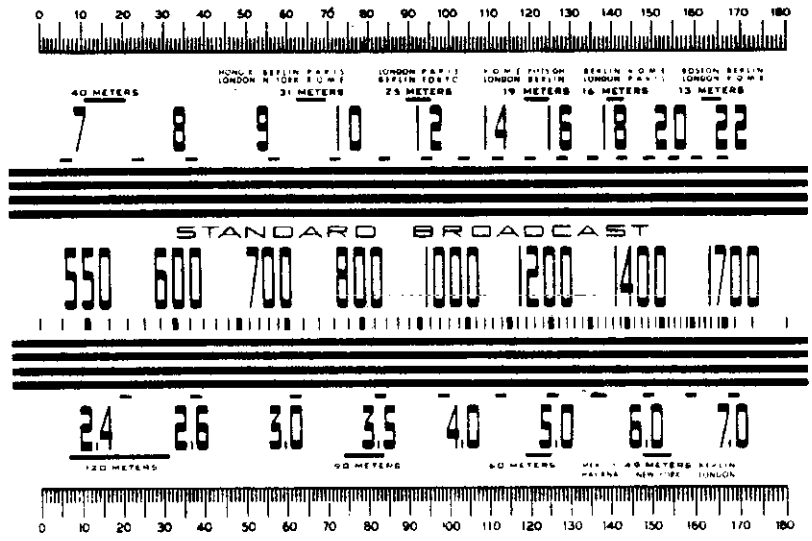
Frequency Ranges:

Standard Broadcast	540-1,720 kc (555-174 m)
Medium Wave	2.3-7.0 mc (130-42.8 m)
Short Wave	7.0-22 mc (42.8-13.6 m)

Loudspeaker:

Type	6-inch permanent-magnet dynamic
Voice Coil Impedance	3.4 ohms at 400 cycles

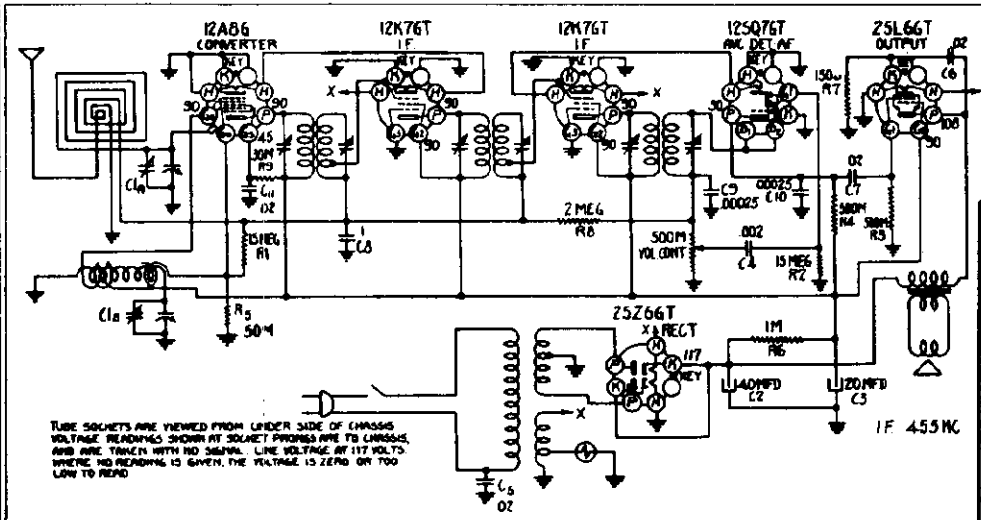
Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial pointer to the drive cable with variable condenser fully closed and pointer on last calibration mark at 550 kc end of Broadcast "A" band. The dial pointer has a spring clip for attachment to the cable.

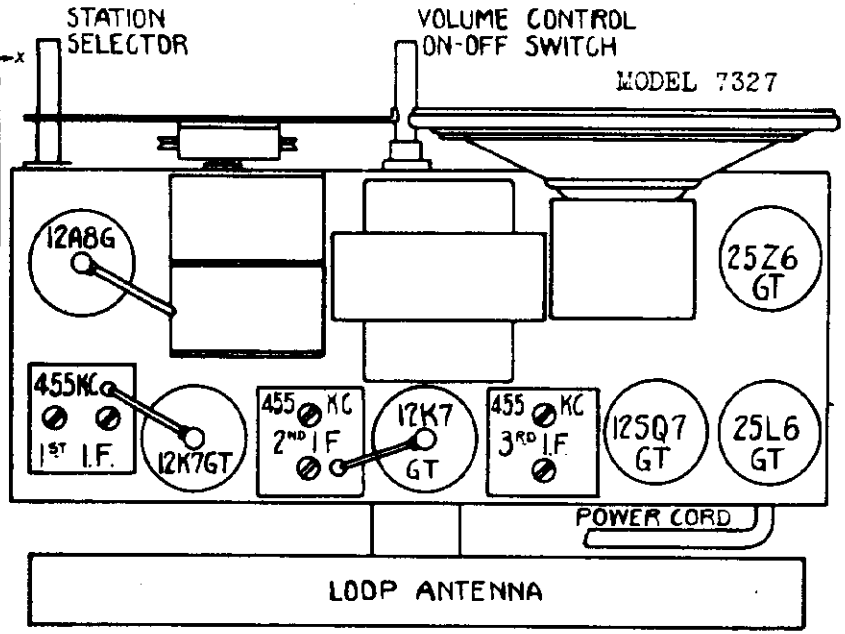


Calibration Scale

Reduced Reproduction of Receiver Dial, and Corresponding 0-180° Calibration Scales

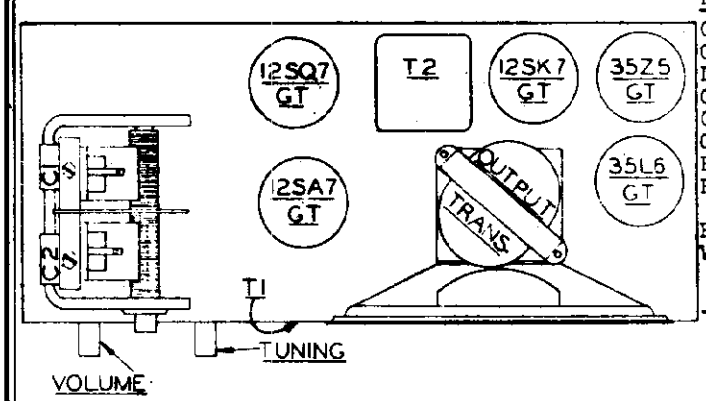
The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale. For example: 33° on the calibration scale corresponds to approximately 7.9 mc on "C" band, and 600 kc on "A" band, etc. Read instructions under "Alignment Procedure."





NOV.1940

MODEL 7327



LOCATION OF PARTS ON TOP OF CHASSIS
MODELS 3611,3711,3811

ALIGNMENT PROCEDURE

PRELIMINARY: MODELS 3611,3711,3811

Output meter connection	Across loud speaker voice coil
Output meter reading to indicate 50 milliwatts	0.38 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	See chart below
Generator modulation	30%, 400 cycles
Position of Volume Control	Fully clockwise
Position of Dial Pointer with variable fully closed	See note below

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION (high)	GENERATOR CONNECTION (low)	TRIMMERS ADJUSTED (in order shown)	TRIMMER FUNCTION
Open	455 kc	.1 mfd.	12SA7 grid	Flt. grnd.	T2, T1	IF
1400 kc	1400 kc	.00005 mfd.	Ant. clip	Flt. grnd.	C2, C1	Translator
600 kc	600 kc	.00005 mfd.	Ant. clip	Flt. grnd.	Check point	---

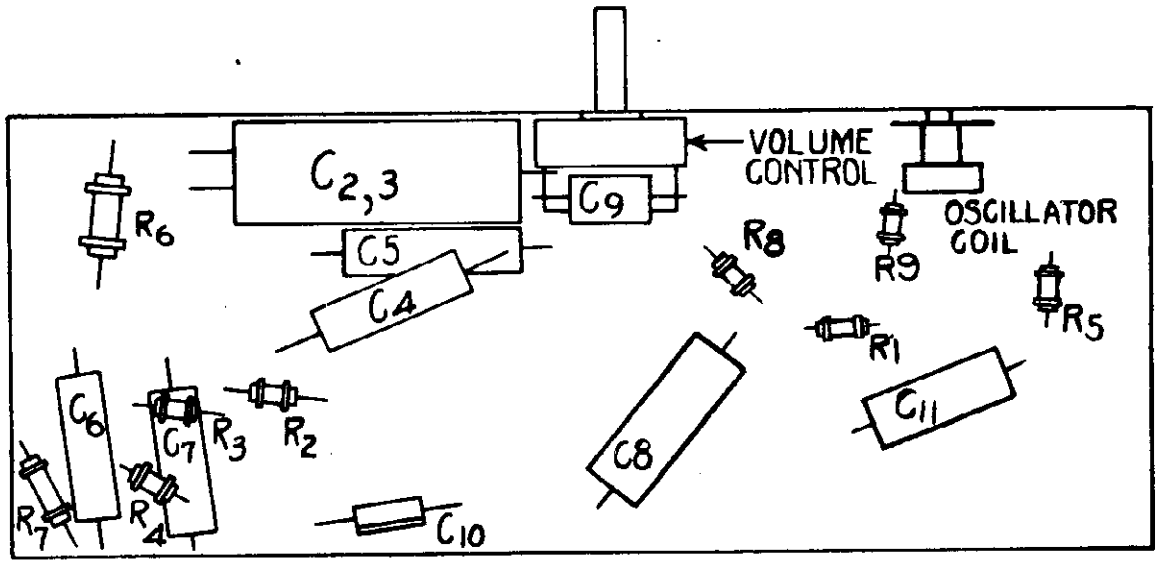
IMPORTANT ALIGNMENT NOTES

With the variable condenser closed the pointer should be in a horizontal position matching the horizontal line across the face of the dial.

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.

MODEL 7327

SEARS, ROEBUCK & CO.



ALIGNMENT PROCEDURE

This receiver covers the broadcast band 540-1600 KC. A "tracking section" oscillator condenser is used to accomplish tracking without a padding condenser. The only adjustments provided on the RF portion of the set are loop and oscillator trimmers. The circuit is quite conventional.

The normal alignment frequencies are shown below. It is to be noted that after aligning according to instructions, the top frequency of the set may not agree with the calibration. If an important station that should be received at the top end of the dial cannot be turned in, the condenser should be opened and the oscillator trimmer adjusted to permit the reception of the desired signal, then the antenna circuit aligned at the specified aligning frequency.

PRELIMINARY:

Output meter connection . . . . . Across loud speaker voice coil
Output meter to indicate 50 milliwatts . . . . . .0.4 volts
Dummy to be used between high side of generator and receiver . . . . . .See Note 1
Position of volume control . . . . . Fully on
Aligning Frequency . . . . . .1400 KC

It should be noted that on this set the dial is not fastened to the gang condenser or any of its supporting members, and since the condenser is flexibly mounted there can be motion of the condenser shaft with respect to the dial scale. This construction has been adopted to make the set as nearly free from microphonic howling as possible on a set with its unusual selectivity. The first step in aligning the set is to remove the pointer, by pulling it off of the condenser shaft and inspecting the shaft to see that it is approximately in the center of the hole in the dial scale. If this is not the case, the screws holding the dial should be loosened and the scale moved until the gang condenser shaft is centered in the hole. Replace the pointer, close the gang condenser and slide the pointer until it coincides with the horizontal line dividing the two scales, kilocycles and meters.

Note 1. This receiver has been designed primarily for operation on the loop without any outside antenna, therefore, it is best to align the set under the conditions under which it will be used most often. It is therefore recommended that the aligning signal be induced from another looop on the set rather than to follow the conventional practice of introducing the signal through a dummy antenna into the antenna lead. A loop 5 or 6 inches in diameter made of ordinary hook-up wire, and placed 3 or 4 inches behind the loop of the set and fed through a carbon resistor of 400 to 2000 ohms is the recommended device for inducing the aligning signal into the receiver loop.

Note 2. Due to productions variations in wiring and in condenser construction, a few loop trimmer condensers may peak wide open. Retrimming the oscillator to a 1400 KC signal when the pointer is set at a frequency slightly above 1400 KC may permit the loop trimmer to pass through a "peak".

POWER SUPPLY . . . . . 105-125 volts 60 cycles, AC only. 48 Watts

FREQUENCY RANGE . . . . . 540-1600 kc ALIGNMENT FREQUENCY . . . . . 1400 kc

INTERMEDIATE FREQUENCY . . . . . 455 kc

POWER OUTPUT:
Tube . . . . . .Beam Tube
Undistorted . . . . . 0.6 Watt
Maximum . . . . . 1.8 Watt

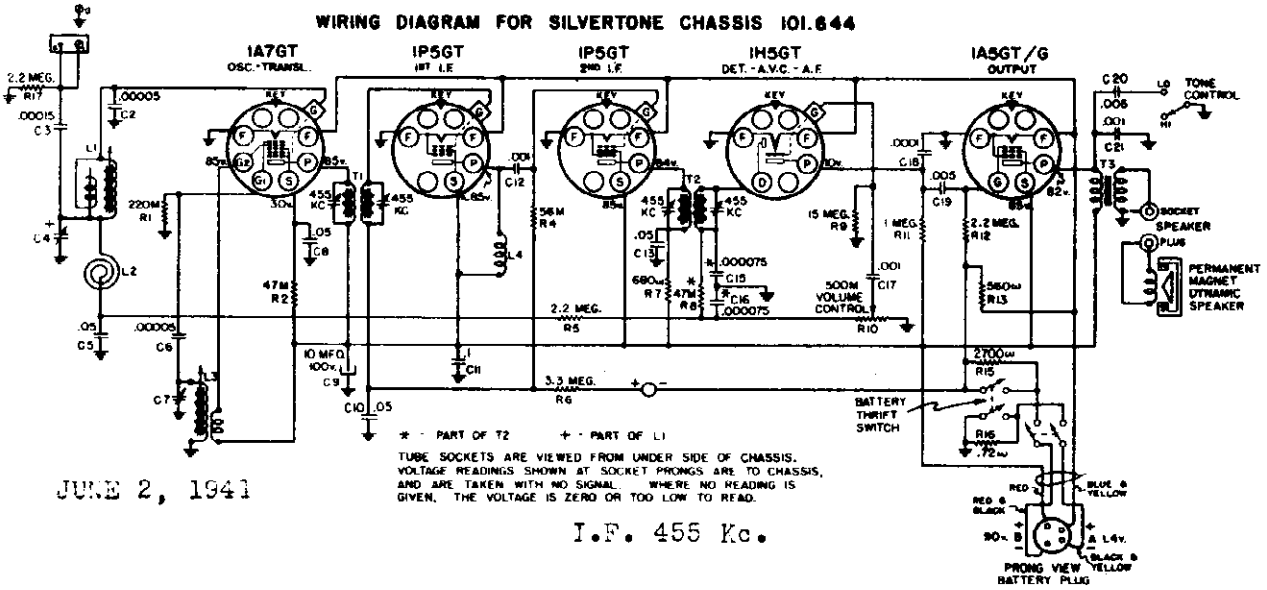
LOUD SPEAKER:
Type . . Permanent Magnet Dynamic
Size . . . . . 5 inch
Field . . . . . Permanent Magnet

FOR ADDITIONAL DATA SEE INDEX.

MODEL 7104
Chassis 101.644

SEARS, ROEBUCK & CO.

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.644



JUNE 2, 1941

I.F. 455 Kc.

PRELIMINARY: **ALIGNMENT PROCEDURE**

Output meter connections	Across loudspeaker voice coil
Output meter reading to indicate 50 milliwatts	0.37 volts
Approximately microvolts input to indicate 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	HI
Position of pointer with tuner fully closed	To left of 540 kc calibration mark.

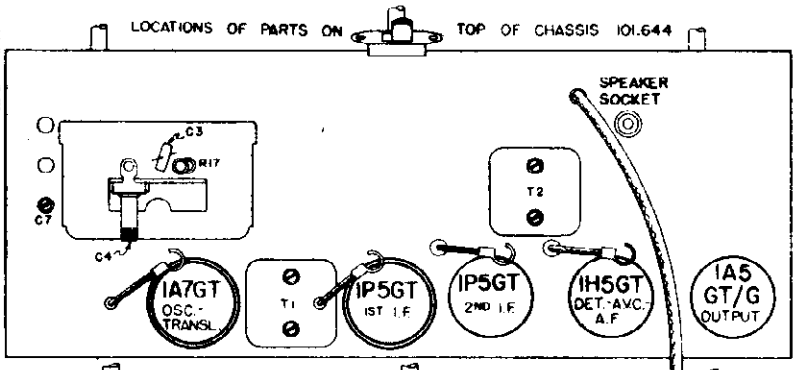
TRIMMER ADJUSTMENTS

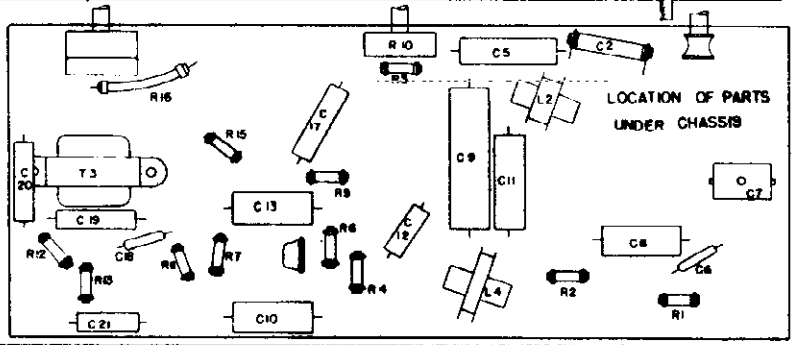
POSITION OF TUNER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	(IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
Closed	455 Kc	.1 mfd.	1A7GT Translator Grid	T2, T1	IF	-
1700	1700 Kc	.00005 mfd.	Antenna Terminal	C7	Oscillator	-
1700	1700 Kc	.00005 mfd.	Antenna Terminal	C4	Translator	10

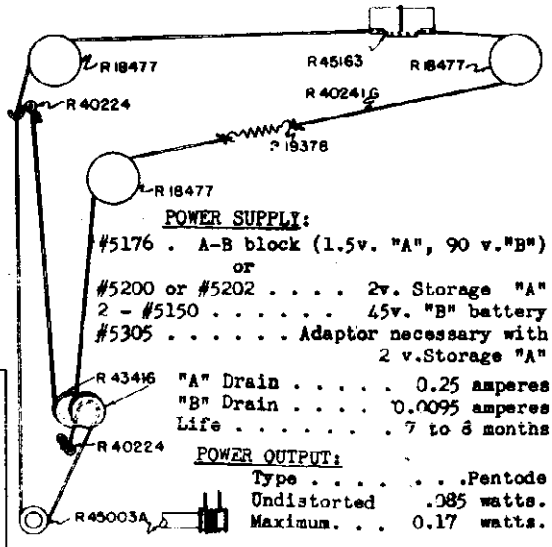
IMPORTANT ALIGNMENT NOTES

Make both the oscillator and translator antenna adjustment at 1700 KC on the BC band.

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.







POWER SUPPLY:

#5176 . A-B block (1.5v. "A", 90 v."B")
or
#5200 or #5202 . . . . 2v. Storage "A"
2 - #5150 . . . . . 45v. "B" battery
#5305 . . . . . Adaptor necessary with 2 v.Storage "A"

"A" Drain . . . . . 0.25 amperes
"B" Drain . . . . 0.0095 amperes
Life . . . . . 7 to 8 months

POWER OUTPUT:

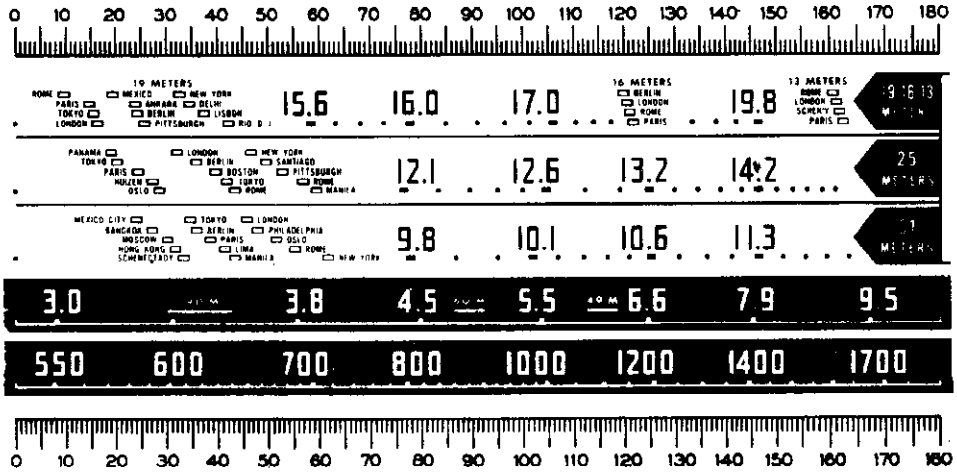
Type . . . . . Pentode
Undistorted . . . . .085 watts.
Maximum. . . 0.17 watts.

ALIGNMENT FREQUENCIES

Oscillator Trimmer 1700 Kc	Antenna-Transl. Trimmer 1700 Kc

MODEL 7330
Chassis 126.227

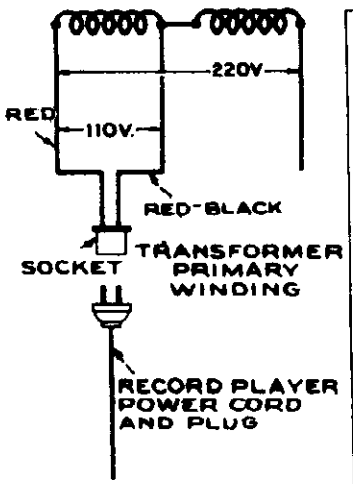
SEARS, ROEBUCK & CO.



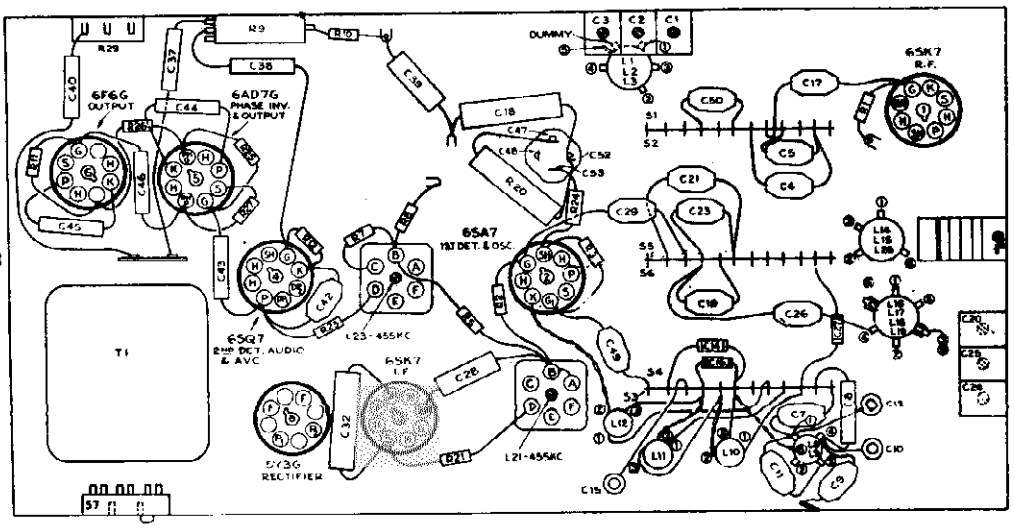
Calibration Scale

Reduced Reproduction of Receiver Dial, and Corresponding 180-0° Calibration Scales

The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale. For example: 30° on the calibration scale corresponds to approximately 600 kc on "A" band, etc. Read instructions under "Alignment Procedure."



RECORD-PLAYER CONNECTIONS
(220 V—110 V)



TUBE, TRIMMER AND PARTS-LOCATION—BOTTOM VIEW

Tuning Dial:

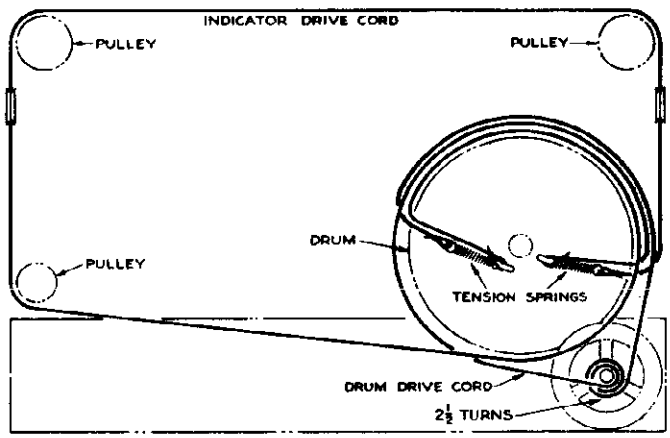
The tuning shaft is connected through a cord drive to a drum on the condenser shaft. This same cord drives the dial indicator by passing over a pulley on the chassis.

Calibration Scale on Variable Condenser Drive Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment when chassis is out of cabinet; therefore, a calibration scale is attached to the rear of the drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 0° mark on the drum scale must be in a vertical position when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "0°" mark on the calibration scale when the plates are fully meshed.

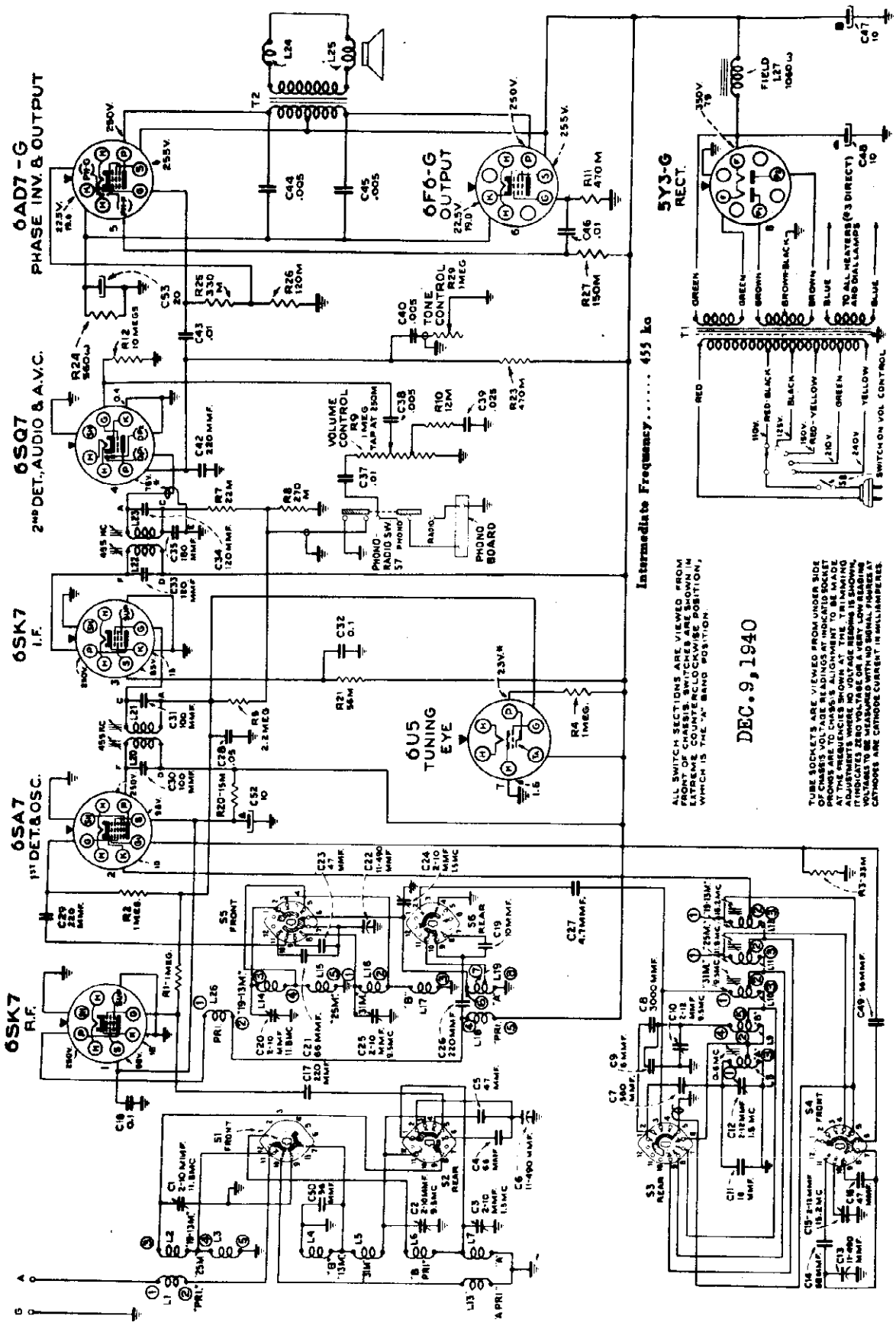
Dial-Indicator Adjustment.—After fastening the chassis in the cabinet attach the dial pointer to the drive cable with variable condenser fully closed and pointer on last calibration mark at 550 kc end of Broadcast "A" band. The dial pointer has a spring clip for attachment to the cable.



CONDENSER AND INDICATOR DRIVE CORDS

SEARS, ROEBUCK & CO.

MODEL 7330
Chassis 126.22



MODEL 7330
Ch. 126.227

SEARS, ROEBUCK & CO.

Spread-Band Alignment.—The most satisfactory method of aligning or checking the spread-band ranges is on actual reception of short-wave stations of known frequency, by adjusting the magnetite-core oscillator coil for each band so that these stations come in at the correct points on the dial.

In exceptional cases, when the set is being serviced in a location where the noise level is high enough to prevent reception of short-wave stations, a test-oscillator may be used for alignment, but an extremely high degree of accuracy is required in the frequency settings of the test-oscillator, as a slight error will produce considerable inaccuracy on the spread-band dials. The frequency settings of the test-oscillator may be checked by one or both of the following methods:

1. Determine the exact dial settings of the test-oscillator (for frequencies at or close to the specified alignment frequencies) by zero-beating the test-oscillator against short-wave stations of known frequency.
2. Use harmonics of the standard-broadcast range of a test-oscillator, or by zero-beating against standard broadcast stations.

When a test oscillator is employed for spread-band alignment, a final check should be made on actual reception of short-wave stations of known frequency, and the magnetite-core oscillator coil for each band should be re-adjusted so that the stations come in at the correct points on the dial.

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connections	Across speaker voice coil
Output meter reading to indicate 1.0 watt output	1.5 volts
Approximate average sensitivity in microvolts for 1.0 watt output	See chart below
Dummy antenna value to be inserted in series with generator output	See chart below
Connection of generator output lead	See chart below
Connection of generator ground lead	To chassis
Generator modulation	30%, 400 cycles
Position of Volume Control	Fully Clockwise
Position of Tone Control	Fully Clockwise

Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Dummy Antenna	Generator Connection	Trimmers Adjusted (In order shown)	Trimmer Function	Approximate Microvolts
A Band	Low End	455 kc	.01 mfd.	6SK7 I-F Grid	L23, L22	2nd I-F Trans.	3,200
A Band	Low End	455 kc	.01 mfd.	6SA7 1st Det. Grid	L21, L20	1st I-F Trans.	71
25M Band	11.8 mc (Rock)	11.8 mc	300 ohms	Ant.	L11, C1, C20	osc., ant., det.†	3.6
25M Band	15.2 mc	15.2 mc	300 ohms	Ant.	C15	osc.*	3.8
19-13M Band	15.2 mc	15.2 mc	300 ohms	Ant.	L12	osc.*	5.4
31M Band	9.5 mc	9.5 mc	300 ohms	Ant.	L10, C2, C25	osc., ant., det.*†	8.8
B Band	9.5 mc	9.5 mc	300 ohms	Ant.	C10	osc.*	2.3
A Band	1,500 kc	1,500 kc	.0002 mfd.	Ant.	C12, C3, C24	osc., ant., det.	1.7
A Band	600 kc (Rock)	600 kc	.0002 mfd.	Ant.	L8	osc.	1.2

IMPORTANT ALIGNMENT NOTES

* Use minimum capacity or inductance peak if two peaks can be obtained.

† Use maximum capacity peak if two peaks can be obtained when adjusting detector trimmer.

Where indicated by the word "Rock," the variable tuning condenser should be rocked back and forth a degree or two while making this adjustment.

Each step of the alignment should be repeated in its original order for greater accuracy. Always keep the output of the generator at its lowest possible value to prevent the AVC action of the set from interfering with accurate alignment.

Adjustment locations are shown on the top and bottom parts location views of chassis.

Only the dummy antenna indicated in the chart for any particular band should be used. Remove the dummy used for alignment in any other band.

Values shown under "Microvolts" are only approximate.

Tubes and Functions:

6SK7 ..... R-F Amplifier
6SA7 ..... First Detector-Oscillator
6SK7 ..... I-F Amplifier
6SQ7 .... Second Detector, A-F Amplifier and A.V.C.
6U5G ..... Tuning Indicator
6AD7G ..... Phase Inverter and Power Output
6F6G ..... Power Output
5Y3-G ..... Rectifier
Dial Lamp ..... 2 Mazda 44, 6.3 volts, 0.25 amp.

Frequency Ranges:

Standard Broadcast (A .. 540-1,720 kc (555-174 m)
Medium Wave (B) ..... 3-9.5 mc (100-31.5 m)
31 Meter Spread Band .. 9.5-11.7 mc (31.5-25.6 m)
25 Meter Spread Band ... 11.7-15.1 mc (25.6-19.9 m)
19-13 Meter Spread Band 15.1-22.5 mc (19.9-13.3 m)
Tuning Drive Ratio ..... 20 to 1

Alignment Frequencies:

"A" Band .. 1,500 kc (osc., ant., det.) 600 kc (osc.)
"B" Band ..... 9.5 mc (osc.)
31 Meter Band ..... 9.5 mc (osc., ant., det.)
25 Meter Band ..... 11.8 mc (osc., ant., det.)
19-13 Meter Band ..... 15.2 mc (osc.)

Loudspeaker:

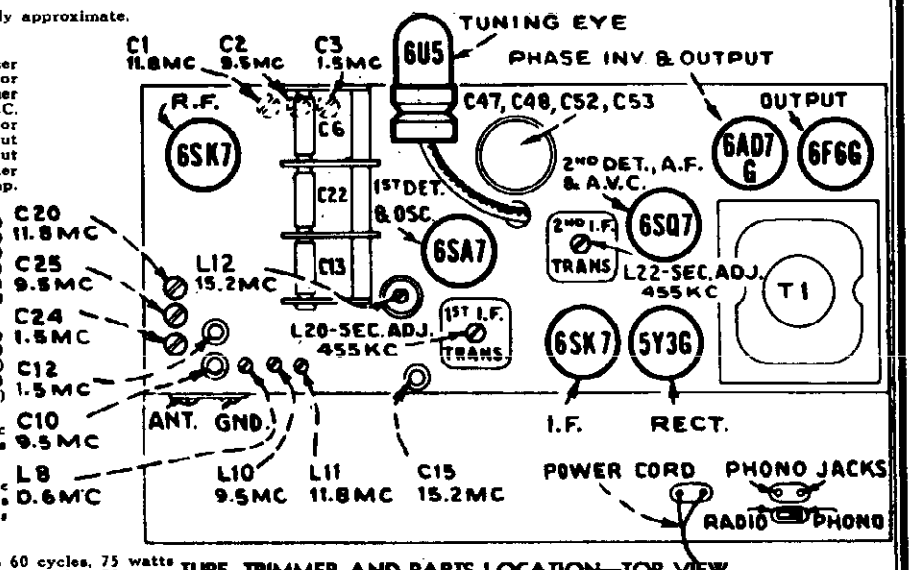
Type ..... 8-inch Electrodynamic
Voice Coil Impedance ..... 2.2 ohms at 400 cycles

Power Output:

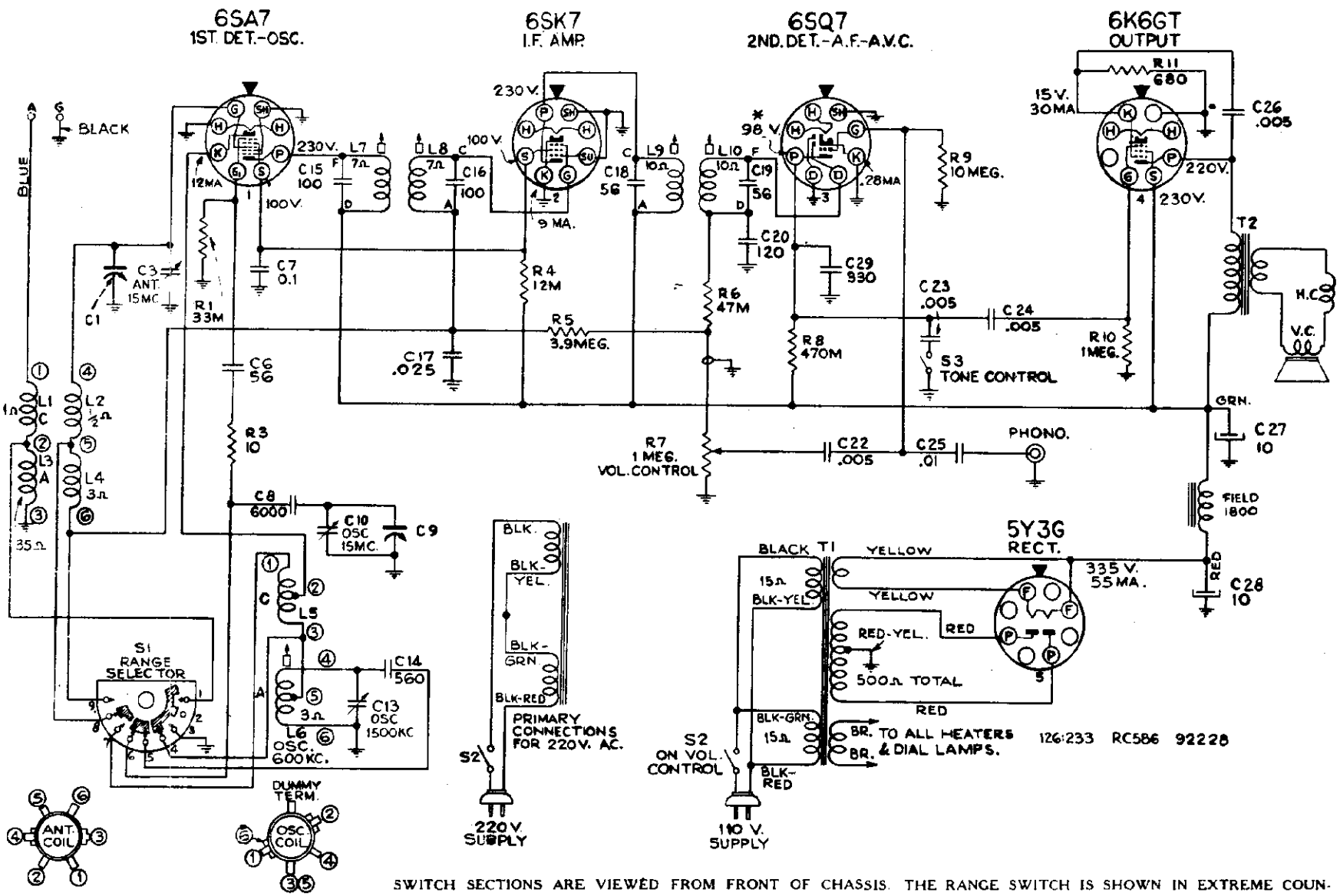
Type ..... Push Pull Pentode
Undistorted ..... 3 watts
Maximum ..... 4.5 watts

Power Supply:

A ..... 105 to 125 volts, 50 to 60 cycles, 75 watts
B ..... 105 to 125 volts, 25 to 60 cycles, 75 watts
C ..... 100-130, 140-160, 200 to 250 volts, 50 to 60 cycles, 75 watts



TUBE, TRIMMER AND PARTS LOCATION—TOP VIEW



SWITCH SECTIONS ARE VIEWED FROM FRONT OF CHASSIS. THE RANGE SWITCH IS SHOWN IN EXTREME COUNTERCLOCKWISE POSITION, WHICH IS THE BROADCAST BAND POSITION. TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS. WHERE NO VOLTAGE READING IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING. VOLTAGES TO BE MEASURED WITH NO SIGNAL. FIGURES AT CATHODES ARE CATHODE CURRENTS IN MILLIAMPERES. VOLTAGES WITH STAR (★) ARE ACTUAL OPERATING VOLTAGES IN HIGH RESISTANCE CIRCUITS, MEASURED WITH ELECTRONIC VOLTMETER.

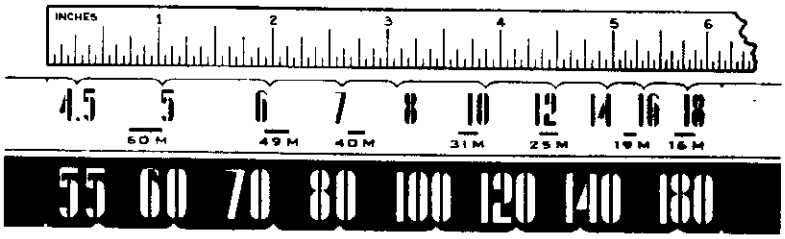
December 1, 1941

SEARS, ROEBUCK & CO.

MODEL 7902
Ch. 126.233
Export

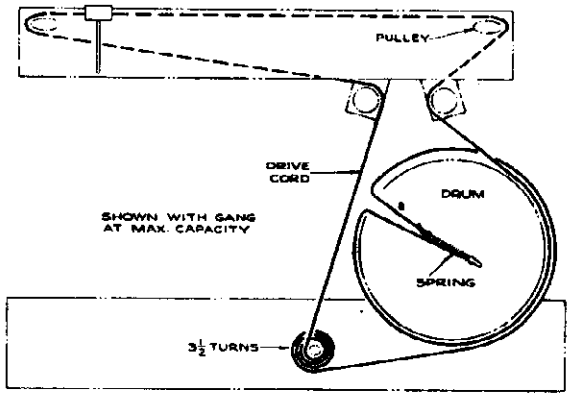
MODEL 7900

SEARS, ROEBUCK & CO.

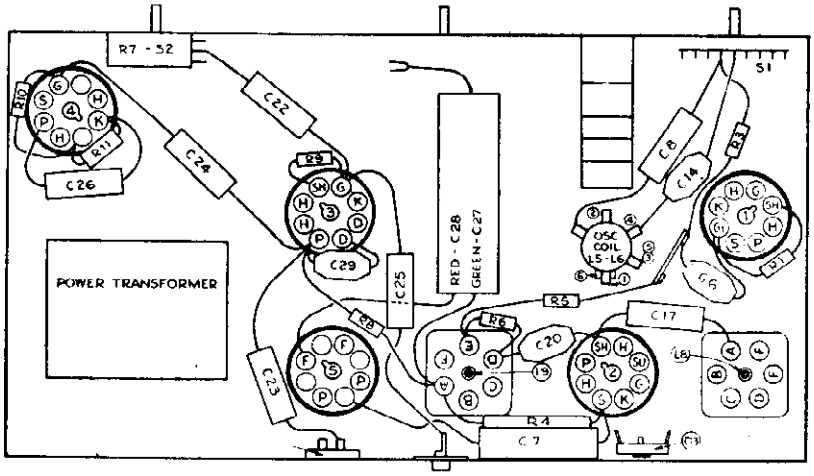


Calibration Scale.—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the chassis for quick reference during alignment. Or, if necessary, the calibration scale printed in this service note can be used in conjunction with an ordinary 6-inch ruler as an accurate and convenient substitute for the regular dial.

RECEIVER DIAL SCALE AND CORRESPONDING CALIBRATION SCALE



DIAL-INDICATOR AND DRIVE MECHANISM

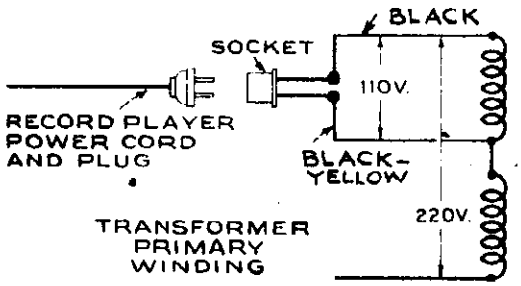


TUBE, TRIMMER AND PARTS LOCATION—BOTTOM VIEW

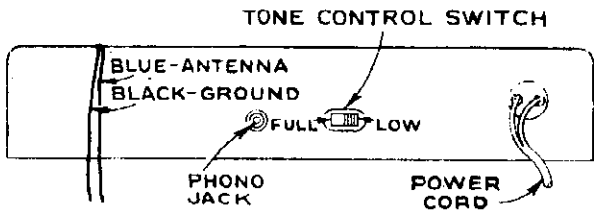
General Information and Service Hints

Record Player:

A jack is provided on the rear of chassis for connection to a No. 6227 Silvertone Record Player which is supplied only in 100-125 volts, 25, 50 or 60 cycle rating. If receiver is to be used on 220 volts, it will be necessary to connect the Record Player power cord to the 110V primary section of the Power Transformer as shown in "Record Player connections" illustration.



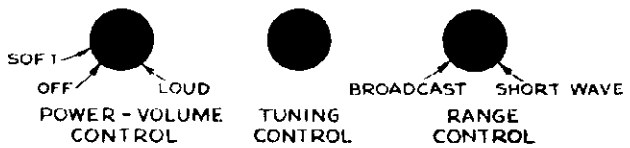
RECORD PLAYER CONNECTIONS (220 V—110 V)



REAR OF CHASSIS

Loudspeaker:

The loudspeaker cone may be centered in the usual manner with three celluloid or paper feelers after gently cutting away the front dust cover. A new cover should be cemented in place upon completion of the adjustment.



CONTROLS

SEARS, ROEBUCK & CO.

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connections	Across speaker voice coil
Output meter reading to indicate 1.0 watt output	2 volts
Approximate average sensitivity in microvolts for 1.0 watt output	See chart below
Dummy antenna value to be inserted in series with generator output	See chart below
Connection of generator output lead	See chart below
Connection of generator ground lead	To chassis
Generator modulation	30% 400 cycles
Position of Volume Control	Fully clockwise
Position of Tone Control	Full position
Position of Dial Pointer	at left mark on dial backing plate with gang at max. capacity

Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Dummy Antenna	Generator Connection	Trimmers Adjusted (In order shown)	Trimmer Function	Approximate Microvolts
Broadcast	Low End	455 kc	0.1 mfd.	6SK7 I-F Grid	L9, L10	2nd I-F Transformer	5200
Broadcast	Low End	455 kc	0.1 mfd.	6SA7 Grid	L7, L8	1st I-F Transformer	92
Short Wave	15 mc	15 mc	300 ohms	Ant.	C10	Osc.*	
Short Wave	15 mc (Rock)	15 mc	300 ohms	Ant.	C3	Ant.	50
Broadcast	1,500 kc	1,500 kc	0.0002 mfd.	Ant.	C13	Osc.	13
Broadcast	600 kc (Rock)	600 kc	0.0002 mfd.	Ant.	L6	Osc.	16
Broadcast	1,500 kc	1,500 kc	0.0002 mfd.	Ant.	C13	Osc.	

Frequency Ranges:

Standard Broadcast (A)	540-1,800 kc (555-166m)
Short Wave (C)	4.5-18 mc (66.7-16.6m)

Chassis Features:

Jack for Phonograph Attachment
Magnetite-Core Adjusted I-F Transformers, and "A" Band Oscillator Coil
Automatic Volume Control
Two-point Tone Control
Tuning Drive Ratio ..... 18 to 1

Intermediate Frequency ..... 455 kc

Alignment Frequencies:

Band "A"	1,500 kc (osc.) 600 kc (osc.)
Band "C"	(15 mc osc. and Ant.)

Loudspeaker:

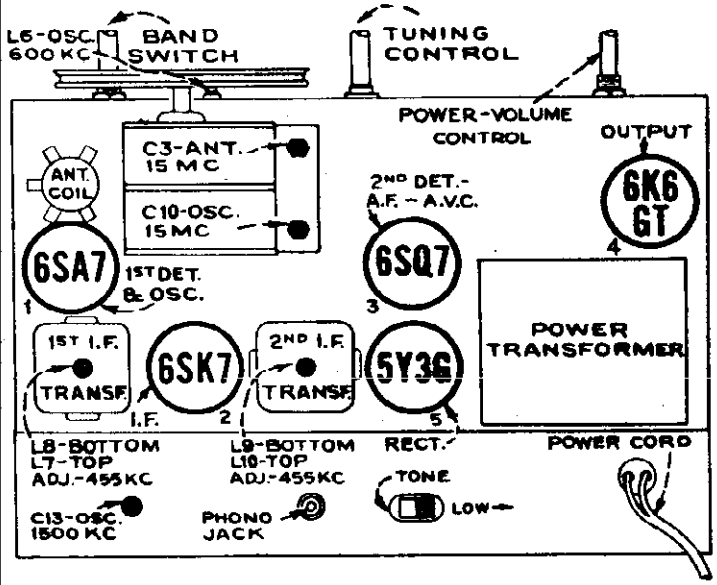
Type	5-inch electrodynamic
Voice Coil Impedance	4 ohms at 400 cycles

Power Output:

Type	Pentode
Undistorted	1.5 watts
Maximum	2.3 watts

Power Supply

A	105 to 125 volts, 50 to 60 cycles, 50 watts
B	105 to 125 volts, 25 to 60 cycles, 50 watts
C	105 to 240 volts, 50 to 60 cycles, 50 watts



TUBE, TRIMMER AND PARTS LOCATION—TOP VIEW

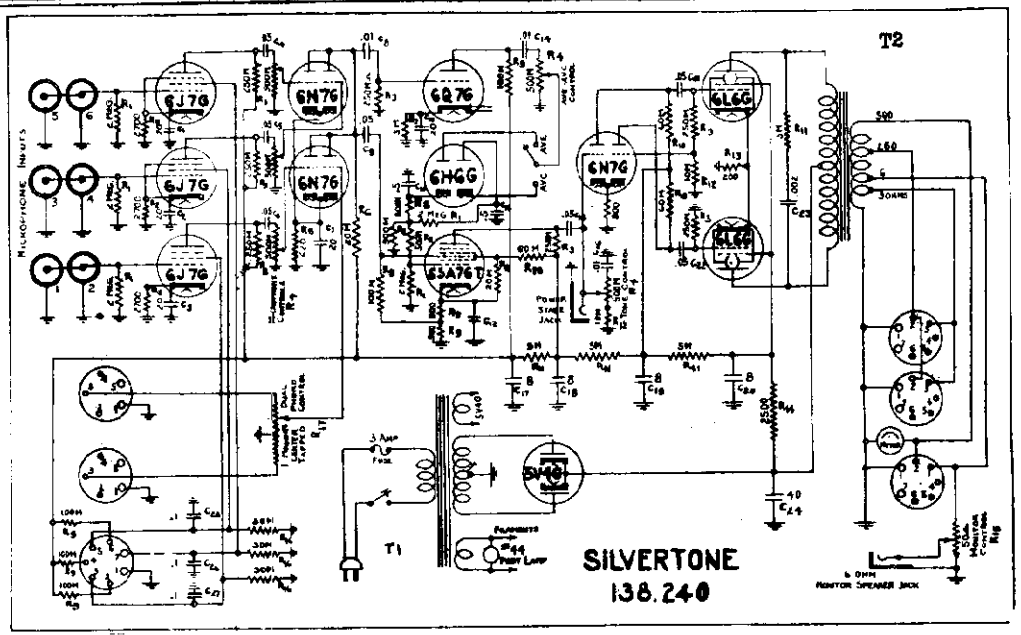
IMPORTANT ALIGNMENT NOTES

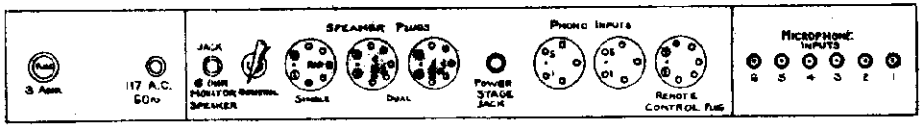
* Use minimum capacity peak if two peaks can be obtained. Where indicated by the word "Rock", the variable tuning condensor should be rocked back and forth a degree or two while making this adjustment.

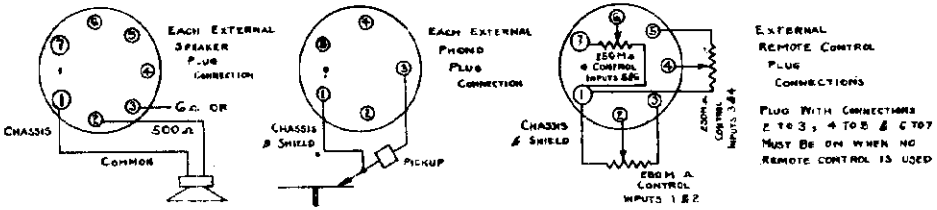
Each step of the alignment should be repeated in its original order for greater accuracy. Always keep the output of the generator at its lowest possible value to prevent the AVC action of the set from interfering with accurate alignment. Adjustment locations are shown on the top and bottom parts location views of chassis. Only the dummy antenna indicated in the chart for any particular band should be used. Remove the dummy used for alignment in any other band. Values shown under "Microvolts" are only approximate. Note: Oscillator tracks 455 Kc. above signal on all bands.

MODEL 8902 Amplifier
Chassis 138.240

SEARS, ROEBUCK & CO.







NOTE : ...R HEAD PHONE USE MONITOR SHOULD BE HIGH IMPEDANCE
MONITOR CONTROL SHOULD BE USED WITH CAUTION

USE RED SPEAKER SOCKET FOR ONE G.A. OR 500Ω SPEAKER PLUG WHEN TWO G.A. OR 500Ω SPEAKER PLUGS ARE USED, BOTH MUST BE IN BLACK SOCKETS FOR CONNECTION TO 3 OHMS OR 250 OHMS.

TUBE COMPLEMENT:

3	6J7G	Input
2	6N7G	Mixer
1	6Q7G	Voltage Amplifier
1	6SA7GT . .	Expander Amplifier
1	6H6G . . .	Expander..Rectifier
1	6N7G	Driver
2	6L6G	Output
1	5V4G	Rectifier

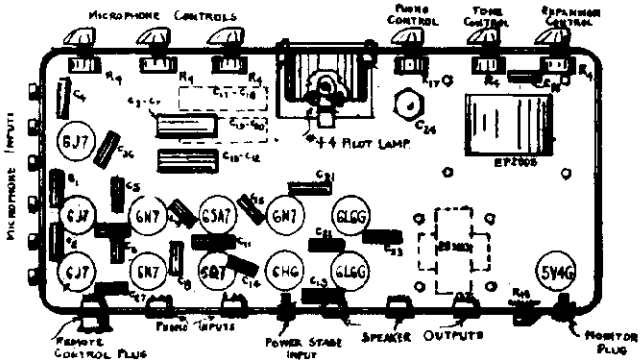
PICKUP: High impedance crystal type, 500M ohms

SPEAKERS: 12 inch permanent magnet type, 6 ohm voice coil. Standard equipment Jensen PM12H.

INPUTS:
6 input positions each to accomodate high impedance crystal velocity, or no voltage velotron microphones, and one high impedance phono unit.

MARCH 14, 1941

35 WATT, 12 TUBE, 5 STAGE, HIGH GAIN AMPLIFIER



This amplifier has five stages with input for six high impedance microphones, fader and two crystal pickups. The circuit also incorporates a volume expansion circuit for use with phonograph records and an automatic volume control circuit to automatically control microphone gain. It must be remembered, however, that this latter function will operate only within the limitations of the enclosure in which the amplifier is used.

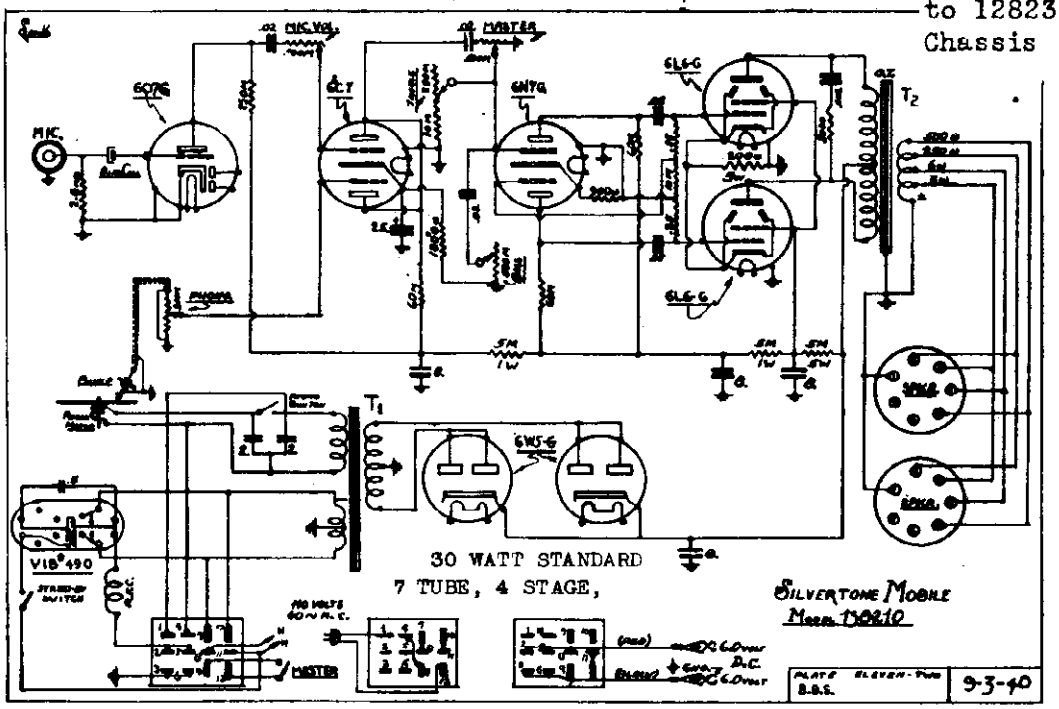
Provision is also made for use of a remote control for the three microphone inputs. If the remote control attachment is not used, be sure that the dummy plug is inserted in the remote control socket at the rear of the amplifier.

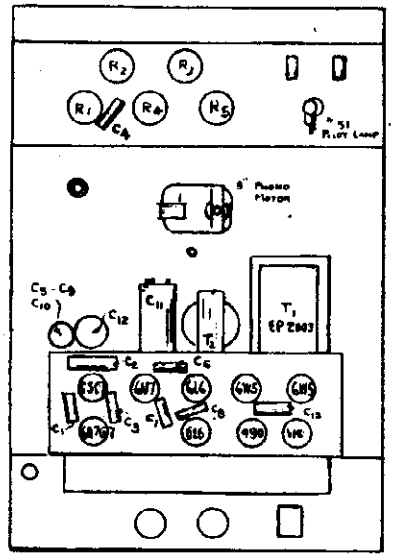
POWER SUPPLY: 110-125 volts, 50-60 cycle, AC only, 140 watts

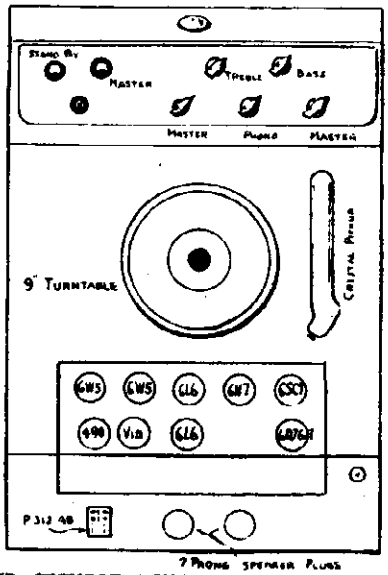
FREQUENCY CHARACTERISTICS: Curve substantially flat from 50 to 10,000 cycles per second.

SEARS, ROEBUCK & CO.

MODELS 8903,1281
to 12823 incl.
Chassis 138.210







MAY 1, 1941

GENERAL INFORMATION AND SERVICE HINTS

This unit is a combination 6 volt-110 volt mobile system. For AC operation use the AC cord. For DC operation, use the heavy cord that is provided with battery clips. The phonograph motor which is 110 volt-60 cycle type operates from a 110 volt winding on the transformer when the system is used on 6 volts, the vibrator functioning as a converter. The vibrator has ample capacity to carry the entire load of the amplifier.

TUBE COMPLEMENT:

1 - 6Q7G. . . . . Input
1 - 6SC7G . . . . . Mixer
2 - 6W5G . . . . . Rectifiers
1 - 6N7G . . . . . Phase Inverter Driver
2 - 6L6G . . . . . Output Stage

ELECTRICAL SPECIFICATIONS

POWER SUPPLY

This unit is so designed as to operate on 110-115 volts, 60 cycles. It requires approximately 110 watts for its operation. It may also be operated on a 6 volt storage battery. Wattage on 6 volt operation, with the motor, 141 watts.

FREQUENCY CHARACTERISTICS

Substantially flat 50 to 10,000 cycles.

INPUT - for one High Impedance Crystal or Dynamic Microphone.

PICKUP: Crystal Type

CONTROLS

1 - 500M ohm Carbon Control - Phonograph Volume
1 - 500M ohm Carbon Control - Microphone Volume
1 - 500M ohm Carbon Control - . . . . . Base
1 - 500M ohm Carbon Control - . . . . . Master
1 - 250M ohm Carbon Control - . . . . . Treble

SWITCHES:

1 Standby
1 Phono turntable switch

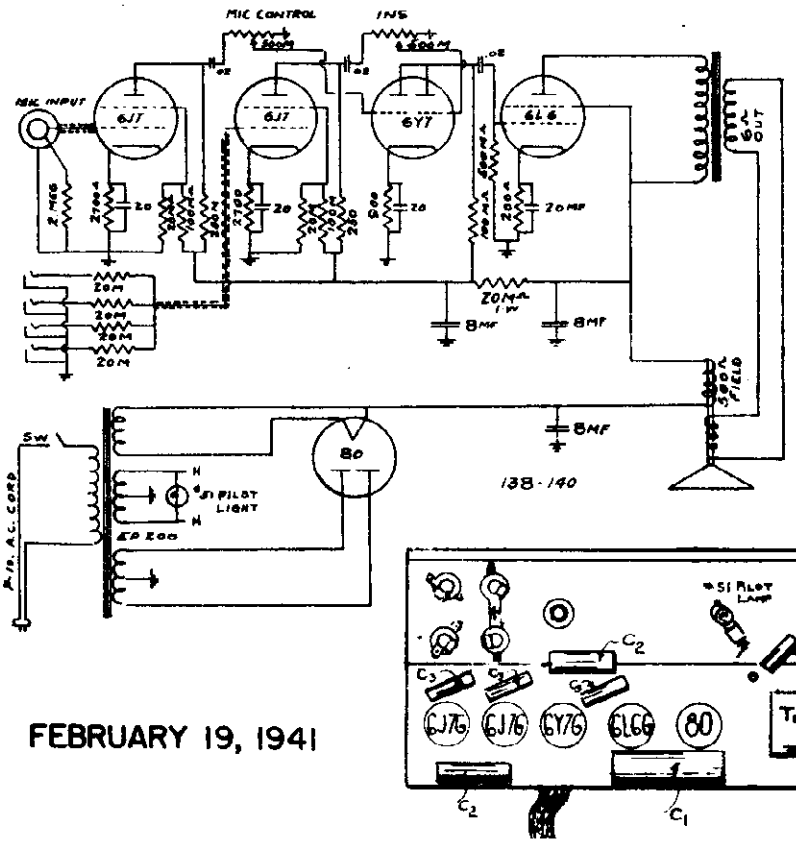
SPEAKERS: Use 12" permanent magnet type with 6 ohm voice coil.

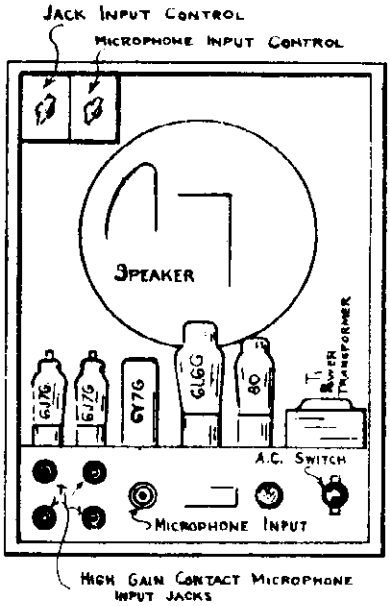
OUTPUT IMPEDANCE: . . . . . 3, 6, 250, 500 ohms.

MODEL 8960 Amplifier
Chassis 138.140

SEARS, ROEBUCK & CO.

8 WATT, 5 TUBE, MUSICAL INSTRUMENT AMPLIFICATION SYSTEM





FEBRUARY 19, 1941

ELECTRICAL SPECIFICATIONS

TUBES AND FUNCTIONS:

1 6J7G	Microphone Input	1 6Y7G	Mixer Tube
1 6J7G	Instrument Input	1 6L6G	Output
	1 80	Rectifier	

POWER SUPPLY: . . . . . 110-125 volts 50-60 Cycles, 71 Watts

INPUTS:
1 High Gain Microphone, 4 High Gain inputs for contact microphones.

GAIN: Approximately 115 DB SPEAKER: Jensen 8" Electro-dynamic with matching transformer.

MECHANICAL SPECIFICATIONS

OPERATING CONTROLS:

1 - 500M ohm control	Microphone Volume.
1 - 500M ohm control	Instrument Volume.
1 - Master A. C. Switch	Power

GENERAL INFORMATION AND SERVICE DATA

The amplifier uses 5 tubes and has 3 stages. Each input tube has an individual volume control which is located in the upper left hand corner of the portable case.

The voice microphone used with this system should be of the high impedance crystal, velocity or dynamic types. Contact or instrument microphones should be similar to the Amperite Contact type. It will be noted that input for four contact microphones is provided. All are connected in parallel so that all must be of the same type.

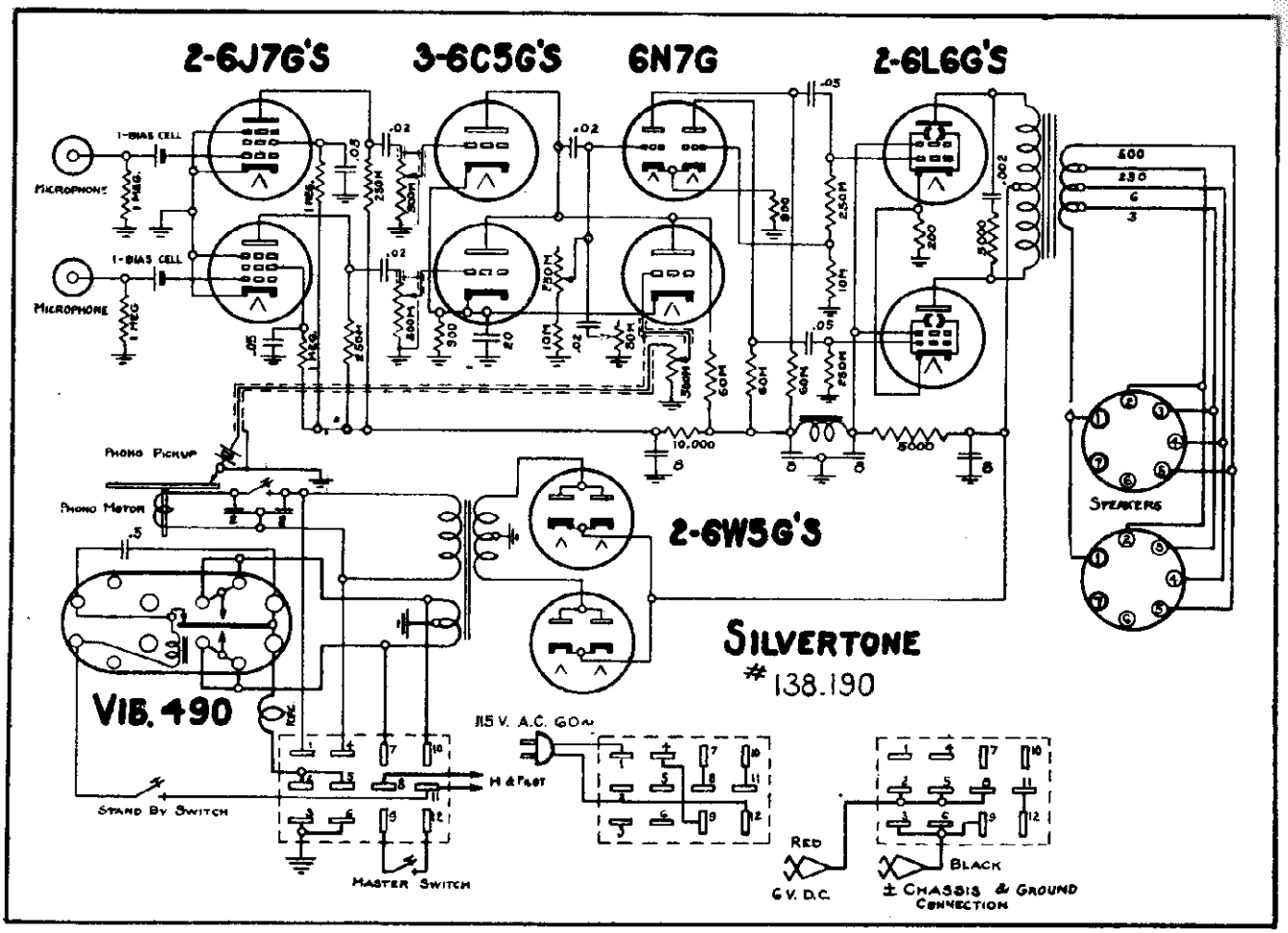
TUBES:
When it is necessary to replace tubes be sure to have them checked as a shorted tube will damage the amplifier. The two 6J7 input tubes must be tested for low hum and noise level.

HUM:
If unit hums, it may be due to any one of several causes. Check your tubes.
Check your microphone cable for breaks in shielding or for inferior microphone cable if you have made replacement.

Microphone wiring should be kept well separated from the heavy power wiring, separate lights, or other electrical equipment. In order to minimize line disturbances, the chassis of the amplifier should be connected to a water pipe ground.

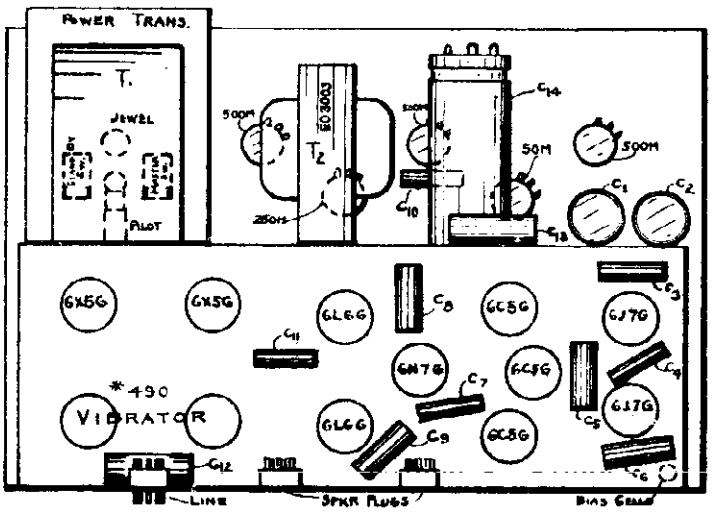
SEARS, ROEBUCK & CO.

MODELS 8928, 8930, 895(
Ch. 138.190 Amplifier

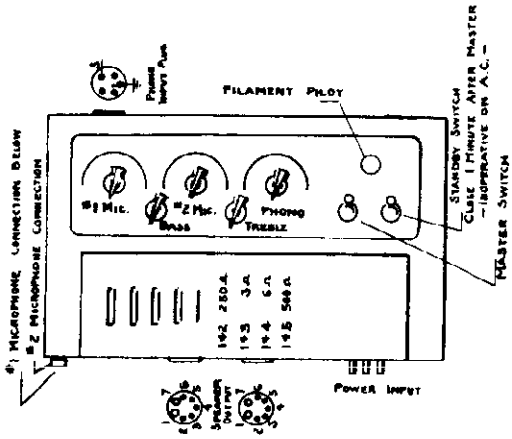


10 TUBE, 4 STAGE, HIGH GAIN AMPLIFIER

138.190
amplifier only



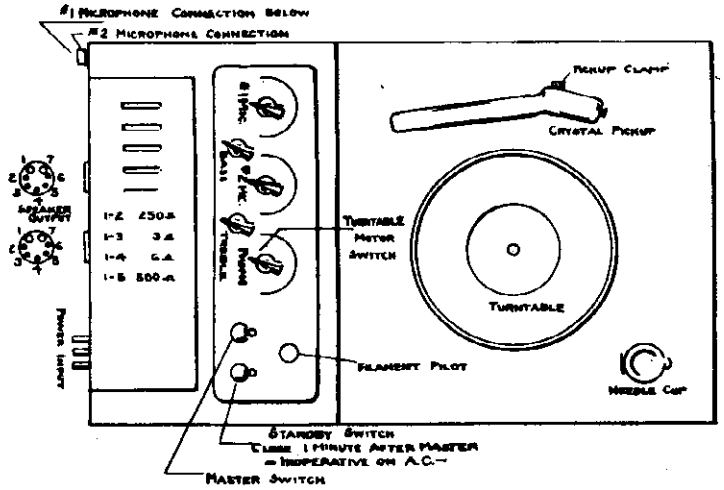
SILVERTONE
30 WATT MOBILE



POWER SUPPLY
This unit is so designed as to operate on 110-115 volt, 60 cycle, 110 Watts, or may be operated on 6 volt storage battery thru a vibrator and transformer. Wattage on 6 volt operation with motor is 141 Watts.

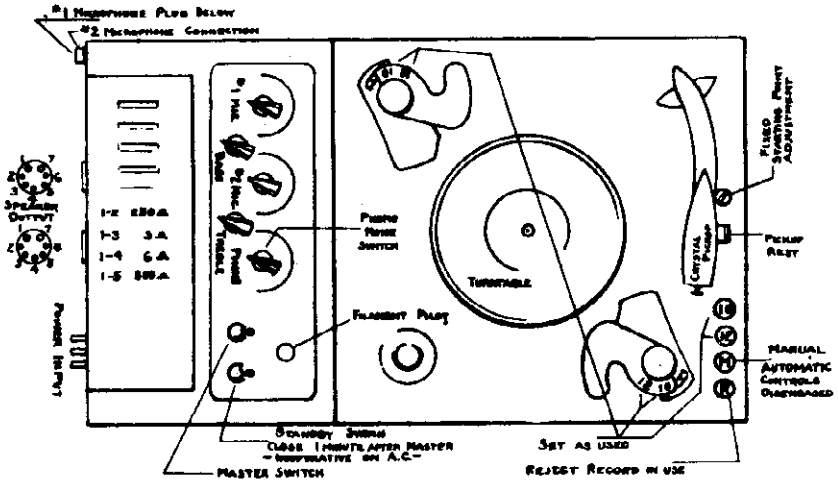
MODELS 8928,8930,8950
Chassis 138.190-1,-2,-3

SEARS, ROEBUCK & CO.



138.190-1
with manual player

The chassis 138.190-3 incorporates a (Erwood) New Products 320 Record Changer. See Riders "Automatic Record Changers and Recorders".



138.190-2 or3
with automatic changer

The chassis 138.190-2 incorporates a Webster 210 Record Changer. See Riders "Automatic Record Changers and Recorders."

This unit contains a four stage amplifier consisting of two high impedance microphone input positions feeding two 6J7 tubes, which in turn feed into a 6C5 tube (second stage). Signal is then fed to the 6N7 driver and thru the two 6L6 output tubes. The phonograph feeds thru a 6C5 into the driver. Two 6W5 rectifiers are used in power supply.

The phonograph motor operates on 110-115 volts, 60 cycle AC current. When unit is used on 6 volt operation, the vibrator is used to transform the current from straight DC to 60 cycles pulsating current. Current is then fed thru a transformer with a secondary which produces 110 volts 60 cycles.

FREQUENCY CHARACTERISTICS
Curve - substantially flat from 50 to 10,000 cycles per second.

INPUTS
2 input positions each to accommodate high impedance crystal, velocity or no-voltage veletron microphones.

PICKUP
High Impedance crystal on models 1 -2 -3; not on 138.190.

CONTROLS
2 - 100M Ohm Carbon Controls - Microphone Volume
1 - 100M Ohm Carbon Control - Tone
1 - 50M Ohm Carbon Control - Phono Volume

SPEAKERS
12 inch permanent magnet type, 6 ohm voice coil.

SWITCHES
2 - Toggle Switches S.P.S.T.-Standby & Phono Motor
1 - Toggle Switch D.P.S.T.-Master Switch

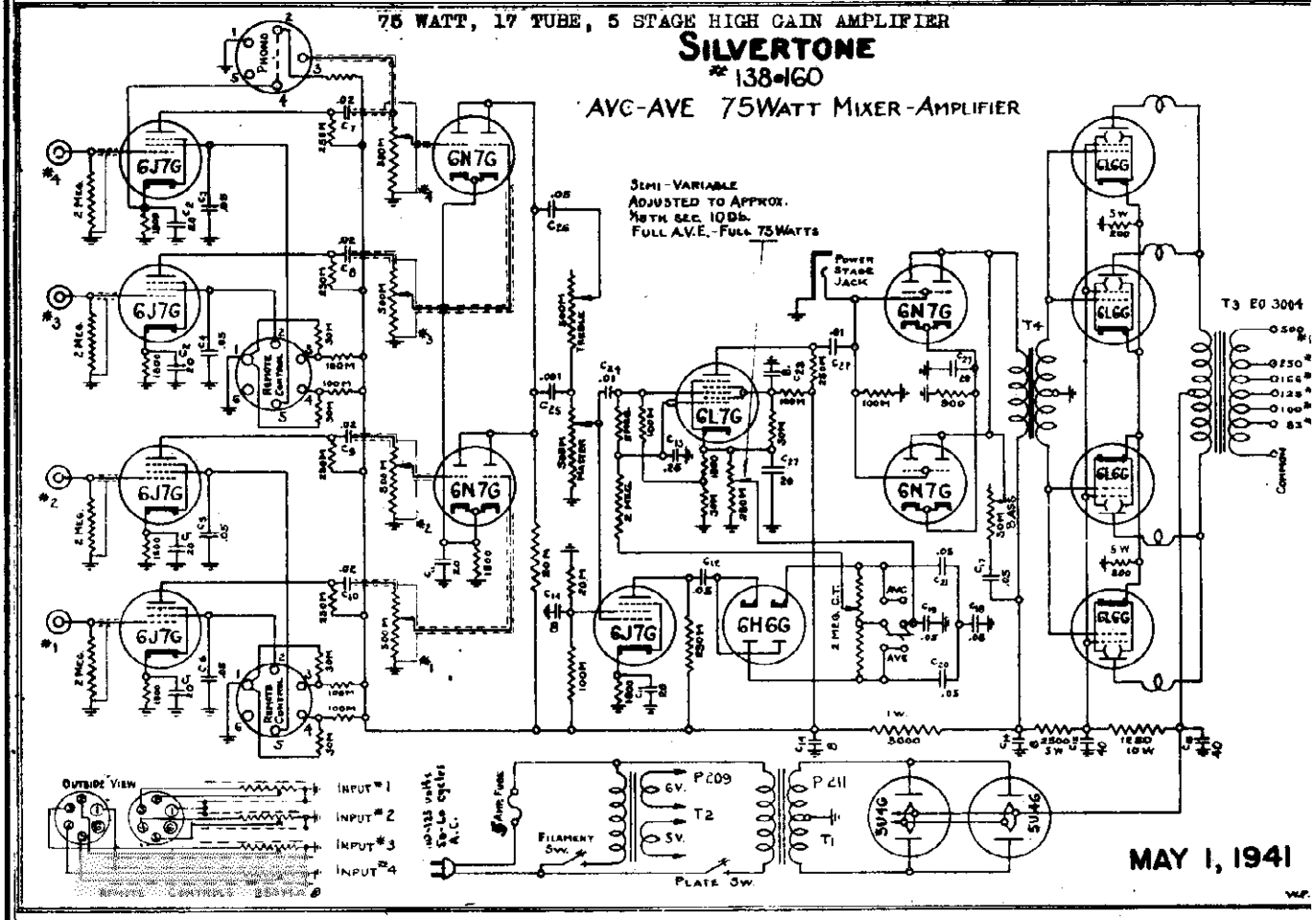
TUBE COMPLEMENT

2 - 6J7	Input	3 - 6C5	Voltage amps.
1 - 6N7	Phase Inverter	2 - 6W5	Rectifiers
2 - 6L6	Output		

TUBES:
When it is necessary to replace tubes, be sure to check tubes as a shorted tube will damage the amplifier.

6J7 input tubes must be audio tested for low hum and noise level. This will also apply on the 6N7's, as these tubes are very critical from this standpoint, and a great deal of trouble due to noise and distortion may arise from this point. It is important that the 6J7 tubes be balanced or matched.

SEARS, ROEBUCK & CO. MODEL 8970 Amplifie
Chassis 138.160



FREQUENCY CHARACTERISTIC: . . . . . Substantially flat from 60 to 10,000 cycles per second

INPUTS:

4 High gain for high impedance microphones. 1 Low gain input for Crystal Pickup.

OUTPUT IMPEDANCE: . . . . . 83, 100, 125, 166, 250, and 500 ohms

SPEAKERS: . . . . . Use Heavy duty type with matching transformers

MECHANICAL SPECIFICATIONS

3	500M Carbon controls .... Microphone Volume	1	500M Carbon Control ..... Treble
1	500M Carbon control ..... Mic-Phono Volume	1	50M Carbon Control ..... Treble
1	500M Carbon Control ..... Master Gain	1	Switch .....AVE-AVC Selector
1	2 Meg Carbon Control ..... AVE-AVC	1	Switch ..... Plate Power
		1	Switch ..... Filament Supply

GENERAL INFORMATION AND SERVICE HINTS

This amplifier is designed for high power installations, and care must be exercised in its installation. It consists of a 17 tube circuit having inputs for four microphones or three microphones and a phonograph attachment. The circuit incorporates a selector switch that permits the use of volume expansion for phonograph record reproduction or automatic volume control when using microphones. The use of this latter feature is limited by the acoustic characteristics of the enclosure.

This amplifier has been checked and inspected under laboratory test conditions for gain hum and power output.

TUBES:

When it is necessary to replace tubes, be sure to check them carefully as a shorted tube will damage the amplifier. The 6J7G tubes must be tested for hum and in order to obtain the full output of the amplifier it is necessary that the 6L6 output tubes all be of the same characteristics. Failure to obtain proper action on the part of the volume expander or volume control circuit can generally be traced to a faulty 6L7 tube.

HUM:

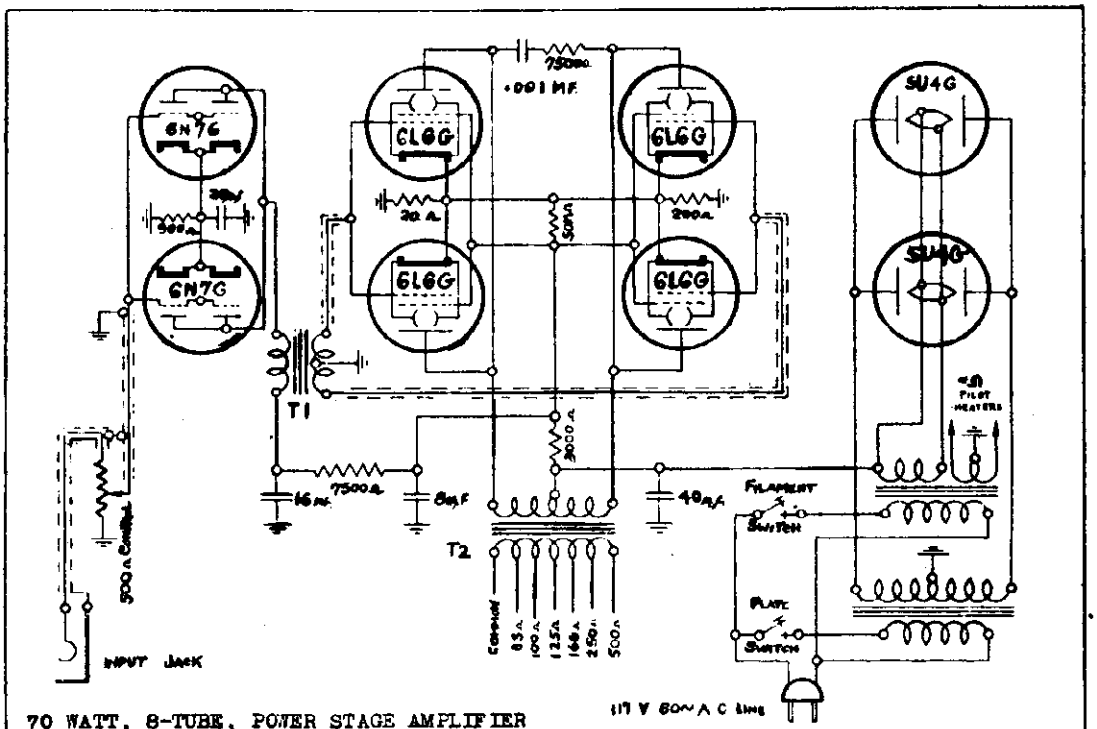
If this amplifier hums recheck the tubes. Be sure that the amplifier is grounded and that all input wiring is carefully shielded. Microphone wiring with a broken or incomplete shield will cause hum. Also be sure that microphone wiring is well separated from the A.C. wiring in the building or enclosure.

INSTALLATION:

In the installation of this unit be sure that the microphone is well separated from the loud speaker, otherwise sound waves from the loud speaker will be picked up by the microphone and the result will be a continuous howl that can only be eliminated by reducing the gain of the amplifier.

MODEL 8980 Amplifier
Chassis 138.170

SEARS, ROEBUCK & CO.



70 WATT, 8-TUBE, POWER STAGE AMPLIFIER

SILVERTONE *138.170

TUBES:

Before placing this amplifier in operation, be sure that the tubes are normal in characteristic. A shorted tube will damage the amplifier. Unbalanced 6L6G's will cause power reduction and increase hum. The rectifier tubes must have proper emission, otherwise the amplifier will not develop full power.

This amplifier has been laboratory checked for power output and hum and will give fine service when it is used correctly.

HUM:

If hum is experienced in using this amplifier, be sure that the amplifier used ahead of it is not the cause of the trouble. It is also necessary that the proper side of the input be connected to the ground of the input amplifier. Be sure to use shielded cable for inter-connection. This cable should not be more than 6 feet long. Be sure before putting this amplifier into operation that the proper speaker connections are made. Operating the amplifier without the proper speaker load will damage the power stage tubes.

RETAIL SELLING PRICES PREPAID
PRICES SUBJECT TO CHANGE WITHOUT NOTICE

70 WATT POWER STAGE AMPLIFIER

LOCATION	PART NUMBER	DESCRIPTION	SELLING PRICE EACH
T3	13810	Plate Transformer	8.75
T4	13811	Filament Transformer	6.90
T2	13813	Output Transformer	4.85
T1	13812	Coupling Transformer	3.20
	13824500M6	500M ohm Input Control	.75
	13818008	Octal socket - state marking	.15
	13849004	Pilot light socket & assembly	.15
	13849003	Pilot light jewel	.25
	13838401	A. C. Switch	.35
	13818111	Input Jack	.75
	13820106	20 mf. 25 volt condenser	.80
	13820115	8x8 mf 450 volt condenser	1.35
	13820121	40 mf 475 volt condenser	1.45
		200 ohm 5 watt resistors	.35
		7500 ohm 5 watt resistor	.35
		50M ohm 1 watt resistor	.15
		3000 ohm 5 watt resistor	.35
		7500 ohm 5 watt resistor	.35
		900 ohm 1 watt resistor	.15

Use #51 Pilot Light.
Use 5 ampere glass fuse.

ELECTRICAL SPECIFICATIONS

TUBES AND FUNCTIONS:
2 6N7G.....Input
2 5U4G.....Rectifier
4 6L6G.....Power Stage

POWER SUPPLY: 110-125 Volts 50-60 cycle only, 220 watts

FREQUENCY CHARACTERISTICS Substantially flat 50 to 10,000 cycles.

INPUT IMPEDANCE 5000ohms.

OUTPUT IMPEDANCE 83,100, 125, 166, 250 and 500 ohms.

GAIN Approximately 35 DB.

SEARS-ROEBUCK & CO.

MODEL 533.661 Wincharge
6V. Heavy Duty
MODEL 533.692 Wincharge
6V. 15-Amps.

Where To Install Charger

The most important part of a successful operating charger is to see that it is installed in the proper location. It must be clear of all obstructions. The general rule to follow is "THE CHARGER SHOULD BE INSTALLED 15 FEET HIGHER THAN ANY OBSTRUCTIONS WITHIN 400 FEET DISTANCE."

Any extra effort spent in selecting and making an installation meeting this requirement will be many times repaid by increased charging current.

It has often been found that an additional 10 or 15 feet height will almost double generator out-put.

Fig. 1 A good installation in the full sweep of the wind. Note how it is clear of obstructions in all directions. This is a typical installation on a farm home.

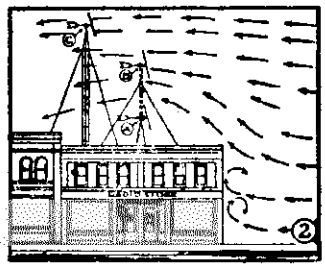


Fig. 2. Installations on a flat-roofed building. Note that wind strikes side of building and builds up a back pressure or cushion which deflects the air stream upward and over the charger, making installation "A" useless.

However, with pipe added to the regular tower, as illustrated at "B," the charger is raised from 10 to 15 feet up into the main wind stream and gives 100% performance.

Wind velocities increase with the height above ground, and still better performance is obtained by mounting charger higher up on a sectional tower as illustrated at "C."

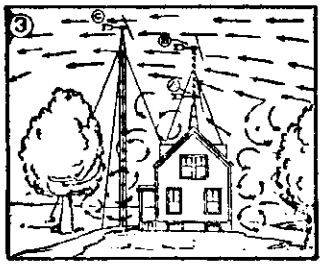


Fig 3 Shows a typical farm home surrounded by trees. Note how the trees to the right of the house deflect the air stream high above the roof top. The installation (A) is too low receiving very little power from the wind.

The installation (B) however, is satisfactory because the charger was mounted higher by adding a section of 1¼" inch pipe to the tower increasing the height 10 to 15 feet.

The same satisfactory results can be obtained by using a sectional tower illustrated in installation (C).

In making your installation **keep this in mind:** If charger location is in the clear, height of installation is not as important. But, if charger is not located in the clear, extra height must be obtained, either by using our pipe adapter, higher tower, or sectional tower.

Remember, the charger should be 15 feet higher than wind obstructions within 400 feet distance.

In selecting your location, bear in mind that it is advisable not to have the charger more than 200 feet away from the batteries. Further distances mean poor charging results as well as greater expense due to more and costlier wire.

In view of this, it is sometimes better to select a location near the house and extend the tower height by the various suggestions mentioned in this book, rather than selecting a location in the clear but a considerable distance from the batteries.

REMEMBER THE SUCCESS OR FAILURE OF YOUR CHARGER DEPENDS ON ITS LOCATION.
FOLLOW THE ABOVE INSTRUCTIONS CAREFULLY

How to Fasten Tower to Roof; Increasing Height of Charger

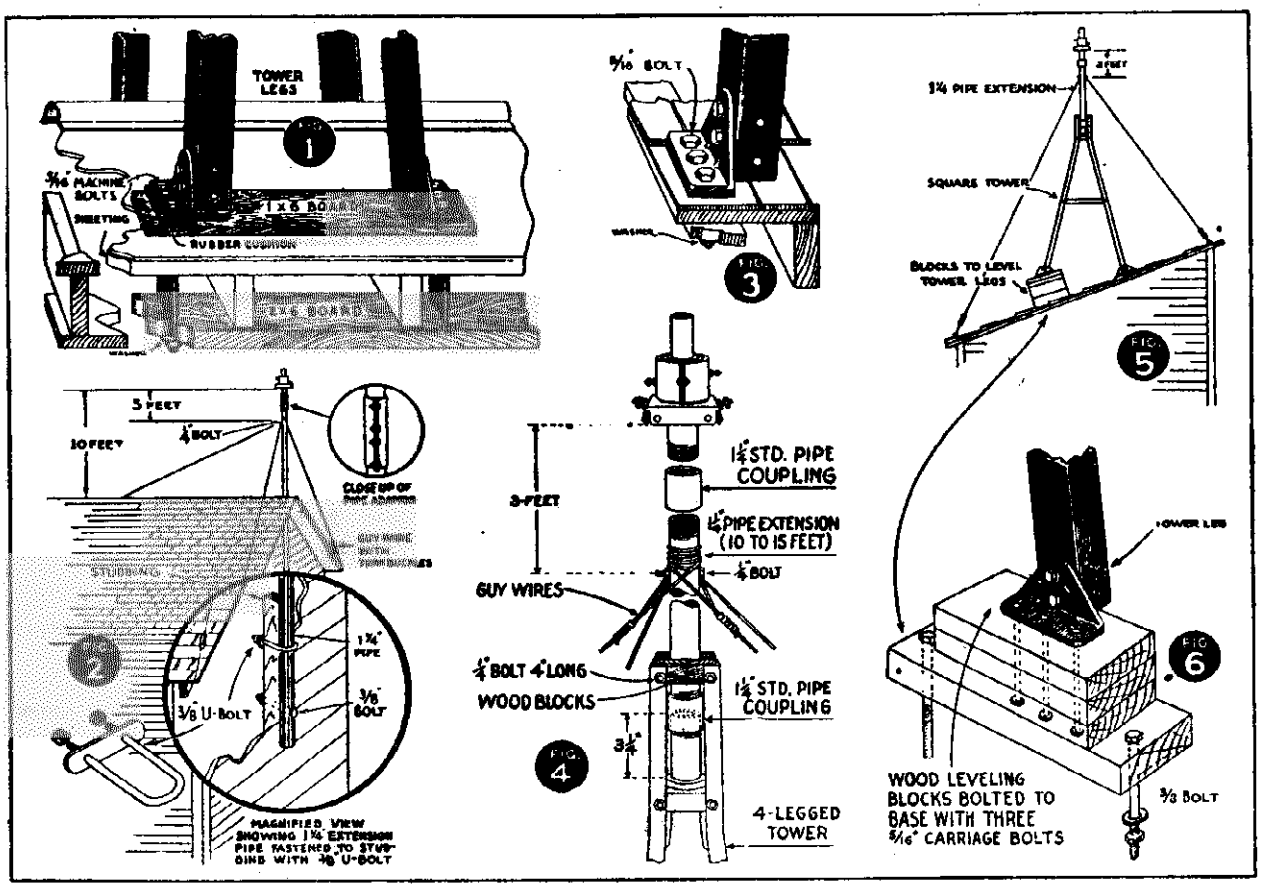


FIGURE 1. Illustrates how you securely bolt the tower to the roof. A board is placed under the rafters and 5/16" machine bolts securely bolt the tower feet to the board. Rubber cushions made of old inner tubes or rubber heels can be inserted under the tower feet to eliminate vibration.

FIGURE 2. For any mounting without a tower—a 1¼" pipe can be used to hold charger. Several ⅜" "U" bolts are recommended for securely holding the pipe in place. A straight ⅜" bolt, through pipe and studding of house as shown should be used to prevent pipe from slipping should the "U" bolts loosen.

Guy wires should be used as shown to brace the pipe. These should be fastened at least 3 to 3½ feet below the upper end of the pipe for propeller clearance. A ¼" bolt through the pipe will prevent the guy wires from slipping down the pipe. Turnbuckles should be used with guy wire to tighten them.

The charger collector ring assembly is fastened to the pipe by threading the ends of the pipe and using a standard 1¼" coupling. A pipe adapter can be obtained from the same place where you purchased the charger enabling you to clamp two 1¼" pipes together without threading the ends and using a coupling.

FIGURE 3. Illustrates another method of securely fastening the tower to the roof. A board, a foot or two in length is placed under the boards of roof (sheeting). Two 5/16" bolts or lag screws through roof and into this board will securely hold the tower.

FIGURE 4. A very effective means of increasing the height of the charger is the use of an extension 1¼" pipe. To do this, cut the 1¼" mounting pipe between the two support plates on top of the tower (cut about 3¼" from lower support plate). Thread the ends of the pipe.

The 1¼" extension pipe used, can be 10 to 15 feet tall—both ends being threaded. It is connected to the tower and charger through 1¼" standard pipe couplings. (Note illustration.)

Pipe adapters can be used to connect the ends of the pipe as illustrated in Figure 2. This eliminates the necessity of threading pipe ends and use of pipe coupling.

This additional length of pipe should have guy wires to brace it as illustrated.

FIGURE 5 AND FIGURE 6: To mount charger on a sloping roof, two tower legs must have leveling blocks, Fig. 5. The bottom block should be bolted to roof, or fastened with lag screws, as shown in Fig. 1. Round head bolts are used to bolt the feet and all other blocks to the bottom block (Fig 6).

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Assembling The Charger

1. TOWER ASSEMBLY

The tower comes in two sections—the 5-foot standard tower and a 5-foot extension to make a 10-foot tower.

a. Five-Foot Standard Tower—

Unpack all parts and with them laid out, study the illustration on the preceding page. You will note that the top of the tower, consisting of the upper and lower support plates, mounting pipe with collector ring assembly, comes assembled in one piece. To this part bolt the four legs and cross braces using short ¼"x½" bolts. Remember to use lock washers.

b. Five-Foot Extension to Make Ten-Foot Tower—

To the above 5-foot tower bolt the extension legs (T-4). (Note—extension legs are on OUTSIDE of upper legs.) At the same time bolt the top horizontal braces (T-3) and the long cross braces (T-6) to the LOWER hole at top end of extension leg. Keep the cross brace on the outside of horizontal brace.

Then bolt lower horizontal braces (T-5) to legs, bolting cross braces to them at the same time. Be sure to place bolt at point where cross braces cross.

Next attach the tower feet. In the lower hole use a large 5/16" diameter bolt. A smaller bolt is used in upper slotted hole—being sure to use a large washer provided so bolt head will not pull through the large slot. The cross braces are bolted BEHIND the tower legs.

2. GENERATOR

The generator is installed on a 1" shaft which extends from collector ring cover.

Place the generator on this mounting shaft, being sure that the generator brackets rest between the two small knobs on top of the collector ring cover.

Generator is securely held about this shaft by two 5/16" x 2" bolts (O).

There is a wire pin in the 1¼" mounting pipe (R) that should be removed as it is used to hold the parts together only during shipment.

3. TAIL VANE

Then fasten the one vane brace (K) to the vane as illustrated. Remember, there is only one vane brace and it is placed on the side of the vane that does not rest against the vane angle.

Next bolt the vane angle assembly to the end plate of the generator (H) using ⅜" diameter bolts.

4. PROPELLER, GOVERNOR AND BRAKE DRUM

These parts can now be bolted to the propeller hub. Note that the governor is shipped to you with the carriage bolts in place. The governor is placed in front of the propeller (and on the FLAT side of the propeller). Then the brake drum is placed in back of the propeller and the entire assembly bolted to the hub.

BE CERTAIN THAT THE FLAT SIDE OF THE PROPELLER FACES THE WIND. It will not operate otherwise..

At this point check the propeller track as stated in the following paragraph.

MODELS 533.661,
533.692

SEARS ROEBUCK & CO.

5. PROPELLER TRACK

To avoid vibration, it is important that the propeller "track" properly. This means that both propeller tips must travel in the same path. This can be checked by measuring between the propeller tip and the tower leg as each tip passes a tower leg. Note accompanying illustration that shows how this is done. If both tips do not pass at the same distance, it can be corrected by adjusting the propeller bolts. (It may sometimes be necessary to place a small piece of cardboard between the propeller and brake drum.

6. BRAKE (Shut-Off) ASSEMBLY

Pass the brake rod (G) down through the end of the brake lever (D) and through the pipe. The loop end of wire should be kept on top of lever as illustrated, being sure washer (L) is in position. At the bottom end of brake rod attach the short spring provided (its purpose is to take up the slack of extension rope or wire, keeping the brake tightly set at all times when shut off.)

Connect an extension wire or rope to end of spring. This should be long enough to almost reach the ground so that charger may be shut off when desired.

7. CONNECTING GENERATOR WIRES TO COLLECTOR RING COVER

The generator has two terminals—one marked "P" which is positive, the other marked "N" which is negative. Connect this positive wire to the UPPER terminal (+) on collector ring cover. Connect the negative wire to the LOWER colector ring cover terminal (—).

8. CONNECTING LEAD-IN WIRES

The lead-in wires are the long wires connecting the generator assembly to the instrument panel in the house. The upper tower support plate has two terminals, one marked + (positive) and one — (negative). The positive terminal has a YELLOW sleeving underneath the support plate. The negative terminal has black sleeving.

After selecting the proper size lead-in wire, connect one wire to the + terminal and one to the — terminal on upper support plate. Identify the positive wire so that there will be no mistake on the instrument panel connections. (This can be done by putting a twist or kink in the loose end.)

These wires should be fastened to the tower legs with tape or strain insulators so that they will not be struck by the propeller or have their connections loosened by swinging in the wind.

9. NOTE

The generator is constructed with double grease sealed ball bearings on each end of the armature shaft, making it unnecessary to ever oil the generator.

The 1-inch pipe shaft is greased before leaving the factory, making it unnecessary to lubricate this part for at least three months.

CAUTION: *Never allow the charger to operate without a battery connected to the circuit. It will result in serious damage to the generator.*

SEARS-ROEBUCK & CO.

Wiring

NO. 8 WIRE
B & S Gauge
For use when distance from charger to battery is under 50 feet.

NO. 6 WIRE
B & S Gauge
For use when distance from charger to battery is 50 to 90 feet.

NO. 4 WIRE
B & S Gauge
For use when distance from charger to battery is 90 to 130 fet.

NO. 2 WIRE
B & S Gauge
For use when distance from charger to battery is 130 to 200 feet.

1. Remember the size of wire is of extreme importance. The above wire size must be used for the various distances. The guarantee is void unless the size wire recommended is used.

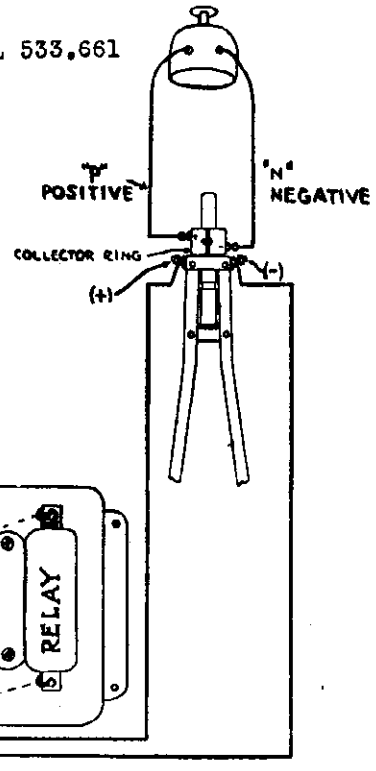
CAUTION: Do not under any circumstances use lamp cord or other small wire as it will seriously affect the operation and life of the charger. Use only insulated weather-proof copper wire in the sizes shown above.

2. LOCATION OF BATTERY AND INSTRUMENT PANEL

The battery should be located as closely as possible to the radio. If it cannot be placed next to the radio, place it in the cellar or basement directly below. The instrument panel should then be placed near the battery.

3. CONNECTING LEAD-IN WIRES TO INSTRUMENT PANEL

MODEL 533.661



The two lead-in wires from generator should be connected to the instrument panel as shown in the diagram on right. The wire connected to the positive terminal on the upper support plate, should be connected to the right hand instrument panel terminal marked **"A" Gen.** The negative wire should be connected to the left hand terminal marked "F" GEN. — BAT.

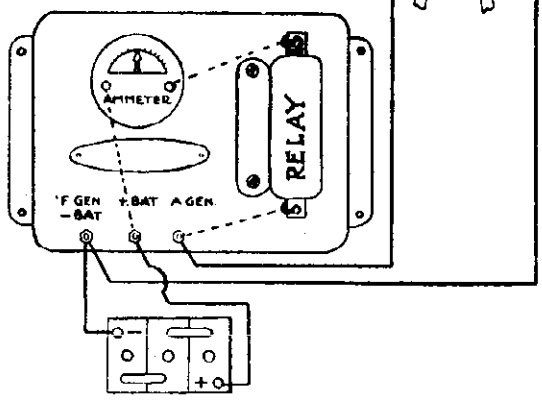
In connecting the wires to the terminals, clean the insulation thoroughly from the end of the wire and make a loop of the end.

CAUTION: Do not attempt to bend the wire about the instrument panel terminal as you may crack the insulating washers.

To make good electrical contact, it is necessary to scrape the bare copper wire with a knife or file at the loop where contact is made.

4. CONNECTING BATTERY WIRES TO INSTRUMENT PANEL

Using No. 6 wire, connect the battery to the instrument panel. The positive battery terminal is connected to the middle instrument panel terminal marked **"+ BAT."** The negative battery post is connected to the left-hand instrument panel terminal marked "F" GEN. — BAT.



Battery clips are provided for connecting wire to the battery.

NOTE: If battery terminals are not plainly marked as to which is positive or negative they can be determined by the following test:

Connect a short wire to the one battery terminal. Connect another short wire to the other battery terminal. Hold the free end of both of these wires about ½ inch apart in a glass of salt water. A violent bubbling will be noticed about the **NEGATIVE** wire.

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5. CONNECTING RADIO WIRES TO BATTERIES

If it is necessary to use additional wire to connect the radio to the batteries, use large size wire (No. 4 or No. 6). Be sure however, that the radio wires are connected directly to the battery posts.

Do not clip the radio wires on top of the charger battery clips, for this may prove harmful to the radio. Instead, be sure that the raido clips are connected directly to the battery post.

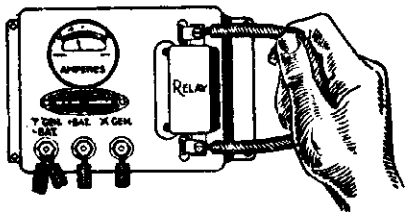
6. CONNECTING LIGHT WIRES

To connect wires for lights, connect them directly to the battery terminals or else to the two terminals on instrument panel marked ("F GEN. — BAT.") and (+ BAT.). The main light wire should be No. 8 size.

CAUTION: Be sure to use 30 ampere fuses in main light wire.

Installation Recheck

To determine if the charger is properly wired, and also to properly polarize the generator in case the wires have been reversed, it is advisable to perform the installation re-check. To perform this re-check, first stop the propeller. Then being sure that the brake has been released, take a short piece of copper wire or a pair of pliers and touch to top and bottom terminals of the relay as shown in the illustration on the right.



This "shorts" the relay, making the generator act as a motor forcing it to revolve the propeller. When doing this, carefully observe the ammeter, for it should show a discharge of approximately 4 to 6 amperes. If this occurs, it is a postive check of the correctness of the hook-up.

.If on shorting the relay, the ammeter needle should show a full deflection of the ammeter scale, it definitely indicates a short circuit somewhere in the wiring.

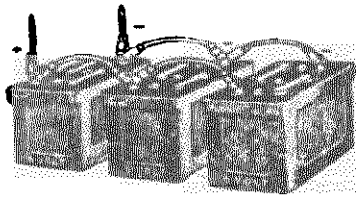
If when the re-check is performed the propeller does not revolve, and the ammeter stays at "0," then there is an open circuit, and somewhere there is a break in the wiring.

Whenever any change in wiring has been done, it is always advisable to perform this installation re-check, for should the wires be reversed the generator will be in opposite polarity with the battery. This can be corrected by the re-check and the generator will be properly polarized. This should be done particularly when there is a furious chattering of the relay, and rapid vibration of the ammeter needle.

Batteries

A great deal of the success of a wind-electric installation depends upon the size and type of battery used to store the electric energy developed by the generator. For this heavy duty 6-volt charger we recommend a radio type battery of at least 200 ampere hour capacity. If this is not available, use two smaller radio type batteries connected in parallel. (This increases capacity but allows the voltage to remain the same.) Note illustration.

Three 6-Volt Batteries—Parallel Connection

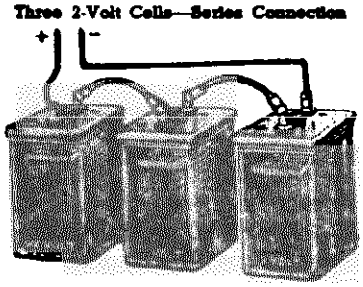


A large size battery is very important for two reasons:

1. **A large capacity battery is necessary to absorb the high charging current.**
2. **This same large capacity provides a large store of energy to carry the electrical load during periods of low wind velocity.**

The ideal type of battery is three glass jar 2-volt cells known as "Farm Lighting Type Battery," each cell to be of 200 ampere hour capacity. These three 2-volt cells should be connected in series for a 6-volt battery supply.

Three 2-Volt Cells—Series Connection



It is not desirable to use automotive batteries as their plate construction is entirely different from that of the radio type battery. The type battery needed for wind electric use is one with a large storage capacity and capable of delivering a comparatively small current (10 to 15 amperes) over a long period of time. You will realize the best results from your charger by utilizing a radio or lighting type of battery.

SEARS, ROEBUCK & CO.

SERVICE

1. PROPER LOCATION

It is absolutely necessary that the charger be located in such a position that it will obtain the full sweep of the wind from all directions. Unless your charger is so located it will be impossible for it to operate properly. The majority of cases of faulty operation are due to this cause. The first step, however, is to see that the charger is properly located, and we suggest that you check the installation against the instructions on Page 2.

REMEMBER, THE CHARGER SHOULD BE 15 FEET HIGHER THAN WIND OBSTRUCTIONS WITHIN 400 FEET DISTANCE.

Should your installation be too low, an easy method of increasing the height is shown on Page 4, Figure 4, through the use of an extension 1¼" pipe.

2. NO CHARGING CURRENT

If the generator refuses to charge at all and the relay does not close, it is probable that there is an open or short circuit present. Immediately perform the installation recheck as described on Page 9. If the ammeter shows a full deflection on discharge, it indicates that there is a short circuit. If the ammeter stays at zero and the propeller does not move, it is an open circuit. (If you are certain there is no open or short circuit, the difficulty may be due to a damaged armature.)

3. LOW CHARGING RATE

Low charging rate may be the result of worn generator brushes. To determine the condition of the brushes, remove the generator cover band found on the front of the generator. After the cover band is removed the brushes can be easily seen and the extent of wear can be determined.

If the ammeter indicates a small charge of never more than 8 or 10 amperes, first observe the charging rate when the wind velocity is high enough to force the governor blades into governing position. If at that time the charging rate is still much less than 15 amperes, there is something wrong with the generator. If the generator is suspected, it can be removed and tested at a reliable repair shop.

However, if the governing blades are forced into governing position, and the charging rate reaches 15 amperes or more, the generator and other parts are functioning properly. If the battery is not being fully charged, it is probably due to the charger being installed too low. We would suggest that you refer to Page 4, Figure 4, where you will find described an easy method of increasing the height of the charger.

4. WHAT CURRENT THE GENERATOR SHOULD PRODUCE

Revolutions per minute	Amperes	
270	0.1	FOR 533.661 only
350	5	
440	10	
570	15	
700	20	
900	25	

Wind Velocity (Mi. Per Hr.)	Amperes
6	0.1
8	4
10	7
12	11
14	14
16	18
18	22
20	25

5. GENERATOR BRUSHES

This is a two-brush generator—both stationary. This eliminates any brush adjustment.

CAUTION:

Never allow the generator to operate without a battery connected. The generator wil become badly over-heated and will require rewinding of the armature.

SEARS, ROEBUCK & CO.

6. RADIO INTERFERENCE

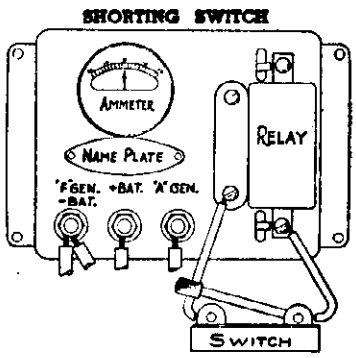
Be sure that the tower and radio are properly grounded. We recommend as an ideal ground a pipe or rod driven 6 or 7 feet into the ground and connected to a bolt on tower with a No. 4 copper wire. It is advisable that the wire connected to the grounding pipe be soldered as a loose connection will oftentimes cause radio interference.

The commutator on the generator should be clean, as a dirty commutator will cause arcing which results in radio interference. Clean the commutator with a cloth soaked in gasoline and then brighten the segments with No. 00 sandpaper.

A .5 MFD condenser connected to the third brush and to the ground will also eliminate radio interference.

In the rear end plate of the generator there is installed a noise eliminator. First check to see if this is in the proper position. The center of the noise eliminator should ride against the end of the armature shaft. Its purpose is to ground the armature to the frame of the generator.

Radio interference sometimes cannot be completely eliminated on the short wave bands by the regular condenser. However, by using a single pole, single throw switch (Shown in the accompanying diagram) the generator can be short circuited and current will not be generated. This will eliminate radio interference.



This switch may also be used to eliminate excessive radio interference on standard broadcast bands. (It is not advisable to use this switch for long periods of time in high wind velocities; instead stop propeller).

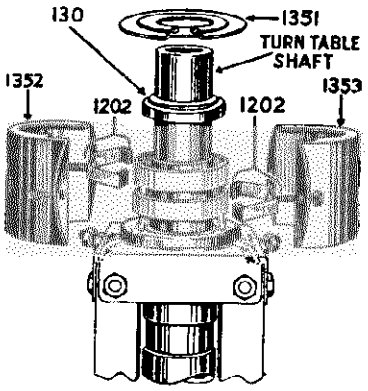
7. OILING AND GREASING CHARGER

Generator—

The generator is equipped with double grease sealed ball bearings. It will be unnecessary to oil the generator bearings for the entire life of the generator.

Collector Ring Bearing and Turntable Shaft—

You may find it necessary to grease the turntable shaft and collector ring bearing. This can be done by opening the collector ring cup (The accompanying illustration will show how this is done). The shaft can then be lifted two to three inches above the cup and a light cup grease applied to the shaft. This will allow the charger to swing freely in any change of wind direction.



COLLECTOR RING ASSEMBLY

Governor—

It is advisable to place a few drops of light oil on the pin joints of the governor flaps. This will allow the flaps to operate freely.

8. VIBRATION

If the charger vibrates badly, first check the propeller track as described. This is most important as vibration will invariably result when the propeller is out of track.

Excessive vibration may be caused by an out-of-balance propeller. This can be determined and corrected by placing it at its exact center on a knife's edge. If out of balance, it can be corrected by placing a small wood screw on the flat side of the propeller at the point where balance is restored.

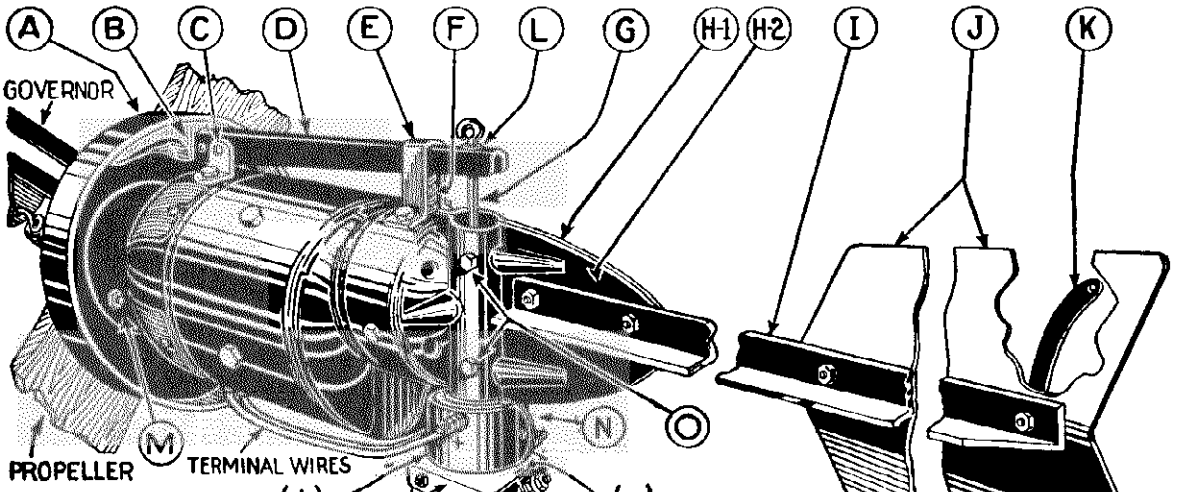
An out-of-balance governor will also cause considerable vibration. To determine whether or not the governor is at fault, remove it and allow the charger to operate without it. If the governor is found to be the cause of vibration, its balance can be restored by inserting or removing small flat washers on the bolts on the governor frame.

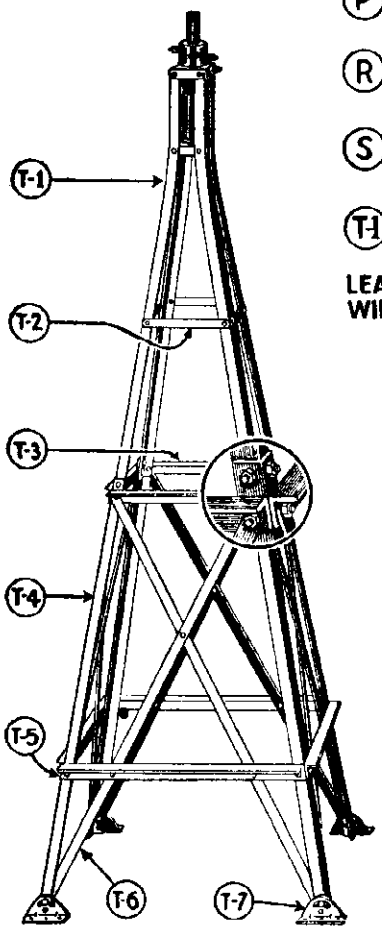
9. BATTERIES

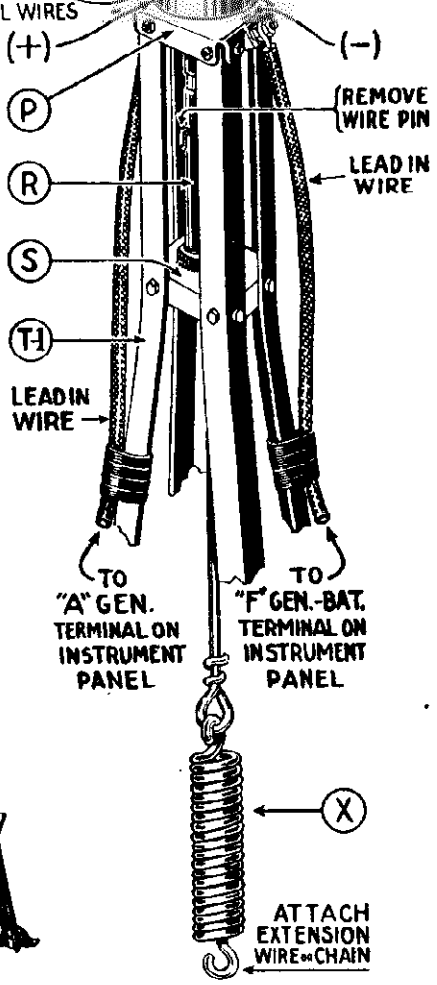
The storage batteries will require only the usual attention given an automobile battery. Check the water level regularly and add sufficient distilled water or rain water to keep the battery plates covered ½ inch. Keep the batteries clean and the terminals well greased with a light cup grease or vaseline to prevent corrosion. See that the battery connections are tight.

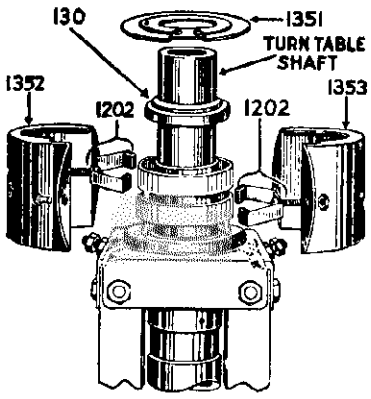
SEARS, ROEBUCK & CO.

MODELS 533.661
533.692

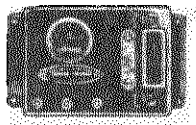








Collector Ring Assembly



Instrument Panel

Silvertone Wincharger

A. Brake Drum
B. Brake Shoe
C. Pivot Bracket
D. Brake Lever
E. Spring Housing
F. Brake Lever Spring
G. Brake Rod
H-1 Generator Bracket (Right)
H-2 Generator Bracket (Left)

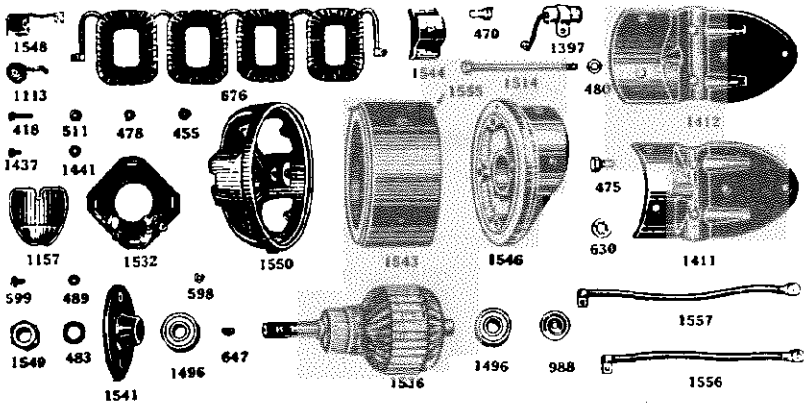
I. Vane Angle
J. Vane
K. Vane Brace
L. Brake Rod Washer
M. Propeller Hub
N. Collector Ring Cup
O. Turntable Shaft Bolts
P. Upper Support Plate
R. 1¼" Mounting Pipe

S. Lower Support Plate
X. Brake Rod Spring
T-1 Stub Tower Leg
T-2 Stub Tower Brace
T-3 Upper Extension Tower Brace
T-4 Extension Tower Leg
T-5 Lower Extension Tower Brace
T-6 Long Cross Brace
T-7 Tower Foot

PARTS LIST

All Prices Are Subject to Change Without Notice

Letter Illus.	No. Part	PART NAME	List Price Each
		PROPELLER	
	5331581	Propeller (7½-foot)	$4.80
	5331541	Hub	.45
		GOVERNOR	
	5331410	Governor (with Mounting Bolts) (31-inch)	4.00
		INSTRUMENT PANEL	
	5331398	Instrument Panel Completely Wired (Heavy Duty)	2.50
	5331422	Ammeter	.70
	5331979	Relay (6-volt Heavy Duty)	1.50
	5331980	Relay (12-volt)	1.50
	5331420	Relay (2-volt)	.85
		BRAKE ASSEMBLY	
	5331537	Brake Shoe, Lever and Pivot Brackets (assembled)	.70
A	5331536	Brake Drum	.80
B	5331530	Brake Shoe	.35
C	5331540	Pivot Bracket (each)	.35
D	5331390	Brake Lever (without shoe)	.10
E	533114	Spring Housing	.10
F	533185	Brake Lever Spring	.10
G	533107	Brake Rod	.35
K	533908	Brake Rod Spring	.10
		COLLECTOR RING ASSEMBLY	
	5331406	Collector Ring Assembly complete (includes Mounting Pipe, Support Plates, Cup, but less Turntable Shaft)	2.00
N	533671	Collector Ring Cup Complete with Brushes	.85
	5331208	Collector Ring Brushes (set of two) (Can be used on all earlier models)	.32
	533136	Bearing for Collector Ring	.30
	5331352	Collector Ring Cup Half, Positive, No Brushes	.15
	5331353	Collector Ring Cup Half, Negative, No Brushes	.15
	5331351	Top for Collector Ring Cup	.06
	533670	Insulating Washers (set of 4) for both Collector Ring Brushes	.08
	5331499	Terminal Bolt and Nuts for Collector Ring Cup	.03
		GENERATOR MOUNTINGS	
H-2	5331411	Generator Mounting Bracket (left)	.30
H-1	5331412	Generator Mounting Bracket (right)	.30
O	533441	Bolts and Nuts for Turntable Shaft Mounting (2 required per unit)	.03
	5331408	Turntable Shaft	.35
		VANE	
J	5331257	Vane	.70
I	5331275	Vane Angle	.50
	5331315	Vane Brace	.17
		SPECIAL MOUNTINGS	
	5331501	5-foot Stub (fits Sectional Tower) (with Pipe Adapter)	6.00
	5331226	10-foot Section (Guy Wire Included)	5.50
	5331502	20-foot Section (Guy Wire Included)	10.00
	5331252	Windmill Adapter (Mounts Charger on Top of Tower)	8.50
	5331076	Windmill Sidemount (Mounts Charger on Side of Tower)	10.00
	5331231	Pipe Adapter complete with Bolts	.50
		TOWER	
	533672	5-foot Tower Complete with Collector Ring Assembly	4.50
	533827	5-foot Tower Extension (To make a 10-ft. Tower)	5.40
T-1	5331371	Tower Leg	.32
T-3	533134	Tower Brace	.85
R, P, S	533182	1¼-inch Mounting Pipe and Both Support Plates (Includes Collector Rings—No Cup)	1.25
P, R	5331517	1¼-inch Mounting Pipe and Upper Support Plate Only—No Cup—For "No Tower" Mounting	1.18
P	5331355	Upper Support Plate	.15
S	5331356	Lower Support Plate	.15
T-2	533828	Upper Extension Tower Brace	.11
T-4	533830	Extension Tower Leg	.32
T-5	533829	Lower Extension Tower Brace	.17
T-6	533831	Long Cross Brace	.20
T-7	5331002	Tower Foot	.10
	533673	Bag of Bolts for 5-foot Tower	$ .45
	533674	Bag of Bolts for 5-foot Extension	.50
	533463	¼"x½" Bolts, Nuts, and Lock Washers for Tower	doz. .16
	533467	5/16"x¾" Bolts, Nuts, and Lock Washers for Tower Foot	doz. .20
	533675	Bag Bolts for Assembling Charger and Tower	.80



NUMBERS OF GENERATOR PARTS ILLUSTRATED ABOVE HAVE PREFIX OF "583" OMITTED.

GENERATOR PARTS

5331552	Generator complete	$0.00
	Frame Assembly	
533416	Brush Plate Screw (8-32x1)	.03
533455	Brush Plate Nut (8-32)	.01
533470	Pole Shoe Bolt—⅜" x 1¼"	.03
533475	Generator Mounting Bracket Bolt—⅜" x ⅝"	.03
533479	Brush Plate Lock Washer	.01
533480	Generator Thru Bolt Lock Washer	.03
533511	Brush Plate Flat Washer	.01
533630	Generator Mounting Bracket Lock Washer ⅜" over lock	.01
533670	Field Coils	6.00
5331411	Generator Mounting Bracket L. H.	.30
5331412	Generator Mounting Bracket R. H.	.30
5331514	Generator Thru Bolt—5/16" x 6⅛"	.04
5331543	Field Frame	4.25
5331544	Pole Shoe	.80
5331555	Positive Lead Wire	.20
5331557	Negative Lead Wire	.20
	Front End Plate Assembly	
533484	Brush Lower Lock Washer	.01
533486	Brush Lower Flat Washer	.01
533680	Brush Lower Screw (10-32x⅝)	.01
5331487	Brush Terminal Screw (8-32x⅝)	.01
5331507	Brush Cover	.15
5331527	Condenser (1mfd)	.45
5331532	Brush Holder Assembly	1.00
5331441	Brush Terminal Lock Washer	.01
5331113	Brush Spring	.11
5331542	Brass	.40
5331550	Front End Casting	2.85
	Armature Assembly	
533483	Armature Shaft Lock Washer	.07
533647	Woodruff Key No. 5 (⅛x⅝)	.07
533908	Noise Eliminator	.09
5331498	Bearing (203YT)	2.70
5331536	Armature Assembly Complete	15.00
5331541	Propeller Hub	.35
5331549	Armature Shaft Nut	.15
5331556	Armature Rewinding (old armature must be returned or add $8.00)	7.00
	Rear End Plate Assembly	
5331548	Rear End Casting	2.40

SEARS, ROEBUCK & CO.

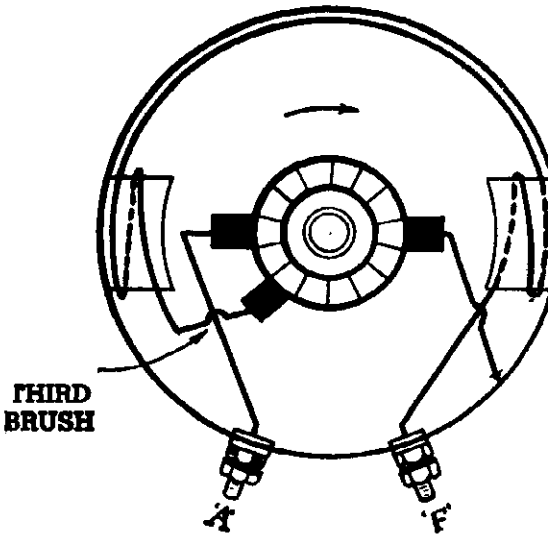
4. WHAT CURRENT THE GENERATOR SHOULD PRODUCE

The following Performance Chart is to be used in checking the generator:

Revolutions Per Minute	Amperes
330	1
370	2
440	4
600	8
700	10
880	12
1000	14
1100	17

Wind Velocity, Miles Per Hr.	Amperes
7½	1
10	4
12	7
16	12
20	17

FRONT END VIEW



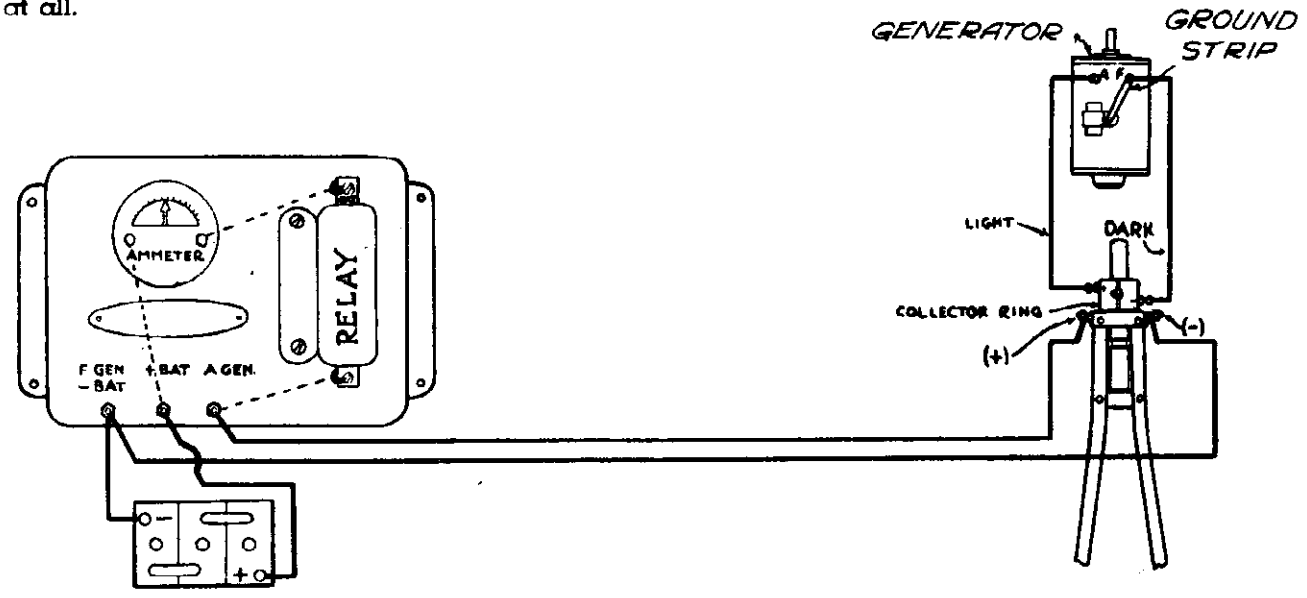
5. GENERATOR BRUSH ADJUSTMENT

The generator has a third brush which controls the charging rate. It also protects the generator from overheating during high speeds.

(The proper position of the third brush is one commutator segment away from the left-hand stationary brush when looking at the front of the generator.) NOTE THE ILLUSTRATION AT THE RIGHT.

The third brush is stationary and cannot be moved.

The chief reason for a damaged armature is allowing the generator to operate without a batter nected. The armature will become badly burned and will show only a few amperes charge or ever at all.



7. CONNECTING GENERATOR WIRES TO COLLECTOR RING COVER

The generator has two terminals--one marked "A" which is positive, the other marked "F" which is negative. To the POSITIVE terminal is connected a LIGHT wire. Connect this LIGHT wire to the UPPER terminal (+) on collector ring cover. To the NEGATIVE generator terminal is connected a DARK wire. Connect this to the LOWER collector ring cover terminal (-).

PARTS LIST

All Prices Are Subject to Change Without Notice

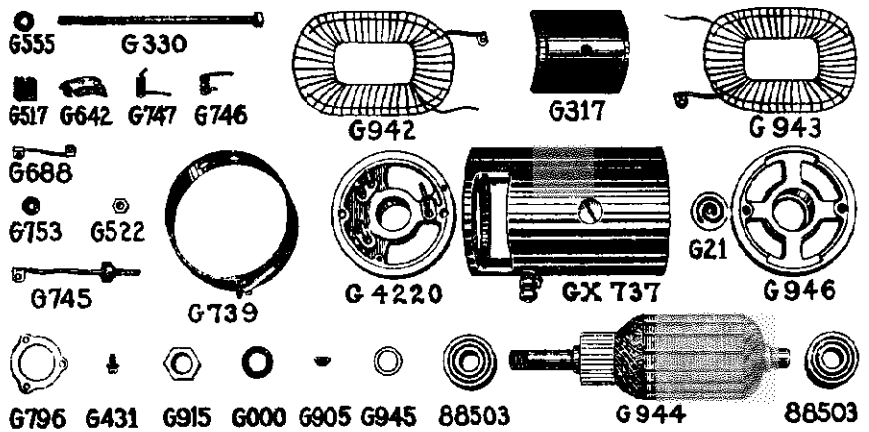
Letter Illus.	No. Part	PART NAME	List Price Each
		PROPELLER	
	533649	Propeller (5-foot)	$5.00
Y	5331413	Hub (Metal Part on Generator to Which Propeller Bolts)	.20
		GOVERNOR	
	533584	Governor (with Mounting Bolts)	2.00
		INSTRUMENT PANEL	
	533829	Instrument Panel Completely Wired	2.00
	533876	Ammeter	.55
	5331468	Relay (6-volt)	.75
	5331376	Relay (6-volt Heavy Duty)	1.00
	5331369	Relay (12-volt)	.75
	5331466	Relay (2-volt)	.75
		BRAKE ASSEMBLY	
	5331417	Brake Shoe, Lever and Pivot Brackets (assembled)	.40
A	533116	Brake Drum	.50
B	533851	Brake Shoe	.25
C	533106	Pivot Bracket (each)	.05
D	533102	Brake Lever (without shoe)	.10
E	533114	Spring Retaining	.10
F	533105	Brake Lever Spring	.10
G	533107	Brake Rod	.03
X	533099	Brake Rod Spring	.10
		COLLECTOR RING ASSEMBLY	
	5331408	Collector Ring Assembly complete (includes Mounting Pipe, Support Plates, Cup, but less Turntable Shaft)	2.00
N	533871	Collector Ring Cup Complete with Brushes	.65
	5331202	Collector Ring Brushes (set of two)	.22
	533130	Bearing for Collector Ring	.20
	5331352	Collector Ring Cup Half, Positive, No Brushes	.15
	5331353	Collector Ring Cup Half, Negative, No Brushes	.15
	5331351	Top for Collector Ring Cup	.06
	533870	Insulating Washers (set of 4) for both Collector Ring Brushes	.06
	5331433	Terminal Bolt and Nuts for Collector Ring Cup	.03
		GENERATOR MOUNTINGS	
H-2	5331411	Generator Mounting Bracket (left)	.30
H-1	5331412	Generator Mounting Bracket (right)	.30
O	533441	Bolts and Nuts for Turntable Shaft Mounting (2 required per unit)	.03
	5331408	Turntable Shaft	.25
		MISCELLANEOUS	
M	5331415	Generator Terminal Wires (set of two)	.20
L	5331120	Condenser	.25
		TOWER	
	533872	5-foot Tower Complete with Collector Ring Assembly	4.50
	533827	5-foot Tower Extension (To make a 10-ft. Tower)	3.40
	533875	Bag Bolts for Assembling Charger and Tower	.65
T-1	5331371	Tower Leg	.32
T-2	533124	Tower Brace	.05
R, P, S	533188	1¼-inch Mounting Pipe and Both Support Plates (includes Collector Rings—No Cup)	1.35
P, R	5331517	1¼-inch Mounting Pipe and Upper Support Plate Only—No Cup—For "No Tower" Mounting	1.10
P	5331355	Upper Support Plate	.15
S	5331356	Lower Support Plate	.15
T-3	533828	Upper Extension Tower Brace	.11
T-4	533830	Extension Tower Leg	.32
T-5	533829	Lower Extension Tower Brace	.17
T-6	533831	Long Cross Brace	.20
T-7	5331382	Tower Foot	.10
	533873	Bag of Bolts for 5-foot Tower	.45
	533874	Bag of Bolts for 5-foot Extension	.50
	533483	¼"x½" Bolts, Nuts, and Lock Washers for Tower ..... doz.	.18
	533487	5/16"x¾" Bolts, Nuts, and Lock Washers for Tower Feet ..... doz.	.28
		VANE	
J	533585	Vane	.70
I	533115	Vane Angle	.28
K	533873	Vane Brace (each)	.04
	533888	Vane Brace Set	.17
V	533106	Vane Bushing (2 required per unit)	.02
	5331515	Vane Brace Set (new style)	.17

SPECIAL MOUNTINGS

5331501	5-foot Stub (fits Sectional Tower) (with Pipe Adapter)	5.00
5331226	10-foot Section (Guy Wire included)	5.50
5331502	20-foot Section (Guy Wire included)	10.00
5331232	Windmill Adapter (Mounts Charger on Top of Tower)	8.50
5331078	Windmill Sidemount (Mounts Charger on Side of Tower)	10.00
5331231	Pipe Adapter complete with Bolts	.50

GENERATOR PARTS LIST MODEL

5331102414 Generator complete 12.00



NUMBERS OF GENERATOR PARTS ILLUSTRATED ABOVE HAVE PREFIX OF "583" OMITTED.

Frame Assembly

583GX737	Field Frame (Shell Only)	8.00
583G943	Field Coil R. H. to "F" Terminal	1.40
583G942	Field Coil L. H. to Third Brush	1.40
583G340	Commutator Cover Band	.20
583G875	Pole Shoe Screw	.07
583G330	Thru Bolt	.20
583G585	Thru Bolt Washer	.02

Commutator End Plate Assembly

583G517	Generator Brush	.10
583G642	Brush Holder	.15
583G747	Brush Spring, Third and Ground	.07
583G746	Brush Spring, Insulated, Positive	.07
583G4210	Commutator End Plate and Pin Assembly	1.60
583G745	Terminal Stud and Lead Assembly	.14
583G522	Terminal Stud Nut	.07
583G753	Terminal Insulation Washer	.03
583G431	Retainer Plate Screw and Washer	.02
583G796	Bearing Retainer Plate	.07
583G688	Brush Ground Lead	.14

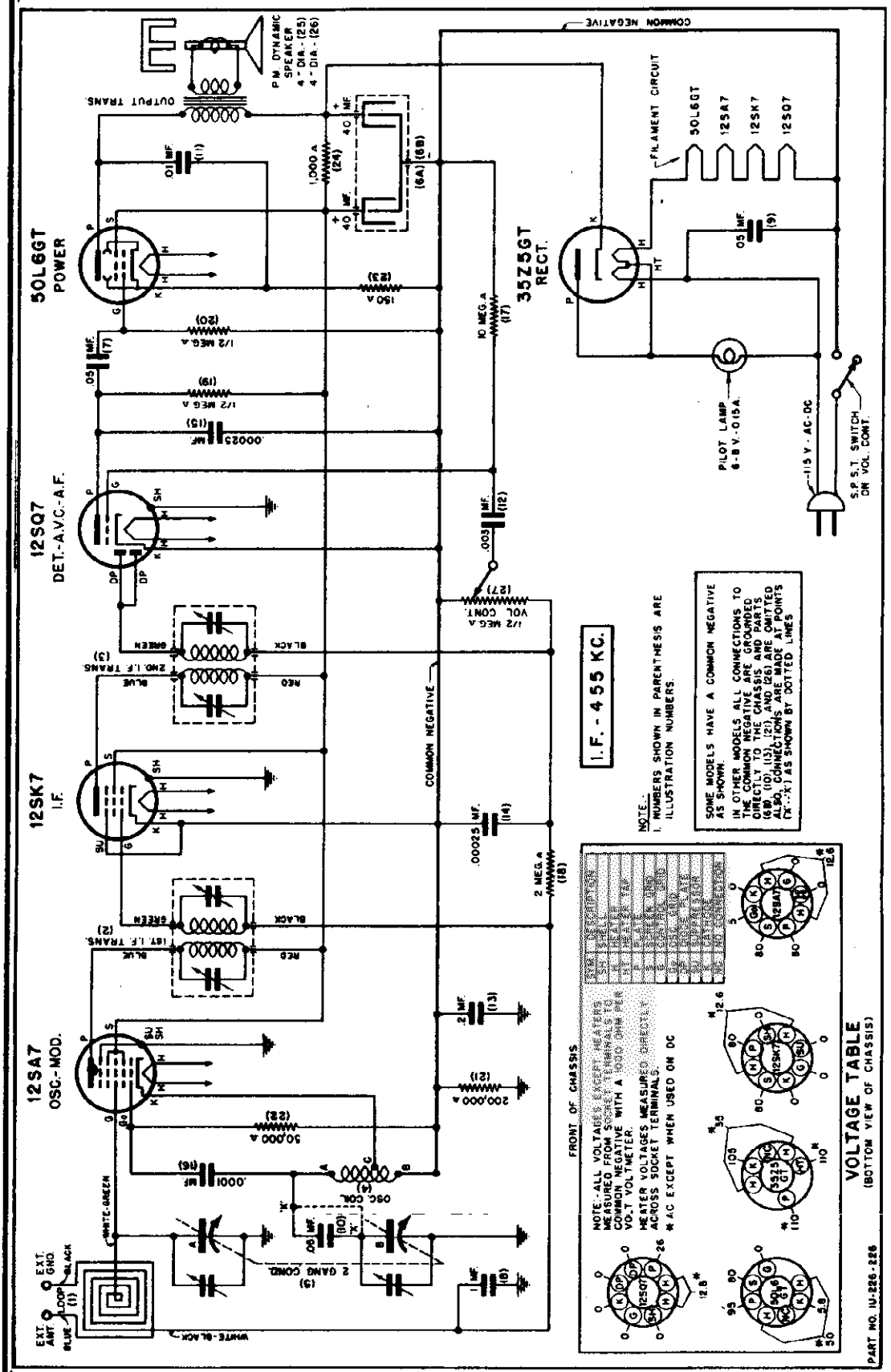
Armature Assembly

583G944	Armature (Return Old Armature) (add $1.50 if Armature Not Returned)	3.00
583G915	Armature Shaft Nut	.14
583G945	Space Washer	.07
583G000	Shaft Lock Washer	.07
583G905	Woodruff Key No. 5	.07
583G21	Noise Eliminator	.03
58288503	Ball Bearing (same for Either End)	2.70
5331413	Hub—Propeller Bolts on This Piece	.20

Rear End Plate Assembly

583G946	Rear End Plate	1.50

SENTINEL RADIO CORP.



VOLTAGE RATING.

THIS RADIO IS DESIGNED FOR USE ON EITHER 110-120 VOLTS 50-60 CYCLES ALTERNATING CURRENT (AC) OR 110-120 VOLTS DIRECT CURRENT (DC)—unless the marking on the white paper license notice which will be found attached either to bottom or inside the cabinet is marked differently, in which case the radio must only be used on the type of current shown on this notice.

GROUND

When a regular aerial is used, best results will be obtained with a ground attached to the black lead.

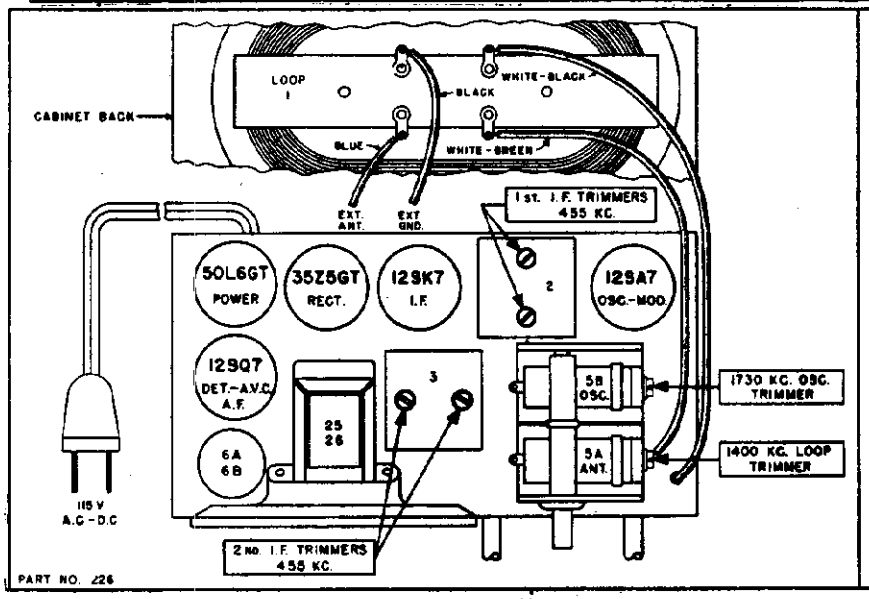
WARNING—Do not attach a ground direct to the radio chassis—**ANY** EXTERNAL GROUND CONNECTION TO ANY **METAL PART** OF THE CHASSIS WILL CAUSE A SHORT AND POSSIBLE DAMAGE.

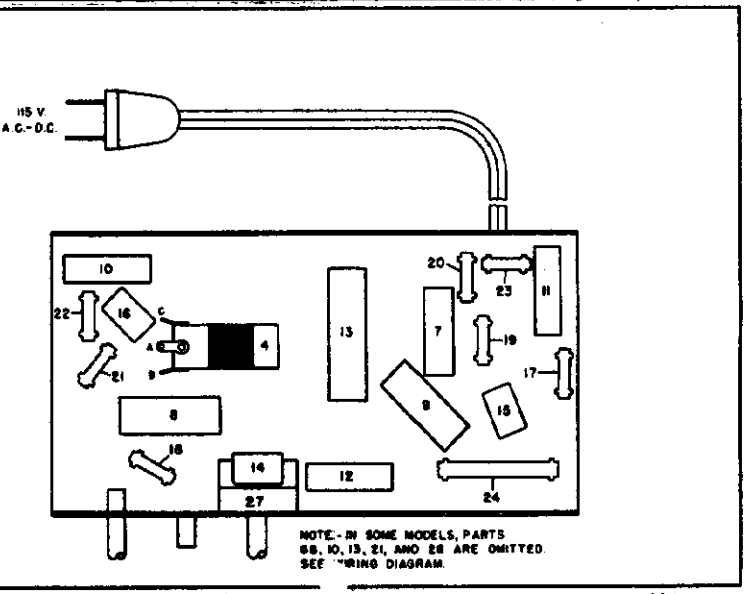
ALIGNMENT PROCEDURE

For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third. IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA IN THE SAME POSITION IT WILL BE IN WHEN THE SET IS IN THE CABINET.

When adjusting 1730 kilocycle oscillator trimmer, and 1400 kilocycle antenna trimmer, do not connect test oscillator to loop. Couple test oscillator to receiver loop by: (a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator. (b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

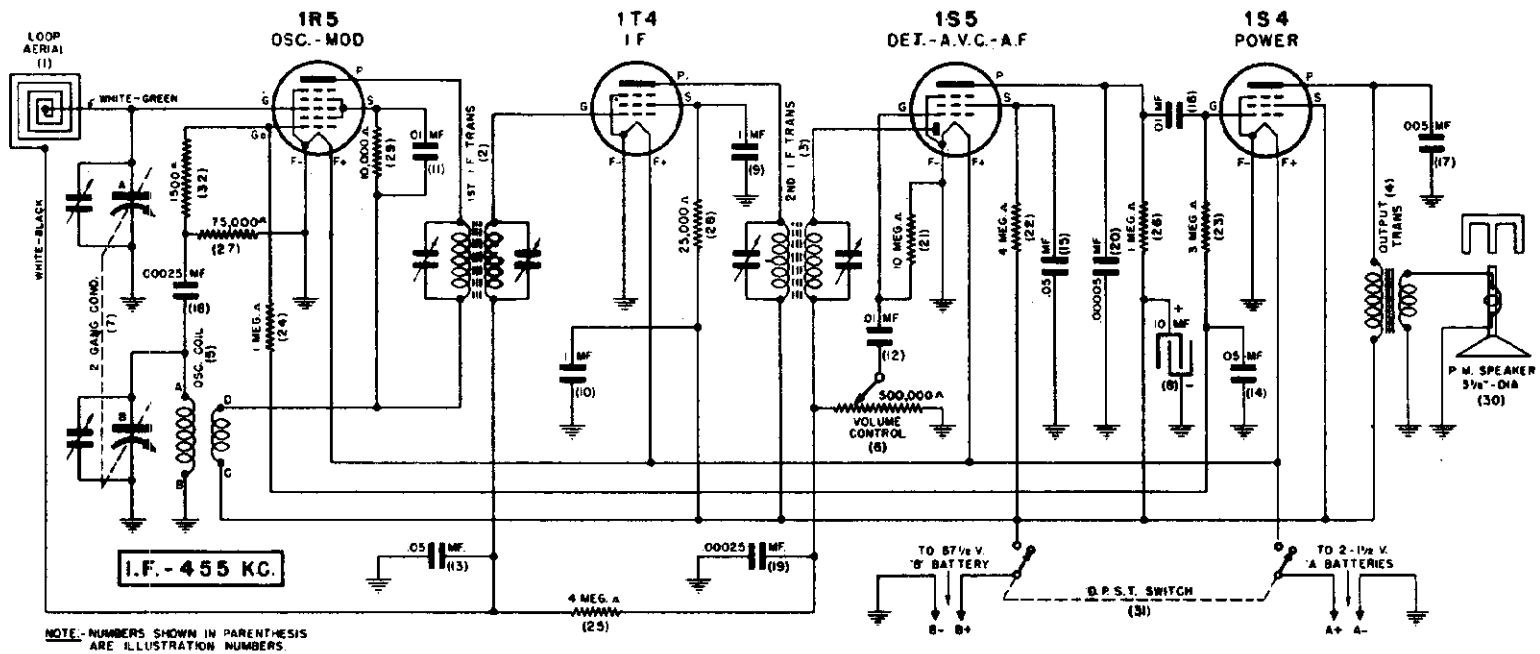
Place band switch for operation on:	Set receiver dial to:	Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below:
I. F. alignment use any band position	Any point where no interfering signal is received	Exactly 455 K.C.	0.2 Mfd. condenser	High side to grid of 12SA7 tube. Low side to frame of gang condenser through .01 Mfd. condenser.	Adjust each of the second I.F. transformer trimmers for maximum output, then adjust each of the first I.F. transformer trimmers for maximum output.
1730 to 540 K.C. Band	1 Exactly 1730 K.C.	Exactly 1730 K.C.	None	Use Small Loop to couple test oscillator to receiver loop. Low side to frame of gang condenser through .01 Mfd. condenser.	Adjust 1730 K.C. oscillator trimmer for maximum output.
	2 Approx. 1400 K.C.	Approx. 1400 K.C.	None	Use Small Loop to couple test oscillator to receiver loop. Low side to frame of gang condenser through .01 Mfd. condenser.	While rocking gang condenser adjust 1400 K.C. loop trimmer for maximum output.





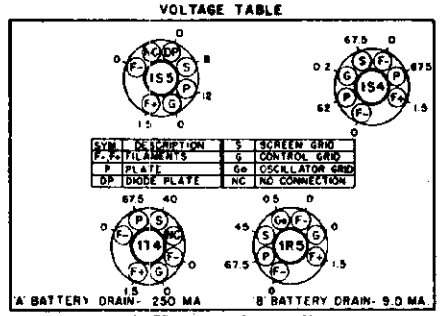
Illus. No.	Part No.	Part Name	Description	List Price
1	12520	Coil	Loop Assembly	$1.25
2	11547	Coil	1st I.F. Transformer	.90
3	11376	Coil	2nd I.F. Transformer	.90
4	11387	Coil	Oscillator	.45
5	11378	Condenser	Tuning Two Gang	1.75
6A	11493	Condenser	Tubular Dry Electrolytic 40-40 Mfd. 150 Volt. Used With Chassis Not Having Common Ground	1.00
6B	11494	Condenser	Tubular Dry Electrolytic 40-40 Mfd. 150 Volt. Used With Chassis Having Common Ground	1.10
7	1147	Condenser	Tubular .05 Mfd. 200 Volt	.10
8	1181	Condenser	Tubular .1 Mfd. 200 Volt	.20
9	9452	Condenser	Tubular .05 Mfd. 400 Volt	.18
10	9457	Condenser	Tubular .05 Mfd. 400 Volt—Used Only With Chassis Having Common Ground	.18
11	9456	Condenser	Tubular .01 Mfd. 400 Volt	.17
12	1388	Condenser	Tubular .003 Mfd. 400 Volt	.17
13	12089	Condenser	Tubular .2 Mfd. 400 Volt—Used Only With Chassis Having Common Ground	.26
14	9458	Condenser	Mica .00025 Mfd.	$0.21
15	9458	Condenser	Mica .00025 Mfd.	.21
16	7934	Condenser	Mica .0001 Mfd.	.21
17	4804	Resister	Carbon 10 Megohm 1/3 Watt	.19
18	2705	Resister	Carbon 2 Megohm 1/3 Watt	.19
19	6984	Resister	Carbon 500,000 Ohm 1/3 Watt	.19
20	6984	Resister	Carbon 500,000 Ohm 1/3 Watt	.19
21	2155	Resister	Carbon 200,000 Ohm 1/3 Watt—Used Only With Chassis Having Common Ground	.19
22	6879	Resister	Carbon 50,000 Ohm 1/3 Watt	.19
23	9018	Resister	Carbon 150 Ohm 1/3 Watt	.19
24	4998	Resister	Carbon 1000 Ohm 1 Watt	.21
25	11390	Speaker	P.M. Dynamic 4", Used Only With Chassis Not Having Common Ground	2.70
26	11393	Speaker	P.M. Dynamic 4", Used Only With Chassis Having Common Ground	2.50
27	11389	Vol. Control	With S.P.S.T. Switch	.80
28	11860	Resister	230 Volt Line Cord Extension	1.50
29	11861	Resister	125 Volt Line Cord Extension	1.50

Part No.	Part Name	Description	List Price
11304	Bulb	6-8 Volt .150 Ampere Dial Light No. 47 Bayonet Base	$0.10
11381	Dial Scale	Calibrated Scale	.30
8184	Dial Cord	Dial Drive Cord 12" of No. 18 Lb. Drive Cord	.10
11379	Dial Shaft	Dial Drive Shaft	.12
11985	Dial Pointer	For Dial—Red Enamel edge	.28
11384	Dial Pointer	For Dial	.15
11391	Dial Crystal	For Dial	.22
11733	Knob	Bakelite for Walnut Plastic Cabinet	.10
10207	Knob	Bakelite for Ivory, Blue & Red Plastic Cabinet	.08
268	Cabinet	Walnut Plastic	1.80
266	Cabinet	Ivory Plastic	2.15



NOTE.-NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.

VOLTAGE TABLE



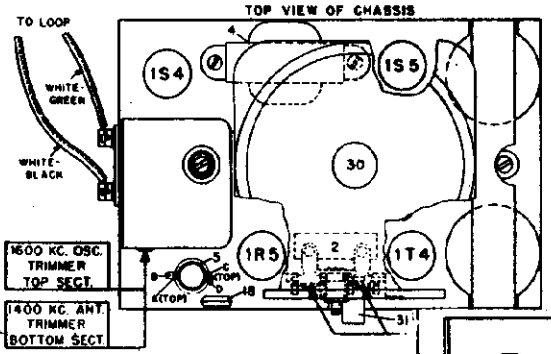
SYM.	DESCRIPTION	S	SCREEN GRID
F-, F+	FILAMENTS	G	CONTROL GRID
P	PLATE	Go	OSCILLATOR GRID
DP	DIODE PLATE	NC	NO CONNECTION

(BOTTOM VIEW OF CHASSIS)

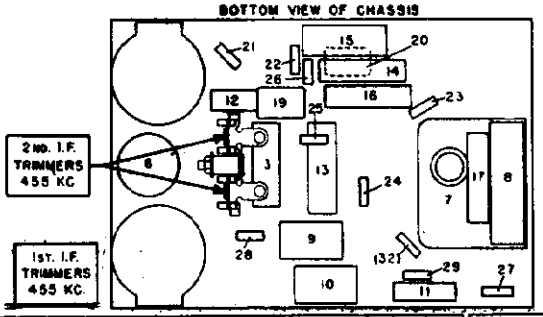
ABOVE VOLTAGES ARE MEASURED FROM SOCKET TERMINALS TO CHASSIS, DIAL AT 1000 KC & NO SIGNAL.

PART NO.-227

TOP VIEW OF CHASSIS



BOTTOM VIEW OF CHASSIS



BATTERY EQUIPMENT MODELS 227 and 233

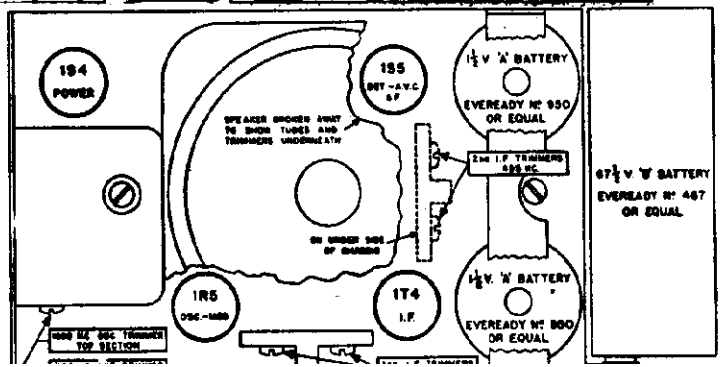
The receiver is designed to use:

Two—1½ volt "A" batteries, such as Eveready No. 950 or equivalent flashlight size cylindrical battery.

One—67½ volt "B" battery, such as Eveready No. 467 or equivalent.

IMPORTANT: THE BATTERIES USED MUST BE OF THE CORRECT VOLTAGE AND SIZE.

DIAGRAM SHOWS CORRECT LOCATION OF BATTERIES



SENTINEL RADIO CORP.

ALIGNMENT PROCEDURE

For alignment procedure read tabulations from left to right. If more than one adjustment is required, make the adjustment marked (1) first, (2) next. IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA AND BATTERIES IN THE SAME POSITION THEY WILL BE IN WHEN THE SET IS IN THE CABINET.

When adjusting 1600 kilocycle oscillator trimmer and 1400 kilocycle antenna trimmer, do not connect test oscillator to loop. Couple test oscillator to receiver loop by: (a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator. (b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

Set receiver dial to:		TEST OSCILLATOR			Refer to parts layout diagram for location of trimmers mentioned below:
		Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	
Any point where no interfering signal is received		Exactly 455 K.C.	0.2 Mfd. condenser	High side to lug on stator of gang condenser to which loop lead is connected.	Adjust each of the second I.F. transformer trimmers for maximum output, then adjust each of the first I.F. transformer trimmers for maximum output.
1	Exactly 1600 K.C.	Exactly 1600 K.C.	None	Use Small Loop to couple test oscillator to receiver loop.	Adjust 1600 K. C. oscillator trimmer for maximum output.
2	Approx. 1400 K.C.	Approx. 1400 K.C.	None	Use Small Loop to couple test oscillator to receiver loop.	While rocking gang condenser adjust 1400 K. C. loop trimmer for maximum output.

CIRCUIT CHANGES IN MODEL 227 CHASSIS

I.F. TRANSFORMER CHANGE:

First production runs of Model 227 used part #12598 first and second I. F. transformer --- these were replaced in later production by part #12902 first and second I. F. transformer. These I.F. transformers are interchangeable, and as performance is somewhat improved with the new type, we are filling all orders for part #12598 I. F. transformers with the new type part #12902.

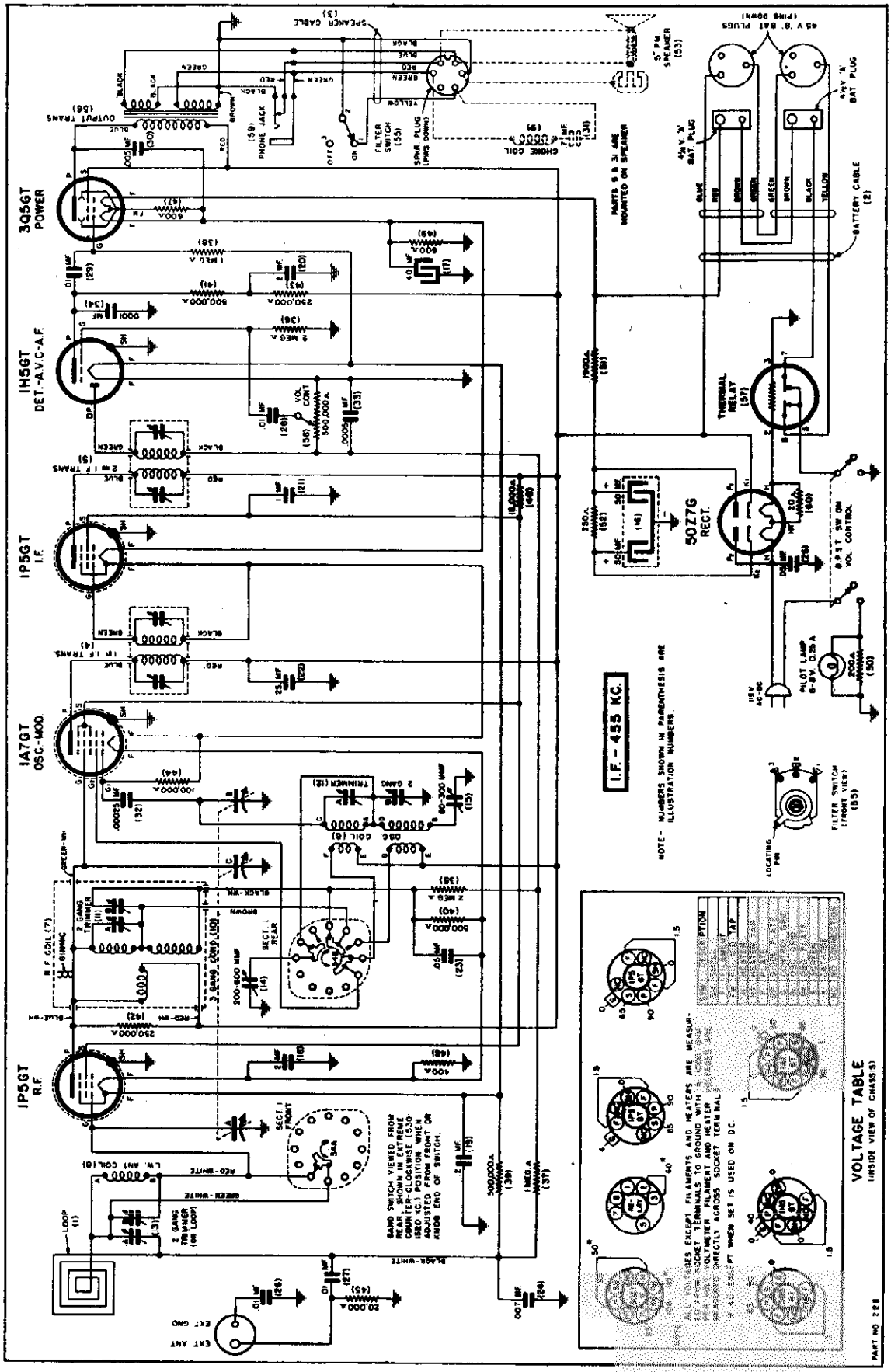
OSCILLATOR COIL CHANGE:

Early production runs used a #12601 oscillator coil. To increase "B" battery life and eliminate self-modulation, this oscillator coil was replaced by part #12906. IN ADDITION A 1500 OHM 1/3 WATT RESISTOR WAS USED IN SERIES WITH THE OSCILLATOR GRID OF THE 1R5 TUBE. As the old and new type oscillator coils are not interchangeable, be sure to use proper coil. ALL CHASSIS HAVING NEW TYPE 12906 OSCILLATOR COIL AND THE 1500 OHM RESISTOR HAVE A LETTER "A" STAMPED ON BACK OF CHASSIS ADJACENT TO THE SERIAL NUMBER.

VOLUME CONTROL CHANGE:

A 500,000 ohm volume control part #12604 was used in early production Model 227 Receivers. This was replaced by part #13014; a two megohm control. As the two megohm control improves sensitivity, we recommend that whenever a 500,000 ohm control part #12604 is replaced that a #13014 two megohm control be used.

SENTINEL RADIO CORP.



VOLTAGE RATING

THIS RADIO IS DESIGNED FOR USE WITH BATTERIES OR ON EITHER 110-120 VOLTS 50-60 CYCLES ALTERNATING CURRENT (AC) OR 110-120 VOLTS DIRECT CURRENT (DC).

IMPORTANT—If hum is high when set is operated on A.C. current, reverse position of set power cord plug in house current socket.

Printed in U.S.A.—S.P.—11-40—2M

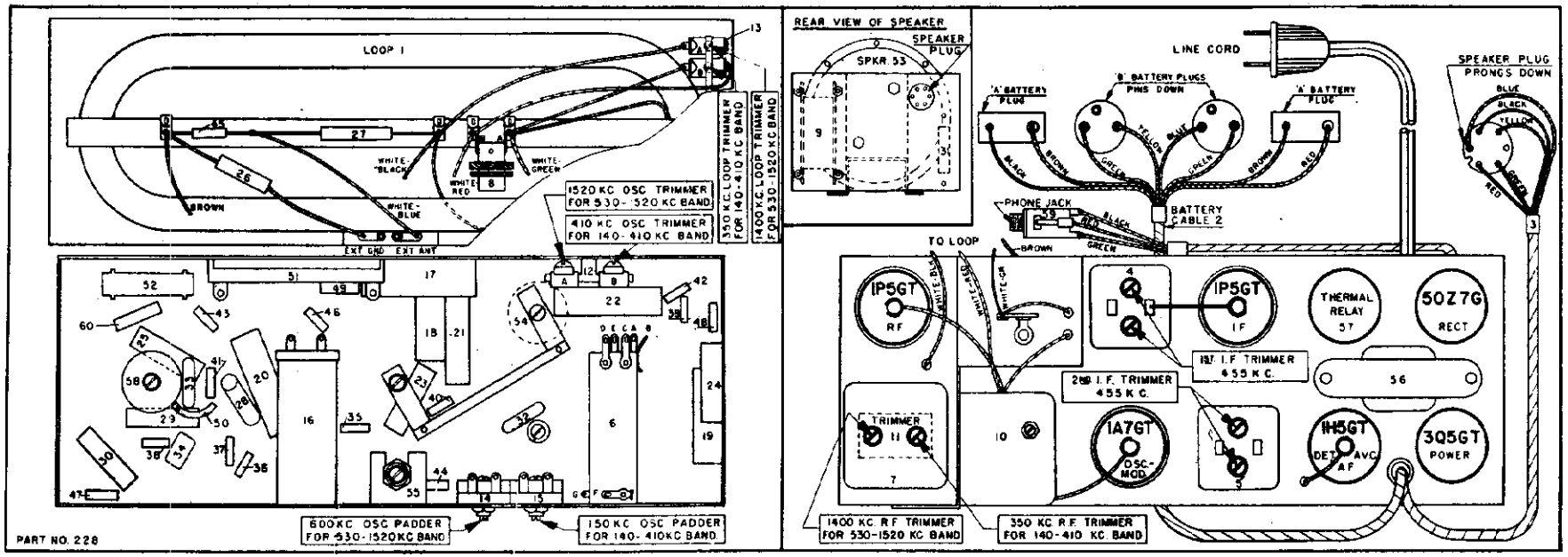
ALIGNMENT PROCEDURE

PART NO. 12296-228

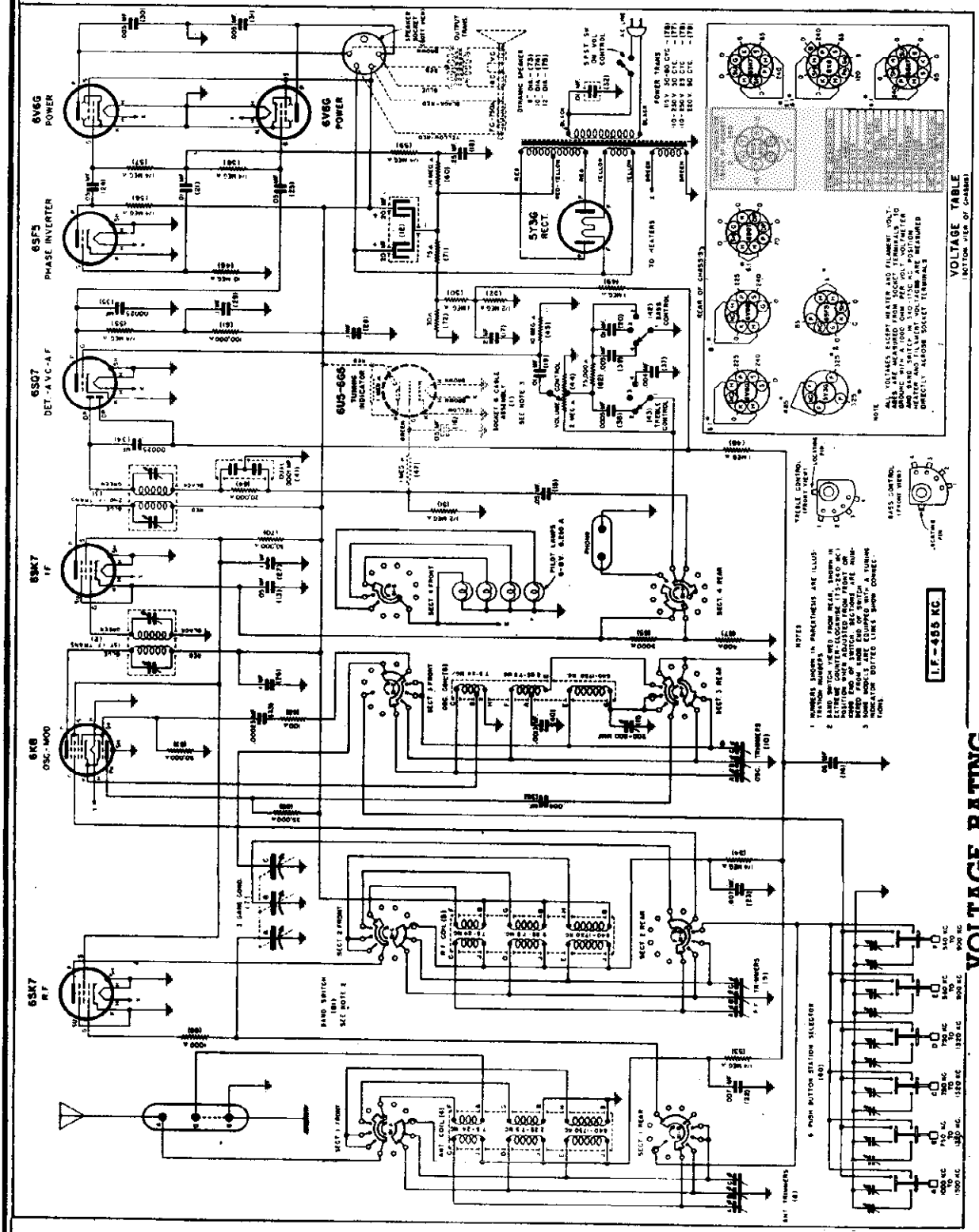
For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third. IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA IN THE SAME POSITION IT WILL BE IN WHEN THE SET IS IN THE CABINET.

When adjusting oscillator R.F. and loop trimmers, do not connect test oscillator to loop. Couple test oscillator to receiver loop by: (a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator. (b) Place test oscillator near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

Place band switch for operation on:	Set receiver dial to:	TEST OSCILLATOR: Adjust test Oscillator frequency to	TEST OSCILLATOR: Use dummy antenna in series with output of test oscillator consisting of:	TEST OSCILLATOR: Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below:
I. F. alignment use any band position	Any point where no interfering signal is received	Exactly 455 K.C.	.02 Mfd. condenser	High side of grid of 1A7G Tube. Do not remove cap.	Adjust each of the second I.F. transformer trimmers for maximum output—then adjust each of the first I.F. transformer trimmers for maximum output.
1520 to 530 K.C. Band	1 Exactly 1520 K.C.	Exactly 1520 K.C.	None	Use Small Loop to couple test oscillator to receiver loop	Adjust 1520 K.C. oscillator trimmer for maximum output.
	2 Approx. 1400 K.C.	Approx. 1400 K.C.	None	Use Small Loop to couple test oscillator to receiver loop	While rocking gang condenser adjust 1400 K.C. loop & R.F. trimmers for maximum output.
	3 Approx. 600 K.C.	Approx. 600 K.C.	None	Use Small Loop to couple test oscillator to receiver loop	While rocking gang condenser adjust 600 K.C. oscillator padder for maximum output.
150 to 410 K.C. Band	1 Exactly 410 K.C.	Exactly 410 K.C.	None	Use Small Loop to couple test oscillator to receiver loop	Adjust 410 K.C. oscillator trimmer for maximum output.
	2 Approx. 350 K.C.	Approx. 350 K.C.	None	Use Small Loop to couple test oscillator to receiver loop	Adjust 350 K.C. loop & R.F. trimmers for maximum output.
	3 Approx. 150 K.C.	Approx. 150 K.C.	None	Use Small Loop to couple test oscillator to receiver loop	While rocking gang condenser adjust 150 K.C. oscillator padder for maximum response.



SENTINEL RADIO CORP.



VOLTAGE RATING

THIS RADIO IS DESIGNED FOR USE ON 110-120 VOLTS 50-60 CYCLES ALTERNATING CURRENT—unless the marking on the white paper license notice which will be found attached either to bottom or inside the cabinet is marked differently, in which case the radio must only be used on the type of current shown on this notice.

BE SURE THAT THE CURRENT RATING GIVEN ON THE LICENSE TAG IS THE SAME AS THE HOUSE CURRENT SUPPLY.

ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.

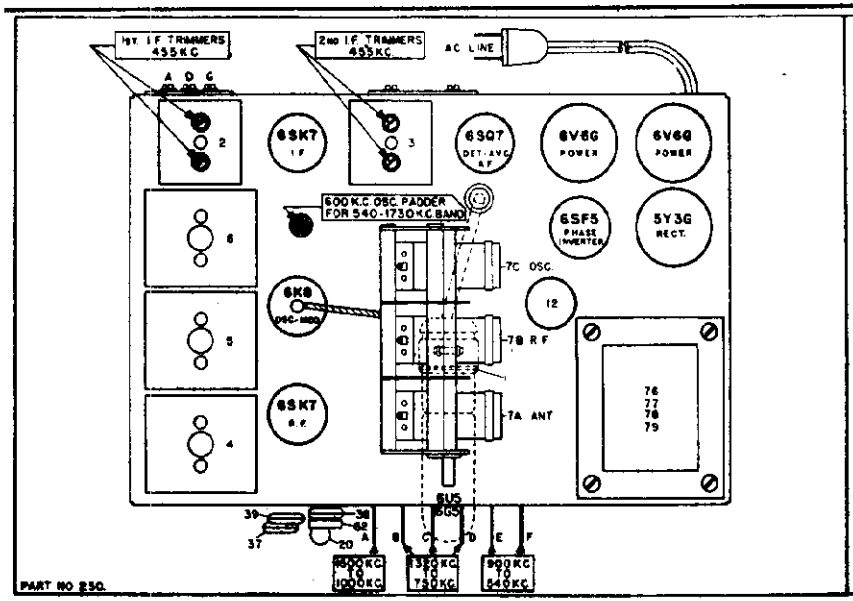
Before starting alignment:

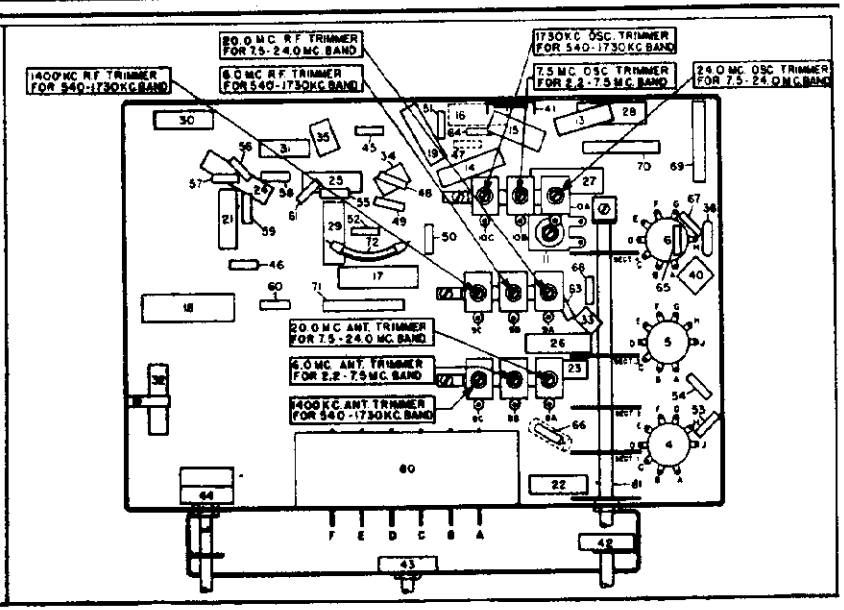
(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move needle to correct position.

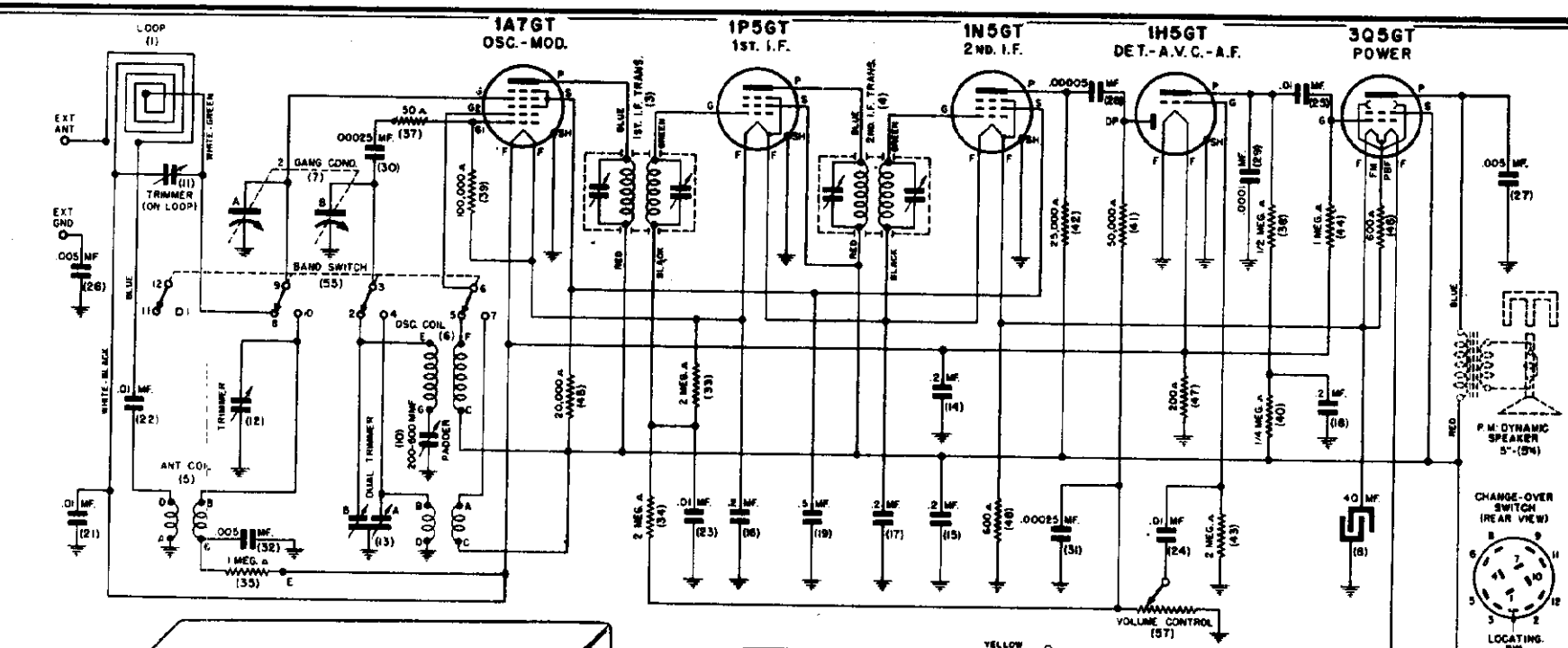
(b) Use an accurately calibrated test oscillator with some type of output measuring device.

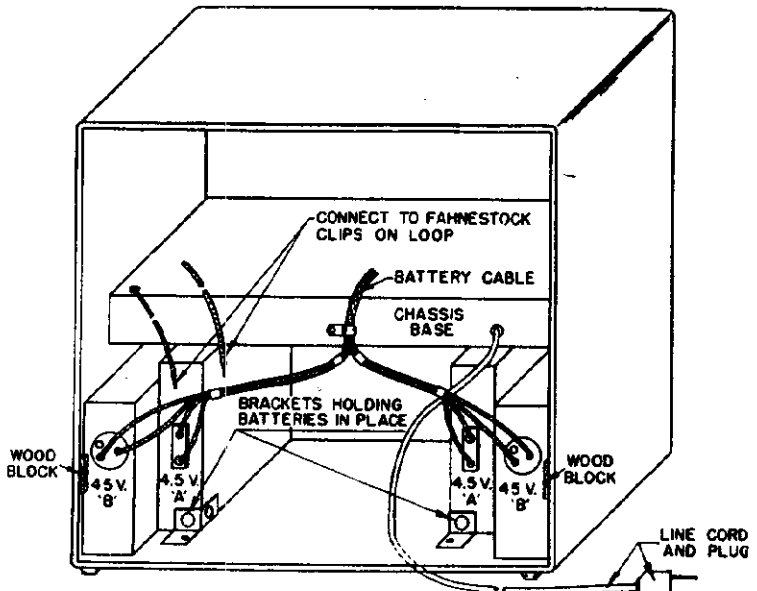
(c) Have ground lead of test oscillator attached to chassis.

Place band switch for operation on:	Set receiver dial to:	TEST OSCILLATOR: Adjust test oscillator frequency to:	TEST OSCILLATOR: Use dummy antenna in series with output of test oscillator: consisting of:	TEST OSCILLATOR: Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below:
I. F. alignment use any band position.	Any point where no interfering signal is received.	Exactly 455 K.C.	.02 Mfd. condenser	High side to grid cap of 6K8 tube. Do not remove cap.	Adjust each of the second I.F. transformer trimmers for maximum output—then adjust each of the first I.F. transformer trimmers for maximum output.
1730 to 540 K.C Band	1 Exactly 1730 K.C.	Exactly 1730 K.C.	.00025 Mfd. condenser	Receiver antenna "A" post	Adjust 1730 K.C. oscillator trimmer for maximum output.
	2 Approx. 1400 K.C.	Exactly 1400 K.C.	.00025 Mfd. condenser	Receiver antenna "A" post	While rocking gang condenser adjust 1400 K.C. antenna and R.F. trimmers for maximum output.
	3 Approx. 600 K.C.	Approx. 600 K.C.	.00025 Mfd. condenser	Receiver antenna "A" post	While rocking gang condenser adjust 600 K.C. oscillator padder for maximum output.
2.2-7.5 M.C. Band	1 Exactly 7.5 M.C.	Exactly 7.5 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	Adjust 7.5 M.C. oscillator trimmer for maximum output.
	2 Approx. 6. M.C.	Exactly 6. M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	While rocking gang condenser adjust 6 M.C. antenna and R.F. trimmers for maximum output.
7.5 to 24 M.C. Band	1 Exactly 24 M.C.	Exactly 24 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	Adjust 24 M.C. oscillator trimmer for maximum output—be sure to use proper peak. If more than one peak is noticed, back off trimmer to minimum capacity, then screw down trimmer (add capacity) until the second peak—which is the proper one to use is tuned in.
	2 Approx. 20 M.C.	Approx. 20 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	While rocking gang condenser adjust 20 M.C. antenna and R.F. trimmers for maximum output.



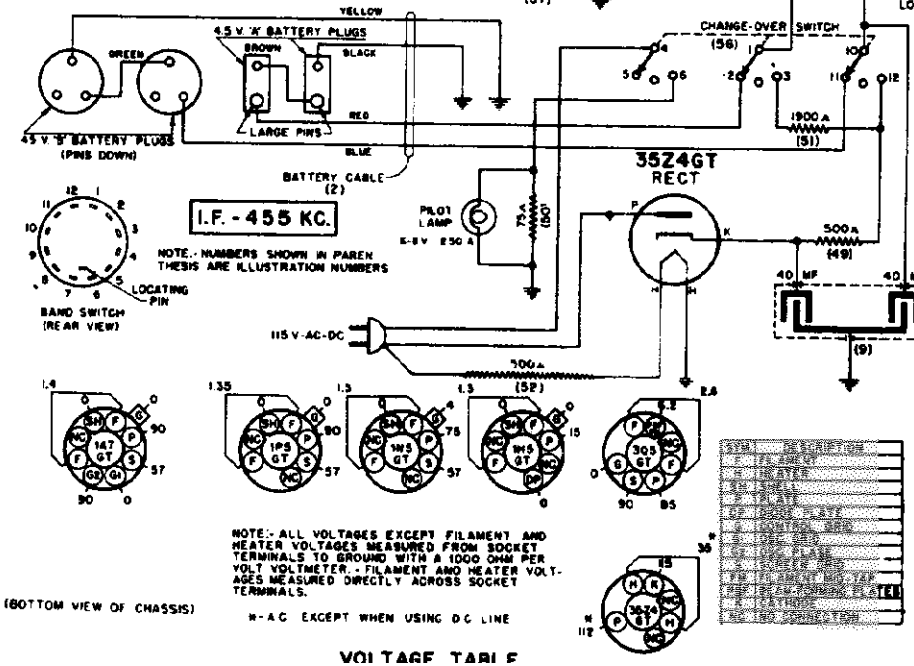






FOR 'AC-DC' OPERATION OPEN DOOR AT BOTTOM OF CABINET, TAKE OUT LINE CORD AND PLACE IN NOTCH AS SHOWN. ALWAYS KEEP BACK ON CABINET, AND DOOR AT BOTTOM CLOSED.

(BOTTOM VIEW OF CHASSIS)

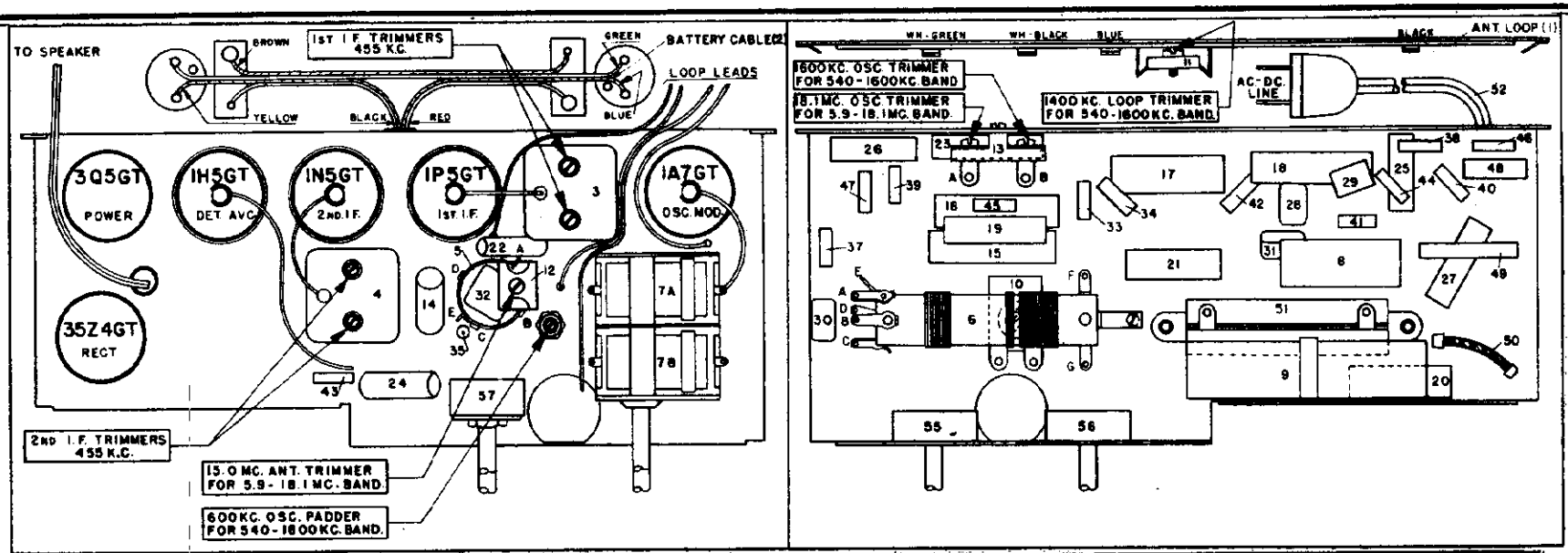


NOTE:- ALL VOLTAGES EXCEPT FILAMENT AND HEATER VOLTAGES MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER. - FILAMENT AND HEATER VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS.

A-A.C. EXCEPT WHEN USING D.C. LINE

12517

VOLTAGE TABLE



Place band switch for operation on:	Set receiver dial to:	TEST OSCILLATOR: Adjust test oscillator frequency to	TEST OSCILLATOR: Use dummy antenna in series with output of test oscillator consisting of:	TEST OSCILLATOR: Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below:
I. F. alignment use any band position	Any point where no interfering signal is received	Exactly 455 K.C.	.02 Mfd. condenser	High side to grid cap of 1A7 G tube. Do not remove cap.	Adjust each of the second I.F. transformer trimmers for maximum output—then adjust each of the first I.F. transformer trimmers for maximum output.
1600 to 540 K.C. Band	1 Exactly 1600 K.C.	Exactly 1600 K.C.	None	Use Small Loop to couple test oscillator to receiver loop.	Adjust 1600 K.C. oscillator trimmer for maximum output.
	2 Approx. 1400 K.C.	Approx. 1400 K.C.	None	Use Small Loop to couple test oscillator to receiver loop.	While rocking gang condenser adjust 1400 K.C. antenna trimmer for maximum output.
	3 Approx. 600 K.C.	Approx. 600 K.C.	None	Use Small Loop to couple test oscillator to receiver loop.	While rocking gang condenser adjust 600 K.C. oscillator padder for maximum output.
5.9 to 18.1 M.C. Band	1 Exactly 18.1 M.C.	Exactly 18.1 M.C.	400 Ohm carbon resistor	High side to "Ant." screw on cabinet back. Low side to "GND" screw on cabinet back.	Adjust 18 M. C. oscillator trimmer for maximum output—be sure to use proper peak. If more than one peak is noticed, back off trimmer to minimum capacity, then screw down trimmer (add capacity) until the second peak—which is the proper one to use is tuned in.
	2 Approx. 15 M.C.	Approx. 15 M.C.	400 Ohm carbon resistor	High side to "Ant." screw on cabinet back. Low side to "GND" screw on cabinet back.	While rocking gang condenser adjust 15 M.C. antenna trimmer for maximum output.

ALIGNMENT PROCEDURE

For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third. IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA IN THE SAME POSITION IT WILL BE IN WHEN THE SET IS IN THE CABINET.

When adjusting 1600 kilocycle oscillator trimmer, 1400 kilocycle antenna trimmer and 600 kilocycle oscillator padder, do not connect test oscillator to loop direct. Couple test oscillator to receiver loop by: (a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator. (b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

VOLTAGE RATING

THIS RADIO IS DESIGNED FOR USE WITH BATTERIES OR ON EITHER 110-120 VOLTS 50-60 CYCLES ALTERNATING CURRENT (AC) OR 110-120 VOLTS DIRECT CURRENT (DC) **IMPORTANT**—If hum is high when set is operated on A.C. current. reverse position of set power cord plug in house current socket.

5.9-18.1 Megacycles—51-16.57 Meters

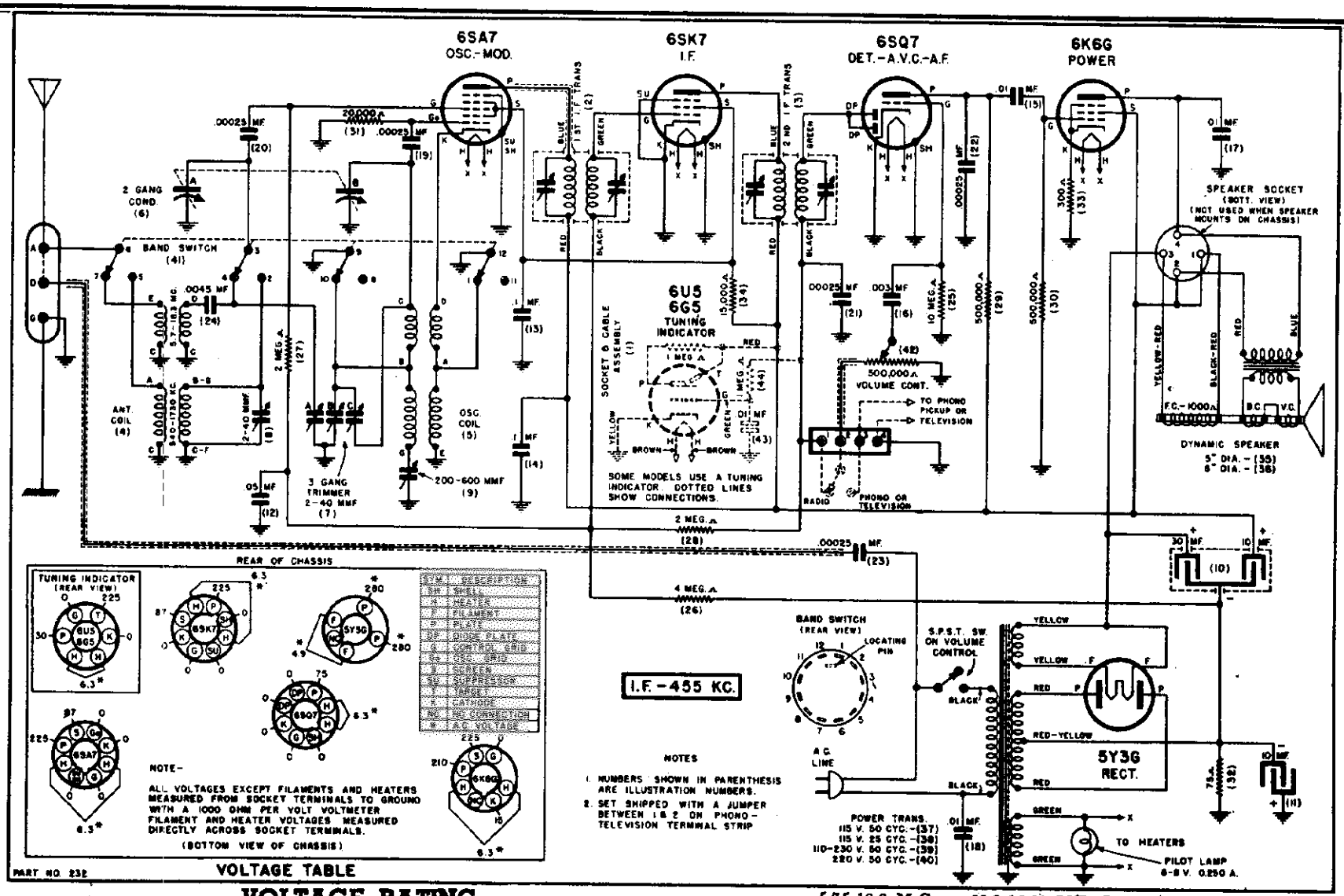
FOR SHORT WAVE—5.9-18.1 M.C.—RECEPTION BE SURE TO ATTACH A 25-50 FOOT AERIAL TO THE SCREW IN THE UPPER LEFT HAND CORNER OF CABINET BACK.

USE SECTION OF THE DIAL that is calibrated from 5.9-18.1 megacycles 51-16.57 meters.

TURN WAVE SWITCH KNOB to maximum left hand position.

TURN THE VOLUME CONTROL KNOB TO THE EXTREME RIGHT.

ROTATE TUNING KNOB VERY VERY SLOWLY so that the dial indicator needle slowly passes over the section of the dial where the desired station should come in.



VOLTAGE RATING

THIS RADIO IS DESIGNED FOR USE ON 110-120 VOLTS 50-60 CYCLES ALTERNATING CURRENT—unless the marking on the white paper license notice which will be found attached either to bottom or inside the cabinet is marked differently, in which case the radio must only be used on the type of current shown on this notice.

BE SURE THAT THE CURRENT RATING GIVEN ON THE LICENSE TAG IS THE SAME AS THE HOUSE CURRENT SUPPLY.

5.75-18.3 M.C. — 52.2-16.39 METER BAND

BE SURE TO ATTACH A 25-50 ft. REGULAR AERIAL TO "A" TERMINAL on rear of chassis when tuning for short wave—5.75-18.3 M.C. — stations.

USE SECTION OF THE DIAL that is calibrated from 5.75 to 18.3 M.C.

TURN WAVE BAND SWITCH KNOB to the left hand position. TURN THE VOLUME TO THE EXTREME RIGHT.

Printed in U.S.A.—S.P.—1-41—2M

ALIGNMENT PROCEDURE

PART NO. 19579-232

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.

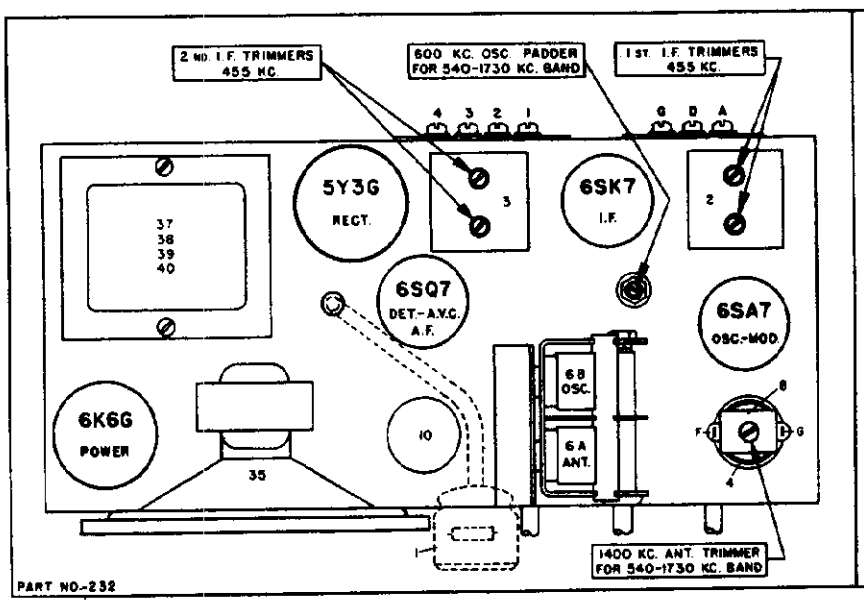
Before starting alignment:

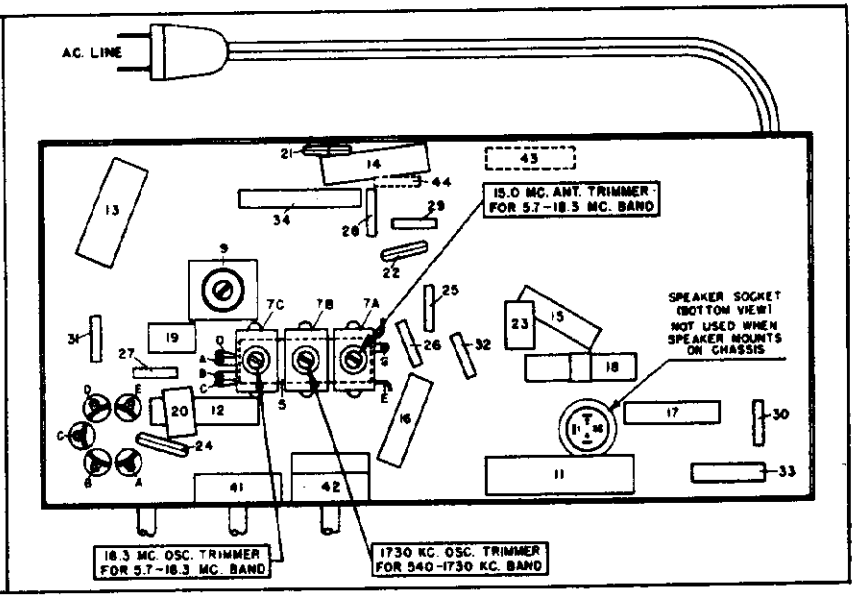
(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move needle to correct position.

(b) Use an accurately calibrated test oscillator with some type of output measuring device.

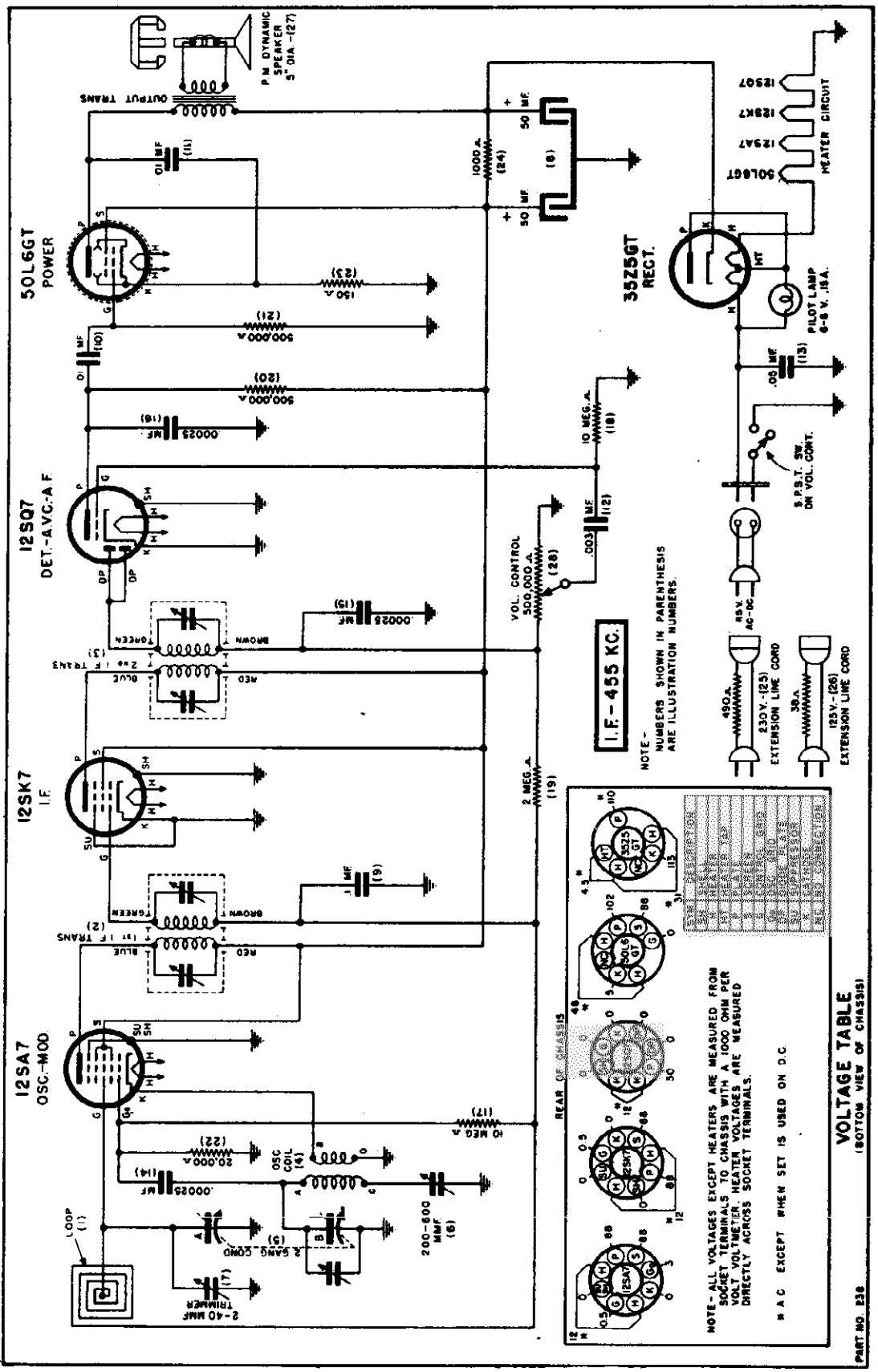
(c) Have ground lead of test oscillator attached to chassis.

Place band switch for operation on:	Set receiver dial to:	TEST OSCILLATOR: Adjust test oscillator frequency to:	TEST OSCILLATOR: Use dummy antenna in series with output of test oscillator consisting of:	TEST OSCILLATOR: Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below:
I. F. alignment use any band position.	Any point where no interfering signal is received.	Exactly 455 K.C.	.02 Mfd. condenser	High side to grid cap of 6SA7 tube, Do not remove cap.	Adjust each of the second I.F. transformer trimmers for maximum output—then adjust each of the first I.F. transformer trimmers for maximum output.
1730 to 540 K.C. Band	1 Exactly 1730 K.C.	Exactly 1730 K.C.	.00025 Mfd. condenser	Receiver antenna "A" post	Adjust 1730 K.C. oscillator trimmer for maximum output.
	2 Approx. 1400 K.C.	Approx. 1400 K.C.	.00025 Mfd. condenser	Receiver antenna "A" post	While rocking gang condenser adjust 1400 K.C. antenna trimmer for maximum output.
	3 Approx. 600 K.C.	Approx. 600 K.C.	.00025 Mfd. condenser	Receiver antenna "A" post	While rocking gang condenser adjust 600 K.C. oscillator padder for maximum output.
5.75 to 18.3 M.C. Band	1 Exactly 18.3 M.C.	Exactly 18.3 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	Adjust 18.3 M.C. oscillator trimmer for maximum output—be sure to use proper peak. If more than one peak is noticed, back off trimmer to minimum capacity, then screw down trimmer (add capacity) until the second peak—which is the proper one to use—is tuned in.
	2 Approx. 15 M.C.	Approx. 15 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	While rocking gang condenser adjust 15 M. C. antenna trimmer for maximum output.





SENTINEL RADIO CORP.



VOLTAGE RATING

THIS RADIO IS DESIGNED FOR USE ON EITHER 110-120 VOLTS 50-60 CYCLES ALTERNATING CURRENT (AC) OR 110-120 VOLTS DIRECT CURRENT (DC)—unless the marking on the white paper license notice which will be found attached either to bottom or inside the cabinet is marked differently, in which case the radio must only be used on the type of current shown on this notice.

If the radio does not operate on DC current after approximately one minute, remove the plug on the end of radio line cord from the house current receptacle, turn it half way around (180°) and reinsert it into the receptacle.

Printed in U. S. A.—S.P.—11-46—2M

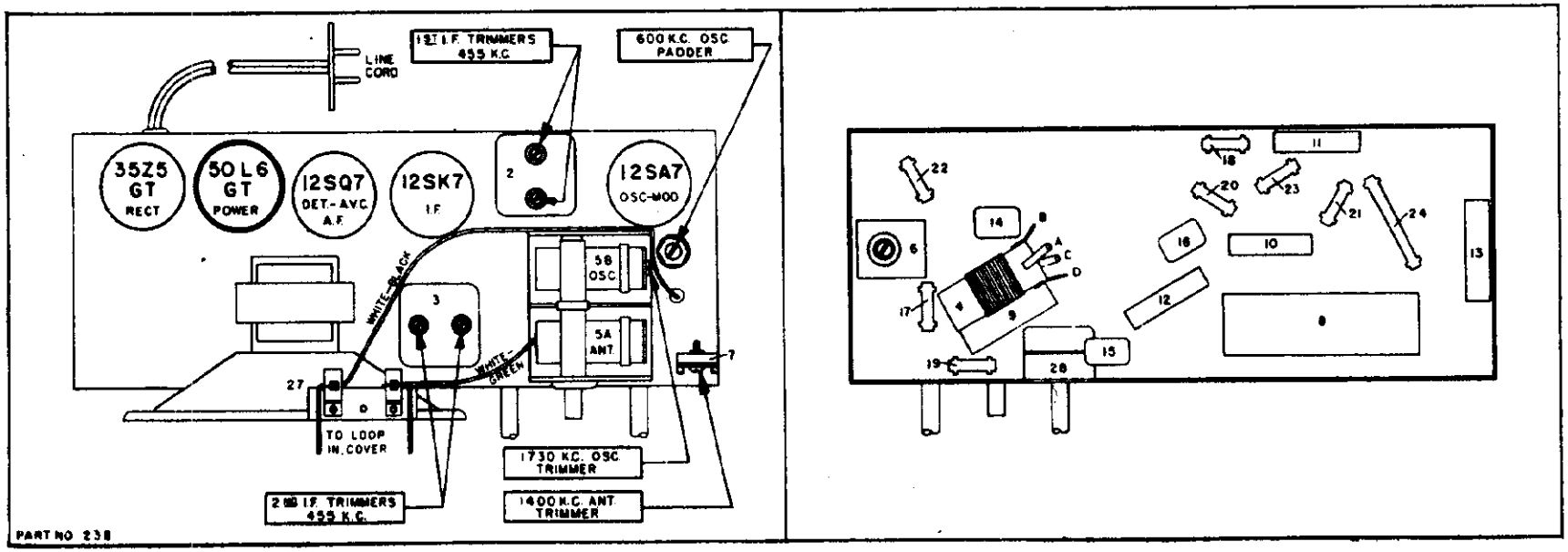
ALIGNMENT PROCEDURE

PART NO. 13006-238

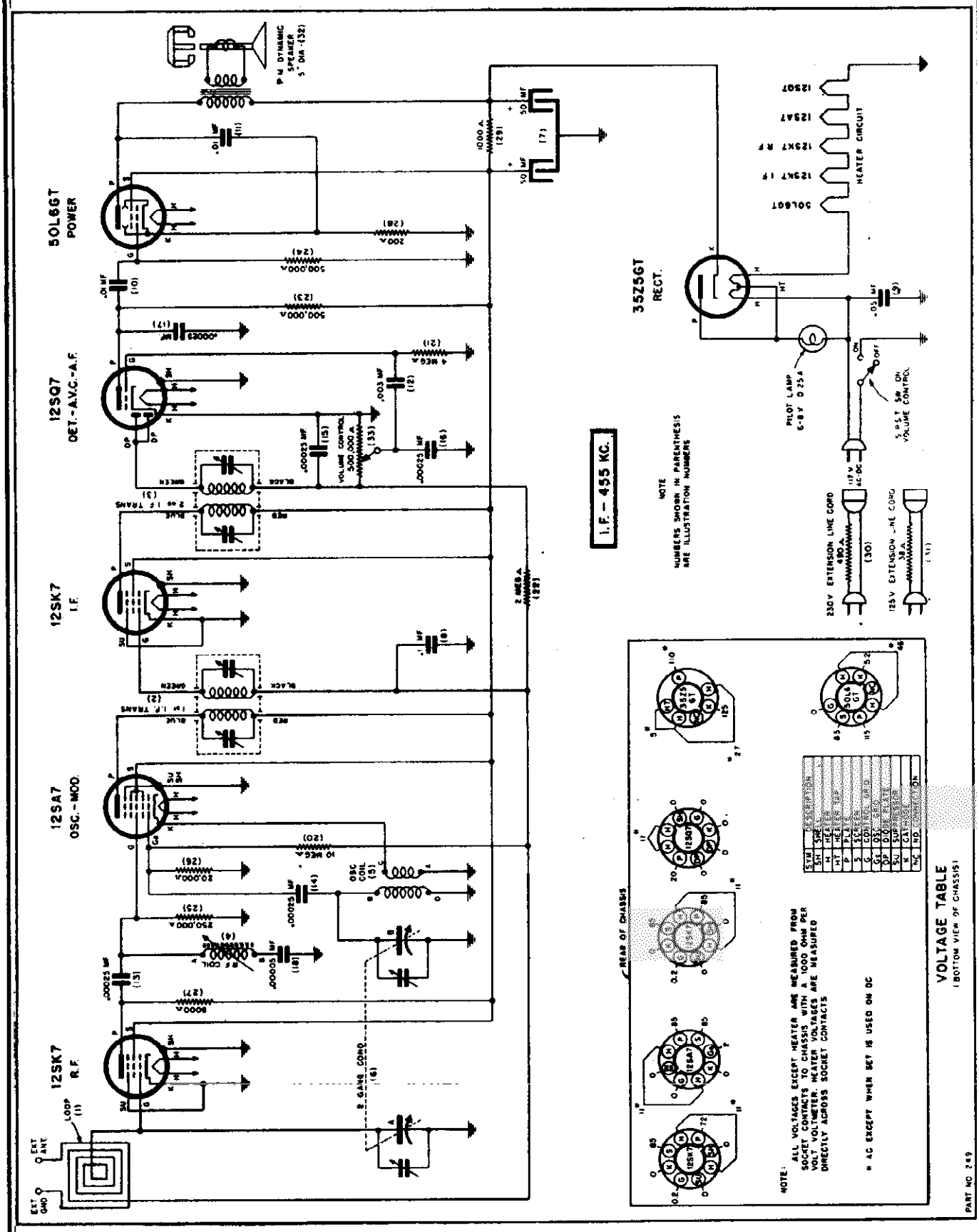
For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third. IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA IN THE SAME POSITION IT WILL BE IN WHEN THE SET IS IN THE CABINET.

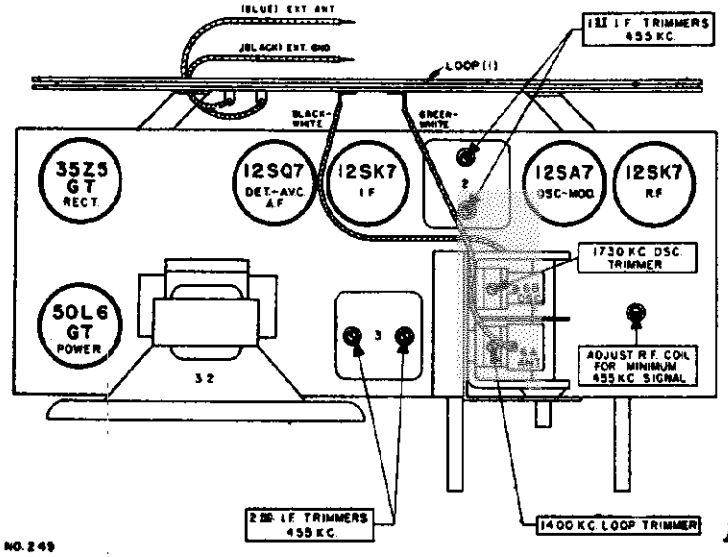
When adjusting 1730 kilocycle oscillator trimmer, 600 K.C. padder and 1400 kilocycle antenna trimmer, do not connect test oscillator to loop. Couple test oscillator to receiver loop by: (a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator. (b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

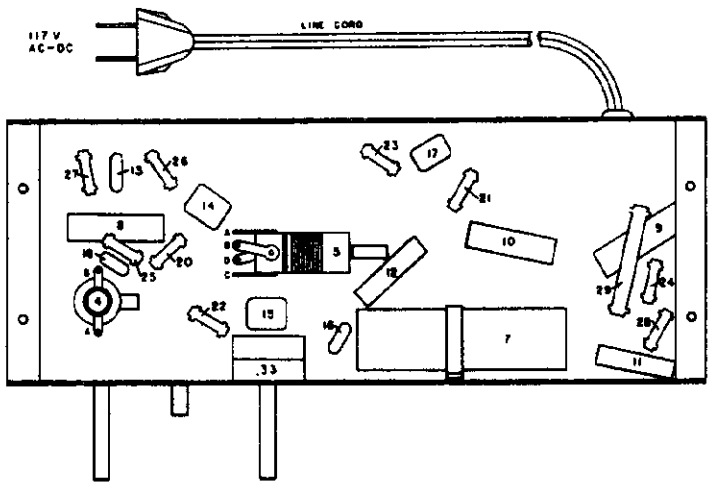
Place band switch for operation on:	Set receiver dial to:	Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below:
I. F. alignment use any band position	Any point where no interfering signal is received	Exactly 455 K.C.	0.2 Mfd. condenser	High side to grid of 12SA7 tube. Low side to frame of gang condenser through .01 Mfd. condenser.	Adjust each of the second I.F. transformer trimmers for maximum output, then adjust each of the first I.F. transformer trimmers for maximum output.
1730 to 540 K.C. Band	1 Exactly 1730 K.C.	Exactly 1730 K.C.	None	Use Small Loop to couple test oscillator to receiver loop.	Adjust 1730 K. C. oscillator trimmer for maximum output.
	2 Approx. 1400 K.C.	Approx. 1400 K.C.	None	Use Small Loop to couple test oscillator to receiver loop.	While rocking gang condenser adjust 1400 K. C. loop trimmer for maximum output.
	3 Approx. 600 K.C.	Approx. 600 K.C.	None	Use Small Loop to couple test oscillator to receiver loop.	While rocking gang condenser adjust 600 K. C. oscillator padder for maximum output.



SENTINEL RADIO CORP.







PART NO. 249

ALIGNMENT PROCEDURE

PART NO. 13232—249

For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third. IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA IN THE SAME POSITION IT WILL BE IN WHEN THE SET IS IN THE CABINET.

When adjusting 1730 kilocycle oscillator trimmer, 455 K. C. R. F. trimmer and 1400 kilocycle antenna trimmer, do not connect test oscillator to loop. Couple test oscillator to receiver loop by: (a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator. (b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

Set receiver dial to:	TEST OSCILLATOR: Adjust test oscillator frequency to:	TEST OSCILLATOR: Use dummy antenna in series with output of test oscillator consisting of:	TEST OSCILLATOR: Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below:
Any point where no interfering signal is received	Exactly 455 K.C.	0.2 Mfd. condenser	High side to grid 12SA7 tube. Low side to frame of condenser through .01 Mfd. condenser	Adjust each of the second I.F. transformer trimmers for maximum output, then adjust each of the first I.F. transformer trimmers for maximum output.
1 Rotate gang condenser to maximum capacity	Exactly 455 K.C.	None	Use Small Loop to couple test oscillator to receiver loop. Low side to frame of condenser through .01 Mfd. condenser	Adjust R.F. coil for minimum 455 K.C. signal.
2 Exactly 1730 K.C.	Exactly 1730 K.C.	None	Use Small Loop to couple test oscillator to receiver loop. Low side to frame of condenser through .01 Mfd. condenser	Adjust 1730 K.C. oscillator trimmer for maximum output.
3 Approx. 1400 K. C.	Approx. 1400 K.C.	None	Use Small Loop to couple test oscillator to receiver loop. Low side to frame of condenser through .01 Mfd. condenser	While rocking gang condenser adjust 1400 K.C. loop trimmer for maximum output.

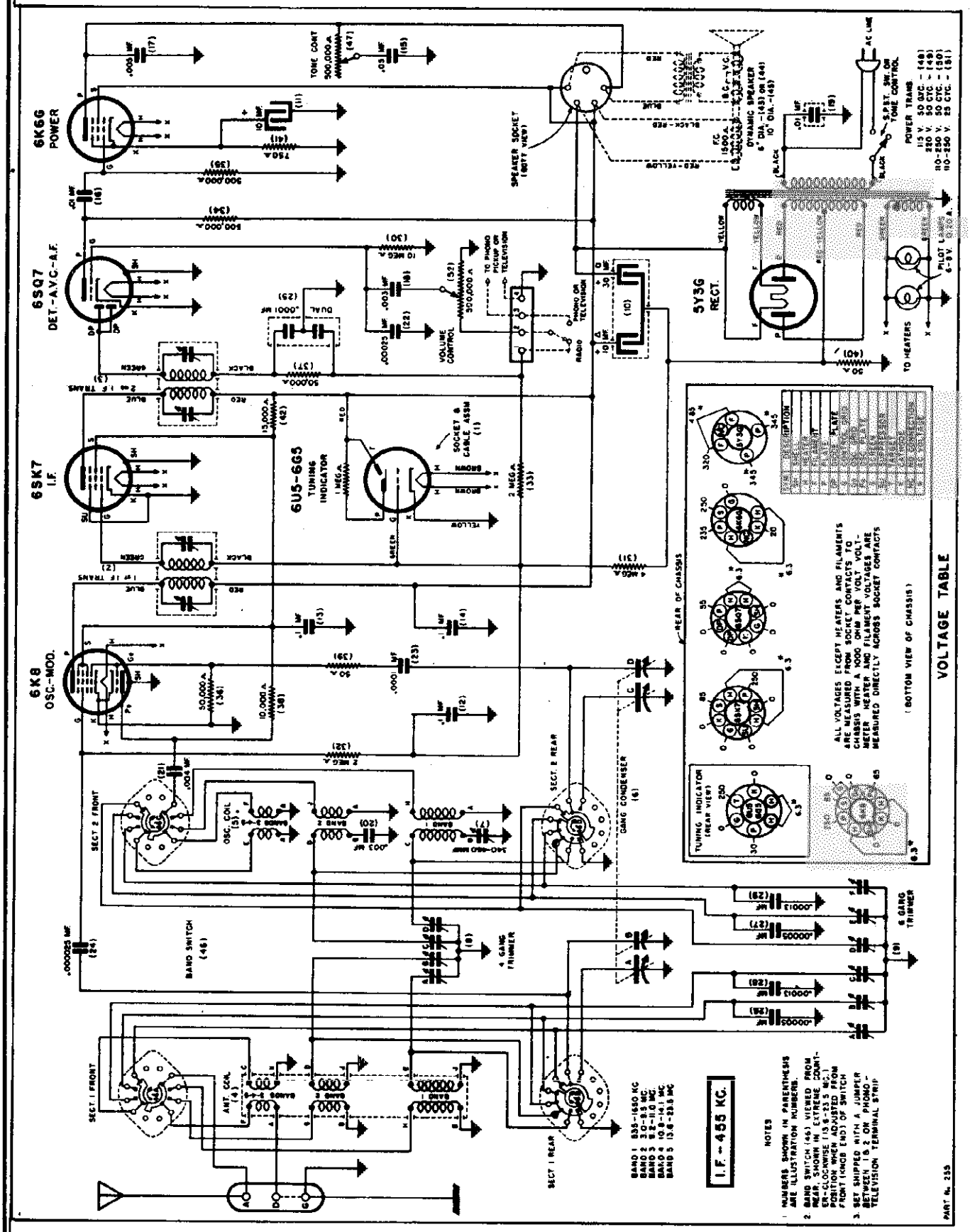
VOLTAGE RATING

WARNING—DO NOT ATTACH A GROUND DIRECT TO THE RADIO CHASSIS—ANY EXTERNAL GROUND CONNECTION TO ANY METAL PART OF THE CHASSIS WILL CAUSE A SHORT AND POSSIBLE DAMAGE.

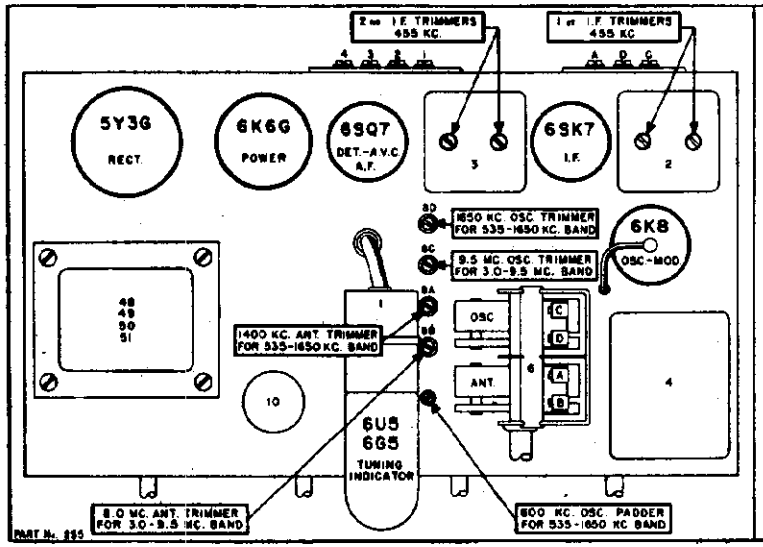
THIS RADIO IS DESIGNED FOR USE ON EITHER 110-120 VOLTS 50-60 CYCLES ALTERNATING CURRENT (AC) OR 110-120 VOLTS DIRECT CURRENT (DC)--unless the marking on the white paper license notice which will be found attached either to bottom or inside the cabinet is marked differently, in which case the radio must only be used on the type of current shown on this notice.

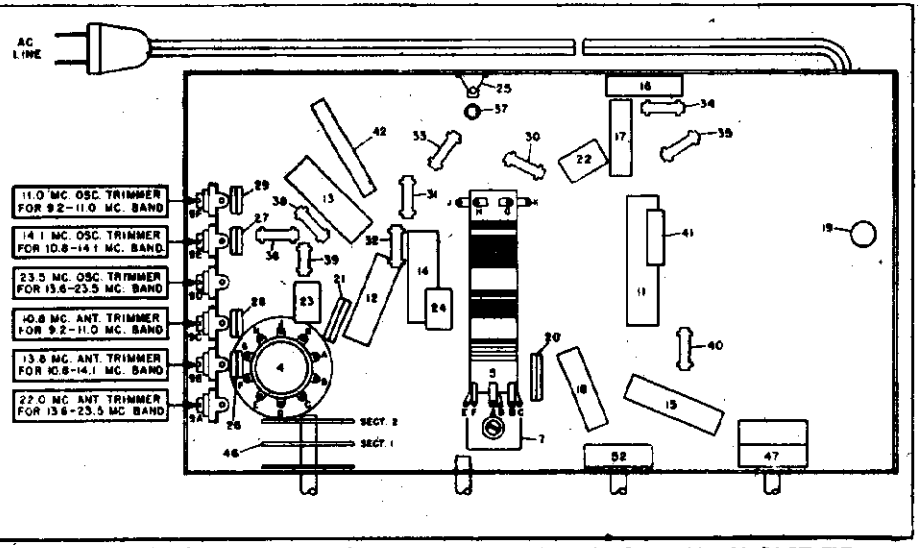
If the radio does not operate on DC current after approximately one minute, remove the plug on the end of radio line cord from the house current receptacle, turn it half way around (180°) and reinsert it into the power receptacle.

SENTINEL RADIO CORP.



Place band switch for operation on:	Set receiver dial to:	TEST OSCILLATOR: Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	ALIGNMENT PROCEDURE (Refer to parts layout diagram for location of trimmers mentioned below:)
I. F. alignment use any band position.	Any point where no interfering signal is received.	Exactly 455 K.C.	.02 Mfd. condenser	High side to grid cap of 6K8 tube. Do not remove cap.	Adjust each of the second I.F. transformer trimmers for maximum output--then adjust each of the first I. F. transformer trimmers for maximum output.
1650 to 535 K.C. Band	Exactly 1650 K.C.	Exactly 1650 K.C.	.00025 Mfd. condenser	Receiver antenna "A" post	Adjust 1650 K.C. oscillator trimmer for maximum output.
	Approx. 1400 K.C.	Approx. 1400 K.C.	.00025 Mfd. condenser	Receiver antenna "A" post	While rocking gang condenser adjust 1400 K.C. antenna trimmer for maximum output.
	Approx. 600 K.C.	Approx. 600 K.C.	00025 Mfd. condenser	Receiver antenna "A" post	While rocking gang condenser adjust 600 K.C. oscillator padder for maximum output.
3 to 9.5 M.C. Band	Exactly 9.5 M.C.	Exactly 9.5 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	Adjust 9.5 M.C. oscillator trimmer for maximum output.
	Approx. 8 M.C.	Exactly 8 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	While rocking gang condenser adjust 8 M.C. antenna trimmer for maximum output.
9.2 to 11 M.C. Band	Exactly 11 M.C.	Exactly 11 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	Adjust 11 M.C. oscillator trimmer for maximum output.
	Approx. 10.8 M.C.	Approx. 10.8 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	While rocking gang condenser adjust 10.8 M.C. antenna trimmer for maximum output.
10.8 to 14.1 M.C. Band	Exactly 14.1 M.C.	Exactly 14.1 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	Adjust 14.1 M.C. oscillator trimmer for maximum output.
	Approx. 13.8 M.C.	Approx. 13.8 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	While rocking gang condenser adjust 13.8 M.C. antenna trimmer for maximum output.
13.6 to 23.5 M.C. Band	Exactly 23.5 M.C.	Exactly 23.5 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	Adjust 23.5 M.C. oscillator trimmer for maximum output.
	Approx. 22 M.C.	Approx. 22 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	While rocking gang condenser adjust 22 M.C. antenna trimmer for maximum output.





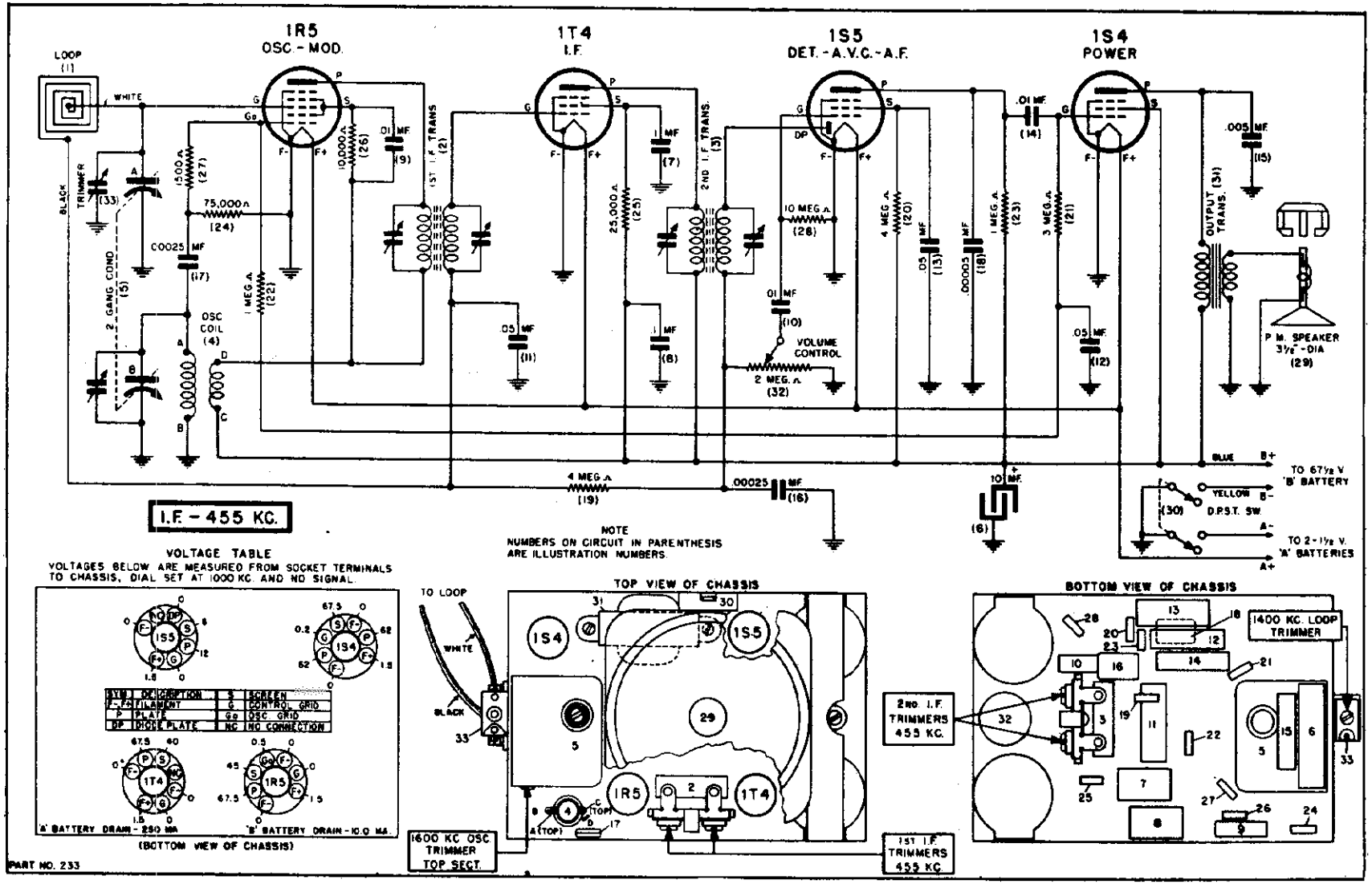
VOLTAGE RATING

BE SURE THAT THE CURRENT RATING GIVEN ON THE LICENSE TAG IS THE SAME AS THE HOUSE CURRENT SUPPLY.

THIS RADIO IS DESIGNED FOR USE ON 110-120 VOLTS 50-60 CYCLES ALTERNATING CURRENT—unless the marking on the white paper license notice which will be found attached either to bottom or inside the cabinet is marked differently, in which case the radio must only be used on the type of current shown on this notice

Based on average usage, the flashlight 1½ volt "A" batteries will supply approximately ten hours' service—the "B" battery approximately forty hours' service.

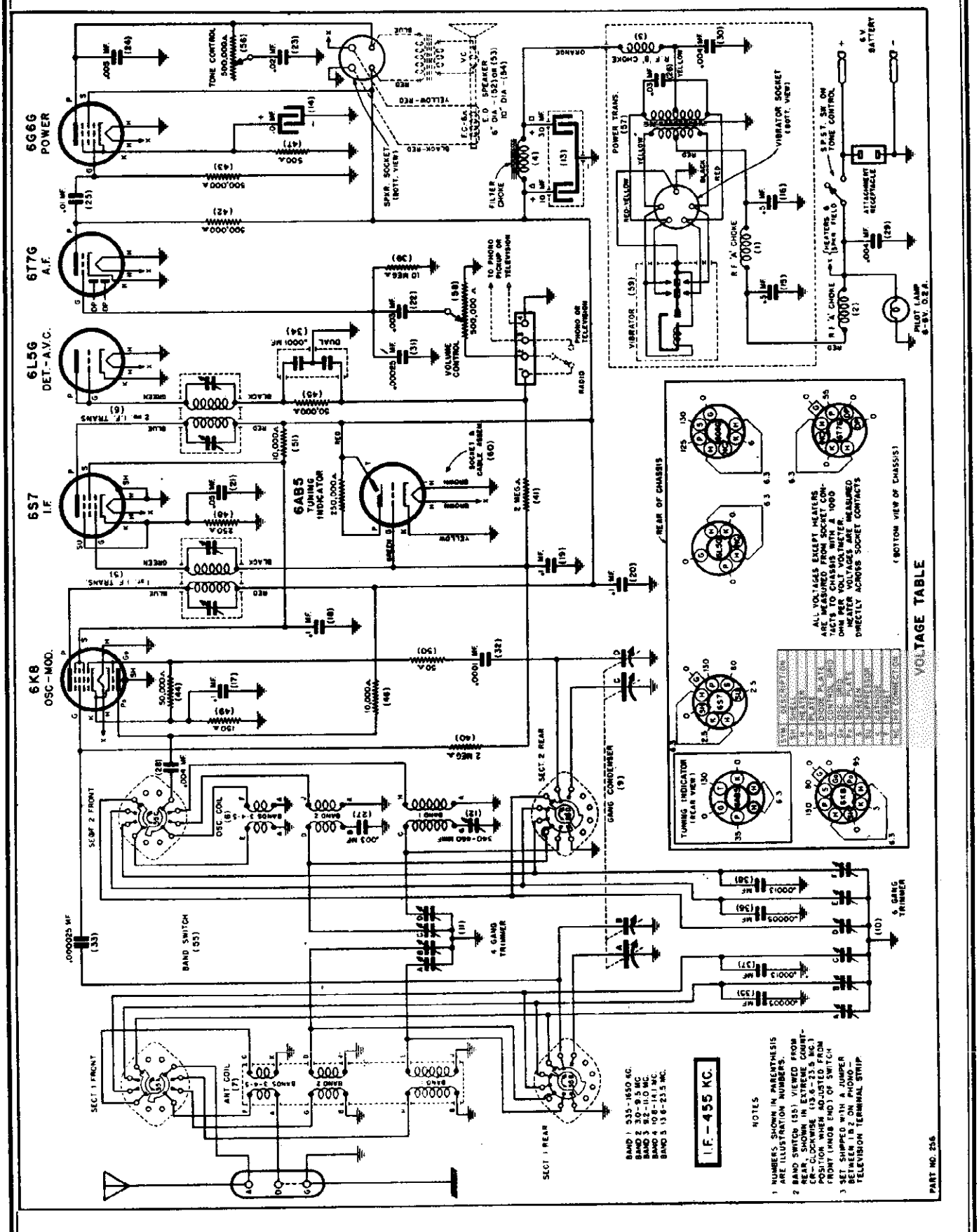
Because the "A" batteries become exhausted much faster than the "B" battery, six to eight "A" batteries may be used during the life of a single "B" battery.

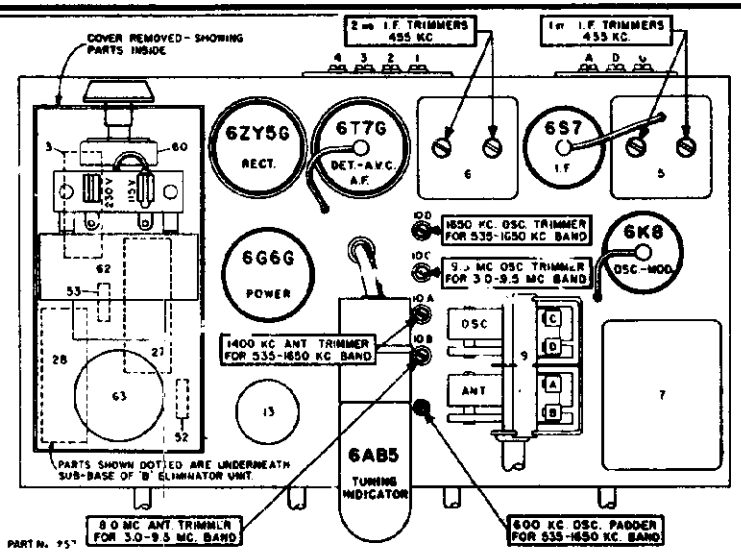


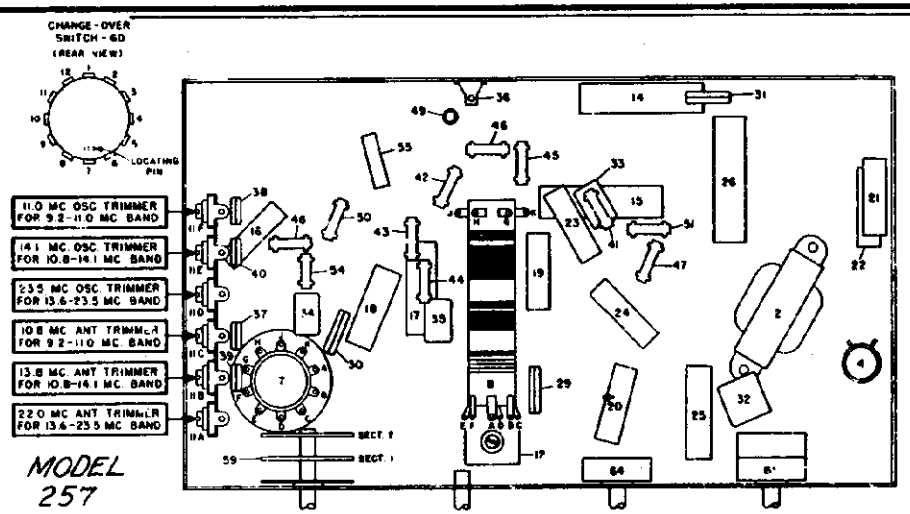
FOR ALIGNMENT AND BATTERY CONNECTIONS SEE INDEX

MODEL 256

SENTINEL RADIO CORP.



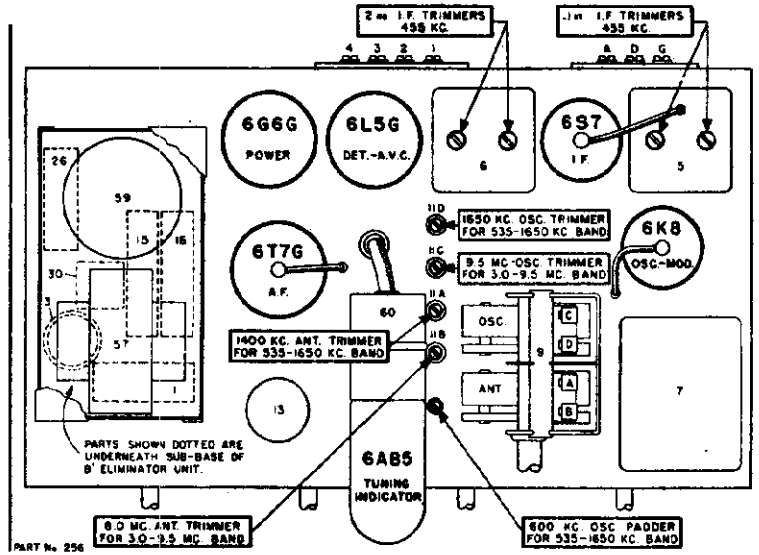


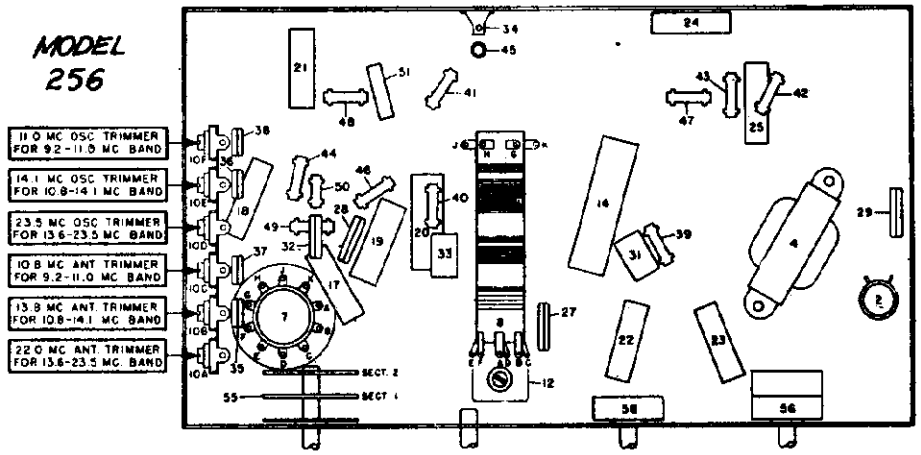


IF ELECTRIC SERVICE IS 110-125 VOLT, INSERT INTO TERMINAL MARKED 115V—if Service is 210-230 Volt insert into terminal marked 230V.

THIS RECEIVER CAN BE OPERATED WITH A SIX VOLT STORAGE BATTERY OR FROM 117 OR 230 VOLT 50 TO 60 CYCLE CURRENT.

NEVER ATTEMPT TO OPERATE THE RECEIVER WITH A 12 VOLT STORAGE BATTERY OR ON 25 CYCLE CURRENT OR ON DIRECT CURRENT (D.C.) OR WITH THE METAL TIPPED LEAD IN THE WRONG TERMINAL SOCKET BECAUSE THE SET WILL BE DAMAGED.





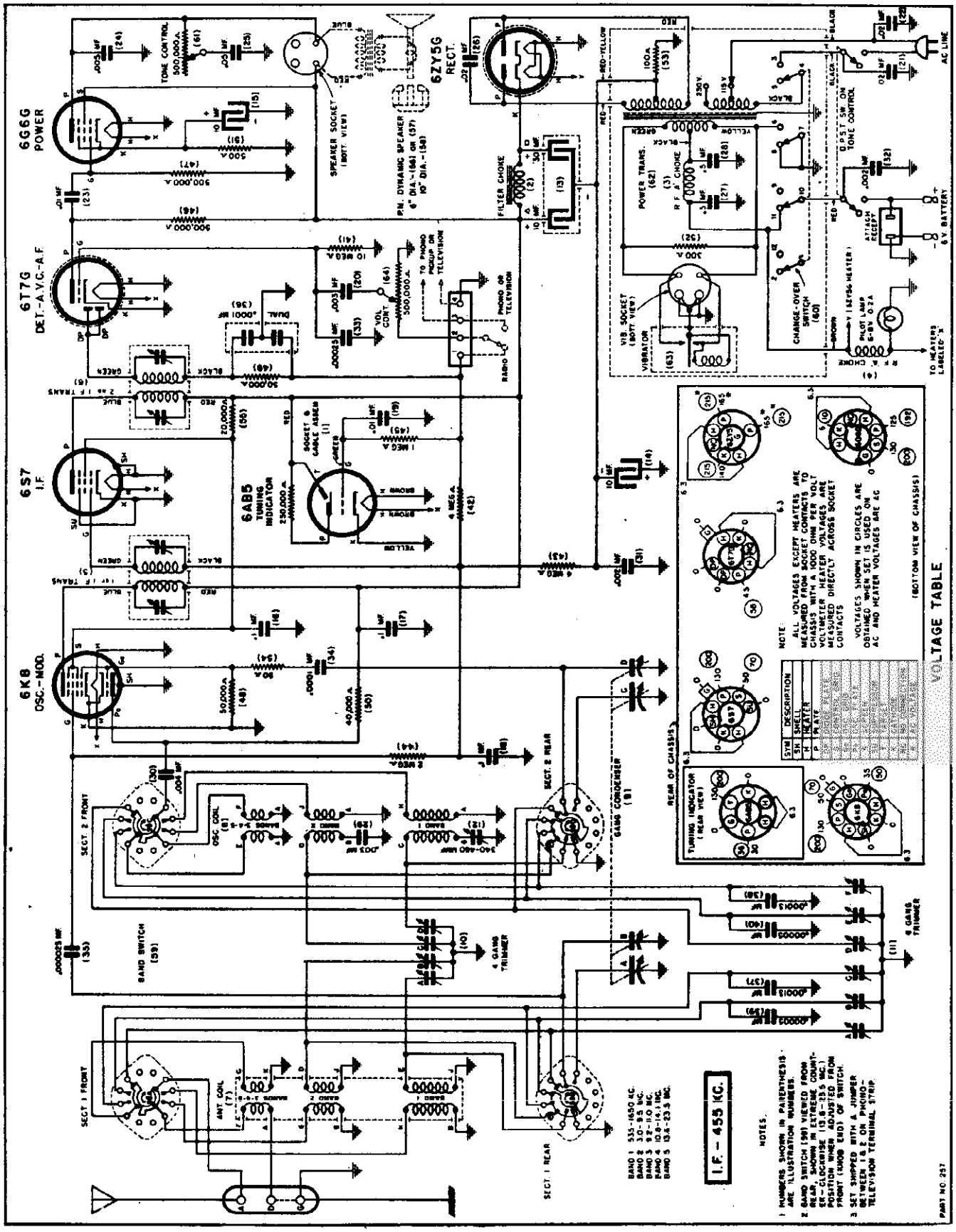
GROUND

A GOOD GROUND such as a cold water pipe, steam radiator, or an iron rod driven into the ground three or four feet in a place where it is moist should be attached to the post marked "G" regardless of the type of antenna used.

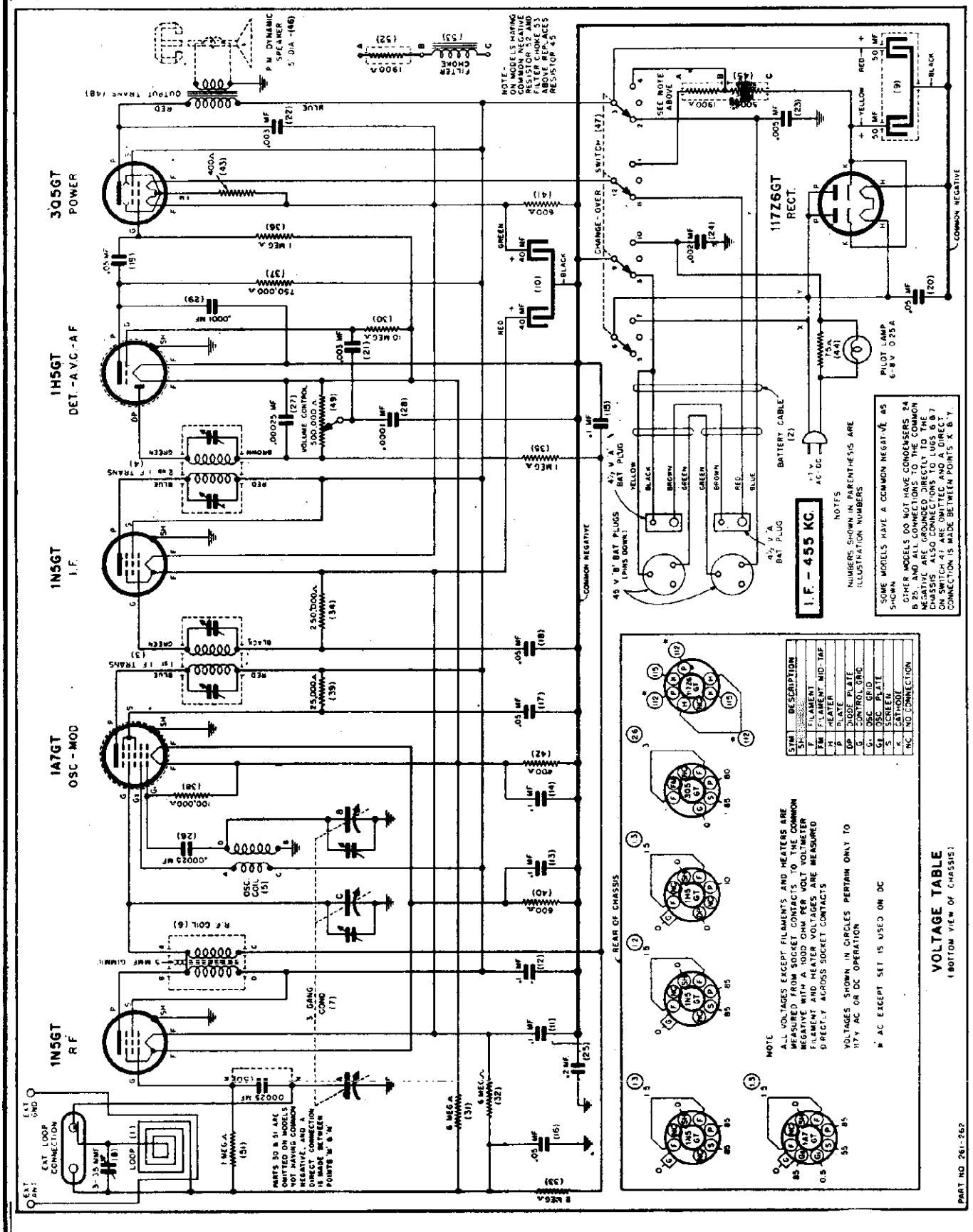
THE RECEPTACLE ON BACK of chassis is connected to the storage battery operating the radio. A single six volt 15 or 25 watt light may be run on the battery by inserting male plug on end of light cord into receptacle. Light cord wire must not be smaller than No. 18 nor longer than six feet, and only one six volt light should be used, otherwise the light will be dim.

MODEL 257

SENTINEL RADIO CORP.



SENTINEL RADIO CORP.

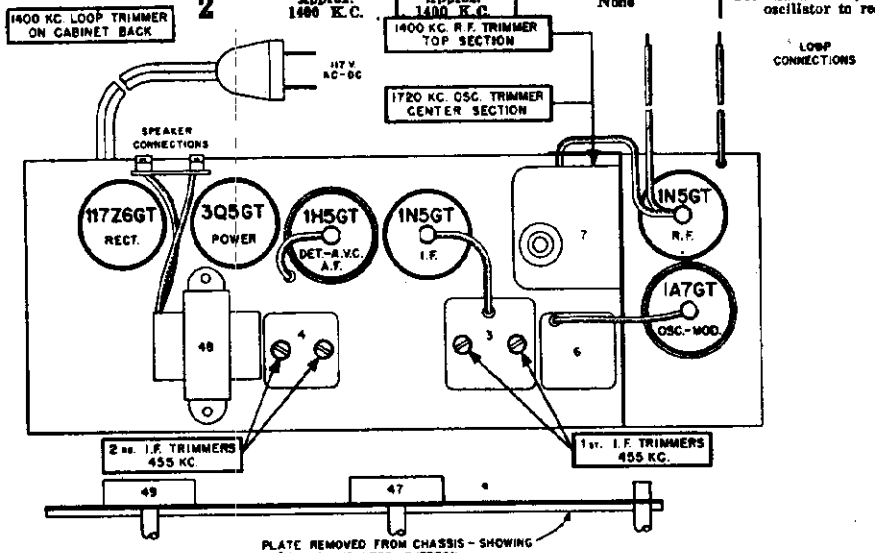


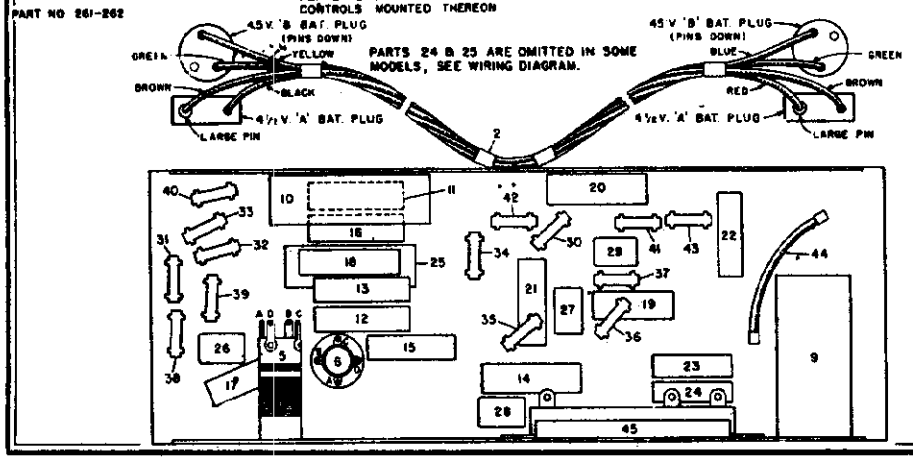
For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third. IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA IN THE SAME POSITION IT WILL BE IN WHEN THE SET IS IN THE CABINET.

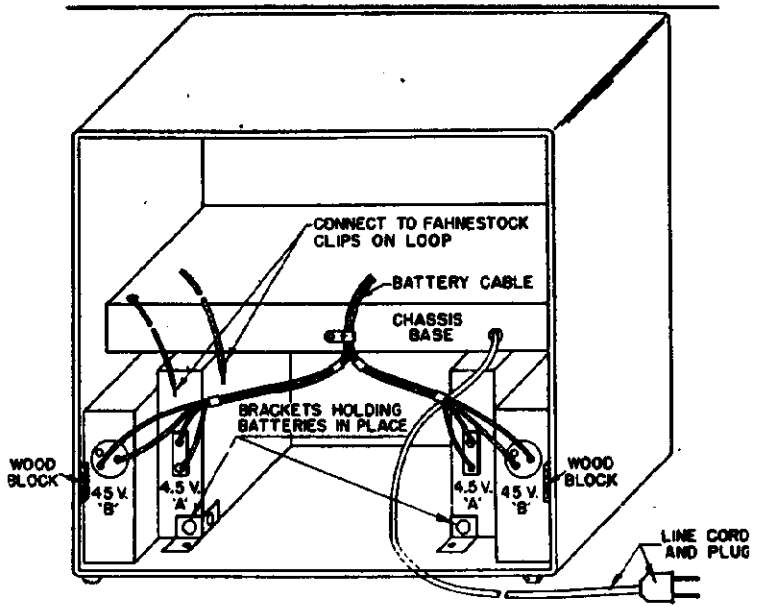
When adjusting 1730 kilocycle oscillator trimmer and 1400 kilocycle antenna and R.F. trimmers, do not connect test oscillator to loop. Couple test oscillator to receiver loop by: (a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator. (b) Place test oscillator near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

TEST OSCILLATOR

Set receiver dial to:		Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below:
Any point where no interfering signal is received.		Exactly 455 K.C.	0.2 Mfd. condenser	High side to grid cap of 1A7GT tube. Do not remove cap.	Adjust each of the second I.F. transformer trimmers for maximum output, then adjust each of the first I.F. transformer trimmers for maximum output.
1	Exactly 1730 K.C.	Exactly 1730 K.C.	None	Use Small Loop to couple test oscillator to receiver loop.	Adjust 1730 K. C. oscillator trimmer for maximum output.
2	Approx. 1400 K.C.	Approx. 1400 K.C.	None	Use Small Loop to couple test oscillator to receiver loop.	Adjust 1400 K.C. loop and R.F. trimmers for maximum output.







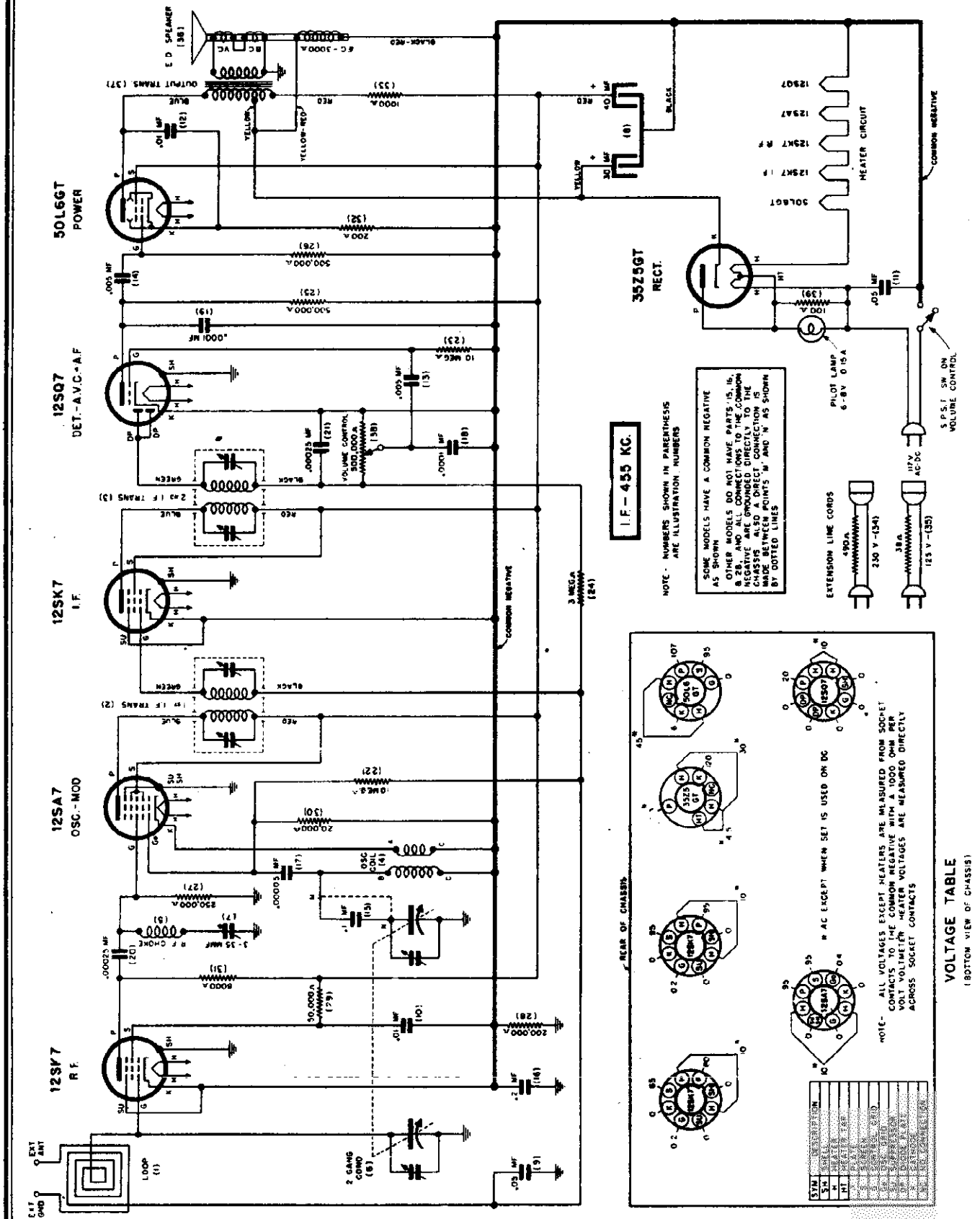
TO INSTALL BATTERIES REMOVE BACK FROM CABINET, AND PLACE BATTERIES AS SHOWN.
FOR AC/DC OPERATION BRING LINE CORD THROUGH OPENING ON BOTTOM OF CABINET.
ALWAYS KEEP BACK ON CABINET.

VOLTAGE RATING

THIS RADIO IS DESIGNED FOR USE WITH BATTERIES OR ON EITHER 110-120 VOLTS 50-60 CYCLES ALTERNATING CURRENT (AC) OR 110-120 VOLTS DIRECT CURRENT (DC).

IMPORTANT—If hum is high when set is operated on A.C. current, reverse position of set power cord plug in house current socket

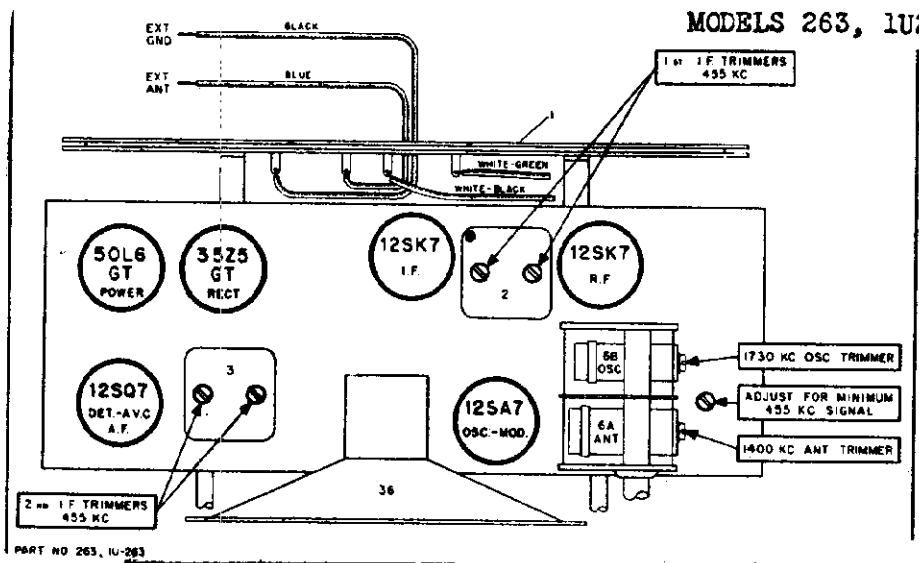
SENTINEL RADIO CORP.



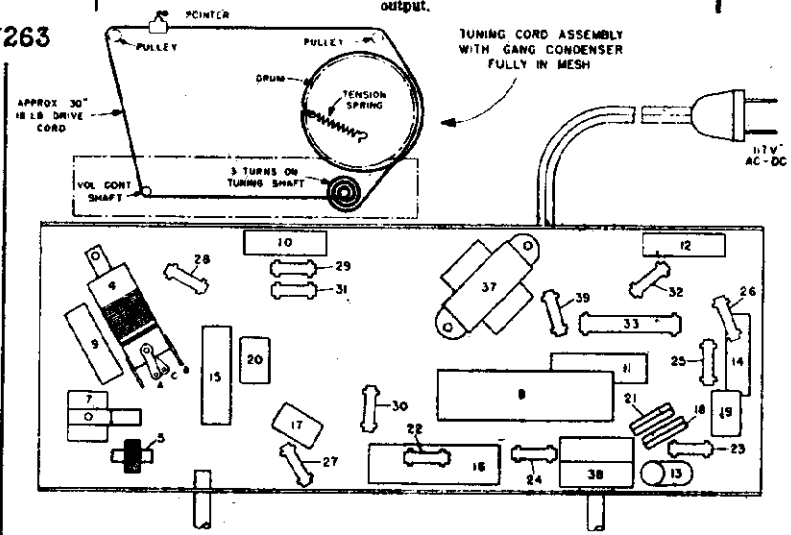
When adjusting 1730 kilocycle oscillator trimmer, 455 K. C. R. F. trimmer and 1400 kilocycle antenna trimmer, do not connect test oscillator to loop. Couple test oscillator to receiver loop by: (a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator. (b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

Set receiver dial to:	TEST OSCILLATOR: Adjust test oscillator frequency to:	TEST OSCILLATOR: Use dummy antenna in series with output of test oscillator consisting of:	TEST OSCILLATOR: Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below:
Any point where no interfering signal is received	Exactly 455 K.C.	0.2 Mfd. condenser	High side to front stator plates of tuning condenser. Low side to frame of condenser through .01 Mfd. condenser.	Adjust each of the second I.F. transformer trimmers for maximum output, then adjust each of the first I.F. transformer trimmers for maximum output.
1 Rotate gang condenser to maximum capacity	Exactly 455 K.C.	None	Use Small Loop to couple test oscillator to receiver loop. Low side to frame of condenser through .01 Mfd. condenser	Adjust R.F. coil trimmer for minimum 455 K.C. signal.
2 Exactly 1730 K.C.	Exactly 1730 K.C.	None	Use Small Loop to couple test oscillator to receiver loop.	Adjust 1730 K.C. oscillator trimmer for maximum output.
3 Approx. 1400 K.C.	Approx. 1400 K.C.	None	Use Small Loop to couple test oscillator to receiver loop.	While rocking gang condenser adjust 1400 K.C. loop trimmer for maximum output.

MODELS 263, 1U263



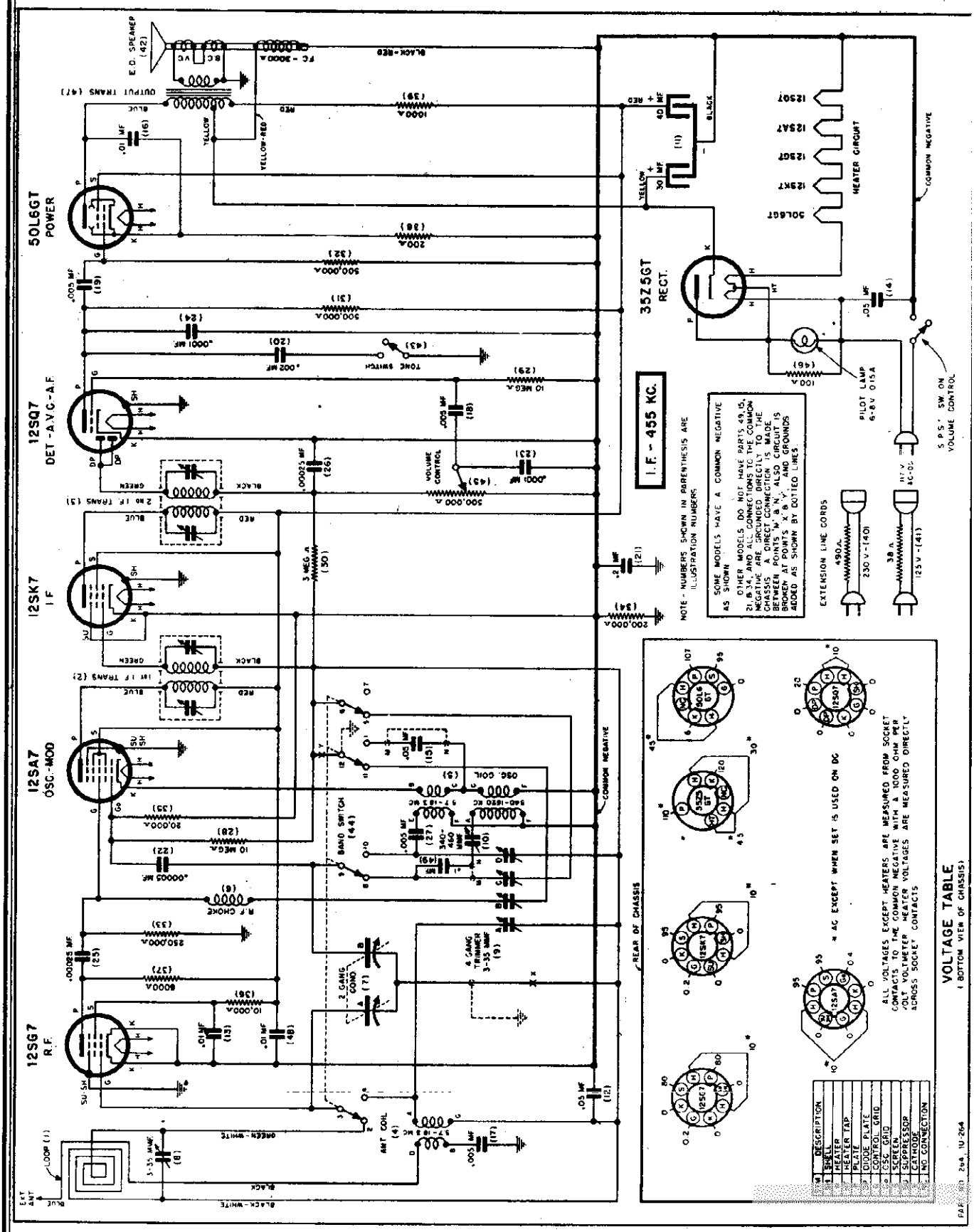
PART NO 263, 1U-263



NOTE - PARTS 15, 16, AND 28 ARE OMITTED ON SOME MODELS, SEE WIRING DIAGRAM

Place band switch for operation on:	Set recei dial to		TEST OSCILLATOR: Adjust test oscillator frequency to:	TEST OSCILLATOR: Use dummy antenna in series with output of test oscillator consisting of:	TEST OSCILLATOR: Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below: MODEL 273
I. F. alignment use any band position.	Any point where no interfering signal is received.		455 K.C.	.02 MFD. condenser	High side to grid terminal of 1A7G tube. DO NOT REMOVE CAP	Adjust each of the second I. F. transformer trimmers for maximum output—then adjust each of the first I. F. trimmers for maximum output.
1730 40 K.C	1	Exactly 1730 K.C.	Exactly 1730 K.C.	.00025 MFD. condenser	High side to Receiver blue antenna lead	Adjust 1730 K.C. oscillator trimmer for maximum output.
	2	Exactly 1400 K.C.	Approx. 1400 K.C.	.00025 MFD. condenser	High side to Receiver blue antenna lead	While rocking gang condenser adjust 1400 K.C. antenna trimmer for maximum output.
	3	Approx. 600 K.C.	Approx. 600 K.C.	.00025 MFD. condenser	High side to Receiver blue antenna lead	While rocking gang condenser adjust 600 K.C. oscillator padder for maximum output.
5.75 to 18.3 M.C. Band	1	Exactly 18.3 M.C.	Exactly 18.3 M.C.	400 Ohm carbon resistor	High side to Blue Antenna Lead	Adjust 18.3 M.C. oscillator trimmer for maximum output—be sure to use proper peak. If more than one peak is noticed, back off trimmer to minimum capacity, then screw down trimmer (add capacity) until the second peak—which is the proper one to use is tuned in.
	2	Approx. 15 M.C.	Approx. 15 M.C.	400 Ohm	High side to Blue Ant. Lead	While rocking gang condenser adjust 15 M.C. antenna trimmer for maximum output.

SENTINEL RADIO CORP.

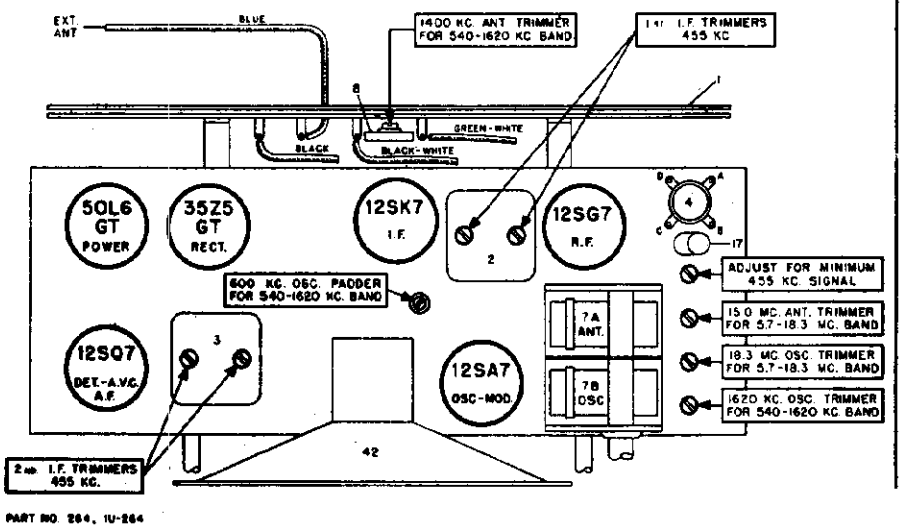


ALIGNMENT PROCEDURE

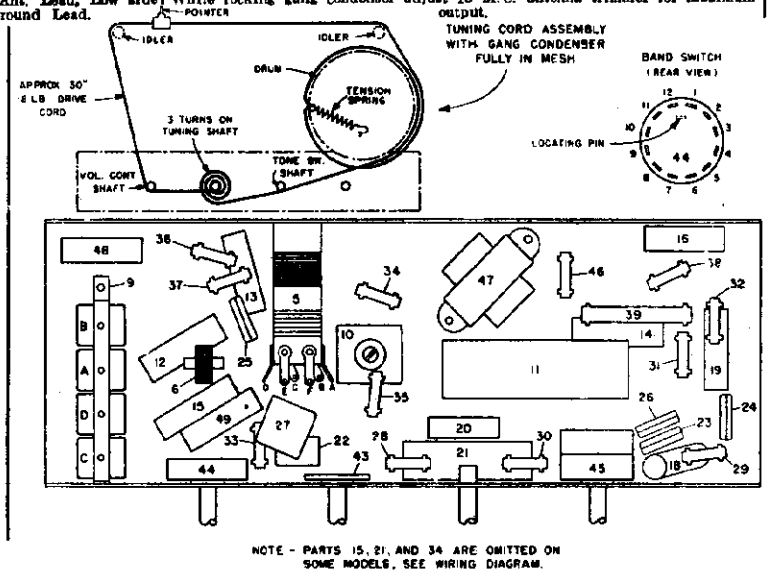
For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third. IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA IN THE SAME POSITION IT WILL BE IN WHEN THE SET IS IN THE CABINET.

When adjusting 1620 kilocycle oscillator trimmer 600 K.C. padder, 455 K.C. R.F. trimmer and 1400 kilocycle antenna trimmer, do not connect test oscillator to loop. Couple test oscillator to receiver loop by: (a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator. (b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

Place band switch for operation on:	Set receiver dial to:	TEST OSCILLATOR: Adjust test oscillator frequency to:	TEST OSCILLATOR: Use dummy antenna in series with output of test oscillator consisting of:	TEST OSCILLATOR: Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below:
I. F. alignment use any band position.	Any point where no interfering signal is received	Exactly 455 K.C.	0.2 Mfd. condenser	High side to rear stator plates of tuning condenser. Low side to frame of condenser through .01 Mfd. condenser.	Adjust each of the second I.F. transformer trimmers for maximum output, then adjust each of the first I.F. transformer trimmers for maximum output.
1620 to 540 K.C. Band	1 Rotate gang condenser to Maximum Capacity	Exactly 455 K.C.	None	Use Small Loop to couple test oscillator to receiver loop.	Adjust R.F. coil trimmer for minimum 455 K.C. signal.
	2 Exactly 1620 K.C.	Exactly 1620 K.C.	None	Use Small Loop to couple test oscillator to receiver loop.	Adjust 1620 K. C. oscillator trimmer for maximum output.
	3 Approx. 1400 K.C.	Approx. 1400 K.C.	None	Use Small Loop to couple test Oscillator to receiver loop.	While rocking gang condenser adjust 1400 K. C. loop trimmer for maximum output.
	4 Approx. 600 K.C.	Approx. 600 K.C.	None	Use Small Loop to couple test oscillator to receiver loop.	While rocking gang condenser adjust 600 K. C. oscillator padder for maximum output.
5.7 to 18.3 M.C. Band	1 Exactly 18.3 M.C.	Exactly 18.3 M.C.	400 Ohm carbon resistor	High side to Blue Ant. Lead, Low side to Black Ground Lead.	Adjust 18.3 M.C. oscillator trimmer for maximum output.
	2 Approx. 15 M.C.	Approx. 15 M.C.	400 Ohm	High side to Blue Ant. Lead, Low side to Black Ground Lead.	While rocking gang condenser adjust 15 M.C. antenna trimmer for maximum output.



PART NO. 264, 1U-264



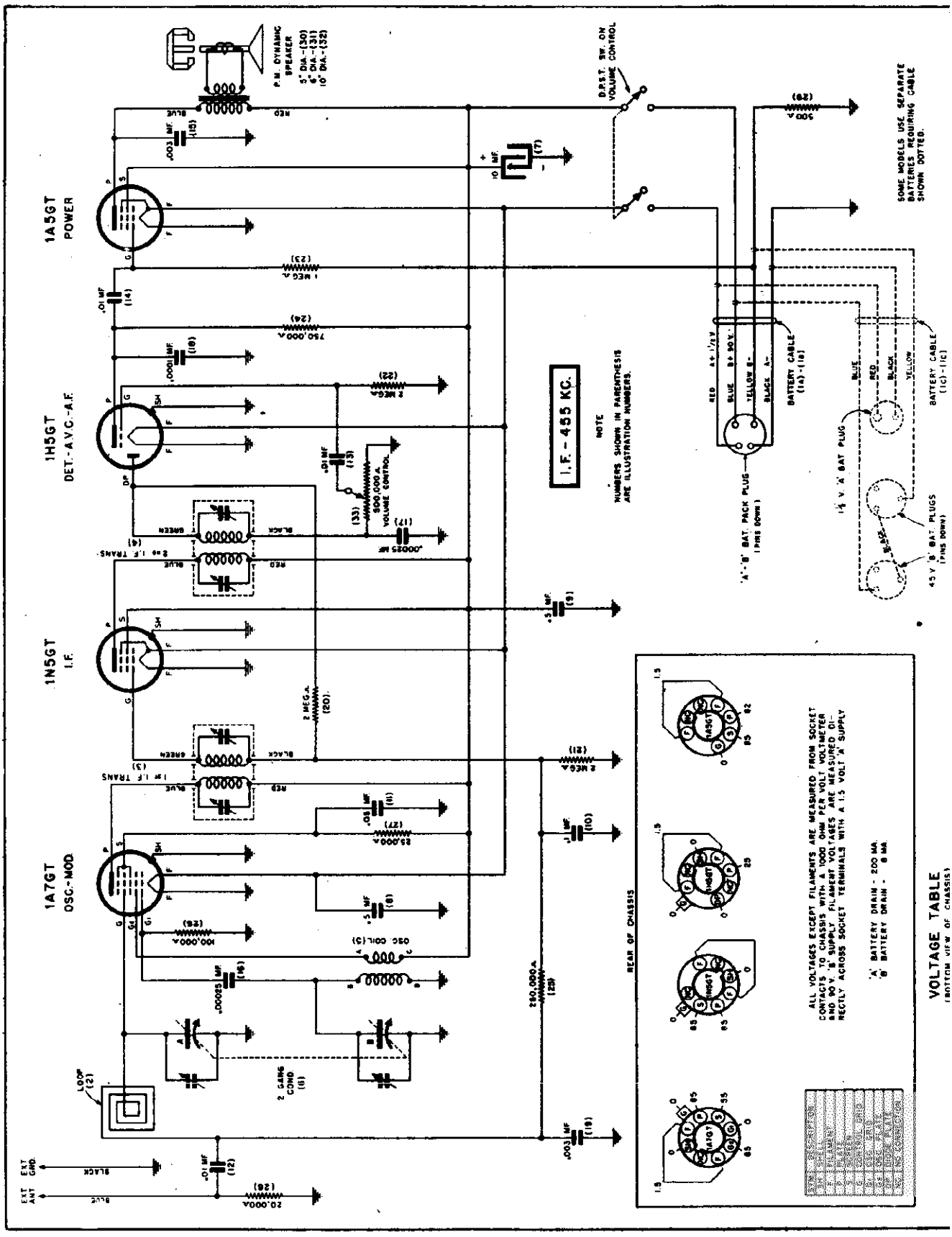
NOTE - PARTS 15, 21, AND 34 ARE OMITTED ON SOME MODELS. SEE WIRING DIAGRAM.

THIS RADIO IS DESIGNED FOR USE ON EITHER 110-120 VOLTS 50-60 CYCLES ALTERNATING CURRENT (AC) OR 110-120 VOLTS DIRECT CURRENT (DC)—unless the marking on the white paper license notice which will be found attached either to bottom or inside the cabinet is marked differently in which case the radio must only be used on the type of current shown on this notice.

If the radio does not operate on DC current after approximately one minute, remove the plug on the end of radio line cord from the house current receptacle, turn it half way around (180°) and reinsert it into the power receptacle.

WARNING—Do not attach a ground to the radio chassis — ANY EXTERNAL GROUND CONNECTION TO ANY METAL PART OF THE CHASSIS WILL CAUSE A SHORT AND POSSIBLE DAMAGE.

SENTINEL RADIO CORP.



ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next.

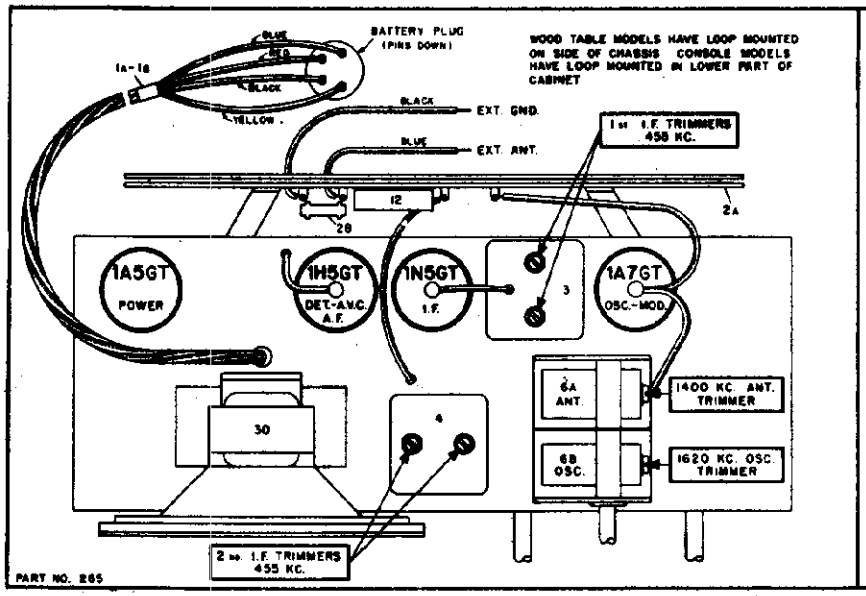
Before starting alignment:

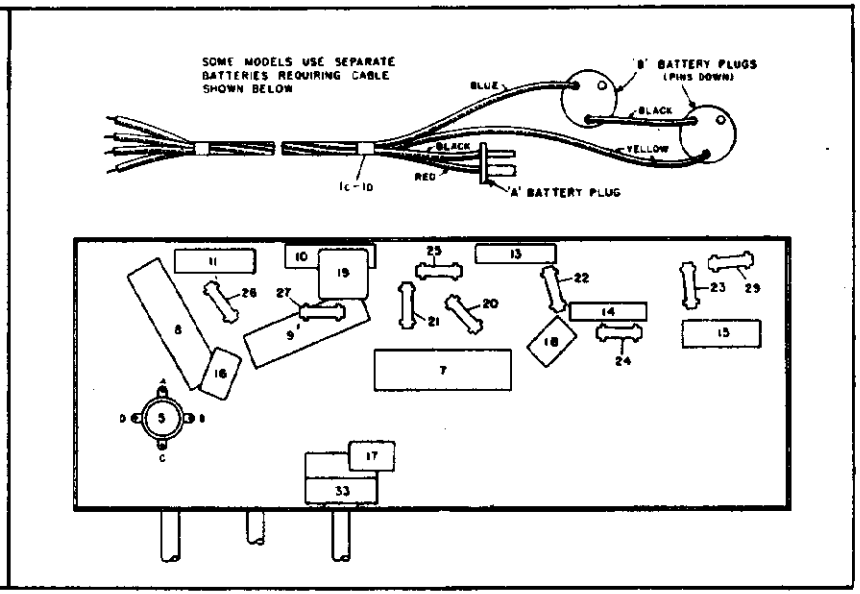
(a) Check tuning dial adjustment by tuning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move to correct position.

(b) Use an accurately calibrated test oscillator with some type of output measuring device.

(c) Have ground lead of test oscillator attached to chassis.

Set receiver dial to:	TEST OSCILLATOR			Refer to parts layout diagram for location of trimmers mentioned below:
	Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	
I.F. Any point where no interfering signal is received	455 K. C.	.02 MFD. condenser	High side to grid terminal of 1A7GT tube DO NOT REMOVE CAP	Adjust each of the second I. F. transformer trimmers for maximum output—then adjust each of the first I. F. trimmers for maximum output.
1 Exactly 1620 K. C.	Exactly 1620 K. C.	.00025 MFD. condenser	Receiver blue antenna lead	Adjust 1620 K. C. oscillator trimmer for maximum output.
2 Approx. 1400 K. C.	Exactly 1400 K. C.	.00025 MFD. condenser	Receiver blue antenna lead	While rocking gang condenser adjust 1400 K. C. antenna trimmer for maximum output.

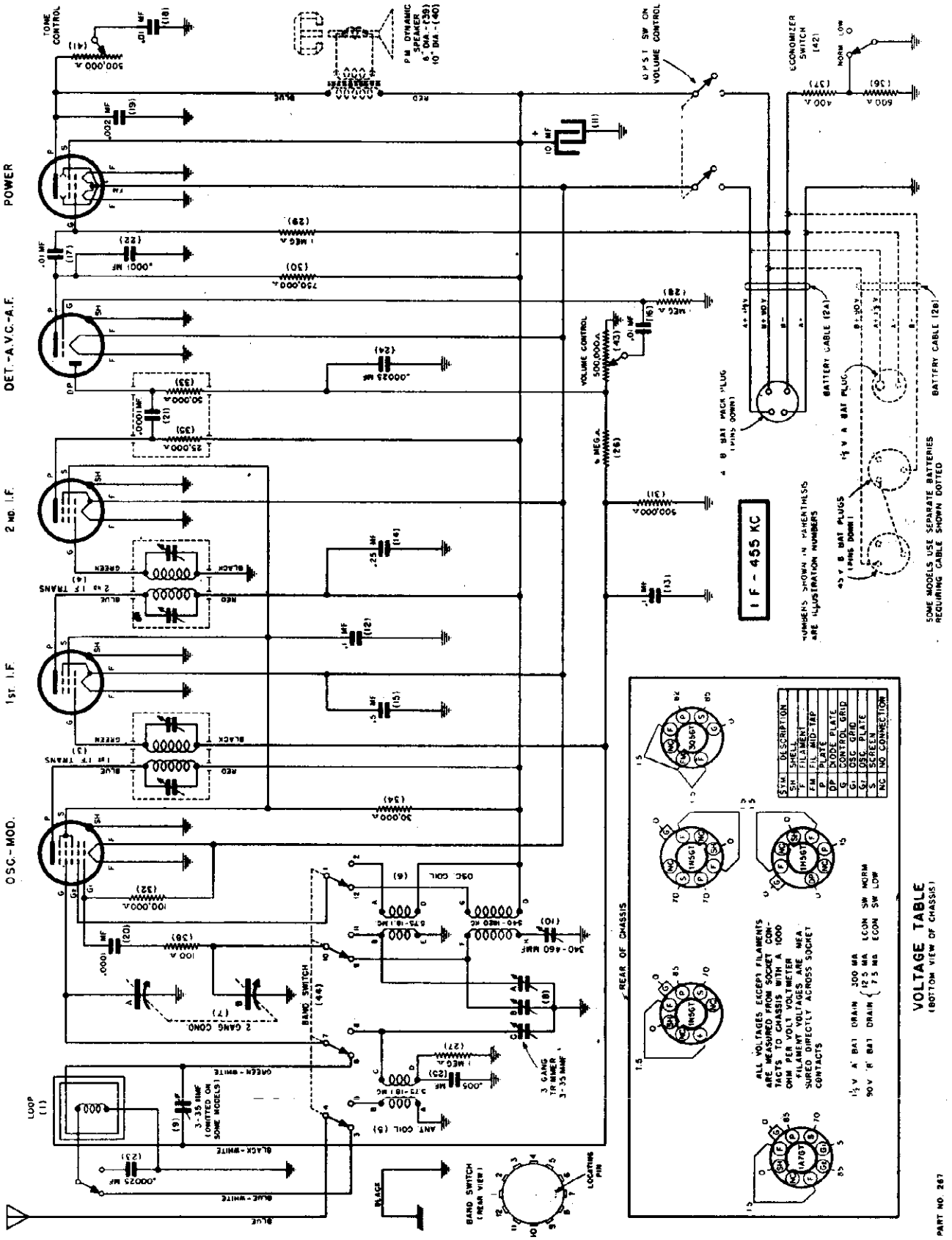




The life of the battery depends entirely on the number of hours the set is operated daily and the quality and size of the battery.

The special large size "AB" Battery Pack, designed specifically for use with this radio, will provide approximately 750 to 1,000 hours of service under normal, average operating conditions.

SENTINEL RADIO CORP.



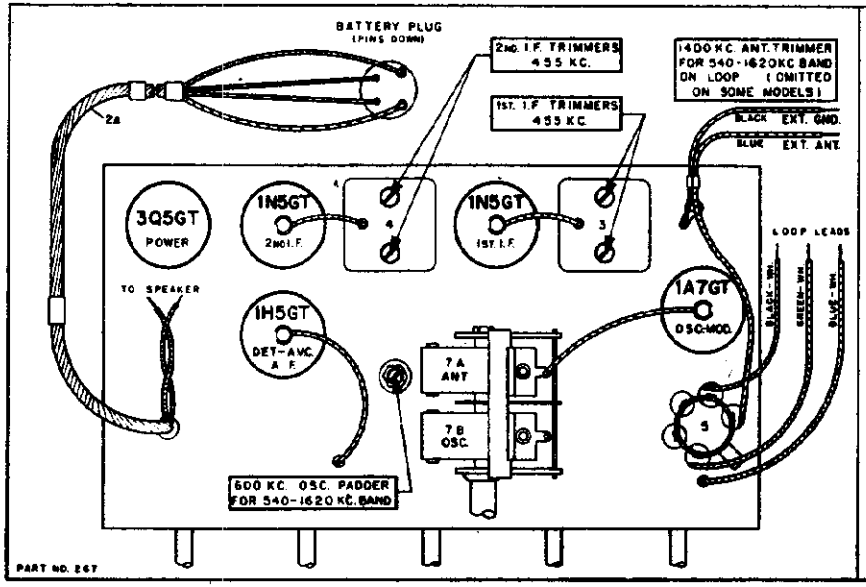
ALIGNMENT PROCEDURE

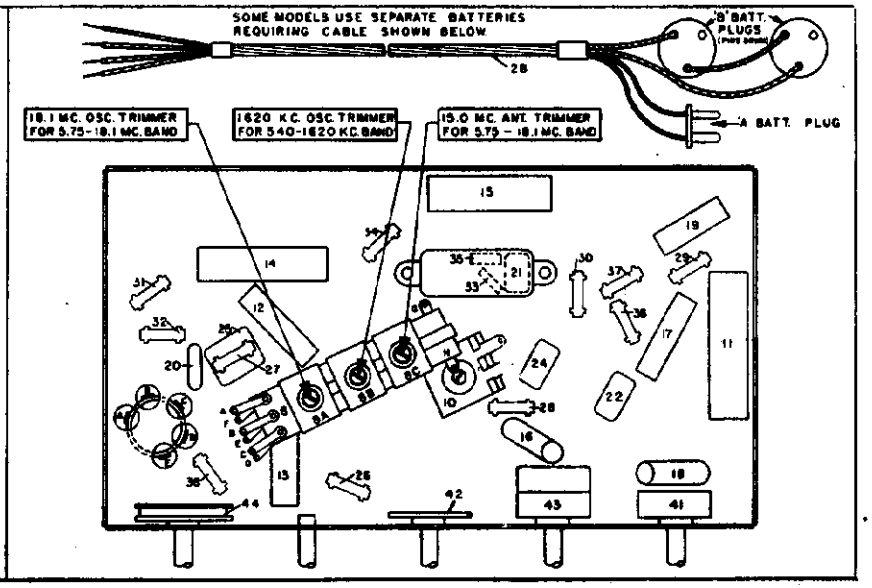
PART No. 13462—267

For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third. IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA IN THE SAME POSITION IT WILL BE IN WHEN THE SET IS IN THE CABINET.

When adjusting 1620 kilocycle oscillator trimmer, 600 K.C. padder, and 1400 kilocycle antenna trimmer, do not connect test oscillator to loop. Couple test oscillator to receiver loop by: (a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator. (b) Place test oscillator loop near set loop—**Be SURE THAT NEITHER MOVES WHILE ALIGNING.**

Place band switch for operation on:	Set receiver dial to:	TEST OSCILLATOR: Adjust test Oscillator frequency to:	TEST OSCILLATOR: Use dummy antenna in series with output of test oscillator consisting of:	TEST OSCILLATOR: Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below:
I. F. alignment use any band position.	Any point where no interfering signal is received	Exactly 455 K.C.	0.2 Mfd. condenser	High side to grid cap of 1A7GT tube. Low side to frame of condenser through .01 Mfd. condenser.	Adjust each of the second I.F. transformer trimmers for maximum output, then adjust each of the first I.F. transformer trimmers for maximum output.
1620 to 540 K.C. Band	1 Exactly 1620 K.C.	Exactly 1620 K.C.	None	Use Small Loop to couple test oscillator to receiver loop. Low side to frame of condenser through .01 Mfd. condenser.	Adjust 1600 K.C. oscillator trimmer for maximum output.
	2 Approx. 1400 K.C.	Approx. 1400 K.C.	None	Use Small Loop to couple test oscillator to receiver loop. Low side to frame of condenser through .01 Mfd. condenser.	While rocking gang condenser adjust 1400 K.C. loop trimmer for maximum output.
	3 Approx. 600 K.C.	Approx. 600 K.C.	None	Use Small Loop to couple test oscillator to receiver loop. Low side to frame of condenser through .01 Mfd. condenser.	While rocking gang condenser adjust 600 K.C. oscillator padder for maximum output.
5.75 to 18.1 M.C. Band	1 Exactly 18.1 M.C.	Exactly 18.1 M.C.	400 Ohm carbon resistor	High side to Blue Ant. Lead. Low side to black ground lead.	Adjust 18.1 M.C. oscillator trimmer for maximum output.
	2 Approx. 15 M.C.	Approx. 15 M.C.	400 Ohm	High side to Blue Ant. Lead. Low side to black ground lead.	While rocking gang condenser adjust 15 M.C. antenna trimmer for maximum output.

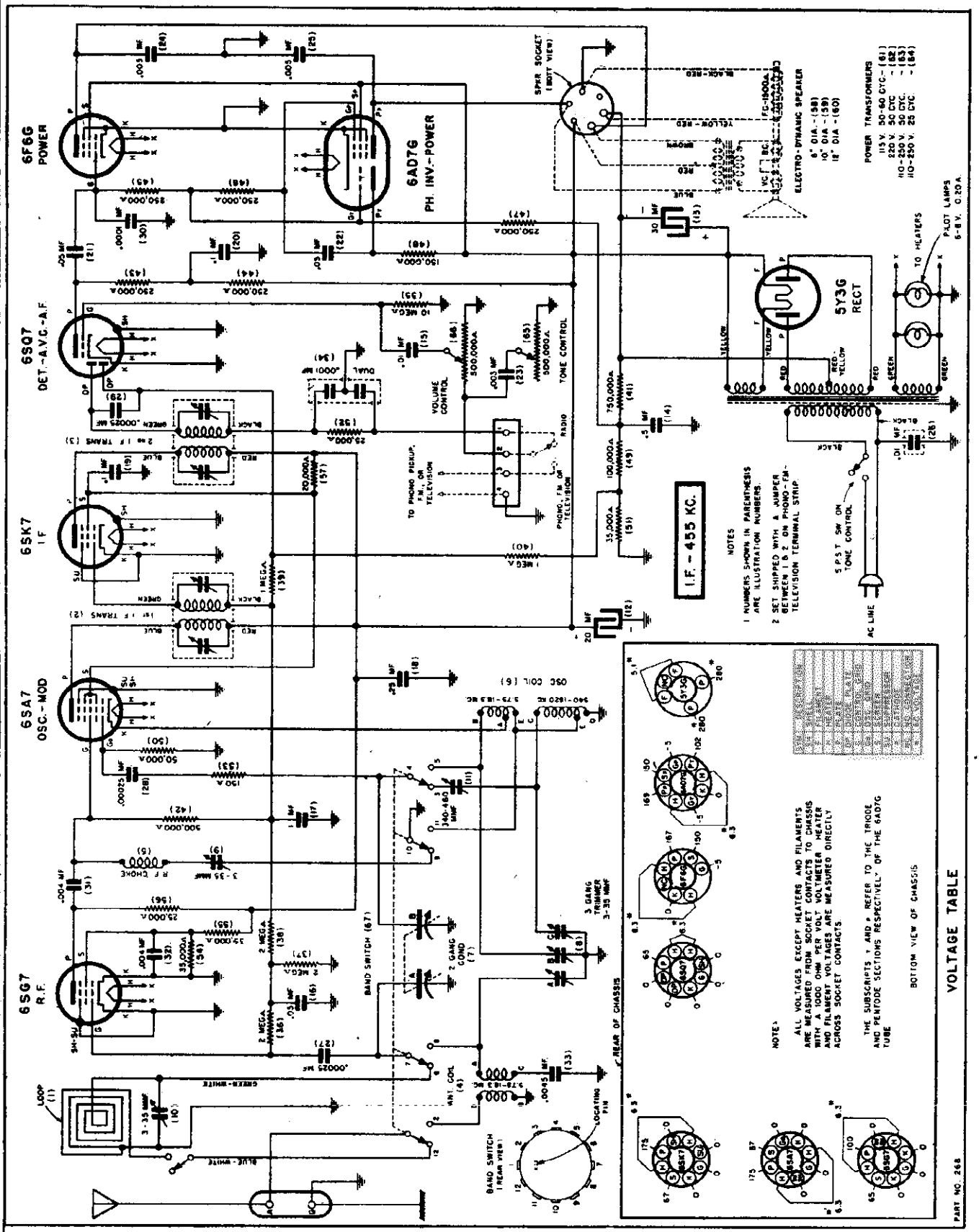




5.75-18.1 M. C. — 52.2-16.6 METER BAND
USE SECTION OF THE DIAL that is calibrated from 5.75-18.1 M. C.

540-1620 K.C.—555-185 METER BAND
USE SECTION OF DIAL THAT IS CALIBRATED FROM 540-1620 K.C.—555-185 METERS.

SENTINEL RADIO CORP.



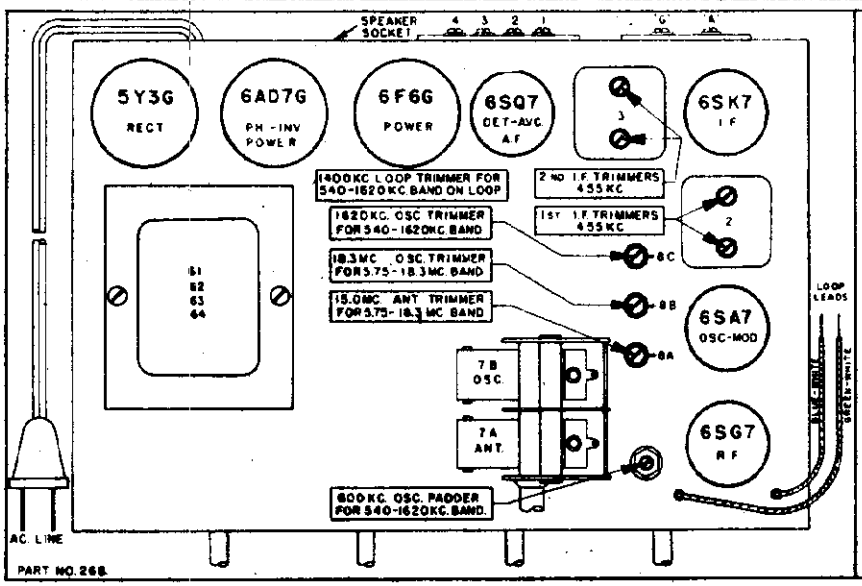
ALIGNMENT PROCEDURE

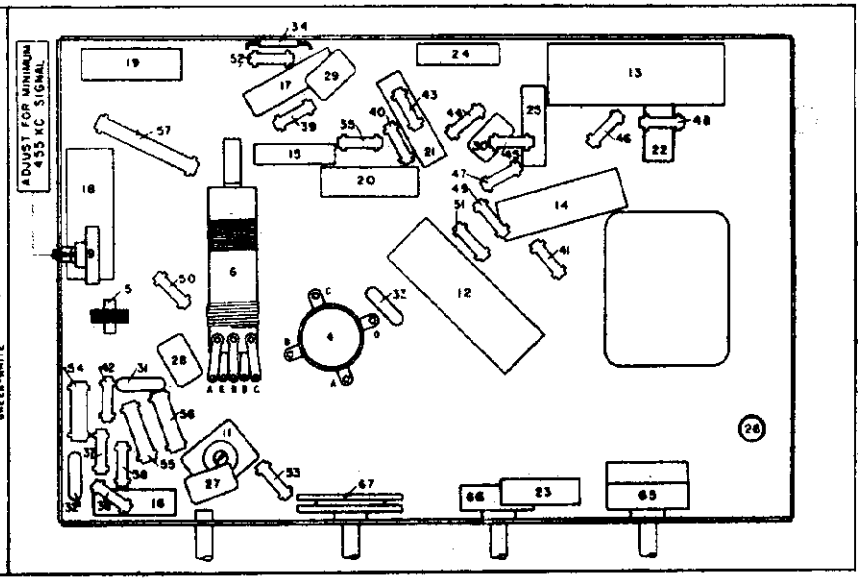
PART No. 13502—268

For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third. IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA IN THE SAME POSITION IT WILL BE IN WHEN THE SET IS IN THE CABINET.

When adjusting 1620 kilocycle oscillator trimmer 600 K.C. padder, 455 K.C. I.F. trimmer and 1400 kilocycle antenna trimmer, do not connect test oscillator to loop. Couple test oscillator to receiver loop by: (a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator. (b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

Place band switch for operation on:	Set receiver dial to:	TEST OSCILLATOR: Adjust test oscillator frequency to:	TEST OSCILLATOR: Use dummy antenna in series with output of test oscillator consisting of:	TEST OSCILLATOR: Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below:
I. F. alignment use any band position.	Any point where no interfering signal is received	Exactly 455 K.C.	0.2 Mfd. condenser	High side to grid of 6SA7 tube. Low side to frame of condenser.	Adjust each of the second I.F. transformer trimmers for maximum output, then adjust each of the first I.F transformer trimmers for maximum output.
1620 to 540 K.C. Band	1 Rotate gang condenser to Maximum Capacity	Exactly 455 K.C.	None	Use Small Loop to couple test oscillator to receiver loop. Low side to frame of condenser.	Adjust R.F. coil for minimum 455 K.C. signal.
	2 Exactly 1620 K.C.	Exactly 1620 K.C.	None	Use Small Loop to couple test oscillator to receiver loop. Low side to frame of condenser.	Adjust 1620 K. C. oscillator trimmer for maximum output.
	3 Approx. 1400 K.C.	Approx. 1400 K.C.	None	Use Small Loop to couple test oscillator to receiver loop. Low side to frame of condenser.	While rocking gang condenser adjust 1400 K. C. loop trimmer for maximum output.
	4 Approx. 600 K.C.	Approx. 600 K.C.	None	Use Small Loop to couple test oscillator to receiver loop. Low side to frame of condenser.	While rocking gang condenser adjust 600 K. C. oscillator padder for maximum output.
5.7 to 18.3 M.C. Band	1 Exactly 18.3 M.C.	Exactly 18.3 M.C.	400 Ohm carbon resistor	High side to "A" antenna post. Low side to frame of gang condenser.	Adjust 18.3 M.C. oscillator trimmer for maximum output.
	2 Approx. 15 M.C.	Approx. 15 M.C.	400 Ohm	High side to "A" antenna post. Low side to frame of gang condenser.	While rocking gang condenser adjust 15 M. C. antenna trimmer for maximum output.



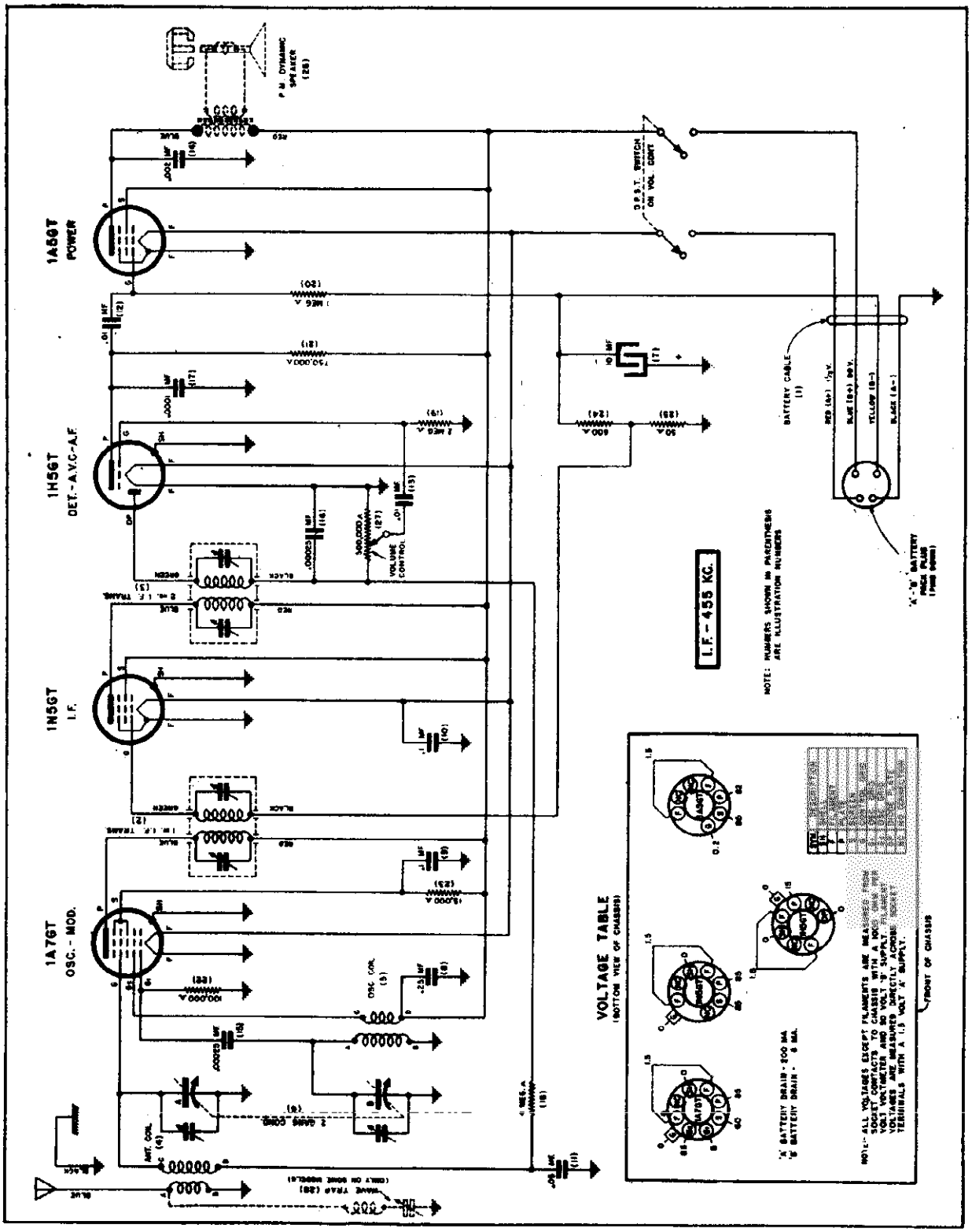


VOLTAGE RATING

THIS RADIO IS DESIGNED FOR USE ON 110-120 VOLTS 50-60 CYCLES ALTERNATING CURRENT—unless the marking on the white paper license notice which will be found attached either to bottom or inside the cabinet is marked differently, in which case the radio must only be used on the type of current shown on this notice.

BE SURE THAT THE CURRENT RATING GIVEN ON THE LICENSE TAG IS THE SAME AS THE HOUSE CURRENT SUPPLY.

SENTINEL RADIO CORP.



ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next.

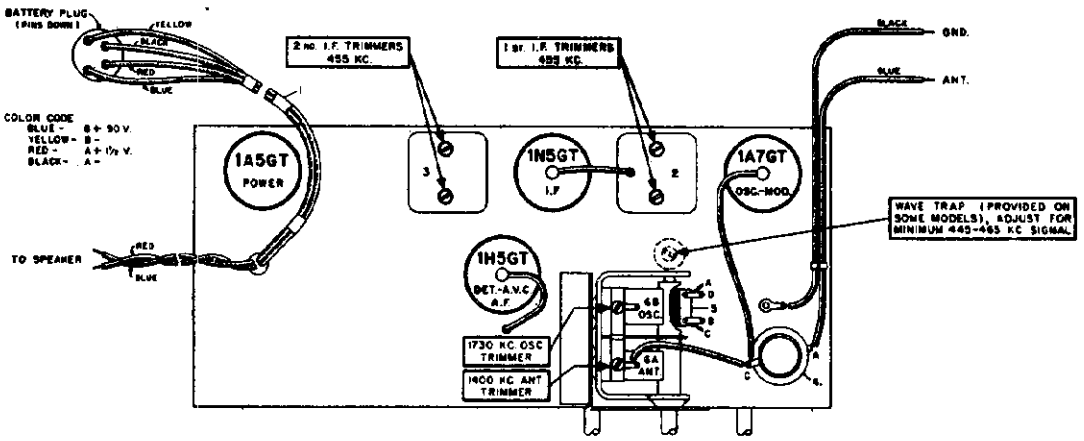
Before starting alignment:

(a) Check tuning dial adjustment by tuning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move to correct position.

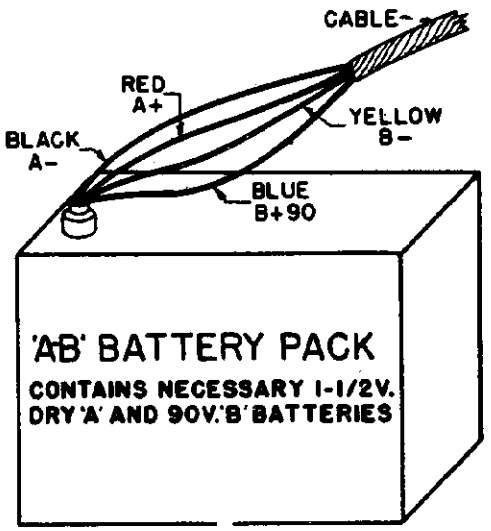
(b) Use an accurately calibrated test oscillator with some type of output measuring device.

(c) Have ground lead of test oscillator attached to chassis.

Set receiver dial to:	TEST OSCILLATOR			Refer to parts layout diagram for location of trimmers mentioned below:
	Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	
I.F. Any point where no interfering signal is received	455 K. C.	.02 MFD. condenser	High side to grid terminal of 1A7GT tube. DO NOT REMOVE CAP.	Adjust each of the second I. F. transformer trimmers for maximum output—then adjust each of the first I. F. trimmers for maximum output.
1 Exactly 1730 K. C.	Exactly 1730 K. C.	.00025 MFD. condenser	Receiver blue antenna lead	Adjust 1730 K. C. oscillator trimmer for maximum output.
2 Approx. 1400 K. C.	Exactly 1400 K. C.	.00025 MFD. condenser	Receiver blue antenna lead	While rocking gang condenser adjust 1400 K. C. antenna trimmer for maximum output.

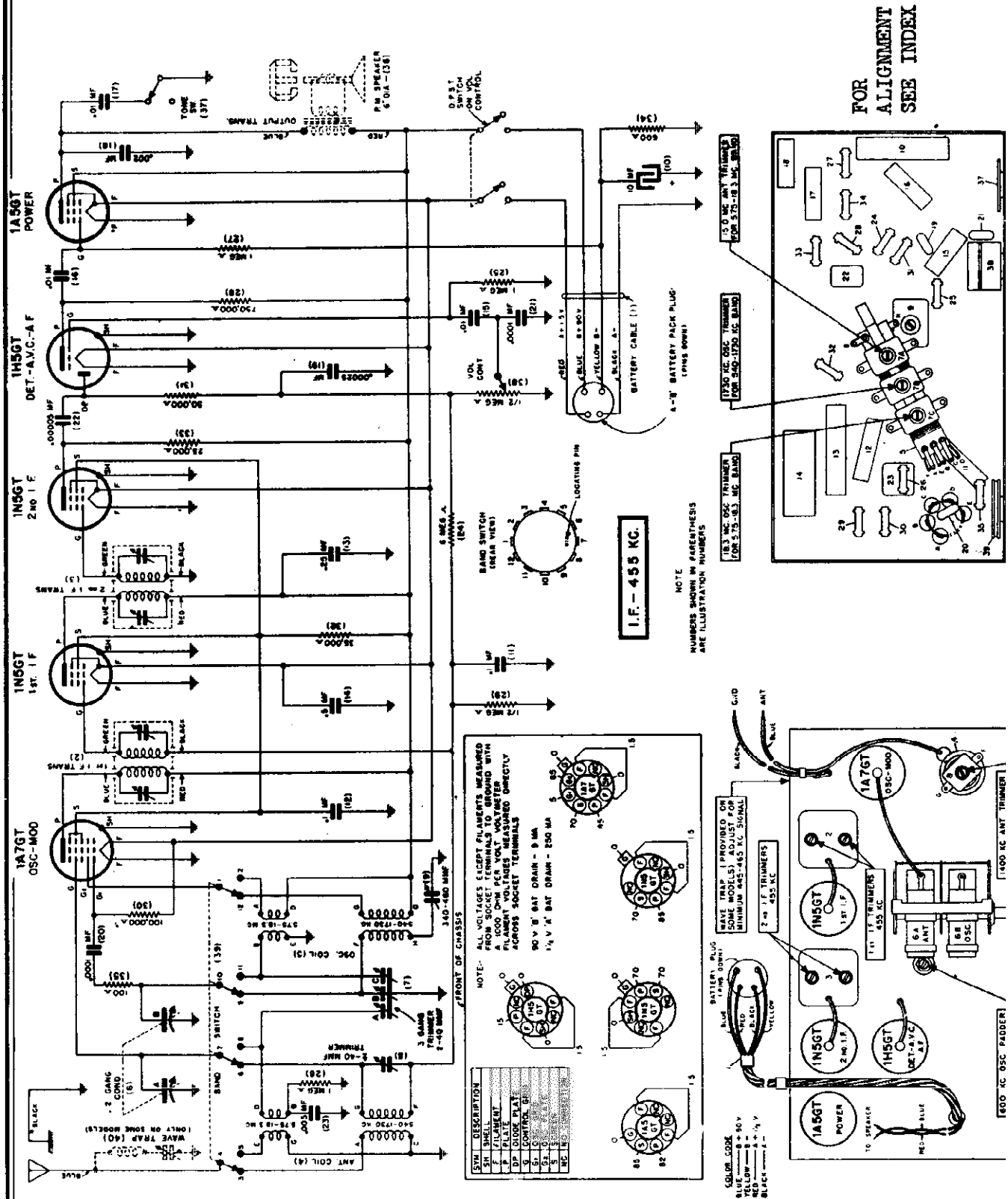


The life of the battery depends entirely upon the number of hours the set is operated daily and the quality and size of the battery. The special large size "AB" Battery Pack, designed specifically for use with this radio, will provide approximately 750 to 1000 hours of service under normal operating conditions.

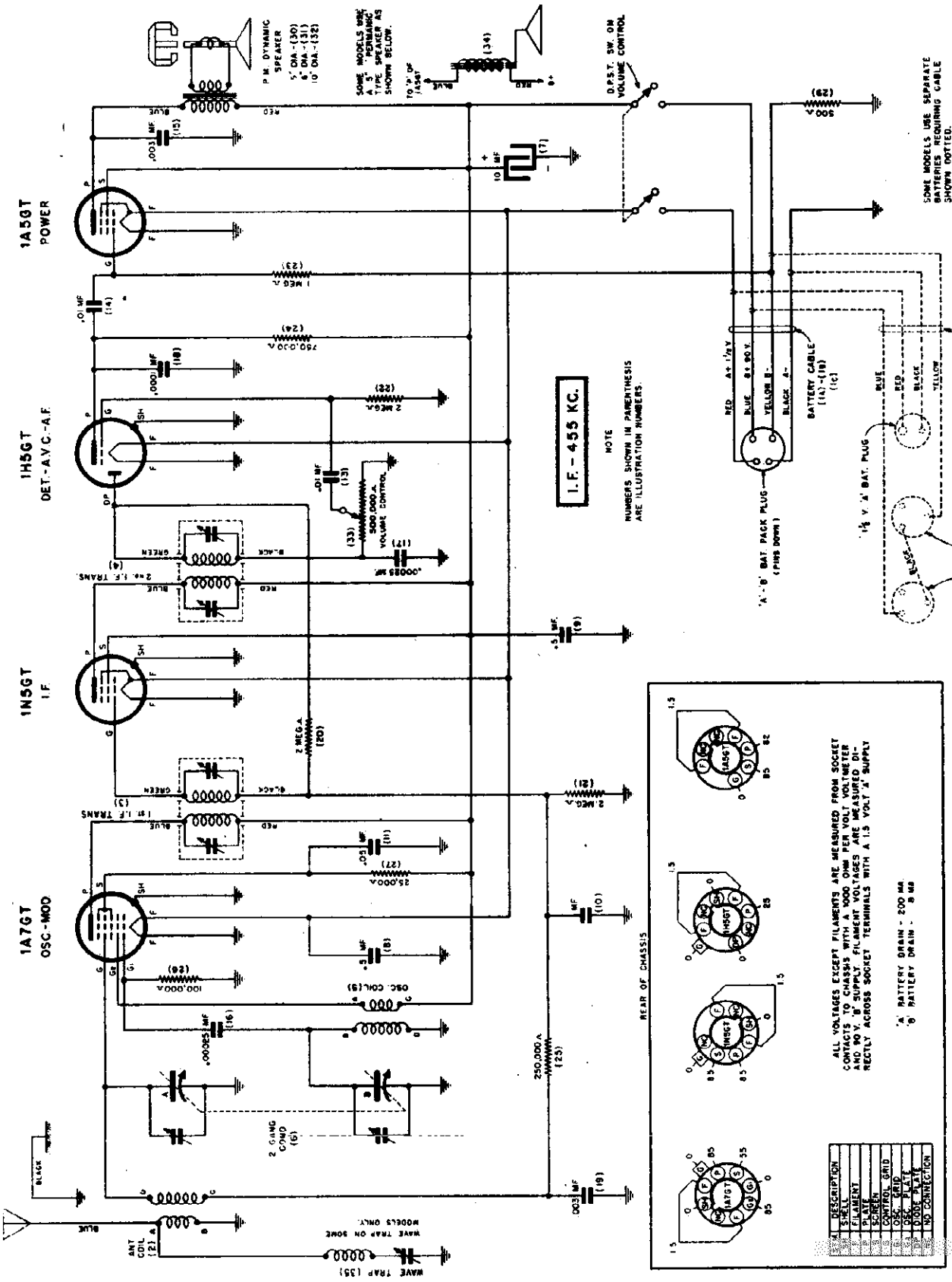


SHOWING 4 PRONG PLUG ON END OF SET BATTERY CABLE INSERTED INTO RECEPTACLE ON TOP OF "AB" BATTERY PACK

SENTINEL RADIO CORP.



SENTINEL RADIO CORP.



ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next.

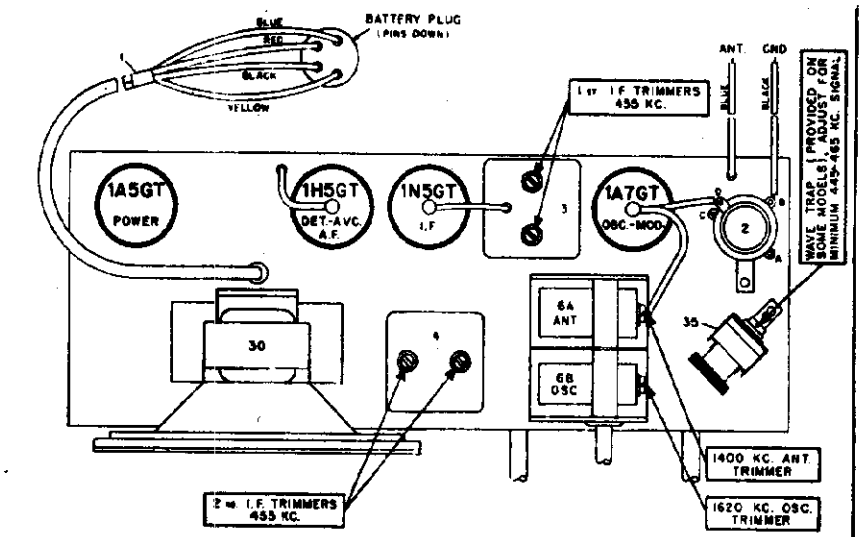
Before starting alignment:

(a) Check tuning dial adjustment by tuning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move to correct position.

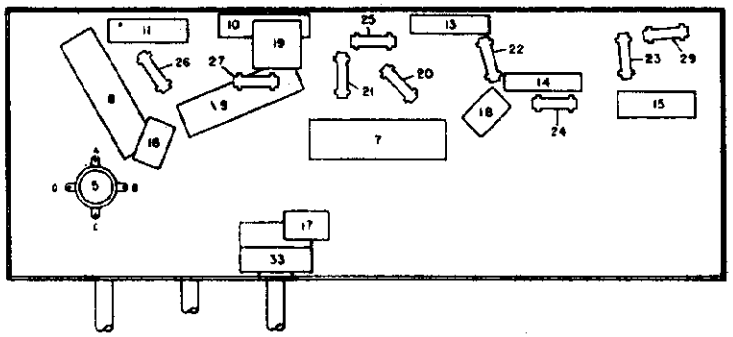
(b) Use an accurately calibrated test oscillator with some type of output measuring device.

(c) Have ground lead of test oscillator attached to chassis.

Set receiver dial to:	TEST OSCILLATOR			Refer to parts layout diagram for location of trimmers mentioned below:
	Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	
I.F. Any point where no interfering signal is received	455 K. C.	.02 MFD. condenser	High side to grid terminal of 1A7GT tube DO NOT REMOVE CAP	Adjust each of the second I. F. transformer trimmers for maximum output—then adjust each of the first I. F. trimmers for maximum output.
1	Exactly 1620 K. C.	Exactly 1620 K. C.	.00025 MFD. condenser	Receiver blue antenna lead	Adjust 1620 K. C. oscillator trimmer for maximum output.
2	Approx. 1400 K. C.	Exactly 1400 K. C.	.00025 MFD. condenser	Receiver blue antenna lead	While rocking gang condenser adjust 1400 K. C. antenna trimmer for maximum output.



PART NO. 275

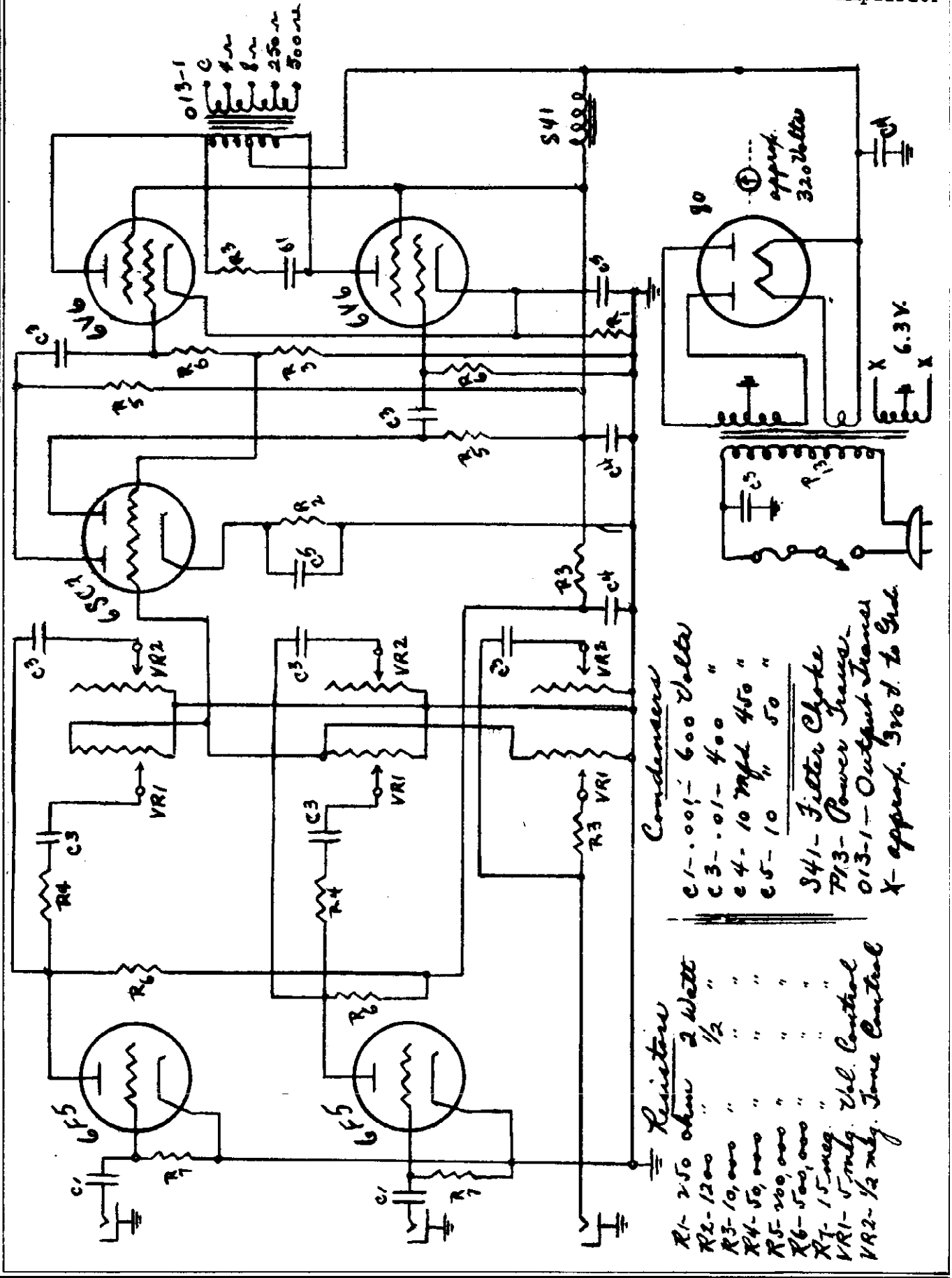


The life of the battery depends entirely on the number of hours the set is operated daily and the quality and size of the battery.

The special "AB" Battery Pack, designed specifically for use with this radio, will provide approximately 750 to 1,000 hours of service under normal, average operating conditions.

SETCHELL-CARLSON, INC.

MODEL 14
Amplifier



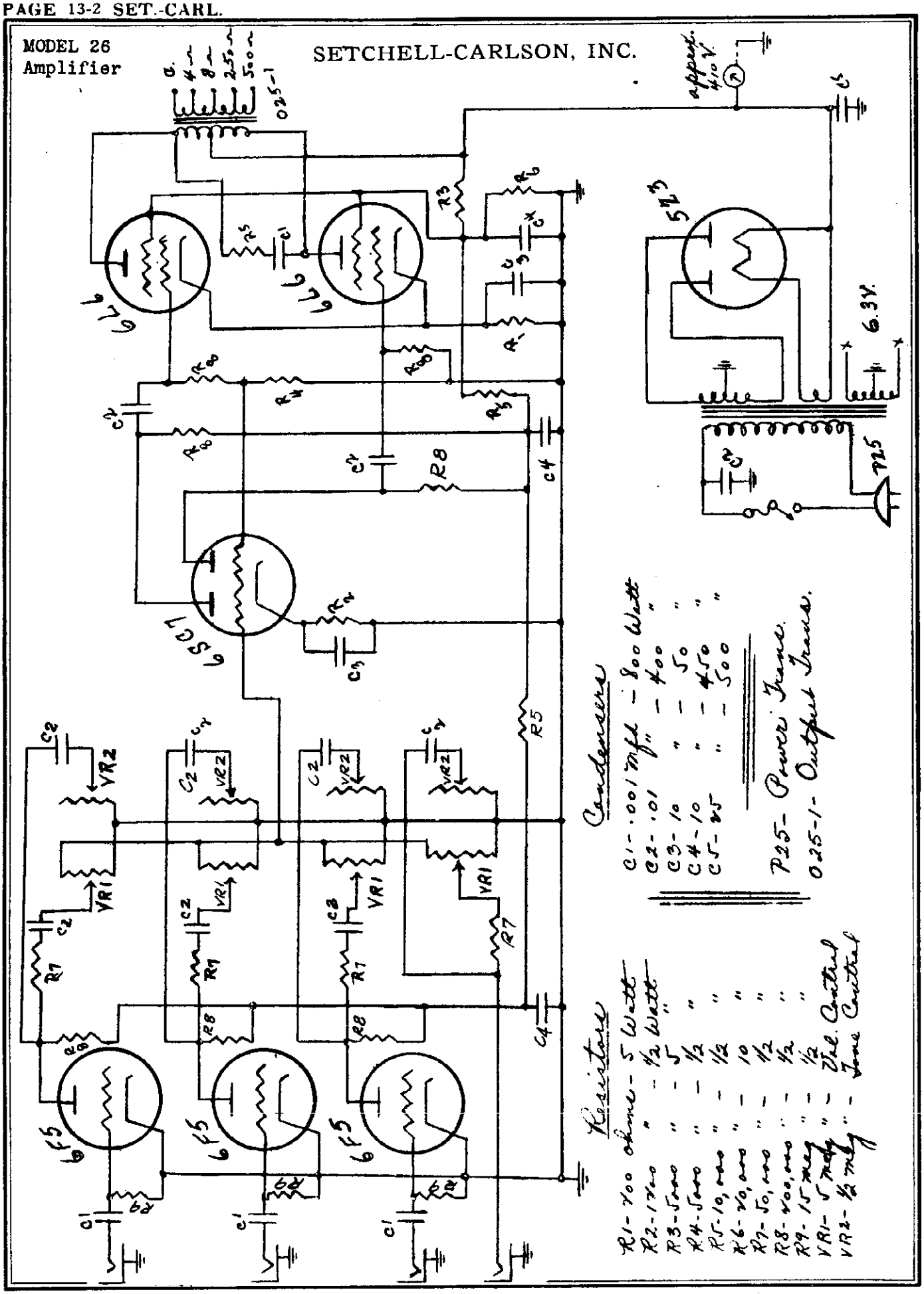
Condensers
C1-.001 - 600 Volts
C3-.01 - 400 "
C4-10 Mfd 450 "
C5-10 " 50 "

S41 - Filter Choke
P13 - Power Trans.
013-1 - Output Trans.
X - approx. 6.3 V. to Gnd.

Resistors
R1- 250 ohms 2 watt
R2- 1200 " ½ " "
R3- 10,000 " " " "
R4- 50,000 " " " "
R5- 100,000 " " " "
R6- 500,000 " " " "
R7- 1.5 meg. " " "
VR1- .5 meg. Vol. Control
VR2- ½ meg. Tone Control

MODEL 26
Amplifier

SETCHELL-CARLSON, INC.



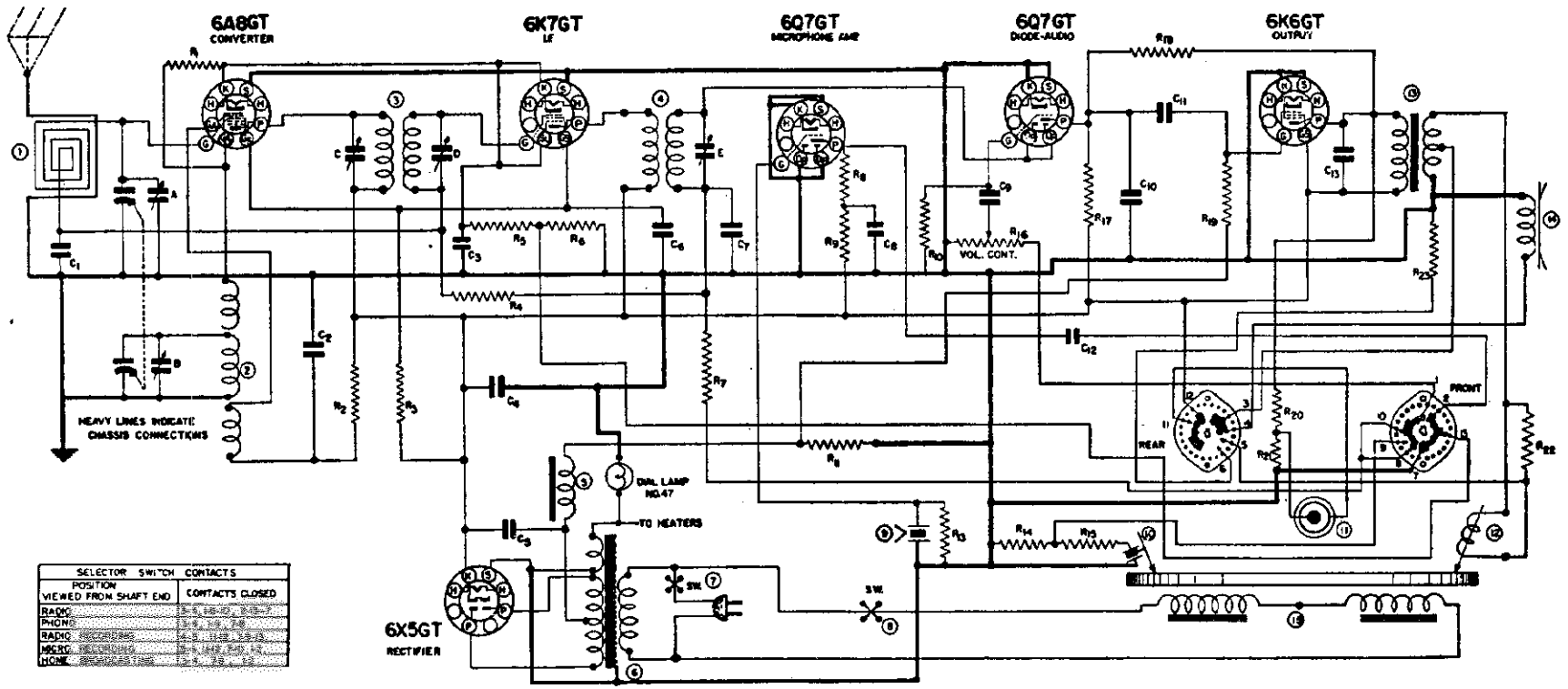
Condensers

C1 - .001 mfd - 600 Watt
C2 - .01 " - 400 "
C3 - 10 " - 50 "
C4 - 10 " - 450 "
C5 - 25 " - 500 "

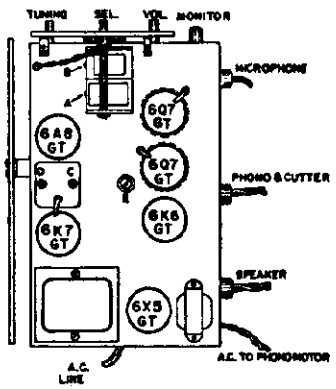
P25 - Power Trans.
025-1 - Output Trans.

Resistors

R1 - 700 ohms - 5 Watt
R2 - 1200 " - 1/2 Watt
R3 - 5000 " - 1 "
R4 - 5000 " - 1/2 "
R5 - 10,000 " - 1/2 "
R6 - 20,000 " - 1 "
R7 - 50,000 " - 1/2 "
R8 - 100,000 " - 1/2 "
R9 - 15 meg " - 1/2 "
VR1 - 5 meg " - Vol. Control
VR2 - 1/2 meg " - Tone Control



DIAG NO.	PART NO.	DESCRIPTION	DIAG NO.	PART NO.	DESCRIPTION	DIAG NO.	PART NO.	DESCRIPTION
R1	N-1280	30,000 OHM .5W 20%	C1	N-1345	.05 MFD. 200V.	1	N-3464	LOOP ANTENNA COIL
R2	N-1527	20,000 OHM .5W 20%	C2	N-1345	.05 MFD. 200V.	2	N-1452	OSCILLATOR COIL
R3	N-1474	25,000 OHM .5W 20%	C3	N-1479	.25 MFD. 200V.	3	N-1598	1ST. I.F. TRANSFORMER
R4	N-1262	1 MEGOHM .5W 20%	C4	N-3440	(15 MFD. / 15 MFD.) ELECTRO. 300V.	4	N-3463	2ND I.F. TRANSFORMER
R5	N-1515	100 OHM .5W 10%	C5			5		SPEAKER FIELD (1200 OHMS)
R6	N-1257	2,000 OHM .5W 20%	C6	N-1551	.1 MFD. 200V.	6	N-3438	POWER TRANSFORMER
R7	N-1474	25,000 OHM .5W 20%	C7	N-1374	100 MMFD.	7		SWITCH ON VOLUME CONTROL
R8	N-1779	150,000 OHM .5W 20%	C8	N-1479	.25 MFD. 200V.	8	N-1880	PHONO MOTOR SWITCH
R9	N-1261	250,000 OHM .5W 20%	C9	N-1344	.01 MFD. 400V.	9	N-3458	MICROPHONE
R10	N-1415	6 MEGOHM .5W 20%	C10	N-3456	75 MMFD.	10		PICK-UP (ON N-3443)
R11	N-1693	225 OHM 1W 10%	C11	N-1344	.01 MFD. 400V.	11	N-3389	NEON MONITOR (G.E. NE-7)
			C12	N-1344	.01 MFD. 400V.	12		CUTTING HEAD (ON N-3443)
R12	N-2169	4 MEGOHM .5W 20%	C13	N-3455	.004 MFD. 600V.	13	N-3437	OUTPUT TRANSFORMER
R14	N-1779	150,000 OHM .5W 20%				14	N-3436	5" DYNAMIC SPEAKER
R15	N-1883	300,000 OHM .5W 20%				15	N-3443	PHONO MOTOR AND TURNTABLE
R16	N-3085	500,000 OHM VOL. CONT.						
R17	N-1377	200,000 OHM .5W 20%						
R18	N-1989	4 MEGOHM .5W 20%						
R19	N-1884	500,000 OHM .5W 20%						
R20	N-1778	100,000 OHM .5W 20%						
R21	N-3480	1.5 MEGOHM .5W 20%						
R22	N-3458	36 OHM .5W 10%						
R23	N-3464	4.5 OHM .5W 10%						



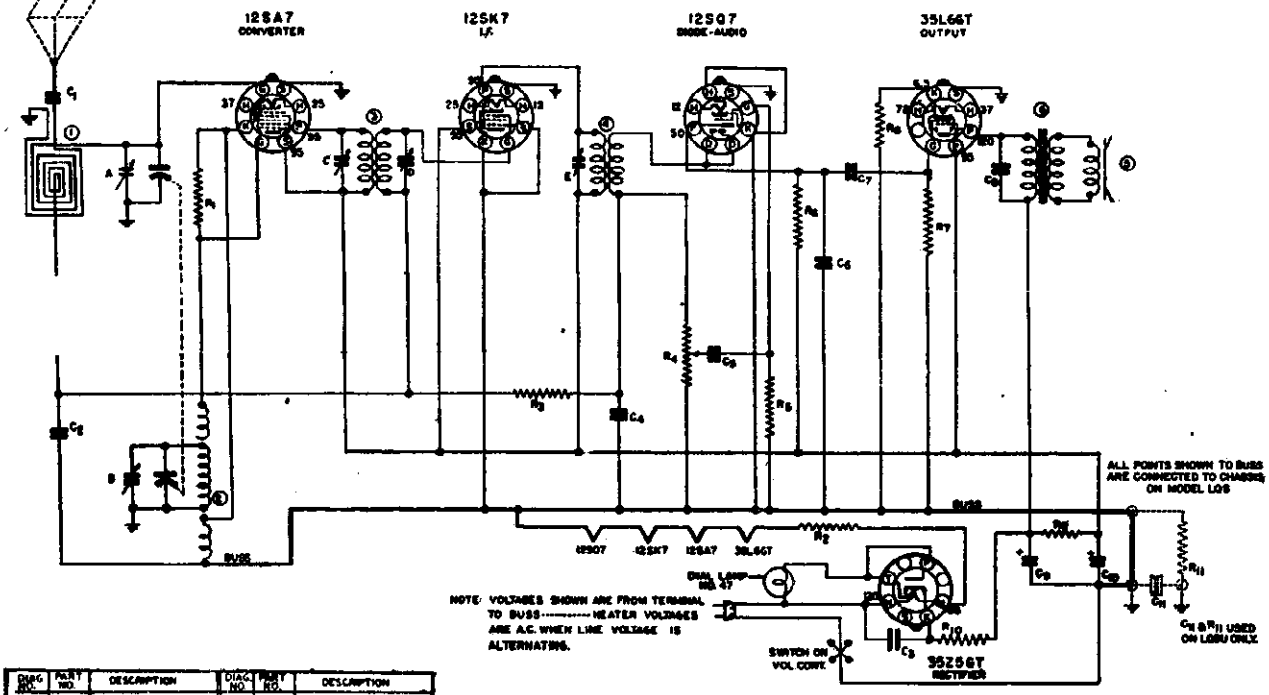
I.F. 456 K.C.

6 TUBE A.C.
SUPERHETERODYNE
SINGLE BAND
RECORDER-PHONO-RADIO COMB.

DRAWN-WJF APPROVED
JULY 9 1940
LCU

FOR GENERAL RECORDER DATA SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

MODELS LQS, LQSU
MODELS LC, LCU, LKS, LKSU,
LMS, LMSU, LR, LZ, MTF-164



DIAG. NO.	PART NO.	DESCRIPTION
R1	N-4025	22,000 OHM .5 W. 20%
R2	N-4023	82 OHM 2 W. 10%
R3	N-3175	1 MEGOHM .5 W. 20%
R4	N-4014	.5 MEGOHM VOL. CONT.
R5	N-4026	6.8 MEGOHM .5 W. 20%
R6	N-4028	220,000 OHM .5 W. 20%
R7	N-4027	470,000 OHM .5 W. 20%
R8	N-4029	220 OHM .5 W. 10%
R9	N-3349	1000 OHM .5 W. 10%
R10	N-4022	33 OHM .5 W. 20%
R11	N-1779	150,000 OHM .2 W. 20% (LQSU ONLY)
C1	N-1344	.01 MFD. 400 V.
C2	N-1345	.05 MFD. 200 V.
C3	N-1345	.05 MFD. 400 V.
C4	N-1334	100 MMFD. MICA
C5	N-1378	.004 MFD. 400 V.
C6	N-1380	.0035 MFD. 400 V.
C7	N-1344	.01 MFD. 400 V.
C8	N-1376	.02 MFD. 400 V.
C9	N-4035	35 MFD. 150 V. ELECT.
C10		30 MFD. 150 V.
C11	N-3080	.22 MFD. 200 V. (LQSU ONLY)

DIAG. NO.	PART NO.	DESCRIPTION
1	N-4338	ANTENNA COIL LOOP
2	N-3696	OSCILLATOR COIL
3	N-4013	1ST I.F. TRANSFORMER
4	N-3908	2 ND I.F. TRANSFORMER
5	N-4010	4" SPEAKER
6	N-4011	OUTPUT TRANSFORMER
	N-4032	2 GANG CONDENSER

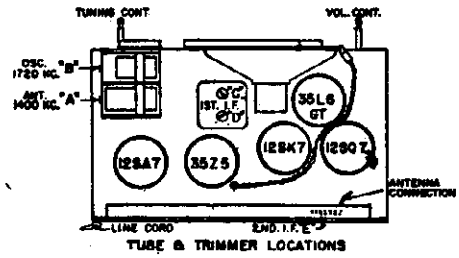
MODELS LQS, LQSU

I.F. 456 KC.

5 TUBE AC-DC

SUPERHETERODYNE
SINGLE BAND
DRAWN [illegible] APPROVED [illegible]

JUNE, 1941



TUBE & TRIMMER LOCATIONS

ALIGNMENT FOR MODELS: LC, LCU, LKS, LKSU, LMS, LMSU, LQS, LQSU, LR, LZ, MTF-164

GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 456, 600, 1400 and 1720 KC and an output meter 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. Remove the chassis from the cabinet and set on a bench taking care that no iron or other metal is near the loop. Do not make this setup on a metal bench. The intermediate frequency (I.F.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the broadcast band should be adjusted.

I. F. ALIGNMENT. With 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* (12A8GT) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the chassis ground. Align all three I.F. trimmers to peak or maximum reading on the output meter. Δ

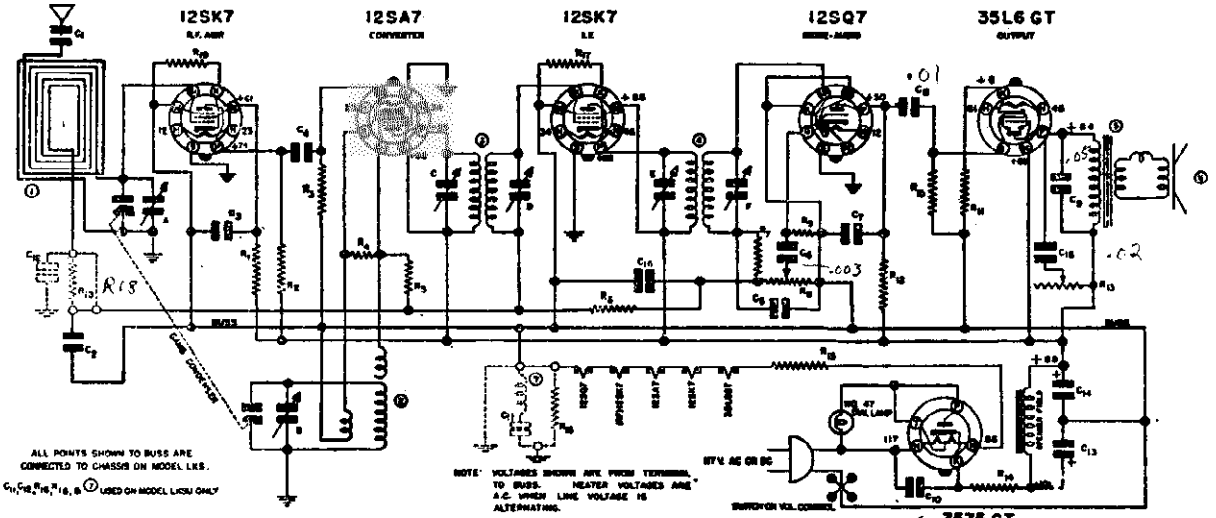
BROADCAST BAND ALIGNMENT. Connect the test oscillator to the antenna of the set through a †200† mmfd. (.0002) condenser. With the gang condenser set at minimum capacity, set the test oscillator at 1720 K.C. and adjust the oscillator (or 1720 KC trimmer) on gang condenser. Next—set the test oscillator at 1400 KC, and tune in the signal on the gang condenser. Adjust the antenna trimmer (or 1400 KC trimmer) for maximum signal. Next set the test oscillator at 600 KC, and tune in signal on condenser to check alignment of coils.

* 6A8GT for MODELS: LC, LCU, 12SA7 for MODELS: LKS, LKSU, LMS, LMSU, LQSU, LQS, 1A7GT for MODELS: LR, LZ

Δ 4 I.F. TRIMMERS ON MODELS LC, LCU, LKS, LKSU

† 100 mmfd for MODELS: LKS, LKSU, LMS, LMSU, LQS, LQSU

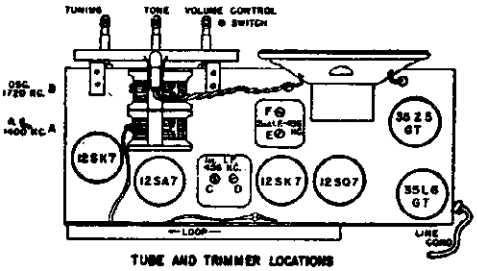
SONORA RADIO & TELEV. CORP.



DIAG NO.	PART NO.	DESCRIPTION	DIAG NO.	PART NO.	DESCRIPTION
C1	N-1344	.01 MFD. 400 V. 20%	R11	N-4067	180 OHM 5 W. 10%
C2	N-1343	.03 MFD. 200 V. 20%	R12	4085	220,000 OHM 5 W. 20%
C3	N-1345	.05 MFD. 200 V. 20%	R13	M 4033	25,000 OHM TONE CONTROL
C4	N-2385	150 MMFD. MICA 20%	R14	N-4088	33 OHM 10 W. 20%
C5	N-1374	100 MMFD. MICA 20%	R15	N-4088	33 OHM 10 W. 20%
C6	N-2063	.003 MFD. 600 V. 20%	R16	N-4086	270,000 OHM 5 W. 20%
C7	N-1447	.0005 MFD 400 V. 20%	R17	N-1491	75 OHM 5 W. 20%
C8	N-1344	.01 MFD. 400 V. 20%	R18	N-1383	1 MEGOHM 5 W. 20%
C9	N-1378	.02 MFD. 400 V. 20%	R19	N-1491	75 OHM 5 W. 20%
C10	N-1346	.05 MFD. 400 V. 20%			
C11	N-3080	.22 MFD. 200 V. 10%			
C12	N-1345	.05 MFD. 200 V. 20%	1	N-4038	ANTENNA LOOP COIL
C13	N-4015	35 MFD. 150 W.V. ELECTROLYTIC	2	N-3258	OSCILLATOR COIL
C14		30 MFD. 150 W.V.	3	N-4002	1ST I.F. TRANSFORMER
C15	N-1348	.05 MFD. 400 V. 20%	4	N-4070	2ND I.F. TRANSFORMER
C16	N-1374	100 MMFD. MICA 20%	5	N-4082	OUTPUT TRANSFORMER
			6	N-4078	6" DYNAMIC SPEAKER
			7	——	CHOKE WOUND ON C_{13}
R1	N-1259	18,000 OHM .5 W. 20%			
R2	N-4065	2200 OHM .5 W. 10%			
R3	N-4063	47,000 OHM .5 W. 20%			
R4	N-4025	22,000 OHM .5 W. 20%	N-4081		2 GANG CONDENSER
R5	N-1263	1 MEGOHM .5 W. 20%			
R6	N-4062	3.3 MEGOHM .5 W. 20%			
R7	N-4065	47,000 OHM .5 W. 20%			
R8	N-4071	0.5 MEGOHM VOLUME CONTROL			
R9	N-4061	4.7 MEGOHM .5 W. 20%			
R10	N-4027	470,000 OHM .5 W. 20%			

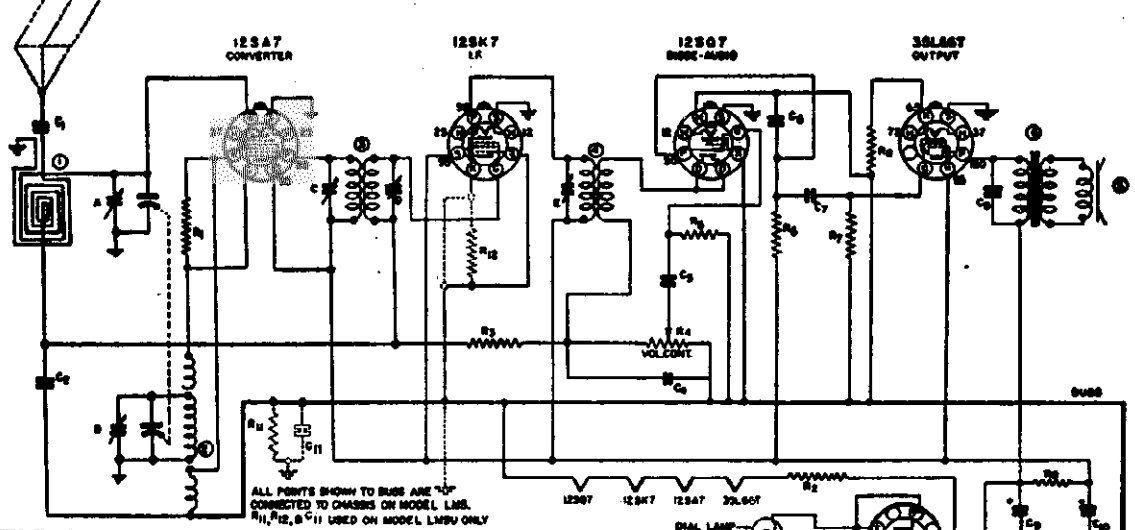
MODELS LKS, LKSU

I.F.—456 K.C.



TUBE AND TRIMMER LOCATIONS

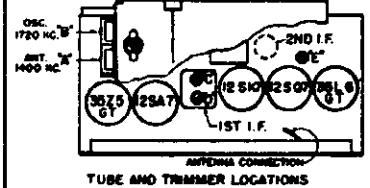
6 TUBE A.C.—D.C.
SUPERHETERODYNE
SINGLE BAND
JUNE, 1941



DIAG NO.	PART NO.	DESCRIPTION	DIAG NO.	PART NO.	DESCRIPTION
R1	N-4027	20,000 OHM .5W. 20%	1	N-4013	ANTENNA COIL LOOP
R2	[illegible]	80 OHM .5W. 10%	2	N-3258	OSCILLATOR COIL
R3	N-4065	1 MEGOHM .5W. 20%	3	N-4002	1ST I.F. TRANSFORMER
R4	[illegible]	.5 MEGOHM VOL. CONT.	4	N-3736	2ND I.F. TRANSFORMER
R5	N-1383	1 MEGOHM .5W. 20%	5	N-4310	4" SPEAKER
R6	[illegible]	220,000 OHM .5W. 20%	6	N-3258	OUTPUT TRANSFORMER
R7	N-1384	2200,000 OHM .5W. 20%			
R8	N 3736	200 OHM .5W. 10%			
R9	N-3349	1000 OHM .5W. 20%			
R10	N-1742	85 OHM .5W. 20%			
R11	[illegible]	1,000,000 OHM .5W. 20%			
R12	[illegible]	250 OHM .5W. 20%	N-4310		2 GANG CONDENSER
C1	N-1344	.01 MFD. 400V.			
C2	N-1343	.03 MFD. 200V.			
C3	N-1345	.05 MFD. 400V.			
C4	N-1374	100 MMFD.			
C5	N-2772	.0041 MFD. 400V.			
C6	N-1447	.0005 MFD. 400V.			
C7	N-1344	.01 MFD. 400V.			
C8	N-1378	.02 MFD. 400V.			
C9	[illegible]	30 MFD. 150V. ELECT.			
C10	[illegible]	30 MFD. 150V. ELECT.			
C11	[illegible]	.22 MFD. 200V.			

MODELS LMS, LMSU

I.F. 456 KC.



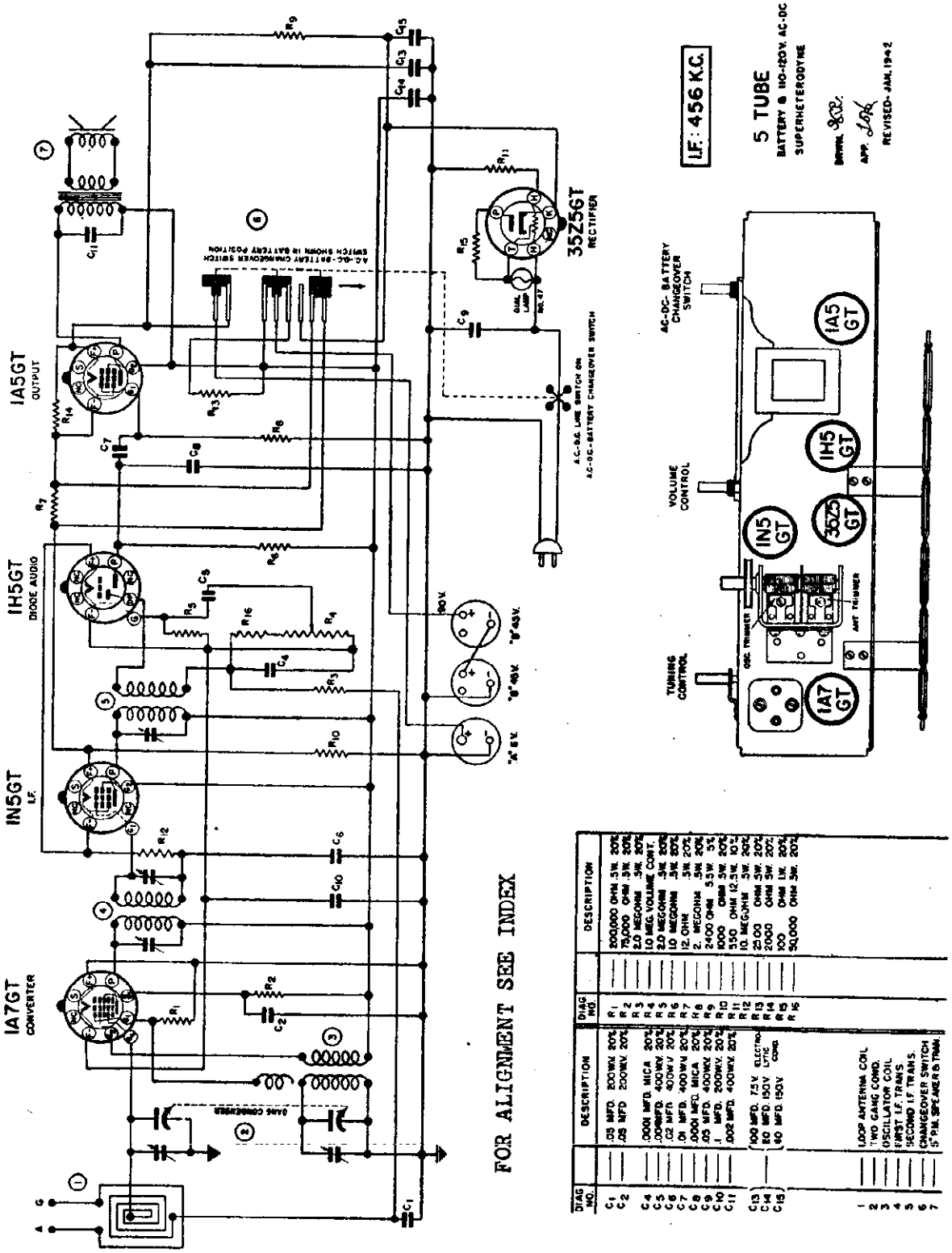
TUBE AND TRIMMER LOCATIONS

6 TUBE AC-DC
SUPERHETERODYNE
SINGLE BAND
JUNE, 1941.

FOR ALIGNMENT SEE OPPOSITE PAGE

MODEL LR

SONORA RADIO & TELEV. CORP



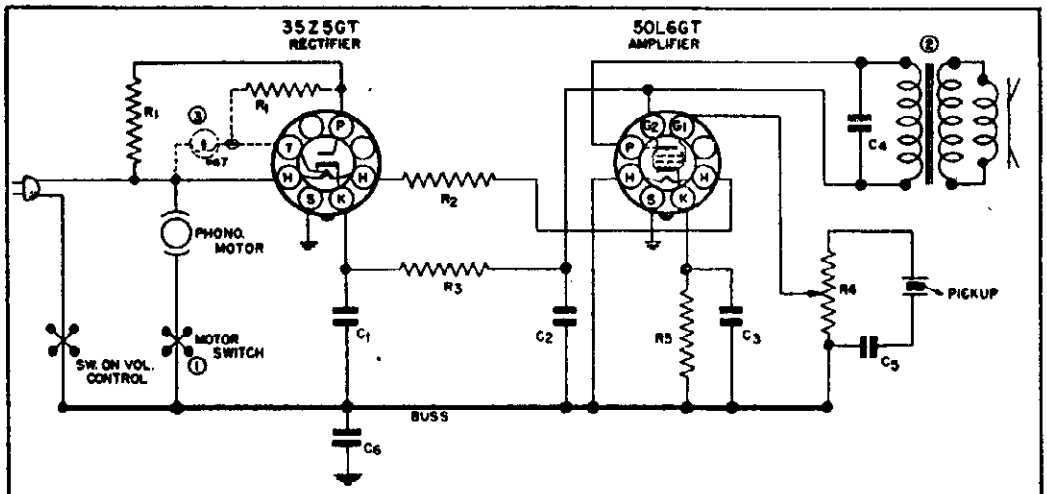
DIAG NO.	DESCRIPTION
C1	.05 MFD. 200 WV. 20%
C2	.05 MFD 200 WV. 20%
C3	
C4	.0001 MFD. MICA 20%
C5	.0008 MFD. 400 WV. 20%
C6	.02 MFD. 400 WV. 20%
C7	.01 MFD. 400 WV. 20%
C8	.0001 MFD. MICA 20%
C9	.05 MFD. 400 WV. 20%
C10	.1 MFD. 200 WV. 20%
C11	.002 MFD. 400 WV. 20%
C12	
C13	100 MFD. 75 V. ELECTRO LYTIC CONS
C14	20 MFD. 150 V.
C15	40 MFD. 150 V.

DIAG NO.		DESCRIPTION
R1		200,000 OHM .5W. 20%
R2		75,000 OHM .5W. 20%
R3		2.0 MEGOHM .5W. 20%
R4		10 MEG. VOLUME CONT.
R5		2.0 MEGOHM .5W. 20%
R6		10 MEGOHM .5W. 20%
R7		12. OHM .5W. 20%
R8		2. MEGOHM .5W. 20%
R9		2400 OHM 5.5W. 5%
R10		1000 OHM 5W. 20%
R11		350 OHM 12.5W. 10%
R12		10. MEGOHM .5W. 20%
R13		2500 OHM 5W. 20%
R14		2000 OHM 5W. 20%
R15		100 OHM 1W. 20%
R16		30,000 OHM 3W. 20%

DIAG NO.	
1	LOOP ANTENNA COIL
2	TWO GANG COND.
3	OSCILLATOR COIL
4	FIRST I.F. TRANS.
5	SECOND I.F. TRANS.
6	CHANGEOVER SWITCH
7	5 PIN SPEAKER PLUG

SONORA RADIO & TELEV., CORP

MODELS TE38, TE40, TE41
Phono
MODELS KWU78, KWU79
Phono



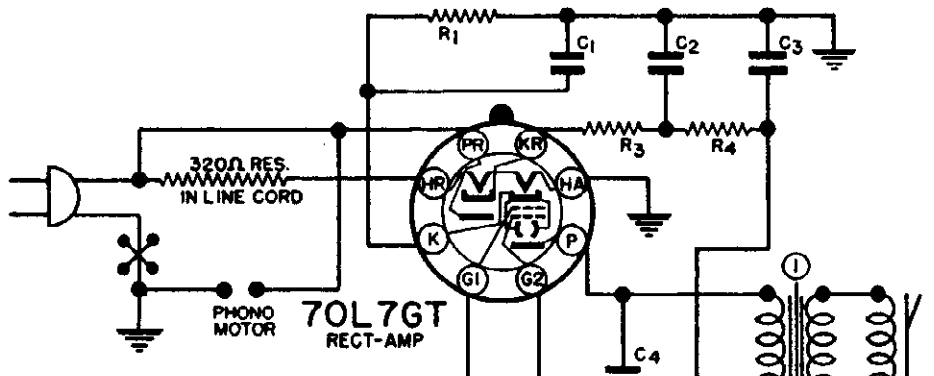
DIAG NO.	PART NO.	DESCRIPTION		DIAG NO.	PART NO.	DESCRIPTION
R1	N-1742	25 OHMS .5W.	20%	①	N-3614 OR N-3549	ROTARY SNAP SW. ON KWU-78 AUTOMATIC STOP SW. ON KWU-79
R2	N-3488	220 OHMS ARMORED	5 W.			
R3	N-1867	500 OHMS 2W.	20%			
R4	N-3248 / N-1864	.5 MEG. VOL. CONT. – KWU-78 / .5 MEG. VOL. CONT. – KWU-79		②	N-2914 / N-3618	4" P.M. SPEAKER / OUTPUT TRANS. } KWU-78
R5	N-1350	150 OHMS .5W.	10%		N-3291 / N-3568	5½" P.M. SPEAKER / OUTPUT TRANS. } KWU-79
C1	N-3617	40 MFD. ELECTRO.	150V.	③		G.E. NO.47 PILOT LAMP USED ON KWU-79 ONLY.
C2		40 MFD. ELECTRO.	15 0V.			CONNECTIONS SHOWN IN DOTTED LINES USED ON KWU-79 ONLY.
C3		20 MFD.	25 V.			
C4	N-1344	.01 MFD.	400V.			
C5	N-1345	.05 MFD.	200V.			
C6	N-1345	.05 MFD.	200V.			

ELECTRIC PHONOGRAPH

DRAWN V.J.F. APP'D. [illegible]

AUG. 7, 1940.

KWU78, KWU79



DIAG. NO.	PART NO.	DESCRIPTION	
R1	N-1360	150 OHM .5 W.	10%
R2	N-1864	0.5 MEGOHM VOL. CONTROL	
R3	N-1742	25 OHM .5W.	20%
R4	N-1867	500 OHM 2W.	20%
C1	N-1866	20MFD. 25V. } ELECTRO.	
C2		30 MFD. 150V. } ELECTRO.	
C3		30 MFD. 150V. } ELECTRO.	
C4	N-1344	.01 MFD.	400V.
1	N-1863	5 1/2" P.M. SPEAKER(TE-38)	
	N-1865	LINE RES. CORD	
1	N-1910	5 1/2" P.M. SPKR.(TE-40&41)	

ELECTRIC PHONOGRAPH

DRN J.B. APP. [illegible] 5-9-39

TE-38,40&41

SONORA RADIO & TELEV., CORP.

OPERATION

Controls and Moving Mechanism

(1) OFF-ON PHONOGRAPH VOLUME CONTROL — This is the only knob on the Phonograph Attachment. A twist to the right switches on the current to the turntable motor; turning the knob further increases volume. On models equipped with automatic stop switch, no off-on switch is used in conjunction with the volume control. To start the turntable motor on these models, it is only necessary to move the automatic switch lever slightly forward.

The automatic stop switch is adjustable and should be adjusted to stop the motor when the pick-up needle travels the last record groove (nearest the center). This can be done by moving the release arm to a position where it just touches the side of the pick-up arm when the needle is in the last groove and with the motor running.

(2) TURNTABLE — In placing the turntable plate on the motor spindle be sure that the small rubber tire of the motor drive wheel makes contact with the inner edge of the turntable plate. Be certain that the phonograph attachment cabinet rests squarely on a flat surface so that the turntable is level and rotates in a true horizontal plane.

(3) PICKUP — The pickup is the new crystal type. To insert a needle, raise the pickup arm to a vertical position, loosen the needle holder screw on the front, insert a needle to its full depth, tighten up the needle holder screw and lower pickup arm to its non-playing position outside the record and slip into the pickup rest holder. When commencing to play, remove pickup from holder, lift and place gently the point of needle in outside starting groove of record.

(4) RADIO RECEIVER CONTROLS — The power control or "ON-OFF" switch on your radio receiver must be in its "ON" position as for radio reception. Other radio controls will, in many cases, affect record reproduction. Adjustment of the radio set's volume and tone controls may add considerably to the enjoyment of your record selections.

(5) PLAYING RECORDS

(a) Turn on the power switch on your radio receiver. The radio dial should light up.

(b) If your radio is the type that has phono-connections applied at the factory and a switch or push-button for phono-radio switching, turn the switch to the phono position or if it has a phono-push button, this button should be depressed.

(c) Place the selected record upon the turntable and turn the knob on the Phonograph Attachment to the right (clockwise) or in the case of automatic stop models, move the switch lever forward. This should place the record in motion.

(d) Lift pickup and lower the needle point gently to the outside record groove.

(e) Adjust volume to suit, by further rotation of the phonograph attachment volume control knob. With some radios the radio volume control will be found effective. In such cases either the Phonograph Attachment volume control, or the radio volume control may be used. Two procedures are possible. The phonograph attachment control knob may be turned fully on and the radio volume control used for regulation, or, if more convenient or desirable, turn the radio volume control about two-thirds (⅔) on, and regulate volume with the phonograph attachment control. If your radio has a tone control it can also be set for best reproduction. If record and needle scratch noise is objectionable the tone control may be used to subdue or eliminate by adjustment of the tone control in the direction that favors "Bass" response. After the selection is completed, lift the pickup, swing the arm to the right beyond the edge of the record and lower and affix to the arm rest bracket.

(f) When you have finished playing, turn knob on the Phonograph Attachment fully to the left. This is unnecessary on models EQUIPPED WITH AUTOMATIC STOP. Lift pickup and place in its rest position and remove record from turntable. Never leave pickup with needle resting on record or on turntable. If you have had to connect the cable to the Grid terminal of your radio's 1st audio amplifier tube, it will have to be removed in order to play the radio only.

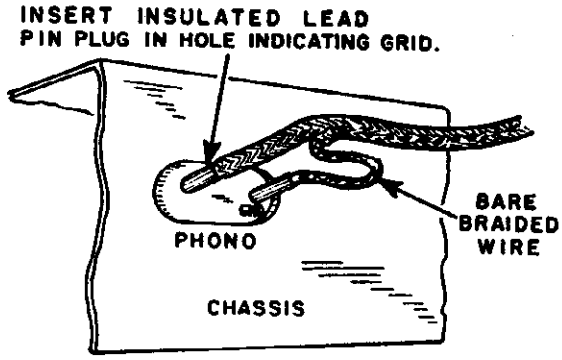
MOTOR SWITCH—(a) *Models with combined motor and amplifier "on-off" switch.* The combined switch is located on the volume control. When the volume is turned to the right the switch will click and the turntable will revolve as the amplifier heats. After the amplifier is heated, the switch should be turned off momentarily for record changing as the amplifier will cool off.

(b) *Models with separate motor switch.* The amplifier switch on the volume control turns on the amplifier. The operation of the motor switch does not turn the amplifier on or off. A separate push button switch is used to turn the motor "on" and "off." The button is pushed to start the motor. Another push of the button stops the motor.

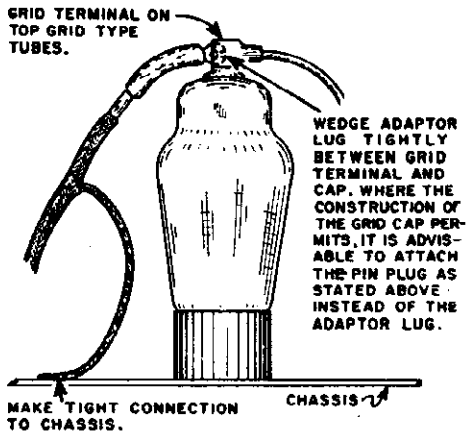
(c) *Models with automatic stop.* These models have the motor switch incorporated in the automatic stop. To start the motor move the lever at the right side of the turntable. The automatic stop can be adjusted so that the pickup arm will strike it at the conclusion of a record and thus turn off the motor. The automatic stop operates a separate switch and does not turn the amplifier on or off.

A little oil applied to the motor, idler and turntable bearings about once every three months will suffice.

SONORA RADIO & TELEV., CORP.



SKETCH NO. 1

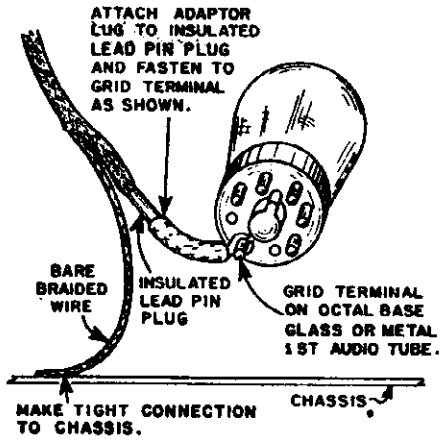


SKETCH NO. 2

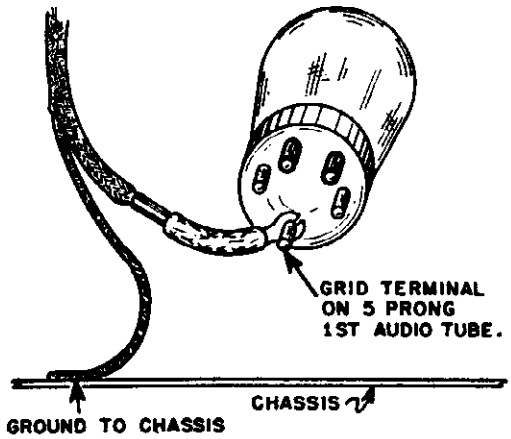
The Phonograph Attachment is designed for use on alternating current (AC) only, and may be badly damaged if subjected to use on direct current (DC). The improper application of power source will burn out the motor that drives the rotating turntable,

The Phonograph Attachment can be operated only on 110 to 125 volt AC (alternating current) 60 cycles.

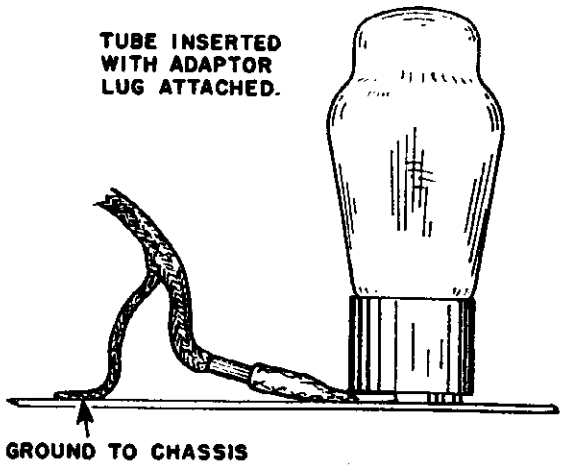
Note: To obtain proper musical rendition of phonograph records the records must revolve at a speed of 78 R.P.M. (revolutions per minute). To insure the proper turning speed to your records the power supply must be 60 cycles. A 50 cycle supply will rotate the phonograph record at reduced speed and consequently change the tempo and true tone of the musical recorded program.



SKETCH NO. 3



SKETCH NO. 4



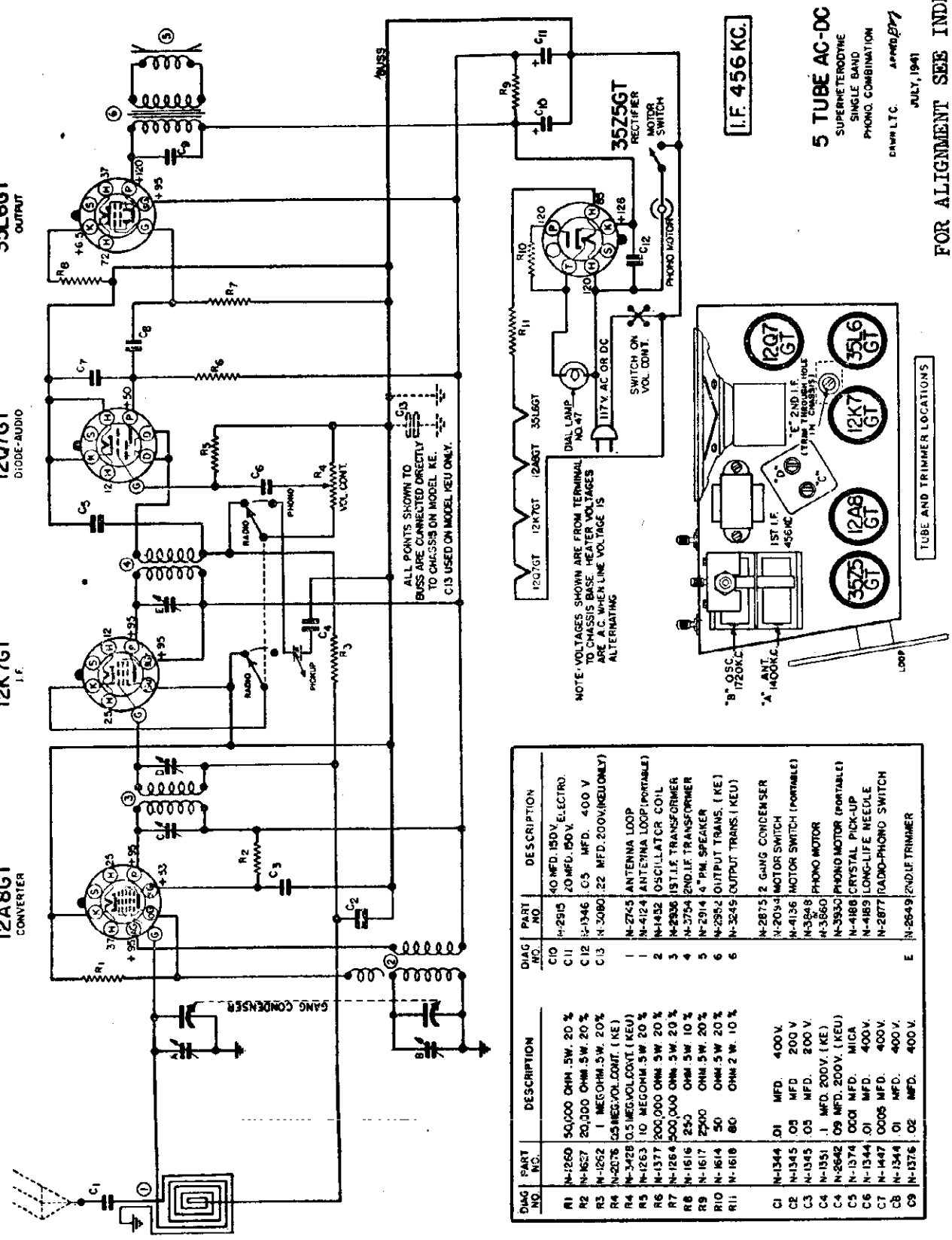
SKETCH NO. 5

Before making any connections from the phonograph attachment to the radio receiver, be certain that the power to the radio set is turned off; a mild electric shock may be experienced if the chassis is touched by the hand on some radios. To prevent any possibility of such an unpleasant occurrence many radios are equipped with means for connecting a phonograph attachment. On such radios a small strip of insulated material (see sketch 1) with two terminals or phono-tip jacks will be marked phono. It is only necessary to connect the pin plug connectors to this strip if your radio has this provision and follow operating instructions of your Phonograph Attachment and your radio. If no provision for phonograph adaption exists on your radio set, the following procedure becomes necessary:

Locate the first audio tube in the radio chassis by reference to radio set manufacturers' instructions or the tube location chart that usually is attached to the interior or bottom of the radio cabinet. There are three (3) distinctive types of tubes that may be found in use in this position and the three accompanying sketches 2, 3, and 4 show their differences and the proper treatment of connection to each type. The insulated pin-plug should be connected to the "Grid" terminal of the first audio tube and the bare braided wire lead to the chassis, as indicated in the sketches. In connecting the insulated lead to grid terminal of tube types as shown in sketch 2 and 3 it will be necessary to attach the adaptor lug furnished separately to the insulated lead pin-plug and fasten to the grid terminal by removing the tube and then replacing the tube with the connection made. This is clearly illustrated in sketches 3, 4 and 5.

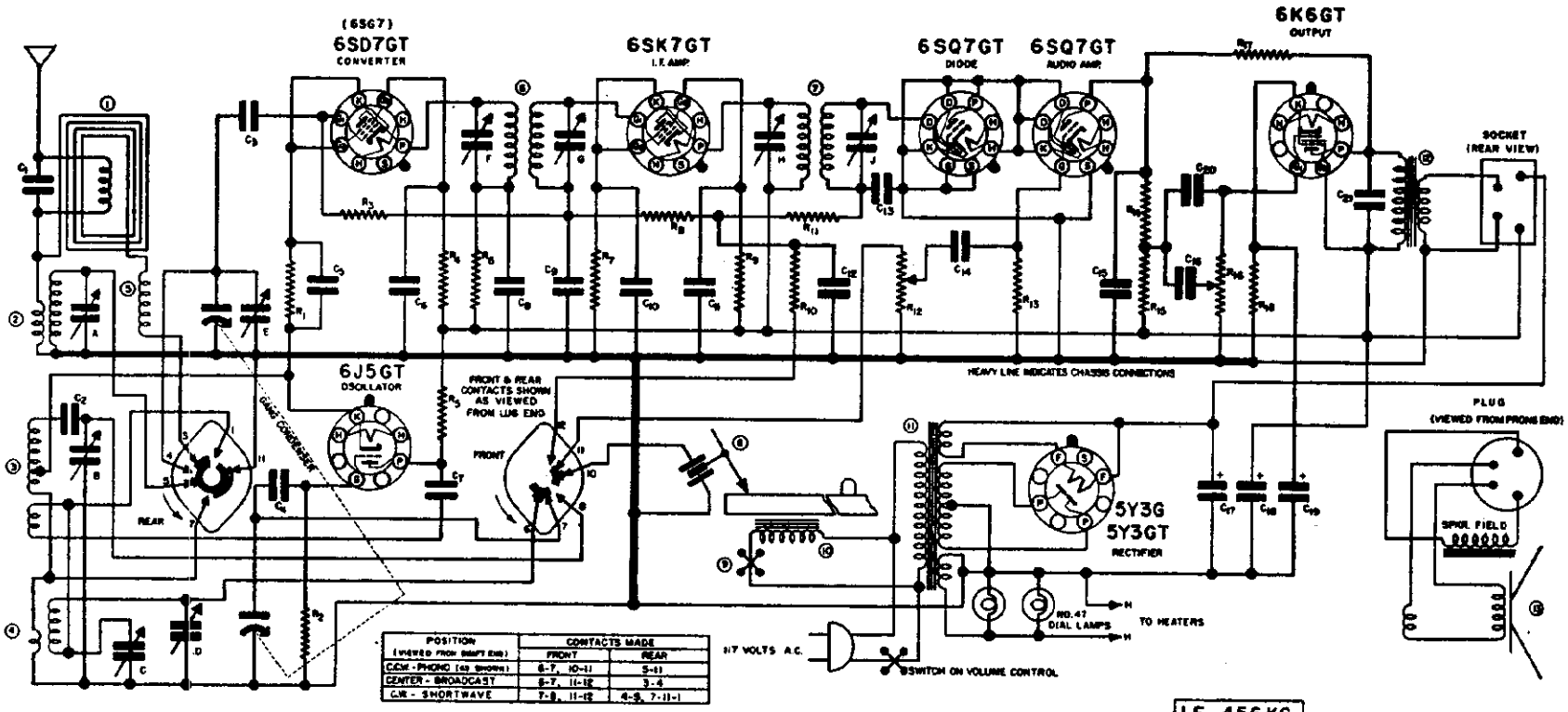
MODEL MTF-164

SONORA RADIO & TELEV. CORP.



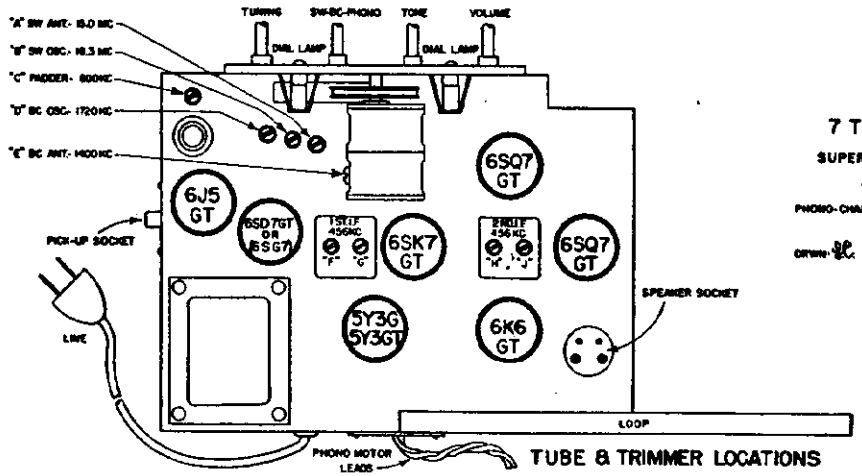
DIAG NO	PART NO.	DESCRIPTION
R1	N-1260	50,000 OHM .5W. 20 %
R2	N-1627	20,000 OHM .5W. 20 %
R3	N-1262	1 MEGOHM .5W. 20%
R4	N-2076	.25 MEG. VOL. CONT. (KE)
R4	N-3428	0.5 MEG. VOL. CONT. (KEU)
R5	N-1263	10 MEGOHM .5W 20 %
R6	N-1377	200,000 OHM 5W 20 %
R7	N-1264	500,000 OHM .5W 20 %
R8	N-1616	250 OHM 5W 10 %
R9	N-1617	2500 OHM .5W 20 %
R10	N-1614	50 OHM .5W 20 %
R11	N-1618	80 OHM 2 W. 10 %
C1	N-1344	.01 MFD. 400 V.
C2	N-1345	.05 MFD 200 V
C3	N-1345	.05 MFD. 200 V.
C4	N-1351	.1 MFD. 200 V. (KE)
C4	N-2642	.09 MFD. 200 V. (KEU)
C5	N-1374	.0001 MFD. MICA
C6	N-1344	.01 MFD. 400 V.
C7	N-1447	.0005 MFD. 400 V.
C8	N-1344	.01 MFD. 400 V.
C9	N-1376	.02 MFD. 400 V.

DIAG NO	PART NO	DESCRIPTION
C10	N-2915	40 MFD. 150 V. ELECTRO.
C11		20 MFD. 150 V.
C12	32-1346	.05 MFD. 400 V
C13	N-3080	.22 MFD. 200 V. (KEU ONLY)
1	N-2745	ANTENNA LOOP
1	N-4124	ANTENNA LOOP (PORTABLE)
2	N-1432	OSCILLATOR COIL
3	N-2936	1ST I.F. TRANSFORMER
4	N-3754	2ND I.F. TRANSFORMER
5	N-2914	4" PM. SPEAKER
6	N-2952	OUTPUT TRANS. (KE)
6	N-3249	OUTPUT TRANS. (KEU)
	N-2875	2 GANG CONDENSER
	N-2094	MOTOR SWITCH
	N-4136	MOTOR SWITCH (PORTABLE)
	N-3848 & N-3860	PHONO MOTOR
	N-3930	PHONO MOTOR (PORTABLE)
	N-4188	CRYSTAL PICK-UP
	N-4189	LONG-LIFE NEEDLE
	N-2877	RADIO-PHONO SWITCH
E	N-2649	2ND I.F. TRIMMER



I.F. - 456 KC.

DIAG. NO.	PART NO.	DESCRIPTION		
R1	M-3341	1,000 OHM	.5W.	10%
R2	M-4082	47,000 OHM	.5W.	20%
R3	M-4088	3.3 MEGOHM	.5W.	20%
R4	M-4423	330,000 OHM	.5W.	20%
R5	M-4422	47,000 OHM	1 W.	10%
R6	M-4258	10,000 OHM	.5W.	20%
R7	M-4420	330 OHM	.5W	10%
R8	M-12582	1 MEGOHM	.5W.	20%
R9	M-4420	68,000 OHM	.5W	20%
R10	M-4084	33,000 OHM	.5W	20%
R11	M-4087	47,000 OHM	.5W.	20%
R12	M-4398	0.5 MEGOHM VOLUME CONTROL		
R13	M-12583	10 MEGOHM	.5W	20%
R14	M-4084	33,000 OHM	.5W.	20%
R15	M-4423	330,000 OHM	.5W.	20%
R16	M-4399	0.5 MEGOHM TONE CONTROL		
R17	M-4424	2.2 MEGOHM	.5W.	10%
R18	M-4421	470 OHM	1 W.	10%
C1	M-3343	.00025 MFD.	MICA	20%
C2	M-1690	.004 MFD.	MICA	5%
C3	M-3343	.00025 MFD.	MICA	20%
C4	M-3342	.00005 MFD.	MICA	20%
C5	M-1345	.05 MFD.	200 V.	20%
C6	M-4376	.02 MFD.	400 V.	20%
C7	M-4344	.01 MFD.	400 V.	20%
C8	M-4823	.1 MFD.	400 V.	20%
C9	M-1345	.05 MFD.	200 V.	20%
C10	M-1351	.1 MFD.	200 V.	20%
C11	M-1423	.1 MFD.	400 V.	20%
C12	M-4897	.00005 MFD.	MICA	20%
C13	M-4376	.0001 MFD.	MICA	20%
C14	M-3344	.01 MFD.	400 V.	20%
C15	M-4376	.0001 MFD.	MICA	20%
C16	M-3347	.006 MFD.	600 V.	20%
C17		14 MFD. 450 W.V.		
C18	M-4828	14 MFD. 450 W.V.		ELECTROLYTIC
C19		20 MFD. 25 W.V.		
C20	M-3346	.01 MFD.	400 V.	20%
C21	M-3347	.006 MFD.	600 V.	20%
	M-4387	2 GANG CONDENSER		
	M-4438	BAND-PHONO SWITCH		
1	M-4429	ANTENNA LOOP		
2	M-4402	SW ANTENNA COIL		
3	M-4404	SW OSCILLATOR COIL		
4	M-4403	BC OSCILLATOR COIL		
5	M-4407	LOOP SERIES COIL		
6	M-4425	1ST. I.F. TRANSFORMER		
7	M-4426	2ND I.F. TRANSFORMER		
8		PICK-UP		
9	M-4437	MOTOR SWITCH		RECORD-CHANGER
10		PHONO MOTOR		
11	M-4427	POWER TRANSFORMER		
12	M-4426	OUTPUT TRANSFORMER		
13	M-4436	10" DYNAMIC SPEAKER		



7 TUBE A.C.
SUPERHETERODYNE
TWO BAND
PHONO-CHANGER COMBINATION

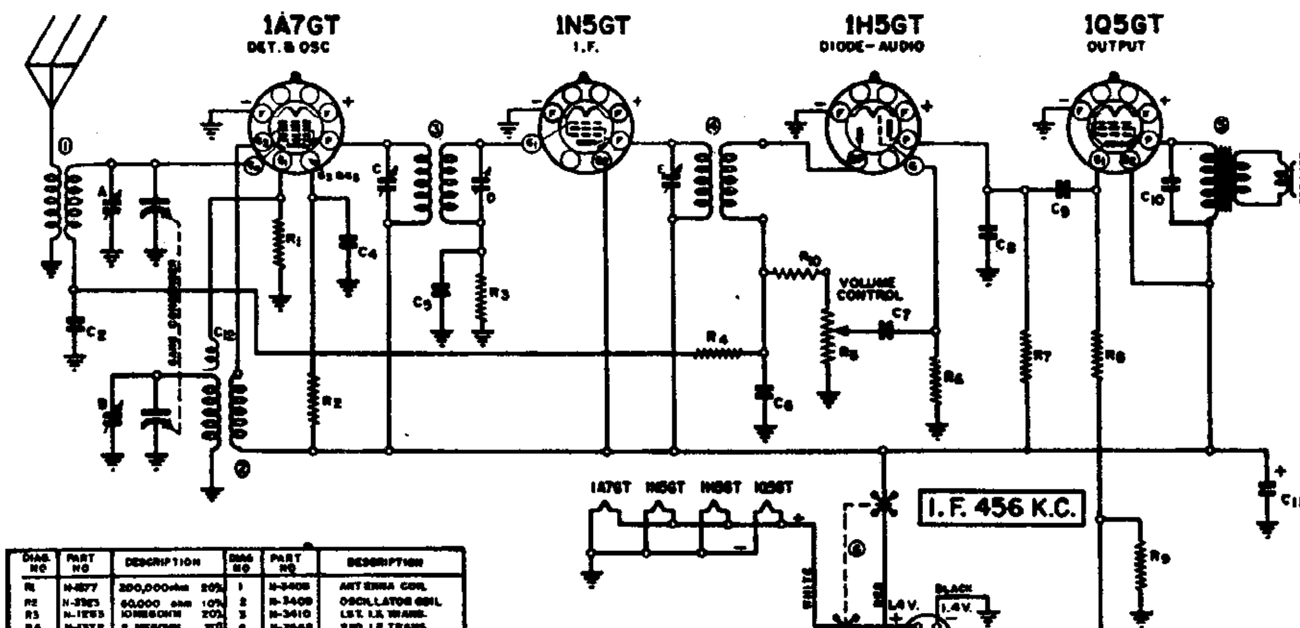
DRWN. APP'D.

JUNE, 1941

TUBE & TRIMMER LOCATIONS

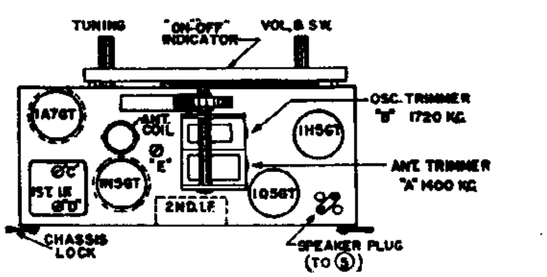
FOR OAK 4200-39 RECORD CHANGER, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

MODEL LZ
MODELS LV-181, KL-185
LV-186



DIAG. NO	PART NO	DESCRIPTION	DIAG. NO	PART NO	DESCRIPTION
R1	N-877	200,000 ohm 20%	1	N-3408	ANTENNA COIL
R2	N-2383	60,000 ohm 10%	2	N-3409	OSCILLATOR COIL
R3	N-1263	10 MEGOHM 20%	3	N-3410	1ST. I.F. TRANS.
R4	N-1378	2 MEGOHM 20%	4	N-2648	2ND. I.F. TRANS.
R5	N-3411	1 MEG. VOL. CONT.	5	N-3406	6" P.M. SPKR. &
R6	N-1378	2 MEGOHM 20%			OUTPUT TRANS.
R7	N-1366	1 MEGOHM 20%	6		BATTERY SW.
R8	N-1378	2 MEGOHM 20%			ON VOL. CONT.
R9	N-2909	420 ohm 10%			
R10	N-1360	50,000 ohm 20%		N-3407	GANG CONDENSER
		(All resistors are ½ watt.)		N-[illegible]	BATTERY CABLE
C2	N-1345	.05 MFD. 200V.			
C4	N-1340	.05 MFD. 200V.			
C5	N-1376	.02 MFD. 400V.			
C6	N-1342	50 MMFD. 20%.			
C7	N-2712	.004 MFD. 400V.			
C8	N-1342	50 MMFD. 20%			
C9	N-1344	.01 MFD. 400V.			
C10	N-2712	.004 MFD. 400V.			
C11	N-1367				
C12	—	CAPACITY IN OSCILLATOR COIL			

TUBE & TRIMMER LOCATIONS



FOR ALIGNMENT SEE INDEX

NOTE: TUBE SOCKETS SHOWN FROM WIRING SIDE.

4 TUBE - 1½ VOLT
SUPERHETERODYNE SINGLE BAND

DRAWN V.J.F. APPROVED
JULY 11, 1940.

ALIGNMENT FOR MODELS: LV-181, KL-185, LV-186

GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 456, 600, 1400, 1720, 6000, 15000 and 18300 KC and an output meter 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.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the Broadcast and Short Wave bands in the order given, should be aligned.

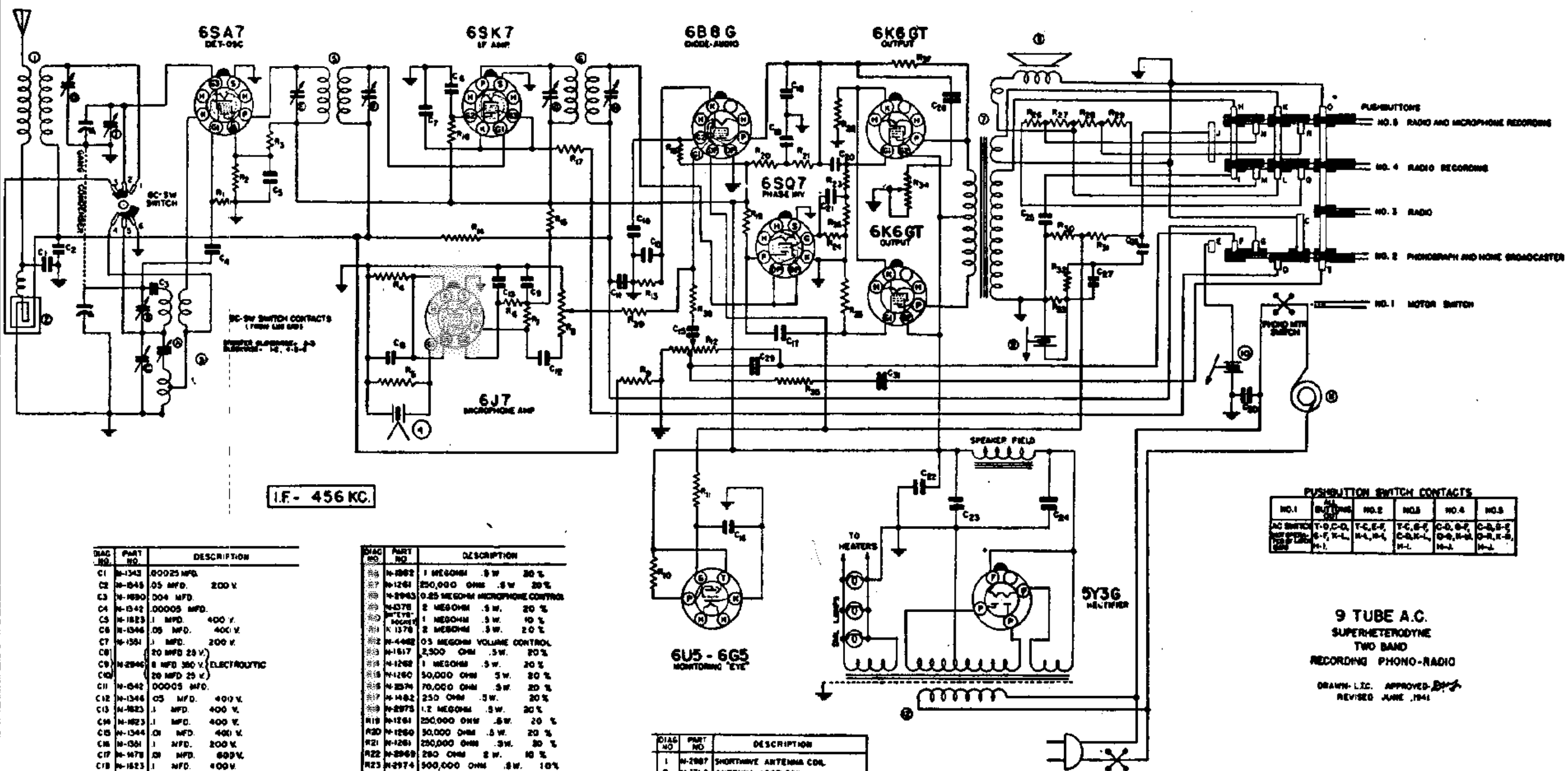
I.F. ALIGNMENT. With the wave switch in the Broadcast Band and the gang condenser set at minimum, adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tube*(6SG7 or 6SD7) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the chassis base. Align all four I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT. With the switch turned to the broadcast position, connect the antenna to the generator through a 100† MMF dummy and the ground of the set (Black wire) to the generator ground. Set the dial and generator at 1720 KC. Align the BC oscillator trimmer for maximum output. Set the generator at 1400 KC and tune-in signal with the dial. Adjust antenna trimmer for maximum output. Next set the generator at 600 KC and tune in the signal with the dial. Adjust the BC pad by rocking the gang back and forth while adjusting the pad until maximum output is attained. Recheck the adjustment at 1400 KC as the pad adjustment may have caused misalignment.

SHORT WAVE BAND ALIGNMENT. With the band switch turned to the S. W. position, connect the generator to the antenna with a 400 ohm dummy and the ground of the set (Black wire) to the generator ground. Adjust the S. W. oscillator to give a maximum output with the dial at 18300 KC (extreme end). Set the generator at 15000 KC and tune-in the signal with the dial. Adjust the antenna trimmer for maximum output. With a strong signal input turn the dial to approximately 1 M. C. lower in frequency and pick up the image frequency. If the image is not received, it will be necessary to return the dial to 18300 KC to reduce the capacity in the oscillator trimmer until a second signal is received. Proceed as before with the alignment of the antenna and recheck for image frequency. Check the sensitivity at 6000 KC to determine if the coils and mica pad are not defective.

* 6SA7 for MODEL KL-185 † 200 mmf for MODEL KL-185

SONORA RADIO & TELEV. CORP.



I.F. - 456 KC.

DIAG. NO.	PART NO.	DESCRIPTION
C1	N-1343	.00025 MFD.
C2	N-1345	.05 MFD. 200 V.
C3	N-1890	.004 MFD.
C4	N-1342	.00005 MFD.
C5	N-1823	.1 MFD. 400 V.
C6	N-1346	.05 MFD. 400 V.
C7	N-1361	.1 MFD. 200 V.
C8	N-2946	20 MFD. 25 V. ELECTROLYTIC
C9		8 MFD. 350 V. ELECTROLYTIC
C10		20 MFD. 25 V. ELECTROLYTIC
C11	N-1342	.00005 MFD.
C12	N-1346	.05 MFD. 400 V.
C13	N-1823	.1 MFD. 400 V.
C14	N-1823	.1 MFD. 400 V.
C15	N-1344	.01 MFD. 400 V.
C16	N-1361	.1 MFD. 200 V.
C17	N-1478	.01 MFD. 600 V.
C18	N-1823	.1 MFD. 400 V.
C19	N-1342	.00005 MFD.
C20	N-1478	.01 MFD. 600 V.
C21	N-1344	.01 MFD. 400 V.
C22	N-1823	.1 MFD. 400 V.
C23	N-2947	15 MFD. 400 V. ELECTROLYTIC
C24		15 MFD. 450 V. ELECTROLYTIC
C25	N-3036	.0005 MFD. 1000 V.
C26	N-2980	.01 MFD. 600 V.
C27	N-2979	.001 MFD. 400 V.
C28	N-3455	.004 MFD. 600 V.
C29	N-1374	.0001 MFD. 20%
C30	N-1478	.01 MFD. 600 V.
C31	N-1376	.02 MFD. 400 V.
R1	N-1427	20,000 OHM .5 W. 20%
R2	N-2971	45,000 OHM 1 W. 20%
R3	N-2970	15,000 OHM 2 W. 10%
R4	N-1894	1000 OHM .5 W. 20%
R5	N-2169	4 MEGOHM .5 W. 20%

DIAG. NO.	PART NO.	DESCRIPTION
R6	N-1862	1 MEGOHM .5 W. 20%
R7	N-1261	250,000 OHM .5 W. 20%
R8	N-2963	0.25 MEGOHM MICROPHONE CONTROL
R9	N-1378	2 MEGOHM .5 W. 20%
R10	IN "EYE" SOCKET	1 MEGOHM .5 W. 10%
R11	N-1378	2 MEGOHM .5 W. 20%
R12	N-4462	0.5 MEGOHM VOLUME CONTROL
R13	N-1617	2,500 OHM .5 W. 20%
R14	N-1262	1 MEGOHM .5 W. 20%
R15	N-1260	50,000 OHM .5 W. 20%
R16	N-2574	70,000 OHM .5 W. 20%
R17	N-1482	250 OHM .5 W. 20%
R18	N-2975	1.2 MEGOHM .5 W. 20%
R19	N-1261	250,000 OHM .5 W. 20%
R20	N-1260	50,000 OHM .5 W. 20%
R21	N-1261	250,000 OHM .5 W. 20%
R22	N-2969	280 OHM 2 W. 10%
R23	N-2974	500,000 OHM .5 W. 10%
R24	N-1263	10 MEGOHM .5 W. 20%
R25	N-1264	500,000 OHM .5 W. 20%
R26	N-2963	8.2 OHM .5 W. 10% (INSULATED)
R27	N-2967	5.2 OHM 3.5 W. 10% (INSULATED)
R28	N-2966	.82 OHM .6 W 10% (INSULATED)
R29	N-2966	.82 OHM .6 W 10% (INSULATED)
R30	N-2976	1 MEGOHM .5 W. 10%
R31	N-2977	2 MEGOHM .5 W. 10%
R32	N-2972	75,000 OHM .5 W. 10%
R33	N-4468	150,000 OHM .5 W. 10%
R34	N-3349	1.0 MEGOHM TONE CONTROL
R35	N-3455	40,000 OHM .5 W. 20%
R36	N-2978	8,400 OHM .5 W. 10%
R37	N-1419	8 MEGOHM .5 W. 20%
R38	N-4470	1.2 MEGOHM .5 W. 10%
R39	N-4469	820,000 OHM .5 W. 10%

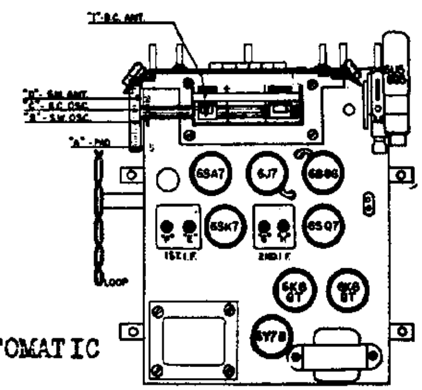
DIAG. NO.	PART NO.	DESCRIPTION
1	N-2987	SHORTWAVE ANTENNA COIL
2	N-3368	ANTENNA LOOP COIL
3	N-3306	OSCILLATOR COIL
4	N-3388	MICROPHONE
5	N-2989	1 ST. I.F. TRANSFORMER
6	N-2961	2 ND. I.F. TRANSFORMER
7	N-2957	OUTPUT TRANSFORMER
8	N-2958	12" DYNAMIC SPEAKER
9	N-4463	RECORD-CUTTING HEAD
10		PHONO PICK-UP
11		PHONO MOTOR & TURNTABLE
12	N-3367	POWER TRANSFORMER
A	N-1254	PADDER CONDENSER
B	N-1356	SW OSCILLATOR TRIMMER CONDENSER
C		BC OSCILLATOR TRIMMER CONDENSER
D		SW ANTENNA TRIMMER CONDENSER
	N-3347	2-GANG CONDENSER WITH 6-BUTTON TUNING UNIT
	N-2983	BAND SWITCH
	N-2981	5 PUSHBUTTON SWITCH

PUSHBUTTON SWITCH CONTACTS

NO. 1	ALL BUTTONS OUT	NO. 2	NO. 3	NO. 4	NO. 5
AC SWITCH [illegible]	T-O, C-Q, G-F, K-L, H-I.	T-C, E-F, H-L, H-I,	T-C, G-F, C-Q, K-L, H-L.	C-Q, G-F, O-G, H-M, H-J.	C-Q, G-E, O-R, K-B, H-J.

9 TUBE A.C.
SUPERHETERODYNE
TWO BAND
RECORDING PHONO-RADIO

DRAWN- L.I.C. APPROVED- [illegible]
REVISED JUNE, 1941

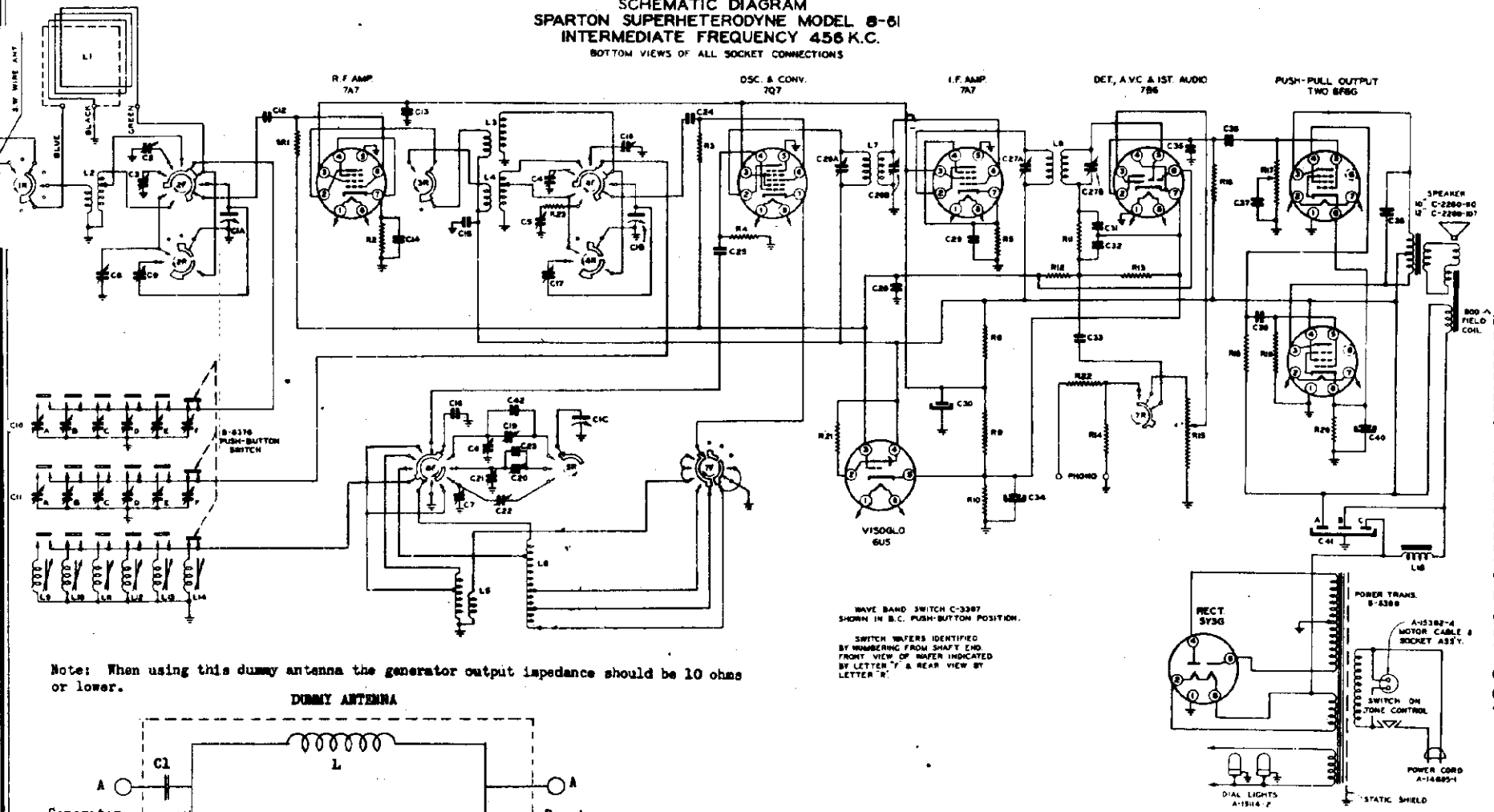


TUBE & TRIMMER LOCATIONS

FOR GENERAL INDUSTRIES RC-130L RECORD CHANGER, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

SCHEMATIC DIAGRAM
SPARTON SUPERHETERODYNE MODEL 8-61
INTERMEDIATE FREQUENCY 456 K.C.

BOTTOM VIEWS OF ALL SOCKET CONNECTIONS

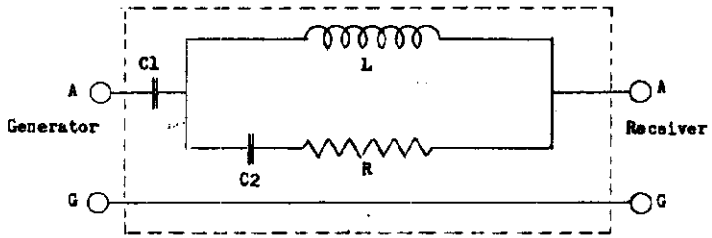


WAVE BAND SWITCH C-3287 SHOWN IN B.C. PUSH-BUTTON POSITION.

SWITCH WAFERS IDENTIFIED BY NUMBERING FROM SHAFT END. FRONT VIEW OF WAFER INDICATED BY LETTER 'F' & REAR VIEW BY LETTER 'R'.

Note: When using this dummy antenna the generator output impedance should be 10 ohms or lower.

DUMMY ANTENNA



C1 - 200 mmf. condenser
C2 - 400 mmf. condenser
R - 100 ohms
L - Choke Coil
---- Case Shield

Choke Coil Specification
Tubing - 3/8" diameter bakelite
Wire - No. 38 enameled.
Turns - 59 closely wound (Impregnated)

C1A/B/C	VARIABLE CONDENSER	B-8374	C23	2300 MMF MICA	C-720-392	R1	1 MEGOHM .25W	C-2795-986	L1	LOOP ANTENNA	D-1568-9
C2	POL. ANT. TRIMMER		C24	250 MMF MICA	C-720-324	R2	1000 Ω .25W	C-2795-628	L2	POL. & S.W. ANT. COIL	A-20361
C3	B.C. " "		C25	50 MMF. MICA	C-720-372	R3	1 MEGOHM .25W.	C-2795-988	L3	B.C. DET. COIL	A-20353
C4	B.C. DET "	A-15888-1	C28A&B	NO. 1 I.F. TRIMMER	B-7200-GG	R4	20,000 Ω .25W.	C-2795-1908	L4	POL. & S.W. DET. COIL	A-20362
C5	POL. " "		C27A&B	NO. 2 I.F. TRIMMER	B-7200-HH	R5	820 Ω .25W.	C-2795-1948	L5	POL. & S.W. OSC. COIL	A-20369
C6	B.C. OSC "		C28	.05 MFD. 200V.	C-3202-84C	R6	18,000 Ω 3 W.	C-2799-77A	L6	B.C. OSC. COIL	A-20352
C7	3 W " "		C29	.05 MFD. 200V.	C-3202-84C	R7	DELETED		L7	NO. 1 I.F. COIL	A-12066-65
C8	3 W ANT. TRIMMER	B-8244-GD	C30	4 MFD 400V. ELECT	A-14782-5	R8	DELETED		L8	NO. 2 I.F. COIL	A-12064-66
C9	3 W ANT. PADDER		C31	100 MMF MICA	C-720-338	R9	22,000 Ω 1 W.	C-2797-1918	L9-L14	P.B. B.C. OSC. COIL	B-8307
C10A-F	ANT. P.B. TRIMMER	A-15825-3	C32	100 MMF MICA	C-720-338	R10	220 Ω .25W.	C-2795-1438	L15	FILTER CHOKE	A-15386
C11A-F	R.F. P.B. TRIMMER	A-15825-4	C33	.02 MFD 200V	C-3202-134C	R11	18,000 Ω .25W.	C-2795-778			
C12	250 MMF MICA	C-720-324	C34	50 MFD 25 W. ELECT	A-14782-8	R12	3.3 MEGOHM .25W.	C-2795-1048			
C13	.05 MFD. 400V	C-3204-28C	C35	100 MMF. MICA	C-720-338	R13	80,000 Ω .25W.	C-2795-698			
C14	.05 MFD. 400V	C-3204-84C	C36	.05 MFD 400V	C-3204-84C	R14	270,000 Ω .25W.	C-2795-918			
C15	.05 MFD. 400V	C-3204-28C	C37	.005 MFD 600V	C-3204-68C	R15	2 MEG. VOL. CONT	A-15140-2			
C16	3 W DET. TRIMMER	B-7200-EG	C38	.005 MFD. 600V	C-3204-68C	R16	270,000 Ω .25W	C-2795-918			
C17	3 W DET. PADDER		C39	.05 MFD. 400V	C-3204-84C	R17	.5 MEG. TONE CONT & SW.	A-15129-12			
C18	350 MMF MICA	B-8285-4	C40	20 MFD 25 V. ELECT	A-14782-9	R18	2000 Ω .25W.	C-2795-1068			
C19	B.C. OSC PADDER	B-7200-YY	A	15 MFD 450V	A-14684-7 ELECT	R19	470,000 Ω .25W.	C-2795-948			
C20	POL. OSC PADDER		B	10 MFD 450V		R20	240 Ω 3W	C-2799-164A			
C21	POL. OSC TRIMMER		C	15 MFD 450V		R21	1 MEGOHM .25W	C-2795-988			
C22	3 W OSC PADDER	B-7200-DG	C42	250 MMF MICA	C-720-324	R22	270,000 Ω .25W	C-2795-918			
						R23	36 Ω .25W	C-2795-1048			

SPARKS WITHINGTON CO.

Sparton Superheterodyne Model 8-Series

VOLTAGE CHART

Models 8W31, 8W71 and 8W61.

Line Voltage: 117 Volts A.C. Position of Volume Control: Full with Antenna Disconnected
Position of Band Switch: Broadcast

TUBE	FUNCTION	Voltage of Socket Prongs to Gnd. See Prong Nos. on Schematic Diagram								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9
7A7	R-F Amplifier	0	260	65	3	0	0	3	6.2*	-
7Q7	Osc - Converter	0	260	65	-4	0	0	0	6.2*	-
7A7	I-F Amplifier	0	245	70	2.5	0	0	2.3	6.2*	-
7B6	2nd Det - AVC - 1st Audio	0	180	0	.8	.4	0	.7	6.2*	-
6F6G	Power Amplifier	0	0	245	240	0	260	6.2*	18	-
6F6G	Power Amplifier	0	0	245	255	0	0	6.2*	18	-
6U5	Vimo-Glo	6.2*	270	0	280	0	0	-	-	-
5Y3G	Rectifier	0	340	0	345*	0	345*	0	340	-

Notes: Voltage readings are for schematic diagram in this bulletin. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 20000 ohms per volt voltmeter.
*AC volts.

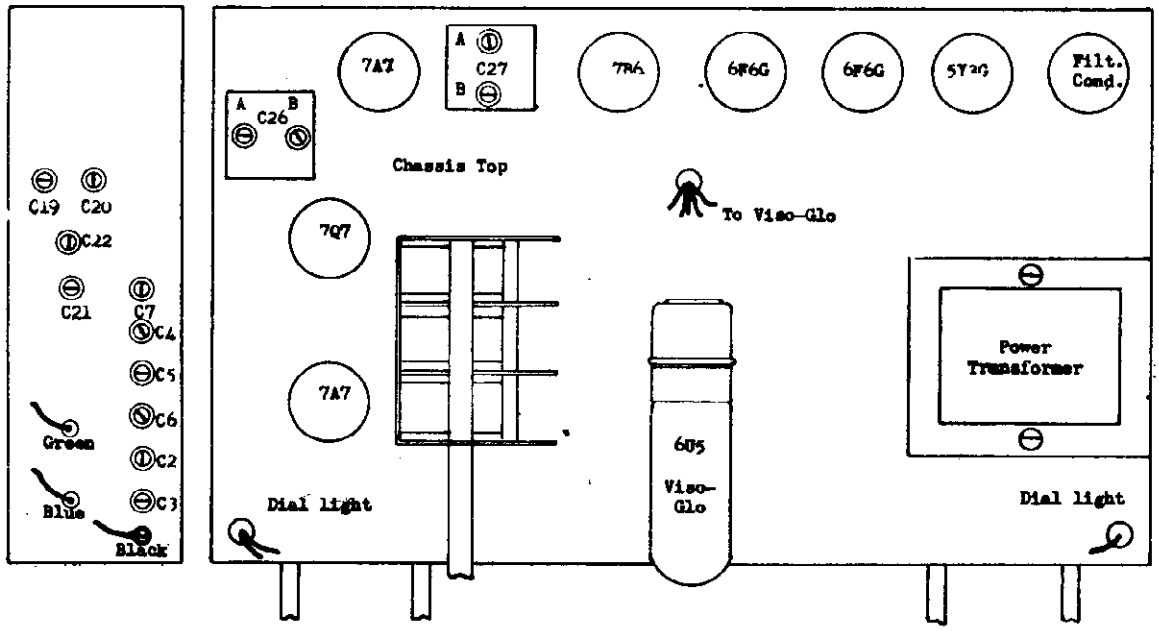
ALIGNMENT CHART

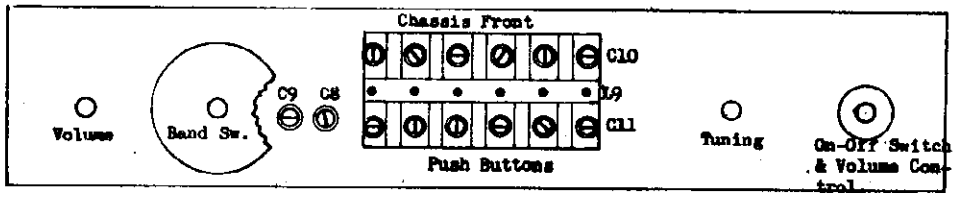
OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND SETTING	TRIMMERS	REMARKS
1	Set dial pointer even with left hand stop line with condenser gang fully meshed.							
2	I.F.	*	.1 MFD	456 KC	B.C.	Open	C27 A&B	Peak Accurately
3							C26 A&B	Peak Accurately
4	Broadcast Band	Ant.	See Note	1500 KC	B.C.	1500 KC	C6 Osc.	" "
							C4 R.F.	" "
							C3 Ant.	" "
5				600 KC	B.C.	600 KC	C19 Pad	Rock **
6	Repeat operation 4.							
7	Check calibration and sensitivity at 600 KC, 1000 KC and 1500 KC.							
8	Police Band	Ant.	See Note	7 MC	Police	7 MC	C21 Osc.	Peak Accurately
							C5 R.F.	" "
							C2 Ant.	" "
9				2.5 MC	Police	2.5 MC	C20 Pad	Rock **
10	Check calibration and sensitivity at 7 MC, 4 MC and 2.5 MC.							
11	Short Wave Band	Ant.	See Note	11.7	S.W.	11.7	C7 Osc. trim	Peak Accurately
							C16 RF. trim	Rock **
							C8 Ant. trim	" **
12				9.3	S.W.	9.3	C22 osc. pad	Peak Accurately
							C17 RF pad	Rock **
							C9 Ant. pad	Rock **
13	Repeat operations 12 as many times as necessary until additional gain cannot be obtained.							
14	Check calibration and sensitivity at 11.7 and 9.3.							
15	Check operations 1 to 14.							

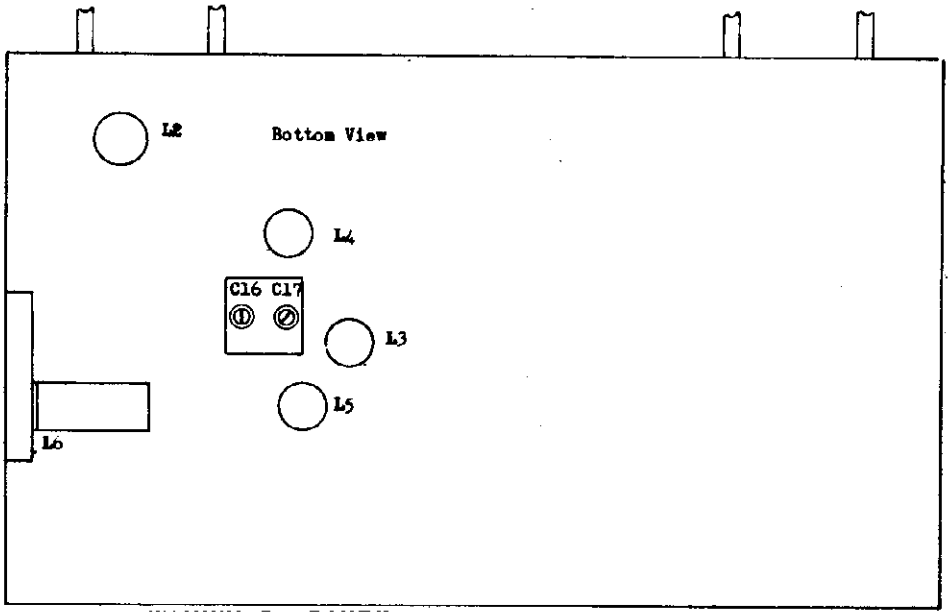
NOTES: Use dummy antenna as described on page 1.
*Connect generator to pin #6 on 7Q7 osc. conv. tube.
**Rock dial while adjusting for maximum output.

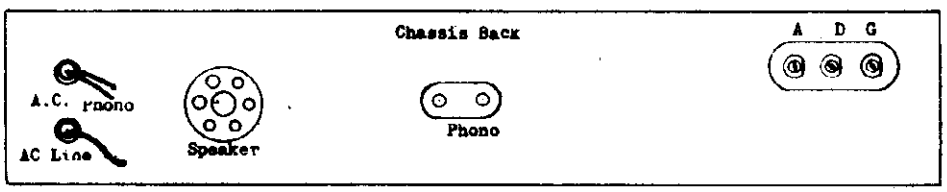
SPARKS WITHINGTON CO.

CHASSIS DIAGRAM





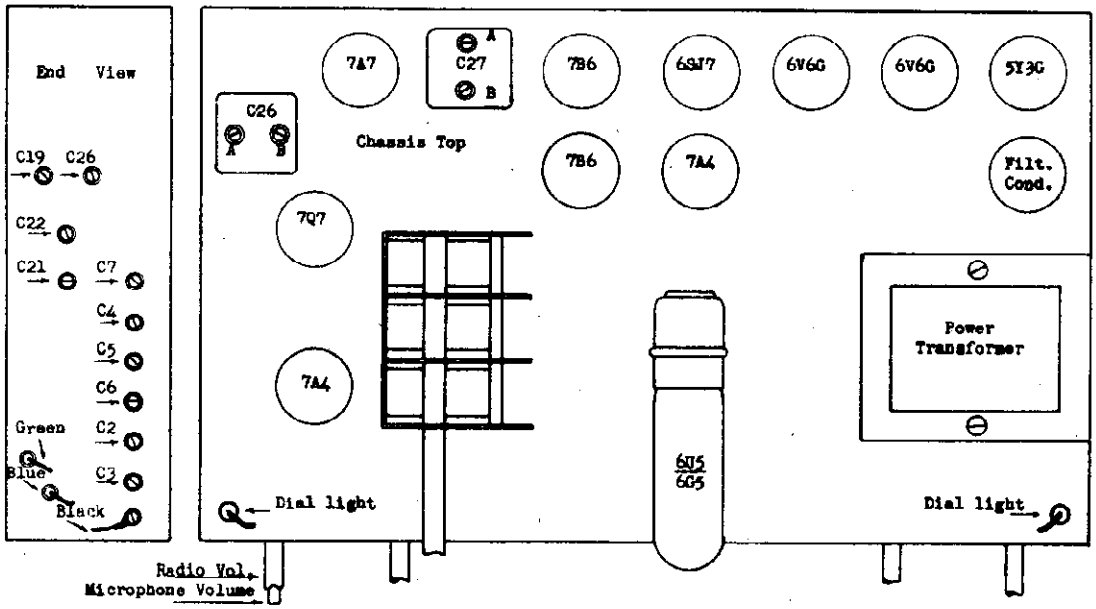


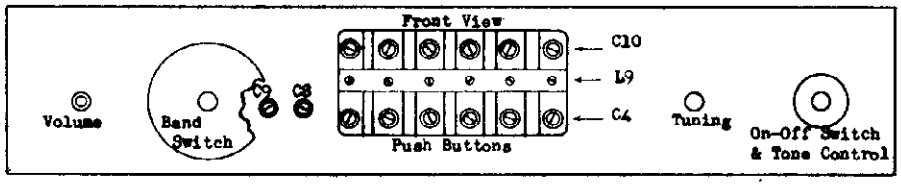


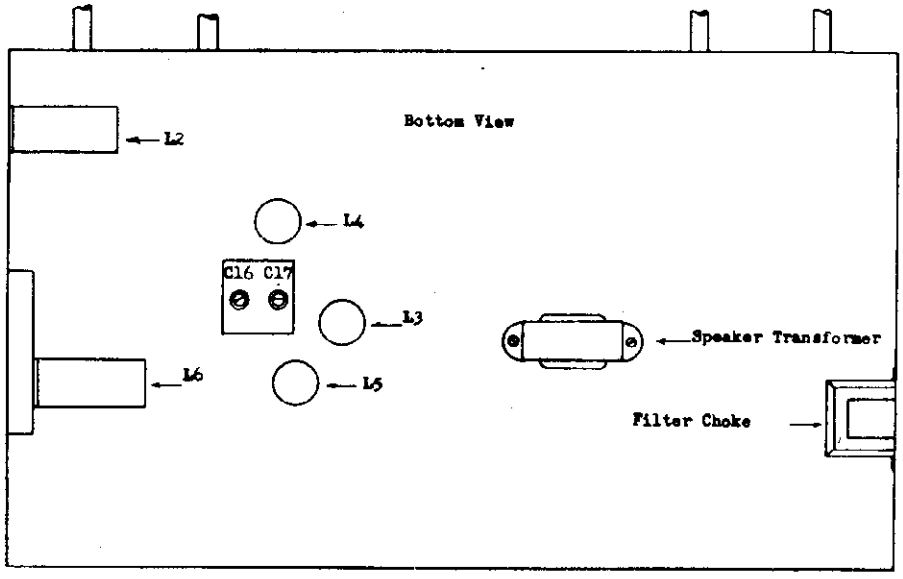
MODEL 11-36

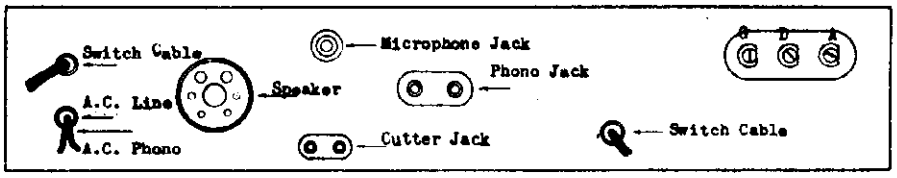
SPARKS WITHINGTON CO.

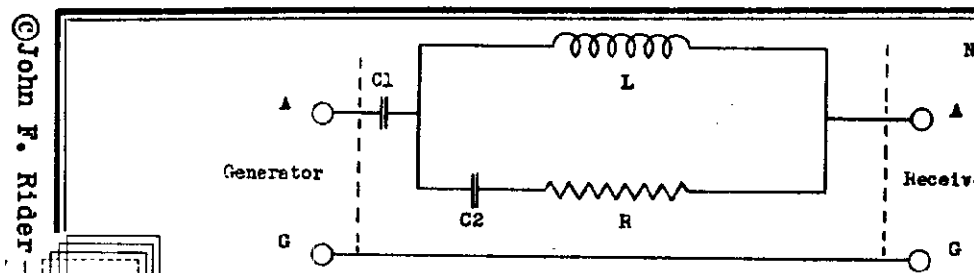
CHASSIS DIAGRAM











Note: When using this dummy antenna the generator output impedence should be 10 ohms or lower.

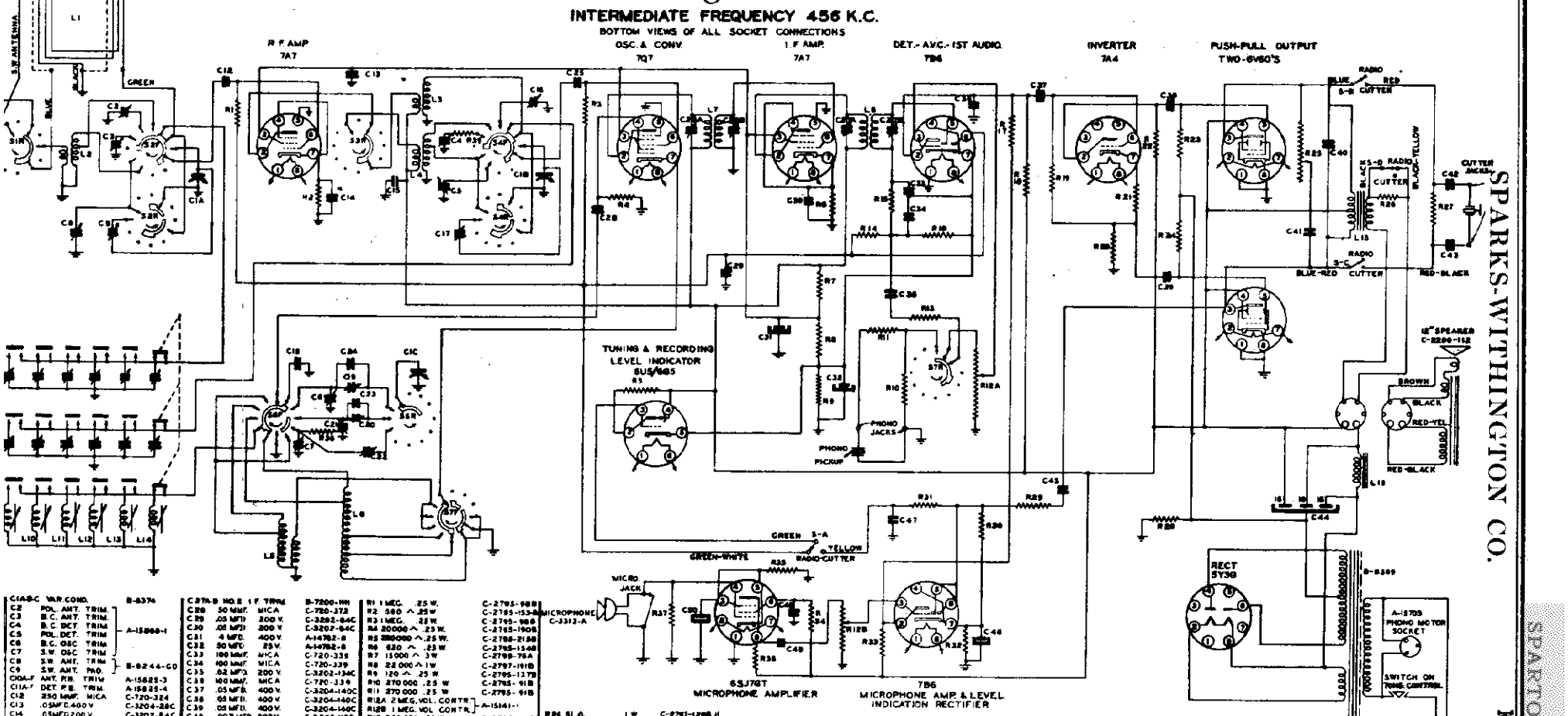
C1 - 200 mmf. Condenser
C2 - 400 mmf. Condenser
R - 100 ohms Resistor
L - 20 microhenryies Choke
---- Case Shield

Choke Coil Specifications
Tubing - 3/8" diameter bakelite.
Wire - No. 36 Enameled.
Turns - 59 closely wound (Impregnated)

INTERMEDIATE FREQUENCY 456 K.C.

BOTTOM VIEWS OF ALL SOCKET CONNECTIONS

R.F. AMP 7A7 · OSC. & CONV. 7Q7 · I.F. AMP. 7A7 · DET.-A.V.C.-1ST AUDIO 7B6 · INVERTER 7A4 · PUSH-PULL OUTPUT TWO-6V6G'S



C1A-B-C	VAR. COND.	B-8374
C2	POL. ANT. TRIM.	A-15868-I
C3	B.C. ANT. TRIM.	
C4	B.C. DET. TRIM.	
C5	POL. DET. TRIM.	
C6	B.C. OSC. TRIM.	
C7	S.W. OSC. TRIM.	
C8	S.W. ANT. TRIM.	B-8244-GO
C9	S.W. ANT. PAD.	
C9A-F	ANT. R.B. TRIM.	A-15825-3
C11A-F	DET. R.B. TRIM.	A-15825-4
C12	250 MMF. MICA	C-720-324
C13	.05MFD.400 V.	C-3204-28C
C14	.05MFD.200 V.	C-3202-84C
C15	.05MFD.400 V.	C-3204-28C
C16	S.W. DET. TRIM.	B-7200-DG
C17	S.W. DET. PAD.	
C18	350 MMF. MICA	B-8245-4
C19	B.C. OSC. PAD.	B-7200-YY
C20	POL. OSC. PAD.	
C21	POL. OSC. TRIM.	B-7200-DG
C22	S.W. OSC. PAD.	
C23	2300 MMF. MICA	C-720-352
C24	250 MMF. MICA	C-720-324
C25	250 MMF. MICA	C-720-324
C26A-B	NO. 1 I.F. TRIM	B-7200-GG

C27A-B	NO. 2 I.F. TRIM	B-7200-HN
C28	.05 MMF. MICA	C-720-272
C29	.05 MFD. 200 V.	C-3202-84C
C30	.05 MFD. 200 V.	C-3202-84C
C31	.1 MFD. 400 V.	A-14782-8
C32	.50 MFD. 25 V.	A-14782-8
C33	100 MMF. MICA	C-720-338
C34	400 MMF. MICA	C-720-339
C35	.02 MFD. 200 V.	C-3202-136C
C36	400 MMF. MICA	C-720-339
C37	.05 MFD. 400 V.	C-3204-140C
C38	.05 MFD. 400 V.	C-3204-140C
C39	.05 MFD. 400 V.	C-3204-140C
C40	.002 MFD. 600 V.	C-3209-118C
C41	.02 MFD. 600 V.	C-3204-134C
C42	.05 MFD. 600 V.	C-3206-84C
C43	.05 MFD. 600 V.	C-3206-84C
C44A	15 MFD. 450 V.	A-14884-7
C44B	10 MFD. 450 V.	
C44C	15 MFD. 450 V.	
C45	.02 MFD. 400 V.	C-3204-134C
C46	.1 MFD. 25 V.	A-14782-7
C47	.01 MFD. 200 V.	C-3202-78C
C48	.05 MFD. 400 V.	C-3204-84C
C49	.02 MFD. 400 V.	C-3204-134C
C50	3 MFD. 25 V.	A-14782-7

R1	1 MEG. .25 W.	C-2795-98B
R2	500 Ω .25 W.	C-2795-153-A
R3	1 MEG. .25 W.	C-2795-98B
R4	20000 Ω .25 W.	C-2795-190B
R5	2250000 Ω .25 W.	C-2788-215B
R6	820 Ω .25 W.	C-2795-154B
R7	15000 Ω 1 W.	C-2799-78A
R8	22 000 Ω 1 W.	C-2797-191B
R9	120 Ω .25 W.	C-2795-117B
R10	270 000 .25 W.	C-2795-91B
R11	270 000 .25 W.	C-2795-91B
R12A	2 MEG. VOL. CONTR.	A-15141-I
R12B	1 MEG. VOL. CONTR.	
R13	330 000 .25 W.	C-2788-92B
R14	3.3 MEG. .25 W.	C-2795-104B
R15	16 000 Ω .25 W.	C-2795-77B
R16	300 000 Ω .25 W.	C-2795-216B
R17	390 000 Ω .25 W.	C-2795-93B
R18	560 000 Ω .25 W.	C-2795-95B
R19	470 000 Ω .25 W.	C-2795-94B
R20	22 000 Ω .25 W.	C-2795-98B
R21	2700 Ω .25 W.	C-2795-109B
R22	22000 Ω .25 W.	C-2795-191B
R23	47000 Ω .25 W.	C-2795-82B
R24	47000 Ω .25 W.	C-2795-82B
R25	250 000 Ω TONE CONTRA.	A-15129-A

R26	81 Ω 1 W.	C-2797-129B
R27	12,000 10 W.	A-14263-4
R28	140 Ω 3 W.	A-20029-I
R29	100,000 Ω .25 W.	C-2795-86B
R30	62,000 Ω .25 W.	C-2795-95B
R31	1 MEGOHM .25 W.	C-2795-98B
R32	11,000 Ω .25 W.	C-2795-94B
R33	100,000 Ω .25 W.	C-2795-98B
R34	1 MEGOHM .25 W.	C-2795-98B
R35	2,000 Ω .25 W.	C-2795-166B
R36	270,000 Ω .25 W.	C-2795-91B
R37	1 MEGOHM .25 W.	C-2795-98B
R38	10,000 Ω .25 W.	C-2795-109B
R39	150 Ω .25 W.	C-2795-138B

L1	LOOP ANTENNA	D-1566-B
L2	POL. & S.W. ANT.	A-20301-I
L3	B.C. DET. COIL	A-20353
L4	POL. & S.W. DET. COIL	A-20302
L5	POL. & S.W. OSC. "	A-20300
L6	B.C. OSC. COIL	A-20352
L7	NO. 1 I.F. "	A-12064-4B
L8	NO. 2 I.F. "	A-12064-4B
L9-14	B.C. (P.B.) OSC. COIL	B-8387
L15	SPEAKER TRANS.	A-20375
L16	FILTER CHOKE	A-15386

BAND-SWITCH C-3367 SHOWN IN B.C. PUSH-BUTTON POSITION.

SWITCH WAFERS IDENTIFIED BY NUMBERING FROM SHAFT END. FRONT VIEW OF WAFER INDICATED BY LETTER "F" AND REAR VIEW BY LETTER "R."

S-A,B,C,D RADIO-CUTTER SWITCH A-15896 SHOWN IN RADIO POSITION.

SPARKS-WITHINGTON CO.

MODEL 11-3

MODEL 11-36

SPARKS WITHINGTON CO.

VOLTAGE CHART

Line Voltage: 117 Volts A.C. — Position of Volume Control: Full with dial tuned to quiet channel. Position of Band Switch: Broadcast

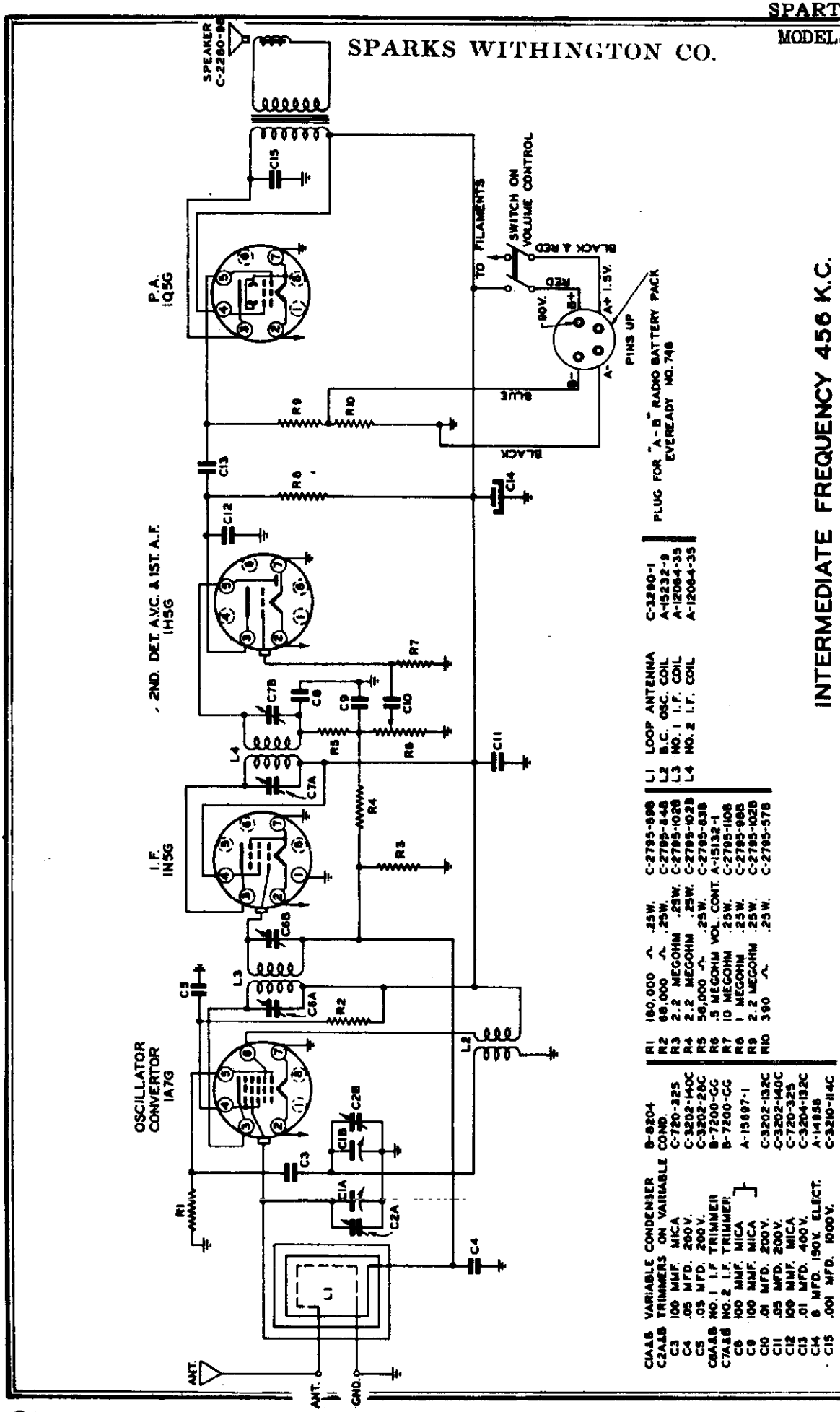
TUBE	FUNCTION	Voltage of Socket Prongs to Gnd. See Prongs Nos. on Schematic Dia.								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9
7A7	R-F Amplifier	0	250	67	2.8	0	0	2.8	6.2*	-
7Q7	Oscillator & Converter	0	250	57	-6.2	0	0	0	6.2*	-
7A7	I.F. Amplifier	0	250	67	2.8	0	0	2.8	6.2*	-
7B6	Det - AVC - 1st Audio	0	108	0	.8	.1	0	7	6.2*	-
6SJ7GT	Microphone Amp.	0	0	1.8	0	.8	43	6.2*	49	-
7B6	Level Indicator Amp.	0	180	0	2	1.2	0	2	6.2*	-
7A4	Inverter	0	205	46	249	0	15	50	6.2*	-
6V6G	Push-Pull Output	0	0	237	250	-15	0	6.2*	0	-
6V6G	Push-Pull Output	0	0	237	250	-16	-15	6.2*	0	-
6U5/6G6	Tuning Eye/Level Indicator	6.2*	210	0	250	.2	0	-	-	-
5Y3G	Rectifier	0	360	0	350*	0	350*	0	360	-

Notes: Voltage readings are for schematic diagram in this bulletin. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 20,000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter. *AC volts.

ALIGNMENT CHART

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMERS	REMARKS
1	Set dial pointer even with left hand stop line with condenser gang fully meshed.							
2	I.F.	*	.1 mfd.	456 KC	BC	Open	C27 A&B	Peak accurately
3							C26 A&B	Peak accurately
4	Broadcast Band	Ant.	See Note	1500 KC	BC	1500 KC	C6 Osc.Trim.	Peak accurately
							C4 RF Trim.	Peak accurately
							C3 Ant.Trim.	Peak accurately
5				600 KC	BC	600 KC	C19 Osc.Pad.	**
6	Repeat operation 4.							
7	Check calibration and sensitivity at 600 KC, 1000 KC and 1500 KC.							
8	Police Band	Ant.	See Note	7 MC	Police	7 MC	C21 Osc.Trim	Peak accurately
							C5 RF Trim.	Peak accurately
							C2 Ant.Trim.	Peak accurately
9				2.5 MC	Police	2.5 MC	C20 Osc.Pad.	**
10	Repeat operation No. 8							
11	Check calibration and sensitivity at 7 MC, 4 MC and 2.5 MC							
12	Short Wave Band	Ant.	See Note	11.7 MC	SW	11.7 MC	C7 Osc.Trim	Peak accurately
							C16 RF Trim.	Peak accurately
							C8 Ant. Trim	Peak accurately
13				9.3 MC	SW	9.3 MC	C22 Osc.Pad.	**
							C17 RF Pad.	**
							C9 Ant. Pad.	**
14	Repeat operation 13 as many times as necessary until additional gain cannot be obtained							
15	Check calibration and sensitivity at 11.7 MC and 9.3.							
16	Check operation 1 to 15.							

Notes: Use Dummy Antenna as described on page 1 of this bulletin.
*Connect generator to pin #6 on 7Q7 Oscillator Converter tube.
**Rock dial while adjusting for maximum output.


SPARKS WITHINGTON CO.
INTERMEDIATE FREQUENCY 456 K.C.
BOTTOM VIEWS OF ALL SOCKET CONNECTIONS
SPEAKER C-2280-96
P.A. 1Q5G
2ND. DET. A.V.C. & 1ST. A.F. 1H5G
I.F. 1N5G
OSCILLATOR CONVERTOR 1A7G
TO FILAMENTS
SWITCH ON VOLUME CONTROL
BLACK & RED
RED
90V.
B+
A+ 1.5V.
A-
B-
PINS UP
BLUE
BLACK
PLUG FOR "A-B" RADIO BATTERY PACK EVEREADY NO. 746
ANT.
GND.
L1 LOOP ANTENNA C-3290-1
L2 B.C. OSC. COIL A-15232-9
L3 NO. 1 I.F. COIL A-12084-33
L4 NO. 2 I.F. COIL A-12084-33
R1 100,000 Ω .25W. C-2795-88B
R2 68,000 Ω .25W. C-2795-84B
R3 2.2 MEGOHM .25W. C-2795-102B
R4 2.2 MEGOHM .25W. C-2795-102B
R5 56,000 Ω .25W. C-2795-83B
R6 .5 MEGOHM VOL. CONT. A-15132-1
R7 10 MEGOHM .25W. C-2795-110B
R8 1 MEGOHM .25W. C-2795-98B
R9 2.2 MEGOHM .25W. C-2795-102B
R10 390 Ω .25W. C-2795-57B
C1A&B VARIABLE CONDENSER B-8204
C2A&B TRIMMERS ON VARIABLE COND. C-720-325
C3 100 MMF. MICA C-3202-140C
C4 .05 MFD. 200 V. C-3202-28C
C5 .05 MFD. 200 V. B-7200-GG
C6A&B NO. 1 I.F. TRIMMER B-7200-GG
C7A&B NO. 2 I.F. TRIMMER A-15697-1
C8 100 MMF. MICA C-3202-132C
C9 100 MMF. MICA C-3202-140C
C10 .01 MFD. 200 V. C-720-325
C11 .05 MFD. 200 V. C-3204-132C
C12 100 MMF. MICA A-14956
C13 .01 MFD. 400 V. C-3290-114C
C14 8 MFD. 150 V. ELECT.
C15 .001 MFD. 1000 V.

MODELS 411-1,4121

SPARKS WITHINGTON CO.

VOLTAGE CHART

"A" Battery Voltage: 1.5 Volts
"B" Battery Voltage: 90 Volts

Volume Control: Full with dial tuned to quiet channel.

TUBE	FUNCTION	Voltage of Socket Prongs to Gnd. (See Schematic Diagram)								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	GC
1A7G	Oscillator-Converter	0	1.5	90	45	-4.6	90	0	-	0
1N5G	I.F. Amplifier	0	1.5	90	90	0	—	0	0	0
1H5G	2nd Det-AVC-1st A.F.	0	1.5	62.5	0	0	0	0	0	0
1Q5G	P.A.	0	1.5	85	90	-1	-5	0	0	-

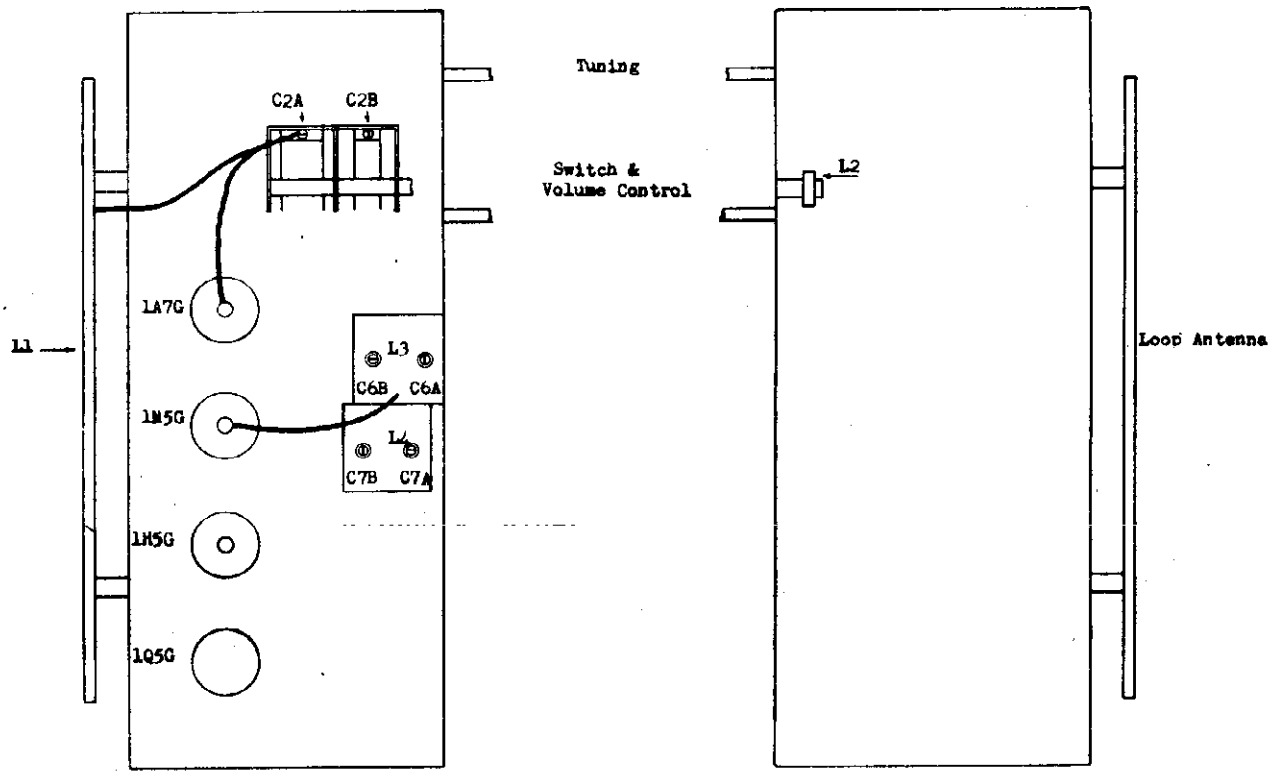
Notes: Allow 15% + or 15% - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All measurements made with 20,000 ohms per volt voltmeter.

ALIGNMENT CHART

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	TUNING COND. SETTING	TRIMMER	REMARKS
1	Set dial pointer with last calibration mark with condenser gang fully meshed.						
2	I.F.	*	.1 mf.Con.	456 KC	Open	C7 A&B	Peak accurately
						C6 A&B	Peak accurately
3	Broad-cast	Ant.	200 mf.	1500 KC	1500 KC	C2B Osc.Tri.	Peak accurately
						C2A Ant. Tr.	Peak accurately
4	Repeat operation 3.						
5	Check calibration and sensitivity at 600 KC and 1500 KC.						

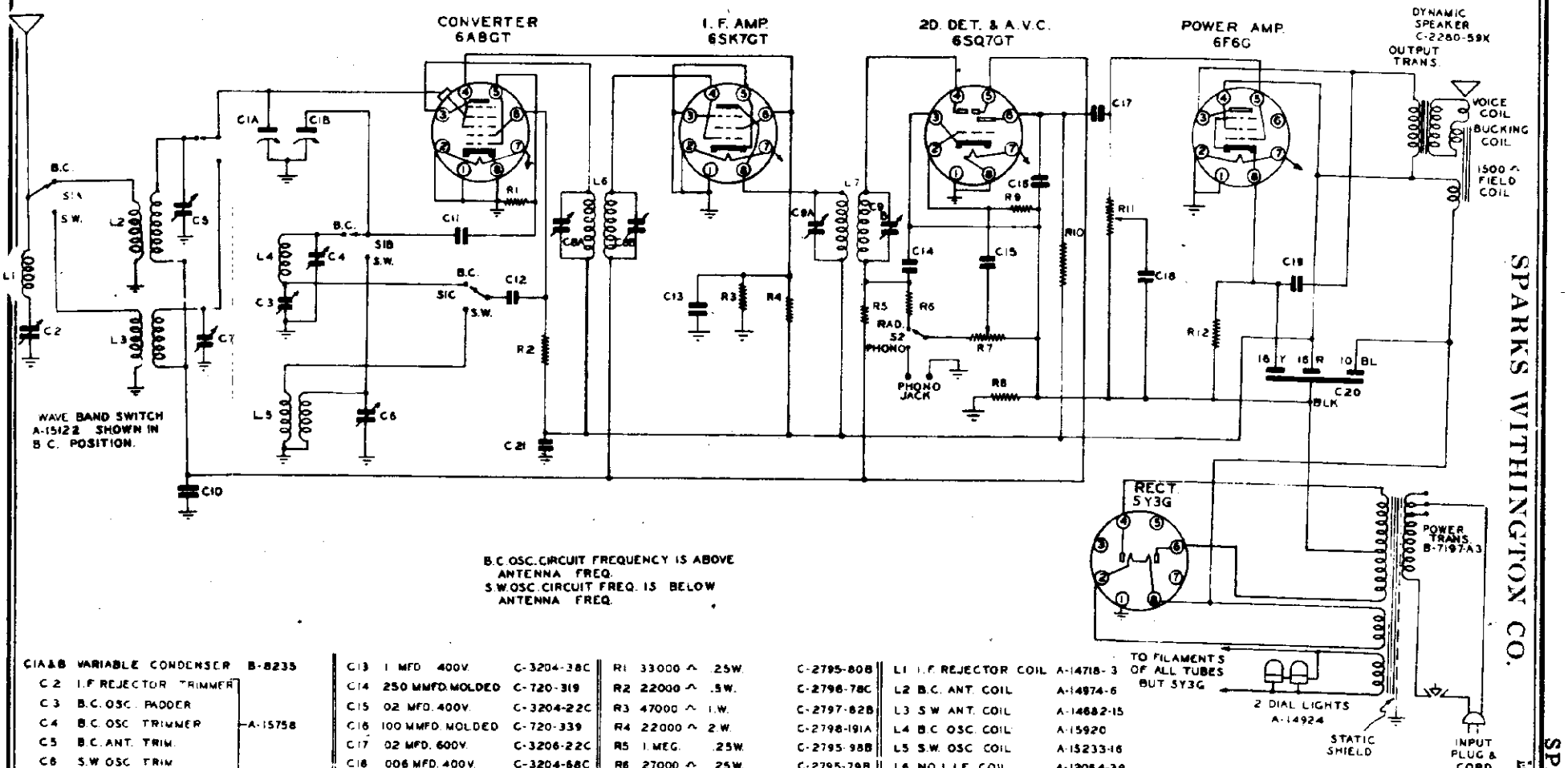
Notes:*Generator connected to grid cap of 1A7G tube.

CHASSIS DIAGRAM



INTERMEDIATE FREQUENCY 456 K.C.

BOTTOM VIEW OF ALL SOCKET CONNECTIONS



C1A&B	VARIABLE CONDENSER	B-8235
C 2	I.F. REJECTOR TRIMMER	A-15758
C 3	B.C. OSC. PADDER	
C 4	B.C. OSC. TRIMMER	
C 5	B.C. ANT. TRIM.	
C 6	S.W. OSC. TRIM	
C 7	S.W. ANT. TRIM	A-14088-5
C8A&B	NO. 1 I.F. TRIM	B-7200-GN
C9A&B	NO. 2 I.F. TRIM	B-7200-GN
C10	.05 MFD. 600V.	C-3206-28C
C11	50 MMFD. MOLDED	C-720-372
C12	.001 MFD. 600V.	C-3206-58C
C13	1 MFD. 400V.	C-3204-38C
C14	250 MMFD. MOLDED	C-720-319
C15	.02 MFD. 400V.	C-3204-22C
C16	100 MMFD. MOLDED	C-720-339
C17	.02 MFD. 600V.	C-3206-22C
C18	.006 MFD. 400V.	C-3204-68C
C19	.006 MFD. 800V.	C-3208-68C
C20	16-16-10 MFD. ELECT.	A-14780-1
C21	1 MFD. 600V.	C-3208-38C
R1	33000 Ω .25W.	C-2795-80B
R2	22000 Ω .5W.	C-2798-78C
R3	47000 Ω 1.W.	C-2797-82B
R4	22000 Ω 2.W.	C-2798-191A
R5	1. MEG. .25W.	C-2795-98B
R6	27000 Ω .25W.	C-2795-79B
R7	.5 MEG. VOL. CONT.	A-15130-5
R8	56 Ω 5W.	C-2796-47C
R9	5.6 MEG. .25W.	C-2795-107B
R10	270000 Ω .25W.	C-2795-91B
R11	.5 MEG. TONE CONT. & S.W.	A-15129-2
R12	680 Ω 1.W.	C-2797-60B
L1	I.F. REJECTOR COIL	A-14718-3
L2	B.C. ANT. COIL	A-14974-6
L3	S.W. ANT. COIL	A-14682-15
L4	B.C. OSC. COIL	A-15920
L5	S.W. OSC. COIL	A-15233-16
L6	NO. 1 I.F. COIL	A-12084-39
L7	NO. 2 I.F. COIL	A-12064-17
S1A-B-C	WAVE BAND SW.	A-15122
S2	PHONO-RADIO SW.	A-15754-1

SPARKS WITHINGTON CO.

SPARTON PAGE

MODELS 531X, 53

MODELS 531X,532X

SPARKS WITHINGTON CO.

VOLTAGE CHART

Line Voltage: 117 Volts A.C. — Position of Volume Control: Full with Dial Turned to Quiet Channel
Position of Band Switch: Broadcast

TUBE	FUNCTION	Voltage of Socket Prongs to Gnd. (See Schematic Diagram)								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	Grid Cap
6A8GT	Converter	0	6*	249	95	-8.2	162	0	0	-4.2
6SK7GT	I-F Amplifier	0	0	0	-2	0	95	6*	249	-
6SQ7GT	2nd Det & AVC	0	-1.4	-1.2	-1.6	-1.8	105	6*	0	-
6F6G	Power Amplifier	0	0	230	249	-.4	-1.2	6*	96	-
5Y3G	Rectifier	0	310	0	300*	0	300*	0	310	-

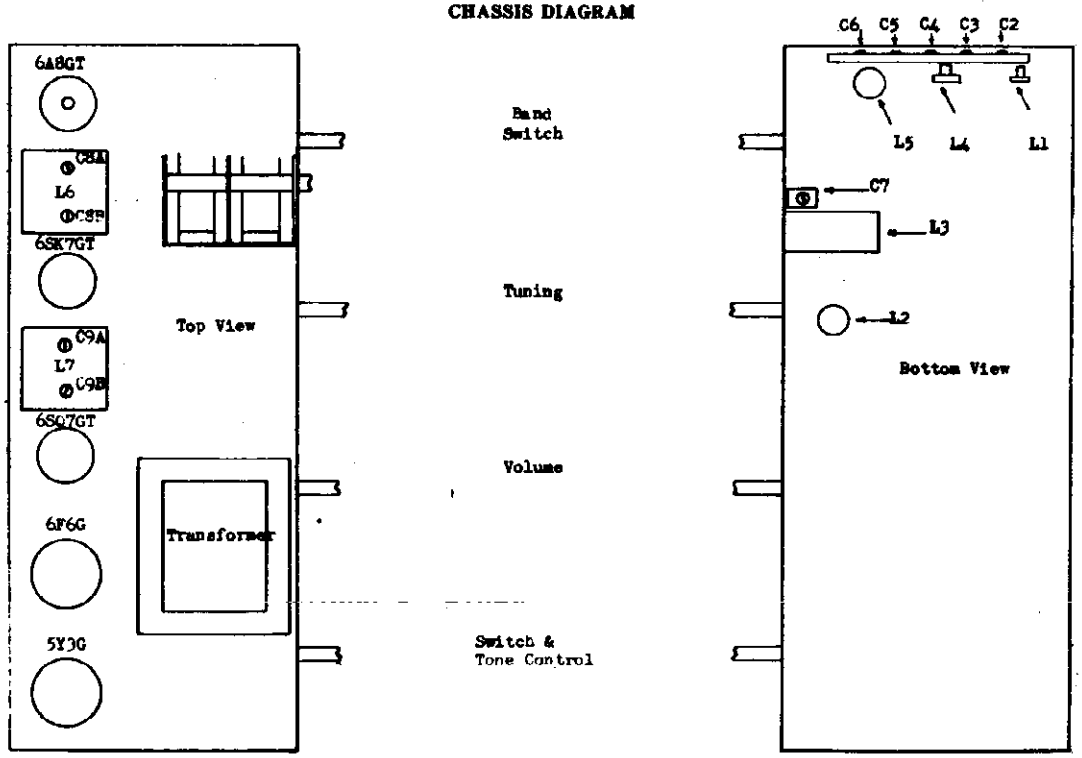
Notes: Voltage readings are for schematic in this Bulletin. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 20,000 ohms per volt voltmeter.
*AC volts.

ALIGNMENT CHART

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	Set dial pointer even with left hand stop line when condenser plates are fully meshed.							
2	I.F.	6A8GT Grid	.1 mf.Con	456 KC	Broad cast	Open	C9 AAB	Peak accurately
							C8 AAB	Peak accurately
3	I.F. Rej.	Ant.	.1 mf.Con.	456 KC	BC	Closed	C2 A	Adjust to minimum
4	BC	Ant.	200 mf. Cond.	1600 KC	BC	1600KC	C4 Osc.Trim	Peak accurately
							C5 Ant.Trim	Peak accurately
5				600 KC	BC	1600 KC	C3 Osc.Pad.	**
6	Repeat operation 4.							
7	Check calibration and sensitivity at 600 KC, 900 KC and 1600 KC.							
8	SW	Ant.	*	18 MC	SW	18 MC	C6 Osc.Trim	**
							C7 Ant.Trim	**
9	Repeat operation 8.							
10	Check calibration and sensitivity at 7 MC.							

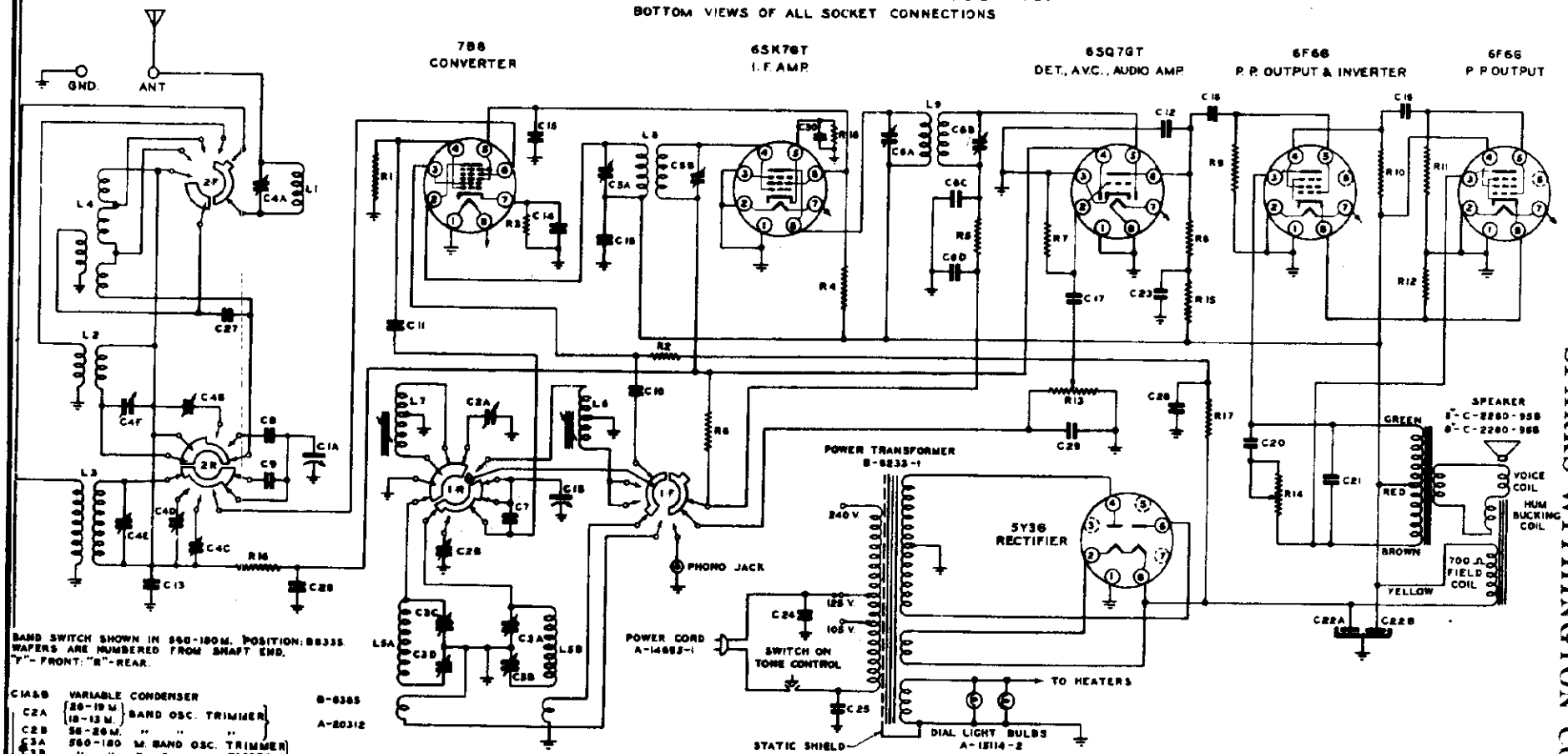
*100 ohms and 200 mf. in series.
**Rock dial while adjusting for maximum output.

CHASSIS DIAGRAM



INTERMEDIATE FREQUENCY 456 K.C.

BOTTOM VIEWS OF ALL SOCKET CONNECTIONS



BAND SWITCH SHOWN IN 560-180 M. POSITION: B8335. WAFERS ARE NUMBERED FROM SHAFT END, "F"-FRONT; "R"-REAR.

C1A&B	VARIABLE CONDENSER	B-8385	
C2A	26-19 M. / 18-13 M. BAND OSC. TRIMMER	A-20312	
C2B	56-26 M. " " "		
C3A	560-180 M. BAND OSC. TRIMMER	A-20313	
C3B	" " " " " PADDER		
C3C	2200-750 M. BAND OSC. TRIMMER		
C3D	" " " " " PADDER		
C4A	I.F. REJECTOR TRIMMER	A-20314	
C4B	18-13 M. BAND ANT. TRIMMER		
C4C	26-19 M. " " "		
C4D	56-26 M. " " "		
C4E	560-180 M. " " "		
C4F	2200-750 M. " " "		
C5A&B	NO. 1 I.F. TRIMMER	B-7800-GN	
C6A&B	NO. 2 I.F. TRIMMER	A-20114	
C6C&D	100-100 MMF. TWEET FILTER		
C7	70 MMF. CERAMIC	A-20252-1	
C8	75 MMF. CERAMIC	A-20252-8	
C9	2000 MMF. MICA 56-26 M. ANT. PADDER	C-720-304	
C10	500 MMF. MICA	C-720-316	
C11	50 MMF. "	C-720-315	
C12	250 MMF. "	C-720-324	
C13	.05 MFD. 600 V. TUBULAR COND.	C-3206-285	

C14	.25	MFD. 200 V.	TUBULAR COND.	C-3202-415
C15	.1	MFD. 600 V.	" "	C-3206-383
C16	.1	MFD. 600 V.	" "	C-3206-383
C17	.02	MFD. 600 V.	" "	C-3208-225
C18	.03	MFD. 600 V.	" "	C-3208-1365
C19	.01	MFD. 600 V.	" "	C-3208-785
C20	.02	MFD. 600 V.	" "	C-3208-1345
C21	.002	MFD. 600 V.	" "	C-3208-1165
C22A	15	MFD. 450 V.	ELECTROLYTIC	A-20316
C22B	30	MFD. 450 V.		
C23	.1	MFD. 600 V.	TUBULAR COND.	C-3206-383
C24	.008	MFD. 600 V.	" "	C-3206-1245
C25	.008	MFD. 600 V.	" "	C-3206-1245
C26	.05	MFD. 600 V.	" "	C-3206-283
C27	15	MMF. MICA		C-720-390
C28	16	MFD. 400 V.	ELECTROLYTIC	A-14782-11
C29	.100	MMF. MICA		C-720-325
C30	.1	MFD. 400 V.	TUBULAR COND.	C-3204-383

R1	56 K Ω	.25W.	C-2795-838
R2	22 K Ω	.5 W.	C-2796-78C
R3	300 Ω	.25 W.	C-2795-1468
R4	33 K Ω	1 W.	C-2797-1958
R5	56 K Ω	.25W.	C-2795-838
R6	1 MEG.	.25W.	C-2795-988
R7	15 MEG.	.25 W.	A-15786
R8	220 K Ω	.5 W.	C-2796-90C
R9	470 K Ω	.25 W.	C-2795-948
R10	2700 Ω	.5 W.	C-2796-169C
R11	470 K Ω	.25 W.	C-2795-948
R12	330 Ω	1 W.	C-2797-1478
R13	500 K Ω	VOL CONTROL	A-15130-6
R14	500 K Ω	TONE CONTROL	A-15131-2
R15	100 K Ω	.25 W.	C-2795-868
R16	100 K Ω	.25 W.	C-2795-868
R17	12 K Ω	1 W.	C-2797-1859
R18	300 Ω	.25 W.	C-2795-1468

L1	I.F. REJECTOR		A-15772-2
L2	2200-750 M. BAND ANT. COIL		A-15406-1
L3	560-180 M. " " "		A-14679-4
L4	56-26 M. " " " / 26-19 M. " " " / 18-13 M. " " "		A-20322
L5A	2200-750 M. BAND OSC. COIL		A-14213-15
L5B	560-180 M. " " "		
L6	56-26 M. " " " / 26-19 M. " " "		A-20320
L7	18-13 M. " " "		A-20320-1
L8	NO. 1 I.F. COIL		A-12064-47
L9	NO. 2 I.F. COIL		A-12064-48

ON 2200-750 M. & 560-180 M. BANDS, OSC FREQ IS ABOVE SIGNAL FREQ
ON 56-26 M., 26-19 M. & 18-13 M. " " " " BELOW " "

SPARKS WITHINGTON CO.

SPARTON PAGE 13-1

MODELS 652X, 652D

MODELS 652X, 652XD

SPARKS-WITHINGTON CO.

ALIGNMENT CHART

OPER-ATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	Set dial pointer even with left hand stop line with variable condenser gang fully meshed.							
2	I.F.	*	.1 mf Cond.	456 KC	Band #1	Open	C6 A&B	Peak accurately
							C5 A&B	Peak accurately
3	I.F. Rej	Ant.	.1 mf C.	456 KC	Band #2	Closed	C4 A	Adjust to minimum
4	Broad cast #1	Ant.	**	1600 KC	BC	1600 KC	C3 A Osc.Tr.	Peak accurately
							C4 E Ant. "	Peak accurately
5				600 KC	BC	600 KC	C3 B Osc.Pad	***
6	Repeat operation 4.							
7	Check calibration and sensitivity at 600 KC, 900 KC and 1600 KC.							
8	S.W. #2	Ant.	**	400 KC	SW #2	400 KC	C3 Osc. Tri.	Peak accurately
							C47 Ant. Tr.	Peak accurately
9				150 KC	SW #2	150 KC	C3D Osc.Pad.	***
10	Repeat operation 8.							
11	Check calibration and sensitivity at 400 KC, and 150 KC.							
12	S.W. #4	Ant.	**	20 M	SW #4	20 M	C2 A Osc.Tr.	***
							C4 C Ant. "	***
13				26 M	#4 Band	26 M	Adjust L6 Slug.	
14	Repeat operation 12 and 13.							
15	Check calibration & sensitivity at 24M. If this band fails to track correctly, C203C trimmer & L6 slug have not been properly adjusted.							
16	SW Band #3	Ant.	**	26 M	SW Band #3	26 M	C2B Osc. Tr.	***
							C4D Ant. "	***
							C9 Ant. Pad.	See Operation 17.
17	Antenna Padder C9 is precision set at the factory and should not be readjusted in the field.							
18	Check calibration and sensitivity at 55 M and 38 M. If this band fails to track correctly, trimmers C2A and L6 slug have not been properly adjusted.							
19	SW Band #5	Ant.	**	15 M	SW Band #5	15 M	adjust L7 slug	
							C4B Ant.Tr.	***
20	Check calibration and sensitivity at 18 M. If this band fails to track correctly, Band #4 has not been properly adjusted.							

*Connect generator to #6 Pin on 7B8 converter tube.
**Use Dummy Antenna as described on Page 1 of this bulletin.
***Rock dial while adjusting for maximum output.
Special Note: All band trimmers should be adjusted to the fundamental of the test signal and not to the image.

VOLTAGE CHART

Line Voltage: 117Volts A.C.

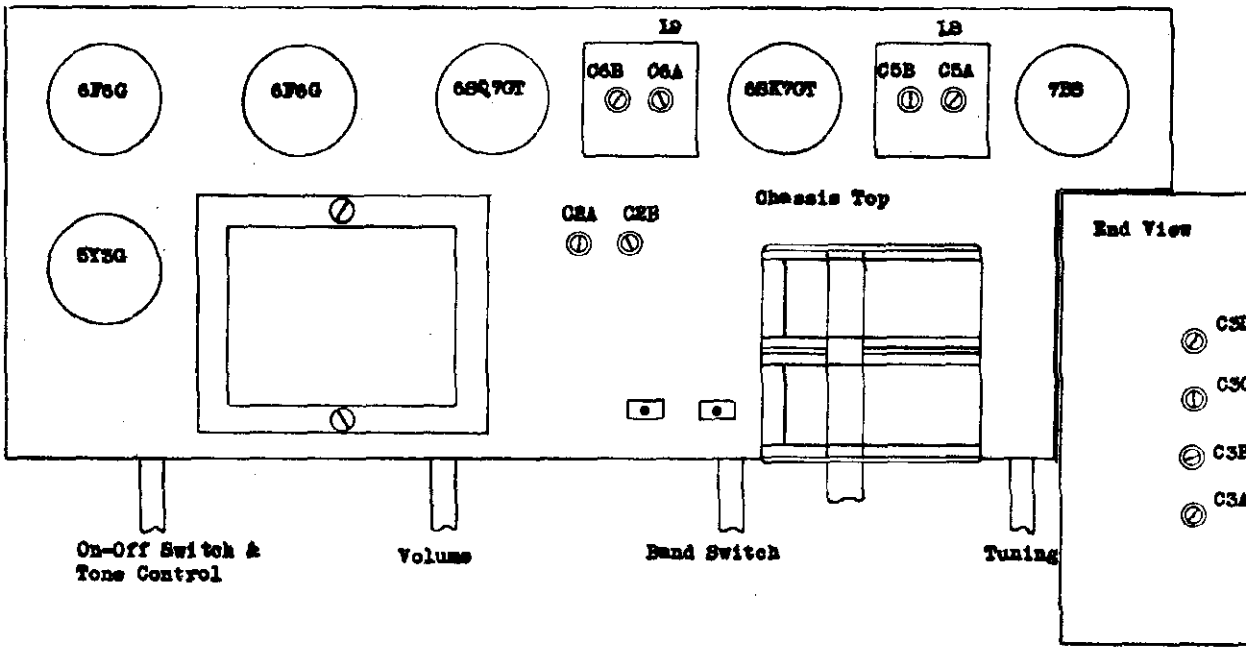
Position of Volume Control: Full with Antenna Disconnected
Position of Band Switch: Broadcast

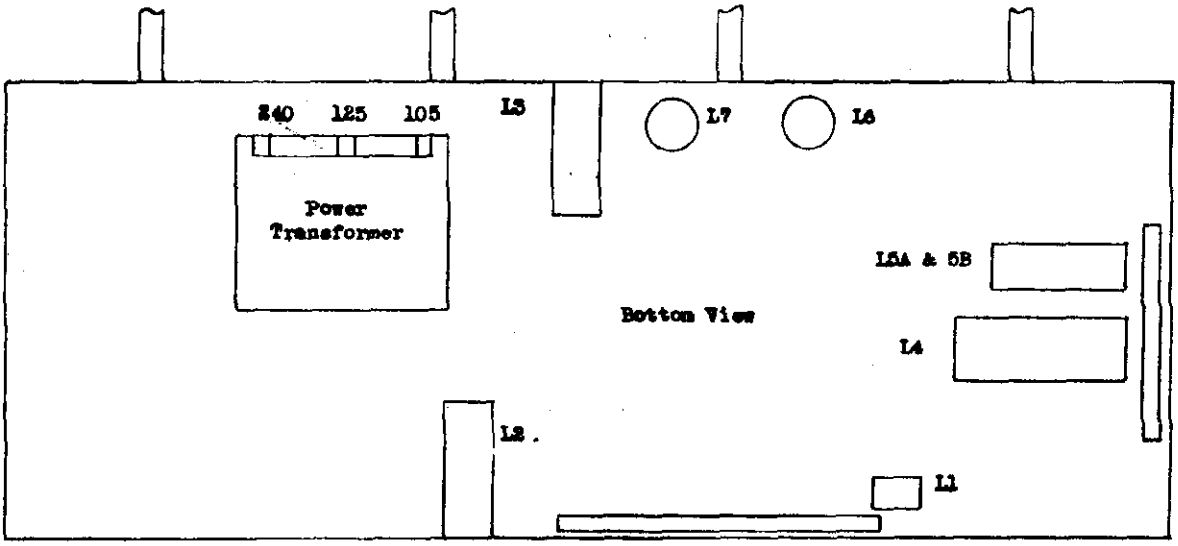
TUBE	FUNCTION	Voltage of Socket Prongs to Gnd. See Prong Nos. on Schematic Dia.								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9
7B8	Converter	0	245	60	-1.6	82	-.2	2	6.2*	-
6SK7GT	I.F. Amp.	0	0	0	-.2	2.1	82	6.2*	245	-
6SQ7GT	2nd Det. AVC 1st Audio	0	-.3	0	-.2	-.2	100	6.2*	0	-
6F6G	P.P. Out-put Inverter	0	0	235	232	0	290	6.2*	18	-
6F6G	P.P. Out-put	0	0	237	247	0	0	6.2*	18	-
5Y3G	Rectifier	0	295	0	300*	0	300*	0	295	-

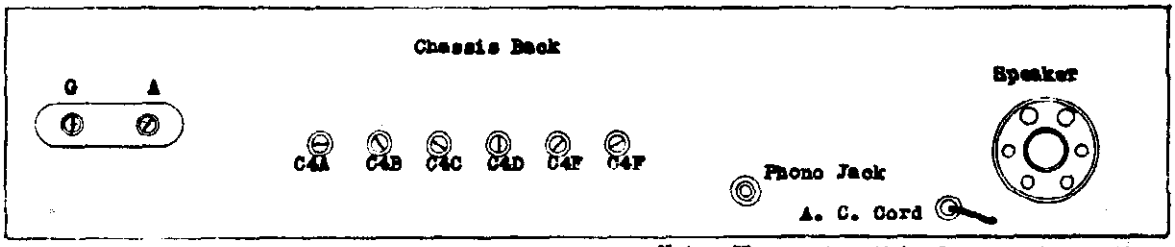
Notes: Voltage readings are for schematic diagram on back of sheet. Allow 15%+or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 20,000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter. Unless designated otherwise, voltages in table are + DC voltages.
*AC volts.

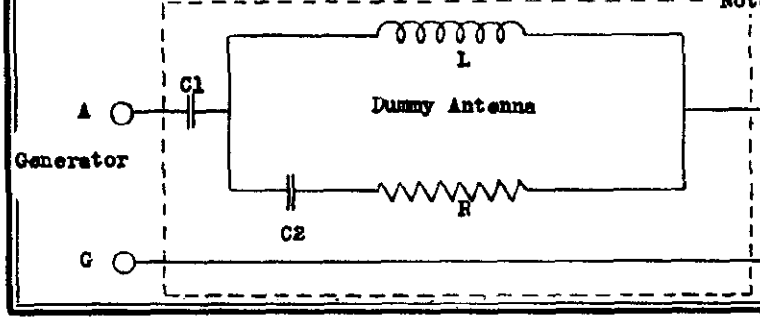
SPARKS-WITHINGTON CO.

CHASSIS DIAGRAM









Note: When using this dummy antenna the generat
output impedance should be 10 ohms or lo

C1 - 200 mmf. Condenser
C2 - 400 mmf. Condenser
R - 100 ohms
L - Choke Coil
---- Case Shield

Choke Coil Specification
Tubing - 3/8" Diameter Bakelite
Wire - No. 38 Enameled
Turns - 59 closely wound (Impregna

MODEL 6021

SPARKS WITHINGTON CO.

VOLTAGE CHART

Receiver operated on: AC
Line Voltage: 117 Volts

Volume Control Full: With dial tuned to Quiet Channel.

TUBE	FUNCTION	Voltage of each socket prong to #1 pin on 1S5 tube							
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
1T4	RF Amplifier	2.6 f	80	39	0	-	0	3.9 f	-
1R5	Osc.-Converter	1.24 f	80	39	.38	1.24	0	2.3 f	-
1T4	I.F. Amplifier	4 f	80	39	-	4	0	5.2 f	-
1S5	Det-AVC-1st Audio	B-**	80	0	13	14.25	0	1.25 f	-
3Q5GT	Output	-	8 f	85	90	0	.6	5.3 f	6.5 f
117Z6GT	Rectifier	-	0	117*	135	117*	-	117*	135

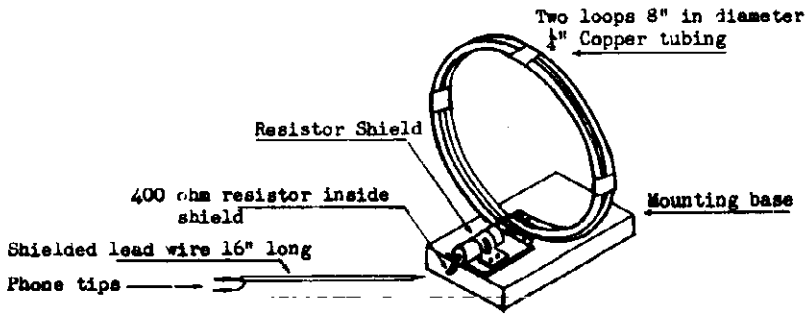
NOTES: f Filament Voltage
* A.C. Voltage
** All voltages measured from this point to socket prongs.

ALIGNMENT CHART

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	TUNING COND. SETTING	TRIMMERS	REMARKS
1	(Set dial pointer even with last calibration point with condenser gang fully meshed).						
2	I.F.	*	.1 mf. Cond.	456KC	Open	C12 A&B	Peak Accurately
						C11 A&B	Peak Accurately
3	Broad-cast	Seperate Loop	**	1500KC	1500KC	C2C osc. trim	" "
						C2B RF trim	" "
						C2A Ant. trim	" "
4				600KC	600KC	C2B osc. pad	***
5	(Repeat operation 3).						
6	(Check calibration and sensitivity at 600KC, 1000KC and 1500KC).						
7	(Check operation 1 to 6 inclusive).						

Notes: The generator must be connected to the dummy loop antenna and not to the loop of the receiver for RF Alignments.
* Generator connected to #6 Pin on 1R5 tube.
** Use dummy antenna as described below.
*** Rock dial while adjusting for maximum output.

DUMMY ANTENNA

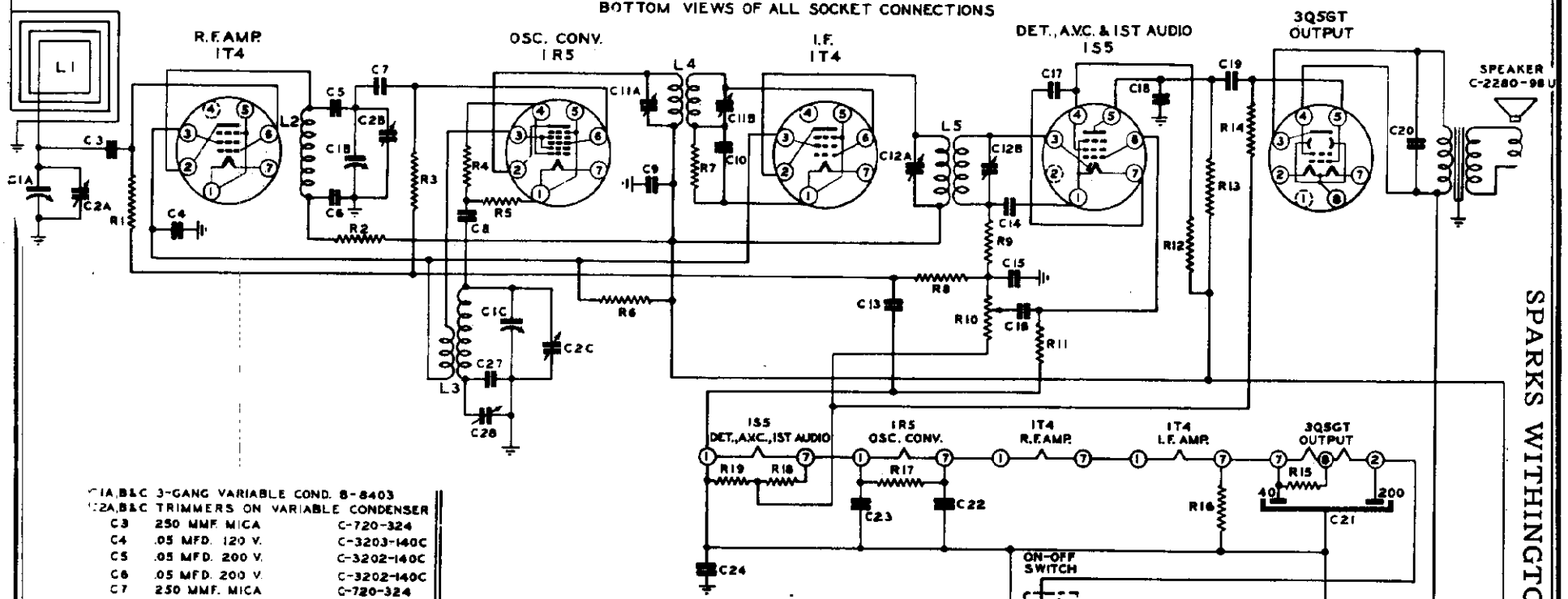


SPECIFICATIONS

Two loops of ¼" copper tubing 8" in diameter spaced ¼" apart with 400 ohms resistor in series.
Connecting cable and resistor must be shielded.
The loop should be spaced twice the diameter of the loop from the receiver being aligned to prevent an over modulated signal and poor alignment of the receiver.

INTERMEDIATE FREQUENCY 456 K.C.

BOTTOM VIEWS OF ALL SOCKET CONNECTIONS



C1A,B&C	3-GANG VARIABLE COND.		B-8403
C2A,B&C	TRIMMERS ON VARIABLE CONDENSER		
C3	250 MMF. MICA		C-720-324
C4	.05 MFD. 120 V.		C-3203-140C
C5	.05 MFD. 200 V.		C-3202-140C
C6	.05 MFD. 200 V.		C-3202-140C
C7	250 MMF. MICA		C-720-324
C8	100 MMF. MICA		C-720-339
C9	.05 MFD. 200 V.		C-3202-84C
C10	.02 MFD. 200 V.		C-3202-134C
C11A&B	NO. 1 I.F. TRIMMER		
C12A&B	NO. 2 I.F. TRIMMER		
C13	.05 MFD. 120 V.		C-3203-140C
C14	100 MMF. MICA		C-720-339
C15	100 MMF. MICA		C-720-339
C16	.005 MFD. 120 V.		C-3203-122C
C17	.05 MFD. 200 V.		C-3202-140C
C18	20 MMF. MICA		C-720-369
C19	.005 MFD. 200 V.		C-3202-122C
C20	.001 MFD. 1000 V.		C-3210-114C
C21	40-200 MFD. ELECT.		A-20367
C22	.1 MFD. 120 V.		C-3203-150C
C23	.05 MFD. 120 V.		C-3203-140C
C24	.1 MFD. 400 V.		C-3204-150C
C25A,B,C	20-40-10 MFD. ELECT.		A-14684-10
C26	.05 MFD. 400 V.		C-3204-140C
C27	300 MMF. MICA		C-720-397
C28	OSCILLATOR PADDER		A-14088-4
R1	1 MEGOHM	.25 W.	C-2795-98B
R2	1,000 Ω	.25 W.	C-2795-62B
R3	20,000 Ω	.25 W.	C-2795-190B
R4	1,500 Ω	.25 W.	C-2795-64B
R5	22,000 Ω	.25 W.	C-2795-191B
R6	4.7 MEGOHMS	.25 W.	C-2795-106B
R7	3.3 MEGOHMS	.25 W.	C-2795-104B
R8	47,000 Ω	.25 W.	C-2795-82B
R9	1 MEGOHM VOL. CONT.		A-15147
R10	10 MEGOHMS	.25 W.	C-2795-110B
R11	4.7 MEGOHMS	.25 W.	C-2795-106B
R12	1 MEGOHM	.25 W.	C-2795-98B
R13	3.3 MEGOHMS	.25 W.	C-2795-104B
R14	620 Ω	.25 W.	C-2795-154B
R15	620 Ω	.25 W.	C-2795-157B
R16	1000 Ω	.25 W.	C-2795-159B
R17	200 Ω	.25 W.	C-2795-142B
R18	200 Ω	.25 W.	C-2795-142B
R19	2,000 Ω	.50 W.	C-2796-166C
R20	3,900 Ω	2 W.	C-2798-173A
R21	2,634 Ω	10 W.	A-14263-3
R22			
L1	LOOP ANTENNA		
L2	B.C. DET. COIL		A-20361
L3	B.C. OSC. COIL		A-15232-10
L4	NO. 1 I.F. COIL		A-20379-1

SPARKS WITHINGTON CO.

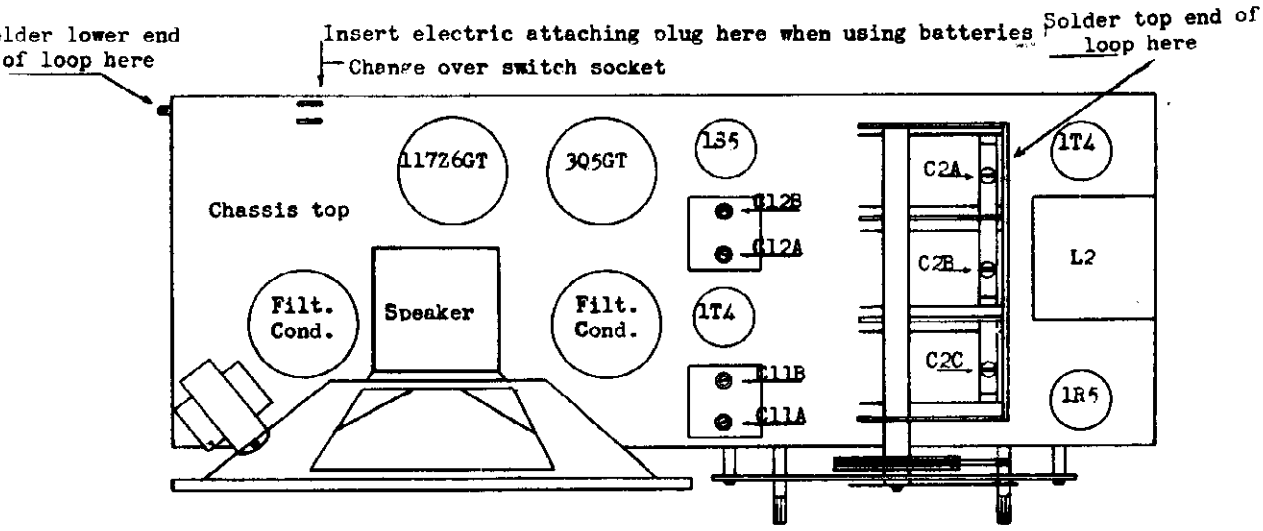
SPARTON PAGE 1

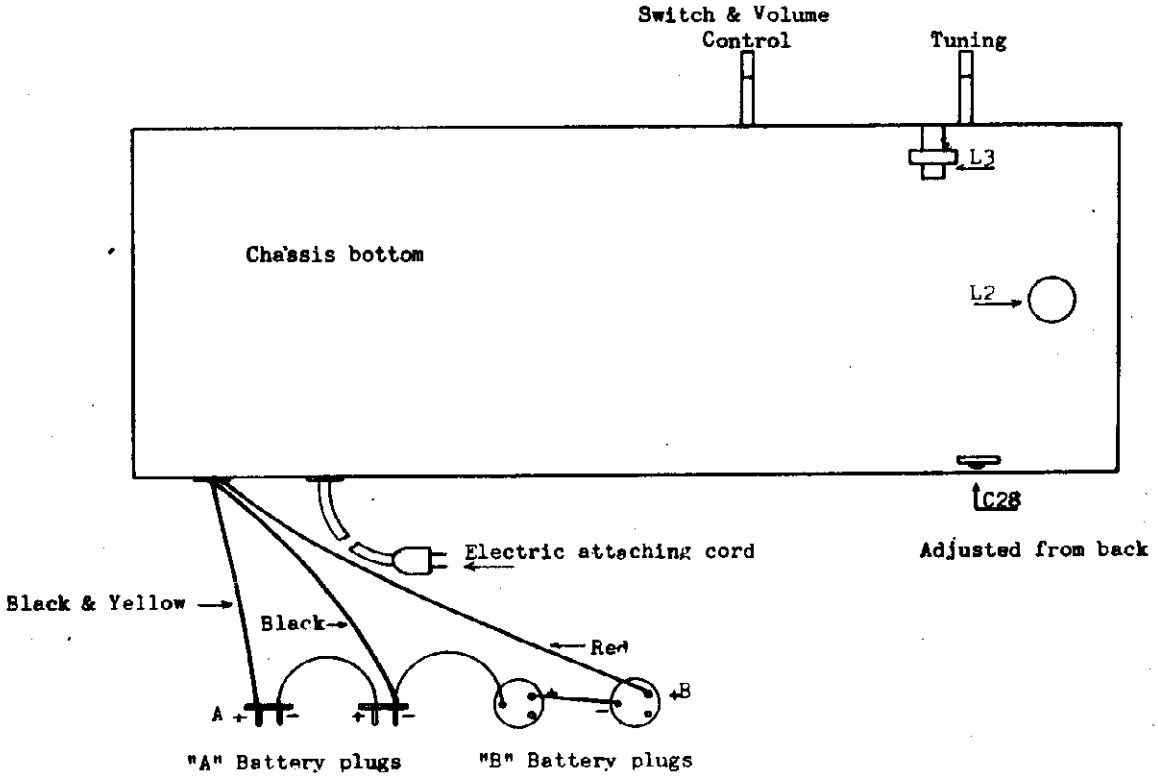
MODEL 6

MODEL 6021

SPARKS WITHINGTON CO.

CHASSIS DIAGRAM

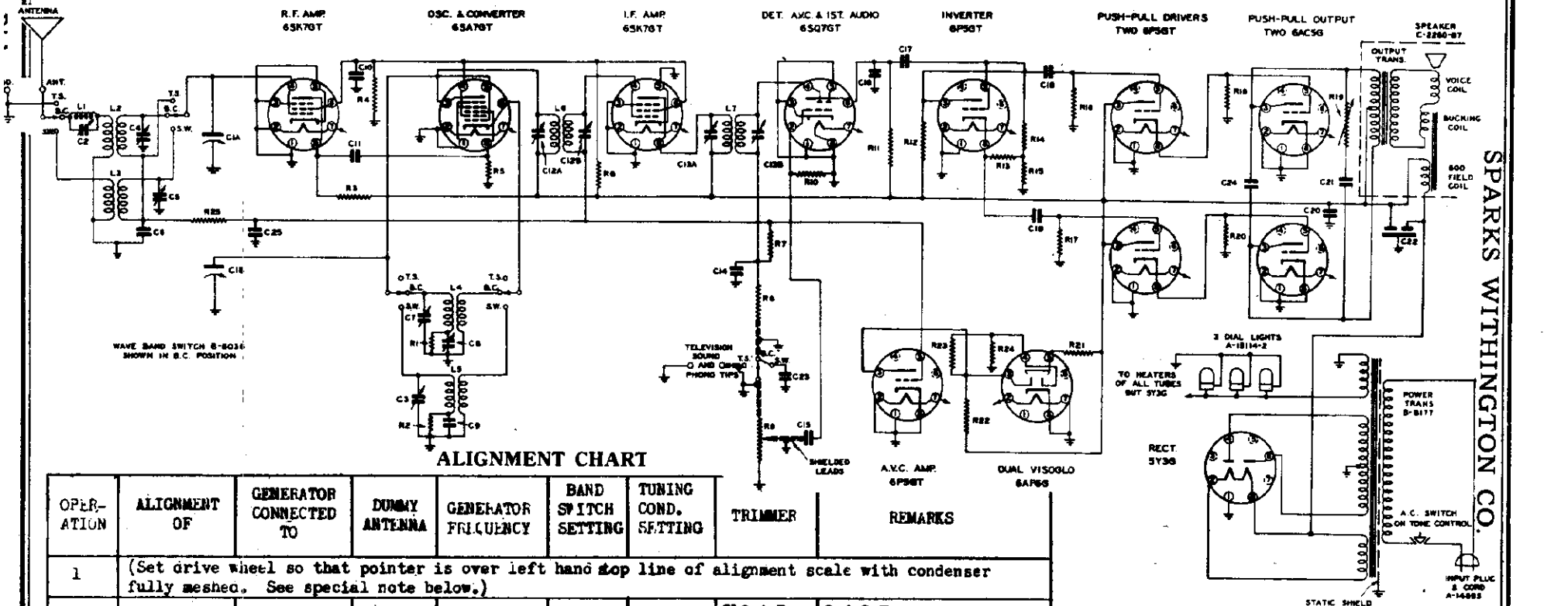




THIS IS A SIX TUBE SUPERHETERODYNE AC/DC OR BATTERY RECEIVER.

INTERMEDIATE FREQUENCY 456K.C

BOTTOM VIEWS OF ALL SOCKET CONNECTIONS



ALIGNMENT CHART

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set drive wheel so that pointer is over left hand stop line of alignment scale with condenser fully meshed. See special note below.)							
2	I.F.	*	.1 mf.	456 KC	BC	Open	C13 A,B	2nd I.F.
							C12 A,B	1st I.F.
3	Rejector	Ant.	200 mmf.	456 KC	BC	Closed	C2	Adjust to minimum
4	Broad-cast Band	Ant.	200 mmf.	1400 KC	BC	1400 KC	C7 (Osc.)	***
							C4 (Ant.)	***
5				600 KC	BC	600 KC	C8 (Pad.)	***
6	(Repeat operation 4)							
7	(Check calibration and sensitivity at 600 KC, 1000 KC and 1400 KC)							
8	Shortwave Band	Ant.	**	18 MC	SW	18 MC	C3 (Osc.)	***
							C5 (Ant.)	***
9	(Check calibration and sensitivity at 6 MC and 18. MC)							
10	(Check operations 1 to 9 inclusive.)							

Notes: *Pin No. 8 of 6SA7GT Osc-Converter tube.
**100 ohm resistor and 200 mmf. condenser in series.
***Rock dial while adjusting for maximum output.

Special Note: For accurate alignment, the special scale (C-3282) reproduced in this bulletin must be used. The scale and full directions for using it will be found on page 4 and 5, Bulletin 27.

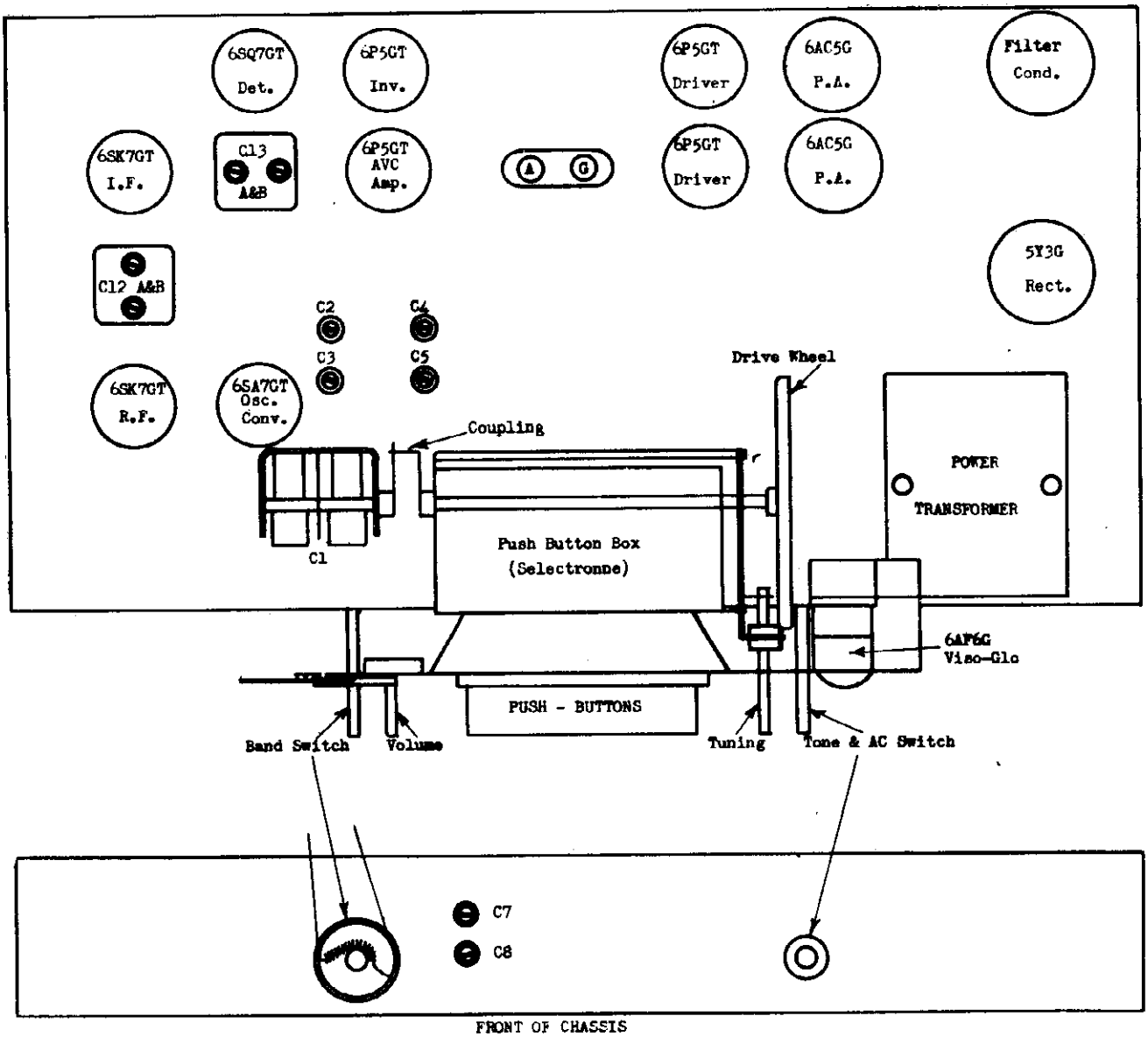
C1A,B	VARIABLE CONDENSER	B-7228	
C2	I.F. REJECT. TRIMMER	A-14200-2	
C3	S.W. OSC. TRIMMER		
C4	B.C. ANT. TRIMMER	A-14200	
C5	S.W. ANT. TRIMMER		
C6	.05 MFD. 200V.	C-3202-84C	
C7	B.C. OSC. TRIMMER	B-7189-EY	
C8	B.C. OSC. PADDER		
C9	2700 MMF. MICA	A-15451	
C10	.05 MFD. 400V.	C-3204-28C	
C11	40 MMF. MICA	C-720-381	
C12A,B	NO.1 I.F. TRIMMER	B-7200-GN	
C13A,B	NO.2 I.F. TRIMMER	B-7200-GN	
C14	250 MMF. MICA	C-720-324	
C15	.02 MFD. 400V.	C-3204-22C	
C16	250 MMF. MICA	C-720-324	
C17	.05 MFD. 400V.	C-3204-28C	
C18	.05 MFD. 400V.	C-3204-28C	
C19	.05 MFD. 400V.	C-3204-28C	
C20	.05 MFD. 400V.	C-3204-28C	
C21	.03 MFD. 600V.	C-3203-24C	
C22	16-16 MFD. 450V. ELECT.	A-15625	
C23	100 MMF. MICA	C-720-330	
C24	.008 MFD. 600V.	C-3206-72C	
C25	.05 MFD. 200V.	C-3202-84C	

R1	56,000 Ω	.25W.	C-2795-83B
R2	39,000 Ω	.25W.	C-2795-81B
R3	3300 Ω	.25W.	C-2795-58B
R4	27,000 Ω	5W.	C-2796-79C
R5	2.2 MEGOHM	.25W.	C-2795-102B
R6	33,000 Ω	2W.	C-2788-80A
R7	1 MEGOHM	.25W.	C-2795-98B
R8	56,000 Ω	.25W.	C-2795-83B
R9	500,000 Ω VOL CONT.		A-15130-2
R10	4.7 MEGOHM	.25W.	C-2795-106B
R11	270,000 Ω	.25W.	C-2795-91B
R12	39,000 Ω	5W.	C-2796-81C
R13	2700 Ω	25W.	C-2795-69B
R14	1 MEGOHM	.25W.	C-2795-98B
R15	33,000 Ω	.5W.	C-2798-195C
R16	270,000 Ω	.25W.	C-2795-91B
R17	270,000 Ω	.25W.	C-2795-91B
R18	22,000 Ω	.25W.	C-2795-78B
R19	TONE CONT. & SW		A-15128-1U
R20	22,000 Ω	.25W.	C-2795-78B
R21	56,000 Ω	.25W.	C-2795-83B
R22	150,000 Ω	.25W.	C-2795-88B
R23	1 MEGOHM	.25W.	C-2795-98B
R24	1 MEGOHM	.25W.	C-2795-98B
R25	270,000 Ω	.25W.	C-2795-91B

L1	I.F. REJECTOR COIL	A-14677-2
L2	B.C. ANT. COIL	A-14678-3
L3	S.W. ANT. COIL	A-14682-7
L4	B.C. OSC. COIL	A-15377
L5	S.W. OSC. COIL	A-15233-7
L6	NO. 1 I.F. COIL	A-12064-39
L7	NO. 2 I.F. COIL	A-12064-17

MODEL 1271

SPARKS WITHINGTON CO.



FRONT OF CHASSIS

VOLTAGE CHART

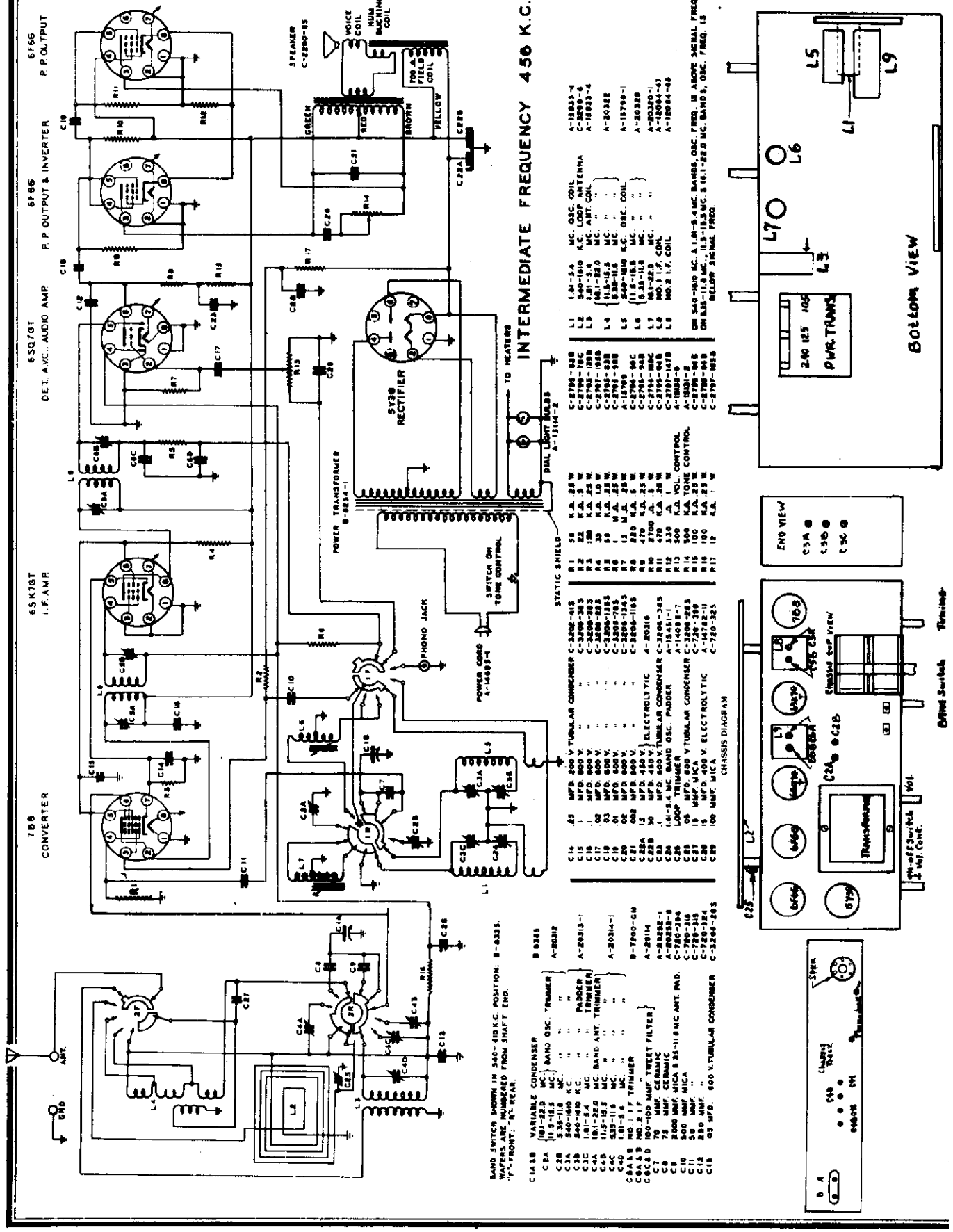
Line Voltage: 117 Volts

Position of Volume Control: Full with Antenna Disconnected
Position of Band Switch: Broadcast

Tube	Function	Voltage of Socket Prongs to Gnd. (See Nos. on Schematic Diagram)								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	Grid Cap
6SK7GT	R-F Amplifier	0	0	0	-.1a	0	40	*6.3	235	-
6SA7GT	Osc - Converter	0	0	250	40	-.3a	0	*6.3	0	-
6SK7GT	I-F Amplifier	0	0	0	-.1a	0	40	*6.3	250	-
6SQ7GT	Det - AVC - Audio Amp.	0	-.1a	0	-.04a	0	43	*6.3	0	-
6P5GT	Phase Inverter	0	0	160	52	b	265	*6.3	62	-
6P5GT	Driver (Push-pull)	0	0	255	—	0	150	*6.3	13.5	-
6P5GT	Driver (Push-pull)	0	0	255	—	0	—	*6.3	13.5	-
6AC5G	Power Amp. (Push-pull)	0	0	245	—	13.5	—	*6.3	0	-
6AC5G	Power Amp. (Push-pull)	0	0	245	—	13.5	—	*6.3	0	-
6P5GT	AVC Amplifier	0	0	22	—	-.1a	—	*6.3	0	-
6AF6G	Dual Viso-Glo	0	*6.3	21.5	b	150	—	0	0	-
5Y3G	Rectifier	-	*385	0	*330	—	*330	*240	*380	-

Notes: Voltage readings are for schematic diagram in this bulletin. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter.
*-A.C. Scale.
a-1- volt scale.
b-Cannot be measured with 1000 ohms/volt voltmeter.

SPARKS WITHINGTON CO.



MODEL 6521

SPARKS WITHINGTON CO.

VOLTAGE CHART

Line voltage: 117 Volts A.C. Position of Volume Control: Full with dial tuned to quiet channel.
Position of Band Switch: Broadcast

TUBE	FUNCTION	Voltage of Socket Prongs to Gnd. (See Prong Nos. on Schematic							
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
7B8	Oscillator Converter	0	245	60	-1.6	82	-.2	2	6.2*
6BK7GT	I-F Amplifier	0	0	0	-.2	2.1	82	6.2*	245
6BQ7GT	2nd Det - AVC - 1st Audio	0	-.3	0	-.2	-.2	100	6.2*	0
6F6G	Power Amplifier	0	0	235	232	0	290	6.2*	18
6F6G	Power Amplifier	0	0	237	247	0	0	6.2*	18
5Y3G	Rectifier	0	295	0	300*	0	300*	0	295

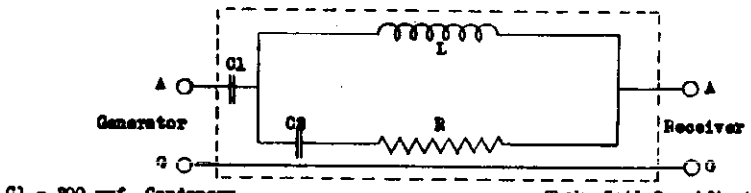
Notes: Voltages readings are for schematic diagram on back of sheet. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 20,000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter. Unless designated otherwise, voltages in table are + DC voltages.
*AC volts.

ALIGNMENT CHART

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	Set dial pointer even with left hand stop line with variable condenser gang fully meshed.							
2	I.F.	*	.1 mf Con.	456 KC	BC	Open	C6 A&B	Peak accurately
							C5 A&B	Peak accurately
3	Broad cast Band	Ant.	**	1600 KC	BC	1600 KC	C3A Osc.Tri.	Peak accurately
							C2E Loop Tr.	Peak accurately
4				600 KC	BC	600 KC	C3B Osc.Pad.	***
5	Repeat operation 3.							
6	Check calibration and sensitivity at 600 KC, 1000 KC and 1600 KC.							
7	Police #2 Band	Ant.	**	5 MC	Police #2 Band	5 MC	C3C Osc.Tri.	***
							C4D Ant.Tri.	***
							C24 Osc.Pad.	See operation #9
8	Check calibration and sensitivity at 2 MC.							
9	Oscillator padder C24 is precision set at the factory and should not be readjusted in the field.							
10	SW #4 Band	Ant.	**	15 MC	SW #4 Band	15 MC	C2A Osc.Tri.	***
							C4B Ant.Tri.	***
11				11.6 MC	#4 Band	11.6 MC	Adjust L6 Slug	
12	Check calibration and sensitivity at 12.5 MC if not tracking properly, readjust C2A & C4B.							
13	Repeat operation 10 and 11.							
14	SW #3 Band	Ant.	**	11.4 MC	SW #3 Band	11.4 MC	C2B Osc.Tri.	***
							C4 Ant. Tri.	***
15	Check calibration and sensitivity at 6 MC and 9 MC. If this band fails to track SW band #4 has not been properly adjusted.							
16	SW #5 Band	Ant.	**	21 MC	SW #5 Band	21 MC	Adjust L7 Slug.	
							C4A Ant. Tri.	***
17	Check calibration and sensitivity at 18 MC. If this band fails to track SW Band #4 has not been properly adjusted.							

Notes: *Connect generator to #6 pin on 7B8 converter tube.
**Use Dummy Antenna as described on page 1 of this bulletin.
***Rock dial while adjusting for maximum output.

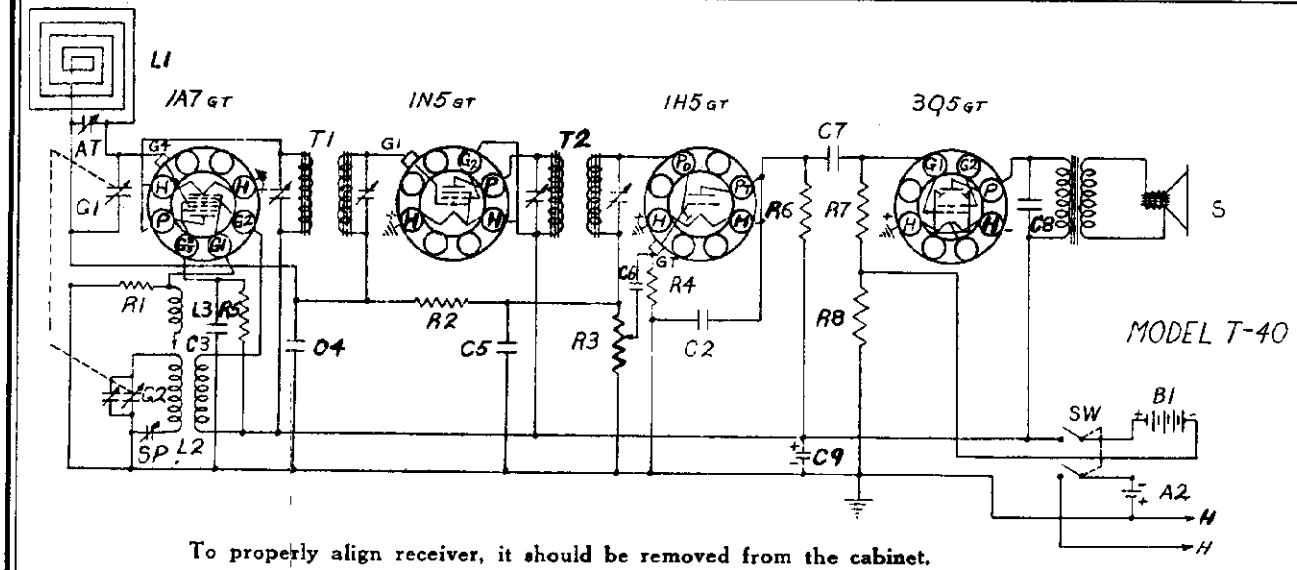
DUMMY ANTENNA



C1 - 200 mmf. Condenser
C2 - 400 mmf. Condenser
R - 100 ohms
L - Choke Coil
---- Case Shield

Choke Coil Specification
Tubing - 3/8" Diameter Bakelite
Wire - No. 38 Enameled.
Turns - 59 closely wound (Impregnated)

Note: When using this Dummy Antenna the generator output impedance should be 100 ohms or lower.



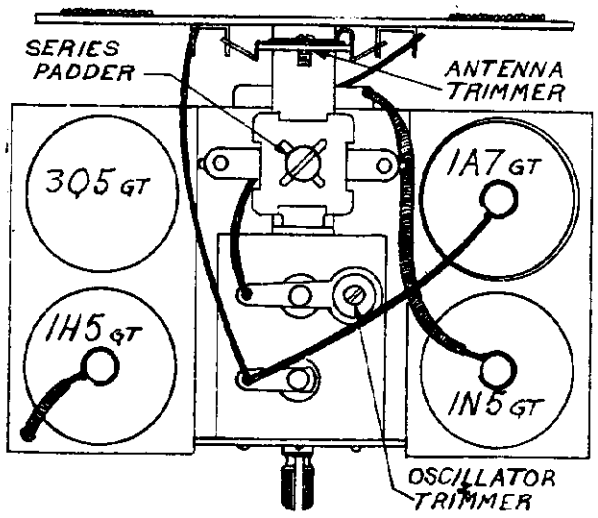
Part No.	Schematic Location	Description
3-304	R1	100,000 Ohm ¼ W. 20%
3-301	R2	4 Megohm ¼ W. 20%
5-300	R3	1 Megohm Vol. Control
3-300	R4	6 Megohm ¼ W. 20%
3-305	R5	30,000 Ohm ¼ W. 20%
3-303	R6	1 Megohm ¼ W. 20%
3-302	R7	2 Megohm ¼ W. 20%
3-306	R8	300 Ohm ¼ W. 20%
10-300	G1 }	2 Section Gang
	G2 }	Variable Condenser
6-303	C2	.0005 MFD. 120 V. 20%
6-300	C3	.01 MFD. 120 V. 20%
6-301	C4	.05 MFD. 120 V. 20%
8- 10	C5	.0001 MFD. Mica 20%
6-300	C6	.01 MFD. 120 V. 20%
6-300	C7	.01 MFD. 120 V. 20%
6-302	C8	.001 MFD. 120 V. 20%
7-300	C9	10 MFD. 75 V. Electrolytic
9- 47	AT	¼ Plate Trimmer 0-8 MFD.
15-300	L1	Loop
15-301	L2	Oscillator Coil }
	L3	Grid Coupling Coil }
16-300	T1	IFT Iron Input
16-301	T2	IFT Iron Output
43-300	S	Speaker P. M.
9-300	SP	Series Pad. 287 MMFD. 3%
	SW	Off & On Switch
	1A7GT	Oscillator-Mixer }
	1N5GT	IF Amplifier }
40-300	1H5GT	Detector-Audio }
	1Q5GT	Power }
42-301	A2	"A" Battery
42-300	B1	"B" Battery

To properly align receiver, it should be removed from the cabinet.

A signal generator is required, having the following frequencies: 456KC, 1400KC, 1720KC. An output meter of some kind is also necessary.

First Step: Connect generator lead to grid cap of 1A7GT tube through a .1MFD condenser. Generator ground lead should be connected to any available spot on the metal chassis of the receiver. Turn tuning condenser so that its plates are completely unmeshed. This puts circuit at 1720KC. Adjust manual volume control to maximum clockwise rotation. This will prevent the automatic volume control from working and giving false readings. All alignment adjustments should be made with manual volume control at maximum. Now adjust the signal generator to 456KC. Align the intermediate frequency amplifier (IF) to this frequency by adjusting the screws in the small metal cans underneath the chassis. There are four screws in all, two for the input IF which is at the rear of the chassis and two for the output IF which is located closer to the front of the chassis. Adjust each screw until a maximum reading is obtained on an output meter which has been connected across the speaker leads. After the IF coils have been aligned, with tuning coils completely unmeshed, turn signal generator to 1720KC and adjust oscillator trimmer condenser which is on top of the tuning condenser (see figure 2 layout) until a maximum reading is noted on the output device. This is the proper oscillator setting for 1720KC. Remove signal generator leads from receiver and connect both to a transmitting loop antenna. This can be made with two turns of wire about 6 inches in diameter, and placed about one foot from the loop antenna of the receiver. It will be necessary to increase the output of the signal generator. Next adjust the generator to 1400KC. Turn tuning condenser so that the plates mesh and the 1400KC signal is tuned in. Adjust trimmer condenser which is located on loop antenna of receiver for maximum output. Unless set has been damaged, no further adjustments are necessary, as the coils and condensers in this receiver have been specially handled at the factory so as to insure proper alignment at the lower frequency end of the dial. As a final step of alignment after the set has been reinstalled in the cabinet, tune in a weak station between 1400KC and 1500KC and readjust loop antenna trimmer for maximum signal strength. This should be done only after receiver has been mounted in place along with the batteries.

IF PEAK 456 KC



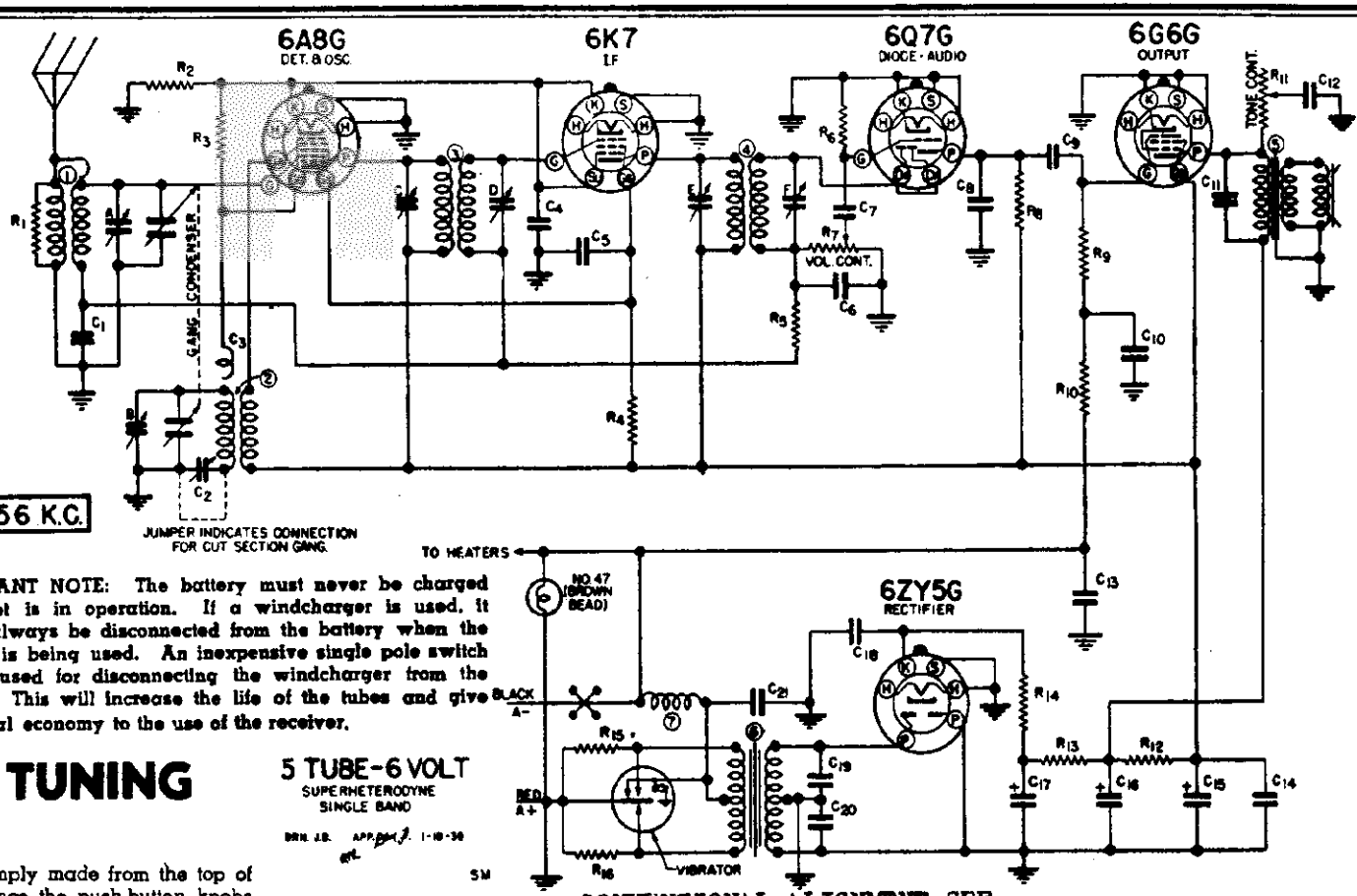
TUBE LAYOUT

FIGURE-2

MODEL 204
Chassis SM
MODELS W102, W216, W300, W302, W312

SPIEGEL, INC.

DIAG NO	PART NO.	DESCRIPTION	
C 1	N-1345	.05 MFD.	200V.
C 2	N-1323	300-600 MMFD. PADDER	
C 3		CAPACITY INCLUDED IN OSCILLATOR COIL	
C 4	N-1479	.25 MFD.	200V.
C 5	N-1351	.1 MFD.	200V.
C 6	N-1374	100 MMFD.	20%
C 7	N-1347	.006 MFD.	600V.
C 8	N-1343	250 MMFD.	20%
C 9	N-1344	.01 MFD.	400V.
C 10	N-1345	.05 MFD.	200V.
C 11	N-1347	.006 MFD.	600V.
C 12	N-1378	.02 MFD.	400V.
C 13	N-1471	.5 MFD.	50 V.
C 14	N-1351	.1 MFD.	200V.
C 15	N-1488	20 MFD. 150V.	ELECTRO.
C 16		20 MFD. 150V.	
C 17		10 MFD. 250 V.	
C 18	N-1478	.01 MFD.	600V.
C 19	N-1480	.01 MFD. (OIL)	1000 V.
C 20	N-1480	.01 MFD. (OIL)	1000V.
C 21	N-1471	.5 MFD.	50 V.
R 1	N-1259	15,000 OHMS 20%	.5W.
R 2	N-1473	200 OHMS 10%	.5W.
R 3	N-1260	50,000 OHMS 20%	.5W.
R 4	N-1474	25,000 OHMS 20%	.5W.
R 5	N-1378	2 MEGOHMS 20%	.5W.
R 6	N-1263	10 MEGOHMS 20%	.5W.
R 7	N-1320	1 MEGOHM VOL. CONT.	
		SET WITH CUT SECTION GANG	
C_2	N-1323	PADDER, ELIMINATED	
	N-1338	GANG CONDENSER	
2	N-1337	OSCILLATOR COIL	



IMPORTANT NOTE: The battery must never be charged while set is in operation. If a windcharger is used, it should always be disconnected from the battery when the receiver is being used. An inexpensive single pole switch can be used for disconnecting the windcharger from the battery. This will increase the life of the tubes and give additional economy to the use of the receiver.

AUTOMATIC TUNING

For Chassis

5 TUBE-6 VOLT
SUPERHETERODYNE
SINGLE BAND

DRN. J.B. APP. 1-10-38

SM

ADJUSTMENT. All adjustments are simply made from the top of the cabinet without the use of tools since the push-button knobs serve this purpose.

To make adjustments, turn each knob to the left about 1 complete turn. The knob is knurled to provide a positive grip for this purpose.

With the knob turned free, tune to any desired station with the manual tuning control. Depress the push button knob as far as possible and turn to the right to tighten adjustment. Meanwhile, hold the manual tuning control in position to the station tuned.

Be sure the push button knob is held down in position while being tightened.

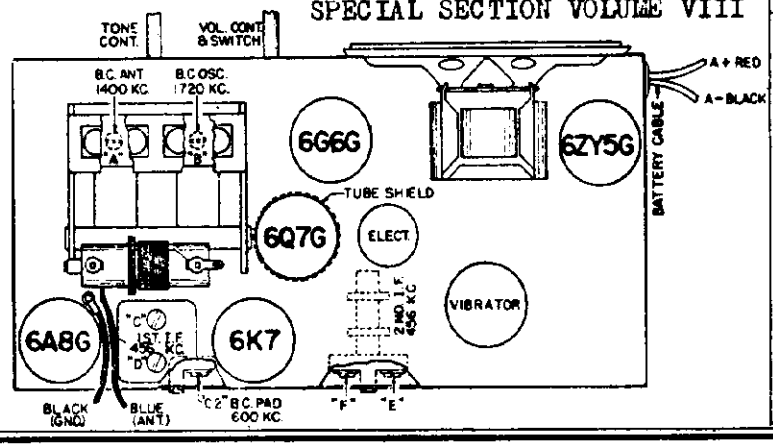
After the stations are adjusted it is advisable to check each button to assure sufficient tightening.

To assure accurate adjustment, the volume control should be set at a moderate level and the station tuned in slowly to a point of maximum volume and clarity.

It is not necessary to follow any particular sequence of stations since each button is adjustable to any station.

With each button definitely set and securely tightened to the selected stations, the tuner is ready for operation.

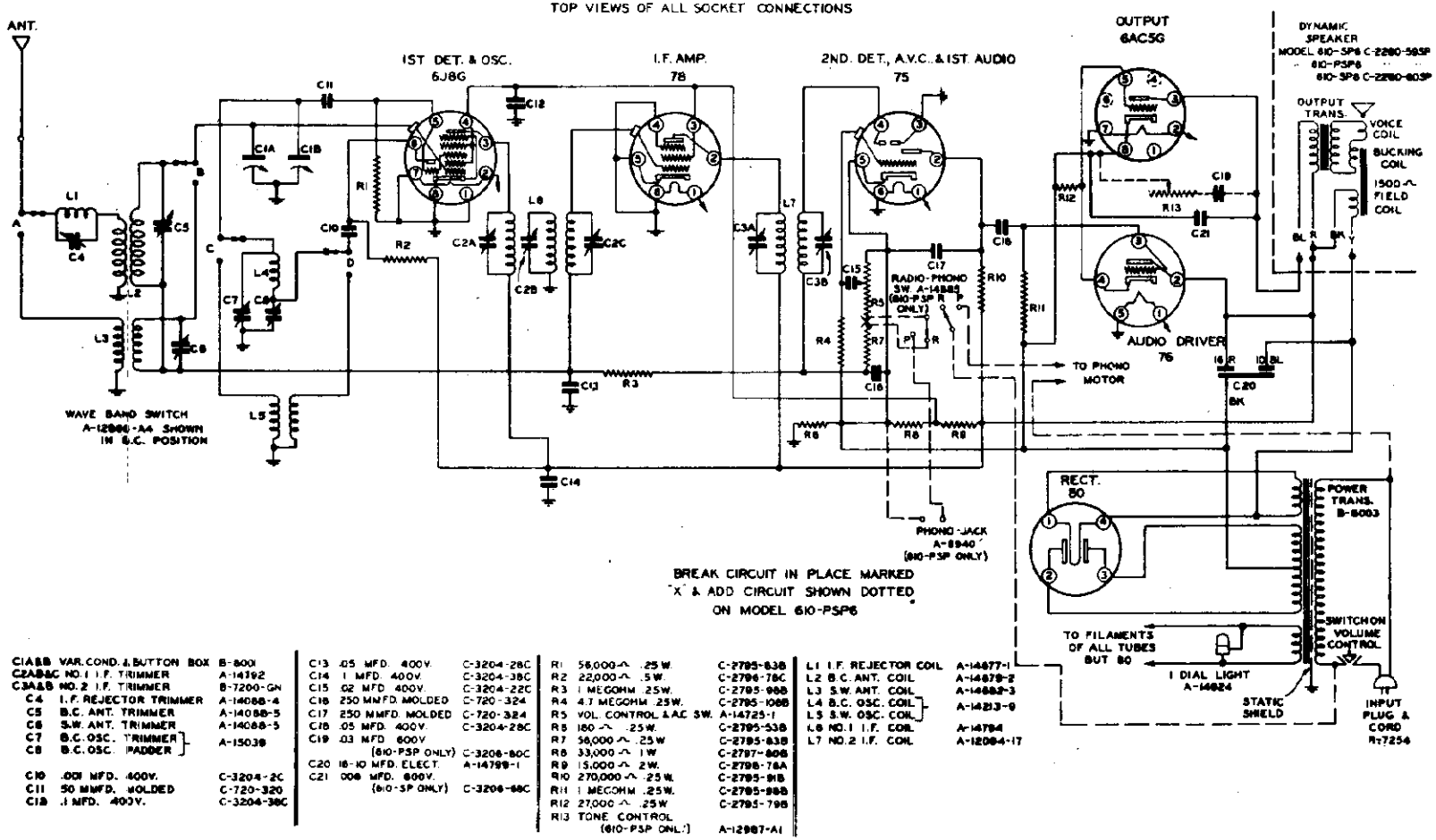
CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII



DIAG NO.	PART NO.	DESCRIPTION	
R 8	N-1261	250,000 OHMS 20%	.5W.
R 9	N-1264	.5 MEGOHMS 20%	.5W.
R 10	N-1260	50,000 OHMS 20%	.5W.
R 11	N-1454	100,000 OHM TONE CONT.	
R 12	N-1256	500 OHMS 20%	.5W.
R 13	N-1482	250 OHMS 20%	.5W.
R 14	N-1482	250 OHMS 20%	.5W.
R 15	N-1498	50 OHMS 20%	1W.
R 16	N-1498	50 OHMS 20%	1W.
1	N-1461	ANTENNA COIL	
2	N-1317	OSCILLATOR COIL	
3	N-1318	1 ST. I.F. TRANS.	
4	N-1319	2ND. I.F. TRANS.	
5	N-1472	5" P.M. SPEAKER & TRANS.	
6	N-1476	POWER TRANS.	
7	N-1477	"A" CHOKE	
	N-1273	GANG CONDENSER	
	N-1485	BATTERY CABLE	
	N-1431	VIBRATOR (NON-SYNCHRO.)	

SCHEMATIC DIAGRAM
AIR CASTLE SUPERHETERODYNE MODEL 610 SERIES
INTERMEDIATE FREQUENCY 456 K.C.

TOP VIEWS OF ALL SOCKET CONNECTIONS



C1A&B	VAR. COND. & BUTTON BOX	B-8001
C2A&B&C	NO. 1 I.F. TRIMMER	A-14792
C3A&B	NO. 2 I.F. TRIMMER	B-7200-GN
C4	I.F. REJECTOR TRIMMER	A-14088-4
C5	B.C. ANT. TRIMMER	A-14088-5
C6	S.W. ANT. TRIMMER	A-14088-5
C7 C8	B.C. OSC. TRIMMER, PADDER	A-15038
C9	.001 MFD. 400V.	C-3204-2C
C11	50 MMFD. MOLDED	C-720-320
C12	.1 MFD. 400V.	C-3204-38C
C13	.05 MFD. 400V.	C-3204-28C
C14	1 MFD. 400V.	C-3204-38C
C15	.02 MFD. 400V.	C-3204-22C
C16	250 MMFD. MOLDED	C-720-324
C17	250 MMFD. MOLDED	C-720-324
C18	.05 MFD. 400V.	C-3204-28C
C19	.03 MFD. 600V. (610-PSP ONLY)	C-3206-80C
C20	16-10 MFD. ELECT.	A-14799-1
C21	006 MFD. 600V. (610-SP ONLY)	C-3206-68C
R1	56,000 Ω .25 W.	C-2795-63B
R2	22,000 Ω .5 W.	C-2796-78C
R3	1 MEGOHM .25 W.	C-2795-98B
R4	4.7 MEGOHM .25 W.	C-2795-106B
R5	VOL. CONTROL & A.C. SW.	A-14725-1
R6	180 Ω .25 W.	C-2795-53B
R7	56,000 Ω .25 W.	C-2795-63B
R8	33,000 Ω 1 W.	C-2797-80B
R9	15,000 Ω 2 W.	C-2798-78A
R10	270,000 Ω .25 W.	C-2795-91B
R11	1 MEGOHM .25 W.	C-2795-98B
R12	27,000 Ω .25 W.	C-2795-79B
R13	TONE CONTROL (610-PSP ONLY)	A-12987-A1
L1	I.F. REJECTOR COIL	A-14677-1
L2	B.C. ANT. COIL	A-14679-2
L3	S.W. ANT. COIL	A-14682-3
L4 L5	B.C. OSC. COIL, S.W. OSC. COIL	A-14213-9
L6	NO. 1 I.F. COIL	A-14784
L7	NO. 2 I.F. COIL	A-12984-17

MODEL W116 IS THE SAME AS MODEL W104 WITH THE ADDITION OF A 6U5 CONNECTED AS SHOWN ON PAGE 13-57

The tube equipment is:

1—Type 6J8G —Converter Heptode
1—Type 78 —Intermediate-Frequency Pentode
1—Type 75 —Duplex-Diode-Triode Second Detector—A. V. C. and Audio Amplifier
1—Type 76 —Driver
1—Type 6AC5G—Power Amplifier Triode
1—Type 80 —Full-Wave Vacuum Rectifier

2. **POWER SUPPLY:** On models designed for operation on 60-cycle current the receptacle plug may be attached to any outlet from 110 to 120 volts, 50 to 60 cycle alternating current (a. c.) power supply system.

This model is available in either 25 cycle or 60 cycle alternating current (a. c.).

This model receiving set, designed for operation on 25 cycle current, will operate satisfactorily on 60 cycle current; however, **a radio set designed for operation on 60 cycle current WILL NOT operate on 25 cycle current.**

MODELS W104,W108,W114,W120,
W150,W164,Z7056,Z7058,W116

SPIEGEL, INC.

VOLTAGE CHART

Line Voltage: 115 volts — Position of Volume Control: Full with Antenna Disconnected

Tube	Function	Voltage of Socket Prongs to Gnd.(See Prong Nos. on Schematic Diagram)								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	Grid Cap
6J8G	Converter	0	6.1	250	94	*-6	12	0	0	0
78	I.F. Amp.	6.1	250	80	0	0	0	-	-	0
75	2nd Det. AVC-Audio	6.1	57	0	-.5	-1.5	0	-	-	-.7
76	Driver	6.1	250	0	10	0	-	-	-	-
6AC5G	P.A.	0	0	225	0	10	0	6.1	-	-
80	Rectifier	325	270	270	325	-	-	-	-	-

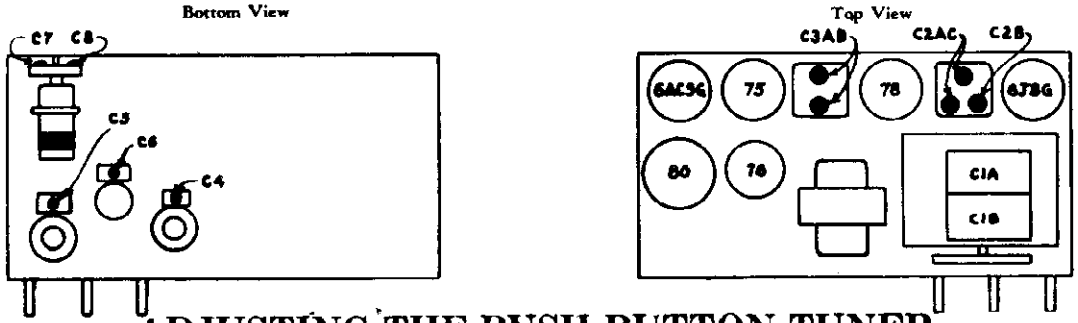
Notes: Voltage readings are for schematic diagram on back of sheet. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter. Unless designated otherwise, voltages in table are + DC voltages. *150 V. scale.

ALIGNMENT

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set dial pointer to last mark on scale when condenser plates are flush)							
2	I.F.	6J8G Grid	.1 mf.	456 KC	BC	Open	C5A,B;C2A,B,C	Adjust to approx. peak
3							C2B(Transfer)	Detune by tightening ½ t.
4							C5A,B;C2A,C	Peak accurately
5							C2B	Peak accurately*
6	Rejector	Ant.	200 mmf.	456 KC	BC	Open	C4	Adjust to minimum
7	Broadcast Band	Ant.	200 mmf.	1500 KC	BC	1500 KC	C7 BC osc.trim	Peak accurately
8							C5 BC ant.trim	Peak accurately
9				600 KC	BC	600 KC	C8 BC osc.pad	Peak accurately
10	(Repeat operations 7 and 8)							
11	(Check calibration and sensitivity at 600 KC, 1000 KC and 1500 KC)							
12	S.W. Band	Ant.	*	18 MC	SW	18 MC	C6 SW ant.trim	**
13	(Check calibration and sensitivity at 6.0 MC and 18 MC)							
14	(Check operations 1 to 13 inclusive)							

*100 ohm non-inductive resistor and 200 mmf. condenser in series.
**Rock dial while making this adjustment. Make certain that adjustment is made on fundamental signal and not on image. Peak accurately.

CHASSIS DIAGRAM



ADJUSTING THE PUSH-BUTTON TUNER

1 Select four favorite nearby broadcast stations and detach the corresponding call letter tabs from the station call letter tab sheets.

2. Insert the station call letter tabs. Any tab may be used for any button, but it is usually more convenient for the operator if the tabs are arranged in sequence so that the tab for the lowest frequency station (station having lowest number of kilocycles [K. C.]) will be at the extreme left. This, however, is not vital, since the tuner will operate with any arrangement of the tabs.

3. **TO ADJUST BUTTONS,** loosen selected button by turning one-half turn to the left (counter-clockwise). Push this loosened button in as far as it will go, and while in this position, tune in manually the station desired or indicated by tab under button.

Then, with the button still pushed in as far as it will go, tighten by turning button to the right (clockwise) until it can be tightened no more.

Be sure the station is tuned in accurately when pushed in button is tightened.

4. Repeat the procedure in paragraph 3 for each of the remaining three buttons and stations.

5. Be sure the buttons have been tightened firmly.

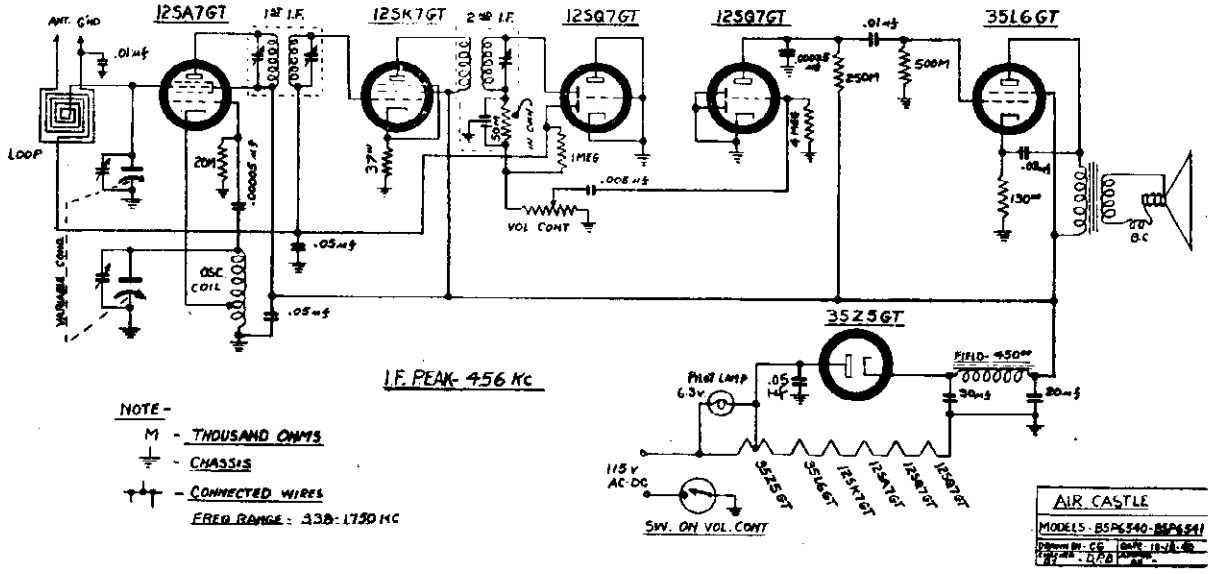
6. Check all buttons by pushing them in, one at a time, to determine whether desired stations are tuned in properly.

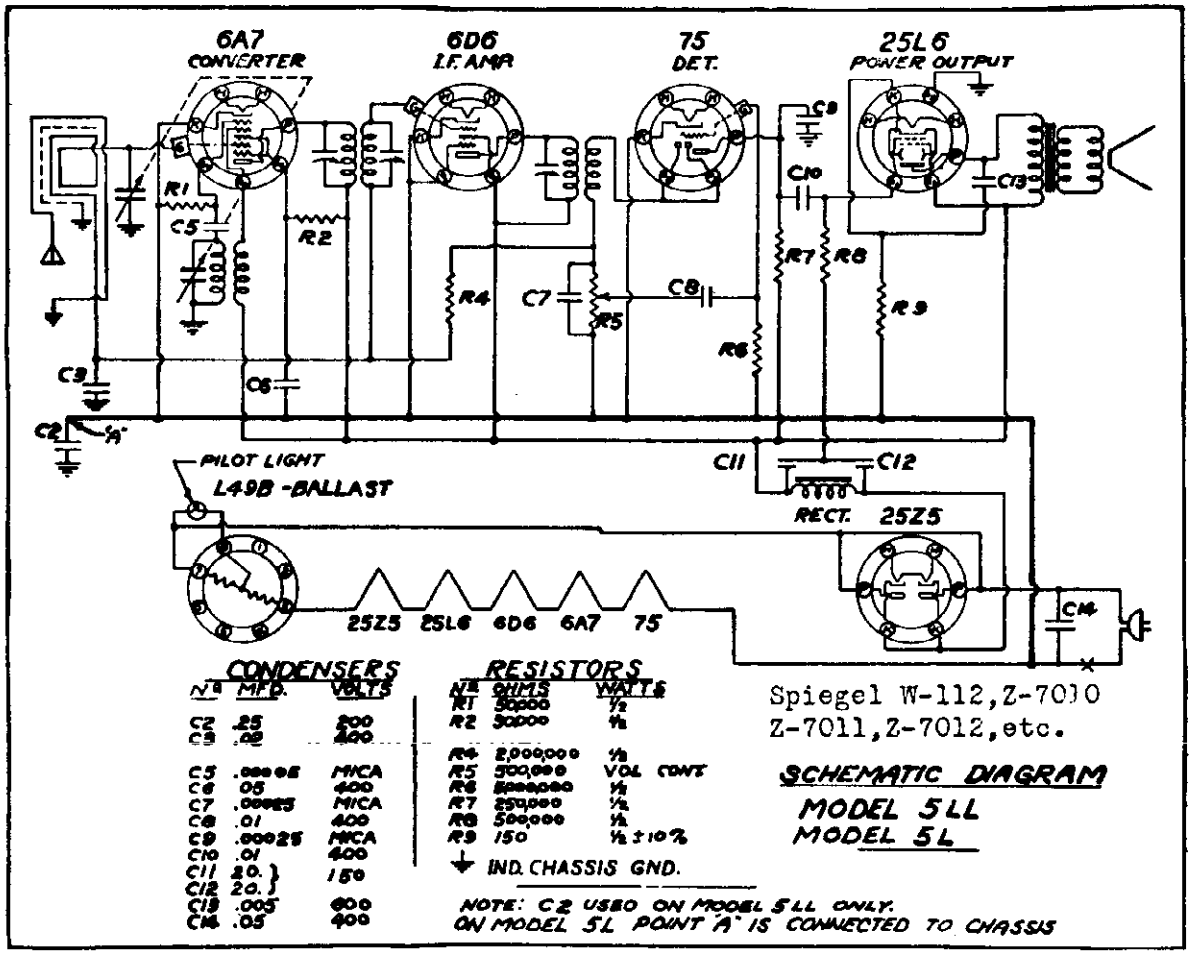
6. Any of the four stations to which the push button tuner has been adjusted may now be instantly received simply by pushing the button for the desired station.

SPIEGEL, INC.

MODELS W112,Z7010,Z7011
Z7012, Chassis 5L
MODELS 540,541

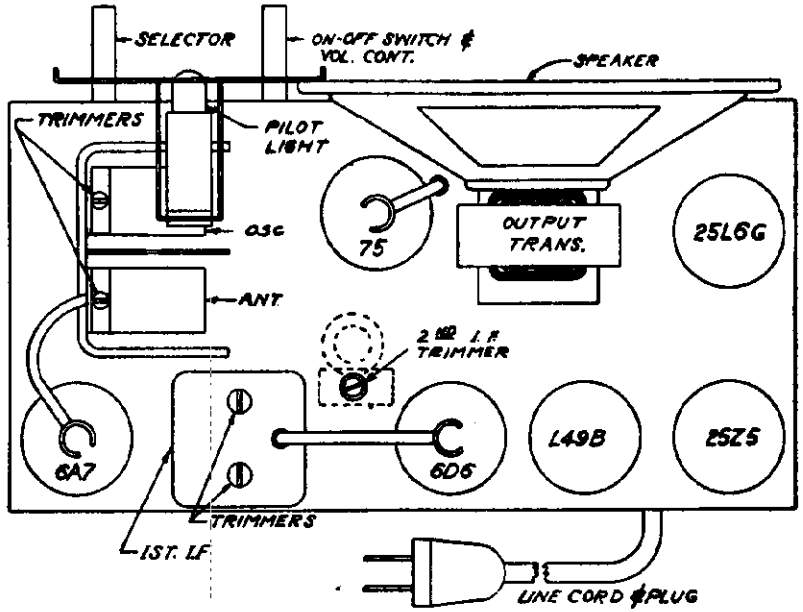
Models 540-541





Spiegel W-112,Z-7010
Z-7011,Z-7012,etc.

SCHEMATIC DIAGRAM
MODEL 5LL
MODEL 5L



ALIGNMENT DATA

GENERAL DATA The alignment of this receiver requires the use of a signal generator that will cover the frequencies of 455, 600, 1400, and 1730, and an output meter 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 signal generator output as low as possible, to prevent the AVC from operating and giving false readings.

I.F. ALIGNMENT Adjust the signal generator to 455 KC and connect the output to the grid of the first detector tube (6A7) through a .05 or .1 mfd. condenser. Connect ground of signal generator to chassis ground through a .1 mfd. condenser. Align all I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT Adjust the signal generator to 1730 KC and connect the output to the antenna lead, through a .0002 mfd. mica condenser. Set the gang condenser to minimum capacity and adjust the oscillator trimmer to receive this signal. After this has been carefully done, the next step is to set the signal generator to 1400 KC and after tuning in the signal adjust the antenna trimmer to peak. Set the signal generator to 600 KC, tune the signal and check the sensitivity; if it is low bend the plates into the position for maximum output.

SERVICE INFORMATION

Voltages—Line 115 Volts A.C. Power Consumption 44 Watts.

Volume Control minimum. Antenna shorted to ground. Meter 1,000 ohms per volt.

Cathode of 25Z5 tube to Ground	124 volts
Screen of 25L6 tube to Ground	95 volts
Screen of 6A7 tube to Ground	44 volts
Cathode of 25L6 tube to Ground	5.7 volts

Speaker (Part No. P2218)

Field resistance	450 ohms
D.C. voice coil resistance	4.6 ohms
Voice coil impedance at 400 cycles	5 ohms

First I.F. Transformer (Part No. P2998)

Primary—Blue white, plate; red white B+—Resistance 26.9 ohms.

Secondary—White, grid; black white, AVC—Resistance 26.5 ohms.

Second I.F. Transformer (Part No. 2999)

Starting at the mounting strip in a clockwise direction the terminals are—No. 1, plate; No. 2, diode; No. 3, AVC; No. 4, B+.

Primary—No. 1 and No. 4—Resistance 33.2 ohms.

Secondary—No. 2 and No. 3—Resistance 34.3 ohms.

Oscillator Coil (Part No. P3003) (Blue Dot)

Looking at the connection end (with dot) in a clockwise direction starting at the chassis the terminals are—No. 1, grid; No. 2, plate; No. 3, B+; No. 4, ground.

Primary—No. 2 and No. 3—Resistance 3.5 ohms.

Secondary—No. 4 and No. 1—Resistance 6.5 ohms.

Electrolytic Condenser (Part No. P2936)

Red, 20 mfd., 150 volt; green, 20 mfd., 150 volt; black, negative for both sections.

Loop Antenna

Since the loop antenna acts also as the antenna coil the set will not operate properly with the loop antenna disconnected.

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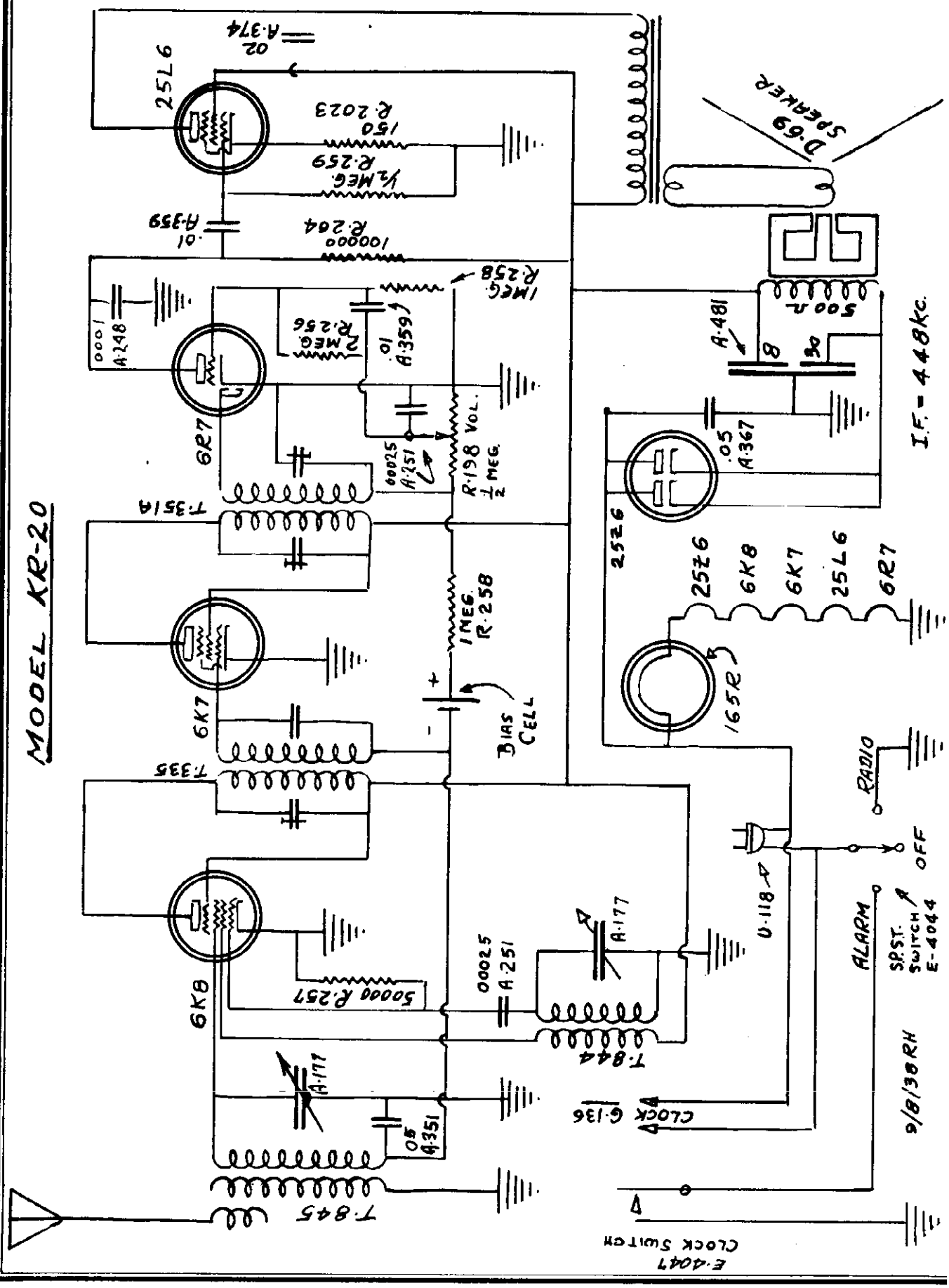
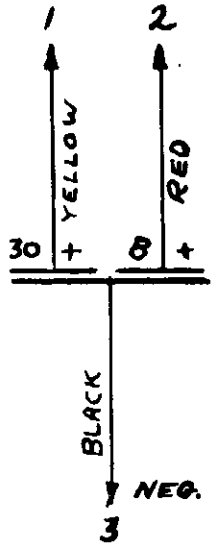


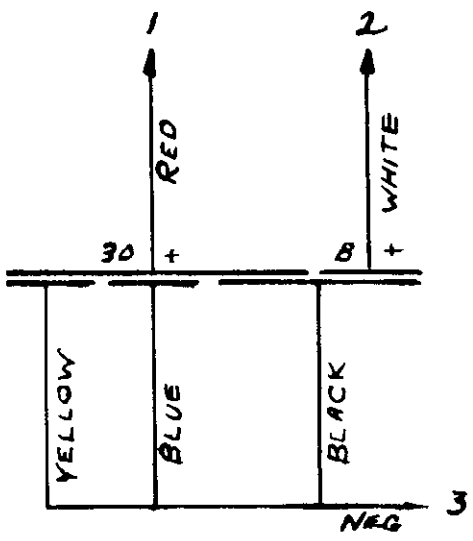
SPIEGEL, INC.

NOTE : SUPPLEMENT TO KR-20 CIRCUIT DIAGRAM

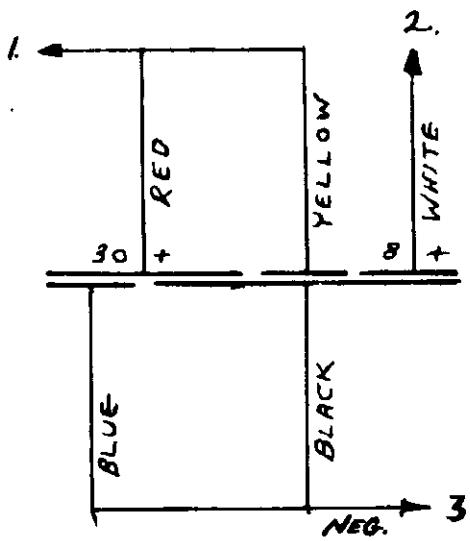
THESE PARTS ARE INTERCHANGEABLE ON MODEL KR-20, BUT MUST BE CONNECTED AS SHOWN.



A-481



A-468



A-469

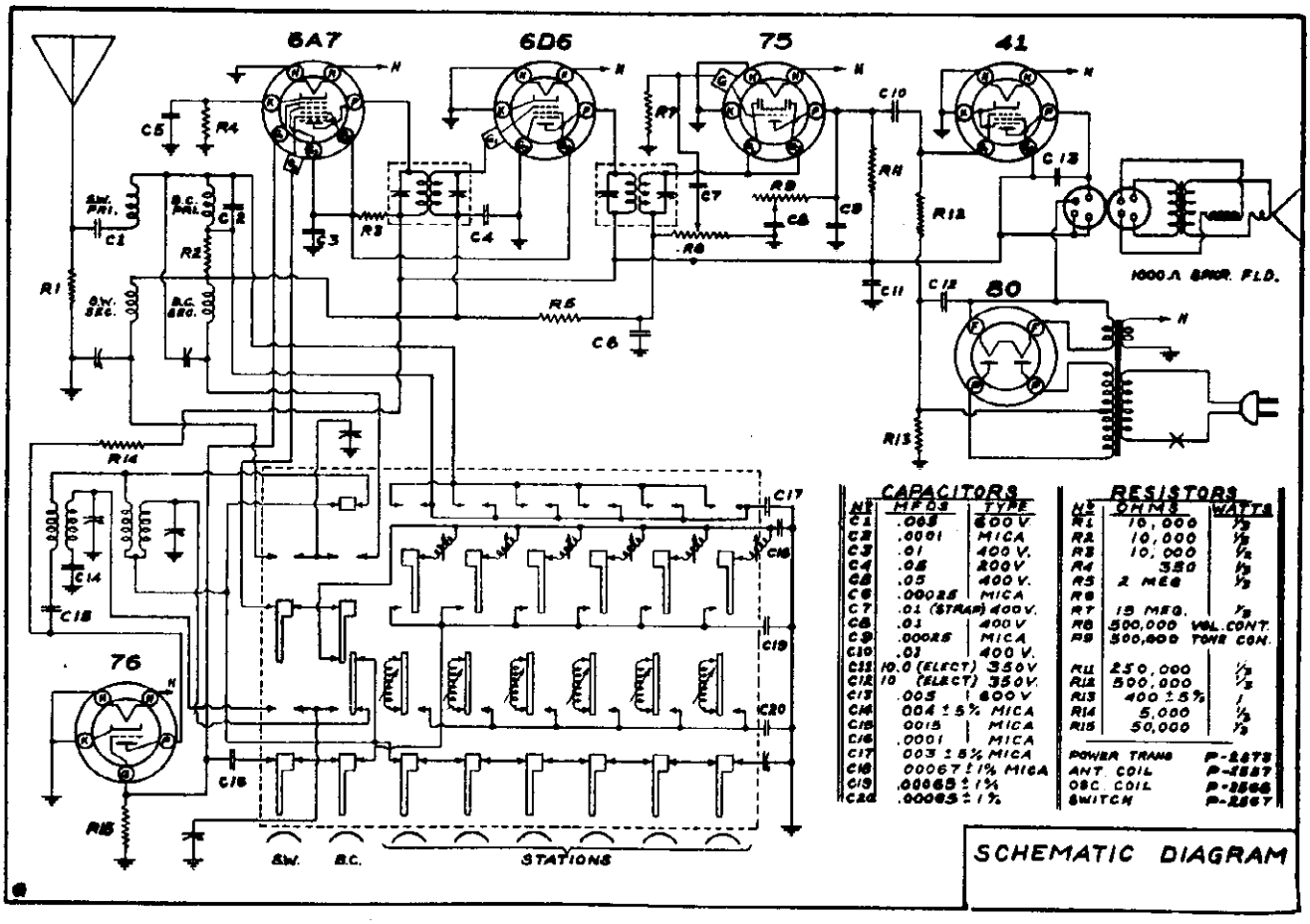
This chassis is designed to operate from 110-125 volt power lines alternating current.
ESSENTIAL DATA: The intermediate frequency employed is 448 Kc.

The standard type of output meter should be used to indicate signal strength. It should be connected from the plate of the 25L6 tube to ground.
Aligning of broadcast band should be done on 1500, 1000 and 600 kilocycles.
I.F. TRIMMERS: 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.
R.F. TRIMMERS: Turn the dial to 1500 Kc. and feed a very weak 1500 Kc. modulated signal from your signal generator to the antenna. Adjust the oscillator trimmer for maximum reading. Then peak the antenna trimmer to this setting.
There is no adjustment padder condensor on this model so resonance on lower frequencies is accomplished by onding plates on tuning condensers.
AVERAGE SOCKET VOLTAGES:

TUBE	POSITION	Ek	Ea	Es	Ep
6K8	Det. Osc.	-	100	100	100
6K7	I.F.	-	-	100	100
6R7	2nd. Det.	-	-	-	25
25L6	Output	6	-	100	90
25Z6	Rect.	100	-	-	-

Line 118 volts. Volume control full on. 10% variation allowable.
Measurements made from tube prongs to circuit ground with 1000 ohms per volt meter.

SPIEGEL, INC.



CAPACITORS

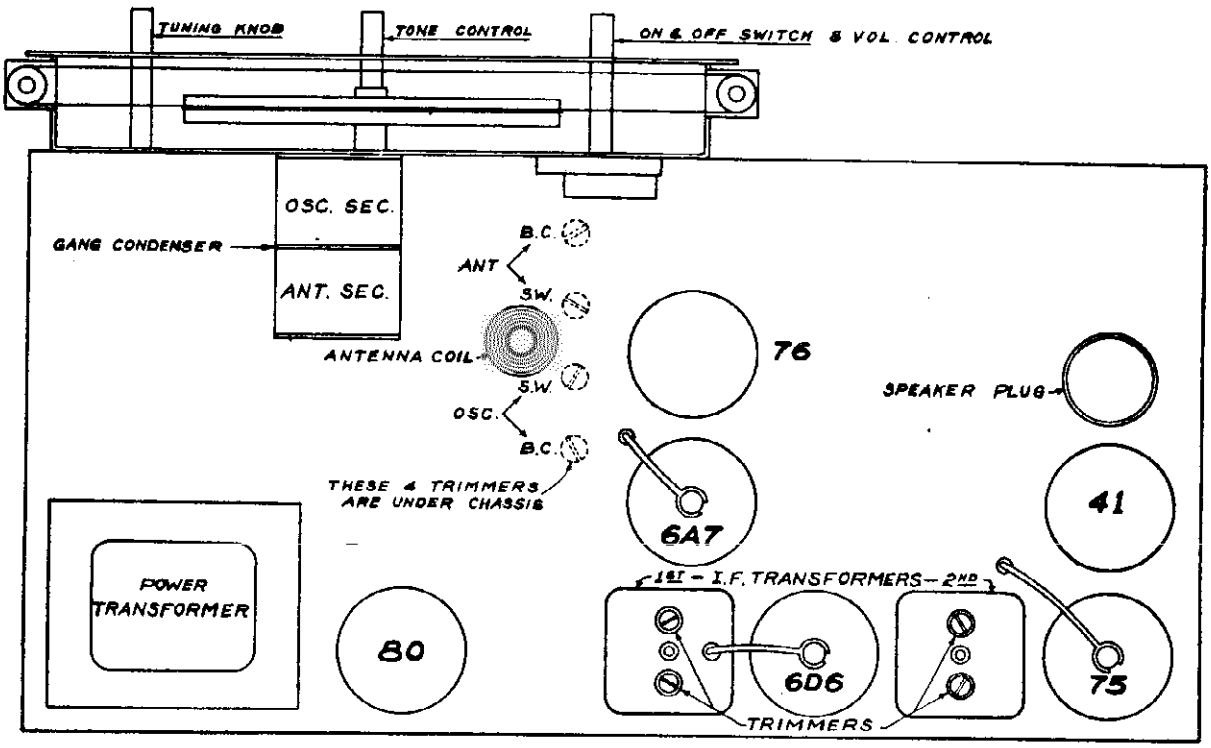
No.	MFDS	TYPE
C1	.068	600 V
C2	.0001	MICA
C3	.01	400 V.
C4	.05	200 V
C5	.05	400 V.
C6	.00025	MICA
C7	.01 (STRAP)	400 V.
C8	.01	400 V
C9	.00025	MICA
C10	.01	400 V.
C11	10.0 (ELECT)	350 V
C12	10 (ELECT)	350 V.
C13	.005	600 V
C14	.004 ± 5%	MICA
C15	.0015	MICA
C16	.0001	MICA
C17	.003 ± 5%	MICA
C18	.00067 ± 1%	MICA
C19	.00065 ± 1%	
C20	.00065 ± 1%	

RESISTORS

No.	OHMS	WATTS
R1	10,000	1/2
R2	10,000	1/2
R3	10,000	1/2
R4	350	1/2
R5	2 MEG	1/2
R6		
R7	15 MEG.	1/2
R8	500,000	VOL. CONT.
R9	500,000	TONE CON.
R10	250,000	1/2
R12	500,000	1/2
R13	400 ± 5%	1
R14	5,000	1/2
R15	50,000	1/2

POWER TRANS	P-2573
ANT. COIL	P-2557
OSC. COIL	P-2566
SWITCH	P-2567

SCHEMATIC DIAGRAM



MODEL W180
MODEL 2460, Late

SPIEGEL, INC.

PROCEDURE FOR SETTING UP AUTOMATIC PUSH BUTTONS

MODEL 2460

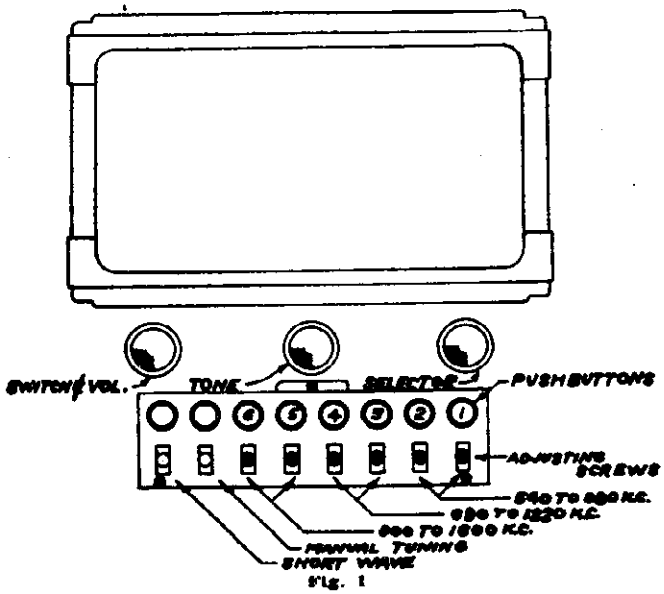


Fig. 1

A glance at Fig. 1 will show that there are eight (8) push buttons, six (6) of which are for automatic use; the adjusting screws are located directly below these push buttons. Fig. 1 also shows the tuning range or frequencies covered by each button.

The remaining two (2) push buttons, located at the extreme left hand end of the push button plate are for short wave and manual tuning. Short wave tuning is accomplished by pressing "short wave" button and tuning with the selector knob. By pressing "manual tuning" button, the automatic disconnects and the selector knob becomes active for the broadcast band.

1. Choose a station having a frequency within the range of button No. 1 (540 to 980 kc).
2. Press "Manual Tuning" button and tune this station conventionally by using the selector knob.
3. Now press button No. 1 and turn adjusting screw in either direction until the previously selected station is heard. Adjust the screw until the station is received with maximum volume.
4. Remove the call letters of the station from the call letter sheet furnished and insert in the window of the adjusting screw.
5. Repeat the above procedure for the remaining five (5) stations.

NOTE: It is advisable to retain the call letter sheet in case of station change later on.

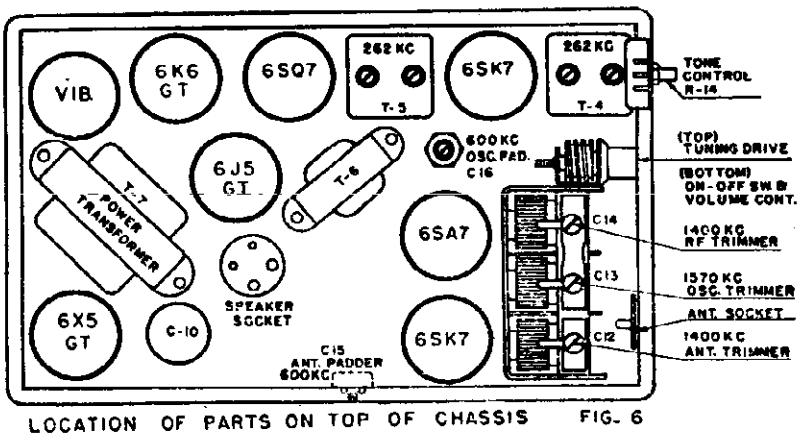
49 METER BAND The popular 49 meter band is the area adjacent to the 6 megacycle calibration and offers the most consistent reception from Italy, Germany, Africa and Java. This area also affords the most popular reception of North and South American Short Wave Broadcasts and many other Foreign Countries. (Best evening reception all year round.)

31 METER BAND The 31 meter band is the area extending from the 10 megacycles and lists Spain, Italy, Portugal and Australia as the most favorable of the Foreign Countries in this range. (Late afternoon and early evening.)

25 METER BAND The 25 meter band is the area adjacent to the 12 megacycle calibration and associates itself with the listing of Russia, France, England and Holland. (Late afternoon and early evening. This band is unusually free from static during the summer months when maximum static is prevalent on the Standard Broadcast Band.)

19 METER BAND The 19 meter band is the area adjacent to 15 megacycle calibration and lists France, Holland England and Amateur phones.

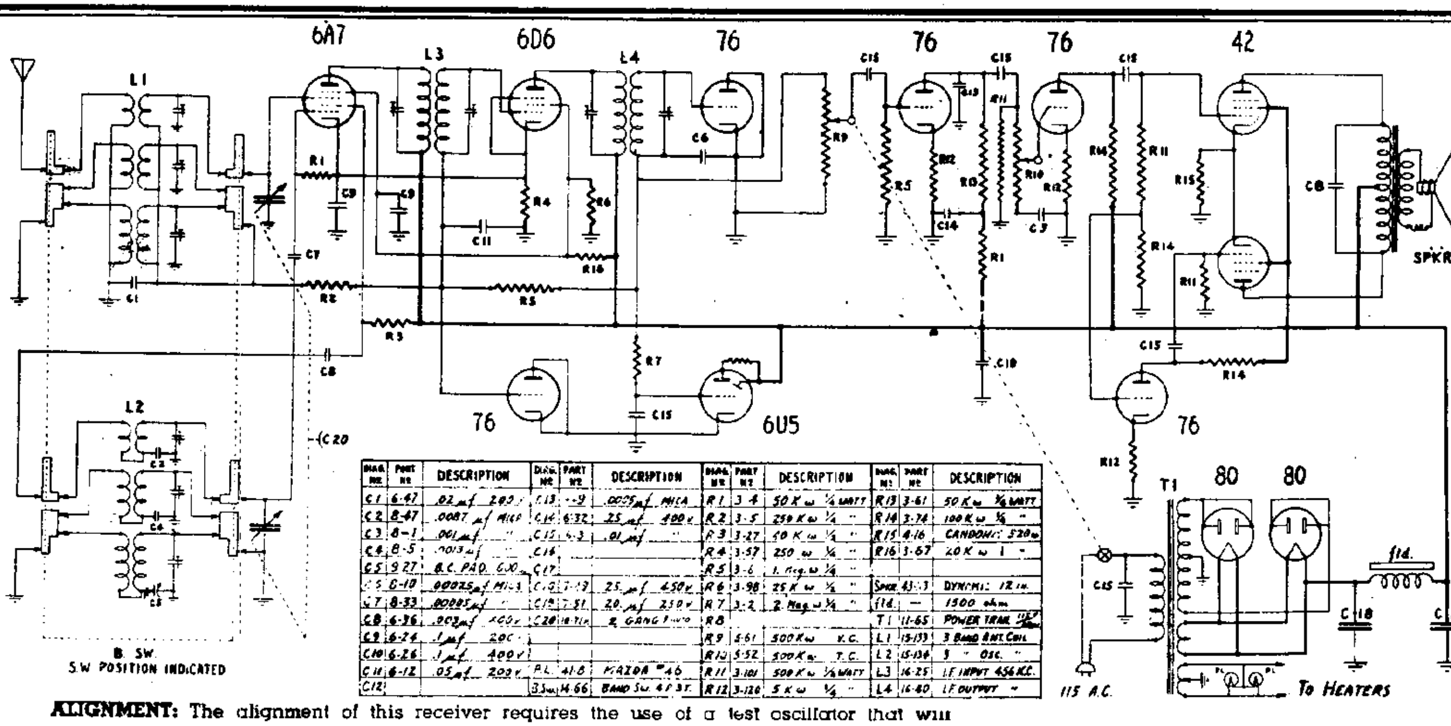
16 METER BAND The 16 meter band is the area between 17 and 18 megacycles and lists Germany and England.



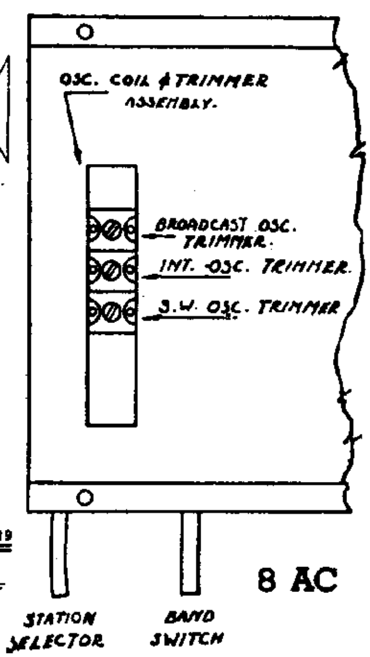
LOCATION OF PARTS ON TOP OF CHASSIS FIG. 6

MODEL W180

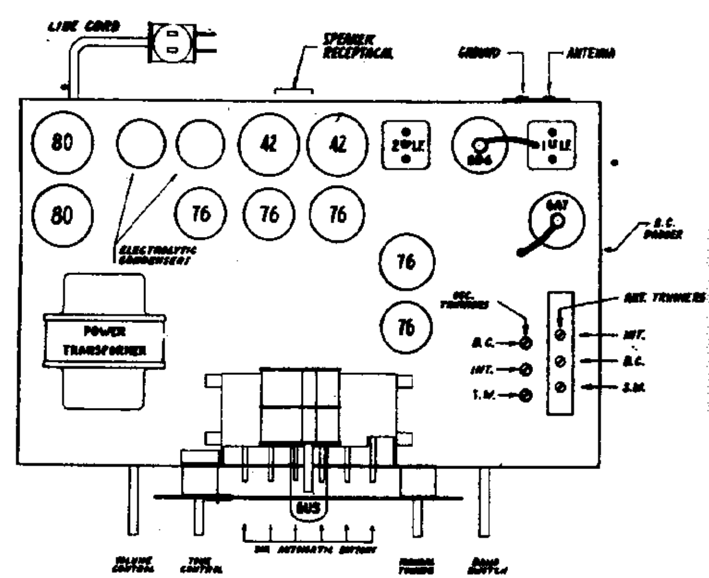
SPIEGEL, INC.



DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
C1	6-47	.02 μf 200 v	C13	[illegible]	.0005 μf MICA	R1	3-4	50 K ω ¼ watt	R13	3-61	50 K ω ¼ watt
C2	8-47	.0087 μf MICA	C14	6-32	25 μf 400 v	R2	3-5	250 K ω ¼ "	R14	3-74	100 K ω ½ "
C3	8-1	.001 μf "	C15	6-3	.01 μf "	R3	3-27	40 K ω ½ "	R15	4-16	CANDOHM 520 ω
C4	8-5	.0013 μf "	C16			R4	3-57	250 ω ¼ "	R16	3-67	20 K ω 1 "
C5	9-27	B.C. PAD. 600	C17			R5	3-6	1. Meg. ω ¼ "			
C6	8-10	.00025 μf MICA	C18	7-13	25 μf 450 v	R6	3-98	25 K ω ½ "	Spkr.	43-3	DYNAMIC 12 in.
C7	8-33	.00005 μf "	C19	7-51	20 μf 250 v	R7	3-2	2 Meg ω ¼ "	fld.	—	1500 ohm
C8	6-36	.002 μf 400 v	C20	[illegible]	2 GANG [illegible]	R8			T1	11-65	POWER TRANS. [illegible]
C9	6-24	.1 μf 200 v				R9	5-61	500 K ω V.C.	L1	15-133	3 BAND ANT. COIL
C10	6-26	.1 μf 400 v				R10	5-52	500 K ω T.C.	L2	15-134	3 " OSC. "
C11	6-12	.05 μf 200 v	P.L.	41-8	MAZDA #46	R11	3-101	500 K ω ¼ watt	L3	16-25	I.F. INPUT 456 KC.
C12			B.Sw.	14-66	BAND SW. 4 P 3 T.	R12	3-120	5 K ω ¼ "	L4	16-40	I.F. OUTPUT "



8 AC



ALIGNMENT: The alignment of this receiver requires the use of a test oscillator that will cover the following frequencies: 456, 1400, 600, 5100, 1800 and 15,000 KC, and an output meter which is to be connected across the output transformer on the speaker. All alignments should be made with the volume control set at maximum and the output of the test oscillator set as low as possible to prevent the automatic volume control from operating and thus giving incorrect reading during alignment.

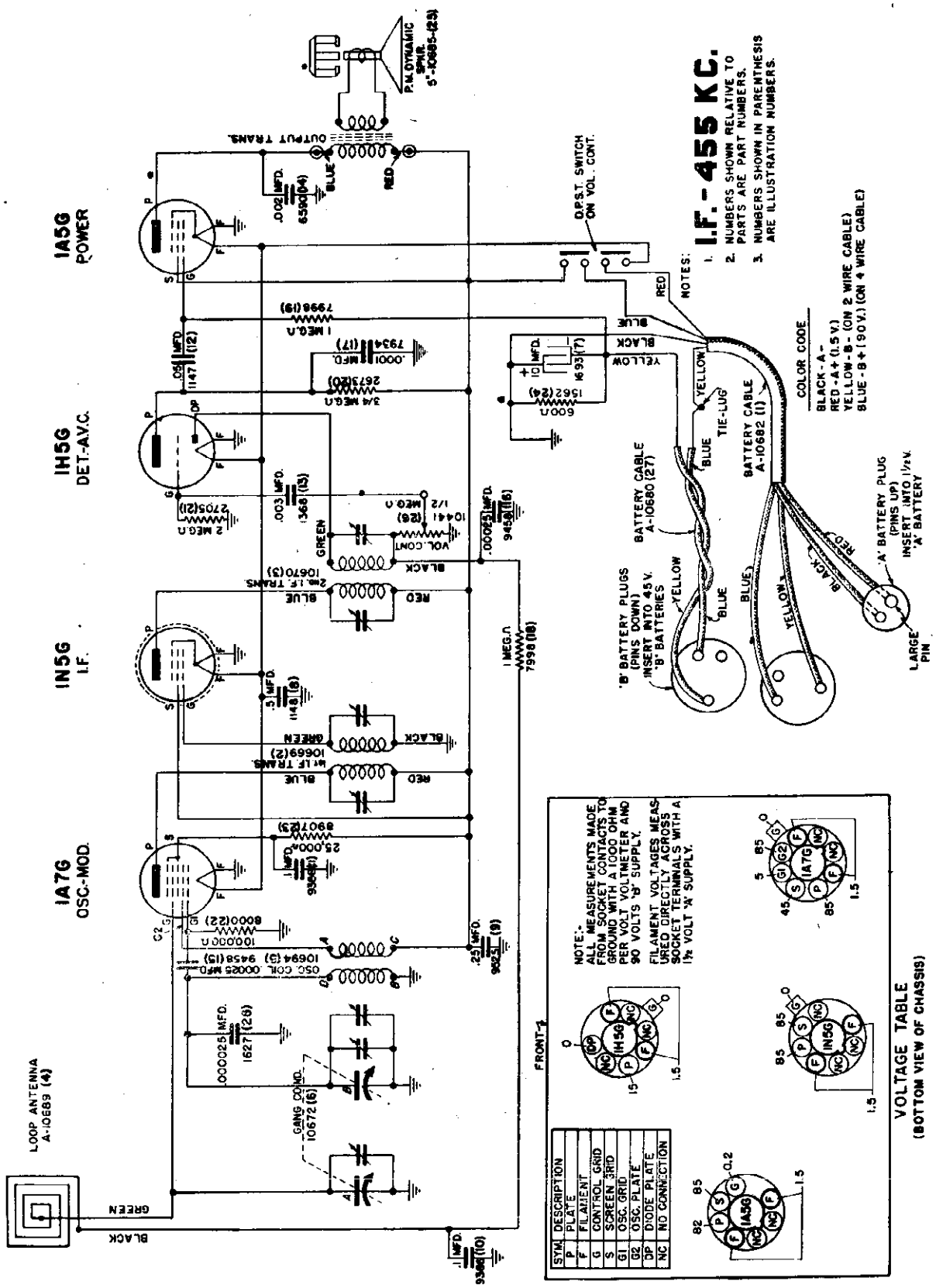
INTERMEDIATE FREQUENCY: Set oscillator to 456 KC. Feed this to the grid of the (6A7) tube. Adjust trimmers on the intermediate frequency transformers for peak readings as indicated on the output meter which is to be placed across the output transformer.

BROADCAST BAND: Set the band switch for broadcast reception. Adjust oscillator to 1400 KC and connect the output of the generator to the antenna connection at the rear of the chassis through a .0002 mfd. mica condenser. Set the pointer on the dial to 1400 KC making sure that the volume control is set at its maximum position. Adjust the broadcast antenna and broadcast oscillator trimmers for maximum signal (as indicated on the output meter). Re-set the dial pointer on the receiver and on the test oscillator to 600 KC. Slowly increase or decrease the **broadcast padding** condenser while tuning back and forth across the signal with the station selector knob until the **maximum** reading is obtained on the output meter. Re-check the 1400 KC alignment as the adjustment at 600 KC may have slightly disturbed the original 1400 KC setting.

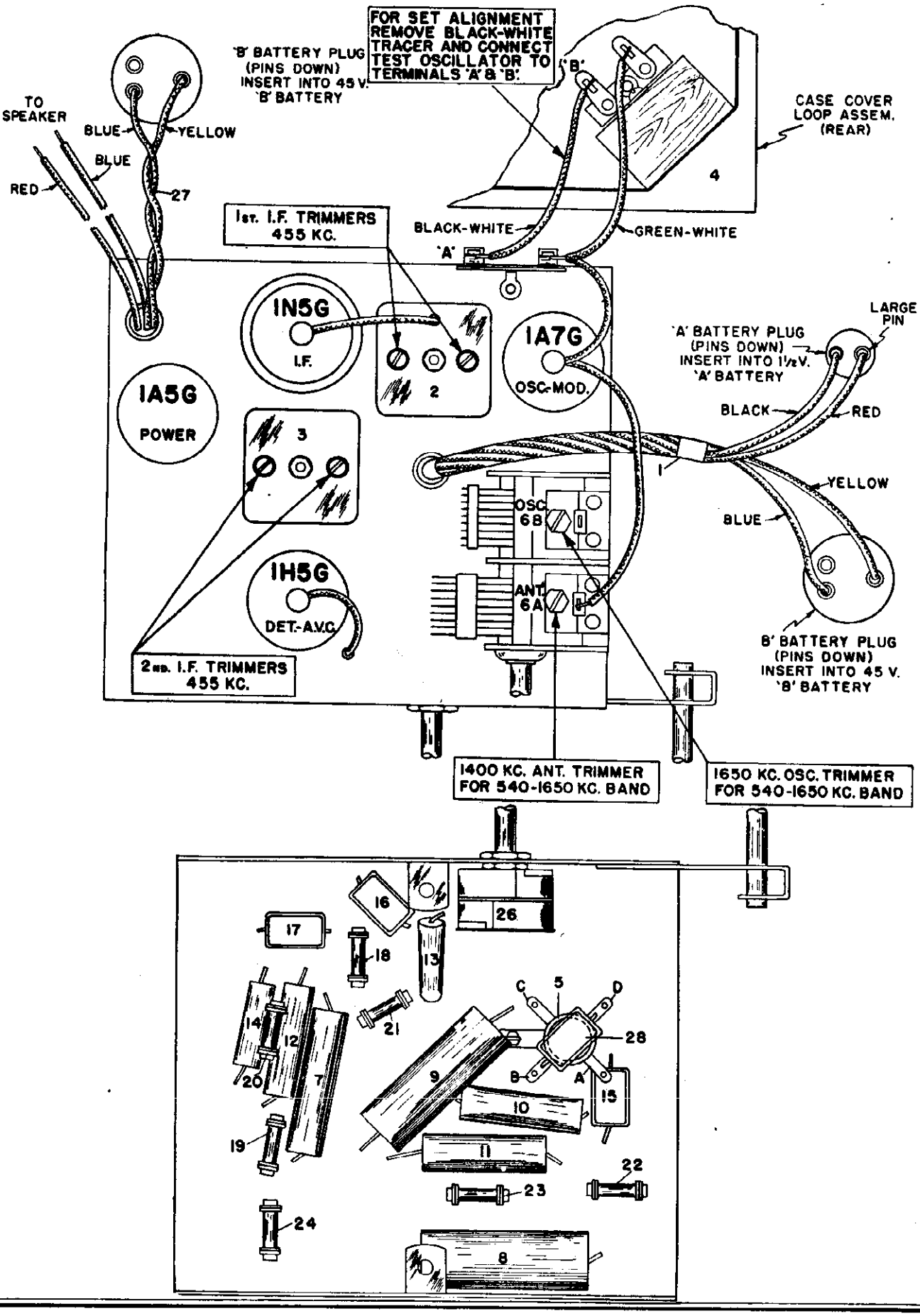
INTERMEDIATE BAND: For a dummy antenna use a .0002 mfd. mica condenser in series with a 400 ohm carbon resistor. Set band switch to the intermediate band position and feed a 5100 KC signal from the oscillator. Set dial pointer at 5100 KC. Adjust intermediate

MODEL W310, Late

SPIEGEL, INC.



SPIEGEL, INC.


FOR SET ALIGNMENT REMOVE BLACK-WHITE TRACER AND CONNECT TEST OSCILLATOR TO TERMINALS 'A' & 'B'.
'B' BATTERY PLUG (PINS DOWN) INSERT INTO 45 V. 'B' BATTERY
TO SPEAKER
BLUE
YELLOW
BLUE
RED
27
'B'
CASE COVER LOOP ASSEM. (REAR)
4
1st. I.F. TRIMMERS 455 KC.
BLACK-WHITE
GREEN-WHITE
'A'
1N5G
I.F.
2
1A7G
OSC-MOD.
LARGE PIN
'A' BATTERY PLUG (PINS DOWN) INSERT INTO 1½ V. 'A' BATTERY
1A5G
POWER
3
BLACK
RED
1
YELLOW
BLUE
OSC 6B
ANT 6A
1H5G
DET.-A.V.C.
2nd. I.F. TRIMMERS 455 KC.
'B' BATTERY PLUG (PINS DOWN) INSERT INTO 45 V. 'B' BATTERY
1400 KC. ANT. TRIMMER FOR 540-1650 KC. BAND
1650 KC. OSC. TRIMMER FOR 540-1650 KC. BAND
16
26
17
18
13
14
12
20
7
21
C
5
D
28
9
B
A
15
10
19
11
22
23
24
8

MODEL W310, Late

SPIEGEL, INC.

1½ Volt Battery Operated Superheterodyne

ALIGNMENT PROCEDURE IN TABULATED FORM

Be sure to follow procedure carefully and in the order given—**otherwise the receiver will be** insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, **make the** adjustment marked (1) first, (2) next, (3) third.

Before starting alignment, check tuning dial adjustment by: turn **gang condenser** until plates touch maximum capacity stop (completely in mesh) at which point the dial indicator must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move needle to correct **position.**

Use an accurately calibrated test oscillator with some type of output measuring device.

BEFORE ALIGNING, PLACE LOOP ANTENNA AND THE "A" AND "B" BATTERIES IN THE SAME APPROXIMATE POSITION IN THE BACK OF CHASSIS THAT THEY WILL BE IN WHEN THE SET IS IN THE CABINET AND THE CABINET BACK CLOSED.

When adjusting 1650 kilocycle oscillator trimmer and 1400 kilocycle antenna trimmer, place test oscillator in series with set loop by:

1. Remove the black with white tracer wire used to connect loop antenna to Fahenstock clip on chassis.
2. Attach test oscillator to terminals marked "A" and "B" on parts layout diagram.

IMPORTANT—No condenser should be in series with generator leads.

Set receiver dial to:	TEST OSCILLATOR: Adjust test oscillator frequency to:	TEST OSCILLATOR: Use dummy antenna in series with output of test oscillator consisting of:	TEST OSCILLATOR: Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below—and:
I. F. Any point where no interfering signal is received	455 K. C.	.02 MFD condenser	High side to grid terminal of 1A7G tube Low side to chassis DO NOT REMOVE CAP.	Adjust each of the second I. F. transformer trimmers for maximum output—then adjust each of the first I. F. trimmers for maximum output.
(1) Exactly 1650 K. C.	Exactly 1650 K. C.	None	Attach in series with "A" and "B" Loop Terminals	Adjust 1650 K. C. oscillator trimmer for maximum output.
(2) Approx. 1400 K. C.	Exactly 1400 K. C.	None	Attach in series with "A" and "B" Loop Terminals	Adjust 1400 K. C. antenna trimmer for maximum output.

PARTS LIST

Illus.	Part No.	Part Name	Description	List Price
1	10682	Cable	Battery, 4 Conductor With Plugs	$ .65
2	10669	Coil	1st I.F. Transformer	1.15
3	10670	Coil	2nd I.F. Transformer	1.15
4	10689	Loop	Antenna, Complete With Frame	1.25
5	10694	Coil	Oscillator	.50
6	10672	Condenser	Tuning Two Gang	1.75
7	1693	Condenser	Tubular Dry Electrolytic 10 Mfd. 25 V. D.C.	.75
8	1148	Condenser	Tubular 5 Mfd. 200 Volt	.40
9	9525	Condenser	Tubular .25 Mfd. 200 Volt	.24
10	9386	Condenser	Tubular .1 Mfd. 200 Volt	.19
11	9386	Condenser	Tubular .1 Mfd. 200 Volt	.19
12	1147	Condenser	Tubular .05 Mfd. 200 Volt	.19
13	1368	Condenser	Tubular .003 Mfd. 400 Volt	.17
14	6590	Condenser	Tubular .002 Mfd. 400 Volt	.19
15	9458	Condenser	Mica .00025 Mfd.	.21
16	9458	Condenser	Mica .00025 Mfd.	.21
17	7934	Condenser	Mica .0001 Mfd.	.21
18	7998	Resistor	Carbon 1 Meg Ohm ⅓ Watt	.19
19	7998	Resistor	Carbon 1 Meg Ohm ⅓ Watt	$ .19
20	2673	Resistor	Carbon 750,000 Ohm ⅓ Watt	.19
21	2705	Resistor	Carbon 2 Meg Ohm ⅓ Watt	.19
22	8000	Resistor	Carbon 100,000 Ohm ⅓ Watt	.19
23	8907	Resistor	Carbon 25,000 Ohm ⅓ Watt	.19
24	1562	Resistor	Carbon 600 Ohm ⅓ Watt	.19
25	10685	Speaker	P.M. Dynamic 5"	4.00
26	10441	Volume Control	With Switch	.95
27	10680	Cable	Battery 2 Conductor With Plug	.10
28	1627	Condenser	Mica .000025 Mfd. ± 20%	.21
			MISCELLANEOUS PARTS	
	10676	Dial Scale	Calibrated Scale	.30
	3814	Dial Cord	Dial Drive Cord	.15
	4975	Dial Shaft	Dial Drive Shaft	.15
	10686	Escutcheon	For Dial	.60
	4958	Knob	Marked Tuning	.12
	4959	Knob	Marked "Off-Volume"	.12
	8117	Shaft Clamp	"C" Retainer Washer for Drive Shaft	.02

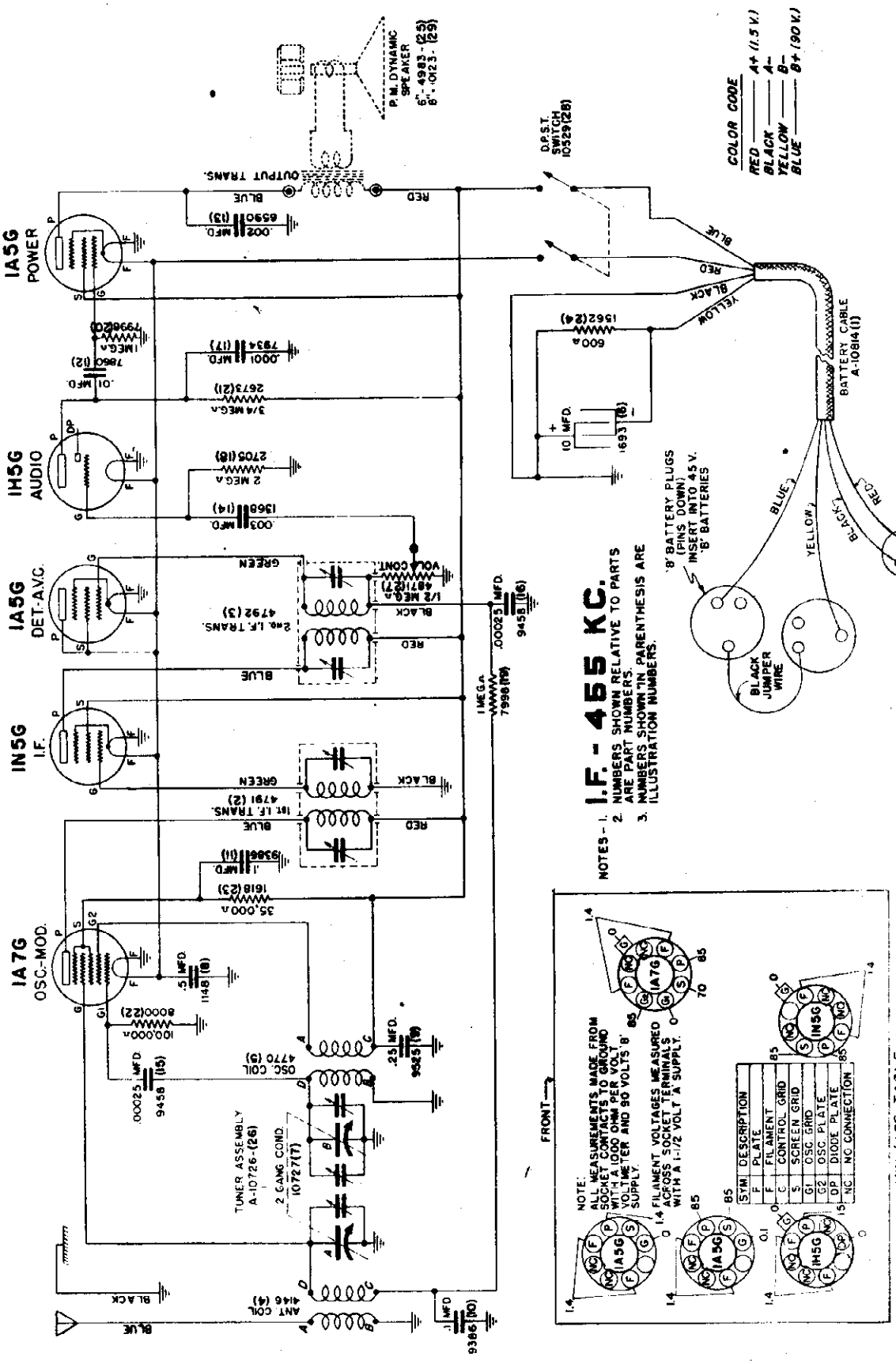
Prices are subject to change without notice.

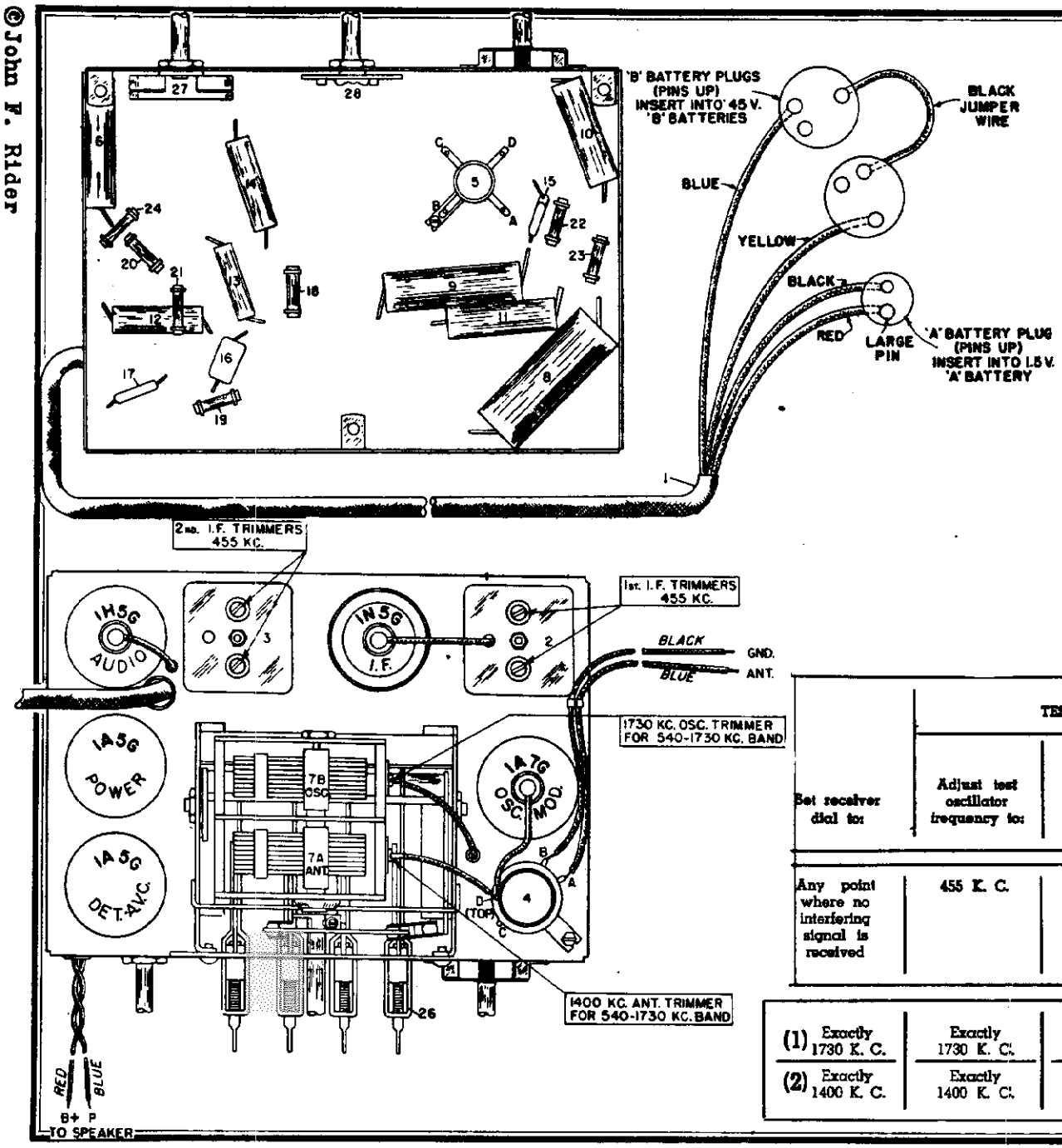
PART No. 178BL

When ordering parts be sure to mention part number.

SPIEGEL, INC.

MODELS W314, W31
Chassis 187B





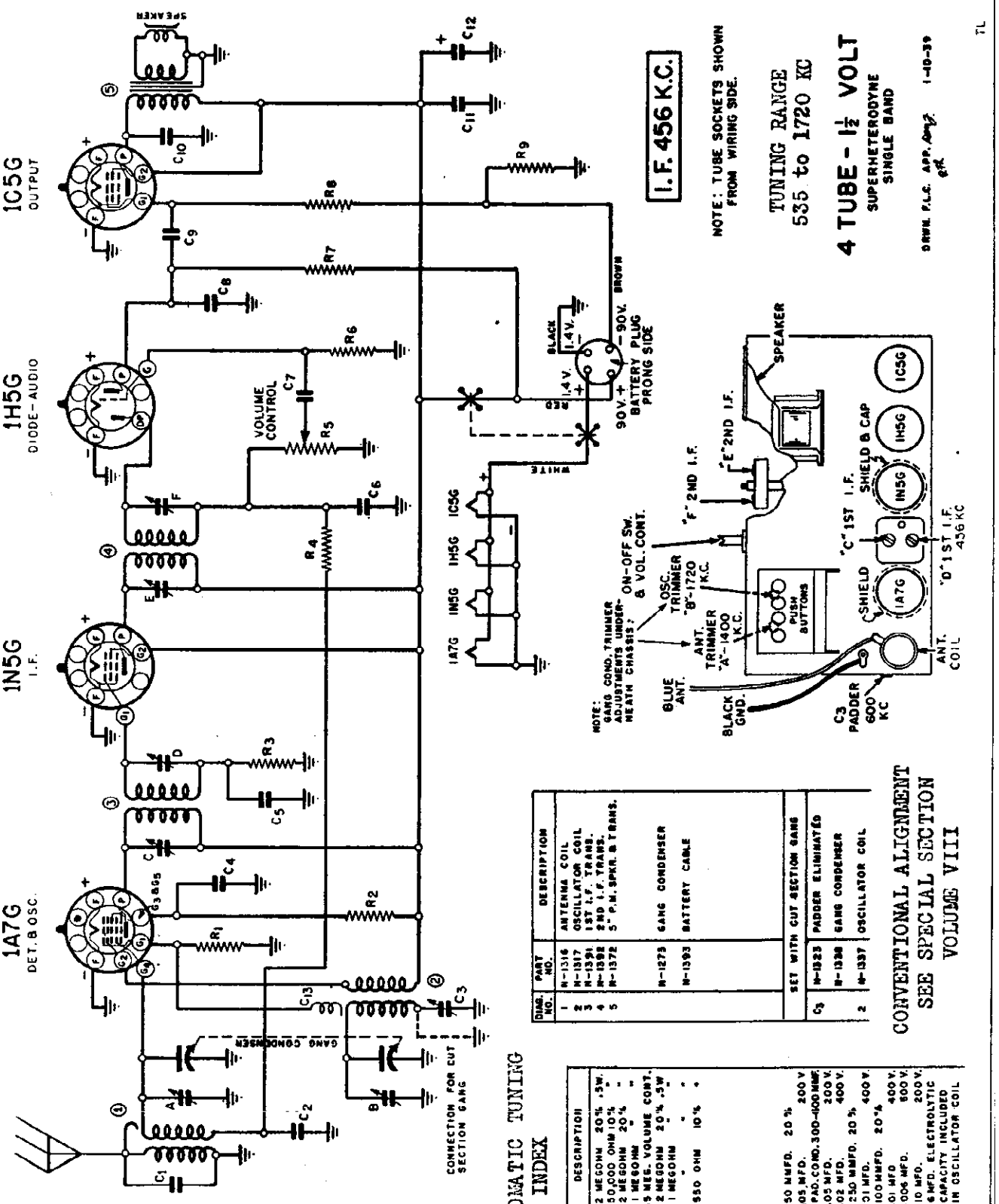
ALIGNMENT PROCEDURE IN TABULATED FORM

ALIGNMENT PROCEDURE IN TABULATED FORM

For alignment procedure read tabulations from left to right. If more than one adj. is required on any band, make adj. marked (1) first, (2) next, (3) third. Before starting alignment, check tuning dial adj. by: turn gang cond. until plates touch max. capacity stop (completely in mesh) at which point dial indicator must be exactly even with last line at low frequency end of dial calibration. If dial needle does not point exactly to last line move needle to correct position. Use accurately calibrated test osc. with some type of output measuring device. Have ground lead of test osc. attached to chassis.

Set receiver dial to:	TEST OSCILLATOR			
	Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below—and:
Any point where no interfering signal is received	455 K. C.	.02 MFD condenser	High side to grid terminal of 1A7G tube DO NOT REMOVE CAP.	Adjust each of the second I. F. transformer trimmers for maximum output—then adjust each of the first I. F. trimmers for maximum output.
(1) Exactly 1730 K. C.	Exactly 1730 K. C.	.00025 MFD condenser	Receiver blue antenna lead	Adjust 1730 K. C. oscillator trimmer for maximum output.
(2) Exactly 1400 K. C.	Exactly 1400 K. C.	.00025 MFD condenser	Receiver blue antenna lead	Adjust 1400 K. C. antenna trimmer for maximum output.

SPIEGEL, INC.



DIAG. NO.	PART NO.	DESCRIPTION
1	N-1316	ANTENNA COIL
2	N-1317	OSCILLATOR COIL
3	N-1391	1ST I.F. TRANS.
4	N-1392	2ND I.F. TRANS.
5	N-1372	5" P.M. SPKR. & TRANS.
	N-1273	GANG CONDENSER
	N-1393	BATTERY CABLE

		SET WITH CUT SECTION GANG
C_3	N-1323	PADDER ELIMINATED
	N-1338	GANG CONDENSER
2	N-1337	OSCILLATOR COIL

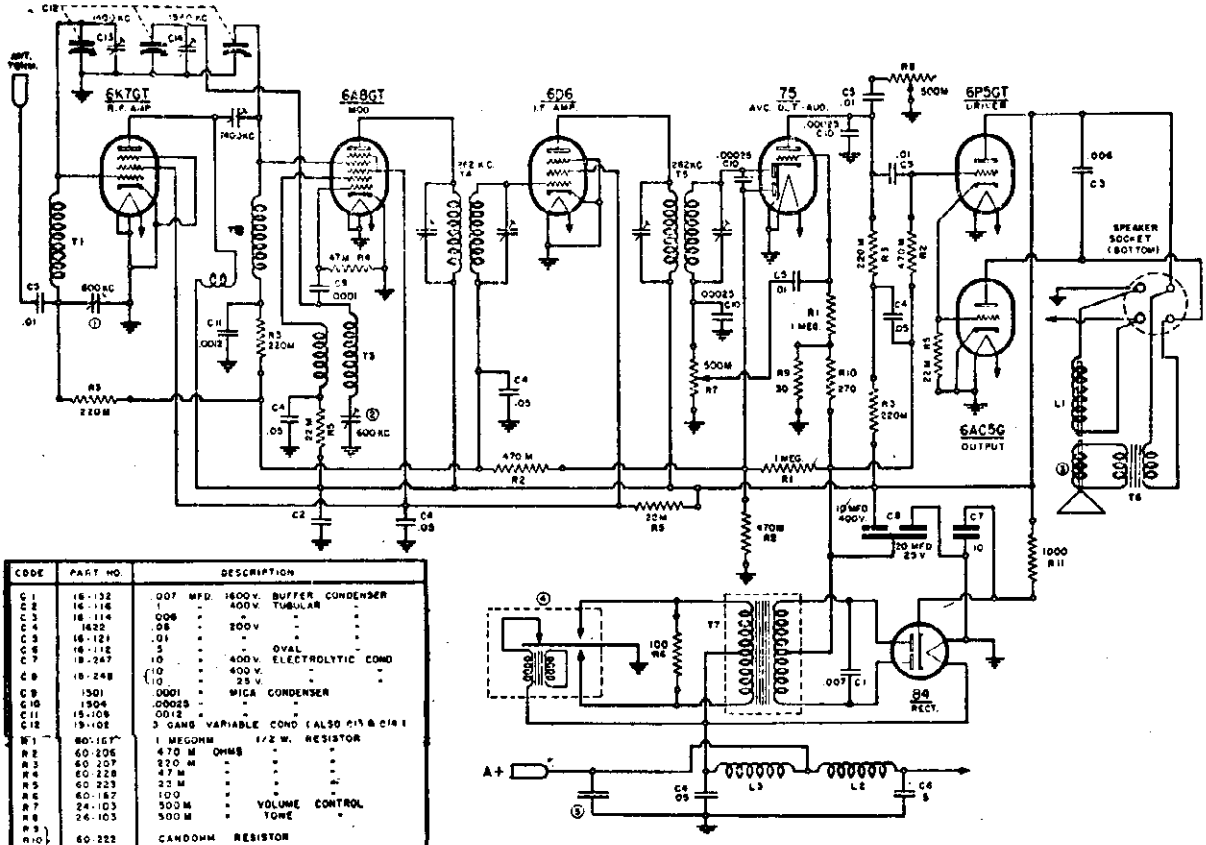
CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

FOR AUTOMATIC TUNING
SEE INDEX

DIAG. NO.	PART NO.	DESCRIPTION	
R1	N-1377	.2 MEGOHM 20% .5W.	
R2	N-1353	50,000 OHM 10% "	
R3	N-1378	2 MEGOHM 20% "	
R4	N-1282	1 MEGOHM "	
R5	N-1373	.5 MEG. VOLUME CONT.	
R6	N-1378	2 MEGOHM 20% .5W.	
R7	N-1262	1 MEGOHM " "	
R8	N- "	" " "	
R9	N-1379	550 OHM 10% "	
C1	N-1342	50 MMFD. 20 %	200 V.
C2	N-1345	.05 MFD.	200 V.
C3	N-1323	PAD. COND. 300-400 MMF.	
C4	N-1345	.05 MFD.	200 V.
C5	N-1376	.02 MFD.	400 V.
C6	N-1343	250 MMFD. 20 %	
C7	N-1364	.01 MFD.	400 V.
C8	N-1374	100 MMFD. 20 %	
C9	N-1344	.01 MFD	400 V.
C10	N-1347	.006 MFD.	600 V.
C11	N-1351	.10 MFD.	200 V.
C12	N-1367	6 MFD. ELECTROLYTIC CAPACITY INCLUDED IN OSCILLATOR COIL	
C13			

MODELS W404,A2460,27452, 2P7452

SPIEGEL, INC.



CODE	PART NO.	DESCRIPTION
C1	16-132	.007 MFD. 1600 V. BUFFER CONDENSER
C2	16-116	1 " 400 V. TUBULAR "
C3	16-114	.006 " " " "
C4	1622	.05 " 200 V. " "
C5	16-121	.01 " " " "
C6	16-112	.5 " " OVAL "
C7	18-247	.10 " 400 V. ELECTROLYTIC COND
C8	18-248	(10 " 400 V. " "
		(10 " 25 V. " "
C9	1501	.0001 " MICA CONDENSER
C10	1504	.00025 " " "
C11	15-109	.0012 " " "
C12	19-102	3 GANG VARIABLE COND (ALSO C1A & C1B)
R1	80-167	1 MEGOHM 1/2 W. RESISTOR
R2	60-206	470 M OHMS " "
R3	60-207	220 M " " "
R4	60-228	47 M " " "
R5	60-223	22 M " " "
R6	60-187	100 " " "
R7	24-103	500 M " VOLUME CONTROL
R8	24-103	500 M " TONE "
R9 R10 R11	60-222	CANDOHM RESISTOR
L1	.....	FIELD COIL (ON SPEAKER)
L2	55-210	FILAMENT CHOKE
L3	55-211	VIBRATOR "
T1	10-208	ANTENNA COIL
T2	10-209	R.F. COIL
T3	10-210	OSCILLATOR COIL
T4	10-211	1 ST I.F. TRANSFORMER
T5	10-212	2 ND. " "
T6	.....	OUTPUT TRANSFORMER (ON SPEAKER)
T7	80-102	POWER "
1	20-118	9 PLATE PADDING CONDENSER
2	20-117	6 " " "
3	79-207	6" DYNAMIC SPEAKER
4	34-101	VIBRATOR
5	98-1	SPARK PLATE

IF PEAK 262 KC

CONVENTIONAL ALIGNMENT

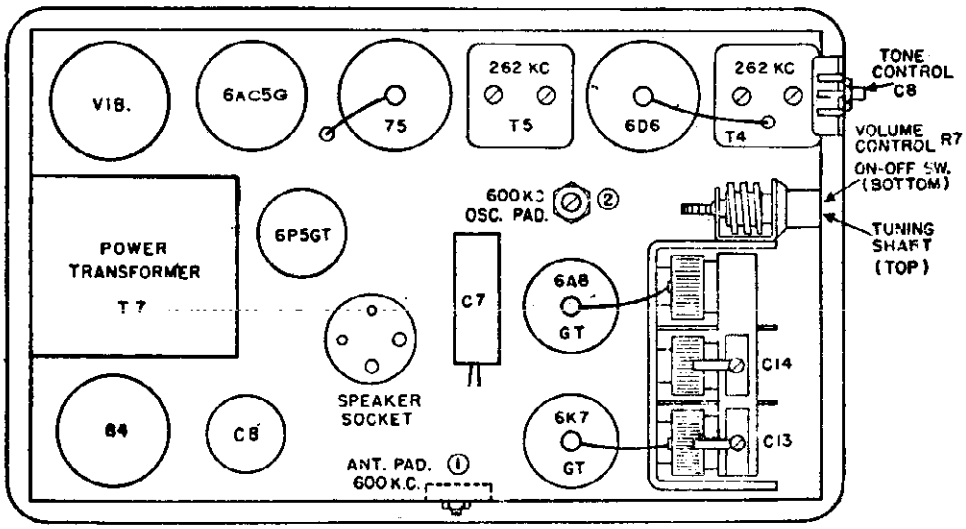
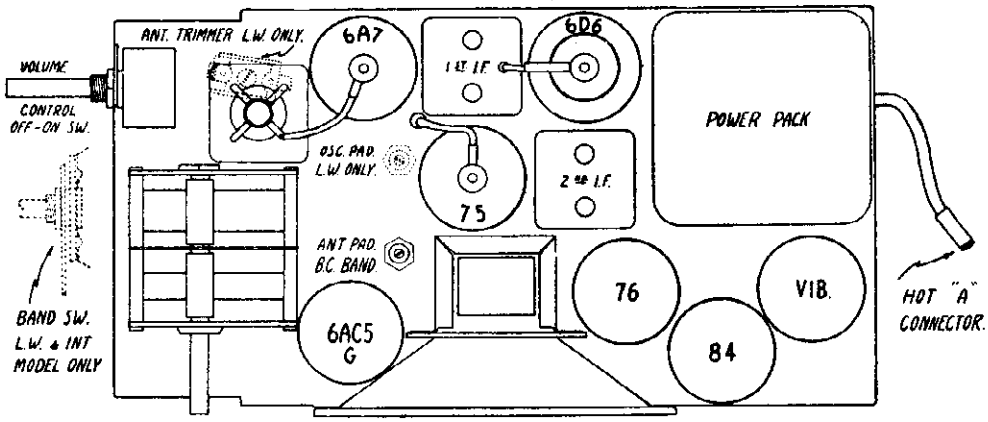
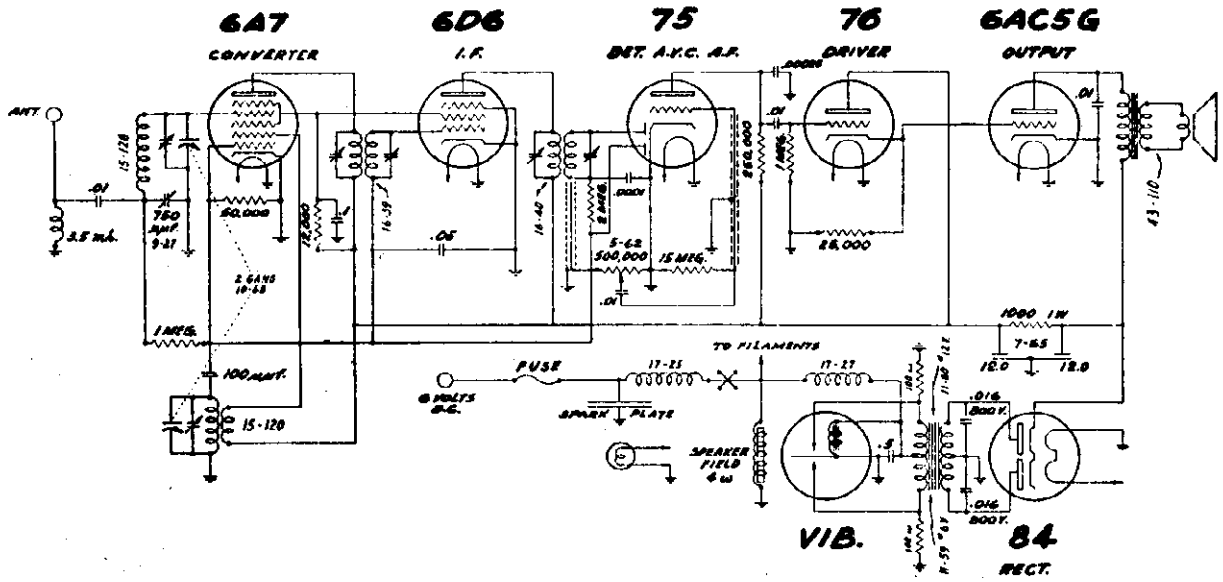


FIG. 6 LOCATION OF PARTS ON TOP OF CHASSIS

MODELS W406,Z7450
Chassis 620

SPIEGEL, INC.





I. F. ALIGNMENT Set the variable condenser at minimum capacity, (dial pointer at 1560 K.C.). Connect the two leads from a good, modulated signal generator, the ground lead to the radio chassis and the other lead through a .1 mfd. condenser, to the grid cap of the 6A7, with the tube's grid lead still in place.

Connect the leads from a fully charged 6 volt storage battery to the receiver chassis and battery lead, the polarity being reversible.

With the set in operation and the volume control full on, set the signal generator to 456 K.C. and increase its output until the signal is heard in the set's speaker. Starting with the second I. F., adjust the I. F. trimmers for maximum output, decreasing the signal generator output as the receiver output increases.

The generator output in all the alignment adjustments should be adjusted so the meter will read approximately .4 volts continually.

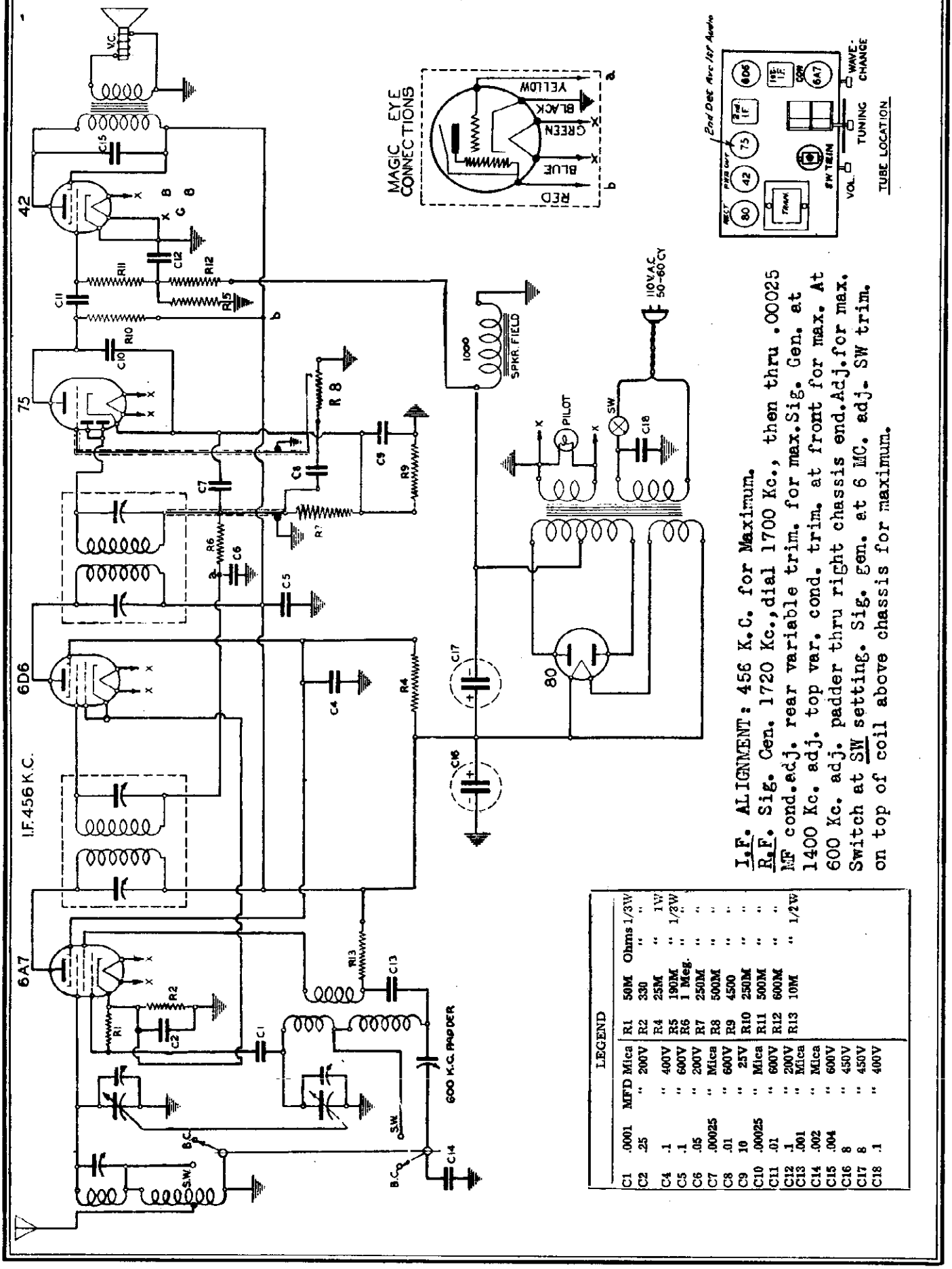
R. F. ALIGNMENT With the variable condenser still full open, set the generator to 1560 K.C. Connect the generator lead to the antenna lead through a .0001 mfd condenser as dummy antenna. Adjust the oscillator trimmer for maximum output. Set the receiver dial and the generator to 1400 K.C. so the signal comes through, and adjust the antenna trimmer for maximum output.

Set the receiver dial and generator to 600 K.C. and adjust the oscillator padder for maximum output by rocking the variable condenser (with the tuning knob) as the padder is adjusted.

Return the dial and generator setting to 1400 K.C. and check for alignment.

MODEL 510

SPIEGEL, INC.



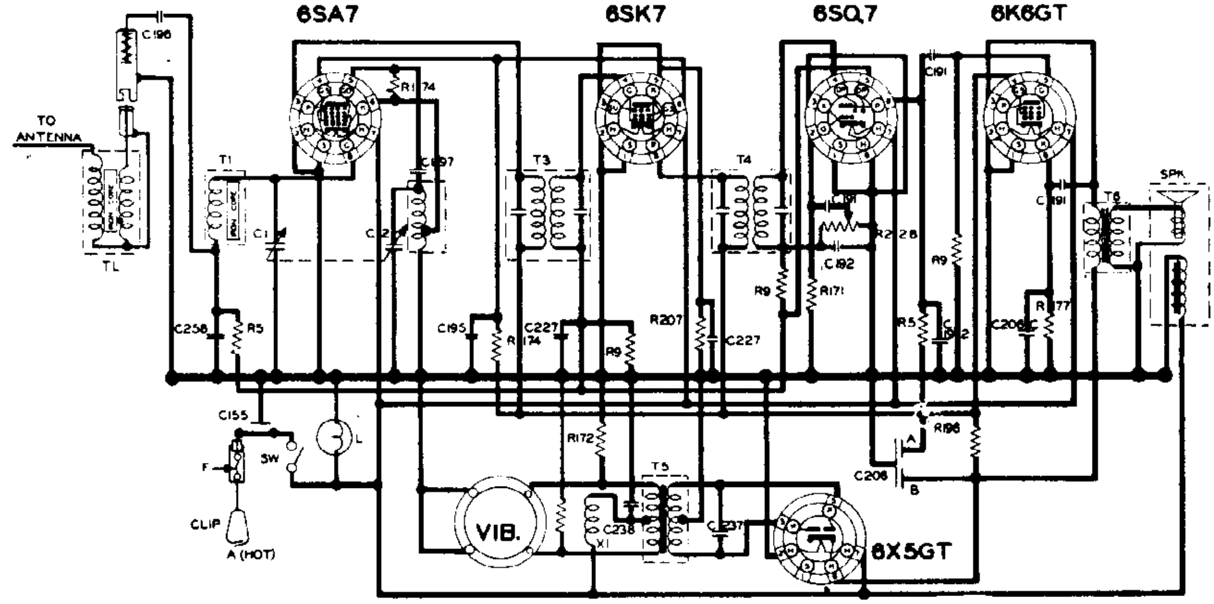
I.F. ALIGNMENT: 456 K.C. for Maximum.
R.F. Sig. Gen. 1720 Kc., dial 1700 Kc., then thru .00025 MF cond. adj. rear variable trim. for max. Sig. Gen. at 1400 Kc. adj. top var. cond. trim. at front for max. At 600 Kc. adj. padder thru right chassis end. Adj. for max. Switch at SW setting. Sig. gen. at 6 MC. adj. SW trim. on top of coil above chassis for maximum.

LEGEND

C1	.0001	MFD Mica	R1	50M	Ohms 1/3W	
C2	.25	" 200V	R2	330	" "	
C4	.1	" 400V	R4	25M	" 1W	
C5	.1	" 600V	R5	190M	" 1/3W	
C6	.05	" 200V	R6	1 Meg.	" "	
C7	.00025	" Mica	R7	250M	" "	
C8	.01	" 600V	R8	500M	" "	
C9	10	" 25V	R9	4500	" "	
C10	.00025	" Mica	R10	250M	" "	
C11	.01	" 600V	R11	500M	" "	
C12	.1	" 200V	R12	600M	" "	
C13	.001	" Mica	R13	10M	" 1/2W	
C14	.002	" Mica				
C15	.004	" 600V				
C16	8	" 450V				
C17	8	" 450V				
C18	.1	" 400V				

SPIEGEL, INC.

SCHEMATIC CIRCUIT DIAGRAM
AIRCASTLE CAR RADIO CHASSIS RE-84



R	OHMS	W	PART NO	
5	500K	1/4	17-2070	
9	1M	1/4	17-2060	
171	15M	1/4	17-14386	
172	100	1/4	17-14280	
174	20K	1/4	17-14291	
177	150	1/4	17-14296	
228	1M	V.C	17-17006	
196	500	[illegible]	17-14340	
207	500	1/4	17-14381	

C	CAPACITY	VOLT	PART NO	
1	2 SEC. GANG			
2	VARIABLE			
55	.0007	200	17-14217	
237	.005	200	17-14345	
206A	10 MFD	300	17-14297	
206B	10 MFD	300		
206C	20 MFD	25		
191	.01	400	17-14272	
192	.00025	600	17-14273	
195	.05	400	17-14276	
196	.1	200	17-14277	
197	.0001	600	17-14278	
238	.5	150	17-14346	
227	.05	600	17-16823	
254	.004	600	17-14381	

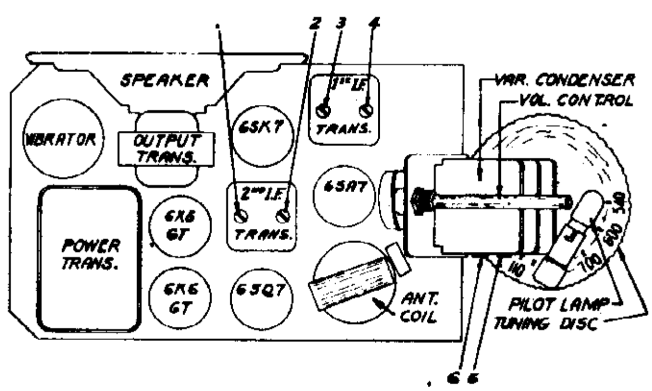
CHOKES & TRANSFORMERS

T-X	TYPE	PART NO	
1	ANTENNA COIL	00-16441	
2	OSCILLATOR COIL	00-[illegible]	
3	FIRST I.F. COIL	00-7003	
4	SECOND I.F. COIL	00-17004	
5	POWER TRANSF.	00-16446	
6	OUTPUT TRANSF.	00-16445	
A	CHOKE		
	SUPPRESSION CHOKE	20-16457	

MISCELLANEOUS UNITS

SYMBOL	DESCRIPTION	PART NO	
F	FUSE 30 AMP	17-2200	
L	DIAL LIGHT BULB - MAZDA NO 47	17-16378	
SPK	SPEAKER ASSEMBLY	17-16486	
SW	POWER SWITCH	17-17006	
TL	TRANSMISSION LINE	00-16[illegible]	
VIB	VIBRATOR	[illegible]	

I.F. PEAK 455 K.C.
FREQUENCY RANGE 1575 TO 540 K.C.



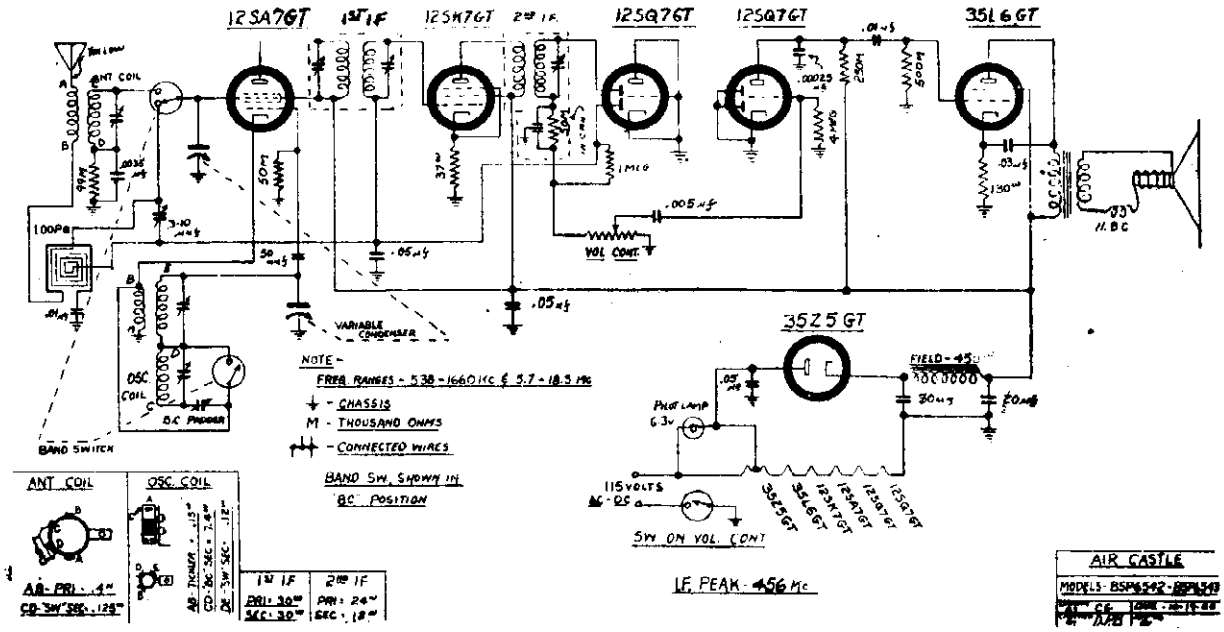
Balancing Instructions

All sensitivities given for 1/2 watt output 1.4 across Voice Coil

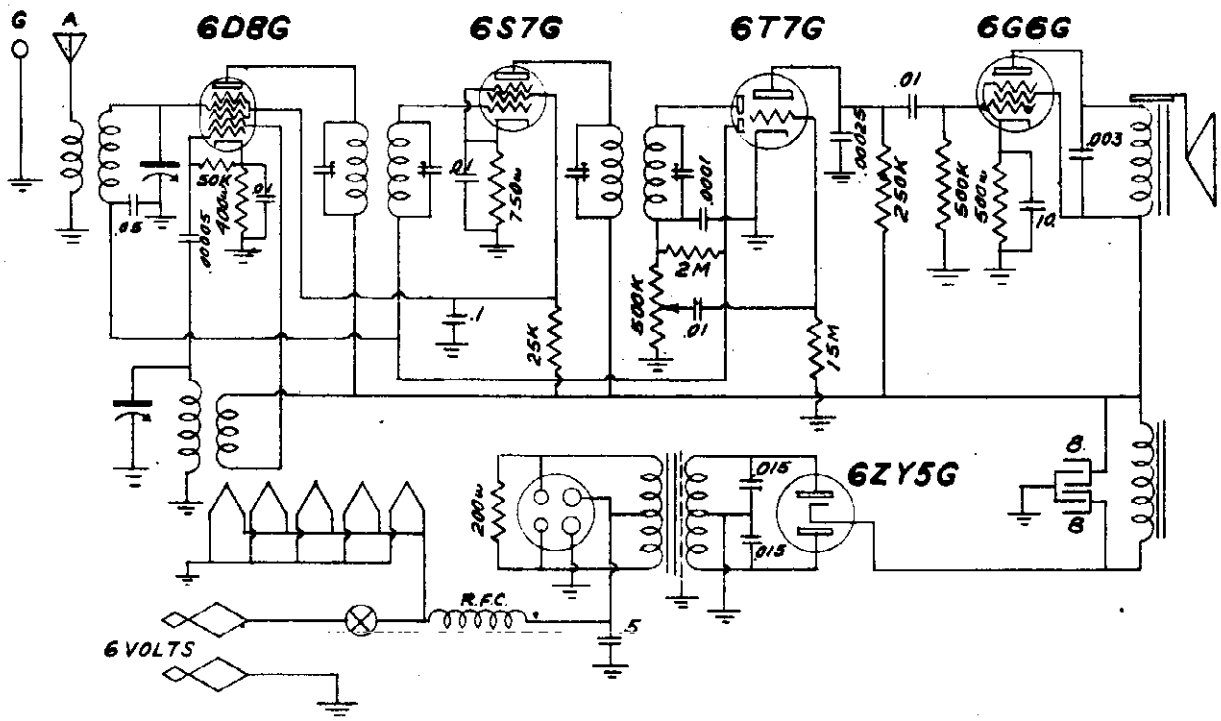
Operation No.	Connect Bal. Oscillator To	Bal. Oscillator Frequency	Adjust Padder No.	Dial Setting	Sensitivity
1	6SA7 Grid	456	1,2,3 & 4	550 KC	50uv
2	Antenna Coupler Through 20 uuf	1400	5	1400	
3	"	1400	6	1400	10uv

MODELS 542,543
MODEL 560B

SPIEGEL, INC.



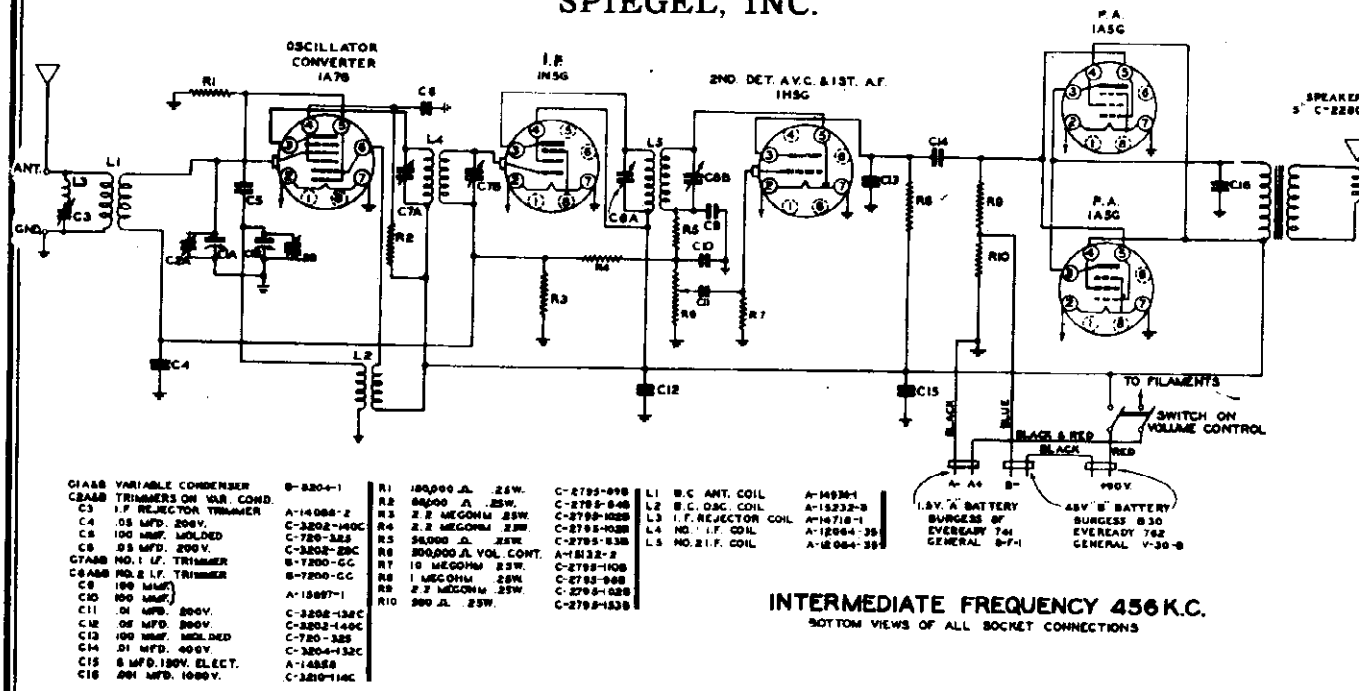
MODELS 542,543



MODEL 560B

FOR OTHER DATA SEE INDEX

SPIEGEL, INC.



C1A&B	VARIABLE CONDENSER	B-8204-1
C2A&B	TRIMMERS ON VAR. COND.	
C3	I.F. REJECTOR TRIMMER	A-14088-2
C4	.05 MFD. 200V.	C-3202-140C
C5	100 MMF. MOLDED	C-720-325
C6	.05 MFD. 200V.	C-3202-28C
C7A&B	NO.1 I.F. TRIMMER	B-7200-GC
C8A&B	NO.2 I.F. TRIMMER	B-7200-GC
C9	100 MMF.	A-15897-1
C10	100 MMF.	
C11	.01 MFD. 200V.	C-3202-132C
C12	.05 MFD. 200V.	C-3202-140C
C13	100 MMF. MOLDED	C-720-325
C14	.01 MFD. 400V.	C-3204-132C
C15	8 MFD. 150V. ELECT.	A-14858
C16	.001 MFD. 1000V.	C-3210-114C

R1	100,000 Ω. .25W.	C-2795-898
R2	66,000 Ω. .25W.	C-2795-846
R3	2.2 MEGOHM .25W.	C-2795-1029
R4	2.2 MEGOHM .25W.	C-2795-1029
R5	56,000 Ω. .25W.	C-2795-838
R6	250,000 Ω. VOL. CONT.	A-15132-2
R7	10 MEGOHM .25W.	C-2795-1108
R8	1 MEGOHM .25W.	C-2795-968
R9	2.7 MEGOHM .25W.	C-2795-1028
R10	900 Ω. .25W.	C-2795-1038

L1	R.C. ANT. COIL	A-14936-1
L2	R.C. OSC. COIL	A-15232-2
L3	I.F. REJECTOR COIL	A-14678-1
L4	NO. 1 I.F. COIL	A-12984-35
L5	NO. 2 I.F. COIL	A-12984-35

INTERMEDIATE FREQUENCY 456 K.C.

BOTTOM VIEWS OF ALL SOCKET CONNECTIONS

VOLTAGE CHART

"A" Battery Voltage: 1.5 volts
"B" Battery Voltage: 90. volts
Position of Volume Control: Full with Antenna disconnected

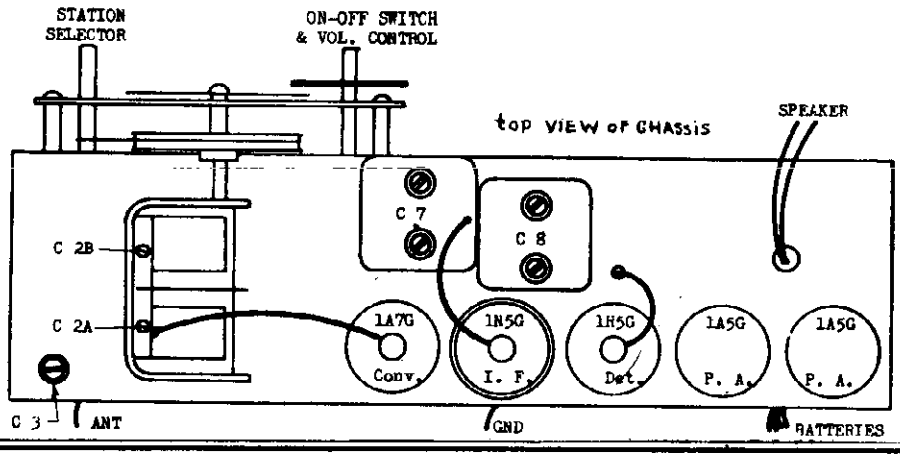
Tube	Function	Voltage of socket prongs to Gnd. (See No's. on schematic diagram)								
		No.1	No.2	No.3	No.4	No.5	No.6	No.7	No.8	Grid Cap
1A7G	Osc-Converter	83	1.3	83	18	*	83	0	83	0
1N5G	I-f Amplifier	0	1.3	83	83	-	-	0	0	0
1H5G	Det-AVC-Audio	-	1.3	*	-	0	0	0	-	0
1A5G	Power Amplifier	-	1.3	78	83	0	-	0	0	-
1A5G	Power Amplifier	-	1.3	78	82	0	-5	0	0	-

Notes: Voltage readings are for schematic diagram 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 1000 ohms per volt voltmeter.

* Cannot be measured with 1000 ohms/volt voltmeter.

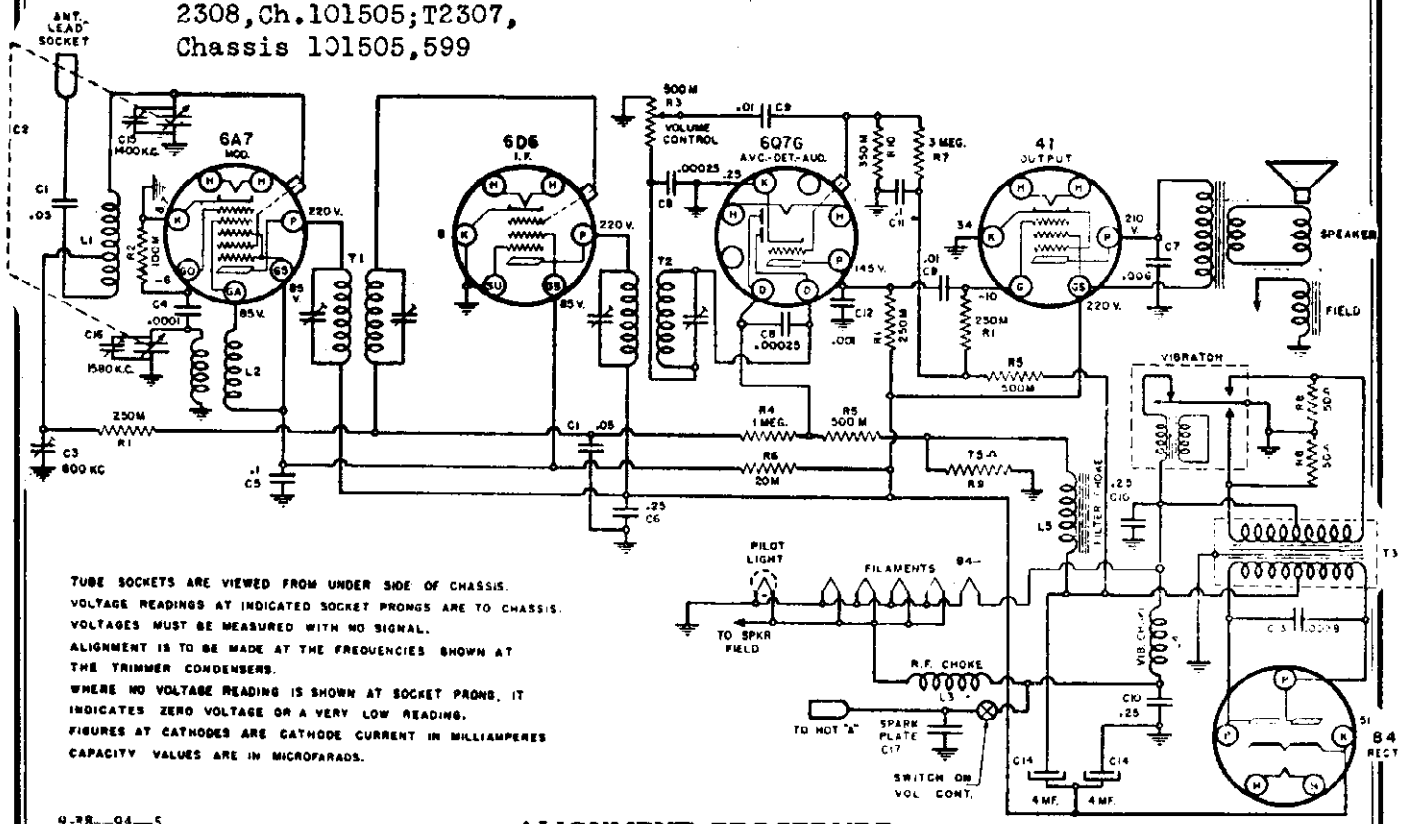
ALIGNMENT CHART

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	TUNING CONDENSER SETTING	TRIMMER	REMARKS
1	(Set pointer parallel with horizontal lines on scale with gang condenser plates fully closed)						
2	I. F.	1A7G grid	.1 mf.	456 kc	open	C 12 A & B	2nd. I. F.
						C 11 A & B	1st. I. F.
3	Rejector	Ant.	200 mmf.	456 kc	closed	C 2	Adjust to minimum
4	Broadcast Band	Ant.	200 mmf.	1500 kc	1500 kc	C 2B	Oscillator
						C 2A	Antenna
5	(Check calibration and sensitivity at 600 kc, 900 kc and 1500 kc)						
6	(Check operations 1 to 5 inclusive)						



MODELS 579,1140,1141
Chassis 559; V1140,2307,
2308,Ch.101505;T2307,
Chassis 101505,599

SPIEGEL, INC.



9-38—94—5

ALIGNMENT PROCEDURE

PRELIMINARY

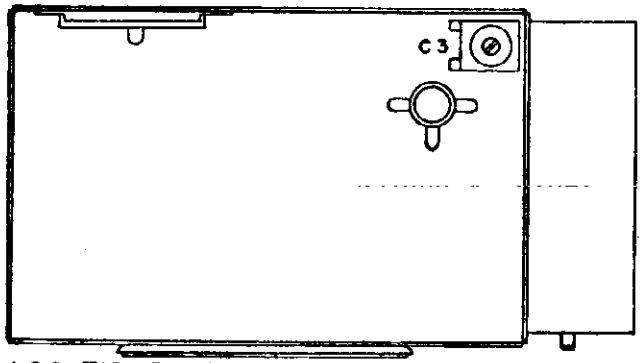
Output Meter Connections ..... Across Loud Speaker Voice Coil
Output Meter Reading to Indicate 1 Watt ..... 1.85 Volts
Generator Ground Lead Connection ..... Receiver Chassis
Dummy Antenna Value to Be in Series with Generator Output ..... See Chart Below
Connection of Generator Output Lead ..... See Chart Below
Generator Modulation ..... 30%, 400 Cycles
Position of Volume Control ..... Fully On

Position of Variable	Generator Frequency	Dummy Antenna	Generator Connection	Trimmer Adjustments (In Order Shown)	Trimmer Function
Closed	456 KC	.1 mfd.	6A7 Grid	T2, T1	I. F.
Fully Open	1580 KC	.0002 mfd.	Antenna Conn.	C16	Oscillator Trimmer
1400 KC	1400 KC	.0002 mfd.	Antenna Conn.	C15	Antenna Trimmer
600 KC	600 KC	.0002 mfd.	Antenna Conn.	C3	Antenna Padder

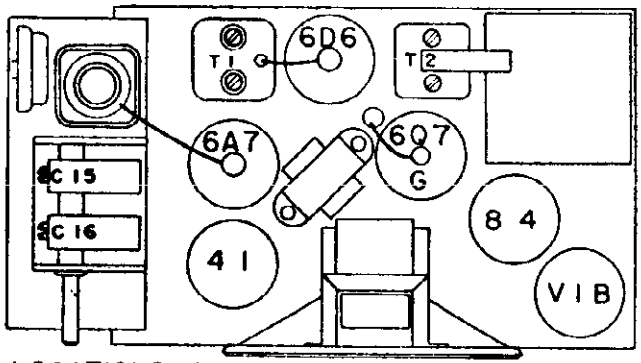
The variable condenser should be at 600 k.c. for antenna adjustment.

The alignment procedure should be repeated in the original order, step by step, to insure greater accuracy. A final adjustment of antenna padder condenser C3 is always made after the receiver is installed in the car, in order to match the car antenna.

Always keep the output power from the generator at its lowest possible value to prevent the A.V.C. of the receiver from interfering with accurate alignment.



LOCATIONS OF PARTS UNDER CHASSIS



LOCATIONS OF PARTS ON TOP OF CHASSIS

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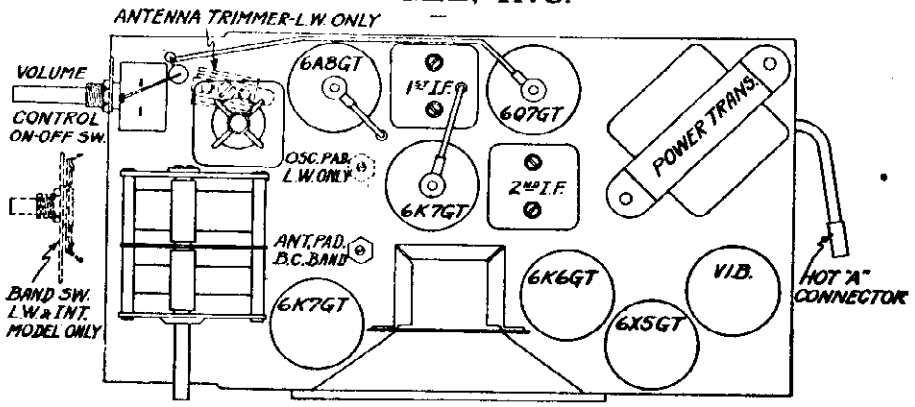
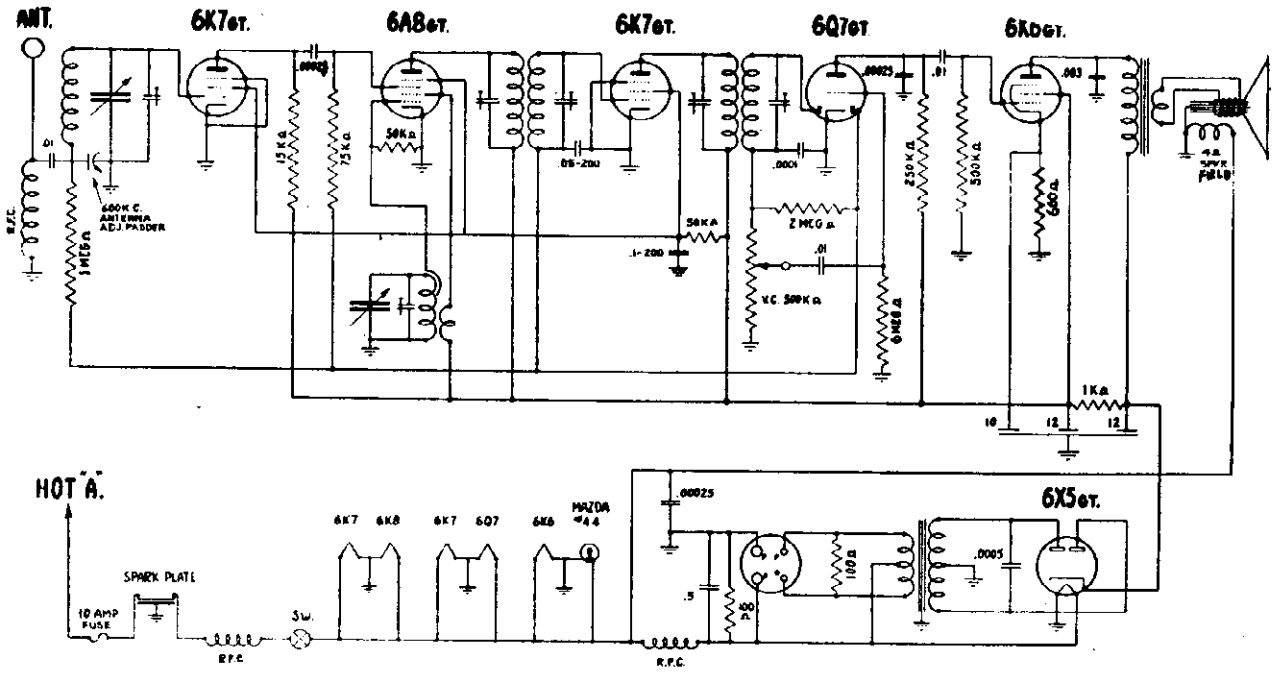




I. F. ALIGNMENT Set the variable condenser at minimum capacity, (dial pointer at 1550 K.C.). Connect the two leads from a good, modulated signal generator, the ground lead to the radio chassis and the other lead through a .1 mfd. condenser, to the grid cap of the 6A8GT with the tube's grid lead still in place.

Connect the leads from a fully charged 6 volt storage battery to the receiver chassis and battery lead, the polarity being reversible.

With the set in operation and the volume control full on, set the signal generator to 456 K.C. and increase its output until the signal is heard in the set's speaker. Starting with the second I. F., adjust the I. F. trimmers for maximum output, decreasing the signal generator output as the receiver output increases.

The generator output in all the alignment adjustments should be adjusted so the meter will read approximately .4 volts continually.

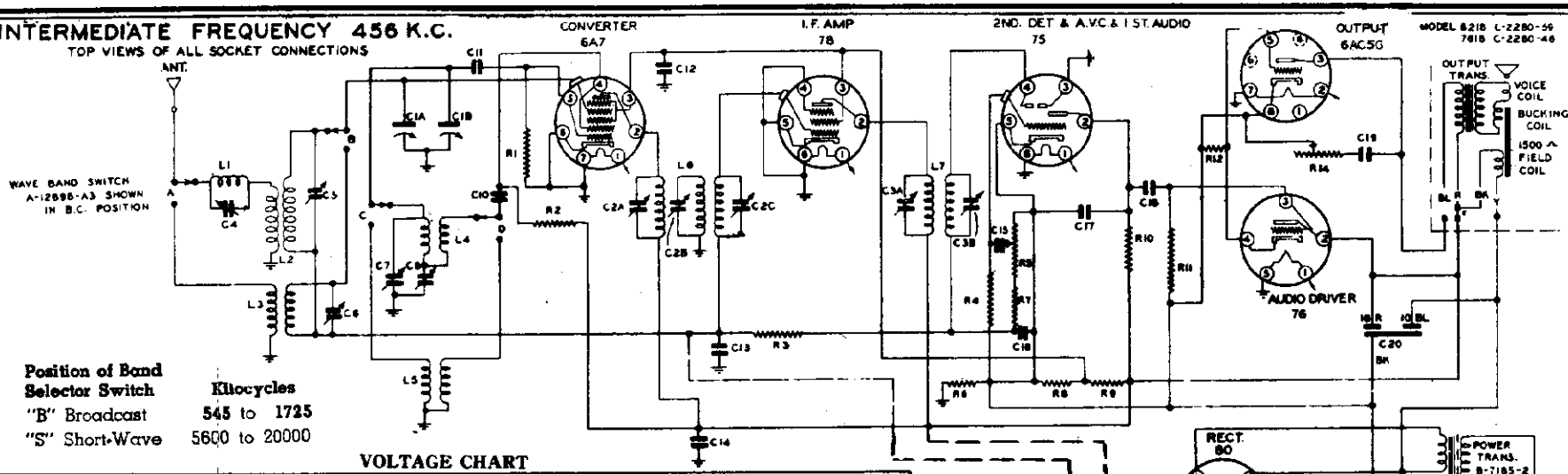
R. F. ALIGNMENT With the variable condenser still full open, set the generator to 1550 K.C. Connect the generator lead to the antenna lead through a .0001 mfd. condenser as dummy antenna. Adjust the oscillator trimmer for maximum output. Set the receiver dial and the generator to 1400 K.C. so the signal comes through, and adjust the antenna trimmer for maximum output.

Set the receiver dial and generator to 600 K.C. and adjust the oscillator padder for maximum output by rocking the variable condenser (with the tuning knob) as the padder is adjusted.

Return the dial and generator setting to 1400 K.C. and check for alignment.

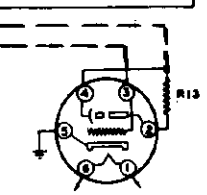
INTERMEDIATE FREQUENCY 456 K.C.

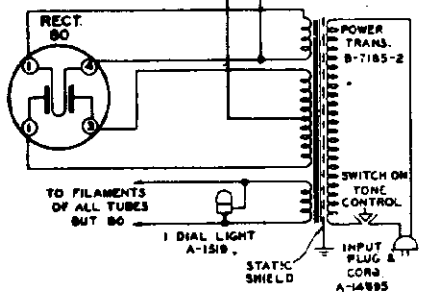
TOP VIEWS OF ALL SOCKET CONNECTIONS



Position of Band Selector Switch

	Kilocycles
"B" Broadcast	545 to 1725
"S" Short-Wave	5600 to 20000





VOLTAGE CHART

Line Voltage: 115 volts — **Position of Volume Control:** Full with Antenna Disconnected

Tube	Function	Voltage of Socket Prongs to Gnd. (See Prong Nos. on Schematic Diagram)								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	Grid Cap
6A7	Converter	6.1	250	60	150	-9	0	0	-	0
78	I.F. Amp.	6.1	250	60	0	0	0	-	-	0
75	2nd Det. AVC-Audio	6.1	57	0	-.5	-1.5	0	-	-	-.7
76	Driver	6.1	250	0	10	0	-	-	-	-
6AC5G	P.A.	0	0	225	0	10	0	6.1	-	-
80	Rectifier	525	270	270	525	-	-	-	-	-
6U5	Tuning Indicator	6.1	50	.2	250	3	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. All DC measurements made with 1000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter. Unless designated otherwise, voltages in table are + DC voltages.

ALIGNMENT

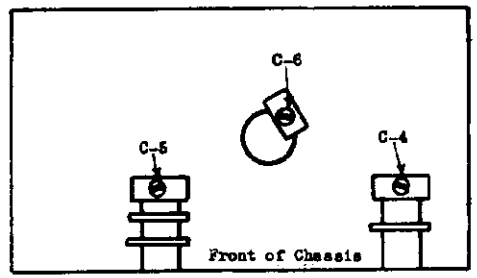
OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set dial pointer to last mark on scale when condenser plates are flush)							
2	I.F.	6A7 Grid	.1 mf.	456 KC	BC	Open	C5A,B;C2A,B,C	Adjust to approx. peak
3							C2B (Transfer)	Detune by tightening ½ t.
4							C5A,B;C2A,C	Peak accurately
5							C2B	Peak accurately*
6	Rejector	Ant.	200 mmf.	456 KC	BC	Open	C4	Adjust to minimum
7	Broadcast Band	Ant.	200 mmf.	1500 KC	BC	1500 KC	C7 BC osc. trim	Peak accurately
8							C5 BC ant trim	Peak accurately
9				600 KC	BC	600 KC	C8 BC osc. pad	Peak accurately
10	(Repeat operations 7 and 8)							
11	(Check calibration and sensitivity at 600 KC, 1000 KC and 1500 KC)							
12	S.W. Band	Ant.	*	18 MC	SW	18 MC	C6 SW ant trim	**
13	(Check calibration and sensitivity at 6.0 MC and 18 MC)							
14	(Check operations 1 to 13 inclusive)							

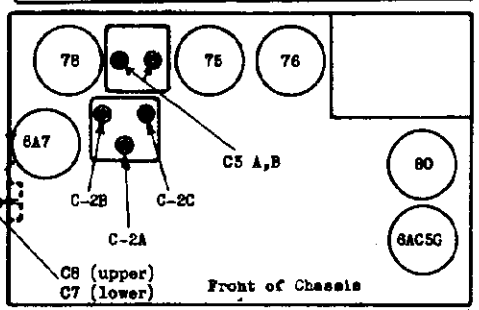
*100 ohm non-inductive resistor and 200 mmf. condenser in series.

**Rock dial while making this adjustment. Make certain that adjustment is made on fundamental signal and not on image. Peak accurately.

L1	I.F. REJECTOR COIL	A-14877
L2	B.C. ANT. COIL	A-14878-1
L3	S.W. ANT. COIL	A-14882-1
L4	B.C. OSC. COIL	A-14813-2A
L5	S.W. OSC. COIL	
L6	NO.1 I.F. COIL	A-14788
L7	NO.2 I.F. COIL	A-12064-17

C1A&B	VARIABLE CONDENSER	B-7228
C2A&C	NO.1 I.F. TRIMMER	A-14792
C3A&B	NO.2 I.F. TRIMMER	B-7200-GN
C4	I.F. REJECTOR TRIMMER	A-14068-4
C5	B.C. ANT. TRIMMER	A-14086-2
C6	S.W. ANT. TRIMMER	A-14068-3
C7	B.C. OSC. TRIMMER	B-7198-AY
C8	B.C. OSC. PADDER	
C9	.001 MFD 400V.	C-3204-2C
C11	50 MMFD MOLDED	C-720-320
C12	.1 MFD. 200V.	C-3202-38C
C13	.03 MFD. 200V.	C-3202-28C
C14	.1 MFD 400V.	C-3204-38C
C15	.02 MFD 200V.	C-3202-22C
C16	250 MMFD. MOLDED	C-720-324
C17	250 MMFD. MOLDED	C-720-324
C18	.05 MFD. 400V.	C-3204-28C
C19	.03 MFD. 800V.	C-3208-80C
C20	10-10 MFD ELECT.	A-14799
R1	56,000 Ω .25 W.	C-2795-53B
R2	22,000 Ω 5 W.	C-2796-78C
R3	1 MEGOHM .25W.	C-2795-90B
R4	4.7 MEGOHM .25W	C-2795-104B
R5	500,000 Ω VOL CONTROL	A-14779
R6	180 Ω .25W.	C-2795-53B
R7	56,000 Ω .25W.	C-2795-53B
R8	27,000 Ω 1W.	C-2797-78A
R9	33,000 Ω 3W.	C-2798-80A
R10	270,000 Ω .25W.	C-2795-91B
R11	1 MEGOHM .25W.	C-2795-96B
R12	27,000 Ω .25W	C-2795-78B
R13	1 MEGOHM .25W.	C-2795-96B
R14	TONE CONTROL & SW.	A-14778





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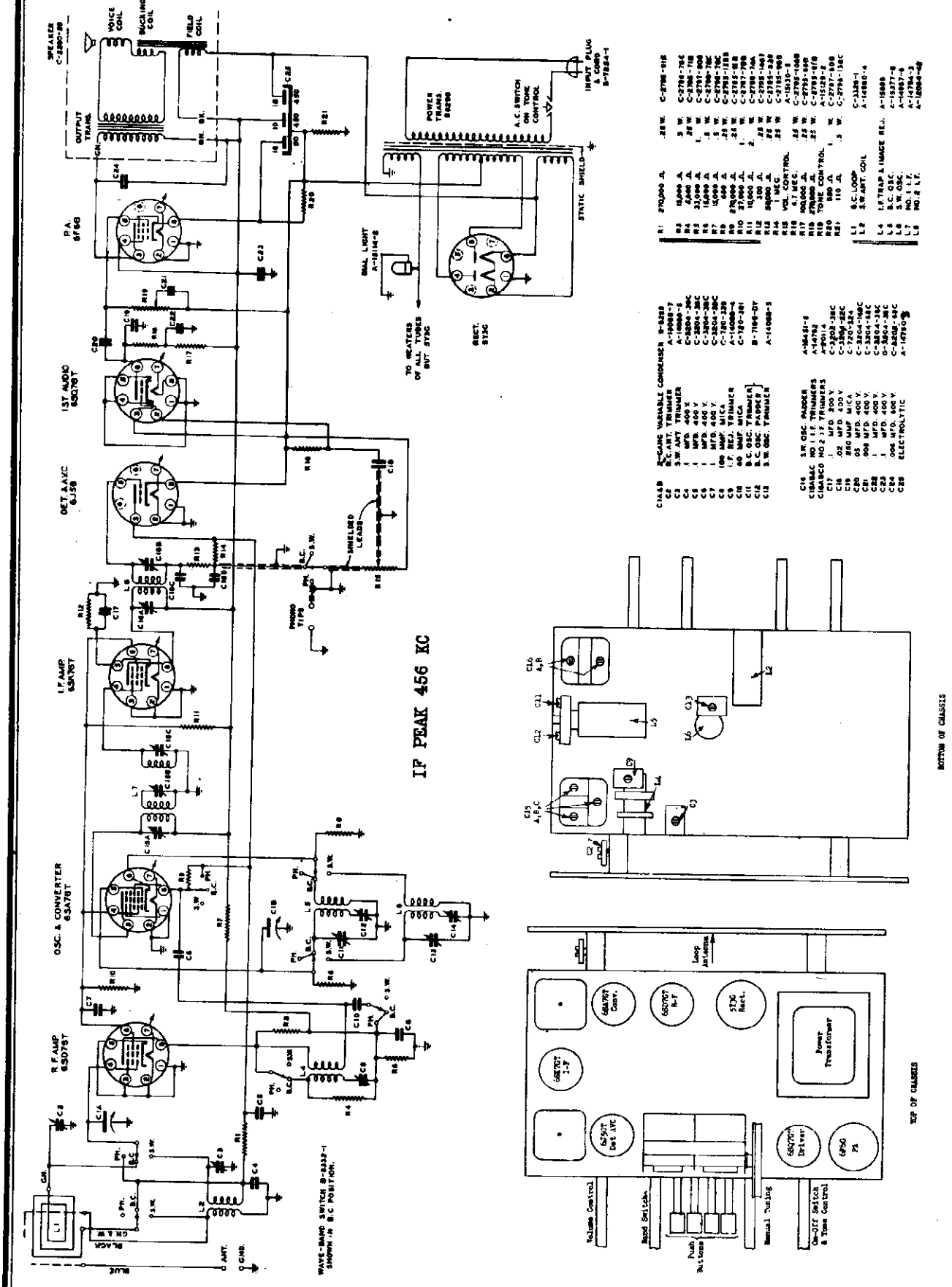


MODEL 752
MODEL 560B

SPIEGEL, INC.

VOLTAGE CHART

Line Voltage: 117 Volts AC

Position of Volume Control: Full with dial turned to quiet channel

Position of Band Switch: Broadcast

TUBE	FUNCTION	Voltage of Socket Prongs to Gnd. (See schematic diagram)							
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
6SD7GT	R-F Amplifier	0	0	0	**	0	75	6*	50
6SA7GT	Osc - Converter	0	0	225	75	-7.5	**	6*	0
6SK7GT	I-F Amplifier	0	0	0	**	2.5	75	6*	225
6J5G	Detector - AVC	0	0	0	**	**	—	6*	**
6SQ7GT	Driver	0	0	0	0	0	45	6*	0
6F6G	Power Amplifier	0	0	225	225	**	130	6*	15
5Y3G	Rectifier	0	300	225	275*	—	275*	150	225

Notes: Voltage readings are for schematic diagram in this bulletin. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter.
*AC volts.
**Cannot test with M-665 Analyzer.

ALIGNMENT CHART

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set pointer even with calibration mark at extreme counter-clockwise position with variable condenser gang fully closed.)							
2	I.F.	Ant. Term. of Loop	200 mmf.	456 KC	BC	Open	C15 B *	**
3							C15 A&C C15 B	Peak accurately
4							C16 A&B	Peak accurately
5	Rejector	Ant.	200 mmf.	456 KC	BC	Closed	C9	Adjust to minimum
6	Broadcast Band	Ant.	200 mmf.	1600 KC	BC	1600 KC	C11 (Osc.)	Peak accurately
							C2 (Ant)	Peak accurately
7				600 KC		600 KC	C12 (Pad)	Peak accurately
8	(Repeat operation 6)							
9	(Check calibration and sensitivity at 600 KC, 1,000 KC and 1,600 KC)							
10	Shortwave Band	Ant.	***	18 MC	SW	18 MC	C13 (Osc.)	Peak accurately
							C3 (Ant.)	****
11	(Check calibration and sensitivity at 6 MC and 18 MC)							
12	(Check operations 1 to 11 inclusive.)							

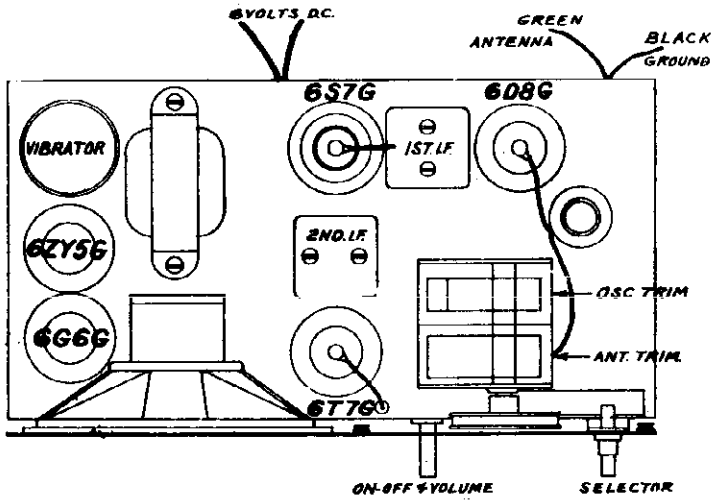
Notes: *Bronze color trimmer screw.
**Turn trimmer screw all the way down.
***100 ohms and 200 mmf. in series.
****Rock dial while adjusting for maximum output.
(ANTENNA Trimmer Condenser C2 is located on the loop antenna assembly.)

MODEL 560 B

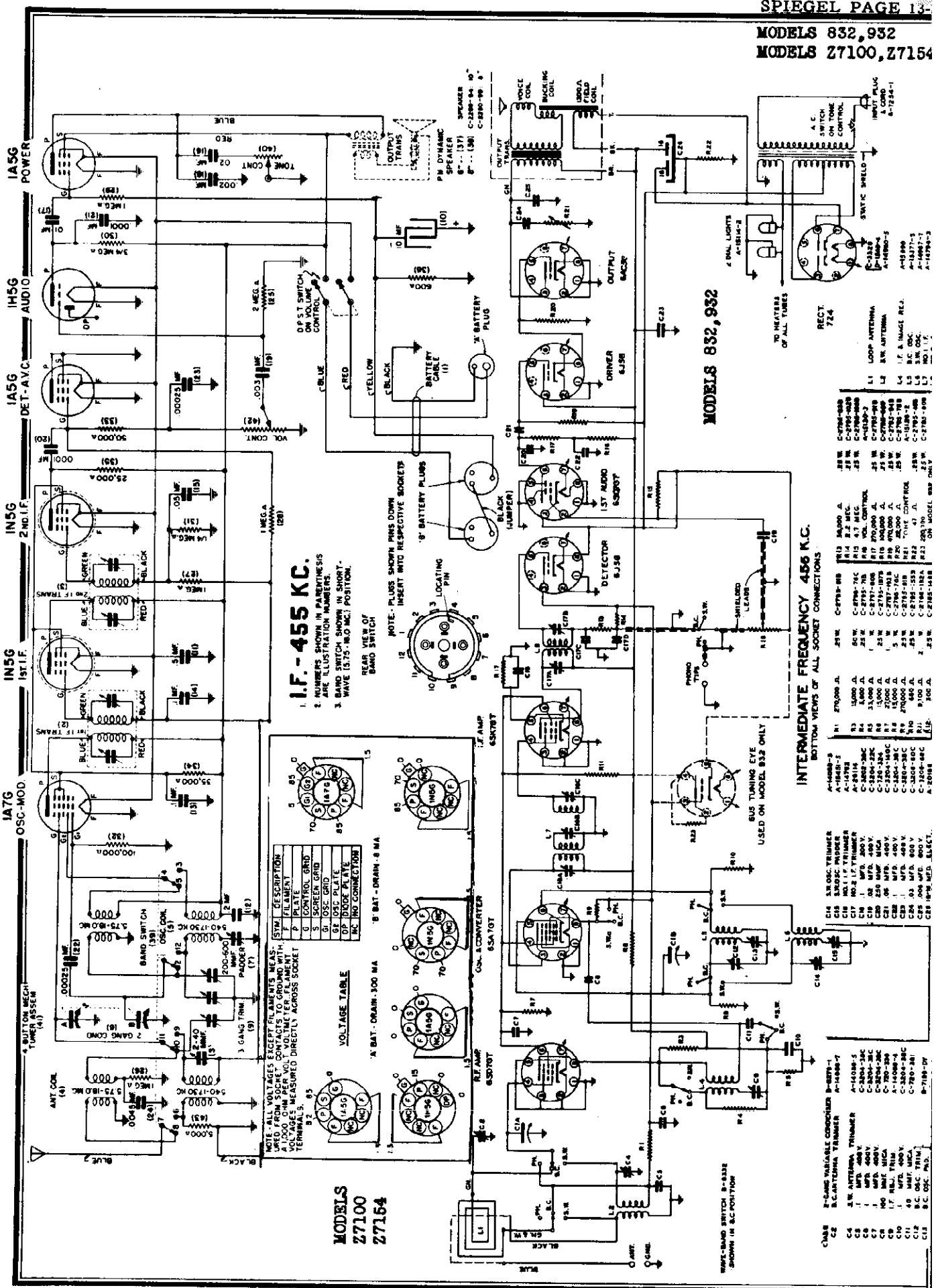
ALIGNMENT

I.F. Sig. gen. at 456 Kc., dial at 1720 Kc. Vol. con. full on, adj. sig. gen. output until sig. is heard. Adj. IF trims. for max.

B.C. Sig. gen. and dial at 1720 Kc. adj. osc. trim. for max. thru .0002 M.F. cond. Sig. gen. and dial at 1400 Kc. adj. ant. trim. for max. Check for alignment at 600 Kc. on sig. gen. and rec.dial.



MODELS 832,932
MODELS Z7100,Z7154



MODELS 832,932

SPIEGEL, INC.

VOLTAGE CHART

Line Voltage: 117 Volts

Position of Volume Control: Full with dial turned to quiet channel.

Position of Band Switch: Broadcast

TUBE	FUNCTION	Voltage of Socket Prongs to Gnd. (See schematic diagram)							
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
6SD7GT	R-F Amplifier	0	0	0	0	0	80	6*	88
6SA7GT	Osc - Converter	0	0	225	80	0	0	6*	0
6SK7GT	I-F Amplifier	0	0	0	0	0	90	6*	250
6J5GT	Detector - AVC	0	0	**	0	0	160	6*	0
6SQ7GT	1st A-F Amplifier	0	0	0	0	0	50	6*	0
6J5GT	Audio Driver	0	0	225	80	0	0	6*	10
6AC5G	Power Amplifier	0	0	220	—	0	0	6*	0
7Z4	Rectifier***	6*	0	300*	0	0	300*	0	0

Notes: Voltage readings are for schematic diagram in this bulletin. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter.

*AC volts.

**Cannot be tested with M-665 Analyzer.

***Rectifier tube type 7Z4 check from socket contacts to ground with tube out.

Type 6U5 Tuning Eye used on Model 932 only.

ALIGNMENT CHART

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set dial drum so that last mark on BC scale is directly toward front of set when condenser plates are fully meshed.)							
2	I.F.	Ant. Term. of Loop	200 mmf.	456 KC	BC	Open	C16 B *	**
3							C16 A&C C16 B	Peak accurately
4							C17 A &B	Peak accurately
5	Rejector	Ant.	200 mmf.	456 KC	BC	Closed	C9	Adjust to minimum
6	Broadcast Band	Ant.	200 mmf.	1600 KC	BC	1600 KC	C12 (Osc.) C2 (ANT)	Peak accurately Peak accurately
7				600 KC		600 KC	C13 (Pad)	Peak accurately
8	(Repeat operation 6)							
9	(Check calibration and sensitivity at 600 KC, 1000 KC and 1600 KC)							
10	Shortwave Band	Ant.	***	18 MC	SW	18 MC	C14 (Osc.) C4 (ANT)	Peak accurately ****
11	(Check calibration and sensitivity at 6 MC and 18 MC)							
12	(Check operations 1 to 11 inclusive)							

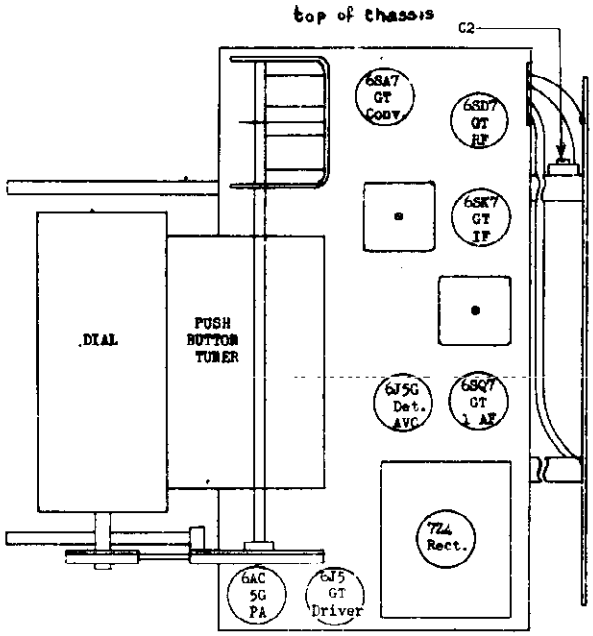
NOTES: *Bronze color trimmer screw.

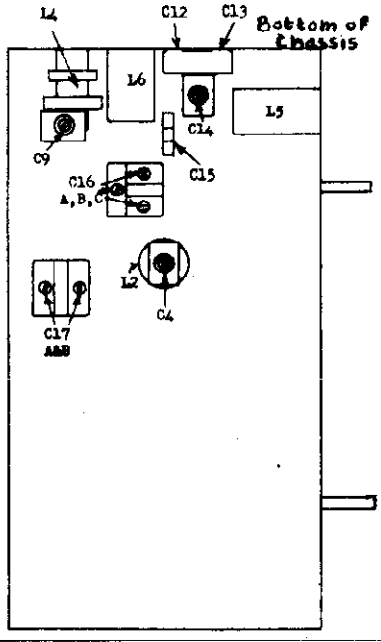
**Turn trimmer screw all the way down.

***100 ohms and 200 mmf. in series

****Rock dial while adjusting for maximum output

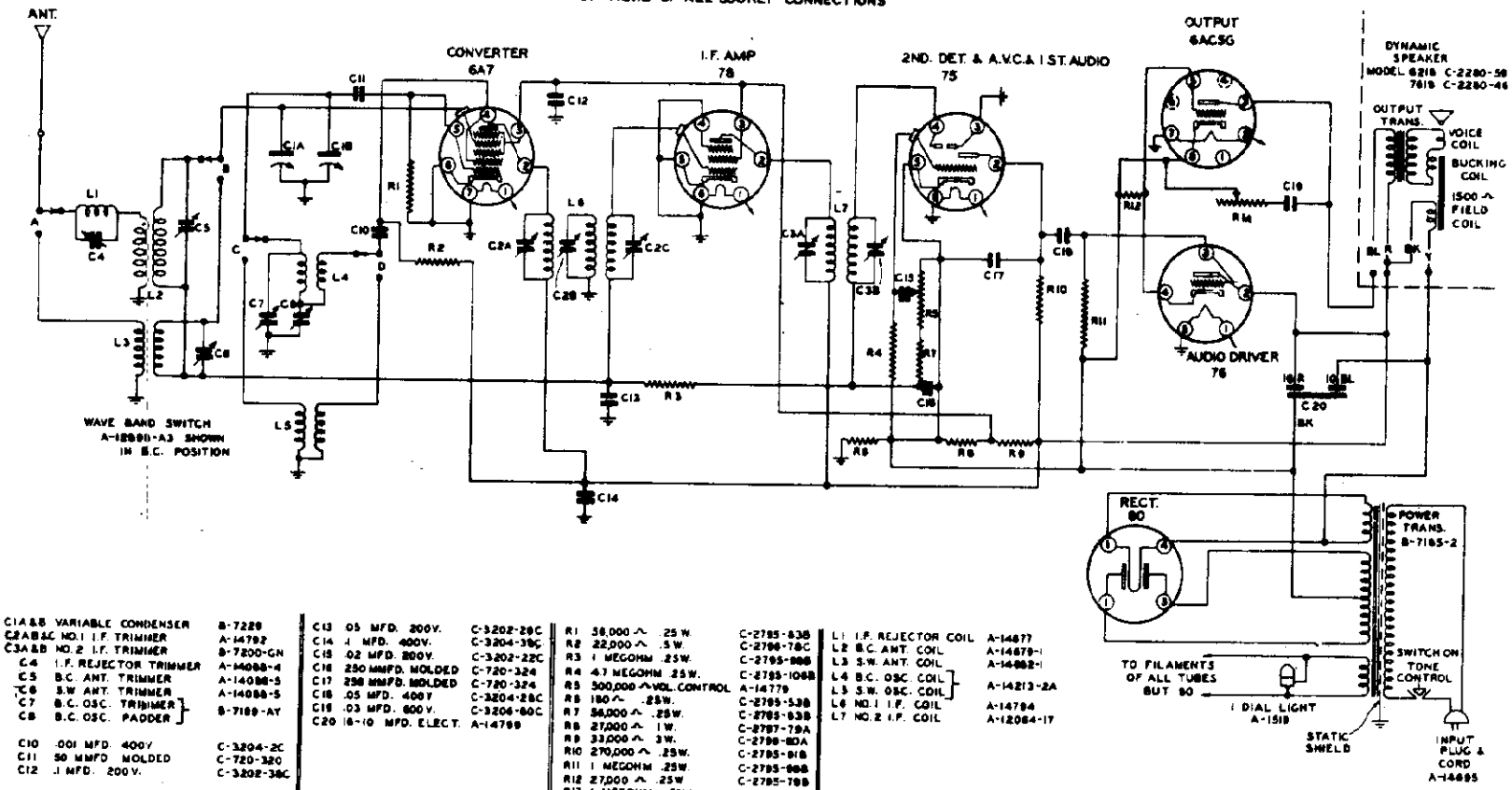
(Antenna Trimmer Condenser C2 is located on the loop antenna assembly.)





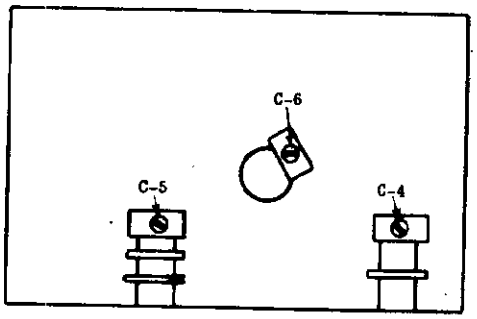
INTERMEDIATE FREQUENCY 456 K.C.

TOP VIEWS OF ALL SOCKET CONNECTIONS



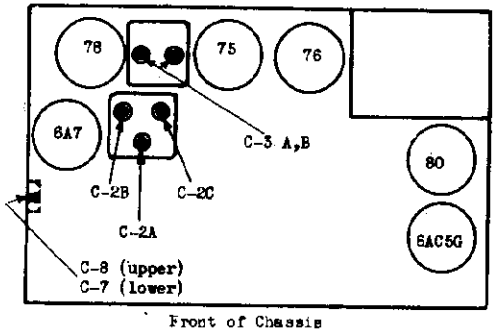
C1A&B VARIABLE CONDENSER		B-7228
C2A&C NO.1 I.F. TRIMMER		A-14792
C3A&B NO.2 I.F. TRIMMER		B-7200-GN
C4 I.F. REJECTOR TRIMMER		A-14088-4
C5 B.C. ANT. TRIMMER		A-14088-5
C6 S.W. ANT. TRIMMER		A-14088-5
C7 B.C. OSC. TRIMMER		B-7189-AY
C8 B.C. OSC. PADDER		
C10 .001 MFD. 400V		C-3204-2C
C11 50 MMFD MOLDED		C-720-320
C12 .1 MFD. 200V.		C-3202-38C
C13 .05 MFD. 200V.		C-3202-28C
C14 .1 MFD. 400V.		C-3204-38C
C15 .02 MFD. 200V.		C-3202-22C
C16 250 MMFD. MOLDED		C-720-324
C17 250 MMFD. MOLDED		C-720-324
C18 .05 MFD. 400V		C-3204-28C
C19 .03 MFD. 600V.		C-3206-60C
C20 10-10 MFD. ELECT.		A-14799
R1 58,000 Ω .25 W.		C-2795-63B
R2 22,000 Ω .5 W.		C-2796-78C
R3 1 MEGOHM .25 W.		C-2795-88B
R4 4.7 MEGOHM .25 W.		C-2795-108B
R5 500,000 Ω VOL. CONTROL		A-14779
R6 150 Ω .25 W.		C-2795-53B
R7 56,000 Ω .25 W.		C-2795-63B
R8 27,000 Ω 1 W.		C-2797-79A
R9 33,000 Ω 3 W.		C-2798-80A
R10 270,000 Ω .25 W.		C-2795-81B
R11 1 MEGOHM .25 W.		C-2795-88B
R12 27,000 Ω .25 W		C-2795-79B
R13 1 MEGOHM .25 W.		C-2795-88B
R14 TONE CONTROL & S.W.		A-14778
L1 I.F. REJECTOR COIL		A-14677
L2 B.C. ANT. COIL		A-14678-1
L3 S.W. ANT. COIL		A-14682-1
L4 B.C. OSC. COIL		A-14213-2A
L5 S.W. OSC. COIL		
L6 NO.1 I.F. COIL		A-14784
L7 NO.2 I.F. COIL		A-12084-17

Trimmer Locations under Chassis



Front of Chassis

Chassis Layout



Front of Chassis

SPIEGEL, INC.

MODELS 1050, 1051, 1052

Chassis 529

MODELS 1050,1051, V1050,Ch.529

SPIEGEL, INC.

VOLTAGE CHART

Line Voltage: 115 volts — Position of Volume Control: Full with Antenna Disconnected

Tube	Function	Voltage of Socket Prongs to Gnd.(See Prong Nos. on Schematic Diagram)								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	Grid Cap
6A7	Converter	6.1	255	60	150	-9	0	0	-	0
78	I.F. Amp.	6.1	255	60	0	0	0	-	-	0
75	2nd Det. AVC-Audio	6.1	57	0	-.5	-1.75	0	-	-	-.7
78	Driver	6.1	255	0	10	0	-	-	-	-
6AC5G	P.A.	0	0	225	0	10	0	6.1	-	-
80	Rectifier	526	275	275	526	-	-	-	-	-

Notes: Voltage readings are for schematic diagram on back of sheet. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter. Unless designated otherwise, voltages in table are + DC voltages.

ALIGNMENT

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set dial pointer to last mark on scale when condenser plates are flush)							
2	I.F.	6A7 Grid	.1 mf.	456 KC	BC	Open	C5A,B;C2A,B,C	Adjust to approx. peak
3							C2B (Transfer)	Detune by tightening ½ t.
4							C5A,B;C2A,C	Peak accurately
5							C2B	Peak accurately*
6	Rejector	Ant.	200 mmf.	456 KC	BC	Open	C4	Adjust to minimum
7	Broadcast Band	Ant.	200 mmf.	1500 KC	BC	1500 KC	C7 BC osc.trim	Peak accurately
8							C5 BC ant.trim	Peak accurately
9				600 KC	BC	600 KC	C8 BC osc.pad.	Peak accurately
10	(Repeat operations 7 and 8)							
11	(Check calibration and sensitivity at 600 KC, 1000 KC and 1500 KC)							
12	S.W. Band	Ant.	*	18 MC	SW	18 MC	C6 SW ant trim	**
13	(Check calibration and sensitivity at 6.0 MC and 18 MC)							
14	(Check operations 1 to 13 inclusive)							

*100 ohm non-inductive resistor and 200 mmf. condenser in series.
**Rock dial while making this adjustment. Make certain that adjustment is made on fundamental signal and not on image. Peak accurately.

ADJUSTING THE PUSH-BUTTON TUNER

1. Select six favorite nearby broadcast stations and detach the corresponding call letter tabs from the station call letter tab sheets.

2. Remove the escutcheon plate from the front of the cabinet by means of the two screws and insert the station call letter tabs. Any tab may be used for any button, but it is usually more convenient for the operator if the tabs are arranged in sequence so that the tab for the lowest frequency station (station having lowest number of kilocycles [K. C.]) will be at the extreme left.

3. Using a small screwdriver or other tool that will fit the slot in the end of the button, push the button in as far as it will go and turn to the right or left until the dial pointer has moved to the desired station frequency. Be sure the button is pushed all the way in and the station is tuned in accurately.

4. Repeat the procedure in paragraph 3 for each of the remaining five buttons.

5. Check all buttons by pushing them in, one at a time, to determine whether desired stations are tuned properly.

6. Replace escutcheon.

7. Any of the six stations to which the automatic push-button mechanism has been adjusted may now be received simply by pushing the button for the desired station.

1. **DESCRIPTION:** Equipped with six-button automatic push button tuner; Dial having tuning scale for Broadcast Band and Short-Wave Band; Automatic Volume Control; Interference Rejector Circuit; Band Selector Switch; Full Dynamic Speaker and six Tubes, with equivalent performance of nine single-purpose tubes.

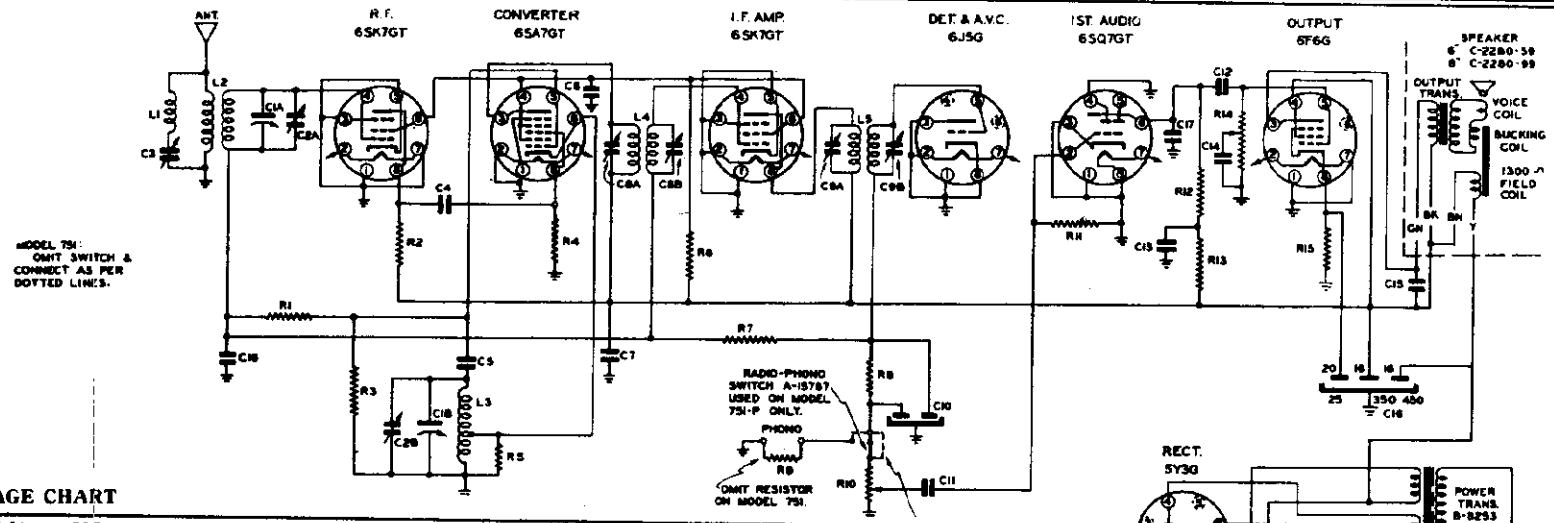
The tube equipment is:

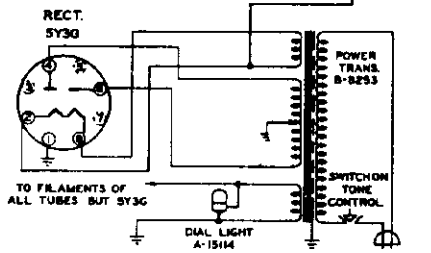
1—Type 6A7 —Converter Heptode
1—Type 78 —Intermediate-Frequency Pentode
1—Type 75 —Duplex-Diode-Triode Second Detector—A. V. C. and Audio Amplifier
1—Type 78 —Driver
1—Type 6AC5G—Power Amplifier Triode
1—Type 80 —Full-Wave Vacuum Rectifier

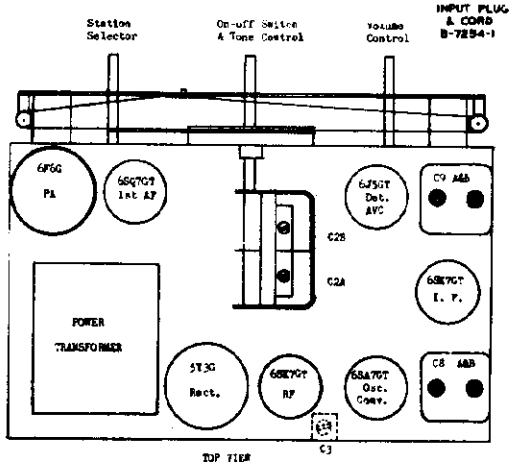
2. **POWER SUPPLY:** On models designed for operation on 60-cycle current the receptacle plug may be attached to any outlet from 110 to 120 volts, 50 to 60 cycle alternating current (a. c.) power supply system.

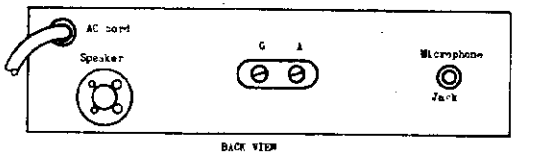
This model is available in either 25 cycle or 60 cycle alternating current (a. c.).

This model receiving set, designed for operation on 25 cycle current, will operate satisfactorily on 60 cycle current; however, **a radio set designed for operation on 60 cycle current WILL NOT operate on 25 cycle current.**









VOLTAGE CHART

Line Voltage: 117 volts — Position of Volume Control: Full with Antenna Disconnected

TUBE	FUNCTION	Voltage of Socket Prongs to Gnd. (See Nos. on Schematic Diagram)							
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
6SK7GT	R-F Amplifier	0	6.2*	0	0	0	55	0	200
6SA7GT	Osc. Converter	0	0	225	54	-2	0	6.2*	**
6SK7GT	I-F Amplifier	0	0	0	-**	0	54	6.2*	220
6J5GT	Det - AVC	0	0	0	-**	-3	225	6.2*	0
6SQ7GT	1st Audio	0	-**	0	0	0	33	6.2*	0
6F6G	Power Amplifier	0	6.2*	210	230	0	90	0	13
5Y3G	Rectifier	0	340*	0	280*	0	280*	0	340*

NOTES: Voltage readings are for schematic diagram on back of sheet. Allow 15% + or - on all measurements. Always use meter scales which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter.
*AC readings
**Cannot be measured with 1000 ohms per volt voltmeter.

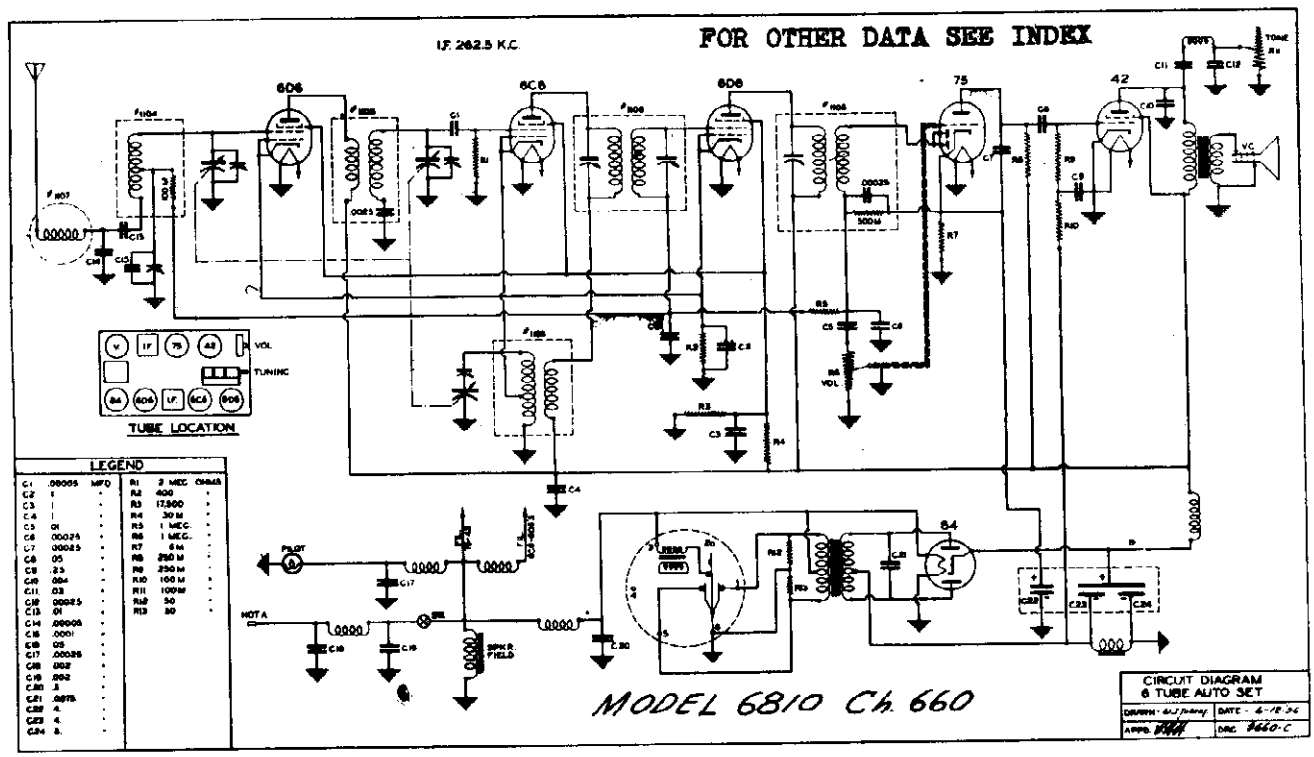
ALIGNMENT CHART

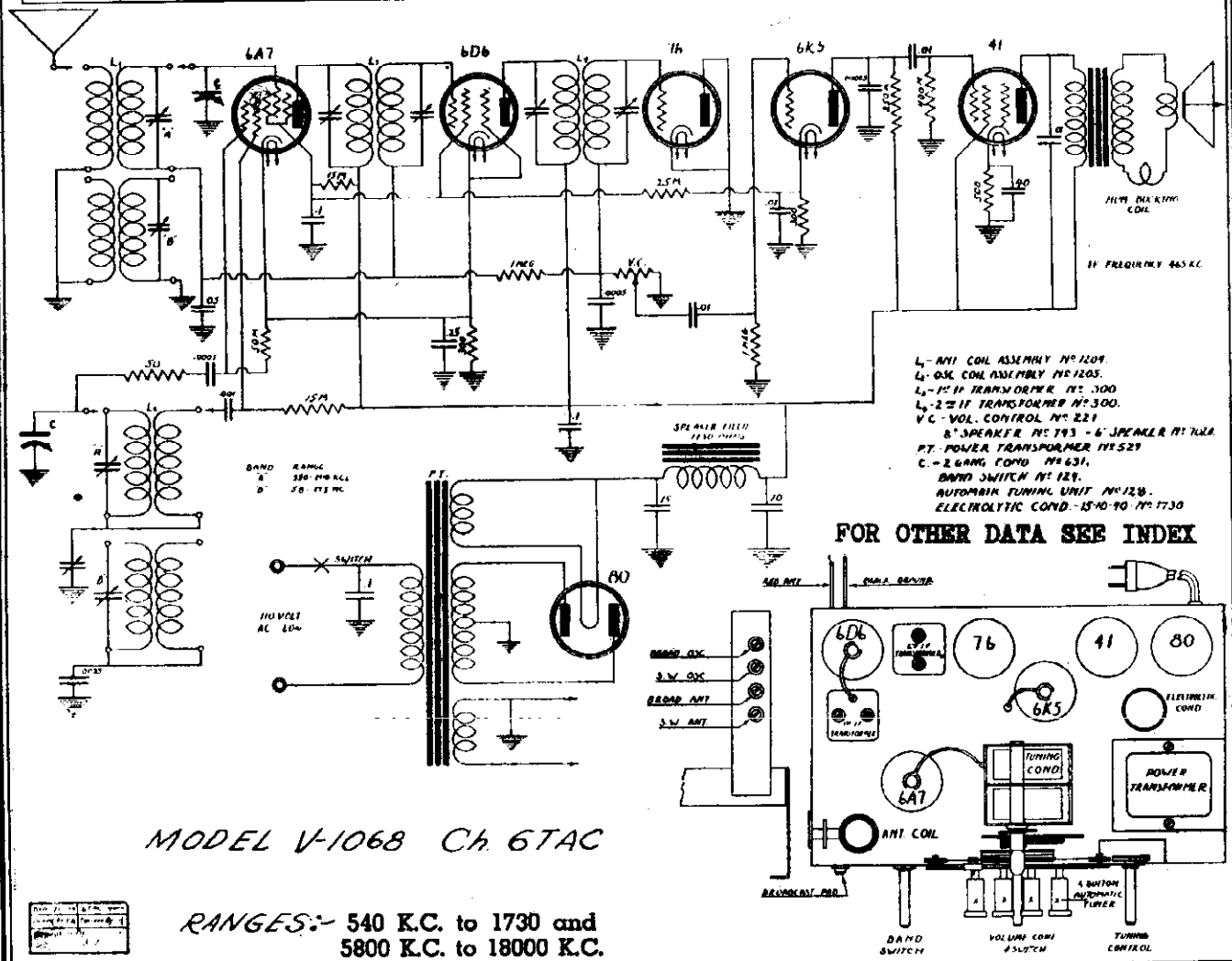
OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	TUNING CONDENSER SETTING	TRIMMER	REMARKS
1	(Set pointer to last calibration mark on KC scale with gang fully closed.)						
2	I.F.	Prong No. 8 of 6SA7GT	.1 mf	456 KC	Open	C9 A&B	2nd I.F.
						C8 A&B	1st I.F.
3	Rejector	Ant.	200 mmf.	456 KC	Closed	C3	Adjust to minimum
4	Broadcast band	Ant.	200 mmf.	1500 KC	1500 KC	C2B Osc.	Peak accurately
						C2A Ant.	Peak accurately
5	(Check calibration and sensitivity at 600 KC, 900 KC and 1500 KC)						
6	(Check operations 1 to 5 inclusive.)						

C1A&B	VARIABLE CONDENSER	B-8225
C2A&B	TRIMMERS ON VAR. COND.	
C3	I.F. REJECT. TRIMMER	A-14088-2
C4	40 MMF. MICA	C-720-381
C5	250 MMF. MICA	C-720-324
C6	.1 MFD. 400 V.	C-3204-38C
C7	.1 MFD. 400 V.	C-3204-38C
C8A&B	NO.1 I.F. TRIMMER	B-7200-GN
C9A&B	NO.2 I.F. TRIMMER	B-7200-GN
C10	250-400 MMF. MICA	A-15697
C11	.02 MFD. 200 V.	C-3202-22C
C12	.02 MFD. 400 V.	C-3204-22C
C13	.1 MFD. 400 V.	C-3204-38C
C14	.006 MFD. 400 V.	C-3204-68C
C15	.006 MFD. 400 V.	C-3204-68C
C16	ELECT. COND.	A-15786
C17	250 MMF MICA	C-720-324
C18	.1 MFD. 400 V.	C-3204-38C
R1	15 MEGOHM .25 W.	A-15788
R2	3900 Ω .25 W.	C-2795-173B
R3	15,000 Ω .25 W.	C-2795-78B
R4	2.2 MEGOHM .25 W.	C-2795-102B
R5	470 Ω .25 W.	C-2795-151B
R6	22,000 Ω 2 W.	C-2798-78A
R7	2.2 MEGOHM .25 W.	C-2795-102B
R8	56,000 Ω .25 W.	C-2795-83B
R9	560,000 Ω .25 W.	C-2795-95B
R10	.5 MEG. VOL. CONT.	A-15130-S
R11	4.7 MEGOHM .25 W.	C-2795-106B
R12	150,000 Ω .25 W.	C-2795-88B
R13	100,000 Ω .25 W.	C-2795-86B
R14	TONE CONTROL & SW	A-15128-2
R15	330 Ω 1 W.	C-2787-56B
L1	I.F. REJECT COIL	A-14718-1
L2	B.C. ANT. COIL	A-14974-S
L3	B.C. OSC. COIL	A-15790
L4	NO.1 I.F. COIL	A-12064-39
L5	NO.2 I.F. COIL	

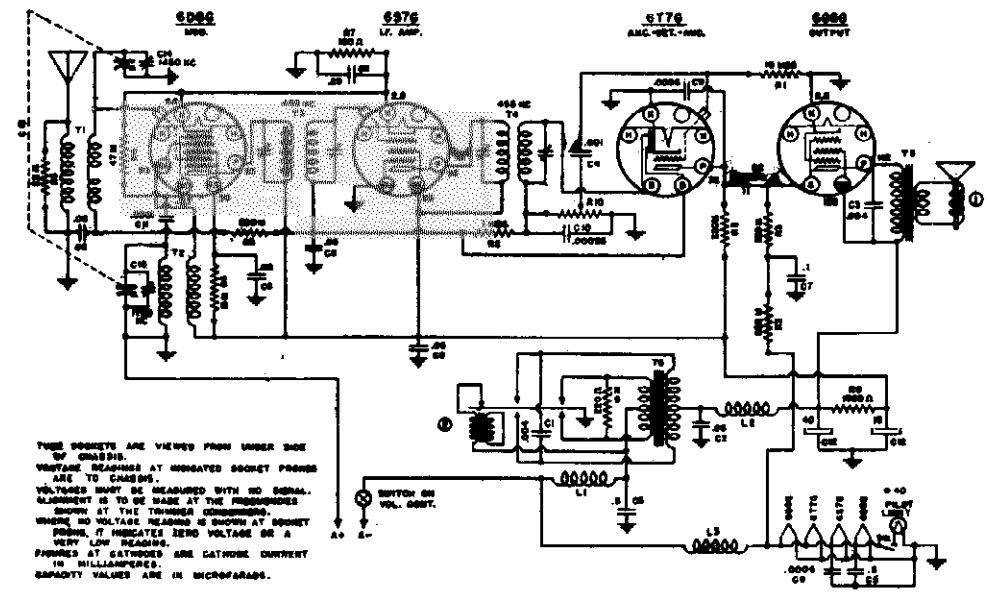
MODEL V1068, Ch. 6TAC
MODEL 6810, Ch. 660

SPIEGEL, INC.





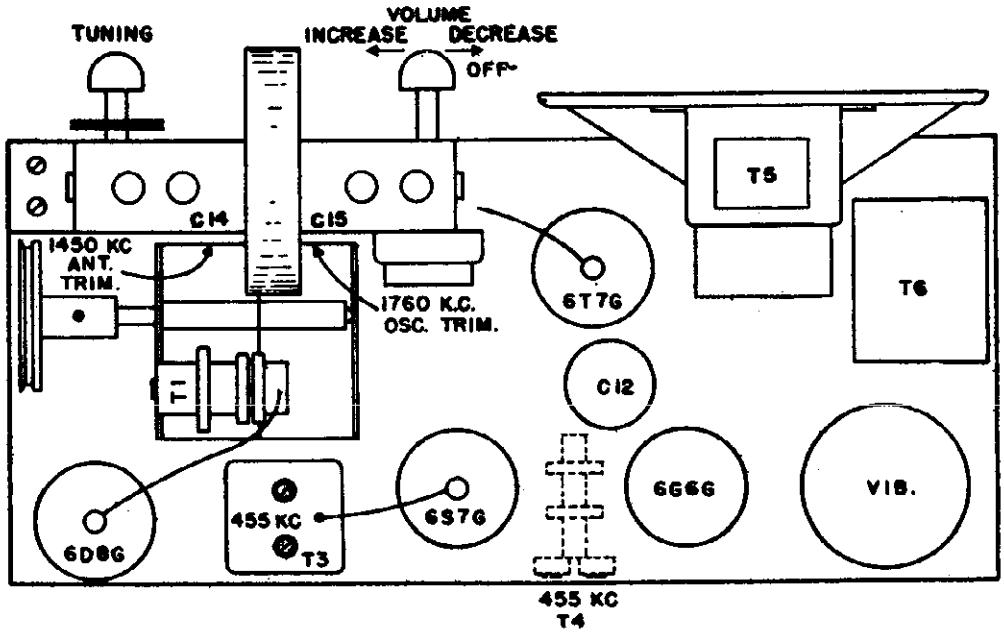
SPIEGEL, INC.



CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION
R1	60-153	10 MEGOHM 1/2 W RESISTOR	C1	10-167	.004 MFD. 1000 V. BUFFER COND	T1	10-228	ANTENNA TRANSFORMER
R2	60-106	1 " " "	C2	1807	.05 " 400 V TUB. CONDENSER	T2	10-240	OSCILLATOR "
R3	60-160	500 M OHM " "	C3	10-125	.006 " " "	T3	10-233	1ST. I.F. "
R4	60-171	47 M " " "	C4	10-124	.001 " " "	T4	10-232	2 ND. I.F. "
R5	60-155	22 M " " "	C5	10-112	.5 " 500 V. "	T5		OUTPUT TRANS. (ON SPKR.)
R6	60-152	15 M " " "	C6	10-109	.25 " " " "	T6	60-100	VIBRATOR TRANSFORMER
R7	60-127	100 " " "	C7	10-115	.1 " " " "	L1	33-217	VIBRATOR CHOKE
R8	60-005	1500 " 1/2 W "	C8	1802	.05 " " "	L2	10-246	R.F. "
R9	60-150	220 " " "	C9	10-112	.0005 " MICA CONDENSER	L3	33-218	FILAMENT "
R10	60-124	VOLUME CONTROL 500M Ω	C10	1804	.00025 " " "	J	79-236	SPEAKER 6" P.M.
			C11	1801	.001 " " "	V	34-100	VIBRATOR
			C12	10-238	40 X 10 MFD ELECTROLYTIC			
			C13	10-132	2 GANG VARIABLE CONDENSER CH1 & CH2			

PUSH BUTTON DATA:

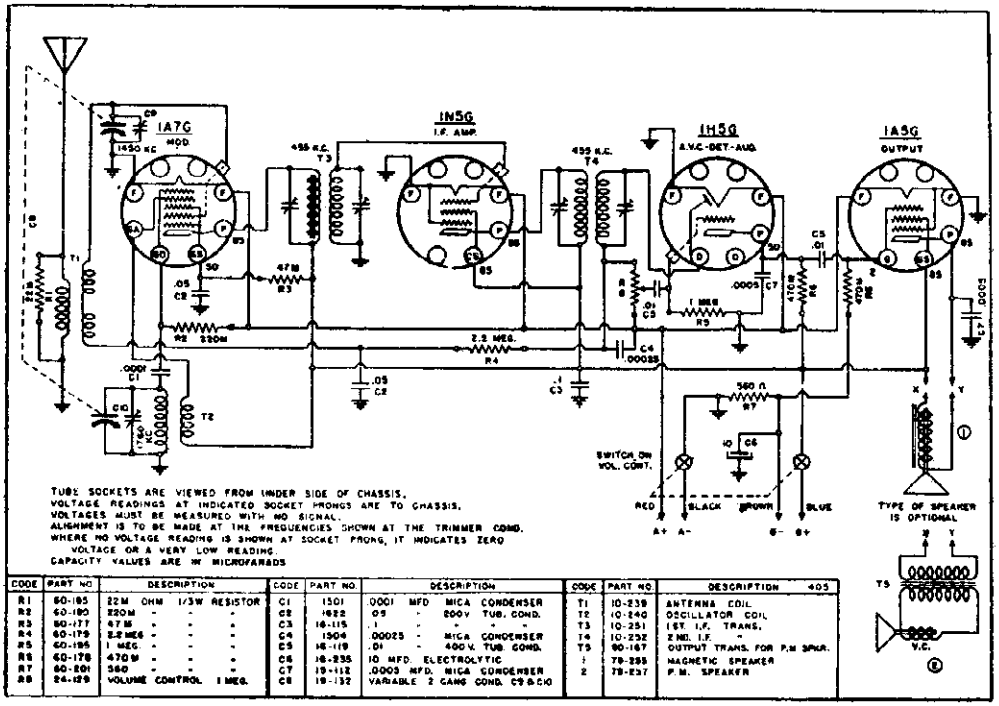
1. By means of Selector Knob tune in WITH RIGHT HAND AS ACCURATELY AS POSSIBLE station with lowest frequency.
2. After station has been tuned in continue to hold in its position with left hand loosen Push-Button to be set up for station by unscrewing Push-Button one turn to left (counter-clockwise).
3. After Push-Button has been depressed, tighten it gently (clockwise). Release Push-Button slowly when in normal position grip button and tighten. Push-Button is now set up for first selected station of lowest frequency and Call Letter Tab for station should be at extreme right of Call Letter Holders. Second station set up will be second lowest in frequency.



LOCATION OF PARTS ON TOP OF CHASSIS

MODEL V1216
Chassis 405

SPIEGEL, INC.



CODE	PART NO.	DESCRIPTION
R1	60-185	22M OHM 1/3W RESISTOR
R2	60-190	220M - - -
R3	60-177	47M - - -
R4	60-179	2.2 MEG - - -
R5	60-195	1 MEG. - - -
R6	60-178	470M - - -
R7	60-801	560 - - -
R8	24-129	VOLUME CONTROL 1 MEG.

CODE	PART NO.	DESCRIPTION
C1	1501	.0001 MFD MICA CONDENSER
C2	1822	.05 - 200V TUB. COND.
C3	16-115	.1 - - -
C4	1504	.00025 - MICA CONDENSER
C5	16-119	.01 - 400 V. TUB. COND.
C6	16-235	10 MFD. ELECTROLYTIC
C7	19-112	.0003 MFD. MICA CONDENSER
C8	19-132	VARIABLE 2 GANG COND. C9 & C10

CODE	PART NO.	DESCRIPTION 405
T1	10-238	ANTENNA COIL
T2	10-240	OSCILLATOR COIL
T3	10-251	1ST I.F. TRANS.
T4	10-252	2 ND. I.F. -
T5	90-167	OUTPUT TRANS. FOR P.M SPKR.
1	78-255	MAGNETIC SPEAKER
2	78-237	P.M. SPEAKER

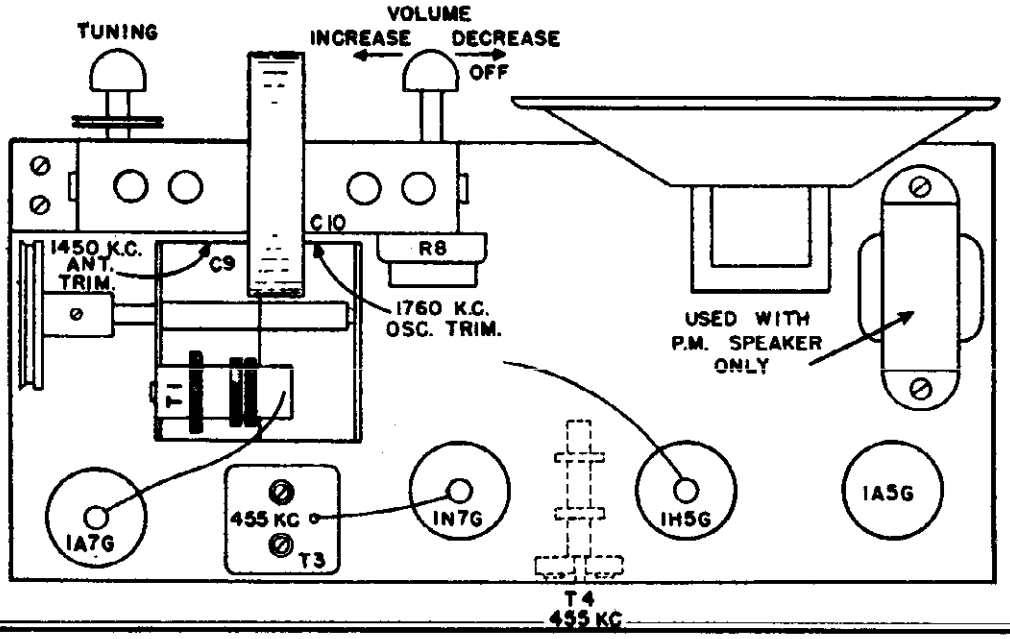
Follow the procedure outlined below, in order to adjust the push-buttons properly:

1. By means of the Station Selector Knob tune in WITH THE RIGHT HAND AS ACCURATELY AS POSSIBLE the station having the lowest frequency.

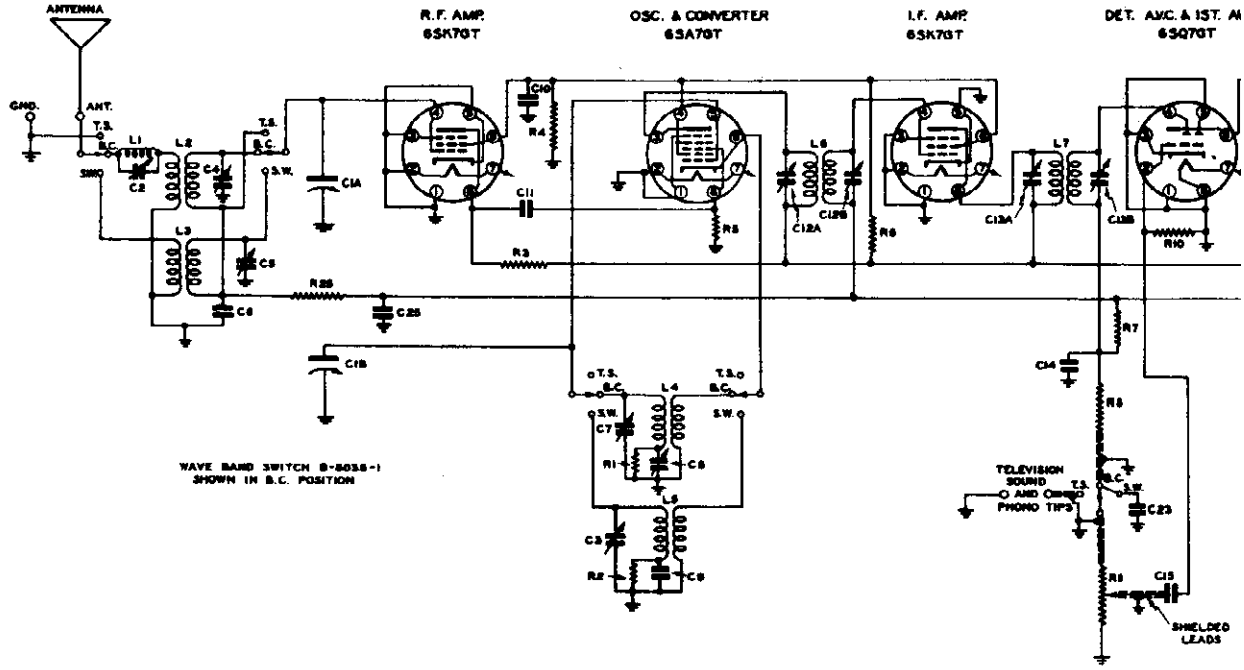
2. After the station has been tuned in accurately with the right hand, continue to hold it in its exact position firmly, and with the left hand loosen the Push-Button to be set up for that station by unscrewing the Push-Button about one turn to the left (counter-clockwise).

3. Continuing to hold the Station Selector Knob in its exact position, PUSH THE PUSH-BUTTON IN ALL THE WAY with the left hand.

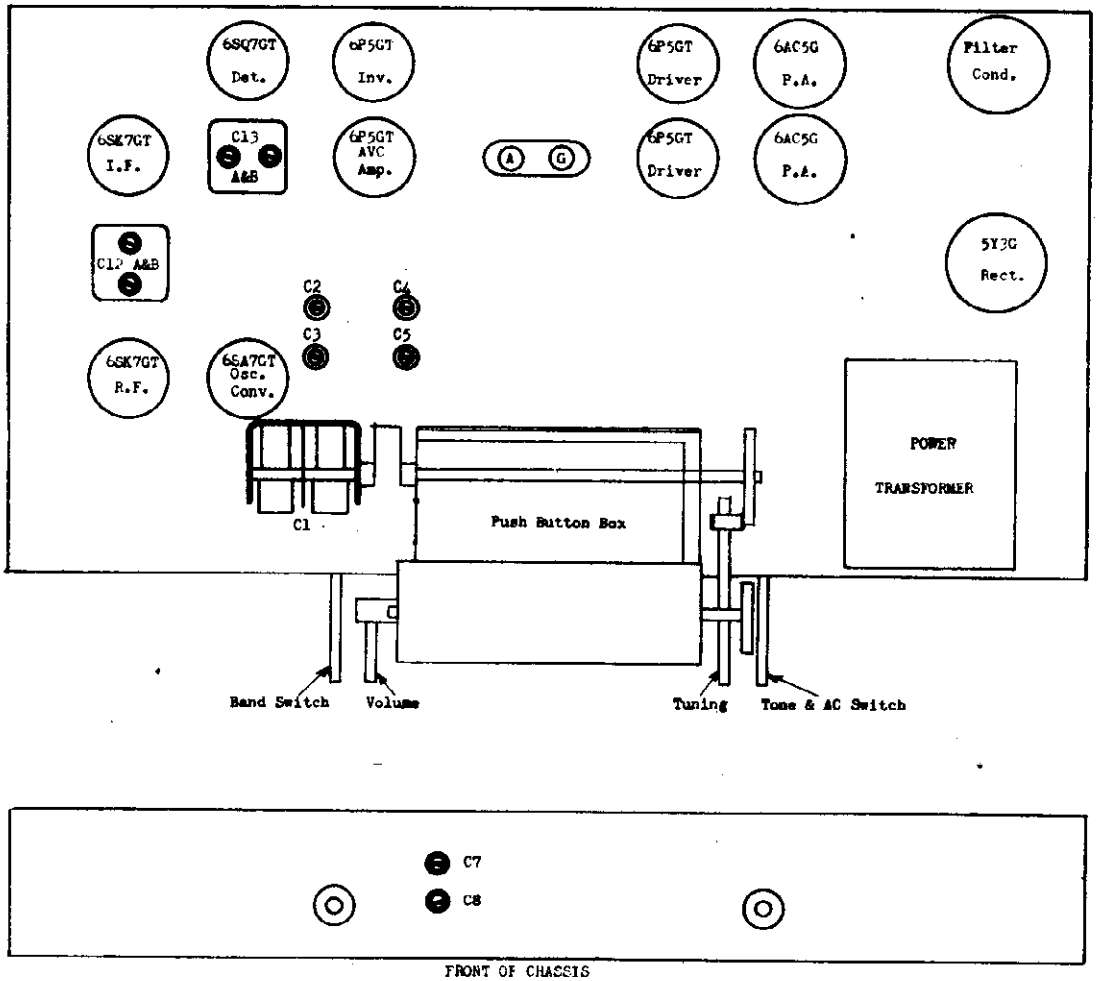
4. After the Push-Button has been depressed all the way, tighten it gently toward the right (clockwise). Release Push-Button slowly and when in normal position grip button and tighten firmly.



SPIEGE



CHASSIS DIAGRAM



Line Voltage: 11	
Tube	Func
6SK7GT	R-F Ampli
6SA7GT	Osc - Con
6SK7GT	I-F Ampli
6SQ7GT	Det - AVC
6P5GT	Phase Inv
6P5GT	Driver
6P5GT	Driver
6AC5G	Power Amp
6AC5G	Power Amp
6P5GT	AVC Ampli
6AF6G	Dual Viso
5Y3G	Rectifier

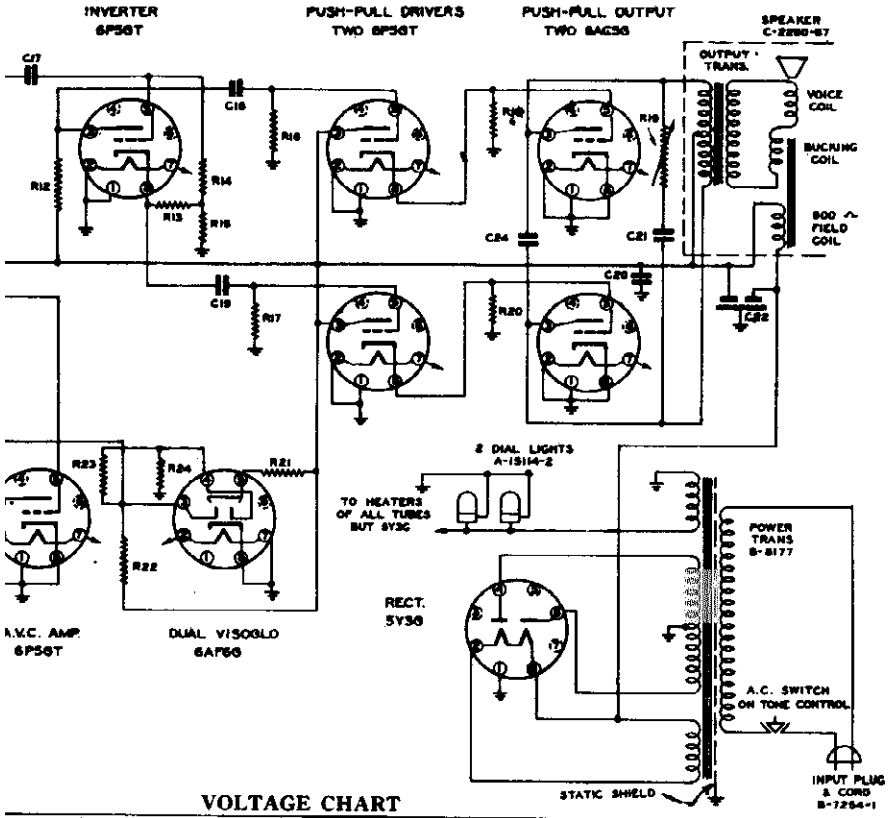
Notes: Voltage r
Always us
ments mad

OPER-ATION	ALIGNMEN OF
1	(Set dri fully me
2	I.F.
3	Rejector
4	Broad-cast
5	Band
6	(Repeat
7	(Check ca
8	Shortwave Band
9	(Check ca
10	(Check op

Notes: *Pin No.
**100 ohm
***Rock dial

NC.

MODEL 1271SP



C1A&B	VARIABLE CONDENSER	B-7229
C2	I.F. REJECT. TRIMMER	A-14200-2
C3	S.W. OSC. TRIMMER	
C4	B.C. ANT. TRIMMER	
C5	S.W. ANT. TRIMMER	A-14200
C6	.05 MFD. 200 V.	C-3202-84C
C7	B.C. OSC. TRIMMER	B-7199-EY
C8	B.C. OSC. PADDER	
C9	2700 MMF. MICA	A-15431
C10	.05 MFD. 400 V.	C-3204-28C
C11	40 MMF. MICA	C-720-381
C12A&B	NO 1 I.F. TRIMMER	B-7200-GN
C13A&B	NO.2 I.F. TRIMMER	B-7200-GN

C14	250 MMF. MICA	C-720-324
C15	.02 MFD. 400V.	C-3204-22C
C16	250 MMF. MICA	C-720-324
C17	.05 MFD. 400V.	C-3204-28C
C18	.05 MFD. 400V.	C-3204-28C
C19	.05 MFD. 400V.	C-3204-28C
C20	.05 MFD. 400V.	C-3204-28C
C21	.03 MFD. 600V.	C-3203-24C
C22	16-16 MFD. 450V. ELECT.	A-15425
C23	100 MMF. MICA	C-720-330
C24	.006 MFD. 600V.	C-3206-72C
C25	.05 MFD. 200V.	C-3202-84C

R1	56,000 Ω	.25W.	C-2795-83B
R2	33,000 Ω	.25W.	C-2795-81B
R3	3300 Ω	.25W.	C-2795-65B
R4	27,000 Ω	.5W.	C-2796-79C
R5	2.2 MEGOHM	.25W.	C-2795-102B
R6	33,000 Ω	2W.	C-2795-80A
R7	1 MEGOHM	.25W.	C-2795-98B
R8	56,000 Ω	.25W.	C-2795-83B
R9	500,000 Ω VOL. CONT.		A-15130-3
R10	4.7 MEGOHM	.25W.	C-2795-106B
R11	270,000 Ω	.25W.	C-2795-91B
R12	39,000 Ω	.5 W.	C-2796-107C
R13	2700 Ω	.25W.	C-2795-69B

R14	1 MEGOHM	.25W.	C-2795-98B
R15	33,000 Ω	.5W.	C-2796-105C
R16	270,000 Ω	.25W.	C-2795-91B
R17	270,000 Ω	.25W.	C-2795-91B
R18	22,000 Ω	.25W.	C-2795-76B
R19	TONE CONT. & S.W.		A-15128-3
R20	22,000 Ω	.25W.	C-2795-76B
R21	56,000 Ω	.25W.	C-2795-83B
R22	150,000 Ω	.25W.	C-2795-89B
R23	1 MEGOHM	.25W.	C-2795-98B
R24	1 MEGOHM	.25W.	C-2795-98B
R25	270,000 Ω	.25W.	C-2795-91B

L1	I.F. REJECTOR COIL	A-14677-2
L2	B.C. ANT. COIL	A-14678-3
L3	S.W. ANT. COIL	A-14682-7
L4	B.C. OSC. COIL	A-15373
L5	S.W. OSC. COIL	A-15233-7
L6	NO. 1 I.F. COIL	A-12084-39
L7	NO. 2 I.F. COIL	A-12084-17

VOLTAGE CHART

Position of Volume Control: Full with Antenna Disconnected
Position of Band Switch: Broadcast

	Voltage of Socket Prongs to Gnd. (See Nos. on Schematic Diagram)								
	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	Grid Cap
	0	0	0	-.1a	0	40	*6.3	235	-
	0	0	250	40	-.3a	0	*6.3	0	-
	0	0	0	-.1a	0	40	*6.3	250	-
o Amp.	0	-.1a	0	-.04a	0	43	*6.3	0	-
	0	0	160	52	b	265	*6.3	62	-
-pull	0	0	255	—	0	150	*6.3	13.5	-
	0	0	255	—	0	—	*6.3	13.5	-
-pull	0	0	245	—	13.5	—	*6.3	0	-
	0	0	245	—	13.5	—	*6.3	0	-
	0	0	22	—	-.14a	—	*6.3	0	-
	0	*6.3	21.5	b	150	—	0	0	-
	-	*385	0	*330	—	*330	*240	*380	-

are for schematic diagram in this bulletin. Allow 15% + or - on all measurements.
scale which will give greatest deflection within scale limits. All DC measure-
1000 ohms per volt voltmeter. *-A.C. Scale.
a-1- volt scale.
b-Cannot be measured with 1000 ohms/volt voltmeter.

ALIGNMENT CHART

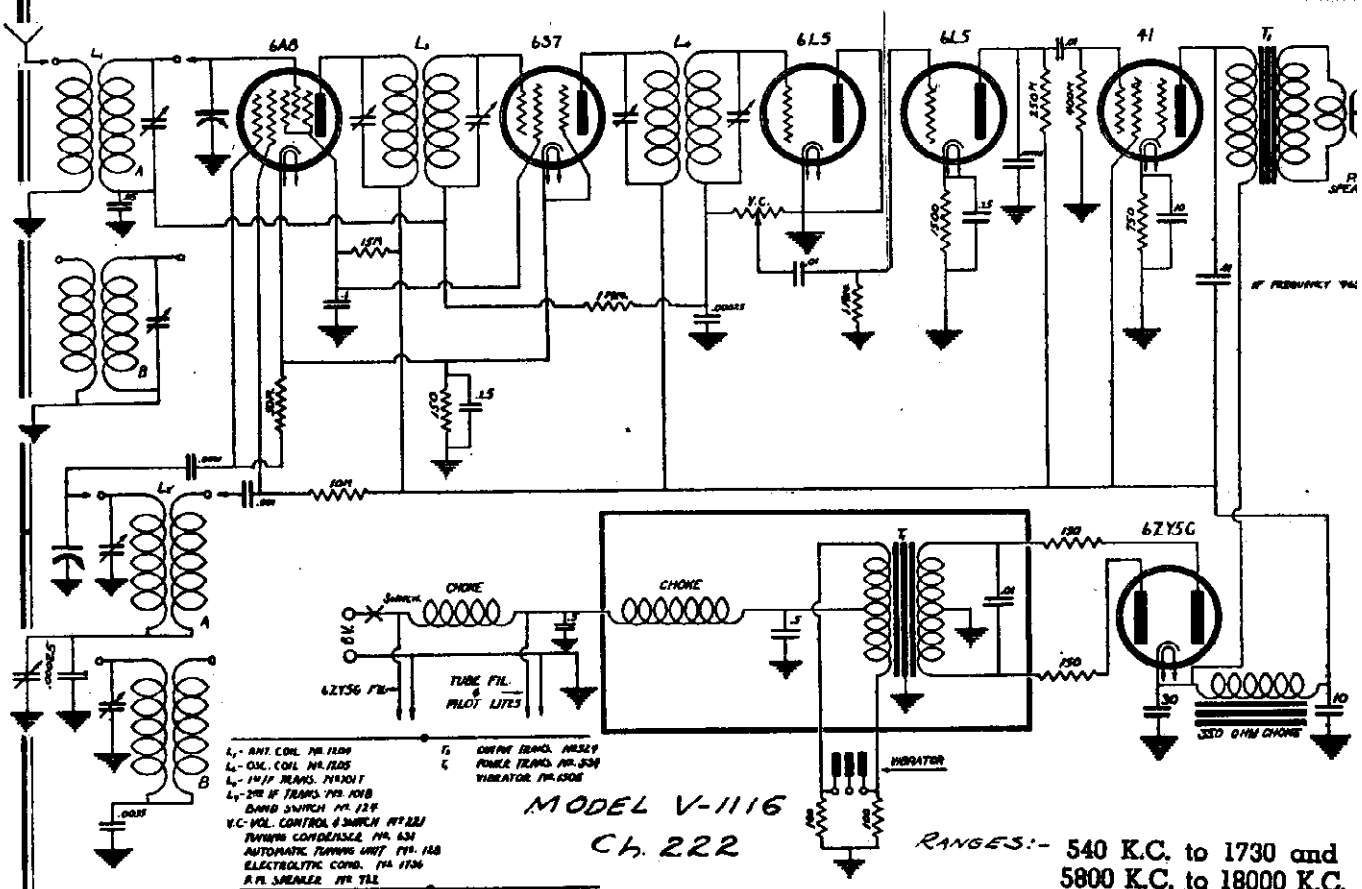
ENERATOR NNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
l so that pointer is over left hand stop line of alignment scale with condenser See special note below.)						
*	.1 mf.	456 KC	BC	Open	C13 A,B	2nd I.F.
					C12 A,B	1st I.F.
Ant.	200 mmf.	456 KC	BC	Closed	C2	Adjust to minimum
Ant.	200 mmf.	1400 KC	BC	1400 KC	C7 (Osc.)	***
					C4 (Ant.)	***
		600 KC	BC	600 KC	C8 (Pad.)	***
on 4)						
ion and sensitivity at 600 KC, 1000 KC and 1400 KC)						
Ant.	**	18 MC	SW	18 MC	C3 (Osc.)	***
					C5 (Ant.)	***
ion and sensitivity at 6.MC and 18. MC)						
ns 1 to 9 inclusive.)						

7GT Osc-Converter tube.
and 200 mmf. condenser in series.
adjusting for maximum output.

SCHEMATIC DIAGRAM
AIR CASTLE SUPER
HETERODYNE MODEL
1271-SP
INTERMEDIATE
FREQUENCY 456 K.C.
Bottom View of all
Socket connections.

MODEL V1116, Ch. 222
MODEL V1224, Ch. 902

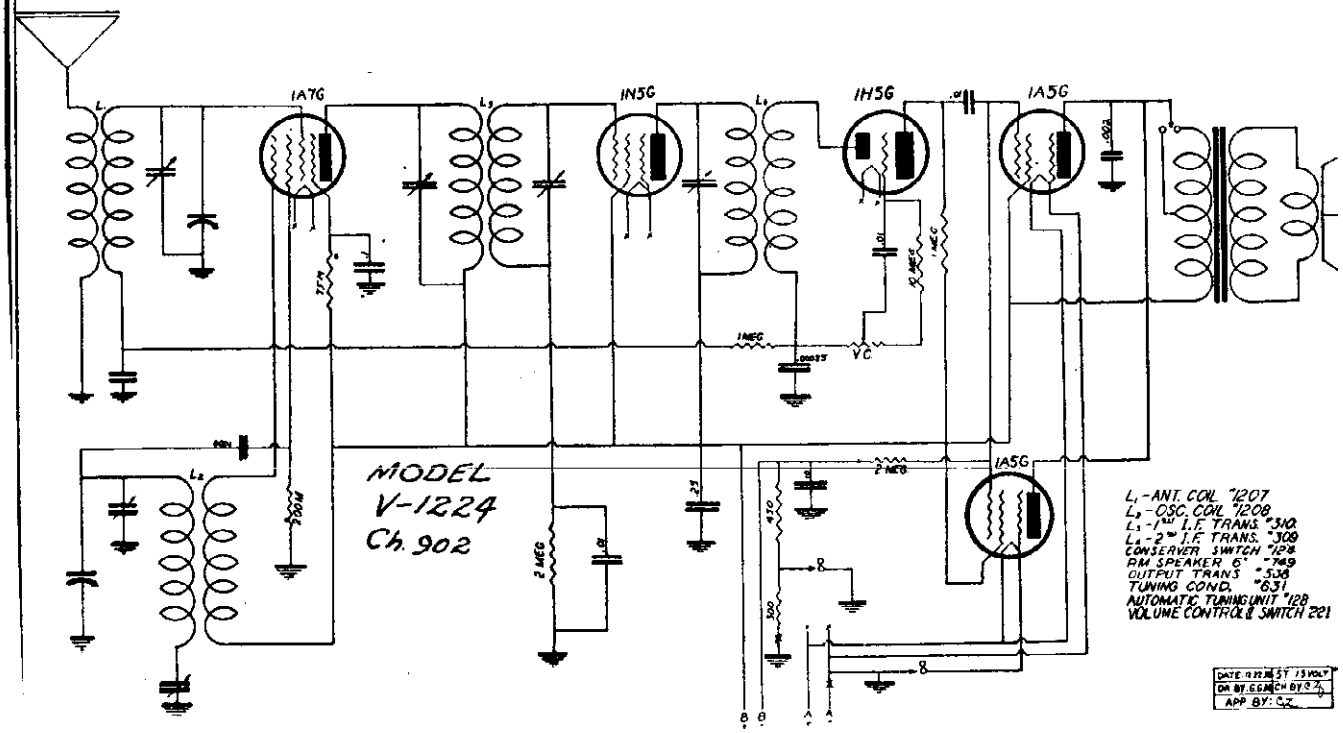
SPIEGEL, INC.



MODEL V-1116
Ch. 222

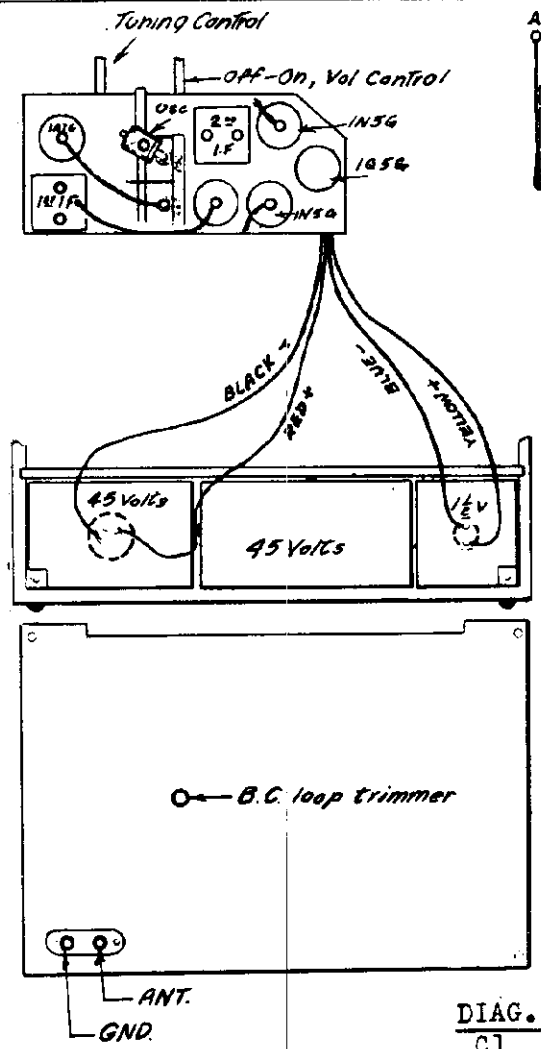
RANGES:- 540 K.C. to 1730 and 5800 K.C. to 18000 K.C.

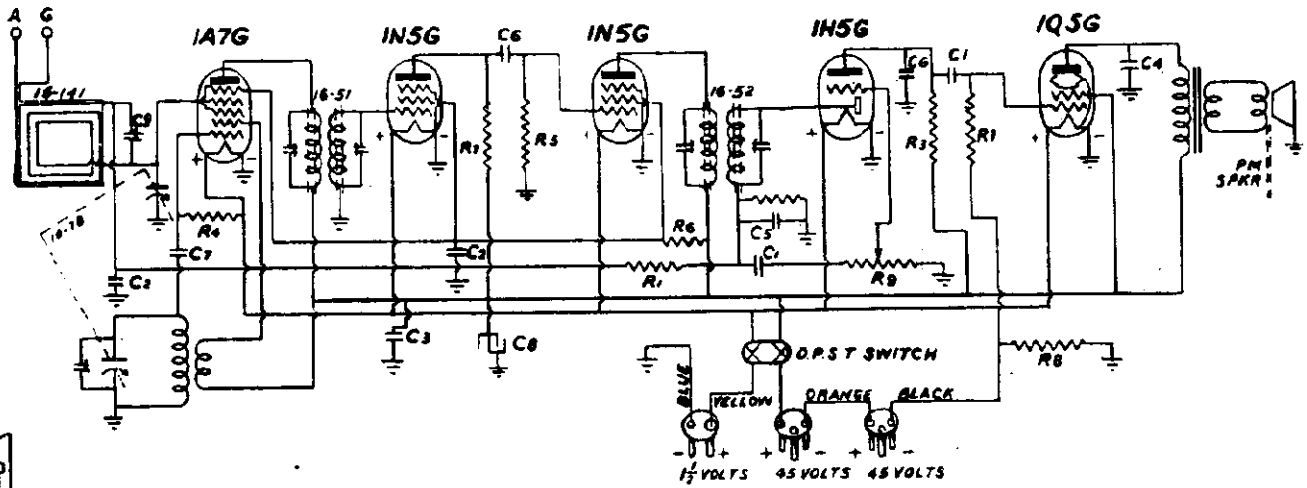
FOR OTHER DATA SEE INDEX



RANGE:- 540-1730 K.C.

FOR OTHER DATA SEE INDEX





I. F. Alignment

Set the pointer to 1500 K. C. Connect the generator leads to the 1A7G grid and to the chassis thru a .1 Mfd. condenser. Adjust the I. F. trimmers for maximum output indication.

R. F. Alignment

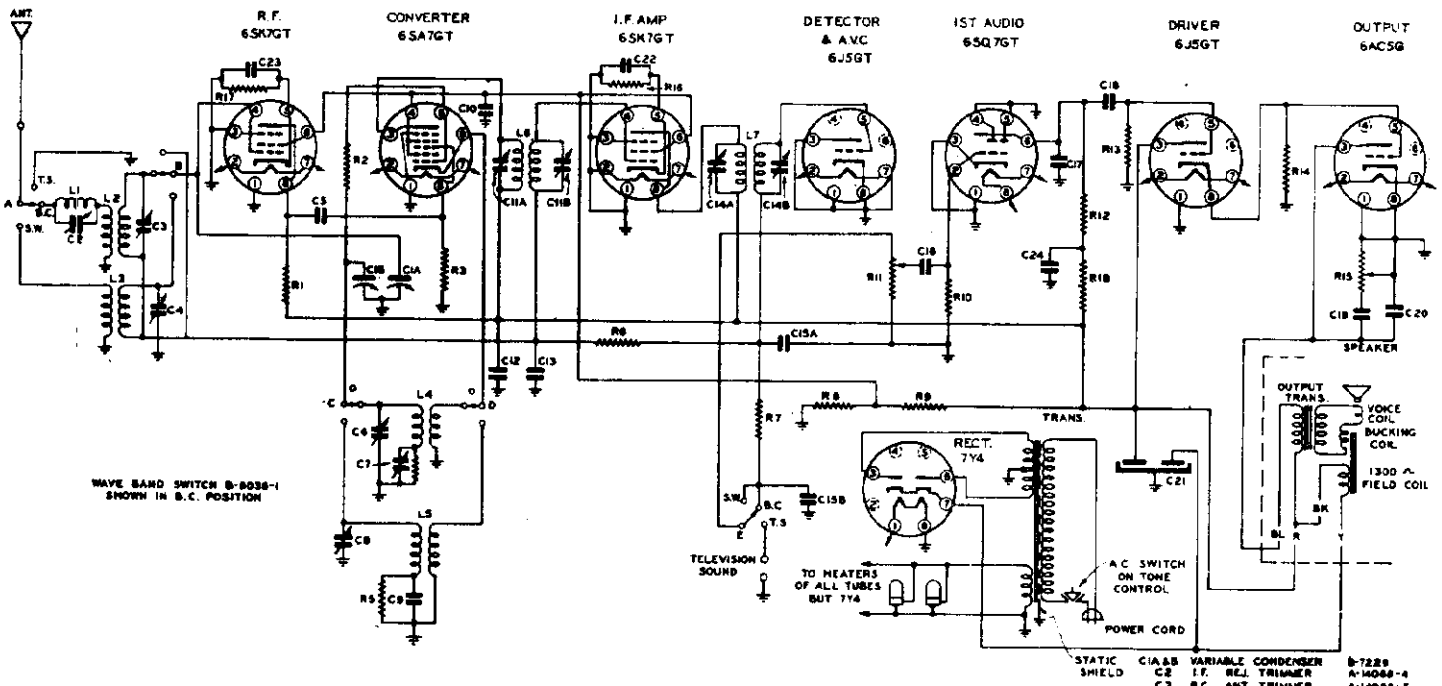
Connect the generator leads to the 1A7G grid and to the chassis through a .1 Mfd. condenser. Set the signal generator at 1400 KC., and set the receiver pointer at 1400 KC. Adjust the oscillator shunt trimmer for resonance.

Fasten the back cover. Connect the generator to the antenna and ground terminal, and adjust the loop antenna trimmer at 1400 KC. for maximum output.

DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
C1	6-1	.01 Mfd.	R1	3-2	2 Megohms
C2	6-12	.05 Mfd.	R2	3-6	1 Megohms
C3	6-24	.2 Mfd.	R3	3-1	500K ohms
C4	6-50	.002 Mfd.	R4	3-62	200K ohms
C5	8-6	.0001 Mfd.	R5	3-51	75X ohms
C6	8-10	.00025 Mfd.	R6	3-26	30K ohms
C7	8-13	.00005 Mfd.	R7	3-14	10 Kohms
C8	7-56	.8 Mfd.	R8	3-175	350 ohms
C9	9-49	.000008 Mfd.	R9	5-65	1 Megohm V.C.

INTERMEDIATE FREQUENCY 456 K.C.

BOTTOM VIEWS OF ALL SOCKET CONNECTIONS



ADJUSTING THE PUSH-BUTTON TUNER

1. Select six favorite nearby broadcast stations and detach the corresponding call letter tabs from the station call letter tab sheets.

2. Any tab may be used for any button, but it is usually more convenient for the operator if the tabs are arranged in sequence so that the tab for the lowest frequency station (station having lowest number of kilocycles [K. C.]) will be at the low frequency end of the dial.

3. Using a small screwdriver or other tool that will fit the screw in the end of the button, push the button in as far as it will go and turn to the right or left until the dial pointer has moved to the desired station frequency. Be sure the button is pushed all the way in and the station is tuned in accurately.

4. Repeat the procedure in Paragraph 3 for each of the remaining five buttons.

5. Check all buttons by pushing them in, one at a time, to determine whether desired stations are tuned properly.

6. Insert the proper tab in each button by pressing it in position.

7. Any of the six stations to which the push-button tuner has been adjusted may now be received simply by pushing the button for the desired station.

C1A&B	VARIABLE CONDENSER	B-7229
C2	I.F. REJ. TRIMMER	A-14088-4
C3	B.C. ANT. TRIMMER	A-14088-5
C4	S.W. ANT. TRIMMER	A-14088-3
C5	40 MMF. MICA	C-720-381
C6	B.C. OSC. TRIMMER	B-7199-E7
C7	B.C. OSC. PADDER	
C8	S.W. OSC. TRIMMER	A-14088-6
C9	2700 MMF. MICA	A-15491
C10	.2 MFD. 200V.	C-3202-40C
C11A&B	NO. 1 I.F. TRIMMER	B-7200-GN
C12	.1 MFD. 400V.	C-3204-38C
C13	.02 MFD. 200V.	C-3202-24C
C14A&B	NO. 2 I.F. TRIMMER	B-7200-GN
C15A	250 MMF. MICA	A-15887
C15B	100 MMF. MICA	
C16	.02 MFD. 200V.	C-3202-22C
C17	250 MMF. MICA	C-720-324
C18	.05 MFD. 400V.	C-3204-28C
C19	.03 MFD. 200V.	C-3202-30C
C20	.006 MFD. 500V.	C-3201-68C
C21	10-10 MFD. ELECT.	A-15741
C22	.1 MFD. 200V.	C-3202-36C
C23	.1 MFD. 200V.	C-3202-38C
C24	.1 MFD. 400V.	C-3204-38C
R1	3,300 Ω .25W.	C-2795-44B
R2	68 Ω .25W.	C-2795-40B
R3	2.2 MEG. .25W.	C-2795-102B
R4	22,000 Ω .25W.	C-2795-78B
R5	22,000 Ω .25W.	C-2795-78B
R6	1 MEG. .25W.	C-2795-94B
R7	56,000 Ω .25W.	C-2795-86B
R8	39,000 Ω 1 W.	C-2797-64B
R9	15,000 Ω 3 W.	C-2798-78A
R10	4.7 MEG. .25W.	C-2795-106B
R11	5 MEG. VOL. CONT.	A-15130-3
R12	150,000 Ω .25W.	C-2795-88B
R13	470,000 Ω .25W.	C-2795-94 B
R14	22,000 Ω .25W.	C-2795-78 B
R15	25 MEG. T.C. & SWITCH	A-15126-2
R16	220 Ω .25W.	C-2795-56B
R17	270 Ω .25W.	C-2795-58B
R18	100,000 Ω .25W.	C-2795-88B
L1	I.F. REJECTOR COIL	A-14677
L2	B.C. ANT. COIL	A-14678-1
L3	S.W. ANT. COIL	A-14682-10
L4	B.C. OSC. COIL	A-15377-2
L5	S.W. OSC. COIL	A-15233-8
L6	NO. 1 I.F. COIL	A-12664-19

MODEL 1831

SPEIGEL, INC.

VOLTAGE CHART

Line voltage: 117 volts

Position of Volume control: Full with Antenna disconnected

Position of Band Switch: Broadcast

Tube	Function	Voltage of socket prongs to Gnd. (Prong no's. on Schematic)							
		No 1	No 2	No 3	No 4	No 5	No 6	No 7	No 8
6SK7GT	R-f Amplifier	0	0	0	**	1.6	76	6.2*	237
6SA7GT	Oscillator-Converter	0	0	245	76	0	**	6.2*	0
6SK7GT	I-f Amplifier	0	0	0	**	1.6	76	6.2*	245
6J5GT	Detector-AVC	0	0	0	0	**	155	6.2*	0
6SQ7GT	1st Audio Amplifier	0	**	0	0	0	60	6.2*	0
6J5GT	Audio Driver	0	0	255	77	0	0	6.2*	11
6AC5G	Power Amplifier	0	0	240	0	11	0	6.2*	0
7Y4	Rectifier ***	0	0	300*	0	0	300*	0	0

Notes: Voltage readings are for schematic diagram on back of sheet. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter. Unless designated otherwise, voltages in table are + DC voltages.

* AC volts

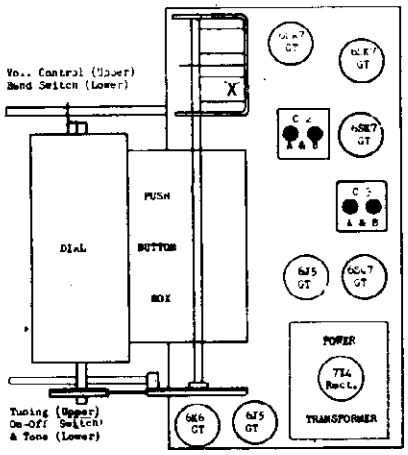
** Cannot be measured with 1000 ohms/volt voltmeter.

*** Tube removed from socket to enable test prods to reach socket prongs.

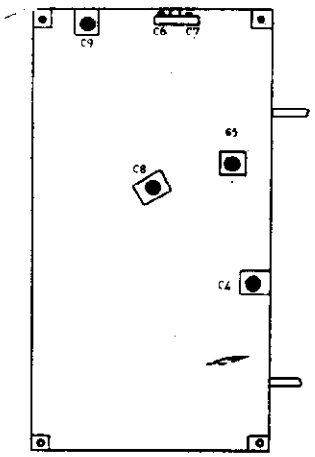
ALIGNMENT CHART

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set dial drum so that last mark on BC scale is directly toward front of set when condenser plates are fully meshed.)							
2	I.F.	*	.1 mf.	456 KC	BC	Open	C3 A&B	2nd I-F
							C2 A&B	1st I-F
3	Rejector	Ant.	200 mmf.	456 KC	BC	Closed	C4	Adjust to minimum
4	Broadcast Band	Ant.	200 mmf.	1500 KC	BC	1500 KC	C6 Osc.	
							C5 Ant.	
5				600 KC	BC	600 KC	C7 Pad.	
6	(Repeat operation 4)							
7	(Check calibration and sensitivity at 600 KC, 1000 KC and 1500 KC)							
8	Shortwave Band	Ant.	*	18 MC	SW	18 MC	C9 Osc.	Rock dial while adjusting for maximum output
							C8 Ant.	
9	(Check calibration and sensitivity at 6 MC and 18 MC)							
10	(Check operations 1 to 9 inclusive)							

Notes: *Connect to point "X" on Variable Condenser. See drawing below.
**100 ohm and 200 mmf. in series



TOP VIEW OF CHASSIS



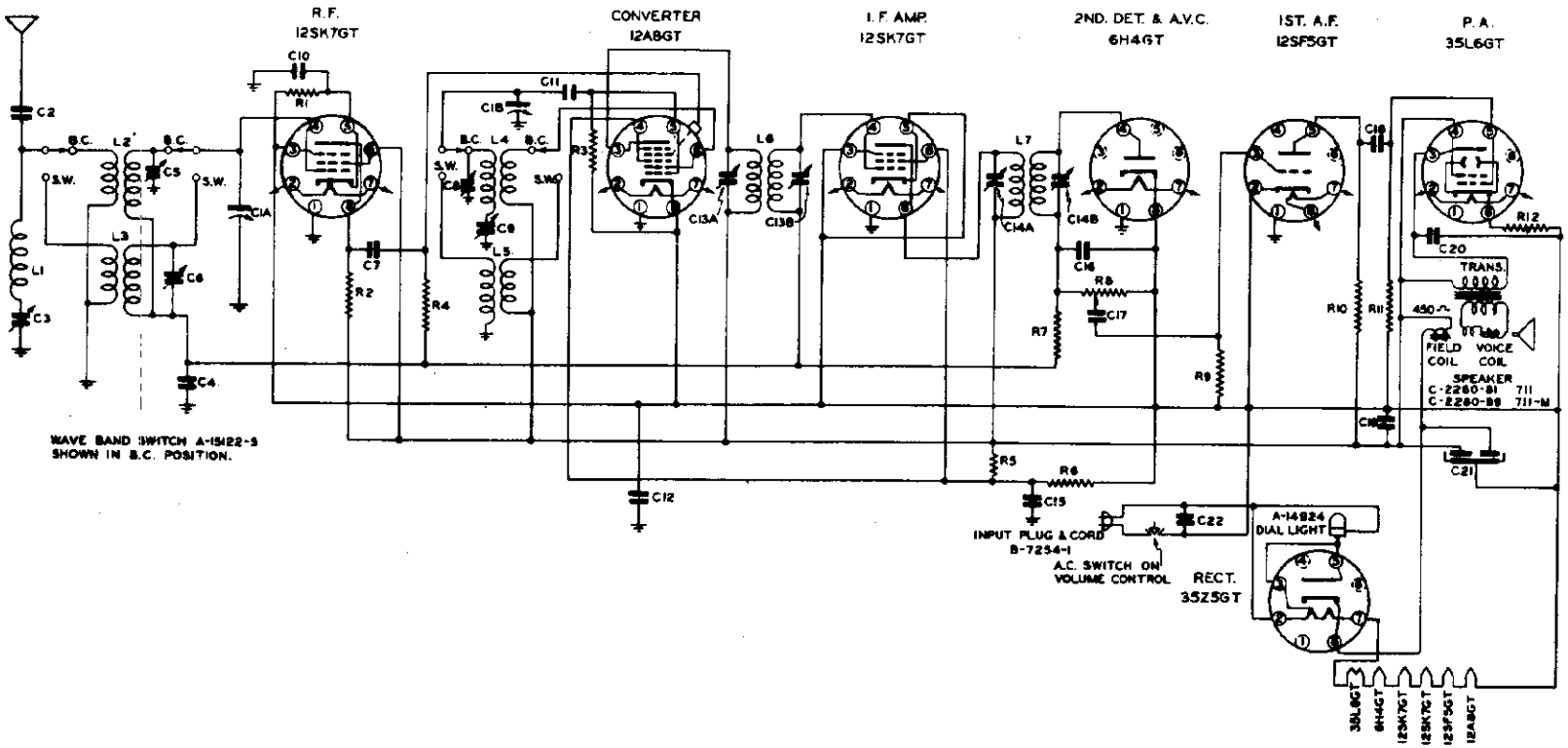
BOTTOM VIEW OF CHASSIS

2. **POWER SUPPLY:** On models designed for operation on 60-cycle current the receptacle plug may be attached to any outlet from 110 to 120 volts, 50 to 60 cycle alternating current (A. C.) power supply system.

Any receiving set designed for operation on 25-cycle current will operate satisfactorily on 60-cycle current; however, **a radio set designed for operation on 60 cycle current WILL NOT operate on 25 cycle current.**

1. **DESCRIPTION:** Equipped with six-button automatic push button tuner; new Rocket-Roto Dial with scales for Broadcast Band and Short-Wave Band; Automatic Volume Control; Continuously variable Tone Control; Interference Rejector Circuit; Band Selector Switch with positions for "Broadcast," "Short-wave" and "Television Sound," which is also used for reproducing phonograph records by means of an electrical pick-up; Full dynamic speaker and eight tubes.

SCHEMATIC DIAGRAM
AIR CASTLE SUPERHETERODYNE
INTERMEDIATE FREQUENCY 456 K.C.
BOTTOM VIEWS OF ALL SOCKET CONNECTIONS



C1A&B	VARIABLE CONDENSER	B-8181
C2	.001 MFD. 400V.	C-3204-58C
C3	I.F. REJECT. TRIMMER	A-14088-2
C4	.05 MFD. 200V.	C-3202-84C
C5	B.C. ANT. TRIMMER	A-14088-1
C6	S.W ANT. TRIMMER	A-14088-1
C7	100 MMF. MICA	C-720-338
C8	B.C. OSC. TRIMMER	A-15573
C9	S.W. OSC. PADDER	
C10	.01 MFD. 200V.	C-3202-20C
C11	50 MMF. MICA	C-720-372
C12	.15 MFD. 400V.	C-3204-95C
C13A&B	NO.1 I.F. TRIM.	B-7200-GG
C14A&B	NO.2 I.F. TRIM.	B-7200-GN
C15	.05 MFD 200V.	C-3202-84C
C16	500 MMF. MICA	C-720-316
C17	.01 MFD. 200V.	C-3202-20C
C18	.01 MFD. 200V.	C-3202-20C
C19	.1 MFD. 200V.	C-3202-38C
C20	.03 MFD. 400V.	C-3204-80C
C21	25-25 MFD. ELECT.	A-15571
C22	.01 MFD. 400V.	C-3204-20C
R1	470 Ω .25W.	C-2795-151B
R2	3900 Ω .25W.	C-2795-698
R3	56,000 Ω .25W.	C-2795-835
R4	56,000 Ω .25W.	C-2795-838
R5	3300 Ω .5W.	C-2796-68C
R6	10,000 Ω .5W.	C-2796-74C
R7	1 MEGOHM .25W.	C-2795-988
R8	500,000-Ω VOL. CONT. & SWITCH	A-15129-1
R9	5.6 MEGOHM .25W.	C-2795-1078
R10	270,000 Ω .25W.	C-2795-918
R11	560,000 Ω .25W.	C-2795-958
R12	180 Ω .5W.	C-2796-53C
L1	I.F. REJECTOR COIL	A-14718-1
L2	B.C. ANT. COIL	A-14974-2
L3	S.W. ANT. COIL	A-14682-9
L4	B.C. OSC. COIL	A-15232-4
L5	S.W. OSC. COIL	A-15233-4
L6	NO.1 I.F. COIL	A-12084-32
L7	NO.2 I.F. COIL	A-12084-17

ALL PARTS SAME FOR MODEL 711-M EXCEPT AS FOLLOWS:

C1 VARIABLE CONDENSER	B-8189
R8 VOLUME CONTROL & SW.	A-15129-2
L2 B.C. ANT. COIL	A-14974-3
L5 S.W. OSC. COIL	A-15233-10
WAVE BAND SWITCH	A-15122

A-2008
A-2010
A-2016
A-2022

SPIEGEL, INC.

SPIEGEL PAGE 15-
MODELS A2008, A2010,
A2016, A2022

MODELS A2008, A2010, A2016, A2022

SPEIGEL, INC.

VOLTAGE CHART

Line voltage 116 AC — Position of Volume Control: Full with Antenna Disconnected — Position of Band Switch - Broadcast

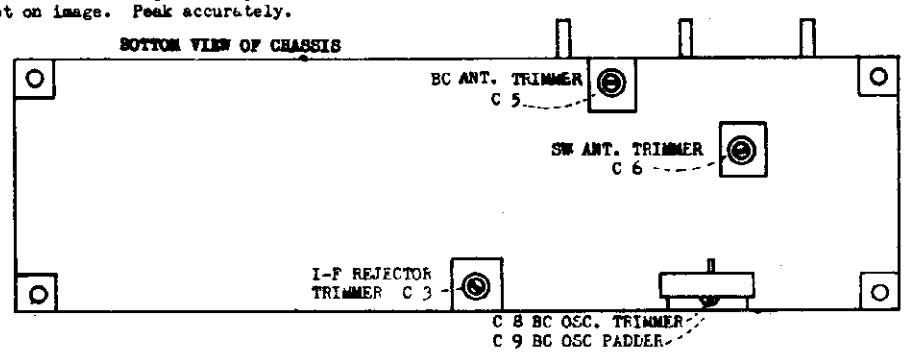
TUBE	FUNCTION	Voltage of Socket Prongs to Gnd. (See Nos. on Schematic Diagram)								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	Grid Cap
12SK7GT	R-F Amplifier	0	*24	0	-.025	1.6	60	*35	78	--
12A8GT	Converter	0	*12	98	60	-.025	95	0	0	-.04
12SK7GT	I-F Amplifier	0	*48	0	-.025	0	60	*36	95	--
6H4GT	Det - AVC	0	*52	0	-.025	-.025	-.025	*48	0	--
12SF5GT	1st Audio	0	0	-.05	--	**58	--	*24	*12	--
35L6GT	Power Amplifier	--	*85	90	95	0	0	*52	5.6	--
35Z5GT	Rectifier	---	*116	*110	--	*110	---	*85	*116	

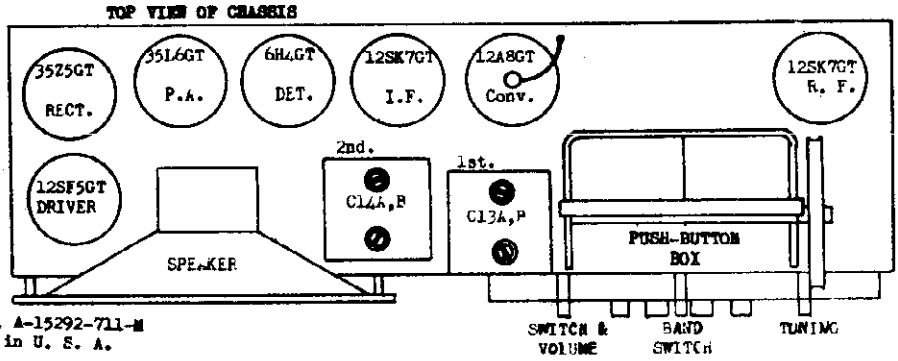
Notes: Voltage readings are for schematic diagram on back of sheet. Allow 15% + or - on all measurements. Always use meter scales which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter.
*AC readings
**100 V scale.

ALIGNMENT CHART

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set pointer even with horizontal dial marks with condenser gang closed)							
2	I. F.	12A8GT Grid	.1 mf.	456 KC	BC	Open	C13A,B;C14A,B	
3	Rejector	Ant.	200mmf.	456 KC	BC	Closed	C 3	Adjust to minimum
4	Broadcast Band	Ant.	200 mmf.	1500 KC	BC	1500 KC	C 8 (Osc) C 5 (Ant)	
5				600 KC	BC	600 KC	C 9 (Pad)	**
6	(Repeat operation 4)							
7	(Check calibration and sensitivity at 600 KC, 1000 KC and 1500 KC)							
8	SW Band	Ant.	*	18 MC	SW	18 MC	C 6 (Ant)	
9	(Check calibration and sensitivity at 6. MC and 18 MC)							
10	(Check operations 1 to 9 inclusive)							

*100 ohm non-inductive resistor and 200 mmf. condenser in series.
**Rock dial while making this adjustment. Make certain that adjustment is made on fundamental signal and not on image. Peak accurately.

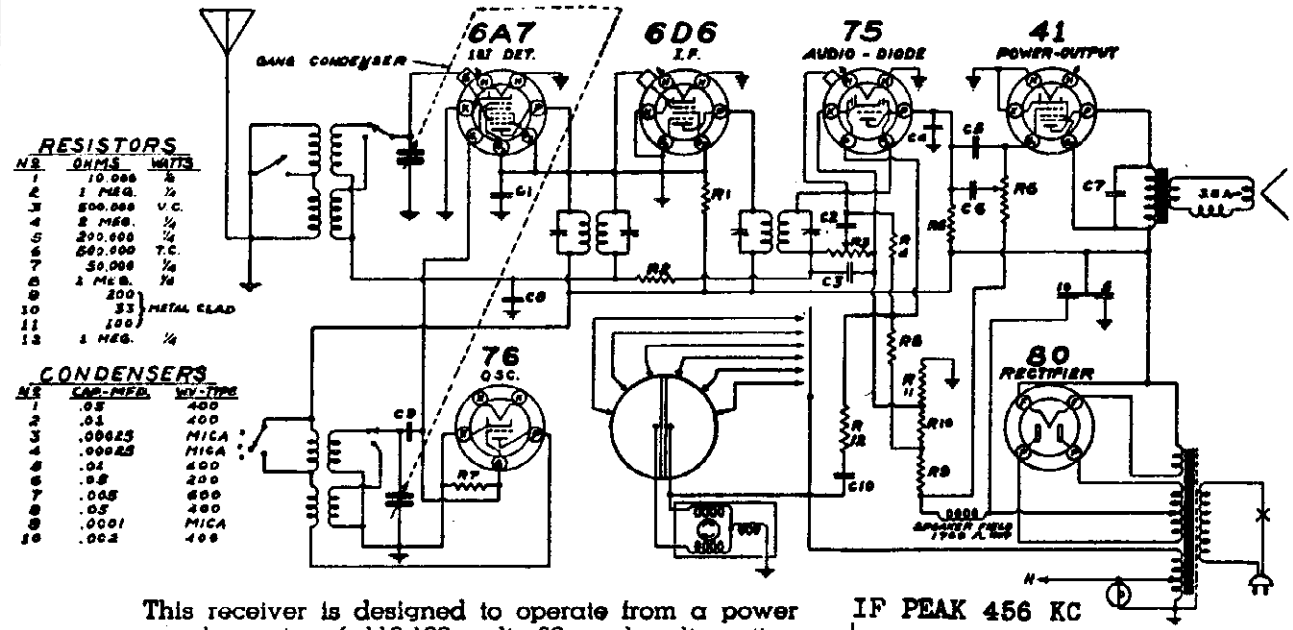




Part No. A-15292-711-M
Printed in U. S. A.

SPIEGEL, INC.

MODELS 2002, 2003, 2020, 2021
2052, 2074, 2075. Chas. 6B



RESISTORS

NO.	OHMS	WATTS
1	10,000	½
2	1 MEG.	½
3	500,000	V.C.
4	2 MEG.	½
5	250,000	½
6	500,000	T.C.
7	50,000	½
8	1 MEG.	½
9	200	METAL CLAD
10	33	METAL CLAD
11	100	METAL CLAD
12	1 MEG.	½

CONDENSERS

NO.	CAP-MFD.	VOLTAGE-TYPE
1	.05	400
2	.01	400
3	.00025	MICA
4	.00025	MICA
5	.01	400
6	.05	200
7	.065	600
8	.05	400
9	.0001	MICA
10	.002	400

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.**

GROUND Where ever possible, a good ground should be employed. Water pipes and steam or hot water radiators make a very desirable ground connection. The ground wire should be connected to the "Black" lead.

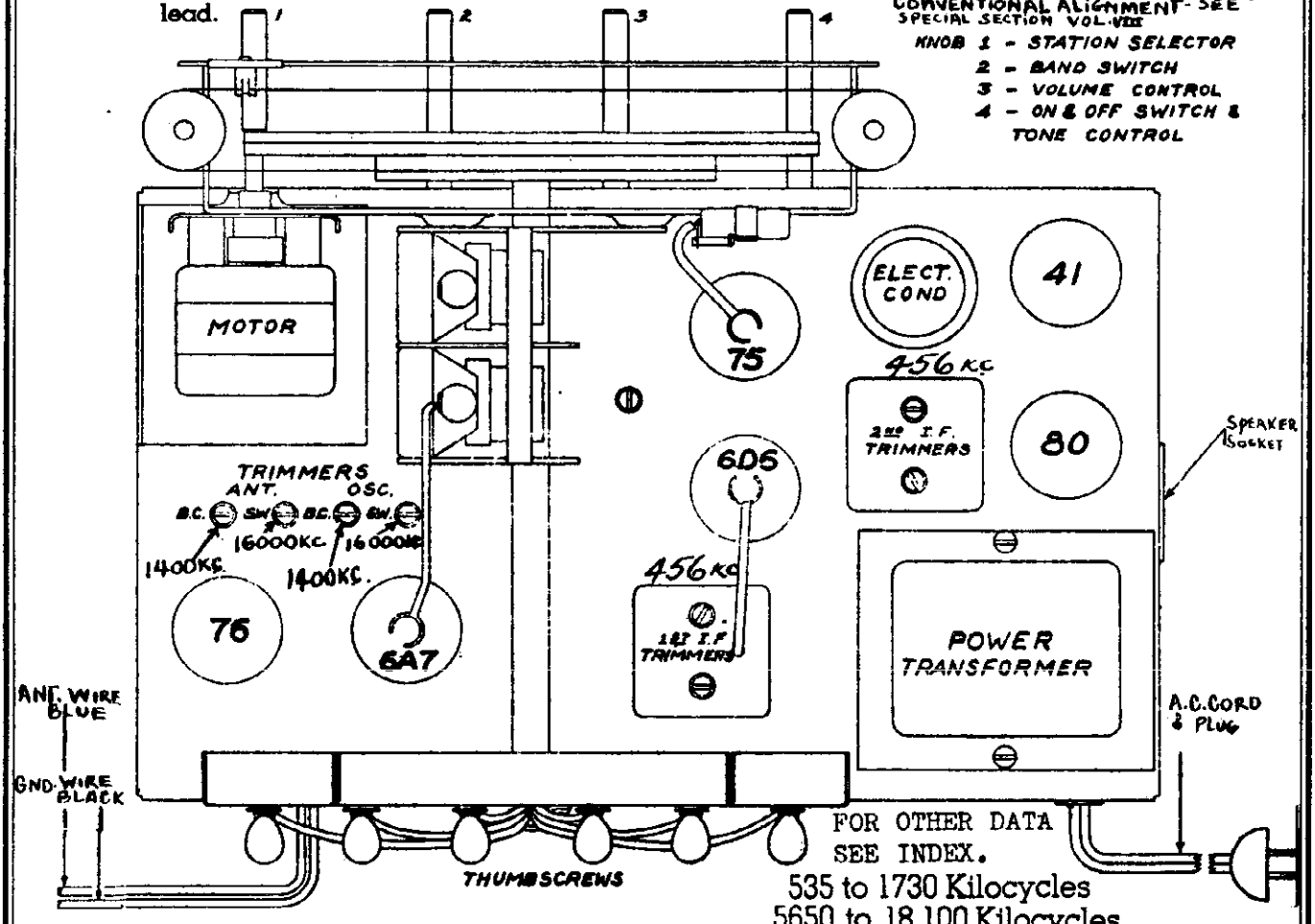
IF PEAK 456 KC

BAND SWITCH IN BROADCAST POSITION
I.F. - 456 K.C.
V.C. - VOLUME CONTROL
T.C. - TONE CONTROL

SCHEMATIC DIAGRAM
MODEL 6B

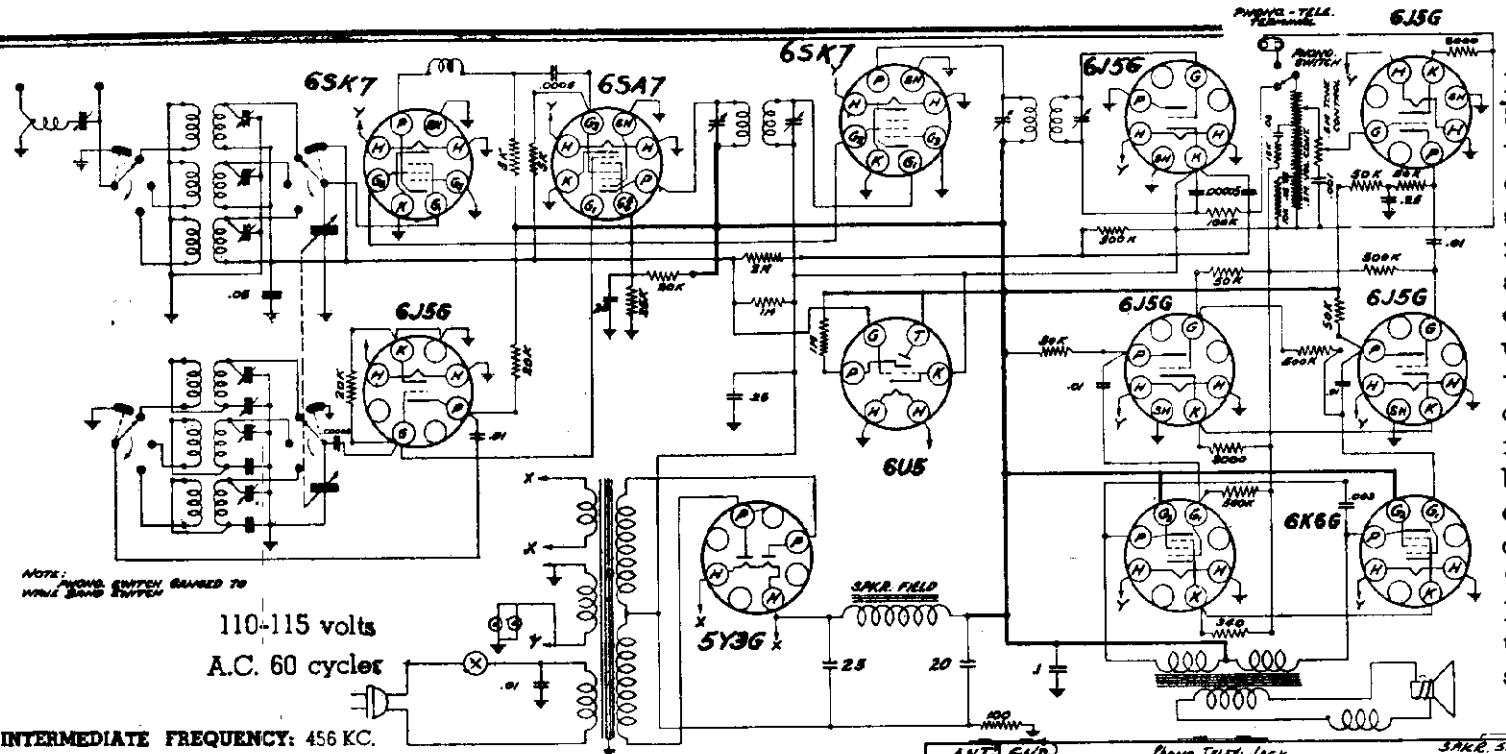
CONVENTIONAL ALIGNMENT - SEE SPECIAL SECTION VOL. VIII

KNOB 1 - STATION SELECTOR
2 - BAND SWITCH
3 - VOLUME CONTROL
4 - ON & OFF SWITCH & TONE CONTROL



FOR OTHER DATA SEE INDEX.

535 to 1730 Kilocycles
5650 to 18,100 Kilocycles



P.B. ADJUSTMENT

Six button auto. tuner on receiver can be adj. to any station on reg. B.C.Band. To adj. use screw driver furnished with receiver. To turn, insert screw driver, keep turning while holding button in. Notice dial turn until desired station is tuned in perfectly. Insert call letter tab to cover adj. screw head.

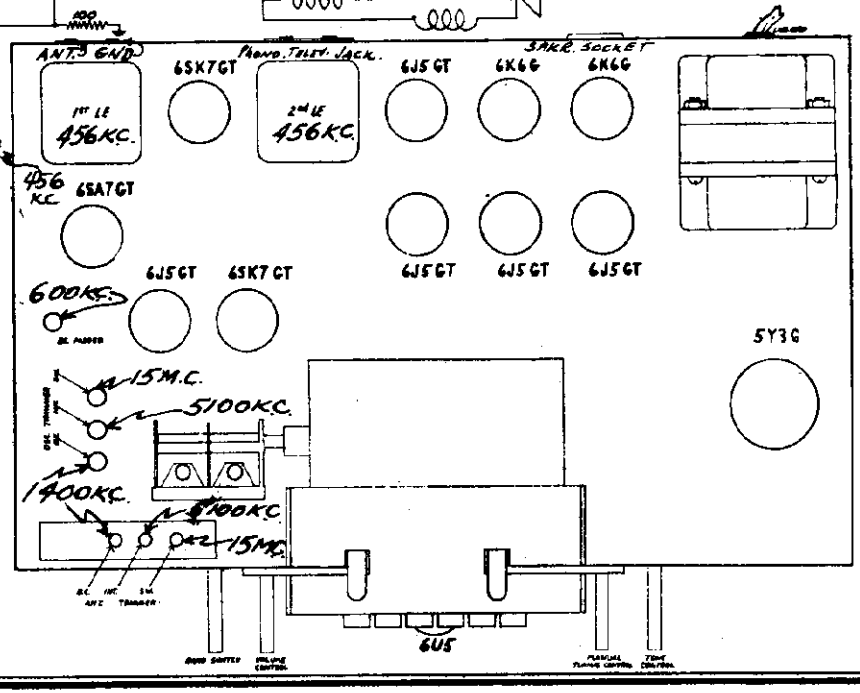
INTERMEDIATE FREQUENCY: 456 KC.

BROADCAST BAND: Set the band switch for broadcast reception. With test oscillator at 456KC and maximum signal, adjust wave trap for a minimum (or dip) in output. Care in this adjustment will insure best rejection of interfering signals at I. F. frequency. Adjust oscillator to 1400 KC and connect the output of the generator to the antenna connection at the rear of the chassis through a .0002 mfd. mica condenser. Set the pointer on the dial to 1400 KC making sure that the volume control is set at its maximum position. Adjust the broadcast antenna and broadcast oscillator trimmers for maximum signal (as indicated on the output meter). Re-set the dial pointer on the receiver and on the test oscillator to 600 KC. Slowly increase or decrease the **broadcast padding** condenser while tuning back and forth across the signal with the station selector knob until the maximum reading is obtained on the output meter. Re-check the 1400 KC alignment as the adjustment at 600 KC may have slightly disturbed the original 1400 KC setting.

INTERMEDIATE BAND: For a dummy antenna use a .0002 mfd. mica condenser in series with a 400 ohm carbon resistor. Set band switch to the intermediate band position and feed a 5100 KC signal from the oscillator. Set dial pointer at 5100 KC. Adjust intermediate antenna and intermediate oscillator trimmers for maximum output.

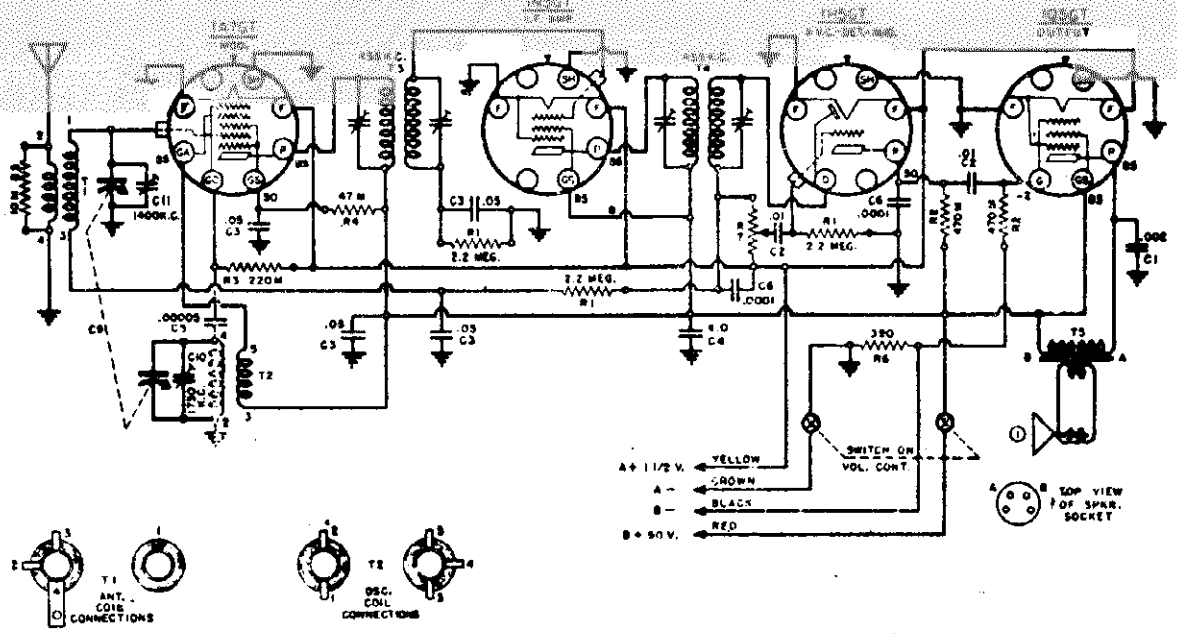
SHORT WAVE: Set band switch on short wave position. Connect the antenna of the radio receiver to the output of the test oscillator through a 400 ohm carbon resistor. Set oscillator and receiver dial at 15 megacycles. Adjust the short wave antenna and short wave oscillator trimming condensers for maximum output as indicated by readings on the output meter. No other adjustments are necessary for aligning this band.

It is advisable to check the sensitivity at 6000 KC to determine whether the circuits are properly aligned.



SPIEGEL, INC.

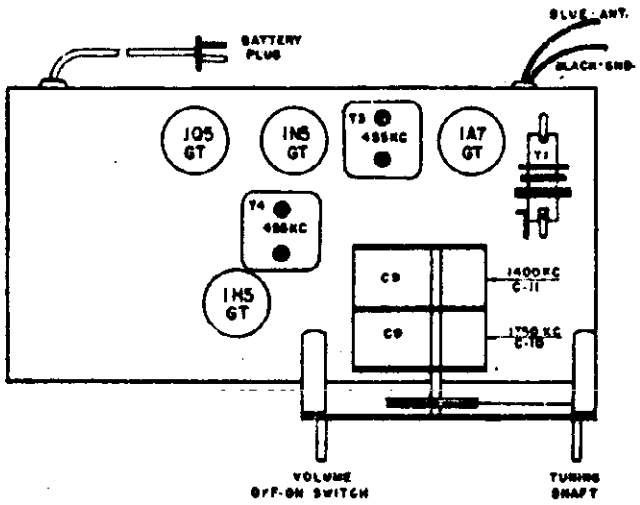
MODEL A-2104 Chs O-44



IF PEAK 455 KC

TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONGS, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDS.
CAPACITY VALUES ARE IN MICROFARADS.

CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION O-44
R1	60-179	2.2 MEGOHM 1/4 W. RESISTOR	C1	16-133	.002 MFD. 400V. TUBULAR COND.	T1	10-344	ANTENNA TRANSFORMER
R2	60-178	470M " " "	C2	16-121	.01 " 200V. " "	T2	10-341	OSCILLATOR "
R3	60-180	220M " " "	C3	1622	.05 " " "	T3	10-342	1ST. I.F. "
R4	60-177	47M " " "	C4	18-250	4.0 " 150W.V. ELECTROLYTICS	T4	10-343	2 ND. I.F. "
R5	60-215	10M " " "	C5	15-120	.00005 MFD. MICA CONDENSER	T5	.....	OUTPUT TRANS. (ON SPKR.)
R6	60-221	390 " " "	C6	1501	.0001 " " "			
R7	24-149	1 MEGOHM VOLUME CONTROL	C9	12-165	2 GANG VAR. COND. ALSO C10 & C11	1	79-297	5" P.M. SPEAKER

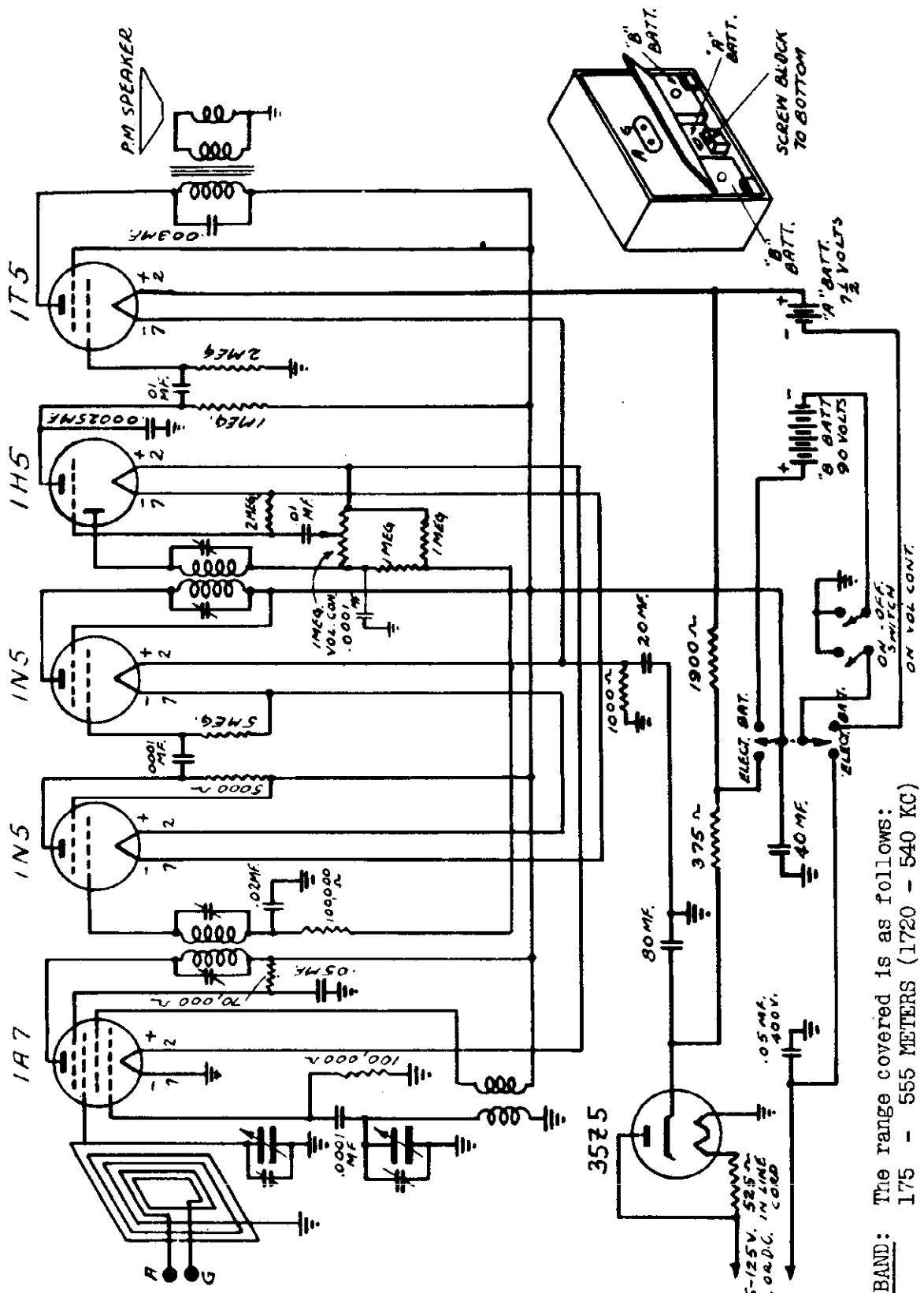


LOCATION OF PARTS ON TOP OF CHASSIS BASE

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII

MODEL A2134,Ch. BP12

SPEIGEL INC.



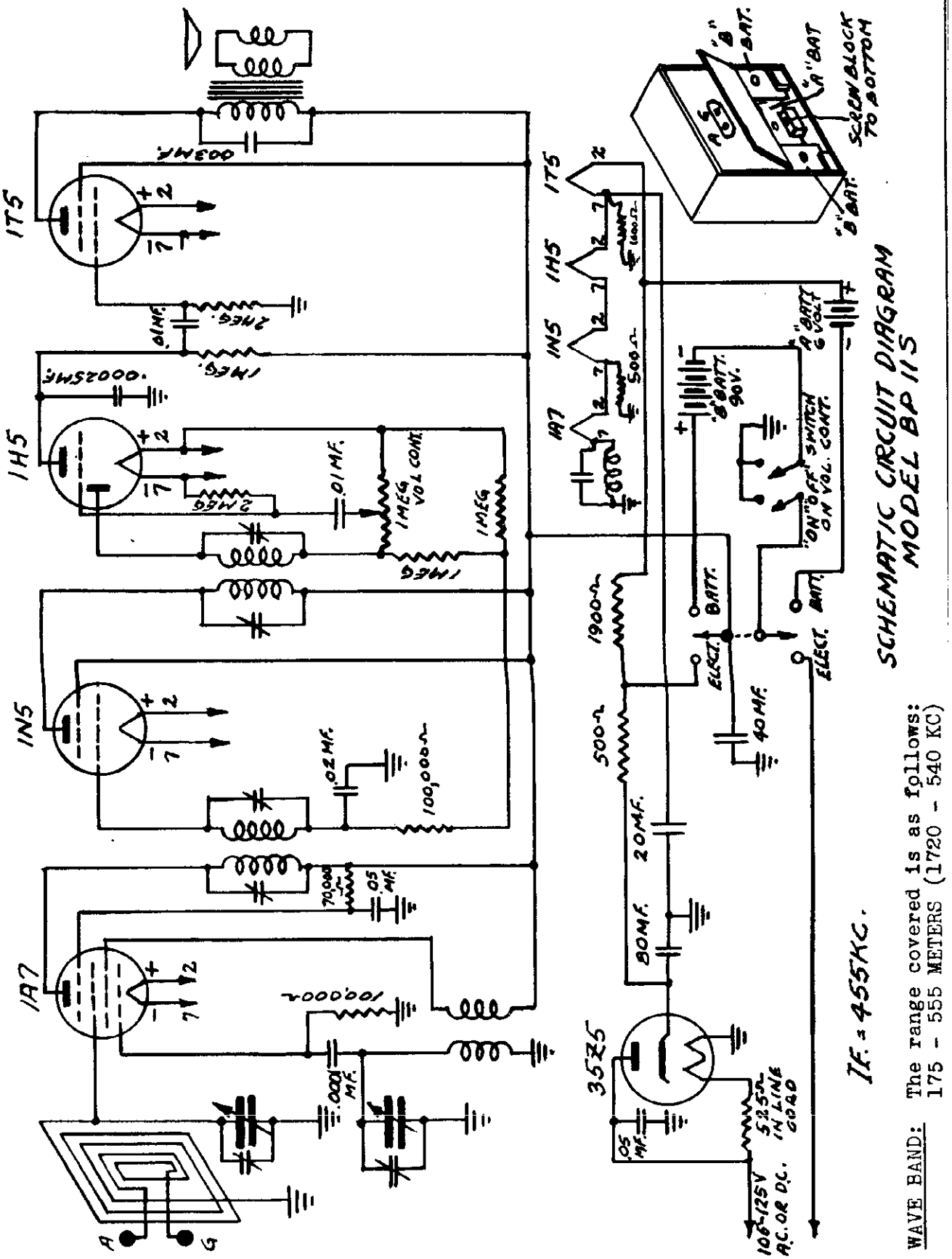
SCHEMATIC CIRCUIT DIAGRAM

MODEL BP-12

I.F. = 455 K.C.

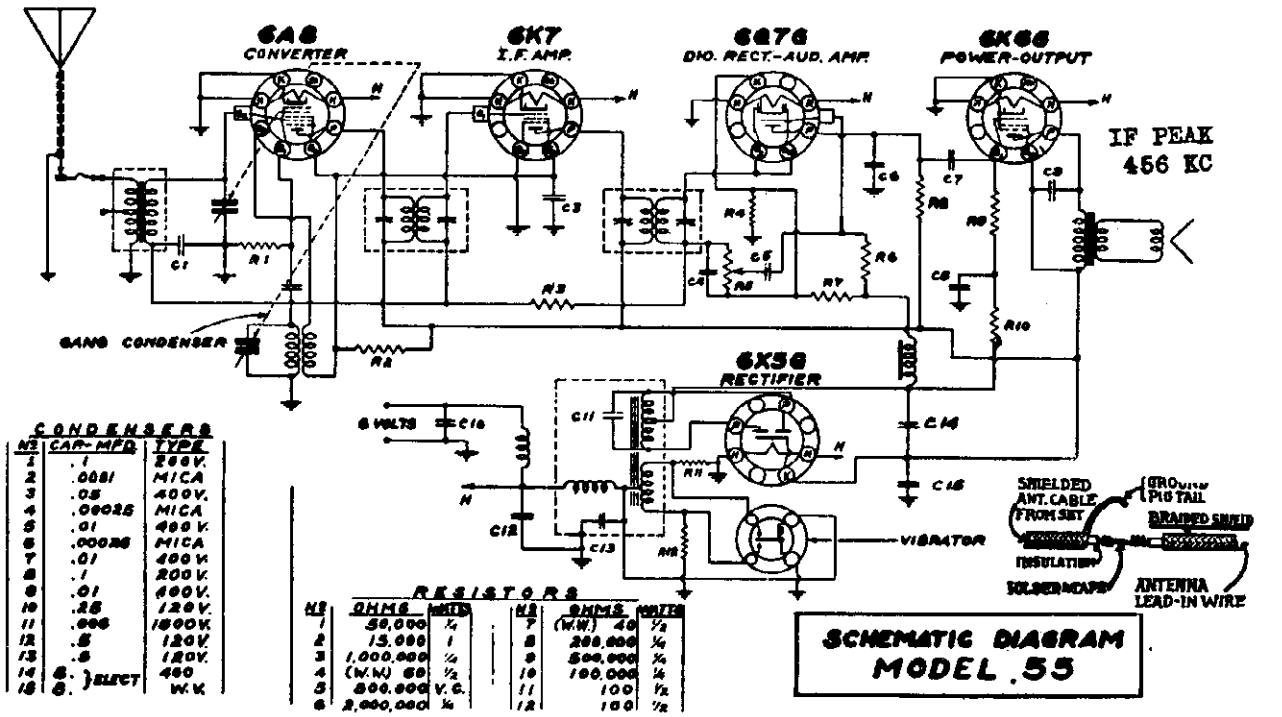
WAVE BAND: The range covered is as follows:
175 - 555 METERS (1720 - 540 KC)

SPEIGEL, INC.



MODELS 2305,2306
Chassis 55

SPIEGEL, INC.



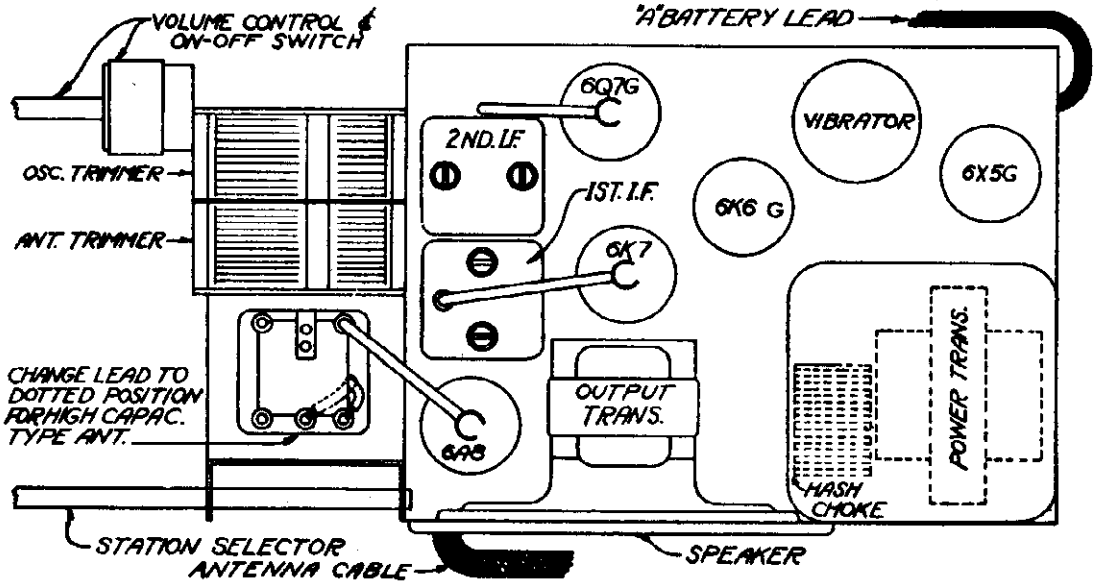
CONDENSERS

NO	CAP. MFD.	TYPE
1	.1	200 V.
2	.0081	MICA
3	.05	400 V.
4	.00025	MICA
5	.01	400 V.
6	.00035	MICA
7	.01	400 V.
8	.1	200 V.
9	.01	400 V.
10	.25	120 V.
11	.006	1800 V.
12	.5	120 V.
13	.5	120 V.
14	SELECT	400
15	SELECT	W.W.

RESISTORS

NO	OHMS	WATTS
1	50,000	½
2	15,000	1
3	1,000,000	½
4	(W.W.) 60	½
5	800,000	V.C.
6	2,000,000	½
7	(W.W.) 40	½
8	250,000	½
9	500,000	½
10	100,000	½
11	100	½
12	100	½

SCHEMATIC DIAGRAM MODEL 55

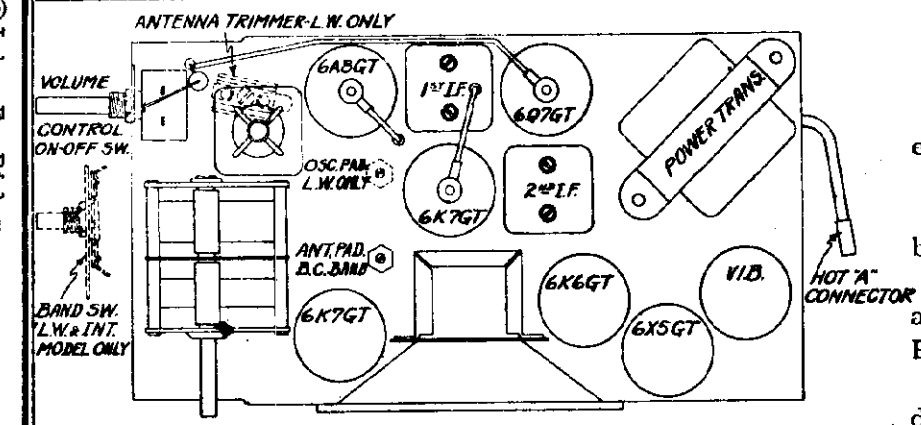


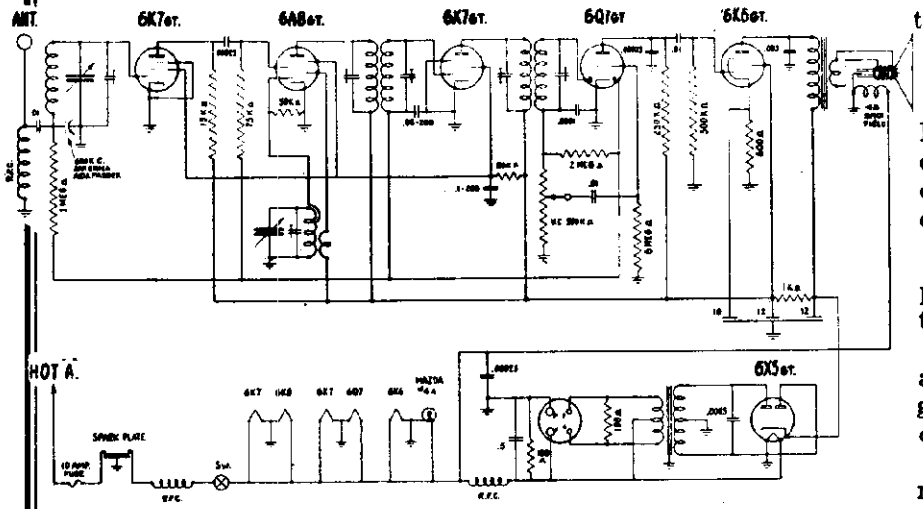
GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 456, 600, 1400, 1550 and an output meter to be connected across the primary or secondary of the output transformers. If possible, all alignments should be made with the volume control 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 alignment should be the next procedure.

I.F. ALIGNMENT. Adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tubes (6A8) 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 oscillator to the antenna lead of the receiver through a 50 mmfd. condenser. This antenna lead should be a two foot length of standard low capacity shielded loom fitted with the proper bayonet type plug to accomodate the antenna input receptacle on the receiver. Set the oscillator to 1550 KC and with the gang condenser at minimum, adjust the oscillator trimmer to receive this signal. Then set the oscillator to 1400 KC and adjust the antenna trimmer to give maximum output.





I. F. ALIGNMENT

Set the variable condenser at minimum capacity, (dial pointer at 1550 K.C.) Connect the two leads from a good, modulated signal generator, the ground lead to the radio chassis and the other lead through a .1 mfd. condenser, to the grid cap of the 6A8GT with the tube's grid lead still in place.

Connect the leads from a fully charged 6 volt storage battery to the receiver chassis and battery lead, the polarity being reversible.

With the set in operation and the volume control full on, set the signal generator to 456 K.C. and increase its output until the signal is heard in the set's speaker. Starting with the second I. F., adjust the I. F. trimmers for maximum output, decreasing the signal generator output as the receiver output increases.

The generator output in all the alignment adjustments should be adjusted so the meter will read approximately .4 volts continually.

ANTENNA MATCHING ADJUSTMENT

As the sizes and types of antennas vary considerably, it is necessary to adjust the radio to "match" the antenna used. To do this, tune in a station, accurately, at roughly 600 kilocycles, reduce the volume of the set, pry out the plug on the underside of the set, insert a screw driver, and turn for maximum output. Replace the plug when this has been accomplished, and the radio is ready to operate efficiently on any station.

PUSH BUTTON ADJUSTMENT

Six push button station selectors are incorporated in this receiver, and each may be set to select any frequency or station within the range of the set.

To adjust each button, follow these instructions.

1. With the set in operation, tune in any station the push button is to be set for, with the right hand tuning knob.

2. Keep a firm grip on the tuning knob so the station will not be detuned, and turn the push button about one turn to the left to loosen the mechanism. Press the button all the way in and turn it to the right until it is tight.

Repeat these operations with the other five buttons, setting each for a different station. Insert the correct call letter tab into the space provided in the panel just above the push buttons.

R. F. ALIGNMENT

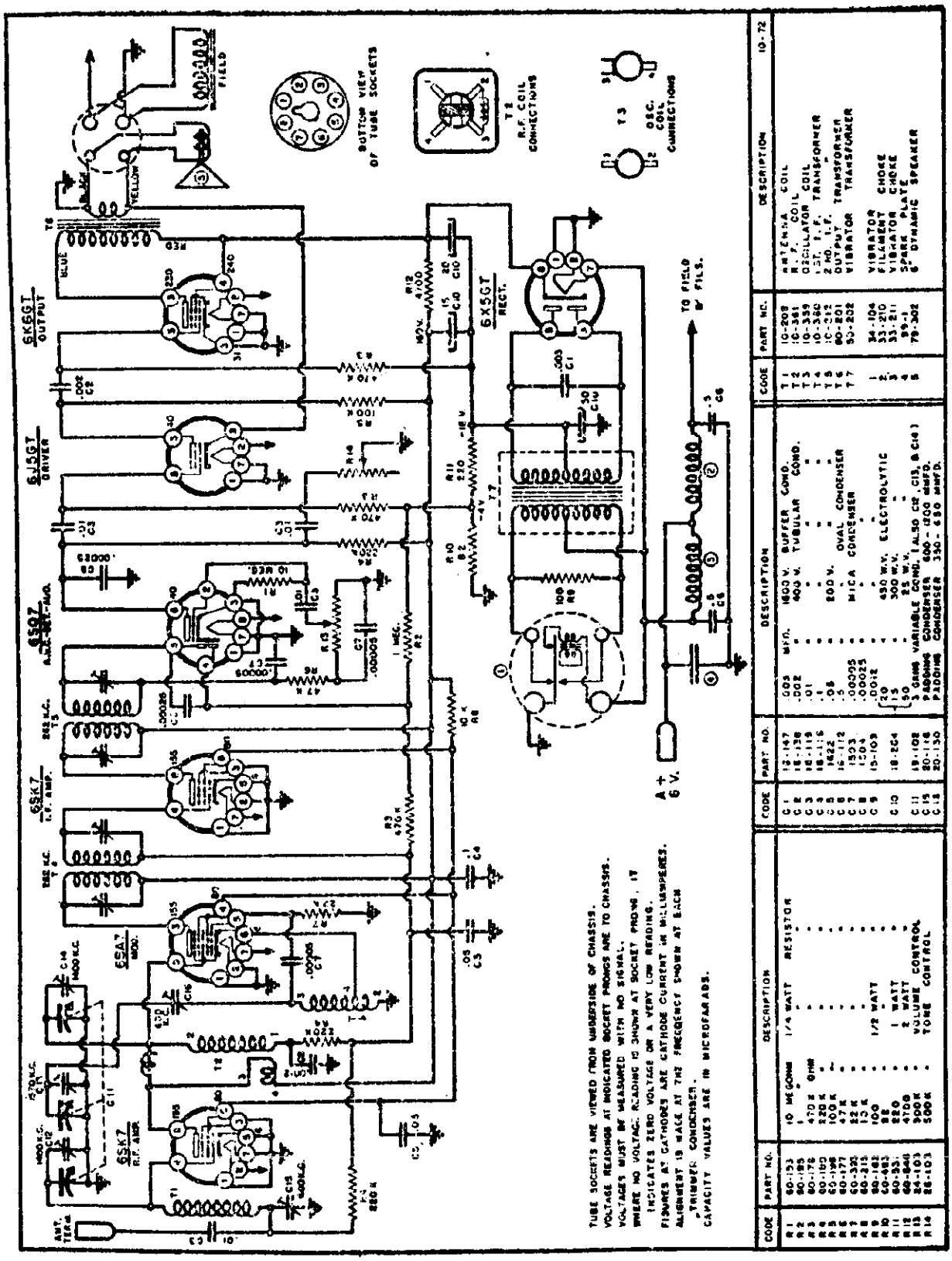
With the variable condenser still full open, set the generator to 1550 K.C. Connect the generator lead to the antenna lead through a .0001 mfd. condenser as dummy antenna. Adjust the oscillator trimmer for maximum output. Set the receiver dial and the generator to 1400 K.C. so the signal comes through, and adjust the antenna trimmer for maximum output.

Set the receiver dial and generator to 600 K.C. and adjust the oscillator padder for maximum output by rocking the variable condenser (with the tuning knob) as the padder is adjusted.

Return the dial and generator setting to 1400 K.C. and check for alignment.

MODEL 2460, Late

SPIEGEL INC.



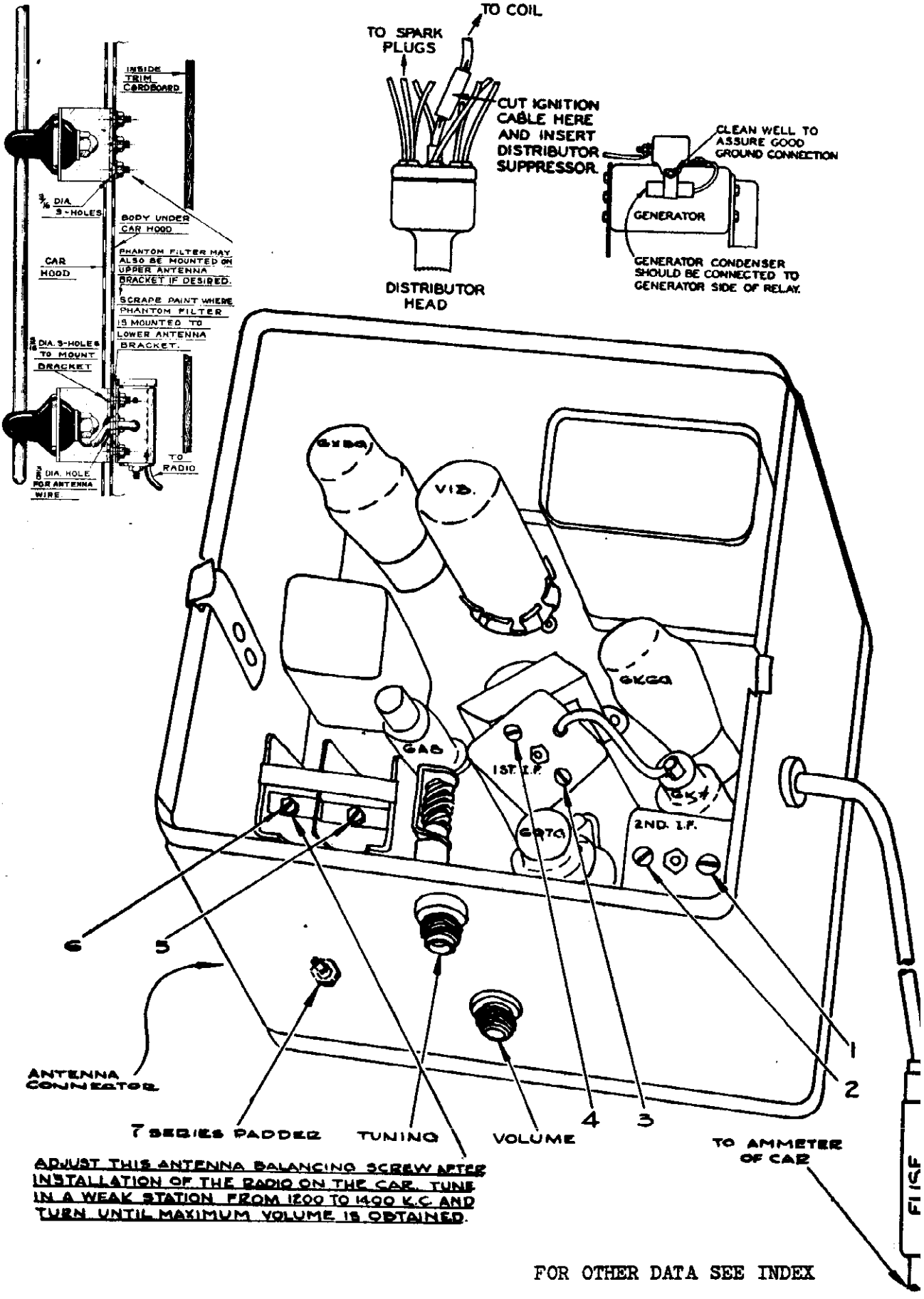
CODE	PART NO.	DESCRIPTION
R1	80-193	10 MEGOHM 1/4 WATT RESISTOR
R2	80-195	" " "
R3	80-198	470Ω " "
R4	80-190	220 K " "
R5	80-189	100 K " "
R6	80-179	47 K " "
R7	80-177	22 K " "
R8	80-335	15 K " "
R9	80-183	100 " "
R10	80-481	82 " 1/2 WATT "
R11	80-331	220 " 1 WATT "
R12	80-846	4700 " 2 WATT "
R13	24-103	500K " VOLUME CONTROL
R14	24-103	500K " TONE CONTROL

CODE	PART NO.	DESCRIPTION
C1	18-147	.003 MFD. 1600 V. BUFFER COND.
C2	18-138	.002 " 400 V. TUBULAR COND.
C3	18-119	.01 " " " "
C4	18-116	.1 " " " "
C5	1622	.1 " 600 V. OVAL CONDENSER
C6	18-112	.5 " " " "
C7	1503	.00025 " MICA CONDENSER
C8	1504	.00025 " " "
C9	15-103	.0012 " " "
C10	18-264	20 " 450 W.V. ELECTROLYTIC
		15 " 300 W.V. "
		50 " 25 W.V. "
C11	19-102	3 GANG VARIABLE COND. (ALSO C12, C13, & C14)
C15	20-116	PADDING CONDENSER 600 - 1200 MMFD.
C16	20-130	PADDING CONDENSER 350 - 650 MMFD.

CODE	PART NO.	DESCRIPTION
T1	10-209	ANTENNA COIL
T2	10-341	R.F. COIL
T3	10-339	OSCILLATOR COIL
T4	10-340	1ST. I.F. TRANSFORMER
T5	10-312	2 ND. I.F. "
T6	60-201	OUTPUT TRANSFORMER
T7	50-202	VIBRATOR TRANSFORMER
	34-104	VIBRATOR
	33-210	FILAMENT CHOKE
	33-211	VIBRATOR CHOKE
	89-1	SPARK PLATE
	79-302	6" DYNAMIC SPEAKER

10-72

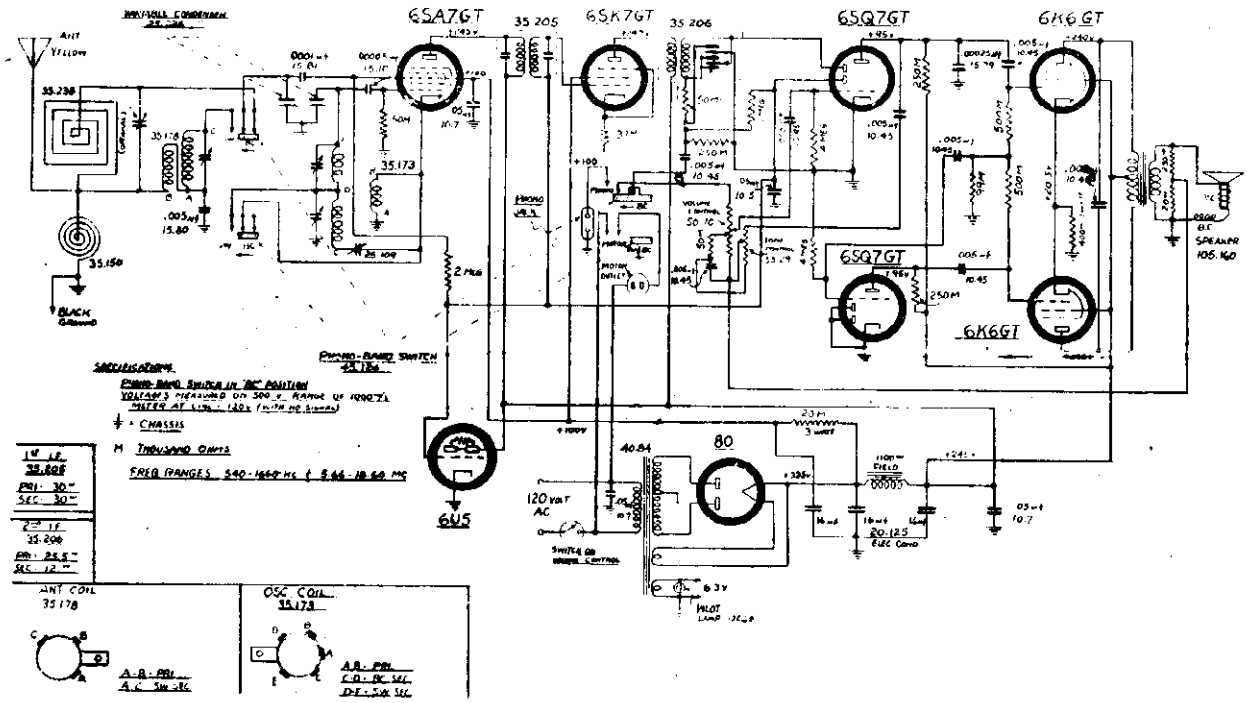
SPIEGEL INC.



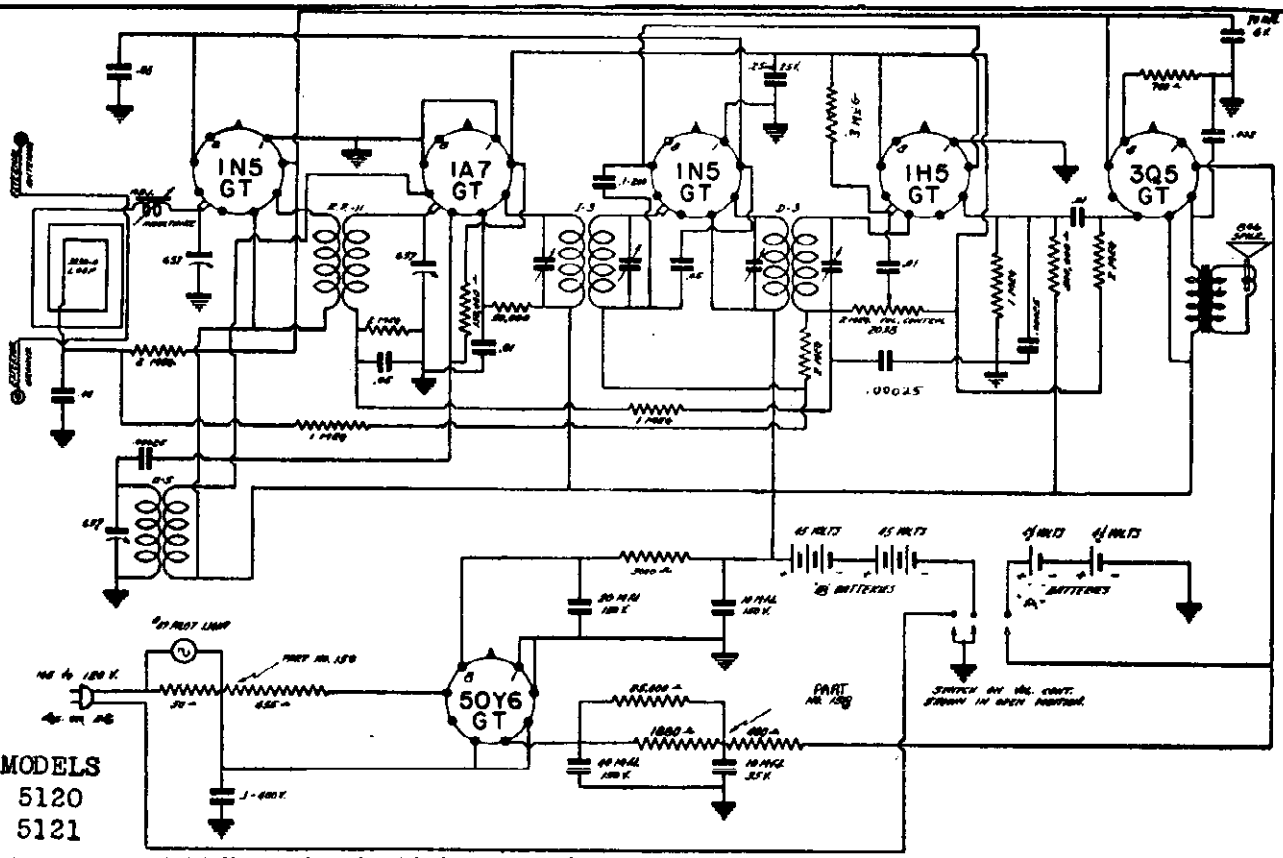
FOR OTHER DATA SEE INDEX

MODELS CP5020, CP5060,
CP5062
MODELS 5120, 5121

SPIEGEL, INC.



MODELS CP5020, CP5060, CP5062



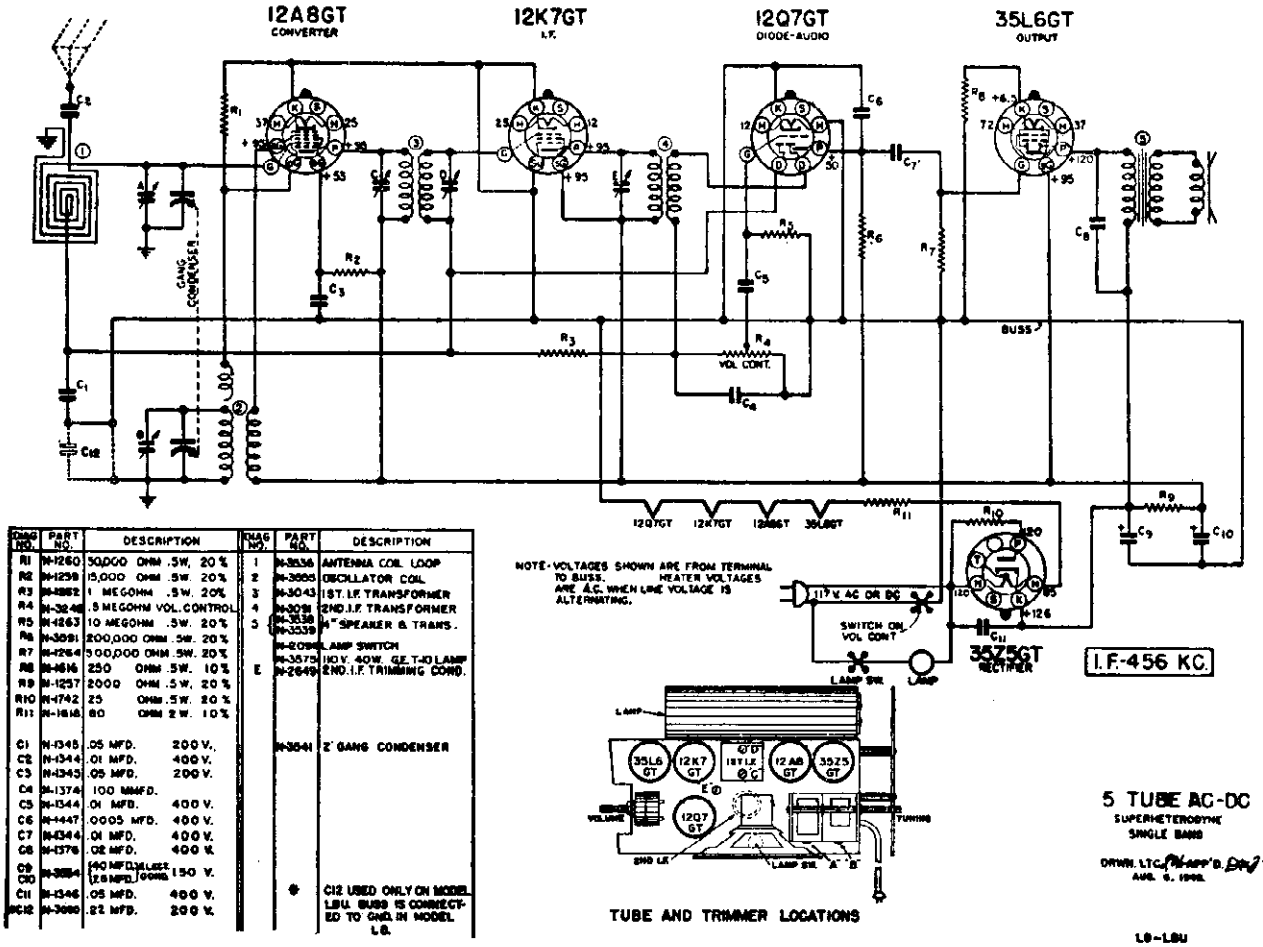
MODELS
5120
5121

When set is initially equipped with batteries, the antenna trimmer is properly adjusted at the factory and no further adjustment is necessary. However, in changing batteries, or installing outside antenna, it may be necessary to adjust this antenna trimmer. If so, proceed as follows:

(1) Tune the receiver to a radio station somewhere near 1400 kilocycles, which is about 140 on the dial.
(2) Remove the plug button from the right hand side of the cabinet (when looking at the front of the set).
(3) Adjust antenna trimmer with a screw driver very slowly until this station is heard the loudest.

No other adjustments are necessary in this set.

SPIEGEL, INC.



CHAS. NO.	PART NO.	DESCRIPTION
R1	M-1260	50,000 OHM .5W. 20%
R2	M-1258	15,000 OHM .5W. 20%
R3	M-1882	1 MEGOHM .5W. 20%
R4	M-3246	.5 MEGOHM VOL. CONTROL
R5	M-1263	10 MEGOHM .5W. 20%
R6	M-3091	200,000 OHM .5W. 20%
R7	M-1264	500,000 OHM .5W. 20%
R8	M-1616	250 OHM .5W. 10%
R9	M-1257	2000 OHM .5W. 20%
R10	M-1742	25 OHM .5W. 20%
R11	M-1618	80 OHM 2W. 10%
C1	M-1345	.05 MFD. 200 V.
C2	M-1344	.01 MFD. 400 V.
C3	M-1345	.05 MFD. 200 V.
C4	M-1374	100 MMFD.
C5	M-1344	.01 MFD. 400 V.
C6	M-1447	.0005 MFD. 400 V.
C7	M-1344	.01 MFD. 400 V.
C8	M-1378	.02 MFD. 400 V.
C9 C10	M-3884	(40 MFD. ELECT. COND. (25 MFD.) 150 V.
C11	M-1346	.05 MFD. 400 V.
*C12	M-3888	.02 MFD. 200 V.

CHAS. NO.	PART NO.	DESCRIPTION
1	M-3536	ANTENNA COIL LOOP
2	M-3505	OSCILLATOR COIL
3	M-3043	1ST. I.F. TRANSFORMER
4	M-3091	2ND. I.F. TRANSFORMER
5	M-3538 M-3539	4" SPEAKER & TRANS.
	M-2098	LAMP SWITCH
	M-3575	110 V. 40W. G.E. T-10 LAMP
E	M-2649	2ND. I.F. TRIMMING COND.
	M-3041	2 GANG CONDENSER
*		C12 USED ONLY ON MODEL LBU. BUSS IS CONNECTED TO GND. IN MODEL LB.

Alignment Data and Servicing

Lack of sensitivity and poor tone quality may be due to any one or a combination of causes such as a weak or defective tube or speaker, open or grounded bias resistor, bypass cond. Never attempt to realign set until all other possible sources of trouble have been thoroughly investigated and proved not to be the cause. NOTE: IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OUTPUT MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER AND THAT THE PROCEDURE BE CAREFULLY FOLLOWED, OTHERWISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT. THE TRIMMERS WILL BE REFERRED TO BY THEIR FUNCTION AS INDICATED ON THE PARTS DIAGRAM.

ALIGNMENT PROCEDURE

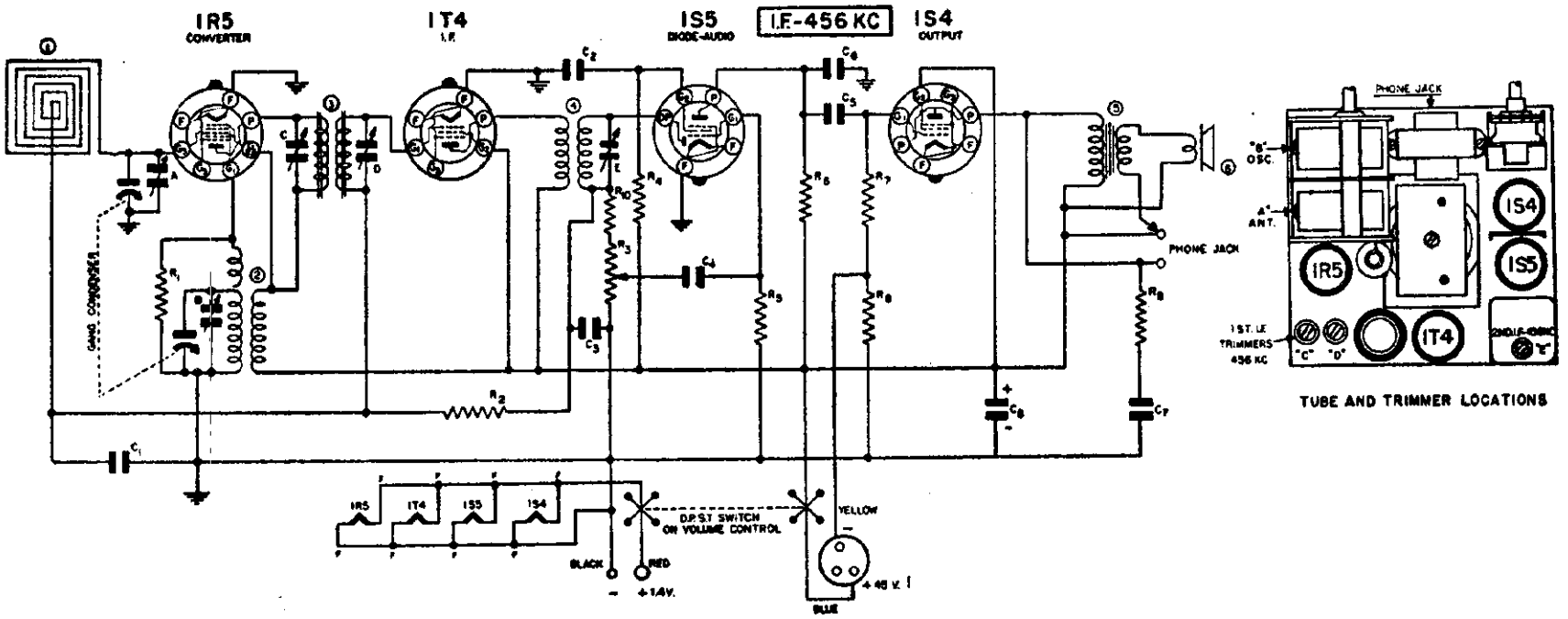
I. F. ALIGNMENT. With the gang condenser set at minimum, adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tube (12A8GT) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the chassis ground. Align all three I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT. Connect the test oscillator to the antenna of the set through a 200 mmfd. (.0002) condenser. With the gang condenser set at minimum capacity, set the test oscillator at 1720 K.C. and adjust the oscillator (or 1720 KC trimmer) on gang condenser. Next—set the test oscillator at 1400 KC, and tune in the signal on the gang condenser. Adjust the antenna trimmer (or 1400 KC trimmer) for maximum signal. Next set the test oscillator at 600 KC, and tune in signal on condenser to check alignment of coils.

GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 456, 600, 1400 and 1720 KC and an output meter 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. Remove the chassis from the cabinet and set on a bench taking care that no iron or other metal is near the loop. Do not make this setup on a metal bench. The intermediate frequency (I.F.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the broadcast band should be adjusted.

Voltages shown on the circuit diagram are from socket terminals to chassis base. In measuring voltages use a voltmeter having a resistance of at least 1000 ohms per volt. Allowances should be made for variations in line voltage.



TUBE AND TRIMMER LOCATIONS

ALIGNMENT PROCEDURE

GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 456, 600, 1400 and 1720 KC and an output meter 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.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the broadcast band should be adjusted.

I. F. ALIGNMENT. With 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 (1R5) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the chassis ground. Align all three I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT. Remove chassis, battery pack, and loop antenna from cabinet and set them up on the bench so that they occupy exactly the same respective positions on the bench as they did in the cabinet. Care should be taken to have no iron or other metal near the loop. Do not make this set-up on a metal bench. Make a loop consisting of two turns of wire approximately one foot in diameter and connect across the generator terminals. Place this loop parallel to the loop antenna and about six inches away from it.

Set the dial and generator at 1720 KC (gang at minimum capacity). Adjust the oscillator trimmer for maximum output. Set the generator at 1400 KC and tune in the signal. Adjust the antenna trimmer maximum output. Check the sensitivity at 600 KC to determine if the gang or the coils have been damaged.

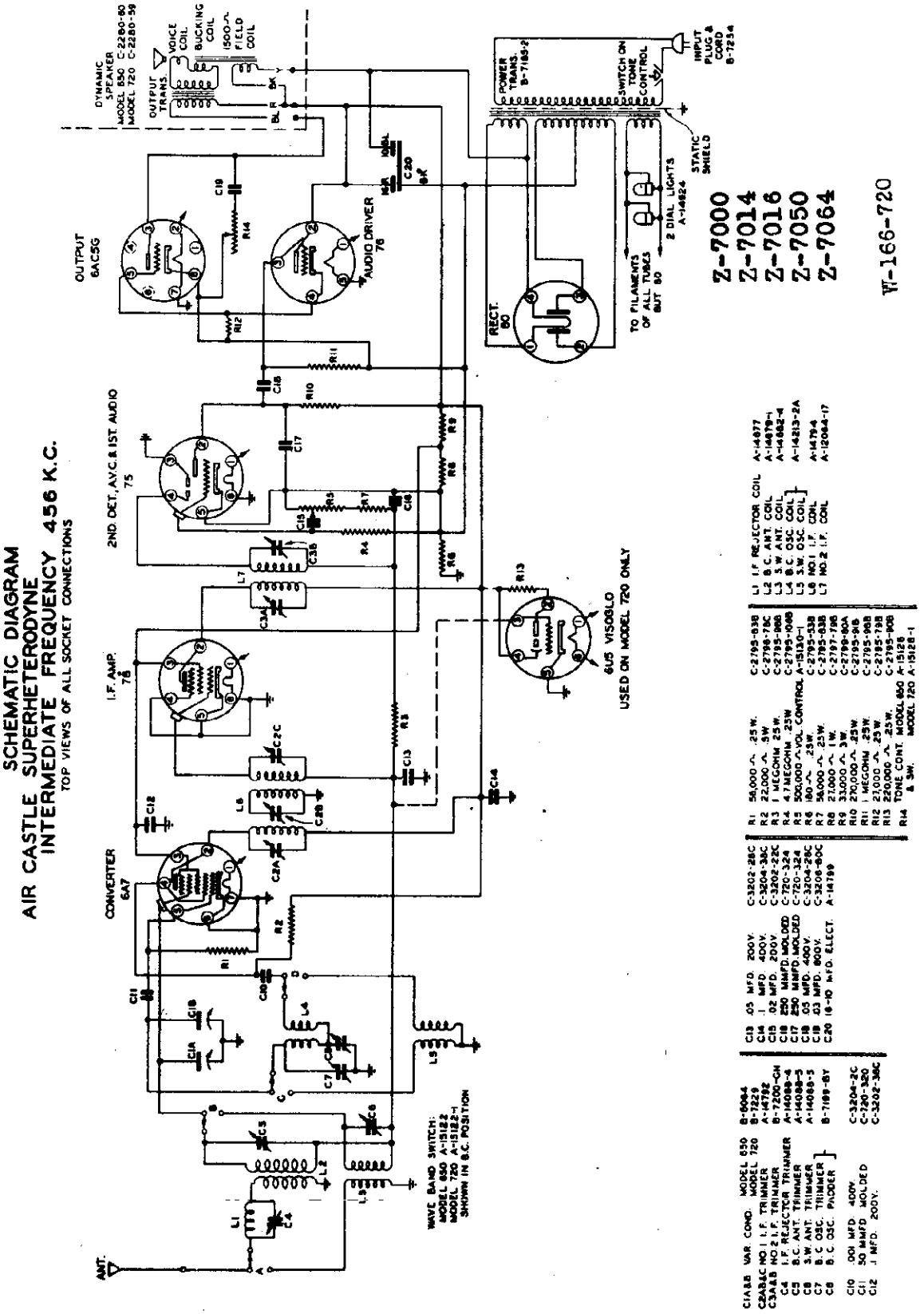
4 TUBE PORTABLE

SUPERHETERODYNE

SINGLE BAND

DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
R1	N-3172	100,000 OHM .5W. 20%	C5	N-3094	.01 MFD. 400 V.
R2	N-3173	2 MEGOHM .5W. 20%	C6	N-1376	.0001 MFD. MICA
R3	N-3092	1 MEGOHM VOLUME CONTROL	C7	N-3094	.01 MFD. 400 V.
R4	N-3174	3 MEGOHM .5W. 20%	C8	N-3111	6 MFD. 50 V. ELECTROLYTIC
R5	N-3093	6 MEGOHM .5W. 20%			
R6	N-3175	1 MEGOHM .5W. 20%			
R7	N-3175	2 MEGOHM .5W. 20%	1	N-3096	ANTENNA LOOP COIL
R8	N-3176	500 OHM .5W. 5%	2	N-3097	OSCILLATOR COIL
R9	N-3177	15,000 OHM .5W. 20%	3	N-3098	1ST. I.F. TRANSFORMER
R10	N-3-84	30,000 OHM .5W. 20%	4	N-3099	2ND. I.F. TRANSFORMER
			5	N-3100	OUTPUT TRANSFORMER
			6	N-3101	4" P.M. SPEAKER
C1	N-1345	.05 MFD. 200 V.			
C2	N-3094	.01 MFD. 400 V.			
C3		.0001 MFD. (IN SMALL I.F. SHIELD)		N-3102	2 GANG CONDENSER
C4	N-3094	.01 MFD. 400 V.			

MODELS W166,720,Z700(
Z7014,Z7016,Z7050,
Z7064

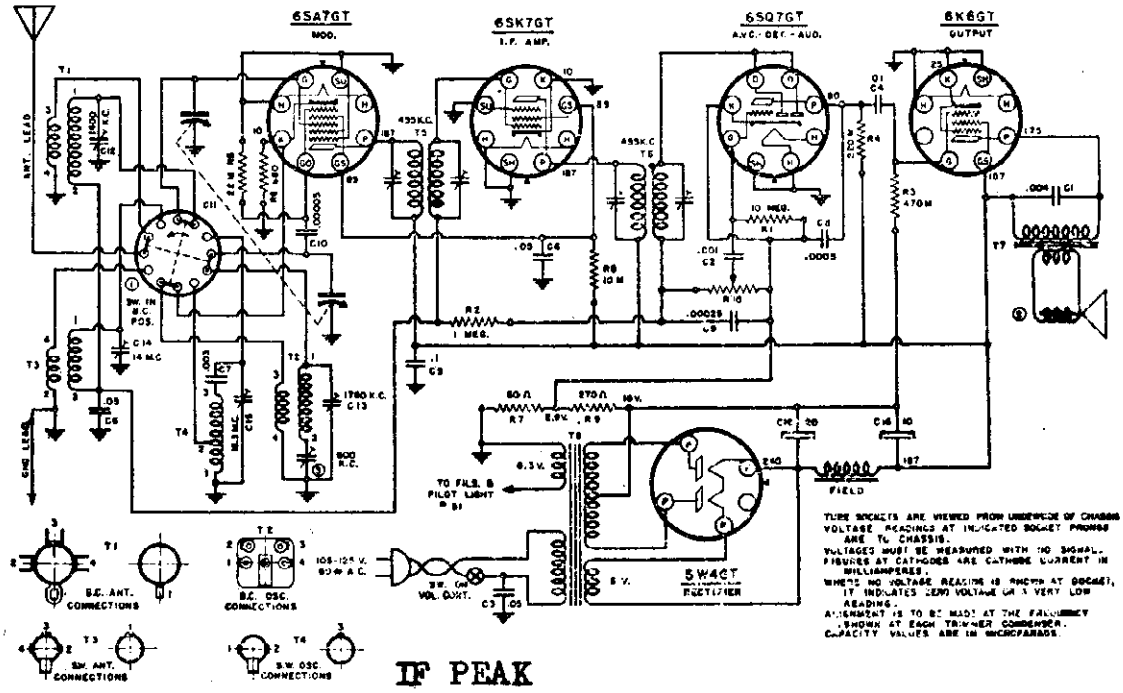


Z-7000
Z-7014
Z-7016
Z-7050
Z-7064

W-166-720

MODEL Z7002, Chassis 0-51

SPIEGEL INC.

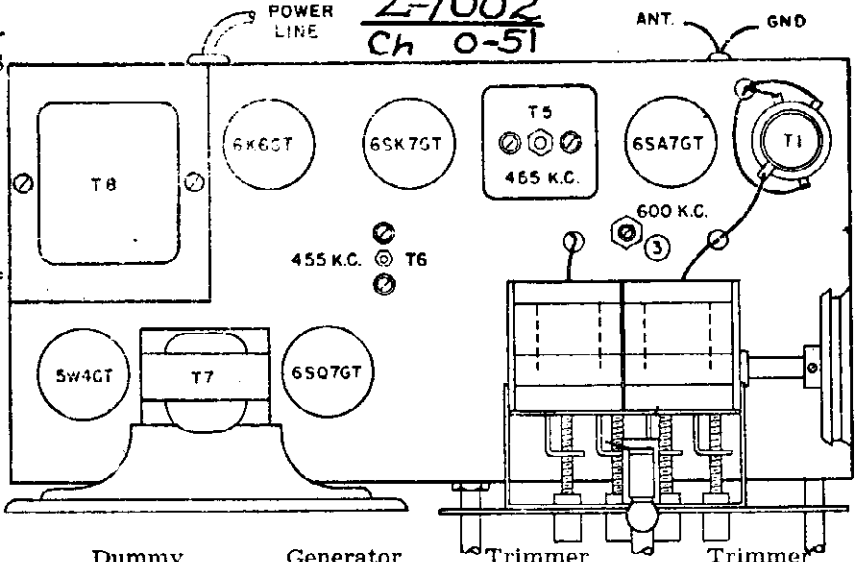


TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER.
CAPACITY VALUES ARE IN MICROFARADS.

IF PEAK
455 KC

Bands:-
537 K.C. to 1760 K.C.
5.7 to 18.3 megacycles

CODE	PART NO.	DESCRIPTION
C1	16-125	.004 MFD. 400 V. TUBULAR COND.
C2	16-124	.001 " " " "
C3	1607	.05 " " " "
C4	16-113	.01 " " " "
C5	16-114	.1 " " " "
C6	1622	.05 " 200 V. "
C7	15-118	.003 " MICA CONDENSER
C8	15-112	.0003 " " "
C9	1504	.00025 " " "
C10	1505	.00009 " " "
C11	89-8	3 GANG. VARIABLE CONDENSER
C12		
C13	80-125	TRIMMER BLOCK
C14		
C15		
C16	18-254	30 X 10 MFD. 350 W.V. ELECTROLYTIC
R1	60-193	10 MEGOHM 1/2 WATT RESISTOR
R2	60-193	1 " " "
R3	60-170	470M. OHM " "
R4	60-180	220M " " "
R5	60-189	22 M " " "
R6	60-246	.047 " " "
R7	60-182	60 " 1/2 " "
R8	60-237	10M " 1 " "
R9	60-243	870 " " " "
R10	84-140	500 M " VOLUME CONTROL & SW.
T1	80-306	B. C. ANTENNA COIL
T2	80-308	B. C. OSCILLATOR COIL
T3	80-309	S. W. ANTENNA COIL
T4	80-310	S. W. OSCILLATOR COIL
T5	80-305	1 ST. I. F. TRANSFORMER
T6	80-284	2ND. I.F. "
T7		OUTPUT TRANSFORMER (ION BAKE)
T8	80-179	POWER TRANSFORMER 60 ~
S	46-118	BAND SWITCH
S	75-573	8" DYNAMIC SPEAKER
S	20-117	FADING CONDENSER

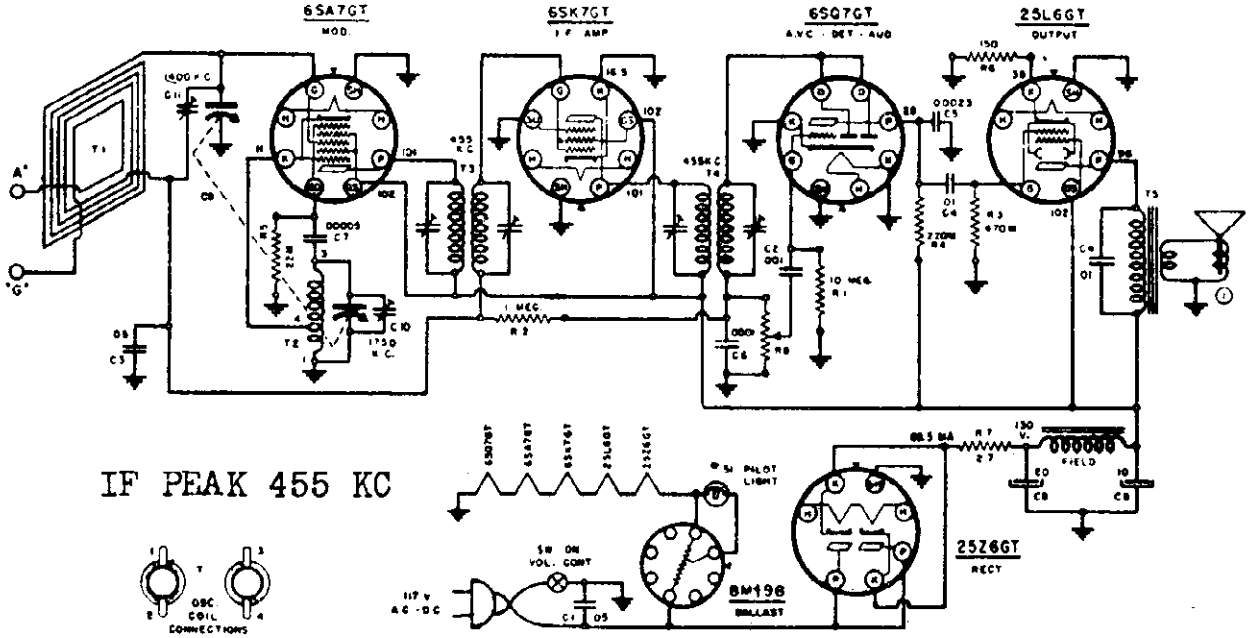


Position of Variable	Generator Freq.	Dummy Ant. mfd.	Generator Connections	Trimmer Adjustment	Trimmer Function
Closed	455 kc.	.1	6SA7 Grid.	T5 T6	I. F.
Fully Open	1760 kc	.0002	Antenna	C13	B. C. Osc.
600 kc	600 kc	.0002	Antenna	(3)	B. C. Padder
1400 kc	1400 kc	.0002	Antenna	C12	B. C. Ant.
Fully Open	18.3 mc	.0002	Antenna	C15	S. W. Osc.
14 mc	14 mc	.0002	Antenna	C14	S. W. Ant.

FOR PUSH BUTTON DATA SEE INDEX

SPIEGEL INC.

MODEL Z7018, Chassis O-61



IF PEAK 455 KC

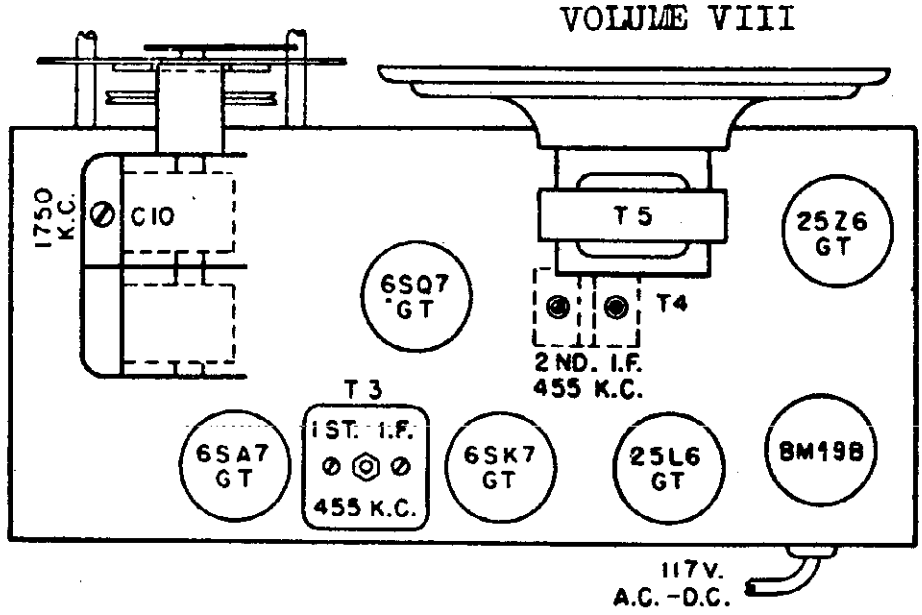
TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
WHERE NO VOLTAGE READING IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
CAPACITY VALUES ARE IN MICROFARADS.
VOLTAGES MEASURED WITH 1000 OHMS PER VOLT VOLTMETER

CODE	PART NO.	DESCRIPTION
R 1	60-193	10 MEGOHM 1/4 W. RESISTOR
R 2	60-193	1 " " "
R 3	60-178	470M OHM " "
R 4	60-180	220M " "
R 5	60-185	22M " "
R 6	60-164	150 " "
R 7	60-220	27 " "
R 8	24-148	500M " VOLUME CONTROL (WITH SW.)

CODE	PART NO	DESCRIPTION	CODE	PART NO.	DESCRIPTION O-61
C 1	1607	.05 MFD 400 V TUBULAR COND	T 1	82-8	LOOP ANTENNA
C 2	16-124	.001 " " "	T 2	10-330	OSCILLATOR COIL
C 3	1522	.05 " 200 V "	T 3	10-333	1ST. I.F. TRANSFORMER
C 4	16-121	.01 " " "	T 4	10-281	2 ND. " "
C 5	1504	.00025 MFD MICA CONDENSER	T 5	------	OUTPUT TRANSFORMER (ON SPKR.)
C 6	1506	.0001 " " "			
C 7	1503	.00005 " " "			
C 8	18-241	20 X 10 " 150 W.V. ELECTROLYTIC		T9-883	9" DYNAMIC SPEAKER
C 9	19-154	2 GANG VARIABLE COND. ALSO C10			
C 11	30-129	TRIMMER (ON LOOP)			

Z-7018 Ch. O-61

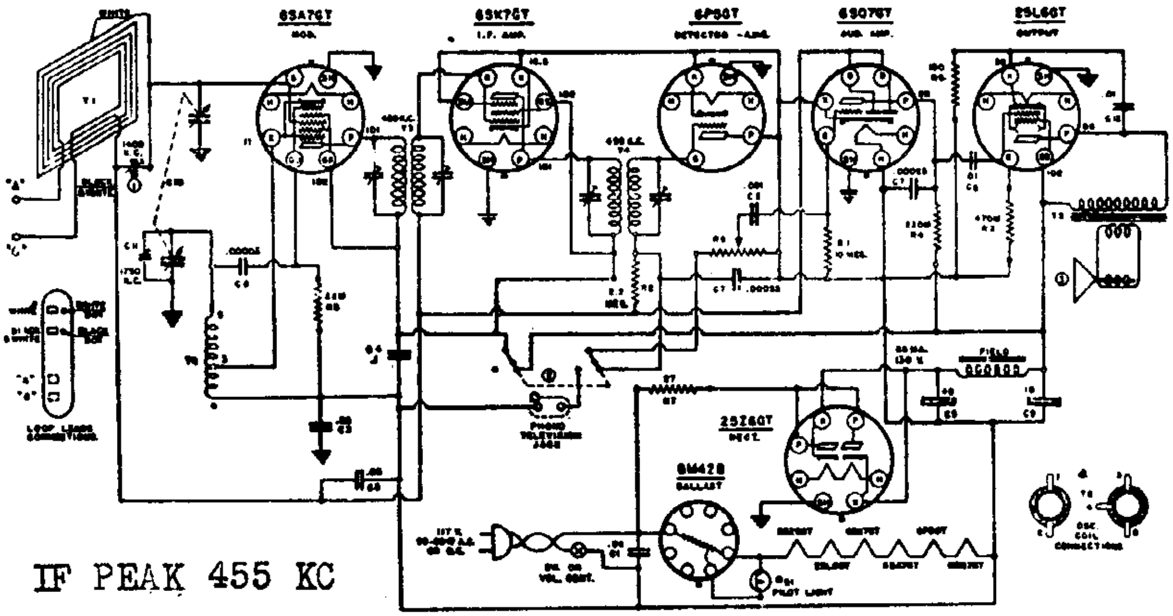
CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII



MODEL Z7026, Chassis O-77

SPIEGEL INC.

MODEL Z-7026 Ch. O-77



IF PEAK 455 KC

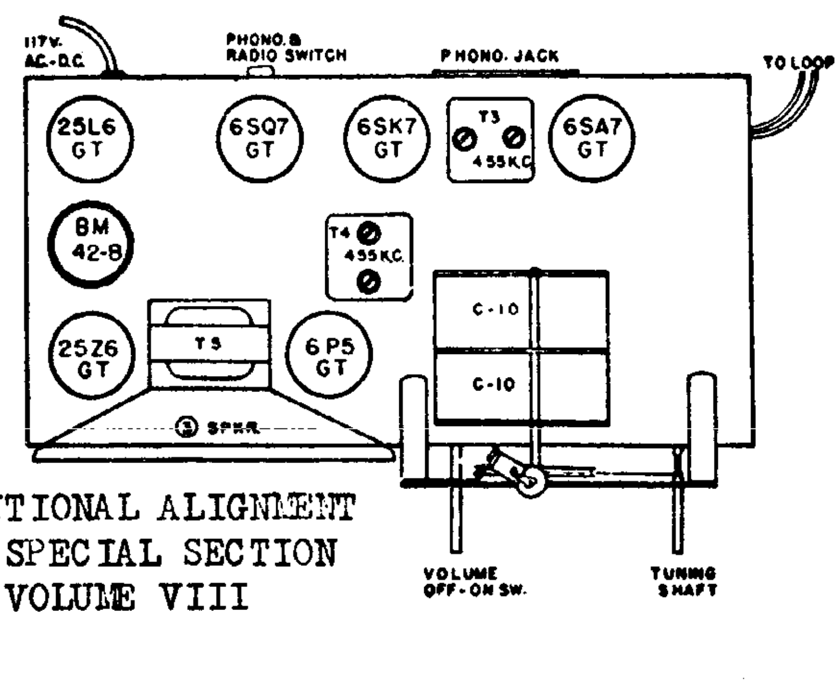
TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO COMMON GROUND.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER.
CAPACITY VALUES ARE IN MICROFARADS.
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER.

TUNING RANGE: 540 to 1750 KC

CODE	PART NO.	DESCRIPTION
C1	1607	.05 MFD. 400 V. TUBULAR COND.
C2	16-124	.001 " " " "
C3	16-128	.25 " 200 V. " "
C4	16-116	.1 " " " "
C5	1622	.05 " " " "
C6	16-121	.01 " " "
C7	1504	.00025 MFD. MICA CONDENSER
C8	1503	.00005 " "
C9	16-258	40 & 10 " 150W.V. ELECTROLYTIC
C10	10-159	2 GANG VARIABLE CONDENSER (ALSO CH)
C11	16-112	.01 MFD 400 V TUBULAR CONDENSER

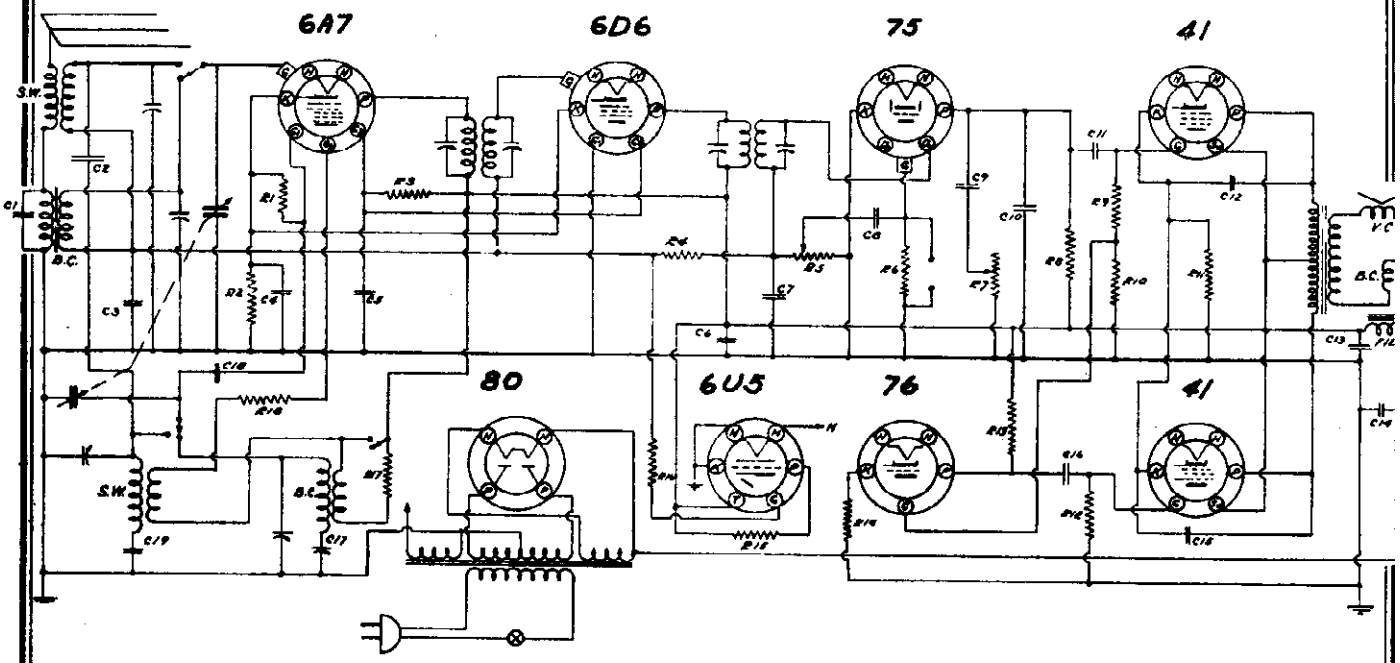
CODE	PART NO.	DESCRIPTION
R1	60-103	10 MEGOHM 1/2 W. RESISTOR
R2	60-170	2.2 " " "
R3	60-170	470 M OHM " "
R4	60-100	220 M " " "
R5	60-103	22 M " " "
R6	60-104	150 " " "
R7	60-230	27 " " "
R8	54-148	500 M VOLUME CONTROL & SW.

CODE	PART NO.	DESCRIPTION O-77
T1	22-10	LOOP ANTENNA
T2	10-211	OSCILLATOR COIL
T3	10-217	1 ST. I.F. TRANSFORMER
T4	10-212	2 ND. " "
T5	------	OUTPUT TRANSFORMER (ON SPKR)
1	20-109	TRIMMER (ON LOOP)
2	69-142	PHONO SWITCH
3	79-083	6" DYNAMIC SPEAKER



CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

SPIEGEL INC. MODEL Z7028, Chassis 8C



CAPACITORS						RESISTORS					
No.	MFDS.	VOLTS	No.	MFDS.	VOLTS	No.	OHMS	WATTS	No.	OHMS	WATTS
C1	.0001	Mica	C11	.01	600	R1	50,000	1/2	R11	300	1/2
C2	GIMMICK		C12	.005	600	R2	200	1/2	R12	1/2 Meg	1/2
C3	.05	200	C13	10.0	350	R3	24,000	1/2	R13	50,000	1/2
C4	.25	200	C14	10.0	350	R4	2 Meg.	1/2	R14	3,000	1/2
C5	.05	400	C15	.005	600	R5	1/2 -	V.C.	R15	1 Meg	1/2
C6	.05	400	C16	.01	400	R6	3 -	1/2	R16	1 -	1/2
C7	.00025	Mica	C17	.0003-.0006	PADDER	R7	1/2 -	T.C.	R17	1000	1/2
C8	.01	400	C18	.0001	Mica	R8	1/2 -	1/2	R18	250	1/2
C9	.005	400	C19	.004 2.5%		R9	200,000	1/2			
C10	.00025	Mica				R10	100,000	1/2			

I.F. 455 K.C.

BAND SWITCHES SHOWN IN BROADCAST POSITION

BOTTOM VIEW OF TUBE SOCKETS SHOWN

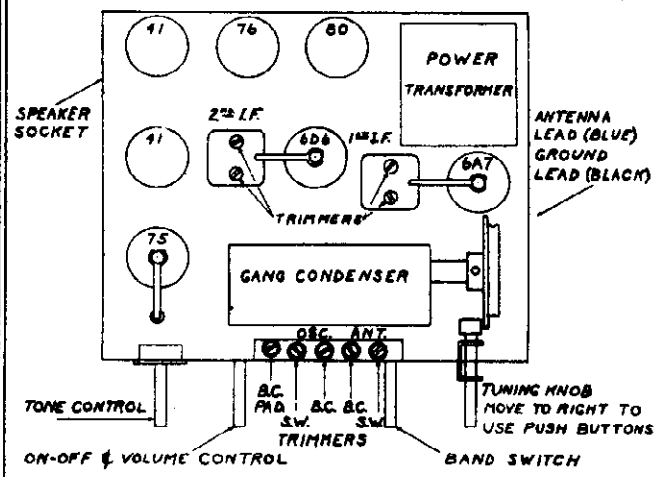


Fig. 2—Top View

ALIGNMENT DATA

I.F. ALIGNMENT

Adjust the signal generator to 455 KC and connect the output to the grid of the first detector tube (6A7) through a .05 or .1 mfd. condenser. Align all I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT

Adjust the signal generator to 1730 KC and connect the output to the antenna lead (blue) through a .0002 mfd. mica condenser. Set the gang condenser to minimum capacity and adjust the oscillator trimmer to receive this signal. The oscillator and antenna trimmers may be reached by removing the dial escutcheon. (See Fig. 2 for trimmer locations.) The next step is to set the signal generator to 1400 KC and after tuning in the signal adjust the antenna trimmer to peak. Next, re-set the dial pointer on the receiver and the signal generator to 600 KC. Slowly increase or decrease the oscillator padding condenser and at the same time continuously tune back and forth across the signal with the receiver until the maximum reading is obtained on the output meter.

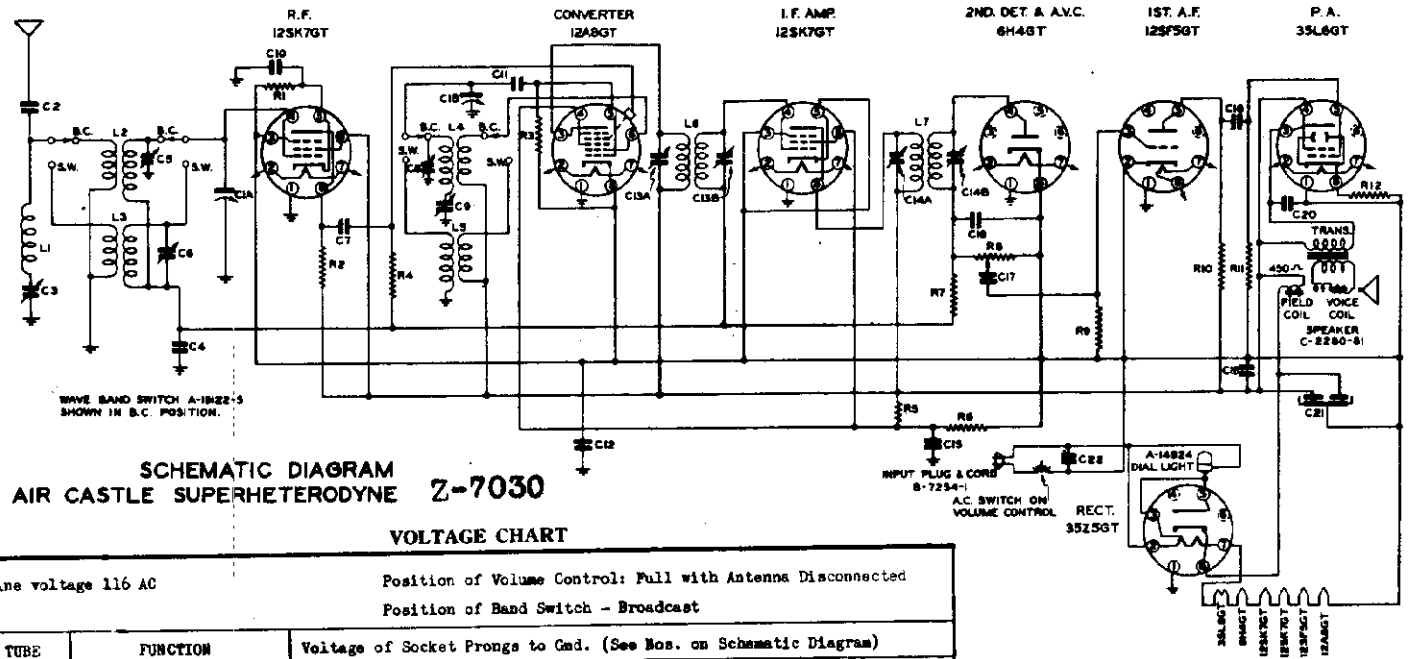
Return to 1400 KC and again go over the adjustments of this frequency to be certain that they were not put slightly out of alignment when adjustment was made at 600 KC.

SHORT WAVE BAND ALIGNMENT

The short wave band is adjusted by setting the signal generator to 18100 KC and connecting the output to the antenna lead through a 400 ohm resistor. Set the gang at minimum and 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 mica padding condenser, should be tested.

INTERMEDIATE FREQUENCY 456 K.C.

BOTTOM VIEWS OF ALL SOCKET CONNECTIONS



C1A&B	VARIABLE CONDENSER	B-8181	C11	56 MMF. MICA	C-720-372
C2	.001 MFD. 400V.	C-3204-58C	C12	.15 MFD. 400V.	C-3204-89C
C3	I.F. REJECT. TRIMMER	A-14088-2	C13A&B	NO.1 I.F. TRIM.	B-7200-GG
C4	.05 MFD. 200 V.	C-3202-84C	C14A&B	NO.2 I.F. TRIM.	B-7200-GH
C5	B.C. ANT. TRIMMER	A-14088-1	C15	.05 MFD. 200V.	C-3202-84C
C6	S.W. ANT. TRIMMER	A-14088-1	C16	500 MMF. MICA	C-720-316
C7	100 MMF. MICA	C-720-339	C17	.01 MFD. 200V.	C-3202-20C
C8	B.C. OSC. TRIMMER	A-15573	C18	.01 MFD. 200V.	C-3202-20C
C9	B.C. OSC. PADDER		C19	.1 MFD. 200V.	C-3202-38C
C10	.01 MFD. 200V.	C-3202-20C	C20	.03 MFD. 400V.	C-3204-80C
			C21	25-25 MFD. ELECT.	A-15571
			C22	.01 MFD. 400V.	C-3204-20C

R1	470 Ω	.25 W.	C-2795-151B
R2	3900 Ω	.25 W.	C-2795-88B
R3	56,000 Ω	.25 W.	C-2795-63B
R4	56,000 Ω	.25 W.	C-2795-63B
R5	3300 Ω	.5 W.	C-2796-68C
R6	10,000 Ω	.5 W.	C-2796-74C
R7	1 MEGOHM	.25 W.	C-2795-69B
R8	500,000 Ω VOL. CONT. & SWITCH		A-15129-1
R9	5.6 MEGOHM	.25 W.	C-2795-107B
R10	270,000 Ω	.25 W.	C-2795-91B
R11	560,000 Ω	.25 W.	C-2795-63B
R12	180 Ω	.5 W.	C-2796-53C

L1	I.F. REJECTOR COIL	A-14716-1
L2	B.C. ANT. COIL	A-14874-2
L3	S.W. ANT. COIL	A-14882-9
L4	B.C. OSC. COIL	A-15232-4
L5	S.W. OSC. COIL	A-15233-4
L6	NO.1 I.F. COIL	A-12084-32
L7	NO.2 I.F. COIL	A-12084-17

SCHEMATIC DIAGRAM
AIR CASTLE SUPERHETERODYNE Z-7030

VOLTAGE CHART

Line voltage 116 AC — Position of Volume Control: Full with Antenna Disconnected — Position of Band Switch - Broadcast

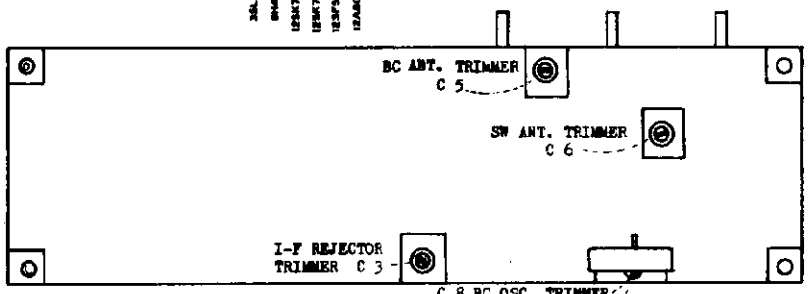
TUBE	FUNCTION	Voltage of Socket Prongs to Gnd. (See Nos. on Schematic Diagram)								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	Grid Cap
12SK7GT	R-F Amplifier	0	*24	0	-.025	1.6	60	*35	78	—
12A8GT	Converter	0	*12	98	60	-.025	95	0	0	-.04
12SK7GT	I-F Amplifier	0	*48	0	-.025	0	60	*36	95	—
6H4GT	Det - AVC	0	*52	0	-.025	-.025	-.025	*48	0	—
12SF5GT	1st Audio	0	0	-.05	—	**58	—	*24	*12	—
35L6GT	Power Amplifier	—	*85	90	95	0	0	*52	5.6	—
35Z5GT	Rectifier	—	*116	*110	—	*110	—	*85	*116	

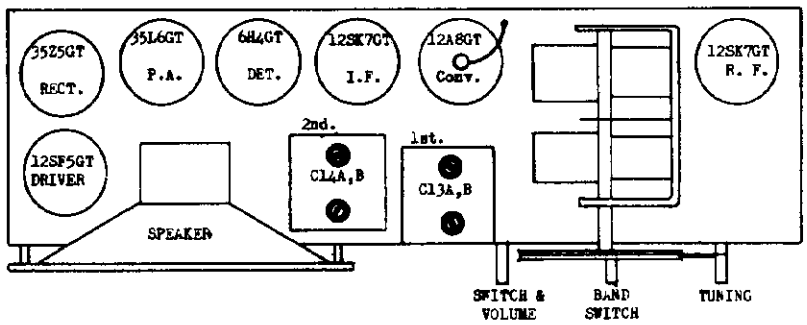
Notes: Voltage readings are for schematic diagram on back of sheet. Allow 15% + or - on all measurements. Always use meter scales which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter.
*AC readings
**100 V scale.

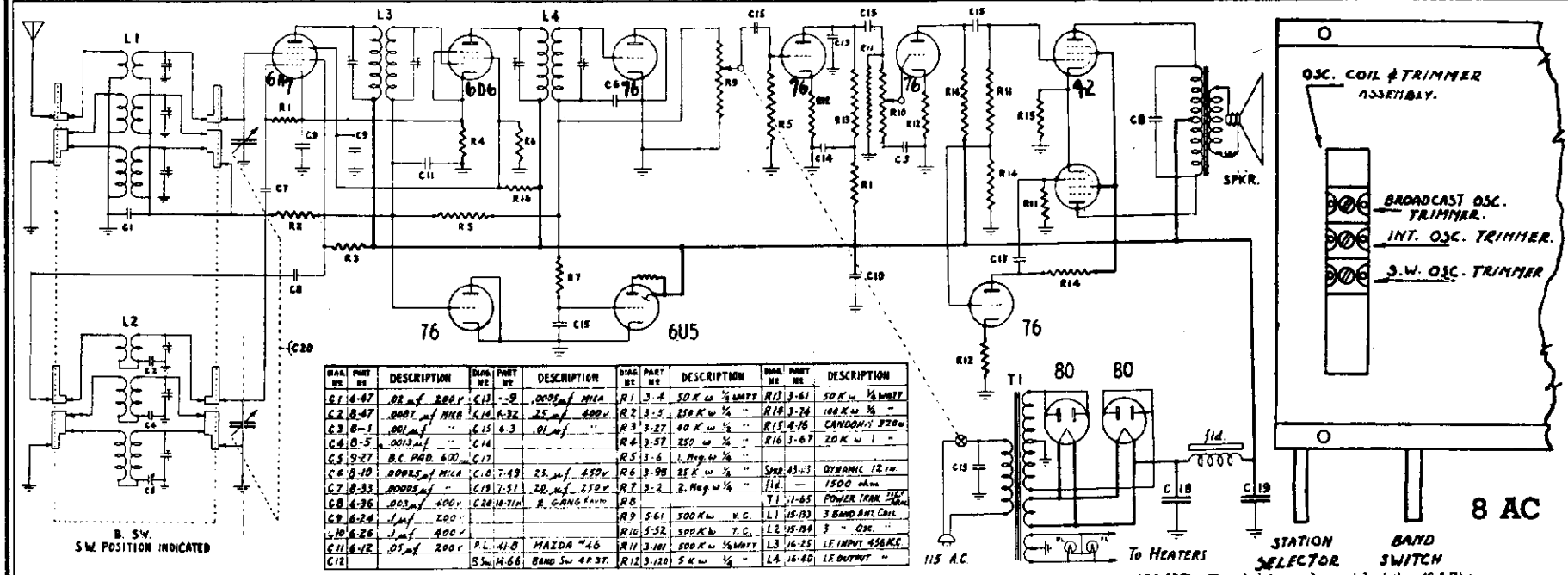
ALIGNMENT CHART

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set pointer even with horizontal dial marks with condenser gang closed)							
2	I. F.	12A8GT Grid	.1 mf.	456 KC	BC	Open	C13A,B;C14A,B	
3	Rejector	Ant.	200mmf.	456 KC	BC	Closed	C 3	Adjust to minimum
4	Broadcast Band	Ant.	200 mmf.	1500 KC	BC	1500 KC	C 8 (Osc) C 5 (Ant)	
5				600 KC	BC	600 KC	C 9 (Pad)	**
6	(Repeat operation 4)							
7	(Check calibration and sensitivity at 600 KC, 1000 KC and 1500 KC)							
8	SW Band	Ant.	*	18 MC	SW	18 MC	C 6 (Ant)	
9	(Check calibration and sensitivity at 6. MC and 18 MC)							
10	(Check operations 1 to 9 inclusive)							

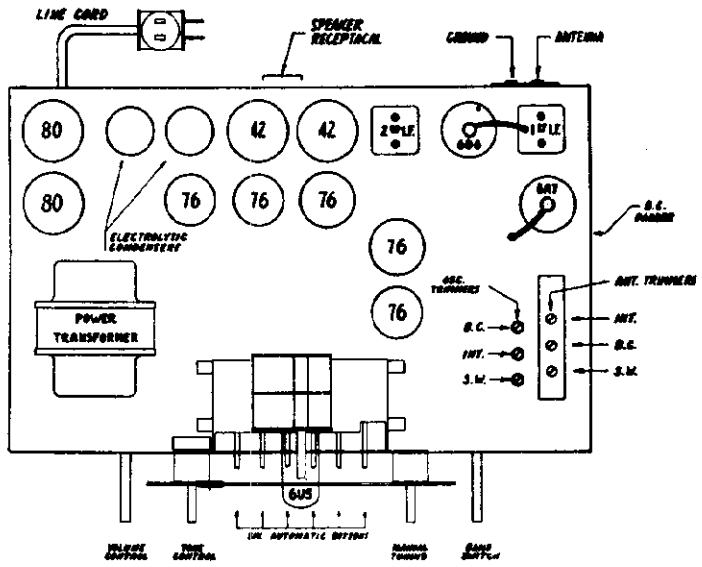
*100 ohm non-inductive resistor and 200 mmf. condenser in series.
**Rock dial while making this adjustment. Make certain that adjustment is made on fundamental signal and not on image. Peak accurately.







DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
C1	6-47	.02 mf 200 v	C13	-9	.0005 mf MICA	R1	3-4	50 K ω ½ WATT	R17	3-61	50 K ω ½ WATT
C2	6-47	.0007 mf MICA	C14	6-32	.25 mf 400 v	R2	3-5	250 K ω ½ "	R18	3-74	100 K ω ½ "
C3	6-1	.001 mf "	C15	6-3	.01 mf "	R3	3-27	40 K ω ½ "	R15	4-16	CANDOHM 320 ω
C4	6-5	.0013 mf "	C16			R4	3-57	250 ω ½ "	R16	3-67	20 K ω 1 "
C5	9-27	B.C. PAD. 600 mf	C17			R5	3-6	1 Meg ω ½ "			
C6	6-10	.00035 mf MICA	C18	7-49	25 mf 450 v	R6	3-98	25 K ω ½ "	Spkr.	43-3	DYNAMIC 12 in.
C7	6-33	.00005 mf "	C19	7-51	20 mf 250 v	R7	3-2	2 Meg ω ½ "	fld.	—	1500 ohms
C8	6-36	.003 mf 400 v	C20	18-71A	3 GANG Auto	R8			T1	41-65	POWER TRAN. 115 V. 60 Cy.
C9	6-24	.1 mf 200 v				R9	5-61	500 K ω V.C.	L1	15-133	3 BAND ANT. COIL
C10	6-26	.1 mf 400 v				R10	5-52	500 K ω T.C.	L2	15-134	3 " OSC. "
C11	6-12	.05 mf 200 v	P.L.	41-8	MAZDA #46	R11	3-101	500 K ω ½ WATT	L3	16-25	I.F. INPUT 456 KC.
C12			S.W.	14-66	BAND SW 4P 3T.	R12	3-120	5 K ω ½ "	L4	16-40	I.F. OUTPUT "



INTERMEDIATE FREQUENCY: Set oscillator to 456 KC. Feed this to the grid of the (6A7) tu... Adjust trimmers on the intermediate frequency transformers for peak readings as indicated on the output meter which is to be placed across the output transformer.

BROADCAST BAND: Set the band switch for broadcast reception. Adjust oscillator to 1400 KC and connect the output of the generator to the antenna connection at the rear of the chassis through a .0002 mfd. mica condenser. Set the pointer on the dial to 1400 KC making sure that the volume control is set at its maximum position. Adjust the broadcast antenna and broadcast oscillator trimmers for maximum signal (as indicated on the output meter). Re-set the dial pointer on the receiver and on the test oscillator to 600 KC. Slowly increase or decrease the **broadcast padding** condenser while tuning back and forth across the signal with the station selector knob until the maximum reading is obtained on the output meter. Re-check the 1400 KC alignment as the adjustment at 600 KC may have slightly disturbed the original 1400 KC setting.

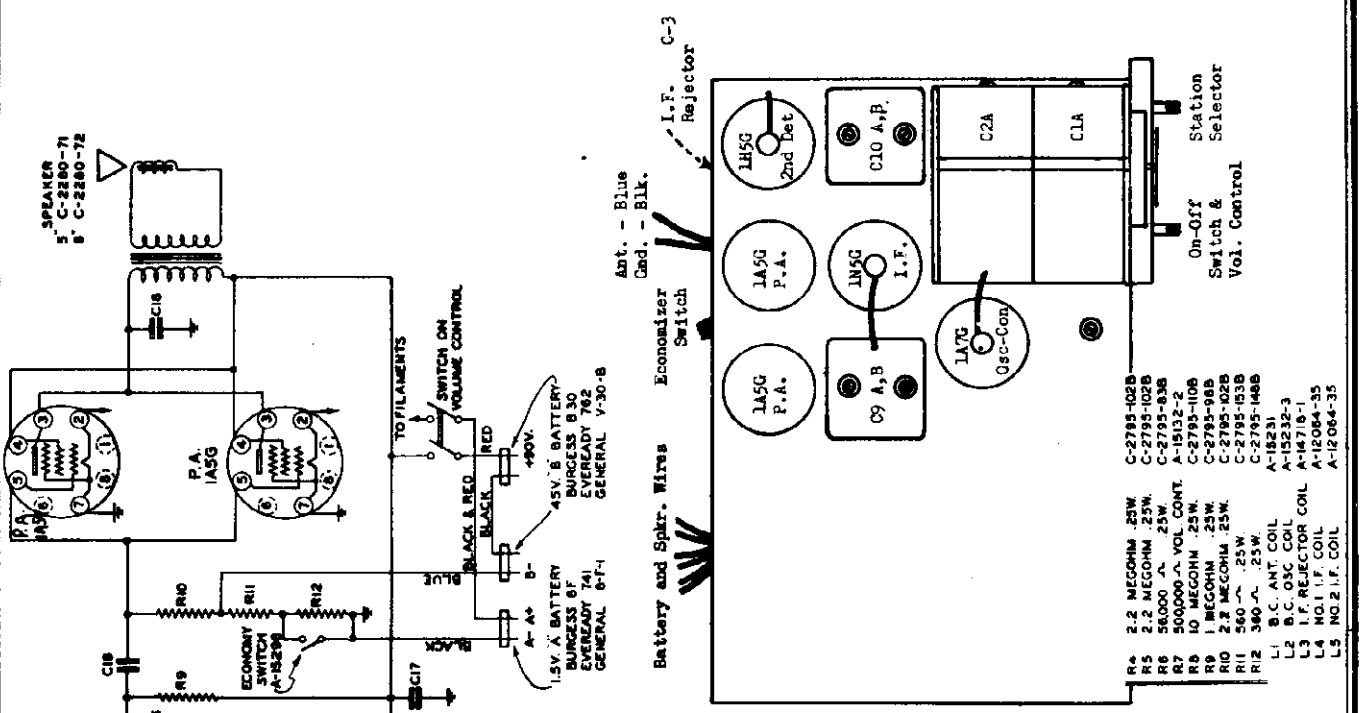
INTERMEDIATE BAND: For a dummy antenna use a .0002 mfd. mica condenser in series with a 400 ohm carbon resistor. Set band switch to the intermediate band position and feed a 5100 KC signal from the oscillator. Set dial pointer at 5100 KC. Adjust intermediate antenna and intermediate oscillator trimmers for maximum output.

SHORT WAVE: Set band switch on short wave position. Connect the antenna of the radio receiver to the output of the test oscillator through a 400 ohm carbon resistor. Set oscillator and receiver dial at 15 megacycles. Adjust the short wave antenna and short wave oscillator trimming condensers for maximum output as indicated by readings on the output meter. No other adjustments are necessary for aligning this band.

It is advisable to check the sensitivity at 6000 KC to determine whether the circuits are properly aligned. Should the receiver lack sensitivity at this frequency check the .0087 mica condenser for short circuit.

MODELS Z7104,Z7150
Chassis 560-1

SPIEGEL INC.



INTERMEDIATE FREQUENCY 456 K.C.

TOP VIEWS OF ALL SOCKET CONNECTIONS

ALIGNMENT CHART

OPER-ATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set dial pointer parallel with horizontal lines on dial with gang fully closed)						
2	I.F.	1A7G Grid	.1 mf.	456 KC	Open	C10 A&B	2nd I.F.
						C9 A&B	1st I.F.
3	I.F.Rejector	Antenna	200 mmf.	456 KC	Closed	C3	Adjust to minimum
4	Broadcast Band	Antenna	200 mmf.	1500 KC	1500 KC	C1A	BC Osc.
						C2A	BC Trimmer
				600 KC	600 KC	C7	BC Padder*
5	(Repeat operation 4)						
6	(Check calibration and sensitivity at 1500 KC, 900 KC and 600 KC)						
7	(Check operations 1 to 7 inclusive)						
8	(Check operations 1 to 7 inclusive)						

*Rock gang condenser while adjusting for maximum output.

VOLTAGE CHART

Condition of Batteries: Good Position of Volume Control: Full with Antenna Disconnected
Position of "Economizer" Switch: "OFF"

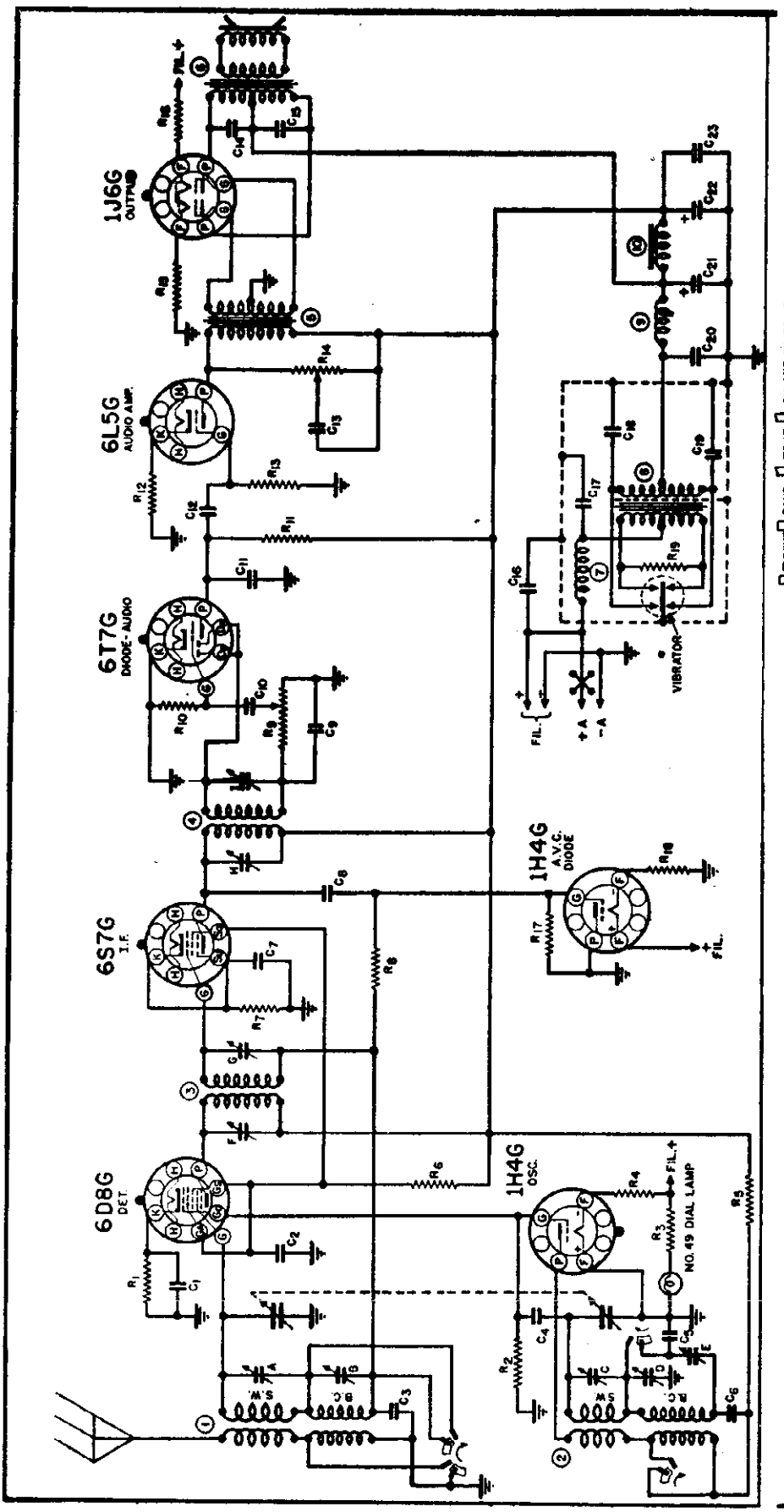
TUBE	FUNCTION	Voltage of Socket Prongs to Gnd.(See Prong Nos. on Schematic Diagram)								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	Grid Cap
1A7G	Oscillator - Converter	80	1½	80	30	0	45	0	45	0
1N5G	I-F Amplifier	0	1½	80	80	0	0	0	0	0
1H5G	2nd Det-AVC-1st A.F.	-	1½	10	0	0	0	0	-	0
1A5G	Power Amplifier	-	1½	75	80	0	0	0	-	-
1A5G	Power Amplifier	-	1½	75	80	0	-6	0	0	-

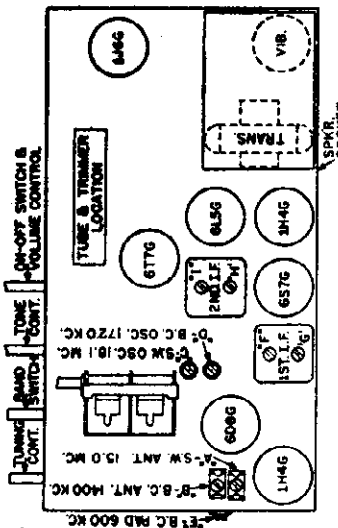
Notes: Voltage readings are for schematic diagram on back of sheet. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits.

C1A&B VARIABLE CONDENSER B-8076
C2A&B TRIMMERS ON VAR. COND. A-14088-2
C3 I.F. REJECTOR TRIMMER C-3202-140C
C4 .05 MFD. 200V. C-720-325
C5 100 MMF. MOLDED C12 100 MMF. MOLDED
C6 .00 MFD. 200V. C-3202-58C
C7 B.C. OSC. PADDER A-14911-44
C8 .05 MFD. 200V.
C9A&B NO. 1 I.F. TRIMMER C-3202-28C
C10A&B NO. 2 I.F. TRIMMER B-7200-GG
C11 100 MMF. MOLDED C-720-325
C13 .01 MFD. 200V. C-3202-13C
C14 .05 MFD. 200V. C-3202-14C
C15 100 MMF. MOLDED C-720-325
C16 .01 MFD. 400V. C-3204-13C
C17 8 MFD. 150V. ELECT. A-14958
C18 .001 MFD. 1000V. C-3210-114
R1 40,000 Ω .25W. C-2795-89B
R2 27000 Ω .5W C-2795-79C
R3 68000 Ω .25W. C-2795-84B
R4 2.2 MEGOHM .25W. C-2795-102B
R5 2.2 MEGOHM .25W. C-2795-102B
R6 58000 Ω .25W. C-2795-83B
R7 500,000 Ω VOL CONT. A-15132-2
R8 10 MEGOHM .25W. C-2795-110B
R9 1 MEGOHM .25W. C-2795-98B
R10 2.2 MEGOHM .25W. C-2795-102B
R11 560 Ω .25W C-2795-153B
R12 360 Ω .25W. C-2795-148B
L1 B.C. ANT. COIL A-15231
L2 B.C. OSC. COIL A-15232-3
L3 I.F. REJECTOR COIL A-14716-1
L4 NO.1 I.F. COIL A-12064-35
L5 NO.2 I.F. COIL A-12064-35

MODELS W200,W230,W24
W254,W264,W270,Z7200
Chassis QT

SPIEGEL INC.





SCHEMATIC AND PARTS LIST INCLUDING CHASSIS LAYOUT AND TUBE POSITIONS

DIAG. NO.	PART NO.	DESCRIPTION
C1	C-13	.05 MFD. 200 V.
C2	C-1	.1 MFD. 200 V.
C3	C-13	.05 MFD. 200 V.
C4	C-115	50 MMFD.
C5	C-109	4,000 MMFD. 5%
C6	C-4	.01 MFD. 400 V.
C7	C-13	.05 MFD. 200 V.
C8	C-115	50 MMFD.
C9	C-110	100 MMFD.
C10	C-27	.006 MFD. 800 V.
C11	C-111	250 MMFD.
C12	C-4	.01 MFD. 400 V.
C13	C-5	.01 MFD. 600 V.
C14	C-4	.01 MFD. 400 V.
C15	C-4	.01 MFD. 400 V.
C16	C-22	.5 MFD. 50 V.
C17	C-22	.5 MFD. 50 V.
C18	C-74	.01 MFD. (OIL) 1,000 V.
C19	C-7-1	.01 MFD. (OIL) 1,000 V.
C20	C-5	.01 MFD. 800 V.
C21	C-242	.10 MFD. 250 V.
C22		.15 MFD. 250 V.
C23	C-1	.1 MFD. 200 V.
R1	N-1256	500 OHM .5 W.
R2	N-1260	50,000 OHM .5 W.
R3	N-1266	67.0 OHM .5 W.
R4	N-1266	67.0 OHM .5 W.
R5	N-1258	10,000 OHM .5 W.
R6	N-1259	15,000 OHM .5 W.
R7	N-1255	400 OHM .5 W.
R8	N-1262	1 MEGOHM .5 W.
R9	V-20	1 MEG. VOLUME CONT. .5 W.
R10	N-1263	10 MEGOHM .5 W.
R11	N-1264	.5 MEGOHM .5 W.
R12	N-1257	2,000 OHM .5 W.
R13	N-1254	.5 MEGOHM .5 W.
R14	V-112	75,000 Ω. TONE CONT. .5 W.
R15	N-1267	8.3 OHM 5% .5 W.
R16	N-1267	8.3 OHM 5% .5 W.
R17	N-1262	1 MEGOHM .5 W.
R18	N-1266	67.0 OHM .5 W.
R19	N-1265	200 OHM .5 W.
	X-17	BAND SWITCH
	G-21	GANG CONDENSER
	F-4	SYN. VIBRATOR
	W-207	BATTERY CABLE
1	L-72	ANTENNA COIL
2	L-63	OSCILLATOR COIL
3	T-38	1ST I.F. TRANS.
4	T-28	2ND I.F. "
5	T-103	AUDIO "
*6	N-1271	SPKR. 6" & TRANS.
7	H-208	"A" CHOKE
8	T-26	POWER TRANS.
9	H-207	R.F. CHOKE
10	H-9	AUDIO CHOKE.
A		2-35 MMFD. "
B		" "
C		" "
D	N-1234	300-600 MMFD.
E	S-27	SPKR. 8" & TRANS
*6		BATTERY CABLE

MODELS W200,W230,W240, W254,W264,W270,Z7200

SPIEGEL INC.

AUTOMATIC TUNING
ADJUSTMENT AND OPERATION

Automatic tuning is a standard feature on this Model. It provides instantaneous selection of any six favorite stations by simply depressing a button. The automatic unit is wholly mechanical in operation and of rugged construction to assure greater accuracy over a longer period of time.

ADJUSTMENT. All adjustments are simply made from the front of the cabinet without the use of tools since the push-button knobs serve this purpose.

To make adjustments, turn each knob to the left about 1 complete turn. The knob is knurled to provide a positive grip for this purpose. A groove is also provided across the knob for use of a small coin to lock each setting with ease and surety.

With the knob turned free, depress as far as possible and hold down, meanwhile tune to any desired station with the manual tuning control. At this point, the automatic push button knob should be turned to the right until securely tightened. Be sure the knob is being held down in position while it is being tightened. To assure accurate adjustment, the volume control should be set at a moderate level and the station tuned in slowly to a point of maximum volume and clarity.

It is not necessary to follow any particular sequence of stations since each button is adjustable to any station.

With each button definitely set and securely tightened to the selected stations, the tuner is ready for operation.

OPERATION. With the set tuned on to a moderate level of volume, the automatic tuner is operated by merely pressing a button set to the desired station.

Station selection may be made automatically or manually at will since the manual tuning control operates free and independent of the automatic unit.

The station call letter tabs furnished should be inserted in the escutcheon above the push-buttons using designations corresponding to the station selected for each button.

ALIGNMENT PROCEDURE

GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 456, 600, 1720, 6000, and 18100 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.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the Short Wave and Broadcast bands in the order given, should 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 should 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. With the band switch turned to the S. W. position, connect the generator to the antenna with a 400 ohm dummy. Adjust the S. W. oscillator to give a maximum output with the dial at 18100 KC (extreme end). Set the generator at 15000 KC and tune-in the signal with the dial. Adjust the antenna trimmer for maximum output. With a strong signal input turn the dial to approximately 1 M. C. lower in frequency and pick up the image frequency. If the image is not received, it will be necessary to return the dial to 18100 KC to reduce the capacity in the oscillator trimmer until a second signal is received. Proceed as before with the alignment of the antenna and recheck for image frequency. Check the sensitivity at 6000 KC to determine if the coils and mica pad are not defective.

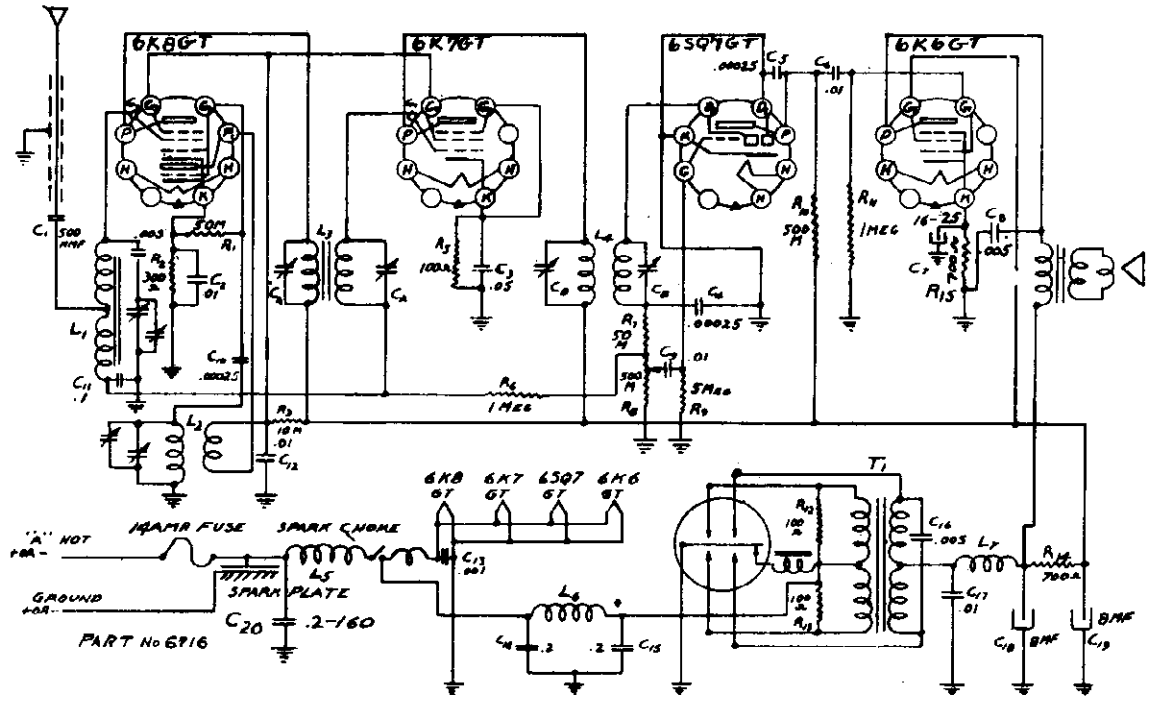
BROADCAST BAND ALIGNMENT. With the switch turned to the broadcast position, connect the antenna to the generator through a 200 MMF dummy and set the dial and generator at 1720 KC. Align the BC oscillator trimmer for maximum output. Set the generator at 1400 KC and tune-in signal with the dial. Adjust antenna trimmer for maximum output. Next set the generator at 600 KC and tune in the signal with the dial. Adjust the BC pad by rocking the gang back and forth while adjusting the pad until maximum output is attained. Recheck the adjustment at 1400 KC as the pad adjustment may have caused misalignment.

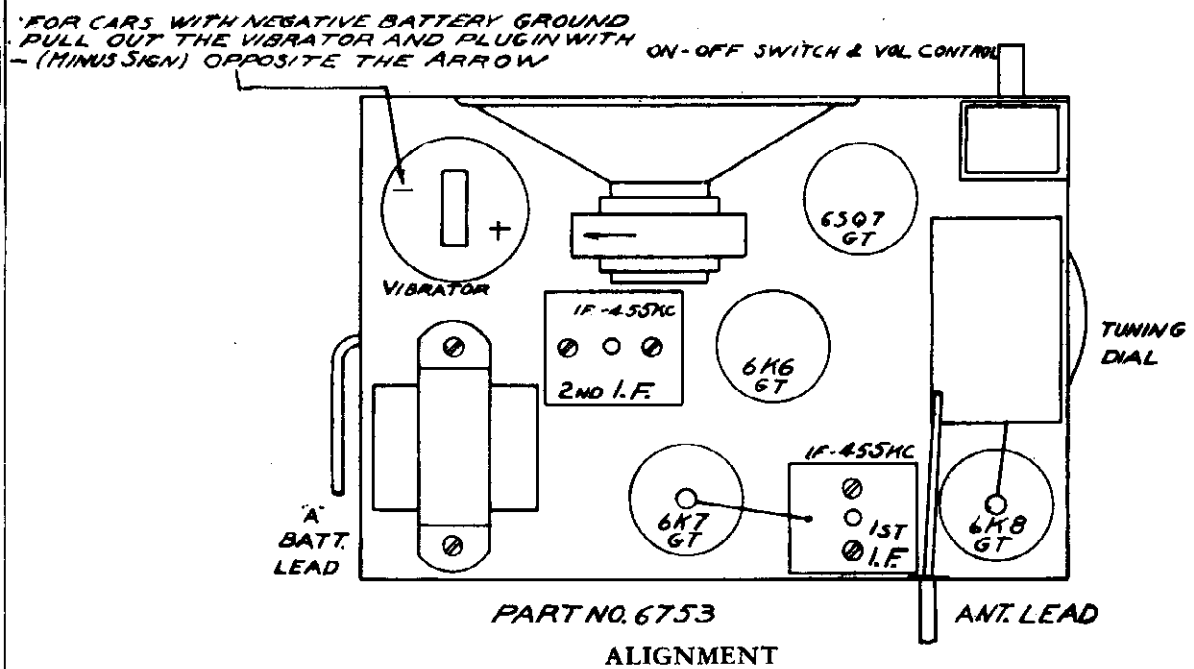
ALIGNMENT DATA AND SERVICING

Lack of sensitivity and poor tone quality may be due to any one or a combination of causes such as a weak or defective tubes or speaker. Open or grounded bias resistor, bypass condenser, inadequate or excessively long antenna etc. Never attempt to realign set until all other possible sources of trouble have been first thoroughly investigated and definitely proven not to be the cause. NOTE: IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OUTPUT MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER AND THAT THE PROCEDURE BE CAREFULLY FOLLOWED, OTHERWISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT. THE TRIMMER AND PADDING CONDENSERS WILL BE REFERRED TO BY THEIR FUNTION AS INDICATED ON THE PARTS DIAGRAM.

SPIEGEL INC.

MODELS Z7456, Z7458
Chassis 297





ALIGNMENT

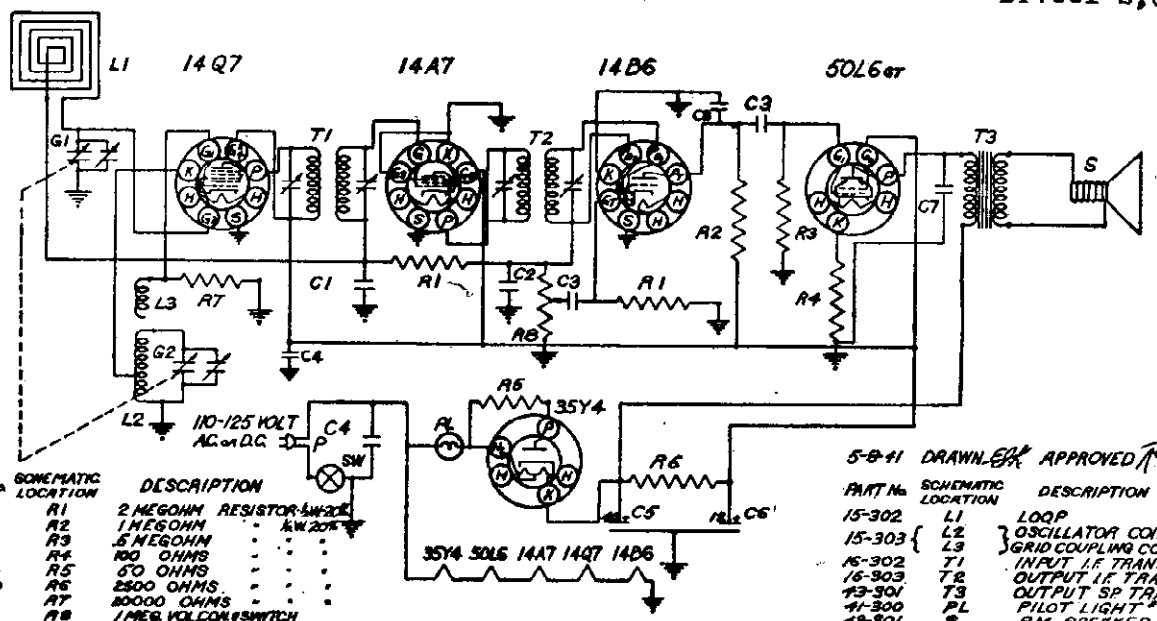
I.F. Frequency	455 KC.
Frequency Range	1550—540 KC.
Dummy Antenna	30 MMF.
Input to I.F.	1/10 MF.

To align the I.F., feed the signal generator or test oscillator through a 1/10 MF condenser to the grid of the 6K8 tube, ground the ground side of signal generator to the case. With volume control full on and a weak signal, adjust screws of 1st and 2nd I.F. transformers using a suitable output meter to indicate resonance.

The oscillator should be set at 1550 K.C. Turn variable condenser to minimum capacity and with a 30 MMF dummy antenna condenser connected to the antenna cable and a low signal input, set the oscillator to its top frequency. The antenna trimmer should be adjusted at 1400 KC. The antenna trimmer should be readjusted at this frequency when the set is installed in the car.

SPIEGEL INC.

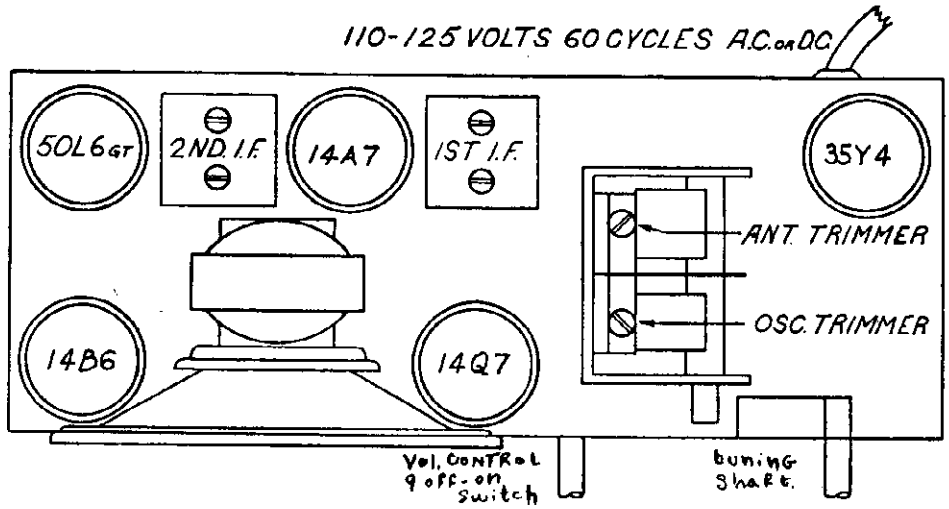
MODELS EP2000-1,
DP7001-2, Ch. T53(



PART No.	SCHEMATIC LOCATION	DESCRIPTION
3-2	R1	2 MEGOHM RESISTOR ½W 20%
3-6	R2	1 MEGOHM " " " "
3-1	R3	.5 MEGOHM " " " "
3-31	R4	100 OHMS " " " "
3-174	R5	60 OHMS " " " "
3-120	R6	2500 OHMS " " " "
3-156	R7	80000 OHMS " " " "
5-301	R8	1 MEG VOL CON & SWITCH
10-301	C1	GANG CONDENSER
	C2	
6-12	C1	.05 MFD. 200V CONDS.
6-8	C2	.0001 MFD. MICA "
6-3	C3	.01 MFD 400V "
6-14	C4	.05 MFD. 400V "
7301	C5	40 MFD. ELECTROLYTIC
	C6	12 MFD.
6-306	C7	.005 MFD. 600V CONDS.
6-305	C8	.0005 MFD. 400V "

5-8-41 DRAWN EGK APPROVED [illegible]

PART No.	SCHEMATIC LOCATION	DESCRIPTION
15-302	L1	LOOP
15-303	L2	OSCILLATOR COIL
	L3	GRID COUPLING COIL
16-302	T1	INPUT I.F. TRANS.
16-303	T2	OUTPUT I.F. TRANS.
43-301	T3	OUTPUT SP. TRANS.
41-300	PL	PILOT LIGHT #47
43-301	S	P.M. SPEAKER
10-301	14Q7	OSCILLATOR MIXER
	14A7	I.F. AMPLIFIER
	14B6	DETECTOR-AUDIO
	50L6 GT	AUDIO AMPLIFIER
	35Y4	RECTIFIER
34-5	P	LINE CORD
6-301	SW	SWITCH ON VOL. CON.

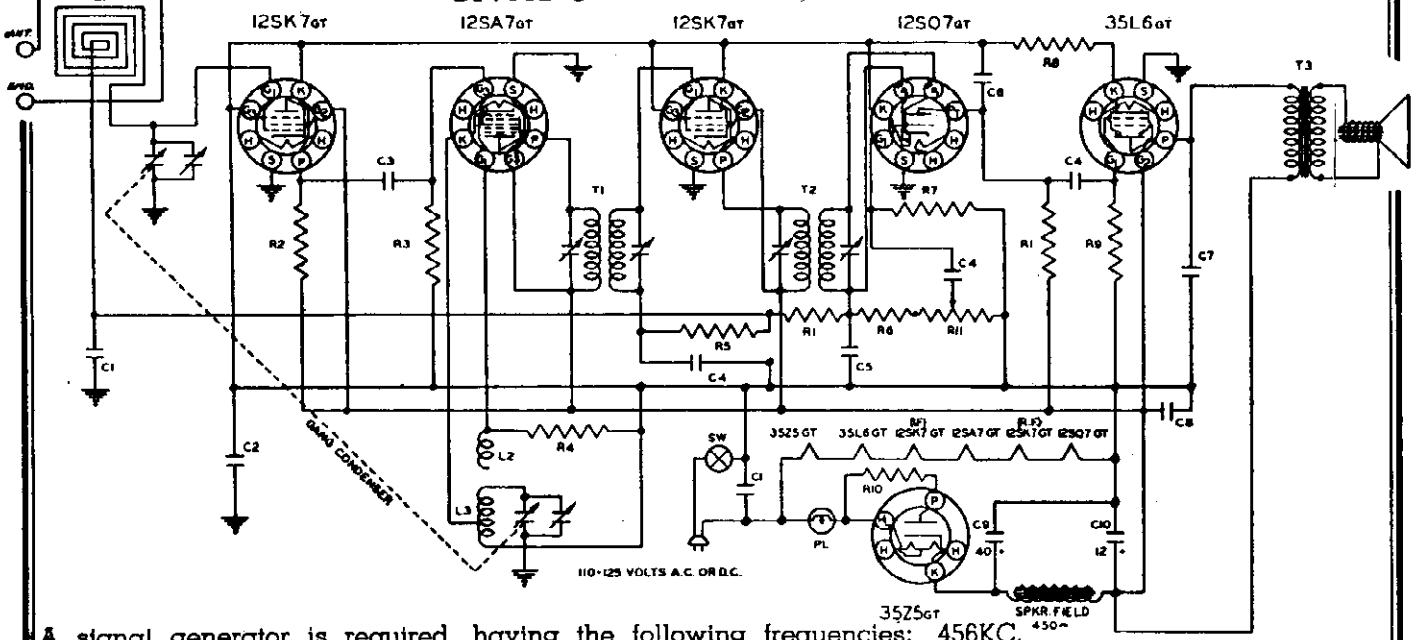


Remove chassis from cabinet for alignment.

A signal generator is required having the following frequencies: 456KC, 1400KC, 1720KC.

First Step: Connect the generator lead through a .1 mfd. condenser to the terminal lug next to the Antenna trimmer on top of the tuning condenser. The ground lead from the generator may be connected to any convenient spot on the metal chassis. Adjust generator to 456KC and adjust IF trimmer screws until a maximum reading is noted on the output meter which has been connected across the speaker. The tuning condenser should be turned out to complete minimum capacity when aligning the IF. With generator lead still connected to antenna trimmer terminal, adjust generator frequency to 1720KC, and with tuning condenser still at minimum, adjust oscillator trimmer till the 1720KC signal is tuned in. Next, remove generator leads from set and connect both to a transmitting loop. This loop can be made with 2 turns of wire about 6 inches in diameter. Adjust generator frequency to 1400KC. Turn tuning condenser until the signal is tuned in and adjust antenna trimmer until a maximum reading is noted. No further adjustment should be necessary, unless the set has been damaged, as the coils and condenser in this receiver have been specially handled at the factory so as to insure proper alignment at the lower frequency end of the dial.

MODELS EP2002-3, DP7002-3 SPIEGEL, INC.



A signal generator is required, having the following frequencies: 456KC, 1400KC, 1720KC. An output meter of some kind is also necessary. (See figure No. 1 for trimmer locations).

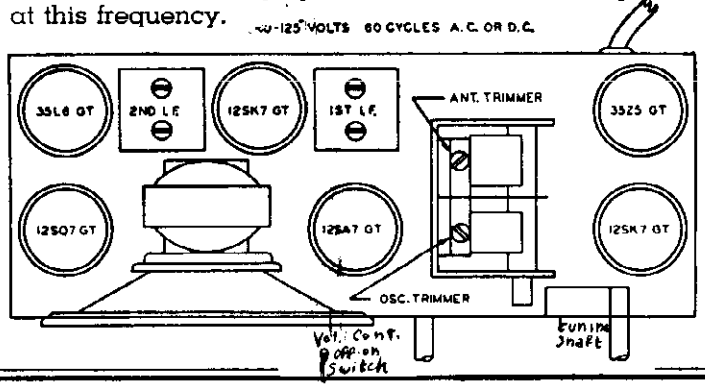
All adjustments in aligning this receiver should be made with the volume control fully turned on, so as to prevent the A. V. C. from working and giving false readings. It is also advisable to keep the gang condenser turned all the way out to complete minimum capacity and keep the signal from the generator down as low as possible so as to prevent false peaks when aligning the I. F. transformers.

FIRST STEP: Connect the generator lead through a .1 condenser to the No. 8 pin at the 12SA7GT socket base (this is the control grid) and connect the generator ground lead to some point on the floating ground, above the .25 MFD floating ground condenser. Adjust the signal generator to 456KC and adjust the I. F. trimmer screws till a maximum reading is noted on the output meter which has been connected across the speaker leads. With the generator leads still connected to the 12SA7GT grid, adjust the generator frequency to 1720KC and adjust the oscillator trimmer till the signal is tuned in, with the gang condenser still at complete minimum.

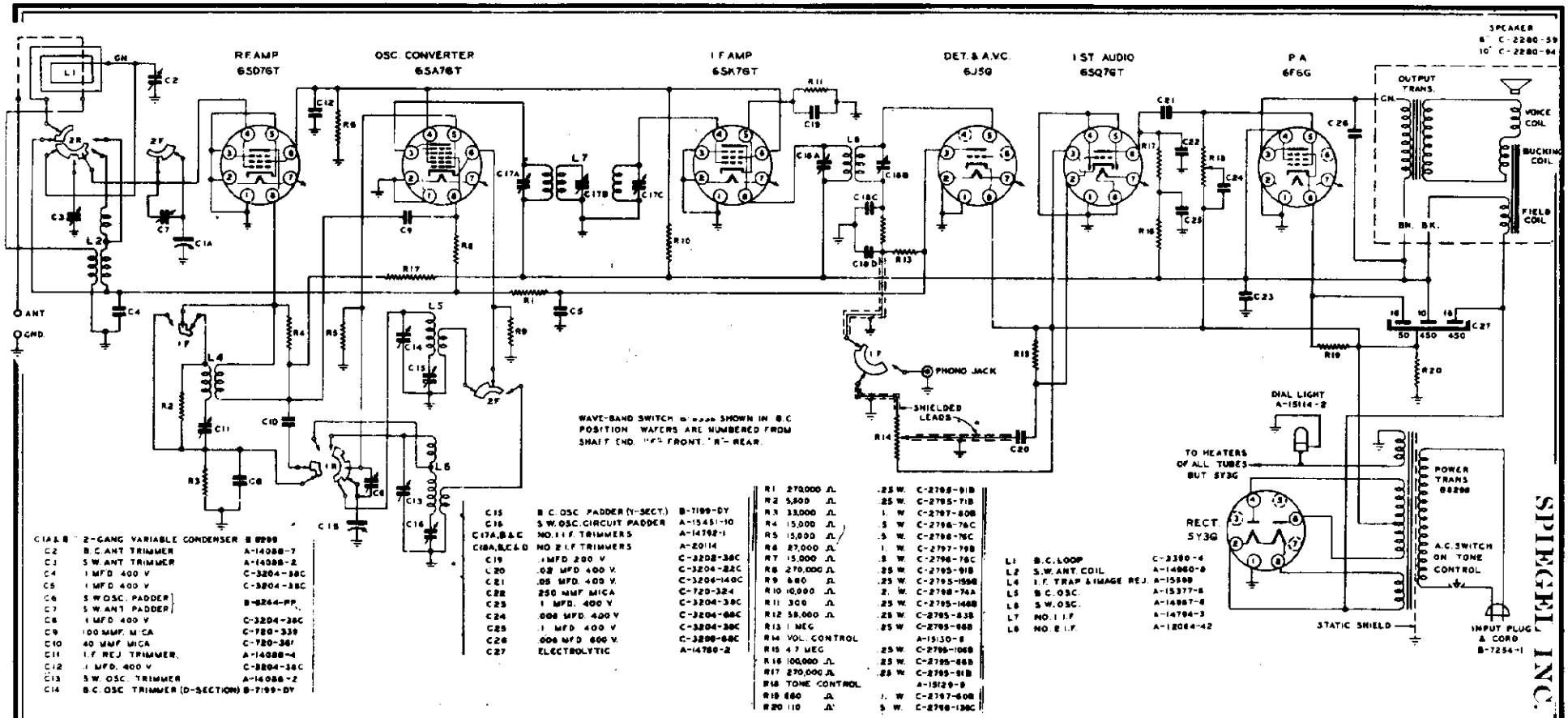
SECOND STEP: Disconnect the generator leads from the receiver and connect both to a transmitting loop which may be made with two turns of wire about six inches in diameter and placed about one foot from the receiver loop. Adjust the generator frequency to 1400KC and turn the tuning condenser till this signal is tuned in. Adjust the antenna trimmer on the gang till a maximum reading is noted on the output meter.

THIRD STEP: Adjust the generator frequency to 600KC and turn tuning condenser till signal is tuned in. The alignment may be checked at this point, but no adjustment should be necessary at this point as the coils and gang condenser have been thoroughly checked at the factory to insure proper alignment at this frequency.

PART NO.	SCHEMATIC LOCATION	DESCRIPTION
3-6	R1	1 MEG Ω ½ WATT 20% RESISTOR
3-36	R2	1500 Ω " " "
3-17	R3	100000 Ω " " "
3-26	R4	30000 Ω " " "
3-141	R5	6 MEG Ω " " "
3-4	R6	50000 Ω " " "
3-2	R7	2 MEG Ω " " "
3-34	R8	100 Ω " " "
3-1	R9	500000 Ω " " "
3-383	R10	50 Ω " " "
5-301	R11	1 MEGOHM VOLUME CONTROL
	SW	SWITCH
6-14	C1	.05 MFD. 400 VOLTS CONDENSER
6-30	C2	.25 " 200 " "
6-8	C3	.0001 " MICA "
6-3	C4	.01 " 400 VOLTS "
6-10	C5	.00025 " MICA "
6-308	C6	.0005 " 600 VOLTS "
6-306	C7	.005 " " " "
6-26	C8	.1 " 400 " "
7-301	C9	40 " 150 " } ELECTROLYTIC
	C10	12 " 150 " }
15-302	L1	LOOP
15-309	L2, L3	OSCILLATOR COIL
16-302	T1	INPUT I.F. TRANSFORMER
16-303	T2	OUTPUT I.F. "
43-307	T3	OUTPUT " ON
	S	SPEAKER (ELECTRODYNAMIC)
61-300	PL	PILOT LIGHT #47
40-306	12SK7 GT	R.F. AMPLIFIER
	12SA7 GT	CONVERTER
	12SK7 GT	I.F. AMPLIFIER
	12SQ7 GT	DETECTOR - AUDIO
	35L6 GT	AUDIO AMPLIFIER
	35Z5 GT	RECTIFIER
10-301		GANG CONDENSER



TUBE AND TRIMMER LOCATION



C1A & B	2-GANG VARIABLE CONDENSER	B-8299
C2	B.C. ANT TRIMMER	A-14088-7
C3	S.W. ANT. TRIMMER	A-14088-2
C4	.1 MFD. 400 V.	C-3204-38C
C5	.1 MFD. 400 V.	C-3204-38C
C6	S.W. OSC. PADDER	B-8264-PP
C7	S.W. ANT. PADDER	
C8	.1 MFD. 400 V.	C-3204-38C
C9	100 MMF. MICA	C-720-339
C10	40 MMF. MICA	C-720-347
C11	I.F. REJ. TRIMMER.	A-14088-4
C12	.1 MFD. 400 V.	C-3204-38C
C13	S.W. OSC. TRIMMER	A-14088-2
C14	B.C. OSC. TRIMMER (D-SECTION)	B-7199-DY
C15	B.C. OSC. PADDER (Y-SECT.)	B-7199-DY
C16	S.W. OSC. CIRCUIT PADDER	A-15451-10
C17A,B&C	NO. 1 I.F. TRIMMERS	A-14792-1
C18A,B,C & D	NO. 2 I.F. TRIMMERS	A-20114
C19	.1 MFD. 200 V.	C-3208-38C
C20	.02 MFD. 400 V.	C-3204-22C
C21	.05 MFD. 400 V.	C-3204-140C
C22	250 MMF. MICA	C-720-324
C23	.1 MFD. 400 V.	C-3204-38C
C24	.008 MFD. 400 V.	C-3204-68C
C25	.1 MFD. 400 V.	C-3204-38C
C26	.006 MFD. 600 V.	C-3208-68C
C27	ELECTROLYTIC	A-14788-2

R1	270,000 Ω	.25 W. C-2795-91B
R2	5,800 Ω	.25 W. C-2795-71B
R3	33,000 Ω	1. W. C-2797-60B
R4	15,000 Ω	.5 W. C-2796-76C
R5	15,000 Ω	.5 W. C-2796-76C
R6	27,000 Ω	1. W. C-2797-19B
R7	15,000 Ω	.5 W. C-2796-76C
R8	270,000 Ω	.25 W. C-2795-91B
R9	680 Ω	.25 W. C-2795-159B
R10	10,000 Ω	2. W. C-2798-74A
R11	300 Ω	.25 W. C-2795-146B
R12	58,000 Ω	.25 W. C-2795-83B
R13	1 MEG	.25 W. C-2795-98B
R14	VOL. CONTROL	A-15130-8
R15	4.7 MEG	.25 W. C-2795-106B
R16	100,000 Ω	.25 W. C-2795-85B
R17	270,000 Ω	.25 W. C-2795-91B
R18	TONE CONTROL	A-15129-8
R19	680 Ω	1. W. C-2797-60B
R20	110 Ω	5 W. C-2798-136C

L1	B.C. LOOP	C-2390-4
L2	S.W. ANT. COIL	A-14080-8
L4	I.F. TRAP & IMAGE REJ.	A-15588
L5	B.C. OSC.	A-15377-6
L6	S.W. OSC.	A-14087-8
L7	NO. 1 I.F.	A-14784-3
L8	NO. 2 I.F.	A-12084-42

Line Voltage: 117 Volts AC	Position of Volume Control: Full with dial turned to quiet channel. Position of Band Switch: Broadcast							
TUBE	FUNCTION	Voltage of Socket Prongs to Gnd. (See schematic diagram)						
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
6SD7GT	R-F Amplifier	0	0	0	0	0	75	6*	50
6SA7GT	Osc - Converter	0	0	225	75	-7.5	0	6*	0
6SK7GT	I-F Amplifier	0	0	0	0	2.5	75	6*	225
6J5G	Detector - AVC	0	0	0	0	0	—	6*	0
6SQ7GT	Driver	0	0	0	0	0	45	6*	0
6F6G	Power Amplifier	0	0	225	225	0	130	6*	15
5Y3G	Rectifier	0	300	225	275*	—	275*	150	225

Notes: Voltage readings are for schematic diagram on back of sheet. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 20,000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter. Unless designated otherwise, voltages in table are + DC voltages.
*AC volts.

IF PEAK 456KC

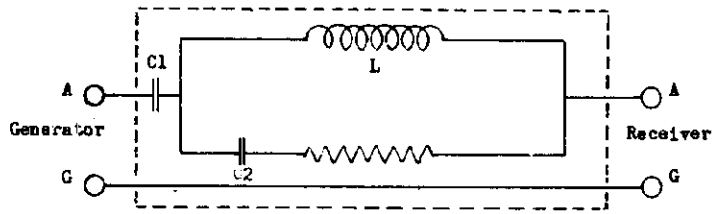
SPIEGEL INC.
SPIEGEL PAGE 137
MODELS EP2010*
DP7012-50-60
Chassis 722

ALIGNMENT CHART

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND SETTING	TRIMMER	REMARKS
1	Set dial pointer even with left hand stop line with condenser plates fully meshed.							
2	I.F.	#5 pin 6SA7GT Tube	.1 mfd. Cond.	456 KC	BC	Open	C18 A&B	Peak accurately
							C17 B*	**
							C17 A&C	Peak accurately
							C17 B	Peak accurately
3	C18 A&B and C17 A&C should not be readjusted after C17B has been peaked.							
4	Rejector	Ant.	.1 mfd.	456 KC	BC	Closed	C11	Adjust to minimum
5	Broad cast Band	Ant.	See Note	1600 KC	BC	1600 KC	C14 Osc.Tri.	Peak accurately
							C2 Ant. Tri.	Peak accurately
6				600 KC		600 KC	C15 Osc.Pad	Peak accurately
7	Repeat operation 5.							
8	Check calibration and sensitivity at 600 KC, 1,000 KC and 1600 KC.							
9	#3 S.W. Band	Ant.	See Note	16 MC	#3 S.W. Band	16 MC	C13 Osc.Tri.	***
							C3 Ant. Tri.	***
10	#2 S.W. Band	Ant.	See Note	6 MC	#2 S.W. Band	6 MC	C6 Osc.Pad.	***
							C7 Ant. Pad.	***
							C16 Osc.Pad	See Note A
11				Check at 9.5 MC				
12	Note A: This padder is precision set at the factory and should not be readjusted.							
13	#3 S.W. Band	Ant.	See Note	Check at 12 MC.				
14	Check operations 1 to 13 inclusive.							

*Bronze color trimmer screw.
**Turn trimmer screw all the way down.
***Rock dial while adjusting for maximum output.
Note: Use dummy antenna as described below. All band trimmers should be adjusted to the fundamental of the test signal.

DUMMY ANTENNA



C1 - 200 mmf. Condenser
C2 - 400 mmf. Condenser
R - 100 ohms
L - Choke coil
---- Case Shield

Choke Coil Specification
Tubing - 3/8" Diameter bakelite.
Wire - No. 38 enameled.
Turns - 59 closely wound (impregnated)

Note - When using this dummy antenna the generator output impedance should be 10 ohms or lower.

PROCEDURE FOR SETTING THE AUTOMATIC PUSH-BUTTONS

IMPORTANT: Read carefully before setting the automatic push buttons.

1. Select four favorite nearby broadcast stations and detach the corresponding call letter tabs from the station call letter tab sheets.

2. Any tab may be used for any button, but it is usually more convenient for the operator if the tabs are arranged in sequence so that the tab for the lowest frequency station (station having lowest number of kilocycles [K. C.]) will be at the extreme left.

3. Pull off push-button knobs so that slots in end of shafts are accessible.

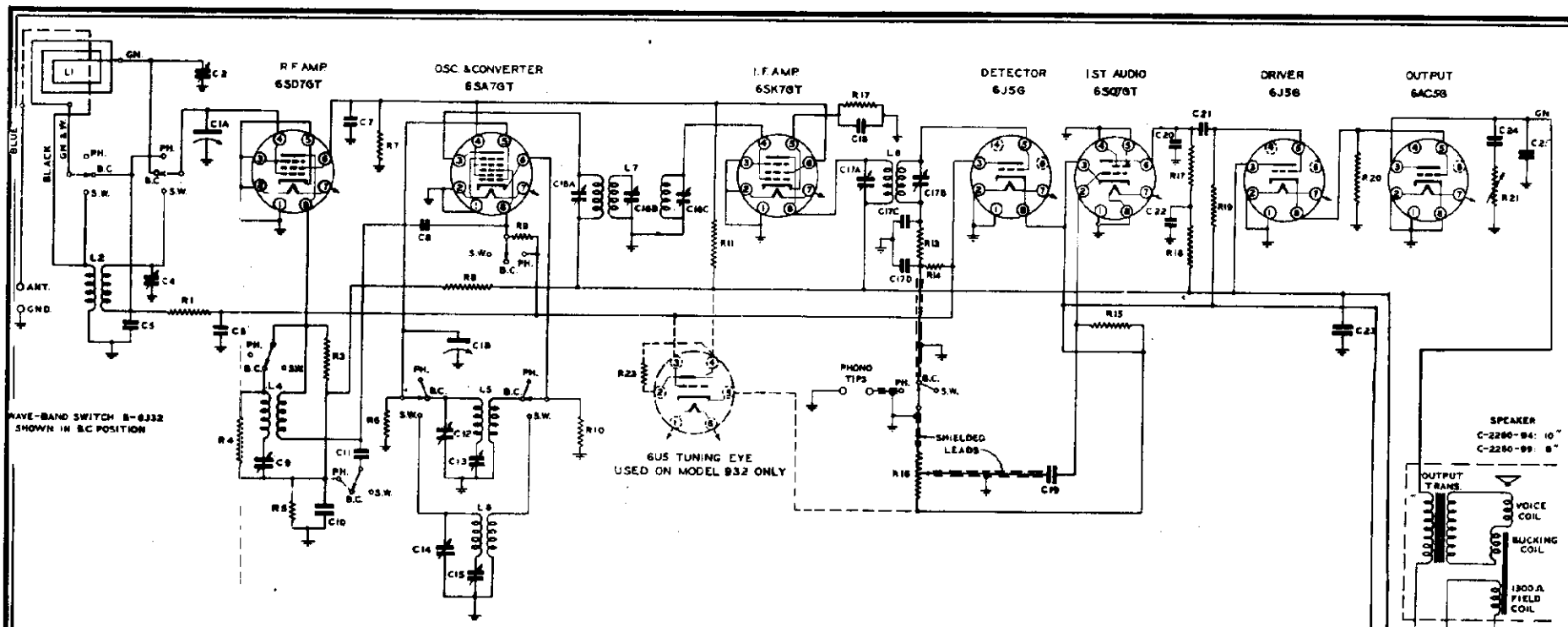
4. Using the small screwdriver furnished with the radio or other tool that will fit the slot in the end of the shaft, push the shaft in as far as it will go and turn to the right or left until the dial pointer has moved to the desired station frequency. Be sure the shaft is pushed all the way in and the station is tuned in accurately.

5. Repeat the procedure in paragraph 4 for each of the remaining three buttons.

6. Check all buttons by pushing them in, one at a time, to determine whether desired stations are tuned properly.

7. Insert proper tab in end of each button knob, and replace knob.

8. Any of the four stations to which the push-button tuner has been adjusted may now be received simply by pushing the button for the desired station.



WAVE-BAND SWITCH B-6332 SHOWN IN B.C POSITION

C1A&B	2-GANG VARIABLE CONDENSER	B-6279-1
C2	B.C. ANTENNA TRIMMER	A-14088-7
C4	S.W. ANTENNA TRIMMER	A-14088-5
C5	.1 MFD. 400 V.	C-3204-38C
C6	.1 MFD. 400 V.	C-3204-38C
C7	.1 MFD. 400 V.	C-3204-38C
C8	100 MMF. MICA	C-720-339
C9	I.F. REJ. TRIM.	A-14088-6
C10	.1 MFD. 400 V.	C-3204-38C
C11	40 MMF. MICA	C-720-38
C12	B.C. OSC. TRIM.	B-7198-07
C13	B.C. OSC. PAD	
C14	S.W. OSC. TRIMMER	A-14088-5
C15	S.W. OSC. PADDER	A-15431-5
C16	NO. 1 I.F. TRIMMER	A-14792
C17	NO. 2 I.F. TRIMMER	A-20114
C18	.1 MFD. 200 V.	C-3202-38C
C19	.02 MFD. 400 V.	C-3204-22C
C20	250 MMF. MICA	C-720-324
C21	.05 MFD. 400 V.	C-3204-140C
C22	.1 MFD. 400 V.	C-3204-38C
C23	.1 MFD. 400 V.	C-3204-38C
C24	.03 MFD. 600 V.	C-3206-90C
C25	.006 MFD. 600 V.	C-3203-66C
C26	16-16 MFD. ELECT.	A-20188

R1	270,000 Ω	.25 W.	C-2795-968
R3	13,000 Ω	.50 W.	C-2796-76C
R4	5,800 Ω	.25 W.	C-2795-718
R5	33,000 Ω	1 W.	C-2797-808
R6	15,000 Ω	.25 W.	C-2795-1078
R7	27,000 Ω	1 W.	C-2797-1038
R8	15,000 Ω	.5 W.	C-2796-76C
R9	270,000 Ω	.25 W.	C-2795-918
R10	660 Ω	.25 W.	C-2795-1353
R11	8,100 Ω	2 W.	C-2798-1182A
R12	300 Ω	.25 W.	C-2795-1468
R13	56,000 Ω	.25 W.	C-2795-838
R14	2.2 MEG.	.25 W.	C-2795-1028
R15	4.7 MEG.	.25 W.	C-2795-1068
R16	VOL. CONTROL		A-15130-3
R17	270,000 Ω	.25 W.	C-2795-918
R18	100,000 Ω	.25 W.	C-2795-868
R19	470,000 Ω	.25 W.	C-2795-948
R20	22,000 Ω	.25 W.	C-2795-788
R21	TONE CONTROL		A-15128-2
R22	47 Ω	.25 W.	C-2795-468
R23	220,000 ON MODEL 932 ONLY	.25 W.	C-2795-908

L1	LOOP ANTENNA	C-3326 TABLE MODEL D-1546-4 CONSOLE A-14960-5
L2	S.W. ANTENNA	
L4	I.F. & IMAGE REJ.	A-15698
L5	B.C. OSC.	A-15377-5
L6	S.W. OSC	A-14967-7
L7	NO. 1 I.F.	A-14784-3
L8	NO. 2 I.F.	A-12048-42

IF PEAK 456 KC

FOR P.B. DATA SEE INDEX.

SPIEGEL INC.

SPIEGEL PAGE 13
MODEL EP206

MODEL EP2060

SPIEGEL, INC.
VOLTAGE CHART

Line Voltage: 117 Volts

Position of Volume Control: Full with dial turned to quiet channel.

Position of Band Switch: Broadcast

TUBE	FUNCTION	Voltage of Socket Prongs to Gnd. (See schematic diagram)							
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
6SD7GT	R-F Amplifier	0	0	0	0	0	80	6*	88
6SA7GT	Osc - Converter	0	0	225	80	0	0	6*	0
6SK7GT	I-F Amplifier	0	0	0	0	0	90	6*	250
6J5GT	Detector - AVC	0	0	**	0	0	160	6*	0
6SQ7GT	1st A-F Amplifier	0	0	0	0	0	50	6*	0
6J5GT	Audio Driver	0	0	225	80	0	0	6*	10
6AC5G	Power Amplifier	0	0	220	—	0	0	6*	0
7Z4	Rectifier***	6*	0	300*	0	0	300*	0	0

Notes: Voltage readings are for schematic diagram in this bulletin. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter.

*AC volts.

**Cannot be tested with M-665 Analyzer.

***Rectifier tube type 7Z4 check from socket contacts to ground with tube out.

Type 6U5 Tuning Eye used on Model 932 only.

ALIGNMENT CHART

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set dial drum so that last mark on BC scale is directly toward front of set when condenser plates are fully meshed.)							
2	I.F.	Ant. Term. of Loop	200 mmf.	456 KC	BC	Open	C16 B *	**
3							C16 A&C	Peak accurately
							C16 B	
4							C17 A &B	Peak accurately
5	Rejector	Ant.	200 mmf.	456 KC	BC	Closed	C9	Adjust to minimum
6	Broadcast Band	Ant.	200 mmf.	1600 KC	BC	1600 KC	C12 (Osc.)	Peak accurately
							C2 (ANT)	Peak accurately
7				600 KC		600 KC	C13 (Pad)	Peak accurately
8	(Repeat operation 6)							
9	(Check calibration and sensitivity at 600 KC, 1000 KC and 1600 KC)							
10	Shortwave Band	Ant.	***	18 MC	SW	18 MC	C14 (Osc.)	Peak accurately
							C4 (ANT)	****
11	(Check calibration and sensitivity at 6 MC and 18 MC)							
12	(Check operations 1 to 11 inclusive)							

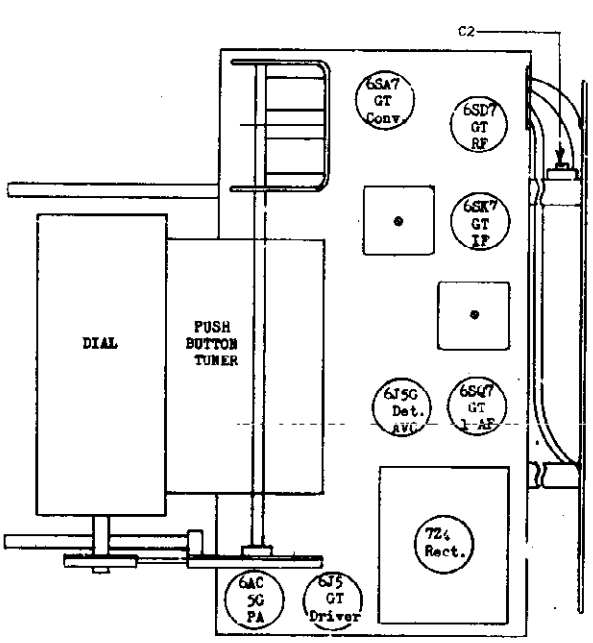
NOTES: *Bronze color trimmer screw.

**Turn trimmer screw all the way down.

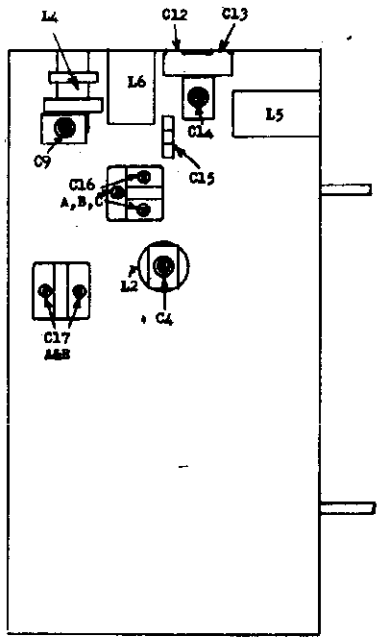
***100 ohms and 200 mmf. in series

****Rock dial while adjusting for maximum output

(Antenna Trimmer Condenser C2 is located on the loop antenna assembly.)



TOP OF CHASSIS



BOTTOM OF CHASSIS

SPIEGEL. INC.

VOLTAGE CHART

"A" Battery Voltage 1½ Volts
"B" Battery Voltage 90 Volts

Position of Volume Control Full with Antenna Disconnected

TUBE	FUNCTION	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
		Voltage of Socket Prongs to Gnd. See Nos. on Schematic Diagram							
1A7G	Osc - Converter	85	1.5	83	38	-8	82	0	85
1N5G	I-F Amplifier	0	1.5	62	82	0	0	0	0
1N5G	I-F Amplifier	0	1.5	82	82	0	0	0	0
1H5G	Det - AVC - AF	0	1.5	55	82	0	0	0.	0
3Q5GT	Power Amplifier	0	1.5	82	83	-.8	-6	1.5	0

Notes: Voltage readings are for schematic diagram on back of sheet. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection with scale limits. All DC measurements made with 20,000 ohms per volt voltmeter.

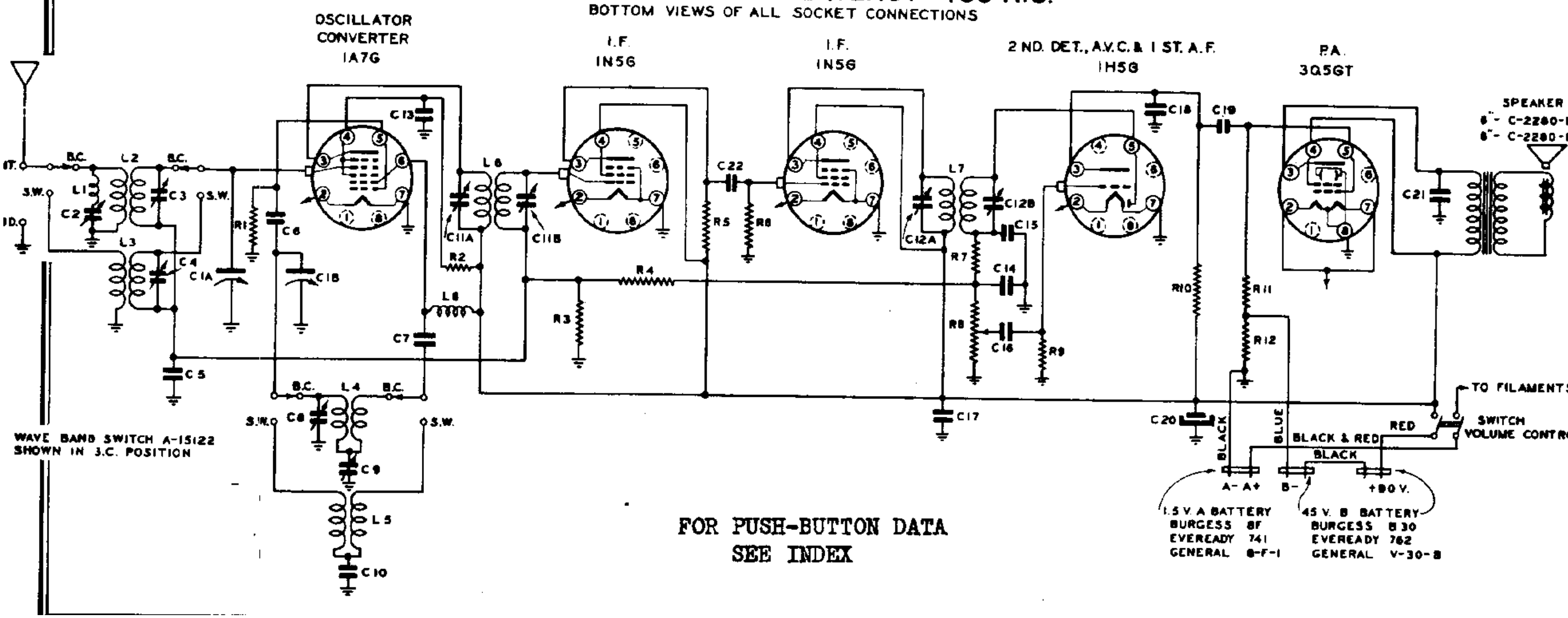
C1A&B	VARIABLE CONDENSER	B-8189
C2	I.F. REJECTOR TRIMMER	A-14088-2
C3	B.C. ANT. TRIMMER	A-14088-1
C4	S.W. ANT. TRIMMER	A-14088-1
C5	.05 MFD. 200 V.	C-3202-140C
C6	100 MMF. MICA	C-720-325
C7	.001 MFD. 200 V.	C-3202-58C
C8	B.C.OSC. TRIMMER	A-15573
C9	B.C.OSC. PADDER	A-15573
C10	1940 MMF. MICA	C-720-387
C11A&B	NO.1 I.F. TRIMMER	B-7200-GG
C12A&B	NO.2 I.F. TRIMMER	B-7200-GG
C13	.05 MFD. 200 V.	C-3202-28C
C14	100 MMF. MICA	A-15897-1
C15	100 MMF. MICA	A-15897-1
C18	.01 MFD. 200 V.	C-3202-132C
C17	.05 MFD. 200 V.	C-3202-140C
C18	100 MMF. MICA	C-720-325
C19	.01 MFD. 400 V.	C-3204-132C
C20	8 MFD. 150 V. ELECT.	A-14958
C21	.001 MFD. 1000 V.	C-3210-114C
C22	250 MMF. MICA.	C-720-324

R1	160,000 Ω	.25W.	C-2795-89B
R2	68,000 Ω	.25W.	C-2795-84B
R3	2.2 MEGOHMS	.25W.	C-2795-102B
R4	3.3 MEGOHMS	.25W.	C-2795-104B
R5	22,000 Ω	.25W.	C-2795-191B
R6	3.3 MEGOHMS	.25W.	C-2795-104B
R7	56,000 Ω	.25W.	C-2795-83B
R8	500,000 Ω V.C.&SW.		A-15132-5
R9	10 MEGOHMS	.25W.	C-2795-110B
R10	1 MEGOHM	.25W.	C-2795-98B
R11	2.2 MEGOHMS	.25W.	C-2795-102B
R12	470 Ω	.25W.	C-2795-151B

L1	I.F. REJECTOR COIL	A-14718-1
L2	B.C. ANT. COIL	A-14974-7
L3	S.W. ANT. COIL	A-14682-14
L4	B.C.OSC. COIL	A-15781
L5	S.W.OSC. COIL	A-15233-15
L6	NO. 1 I.F. COIL	A-12064-40
L7	NO. 2 I.F. COIL	A-12064-40
L8	OSC. PLATE CHOKE	A-14718-1

INTERMEDIATE FREQUENCY 456 K.C.

BOTTOM VIEWS OF ALL SOCKET CONNECTIONS



FOR PUSH-BUTTON DATA
SEE INDEX

MODELS EP2104,DP7108

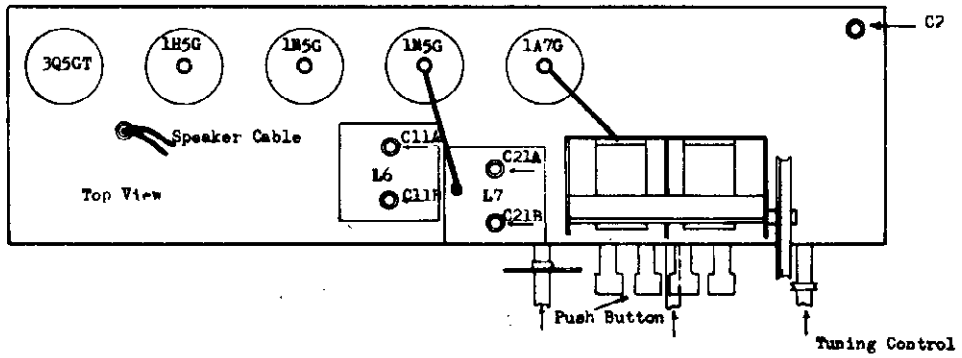
SPIEGEL, INC.

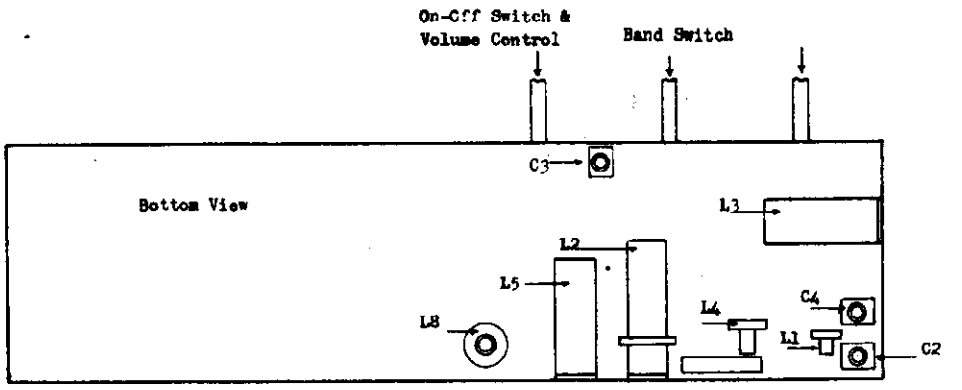
ALIGNMENT CHART

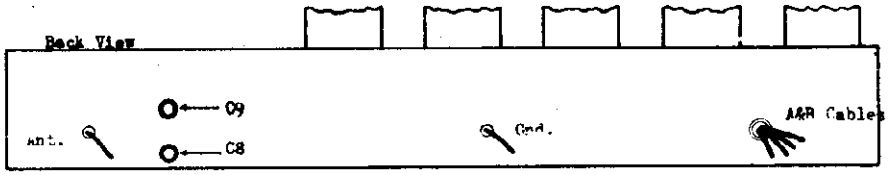
OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	Set dial pointer even with last calibration mark when condenser gang is fully meshed.							
2	I.F.	1A7G Grid	.1 mfd Cond.	456 KC	BC	Open	C12 A&B	Peak accurately
							C11 A&B	Peak accurately
3	I-F. Rej.	Ant.	.1 mfd.	456 KC	BC	Closed	C2	Adjust to minimum
4	Broad-cast band	Ant.	200 mf.	1500 KC	BC	1500 KC	C8 Osc.Trim	Peak accurately
							C3 Ant. "	Peak accurately
5				600 KC	BC	600 KC	C9 Osc. Pad	**
6	Repeat operation 4.							
7	Check calibration and sensitivity at 1500 KC, 900 KC and 600 KC.							
8	S.W. Band	Ant.	*	18 MC	SW	18 MC	C4 Ant. Tri.	**
9	Check calibration and sensitivity at 6 MC and 18 MC.							
10	Check operations 1 to 9 inclusive.							

Notes: * 100 ohm non-inductive resistor in series.
**Rock dial while adjusting for maximum output.
Make certain that adjustments are made on fundamental signal and not on image.

CHASSIS DIAGRAM

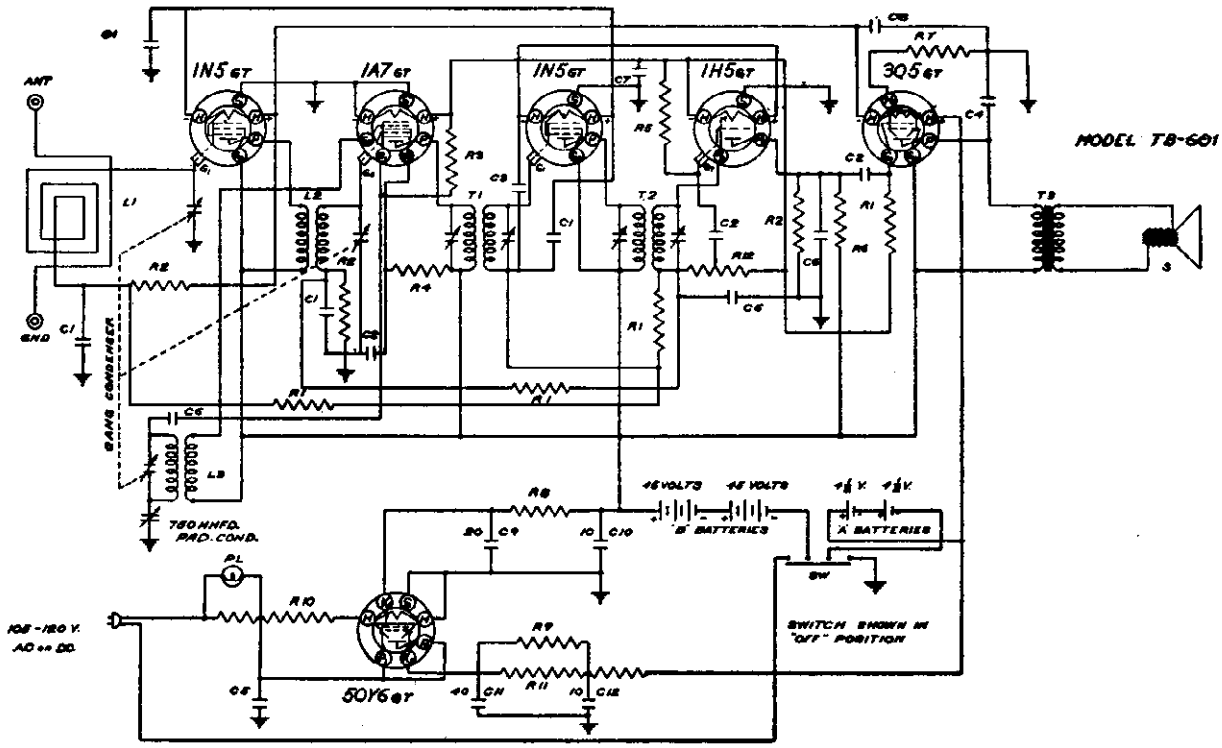






SPIEGEL INC.

SCHEMATIC DIAGRAM



DRAWN BY E.J.K. APPROVED BY

PART No.	SCHEMATIC LOCATION	DESCRIPTION
3-2	R1	2 MEG ½ W. 20% RESISTOR
3-6	R2	1 " " " "
3-108	R3	150,000 " " " "
3-157	R4	50,000 " " " "
3-311	R5	2 MEG " " " "
3-309	R6	500,000 " " " "
3-21	R7	700 " " " "
3-312	R8	5000 " " " "
3-8	R9	25000 " " " "
4-301	R10	445 " WIRE WOUND "
4-302	R11	2250 " " "
6-204	R12	2 MEG " VOLUME CONTROL
	SW	& SWITCH
6-12	C1	.05 MFD. 200V CONDENSER
6-3	C2	.01 MFD. 400V "
6-98	C3	.1 MFD. 200V "
6-60	C4	.002 MFD. 400V "
6-42	C5	.1 MFD. 400V "
6-307	C6	.00005 MFD. MICA "
6-308	C7	.25 MFD. 25V "
7-303	C8	70 MFD. 7V ELECT. "
7-304	C9	20 MFD. 150V ELECTROLYTIC CONDENSER
	C10	10 MFD. 150V "
	C11	40 MFD. 150V "
7-305	C12	20 MFD. 90V ELECT. COND.
15-306	L1	LOOP
15-307	L2	R.F. COIL
15-308	L3	OSCILLATOR COIL
15-305	T1	INPUT I.F. TRANSFORMER
15-306	T2	OUTPUT I.F. "
15-606	T3	OUTPUT "
	S	ON P.M. SPEAKER
19-300	PL	PILOT LIGHT #47
400504	1N5 GT	R.F. AMPLIFIER
	1A7 GT	OSCILLATOR-MIXER
	1N5 GT	I.F. AMPLIFIER
	1H5 GT	DETECTOR-AVDIO
	30 & GT	POWER AMPLIFIER
	50Y6 GT	RECTIFIER

TO CHANGE FROM BATTERY TO AC OR DC

When the set is to be used as a strictly portable set using the batteries for power, it is only necessary to turn on the volume control knob as described above and the set is operating on batteries.

When it is desired to operate this set on house current, merely remove the cord from the back of the set, plug it into the outlet making sure that the outlet is alive and the set will be operating on either AC or DC, whichever is available. It is not necessary to use any switches whatsoever to make this change. Just plugging into a live outlet automatically changes from battery to AC or DC.

This set is designed to operate on 110 volts, either AC or DC. If you are in doubt as to the voltage at the outlet to be used, check with your service man or local power company.

When operating this set on DC, plug the cord into the outlet and turn the set on. After about three minutes have elapsed, giving the rectifier tube a chance to warm up, reverse the plug in the outlet, watching the pilot light to see which position gives the greatest brilliance. That is the position in which the set should be operated.

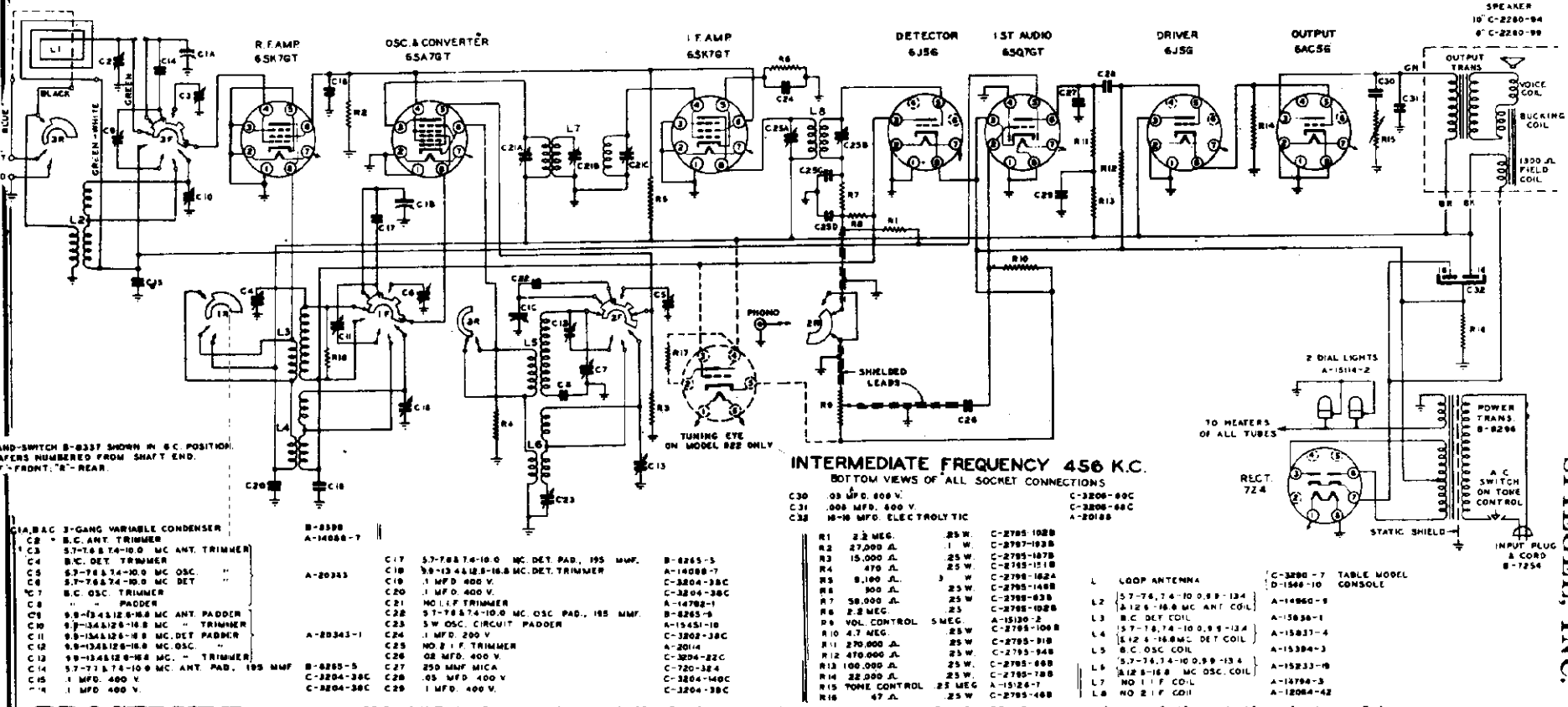
When changing from AC or DC operation to battery operation merely remove the plug from the outlet and the set will be running on batteries.

BATTERY LIFE

In normal use (three to four hours daily) the batteries your set is originally equipped with, will give approximately 250 or more working hours' service. Replacement should be made with one of the following kits of batteries, or their equivalent in another make:

2—"Ray-O-Vac" 45 V. "B" No. 5303.
2—"Ray-O-Vac" stand. 4½ V. "A" P83A.
2—"General" 45 V. "B" Bat. No. V-30-B.
2—"General" 4½ V. "A" Bat. 3H3.

If batteries inferior to the ones initially installed are used, service may be shortened considerably.



INTERMEDIATE FREQUENCY 456 K.C.

BOTTOM VIEWS OF ALL SOCKET CONNECTIONS

C30	.03 MFD. 600 V.	C-3206-60C
C31	.005 MFD. 600 V.	C-3206-68C
C32	10-10 MFD. ELECTROLYTIC	A-20188

C1A,B&C	3-GANG VARIABLE CONDENSER	B-8338	
C2 *	B.C. ANT. TRIMMER	A-14068-7	
C3	5.7-7.6 & 7.4-10.0 MC. ANT. TRIMMER		
C4	B.C. DET. TRIMMER		
C5	5.7-7.6 & 7.4-10.0 MC. OSC. "		
C6	5.7-7.6 & 7.4-10.0 MC. DET. "		
C7	B.C. OSC. TRIMMER		
C8	" " PADDER		
C9	9.8-13.4 & 12.6-16.8 MC. ANT. PADDER	A-20343	
C10	9.8-13.4 & 12.6-16.8 MC. " TRIMMER		
C11	9.8-13.4 & 12.6-16.8 MC. DET. PADDER	A-20343-1	
C12	9.8-13.4 & 12.6-16.8 MC. OSC. "		
C13	9.8-13.4 & 12.6-16.8 MC. " TRIMMER		
C14	5.7-7.1 & 7.6-10.0 MC. ANT. PAD., 195 MMF	B-8265-5	
C15	.1 MFD. 400 V.	C-3204-38C	
C16	.1 MFD. 400 V.	C-3204-38C	
C17	5.7-7.6 & 7.6-10.0 MC. DET. PAD., 195 MMF.	B-8265-5	
C18	9.8-13.4 & 12.6-16.8 MC. DET. TRIMMER	A-14088-7	
C19	.1 MFD. 400 V.	C-3204-38C	
C20	.1 MFD. 400 V.	C-3204-38C	
C21	NO. 1 I.F. TRIMMER	A-14702-1	
C22	5.7-7.6 & 7.4-10.0 MC. OSC. PAD., 195 MMF.	B-8265-5	
C23	5 W. OSC. CIRCUIT PADDER	A-19451-10	
C24	.1 MFD. 200 V.	C-3202-38C	
C25	NO. 2 I.F. TRIMMER	A-20014	
C26	.02 MFD. 400 V.	C-3204-22C	
C27	250 MMF. MICA	C-720-324	
C28	.05 MFD. 400 V.	C-3204-140C	
C29	.1 MFD. 400 V.	C-3204-38C	

R1	2.2 MEG.	.25 W.	C-2795-102B
R2	27,000 Ω.	1 W.	C-2797-193B
R3	15,000 Ω.	.25 W.	C-2795-187B
R4	470 Ω.	.25 W.	C-2795-151B
R5	8,100 Ω.	.5 W.	C-2795-162A
R6	300 Ω.	.25 W.	C-2795-146B
R7	58,000 Ω.	.25 W.	C-2795-033
R8	2.2 MEG.	.25	C-2795-102B
R9	VOL. CONTROL	.5 MEG.	A-15130-2
R10	4.7 MEG.	.25 W.	C-2795-106B
R11	270,000 Ω.	.25 W.	C-2795-318
R12	470,000 Ω.	.25 W.	C-2795-94B
R13	100,000 Ω.	.25 W.	C-2795-66B
R14	22,000 Ω.	.25 W.	C-2795-78B
R15	TONE CONTROL	.25 MEG.	A-15126-7
R16	47 Ω.	.25 W.	C-2795-46B

L	LOOP ANTENNA	C-3200-7	TABLE MODEL
L2	5.7-7.6, 7.4-10.0, 9.8-13.4 & 12.6-16.8 MC. ANT. COIL	D-1566-10	CONSOLE
L3	B.C. DET. COIL	A-14960-9	
L4	5.7-7.6, 7.4-10.0, 9.8-13.4 & 12.6-16.8 MC. DET. COIL	A-15836-1	
L5	B.C. OSC. COIL	A-15837-4	
L6	5.7-7.6, 7.4-10.0, 9.8-13.4 & 12.6-16.8 MC. OSC. COIL	A-15384-3	
L7	NO. 1 I.F. COIL	A-15233-19	
L8	NO. 2 I.F. COIL	A-14794-3	
		A-12864-42	

PROCEDURE FOR SETTING AUTOMATIC PUSH-BUTTONS

IMPORTANT: Read carefully before setting the automatic push buttons.

1. Select six favorite nearby broadcast stations and detach the corresponding call letter tabs from the station call letter tab sheets supplied.

2. Any tab may be used for any button.

3. Using a small screw driver furnished with radio, or other tool that will fit the screw in the end of the button, push the first button in as far as it will go, and turn to the right or left until the dial pointer has moved to the correct point on the dial for receiving that same station. Be sure the button is pushed all the way in and the station is tuned in accurately.

4. Repeat the procedure in Paragraph 3 for each of the remaining five buttons.

5. Check all six buttons by pushing them in, one at a time, to determine whether the desired stations are all tuned in properly.

6. Insert the proper station call letter tab in each button by pressing it in position.

7. Any of the six stations to which the automatic push button tuner has been adjusted may now be received simply by pushing the button all the way in for the desired station.

SPIEGEL, INC.

VOLTAGE CHART

Line Voltage: 117 Volts A.C. Position of Volume Control: Full with dial turned to quiet channel. Position of Band Switch: Broadcast

TUBE	FUNCTION	Voltage of Socket Prongs to Gnd. See Schematic Diagram.							
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
6SK7GT	R-F Amplifier	0	0	0	-2.3	0	85	6.2*	225
6SA7GT	Osc - Converter	0	0	225	85	-3.2	0	6.2*	-2.2
6SK7GT	I.F. Amplifier	0	0	0	0	3	85	6.2*	225
6J5G	Detector	0	0	-2.2	-2.1	-3	182	6.2*	-2.1
6SQ7GT	1st Audio	0	-2.3	-2.1	0	-2.3	80	6.2*	0
6J5G	Driver	0	0	220	85	0	0	6.2*	8.3
6AC5G	Power Amplifier	0	0	210	0	8.3	-2.1	6.2*	0
7Z4	Rectifier	6.2*	0	290*	0	0	290	0	0

Notes: Voltage readings are for schematic diagram in this bulletin. Allow 15% - or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 20,000 ohms per volt voltmeter.
*AC volts.

ALIGNMENT CHART

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	Set dial pointer even with left hand stop line when condenser gang is fully meshed.							
2	I.F.	#4 Pin 6SA7GT	.1 MFD Cond.	456 KC	BC	Open	C25 A&B	Peak accurately
3							C21 B*	**
4							C21 A&C	Peak accurately
5							C21B	Peak accurately
6	BC	Ant.	See Note	1600 KC	BC	1600 KC	C7 Osc. Tr.	Peak accurately
							C2 Ant. Tr.	Peak accurately
							C4 Det. Tr.	Peak accurately
7				600 KC	BC	600 KC	C8 Osc.Pad.	***
8	Repeat operations 6 and 7.							
9	Check calibration and sensitivity at 600 KC, 1000 KC and 1600 KC.							
10	#5 Band	Ant.	See Note	16.5 MC	#5 Band	16.5 MC	C13 Osc.Tr.	Peak accurately
							C10 Ant.Tr.	Peak accurately
							C18 Det.Tr.	Peak accurately
11				12.6 MC	#5 Band	12.6 MC	C12 Osc.Pad	***
							C9 Ant.Pad.	***
							C11 Det.Pad	***
12	Repeat operations 10 and 11.							
13	Check calibration and sensitivity at 12.6 MC and 16.5 MC.							
14	#4 Band	Ant.	See Note		#4 Band	Check calibration and sensitivity at 13 MC, 11 MC and 10 MC.		
15	#3 Band	Ant.	See Note	9.75 MC	#3 Band	9.75 MC	C5 Osc.Tr.	***
							C3 Ant.Tr.	***
							C6 Det.Tr.	***
16	Check calibration and sensitivity of #3 band at 7.6 MC.							
17	#2 Band	Ant.	See Note	7.6 MC	#2 Band	7.6 MC	Check calibration and sensitivity at 7.6 MC.	
18	Repeat operations on bands #5, 4, 3 and 2 in this sequence as many times as necessary until additional gain cannot be obtained.							

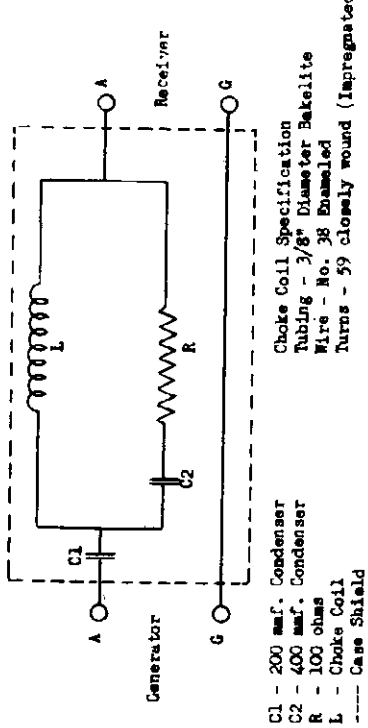
*Bronze color trimmer screw.
**Turn trimmer screw all the way down.
***Rock dial while adjusting for maximum output.
Note: Use Dummy Antenna as described on page 2.

Eight-tube Superheterodyne with Push-Button Tuning

(Five Bands—Broadcast and Four Short-wave Band Spread)

MODEL DP7014

SPIEGEL, INC.



C1 - 200 mmf. Condenser
C2 - 400 mmf. Condenser
R - 100 ohms
L - Choke Coil
---- Case Shield

Choke Coil Specification
Tubing - 3/8" Diameter Bakelite
Wire - No. 38 Enameled
Turns - 59 closely wound (Impregnated)

Note: When using this dummy antenna the generator output impedance should be 10 ohms or lower.

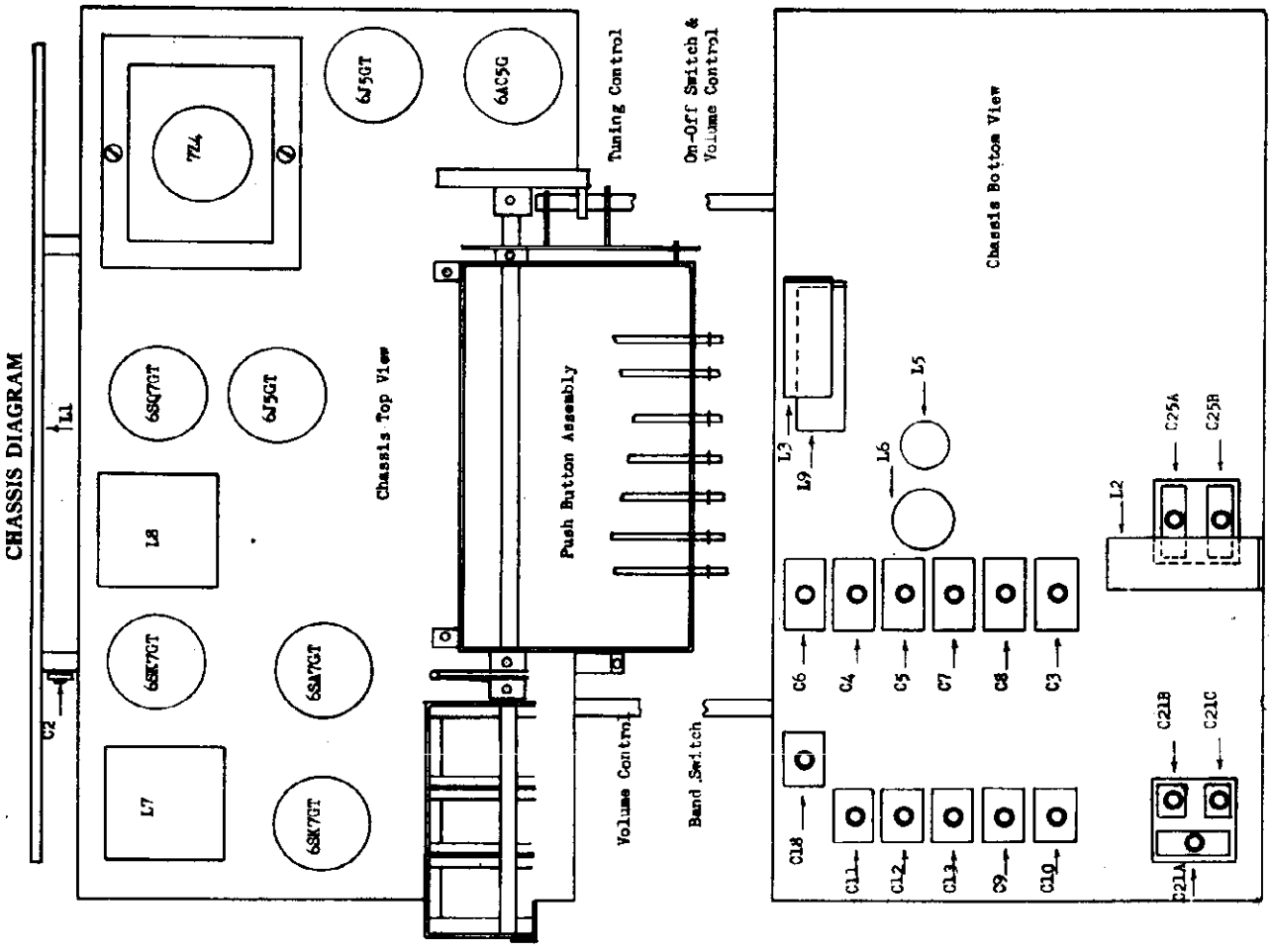
POWER SUPPLY:

CAUTION: This radio, unless otherwise marked, must be connected to 110 to 120 volts, 50 to 60 cycle alternating current (AC) supply only. If you are in doubt about the voltage or "cycle" of your electric outlets, consult your local power company before connecting the radio. Do not connect radio unless all tubes and speaker plug are in their proper sockets.

Receivers of this model which are to be used on power supplies other than 110-120 volts, 50-60 cycle, are marked accordingly.

The tuning range of each band is as follows:

Position of Switch	Meters	Kilocycles	Megacycles
1 Broadcast	548 to 186	547 to 1,610	.54 to 1.61
2 Short-wave	18 to 24	16,800 to 12,600	16.8 to 12.6
3 Short-wave	22.5 to 30	13,400 to 9,900	13.4 to 9.9
4 Short-wave	20 to 40	10,000 to 7,400	10.0 to 7.4
5 Short-wave	40 to 53	7,600 to 5,700	7.6 to 5.7
6 Phono—Use Tip Jack at Back of Chassis.			



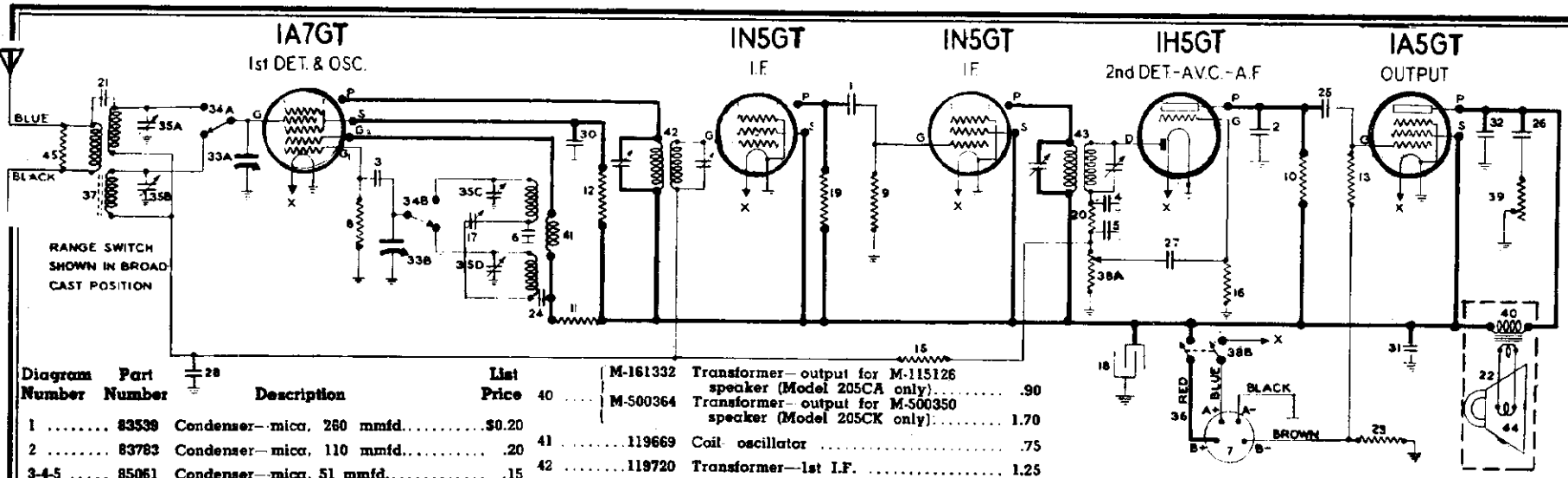


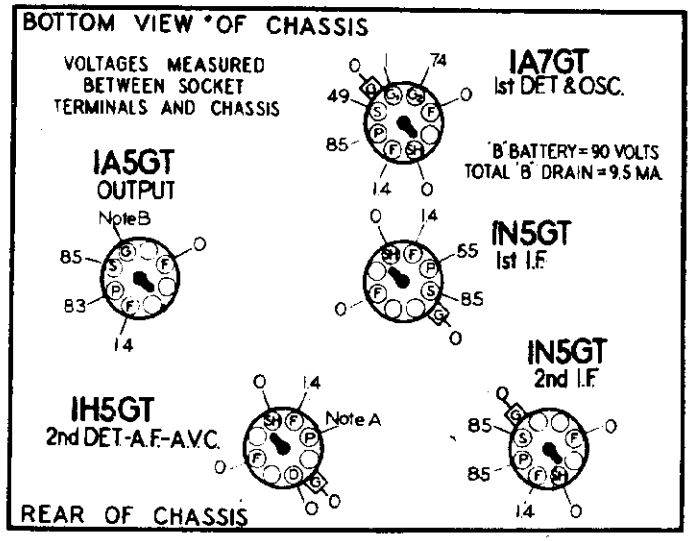
Diagram Number	Part Number	Description	List Price
1	83539	Condenser—mica, 260 mmfd.	$0.20
2	83783	Condenser—mica, 110 mmfd.	.20
3-4-5	85061	Condenser—mica, 51 mmfd.	.15
6	88587	Condenser—mica, .0042 mfd.	.35
7	88631	Plug—4 prong, male	.06
8	110553	Resistor—carbon, 220,000 ohms, ¼ watt	.12
9	110580	Resistor—carbon, 3.3 meg. ¼ watt	.12
10	110554	Resistor—carbon 1 megohm ¼ watt	.12
11	110557	Resistor carbon, 4,700 ohms, ¼ watt	.12
12	110566	Resistor—carbon, 33,000 ohms, ¼ watt.	.12
13	110570	Resistor—carbon, 2.2 meg., ¼ watt.	.15
15-16	110580	Resistor—carbon, 3.3 meg., ¼ watt.	.12
17	112799	Condenser—padder	.36
18	112898	Condenser—electrolytic 16 mfd., 150 volt	.50
19	116063	Resistor—carbon, 10,000 ohms, ¼ watt	.12
20	110565	Resistor—carbon, 22,000 ohms, ¼ watt.	.12
21	114969	Condenser—mica, 15 mmfd.	.12
22	M-115126	Speaker—P.M. (6") Model 205CA only.	5.50
	M-500350	Speaker—P.M. (8") Model 205CK only.	6.30
23	116078	Resistor—560 ohms, ¼ watt	.12
24-25-26	119193	Condenser .01 mfd., 600 volt.	.15
27	119817	Condenser .094 mfd., 600 volt.	.15
28 to 30	116819	Condenser .05 mfd., 600 volt.	$0.20
31	116625	Condenser .1 mfd., 600 volt.	.25
32	119875	Condenser—.002 mfd., 600 volt.	.15
33A-33B	500358	Condenser—tuning (with drum).	3.50
34A-34B	119859	Range switch	.65
35A-35D	119536	Condenser—trimmer (4 sections).	.60
36	119537	Battery cable	.40
37	119541	Coil antenna	1.25
38A-38B	500356	Volume control—1 meg. (with switch).	1.40
40	M-161332	Transformer—output for M-115126 speaker (Model 205CA only).	.90
	M-500364	Transformer—output for M-500350 speaker (Model 205CK only).	1.70
41	119669	Coil—oscillator	.75
42	119720	Transformer—1st I.F.	1.25
43	119673	Transformer—2nd I.F.	1.25
44	M-161334	Cone & voice coil for M-115126 speaker (Model 205CA only).	1.20
	M-119750	Cone & voice coil for M-500350 speaker (Model 205CK only).	1.60
45	116063	Resistor—carbon, 10,000 ohms, ¼ watt	.12

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

BATTERIES REQUIRED: One of the following or its equivalent is required: Eveready No. 748, Burgess 17G-D60, General 60DL-11L, Ray-O-Vac AB82. A special battery cable assembly (Part No. 116566) is available so that heavy duty batteries may be used with this receiver.

ANTENNA GROUNDED DIAL TUNED TO 540 KC.

INTERMEDIATE FREQUENCY
455 KC



Note A: Only a small voltage will be measured at the plate of the 1H5GT when using a voltmeter having a resistance of 1000 ohms per volt.

Note B: The bias on the 1A5GT grid is -5 volts measured across resistor

MODELS 205CA to 205CZ
Chassis 205C

STEWART-WARNER CORP.

ALIGNMENT PROCEDURE

FOR ALIGNMENT an output meter and an accurately calibrated signal generator are required.

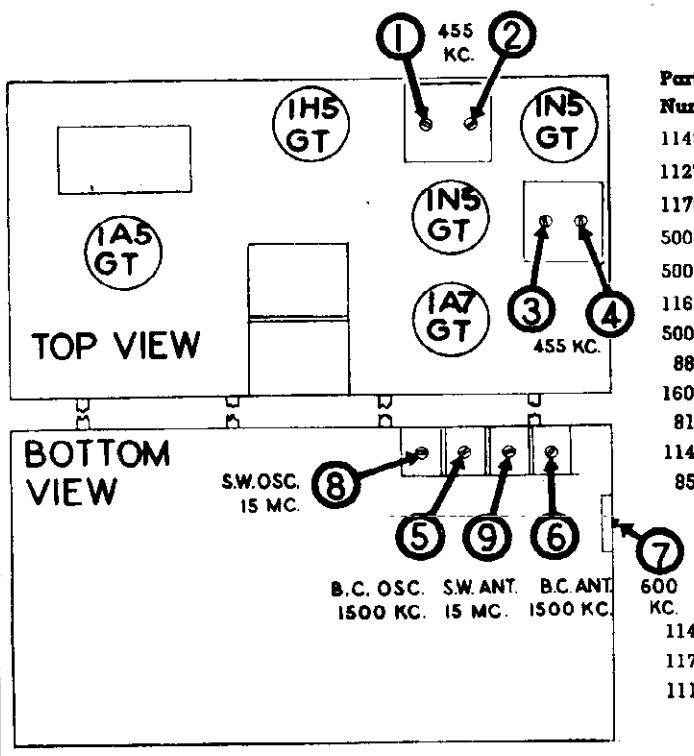
Connect the output meter across the voice coil or between the plate of the 1A5GT output tube and ground through a 0.1 Mfd. condenser, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)

Connect the ground lead of the signal generator to the black ground wire or the chassis.

Turn the volume control to the maximum volume position and keep it in this position while aligning.

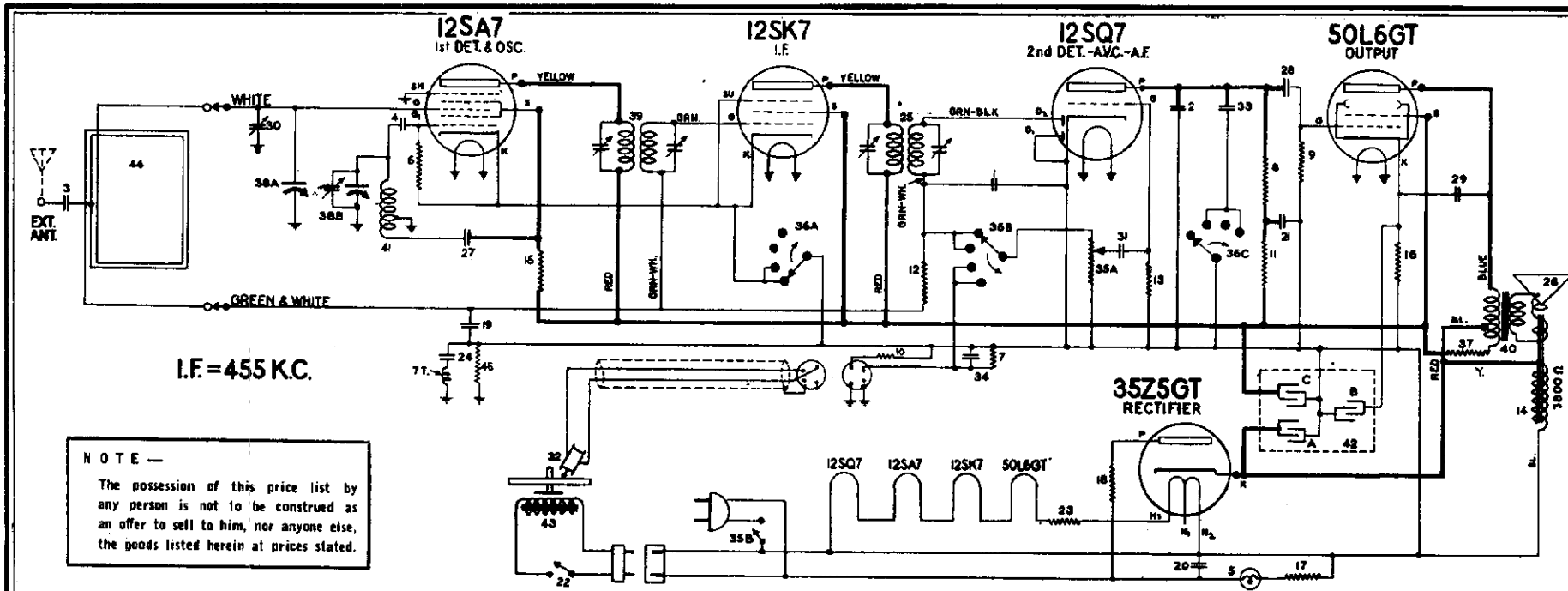
With the gang condenser in full mesh, set the dial pointer to the low frequency edge of the dial scale.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output To Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD. Condenser	Control Grid of 1A7GT	455 KC	Broadcast	Any Point Where It Does Not Affect The Signal	1-2	2nd I. F.	Adjust for maximum output. Then repeat adjustment.
					3-4	1st I. F.	
200 MMFD. Mica Condenser	Antenna Lead (Blue Wire)	1500 KC	Broadcast	1500 KC	5	Broadcast Oscillator (Shunt)	Adust for maximum output.
200 MMFD. Mica Condenser	Antenna Lead (Blue Wire)	1500 KC	Broadcast	Tune To 1500 KC Generator Signal	6	Broadcast Antenna	Adjust for maximum output.
200 MMFD. Mica Condenser	Antenna Lead (Blue Wire)	600 KC	Broadcast	Tune To 600 KC Generator Signal	7	Broadcast Oscillator (Series Pad)	Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained.
400 OHM Carbon Resistor	Antenna Lead (Blue Wire)	15 MC	Foreign	15 MC	8	Foreign Oscillator (Shunt)	Adjust for maximum output. Check to see if proper peak was obtained by tuning in image at approx. 14.1 MC. If image does not appear realign at 15 MC. with trimmer screw farther out. Recheck image.
400 OHM Carbon Resistor	Antenna Lead (Blue Wire)	15 MC	Foreign	15 MC	9	Foreign Antenna	Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained.



MISCELLANEOUS PARTS

Part Number	Description	List Price
114955	Clamp, for Dial Cord	$0.01
112745	Clip, Coil Mounting	.01
117057	Cord, Drive supplied in 3 Ft. Lengths	.15
500475	Dial Scale	.45
500503	Escutcheon—Dial with glass	1.35
116773	Knob	.10
500382	Lever, for on-off indicator	.12
88631	Plug, 4 prong male for battery cable	.06
160436	Pointer	.18
81145	Retaining Ring, for tuning shaft	Per C .50
114914	Screw, Special Head for Mtg. Escutcheon	Per Doz. .15
85827	Set Screw, 8-32 Sq. Head for Ind. Lever	.02
500354	Shaft, tuning	.12
116592	Shield, Tube	.10
119781	Socket, Octal	.12
111090	Spacer, Steel Mtg. for gang	.02
114968	Spring, Dial cord tension	.03
117157	Spring, for On-Off indicator	.03
111456	Washer, Spring washer for tuning shaft	Per C .50

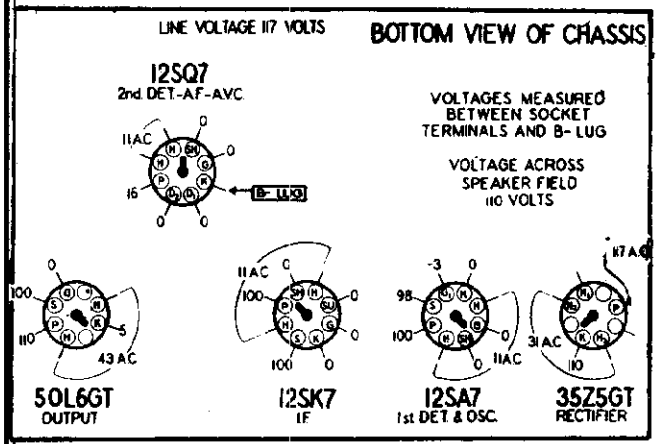


NOTE —

The possession of this price list by any person is not to be construed as an offer to sell to him, nor anyone else, the goods listed herein at prices stated.

SOCKET VOLTAGES

Volume on full with no signal. Dial tuned to 540 KC.



REAR OF CHASSIS

TONE & PHONO SWITCH POSITIONS

The radio-phonograph switch and the tone control are combined in one switch. This table shows the various positions.

POSITION OF SWITCH	COMBINATION
FIRST POSITION (Fully Counter-Clockwise) Circuit shows switch in this position	Radio — Treble
SECOND POSITION	Radio — Bass
THIRD POSITION	Phono — Treble
FOURTH POSITION (Fully Clockwise)	Phono — Bass

ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1-2	83539	Condenser—mica 260 mmfd.	$0.20
3	83783	Condenser—mica 110 mmfd.	.20
4	85061	Condenser—mica 51 mmfd.	.15
5	500897	Lamp-dial (Mazda No. C7)	.26
6	110552	Resistor—carbon 47,000 ohms ¼ watt	.12
7	112962	Resistor—carbon 150,000 ohms ¼ watt	.12
8-9	110559	Resistor—carbon 470,000 ohms ¼ watt	.12
10	110591	Resistor—carbon 680,000 ohms ¼ watt	.12
11	110564	Resistor—carbon 100,000 ohms ¼ watt	.12
12	110570	Resistor—carbon 2.2 meg. ¼ watt	.15
14	R-501204	Speaker—dynamic (5")	$4.75
15	118803	Resistor—680 ohms ¼ watt	.12
16	116092	Resistor—140 ohms 1 watt W.W.	.15
17	160078	Resistor—220 ohms 1 watt W. W.	.20
18	116752	Resistor—33 ohms 1 watt wire wound	.15
19 to 21	116819	Condenser—.05 mfd. 600 volt	.20
22	116964	Switch—"on-off" for phono motor	.32
23	117395	Resistor—20 ohms 1 watt	.16
24	116625	Condenser—.1 mfd. 800 volts	.35
25	501186	Transformer—2nd I.F.	1.20
26	R-500425	Cone & Voice Coil for R-501204 speaker	1.60
27 to 29	119193	Condenser—.01 mfd. 600 volt	.15
30	119345	Condenser—trimmer	.20
31	119875	Condenser—.002 mfd. 600 volt	.15
32	500725	Crystal cartridge	7.00
33-34	119875	Condenser—.002 mfd. 600 volt	.15
35A-35B	119912	Volume control—1 meg. (with switch)	1.40
36A-36B-36C	119921	Switch—tone & phonograph (See table for switch positions)	1.00
37	500306	Resistor—2000 ohms 1 watt	.25
38A-38B	119928	Condenser—variable tuning	2.40
39	501233	Transformer—1st I.F.	1.20
40	R-501205	Transformer—output for R-501204 Speaker	1.80
41	119954	Coil—oscillator	.36
42A-42B-42C	160012	Condenser—electrolytic, A—40 mfd.—200 volt; B—20 mfd.—25 volt; C—20 mfd.—200 volt	1.15
43	160093	Phonograph motor—60 cycle (less turntable)	6.00
44	160140	Loop antenna & back (complete)	1.40

MODEL 205FA
Chassis 205F

STEWART-WARNER CORP.

SERVICE DATA FOR 205F CHASSIS (RECEIVER MODEL 205FA)

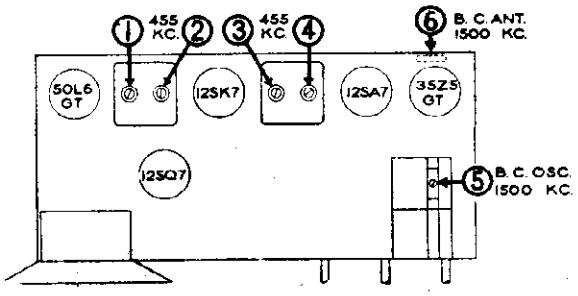
ALIGNMENT PROCEDURE

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator are required.

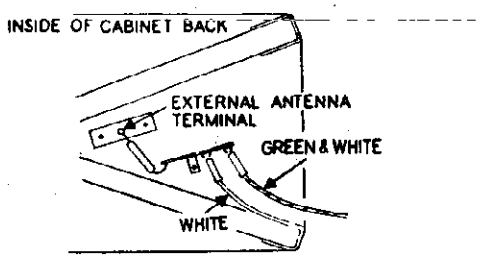
1. **Connect the output meter across the voice coil; or, using a condenser in series, connect between the plate of the 50L6GT output tube and B— as shown on the voltage chart. The more sensitive type should be connected across the voice coil.**
2. **Connect the ground lead of the signal generator to the B— lug (shown on the voltage chart) through a .25 mfd. condenser and keep it connected in this manner throughout the entire alignment procedure. Failure to use the series condenser may have serious results, as one side of the power line may be grounded in the signal generator, or hum may be encountered.**
3. **Turn the volume control to the maximum volume position and leave it in this position throughout the entire alignment procedure.**
4. **Set the Dial Pointer to last mark after 55 on the dial with the gang condenser in full mesh.**
5. **The loop must be connected at all times.**

Dummy Ant. in Series with Signal Generator	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
200 MMFD. Mica Condenser	White wire of Loop (loop must be connected)	455 KC	Any point where it does not affect the signal	1-2	2nd I.F.	Adjust for maximum output. Then repeat adjustment.
				3-4	1st I.F.	
No Connection	Place Lead from Signal Generator near Loop	1500 KC	1500 KC	5	Broadcast Oscillator (Shunt)	Adjust for maximum output.
No Connection	Place Lead from Signal Generator near Loop	1500 KC	Tune to 1500 KC Generator Signal	6*	Broadcast Antenna (Shunt)	Adjust for maximum output.

***Make adjustment of trimmer No. 6 with the chassis in the cabinet, and with the loop mounted to the cabinet by the top-center mounting screw. The loop and cabinet back may be tilted on this screw to permit reaching the trimmer.**



LOOP CONNECTIONS



MISCELLANEOUS PARTS

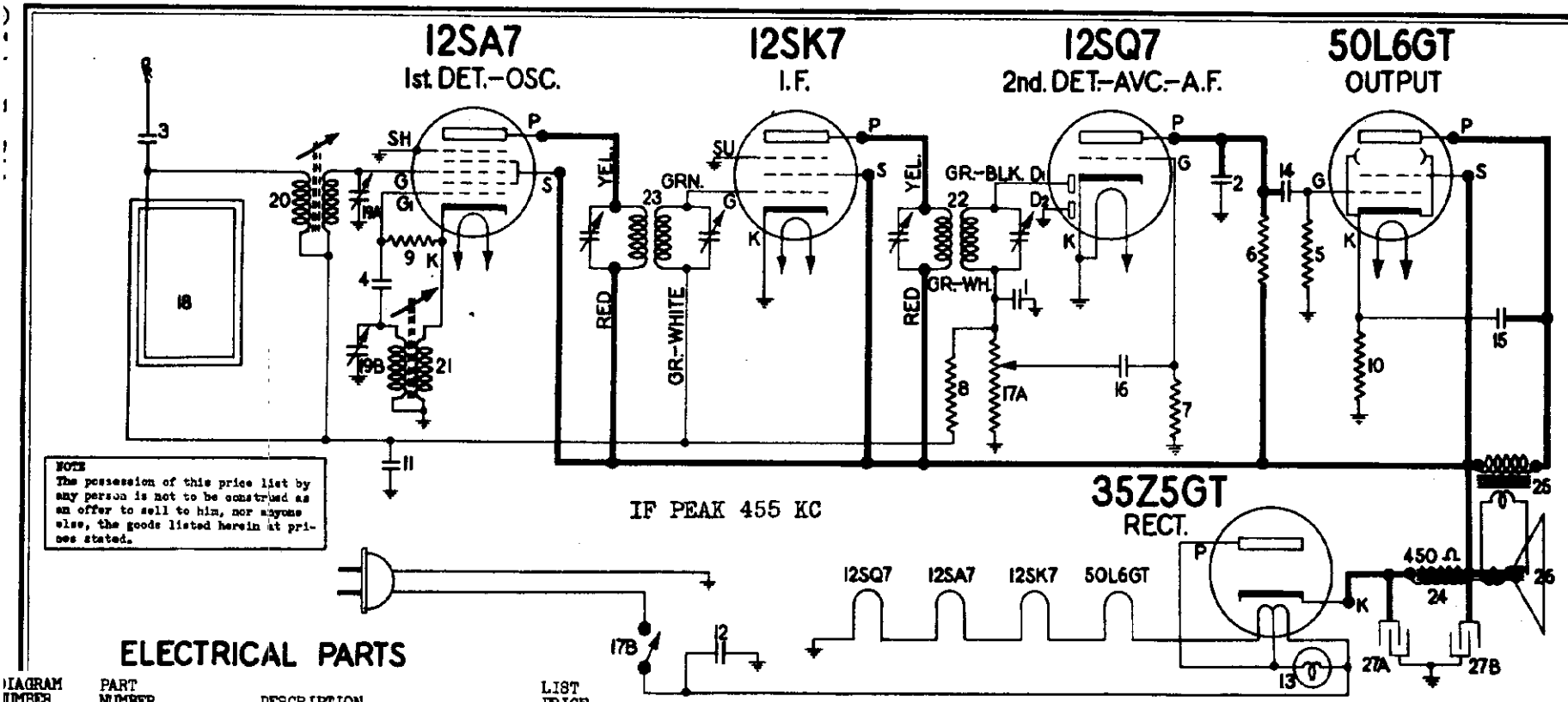
Part Number	Description	List Price
117117	Cable—motor (complete with plug)	$0.38
112745	Clip—coil mounting	.01
116948	Cord—dial drive (supplied in 6 ft. lengths)	.18
160016	Dial scale	.18
161104	Idler wheel for 160093 motor	1.00
160021	Knob (cream)	.10
160022	Knob (with indicator)	.16
160033	Needle—cup	.08
119945	Pointer	.11
81145	Retaining ring—for drive shaft	Per C .50
116690	Socket—octal base (four used)	.12
160392	Socket—octal base (one used)	.12
160171	Socket—four prong	.12
500896	Socket—Pilot light	.25
111981	Spring—for dial cord tension	.03
119910	Tuning shaft	.10
160092	Turntable (8")	1.15
111456	Washer—spring washer	Per C .50
119896	Window—dial	.38

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

REDUCING HUM

If excessive hum is encountered on connecting an external antenna to this receiver, try reversing the power cord plug in the power outlet.

STEWART-WARNER CORP. MODELS 205GA to 205G Chassis 205G



ELECTRICAL PARTS

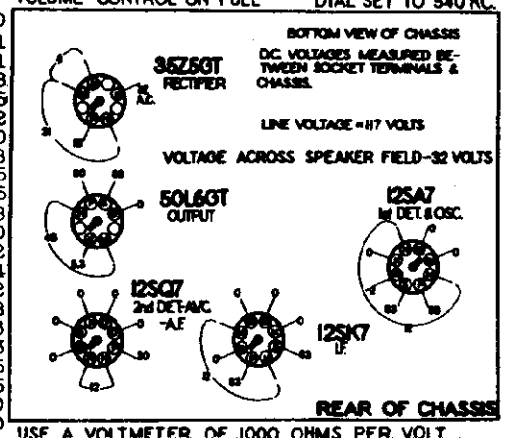
DIAGRAM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE
1-2	83539	Condenser - mica 260 mmfd.	.20
3	85081	Condenser - mica 51 mmfd.	.15
4	88686	Condenser - mica 200 mmfd.	.14
5	112971	Resistor - insulated, 470,000 ohm ½ watt	.15
6	112987	Resistor - insulated, 220,000 ohm ½ watt	.15
7	116050	Resistor - insulated, 10 meg. ½ watt	.12
8	116056	Resistor - 2.2 meg. ½ watt	.10
9	116059	Resistor - insulated, 22,000 ohm ½ watt	.12
10	116092	Resistor - 140 ohm, 1 watt-wire wound	.14
11-12	116819	Condenser - .05 mfd. 600 volt	.20
13	118921	Lamp-Dial (Mazda #47)	.15
14-15	119193	Condenser - .01 mfd. 600 volt	.15
16	119875	Condenser - .002 mfd. 600 volt	.15
17A-17B	500223	Volume Control - 1 meg. (with switch)	.95
18	501368	Loop Antenna	1.50
19A-19B	501223	Condenser - trimmer (2 sections) (A-35 mmfd.) (B-238 mmfd.)	.40
20	501157	Coil - antenna (with slug)	1.20
21	501158	Coil - oscillator (with slug)	1.20
22	501166	Transformer - 2nd I.F.	1.20
23	501233	Transformer - 1st I.F.	1.20
24	R-500916	Speaker - dynamic (4")	3.90
25	R-501163	Transformer - output for R-500916 Spkr.	1.50
26	R-501164	Cone & Voice Coil for R-500916 Spkr.	1.50
27A-27B	501213	Electrolytic Condenser (A-40 mfd. - 150 volt) (B-20 mfd. - 150 volt)	1.00

MISCELLANEOUS PARTS

PART NUMBER	DESCRIPTION	LIST PRICE
501372	Cabinet back only	.20
114955	Clamp - for drive cord	.01
112764	Clip - coil mounting	.01
116948	Cord - tuning mech. drive (6 ft. length)	.18
117057	Cord - dial drive (3 ft. length)	.15
501099	Dial Scale	.12
501140	Drive - drum & bushing	.20
501135	Drive - shaft & disc	.18
501370	Escutcheon	2.25
501367	Knob - tuning or volume	.15
500218	Pointer	.08
81145	Retaining ring - for tuning shaft - Per C	.50
85827	Set Screw - 8/32 square head	.02
160028	Socket - condenser mtg. (used with alum. can only)	.04
116690	Socket - octal base	.12
500499	Socket - pilot lamp (with leads)	.18
161384	Spring - dial cord tension	.06
501145	Spring - tension for tuning mech.	.03
500216	Tuning shaft	.26
111972	Washer - extruded & tapped (mtg.)	.05
111456	Washer - spring washer for tuning shaft - Per C	.50
500219	Window - dial	.30

SOCKET VOLTAGES

VOLUME CONTROL ON FULL — DIAL SET TO 540 KC.



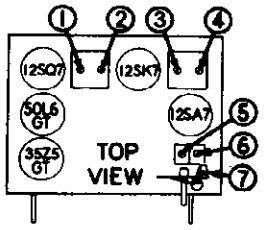
USE A VOLTMETER OF 1000 OHMS PER VOLT

MODELS 205GA to 205GZ
Chassis 205G

STEWART-WARNER CORP.

1. Connect output meter across voice coil or from 50L6GT plate through a .1 mfd. condenser to chassis.
2. Set Volume Control in maximum position.
3. Connect signal generator ground through a .1 mfd. condenser to chassis.
4. Set dial pointer to 160 with slugs all the way out.

Dummy Ant. in Series with Sig. Gen.	Connection Sig. Gen. Output to Receiver	Sig. Gen. Freq.	Receiver Dial Setting	Trimmer No.	Trimmer Description	Type of Adjustment
200 Mmfd. Mica Condenser	Grid of 12SA7 Tube	455 KC	Any place where it does not affect signal	1-2 3-4	2nd I.F. 1st I.F.	Adjust screws on top of I.F. cans for maximum output
200 Mmfd. Mica Condenser	Antenna Terminal	1600 KC	1600 KC	5	B.C. Osc.	Adjust for maximum output
200 Mmfd. Mica Condenser	Antenna Terminal	1600 KC	Tune to 1600 KC Gen. Sig.	6	B.C. Ant.	Adjust for maximum output
200 Mmfd. Mica Condenser	Antenna Terminal	1400 KC	Tune to 1400 KC Gen. Signal	7	B.C. Ant. Coil	Adjust moveable Antenna Coil for maximum output



NOTE: After completing adjustment No. 7 return slugs to maximum out position and check trimmer No. 6. If no appreciable change in trimmer adjustment is necessary for maximum output, the antenna circuit is tracking. If the trimmer No. 6 requires considerable change it will be necessary to repeat adjustment No. 7 again. These two adjustments (Nos. 6 & 7) should be made several times until no change in trimmer adjustment for maximum output is necessary at either point.

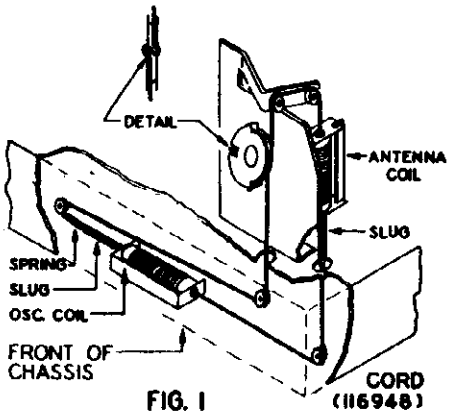


FIG. 1

TO RESTRING TUNING MECHANISM

1. Form a loop in one end of the cord and attach it to the hook nearest to the dot on the slug marked with a yellow dot. Form another loop through the hook farthest from the dot on the slug with the white dot and adjust the length so that the distance from the iron end of one slug to the iron end of the other is 2 15/16 inches.
2. Attach another length of cord to the other end of the yellow dot slug and drop the assembly through the hole in the top of the antenna coil leaving the newly added length of cord on the top end.
3. Pass the lower slug through the hole in the chassis, around the lower pulley and through the oscillator coil.
4. Now pass the cord from the top end over the two pulleys at the top of the mounting bracket, around the rear side of the small irregularly shaped pulley (see Fig. 1) threading it through the slots as shown in the "Detail" drawing and across the front down through the second hole in the chassis. Pass the cord under the upper pulley and around the top of the left hand pulley.
5. Form a loop and attach to spring (part no. 501145). Attach spring to slug in oscillator coil and adjust loop in cord to give normal tension.
6. The iron slug in the oscillator coil should project 1½" from the end of the coil when the drive pulley is in its maximum counter-clockwise position. This may be adjusted by sliding the cord in the slots shown in the "Detail" drawing.
7. If the procedure outlined in the steps above has been carefully followed, the colored dot ends of the slugs will enter the coil last when the slugs are fully entered in the coils.
8. After restringing tuning mechanism, perform the alignment indicated under " Alignment Procedure " above.

DRUM SHOWN WITH SLUGS IN FULL OUT POSITION

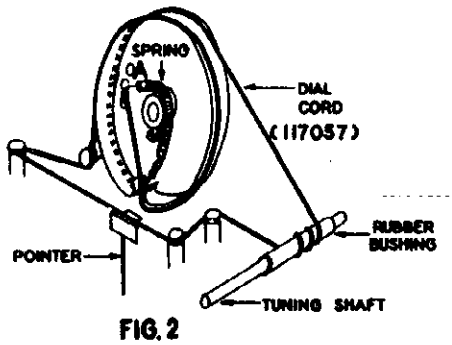


FIG. 2

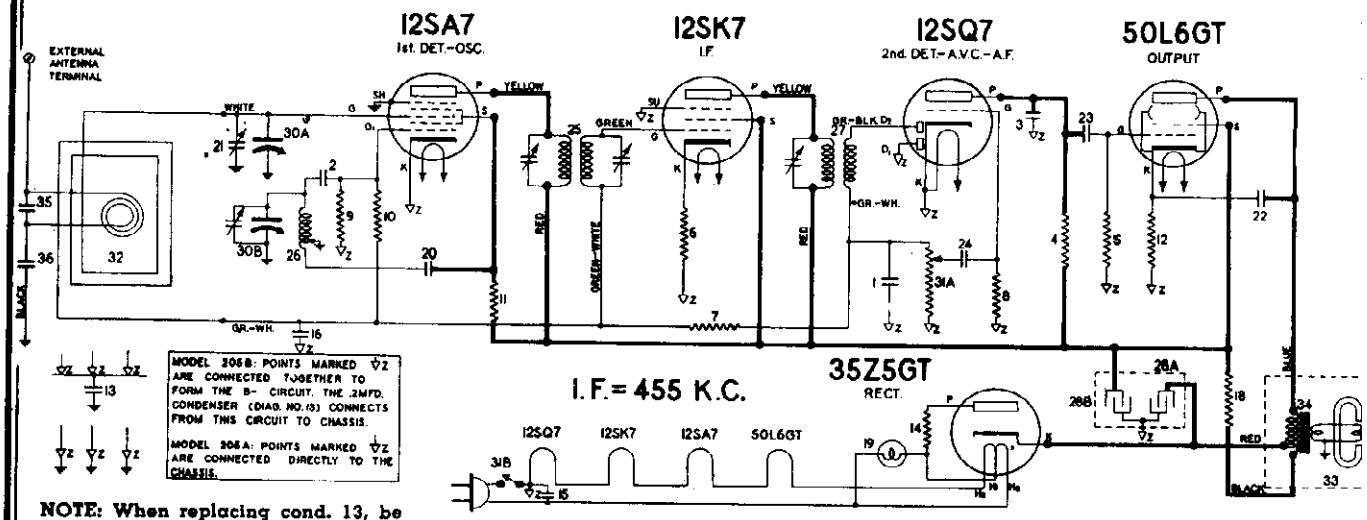
TO RESTRING DIAL CORD

1. Set drum to position shown in Figure 2 with slugs in full out position (shown in Fig. 1).
2. Attach one end of the dial cord to point A on the drum.
3. Pass the cord through the opening at the bottom of the drum around the rear of the left side over the top and make two and one half turns around the rubber bushing on the tuning shaft as shown in Fig. 2.
4. Pass the cord around the guides as shown and over the front edge of the drum around and up through the opening at the bottom of the drum.
5. Attach spring to point A and bring it over hub of drum.
6. Form a loop in the cord and adjust for normal tension on the spring. (See Fig. 2).
7. Set the pointer to 1600 KC on the dial scale with the drum in the maximum counter-clockwise position.

MODELS 205BA to 205BZ
Chassis 205B

STEWART-WARNER CORP.

MODELS 205AA to 205A
Chassis 205A



NOTE: When replacing cond. 13, be sure to replace five series turns.

ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1	83539	Condenser—mica, 260 mmfd.	$0.20
2	83783	Condenser—mica, 110 mmfd.	.20
3	85394	Condenser—mica, 510 mmfd.	.25
4	110553	Resistor—carbon, 220,000 ohms ¼ watt	.12
5	110559	Resistor—carbon, 470,000 ohms ¼ watt	.12
6	110560	Resistor—carbon, 100 ohms ¼ watt	.12
7	110570	Resistor—carbon, 2.2 meg. ¼ watt	.15
8	110580	Resistor—carbon, 3.3 meg. ¼ watt	.12
9	112958	Resistor—carbon, 18,000 ohms ¼ watt	.12
10	112975	Resistor—carbon, 10 meg. ¼ watt	.12
11	116068	Resistor—carbon, 680 ohms ¼ watt	.10
12	116092	Resistor—140 ohms 1 watt W.W.	.14
13	116706	Condenser—.2 mfd. 600 volt (205B only)	.35
14	116752	Resistor 33 ohms 1 watt W.W.	.15
15-16	116819	Condenser—.05 mfd. 600 volt	.20
18	118824	Resistor—carbon, 1500 ohms ½ watt	.12
19	118921	Lamp—Dial (Mazda No. 47)	.15
20	119193	Condenser—.01 mfd. 600 volt	.15
21	119345	Condenser—Trimmer	.20
22	119414	Condenser—.02 mfd. 600 volt	.15
23	119417	Condenser—.006 mfd. 600 volt	.15
24	119817	Condenser—.004 mfd. 600 volt	.15
25	500131	Transformer -1st I.F.	1.00
26	500232	Coil—Oscillator	.52
27	500236	Transformer—2nd I.F.	1.10
28A-28B	500256	Condenser—Electrolytic A—40 mfd.—150 volt / B—20 mfd.—150 volt	1.00
29	C-500329	Cone and voice coil for C-500594 speaker	1.25
30A-30B	500443	Condenser—variable tuning, with drum	2.50
31A-31B	500480	Volume Control 1 meg. (with switch)	1.20
32	500566	Loop Antenna & Cabinet Back (205AA & 205BA)	1.60
	500567	Loop Antenna & Cabinet Back (205AB & 205BB)	1.60
	500576	Loop Antenna & Cabinet Back (205AC &205BC)	1.60
33	C-500594	Speaker—P.M. (4")	3.50
34	C-500615	Transformer—output for C-500594 speaker	1.10
35	83783	Condenser—mica, 110 mmfd.	.20
36	119193	Condenser .01 mfd. 600 volt (205A only)	.15

MISCELLANEOUS PARTS

Part Number	Description	List Price
116467	Base for mounting electrolytic condenser	$0.04
114955	Clamp for dial cord	.01
112745	Clip—coil mounting	.01
117057	Cord—drive supplied in 3' lengths	.15
500562	Dial Scale	.40
500422	Knob (for 205AA & 205AC) (205BA & 205BC)	.05
500428	Knob (for 205AB & 205BB)	.06
500527	Pointer	.06
81145	Retaining ring for tuning shaft	Per C .50
116690	Socket—octal base	.12
160392	Socket—octal (rectifier)	.12
500498	Socket—pilot lamp (with leads)	.18
161384	Spring—dial cord tension	.06
500497	Stud—dial scale retaining	.02
111456	Washer spring washer for tuning shaft	Per C .50

CABINETS

500539	Cabinet—walnut, complete (205AA & 205BA)	3.20
500565	Cabinet—sprayed ivory, complete (205AB & 205BB)	4.20
500572	Cabinet—wood (205AC & 205BC)	7.60

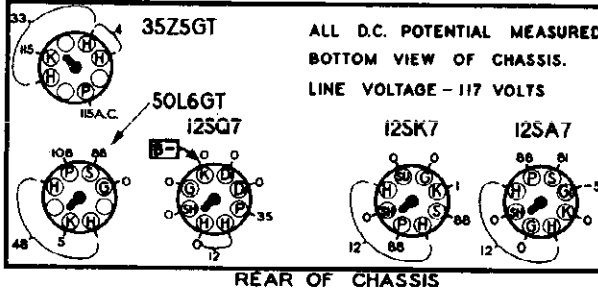
PRICES SUBJECT TO CHANGE WITHOUT NOTICE

ALIGNMENT PROCEDURE

1. Connect output meter across the voice coil; or from 50L6GT plate to B— as shown on voltage chart.
2. Connect the ground lead of the signal generator to the chassis through a .25 mfd. condenser.
3. Set the volume control to the maximum volume position.
4. Set dial pointer to lowest frequency point on dial scale with gang in full mesh.
5. Connect the antenna lead of the signal generator to the lug on the top of the rear section of the gang, using a 200 mmfd. mica condenser in series.
6. Set the signal generator to 455 KC. Set receiver dial to a point where it does not affect signal. Adjust the trimmer screws on the top of each I.F. Transformer for maximum output.
7. Connect the output of the signal generator in series with a 200 mmfd. mica condenser to the antenna terminal on the cabinet back. Set the receiver dial to 1500 KC.
8. Set the signal generator to 1500 KC and adjust the trimmer on the front section of the gang condenser for maximum output of the oscillator signal.
9. Place the loop antenna in its correct position at the rear of the cabinet and adjust the trimmer screw on the back of the chassis for maximum output at 1500 KC.

SOCKET VOLTAGES

VOLUME ON FULL WITH NO SIGNAL — DIAL TUNED TO 540 KC.



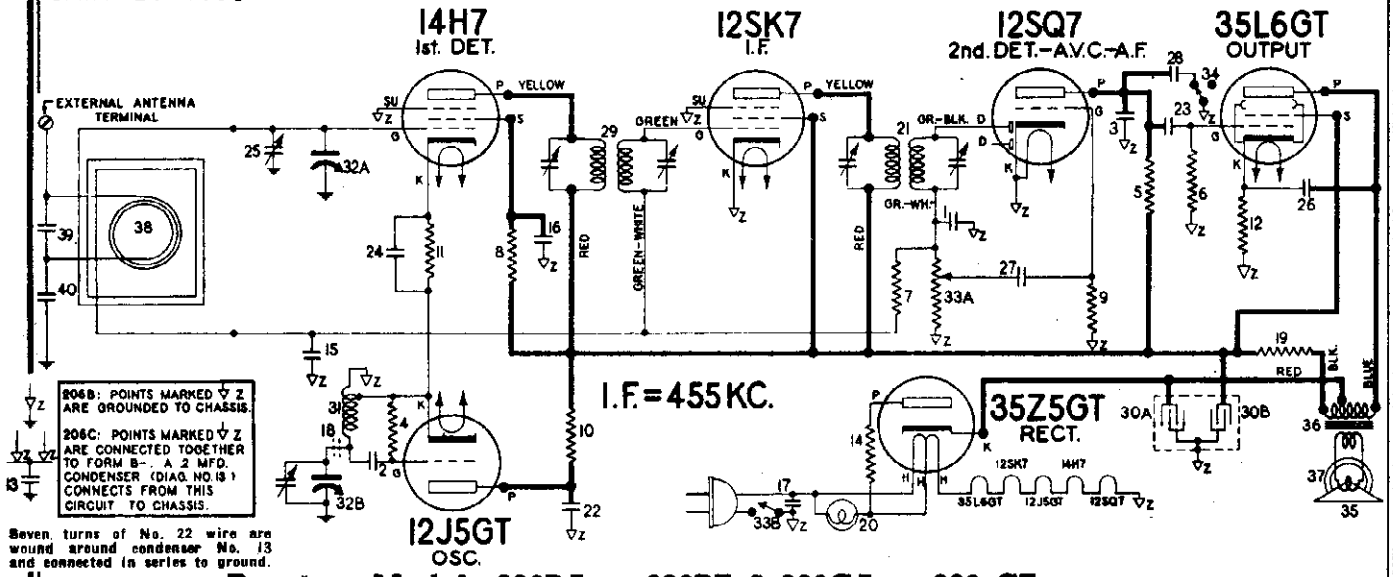
ALL D.C. POTENTIAL MEASURED TO B-
BOTTOM VIEW OF CHASSIS.
LINE VOLTAGE - 117 VOLTS

REAR OF CHASSIS

Use a voltmeter of 1000 ohms per volt.

MODELS 206BA to 206BZ
Chassis 206B
MODELS 206CA to 206CZ
Chassis 206C

STEWART-WARNER CORP.



Receiver Models 206BA to 206BZ & 206CA to 206 CZ

APPLIES ONLY TO THE ABOVE MODELS WITH P.M. SPEAKERS

Diagram Number	Part Number	Description	List Price
1	83539	Condenser—mica, 250 mmfd.	$0.20
2	83783	Condenser—mica, 110 mmfd.	.20
3	85394	Condenser—mica, 510 mmfd.	.25
4	110552	Resistor—carbon 47,000 ohms ¼ watt	.12
5	110553	Resistor—carbon 220,000 ohms ¼ watt	.12
6	110559	Resistor—carbon 470,000 ohms ¼ watt	.12
7	110570	Resistor—carbon 2.2 meg. ¼ watt	.15
8	110578	Resistor—carbon 68,000 ohms ¼ watt	.12
9	110580	Resistor—carbon 3.3 meg. ¼ watt	.12
10	116068	Resistor—carbon 680 ohms ¼ watt	.10
11	116079	Resistor—carbon 1200 ohms ¼ watt	.12
12	116092	Resistor 140 ohms, 1 watt W.W.	.14
13	116706	Condenser—.2 mfd. 600 volt (206C)	.35
14	116752	Resistor—33 ohms 1 watt W.W.	.15
15-17	116819	Condenser—.05 mfd. 600 volt	.20
16	119193	Condenser—.01 mfd. 600 volt	.15
18	116819	Condenser—.05 mfd. 600 volt (206C only)	.20
19	118824	Resistor—carbon 1,500 ohms ½ watt	.12
20	118921	Lamp—dial (Mazda No. 47)	.15
21	119024	Transformer—2nd I.F.	1.15
22-23-24	119193	Condenser .01 mfd. 600 volt	.15
25	119345	Condenser—trimmer (loop)	.20
26	119414	Condenser—.02 mfd. 600 volt	.15
27	119817	Condenser—.004 mfd. 600 volt	.15
28	119875	Condenser—.002 mfd. 600 volt	.15
29	500131	Transformer—1st I.F.	1.00
30A-30B	500256	Condenser—Electrolytic { A-40 mfd. 150 volt / B-20 mfd. 150 volt }	1.00
31	500408	Coil—oscillator	.42
32A-32B	500443	Condenser—variable tuning with drum	2.60
33A-33B	500480	Volume Control—1 meg. (with switch)	1.20
34	{ 500509 / 500546	Switch—tone (206B only) / Switch—tone (206C only)	.55 / .55
35	R-500587	Cone & Voice Coil for R-500618 speaker	1.50
36	R-500617	Transformer—output for R-500618 speaker	1.50
37	R-500618	Speaker—P.M. dynamic (5")	4.10
38	{ 500580 / 500581 / 500678	Loop Antenna & Cabinet Back (206BA & 206CA) / Loop Antenna & Cabinet Back (206BB & 206CB) / Loop Antenna & Cabinet Back (206BC & 206CC)	1.50 / 1.50 / 1.60
39	83783	Condenser—mica, 110 mmfd.	.20
40	119193	Condenser—.01 mfd. 600 volt (206B only)	.15

MISCELLANEOUS PARTS

Part Number	Description	List Price
116467	Base for mounting Electrolytic Condenser (206C)	$0.04
160026	Base for mounting Electrolytic Condenser (206B)	.04
114955	Clamp—for dial cord	.01
112745	Clip—coil mounting	.01
117057	Cord—Drive, supplied in 3' lengths	.15
500563	Dial Scale	.42
500422	Knob—(walnut)	.05
500428	Knob (ivory)	.06
500527	Pointer	.06
81145	Retaining ring for tuning shaft	Per C .50
116690	Socket—octal base	.12
160392	Socket—octal (rectifier)	.12
160294	Socket—8 prong for 14H7	.12
500499	Socket—pilot lamp (with leads)	.18
161384	Spring—dial cord tension	.06
500497	Stud—dial scale retaining	.02
500289	Tuning Shaft	.22
111456	Washer—spring washer for tuning shaft	Per C .50

ALIGNMENT PROCEDURE

1. Connect the output meter across the voice coil or from the plate of the 35L6GT output tube to B— through a .25 mfd. condenser.
2. Connect the ground lead from signal generator to B— through a .25 mfd. condenser for all alignment steps.
3. Set volume control in maximum position.
4. Set dial pointer to last marking on dial with gang in full mesh.
5. Connect hot lead from signal generator to stator on rear section of gang using 200 mmfd. in series as dummy.
6. Set generator to 455 KC. and adjust trimmer screws on top of I.F. transformer cans for maximum output.
7. Connect hot lead to antenna terminal on loop through a 200 mmfd. condenser as a dummy. Set dial to 1500 KC. and adjust trimmer on front section of gang for maximum output on a 1500 KC. generator signal.
8. Place chassis in cabinet and using connections in "7," place loop in position and adjust loop trimmer at rear of chassis for maximum output while tuning dial to maximum signal.

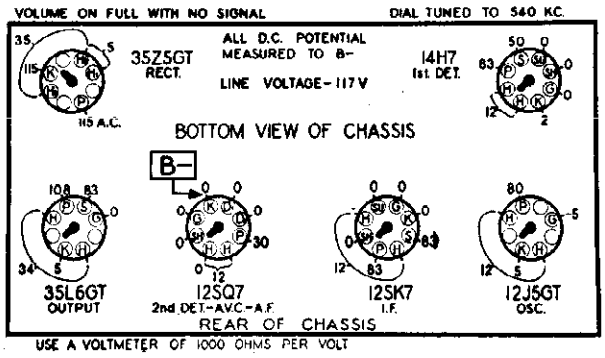
NOTE: Place the chassis in the cabinet to find dial settings.

CABINETS

500578	Cabinet—walnut (plastic)	3.50
500579	Cabinet—sprayed ivory (plastic)	4.80
500548	Cabinet—wood	10.20

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

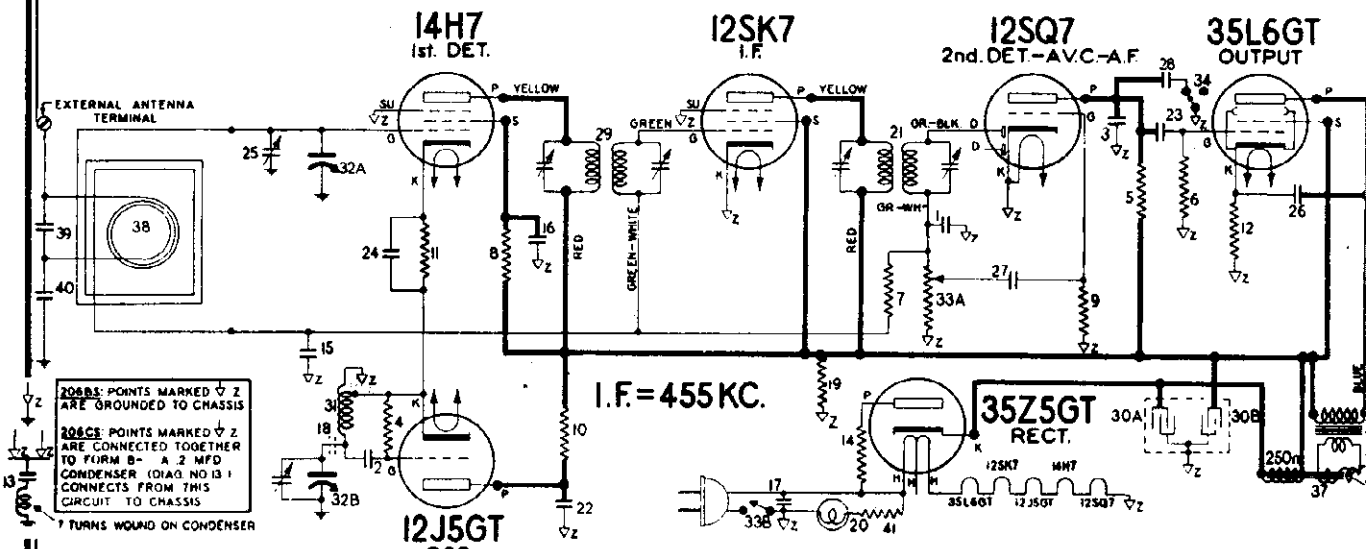
SOCKET VOLTAGES



USE A VOLTMETER OF 1000 OHMS PER VOLT

STEWART-WARNER CORP.

MODELS 206BAS to 206BZ
Chassis 206BS
MODELS 206CAS to 206CZ
Chassis 206CS



Receiver Models 206BAS to 206BZS & 206CAS to 206CZS

APPLIES Only to the Above MODELS with ELECTRO-DYNAMIC SPEAKER

Diagram Number	Part Number		
1	83539	Condenser—mica, 260 mmfd.	$0.20
2	83783	Condenser—mica, 110 mmfd.	.20
3	85394	Condenser—mica, 510 mmfd.	.25
4	110552	Resistor carbon 47,000 ohms ¼ watt	.12
5	110553	Resistor—carbon 220,000 ohms ¼ watt	.12
6	110559	Resistor—carbon 470,000 ohms ¼ watt	.12
7	110570	Resistor—carbon 2.2 meg. ¼ watt	.15
8	110578	Resistor—carbon 68,000 ohms ¼ watt	.12
9	110580	Resistor carbon 3.3 meg. ¼ watt	.12
10	116068	Resistor—carbon 680 ohms ¼ watt	.10
11	116079	Resistor—carbon 1200 ohms ¼ watt	.12
12	501093	Resistor 120 ohms, 1 watt W.W.	.20
13	116706	Condenser .2 mfd. 600 volt (206CS)	.35
14	116752	Resistor—33 ohms 1 watt W.W.	.15
15-17	116819	Condenser—.05 mfd. 600 volt	.20
16	119193	Condenser—.01 mfd. 600 volt	.15
18	116819	Condenser—.05 mfd. 600 volt (206CS only)	.20
19	118813	Resistor—carbon—5000 ohms, 2 watts	.18
20	500897	Lamp—dial (Mazda C7)	.26
21	119024	Transformer—2nd I.F.	1.15
22-23-24	119193	Condenser—.01 mfd. 600 volt	.15
25	119345	Condenser—trimmer (loop)	.20
26	119414	Condenser—.02 mfd. 600 volt	.15
27	119817	Condenser—.004 mfd. 600 volt	.15
28	119875	Condenser—.002 mfd. 600 volt	.15
29	500131	Transformer—1st I.F.	1.00
30A-30B	500256	Condenser—Electrolytic (A-40 mfd. 150 volt / B-20 mfd. 150 volt)	1.00
31	500408	Coil—oscillator	.42
32A-32B	500443	Condenser—variable tuning with drum	2.60
33A-33B	500480	Volume Control—1 meg. (with switch)	1.20
34	500509	Switch—tone (206BS only)	$0.
	500546	Switch—tone (206CS only)	
35	R-500731	Cone & Voice Coil for R-500924 speaker	1.
36	R-500925	Transformer—output for R-500924 speaker	1.
37	R-500924	Speaker—dynamic (5")	4.
38	500580	Loop Antenna & Cabinet Back (206BAS & 206CAS)	1.
	500581	Loop Antenna & Cabinet Back (206BBS & 206CBS)	1.
	500678	Loop Antenna & Cabinet Back (206BCS & 206CCS)	1.
39	83783	Condenser—mica, 110 mmfd.	
40	119193	Condenser—.01 mfd. 600 volt (206BS only)	
41	160078	Resistor—carbon 220 ohms, 1 W.	

ALIGNMENT PROCEDURE

1. Connect the output meter across the voice coil or from the plate of the 35L6GT output tube to B— through a .25 mfd. condenser.
2. Connect the ground lead from signal generator to B— through a .25 mfd. condenser for all alignment steps.
3. Set volume control in maximum position.
4. Set dial pointer to last marking on dial with gang in full mesh.
5. Connect hot lead from signal generator to stator on rear section of gang using 200 mmfd. in series as dummy.
6. Set generator to 455 KC. and adjust trimmer screws on top of I.F. transformer cans for maximum output.
7. Connect hot lead to antenna terminal on loop through a 200 mmfd. condenser as a dummy. Set dial to 1500 KC. and adjust trimmer on front section of gang for maximum output on a 1500 KC. generator signal.
8. Place chassis in cabinet and using connections in "7," place loop in position and adjust loop trimmer at rear of chassis for maximum output while tuning dial to maximum signal.

NOTE: Place the chassis in the cabinet to find dial settings.

MISCELLANEOUS PARTS

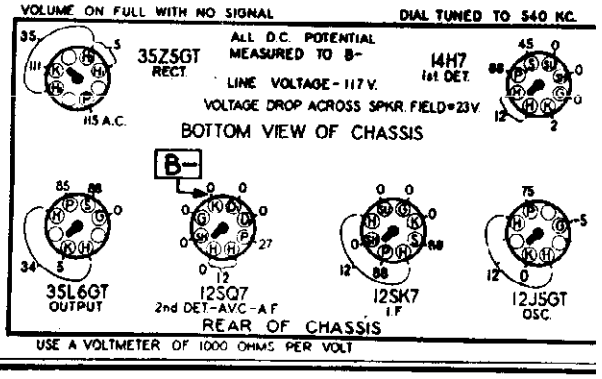
Part Number	Description	Li Pri
116467	Base for mounting Electrolytic Condenser (206CS)	$0.
160026	Base for mounting Electrolytic Condenser (206BS)	
114955	Clamp—for dial cord	
112745	Clip coil mounting	
117057	Cord—Drive, supplied in 3' lengths	
500563	Dial Scale	
500422	Knob—(walnut)	
500428	Knob—(ivory)	
500527	Pointer	
81145	Retaining ring for tuning shaft	Per C
116690	Socket—octal base	
160392	Socket—octal (rectifier)	
160294	Socket—8 prong for 14H7	
500898	Socket—pilot lamp (with leads)	
161384	Spring—dial cord tension	
500497	Stud—cabinet back retaining	
500289	Tuning Shaft	
111456	Washer—spring washer for tuning shaft	Per C

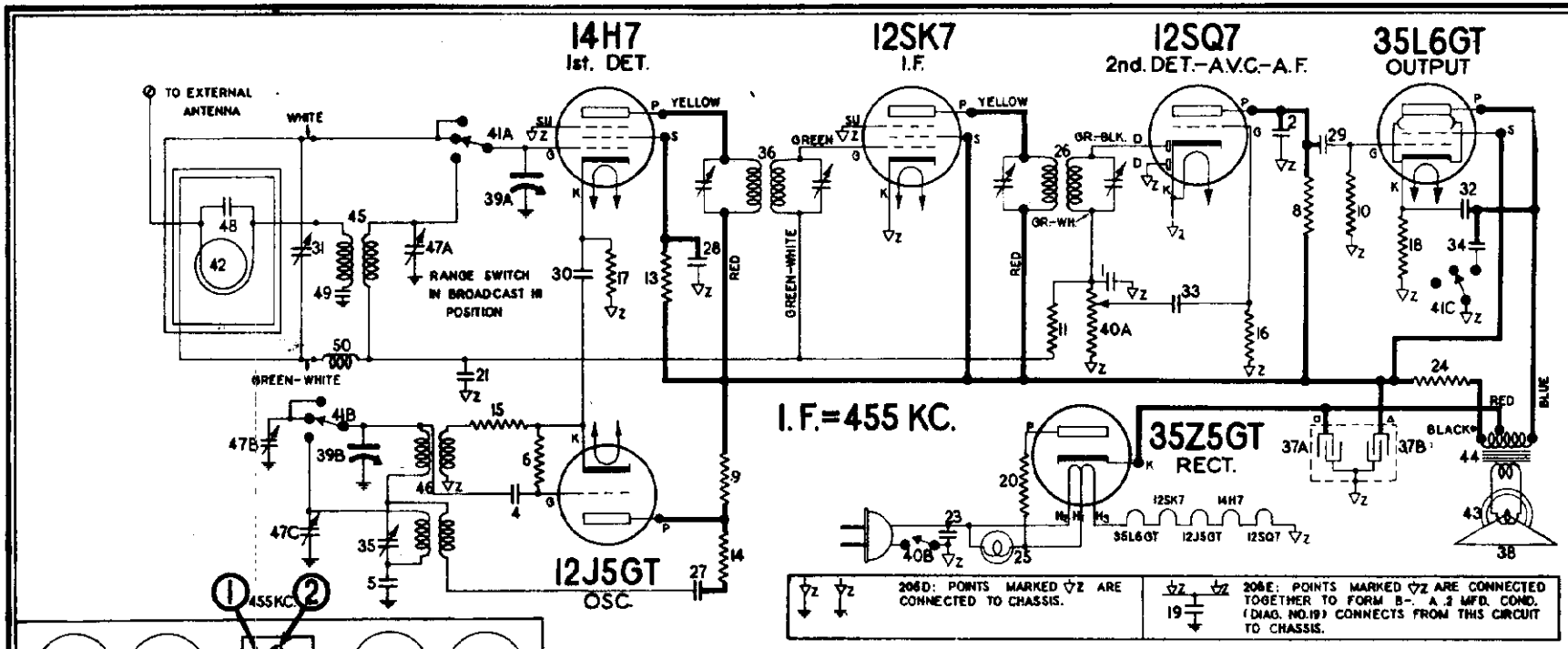
CABINETS

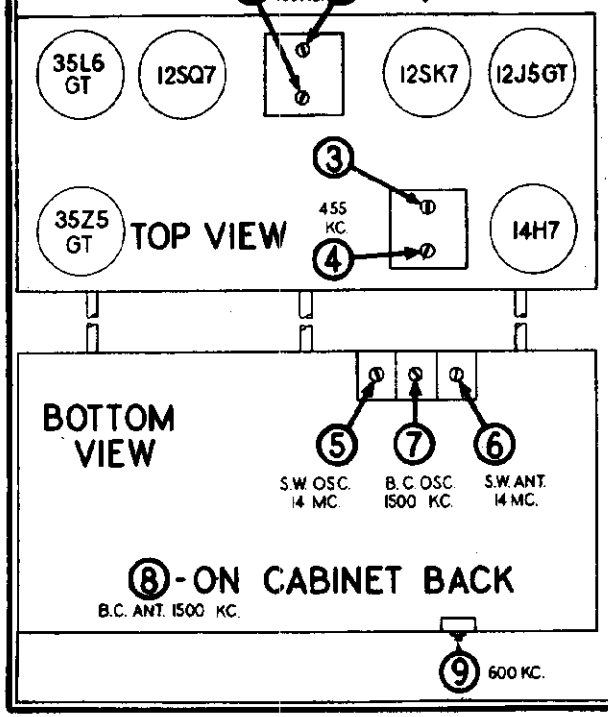
500578	Cabinet—walnut (plastic)	3.
500579	Cabinet—sprayed ivory (plastic)	4.
500548	Cabinet—wood	10.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

SOCKET VOLTAGES







ELECTRICAL PARTS

Diagram No.	Part No.	Description	List Price
1-2	83539	Condenser, Mica 260 Mmfd.	$ .20
4	83783	Condenser, Mica 110 Mmfd.	.20
5	88587	Condenser, Mica .0042 Mfd.	.35
6	110552	Resistor, Carbon—47,000 Ohms ¼ Watt	.12
8	110553	Resistor, Carbon—220,000 Ohms ¼ Watt	.12
9	110557	Resistor, Carbon—4,700 Ohms ¼ Watt	.12
10	110559	Resistor, Carbon—470,000 Ohms ¼ Watt	.12
11	110570	Resistor, Carbon—2.2 Meg. ¼ Watt	.15
13	110578	Resistor, Carbon—68,000 Ohms ¼ Watt	.12
14-15	110590	Resistor, Carbon—180 Ohms ¼ Watt	.12
16	110580	Resistor, Carbon—3.3 Meg. ¼ Watt	.12
17	116079	Resistor, Insulated 1200 Ohms ¼ Watt	.12
18	116092	Resistor, 140 Ohms 1 Watt—W.W.	.14
19	116706	Condenser, .2 Mfd. 600 Volt (206E only)	.35
20	116752	Resistor, 33 Ohms, 1 Watt—W.W.	.15
21 to 23	116819	Condenser, .05 Mfd. 600 Volt	.20
24	118824	Resistor, Carbon—1,500 Ohms ½ Watt	.12
25	118921	Lamp, Dial (Mazda No. 47)	.15
26	119024	Transformer, 2nd. I.F.	1.15
27 to 30	119193	Condenser, .01 Mfd. 600 Volt	.15
31	119345	Condenser, Trimmer (Loop)	.20
32	119414	Condenser, .02 Mfd. 600 Volt	.15
33	119817	Condenser, .004 Mfd. 600 Volt	.15
34	119880	Condenser, .04 Mfd. 600 Volt	$ .20
35	119934	Condenser, Padder	.36
36	500131	Transformer, 1st I.F.	1.00
37A-37B	500256	Condenser, Electrolytic A—40 Mfd. 150 Volt B—20 Mfd. 150 Volt	1.00
38	R-500331	Cone & Voice Coil for R-500620 Spkr.	1.50
39A-39B	500442	Condenser, Variable Tuning (with drum)	2.60
40A-40B	500480	Volume Control, 1 Meg. (with switch)	1.20
41A-41B-41C	500508	Switch, Tone & Band	.90
42	500612	Loop Antenna & Cabinet Back (206DA & 206EA)	1.50
	500613	Loop Antenna & Cabinet Back (206DB & 206EB)	1.50
	500660	Loop Antenna & Cabinet Back (206DC & 206EC)	1.60
43	R-500620	Speaker, P.M. Dynamic (6" Oval)	4.80
44	R-500621	Transformer, Output for R-500620 Spkr.	1.50
45	500645	Coil, Short Wave Antenna	.50
46	500646	Coil, Oscillator (B.C. & S.W.)	1.00
47A to 47C	500647	Condenser, Three Section Trimmer	.48
48	83783	Condenser, Mica 110 Mmfd.	.20
49	119193	Condenser, .01 Mfd., 600 Volt (206D only)	.15
50	500911	Loading Coil	.25

MISCELLANEOUS PARTS LIST ON OTHER SIDE

RECEIVER MODELS 206DA to 206DZ and 206EA to 206EZ

APPLIES ONLY TO RECEIVERS WITH P.M. SPEAKERS

STEWART-WARNER CORP.

CHASSIS 206D, 206E
CHASSIS 206DS, 206

1. Connect the output meter across the voice coil or from plate of the 35L6GT output tube to B— through a .1 mfd condenser.
2. Connect ground lead from signal generator to B— (cathode on 12SQ7) through a .25 mfd. condenser.
3. Turn volume control to maximum position throughout alignment.
4. Use a weak signal from the signal generator.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
200 MFD. Mica Condenser	Lug on Rear Section of Gang Cond.	455 KC	Broadcast	Any Point Where It Does Not Affect the Signal	1-2	2nd I.F.	Adjust for Maximum Output. Then peat Adjustment.
					3-4	1st I.F.	
400 Ohm Carbon Resistor	Terminal Marked "Antenna"	14 MC	Short Wave	14 MC	5	Short Wave Oscillator	Adjust for Maximum Output. Check see if Proper Peak was Obtained Tuning in Image at Approx. 13.1 M If Image does not appear, Realign 14 MC, with Trimmer Screw fartl out. Recheck Image.
400 Ohm Carbon Resistor	Terminal Marked "Antenna"	14 MC	Short Wave	Tune to 14 MC Generator Signal	6	Short Wave Antenna	Adjust for Maximum Output. Try Increase Output by Detuning Trimn and Retuning Receiver Dial until M imum Output is Obtained.
200 MMFD. Mica Condenser	Terminal Marked "Antenna"	1500 KC	Broadcast	1500 KC	7	Broadcast Oscillator	Adjust for maximum output.
200 MMFD. Mica Condenser	Terminal Marked "Antenna"	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	8*	Broadcast Antenna	Adjust for maximum output.
200 MMFD. Mica Condenser	Terminal Marked "Antenna"	600 KC	Broadcast	Tune to 600 KC Generator Signal	9*	Broadcast Oscillator (Series)	Adjust for Maximum Output. Try Increase Output by Detuning Trimm and Retuning Receiver Dial until Mc imum Output is Obtained.

*NOTE: ADJUSTMENTS No. 8 AND No. 9 SHOULD BE MADE WITH THE SET IN THE CABINET AND WITH LOOP LEADS AND LOOP FINAL POSITION.

MISCELLANEOUS PARTS

Part Number	Description	List Price
116467	Base for Mtg. Elec. Condenser (206E)	$ .04
160026	Base for Mtg. Elec. Condenser (206D)	.04
114955	Clamp for Dial Cord	.01
112745	Clip, Coil Mounting	.01
117057	Cord, Drive Supplied in 3' Lengths	.15
500564	Dial Scale	.50
500422	Knob (Walnut)	.05
500428	Knob (Ivory)	.06
500495	Knob, "Tone" (Walnut)	.05
500496	Knob, "Tone" (Ivory)	.05
500527	Pointer	.06
81145	Retaining Ring for Tuning Shaft Per C	.50
116690	Socket, Octal Base	.12
160392	Socket, Octal (Rectifier)	.12
160294	Socket, 8 Prong for 14H7	.12
500499	Socket, Pilot Lamp (With Leads)	.18
161384	Spring—Tension for dial cord	.06
500497	Stud, Dial Scale Retaining	.02
500289	Tuning Shaft	.22
111456	Washer, Spring Washer for Tuning Shaft Per C	.50
500583	Cabinet, Walnut (206DA & 206EA)	3.50
500584	Cabinet, Sprayed Ivory (206DB & 206EB)	4.80
500600	Cabinet, Wood (206DC & 206EC)	10.50

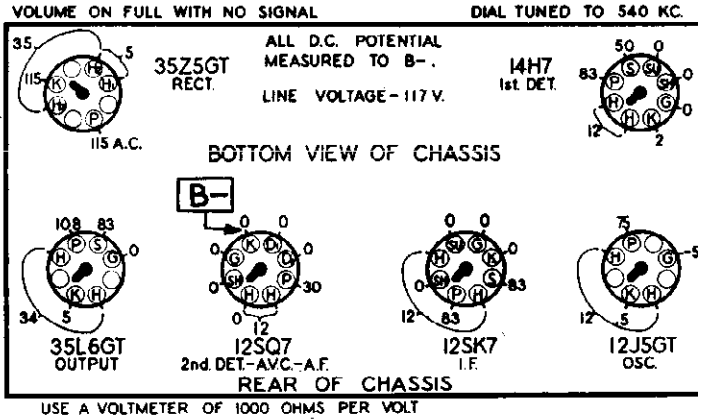
ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

RANGE-TONE SWITCH

The range and tone switch are combined in this receiver. This table shows the various positions.

SWITCH POSITION	BAND	TONE
EXTREME COUNTER-CLOCKWISE	BROADCAST	LOW
MIDDLE POSITION Shown on Circuit Diagram)	BROADCAST	HIGH
EXTREME CLOCKWISE	FOREIGN	HIGH

VOLUME ON FULL WITH NO SIGNAL — DIAL TUNED TO 540 KC.

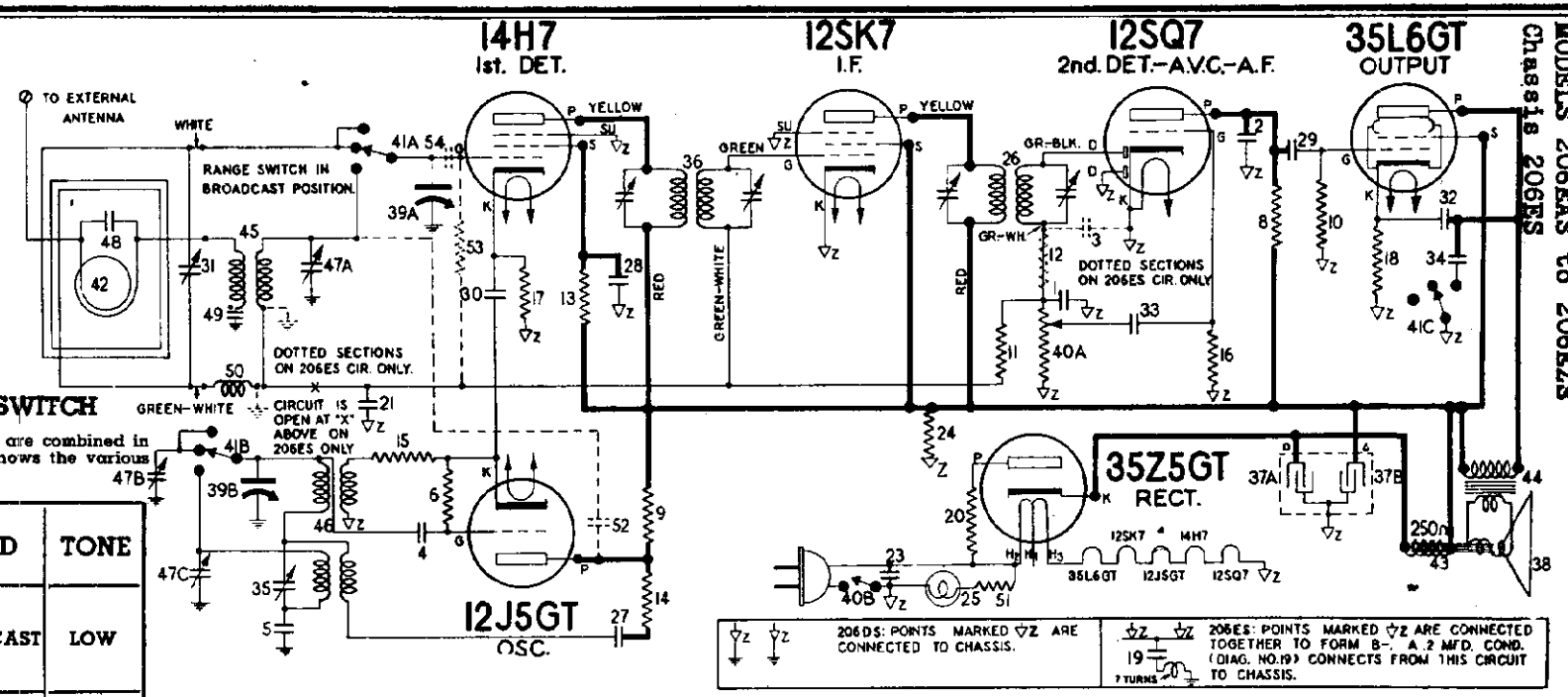


USE A VOLTMETER OF 1000 OHMS PER VOLT

MODELS 206DAS to 206DZS STEWART-WARNER CORP.

Chassis 206DS MODELS 206EAS to 206EZS

Chassis 206ES



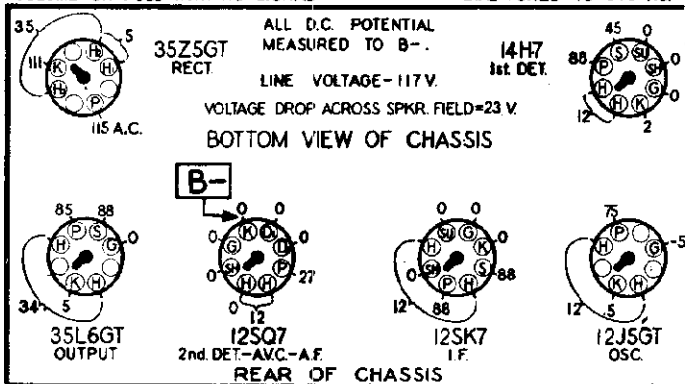
RANGE-TONE SWITCH

The range and tone switch are combined in this receiver. This table shows the various positions.

SWITCH POSITION	BAND	TONE
EXTREME COUNTER-CLOCKWISE	BROADCAST	LOW
MIDDLE POSITION Shown on Circuit Diagram)	BROADCAST	HIGH
EXTREME CLOCKWISE	FOREIGN	HIGH

SOCKET VOLTAGES

VOLUME ON FULL WITH NO SIGNAL — DIAL TUNED TO 540 KC.



USE A VOLTMETER OF 1000 OHMS PER VOLT

ELECTRICAL PARTS

Diagram No.	Part No.	Description	List Price
1-2	83539	Condenser, Mica 260 Mmfd.	$ .20
3-4	83783	Condenser, Mica 110 Mmfd.	.20
5	88587	Condenser, Mica .0042 Mfd.	.35
6	110552	Resistor, Carbon—47,000 Ohms ¼ Watt	.12
8	110553	Resistor, Carbon—220,000 Ohms ¼ Watt	.12
9	110557	Resistor, Carbon—4,700 Ohms ¼ Watt	.12
10	110559	Resistor, Carbon—470,000 Ohms ¼ Watt	.12
11	110570	Resistor, Carbon—2.2 Meg. ¼ Watt	.15
12-13	110578	Resistor, Carbon—68,000 Ohms ¼ Watt	.12
14-15	110590	Resistor, Carbon—180 Ohms ¼ Watt	.12
16	110580	Resistor, Carbon—3.3 Meg. ¼ Watt	.12
17	116079	Resistor, Insulated 1200 Ohms ¼ Watt	.12
18	501093	Resistor, 120 Ohms, 1 Watt W.W.	.15
19	116706	Condenser, .2 Mfd. 600 Volt (206E only)	.35
20	116752	Resistor, 33 Ohms, 1 Watt—W.W.	.15
21 to 23	116819	Condenser, .05 Mfd. 600 Volt	.20
24	118813	Resistor, Carbon—5000 Ohms 2 W.	.18
25	500897	Lamp, Dial (Mazda C7)	.26
26	119024	Transformer, 2nd I.F.	1.15
27 to 30	119193	Condenser, .01 Mfd. 600 Volt	.15
31	119345	Condenser, Trimmer (Loop)	.20
32	119414	Condenser, .02 Mfd. 600 Volt	.15
33	119817	Condenser, .004 Mfd. 600 Volt	.15
34	119880	Condenser, .04 Mfd. 600 Volt	.20
35	119934	Condenser, Padder	.36
36	500131	Transformer, 1st I.F.	$1.00
37A-37B	500256	Condenser, Electrolytic A—40 Mfd. 150 Volt / B—20 Mfd. 150 Volt	1.00
38	R-500331	Cone & Voice Coil for R-500920 Spkr.	1.50
39A-39B	500442	Condenser, Variable Tuning (with drum)	2.60
40A-40B	500480	Volume Control, 1 Meg. (with switch)	1.20
41A-41B-41C	500508	Switch, Tone & Band	.90
42	500612	Loop Antenna & Cabinet Back (206DAS & 206EAS)	1.50
	500613	Loop Antenna & Cabinet Back (206DBS & 206EBS)	1.50
	500660	Loop Antenna & Cabinet Back (206DCS & 206ECS)	1.60
43	R-500920	Speaker, Electro-Dynamic (6" Oval)	5.00
44	R-500921	Transformer, Output for R-500920 Spkr.	1.35
45	500645	Coil, Short Wave Antenna	.50
46	500646	Coil, Oscillator (B.C. & S.W.)	1.00
47A to 47C	500647	Condenser, Three Section Trimmer	.48
48	83783	Condenser, Mica 110 Mmfd.	.20
49	119193	Condenser, .01 Mfd., 600 Volt (206DS only)	.15
50	500911	Loading Coil	.25
51	160078	Resistor, 220 Ohms, 1 Watt W.W.	.25
52	110510	Condenser, Wire 3 Mmfd.	.12
53	110570	Resistor, Carbon—2.2 Meg. ¼ Watt	.15
54	83539	Condenser, Mica—260 Mmfd. (206ES only)	.20

MISCELLANEOUS PARTS LIST ON OTHER SIDE

RECEIVER MODELS 206DAS to 206DZS and 206EAS to 206EZS

APPLIES ONLY TO ABOVE RECEIVERS WITH ELECTRO-DYNAMIC SPEAKERS

MODELS 206GA to 206G

STEWART-WARNER CORP. Chassis 206G

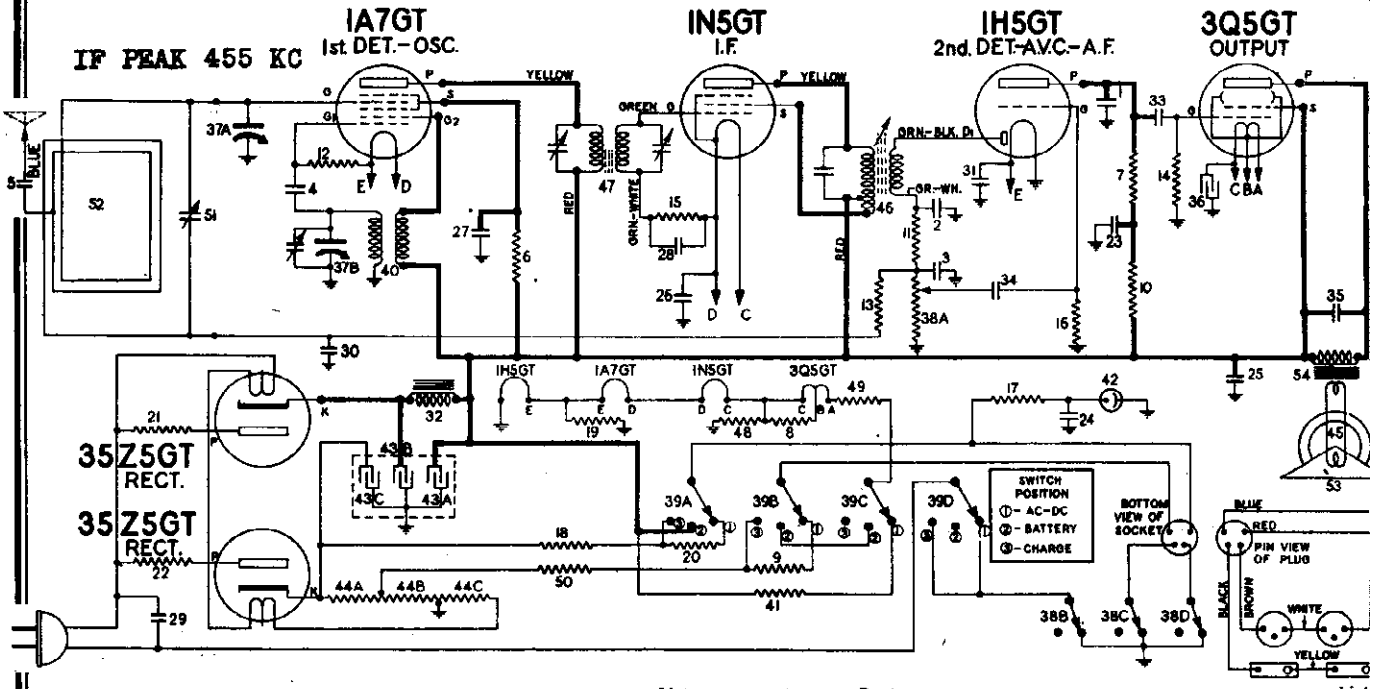


Diagram Number	Part Number	Description	List Price
1	83783	Condenser, Mica. 110 Mmfd.	$0.20
2-3-4	85061	Condenser, Mica. 51 Mmfd.	.15
5	85563	Condenser, Mica. 26 Mmfd.	.15
6	110552	Resistor, Carbon—47,000 Ohms ¼ Watt.	.12
7	110554	Resistor, Carbon—1 Megohm ¼ Watt.	.12
8-9	110556	Resistor, Carbon—330 Ohm ¼ Watt.	.12
10	110559	Resistor, Carbon—470,000 Ohms ¼ Watt.	.12
11	110564	Resistor, Carbon—100,000 Ohms ¼ Watt.	.12
12-13-14	110570	Resistor, Carbon—2.2 Meg. ¼ Watt.	.15
15-16-17	110580	Resistor, Carbon—3.3 Meg. ¼ Watt.	.12
18	110588	Resistor, Carbon—6800 Ohms ¼ Watt.	.12
19	112974	Resistor, Carbon—220 Ohm ¼ Watt.	.15
20	112995	Resistor, Carbon—15,000 Ohm ¼ Watt.	.12
21-22	116013	Resistor, 50 Ohm 1 Watt.	.18
23 to 26	116625	Condenser, .1 Mfd. 600 Volts.	.25
27 to 31	116819	Condenser, .05 Mfd. 600 Volts.	.20
32	117888	Filter Choke	.85
33	119193	Condenser, .01 Mfd. 600 Volts.	.15
34	119817	Condenser, .004 Mfd. 600 Volts.	.15
35	119875	Condenser, .002 Mfd. 600 Volts.	.15
36	161273	Condenser, Electrolytic 50 Mfd. 25 Volt.	.50
37A-37B	500443	Condenser, Variable Tuning—with drum.	2.60
38A to 38D	500481	Volume Control, 1 Meg. (with switch).	1.20
39A to 39D	500507	Switch, AC—DC & Battery.	.90
40	500689	Coil, Oscillator	.55
41	500712	Resistor, 1830 Ohms 5 Watt, Wire Wound.	.24
42	500713	Neon Glow Lamp.	.75
43A to 43C	500714	Condenser, Electrolytic— A—20 Mfd. 200 Volt; B—20 Mfd. 200 Volt; C—20 Mfd. 150 Volt	1.25
44A to 44C	500715	Resistor, Load— A—1460 Ohms 10 Watt; B— 155 Ohms 1 Watt; C— 310 Ohms 10 Watt	1.00
45	R-500730	Speaker, P.M. Dynamic (5").	4.50
46	500749	Transformer, 2nd I.F.	1.30
47	500759	Transformer, 1st I.F.	1.20
48	500832	Resistor, Carbon—430 Ohms ¼ Watt.	.10
49-50	500833	Resistor, Carbon—27 Ohms ¼ Watt.	.10
51	500842	Condenser, Trimmer for loop.	.20
52	500853	Loop Antenna	1.70
53	R-500731	Cone & Voice Coil for R-500730 Speaker.	1.30
54	R-500729	Transformer—Output for R-500730 Speaker.	1.30

MISCELLANEOUS PARTS

Part Number	Description	List Price
500740	Cabinet & Back (206-GA).	$7.20
500741	Cabinet & Back (206-GB).	11.60
500746	Cable, Battery	.85
500774	Cable, Extension	.50
114955	Clamp, for Dial Cord.	.01
112745	Clip, Coil Mounting	.01
117057	Cord, Drive (Supplied in 3 Ft. Lengths).	.15
500571	Dial Scale	.50
500492	Knob, "AC — DC — Battery"	.06
500494	Knob, "Tune"	.06
500493	Knob, "Volume"	.06
117769	Name Plate (Stewart-Warner)	.07
500748	Plug, 2 prong male for battery cable	.05
116398	Plug, 3 prong male for battery cable	.06
500747	Plug, 4 prong male for battery cable	.08
500527	Pointer	.06
81145	Retaining Ring for Tuning Shaft. Per C	.50
500501	Shaft, Tuning	.25
117716	Shield, Tube	.07
160026	Socket, Condenser Mtg.	.04
500681	Socket, 4 prong (special).	.10
116690	Socket, Octal Base	.12
161384	Spring, Dial Cord Tension.	.06
111456	Washer, Spring Washer. Per C	.50

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

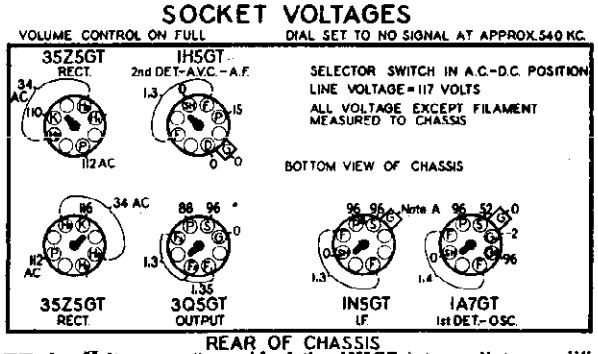
INDICATOR LAMP

This receiver is equipped with a neon lamp on the dial scale which indicates the condition of the batteries. The neon lamp is included in an oscillating (R-C) circuit which has been designed to oscillate at approximately 3 pulses per second when the batteries are in a fully charged condition. As the battery voltage decreases with use the number of pulses per second decreases.

When the battery voltage is low (approximately 72 volts) the light flickers more slowly (approximately 1 a second). The set should not be operated from battery power after this point is reached. The batteries should be charged for at least twice the time they were used—as soon as possible after they have been run down. (See "Charging Batteries" on other side).

The indicator lamp shows the condition of the batteries only when the Selector Switch is in the "Battery" position, as the voltage is much higher during charging or AC-DC operation.

SOCKET VOLTAGES



NOTE A: Voltage on the grid of the 1N5GT intermediate amplifier tu cannot be measured with a standard voltmeter because of the hi resistance of resistor No. 15.

Use A Voltmeter of 1000 Ohms Per Volt.

MODELS 206GA to 206GZ
Chassis 206G

STEWART-WARNER CORP.

1. Connect the output meter across the voice coil of the speaker or between the plate of the 3Q5GT output tube and chassis through a .1 mfd. condenser.
2. Connect the ground lead of the signal generator to chassis through a .25 mfd. condenser.
3. Set the volume control in the maximum position and use a weak signal from the generator.
4. Set Selector Switch in AC-DC position.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
200 MMFD. Condenser	Lug on Rear Section of Gang Condenser	455 KC.	Any Point Where It Does Not Affect Signal	1	2nd I.F.	Adjust the screws on the top of each I.F. can for maximum output. Then repeat adjustment.
				2-3	1st I.F.	
200 MMFD. Condenser	"A" Terminal	1500 KC.	1500 KC	4 (On front section of variable condenser)	Broadcast Oscillator (Shunt)	Adjust trimmer for maximum output.
200 MMFD. Condenser	"A" Terminal	1500 KC.	Tune To 1500 KC Generator Signal	5 (Located on cabinet back)	Broadcast Antenna	Adjust for maximum output.

Now disconnect the output meter and signal generator leads and replace the chassis and batteries in the cabinet being sure to connect the loop. Bring the antenna lead of the signal generator near the loop until the 1500 KC. signal is heard weakly and re-adjust trimmer No. 5 for maximum output by ear.

CHARGING BATTERIES

A separate charging system consisting of a 35Z5GT rectifier and a suitable resistor voltage dividing network and filter is incorporated in this receiver. The circuit is arranged to provide a very light charging current when the receiver is operated from either AC or DC. This is just enough to maintain the batteries but will not charge up used batteries. A separate charging position is provided for rapid recharging of the batteries. The resistance voltage divider is designed to give a charging rate of approximately one third the discharge rate, this having been found to give best results. It is recommended that the batteries be left on charge at least twice the time they were used. As the batteries age it is necessary to charge for a longer period. For longest battery life the batteries should be placed on charge immediately after they have been used. Batteries deteriorate from standing idle so if the set is not used on AC or DC occasionally, the batteries should be charged for a short time every few weeks even though they have not been used. The batteries are automatically maintained if the set is used on house current at regular intervals.

IMPORTANT:
1. **Completely dead batteries cannot be recharged.**
2. **Check polarity by operating set from power line before attempting to charge batteries from D.C.**
3. **The batteries will be discharged if the ON-OFF switch is left on when the power cord is not connected.**

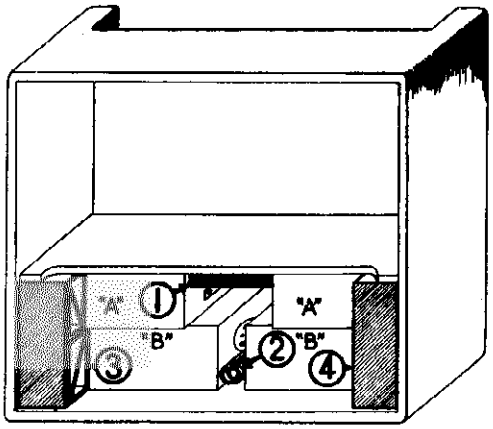


FIG. 1

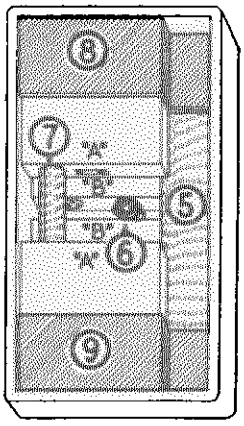


FIG. 2

4½ Volt "A" Battery	45 Volt "B" Battery
Eveready No. 746	Eveready No. 482
Burgess No. G3	Burgess No. M30
Ray-O-Vac No. P83A	Ray-O-Vac No. P7830

REPLACING THE BATTERIES

When the Selector Switch is turned to the Battery position, the flickering red neon light indicates the condition of the batteries. (See section INDICATOR LAMP on front page). As the batteries age the dropping off in voltage after charging becomes more rapid. The batteries should be replaced when the operating period is reduced to two hours, after the batteries have been fully charged. For satisfactory results all the batteries MUST be replaced at one time.

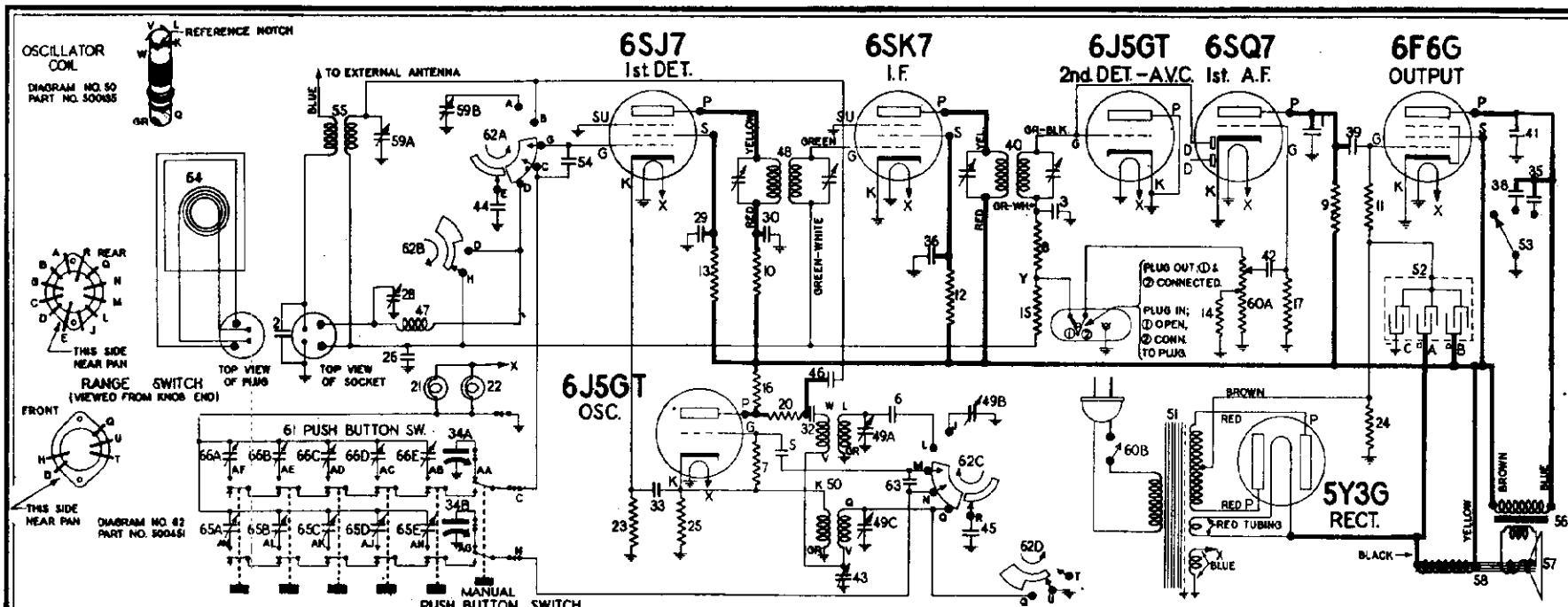
INSTALLING THE BATTERIES

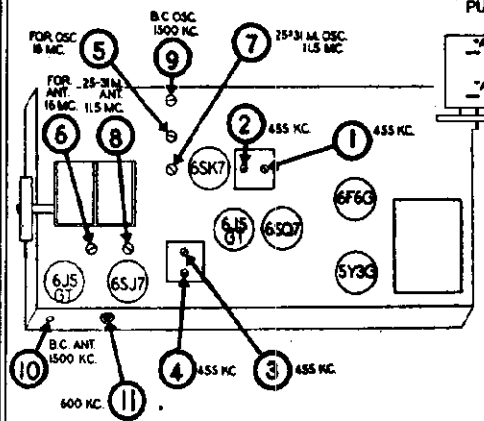
Plug the two prong plugs on the battery cable into the sockets on the tops of the "A" batteries and the three prong plugs into the sockets on the tops of the "B" batteries.

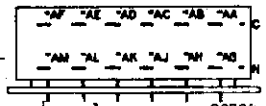
Model 206GA: Place the two "B" batteries on the bottom and the two "A" batteries on the top, in the battery compartment at the bottom of the cabinet with the battery plug sockets facing each other at the center. Insert the long corrugated board piece (1) between the "A" batteries, and the corrugated board roll (2) between the "B" batteries. Insert pieces (3) and (4) at each end as shown in Figure 1. Plug the four prong plug on the battery cable into the socket at the rear of the chassis.

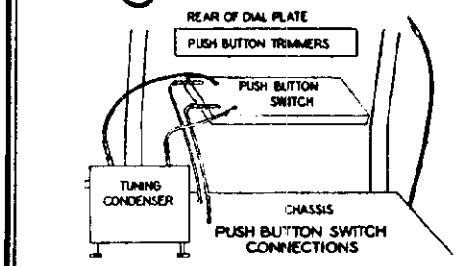
Model 206GB: Place the two "B" batteries in the bottom of the battery compartment. Insert the long rectangular corrugated board piece (5) alongside the batteries and force the small corrugated board roll (6) in between the ends of the "B" batteries. Place the "A" batteries on top of the "B" batteries and force the long roll of corrugated board (7) lengthwise between them. The sockets of both "A" and "B" batteries face each other at the center. The offset pieces (8) and (9) are placed on top of each "A" battery as shown in Figure 2. Plug the four prong plug on the battery cable in the socket on the bottom of the cabinet. The extension from this socket must be plugged into the socket on the rear of the chassis.

CAUTION: DO NOT LEAVE BATTERIES IN CABINET AFTER THEY ARE DISCHARGED AS THEIR SWELLING MAY CAUSE DAMAGE.









IF PEAK 455 KC

NOTE: RESISTOR No. 7 RETURNS TO CHASSIS INSTEAD OF CATHODE AS SHOWN.

NOTE: A 110 MMFD. MICA CONDENSER IS CONNECTED FROM POINT "Y" TO CHASSIS.

Diagram Number	Part Number	Description	List Price
1	83783	Condenser—mica 110 mmfd.	$0.20
2-3	83539	Condenser—mica 260 mmfd.	.20
5	85061	Condenser—mica 51 mmfd.	.15
6	88587	Condenser—mica .0042 mfd.	.35
7-8	110552	Resistor—carbon 47,000 ohms ¼ watt	.12
9	110553	Resistor—carbon 220,000 ohms ¼ watt	.12
10	110557	Resistor—carbon 4700 ohms ¼ watt	.12
11	110559	Resistor—carbon 470,000 ohms ¼ watt	.12
12-13	110564	Resistor—carbon 100,000 ohms ¼ watt	.12
14	110565	Resistor—carbon 22,000 ohms ¼ watt	.12
15	110570	Resistor—carbon 2.2 Meg. ¼ watt	.15
16	110576	Resistor—carbon 10,000 ohms ½ watt	.12
17	112975	Resistor—carbon 10 Meg. ¼ watt	.12
18-19	110584	Resistor—carbon 330,000 ohms ¼ watt	.12
20	110590	Resistor—carbon 180 ohms ¼ watt	.12
21-22	110629	Dial Light Bulb—6.3 volt (Mazda No. 44)	.15
23	112952	Resistor—carbon 3300 ohms ¼ watt	.10
24	117075	Resistor—300 ohm 1 watt w.w.	.16
25	116078	Resistor—560 ohms ¼ watt	.12
26-27	116819	Condenser—.05 mfd. 600 volt	.20
28	119132	Condenser—trimmer	.20
29 to 33	119193	Condenser—.01 mfd. 600 volt	.15
34A-34B	119291	Condenser—variable tuning	2.75
35	119880	Condenser—.04 mfd. 600 volt	.20
36-37	119414	Condenser—.02 mfd. 600 volt	.15
38	119416	Condenser—.008 mfd. 600 volt	.15
39	116819	Condenser—.05 mfd. 600 volt	.20
40	119024	Transformer—2nd I.F.	1.15
41	119417	Condenser—.008 mfd. 600 volt	.15
42	119875	Condenser—.002 mfd. 600 volt	$0.15
43	119934	Condenser—padder	.36
44-45	160646	Condenser—compensating, 100 mmfd.	.28
46	161315	Condenser—twisted wire—5 mmfd.	.16
47	500108	Coil—compensating	.50
48	500131	Transformer—1st I.F.	1.00
49A-49B-49C	500133	Condenser—three section trimmer	.50
50	500135	Coil—B.C. & S.W. Osc.	.75
51	500137	Transformer—power (60 cycles)	3.50
	500202	Transformer—power (25 cycles)	5.60
52	500201	Condenser—electrolytic A—20 mfd.—350 volt, B—10 mfd.—350 volt, C—20 mfd.—25 volt	1.35
53	500207	Switch—tone	55
54	500212	Condenser—compensating 200 mmfd.	.35
55	500249	Coil—short wave antenna	.50
56	R-500710	Transformer—output for R-500426 Spkr.	1.35
57	R-500711	Cone & Voice Coil for R-500426 Spkr.	1.25
58	R-500426	Speaker, dynamic (6")	4.80
59A-59B	500438	Condenser—trimmer two section	.35
60A-60B	500439	Volume Control—1 Meg. (with switch)	1.40
61	500440	Switch—push button	2.25
62A to 62D	500451	Switch—and	1.51
63	500484	Condenser—compensating, 215 mmfd.	.38
64	500490	Loop antenna & cabinet back	1.90
65A to 65E	500553	Trimmers—push button (top bank)	1.10
66A to 66E	500554	Trimmers—puh button (bottom bank)	1.10

MISCELLANEOUS PARTS LIST ON OTHER SIDE

MODELS 207BA to 207BZ
Chassis 207B

STEWART-WARNER CORP.

ALIGNMENT EQUIPMENT & PROCEDURE

THIS RECEIVER MAY BE ALIGNED IN THE CABINET WITH LOOP CONNECTED

1. Connect the output meter across the voice coil or from the plate of the 6F6G output tube to chassis through a .1 mfd. condenser.
2. Connect the ground lead of the signal generator to the receiver chassis.
3. Make sure that the wires coming from the chassis and push button switch are connected as shown in the figure below.
4. Push in the "manual" button and keep it pushed in. Check the pointer to see that it is correctly set to 540 KC. with gang in full mesh.
5. Turn the volume control to the maximum volume position, and the tone control to the "speech" position.
6. FOLLOW THE ORDER OF ALIGNMENT INDICATED BELOW.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD Condenser	Lug on Outer Section of Gang Cond.	455 KC	Broadcast	Any Point Where It Does Not Affect the Signal	1-2	2nd I.F.	Adjust for Maximum Output. Then repeat Adjustment.
					3-4	1st I.F.	
400 OHM Carbon Resistor	Blue Lead from Chassis	16 MC	Foreign	16 MC	5	Foreign Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 15.1 MC. If Image does not appear, Realign at 16 MC, with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	Blue Lead from Chassis	16 MC	Foreign	Tune to 16 MC Generator Signal	6	Foreign Antenna	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.
400 OHM Carbon Resistor	Blue Lead from Chassis	11.5 MC	Intermediate	11.5 MC	7	Spread Band Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 10.6 MC. If Image does not appear, Realign at 11.5 MC, with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	Blue Lead from Chassis	11.5 MC	Intermediate	Tune to 11.5 MC Generator Signal	8	Spread Band Antenna	Adjust for Maximum Output.
No Connection	Place Lead from Signal Gen. Near Loop	1500 KC	Broadcast	1500 KC	9	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.

NOW PLACE THE CABINET BACK AND LOOP ANTENNA INTO POSITION AT THE BACK OF THE CABINET.

No Connection	Place Lead from Signal Gen. Near Loop	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	10	Broadcast Antenna	Adjust for Maximum Output.
No Connection	Place Lead from Signal Gen. Near Loop	600 KC	Broadcast	Tune to 600 KC Generator Signal	11	Broadcast Oscillator (Series)	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.

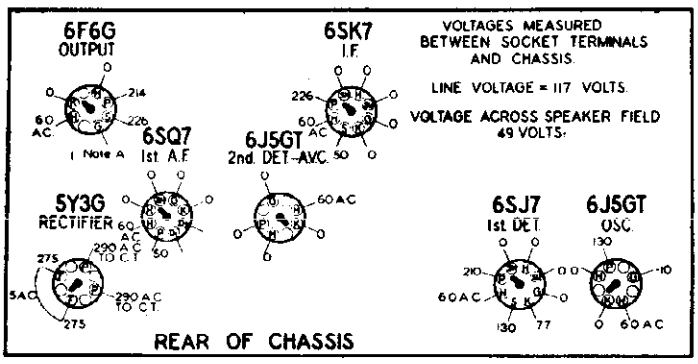
MISCELLANEOUS PARTS

Part Number	Description	List Price
116467	Base for mounting electrolytic condenser	$ .04
83552	Bolt—chassis mounting No. 10—⅞	.03
114955	Clamp—for dial cord	.01
112745	Clip—coil mounting	.01
117057	Cord—drive—supplied in 3' lengths	.15
500436	Dial background	.14
500401	Dial Scale	3.00
113402	Drum—dial cord drive	.56
500552	Knob	.10
12349	Nut—8-32 for mounting gang	Per C .45
119911	Phono—terminal strip	.16
500445	Pointer	.20
500551	Push Button	.10
81145	Retaining ring for tuning shaft	Per C .50
83624	Screw—self tapping 8 x ¼	.01
85827	Set screw—8-32 square head	.02
500411	Shaft—tuning	.30
111090	Spacer—steel mounting for gang	.02
113177	Spring—dial cord tension	.09
500051	Socket for loop antenna	.15
119781	Socket—octal	.12
114876	Socket—octal (rectifier)	.15
114878	Socket—octal with special ground	.15
117315	Tabs—station call letter	.55
111456	Washer—spring washer for tuning shaft	Per C .50

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

SOCKET VOLTAGES

Volume on Full with no Signal **Dial Tuned to 540 KC.**

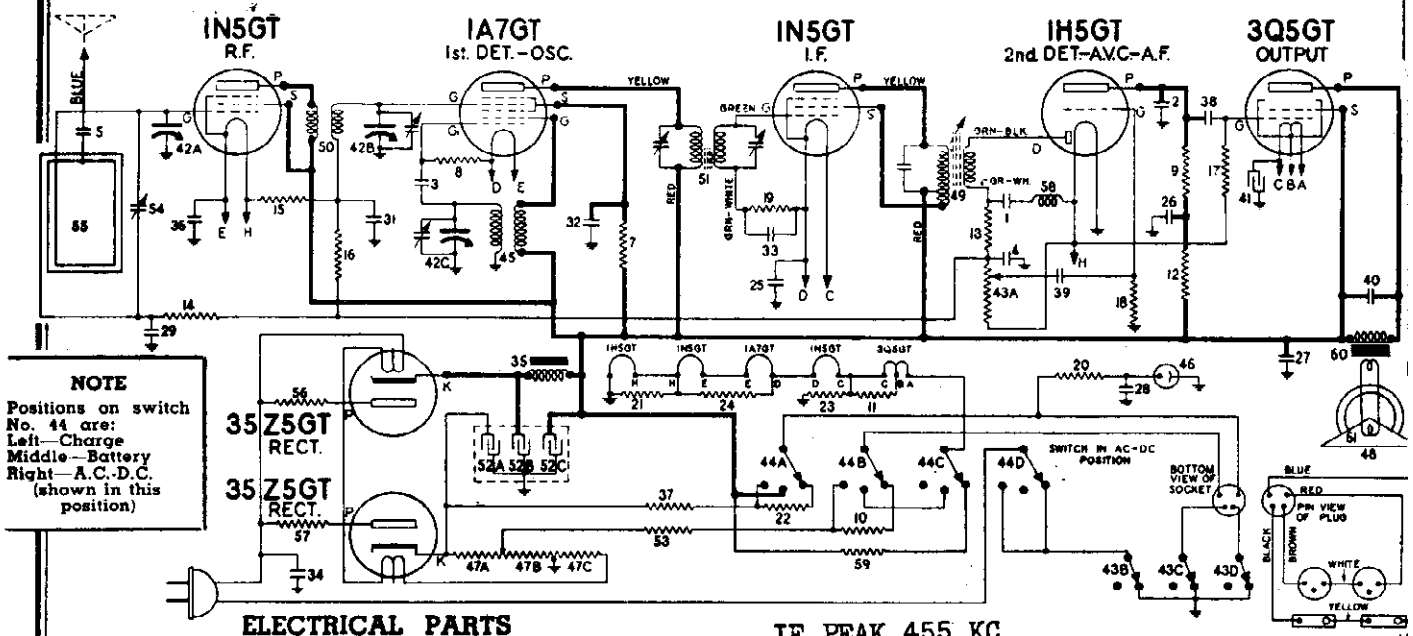


NOTE A: Grid voltage on the 6F6G output tube is —17 volts measured across resistor No. 24.

Use a high resistance voltmeter of 1000 ohms per volt.

STEWART-WARNER CORP.

MODELS 207CA to 207CZ
Chassis 207C



NOTE
Positions on switch No. 44 are:
Left—Charge
Middle—Battery
Right—A.C.-D.C.
(shown in this position)

ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1	83109	Condenser, mica 100 mmfd.	$ .20
2	83783	Condenser, mica 110 mmfd.	.20
3-4	85061	Condenser, mica 51 mmfd.	.15
5-6	85563	Condenser, mica 26 mmfd.	.15
7	110552	Resistor, carbon 47,000 ohms ¼ Watt	.12
8	110553	Resistor, carbon 220,000 ohms ¼ Watt	.12
9	110554	Resistor, carbon 1 megohm ¼ Watt	.12
10-11	110556	Resistor, carbon 330 ohms ¼ Watt	.12
12	110559	Resistor, carbon 470,000 ohms ¼ Watt	.12
13	110564	Resistor, carbon 100,000 ohms ¼ Watt	.12
14 to 17	110570	Resistor, carbon 2.2 meg. ¼ Watt	.15
18 to 20	110580	Resistor, carbon 3.3 meg. ¼ Watt	.12
21	112974	Resistor, carbon 220 ohms ¼ Watt	.15
22	112995	Resistor, carbon 15,000 ohms ¼ Watt	.12
23-24	116080	Resistor, insulated 680 ohms ¼ Watt	.15
25 to 28	116625	Condenser, .1 mfd. 600 Volt	.25
29 to 34	116819	Condenser, .05 mfd. 600 Volt	.20
35	117888	Filter choke	.85
36	118231	Condenser, .25 mfd. 150 Volt	.32
37	118816	Resistor, carbon 6800 ohms ¼ Watt	.12
38	119193	Condenser, .01 mfd. 600 Volt	.15
39	119817	Condenser, .004 mfd. 600 Volt	.15
40	119875	Condenser, .002 mfd. 600 Volt	.15
41	161273	Condenser, electrolytic 50 mfd. 25 Volt	.50
42A to 42C	500441	Condenser, variable tuning with drum	3.75
43A to 43D	500481	Volume control, 1 meg. (with switch)	1.20
44A to 44D	500507	Switch, A.C.-D.C. and Battery	.90
45	500689	Coil, oscillator	.55
46	500713	Neon glow lamp	.75
47A to 47C	500715	Resistor, load— A—1460 Ohms 10 Watt / B 155 Ohms 1 Watt / C 310 Ohms 10 Watt	1.00
48	R-500730	Speaker, P.M. dynamic (5")	4.50
49	500749	Transformer, 2nd I.F.	1.30
50	500750	Coil R.F.—Complete with shield can	1.40
51	500759	Transformer, 1st I.F.	1.20
52A to 52C	500766	Condenser, Electrolytic— A—20 Mfd. 150 Volt / B—20 Mfd. 200 Volt / C—20 Mfd. 200 Volt	$1.25
53	500833	Resistor, carbon 27 ohms ¼ Watt	.10
54	500842	Condenser, trimmer	.20
55	500854	Loop antenna	1.80
56-57	116013	Resistor, 50 ohms 1 Watt	.18
58	500888	Choke coil assembly	.40
59	500712	Resistor, carbon 1830 ohms 5 Watt	.24
60	R-500729	Transformer, output for R-500730 speaker	1.30
61	R-500731	Cone & Voice Coil for R-500730 speaker	1.30

IF PEAK 455 KC

MISCELLANEOUS PARTS

Part Number	Description	List Price
500742	Cabinet and Back (207CA)	$8.20
500746	Cable, Battery	.85
114955	Clamp, for dial cord	.01
112745	Clip, coil mounting	.01
117057	Cord, drive (supplied in 3 ft. lengths)	.15
500571	Dial scale (glass)	.50
500492	Knob, "A.C.-D.C. Battery"	.06
500494	Knob, "Tune"	.06
500493	Knob, "Volume"	.06
117769	Name Plate (Stewart-Warner)	.07
500748	Plug, 2 prong male for battery cable	.03
116398	Plug, 3 prong male for battery cable	.06
500747	Plug, 4 prong male for battery cable	.05
500527	Pointer	.06
81145	Retaining ring for tuning shaft	Per C .50
113672	Rubber grommet (on tuning shaft)	.02
500501	Shaft, tuning	.22
117716	Shield, tube	.07
500681	Socket, 4 prong	.10
116690	Socket, octal base	.12
161384	Spring, dial cord tension	.06
111456	Washer, spring washer	Per C .50

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

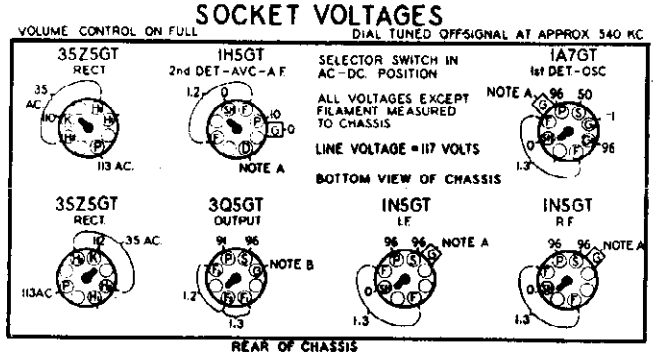
INDICATOR LAMP

This receiver is equipped with a neon lamp on the dial scale which indicates the condition of the batteries. The neon lamp is included in an oscillating (R-C) circuit which has been designed to oscillate at approximately 3 pulses per second when the batteries are in a fully charged condition. As the battery voltage decreases with use the number of pulses per second decreases.

When the battery voltage is low (approximately 72 volts) the light flickers more slowly (approximately 1 a second). The set should not be operated from battery power after this point is reached. The batteries should be charged for at least twice the time they were used—as soon as possible after they have been run down. (See "Charging Batteries" on other side).

The indicator lamp shows the condition of the batteries only when the Selector Switch is in the "Battery" position, as the voltage is much higher during charging or AC-DC operation.

SOCKET VOLTAGES



NOTE A: Voltages on these elements cannot be measured with a standard voltmeter because of high series resistance.

NOTE B: Bias on the grid of the 3Q5GT output tube is obtained across the filaments of the 1N5GT R.F., 1A7GT 1st Det.—Osc., and the 1N5GT I.F. in series.

MODELS 207CA to 207CZ
Chassis 207C

STEWART-WARNER CORP.

1. Connect the output meter across the voice coil of the speaker or between the plate of the 3Q5GT output tube and chassis through a .1 mfd. condenser.
2. Connect the ground lead of the signal generator to chassis through a .25 mfd. condenser.
3. Set the volume control in the maximum position and use a weak signal from the generator.
4. Set Selector Switch in AC-DC position.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
200 MMFD. Condenser	Lug on Middle Section of Gang Condenser	455 KC.	Any Point Where It Does Not Affect Signal	1	2nd I.F.	Adjust the screws on the top of each I.F. can for maximum output. Then repeat adjustment.
				2-3	1st I.F.	
200 MMFD. Condenser	Blue Wire on Cabinet Back	1500 KC.	1500 KC	4 (On front section of gang)	Broadcast Oscillator (Shunt)	Adjust trimmer for maximum output.
200 MMFD. Condenser	Blue Wire on Cabinet Back	1500 KC.	Tune To 1500 KC Generator Signal	5 (Middle section of gang)	Broadcast Det.	Adjust for maximum output. Repeat adjustment.
				6 (On cabinet back)	Broadcast Ant.	

Now disconnect the output meter and signal generator leads and replace the chassis and batteries in the cabinet being sure the loop is connected. Bring the antenna lead of the signal generator near the loop until the 1500 KC. signal is heard weakly and re-adjust trimmer No. 6 for maximum output by ear.

CHARGING BATTERIES

A separate charging system consisting of a 35Z5GT rectifier and a suitable resistor voltage dividing network and filter is incorporated in this receiver. The circuit is arranged to provide a very light charging current when the receiver is operated from either AC or DC. This is just enough to maintain the batteries but will not charge up used batteries. A separate charging position is provided for rapid recharging of the batteries. The resistance voltage divider is designed to give a charging rate of approximately one third the discharge rate, this having been found to give best results. It is recommended that the batteries be left on charge at least twice the time they were used. As the batteries age it is necessary to charge for a longer period. For longest battery life the batteries should be placed on charge immediately after they have been used. Batteries deteriorate from standing idle so if the set is not used on AC or DC occasionally, the batteries should be charged for a short time every few weeks even though they have not been used. The batteries are automatically maintained if the set is used on house current at regular intervals.

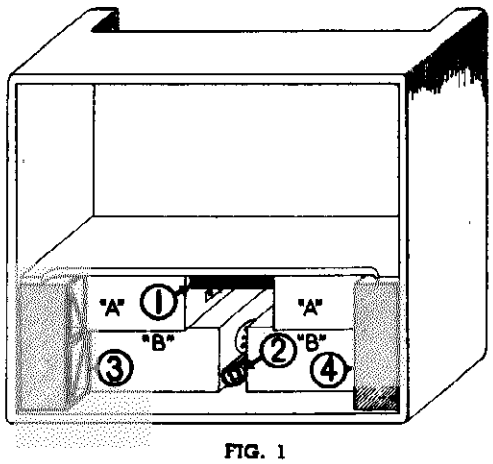


FIG. 1

4½ Volt "A" Battery	45 Volt "B" Battery
Eveready No. 746 Burgess No. G3 Ray-O-Vac No. P83A	Eveready No. 482 Burgess No. M30 Ray-O-Vac No. P7830

REPLACING THE BATTERIES

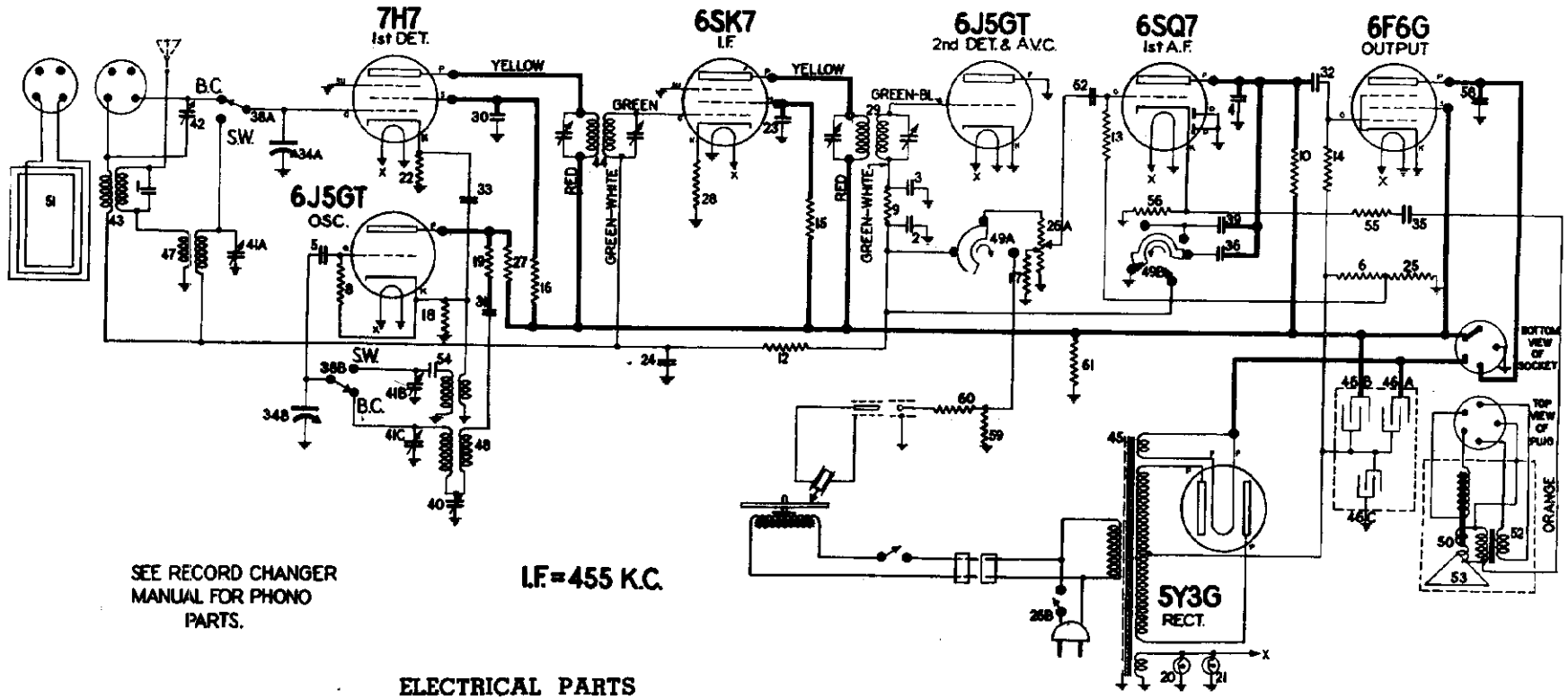
When the Selector Switch is turned to the Battery position, the flickering red neon light indicates the condition of the batteries. (See section INDICATOR LAMP on front page). As the batteries age the dropping off in voltage after charging becomes more rapid. The batteries should be replaced when the operating period is reduced to two hours, after the batteries have been fully charged. For satisfactory results all the batteries MUST be replaced at one time.

INSTALLING THE BATTERIES

Plug the two prong plugs on the battery cable into the sockets on the tops of the "A" batteries and the three prong plugs into the sockets on the tops of the "B" batteries.

Model 207CA. Place the two "B" batteries on the bottom and the two "A" batteries on the top, in the battery compartment at the bottom of the cabinet with the battery plug sockets facing each other at the center. Insert the long corrugated board piece (1) between the "A" batteries, and the corrugated board roll (2) between the "B" batteries. Insert pieces (3) and (4) at each end as shown in Figure 1. Plug the four prong plug on the battery cable into the socket at the rear of the chassis.

CAUTION: DO NOT LEAVE BATTERIES IN CABINET AFTER THEY ARE DISCHARGED AS THEIR SWELLING MAY CAUSE DAMAGE.



SEE RECORD CHANGER MANUAL FOR PHONO PARTS.

I.F. = 455 K.C.

ELECTRICAL PARTS

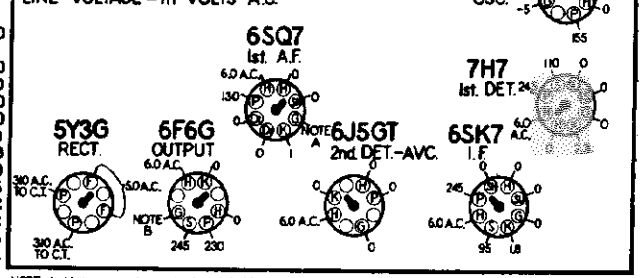
Diagram Number	Part Number	Description	List Price
1 to 3	83783	Condenser—mica 110 mmfd.	$0.20
4	83539	Condenser—mica 260 mmfd.	.20
5	85061	Condenser—mica 51 mmfd.	.15
6	89762	Resistor—220 ohms, wire wound, 1 watt	.16
8-9	110552	Resistor—carbon 47,000 ohms ¼ watt	.12
10-11	110553	Resistor—carbon 220,000 ohms ¼ watt	.12
12-13	110554	Resistor—carbon 1 megohm ¼ watt	.12
14	110559	Resistor—carbon 470,000 ohms ¼ watt	.12
15-16	110564	Resistor—carbon 100,000 ohms ¼ watt	.12
17	110569	Resistor—carbon 10,000 ohms ¼ watt	.12
18-19	110590	Resistor—carbon 180 ohms ¼ watt	.12
20-21	110629	Dial Light Bulb—6.3 volt (Mazda No. 44)	.15
22	116078	Resistor—560 ohms ¼ watt	.12
23-24	116819	Condenser—.05 mfd. 600 volt	.20
25	117395	Resistor—20 ohm 1 watt	.16
26A-26B	118669	Volume Control—1 meg. (with switch)	1.40
27	118805	Resistor—carbon 10,000 ohm 1 watt	.12
28	118827	Resistor—carbon 270 ohm ¼ watt	.10
29	119024	Transformer, 2nd I.F.	1.15
30 to 33	119193	Condenser—.01 mfd. 600 volt	.15
34A-34B	119291	Condenser—variable tuning	2.75
35	116625	Condenser—.1 mfd. 600 volt	.25
36	119416	Condenser—.008 mfd. 600 volt	.15
37	160430	Condenser—.001 mfd. 600 volt	.15
38A-38B	119859	Switch—band	.65
39	119875	Condenser—.002 mfd. 600 volt	.15
40	119934	Condenser—padder	$0.36
41A to 41C	160415	Condenser—trimmer, 3 section	.48
42	160449	Condenser—trimmer (Loop)	.18
43	500255	Coil—B.C. antenna loading	1.05
44	500801	Transformer—1st I.F.	1.20
45	501044	Transformer—power, 60 cycle	6.50
46A to 46C	501060	Condenser—Electrolytic— (A—20 Mfd. 400 V. / B—15 Mfd. 400 V. / C—20 Mfd. 25 V.)	1.70
47	501159	Coil—short wave antenna	.40
48	501160	Coil—oscillator (B.C. & S.W.)	1.00
49A-49B	501180	Switch—tone	1.20
50	M-501225	Speaker—Dynamic (12")	9.50
51	501226	Loop Antenna Complete	1.50
52	M-501280	Transformer—output for M-501225 Spkr.	2.00
53	M-501281	Cone & Voice Coil for M-501225 Spkr.	2.00
54	88587	Condenser—mica .0042 mfd.	.35
55	118816	Resistor—6800 ohms ¼ watt	.12
56	116078	Resistor—560 ohms ¼ watt	.12
58	119875	Condenser—.002 mfd. 600 volt	.15
59	110584	Resistor—330,000 ohms ¼ watt	.12
60	112962	Resistor—150,000 ohms—¼ watt	.12
61	116076	Resistor—33,000 ohms 2 watt	.30
62	119193	Condenser—.01 mfd. 600 volt	.15
	501366	Crystal Cartridge	4.80

SOCKET VOLTAGES

NO SIGNAL INPUT—VOLUME CONTROL ON FULL DIAL SET TO APPROXIMATELY 540 KC.

BOTTOM VIEW

ALL D.C. VOLTAGES MEASURED TO CHASSIS
VOLTAGE ACROSS SPEAKER FIELD = 60 VOLTS
LINE VOLTAGE = 117 VOLTS A.C.



NOTE A: Voltage on the grid of the 6SQ7 1st A.F. is −1 volt measured across resistor No. 25.

NOTE B: Voltage on the grid of the 6F6G Output Tube is −16 volts measured across Resistors No. 25 and 6.

USE A VOLTMETER OF 1000 OHMS PER VOLT.

MODEL 207DK,
Chassis 207D

STEWART-WARNER CORP.

ALIGNMENT EQUIPMENT & PROCEDURE

1. Connect the output meter across the voice coil or from plate of the 6F6G output tube to chassis through a .1 mfd. condenser. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the receiver chassis.
3. Turn the RADIO-PHONO TONE SWITCH to the "Radio-Speech" position.
4. Turn the volume control to the maximum position and keep it in this position throughout the alignment procedure.
5. Check the pointer to see that it is correctly set to low freq. end of dial scale with gang in full mesh.
6. The loop must be connected as indicated in circuit diagram at all times.

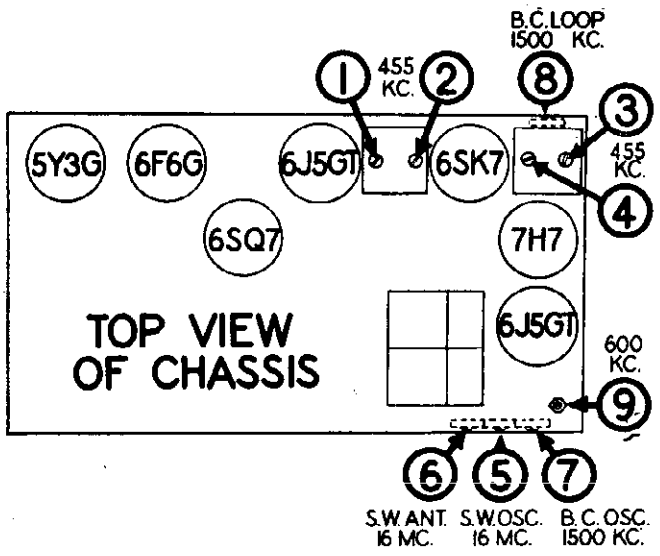
Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD. Condenser	Lug on front Section of Gang Cond.	455 KC	American	Any Point Where It Does Not Affect the Signal	1-2	2nd I.F.	Adjust for Maximum Output. Then repeat Adjustment.
					3-4	1st I.F.	
400 OHM Carbon Resistor	Antenna Terminal (Blue Wire)	16 MC	Foreign	16 MC	5	Foreign Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 15.1 MC. If Image does not appear, Realign at 16 MC, with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	Antenna Terminal (Blue Wire)	16 MC	Foreign	Tune to 16 MC Generator Signal	6	Foreign Antenna	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.
200 MMFD. Mica Condenser	Antenna Terminal (Blue Wire)	1500 KC	American	1500 KC	7	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.

Now replace the chassis and loop antenna in the cabinet before proceeding further.

200 MMFD. Mica Condenser	Antenna Terminal (Blue Wire)	1500 KC	American	Tune to 1500 KC Generator Signal	8	Broadcast Antenna	Adjust for Maximum Output.
200 MMFD. Mica Condenser	Antenna Terminal (Blue Wire)	600 KC	American	Tune to 600 KC Generator Signal	9	Broadcast Oscillator (Series)	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.

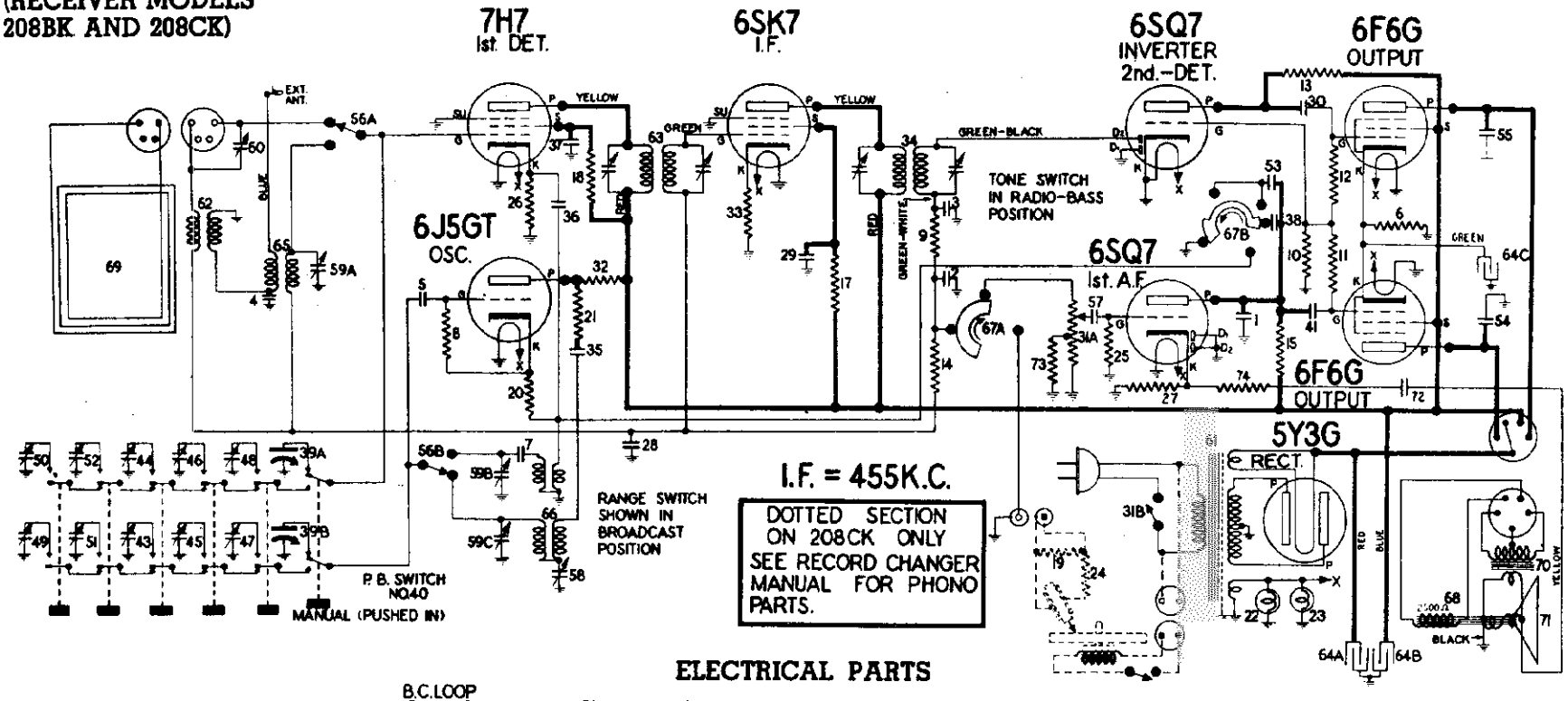
MISCELLANEOUS PARTS

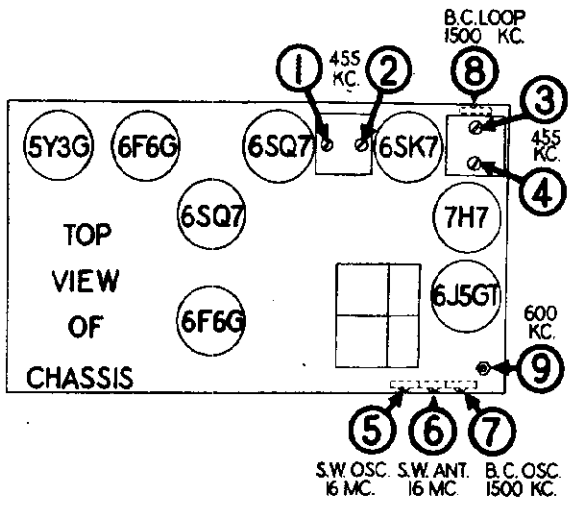
Part Number	Description	List Price
160395	Cable—motor	$0.48
117493	Cable—pickup	.40
114955	Clamp—for dial cord	.01
112745	Clip—coil mounting	.01
117057	Cord—drive (order in 6 foot lengths)	.30
501366	Crystal Cartridge	4.80
501200	Dial scale	.50
113402	Drum—dial cord drive	.56
160182	Escutcheon—dial with glass	2.10
88348	Eyelet—for pointer cord Per Dz.	.05
160219	Knob	.06
12349	Nut—8-32 for mounting Per C	.45
119451	Pointer	.06
81145	Retaining ring for tuning shaft Per C	.50
113463	Rubber Bushing—chassis mounting	.03
85040	Screw—No. 6 Hex. Hd. Per C	.35
112874	Screw—No. 10 x 1⅛ chassis mounting	.01
114914	Screw—special head for mtg. escutcheon Per Dz.	.15
118606	Shaft—tuning	.18
117704	Socket—5 prong (for Spkr.)	.13
160294	Socket for 7H7, 8 prong	.12
119791	Socket—octal	.12
114878	Socket—octal with special ground	.15
114876	Socket—octal (rectifier)	.15
500051	Socket—for loop antenna	.15
160039	Socket—phono	.08
111090	Spacer—steel, mtg. for gang	.02
113177	Spring—dial cord tension	.09
110829	Washer—flat steel, for mtg. chassis	.01
111456	Washer—spring washer for tuning shaft Per C	.50



NOTE:—
The possession of this price list by any person is not to be construed as an offer to sell to him, nor anyone else, the goods listed herein at prices stated.

(RECEIVER MODELS 208BK AND 208CK)





ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1 to 4	83783	Condenser—mica 110 mmfd.	$0.20
5	85061	Condenser—mica 51 mmfd.	.15
6	88462	Resistor—wire wound 270 ohms 1 watt	.15
7	88587	Condenser—mica .0042 mfd.	.35
8-9	110552	Resistor—carbon 47,000 ohms ¼ watt	.12
10 to 13	110553	Resistor—carbon 220,000 ohms ¼ watt	.12
14	110554	Resistor—carbon 1 meg. ¼ watt	.12
15	110559	Resistor—carbon 470,000 ohms ¼ watt	.12
17-18	110564	Resistor—carbon 100,000 Ohms ¼ watt	.12
	110565	Resistor—carbon 22,000 ohms ¼ watt	.12
19	110591	Resistor—carbon 680,000 ohms ¼ watt	.12
20-21	110590	Resistor—carbon 180 ohms ¼ watt	.12
22-23	110628	Dial Light Bulb—6.3 volt (Mazda No. 44)	.15
24	112962	Resistor—carbon 150,000 ohms ¼ watt	.12
25	112975	Resistor—carbon 10 meg. ¼ watt	.12
26-27	116078	Resistor—560 ohms ¼ watt	.12
	116625	Condenser—.1 mfd. 600 volt	.25
28 to 30	116819	Condenser—.05 mfd. 600 volt	.20
31A-31B	118669	Volume Control—1 meg. (with switch)	1.40
32	118805	Resistor—carbon 10,000 ohm 1 watt	.12
33	118827	Resistor—carbon 270 ohms ¼ watt	.10
34	119024	Transformer—2nd I.F.	1.15
35 to 38	119193	Condenser—.01 mfd. 600 vplt	.15
39A-39B	119291	Condenser—variable tuning	2.75
40	119346	Switch—push button	2.25
41	119414	Condenser—.02 mfd. 600 volt	.15
43 to 46	119663	Condenser—push button trimmer (Med. Freq.)	.24
47-48	119664	Condenser—push button trimmer (High Freq.)	$0.24
49 to 52	119753	Condenser—push button trimmer (Low Freq.)	.24
53 to 55	119817	Condenser—.004 mfd. 600 volt	.15
56A-56B	119859	Switch—band	.65
57	119875	Condenser—.002 mfd. 600 volt	.15
58	119934	Condenser—padder	.36
59A to 59C	160415	Condenser—trimmer—3 section	.48
60	160449	Condenser—trimmer for loop	.18
61	500116	Transformer—power (60 cycles)	6.50
62	500255	Coil—B. C. antenna loading	1.05
63	500801	Transformer—1st I.F.	1.20
64A to 64C	501060	Condenser electrolytic A—20 mfd. 400 volt; B—15 mfd. 400 volt; C—20 mfd. 25 volt	1.70
65	501159	Coil—short wave antenna	.40
66	501160	Coil—oscillator (B.C. & S.W.)	1.00
67A-67B	501180	Switch—tone	1.20
68	M-501245	Speaker—dynamic 12"	12.50
69	501293	Loop Antenna	1.85
70	M-501304	Transformer—output for M-501245 Spkr.	1.95
71	M-501305	Cone & Voice Coil for M-501245 Spkr.	1.95
72	116625	Condenser—.1 mfd.	.25
73	110565	Resistor—carbon 22,000 ohms ¼ watt	.12
74	110569	Resistor—carbon 10,000 ohms ¼ watt	.12

MODELS 208BK, Chas. 208B; 208CK, Chassis 208C

STEWART-WARNER CORP.

ALIGNMENT EQUIPMENT & PROCEDURE

1. Connect the output meter across the voice coil or from the plate of one 6F6G output tube to chassis through a .1 mfd. condenser.
2. Connect the ground lead of the signal generator to the receiver chassis.
3. Check the pointer to see that it is correctly set to the low freq. end of the dial scale with gang in full mesh.
4. Push in the "manual" button and keep it pushed in.
5. Turn the volume control to the maximum volume position, and the tone control to the "Radio-Speech" position.
6. FOLLOW THE ORDER OF ALIGNMENT INDICATED BELOW.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD Condenser	Lug on Rear Section of Gang Cond.	455 KC	Broadcast	Any Point Where It Does Not Affect the Signal	1-2	2nd I.F.	Adjust for Maximum Output. Then repeat Adjustment.
					3-4	1st I.F.	
400 OHM Carbon Resistor	Blue Lead from Chassis	16 MC	Foreign	16 MC	5	Foreign Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obained by Tuning in Image at Approx. 15.1 MC. If Image does not appear, Realign at 16 MC, with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	Blue Lead from Chassis	16 MC	Foreign	Tune to 16 MC Generator Signal	6	Foreign Antenna	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.
No Connection	Place Lead from Signal Gen. Near Loop	1500 KC	Broadcast	1500 KC	7	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.

NOW PLACE THE CHASSIS AND LOOP ANTENNA INTO POSITION IN THE CABINET.

No Connection	Place Lead from Signal Gen. Near Loop	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	8	Broadcast Antenna	Adjust for Maximum Output.
No Connection	Place Lead from Signal Gen. Near Loop	600 KC	Broadcast	Tune to 600 KC Generator Signal	9	Broadcast Oscillator (Series)	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.

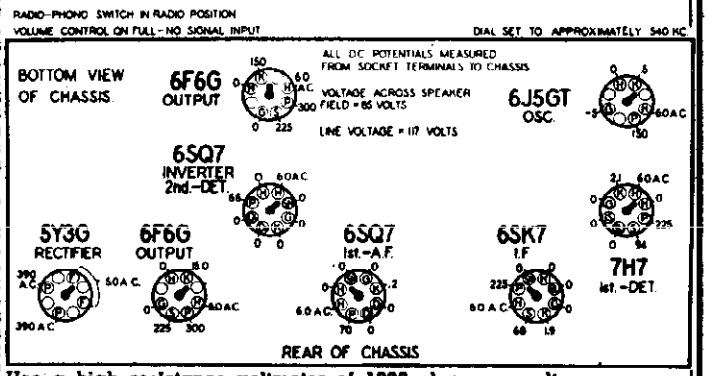
MISCELLANEOUS PARTS

Part Number	Description	List Price
501182	Cable—motor (with receptacle)	$0.45
117493	Cable—pickup	.40
114355	Clamp—for dial cord	.01
112745	Clip—coil mounting	.01
117057	Cord—drive (specify 6 ft. lengths)	.30
501199	Dial Scale	.40
113402	Drum—dial cord drive	.56
160182	Escutcheon—dial with glass	2.10
160634	Escutcheon—push button (complete)	1.20
88348	Eyelet—for pointer cord	Per Dz. .05
160219	Knob	.06
12349	Nut—8-32 for mounting	Per C .45
116952	Pin for push buttons	.02
119451	Pointer	.06
160185	Push button	.06
81145	Retaining ring for tuning shaft	Per C .50
113463	Rubber Bushing—chassis mounting	.03
118606	Shaft—tuning	.18
112874	Screw—No. 10 x 1⅛ chassis mounting	.01
114314	Screw—special head for mounting escutcheon	Per Dz. .15
85827	Set Screw—8-32 Sq. Hd. for drive drum	.02
119791	Socket—octal	.12
114378	Socket—octal, with special ground	.15
114876	Socket octal (rectifier)	.15
160294	Socket for 7H7 8 prong	.12
500051	Socket for loop antenna	.15
160039	Socket—phono	.08
117704	Socket—for speaker 5 prong	.13
111030	Spacer—steel mounting for gang	.02
113177	Spring—dial cord tension	.09
117458	Spring—for push button	.05
110829	Washer—flat steel for mounting chassis	.01
111456	Washer—spring washer for tuning shaft	Per C .50

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

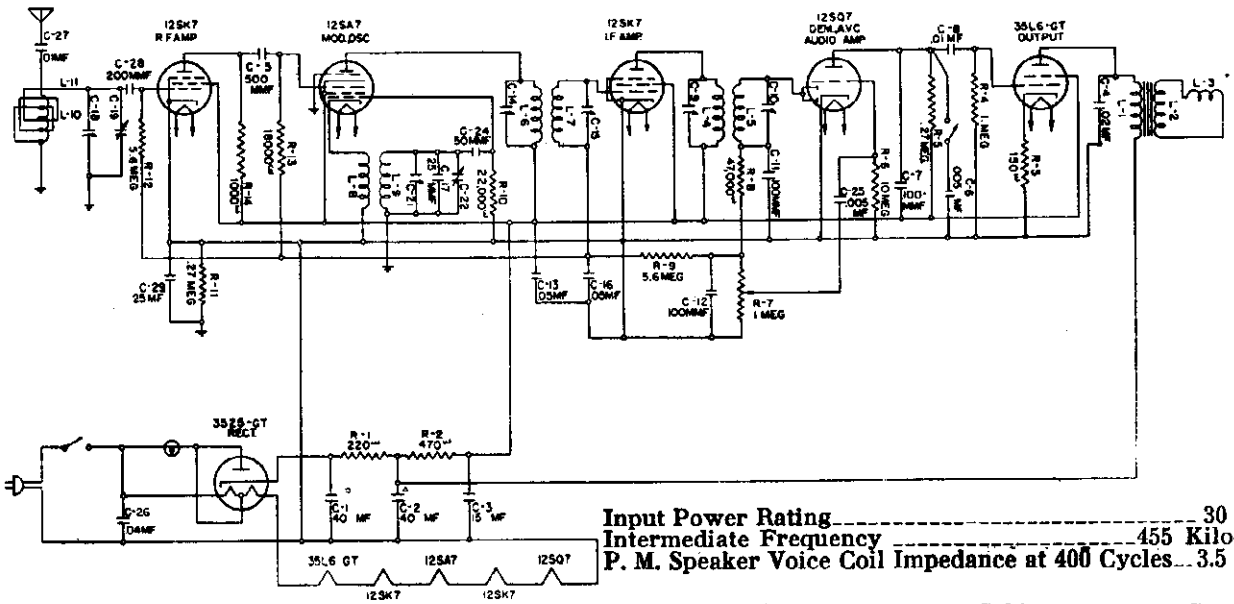
NOTE—
The possession of this price list by any person is not to be construed as an offer to sell to him, nor anyone else, the goods listed herein at prices stated.

SOCKET VOLTAGES



Use a high resistance voltmeter of 1000 ohms per volt.

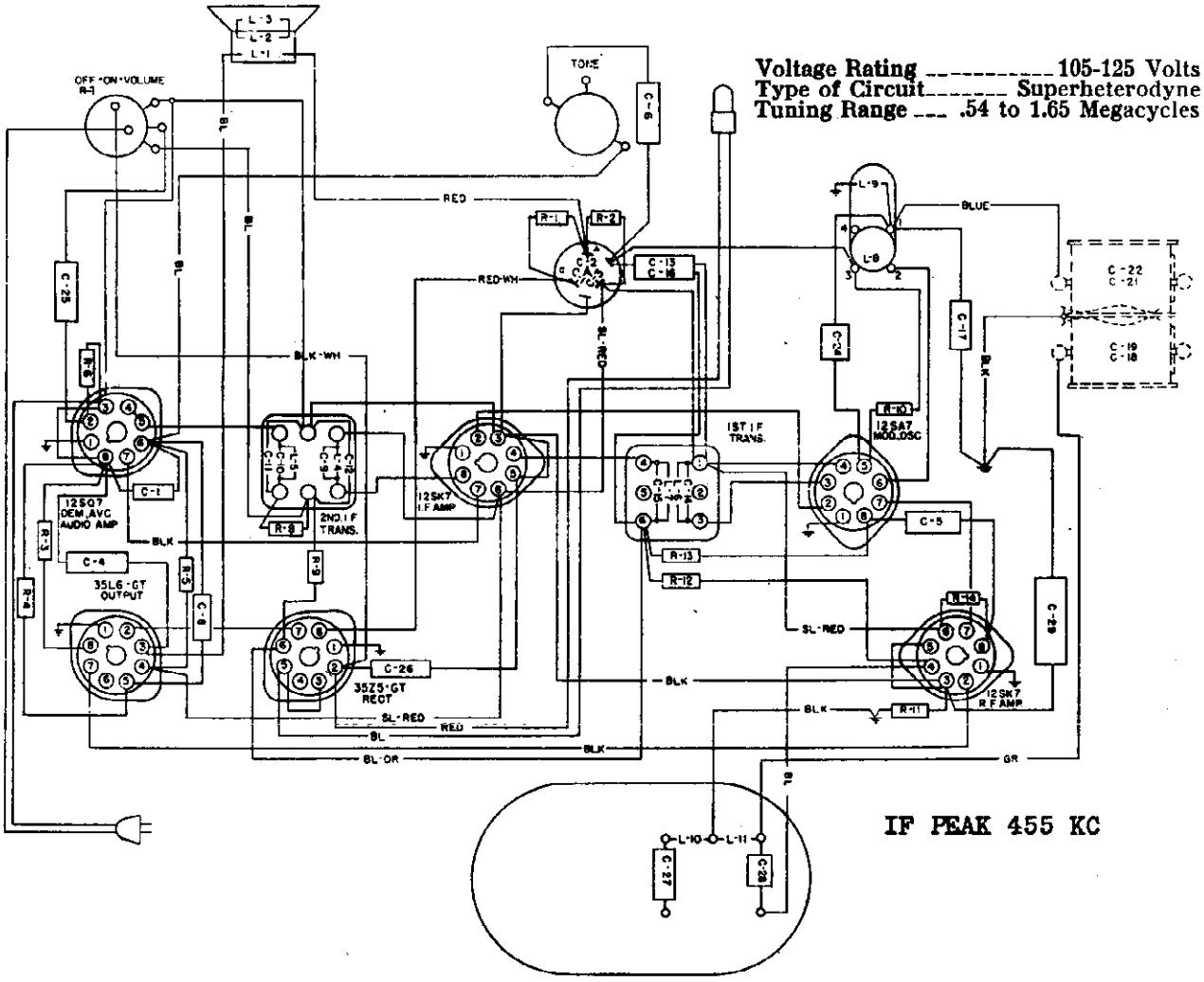
STROMBERG-CARLSON TEL. MFG. CO.



Input Power Rating ..... 30 Watts
Intermediate Frequency ..... 455 Kilocycles
P. M. Speaker Voice Coil Impedance at 400 Cycles ... 3.5 Ohms

Model	Input Power Frequency	Chassis	Cabinet	Speaker
500-H Blue	25-60 Cycles AC (or DC)	31674	31806	31696
500-H Brown	25-60 Cycles AC (or DC)	31985	32812	31976
500-H Silver	25-60 Cycles AC (or DC)	31674	32813	31976
500-H Ivory	25-60 Cycles AC (or DC)	31985	32814	31976
500-J	25-60 Cycles AC (or DC)	31985	31981	31696
500-S	25-60 Cycles AC (or DC)	31985	32026	31696

Voltage Rating ..... 105-125 Volts
Type of Circuit ..... Superheterodyne
Tuning Range ..... .54 to 1.65 Megacycles

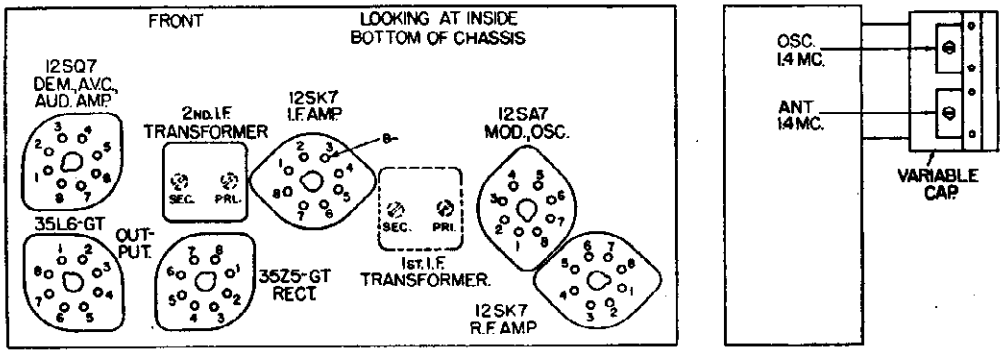


IF PEAK 455 KC

STROMBERG-CARLSON TEL. MFG. CO.

ADJUSTING DIAL LAMP

To adjust the dial lamp simply push the pilot lamp and socket forward until maximum illumination of the dial is obtained.



Location Chart

ALIGNING INFORMATION

Never realign unless absolutely necessary.

Use a good modulated signal generator (test oscillator) with variable output voltage and a sensitive output meter across the voice coil of the speaker.

Always align using the smallest possible input from the signal generator. A strong signal makes adjustments inaccurate.

Always have the volue control "full on".

Important: Be sure the metal plate is fastened in place on the bottom of the chassis before alignment is attempted.

ALIGNING PROCEDURE (follow this order exactly).

I. Dial Pointer Adjustment.
With the plates of the gang tuning capacitor fully engaged set the dial pointer in a vertical position directly on the calibration marks located at the top and bottom of the dial scale.

II. Intermediate Frequency Adjustments.

1. Tune the set to the extreme low frequency position. (Variable capacitor plates all the way in).
2. Connect the ground terminal of the signal generator to the chassis base.
3. Introduce a modulated signal of 455 kilocycles using a .01 M. F. capacitor in series with the lead from the signal generator to the oscillator aligning capacitor located on the front section of the variable capacitor.
4. Adjust the I. F. aligners for maximum output in the following order:
   A. Secondary of second I. F. Transformer.
   B. Primary of second I. F. Transformer.
   C. Secondary of first I. F. Transformer.
   D. Primary of first I. F. Transformer.

III. Radio Frequency Adjustments.

1. Replace the .01 M. F. capacitor in series with the output lead of the signal generator with a 200 mmf. capacitor and connect them to the antenna terminal located on the back of the loop assembly.
2. Set the signal generator's frequency and the receiver's tuning dial to 1.4 megacycles.
3. Adjust the oscillator and antenna aligning capacitors for maximum signal.
4. Set both the signal generator's frequency and the receiver's tuning dial to 0.6 megacycles and check calibration.

   NOTE: If the calibration is too far off at 0.6 megacycles, operations 2 and 3 may be repeated until the best results are obtained.

		TERMINALS OF SOCKETS							
Tube	*Circuit*	1	2	3	4	5	6	7	8
12SK7	R. F. Amp.	—	*52*	0	0	0	+91	*57*	+86
12SA7	Mod. and Osc.	—	*57*	+86	+91	+7.5*	0	*24.8*	0
12SK7	I. F. Amp.	0	*24.8*	0	0	0	+91	*12.5*	+86
12SQ7	Demod., AVC and Audio Amp.	0	0	0	0	0	+23	*12.5*	0
35L6GT	Output	0	*86*	+98	+91	0	—	*52*	+4.8
35Z5GT	Rectifier	—	*120*	*114*	—	*114*	—	*86*	+115

***Read on 100 V. scale of meter having a resistance of 1000 ohms per volt.**

Take all D. C. voltage readings on the 500 volt scale except where an asterisk appears.

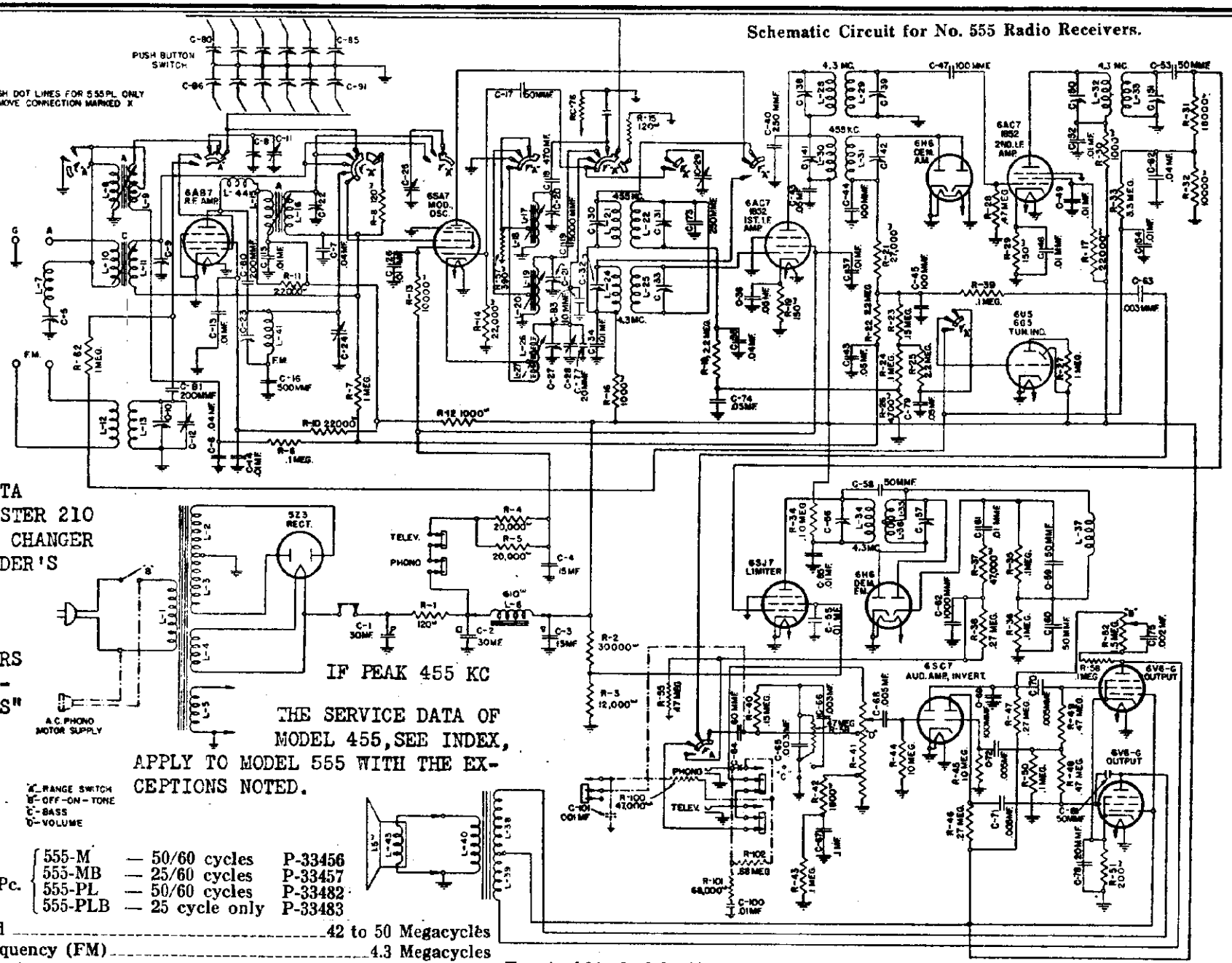
Take all readings with chassis operating and tuned to 1000 Kc.—no signal.

Use a line voltage of 120 volts or make allowance for the variation.

Read from indicated socket terminals to terminal No. 3 of the 12SK7 I. F. Amp. Socket (B—).

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 A. C. voltages shown.

Schematic Circuit for No. 555 Radio Receivers.



FOR DATA ON WEBSTER 210 RECORD CHANGER SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS"

IF PEAK 455 KC

THE SERVICE DATA OF MODEL 455, SEE INDEX, APPLY TO MODEL 555 WITH THE EXCEPTIONS NOTED.

K—RANGE SWITCH
S—OFF-ON-TONE
C—BASS
V—VOLUME

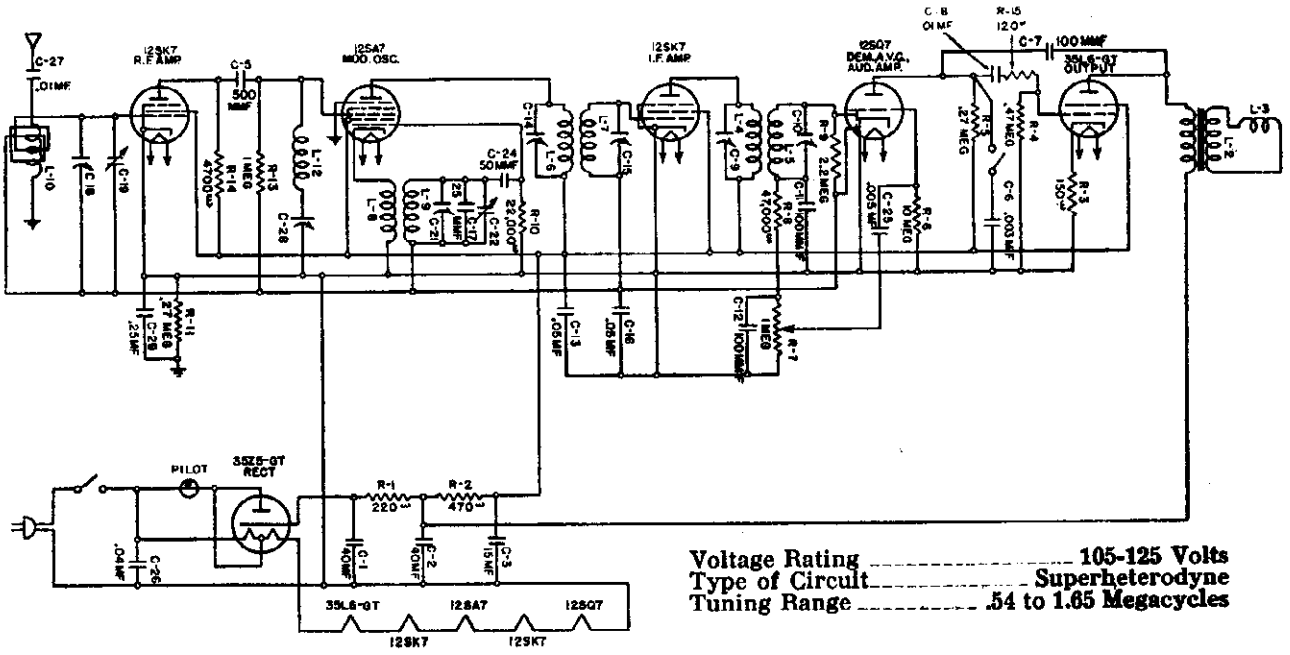
Chassis Pc.	555-M	— 50/60 cycles	P-33456
	555-MB	— 25/60 cycles	P-33457
	555-PL	— 50/60 cycles	P-33482
	555-PLB	— 25 cycle only	P-33483

FM Band ..... 42 to 50 Megacycles
I. F. Frequency (FM) ..... 4.3 Megacycles
R. F. Aligning points for FM Band ..... 48 and 43 Megacycles
One 6AB7 R. F. Tube replaces one 6SK7 R. F. Tube

Terminal No. 8 of the 6SA7 Mod. and Osc. Tube should read "0"
Terminal No. 8 of the 6AC7 1st I. F. Amp. Tube (FM and AM) should read +240 volts
Terminal No. 8 of the 6SJ7 Limiter Tube (FM) should read +100 volts

MODEL 600H

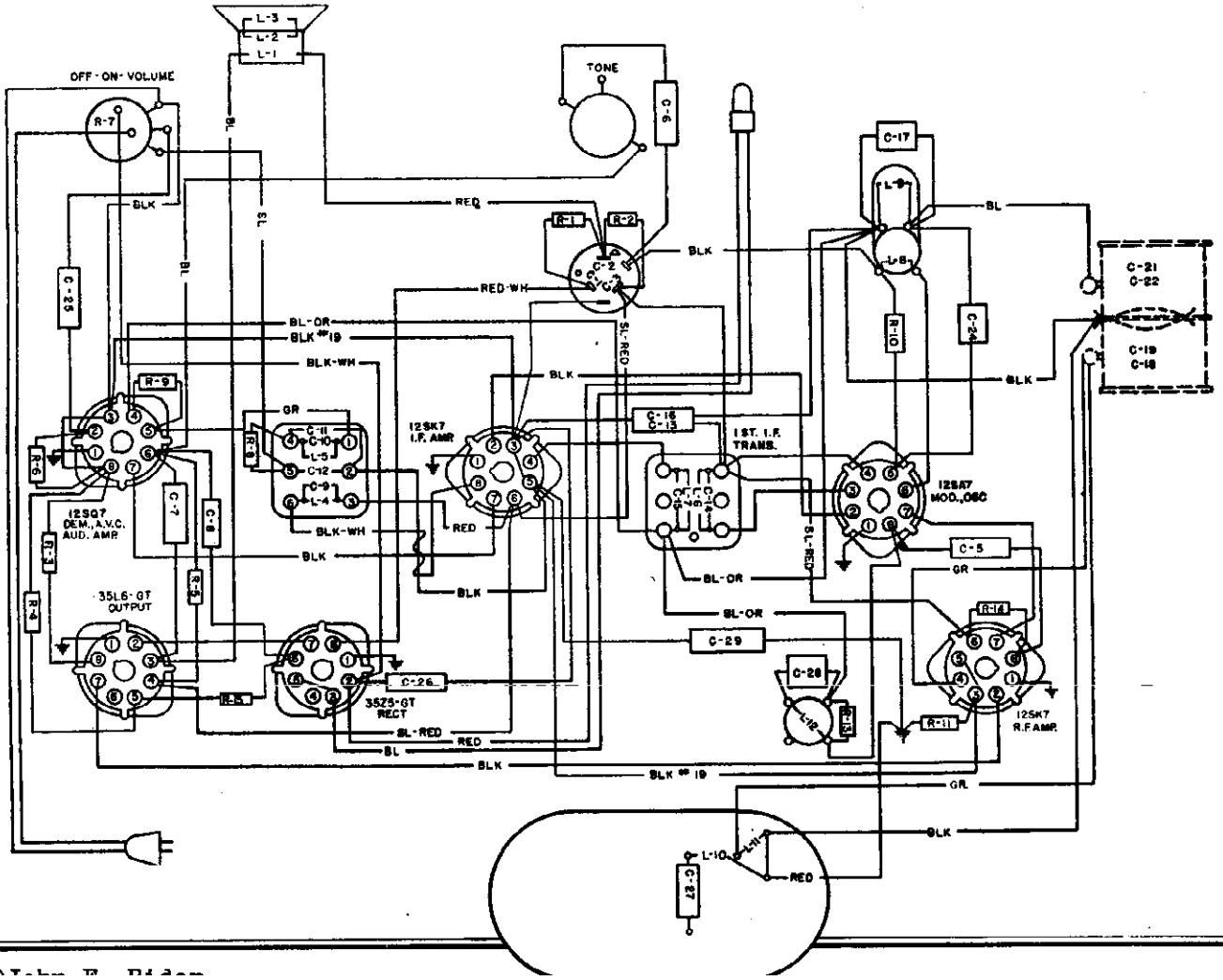
STROMBERG-CARLSON TEL. MFG. CO.



Voltage Rating ..... 105-125 Volts
Type of Circuit ..... Superheterodyne
Tuning Range ..... .54 to 1.65 Megacycles

600-H Ivory	25-60 Cycles AC (or DC)	33196	32814	31696
600-H Brown	25-60 Cycles AC (or DC)	33196	32812	31696

Input Power Rating ..... 30 Watts
Intermediate Frequency ..... 455 Kilocycles
P. M. Speaker Voice Coil Impedance at 400 Cycles ..... Approximately 3.5 Ohms



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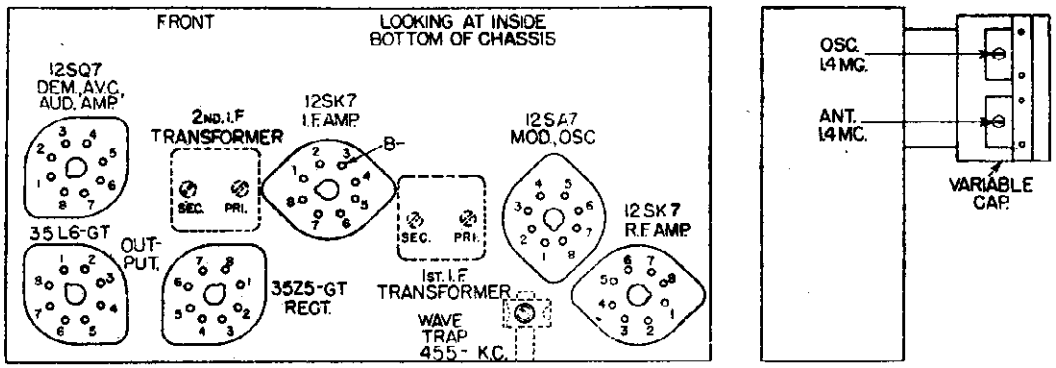
MODEL 600H
MODEL 900H, 900J



Location Chart

ALIGNING INFORMATION

Never realign unless absolutely necessary.

Use a good modulated signal generator (test oscillator) with variable output voltage and a sensitive output meter across the voice coil of the speaker.

Always align using the smallest possible input from the signal generator. A strong signal makes adjustments inaccurate.

Always have the volume control "full on".

Important: Be sure the metal plate is fastened in place on the bottom of the chassis before alignment is attempted.

ALIGNING PROCEDURE **(follow this order exactly).**

I. **Dial Pointer Adjustment.**

With the plates of the gang tuning capacitor fully engaged set the dial pointer in a horizontal position directly on the top of the calibration mark located at 550 Kc. on the dial scale.

II. **Intermediate Frequency Adjustments.**

1. Tune the set to the extreme low frequency position. (Variable capacitor plates all the way in.)
2. Connect the ground terminal of the signal generator to the chassis base.
3. Introduce a modulated signal of 455 kilocycles using a .01 M. F. capacitor in series with the lead from the signal generator to the oscillator aligning capacitor located on the front section of the variable capacitor.
4. Adjust the I. F. aligners for maximum output in the following order:
   - A. Secondary of second I. F. Transformer.
   - B. Primary of second I. F. Transformer.
   - C. Secondary of first I. F. Transformer.
   - D. Primary of first I. F. Transformer.

III. **Radio Frequency Adjustments.**

1. Replace the .01 M. F. capacitor in series with the output lead of the signal generator with a 200 mmf. capacitor and connect them to the antenna terminal located on the back of the loop assembly.
2. Set the signal generator's frequency and the receiver's tuning dial to 1.4 megacycles.
3. Adjust the oscillator and antenna aligning capacitors for maximum signal.
4. Set both the signal generator's frequency and the receiver's tuning dial to 0.6 megacycles and check calibration.

   NOTE: If the calibration is too far off at 0.6 megacycles, operations 2 and 3 may be repeated until the best results are obtained.

Wave Trap Adjustment.

(Leave the receiver connected in the same manner as when making the Radio Frequency Adjustments.)

1. Tune set to 1000 K. C.
2. Set the signal generator frequency to 455 K. C. and introduce a fairly strong Modulated signal to the receiver.
3. Adjust the wave trap aligner for minimum signal.

		TERMINALS OF SOCKETS							
Tube	*Circuit*	1	2	3	4	5	6	7	8
12SK7	R. F. Amp.	—	*52*	0	0	0	+91	*37*	+86
12SA7	Mod. and Osc.	—	*37*	+86	+91	+7.5*	0	*24.8*	0
12SK7	I. F. Amp.	0	*24.8*	0	0	0	+91	*12.5*	+86
12SQ7	Demod., AVC and Audio Amp.	0	0	0	0	0	+23	*12.5*	0
35L6GT	Output	0	*86*	+98	+91	0	—	*52*	+4.8
35Z5GT	Rectifier	—	*120*	*114*	—	*114*	—	*86*	+115

***Read on 100 V. scale of meter having a resistance of 1000 ohms per volt.**

Take all D. C. voltage readings on the 500 volt scale except where an asterisk appears.

Take all readings with chassis operating and tuned to 1000 Kc.—no signal.

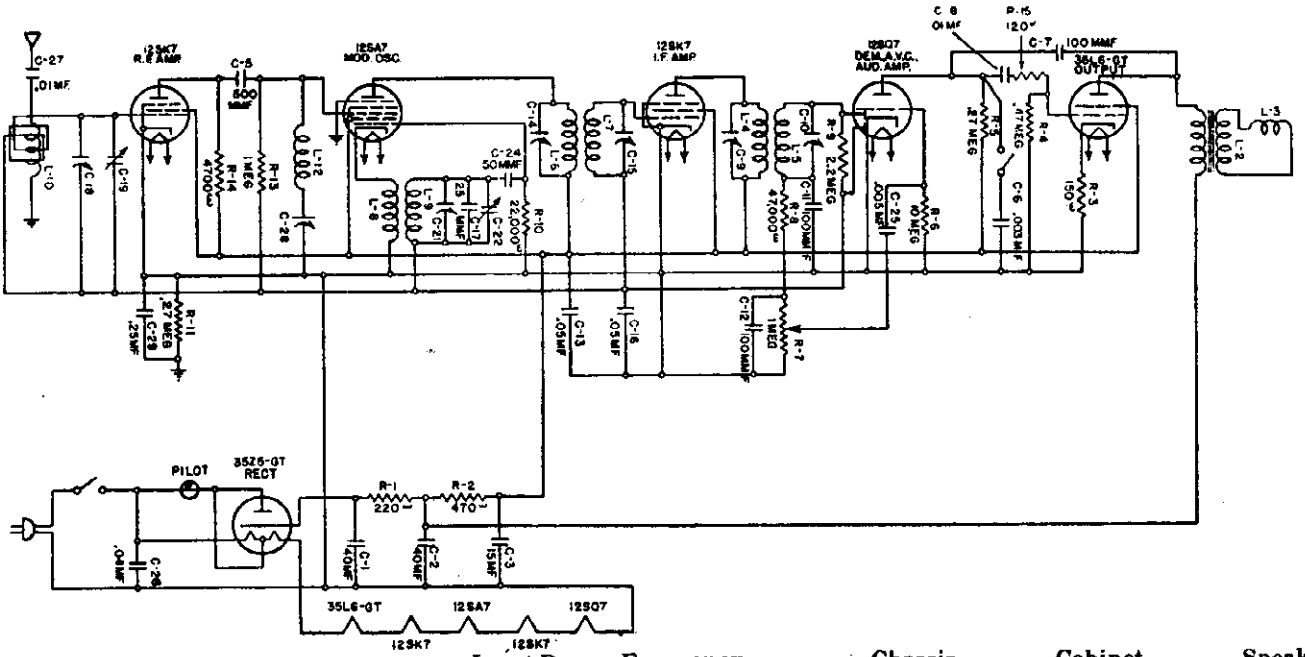
Use a line voltage of 120 volts or make allowance for the variation.

Read from indicated socket terminals to terminal No. 3 of the 12SK7 I. F. Amp. Socket (B—).

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 A. C. voltages shown.

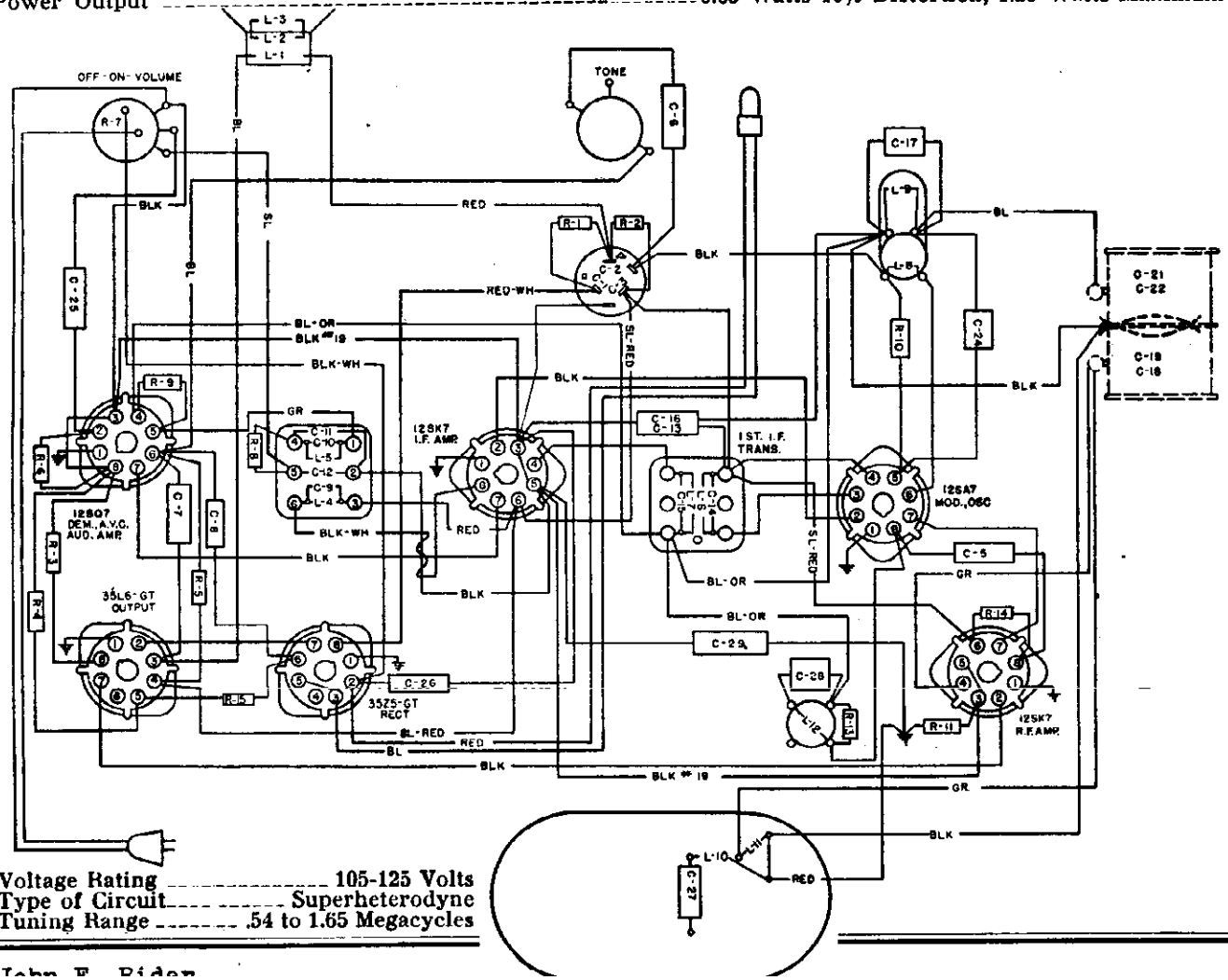
MODELS 900H, 900J

STROMBERG-CARLSON TEL. MFG. CO.

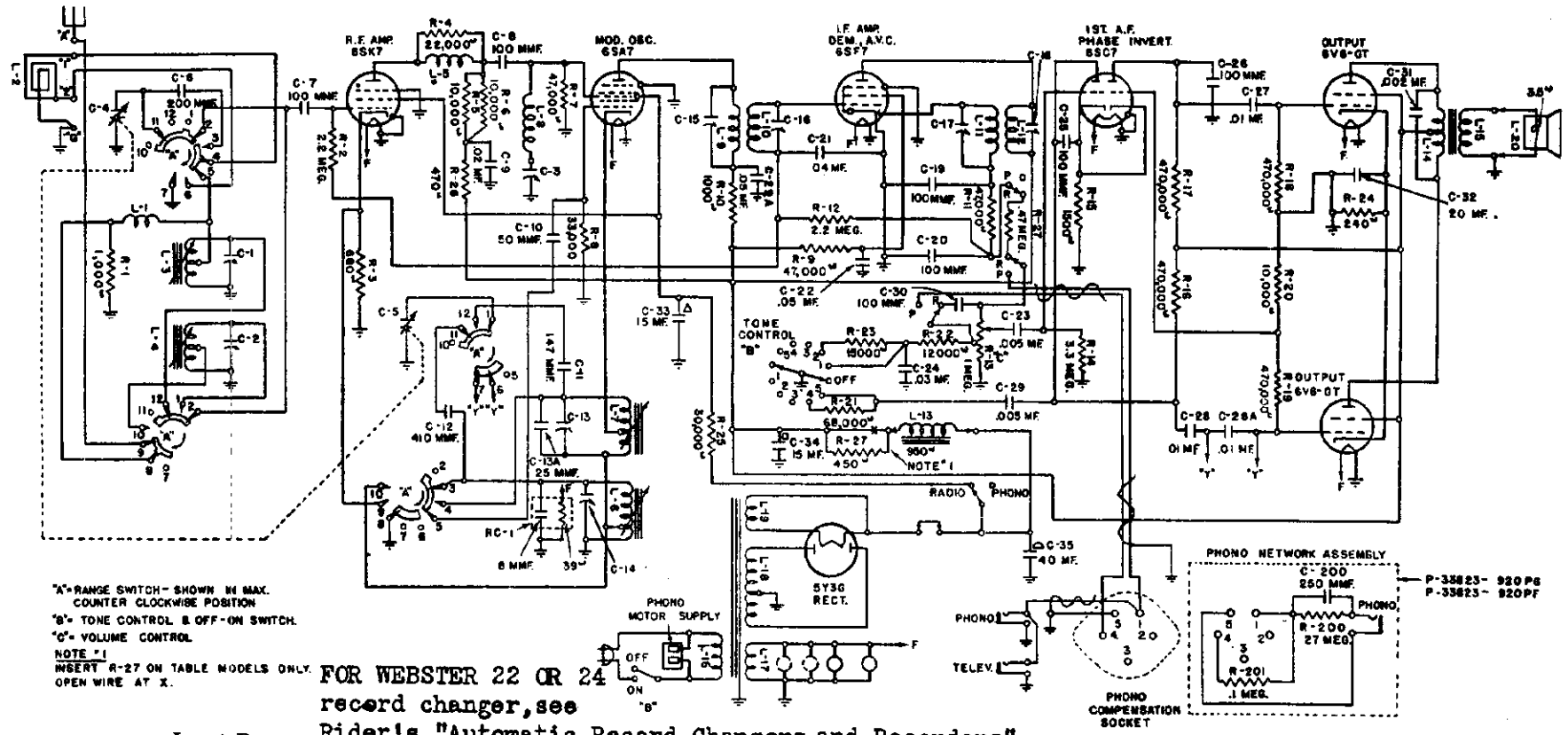


Model	Input Power Frequency	Chassis	Cabinet	Speaker
900-H Brown and Ivory	25-60 Cycles AC (or DC)	33527	33528	31696
900-J Burgundy and Ivory	25-60 Cycles AC (or DC)	33527	33961	31696

Input Power Rating ..... 30 Watts
Intermediate Frequency ..... 455 Kilocycles
P. M. Speaker Voice Coil Impedance at 400 Cycles ..... Approximately 3.5 Ohms
Power Output ..... 0.65 Watts 10% Distortion; 1.25 Watts Maximum

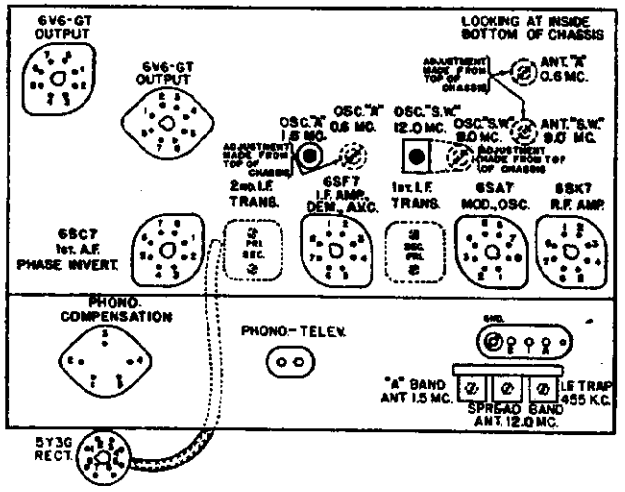


Voltage Rating ..... 105-125 Volts
Type of Circuit ..... Superheterodyne
Tuning Range ..... .54 to 1.65 Megacycles



FOR WEBSTER 22 OR 24 record changer, see Rider's "Automatic Record Changers and Recorders"

Model	Input Power Frequency	Chassis	Cabinet	Speaker	Phonograph Equipment
920-H	50-60 Cycles	33449	33825	33517	Use a Stromberg-Carlson Record Player
920-HB	25-60 Cycles	33450	33825	33517	Use a Stromberg-Carlson Record Player
920-L	50-60 Cycles	33449	33451	33435	Use a Stromberg-Carlson Record Player
920-LB	25-60 Cycles	33450	33451	33435	Use a Stromberg-Carlson Record Player
920-PF	60 Cycle	33449	33827	33435	33929
920-PFB	25 Cycle	33450	33827	33435	33930
920-PG	60 Cycle	33449	33795	33435	33929
920-PGB	25 Cycle	33450	33795	33435	33930

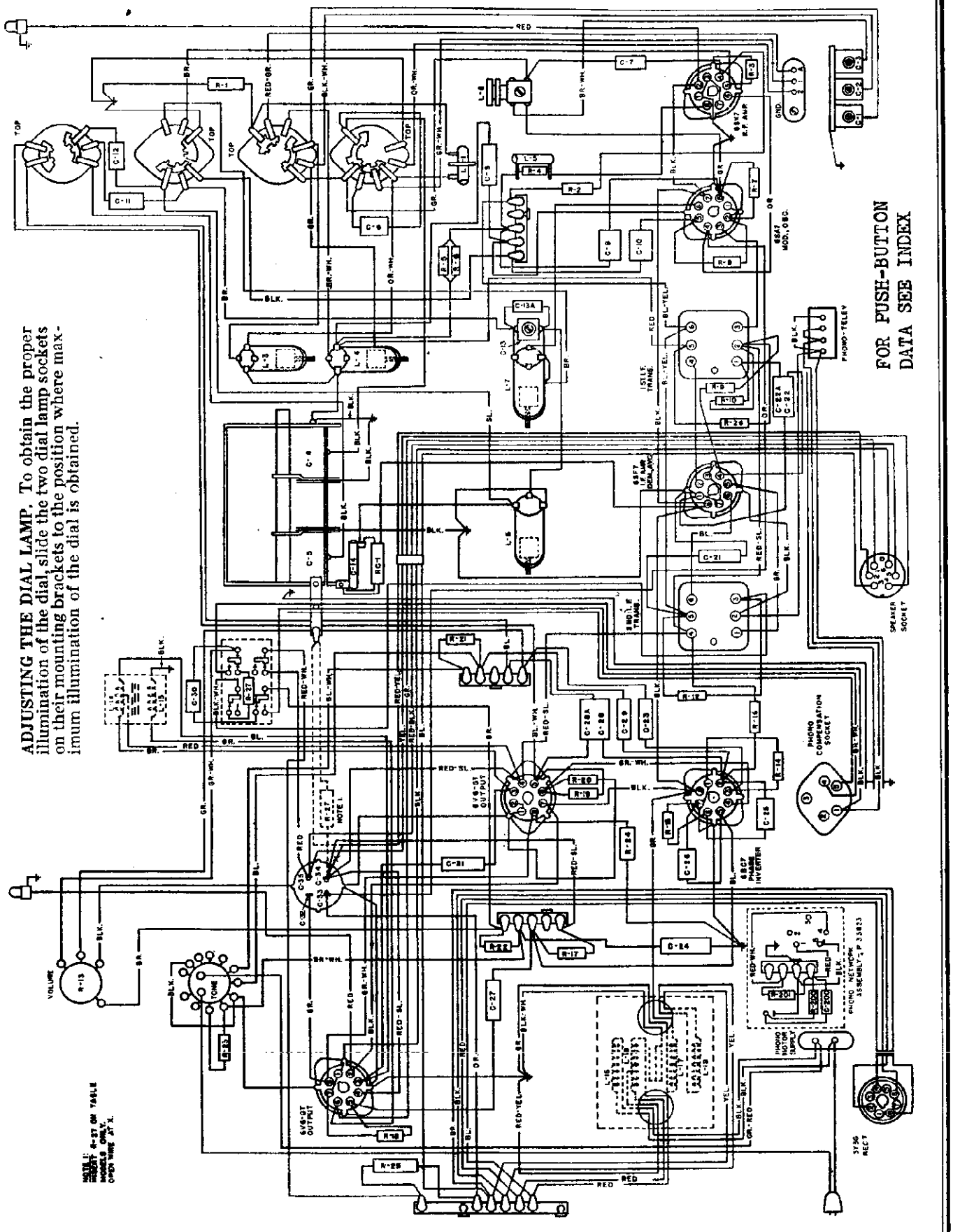


Location Chart

Type of Circuit	Superheterodyne with Push Button Tuning
Tuning Ranges	A—540 to 1600 Kc., C—8.8 to 12 Mc.
Voltage Rating	A.C. 105 to 125 Volts
Input Power Rating, 520-H, and L	96 Watts
Input Power Rating, 520-PF and PG	115 Watts
Intermediate Frequency	455 Kilocycles
Speaker Voice Coil Impedance at 400 Cycles	Approximately 3.5 Ohm
Speaker Field Coil Resistance	Approximately 1000 Ohms
Power Output	9 watts 10% distortion 12 watts maximum

MODEL 920

STROMBERG-CARLSON TEL. MFG. CO.



STROMBERG-CARLSON TEL. MFG. CO.

Use a good modulated signal generator (test oscillator with variable output voltage and a sensitive output meter across the voice coil of the speaker.)

Always align using the smallest possible input from the signal generator. A strong signal makes adjustments inaccurate.

Always have the volume control "full on".

ALIGNING PROCEDURE. (Follow this order exactly.)

I. Dial pointer adjustment.

With the plates of the gang tuning capacitor fully engaged, check to be sure that the dial pointer is in a vertical position directly on the calibration marks located at the low frequency end of the dial scale. Adjust the dial pointer if necessary.

II. Intermediate frequency adjustments.

1. Set range switch to Standard Broadcast position.
2. Tune set to extreme low frequency end of dial.
3. Connect the ground terminal of the signal generator to the ground terminal of the chassis.
4. Introduce a modulated signal of 455 kilocycles to the grid of the 6SA7 Modulator and Oscillator tube (terminal No. 8) using a 0.1 microfarad capacitor in series with the output lead of the signal generator.
5. Adjust the I. F. aligners for maximum output in the following order:
   - A. Secondary of second I. F. Transformer.
   - B. Primary of second I. F. Transformer.
   - C. Secondary of first I. F. Transformer.
   - D. Primary of first I. F. Transformer.

III. Radio frequency adjustments.

Short Wave Range

1. Remove the output lead of the signal generator and the 0.1 microfarad capacitor from the grid of the 6SA7 tube.
2. Disconnect the output lead from the signal generator and replace with a few turns of wire connected to the signal generator output terminals.
3. Place the signal generator two or three feet from the receiver's loop.
4. Set the range switch to the short-wave range position.
5. Set the signal generator frequency and the receiver tuning dial to 9 megacycles.
6. Adjust the 9 megacycle oscillator and loop aligners (iron cores) for maximum signal.
7. Set the signal generator frequency and the receiver tuning dial to 12 megacycles.
8. Adjust the 12 megacycle oscillator aligning capacitors for maximum signal. Then rock the tuning gang capacitor slowly through resonance and adjust the 12 megacycle loop aligning capacitor for maximum signal.
9. Repeat operations 5 and 6.
10. Repeat operations 7 and 8.

Standard Broadcast Range

1. Set the range switch to the "Loop" position.
2. Set the signal generator frequency and the receiver tuning dial to 600 kilocycles.
3. Adjust the 600 K. C. oscillator and loop aligner (iron cores) for maximum signal.
4. Set the signal generator frequency and the receiver tuning dial to 1500 kilocycles.
5. Adjust the 1500 K. C. oscillator and loop aligning capacitors for maximum signal.
7. Repeat operations 2 and 3.
8. Repeat operations 4 and 5.

IV. Wave trap adjustment

1. Tune the receiver to 1000 kc.
2. Set the signal generator frequency to 455 kc., and introduce a fairly strong modulated signal to the receiver.
3. Adjust the wave trap aligning capacitor for minimum signal.

		TERMINALS OF SOCKETS							
Tube	*Circuit*	1	2	3	4	5	6	7	8
6SK7	R. F. Amp.	0	*6.3*	0	0	0	+85	0	+178
6SA7	Osc. and Mod.	0	0	+240	+85	0	0	*6.3*	0
6SF7	I. F. Amp. Demod. and A. V. C.	0	0	0	+95	0	+240	0	*6.3*
6SC7	Audio Amp. and Inverter	0	+65	0	0	+65	4*	0	*6.3*
6V6GT	Output	0	0	+235	+240	0	0	*6.3*	13*
6V6GT	Output	0	*6.3*	+235	+240	0	0	0	13*
5Y3G	Rectifier	0	+380	—	*380*	—	*380*	—	+380

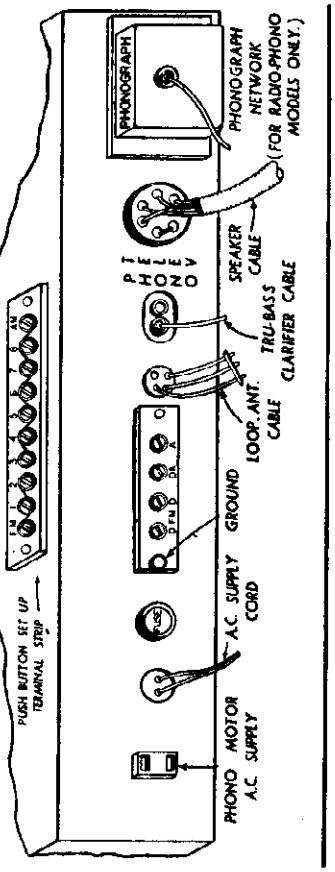
*Read on lowest possible scale of voltmeter

MODEL 925
MODEL 935

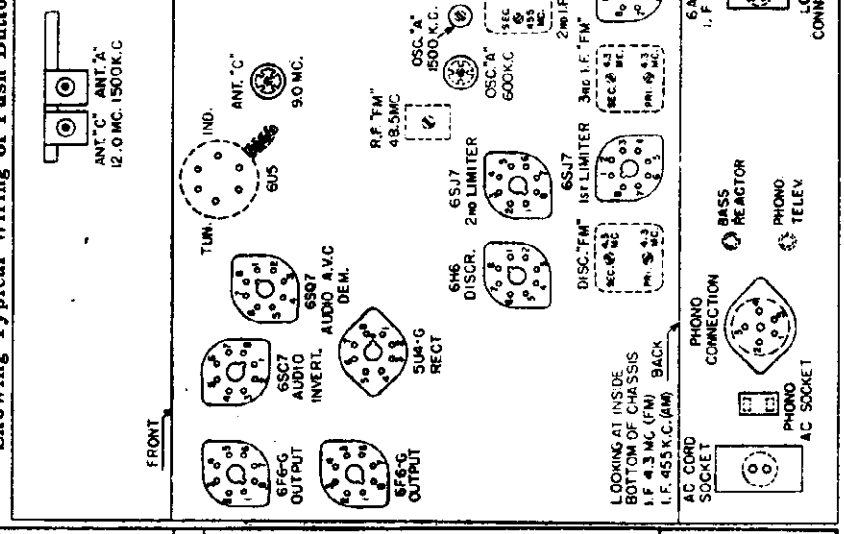
STROMBERG-CARLSON TEL. MFG. CO.

PHONOGRAPH OPERATION. The 935-PL, PF and PR Phonograph Models are equipped with an automatic record changer using a one ounce sapphire pick-up in conjunction with specially equalized circuits. This type of pick-up eliminates the frequent changing of needles and reduces record wear to a minimum. This record player shifts and plays the standard 10 or 12 inch records. The 935-M Receivers are provided with a phonograph jack on the back of the chassis into which a record player may be plugged.

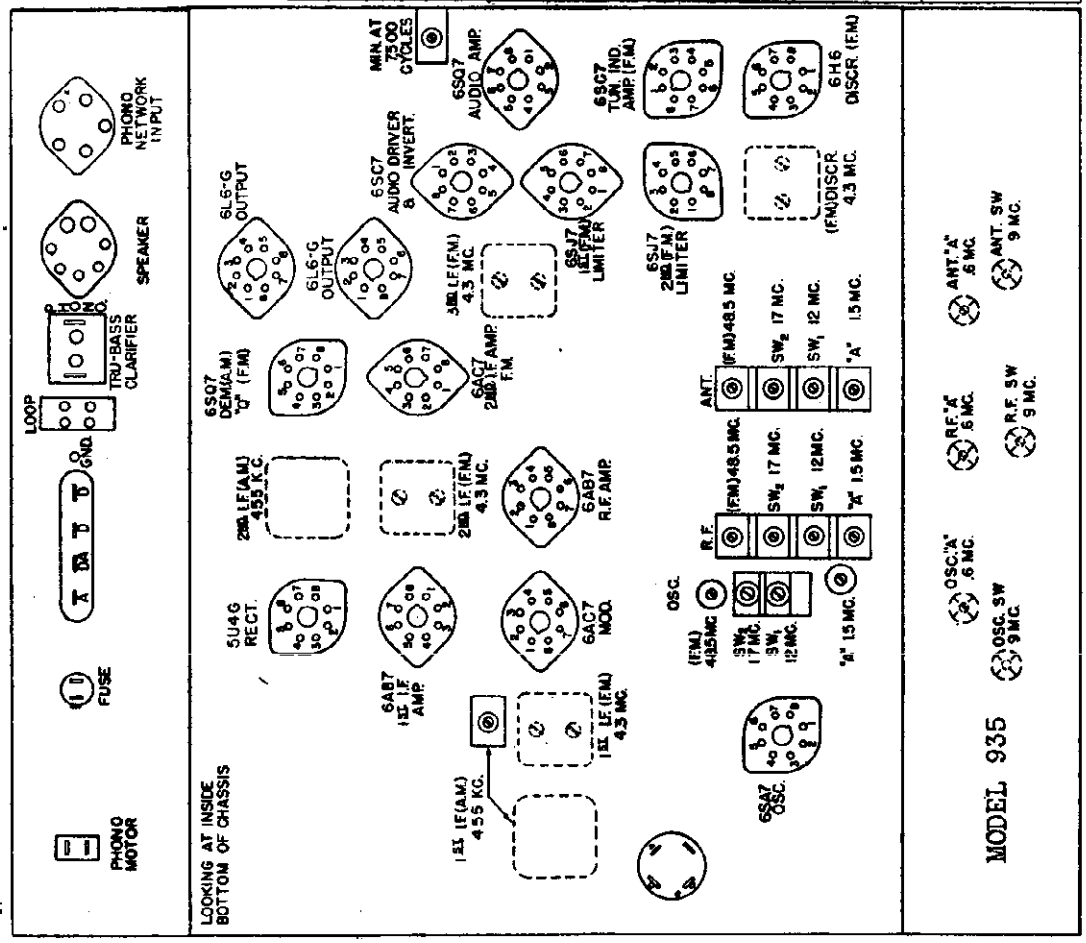
ADJUSTING THE DIAL LAMP. To obtain the proper illumination of the dial, slide the two dial lamp sockets on their mounting brackets to the position where maximum illumination of the dial is obtained.



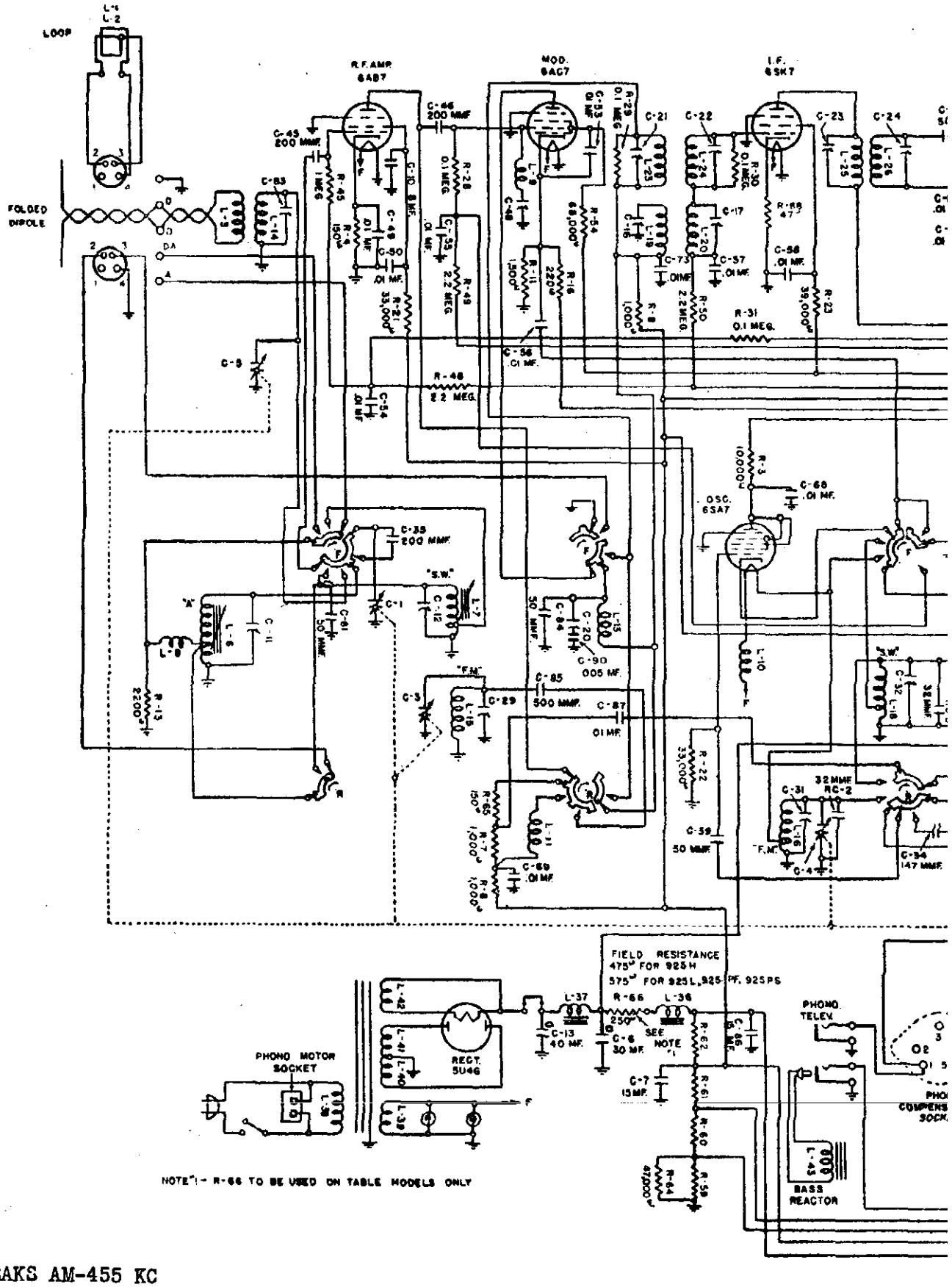
Showing Typical Wiring of Push Button Set-up Terminal Strip



MODEL 925

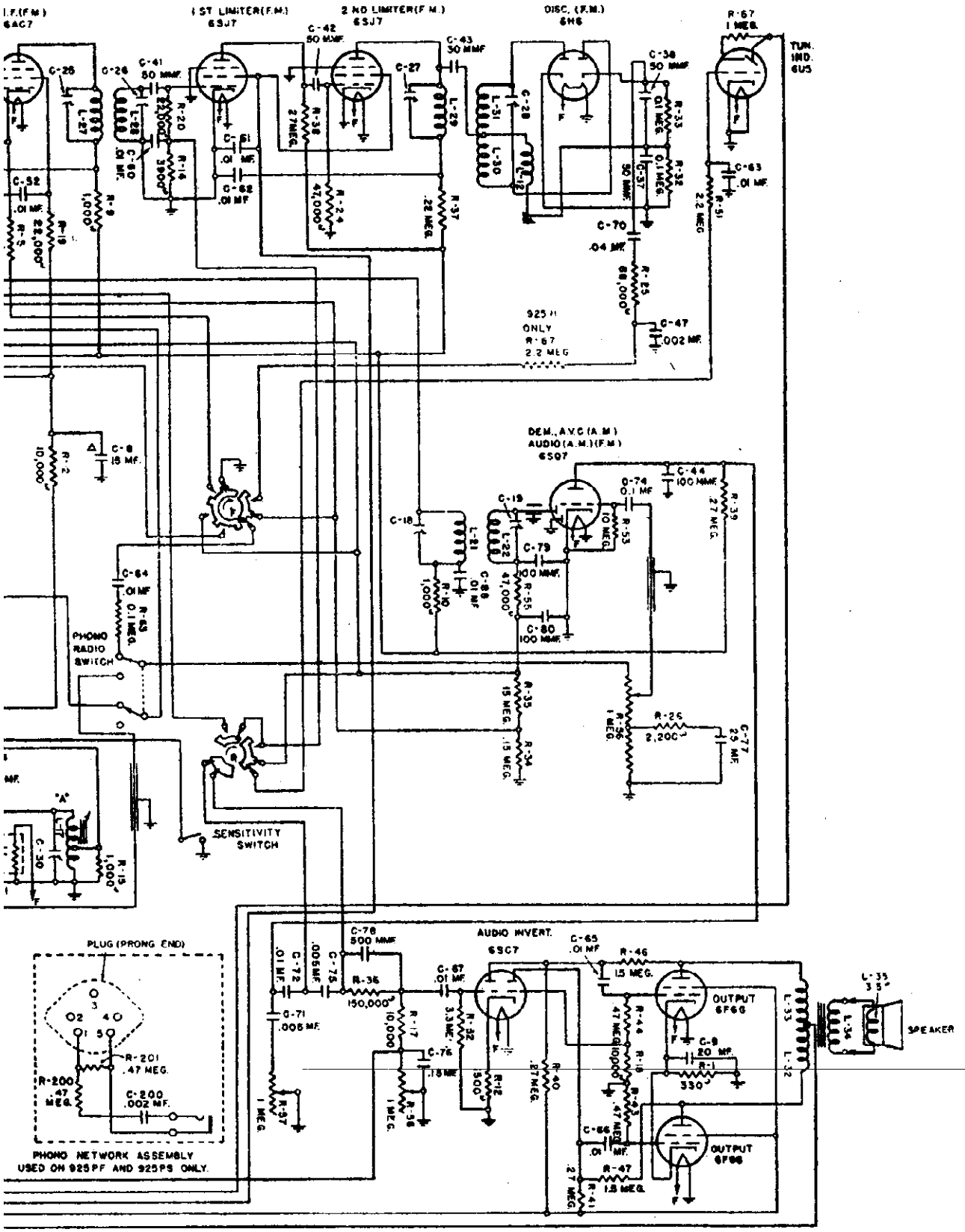


MODEL 935



IF PEAKS AM-455 KC
FM-4.3 MC

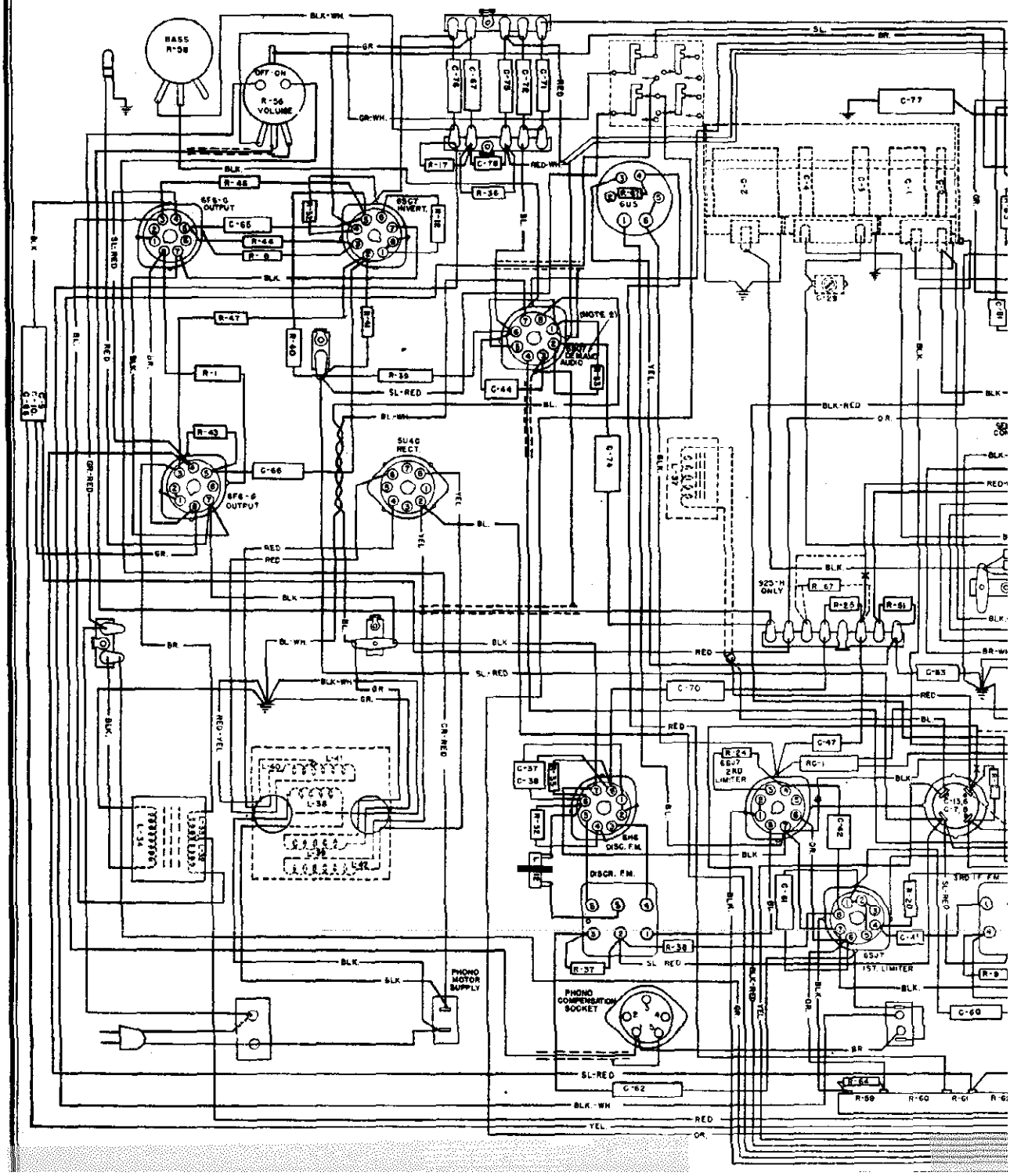
LSON TEL. MFG. CO.



MODEL 925

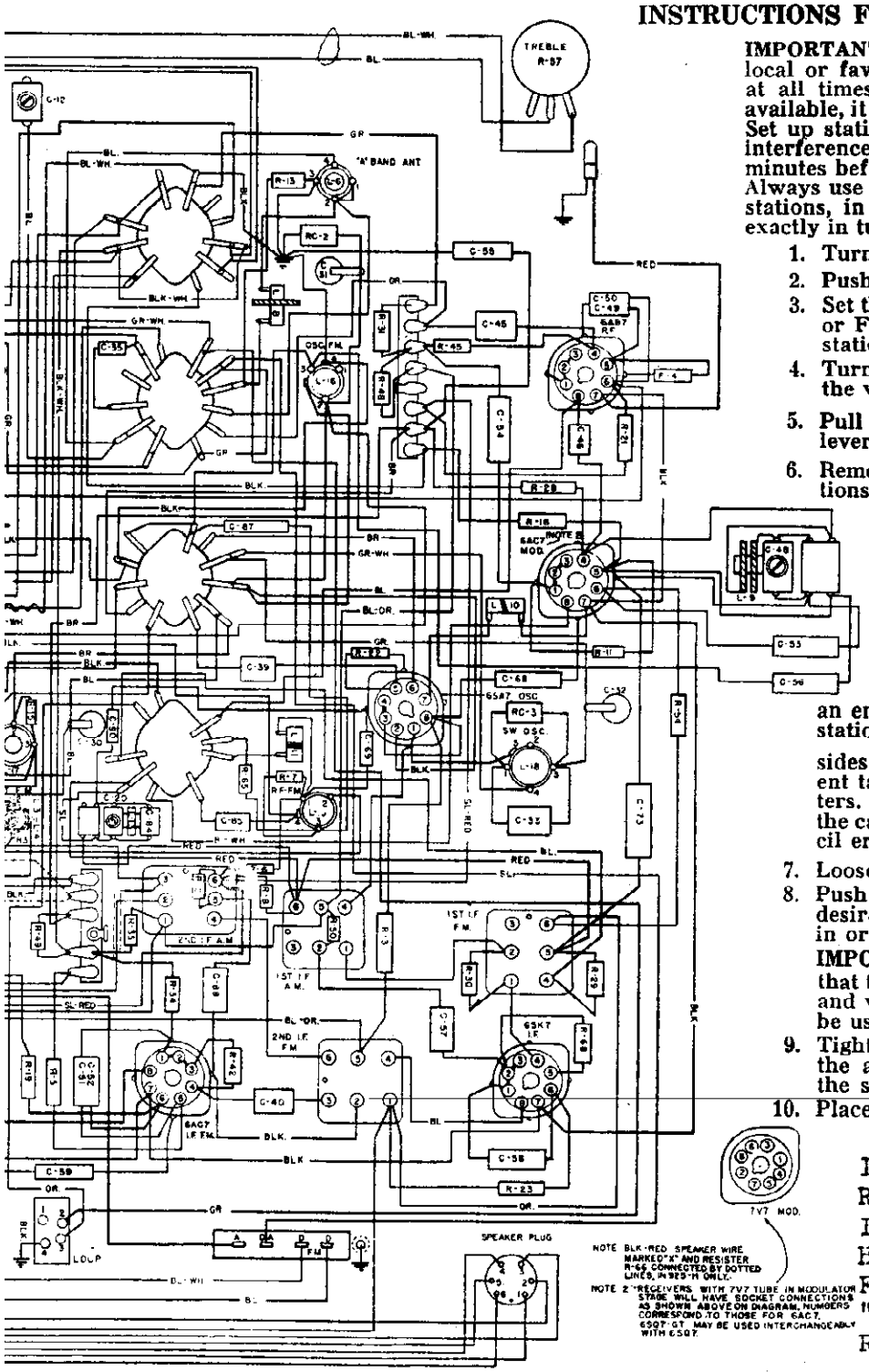
STROMBERG-CA

Model	Input Power Frequency	Chassis	Cabinet	Speaker	Phonograph Equipment
925-H	50-60 cycles	33264	33803	33974	Use a Stromberg-Carlson Record Pl
925-HB	25-60 cycles	33265	33803	33974	Use a Stromberg-Carlson Record Pl
925-L	50-60 cycles	33264	33840	33982	Use a Stromberg-Carlson Record Pl
925-LB	25-60 cycles	33265	33840	33982	Use a Stromberg-Carlson Record Pl
925-PF	60 cycles	33264	34026	33982	33993
925-PFM	60 cycles	33264	34103	33982	33993
925-PFB	25 cycles	33265	34026	33982	33994
925-PS	60 cycles	33264	34027	33982	34066
925-PSY	60 cycles	32264	34146	33982	34066
925-PSB	25 cycles	33265	34027	33982	34067



SPECIFICATIONS

Tuning Ranges	Standard Broadcast 540 to 1600 kilocycles Short Wave Spread Band 8.8 to 12 megacycles Frequency Modulation 42 to 50 megacycles
Voltage Rating	105 to 125 Volts
Input Power Rating 925-H, L	160 Watts
Input Power Rating 925-PF, PS	190 Watts
Intermediate Frequency	455 Kilocycles (Amplitude Modulation) 4.3 Megacycles (Frequency Modulation)
Speaker Field Coil Resistance	925-H—475 ohms; 925-L, PF, PS—575 ohms
Speaker Voice Coil Impedance	3.5 ohms
Power Output	10 watts 10% distortion, 16 watts maximum



NOTE BLK-RED SPEAKER WIRE MARKED "A" AND RESISTER R-45 CONNECTED BY DOTTED LINES, IN 925-H ONLY.

NOTE 2 "RECEIVERS WITH 7V7 TUBE IN MODULATOR STAGE WILL HAVE SOCKET CONNECTIONS AS SHOWN ABOVE ON DIAGRAM, NUMBERS CORRESPOND TO THOSE FOR 6A7. 6SQ7 GT MAY BE USED INTERCHANGEABLY WITH 6SQ7.

INSTRUCTIONS FOR SETTING UP PUSH BUTTONS

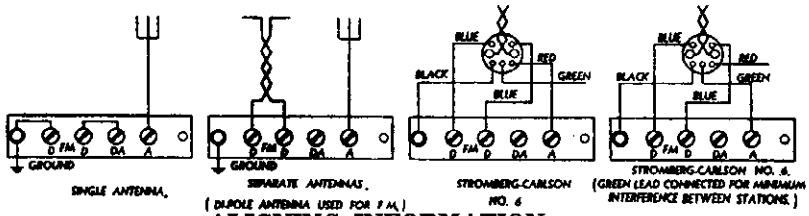
IMPORTANT: The stations selected should be the local or favorite stations which give good reception at all times. If a Frequency Modulation station is available, it may be set up on one of the push buttons. Set up stations in the daytime to avoid unnecessary interference. Allow the set to run for about twenty minutes before setting up stations.

Always use the tuning indicator unit when setting up stations, in order to determine when the station is exactly in tune.

1. Turn the receiver "On".
2. Push in the button designated "Radio".
3. Set the range switch to the Standard Broadcast or F. M. position depending on the particular stations which are to be set up.
4. Turn volume control about three-quarters of the way on (in a clockwise direction).
5. Pull the six station push buttons off their levers.
6. Remove the call letters of the six selected stations from the call letter sheets, which are in an envelope stapled to the cabinet. Insert the station call letters part way in the slots at the sides of the buttons. Next, insert a transparent tab in each slot in front of the station letters. Then push both the transparent tabs and the call letters all the way into the slot. (A pencil eraser may be helpful.)
7. Loosen the set screw of the lever to be set up.
8. Push in the lever and manually tune in the desired station, observing the tuning indicator in order to obtain exact resonance.
   IMPORTANT: For accurate set-up, be sure that the lever is pushed in, in the same manner and with the same amount of pressure as will be used when operating the push buttons.
9. Tighten the set screw. Be sure not to disturb the adjustment in any way while tightening the screw.
10. Place the proper button on the lever.

IN MODEL 925PF, WEBSTER 22 or 24 RECORD CHANGER IS USED.
IN MODEL 925PS, FARNSWORTH CAPEHART P44 RECORD CHANGER IS USED.
FOR DATA ON THESE, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

STROMBERG-CARLSON TEL. MFG. CO.



ALIGNING INFORMATION

NEVER REALIGN UNLESS ABSOLUTELY NECESSARY.

GENERAL. All aligning adjustments are carefully made at the factory with special equipment which is designed for aligning Frequency Modulation receivers. The limitations of commercial oscillographs and other ordinary test equipment are such that alignment should not be attempted in the field unless absolutely necessary.

If alignment is attempted, it will not be successful unless the instructions which follow are adhered to exactly.

The following equipment will be required:

1. Standard signal generator with sweep circuit.
2. Wide band sweep signal generator.
3. Oscillograph.
4. Microammeter—0 to 200 microamps.
5. Center "0" microammeter with 100 divisions either side of "0".

See location chart for location of all aligners.

ALIGNING PROCEDURE (AMP. MOD.)

I. **Dial Pointer Adjustment. (A. M.)**

With the plates of the gang tuning capacitor fully engaged, check to be sure that the dial pointer is in a vertical position directly on the calibration marks located at the low frequency end of the dial scale. Adjust if necessary.

II. **Intermediate Frequency Adjustments. (A. M.)**

1. Set the range switch to standard broadcast position.
2. Tune set to extreme low frequency end of dial.
3. Connect the ground terminal of the signal generator to the ground terminal of the chassis.
4. Introduce a modulated signal of 455 kilocycles to the grid of the 6AC7 or 7V7 Modulator, using a 0.1 mmf. capacitor in series with the output lead of the signal generator.
5. Adjust the I. F. aligners for maximum output in the following order:
   a. Secondary of second I. F. transformer.
   b. Primary of second I. F. transformer.
   c. Secondary of first I. F. transformer.
   d. Primary of first I. F. transformer.

III. **Wave Trap Adjustment.**

(Leave the signal generator connected in the same manner as when making the A. M. I. F. Frequency adjustments.)

1. Tune the set to 1000 kc.
2. Introduce a fairly strong modulated signal to the grid of the modulator tube and adjust the wave trap aligner for minimum signal.

IV. **Radio Frequency Adjustments. (A. M.)**

Standard Broadcast Range (A Band)

1. Remove the output lead from the signal generator and the grid of the modulator tube.
2. Connect a few turns of wire to the output terminals of the signal generator.
3. Place the signal generator two or three feet away from the receiver's loop.
4. Set the range switch to the Standard Broadcast range (A Band).
5. Set the signal generator frequency and the receiver tuning dial to 600 kc.
6. Adjust the 600 kc. oscillator and antenna aligners (iron cores) for maximum signal.
7. Set the signal generator frequency and the receiver tuning dial to 1500 kc.
8. Adjust the 1500 kc. oscillator and antenna aligning capacitors for maximum signal.
9. Repeat operations three and four.
10. Repeat operations five and six.

Short Wave Range (C Band)

1. Set the range switch to the Short Wave Range (C Band).
2. Set the signal generator frequency and the receiver tuning dial to 9 megacycles.
3. Adjust the 9 megacycle oscillator and antenna aligners (iron cores) for maximum signal.
4. Set the signal generator frequency and the receiver tuning dial to 12 megacycles.
5. Adjust the 12 megacycle oscillator and antenna aligning capacitors for maximum signal.
6. Repeat operations three and four.
7. Repeat operations five and six.

Note: After the receiver has been placed in the cabinet, plug the loops into their respective sockets and readjust the Standard Broadcast and Short Wave antenna high frequency shunt aligners for maximum signal.

ALIGNING PROCEDURE (FREQ. MOD.)

V. **Intermediate Frequency Adjustments (F. M.)**

Note: All I. F. adjustments are made using a wide band sweep signal generator with a sweep circuit of plus or minus 300 kilocycles.

1. Set the range switch to the F. M. position.
2. Tune the set to the extreme high frequency end of the dial (50 megacycles).
3. Connect the 0-200 microammeter between the R-14, 3900-ohm resistor and ground.
4. Connect the oscillograph between ground and the tap of the limiter grid resistors R-14 and R-20.
5. Connect the ground terminal of the wide band sweep signal generator to the ground terminal of the 6AC7 second I. F. tube socket.
6. Introduce a signal of 4.3 megacycles to the grid of the 6AC7 second I. F. tube socket (terminal No. 4), using a 0.1 capacitor in series with the output lead of the signal generator. Keep the 0 to 200 microammeter at approximately 100 microamps.
7. Adjust the secondary and primary of the third I. F. transformer for maximum reading on the 0 to 200 microammeter. Check pattern on oscilloscope for symmetrical curve.
8. Connect the output lead of the wide band sweep signal generator and the 0.1 microfarad capacitor in series with it to the grid of the 6SK7 first I. F. tube socket (terminal No. 4).
9. Connect the ground lead of the signal generator to the ground terminal of the 6SK7 first I. F. tube socket.
10. Adjust the second I. F. transformer for maximum reading of microammeter.
11. Connect the output lead of the wide band sweep signal generator with the 0.1 microfarad capacitor in series with it to the grid of the 6AB7 R. F. tube.

12. Connect the ground terminal of the signal generator to the ground terminal of the 6AB7 tube socket.
13. Adjust the first I. F. transformer for maximum reading on microammeter. Adjust slightly for symmetrical curve on oscilloscope.

VI. **Discriminator Adjustment. (F. M.)**

1. Connect the ground terminal of the standard unmodulated signal generator to the ground terminal of the 6SK7 first I. F. tube socket.
2. Connect the output lead of the unmodulated standard signal generator to the grid of the 6SK7 first I. F. tube (terminal No. 4), using a 0.1 microfarad capacitor in series with the output lead of the standard signal generator, leaving the wide band sweep signal generator connected to the grid of the 6AB7 R. F. tube socket.
3. Adjust the attenuator of the wide band sweep signal generator for a curve on the oscillograph.
4. Set the frequency of the unmodulated standard signal generator to approximately 4.3 megacycles and adjust the attenuator for interference patterns on the oscillograph. Adjust the unmodulated standard signal generator frequency until interference patterns on each trace come together. (This is done in order to assure that the frequency of the standard signal generator which is used to align the discriminator coincides with the mean frequency of the wide band sweep signal generator.)
5. Remove the wide band sweep signal generator.
6. Connect the center "0" microammeter with a .5 megohm resistor in series across one-half of the discriminator load. (From ground to the junction of the two .1 megohm resistors R-32 and R-33.)
7. Set the attenuator of the standard signal generator for maximum output.
8. Adjust the primary of the discriminator transformer for maximum reading on the center "0" microammeter.
9. Connect the center "0" microammeter and the .5 megohm resistor in series with it across the whole discriminator load. (From ground to the junction of R-33 .1 megohm resistor and C-70 .04 mf. capacitor.)
10. Adjust the secondary of the discriminator transformer for center "0" reading of the microammeter.
11. Vary the frequency of the standard signal generator, making sure that the voltage peaks, which should be of the same magnitude, are the same number of kilocycles off on either side of resonance. Any departure from these conditions may be corrected by a slight readjustment of the primary.

    Note: Leave the wide band sweep signal generator connected to the grid of the 6SB7 R. F. tube socket and make slight readjustments of the I. F. transformers for proper curve, since there is some interaction between these stages and the discriminator.

VII. **Radio Frequency Adjustments (F. M.)**

1. Set the signal generator frequency and the receiver tuning dial to 48.5 megacycles.
2. Replace the 0.1 microfarad capacitor in series with the output lead from the signal generator with a 100 ohm resistor and connect it to one of the F. M. terminals on the back of the chassis.
3. Connect the ground lead of the signal generator to the other F. M. terminal.
4. Adjust the oscillator aligner (air trimmer) for maximum signal.
5. Adjust the R. F. and antenna aligners for maximum signal on the 0 to 200 microammeter, maintaining the center "0" microammeter at "0" at all times by rotating the receiver dial slightly back and forth.

NORMAL VOLTAGE READINGS

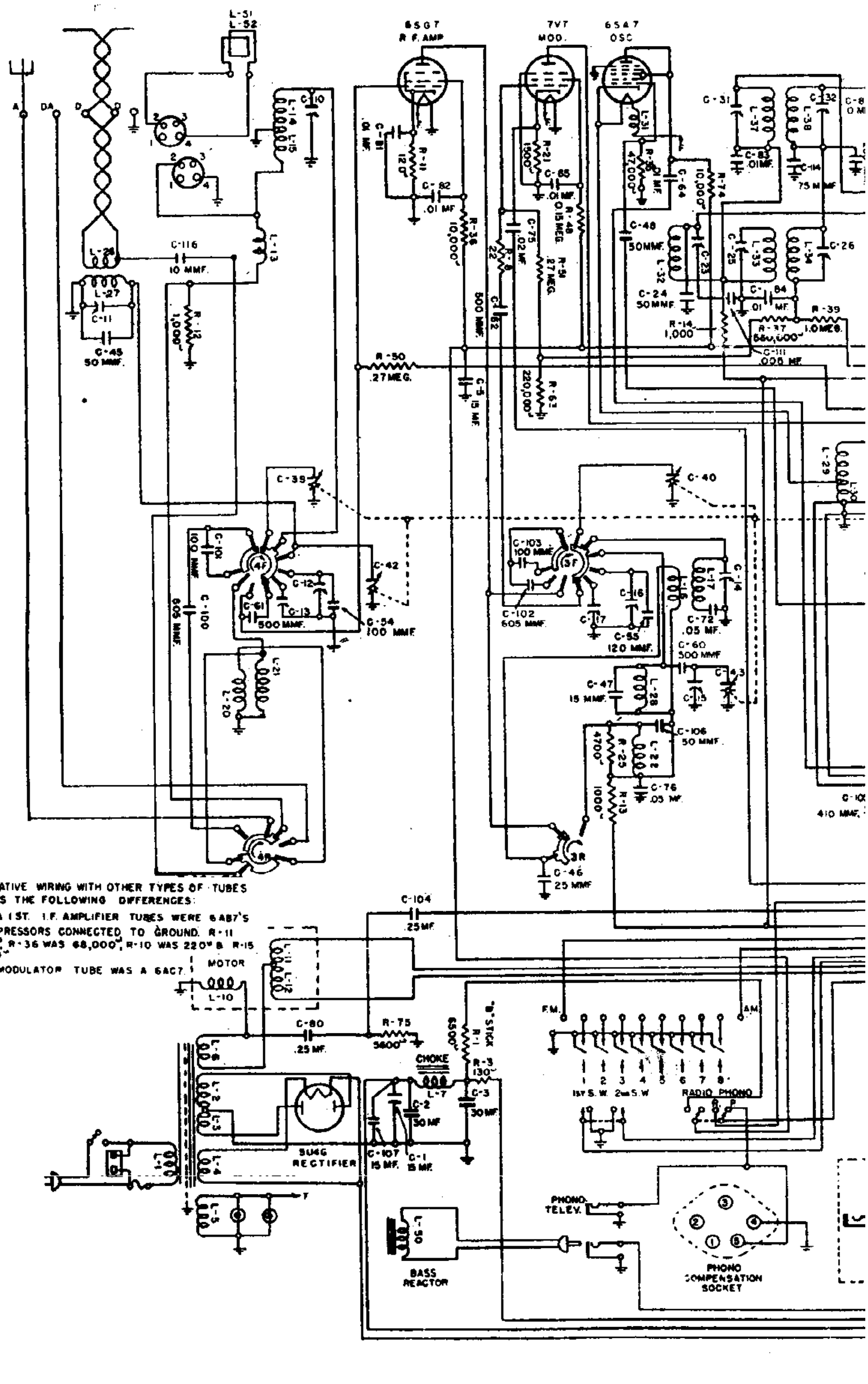
NOTE: These receivers use either a 6AC7 or 7V7 tube in the modulator stage. (See wiring diagram

Take all readings with chassis operating and tuned manually to 1000 kc. or 47 megacycles—no signal.
Use a line voltage of 120 volts or make allowance for the variation.

Use a good high resistance voltmeter having a resistance of at least 1000 ohms per volt.
Take all D. C. readings on the 500 volt scale, except when an asterisk appears.
Read from indicated terminals to chassis base.
See location chart for position of terminals.
A. C. voltages are indicated by italics.

		TERMINALS OF SOCKETS							
Tube	*Circuit*	1	2	3	4	5	6	7	8
6AB7	R. F. Amplifier	0	0	0	0	+2.4	+182	*6.3*	+275
6AC7	Modulator	0	0	0	0	+6	+218	*6.3*	+300
or 7V7		0	+300	+218	0	0	0	+6	*6.3*
6SA7	Oscillator	0	0	+120	+120	−5	0	*6.3*	+120
6SK7	I. F. Amplifier	0	0	0	0	0	+110	*6.3*	+290
6AC7	2nd I. F. Amplifier (F. M.)	0	0	0	0	+8	+265	*6.3*	+300
6SJ7	1st Limiter (F. M.)	0	0	0	0	0	+54	*6.3*	+2
6SJ7	2nd Limiter (F. M.)	0	0	0	0	0	+54	*6.3*	+3
6H6	Discriminator (F. M.)	0	0	0	0	0	0	*6.3*	0
6SQ7	Demod., A. V. C. (A. M.), Audio Amplifier	0	0	0	0	0	+100*	0	*6.3*
6SC7	Audio Amp. and Inverter	0	+140*	0	0	+130*	+2	*6.3*	0
6F6G	Output	0	0	+340	+300	0	0	*6.3*	+22
6F6G	Output	0	0	+340	+300	0	0	*6.3*	+22
5U4G	Rectifier	0	+450	0	*415*	0	*415*	0	+450
6U5	Tuning Indicator	*6.3*	+80	0	+250	0	0	—	—

*Read on 1000 volt scale of voltmeter.
Between terminals 2 and 8 of rectifier socket—5 volts A. C.

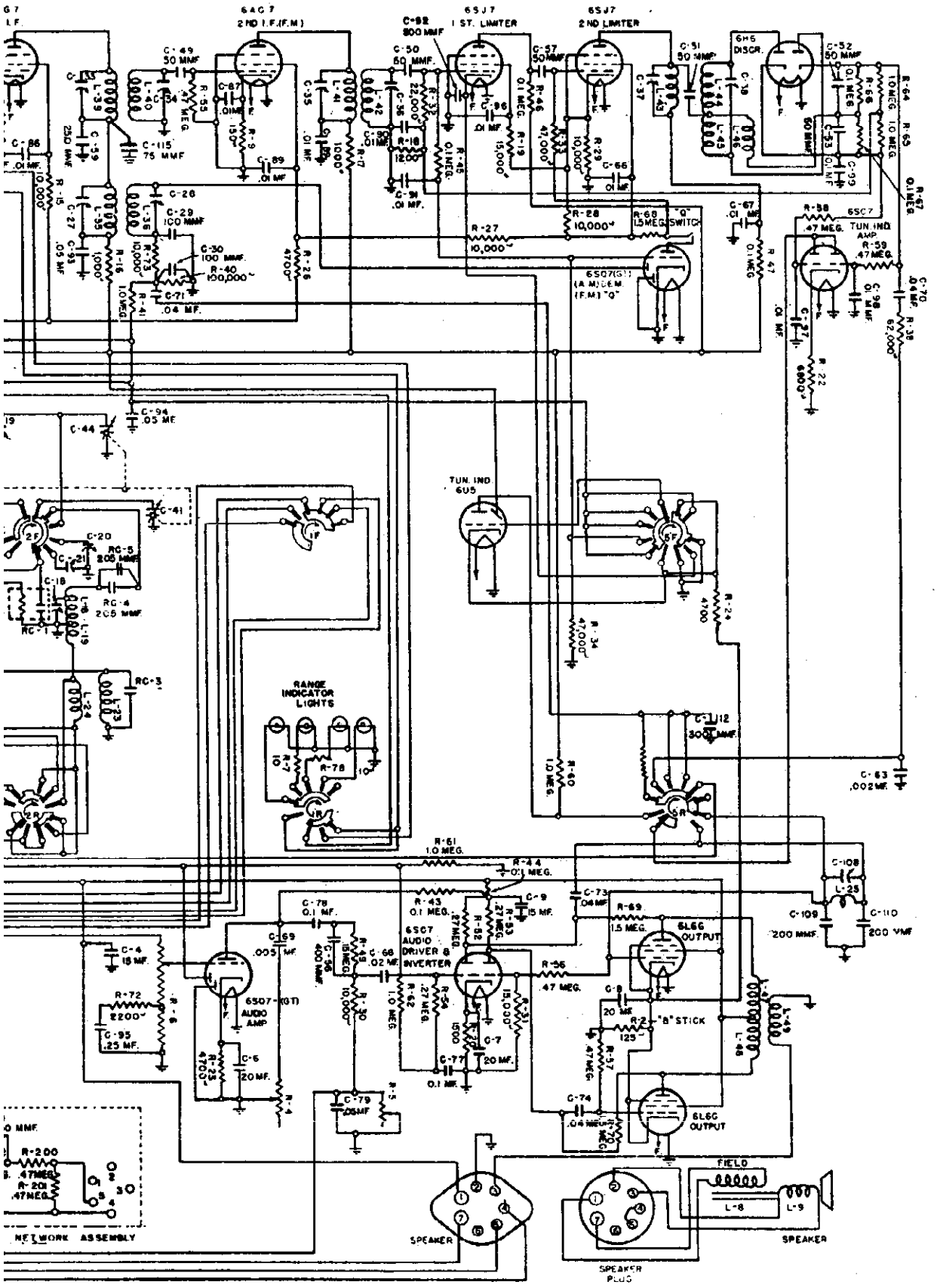


NOTE #1 - ALTERNATIVE WIRING WITH OTHER TYPES OF TUBES INVOLVES THE FOLLOWING DIFFERENCES:

1) R.F. & 1ST. I.F. AMPLIFIER TUBES WERE 6AB7'S WITH SUPPRESSORS CONNECTED TO GROUND. R-11 WAS 270Ω, R-36 WAS 68,000Ω, R-10 WAS 220Ω & R-15 WAS 1,000Ω.

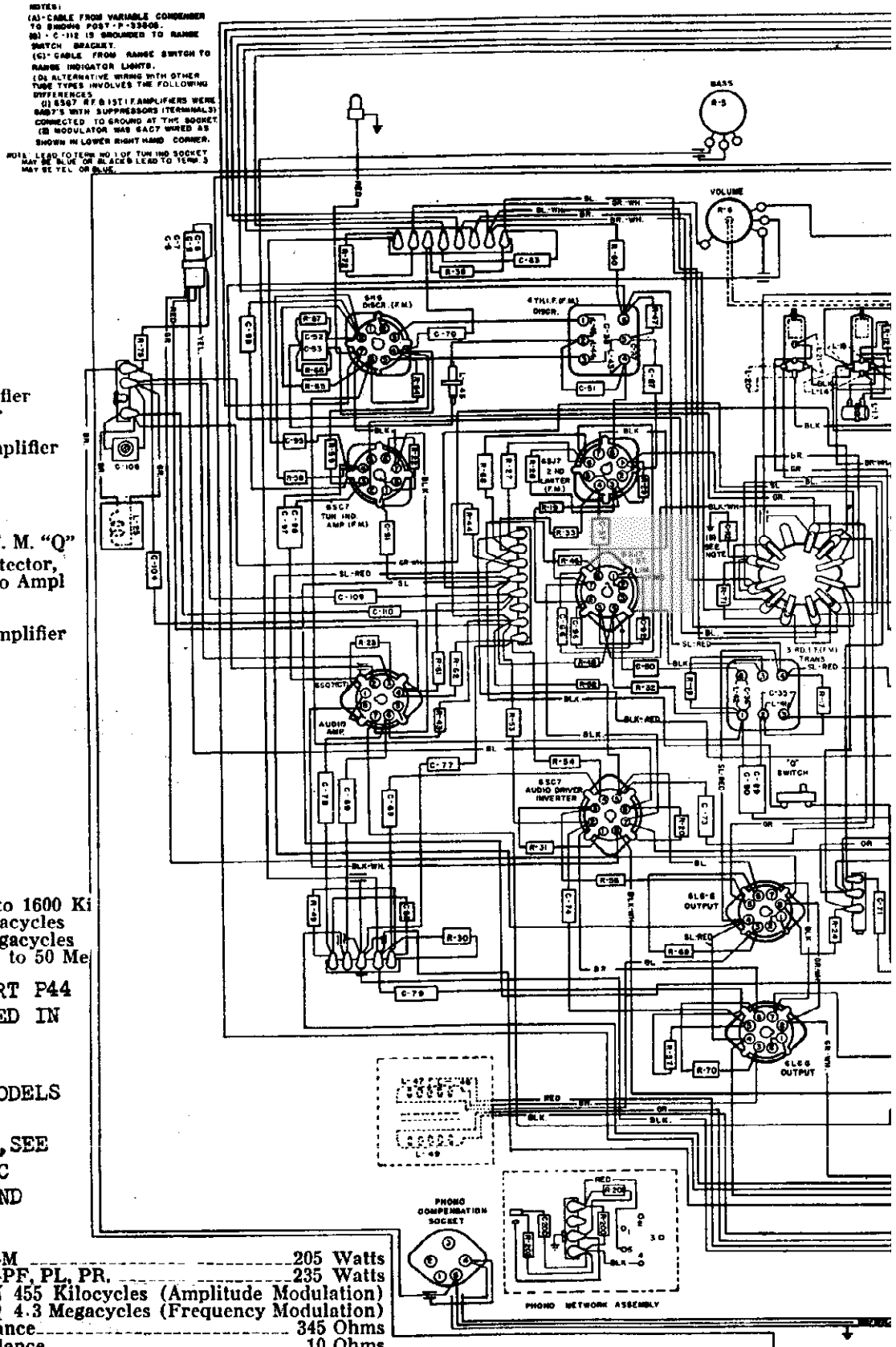
2) THE MODULATOR TUBE WAS A 6AC7.

ON TEL. MFG. CO.


6AC7
2ND I.F.(F.M.)
6SJ7
1ST. LIMITER
6SJ7
2ND LIMITER
6H6
DISCR.
6SC7
TUN. IND. AMP.
6507(GT)
(A.M.)DEM
(F.M.) "D"
"Q" SWITCH
TUN. IND.
6U5
RANGE INDICATOR LIGHTS
6507
AUDIO DRIVER & INVERTER
6507-(GT)
AUDIO AMP.
6L6G
OUTPUT
6L6G
OUTPUT
"B" STICK
FIELD
L-8
L-9
SPEAKER
SPEAKER
SPEAKER PLUG
NETWORK ASSEMBLY

MODEL 935

STROMBERG-CARLSON TE



Number of Tubes—16

6AB7 or 6SG7 R. F. Amplifier
6AC7 or 1—7V7 Modulator
6SA7 Oscillator
6AB7 or 6SG7 1st I. F. Amplifier
6AC7 2nd I. F. Amplifier
6SJ7 1st Limiter
6SJ7 2nd Limiter
6H6 Discriminator

F. M. "Q"

6SQ7 or 6SQ7GT A. M. Detector,
6SQ7 or 6SQ7GT 1st Audio Ampl
6SC7 Driver and Inverter
6U5 Tuning Indicator
6SC7 F. M. Tuning Ind. Amplifier
6L6G Power Output
5U4G Rectifier

Tuning Ranges

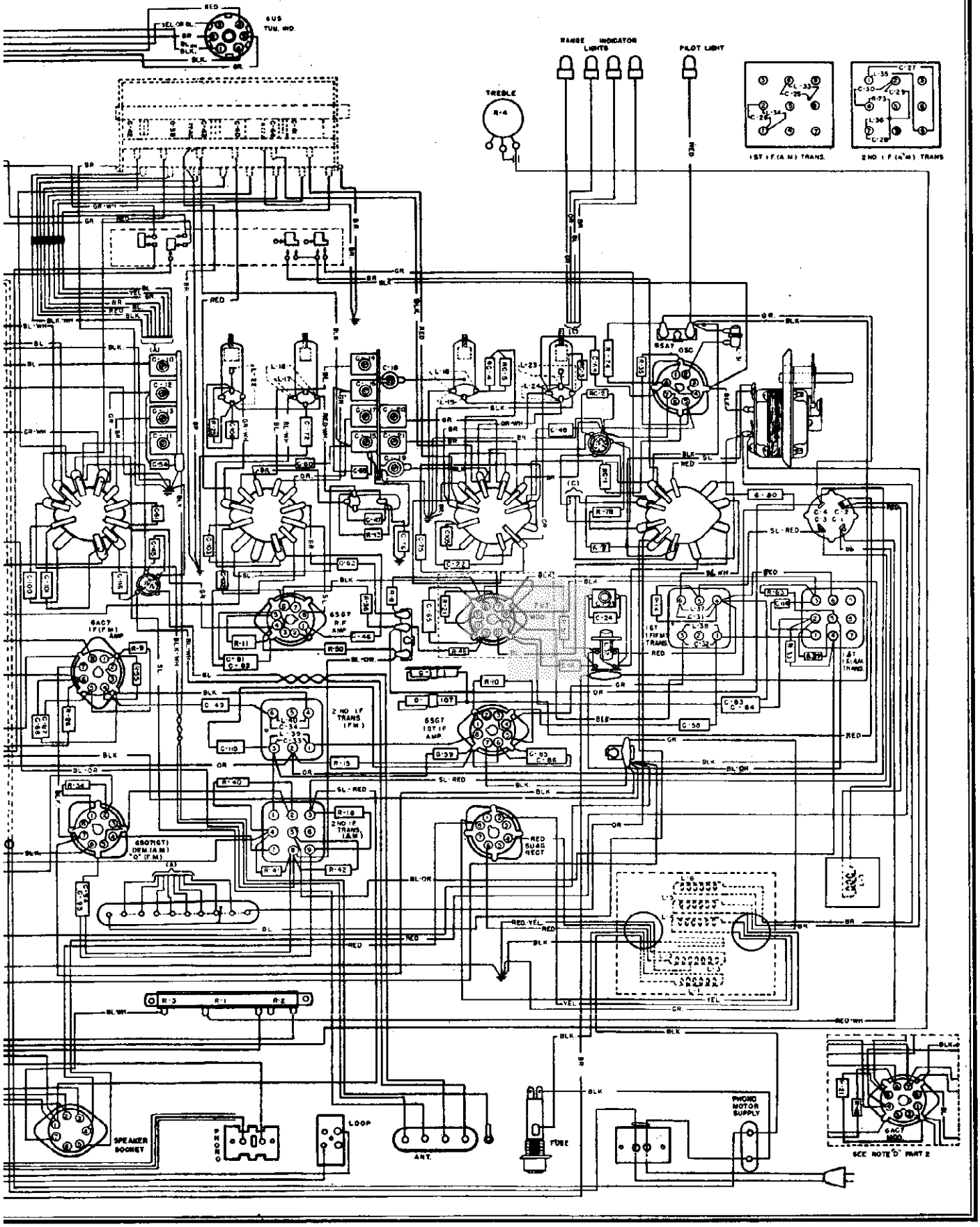
Standard Broadcast 540 to 1600 Ki
Short Wave 8.8 to 12 Megacycles
Short Wave 14.4 to 18 Megacycles
Frequency Modulation 42 to 50 Me

FARNSWORTH CAPEHART P44 RECORD CHANGER USED IN MODEL 935 PL.
WEBSTER 41 RECORD CHANGER USED IN MODELS 935PF, 935PR.
FOR DATA ON THESE, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

Input Power Rating	935-M	205 Watts
	935-PF, PL, PR.	235 Watts
Intermediate Frequency	455 Kilocycles (Amplitude Modulation)	
	4.3 Megacycles (Frequency Modulation)	
Speaker Field Coil Resistance		345 Ohms
Speaker Voice Coil Impedance		10 Ohms
Power Output		19 Watts at 10% Distortion

. MFG. CO.

Model	Input Power Frequency	Chassis	Cabinet	Speaker	Phonograph Equipment
935-M	50-60 cycles	33842	33950	33963	Use a Stromberg-Carlson Record Player
935-PF	50-60 cycles	33842	34075	33963	33989
935-PL	50-60 cycles	33842	34090	33963	34066
935-PR	50-60 cycles	33842	34077	33963	33989



VOLTAGE READING AT 120 V. LINE

Type	Function	1	2	3	4	5	6	7	8
		0	0	0	—	0.8*	122	6.3	272
†† 6AB7	R. F. Amplifier	0	0	0	—	0.8*	114	6.3	272
		0	0	0	—	1.8*	101	6.3	275
†† 6AC7	Modulator	0	0	0	—	1.8*	112	6.3	275
		0	6.3	101	101	—	0	0	101
6SA7	Oscillator	0	6.3	95	95	—	0	0	95
		0	0	0	—	1.4*	200	6.3	266
†† 6AB7	1st I. F. Amp.	0	0	0	—	1.4*	200	6.3	266
		0	0	0	—	1.2*	165	6.3	263
6AC7	2nd I. F. Amp.	0	0	0	—	1.2*	158	6.3	263
		0	0	0	—	3.5*	63	6.3	227
6SJ7	1st Limiter	0	0	0	—	0	35	6.3	45
		0	0	70	26	70	110	6.3	235†
6SJ7	2nd Limiter	0	0	47	45*	47	100	6.3	235†
		0	0	—	—	—	—	6.3	—
6H6	Discriminator	0	0	—	—	—	—	6.3	—
	A. M. Detector	0	—	0	—	0	0.6‡	6.3	0
6SQ7	F. M. "Q"	0	—	0	—	0	0.5‡	6.3	0
		0	—	1.2*	—	0	113	6.3	0
6SQ7	1st Audio Amp.	0	—	1.2*	—	0	113	6.3	0
		0	86	—	—	86	1.0*	6.3	0
6SC7	Driver and Inverter	0	86	—	—	86	1.0*	6.3	0
		0	0	268	276	—	85	6.3	16
6L6G	Power Output (2)	0	0	268	276	—	85	6.3	16
		—	36.4	—	365	—	365	—	364
5U4G	Rectifier	—	36.4	—	365	—	365	—	364
		6.3	50	—	275	20	0		
6U5	Tuning Indicator	6.3	50	—	275	20	0		
	F. M. Tuning Ind.	0	0	—	—	0	0	6.3	0
6SC7	Amplifier	0	50	—	—	50	0.8*	6.3	0
		276	0	0	364		—	343	
—	Speaker Socket	276	0	0	364		—	343	

†† WHERE THE FOLLOWING TUBES ARE USED IN THESE STAGES THE VOLTAGES LISTED APPLY

Tube	Function	1	2	3	4	5	6	7	8
		0	270	77	0	0	—	2.8*	6.3
7V7	Modulator	0	275	72	0	0	—	2.6*	6.3
		0	0	1.5 *	—	1.5*	145	6.3	270
6SG7	R. F. Amplifier	0	0	1.6*	—	1.6*	140	6.3	260
		0	0	2.0*	—	2.0*	135	6.3	260
6SG7	1st I. F. Amp.	0	0	2.0*	—	2.0*	132	6.3	260

Upper values are for Broadcast Band.
Lower values are for F. M. Band.
*** Use 10 volt scale. All others except AC on 500 volt scale. 1000 ohm per voltmeter used on DC.**
† Value is for white dot showing on "Q" switch, with white dot not showing these values change to 100 volts.
‡ Value shown is for white dot showing; white dot not showing, value is zero. Rectifier filament voltage is 4.6 volts.

ALIGNING INFORMATION

Never Realign Unless Absolutely Necessary

If alignment is attempted, it will not be successful unless the instructions which follow are adhered to exactly.

The following equipment will be required:

1. Standard signal generator.
2. F. M. signal generator with wide band sweep circuit.
3. Oscillograph.
4. Volt ohmyst or equivalent.

ALIGNING PROCEDURE (AMP. MOD.)

I. Intermediate Frequency Adjustments (A. M.)

1. Set the range switch to standard broadcast position.
2. Tune set to 1000 kc.
3. Connect the ground terminal of the signal generator to the ground terminal of the chassis.
4. Introduce a modulated signal of 455 kilocycles to the grid of the modulator tube, using a 0.1 mf. Capacitor in series with the output lead of the signal generator.
5. Adjust the following I. F. aligners for maximum output.
   - A. Secondary of second I. F. transformer.
   - B. Primary of second I. F. transformer.
   - C. Secondary of first I. F. transformer.
   - D. Primary of first I. F. transformer.
   - E. Tertiary of first I. F. circuit.

II. Radio Frequency Adjustments (A. M.)
Standard Broadcast Range (A Band)

1. Replace the 0.1 mf. capacitor in series with the output lead of the signal generator with a 200 mmf. capacitor and connect it to the antenna terminal of the chassis. Be sure loop antenna is plugged in.
2. Set the signal generator frequency and the receiver tuning dial to 600 kc.
3. Set the range switch to the standard broadcast range (A Band).
4. Adjust the 600 kc. oscillator and R. F. aligners (iron cores) for maximum signal.
5. Set the signal generator frequency and the receiver tuning dial to 1500 kc.
6. Adjust the 1500 kc. oscillator, R. F. and antenna aligning capacitors for maximum signal.
7. Repeat operations five and six.

1st Short Wave Spread Band (Red)

1. Replace the 0.1 mf. capacitor in series with the output lead from the signal generator with a 400 ohm carbon type resistor and connect it to the antenna terminal of the chassis.
2. Ground the F. M. dipole terminal which is nearest the ground binding post.
3. Switch to Red Band.
4. Set the signal generator frequency and the receiver tuning dial to 12 megacycles.
5. Adjust the oscillator R. F. and antenna aligning capacitors for maximum signal.
6. Set pointer to 9.0 megacycles on dial and adjust oscillator, R. F. and antenna iron cores for a maximum.
7. Repeat operations 3, 4 and 5.

2nd Short Wave Spread Band (Green)

1. Leave the signal generator connected in the same manner.
2. Switch to Green Band.
3. Set the signal generator frequency and the receiver tuning dial to 17 megacycles.
4. Adjust the oscillator, R. F. and antenna trimmers for maximum signal.

ALIGNING PROCEDURE (FREQ. MOD.)

I. Intermediate Frequency Adjustments (F. M.)

Note: All I. F. adjustments are made using a wide band sweep signal generator with a sweep circuit of plus or minus 300 kilocycles.

1. Switch to F. M. band.
2. Tune the set to the extreme high frequency end of the dial (50 megacycles).
3. Connect a volt ohmyst or equivalent between ground and terminal 6 of the 6SQ7 "Q" tube socket.
4. Connect the oscillograph between same points as Volt Ohmyst.
5. Connect the ground terminal of the wide band sweep signal generator to the ground terminal of the 6AC7 second I. F. tube socket.
6. Introduce a signal of 4.3 megacycles to the grid of the 6AC7 second I. F. tube socket (terminal No. 4) using a 0.1 mf. capacitor in series with the output lead of the signal generator. Maintain a reading of about two volts on the Volt Ohmyst.
7. Adjust the secondary and primary of the third I. F. transformer for maximum reading.
8. Connect the output lead of the wide band sweep signal generator and the 0.1 microfarad capacitor in series with it to the grid of the first I. F. tube socket terminal No. 4.
9. Connect the ground lead of the signal generator to the ground terminal of the first I. F. tube socket.
10. Adjust the second I. F. transformer in the same manner.
11. Connect the output lead of the wide band sweep signal generator with the 0.1 microfarad capacitor in series with it to the grid of the Modulator tube.
12. Adjust the first I. F. transformer in the same manner.

II. Discriminator Adjustment (F. M.)

1. Connect the ground terminal of the standard unmodulated signal generator to the ground terminal of the first I. F. tube socket.
2. Connect the output lead of the unmodulated standard signal generator to the grid of the first I. F. tube (terminal No. 4) using a 0.1 microfarad capacitor in series with the output lead of the standard signal generator.
3. Place "Q" switch in position where white dot does not show.
4. Ground terminal 8 of 6H6 socket.
5. Connect the Volt Ohmyst across one half of the discriminator load (from ground to the junction of the two .1 megohm resistors R-66 and R-67.
6. Set the attenuator of the standard signal generator for maximum output.
7. Adjust the primary of the discriminator transformer for maximum reading.
8. Connect the volt ohmyst across the whole discriminator load (from ground to the junction of R-66, 0.1 megohm resistor and C-76 .04 mf. capacitor).
9. Adjust the secondary of the discriminator transformer for center "O" reading.
10. Vary the frequency of the standard signal generator making sure that the voltage peaks, which should be of the same magnitude, are the same number of kilocycles off on either side of resonance. Any departure from these conditions may be corrected by a slight readjustment of the primary.
11. Remove ground from terminal 8 of 6H6 tube socket.

Radio Frequency Adjustments (F. M.)

1. Set the signal generator frequency and the receiver tuning dial to 48.5 megacycles.
2. Connect a wire between the ground binding post and the nearest F. M. dipole connection.
3. Replace the 0.1 microfarad capacitor in series with the output lead from the signal generator with a 100 ohm resistor and connect it to the other F. M. terminal on the back of the chassis.
4. Connect Volt Ohmyst between ground and terminal No. 6 of the 6SQ7, "Q" tube socket.
5. Adjust the oscillator aligner (Air trimmer) for maximum signal.
6. Adjust the R. F. and antenna aligners for maximum signal.

MODEL 920
MODELS 935 and 955

STROMBERG-CARLSON TEL. MFG. CO.

INSTRUCTIONS FOR SETTING UP PUSH BUTTONS

MODEL 920

IMPORTANT: The stations selected should be the local or favorite stations which give good reception at all times.

Set up stations in the daytime to avoid unnecessary interference.

Allow the set to run for about twenty minutes before setting up stations.

1. **Turn the receiver "On".**
2. **Push in the "Radio" button.**
3. **Set the Range Switch as follows:**
   a. **If an external antenna is used, set knob so arrow points to designation "ANT.".**
   b. **If the built-in loop antenna is used, set knob so arrow points to designation "Loop".**
4. **Turn volume control about three-quarters of the way on (in a clockwise direction).**
5. **Pull the six station push buttons off their levers.**
6. **Remove the call letters of the six selected stations from the call letter sheets, which are in an envelope stapled to the cabinet. Insert the station call letters part way in the slots at the sides of the buttons. Next, insert a transparent tab in each slot in front of the station letters. Then push both the transparent tabs and the call letters all the way into the slot. A pencil eraser may be helpful.**
7. **Loosen the set screw of the lever to be set up.**
8. **Push in the lever and manually tune in the desired station, observing the tuning indicator in order to obtain exact resonance.**

   IMPORTANT: For accurate set-up, be sure that the lever is pushed in, in the same manner and with the same amount of pressure as will be used when operating the push buttons.
9. **Tighten the set screw. Be sure not to disturb the adjustment in any way while tightening the screw.**
10. **Place the proper button on the lever.**
11. **Check the accuracy of the adjustment by detuning the station and retuning with the button several times, pushing the button with an even pressure. Readjust if necessary.**
12. **Set up the other five stations in the same manner.**

MODEL 935
MODEL 955

IMPORTANT. The eight selected broadcast stations should be local or favorite stations which give good reception at all times. Set up stations in the daytime to avoid unnecessary interference. Allow the set to run for about twenty minutes before setting up stations. Always use the tuning indicator unit when setting up stations in order to determine when the station is correctly tuned in.

1. Turn the receiver "on" by rotating the "Off-On-Volume" control.
2. Push in the button designated, "Radio".
3. Decide which buttons are to be used for F. M. stations and which for standard broadcast stations. (Button No. 1 is the extreme right-hand button.)

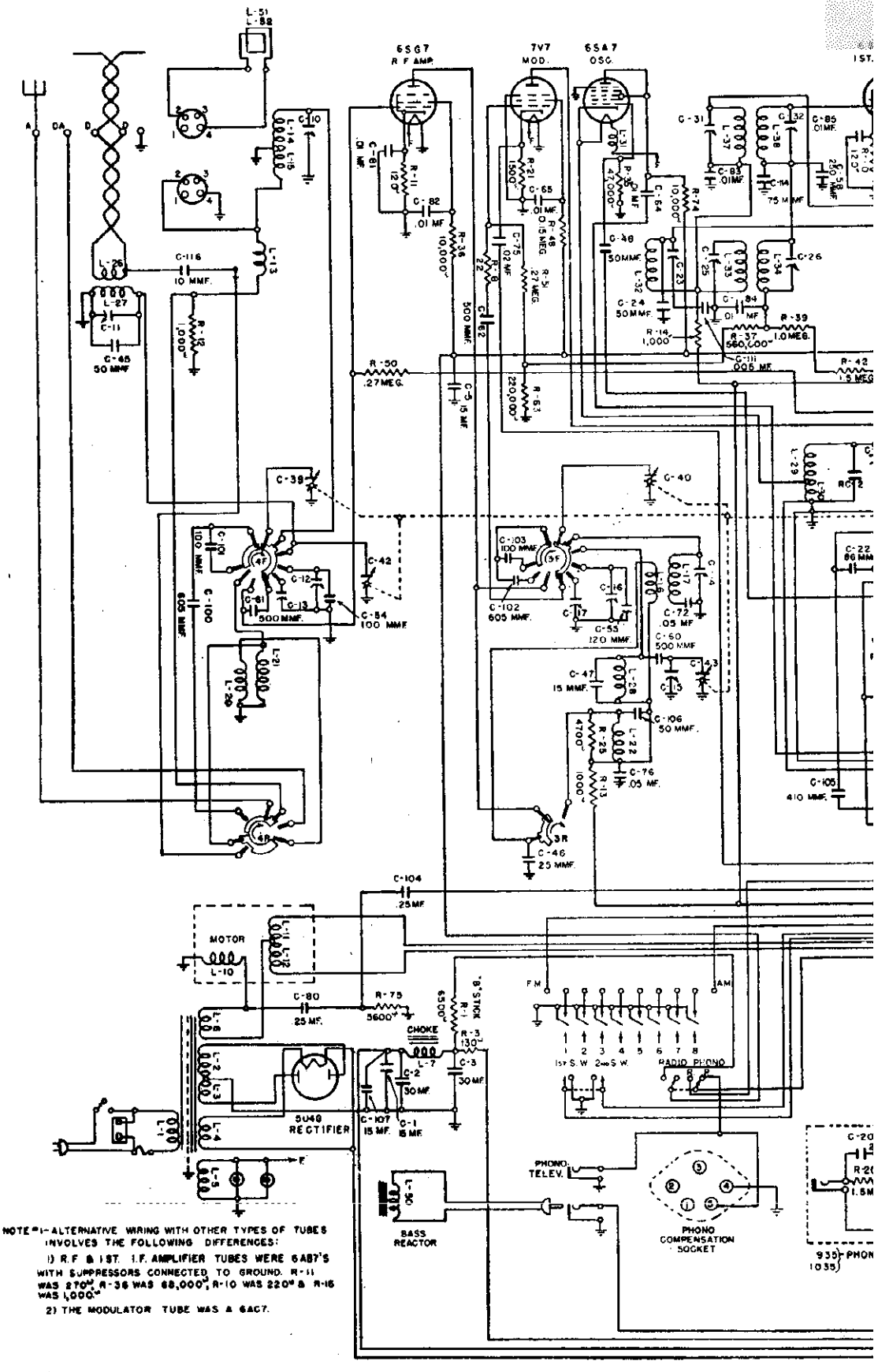
   On the push-button set-up terminal strip (see Figure 3), connect the F. M. button terminal to the end terminal labelled F. M., and the standard broadcast button terminals to the other end terminal labelled A. M.

   NOTE: All station buttons may be used for either the F. M. or standard broadcast range, but if it is desired to tune in both F. M. stations and standard broadcast stations either manually or with push buttons, at least one station button must be set up for each range.
4. Turn the Volume control to about three-quarters of its maximum rotation (in clockwise directions).
5. Pull the eight station push buttons off their levers.
6. Remove the station identification tabs from the sheets which will be found in the envelope stapled to the cabinet. For stations located in the standard broadcast range, call letters are provided; for identification of F. M. stations, assigned channel numbers from 21 to 99 are provided for the push buttons. Push buttons set up for F. M. stations should be designated by inserting the appropriate channel number tabs.

   For example, assume that a local F. M. station's call is W51R. This indicates that its assigned frequency is 45.1 megacycles. Therefore, the channel number tab, 51, which corresponds to the last two numbers of the assigned frequency would be inserted in the push button. Channel numbers for F. M. stations will not be repeated in the same or nearby localities; thus the tabs provided will always be suitable for these stations. Insert the station identification tabs part way in the slots at the sides of the buttons. Next insert a transparent tab in each slot in front of the station identification tabs. Then push both the transparent tab and the station identification tabs all the way into the slot.
7. Loosen the set screw of the lever to be set up.
8. Push in the lever and manually tune in the desired station, observing the tuning indicator in order to obtain exact resonance.

   IMPORTANT. For accurate set up, it is essential that the lever be pushed in, in the same manner and with the same amount of pressure as will be used in the normal operation of the push buttons.
9. Tighten the set screw. **Be sure not to disturb the adjustment in any way while tightening the screw.**
10. Place the proper button on the lever.
11. Check the accuracy of the adjustment by detuning the station and returning with this button several times, pushing the button with an even pressure. Readjust if necessary.
12. Set up the other seven stations in the same manner.

In order that the push buttons may be set up for either A. M. or F. M. stations we have provided a terminal strip in the rear of the chassis which has ten screw type terminals. The F. M. connection is on the left end (facing the rear of the chassis), the A. M. connection on the right. It is possible, therefore, to connect any one of the eight push button terminals for either A. M. or F. M. operation by merely connecting the push button terminals required for F. M. operation to the terminal marked F. M. and the buttons to be used on the A. M. band to terminal marked A. M. When the sets leave our factory terminals one and two are connected for F. M., the other six for A. M. **See cut below.**



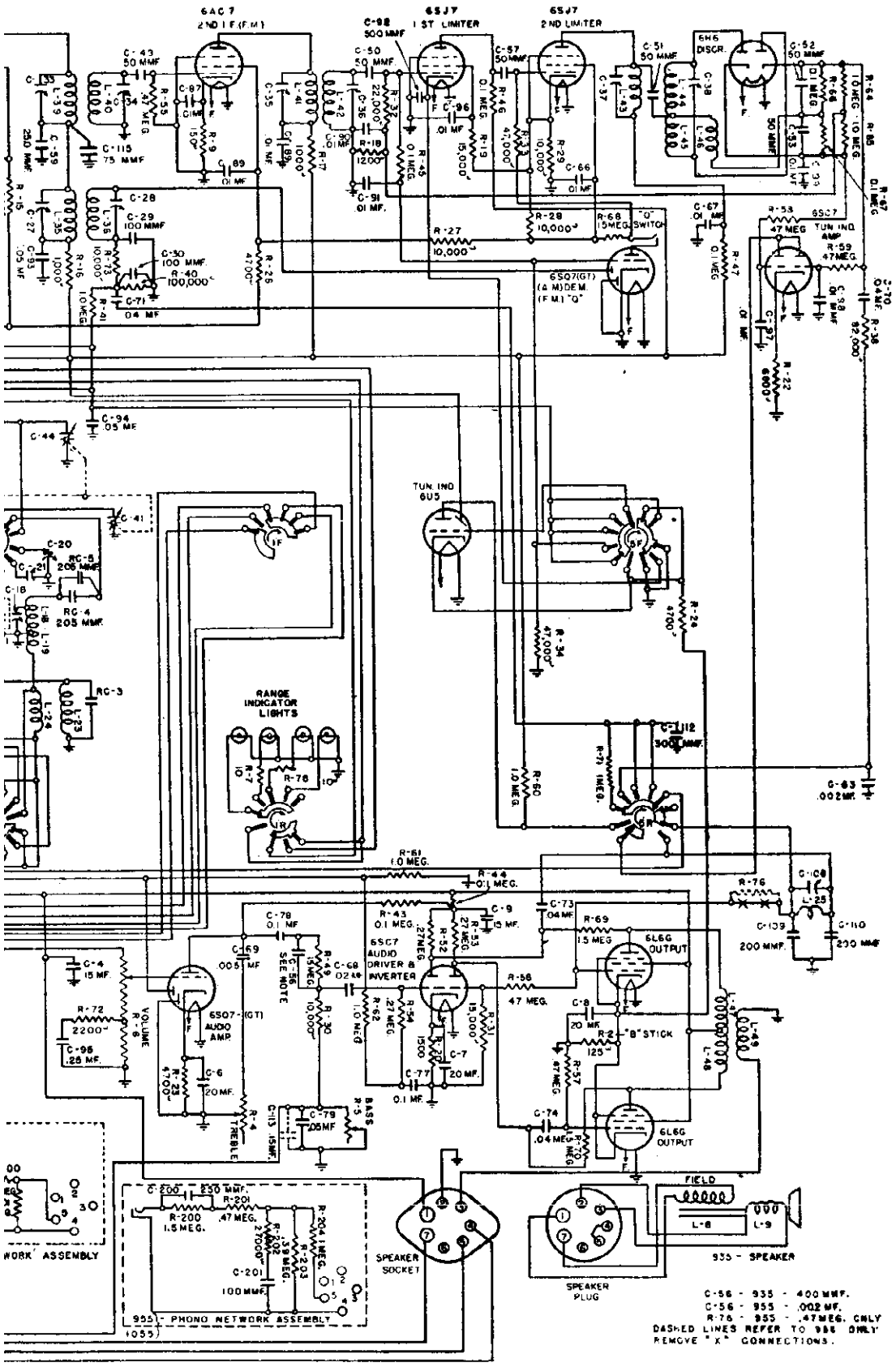
NOTE #1- ALTERNATIVE WIRING WITH OTHER TYPES OF TUBES INVOLVES THE FOLLOWING DIFFERENCES:

1) R.F. & 1ST. I.F. AMPLIFIER TUBES WERE 6AB7'S WITH SUPPRESSORS CONNECTED TO GROUND. R-11 WAS 270Ω, R-36 WAS 68,000Ω, R-10 WAS 220Ω & R-16 WAS 1,000Ω.

2) THE MODULATOR TUBE WAS A 6AG7.

IF PEAKS **AM-455 KC**
FM-4.3 MC

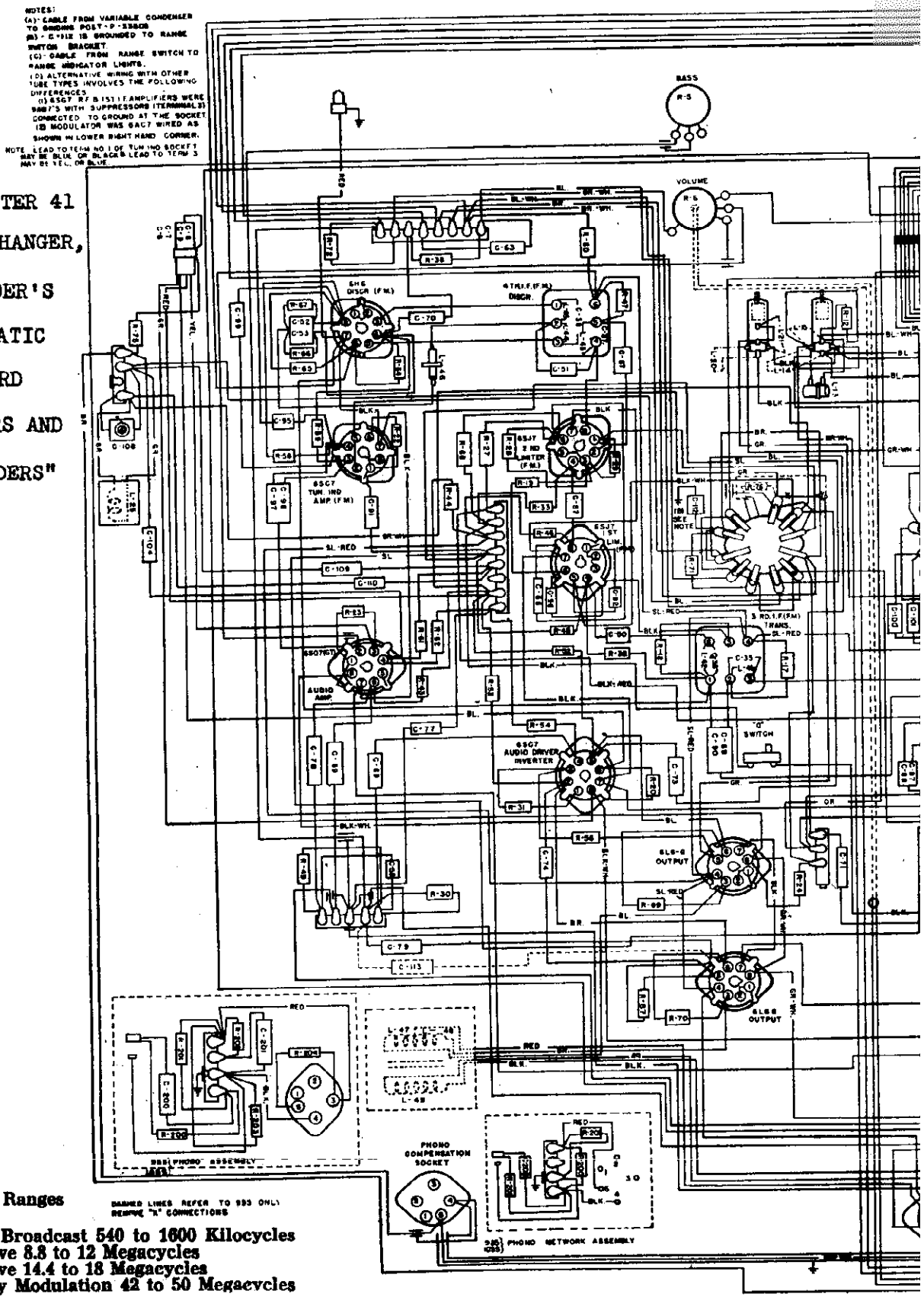
LSON TEL. MFG. CO.



MODEL 955-PF

STROMBERG-CAR

FOR WEBSTER 41 RECORD CHANGER, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS"



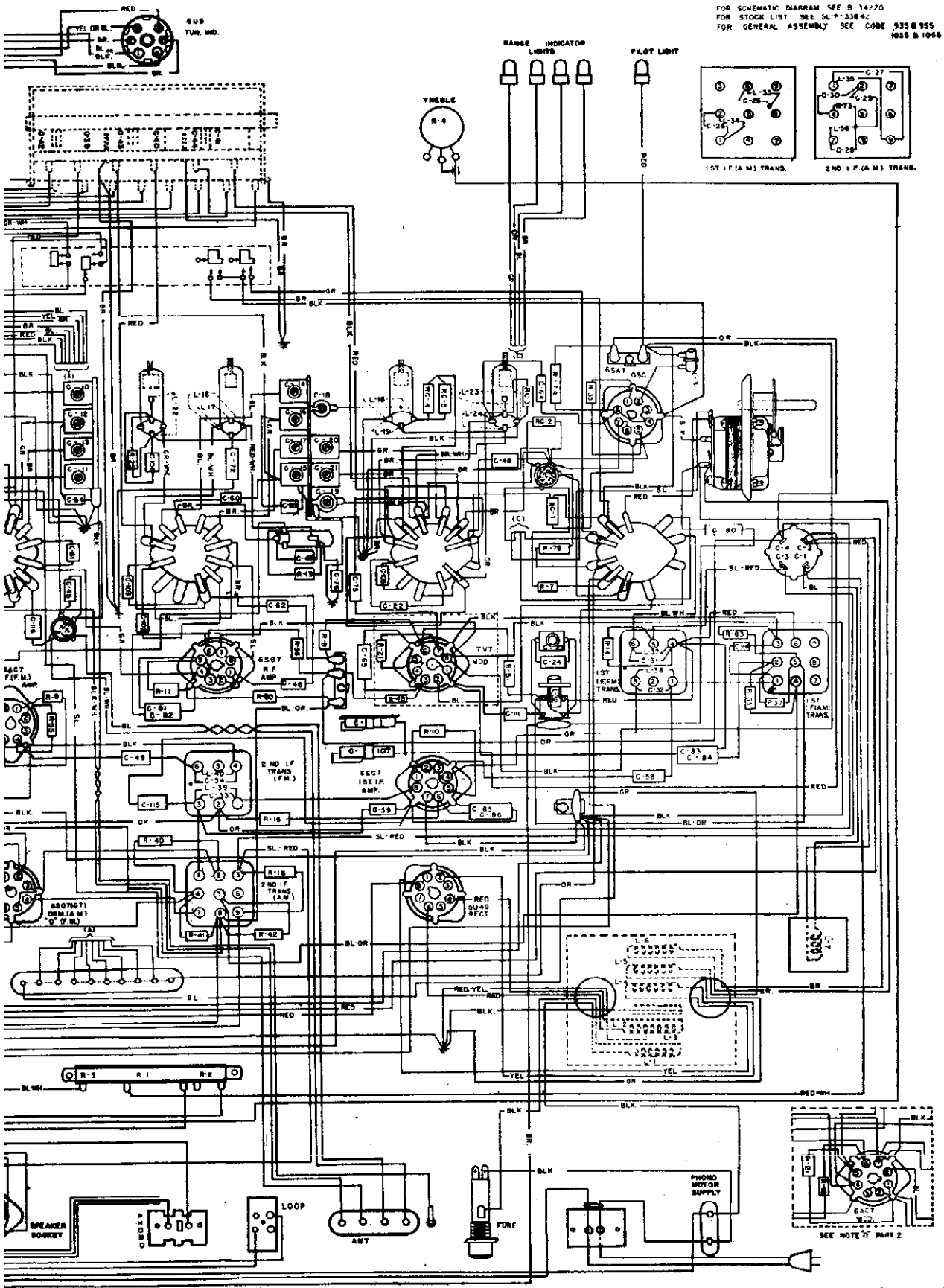
Tuning Ranges

DASHED LINES REFER TO 933 ONLY REMOVE "X" CONNECTIONS

Standard Broadcast 540 to 1600 Kilocycles
Short Wave 8.8 to 12 Megacycles
Short Wave 14.4 to 18 Megacycles
Frequency Modulation 42 to 50 Megacycles

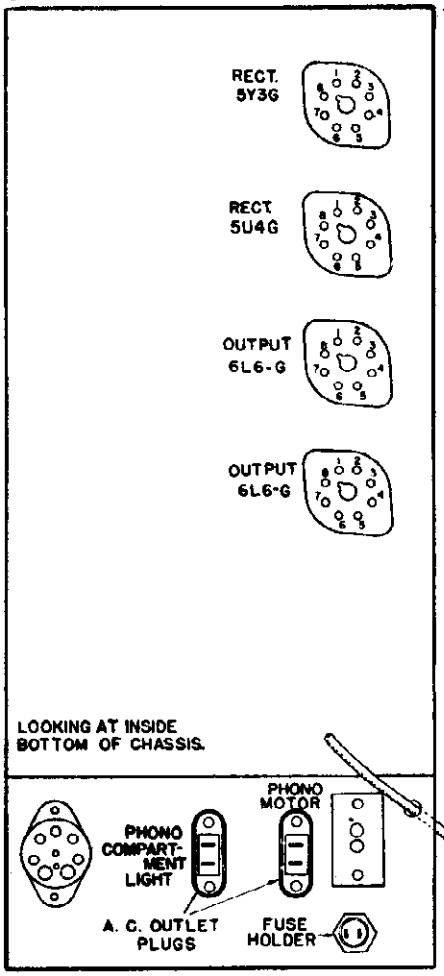
Model	Input Power Frequency	Chassis	Cabinet	Speaker	Phonograph Equipment
955-PF	50-60 Cycles	34033	34038	{ 34036 Lo-F 33765 Hi-F }	33989

N TEL. MFG. CO.



ut Power Rating, 955-PF_____320 Watts including Phono Motor
ermediate Frequency____{455 Kilocycles (Amplitude Modulation) / 4.3 Megacycles (Frequency Modulation)
aker Field Coil Resistance—Low Frequency Speaker____345 Ohms
Speaker Voice Coil Impedance {Low Freq. 12 Ohms / High Freq 11 Ohms
Power Output _____ 30 Watts at 10% Distortion

STROMBERG-CARLSON TEL. MFG. CO.



Location Chart—Amplifier

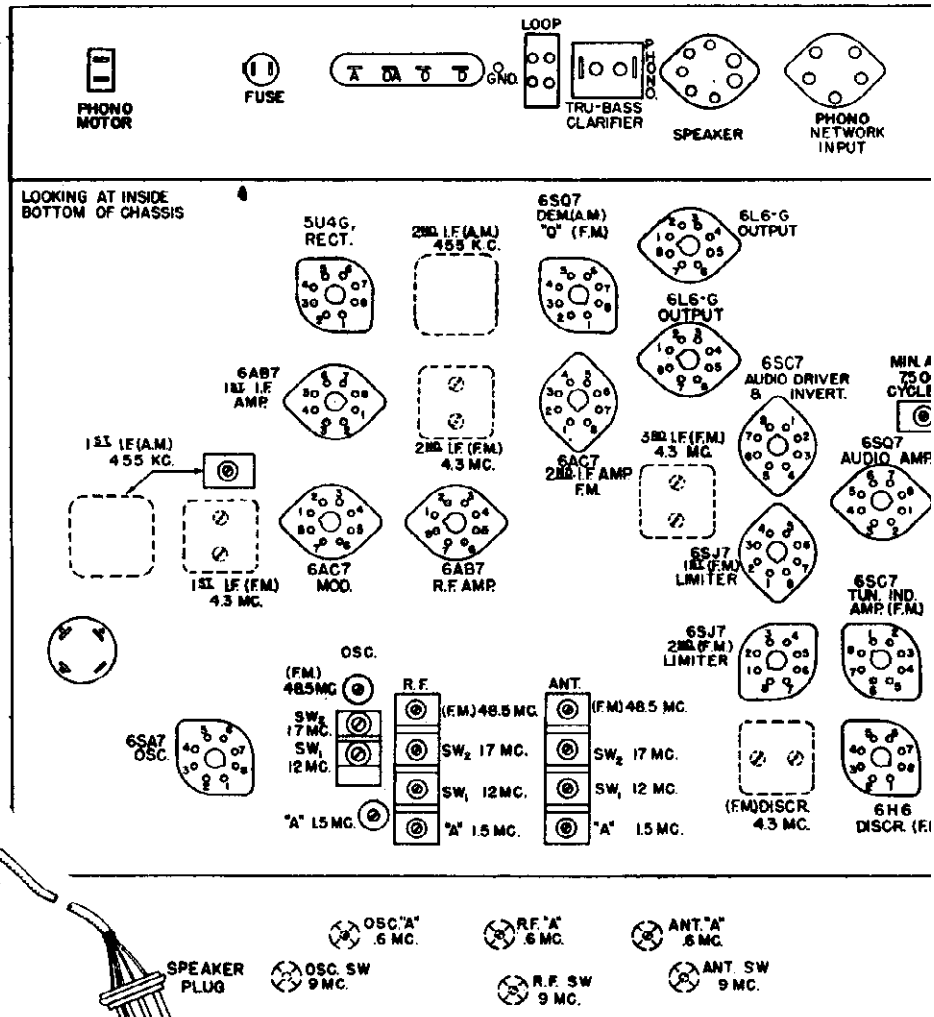
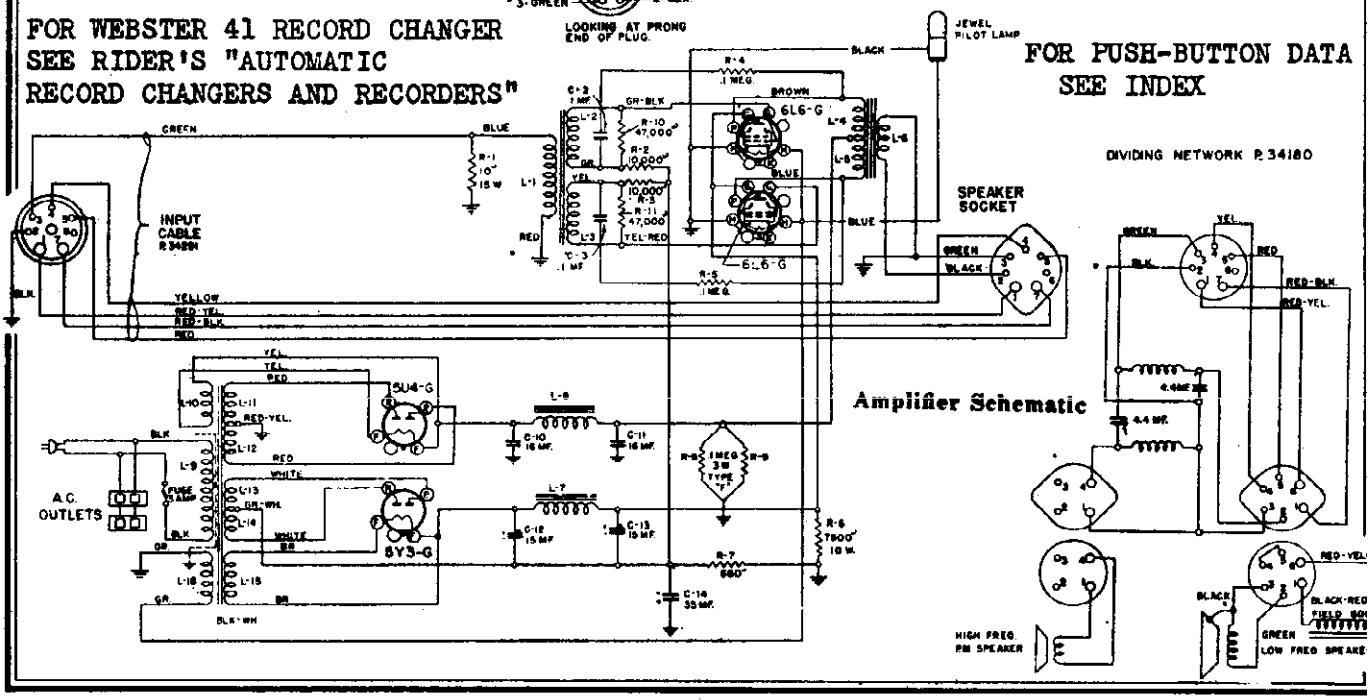


Fig. 2—Location Chart—Tuner

FOR WEBSTER 41 RECORD CHANGER SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS"

FOR PUSH-BUTTON DATA SEE INDEX



Amplifier Schematic

VOLTAGE READING TUNER CHASSIS AT 120 V. LINE

Type	Function	1	2	3	4	5	6	7	8
		0	0	0	—	0.8*	122	6.3	272
†† 6AB7	R. F. Amplifier	0	0	0	—	0.8*	114	6.3	272
		0	0	0	—	1.8*	101	6.3	275
†† 6AC7	Modulator	0	0	0	—	1.8*	112	6.3	275
		0	6.3	101	101	—	0	0	101
6SA7	Oscillator	0	6.3	95	95	—	0	0	95
		0	0	0	—	1.4*	200	6.3	266
†† 6AB7	1st I. F. Amp.	0	0	0	—	1.4*	200	6.3	266
		0	0	0	—	1.2*	185	6.3	263
6AC7	2nd I. F. Amp.	0	0	0	—	1.2*	158	6.3	263
		0	0	0	—	3.5*	63	6.3	227
6SJ7	1st Limiter	0	0	0	—	0	35	6.3	45
		0	0	70	26	70	110	6.3	235†
6SJ7	2nd Limiter	0	0	47	45*	47	100	6.3	235†
		0	0	—	—	—	—	6.3	—
6H6	Discriminator	0	0	—	—	—	—	3.3	—
	A. M. Detector	0	—	0	—	0	0.6‡	6.3	0
6SQ7	F. M. "Q"	0	—	0	—	0	0.5‡	6.3	0
		0	—	1.2*	—	0	113	6.3	0
6SQ7	1st Audio Amp.	0	—	1.2*	—	0	113	6.3	0
		0	86	—	—	86	1.0*	6.3	0
6SC7	Driver and Inverter	0	86	—	—	86	1.0*	6.3	0
		0	0	268	278	—	85	6.3	16
6L6G	Power Output (2)	0	0	268	278	—	85	6.3	16
		—	36.4	—	365	—	365	—	364
5U4G	Rectifier	—	36.4	—	365	—	365	—	364
		6.3	50	—	275	20	0		
6U5	Tuning Indicator	6.3	50	—	275	20	0		
	F. M. Tuning Ind.	0	0	—	—	0	0	6.3	0
6SC7	Amplifier	0	50	—	—	50	0.8*	6.3	0
		276	0	0	364		—	343	
—	Speaker Socket	276	0	0	364		—	343	

†† WHERE THE FOLLOWING TUBES ARE USED IN THESE STAGES THE VOLTAGES LISTED APPLY

Tube	Function	1	2	3	4	5	6	7	8
		0	270	77	0	0	—	2.8*	6.3
7V7	Modulator	0	275	72	0	0	—	2.0*	6.3
		0	0	1.5 *	—	1.5*	145	6.3	270
6SG7	R. F. Amplifier	0	0	1.6*	—	1.6*	140	6.3	260
		0	0	2.0*	—	2.0*	135	6.3	260
6SG7	1st I. F. Amp.	0	0	2.0*	—	2.0*	132	6.3	260

Upper values are for Broadcast Band.
Lower values are for F. M. Band.
*** Use 10 volt scale. All others except AC on 500 volt scale. 1000 ohm per voltmeter used on DC.**
† Value is for white dot showing on "Q" switch, with white dot not showing these values change to 100 volts.
‡ Value shown is for white dot showing; white dot not showing, value is zero. Rectifier filament voltage is 4.8 volts.

POWER AMPLIFIER VOLTAGE TABLE

Tube	Function	1	2	3	4	5	6	7	8
6L6G	Output (2)	0	0	386	290	—27	386	6.3	0
5U4G	Rectifier	—	390	—	535	—	535	—	390
5Y3G	Rectifier	—	292	—	375	—	375	—	292
Speaker Socket		276	0	0	364	364	—	343	

5U4G Rectifier Filament 4.75 Volts AC
5Y3G Rectifier Filament 4.75 Volts AC

ALIGNING PROCEDURE (AMP. MOD.)

I. Intermediate Frequency Adjustments (A. M.)

1. Set the range switch to standard broadcast position.
2. Tune set to 1000 kc.
3. Connect the ground terminal of the signal generator to the ground terminal of the chassis.
4. Introduce a modulated signal of 455 kilocycles to the grid of the modulator tube, using a 0.1 mf. Capacitor in series with the output lead of the signal generator.
5. Adjust the following I. F. aligners for maximum output.

A. Secondary of second I. F. transformer.
B. Primary of second I. F. transformer.
C. Secondary of first I. F. transformer.
D. Primary of first I. F. transformer.
E. Tertiary of first I. F. circuit.

II. Radio Frequency Adjustments (A. M.)
Standard Broadcast Range (A Band)

1. Replace the 0.1 mf. capacitor in series with the output lead of the signal generator with a 200 mmf. capacitor and connect it to the antenna terminal of the chassis. Be sure loop antenna is plugged in.
2. Set the signal generator frequency and the receiver tuning dial to 600 kc.
3. Set the range switch to the standard broadcast range (A Band).
4. Adjust the 600 kc. oscillator and R. F. aligners (iron cores) for maximum signal.
5. Set the signal generator frequency and the receiver tuning dial to 1500 kc.
6. Adjust the 1500 kc. oscillator, R. F. and antenna aligning capacitors for maximum signal.
7. Repeat operations five and six.

1st Short Wave Spread Band (Red)

1. Replace the 0.1 mf. capacitor in series with the output lead from the signal generator with a 400 ohm carbon type resistor and connect it to the antenna terminal of the chassis.
2. Ground the F. M. dipole terminal which is nearest the ground binding post.
3. Switch to Red Band.
4. Set the signal generator frequency and the receiver tuning dial to 12 megacycles.
5. Adjust the oscillator R. F. and antenna aligning capacitors for maximum signal.
6. Set pointer to 9.0 megacycles on dial and adjust oscillator, R. F. and antenna iron cores for a maximum.
7. Repeat operations 3, 4 and 5.

2nd Short Wave Spread Band (Green)

1. Leave the signal generator connected in the same manner.
2. Switch to Green Band.
3. Set the signal generator frequency and the receiver tuning dial to 17 megacycles.
4. Adjust the oscillator, R. F. and antenna trimmers for maximum signal.

ALIGNING PROCEDURE (FREQ. MOD.)

I. Intermediate Frequency Adjustments (F. M.)

Note: All I. F. adjustments are made using a wide band sweep signal generator with a sweep circuit of plus or minus 300 kilocycles.

1. Switch to F. M. band.
2. Tune the set to the extreme high frequency end of the dial (50 megacycles).
3. Connect a volt ohmyst or equivalent between ground and terminal 6 of the 6SQ7 "Q" tube socket.
4. Connect the oscillograph between same points as Volt Ohmyst.
5. Connect the ground terminal of the wide band sweep signal generator to the ground terminal of the 6AC7 second I. F. tube socket.
6. Introduce a signal of 4.3 megacycles to the grid of the 6AC7 second I. F. tube socket (terminal No. 4), using a 0.1 mf. capacitor in series with the output lead of the signal generator. Maintain a reading of about two volts on the Volt Ohmyst.
7. Adjust the secondary and primary of the third I. F. transformer for maximum reading.
8. Connect the output lead of the wide band sweep signal generator and the 0.1 microfarad capacitor in series with it to the grid of the first I. F. tube socket terminal No. 4.
9. Connect the ground lead of the signal generator to the ground terminal of the first I. F. tube socket.
10. Adjust the second I. F. transformer in the same manner.
11. Connect the output lead of the wide band sweep signal generator with the 0.1 microfarad capacitor in series with it to the grid of the Modulator tube.
12. Adjust the first I. F. transformer in the same manner.

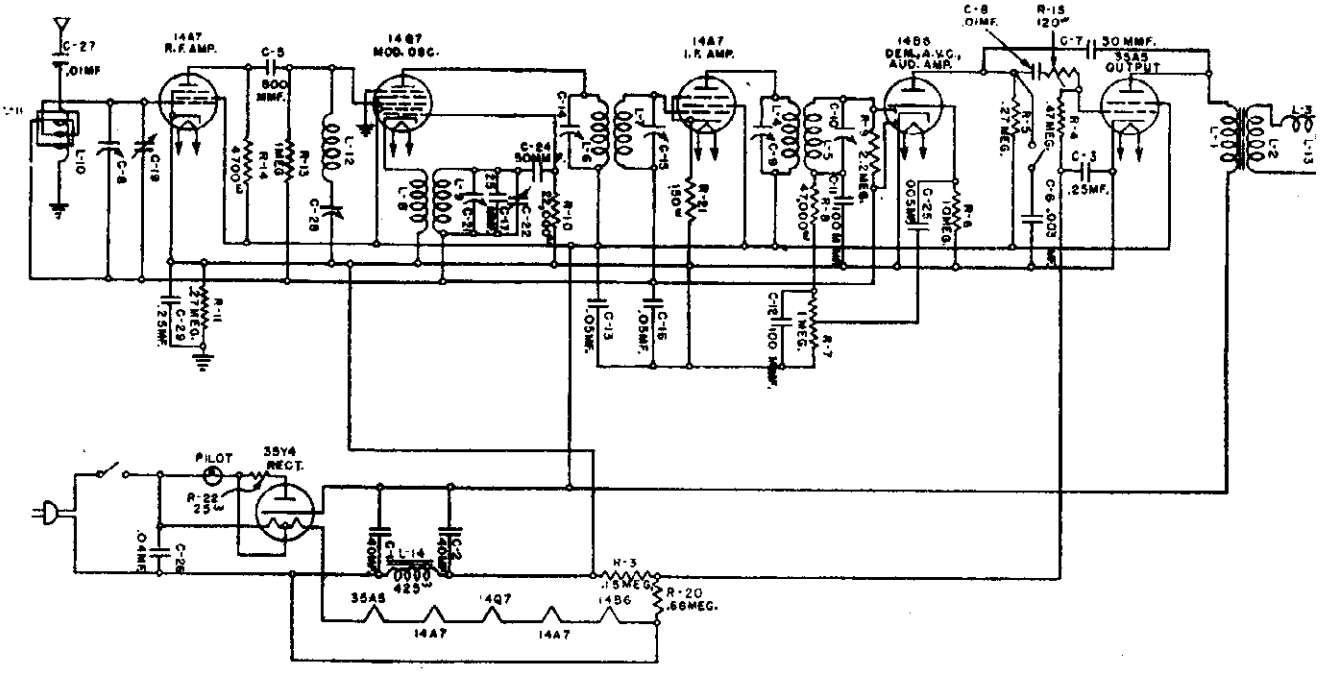
II. Discriminator Adjustments (F. M.)

1. Connect the ground terminal of the standard unmodulated signal generator to the ground terminal of the first I. F. tube socket.
2. Connect the output lead of the unmodulated standard signal generator to the grid of the first I. F. tube (terminal No. 4) using a 0.1 microfarad capacitor in series with the output lead of the standard signal generator.
3. Place "Q" switch in position where white dot does not show.
4. Ground terminal 8 of 6H6 socket.
5. Connect the Volt Ohmyst across one half of the discriminator load (from ground to the junction of the two .1 megohm resistors R-66 and R-67).
6. Set the attenuator of the standard signal generator for maximum output.
7. Adjust the primary of the discriminator transformer for maximum reading.
8. Connect the volt ohmyst across the whole discriminator load (from ground to the junction of R-66, 0.1 megohm resistor and C-70 .04 mf. capacitor).
9. Adjust the secondary of the discriminator transformer for center "O" reading.
10. Vary the frequency of the standard signal generator making sure that the voltage peaks, which should be of the same magnitude, are the same number of kilocycles off on either side of resonance. Any departure from these conditions may be corrected by a slight readjustment of the primary.
11. Remove ground from terminal 8 of 6H6 tube socket.

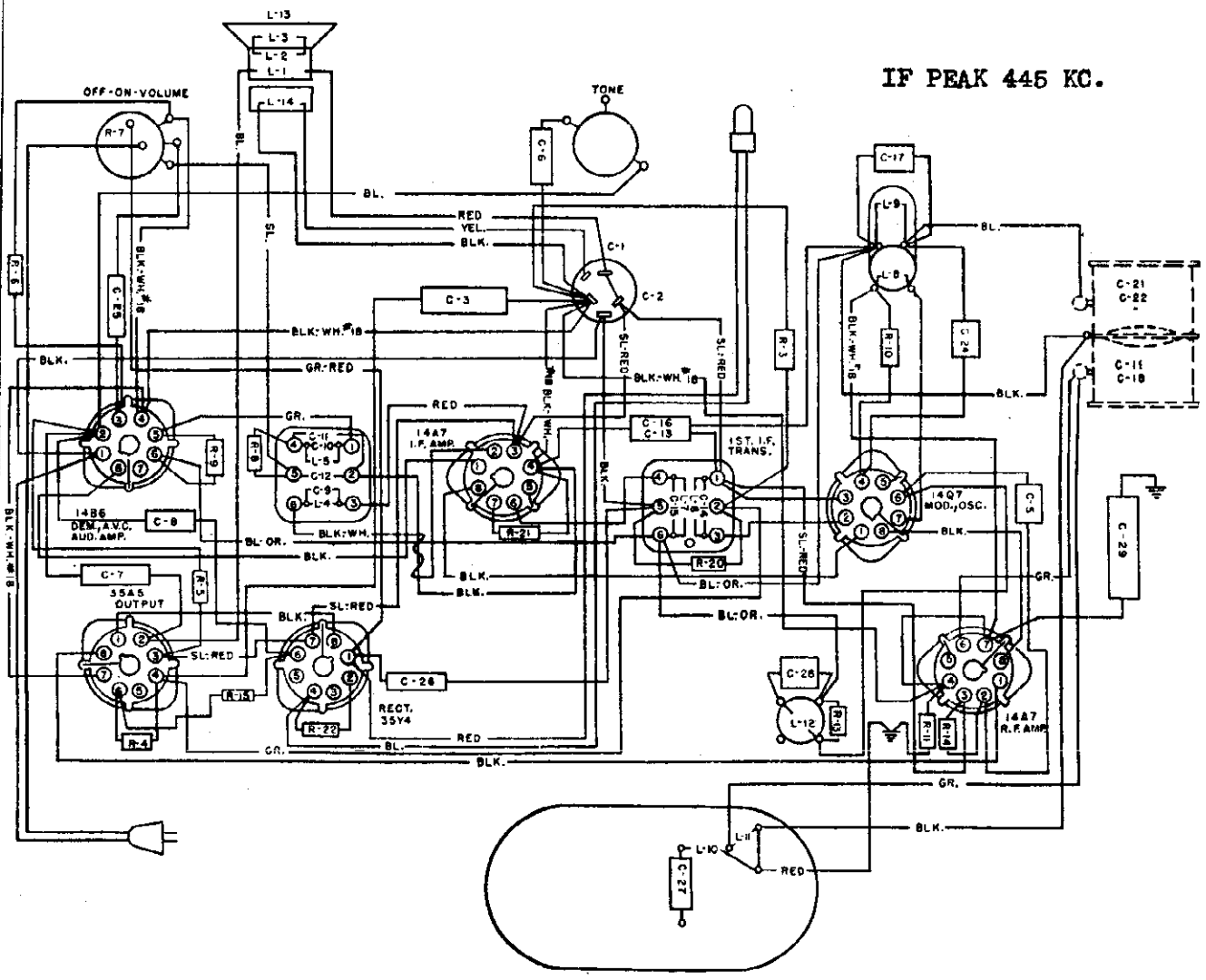
Radio Frequency Adjustments (F. M.)

1. Set the signal generator frequency and the receiver tuning dial to 48.5 megacycles.
2. Connect a wire between the ground binding post and the nearest F. M. dipole connection.
3. Replace the 0.1 microfarad capacitor in series with the output lead from the signal generator with a 100 ohm resistor and connect it to the other F. M. terminal on the back of the chassis.
4. Connect Volt Ohmyst between ground and terminal No. 6 of the 6SQ7, "Q" tube socket.
5. Adjust the oscillator aligner (Air trimmer) for maximum signal.
6. Adjust the R. F. and antenna aligners for maximum signal.

STROMBERG-CARLSON TEL. MFG. CO.



IF PEAK 445 KC.



MODELS 1000H, 1000J

STROMBERG-CARLSON TEL. MFG. CO.

The 1000 series is similar to 900 series except for tube complement, and small circuit changes, all of which are shown here.

IDENTIFICATION TABLE

Model		Input Power Frequency	Chassis	Cabinet	Speaker
1000-H	Brown and Ivory	25-60 Cycles AC (or DC)	34498	33528	34505
1000-J	Burgundy and Ivory	25-60 Cycles AC (or DC)	34498	33961	34505

SPECIFICATIONS

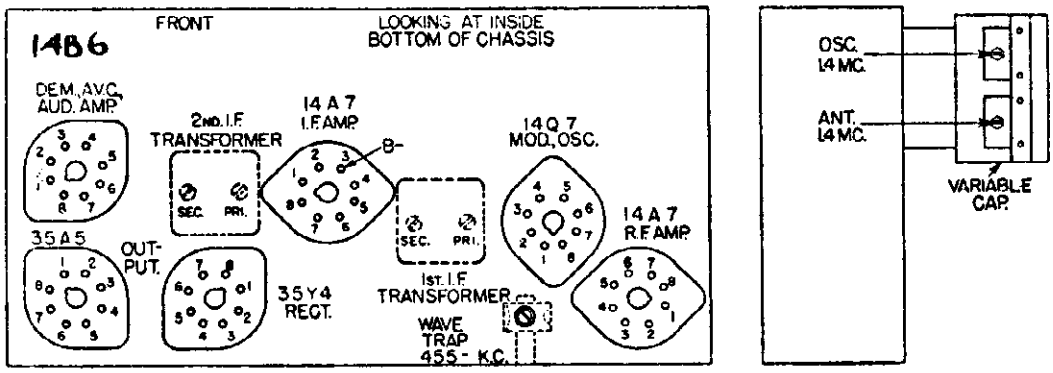
Voltage Rating ..... 105-125 Volts
Type of Circuit ..... Superheterodyne
Tuning Range ..... .54 to 1.65 Megacycles
Number and type of tubes—6
1—14A7 R. F. Amplifier
1—14Q7 Modulator and Oscillator
1—14A7 I. F. Amplifier
1486 1— Demodulator, AVC and Audio
1—35A5 Output
1—35Y4 Rectifier
Input Power Rating ..... 30 Watts
Intermediate Frequency ..... 455 Kilocycles
Speaker Voice Coil Impedance ..... Approximately 3.5 Ohms
Speaker Field Coil Resistance ..... 425 Ohms
Power Output ..... .0.65 Watts 10% Distortion, 1.25 Watts Maximum

VOLTAGE TABLE

		TERMINALS							
Tube	*Use*	1	2	3	4	5	6	7	8
14A7	R. F. Amp.	56 AC	42	82	0	0	0	0	45 AC
14Q7	Mod. Osc.	35 AC	82	82	0	0	0	0	45 AC
14A7	I. F. Amp.	32 AC	82	83	0	0	0	1.5	35 AC
1486	Dem., AVC. Audio	32 AC	61	0	0	0	0	0	32 AC
35A5	Output	92 AC	76	83	—5	0	—5	0	112 AC
35Y4	Rectifier	125 AC	120 AC	0	120 AC	0	—5	83	92 AC

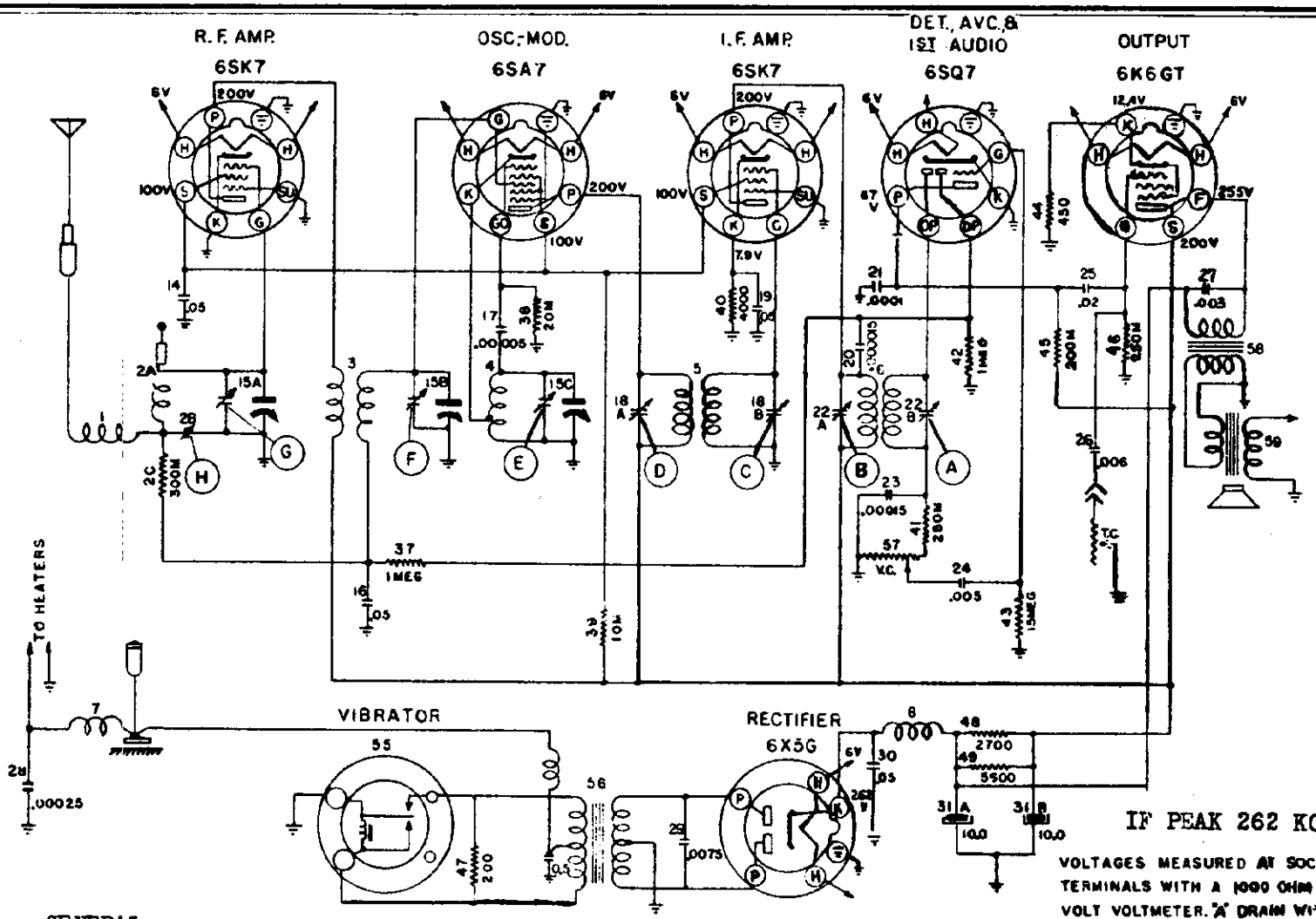
Read on 100 V. scale of meter having a resistance of 1000 ohms per volt.
Voltages measured to — B
120 V. line

LOCATION CHART



REPLACEMENT PARTS

Piece No.	Circuit Designation	Part
34506	C-1, 2 . . .	Capacitor
29973	C-3	Capacitor
27305	C-7	Capacitor
26367	R-20	Resistor
26323	R-21	150 Ohm Resistor
34587	R-22	25 Ohm Resistor
26359	R-3	.15 Megohm Resistor
34590	. . . . .	Tube Socket
34505	. . . . .	Speaker



GENERAL

MOUNTING--Universal.

TUBES--Six.

SPEAKER--7" Dynamic.

TUNING--Manual Control Only.

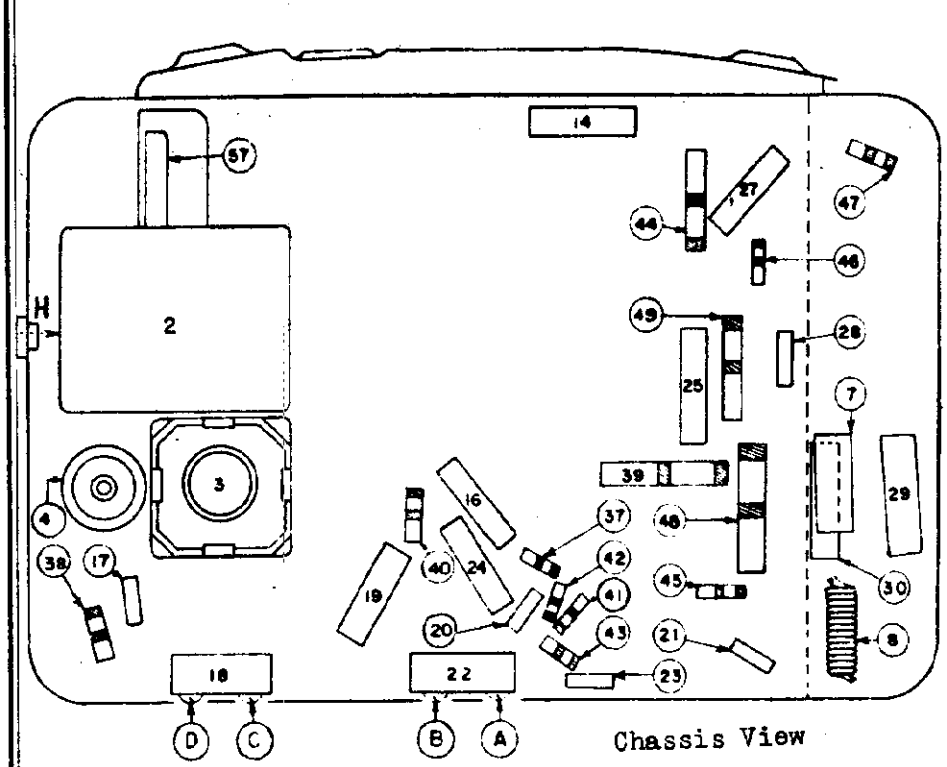
CAR ANTENNA CAPACITY--.000050 Mfd. to .000225 Mfd.

TUNING RANGE--540 - 1530 K.C.

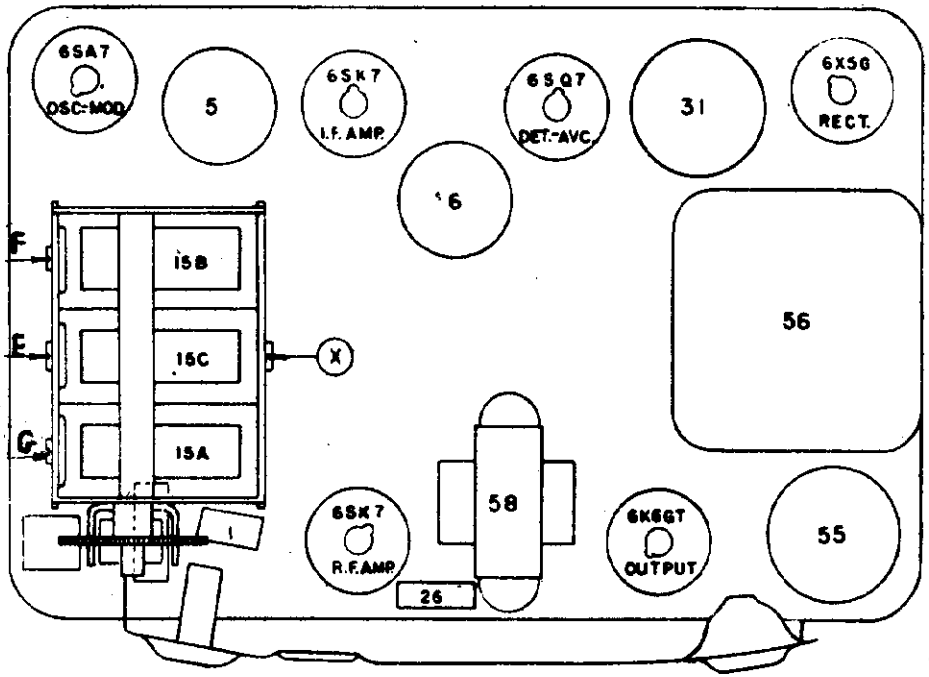
Delco R-698

Date: 3-27-41

Tube View



Chassis View



TUBE VIEW

Series Condenser Dummy Antenna	Connect To	Signal Generator Frequency	Adjust Screws In Order
0.1 Mfd.	Grid Side 15B	262 K.C.	A B C D
.000070 Mfd.	Antenna Terminal	1530 K.C.	E
.000070 Mfd.	Antenna Terminal	1400 K.C.	F G
.000070 Mfd.	Antenna Terminal	600 K.C.	H
.000070 Mfd.	Antenna Terminal	1400 K.C.	F G

ALIGNMENT PROCEDURE

VOLUME CONTROL MAXIMUM.

SIGNAL GENERATOR MINIMUM FOR SATISFACTORY OUTPUT INDICATION.

Adjust trimmer (H) to match car antenna (600 K.C.) when radio is installed.

Trimmer (X) is in parallel with trimmer (E) and has been set at the factory. This should not be touched in the field.

UNITED MOTORS SERVICE

MODEL R-68
MODEL R-70
MODEL R-69

1. Superheterodyne Theory and Alignment

Most Auto Radios employ the superheterodyne circuit which uses an intermediate frequency (I-F) amplifier, the characteristics of which largely govern the selectivity of the receiver. The I-F amplifier characteristics are determined principally by the adjustment and design of the I-F transformers. It is, therefore, important that the I-F amplifier be correctly adjusted to provide the best selectivity. These adjustments may be in the form of adjustable trimmers connected across the coils or movable iron cores placed within the coils. During alignment, it is necessary only to adjust these trimmers or iron cores as specified in the tabular Alignment Procedure, to obtain the best operation.

Incorporated in every superheterodyne is a local oscillator, the output of which mixes with the incoming signal from the antenna. The local oscillator does not operate at the same frequency as the incoming signal which is to be received. The resonant (acceptance) frequency of the I-F amplifier establishes the difference in frequency required; 262 KC is commonly used. In most auto radios the local oscillator operates at a frequency higher than the incoming signal frequency. When the local oscillator output mixes with the incoming signal, the two predominating resultant frequencies produced are the sum and difference of the two frequencies. The design of most superheterodyne receivers is such that the difference in frequency is the same as the I-F amplifier resonant frequency. Modulation of the incoming signal will be present as modulation of input to the I-F amplifier.

2. Effects of R-F or I-F Misalignment

The effects of misaligned R-F or I-F stages are most commonly observed as a loss of sensitivity either over a portion or over the entire band; loss of selectivity, often characterized by the selectivity being noticeably unequal on the two sides of the point of best reception; change in fidelity; and inaccurate dial readings. Loss of Fidelity will be apparent as a loss of high or low audio frequencies. If the I-F amplifier is not tuned to the specified frequency, the oscillator and other tuned circuits will not track. The dial readings will then be incorrect and a portion of the band will have low sensitivity.

3. Alignment Preliminaries

The radio receiver should be functioning normally before the various aligning adjustments are made. The trouble shooting, if necessary, should precede the final alignment.

Receiving signals at the correct dial setting depends upon having the proper relation between tuning condenser or iron cores and the dial scale. Pointer or dial setting is necessary because the scales are not linear with frequency and all scales are precalibrated for maximum accuracy.

4. Test Oscillator Connection -- Dummy Antenna Use

The chassis or frame of the radio receiver is considered as being at ground potential and the "O" or "GND" terminal of the Test Oscillator should be connected to the chassis wherever good contact can be established.

The "Ant" or "High" terminal of the Test Oscillator output must be connected to the Antenna connector or other points in the radio receiver as specified in the Alignment Procedure. The use of a fixed condenser in series with the Test Oscillator lead, is specified in some instances. A .1 mfd. condenser is usually used in aligning the I-F stages and a smaller condenser is used in series with the antenna connector. This condenser, sometimes called a "Dummy Antenna", provides the proper input loading to the receiver. It is important that this condenser be connected at the point where the Test Oscillator lead joins the radio set, and should not be connected at the

test oscillator. In order to provide d-c bias to the tubes, the grid caps should be left connected if test oscillator connection is made also. Shielded leads should be used.

5. Output Meter Connections

Any standard type of output meter can be employed during alignment. The meter should be connected across either the primary or secondary of the output transformer. It is best to leave the voice coil connected while using the output meter. It is essential that an Output Meter with sufficient sensitivity be used to avoid the possibility of using too much Test Oscillator Output to get a readable indication on the Output Meter. Sometimes it is desirable to connect the output meter from the output tube plate to ground; when this connection is employed be sure that a .1 mfd. condenser is connected in series with the meter to afford protection from the d-c potential.

6. Alignment of the Tuned Circuits

Tuning adjustments with trimmers or adjustable iron cores is accomplished while applying a modulated signal, of the specified frequency, to the input of the stage being adjusted. Maximum Output Meter indication, of the amplitude of Audio-Frequency output, of the radio receiver, shows when tuning is correct.

The various, tuned circuits are aligned by adjusting each in this manner. During all alignment adjustments, the output of the Test Oscillator must be kept as low as possible, consistent with a reasonable output meter indication, to prevent A-V-C action from taking place and making all adjustments seem very broad.

The tuning tool used must have a minimum of metal so it will cause little or no tuning reaction. If removing the tool, after making an adjustment, reduces the output appreciably, a slight compensating mis-tuning will correct the error and produce maximum output when the tool is removed.

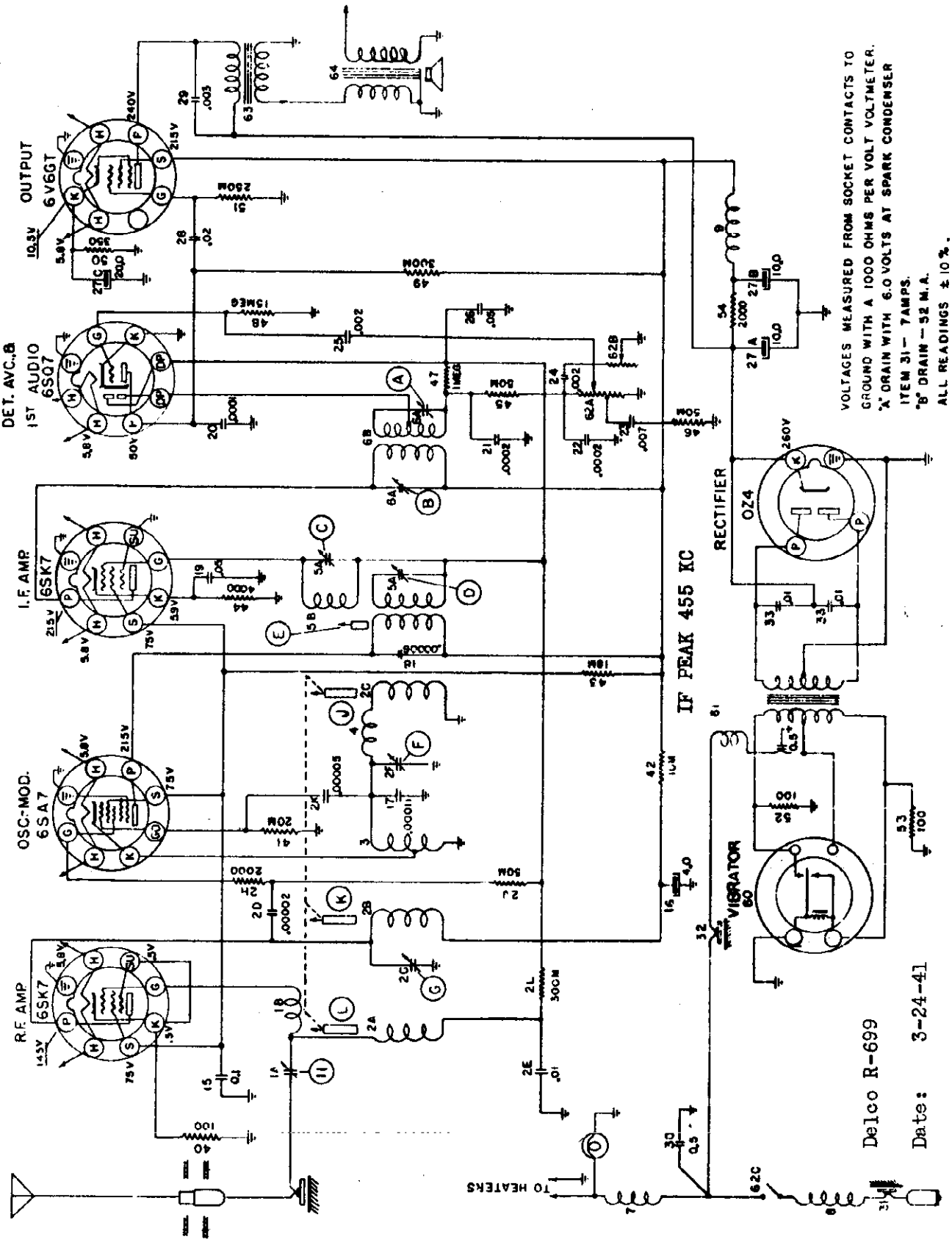
7. Rocking-In Adjustments

Provisions are incorporated in the Oscillator circuit of some Superheterodyne receivers for a tracking adjustment at the low frequency end of the band. This consists of a variable oscillator tracking condenser or magnetic core. Tuning frequencies specified in Alignment Procedure Table for making these adjustments should be carefully followed because the tuned circuits design is such that only this procedure will produce correct dial calibration.

For maximum sensitivity at low frequency end of the band, this should be a rocking adjustment. To make a rocking adjustment, change the setting of the specified oscillator tracking condenser or magnetic core slightly, then tune the gang condenser for maximum output regardless of dial setting, and note the exact reading of the output meter. Now repeat this procedure and note if the Output Meter reading so obtained is greater, or less than the first one. If the Second Reading is greater than the first, continue this process while changing the Oscillator tracking adjustment in the same direction until the highest possible output meter reading is obtained. If the second reading is less than the first, continue this process while changing the Oscillator tracking adjustment in the opposite direction until the highest possible output reading is obtained. The maximum amplitude setting which produces the most accurate dial calibration should be used.

This procedure increases the receiver sensitivity by effectively tuning the local Oscillator circuit simultaneously with the R-F and 1st Detector stages at the low frequency end of the band. Simultaneous adjustment is necessary to maintain correct tracking. An adjustment at the low-frequency end of a band should be followed by readjustments at the high frequency end because each tuning adjustment affects the other.

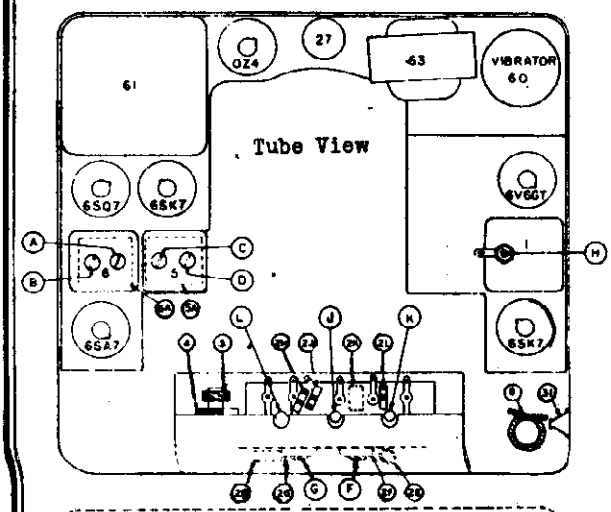
UNITED MOTORS SERVICE

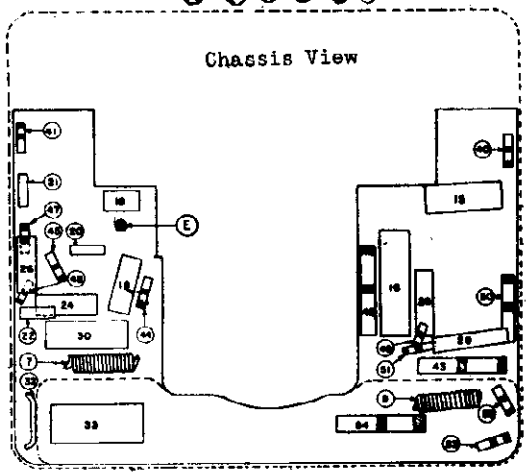


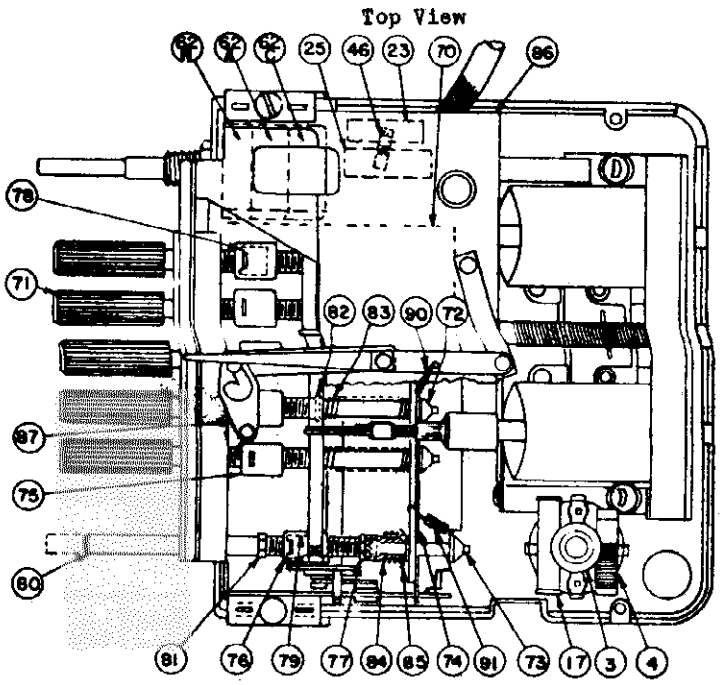
MODEL R-699

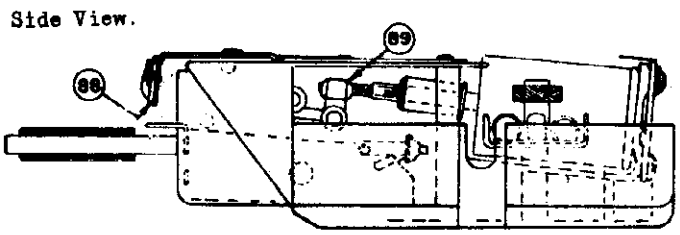
UNITED MOTORS SERVICE

LAYOUT DIAGRAMS









ALIGNMENT PROCEDURE

Volume Control Maximum.

Signal Generator output minimum for satisfactory output indication.

Series Condenser Or Dummy Antenna	Connect To	Signal Generator Frequency	Adjust Screws In Order
0.1 Mfd.	Grid side of Resistor 2H	455 K.C.	A B C D E
.00007 Mfd.	Antenna Terminal	1560 K.C.	F
.00007 Mfd.	Antenna Terminal	600 K.C.	G H

Adjust trimmer H to match car antenna (600 K.C.) when radio is installed.

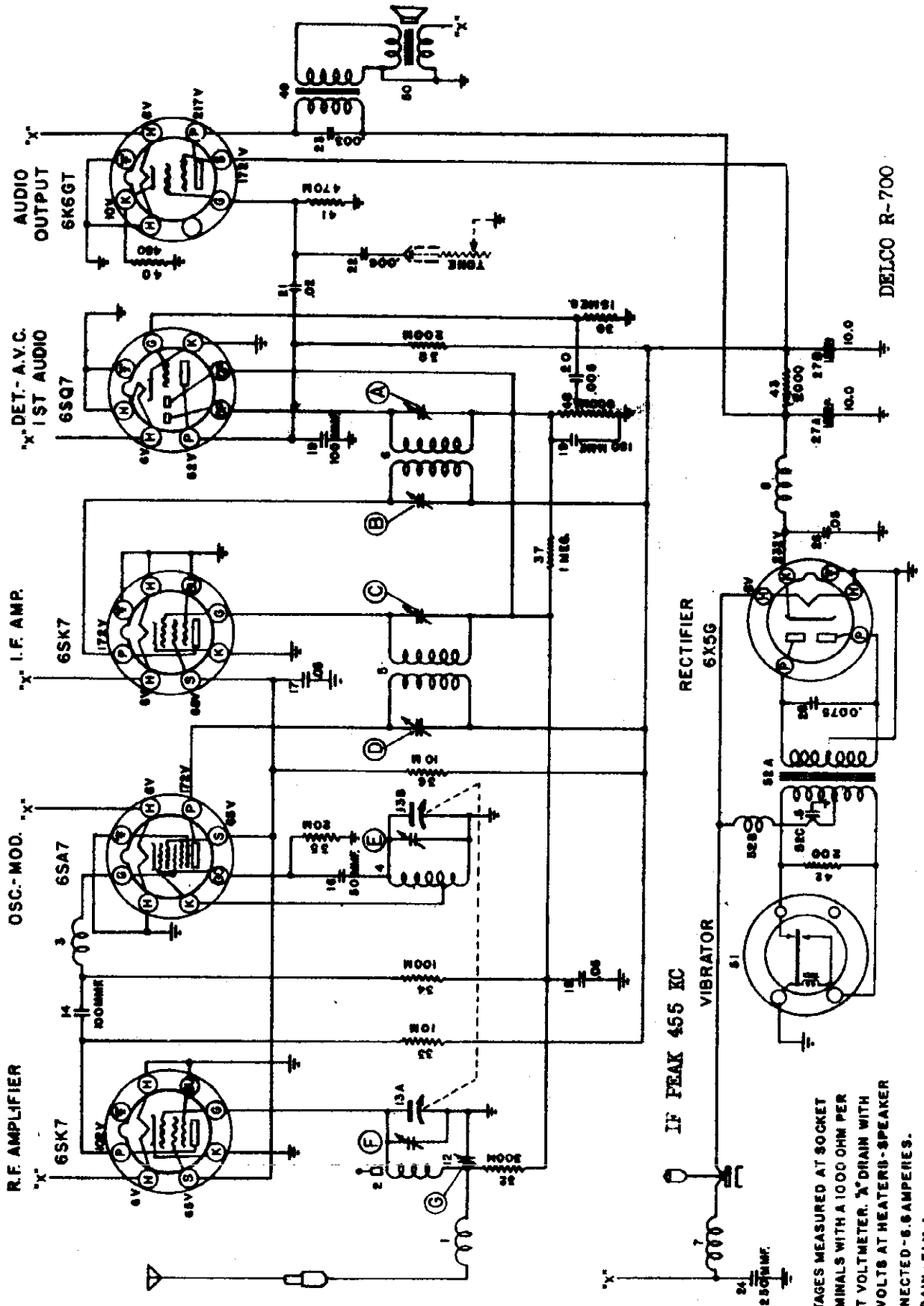
SPECIAL INSTRUCTIONS

FOR ALIGNMENT NOTES SEE INDEX

Mechanical Alignment of Iron Cores: Tune to stop at H.F. end of dial. Adjust oscillator core (J) to extend 1-3/8" from end of coil winding. Line up antenna and R.F. cores (K&L) as far out as the oscillator core. Adjust trimmer (F) (S. G. at 1560 K.C.). With S. G. at 1400, adjust (K&L) then follow electrical alignment shown above.

UNITED MOTORS SERVICE

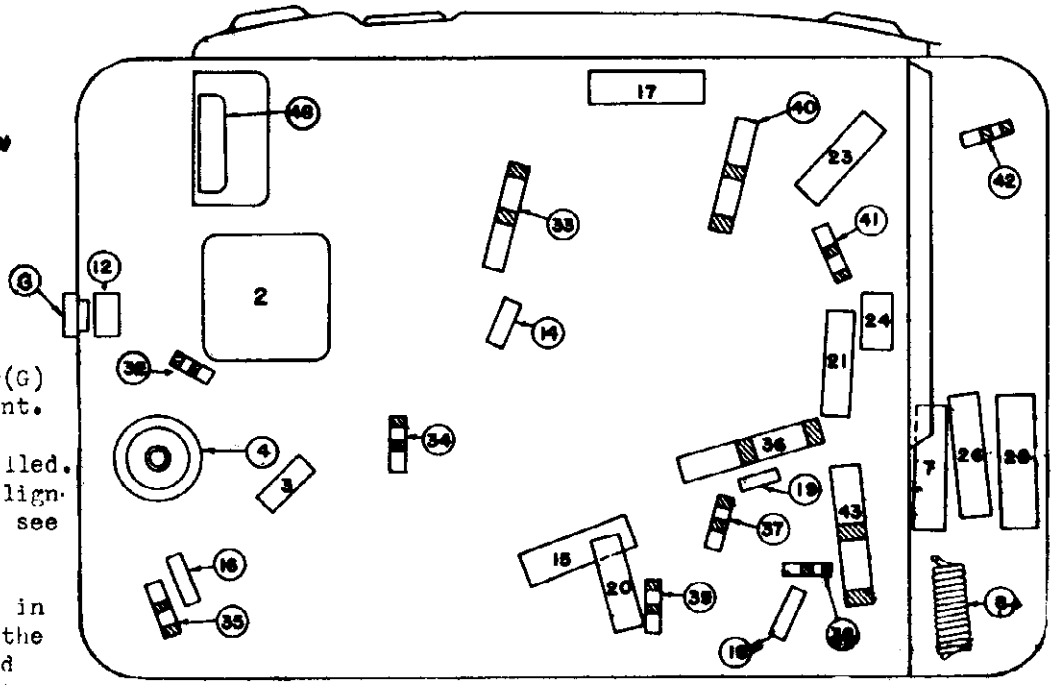
MODEL R-700



MODEL R-700

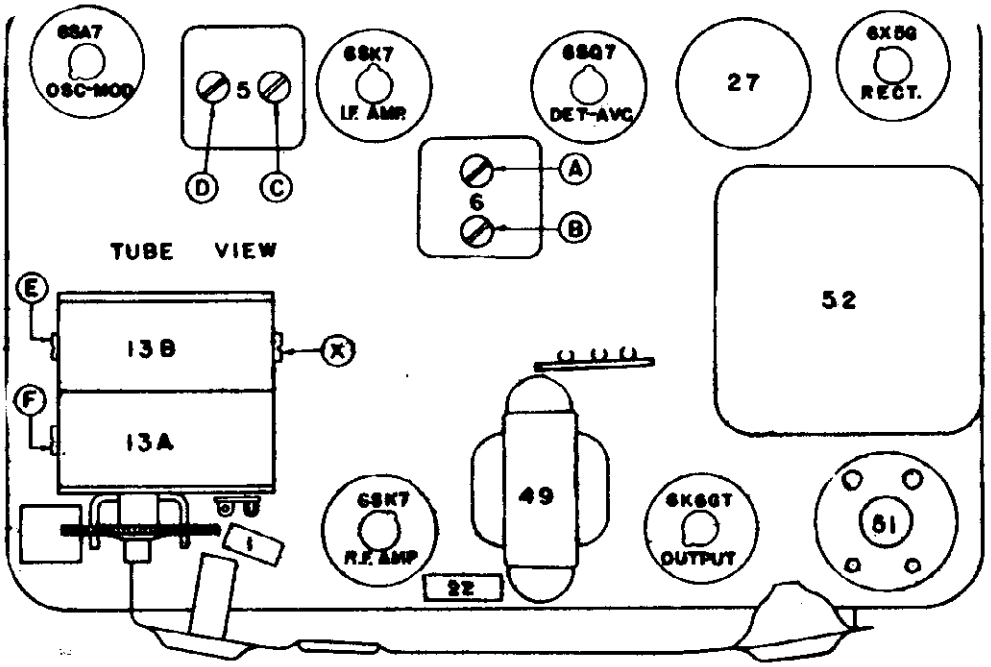
UNITED MOTORS SERVICE

CHASSIS VIEW



Adjust Trimmer(G) to match car ant. (600KC.) when radio is installed. For complete alignment procedure see Model R-698.

Trimmer(X) is in Parallel with the trimmer (E) and has been set at the factory. This should not be touched in the field.



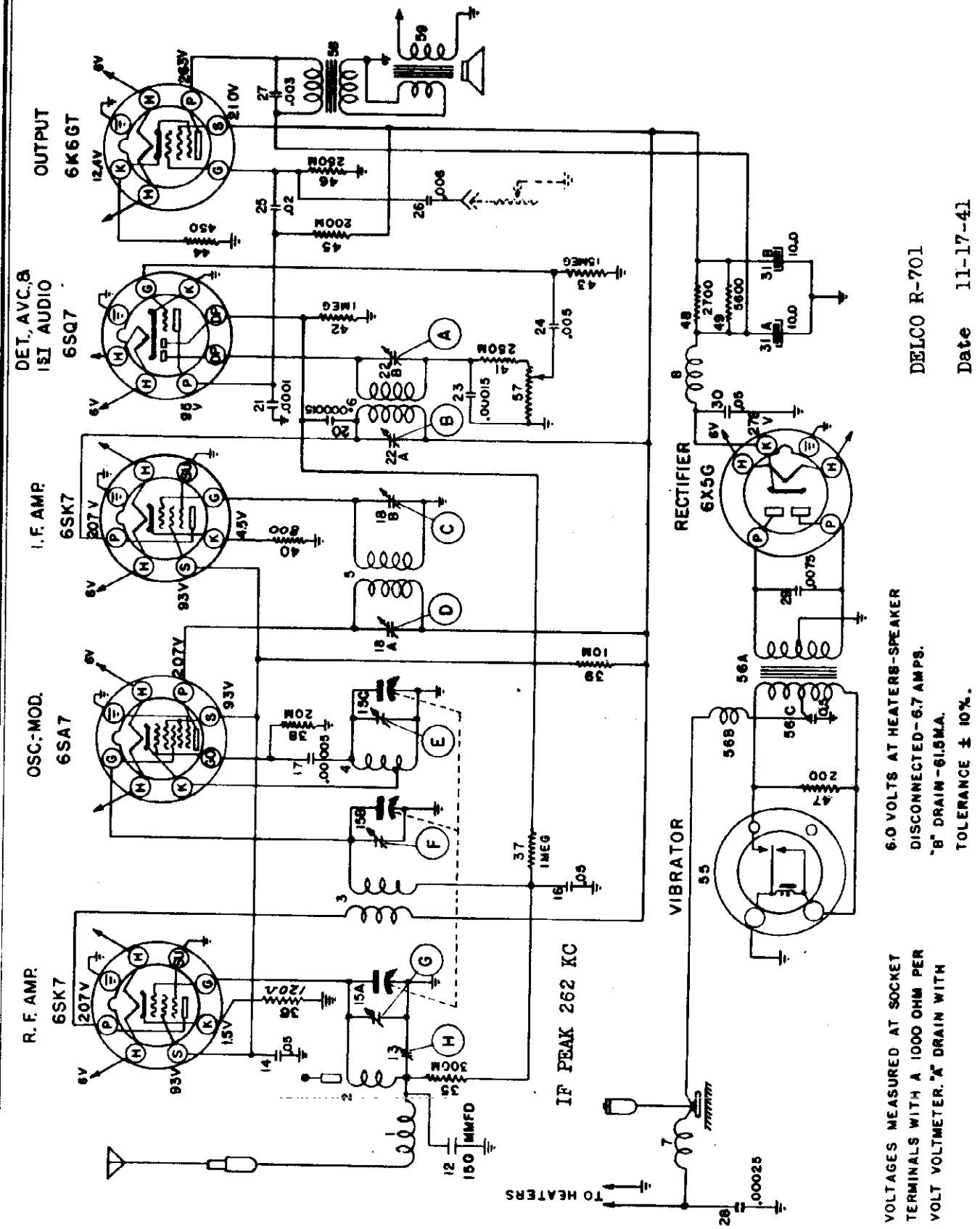
ALIGNMENT PROCEDURE

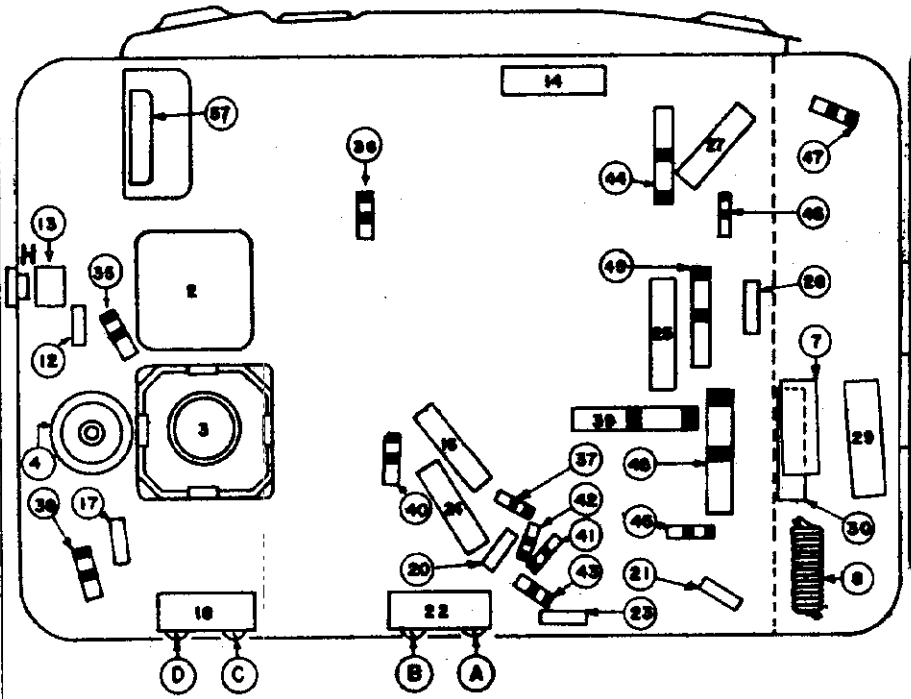
Volume Control Maximum.

Signal Generator minimum for a satisfactory output indication.

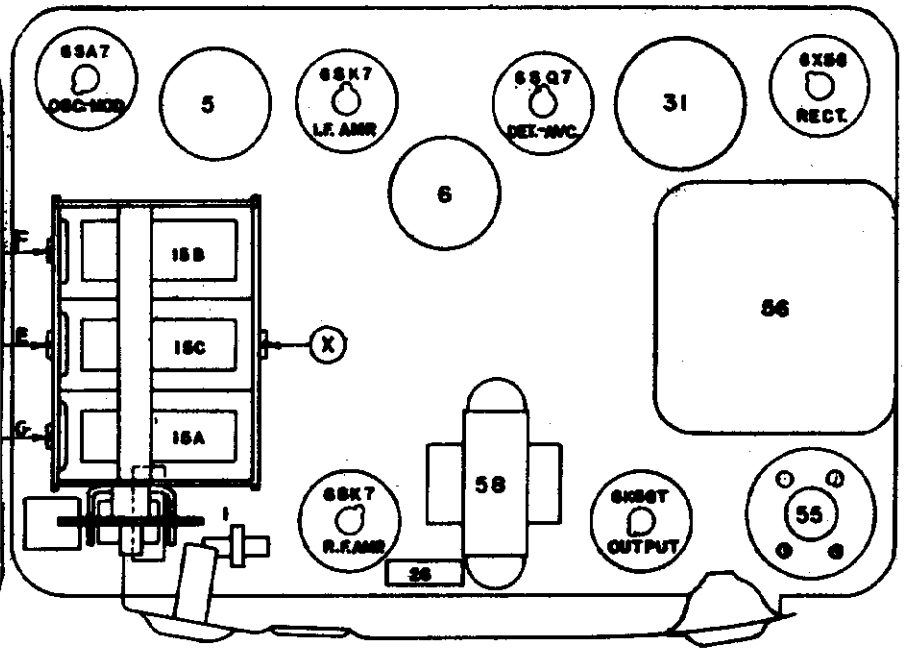
Series Condenser Or Dummy Antenna	Connect to	Signal Generator Frequency	Adjust Screws In Order
0.1 Mfd.	Grid Side of 13A	455 K.C.	A B C D
.000070 Mfd.	Antenna Terminal	1615 K.C.	E
.000070 Mfd.	Antenna Terminal	1400 K.C.	F
.000070 Mfd.	Antenna Terminal	600 K.C.	G
.000070 Mfd.	Antenna Terminal	1400 K.C.	F

UNITED MOTORS SERVICE





CHASSIS VIEW



TUBE VIEW

ALIGNMENT PROCEDURE

Volume control Maximum.
Signal generator minimum for satisfactory output indication.

TUBES------Six. SPEAKER-----7"Dynamic
CAR ANTENNA CAPACITY----- .000050 to .000225 Mfd.

TUNING RANGE--------550-1600Kc.

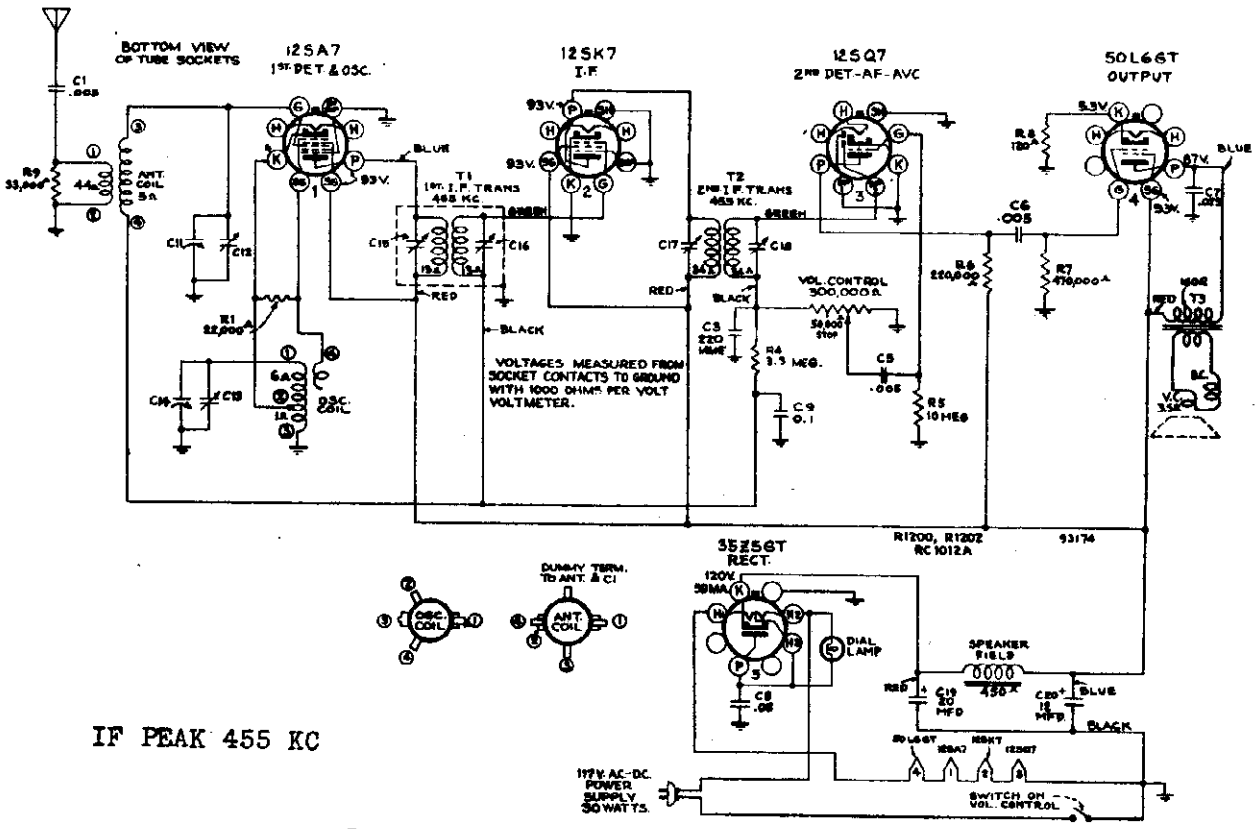
FOR ALIGNMENT NOTES SEE INDEX

Series Condenser Or Dummy Antenna	Connect to	Signal Generator Frequency	Adjust Screws In Order
0.1 Mfd.	Grid side of 15 B	262 K.C.	A B C D
.000070 Mfd.	Antenna Terminal	1615 K.C.	E
.000070 Mfd.	Antenna Terminal	1400 K.C.	F G
.000070 Mfd.	Antenna Terminal	600 K.C.	H
.000070 Mfd.	Antenna Terminal	1400 K.C.	F G

Adjust trimmer (H) to match car antenna (600 K.C.) when radio is installed.

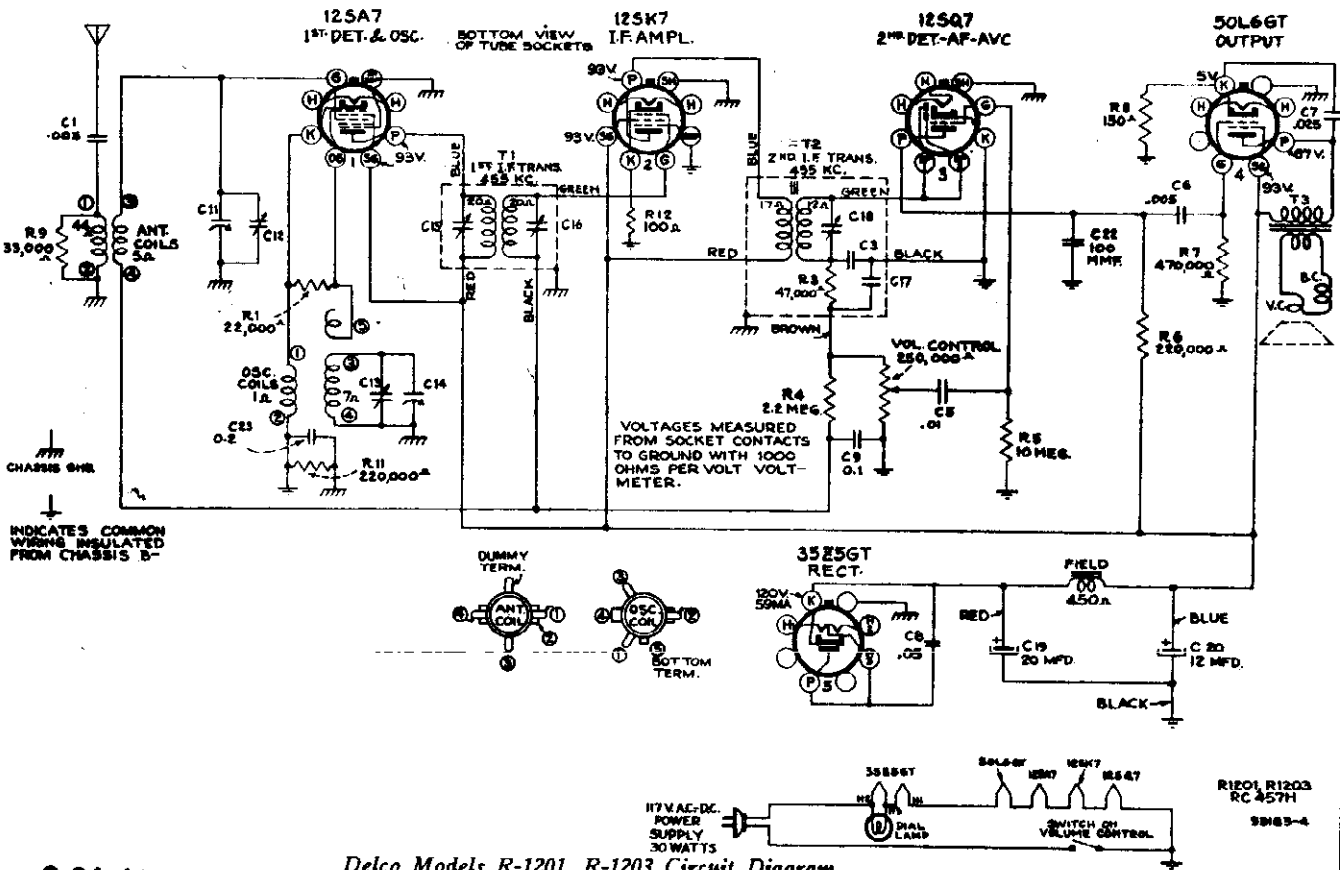
Trimmer (X) is in parallel with trimmer (E) and has been set at the factory. This should not be touched in the field.

UNITED MOTORS SERVICE



IF PEAK 455 KC

Delco Models R-1200, R-1202 Circuit Diagram



Delco Models R-1201, R-1203 Circuit Diagram

9-26-41

MODELS R-1200 to R-1203 incl.

UNITED MOTORS SERVICE

GENERAL

Tubes	Five
Speaker	4-in. Electrodynamic
Tuning	Manual
Tuning Range	540-1,720 kc
Intermediate Frequency	455 kc

POWER SUPPLY RATING

105-125 volts, AC, 50 or 60 cycles or DC..... 30 watts

Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

These Delco Models are identical with the exception of minor circuit changes—see schematic diagrams and parts list.

Pre-Setting Dial.—With gang condenser in full mesh, the pointer should be adjusted so that it is vertical.

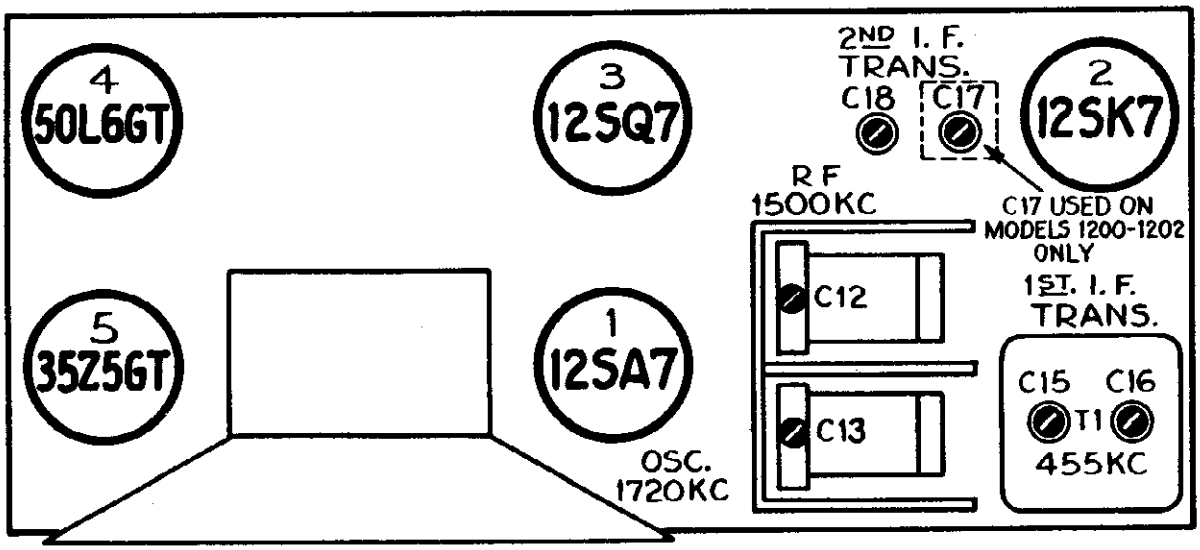
Antenna.—The set is equipped with length of antenna wire. Do not connect the antenna to ground. If an outdoor antenna is used, it should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

ALIGNMENT PROCEDURE

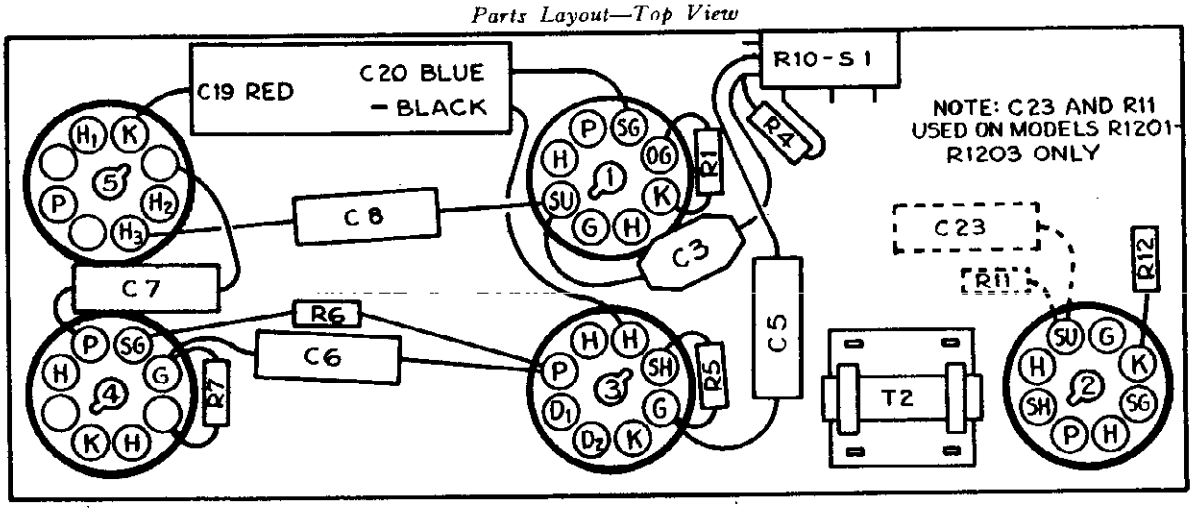
Volume Control maximum, Signal Generator output minimum for satisfactory output indication.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	12SK7 I-F grid in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	(C17*) C18 (2nd I-F trans.)
2	Tuning Condenser stator (osc.) in series with .01 mfd.			C15 and C16 (1st I-F trans.)
3	Antenna term. of ant. trans. in series with 100 mmfd.	1,720 kc	Full clockwise (out of mesh)	C13 (oscillator)
4		1,400 kc	Resonance on 1,400 kc signal	C12 (antenna)

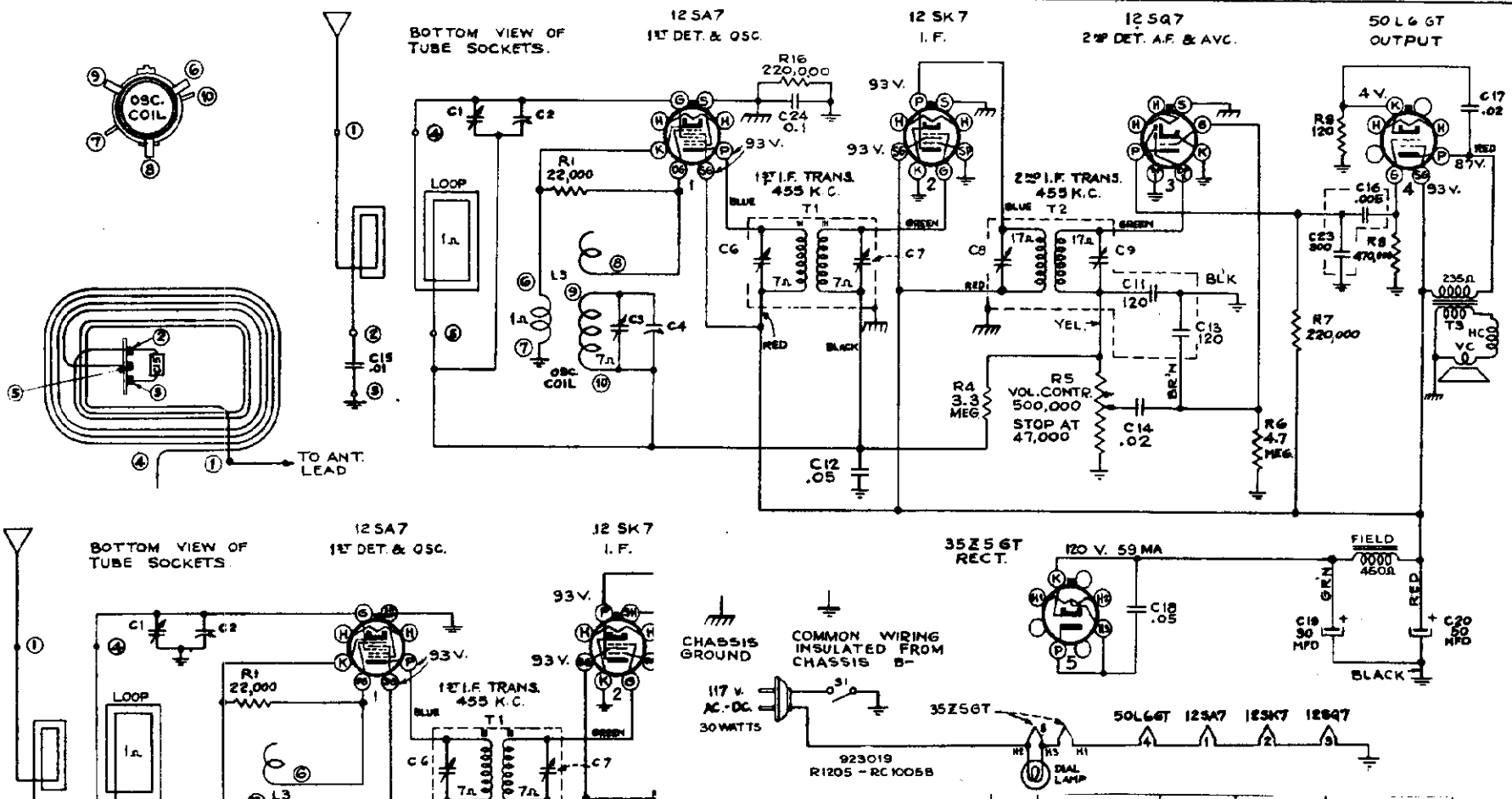
*C17 used on Models R-1200, R-1202 only.



Parts Layout—Top View



Parts Layout—Bottom View



Model R-1205 Circuit Diagram

Model R-1204 Circuit Diagram

IF PEAK 455 KC

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	I-F grid, in series with .01 mfd.	455 kc	Quiet point 1,700 kc end of dial	C8 and C9 2nd I-F Transformer
2	1st Det. grid in series with .01 mfd.			C6 and C7 1st I-F Transformer
3	Ant. terminal in series with 200 mmfd.	1,720 kc	Gang at minimum	C3 (osc.)
4	Radiation loop consisting of two turns of wire 18 inches in diameter located 4 to 6 feet from receiver	1,300 kc	Signal Frequency	C1 (ant.)
5	Repeat steps 3 an 4.			

8-15-41

Model R-1204 is the same as R-1205 with the exceptions shown above

MODELS R-1204, R-1205

UNITED MOTORS SERVICE

POWER SUPPLY RATING

105-125 volts, AC, 50 or 60 cycles or DC..... 30 watts

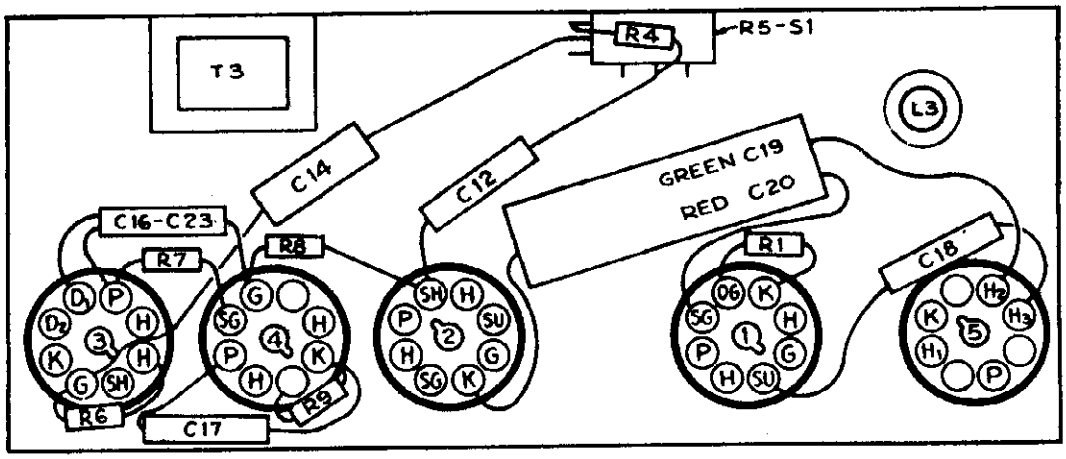
These Delco Models are identical with the exception of minor circuit changes — see schematic diagrams and parts list.

ALIGNMENT PROCEDURE

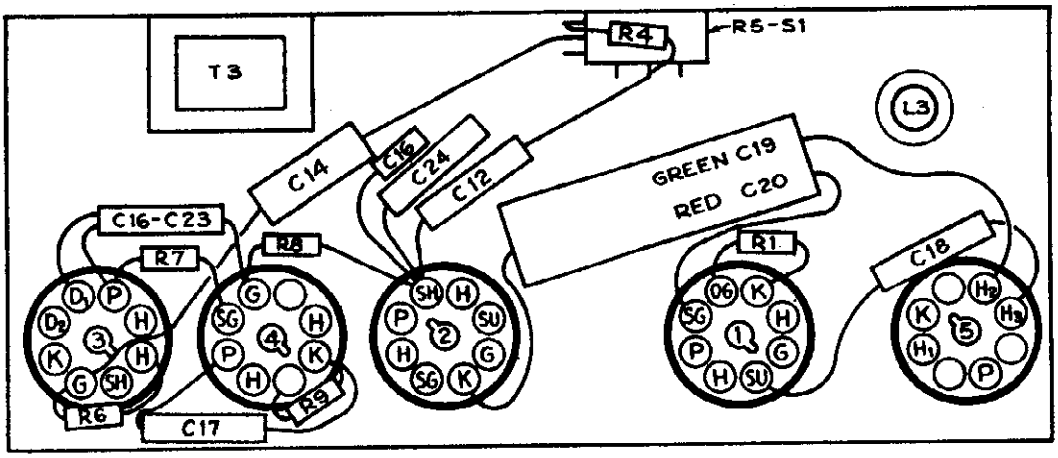
Volume Control maximum, Signal Generator output minimum for satisfactory output indication.

GENERAL

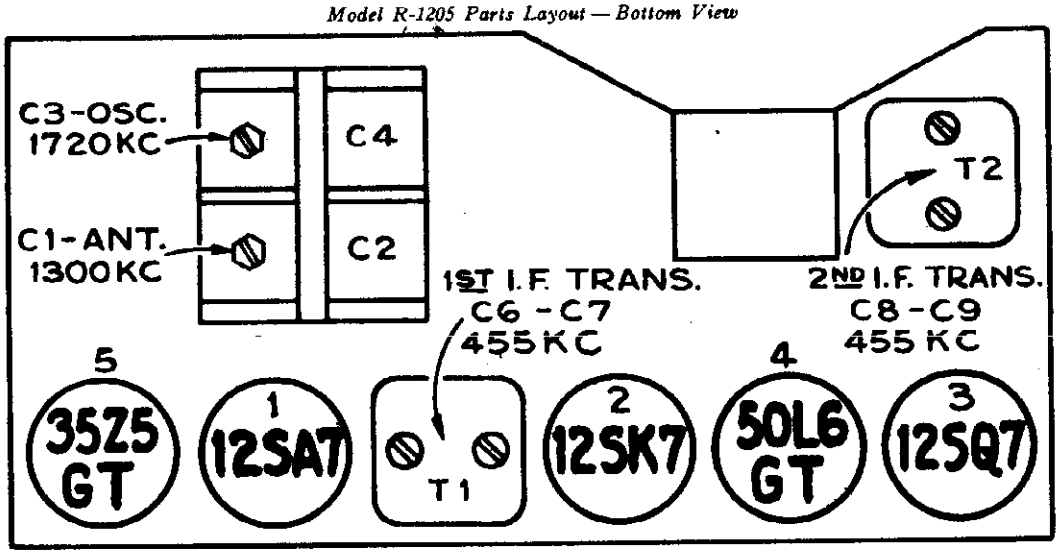
Tubes	Five
Speaker	5-in. Electrodynamic
Antenna	Built-in Loop or external
Tuning	Manual
Tuning Range	540-1,720 kc
Intermediate Frequency	455 kc



Model R-1204 Parts Layout — Bottom View



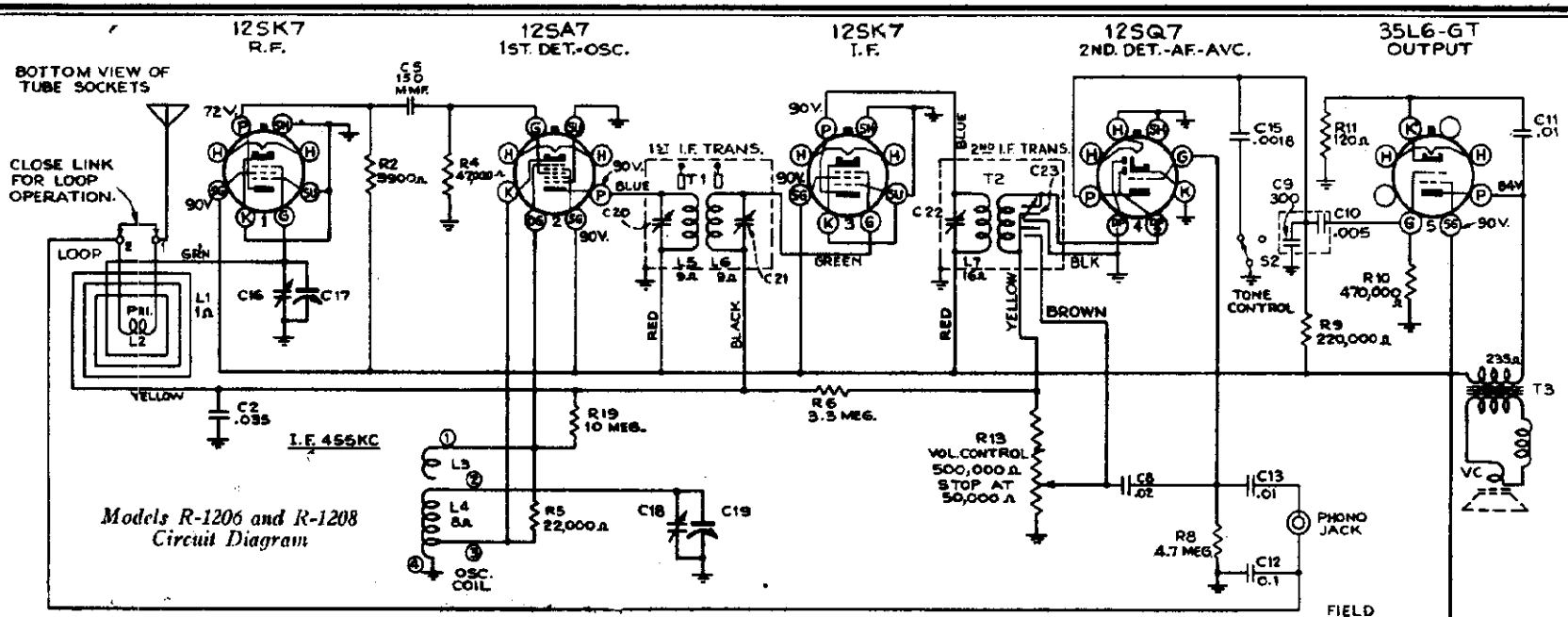
Model R-1205 Parts Layout — Bottom View



Models R-1204 and R-1205 Parts Layout — Top View

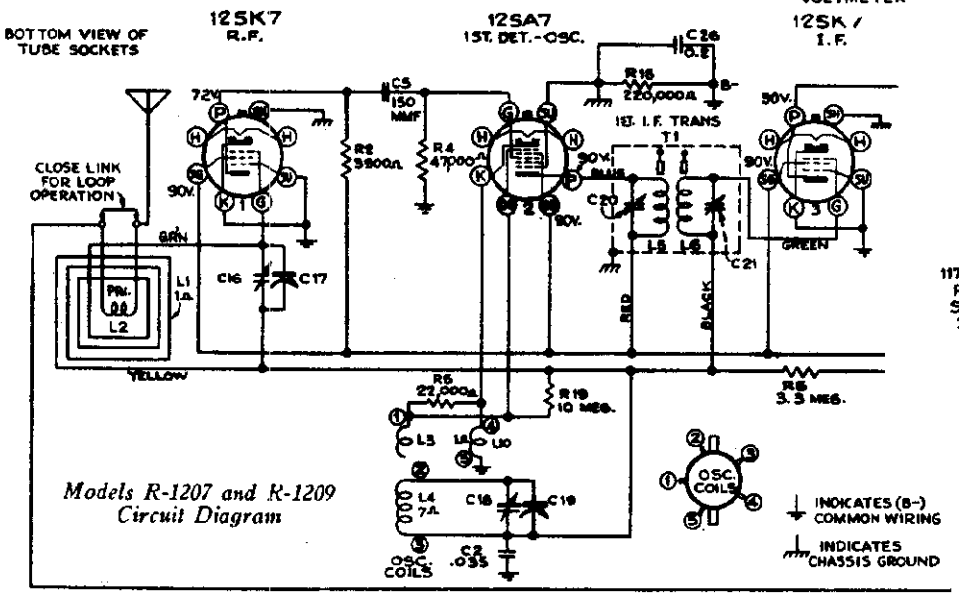
7-30-41

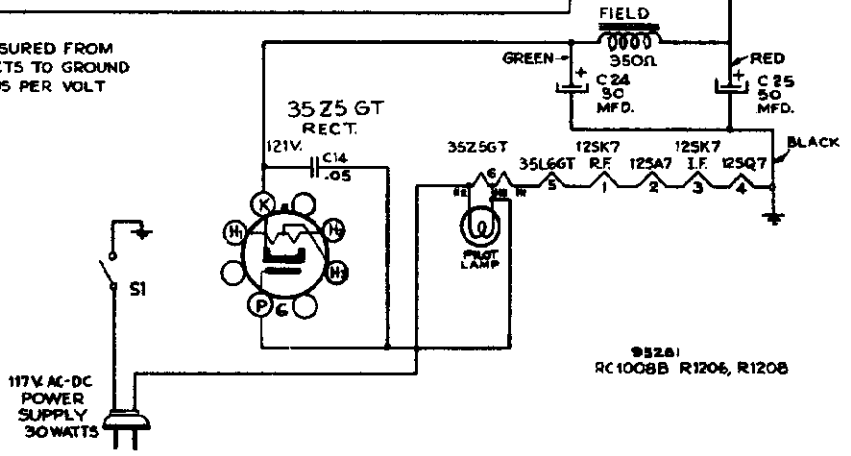
R-1206,
R-1208,

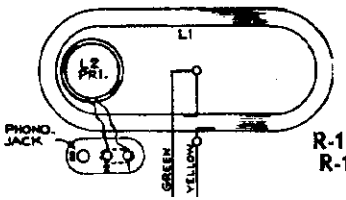


Models R-1207, R-1209 are the same as Model R-1206 with the exceptions shown below

VOLTAGES MEASURED FROM SOCKET CONTACTS TO GROUND WITH 1000 OHMS PER VOLT VOLTMETER







R-1207,
R-1209

FOR SOCKET AND PARTS LAYOUTS, SEE INDEX

MODELS R-1206 to R-1209 incl.

Models R-1206, R-1207, R-1208 and R-1209 Home Radio

GENERAL

Tubes ..... Six
Speaker ..... 5-in. Electrodynamic
Antenna ..... Built-in Loop or external
Tuning ..... Manual
Tuning Range ..... 540-1,720 kc
Intermediate Frequency ..... 455 kc

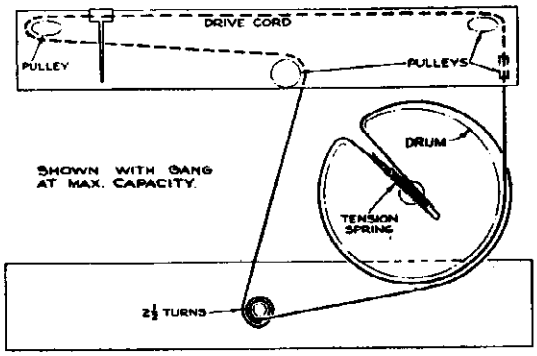
POWER SUPPLY RATING

105-125 volts, AC, 50 or 60 cycles or DC..... 30 watts

These Delco Models are identical with the exception of minor circuit changes—see schematic diagrams and parts list.

ALIGNMENT PROCEDURE

Volume Control maximum, Signal Generator output minimum for satisfactory output indication.



Dial Cord Layout

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	I-F grid, in series with .01 mfd.	455 kc	Quiet point 1,700 kc end of dial	C23 and C22 2nd I-F Transformer
2	1st Det. grid in series with .01 mfd.			C21 and C20 1st I-F Transformer
3	Ant. terminal in series with 200 mmfd.	1,720 kc	Gang at minimum	C18 (osc.)
4	Radiation loop consisting of two turns of wire 18 inches in diameter located 4 to 6 feet from receiver	1,300 kc	Signal Frequency	C16 (ant.)
5	Repeat steps 3 and 4.			

Chassis Electrical Parts

Illus. No.	Service Part No.	Part Name	Description
C2	1211201	Condenser	.035 mfd. 400 V. tubular
C5	7230883	Condenser	.00015 mfd. moulded
C8	1212099	Condenser	.02 mfd. 600 V. tubular
C9	1216115	Condenser	.0003—.005 mfd. Dual Section
C10	"	Condenser	
C11	1208600	Condenser	.01 mfd. 600 V. tubular
C12	1207908	Condenser	.1 mfd. 400 V. tubular
C13	1208600	Condenser	.01 mfd. 600 V. tubular
C14	7230592	Condenser	.05 mfd. 400 V. tubular
C15	1209148	Condenser	.002 mfd. 600 V. tubular
C16	1215722	Condenser	Trimmer
C17	"	Condenser	Tuning
C18	"	Condenser	Trimmer
C19	"	Condenser	Tuning
C24	1214758	Condenser	30 mfd. 150 V. electrolytic
C25	"	Condenser	50 mfd. 150 V. electrolytic
C26	7240579	Condenser	0.2 mfd. 300 V. tubular (R1207, 1209)
L1	1215723	Loop	Antenna
L2	1215724	Coil	Loop primary coil
L3	1215725	Coil Assy.	Oscillator coil (R1206, 1208)
L4	"	Coil Assy.	
L3	1215726	Coil Assy.	Oscillator coil (R1207, 1209)
L4	"	Coil Assy.	
R2	1211060	Resistor	4,000 ohms ½ watt
R4	1211107	Resistor	45,000 ohms ½ watt
R5	1210882	Resistor	20,000 ohms ½ watt
R6	1211149	Resistor	3 meg. ½ watt
R8	1211154	Resistor	5 meg. ½ watt
R9	1210119	Resistor	200,000 ohms ½ watt
R10	1210470	Resistor	500,000 ohms ½ watt
R11	1211000	Resistor	100 ohms ½ watt
R13	1215727	Control	Volume, and power switch
R18	1210119	Resistor	200,000 ohms ½ watt (R1207, 1209)
R19	1212980	Resistor	10 meg. ½ watt
S1		Switch	(Included in R13)
S2	1215728	Switch	Tone control (R1206, 1208)
S2	1215729	Switch	Tone control (R1207, R1209)
T1	1214620	Transformer	1st I. F.
T2	1215730	Transformer	2nd I. F.
T3	1215755	Transformer	Output transformer
		Speaker	5-inch E.M.
	1215840	Cone	Speaker cone and voice coil
	1215665	Cap	Cone dust cap
	1215756	Coil	Field coil

Chassis Miscellaneous Parts

1215732	Board	Receptacle and terminal board
1215733	Bracket	Dial lamp bracket
1215734	Clamp	L.H. dial clamp
1215735	Clamp	R.H. dial clamp
7241702	Cord	Drive cord (approx. 49-in. long)
1215736	Dial	Glass dial scale
1215737	Drum	Drive drum
1215738	Fastener	Push fastener for cabinet back
1215739	Indicator	Station selector indicator
1215740	Knob	Walnut knobs (R1206, 1207)
1215741	Knob	Ivory knobs (R1208, 1209)
51	Lamp	Dial lamp
1215742	Plate	Dial back plate complete with pulleys (less dial)
1215743	Pulley	Drive cord pulley
1215744	Shaft	Tuning knob shaft
1215745	Socket	Dial lamp socket (R1206, R1208)
1215746	Socket	Dial lamp socket (R1207, R1209)
1215747	Socket	Tube socket (moulded type)
7230283	Socket	Tube socket (wafer type)
1214519	Spring	Drive cord spring
1215684	Spring	Retaining spring for knobs
1215177	Washer	Tuning shaft "C" washer

Tubes

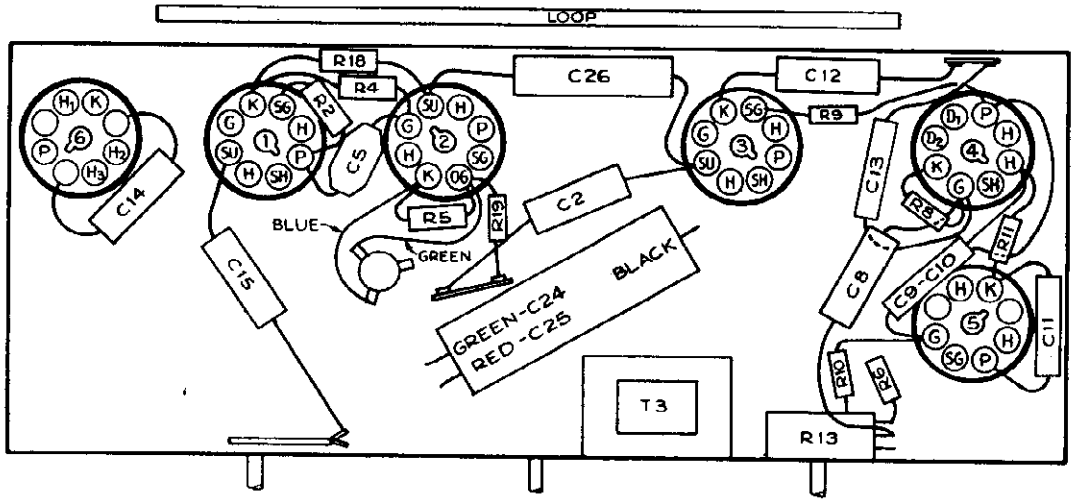
1213812	12SK7	R. F.
1213809	12SA7	1st Det.—Osc.
1213812	12SK7	I. F.
1213813	12SQ7	2nd Det.—A.F. and A.V.C.
1213818	35L6GT	Output
1213848	35Z5GT	Rectifier

Cabinet Parts

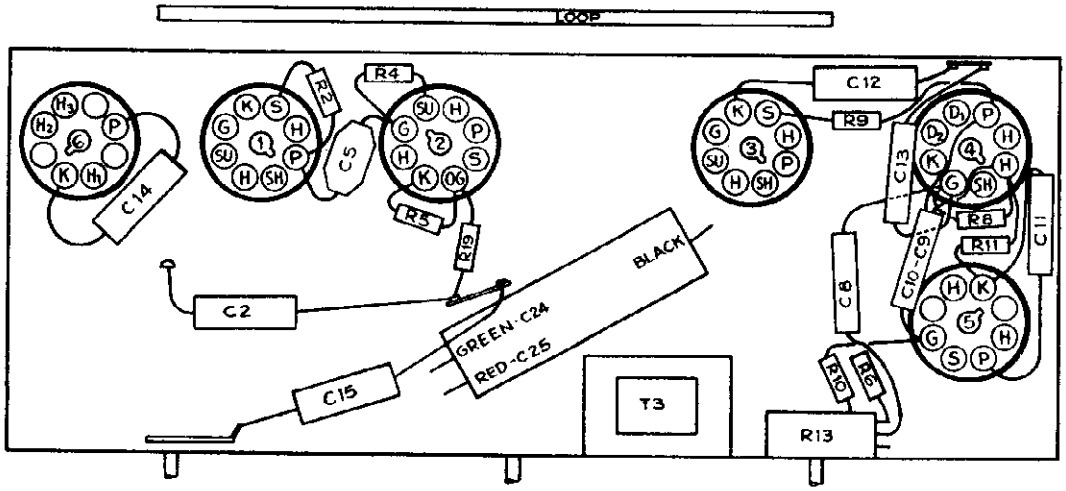
1215748	Back	Cabinet back (R1206, R1207)
1215749	Back	Cabinet back (R1208, R1209)
1215750	Cabinet	Models R1206 and R1207
1215751	Cabinet	Models R1208 and R1209

UNITED MOTORS SERVICE

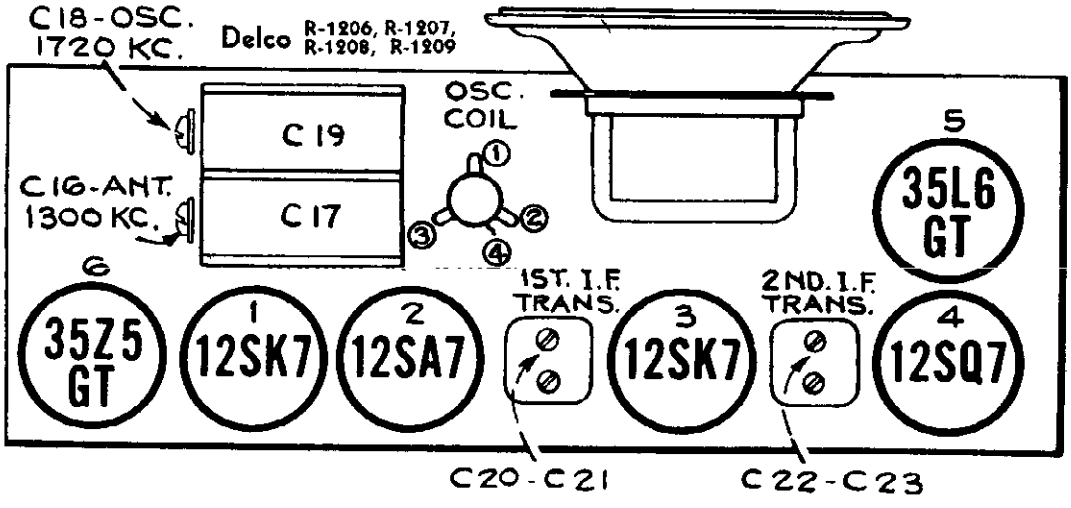
MODELS R-1206 to R-1209 incl.



Models R-1207 and R-1209
Parts Layout—Bottom View

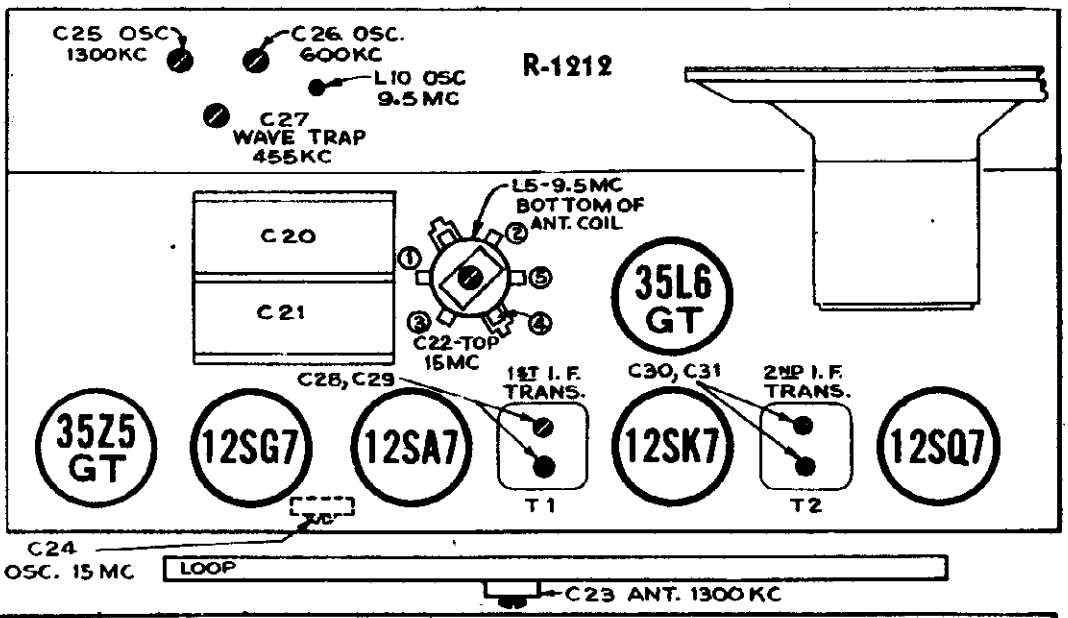


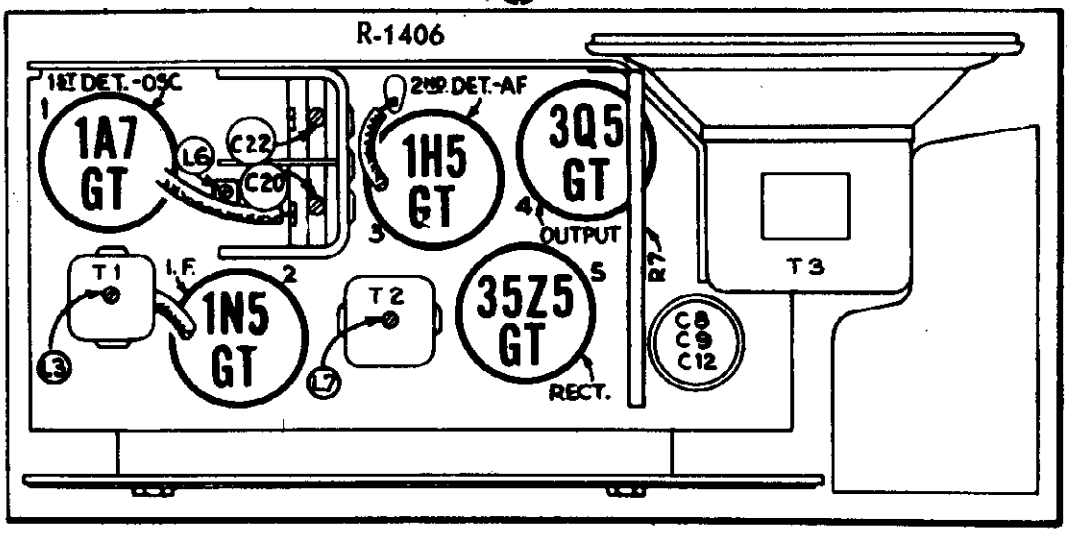
Models R-1206 and R-1208
Parts Layout—Bottom View

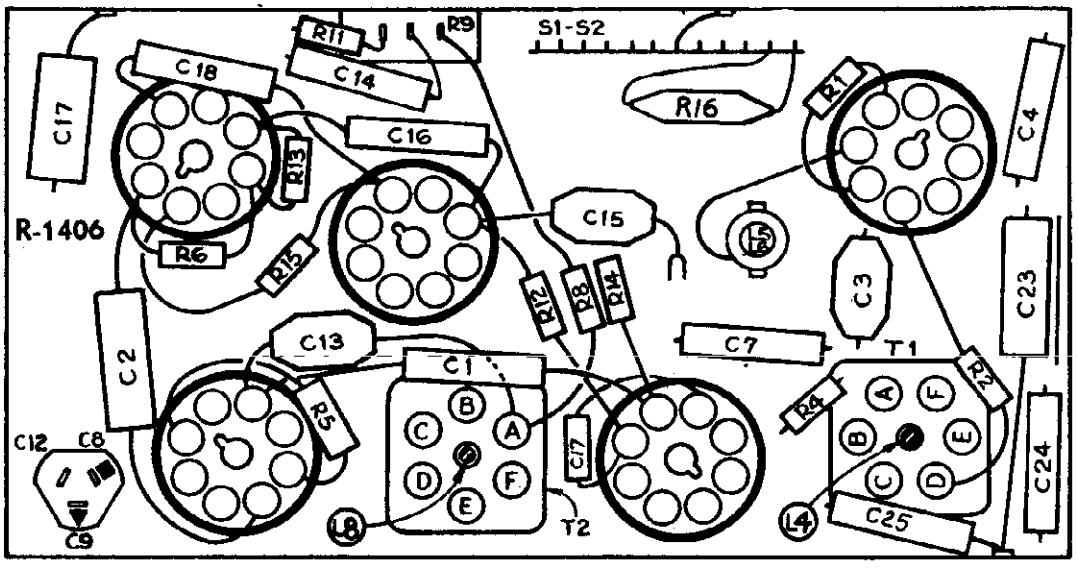


MODEL R-1212
MODEL R-1406

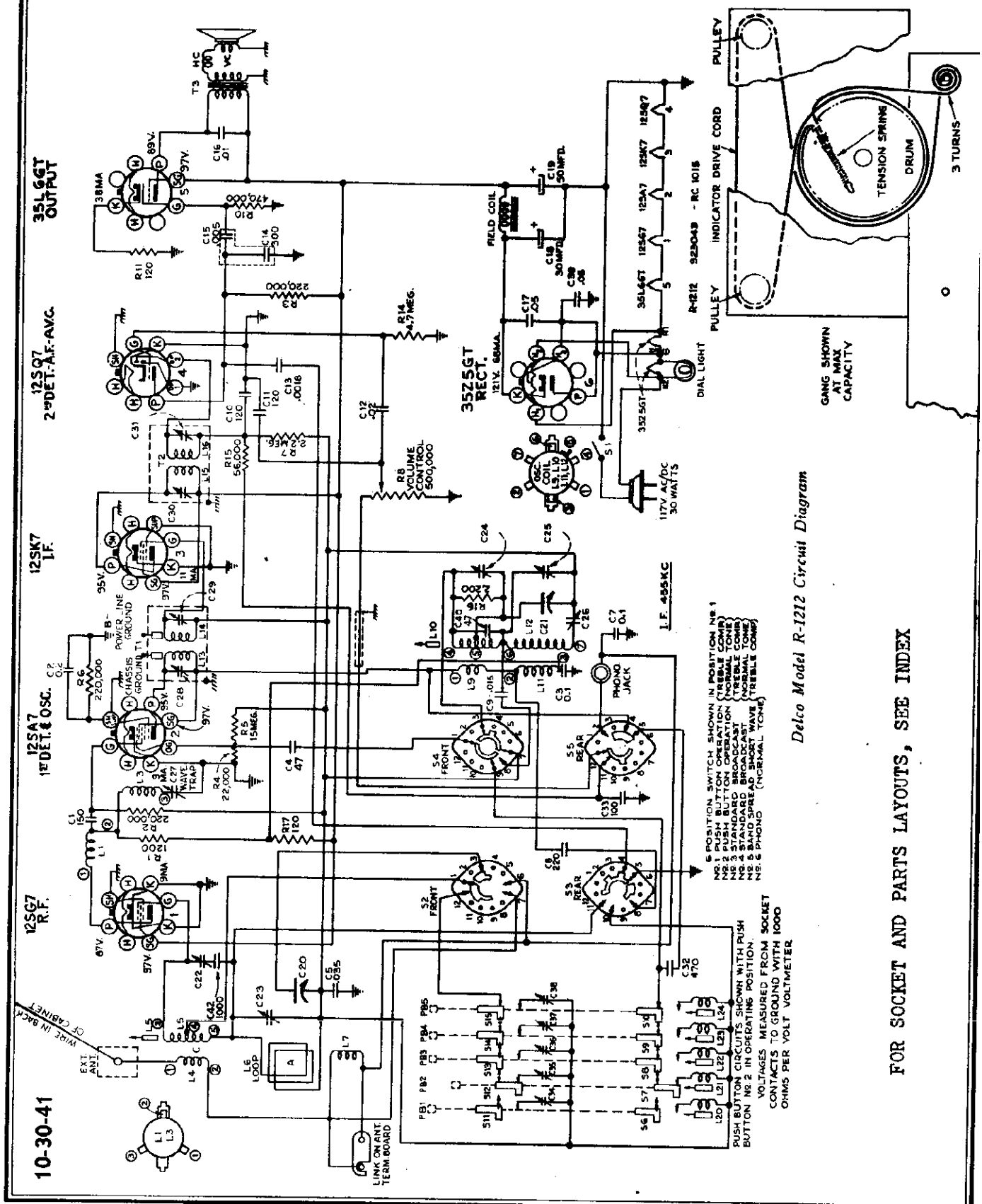
UNITED MOTORS SERVICE







UNITED MOTORS SERVICE



FOR SOCKET AND PARTS LAYOUTS, SEE INDEX

MODEL R-1212
MODEL R-1214

UNITED MOTORS SERVICE

ALIGNMENT PROCEDURE

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Steps	Connect high side of the test oscillator to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	I.F. grid in series with 0.1 mfd.	455 kc	Quiet Point at 1,700 kc end of dial	C-30, C-31
2	1st det. grid in series with 0.1 mfd.			C-28, C-29
3	R.F. grid in series with 0.1 mfd.			C-27**
4	Ant. terminal in series with 47 mmf. (link open)	15 mc	15 mc "C" Band	C-24 (osc.)* C-22 (ant.)
5		9.5 mc	9.5 mc "C" Band	L-10 (osc.) L-5 (ant.)
6		Repeat steps 4 and 5.		
7	Ant. terminal in series with 220 mmf. (link open)	1,300 kc	1,300 kc "A" band	C-25 (osc.) C-23 (ant.)
8		600 kc	600 kc "A" Band	C-26 (osc.)
9		Repeat steps 7 and 8.		

* Use minimum capacity peak if two peaks can be obtained.
** Adjust C-27 for minimum signal with 455 kc applied to R.F. grid.
Note.—Oscillator tracks 455 kc above signal on all bands.

Speaker ..... 5-inch Electrodynamic
Antenna..... Built-in Loop or External
Tuning..... Manual and 5 electric push-buttons
Tuning Range..... 540-1,600 kc, 9-15.5 mc
Power Supply..... 105-125 A. C., 50-60 cy. or D. C.

MODELS R-1212 and R-1214

ADJUSTMENT FOR ELECTRIC TUNING

The station push buttons connect to separate magnetite-core oscillator coils and separate antenna trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool and allow at least five minutes warm-up period before making adjustments.

In the event that the receiver is to be used with an external antenna use one or two feet of wire (as an antenna) to ensure sharp peaking during the final adjustment procedure.

1. Make a list of the desired stations, arranged in order from low to high frequencies.
2. Turn the range selector to Broadcast band, and manually tune in the first station on the list.
3. After turning range selector to "PB" position, push in station button No. 1 (extreme left). Then adjust the No. 1 oscillator core to receive the station. It may be necessary to maintain approximate tracking between antenna and oscillator to receive weak stations.
4. After oscillator core is adjusted properly, adjust antenna trimmer No. 1 for maximum output.
   Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.
5. Adjust each of the remaining stations in the same manner.

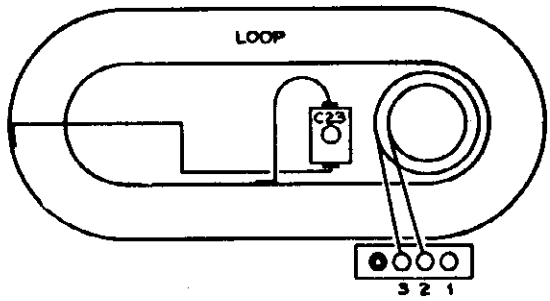
Antenna.—The set is equipped with a built-in loop antenna. If an outdoor antenna is used, it may be connected to the "ANT" terminal on rear of cabinet. It should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

Phono Attachment.—A jack is provided on the rear of cabinet for connecting a Phono Attachment into the audio-amplifying circuit.

Calibration Scale.—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the dial backing plate for quick reference during alignment.

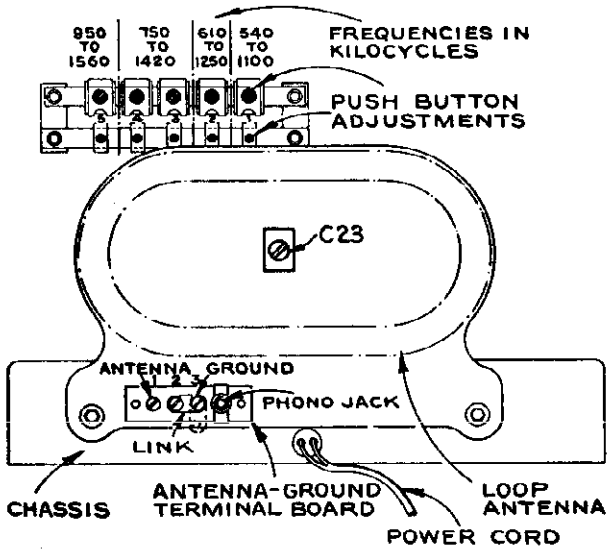
With gang in full mesh, move the dial pointer to the last mark at the left-hand end of the dial scale.



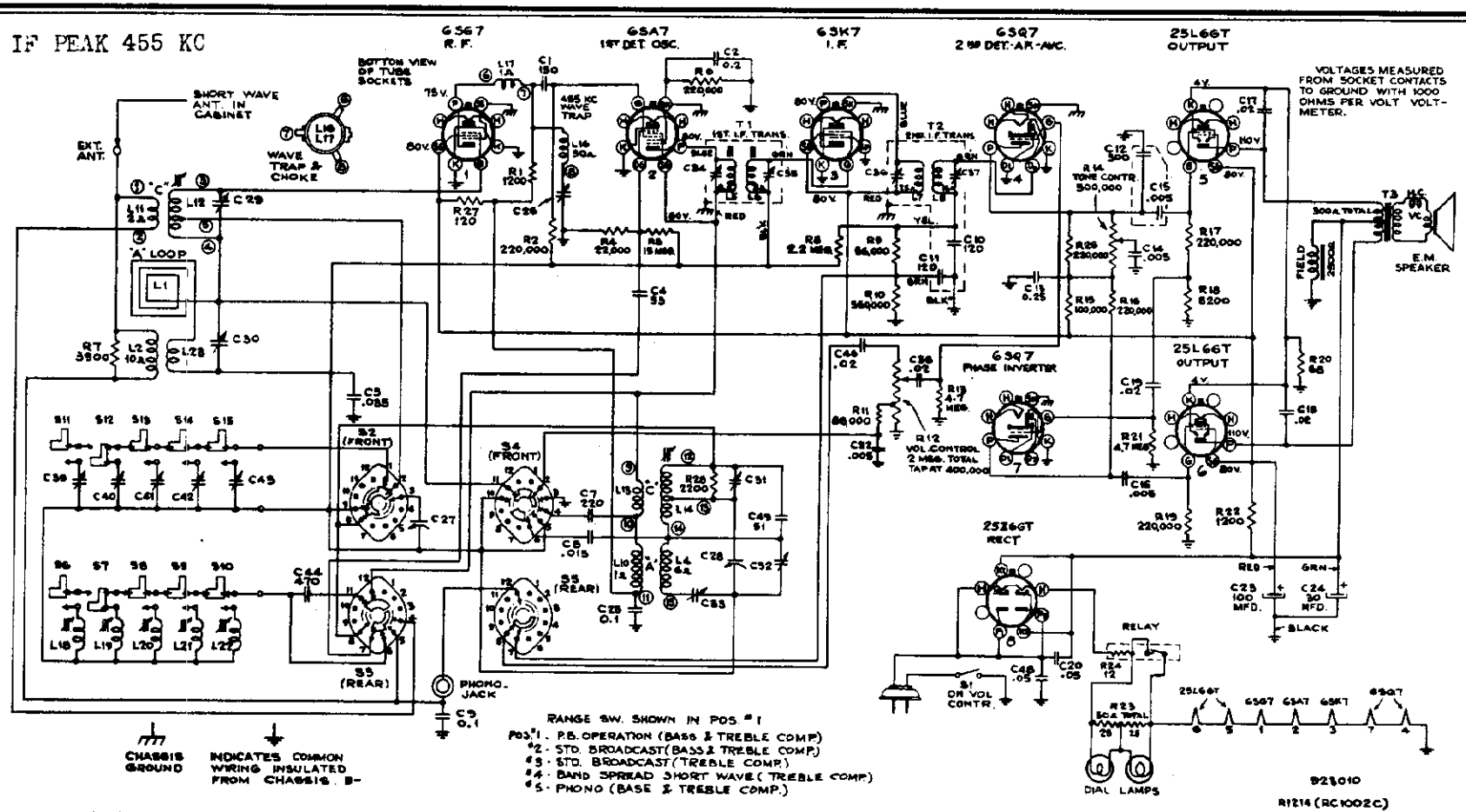
Loop Antenna Connections

6. Make a final careful adjustment of the oscillator cores and antenna trimmers.

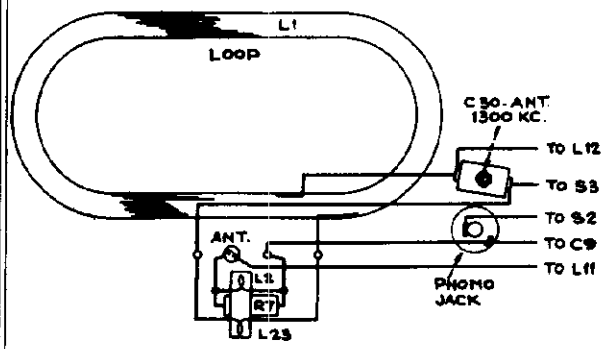
On push-button No. 5, the higher frequency stations may be obtained with the oscillator core No. 5 either in or out. (Oscillator frequency either 455 kc below or above the signal.) The out position should be used so the oscillator is 455 kc above the signal.



Rear View—Push Button Adjustments



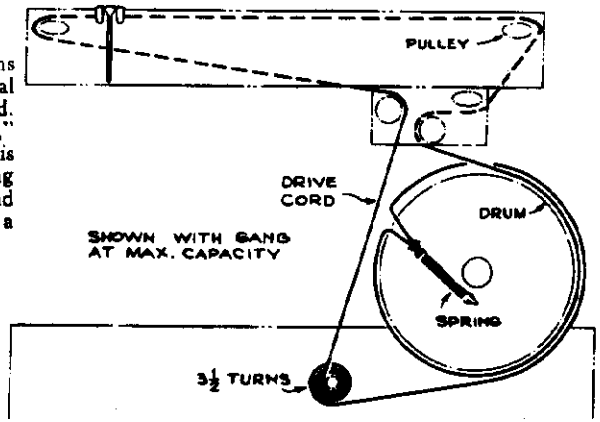
Delco Model R-1214 Circuit Diagram



Loop Antenna Connections

Thermal relay cuts in the dial lamps after the set warms up.—This set incorporates a thermal relay to control the dial lamps. When the set is "off," the relay contacts are closed. This shorts out the two lamps. When the set is turned "on," the heater current flows through the relay element R24. This heats up and causes the relay contacts to open, permitting the heater current to flow through the two dial lamps and light them. In normal operation, the lamps light about a half-minute after the set is turned on.

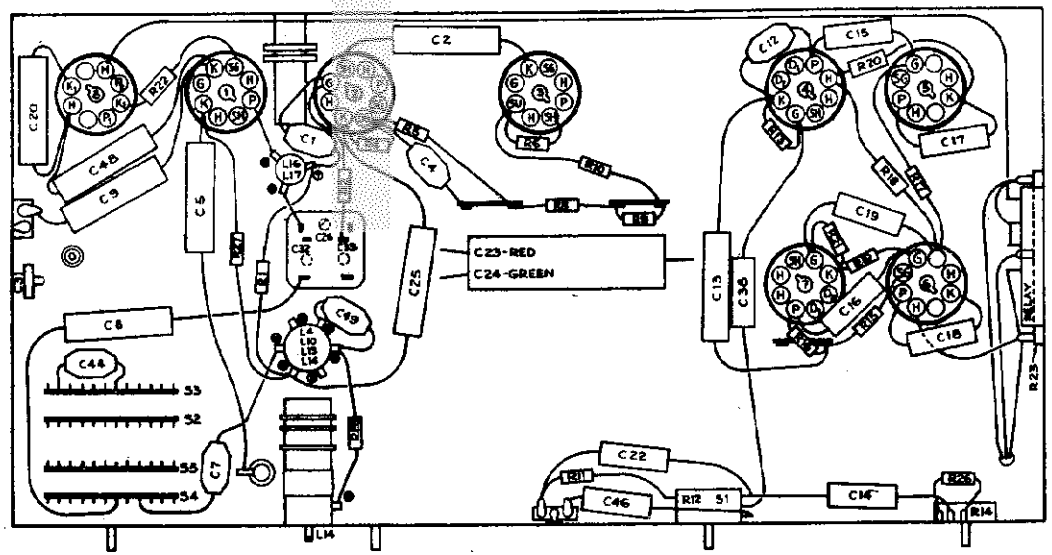
Speaker	9x6-in. Elliptical Electrodynamic
Antenna	Built-in Loop or external
Tuning	Manual and 5 electric push-buttons
Tuning Range	535-1,600 kc, 8.7-15 mc
Power Supply	105-125 A. C., 50-60 cy. or D. C.



Steps	Connect the high side of test osc. to—	Tune test. osc. to—	Range Switch to—	Turn Radio dial to—	Adjust the following for max. peak output
1	I-F grid in series with .01 mfd.	455 kc	A	Quiet Point near middle of dial	C-36, C-37 2nd I-F trans.
2	Det. grid in series with .01 mfd.				C-34, C-35 1st I-F trans.
3	Ant. lead in series with 50 mmfd.	15 mc	C	15 mc	C-31 (osc.)* C-29 (ant.)
4		9.5 mc	C	9.5 mc	L-14 (osc.) L-12 (ant.)
		Repeat steps 3 and 4.			
5	Antenna terminal in series with 200 mmfd.	1,300 kc	A	1,300 kc	C-32 (osc.) C-30 (ant.)
6		600 kc	A	600 kc	C-33 Rock in
7		Repeat steps 5 and 6.			
8	R-F grid in series with .01 mfd.	455 kc	A	low end of dial	C-26** (Wave Trap)

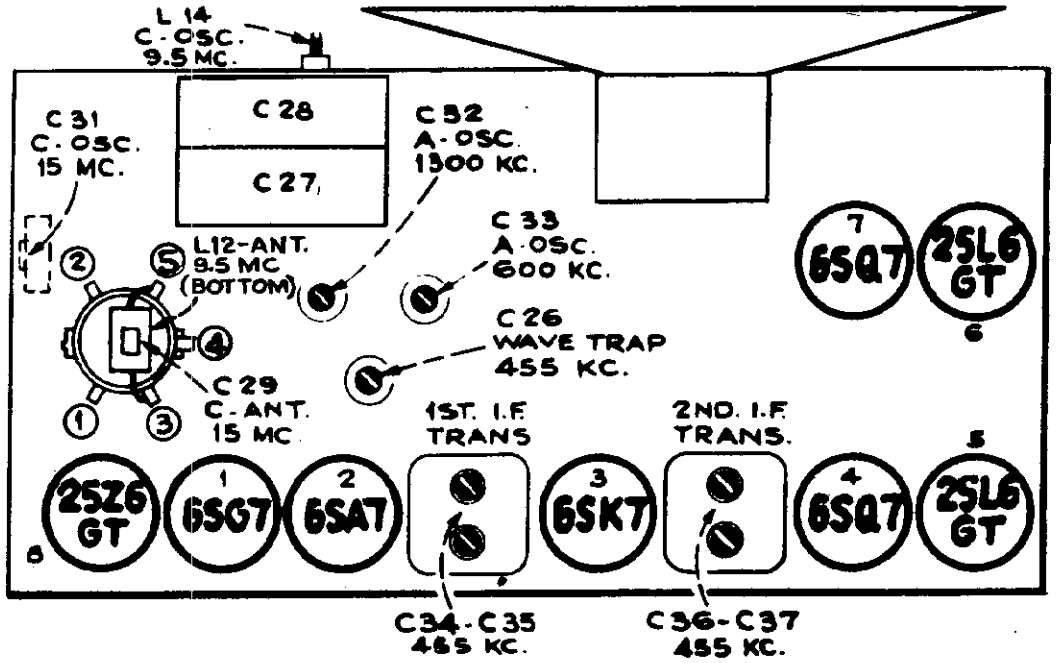
*Oscillator should track on high frequency side of signal. If two peaks are obtained use high frequency (minimum capacity peak).

**Feed a high signal level of 455 kc into R.F. grid and adjust C-26 for minimum signal.

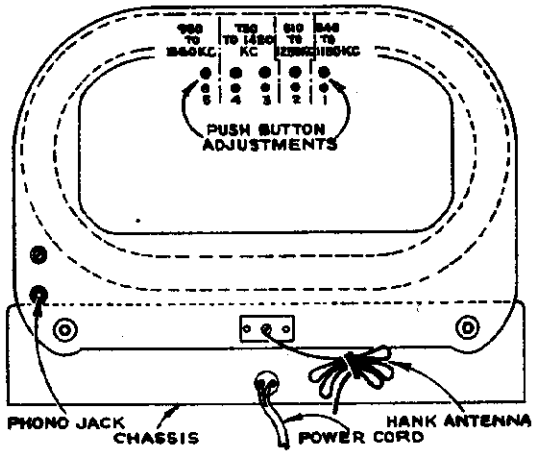


FOR PUSH-BUTTON DATA, SEE INDEX

Parts Layout—Bottom View



Parts Layout—Top View

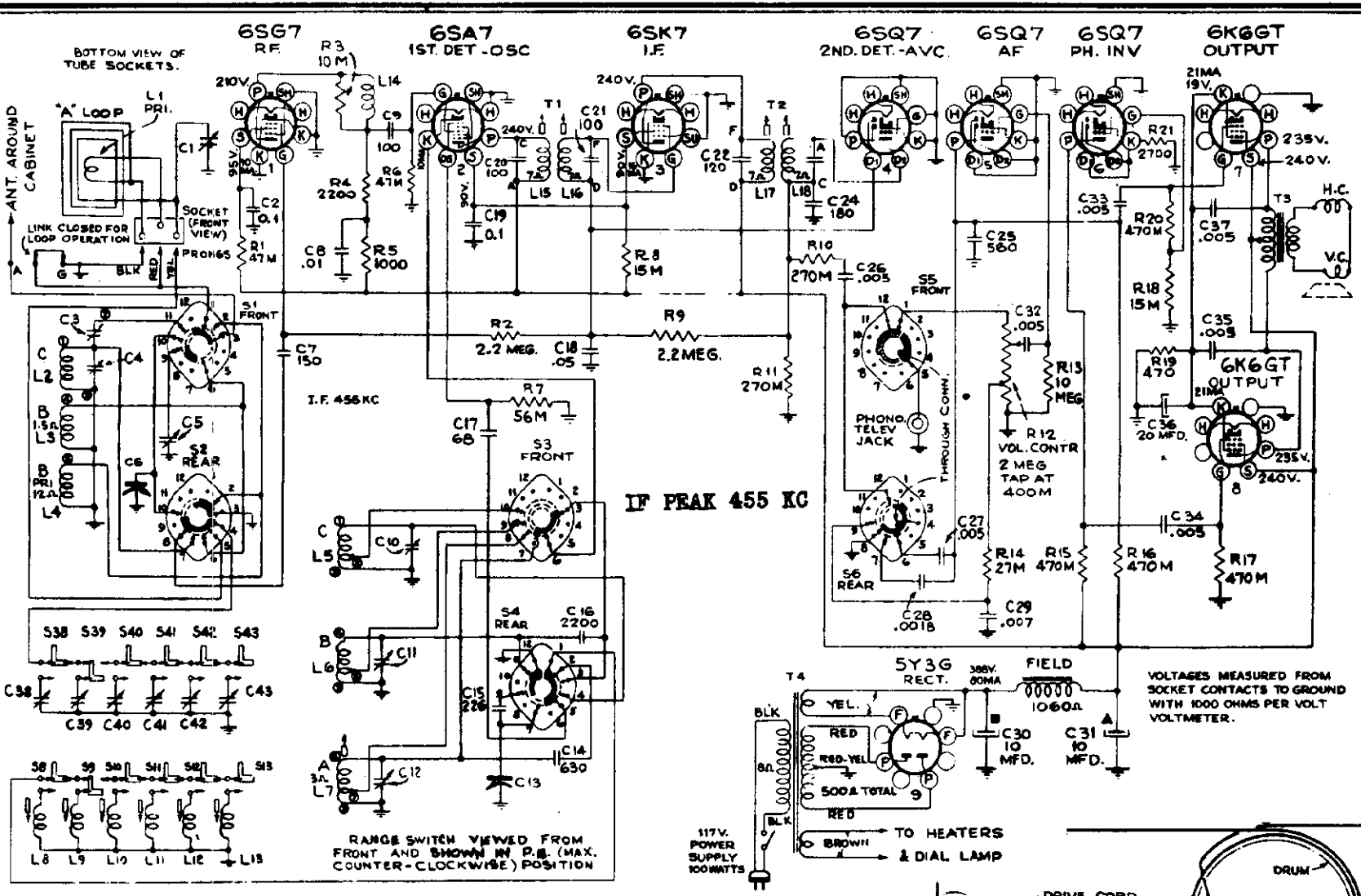


Rear View—Push Button Adjustments

Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

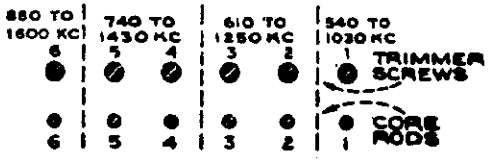
Phono Attachment.—A jack is provided on the rear of cabinet for connecting a Phono Attachment into the audio-amplifying circuit.

Dial Pointer Adjustment.—The dial pointer should be set at the left-hand end dial marks, with the gang in full mesh.



8-22-41

Delco Model R-1216 Circuit Diagram



Push Button Adjustments

GENERAL

Tubes	Nine
Speaker	12-inch Electrodynamic
Antenna	Built-in Loop or external
Tuning	Manual and 6 electric push-buttons
Tuning Range	540-1,600 kc, 2.3-6.3 mc, 9.4-15.4 mc
Power Supply	105-120 V. 25 cycle AC or 105-120 V. 50-60 cycle AC

Dial Cord Layout

MODEL R-1216
MODEL R-1217

UNITED MOTORS SERVICE

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Range Switch	Turn radio dial to—	Adjust the following for max. peak output
1	6SK7 I-F grid in series with .01 mfd.	455 kc	"A"	Quiet Point near 180°	L17 and L18 (2nd I-F Trans.)
2	6SA7 Det. grid in series with .01 mfd.				L-15 and L-16 (1st I-F Trans.)
3	Ant. section of Gang Condenser	1,500 kc	"A"	160°	C-12 (osc.)
4		600 kc		30.5°	L-7 (osc.)
5	Ant. terminal "A" in series with 47 mmf. link open	6,100 kc	"B"	161°	C-11 (osc.)* C-5 (ant.)
6		15,200 kc	"C"	167°	C-10 (osc.)* C-4 (ant.)
7		9,600 kc		32°	C-3 (ant.) (Rock Gang)
8		Repeat steps 6 and 7.			
9	Fasten chassis in cabinet, see that link is closed on antenna terminal board, indicator at left end of dial scales with gang at maximum capacity.				
10	A rad ation loop consisting of two turns of wire 18 inches in diameter located 4 to 6 feet from receiver	1,500 kc	"A"	1,500 kc signal	C-1 (ant.) on loop
11		600 kc		600 kc	L-7 (osc.) (Rock Gang)
12		Repeat steps 10 and 11.			

*Use minimum capacity peak if two peaks can be obtained.
Note: Oscillator tracks above signal on all bands.

External Antenna. — When using an External Antenna, peak C3 for max. output on a station in the 31 meter band.

ADJUSTMENT FOR ELECTRIC TUNING

This model has six push buttons for electric tuning. The buttons connect to separate magnetite-core oscillator coils and separate antenna trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool, and allow at least five minutes warm-up period before making adjustments.

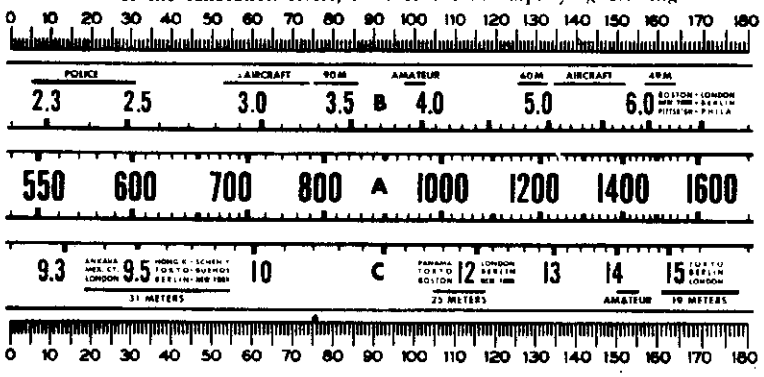
The procedure is as follows:

1. Make a list of the six desired stations, arranged in order from low to high frequencies.
2. Turn Range Control knob to "A" position, and manually tune in the first station on the list.
   Turn the Loop Antenna to give **minimum** pickup of signal, no outside antenna should be used and link on antenna board should be closed.
3. Turn Range Control knob to "PB" and press push button No. 1 and adjust No. 1 oscillator core to receive this station. Screw the core all the way in, to lowest frequency, and then unscrew slowly until station is received.
4. Adjust No. 1 antenna trimmer for maximum output on this station.
   Owing to the relatively high R-F gain, it may be found that there are several settings of each push-button magnetite core that will bring in any particular station. In such cases it is advisable to unscrew the push button antenna trimmers to minimum capacity before adjusting the oscillator cores.
   Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.
5. Adjust for each of the remaining five stations in the same manner.
6. After all six stations are tuned-in on the buttons, turn the Loop Antenna to a position giving the best signal pickup and make a final careful adjustment of all core rods until best reception is obtained for each. Outdoor antenna should now be reconnected if used.

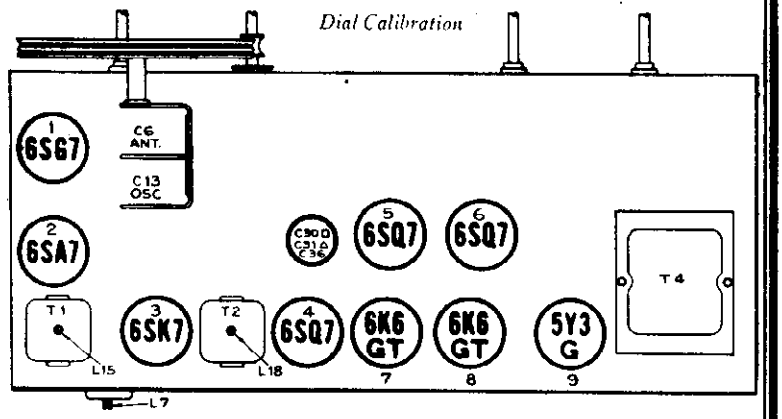
Calibration Scale on Indicator-Drive-Cord Drum. — The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the indicator-drive-cord drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in R.F. alignment, check the position of the drum. The 135° mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are in minimum capacity position. The drum is held to the shaft by means of plastic cement which must be securely fastened when the drum is in the correct position.

To determine the corresponding frequency for any setting of the calibration scales, refer to the accompanying drawing

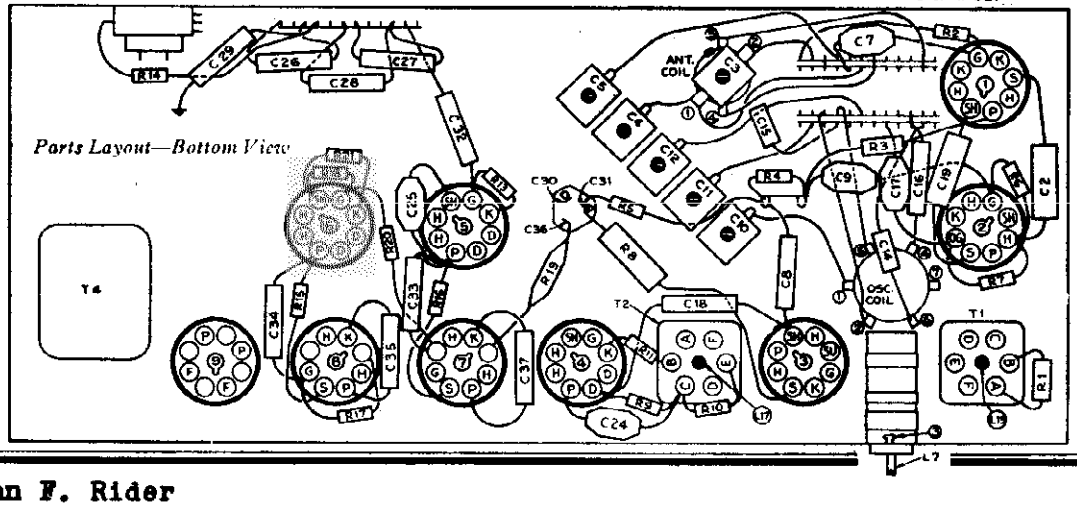


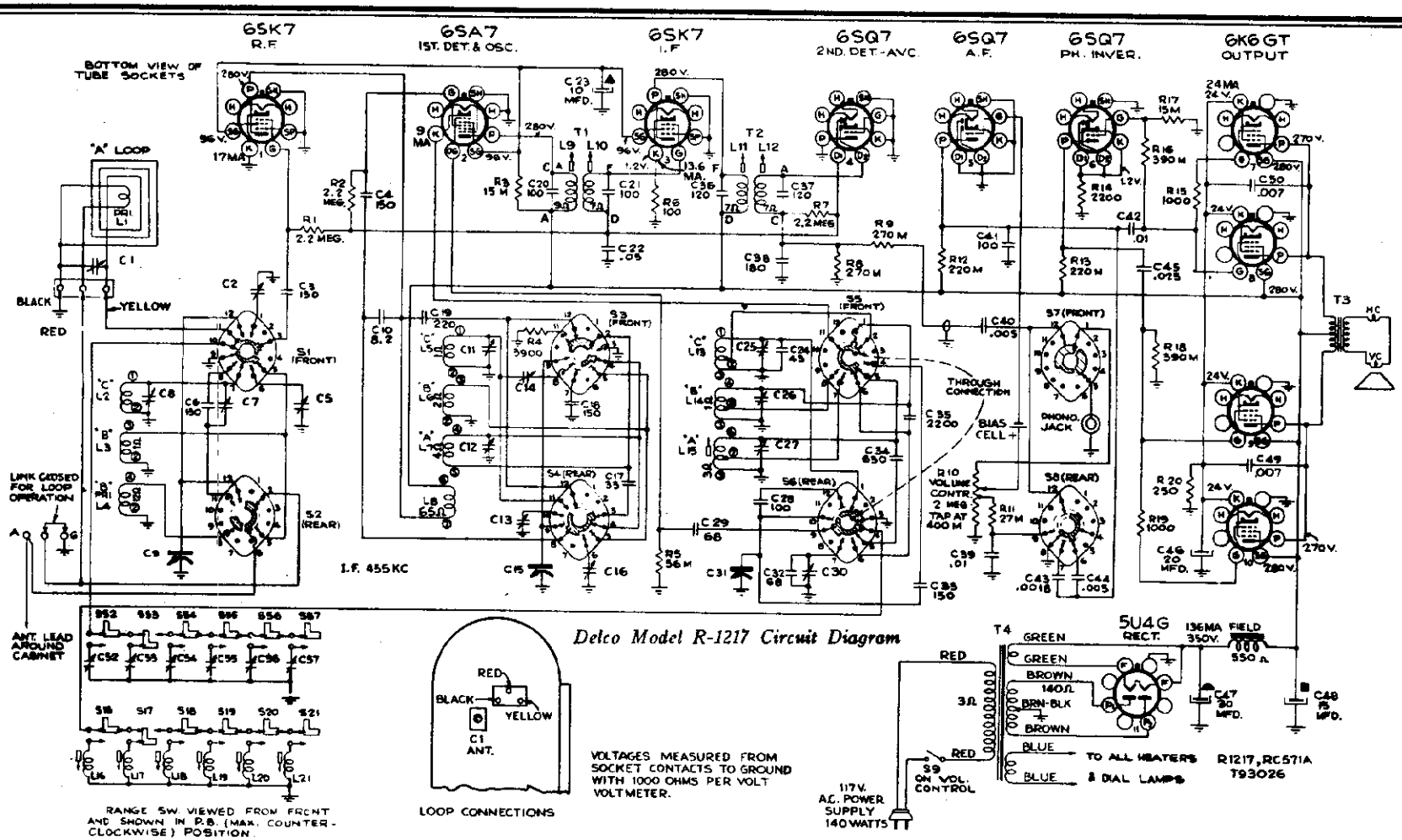
Dial Calibration



Parts Layout—Top View

PUSH-BUTTON DATA ON THE LEFT FOR MODELS R-1216 and R-1217





Delco Model R-1217 Circuit Diagram

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the indicator-drive-cord drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

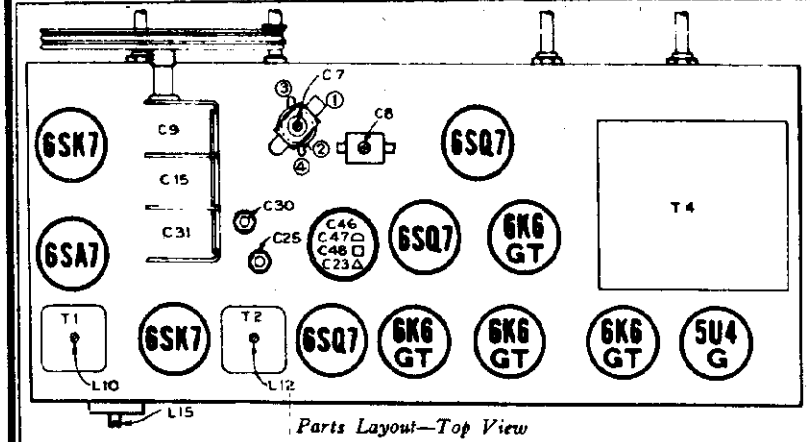
As the first step in R.F. alignment, check the position of the drum. The 135° mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are in minimum capacity position. The drum is held to the shaft by means of plastic cement which must be securely fastened when the drum is in the correct position.

To determine the corresponding frequency for any setting of the calibration scales, refer to the accompanying drawing which shows the dial with 0-180° calibration scales drawn at top and bottom.

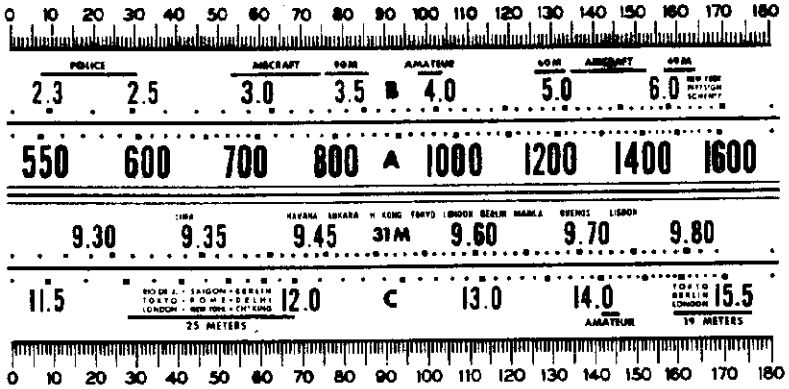
Speaker	**12-inch Electrodynamic**
Antenna	**Built-in Loop or external**
Tuning	**Manual and 6 electric push-buttons**
Tuning Range—	
Broadcast "A"	540-1,600 kc
Medium Wave "B"	2.3-6.3 mc
Spread Band	9.35-9.75 mc
Short Wave "C"	11.7-15.4 mc
Power Supply	**105-120 V. 25 cycle AC or**
	105-120 V. 50-60 cycle AC

IF PEAK 455 KC

9-26-41



Parts Layout—Top View

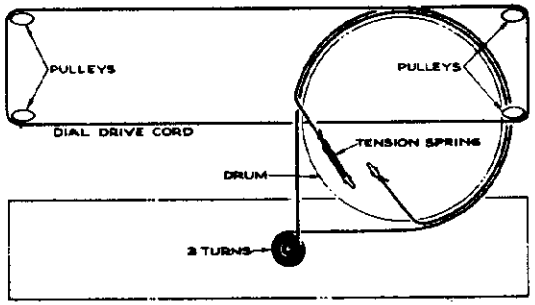


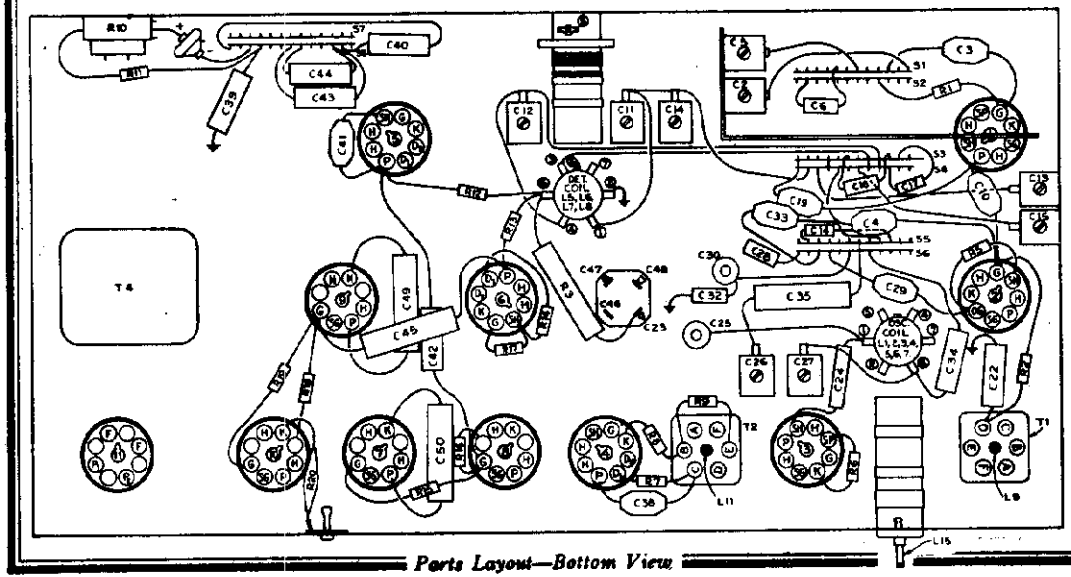
Dial Calibration

External Antenna.—When using an External Antenna, Peak C7 for max. output on a station in the 31-meter band.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "0" mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 540 kc mark, and gang condenser fully meshed. The indicaor has a spring clip for attachment to the cable.



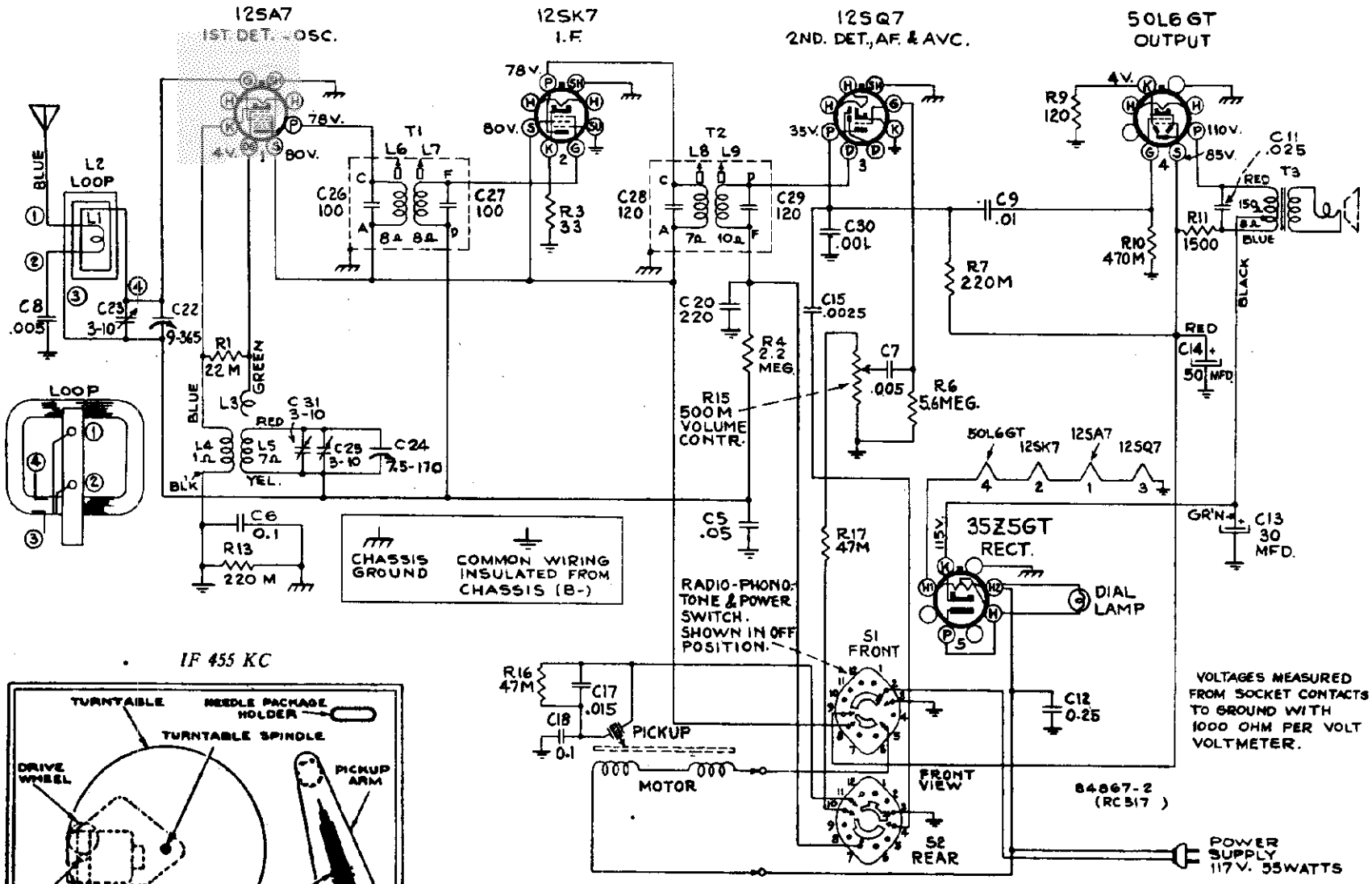


Parts Layout—Bottom View

Steps	Connect the high side of the test oscillator to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output—
1	I-F grid in series with .01 mfd.	455 kc	Quiet Point on "A" Band	L-11 and L-12 (2nd I-F Trans.)
2	1st Det. grid in series with .01 mfd.			L-9 and L-10 (1st I-F Trans.)
3	Yellow loop lead in series with 200 mmf.	1,500 kc	1,500 kc (180°) "A" Band	C-27 (osc.) C-12 (det.)
4		600 kc	600 kc (30.5°)	L-15 (osc.) Rock
5		Repeat steps 3 and 4.		
6	Antenna terminal (A) in series with 47 mmfd. (link open)	6,100 kc	6,100 kc (161°) "B" Band	C-26 (osc.)* C-13 (det.) Rock C-2 (ant.) Gang
7		15.2 mc	15.2 mc (185°) "C" Band	C-25 (osc.)* C-11 (det.) Rock C-8 (ant.) Gang
8		11.8 mc	11.8 mc (52°) "C" Band	C-7 (ant.) C-14 (det.) Rock Gang
9		Repeat steps 7 and 8.		
10		9.5 mc	9.5 mc (87.5°) 31M-Band	C-30 (osc.)* C-5 (ant.) Rock C-16 (det.) Gang
11	Fasten chassis in cabinet, close ant. link, adjust indicator to left-hand end of dial scales with gang closed.			
12	Radiation loop consisting of two turns of wire 18 inches in diameter located 4 to 8 feet from receiver	1,500 kc	1,500 kc signal "A" Band	C-1 (ant.) on loop
13		600 kc	600 kc signal "A" Band	L-15 (osc.) Rock Gang
14	Repeat steps 12 and 13.			

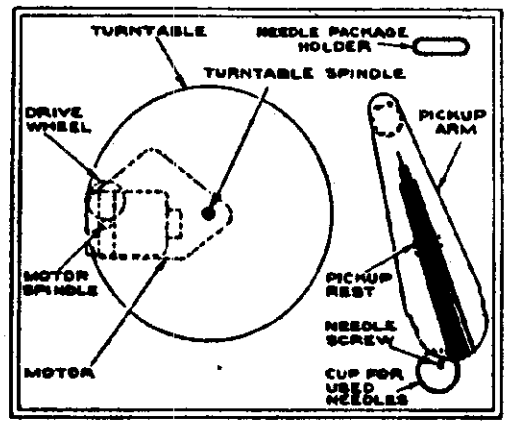
* Use minimum capacity peak if two peaks can be obtained.

Note: Oscillator tracks 455 kc above signal on all bands.



Delco Model R1218 Circuit Diagram

IF 455 KC



Phonograph

IF PEAK 455 KC

6-9-41

MODEL R-1218

UNITED MOTORS SERVICE

GENERAL

The Delco Model R-1218 is a five-tube, single-band, AC, superheterodyne radio and phonograph with 5-inch permanent magnet dynamic speaker and built-in loop antenna.

ANTENNA

A loop antenna is attached to the chassis. This type of antenna is somewhat directional, therefore, the radio should be tried in different positions to determine the position which will produce the best reception. An antenna lead is provided for coupling an outside antenna to the receiver.

ALIGNMENT PROCEDURE

Volume Control maximum, Signal Generator output minimum for satisfactory output indication.

PHONOGRAPH MOTOR

The phonograph motor is of the self starting synchronous type and operates the turntable through friction drive between the motor drive spindle and the rubber tired idler on the rim of the turntable.

The motor should be lubricated once or twice a year by placing a few drops of S.A.E. 20 oil on the turntable spindle and saturating the felt oil retaining pads on the motor shaft.

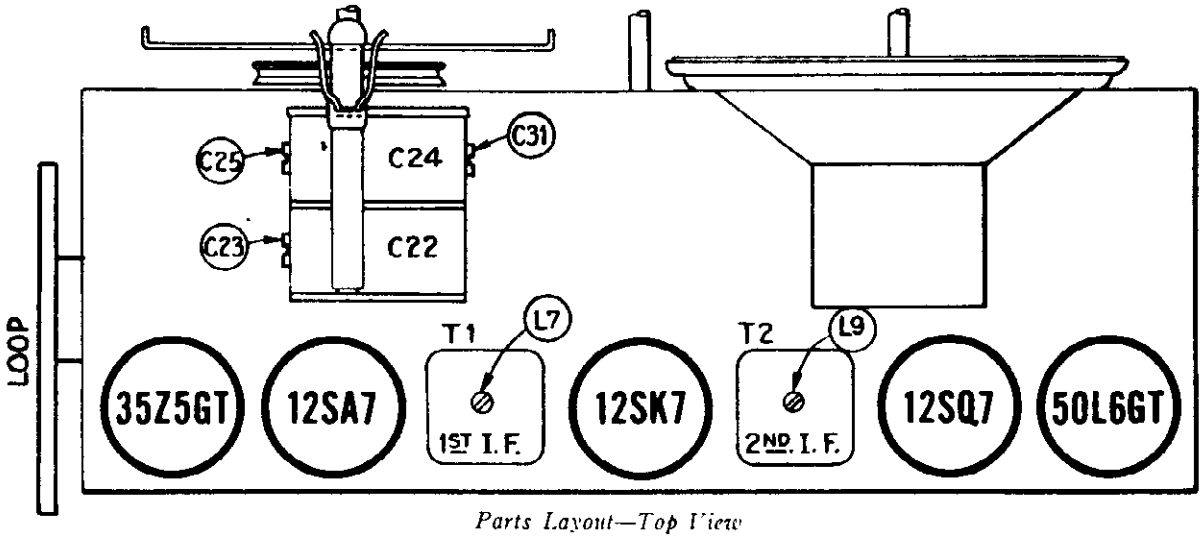
CAUTION

The motor drive spindle and the rubber tire on the idler must be kept clean and entirely free from oil and grease at all times.

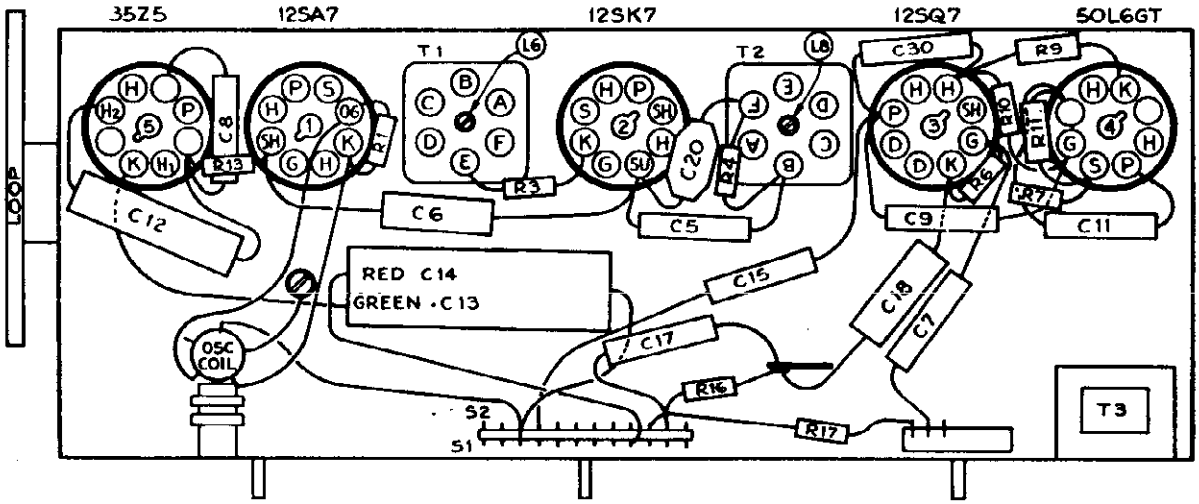
POWER SUPPLY

Although this model employs an AC-DC chassis, it is not suitable for use on DC, as this would damage the motor.

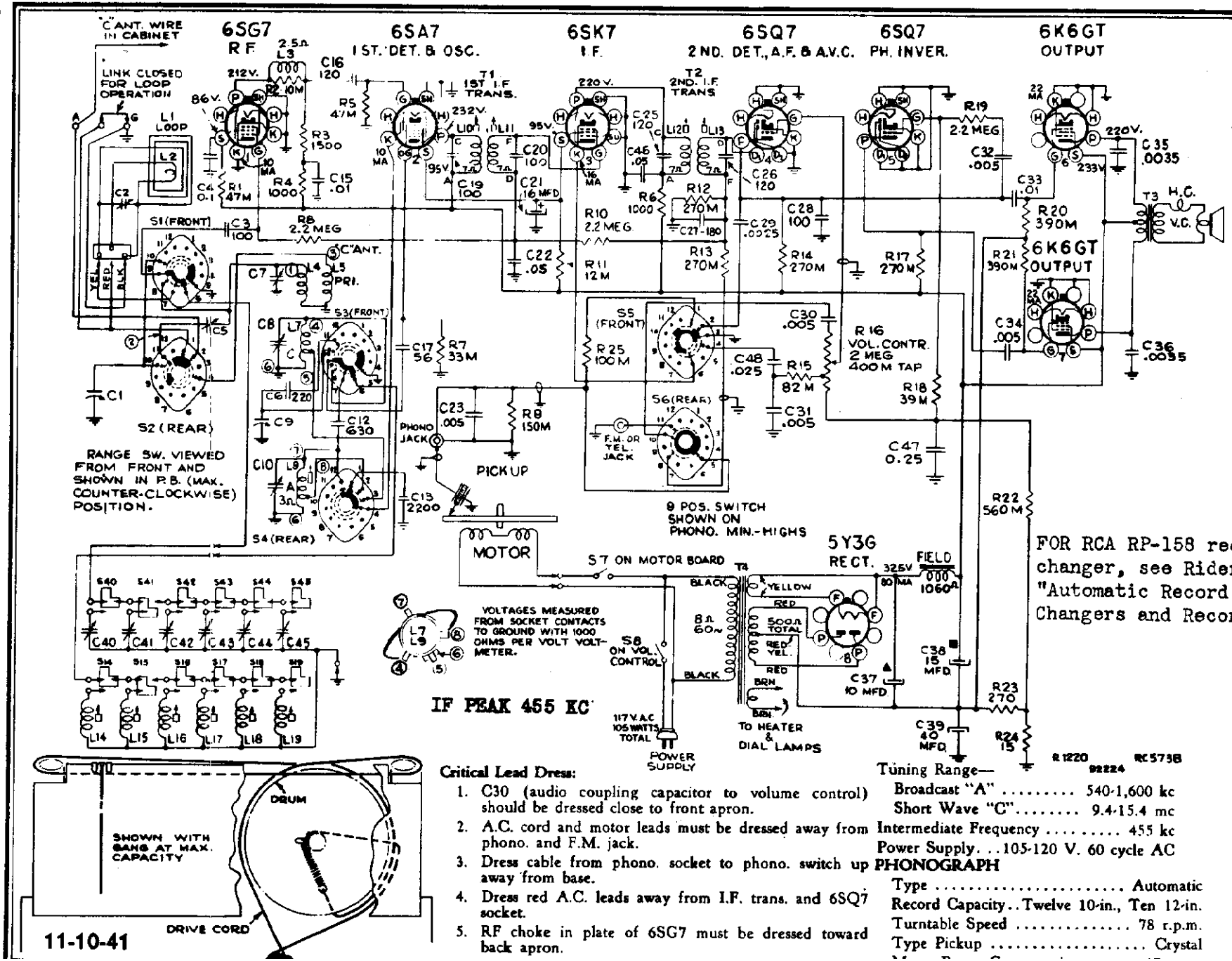
Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	I-F grid, in series with .01 mfd.	455 kc	Quiet point 1,600 kc end of dial	L8 and L9 2nd I-F Transformer
2	1st Det. grid in series with .01 mfd.			L6 and L7 1st I-F Transformer
3	Ant. terminal in series with 200 mmfd.	1,650 kc	Gang at minimum	C25 (osc.) C31 (osc.)
4	Radiation loop consisting of two turns of wire 18 inches in diameter located 4 to 6 feet from receiver	1300 kc	Signal Frequency	C23 (ant.)
5	Repeat steps 3 and 4.			



Parts Layout—Top View



Parts Layout—Bottom View



Critical Lead Dress:

1. C30 (audio coupling capacitor to volume control) should be dressed close to front apron.
2. A.C. cord and motor leads must be dressed away from phono. and F.M. jack.
3. Dress cable from phono. socket to phono. switch up away from base.
4. Dress red A.C. leads away from I.F. trans. and 6SQ7 socket.
5. RF choke in plate of 6SG7 must be dressed toward back apron.

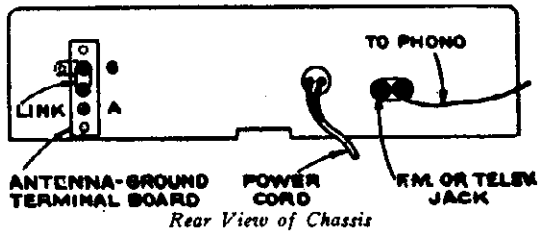
Tuning Range—
Broadcast "A" ..... 540-1,600 kc
Short Wave "C"..... 9.4-15.4 mc
Intermediate Frequency ..... 455 kc
Power Supply. . .105-120 V. 60 cycle AC

PHONOGRAPH

Type ..... Automatic
Record Capacity..Twelve 10-in., Ten 12-in.
Turntable Speed ..... 78 r.p.m.
Type Pickup ..... Crystal

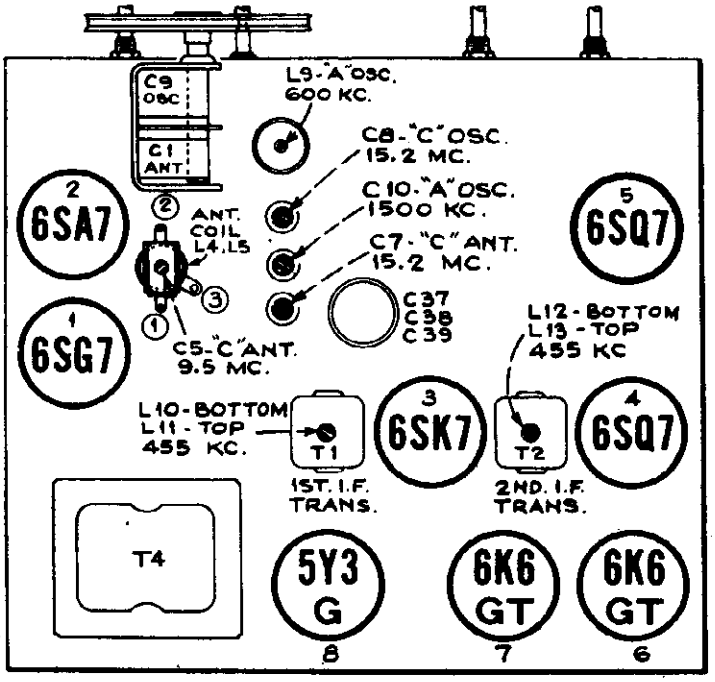
MODEL R-1220
MODEL R-1221

UNITED MOTORS SERVICE

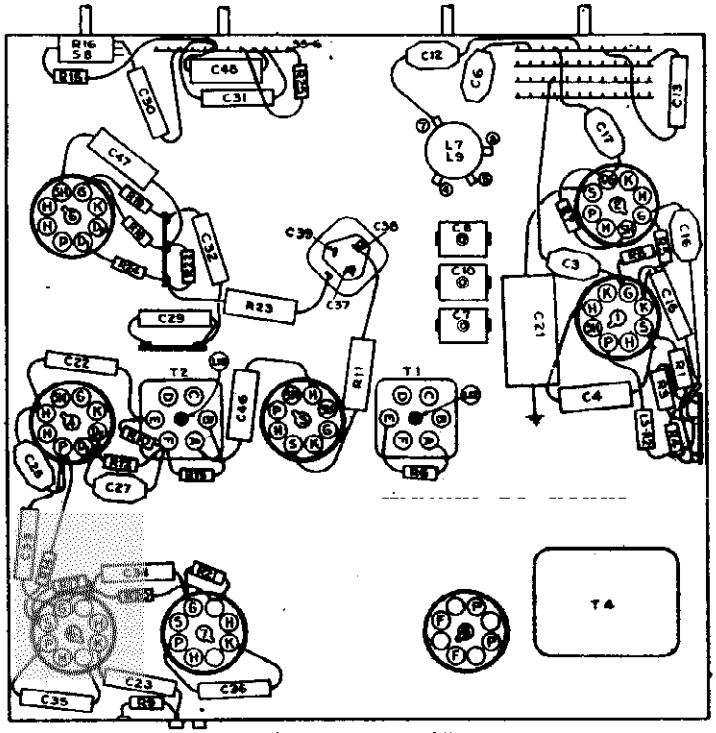


Rear View of Chassis

MODELS
R-1220
R-1221



Parts Layout—Top View



Parts Layout—Bottom View

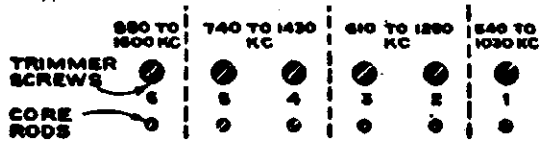
GENERAL

Tubes ..... Eight
Speaker ..... 12-inch Electrodynamic
Antenna ..... Built-in Loop or external
Tuning ..... Manual and 6 electric push-buttons

The procedure is as follows:

1. Make a list of the six desired stations, arranged in order from low to high frequencies.
2. Turn Range Control knob to standard broadcast position, and manually tune in the first station on the list.
   No outside antenna should be used and link on antenna board should be closed.
3. Turn Range Control knob to electric tuning and press push button No. 1 and adjust No. 1 oscillator core to receive this station. Screw the core all the way in, to lowest frequency, and then unscrew slowly until station is received.
4. Adjust No. 1 antenna trimmer for maximum output on this station.
   Owing to the relatively high R-F gain, it may be found that there are several settings of each push-button magnetite core that will bring in any particular station. In such cases it is advisable to unscrew the push button antenna trimmers to minimum capacity before adjusting the oscillator cores.
   Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.
5. Adjust for each of the remaining five stations in the same manner.

On the 880 to 1,600 kc push-button, the higher frequency stations may be received with osc. core either in or out (oscillator frequency either 455 kc below or 455 kc above the station frequency). The adjustment with this core in its out position (oscillator frequency 455 kc above the station frequency) is the correct one.



Push Button Adjustments

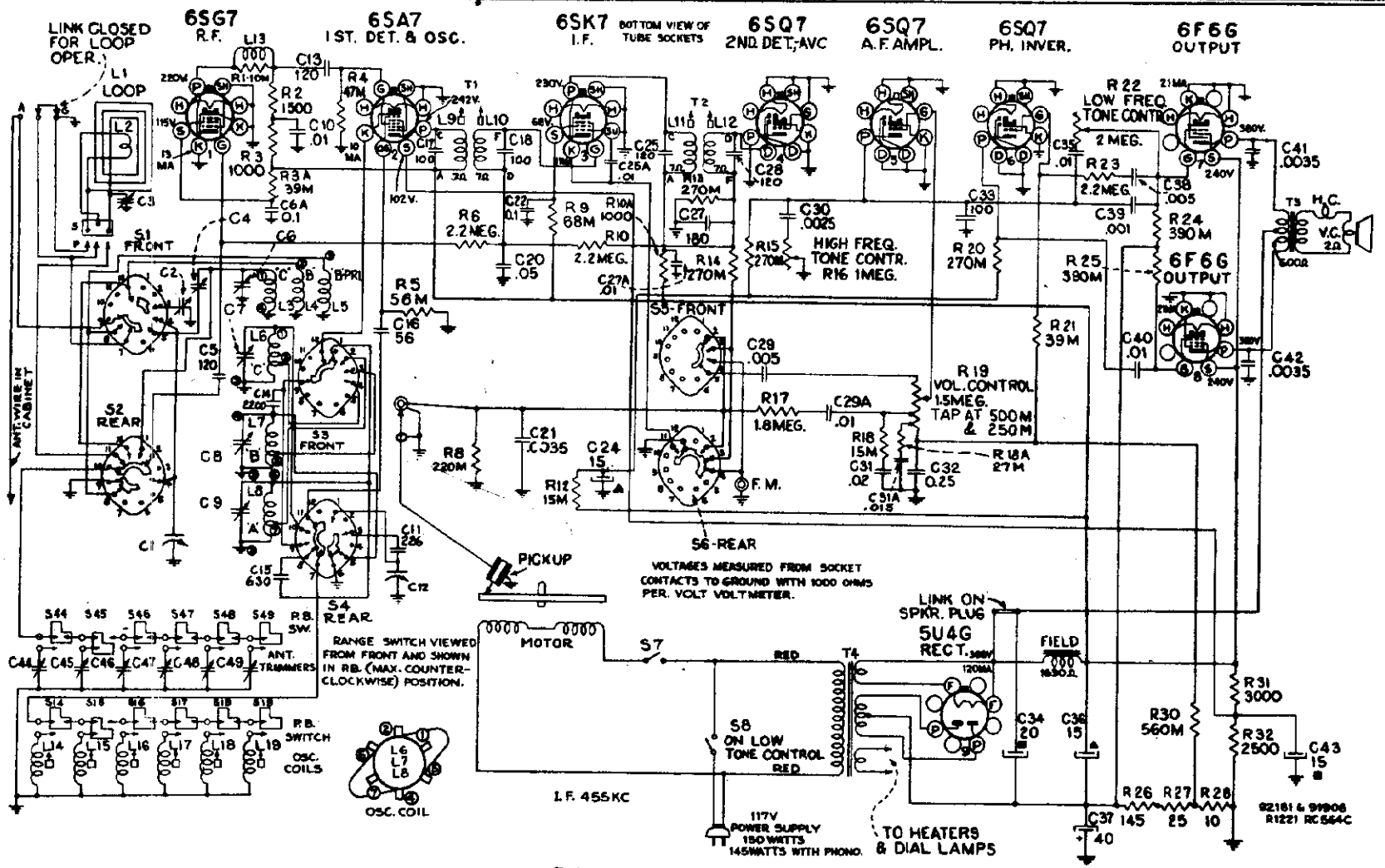
Using Tuning Dial.—

1. Remove glass dial from the cabinet.
2. With gang in full mesh, move the dial pointer to a point 1/16 inch to left of reference mark at left hand end of the dial backing plate.
3. Place the glass dial under the pointer so that the extreme left scale graduation coincides with the pointer. Use scotch tape to hold the glass dial in place.

"C" Band Reception—For best reception on "C" band with an outside antenna, adjust the trimmer screw on the RF coil on the chassis. Turn screw carefully with an insulated screwdriver while the receiver is tuned to a station in the 31-meter band, and make setting for best reception. If returning to internal antenna at any time, close the link on the center terminal and adjust "C" band antenna trimmer for best reception on 31-meter band.

Steps	Connect test-osc. output to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output—
1	I-F grid in series with .01 mfd.	455 kc	"A" band 540 kc	L12 and L13 (2nd I-F trans.)
2	1st Det. grid in series with .01 mfd.			L10 and L11 (1st I-F trans.)
3	A-Terminal in series with 47 mmfd. (link closed)	15.2 mc	"C" band 15.2 mc	C8 (osc.)* C7 (ant.)
4		9.5 mc	"C" band 9.5 mc	C5 (ant.) (Rock gang)
5		Repeat steps 3 and 4		
6	Yellow loop lead in series with 200 mmfd. (link closed)	1,500 kc	"A" band 1,500 kc	C10 (osc.)
7		600 kc	"A" band 600 kc	L9 (osc.)
8		Repeat steps 6 and 7		
9	Install and connect chassis in cabinet with antenna link closed. Tune in a radiated oscillator signal at 1,500 kc. and peak the "A" band trimmer C2 (on loop). Rock in L9 for peak output at 600 kc.			

* Use minimum capacity peak if two peaks can be obtained. Oscillator tracks 455 kc. above signal on all bands.



Delco Model R-1221 Circuit Diagram

GENERAL

Tubes	Nine
Speaker	12-in. Electrodynamic
Antenna	Built-in Loop or external
Tuning	Manual and 6 electric push-buttons
Tuning Range—	
Standard Broadcast (A)	540-1,600 kc
Medium Wave (B)	2.3-6.3 mc
Short Wave (C)	9.3-15.4 mc
Intermediate Frequency	455 kc
Power Supply	105-125 V. 60 cycle AC

PHONOGRAPH

Type	Automatic
Record Capacity	Twelve 10-in., Ten 12-in.
Turntable Speed	78 r.p.m.
Type Pickup	Crystal
Motor Power Consumption	17 watts

FOR PUSH-BUTTON DATA SEE INDEX

For RCA RP-158 record changer, see Rider's "Automatic Record Changers and Recorders".

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MODEL R-1221

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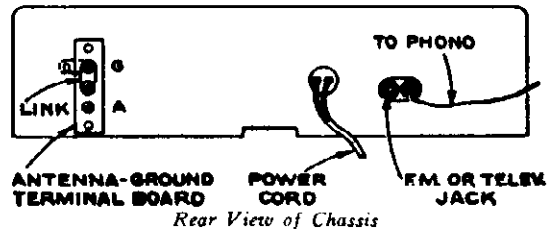
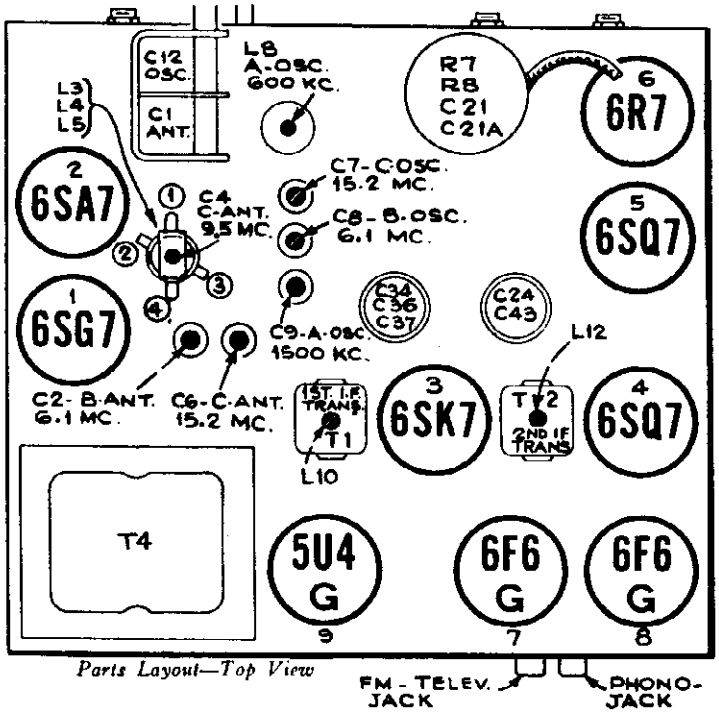
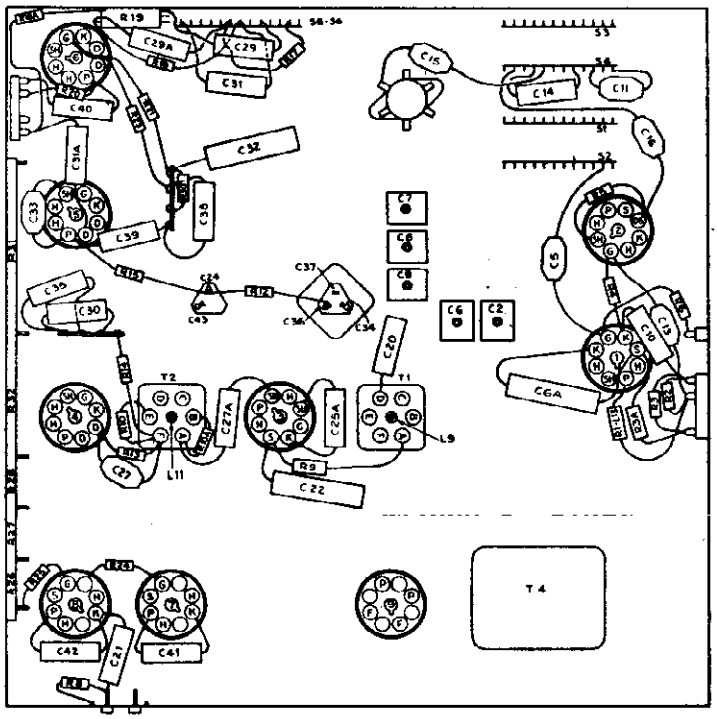


Rear View of Chassis



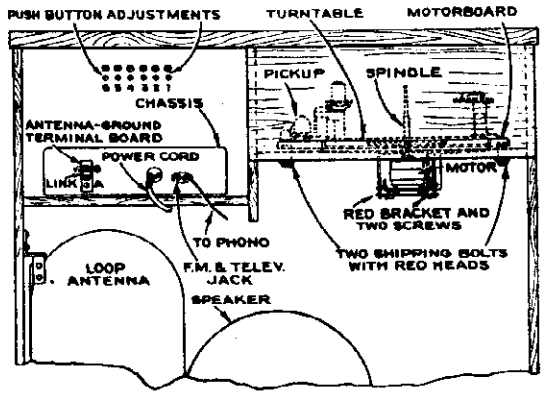
Parts Layout—Top View



Parts Layout—Bottom View

Critical Lead Dress

1. Push button, R.F. and oscillator leads should be separated as much as possible to reduce degeneration on push button reception.
2. R.F. choke in plate circuit of 6SG7 should be dressed towards the back apron.
3. Dress green push button lead under clamp and away from "C" band series capacitor.
4. Dress heater leads away from grids and diodes.
5. Dress green lead from 6SA7 screen to electrolytic down close to chassis.
6. Keep yellow loop lead clear of all wiring.
7. Dress oscillator grid capacitor (56 mmfd.) up and away from the screen and plate of 6SA7 socket.
8. Keep all leads away from Phono.-FM jack to prevent audio oscillation and hum. Dress underneath the shield provided.
9. Remove all excess slack from pilot light assembly and dress it close to chassis base away from volume control.
10. A-C leads to "off-on" switch should be kept away from tone control cable to reduce hum.



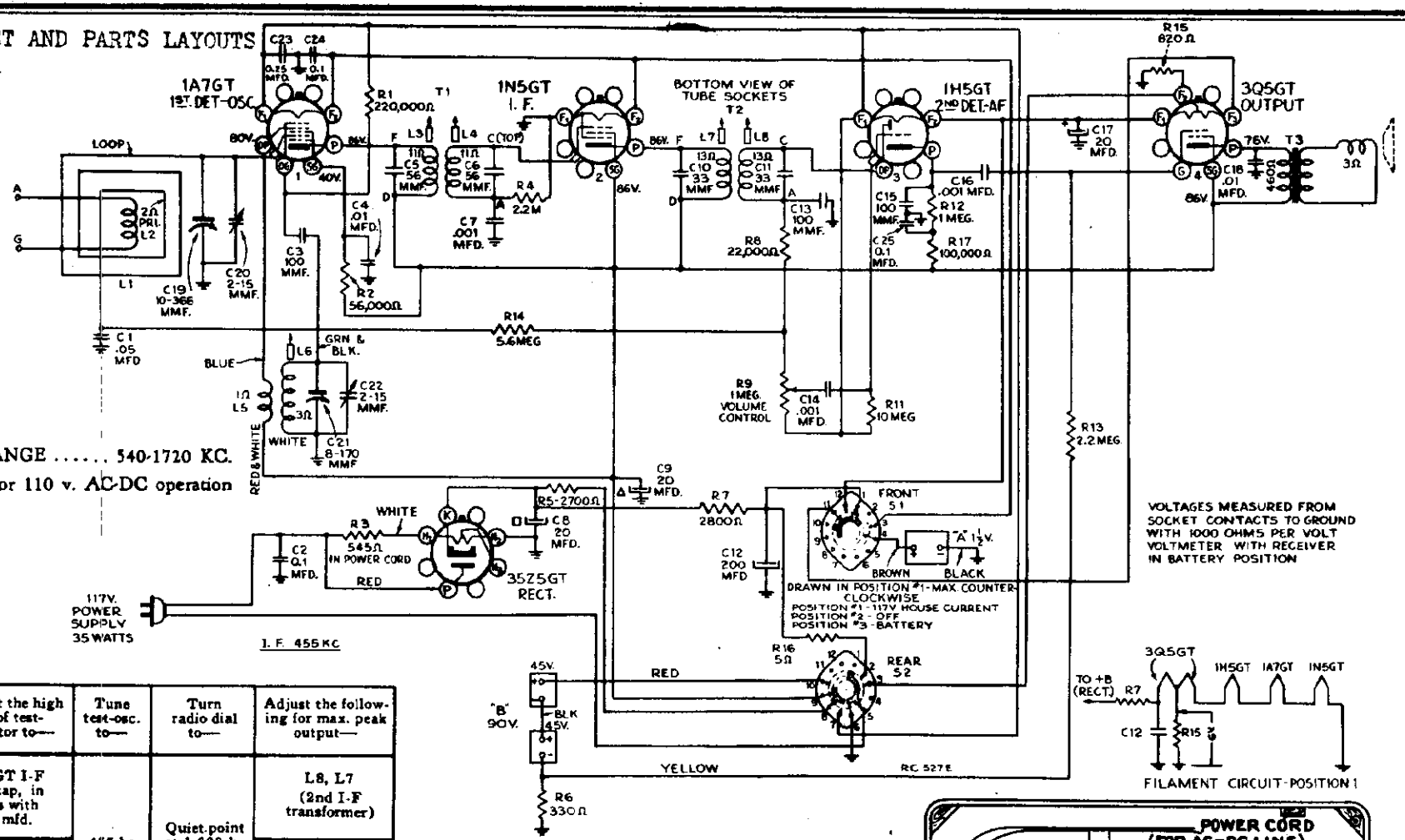
Rear View of Cabinet

Steps	Connect high side of test osc. to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output—
1	I-F grid in series with .01 mfd.	455 kc	"A" Band 540 kc	L12, L11 (2nd I-F Trans.)
2	1st Det: grid in series with .01 mfd.			L10, L9 (1st I-F Trans.)
3	Yellow loop lead in series with 200 mmf. (link closed)	1,500 kc	"A" Band 1,500 kc	C9 (osc.)
4		600 kc	"A" Band 600 kc	L8 (osc.)
5	Repeat steps 3 and 4			
6	Ant. terminal in series with 47 mmf. (link closed)	6.1 mc	"B" Band 6.1 mc	C8 (osc.)* C2 (ant.)
7		15.2 mc	"C" Band 15.2 mc	C7 (osc.)* C6 (ant.)
8		9.5 mc	"C" Band 9.5 mc	C4 (ant.)
9	Repeat steps 7 and 8			
10	Install and connect chassis in cabinet, with link closed. Tune in a radiated oscillator signal at 1,500 kc and peak the "A" band ant. trimmer C3 (on loop). Rock in L8 for peak output at 600 kc.			

* Use minimum capacity peak if two peaks can be obtained. Oscillator tracks 455 kc above signal on all bands.

For other alignment notes and drive-cord data, see Model R-1220

FOR SOCKET AND PARTS LAYOUTS SEE INDEX



VOLTAGES MEASURED FROM SOCKET CONTACTS TO GROUND WITH 1000 OHMS PER VOLT VOLTMETER WITH RECEIVER IN BATTERY POSITION

TUNING RANGE ..... 540-1720 KC.

BATTERY..or 110 v. AC-DC operation

6-2-41

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	1N5GT I-F grid cap, in series with .01 mfd.	455 kc	Quiet-point at 1,600 kc end of dial	L8, L7 (2nd I-F transformer)
2	1A7GT 1st-Det. grid cap, in series with .01 mfd.			L4, L3 (1st I-F transformer)
3	Radiation loop consisting of two turns of wire 18 inches in diameter located 4 to 6 feet from receiver	1,720 kc	signal frequency	C22 (Osc. Trimmer)
4		1,400 kc		C20 (Ant. Trimmer)
5		600 kc		L6 (Rock in)
6	Repeat steps 3, 4 and 5 until aligned.			

SPEAKER.....5-in. Permanent-magnet dynamic

ANTENNA.....Built-in Loop or external

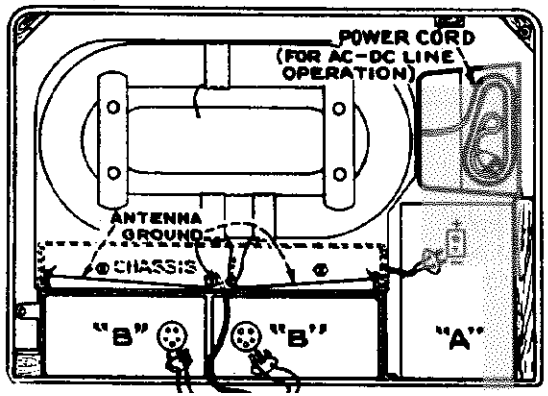
CURRENT CONSUMPTION

BATTERY OPERATION..... { "A" 0.25 amperes / "B" 11.5 milliamperes

A-C—105-125 volt 50-60 cycles / D-C—105-125 volt .....35 watts

"A"-ONE 1.5 VOLT RAYOVAC *P96A, EVEREADY *743, OR EQUAL.

"B"-TWO 45 VOLT RAYOVAC *P7830, EVEREADY *482, OR EQUAL.



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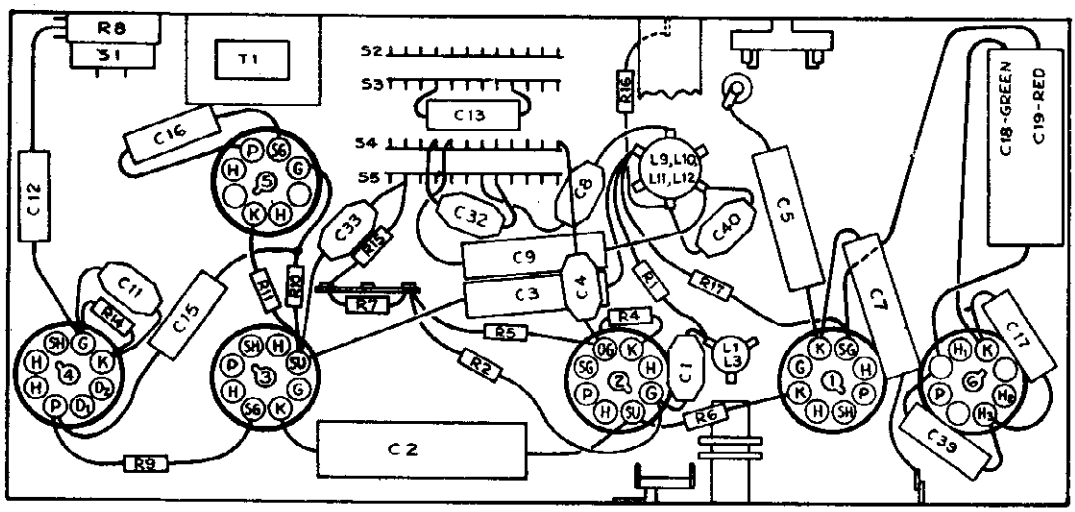
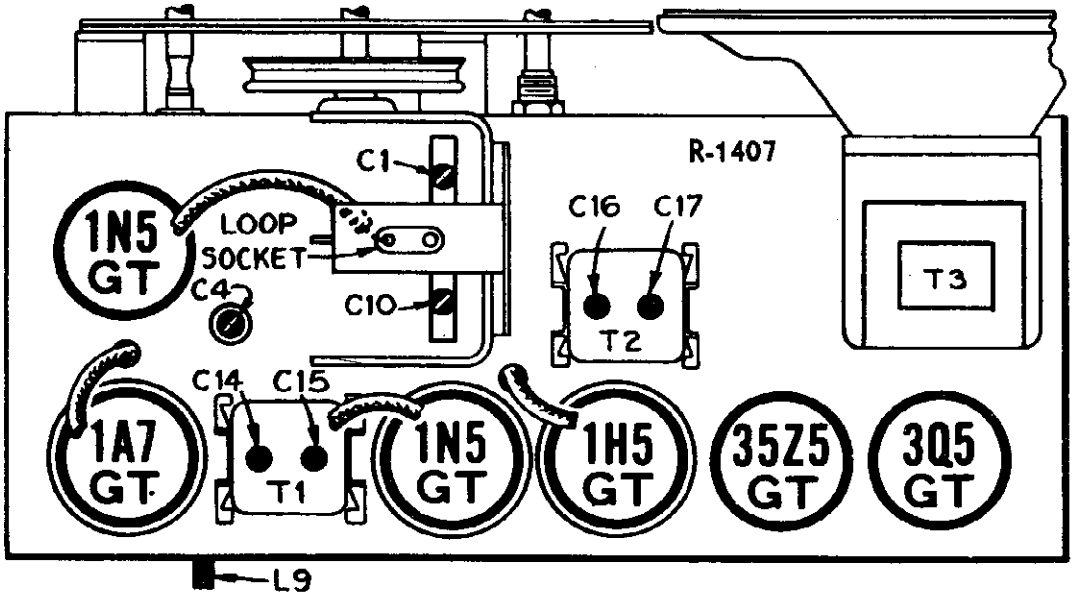
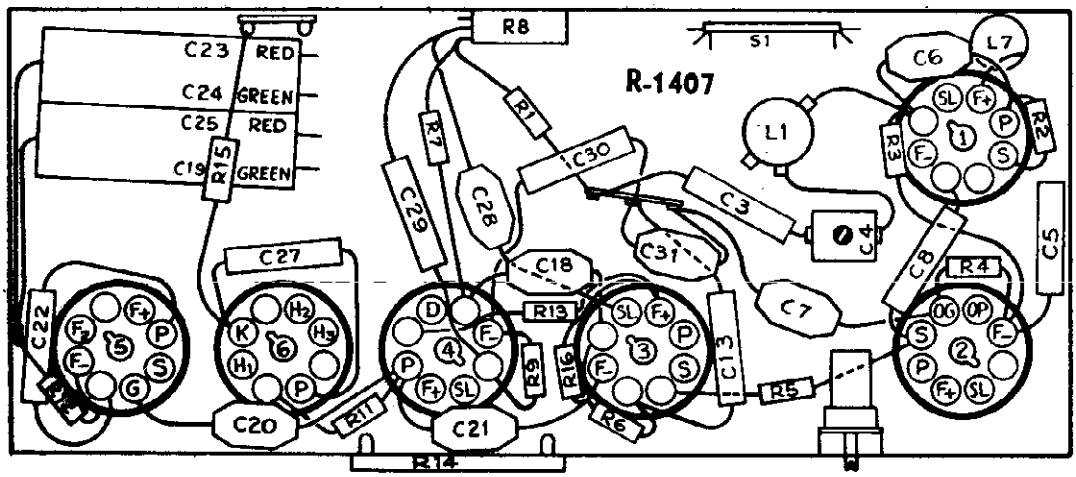
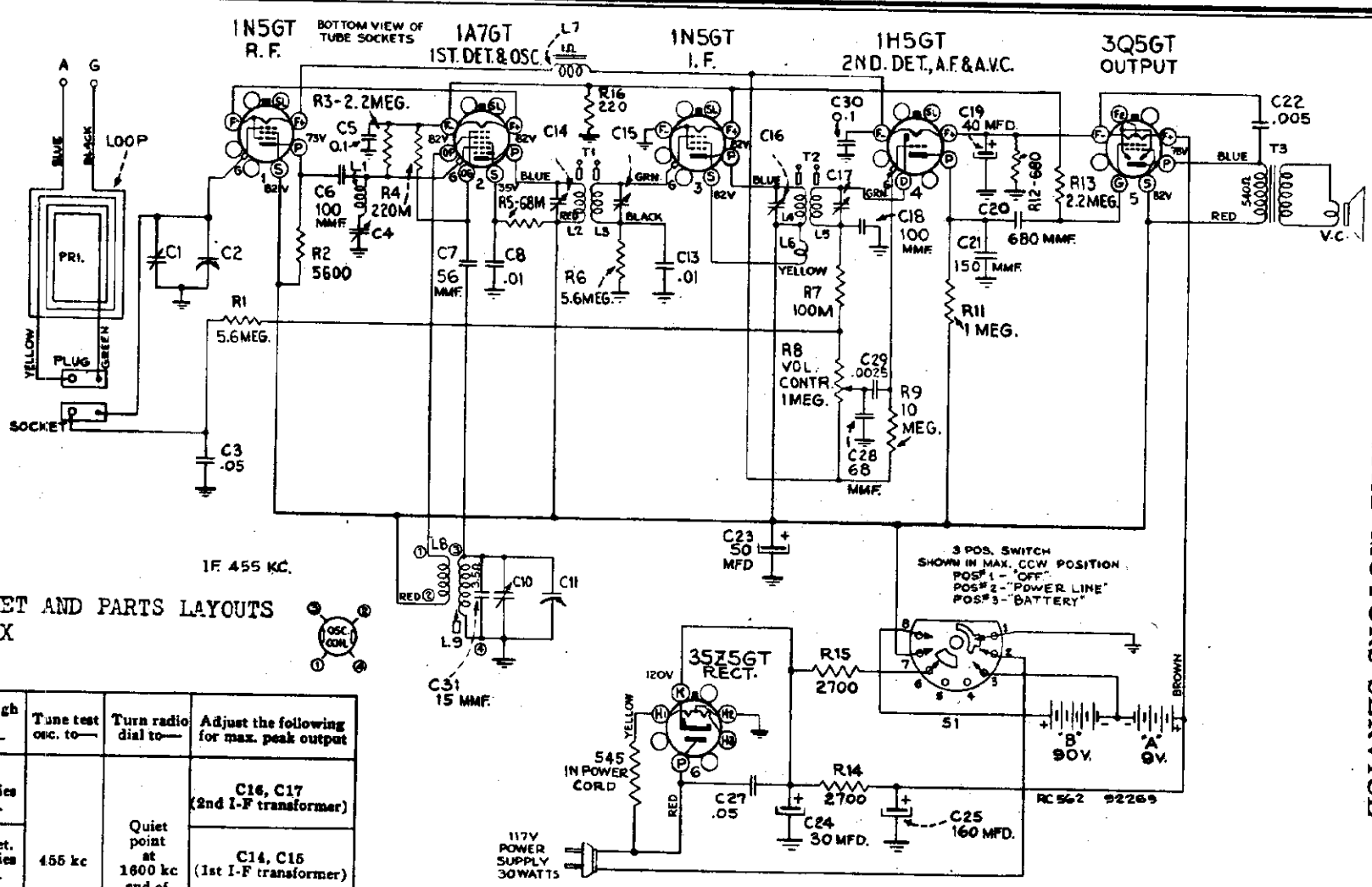


MODEL R-1212 *Parts Layout—Bottom View*







1F 455 KC.

FOR SOCKET AND PARTS LAYOUTS SEE INDEX

Steps	Connect the high side of test-osc. to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	1N5GT I-F grid cap, in series with .01 mfd.	455 kc	Quiet point at 1600 kc end of dial	C16, C17 (2nd I-F transformer)
2	1A7GT 1st Det. grid cap, in series with .01 mfd.			C14, C15 (1st I-F transformer)
3	Antenna terminal in series with 200 mmfd.			C4 Wave trap for *minimum* output
4		600 kc	600 kc	L9 (osc.) (Rock in)
5		1,600 kc	1,600 kc	C10 (osc.)
6		1,300 kc	1,300 kc	C1 (ant.)
7	Repeat steps 4, 5 and 6 until aligned			

Delco Model R1407 Circuit Diagram

"A"—TWO 4.5-VOLT EVEREADY NO. 746, BURGESS NO. 6-3, RAY-O-VAC NO. P-63-A, OR EQUIVALENT.
"B"—TWO 45-VOLT EVEREADY NO. 482, BURGESS NO. M-30, RAY-O-VAC NO. P-7830, OR EQUIVALENT.

CURRENT CONSUMPTION

BATTERY OPERATION..... "A" 0.05 amperes; "B" 14 milliamperes

A-C—105-125 volt 50-60 cycles

VOLTAGES MEASURED FROM SOCKET CONTACTS TO GROUND WITH 1000 OHMS PER VOLT VOLTMETER WITH RECEIVER IN BATTERY POSITION

6-16-41

MODEL 983705

UNITED MOTORS SERVICE

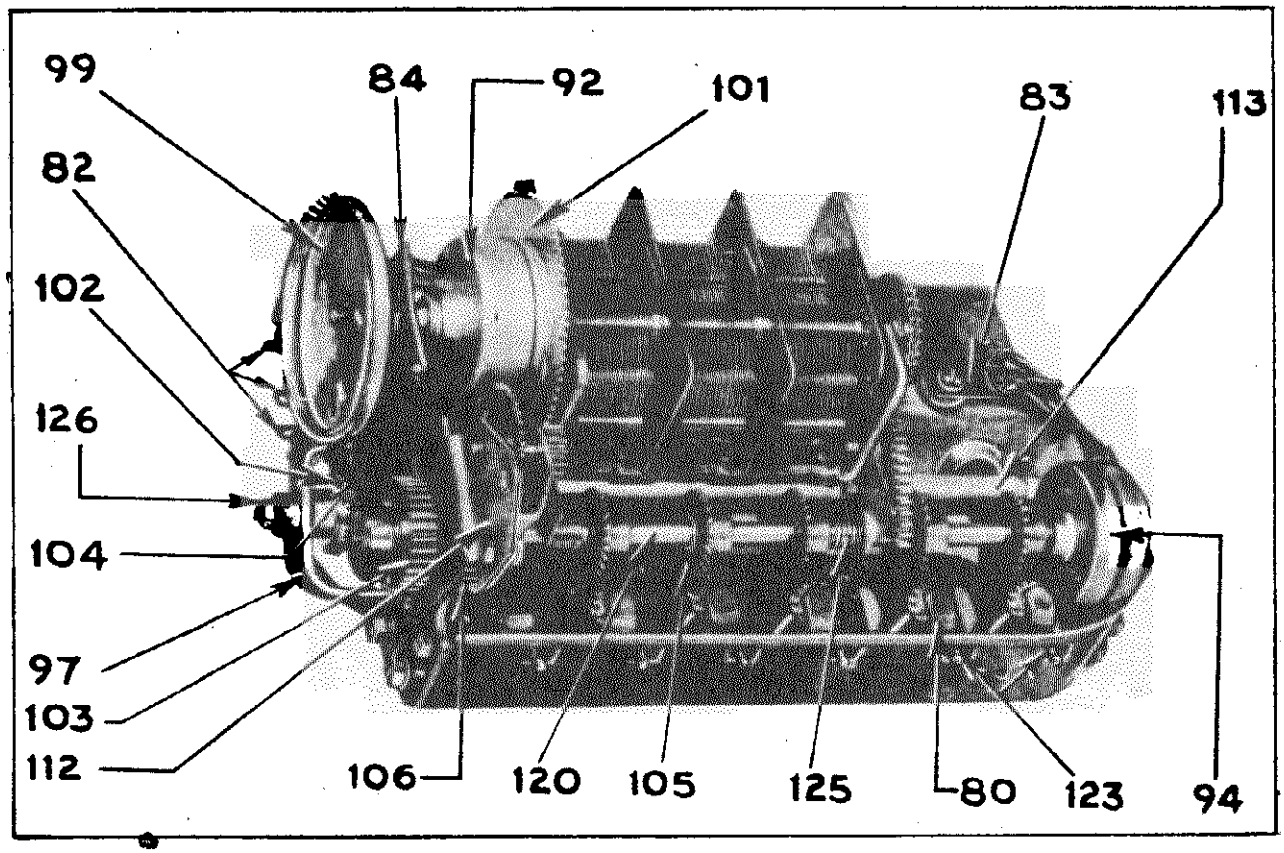
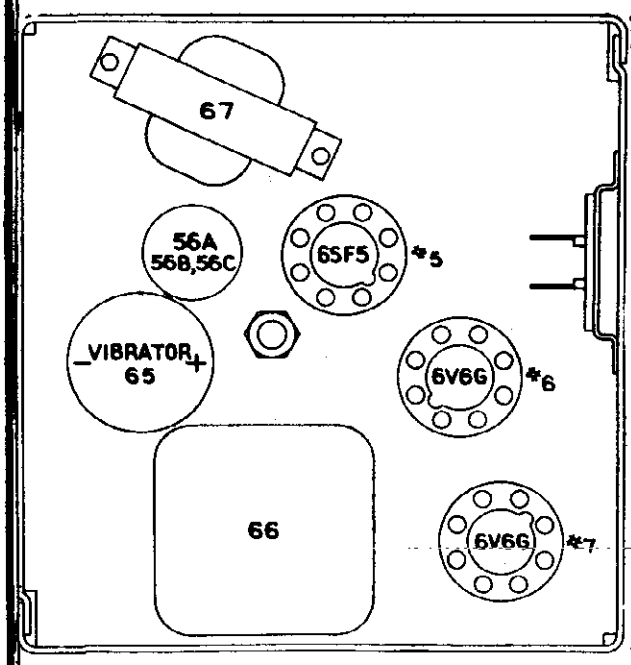


FIG. 9--PARTS LAYOUT--TUNER UNIT



-PARTS LAYOUT--DASH UNIT--TOP VIEW

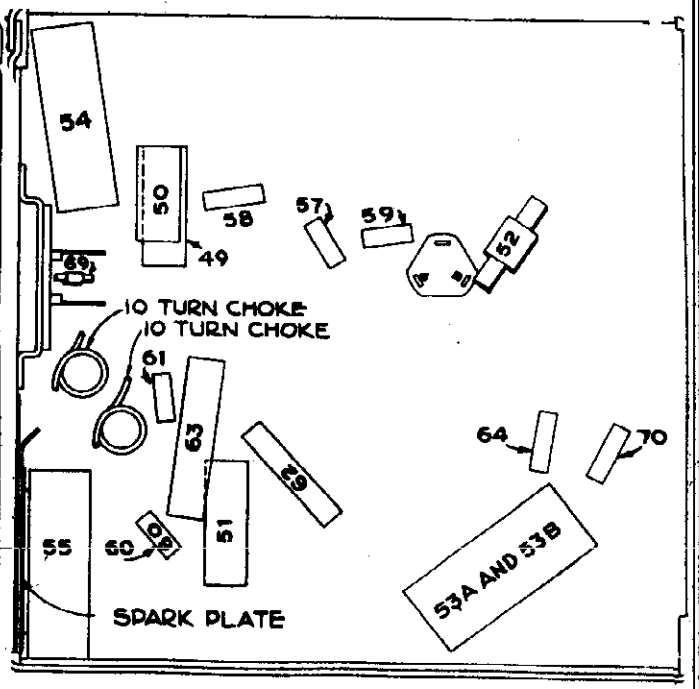
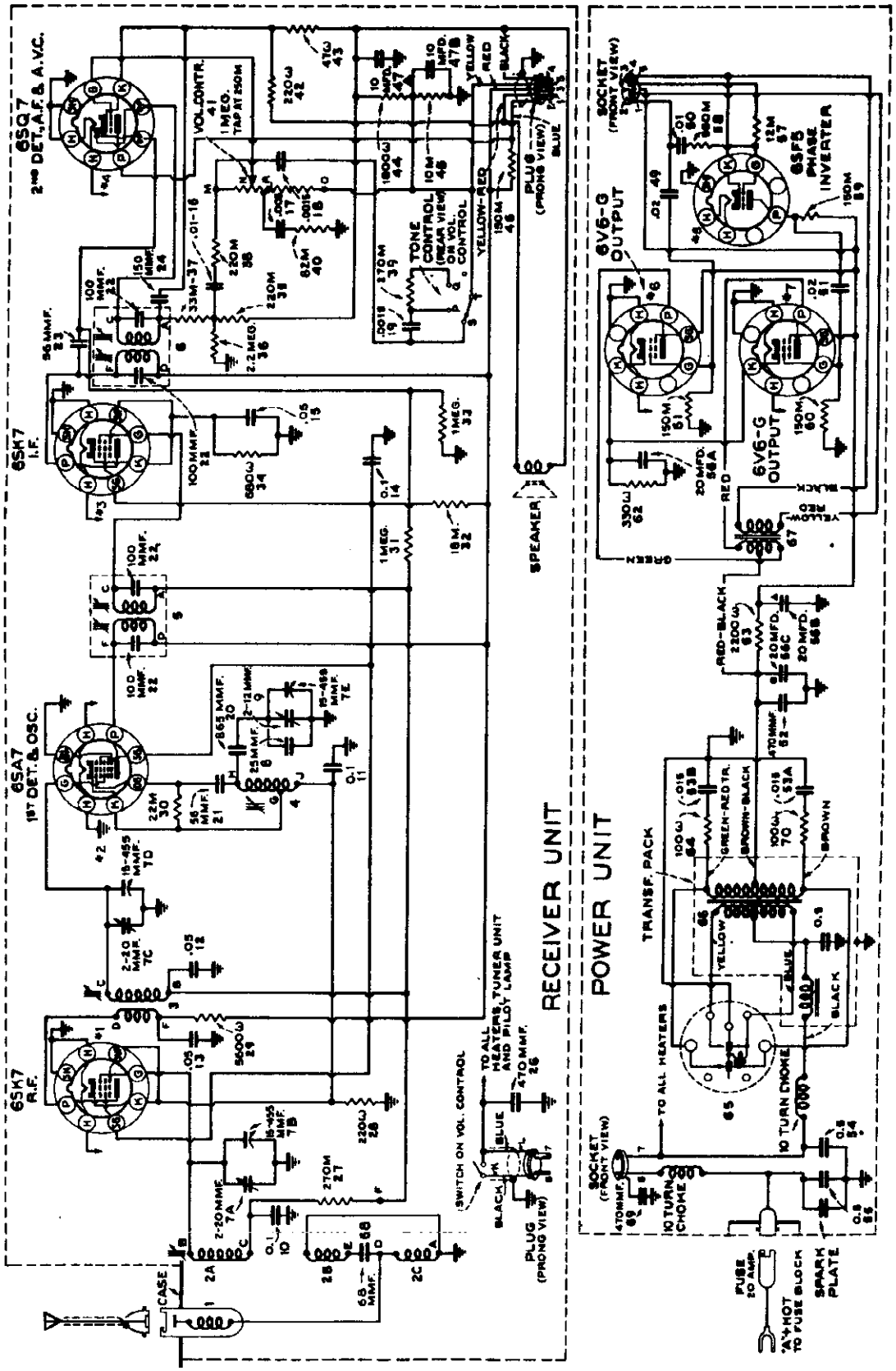


FIG. 8--PARTS LAYOUT--DASH UNIT--BOTTOM VIEW

UNITED MOTORS SERVICE



-PONTIAC MODEL 983705

GENERAL: The Pontiac Model 983705 is a seven-tube, two unit superheterodyne receiver with automatic push-button tuning and an 8 inch P. M. speaker, and is designed specifically for the 1940 Pontiac automobile.

CIRCUIT DIAGRAM

CIRCUIT ALIGNMENT

If realignment is found necessary the circuits can be properly adjusted only with the use of a calibrated test oscillator or signal generator and an output meter.

All adjustments on back of the tuner unit are accessible by removing the back cover. During I.F. alignment, the speaker cover must be removed from the tuner unit to permit access to the two I.F. adjustments located in front of the chassis. Turn the volume control full on, to maximum volume position.

1. Aligning I.F. Stages at 260 kilocycles

   (a) Connect the signal lead of the signal generator to the control grid of the 6SA7 tube (Pin #8) through a .1 mfd. condenser.

   (b) Connect the ground lead of the signal generator to the chassis frame.

   (c) Connect the output meter from the plate prong of one 6V6G to the plate prong of the other 6V6G.

   (d) Set the signal generator to exactly 260 k. c.

   (e) Adjust the core screws on the I.F. coils carefully (Ill. 5 & 6 Figs. 5 & 6, one on bottom and one on top of each I.F. coil) for maximum output. These adjustments should be repeated several times and during alignment, the signal generator 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

   (a) Leave the signal generator leads connected the same as for aligning the I.F. circuits.

   (b) Turn the rotor plates of the gang condenser all the way out of mesh and against the high frequency stop.

   (c) Set the signal generator to 1560 kilocycles.

   (d) Adjust the parallel trimmer for the oscillator section of the condenser gang (Ill. 9 Fig. 5) for a 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 545 kilocycles

   (a) Leave the signal generator leads connected the same as before.

   (b) Turn the rotor plates of the gang condenser all the way into mesh so that they rest against the low frequency stop.

   (c) Set the signal generator to 545 k. c.

   (d) Adjust the magnetite core of the oscillator coil (Ill. 4 Fig. 5) to maximum output.

   (This adjustment sets the low frequency tuning range of this receiver to 545 k. c.)

4. Realigning at 1560 kilocycles

   Recheck alignment of oscillator parallel trimmer as given in paragraph #2.

5. Aligning at 1400 kilocycles

   (a) Remove the signal lead of the signal generator from the control grid of the 6SA7 tube and connect to the antenna connector of the receiver through a .00006 mfd. mica condenser connected in place of the .1 mfd. condenser previously used.

   (b) Set the signal generator to 1400 k. c.

   (c) Turn the condenser rotor plates until this frequency is tuned in with maximum output.

   (d) Adjust the R.F. parallel trimmer on the condenser gang (Ill. 7C, Fig. 6 & 10) and the antenna parallel trimmer on the gang condenser (Ill. 7A, Fig. 6 & 10) for maximum output.

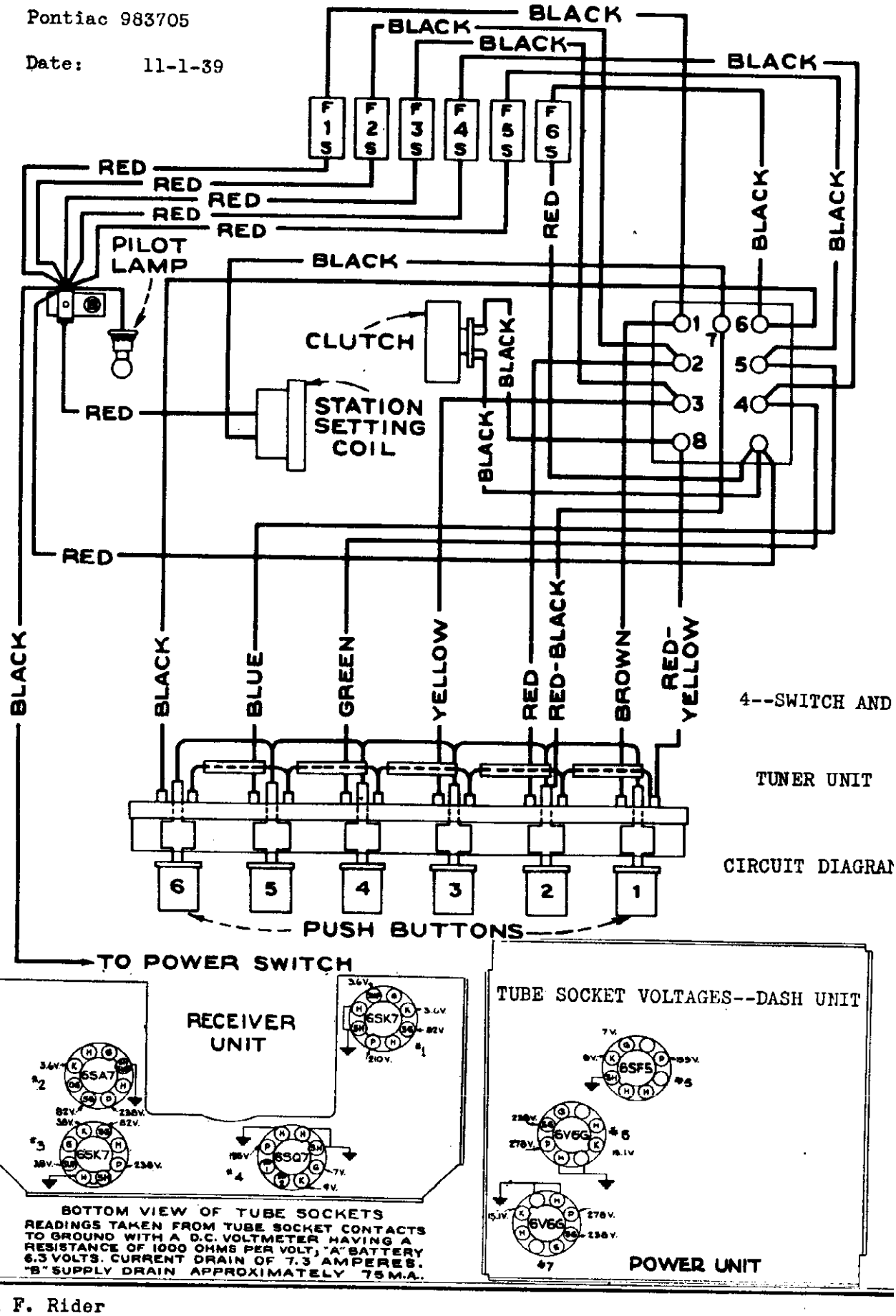
TUNING CONTROL PARTS

Illus. No.	Part No.	Part Name	Description
80	1214173	Armature Assy.	Station Selector Complete
	1214174	Bar	Pointer Slide
82	1212942	Board	Nine contact terminal
83	1214281	Board	One contact terminal
84	1214280	Board	Two contact clutch terminal
	1214175	Bracket Assy.	L.H. Pointer slide, pulley, shield
	1214176	Bracket Assy.	R.H. Pointer slide & pulleys
	1214177	Bracket	Tuner mtg. bottom
	1214274	Bracket	Tuner top mtg.
	1214179	Button	Pushbutton
	1214180	Cable Assy.	"A" lead & 2 prong plug
	1214181	Cable Assy.	Power & A.F. 5 prong plug
	504844	Call Letters	Complete Set
92	1212939	Coil	Cond. drive clutch
	1212944	Coil	Key Solenoid
94	1212949	Coil	Station setting magnet
	1212253	Cord	Pointer Drive (6' length)
97	1214282	Cradle	Man. tuning gear
	1214182	Dial	Calibrated
99	1214268	Drum	Pointer Drive Cord
	1214189	Escutcheon	Dial escutcheon & crystal
101	1212938	Gear	Cond. drive (large)
102	1214269	Gear	Man. tuning dual
103	1214267	Gear	Man. tuning key setting
104	1214268	Gear Assy.	Man. tuning shaft connector
105	1212952	Gear	Station
106	1212953	Gear	Station setting bevel
	1212941	Insulator	Clutch coil
	1212945	Insulator	Solenoid Coil
	1212950	Insulator	Station setting coil
	7258487	Knob	Tone control
	7258288	Knob	Tuning & Volume
	504909	Knob	Dummy
	7258749	Washer	Felt
	1214184	Lamp	Dial lamp (special)
112	1214185	Plate	Gear Plate Assy.
113	1214271	Plate Assy.	Rocker & Sector Gear
	1214187	Plug Assy.	2 Prong "A"
	1214186	Plug Assy.	5 Prong Power
	1214188	Pointer	Station Indicator
	1215313	Pole Piece	Key solenoid
	140852	Screw	8-32 x 1/8 set
	1214190	Shaft	Flexible tuning
120	1214264	Shaft	Key setting
	1212940	Silencer	Clutch silencer
	1214192	Socket	Dial lamp
123	1212946	Spring	Key return
	1214193	Spring	Cord tension
125	1214283	Spring	Key setting shaft
126	1214272	Stud	Man. tuning gear mtg.
	1214194	Switch Assy.	Push button switch

UNITED MOTORS SERVICE

Pontiac 983705

Date: 11-1-39



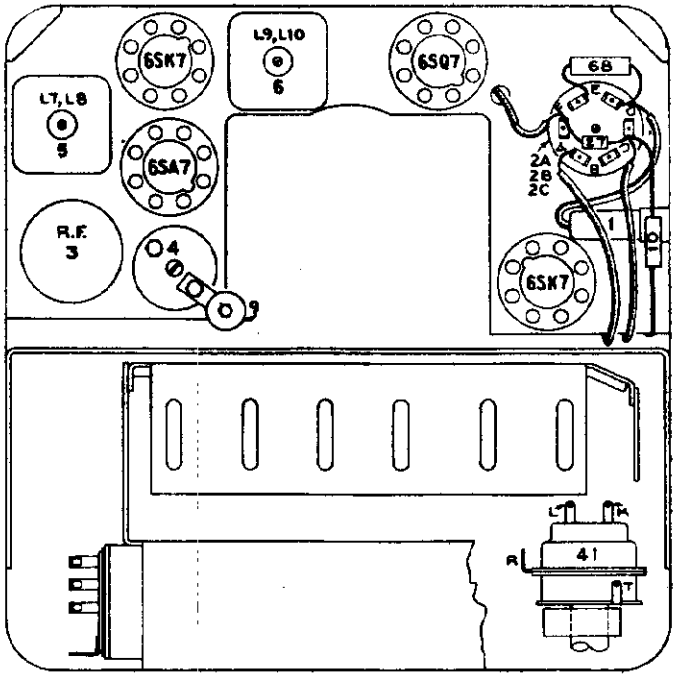


FIG. 5--PARTS LAYOUT--I-P UNIT--TOP VIEW

Tuning is by conv. manual tuning or by six P.B. which control the circuits of solenoids which rotate tuning cond. to any setting.

1. slight touch and movement of less than 1/8" is required to tune receiver with P.B. after button is adj.

2. Heavier pressure and movement of about 1/4" is required when button is set to station selected. To adj. button, P.B. in and hold in that pos. while tuning desired station accurately as possible with manual tuning knob. Release button and station is set.

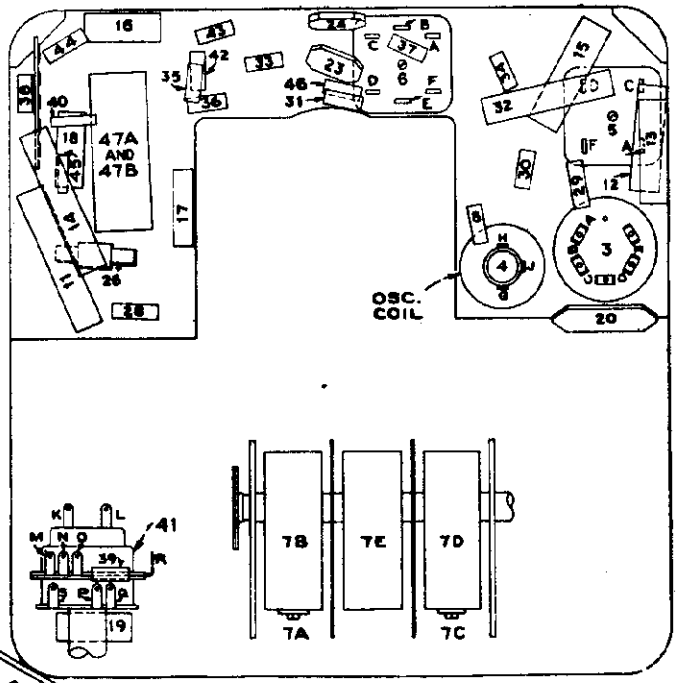


FIG. 6--PARTS LAYOUT--I-P UNIT--BOTTOM VIEW

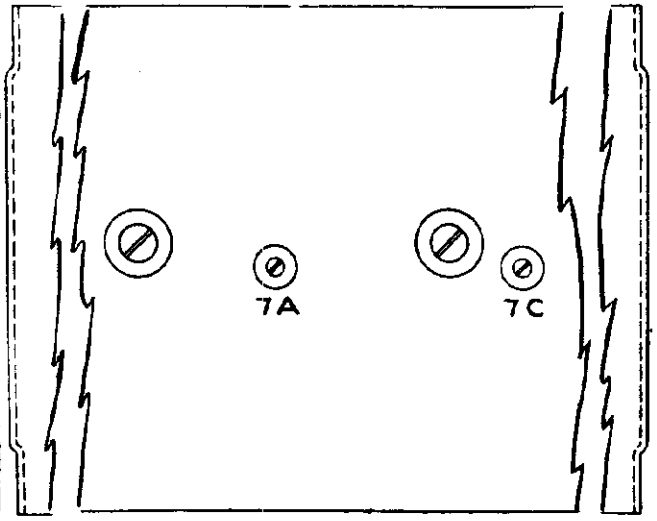


FIG. 10--TRIMMER LOCATIONS

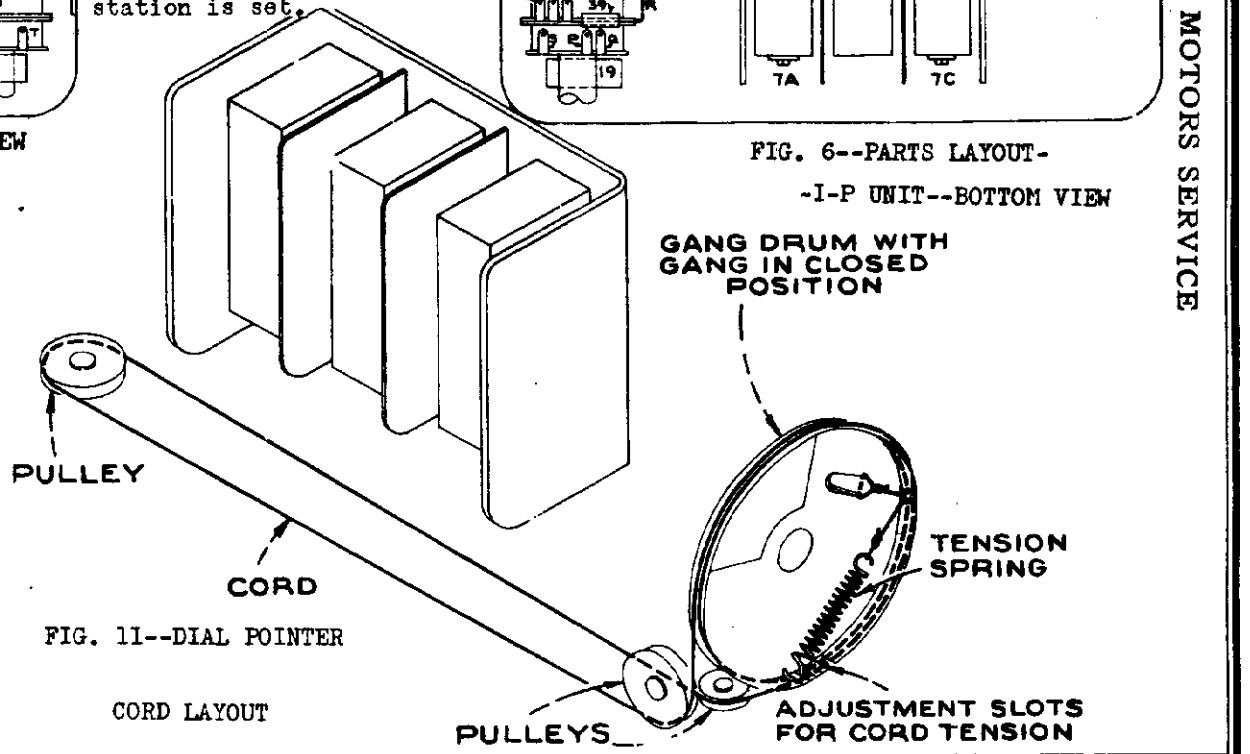


FIG. 11--DIAL POINTER

CORD LAYOUT

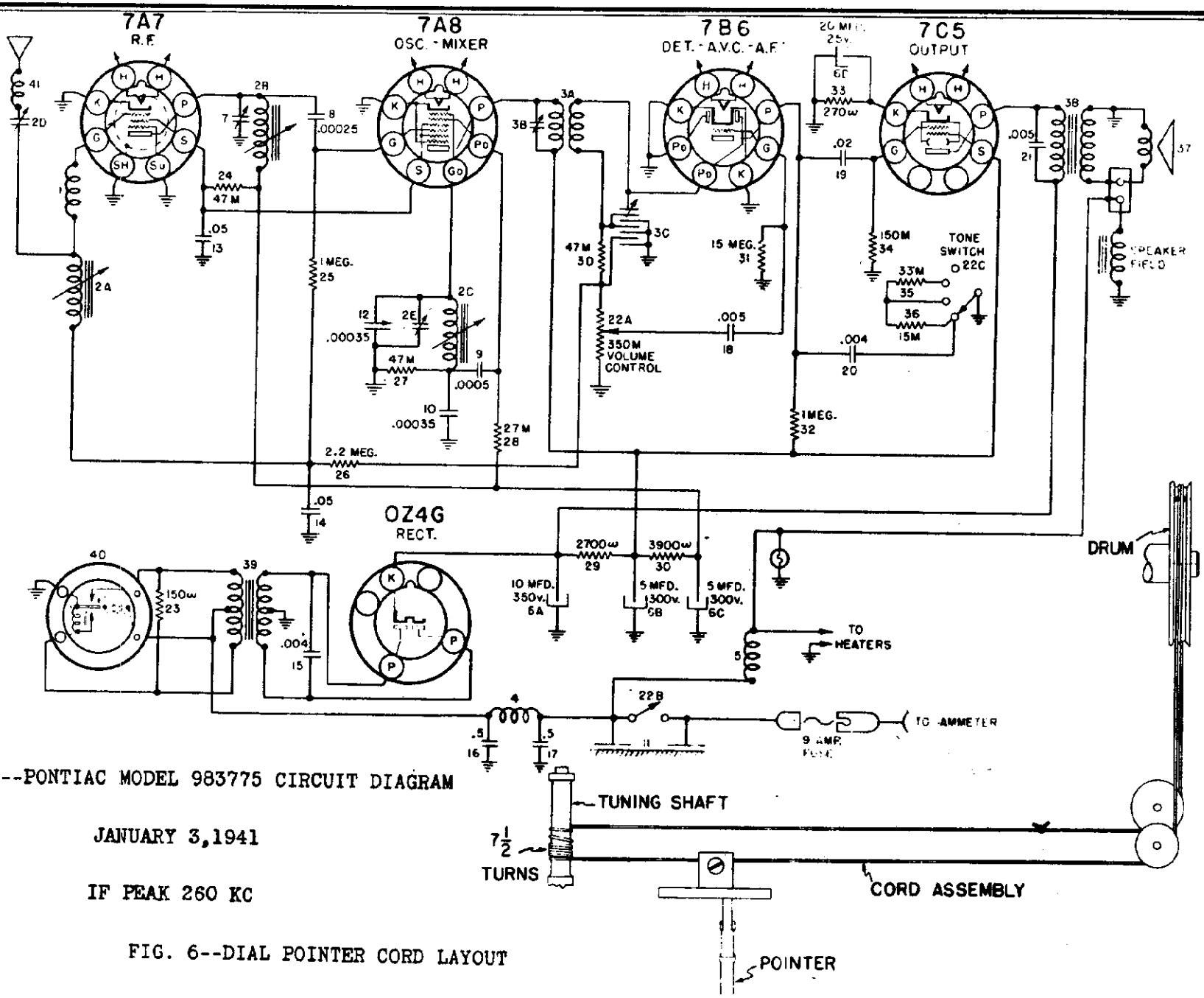


FIG. 2--PONTIAC MODEL 983775 CIRCUIT DIAGRAM

JANUARY 3,1941

IF PEAK 260 KC

FIG. 6--DIAL POINTER CORD LAYOUT

CIRCUIT ALIGNMENT

If realignment is found necessary the circuits can be properly adjusted only with the use of a calibrated test oscillator or signal generator and an output meter. It is not necessary to remove the chassis from the case for alignment.

1. Aligning I-F stages at 260 kilocycles

   (a) Connect the ground lead of the test oscillater to the chassis.
   (b) Connect the signal lead of the test oscillator to terminal (Illus. X, Fig. 4) through a .1 mfd. condenser.
   (c) Connect the output meter across the speaker voice coil at the terminal board mounted on the speaker.
   (d) Set the test oscillator to 260 K.C.
   (e) Adjust the trimmers (Illus. A-B, Fig. 4) on the I-F coil 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 1610 kilocycles

   (a) Leave the test oscillator leads connected as for aligning the I-F circuits.
   (b) Loosen lock screw (Illus. C, Fig. 4) and turn the receiver by means of the manual control to the extreme high frequency position, against the stop, and tighten screw (Illus. C, Fig. 4).
   (c) Set the test oscillator to 1610 K.C.
   (d) Adjust the condenser (Illus. D, Fig. 4) for maximum output.

3. Aligning at 1400 kilocycles.

   (a) Connect the signal lead of the test oscillator to the antenna connections of the receiver, through a 50 mmfd. mica condenser.
   (b) Set the test oscillator to 1400 K.C.
   (c) Tune the receiver until this frequency is tuned in with maximum output.
   (d) Adjust the R.F. trimmer (Illus. F, Fig. 4) for maximum output.

*IMPORTANT NOTE: Lock Screw (Illus. C, Fig. 4) maintains the location of the mechanical stop at the high frequency end of the band. New frequency assignments to 1600 K.C. make it desirable for the receiver to cover this range, but due to local ordinances it is not permissable in all locations. The stop is set at 1560 K.C. at the factory and to increase the frequency range, where permissable, loosen lock screw (Illus. C, Fig. 4) and tune manually to the frequency to be covered and tighten the screw.

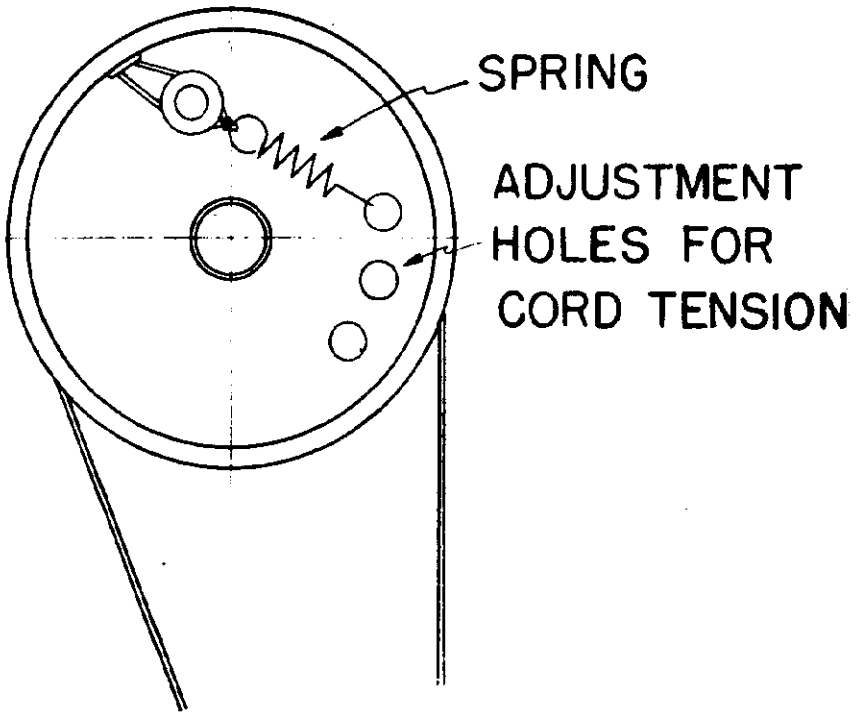


FIG. 7--POSITION OF DRUM ASSY. WITH COIL CORES FULLY IN

ANTENNA SYSTEM: The antenna system used with the receiver consists of a rod type antenna with a specially designed low capacity lead-in.

TUNING CONTROLS: Tuning is accomplished by means of the conventional manual control or by means of 5 push-buttons which mechanically drive the permeability cores to pre-selected settings.

UNITED MOTORS SERVICE

GENERAL: The Pontiac Model 983775 is a five tube, single unit receiver with automatic push-button tuning and a 6" dynamic speaker. This set is designed specifically for mounting behind the dash of the 1941 Pontiac car.

BOTTOM VIEW OF TUBE SOCKETS

READINGS TAKEN FROM TUBE SOCKET CONTACTS TO GROUND WITH A D.C. VOLTMETER HAVING A RESISTANCE OF 1000 OHMS PER VOLT; "A" BATTERY 6.0 VOLTS. CURRENT DRAIN 6.5 AMPERES. "B" SUPPLY DRAIN APPROXIMATELY 50 M.A.

FIG. 1--TUBE SOCKET VOLTAGES

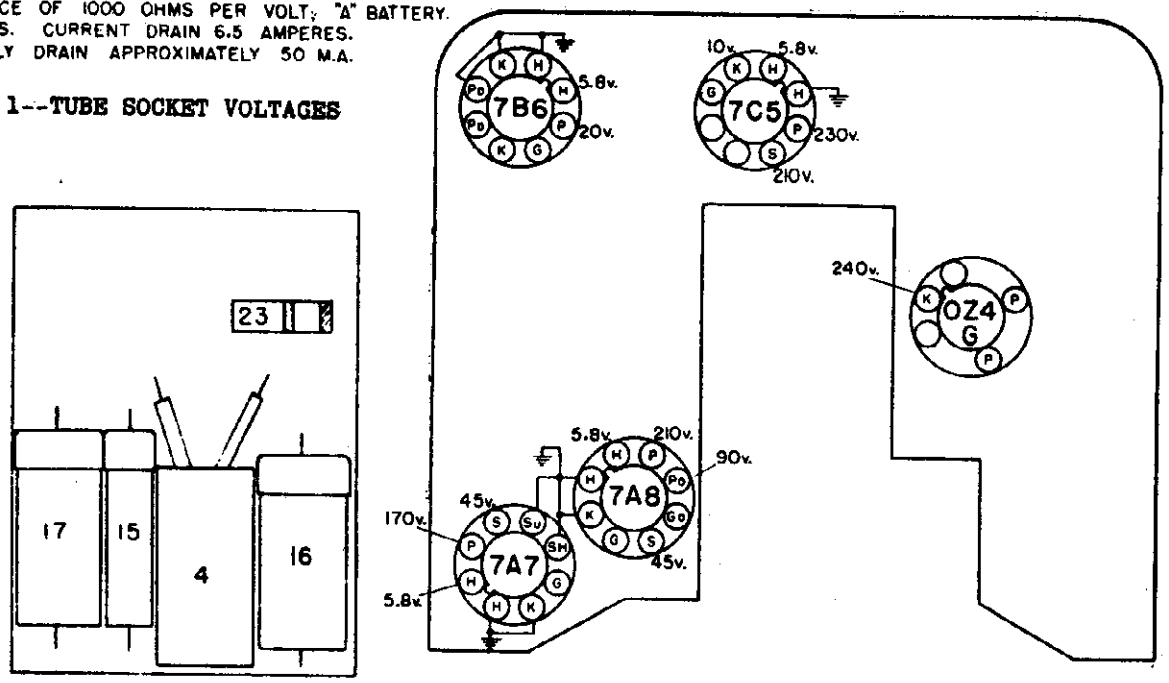


FIG. 5--PARTS LAYOUT--POWER SUPPLY--Bottom View

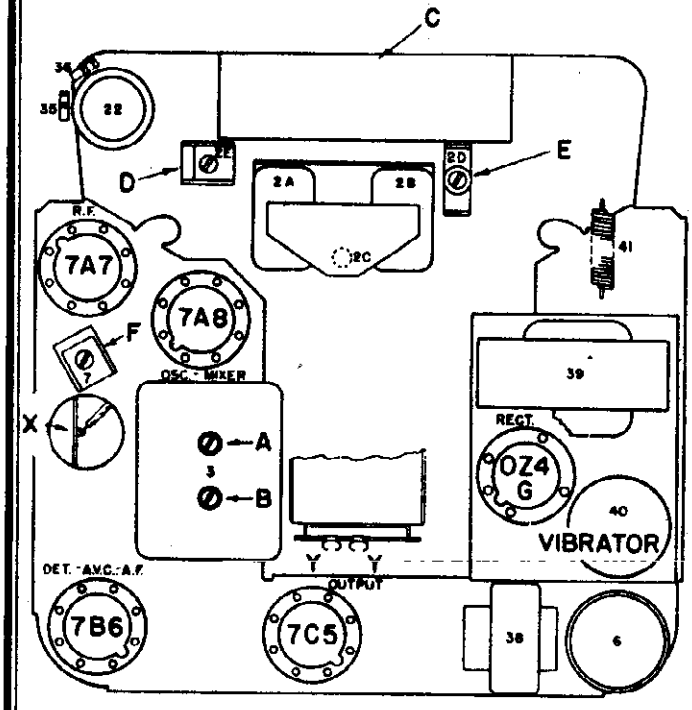


FIG. 4--PARTS LAYOUT--Top View

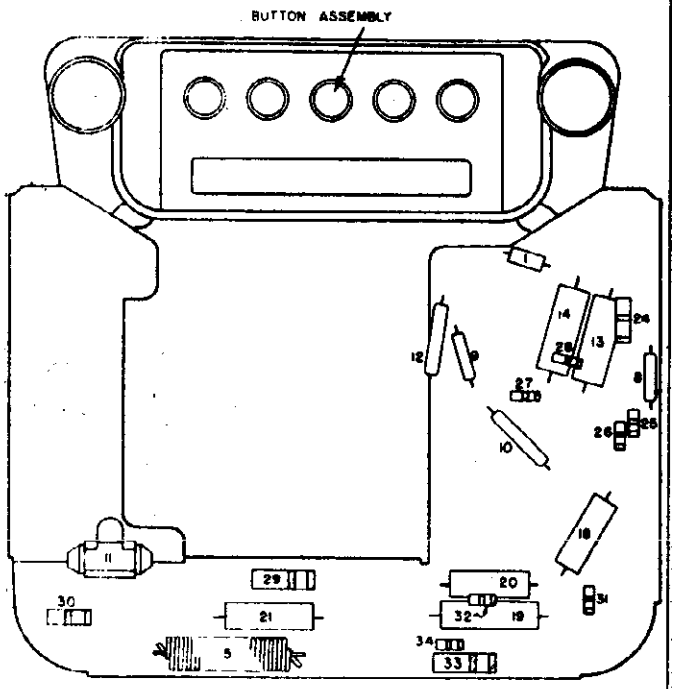


FIG. 3--PARTS LAYOUT--Bottom View

MODEL 983776

UNITED MOTORS SERVICE

GENERAL: The Pontiac Model 983776 is a seven tube, single unit superheterodyne receiver with an 8" P.M. speaker. The unit is custom built for 1941 Pontiac and mounts behind the instrument panel.

ANTENNA: The receiver is designed to operate at maximum efficiency with a cowl type antenna and a specially designed low capacity lead-in.

TUNING CONTROLS: Tuning is accomplished by means of a conventional manual tuning knob, or by five push-buttons which mechanically rotate the tuning condenser to pre-selected frequencies.

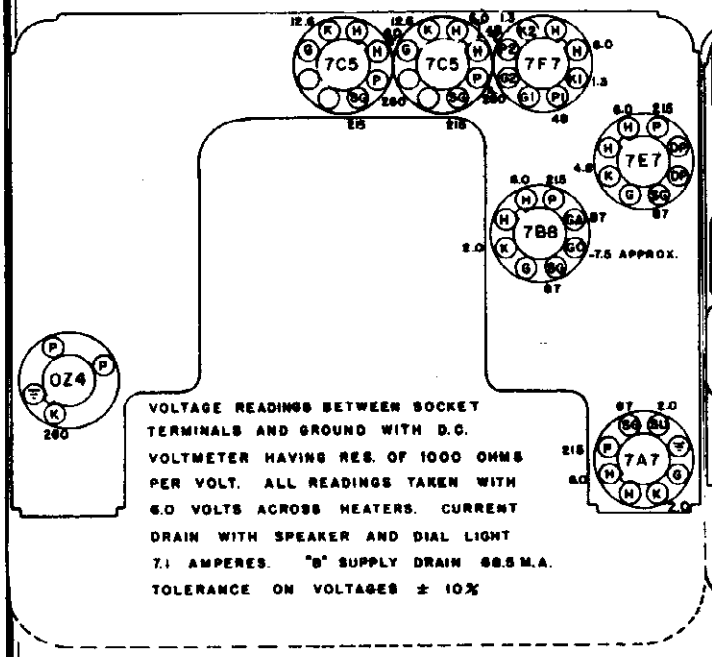


FIG. 1--TUBE SOCKET VOLTAGES

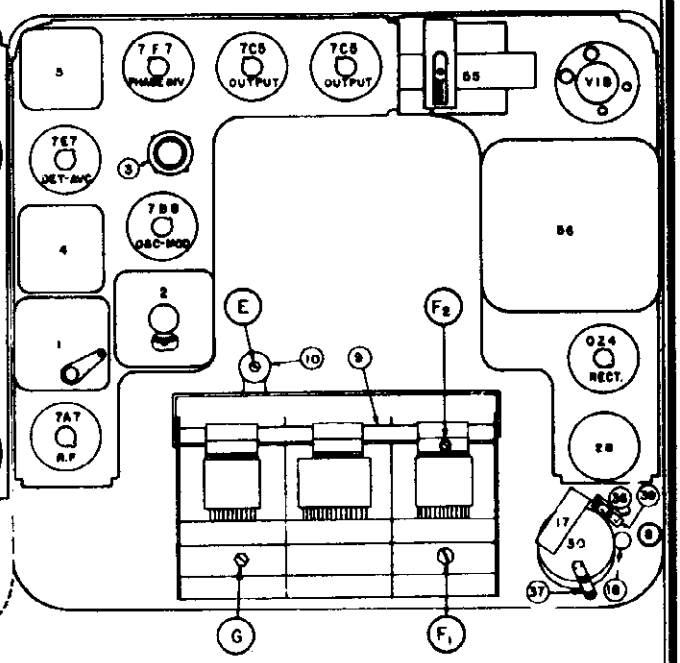


FIG. 3--PARTS LAYOUT--Top View

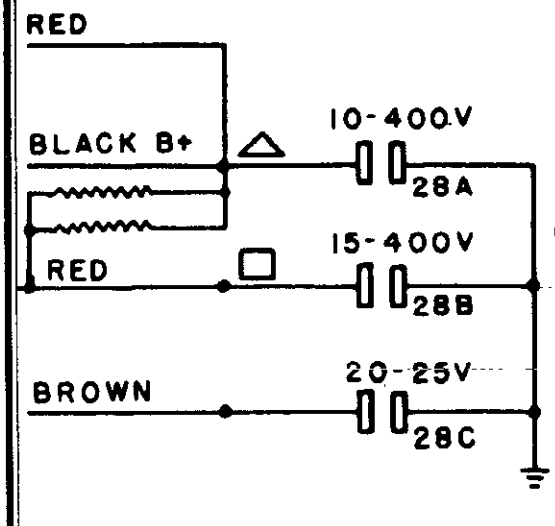


FIG. 8--BY-PASS CONDENSER

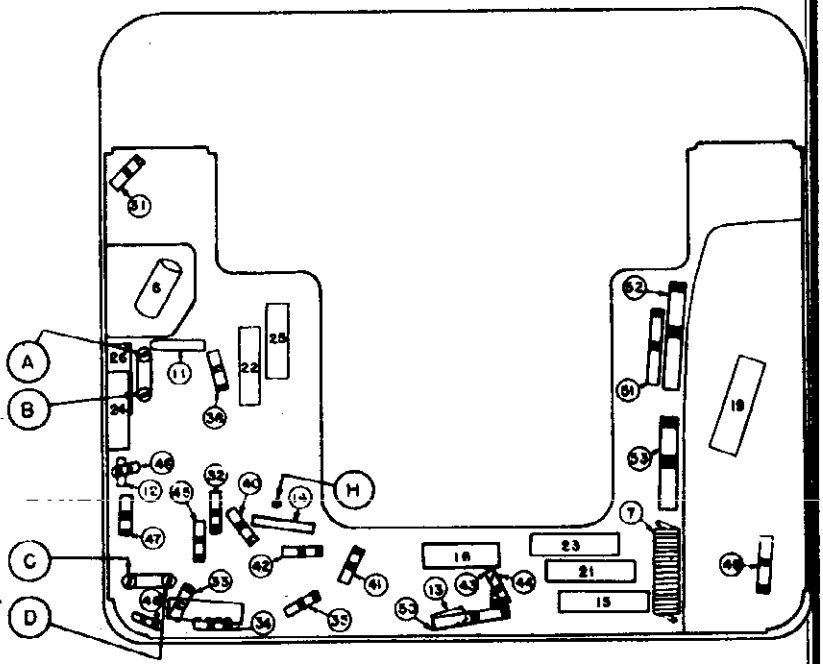
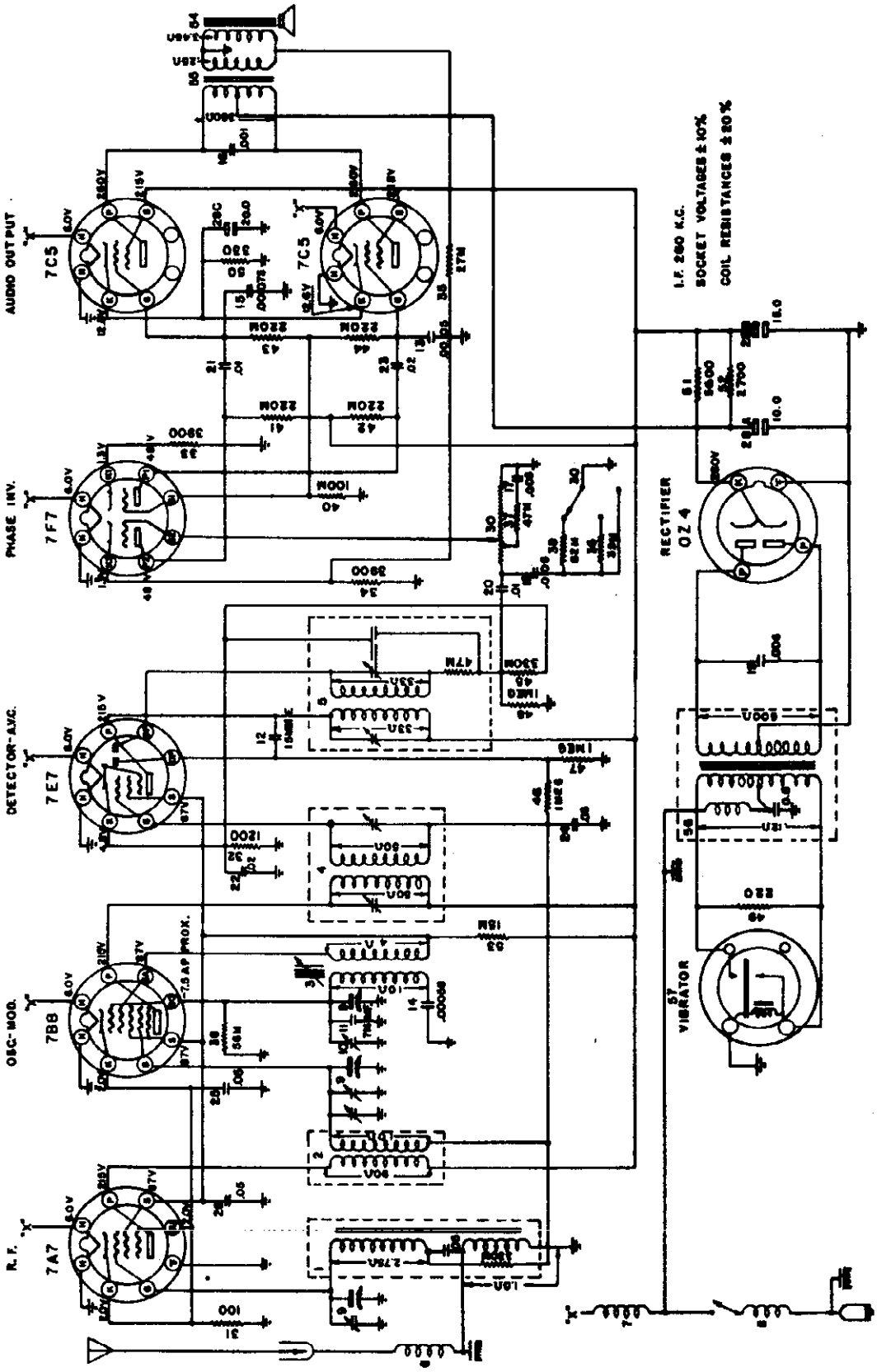


FIG. 4--PARTS LAYOUT--Bottom View

UNITED MOTORS SERVICE



IF PEAK 260 KC

FIG. 2--PONTIAC MODEL 983776 CIRCUIT DIAGRAM

Date: 1-29-41

CIRCUIT ALIGNMENT

If alignment is found necessary, the circuits can be properly aligned only with the use of a calibrated test oscillator or signal generator and an output meter. The back and front covers must be removed for alignment.

1. Aligning I-F Stages at 260 Kilocycles

   (a) Connect the ground lead of the signal generator to the chassis frame.
   (b) Connect the signal lead of the signal generator to the R.F. trimmer condenser, (Illus. F, Fig. 3) through a .1 mfd. condenser.
   (c) Connect the output meter from the speaker lead connector to the chassis. Leave the speaker connected in the circuit and ground the speaker to the case.
   (d) Set the signal generator to exactly 260 kilocycles.
   (e) With volume control on full, adjust the trimmers (Illus. A,B,C, D, Fig. 4) for maximum output. These adjustments should be repeated several times and during alignment, the signal generator output should be kept to as low a value as in consistent with obtaining a readable indication on the output meter.

2. Aligning at 1560 Kilocycles

   (a) Connect the signal lead of the signal condenser to the antenna connection of the receiver through a .000075 mfd. mica condenser.
   (b) Turn the rotor plates of the gang condenser all the way out against the high frequency stop.
   (c) Set the signal generator to exactly 1560 kilocycles.
   (d) Adjust the oscillator trimmer (Illus. E, Fig. 3) for maximum output.

3. Aligning at 1400 Kilocycles

   (a) Leave the signal generator leads connected the same as before.
   (b) Set the signal generator to 1400 kilocycles.
   (c) Tune the receiver until this signal is tuned in with maximum output.
   (d) Adjust the trimmers (Illus. F1, G, Fig. 3) for maximum output. NOTE: (Illus. F2, Fig. 3) is sealed at the factory and SHOULD NOT be adjusted.

4. Aligning at 600 Kilocycles

   (a) Leave the signal generator leads connected the same as before.
   (b) Set the signal generator to 600 kilocycles.
   (c) Tune the receiver until this signal is tuned in with maximum output.
   (d) Adjust the oscillator coil core screw (Illus. H, Fig. 4) while rocking the rotor plates back and forth through the signal until maximum output is obtained.

5. Realignment at 1560 and 1400 Kilocycles

   Repeat alignment of R.F. and antenna sections of the gang condenser as outlined under paragraphs 2 and 3.

   When the set is reinstalled in the car, the antenna trimmer (Illus. G, Fig. 3) should be readjusted on a weak signal at approximately 1400 K.C. for maximum output.

TUNER SERVICE PARTS

58	7240495	Bracket	Tuner end bkt. R. H.
59	7240496	Bracket	Tuner end bkt. L. H.
60	7241218	Bar	Latch bar assy.
61	7240700	Bracket	Dial back strip
62	7240871	Bracket	Calibration strip
63	7230263	Bumper	Rubber--plunger return
64	7241219	Button	Push button assy.
65	7240667	Bracket	Tuner mtg. bkt. assy.
66	7240793	Cord	Cord and link assy.
67	7240792	Cord	Cord and spring assy.
68	7240872	Dial	Glass
69	7240746	Dial	Back strip
70	7240677	Escutcheon	
71	7241590	Gear	Crown gear assy.
72	7241209	Bracket	Man. drive mtg. bkt. assy.
73	7241216	Light	Dial light assy.
74	7240523	Plate	Brake spring
75	7241220	Plate	Guide plate assy. (includes items 10, 78 and 88)
76	7240387	Pointer	Pointer & guide pin & pointer tip assy.
77	7240795	Pulley	Pointer drive pulley assy.
78	7240386	Pulley	Pulley and stud pkg.
79	7240706	Shield	Felt pad light shield
80	7240878	Shield	Light shield
81	7241207	Spring	Brake spring assy.
82	7238950	Spring	Plunger return
83	7240368	Screw	Reset
84	7238861	Spring	Latch bar hook-up
85	7230933	Bushing	Latch bar hook-up insulating
86	7240698	Bushing	Manual drive
87	7241647	Pad	Rubber pad
88	7238581	Pin	Pointer pivot pin
89	7238531	Spacer	Latch bar
90	7241153	Washer	Latch bar hook-up insulating
9	7240575	Tuner	Push button tuner

MISCELLANEOUS PARTS

7238455	Socket	Loctal tube
7234925	Socket	Vibrator
7236279	Socket	Octal tube
7241179	Cable	Shielded volume control cable
505627	Knob	Tuning & volume
505626	Knob	Tone control
505625	Knob	Dummy knob
505631	Escutcheon	Escutcheon trim plate
7241210	Cover	Rear cover assy.
505630	Washer	Felt, tone control knob
505765	Spacer	
5273906	"A" lead assy.	"A" lead & female fuse holder
115273	Lamp	Dial lamp
7240797	Fuse holder assy.	Spark plate & fuse holder assy.
7235968	Hex nut	
7238755	Spring washer	

UNITED MOTORS SERVICE

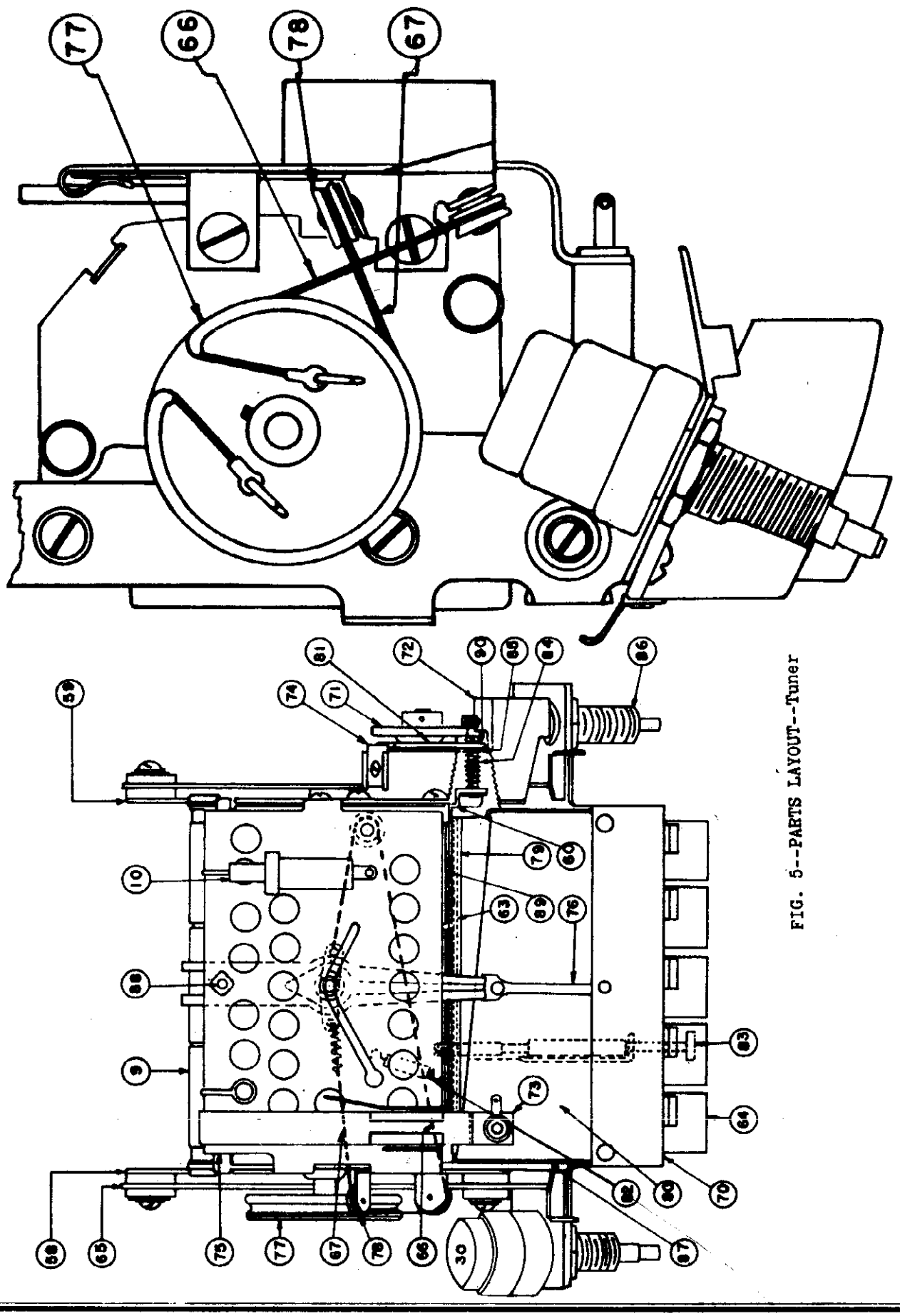
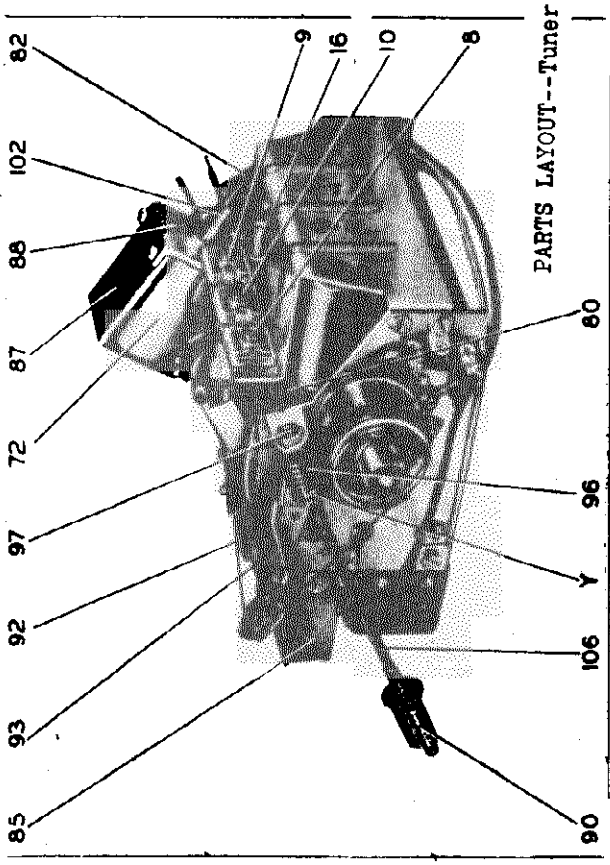


FIG. 5--PARTS LAYOUT--Tuner

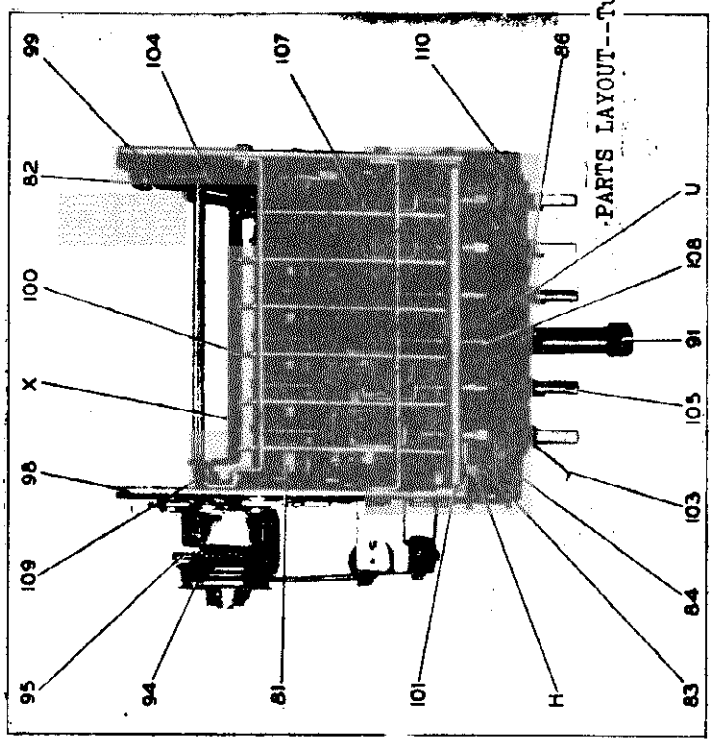
MODEL 983777

UNITED MOTORS SERVICE

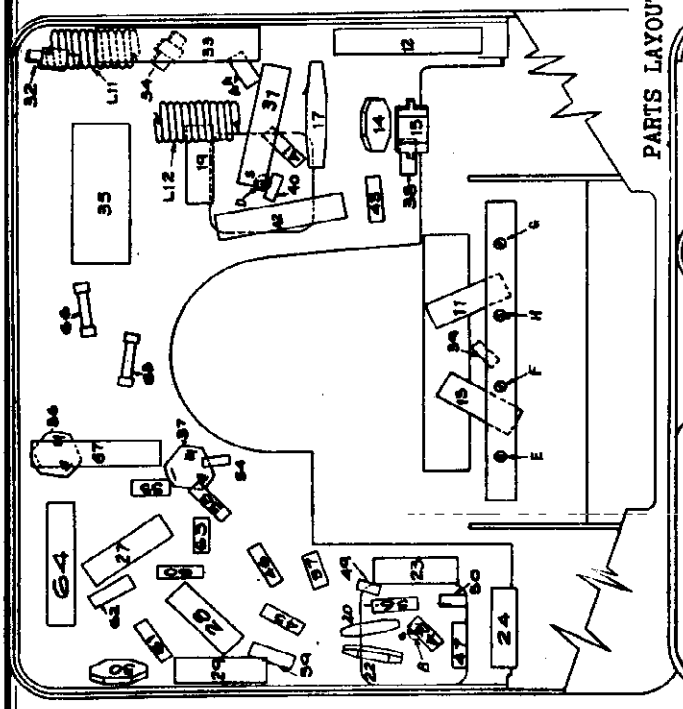
PARTS LAYOUT--Tuner



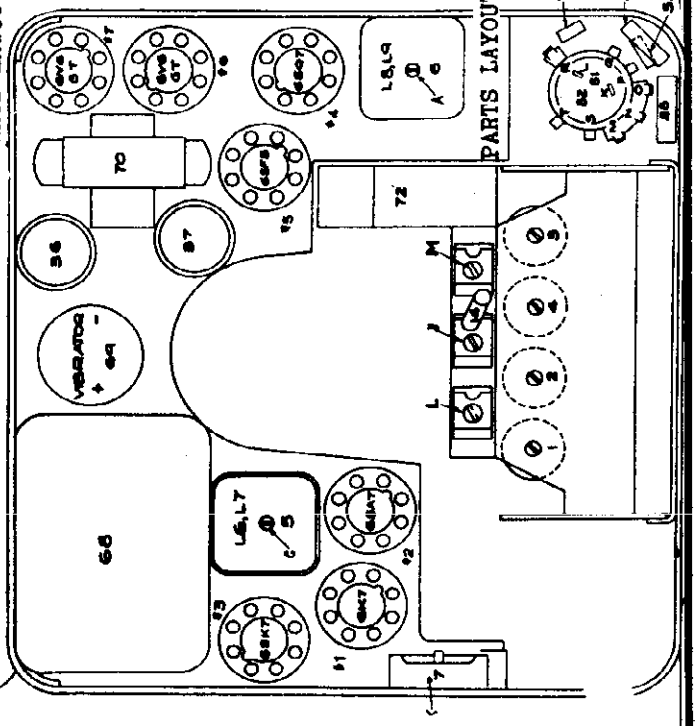
PARTS LAYOUT--Tuner



PARTS LAYOUT--Top View



PARTS LAYOUT--Bottom View



UNITED MOTORS SERVICE

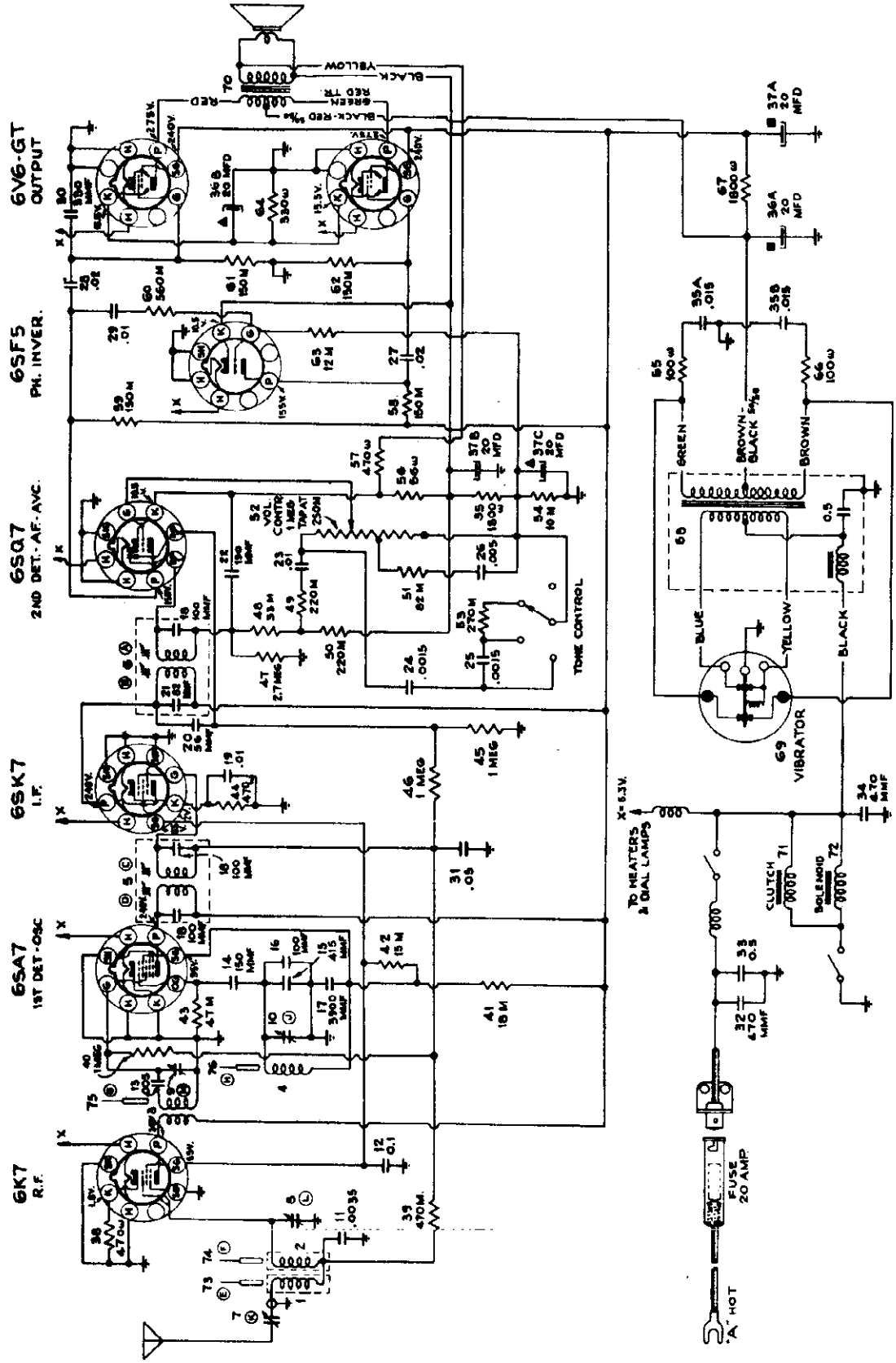


FIG. 2--PONTIAC MODEL 983777 CIRCUIT DIAGRAM

ANTENNA SYSTEM: This set is designed to operate at maximum efficiency with either a Pontiac standard mast or vacuum mast type antenna and a special low capacity lead-in.

Date: 1-27-41

CIRCUIT ALIGNMENT

If realignment is found necessary the circuits can be properly adjusted only with the use of a calibrated test oscillator or signal generator and an output meter.

All R.F. and I.F. adjustments are accessible by removing the front and rear covers. Turn the volume control full on, to maximum volume position.

1. Aligning I.F. Stages at 260 Kilocycles

   (a) Connect the ground lead of the signal generator to the chassis frame of the receiver.
   (b) Connect the signal lead of the signal generator to the control grid of the 6SA7 tube (PIN #6, Fig. 2) through a .01 mfd. condenser.
   (c) Connect the output meter across the speaker voice coil.
   (d) Set the signal generator to 260 kilocycles.
   (e) Adjust the core screws on the I.F. coils (Illus. A,B,C,D, Figs. 3 & 4) for maximum output.

   These adjustments should be repeated several times and during alignment, the signal generator output should be kept to as low a value as is consistent with obtaining a readable indication on the output meter.

2. Aligning at 1645 Kilocycles

   (a) Connect the signal lead of the signal generator to the antenna connector through a .000075 mfd. mica condenser.
   (b) Tune the receiver to the extreme high frequency end against the stop.
   (c) Turn each of the four iron core screws (Illus. E,F,G,H, Fig. 4) in a counter-clockwise direction, four turns.
   (d) Set the signal generator to 1645 Kilocycles.
   (e) Adjust the oscillator trimmer (Illus. J, Fig. 3) for maximum output.
   (f) Adjust the antenna and R.F. trimmers (Illus. K,L,M, Fig. 3) for maximum output.

3. Aligning at 1620 Kilocycles

   (a) Leave the signal generator connected the same as before.
   (b) Set the signal generator to 1620 kilocycles.
   (c) Turn the oscillator iron core adjustment (Illus. H, Fig. 4) clockwise until maximum output is obtained.
   (d) Adjust antenna and R.F. iron core (Illus. E,F,G, Fig. 4) for maximum output by turning them clockwise and reduce signal generator output to a satisfactory level.

4. Aligning at 1200 Kilocycles

   (a) Leave signal generator connected same as before.
   (b) Set signal generator to 1200 kilocycles.
   (c) Tune receiver for maximum signal at 1200 kilocycles.
   (d) Adjust antenna and R.F. cores (Illus. E,F,G, Fig. 4) for maximum output.

5. Aligning at 600 Kilocycles.

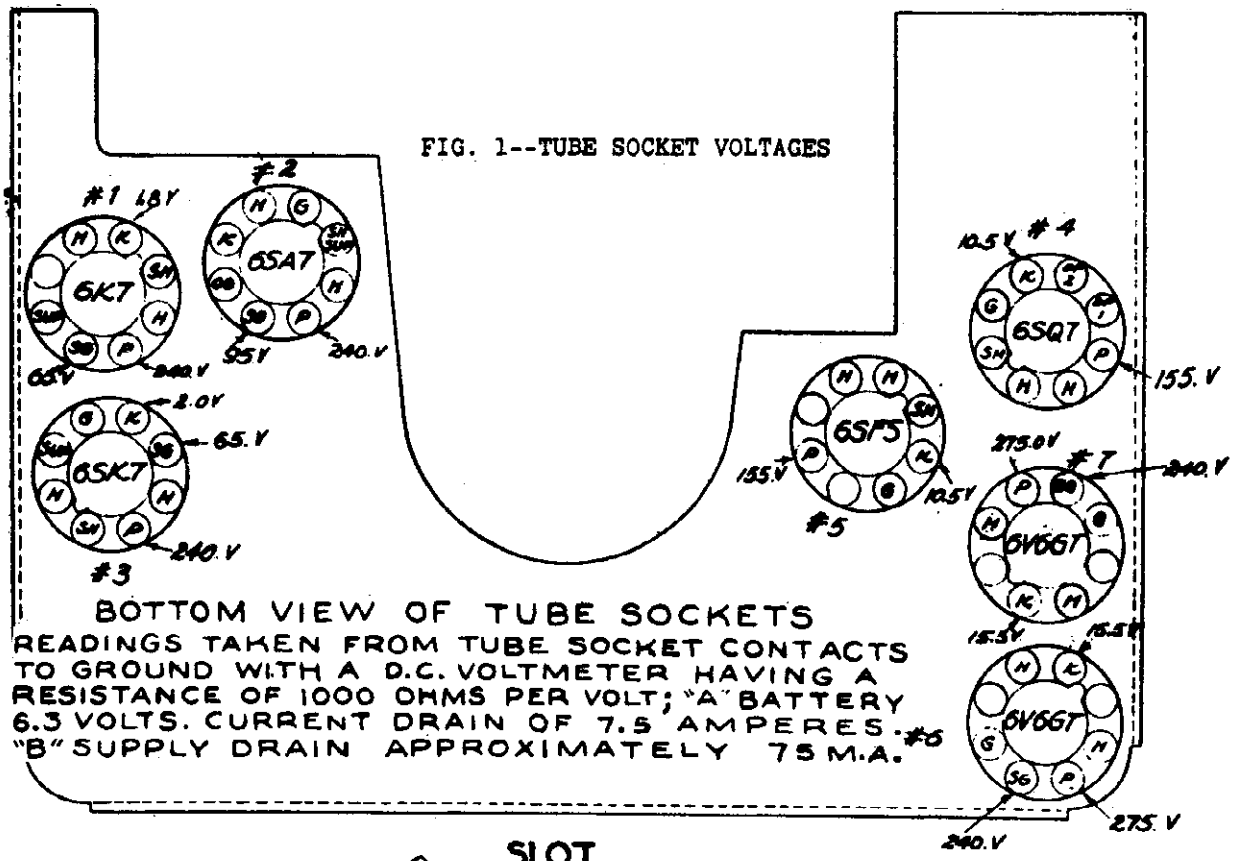
   (a) Leave the signal generator connected the same as before.
   (b) Set the signal generator to 600 kilocycles.
   (c) Tune receiver for maximum signal at 600 kilocycles.
   (d) Adjust antenna and R.F. trimmers (Illus. K,L,M, Fig. 3) for maximum output.
   (e) Repeat adjustments under alignment number 4.

TUNER PARTS

Illus No.	Service Part No.	Part Name	Description
	145835	Ball	Steel ball for worm gear bearing
80	1214461	Bar	Coil draw bar
81	1214458	Bar	Rocker bar and segment gear
82	1214447	Bar	Solenoid draw bar and link
83	1214484	Bar	Switch finger bar
84	1214485	Bar	Switch finger latch bar (pawl)
	1214465	Bracket	Clutch and worm gear brkt. and rocker bar drive gear and shaft
85	1214504	Bracket	Dial back plate bkt.
	1214830	Bracket	Dial pointer arm (less pointer)
86	1214481	Bracket	Push button guide bkt.
87	1214450	Bracket	Solenoid coil holder (bottom section)
88	1214449	Bracket	Solenoid coil holder (top section)
	1214451	Bracket	Solenoid mtg. bkt.
89	1214476	Bracket	Tuning coil mtg. bkt.
90	1214478	Bushing	Tuning shaft bushing
	1214479	Button	Push button
91	1214446	Button	Set up button
	1214833	Can	Ant. R.F. or Osc. shield can
92	1214507	Cord	Dial cord--link and spring
93	1214508	Cord	Dial cord and link (no spring)
	7235945	Disc	Clutch drive disc (rubber)
94	1214468	Drum	Clutch drive drum and disc assy.
95	1214467	Disc	Clutch friction disc and gear assy.
96	1214842	Gear	Worm gear
	1214462	Link	Coil draw bar link
	1305217	Nut	Locknut for solenoid pole piece
97	1214821	Nut	Locknut for worm gear bearing screw
	1214457	Plate	Bottom plate with pulleys
	1214505	Plate	Dial back plate
	1214443	Plate	Front bearing plate
98	1214442	Plate	L. H. end plate
99	1214441	Plate	R. H. end plate
100	1214444	Plate	Rear bearing plate
	1214459	Plate	Set-up button retaining plate
101	1214460	Plate	Set-up button stop plate & switch rear contact
	1214509	Plate	Tuner mtg. top plate
102	1214475	Plunger	Solenoid plunger and stud
103	1214506	Pointer	Dial pointer only (less bkt.)
	1214452	Pole piece	Solenoid pole piece
	1214834	Ring	Retaining ring for ant. R.F. or Osc. coil
104	1214822	Retainer	Solenoid draw bar retaining clip
105	1214445	Rod	Push rod assy.
	1214847	Screw	Coil draw bar mtg. screw
	1214820	Screw	Mtg. screw for set-up button retaining
	1214579	Screw	Tuning coil mtg. screw
	7240316	Screw	Worm gear bearing screw
106	1214477	Shaft	Flexible shaft--less bushing
	1214483	Shaft	Latch bar and finger bar hinge rod
	1214469	Shaft	Solenoid draw for shaft
	1214464	Shell	Clutch coil housing
	1214486	Shield	Light shield (Mounts below P.B. guide bkt.)
	1214466	Spring	Clutch spring
	1214843	Spring	Coil draw bar link spring
	1214831	Spring	Coil draw bar spring
	1214482	Spring	P.B. retaining spring strap
	1214844	Spring	Push rod return spring
107	7236121	Spring	Rocker bar segment gear spring
108	1214470	Spring	Set-up button spring
109	1214826	Spring	Solenoid draw bar spring
	1214825	Spring	Switch finger bar spring
110	1214824	Spring	Switch finger latch bar spring
	7235001	Washer	"C" washer for flexible shaft
	1214835	Washer	Felt washer for set-up button
	1214837	Washer	Felt washer for solenoid draw for shaft
	148473	Washer	Tuning coil mtg. screw lock washer
	1214823	Washer	Worm gear thrust washer (bronze)
	7235892	Washer	Worm gear thrust washer (fibre)

UNITED MOTORS SERVICE

FIG. 1--TUBE SOCKET VOLTAGES



BOTTOM VIEW OF TUBE SOCKETS

READINGS TAKEN FROM TUBE SOCKET CONTACTS TO GROUND WITH A D.C. VOLTMETER HAVING A RESISTANCE OF 1000 OHMS PER VOLT; "A" BATTERY 6.3 VOLTS. CURRENT DRAIN OF 7.5 AMPERES. "B" SUPPLY DRAIN APPROXIMATELY 75 M.A.

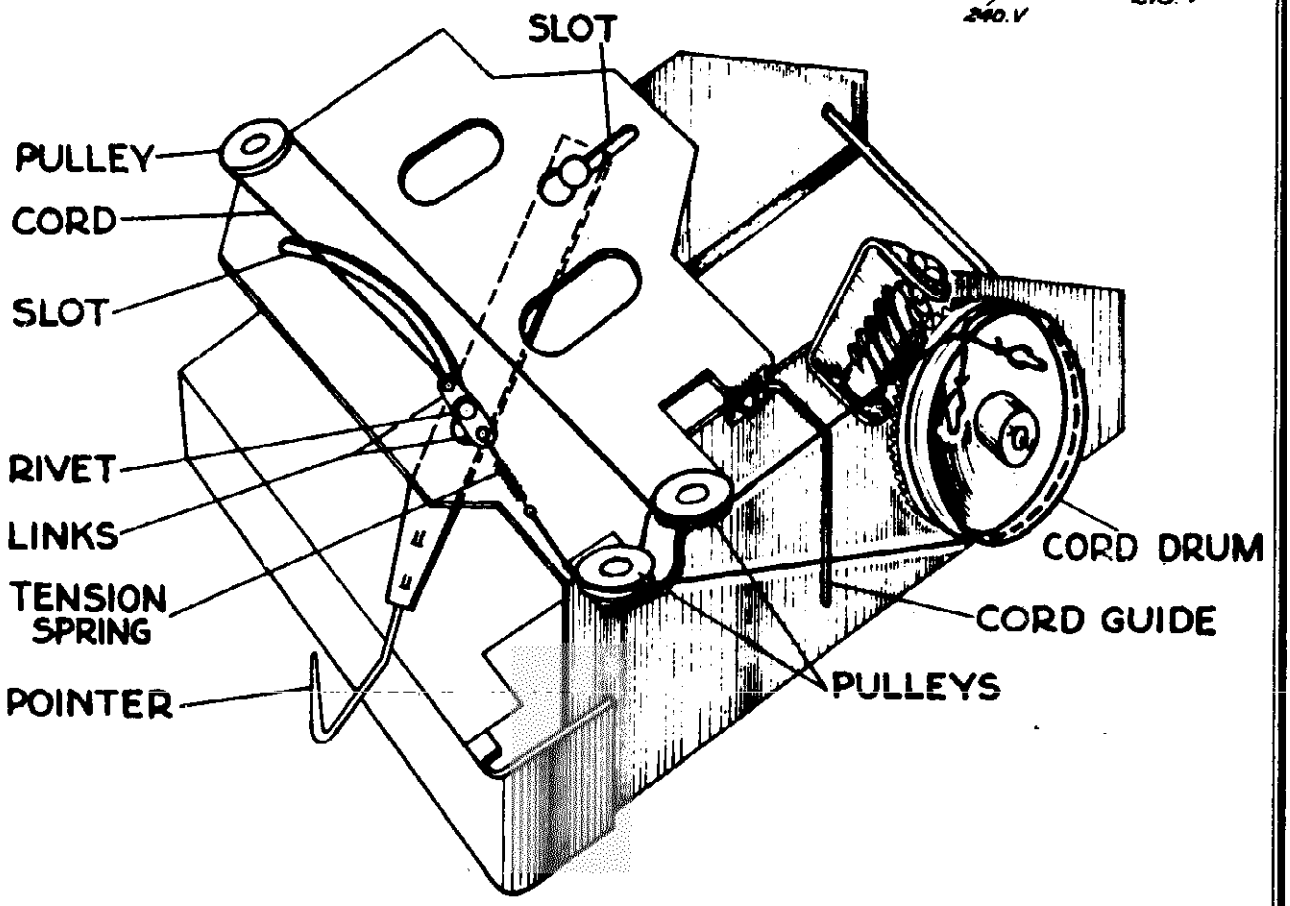
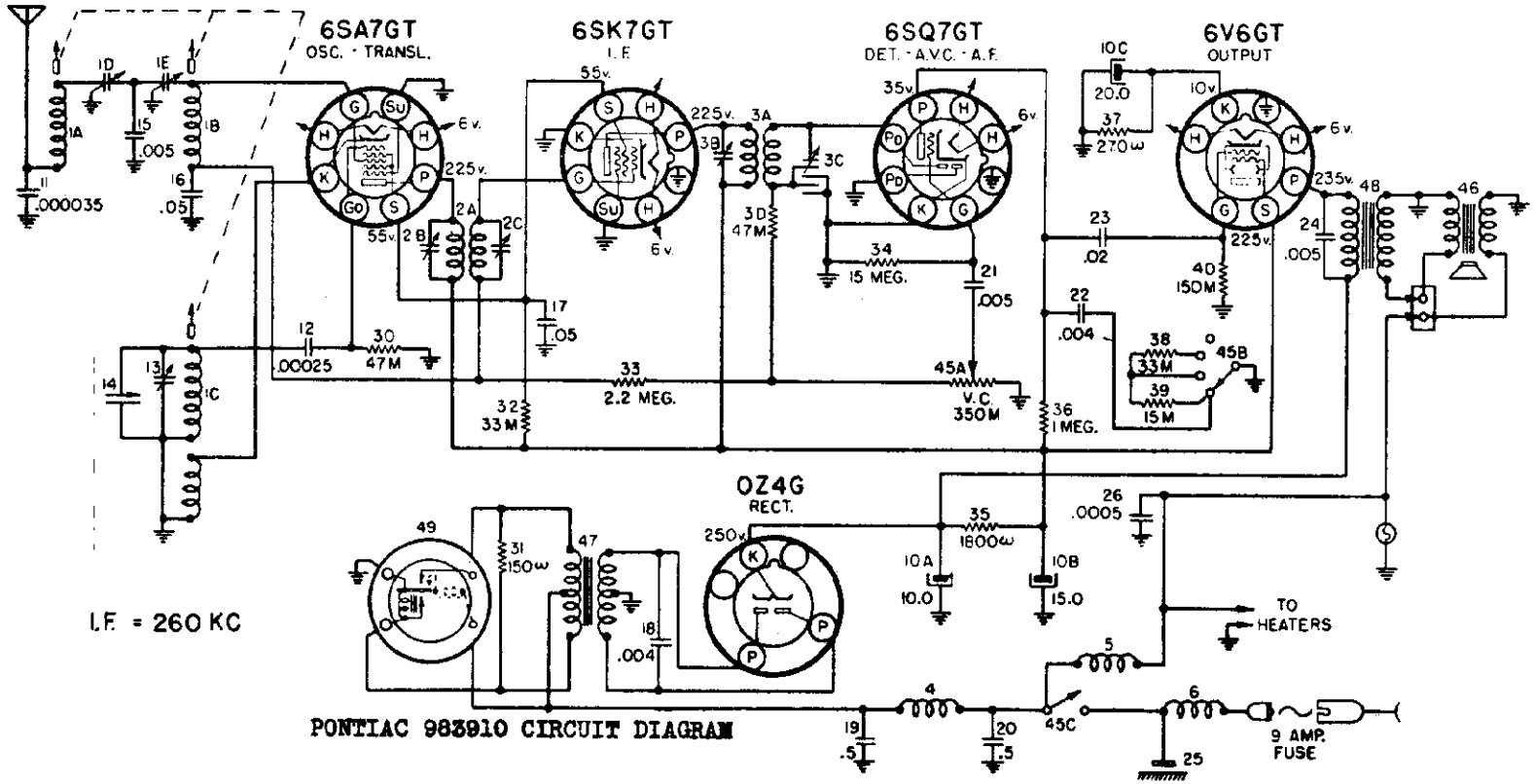


FIG. 7--DRIVE CORD LAYOUT



PONTIAC 983910 CIRCUIT DIAGRAM

Volume Control Maximum

ALIGNMENT PROCEDURE

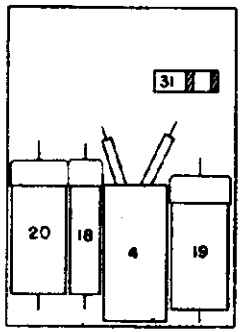
Signal Generator Output minimum for satisfactory output indication

Series Condenser or Dummy Antenna	Connect to	Signal Generator Frequency	Adjust Screws In Order
0.1 mfd	Terminal X	260 KC	A-B-C-D
0.1 mfd	Terminal X	1610 KC	E
.000060 mfd.	Antenna Terminal	1400 KC	F-G

Low frequency alignment not required.

Adjust Trimmer F to match car antenna (1400 KC) when radio is installed.

READINGS TAKEN FROM TUBE SOCKET CONTACTS TO GROUND WITH A 1000 OHMS PER VOLT D.C. VOLTMETER, "A" BATTERY - 6.0 VOLTS. CURRENT DRAIN - 6.0 AMPERES. "B" SUPPLY DRAIN - APPROX. 50 MA. ALL READINGS ±10%



Power Supply

Date: 7-23-41

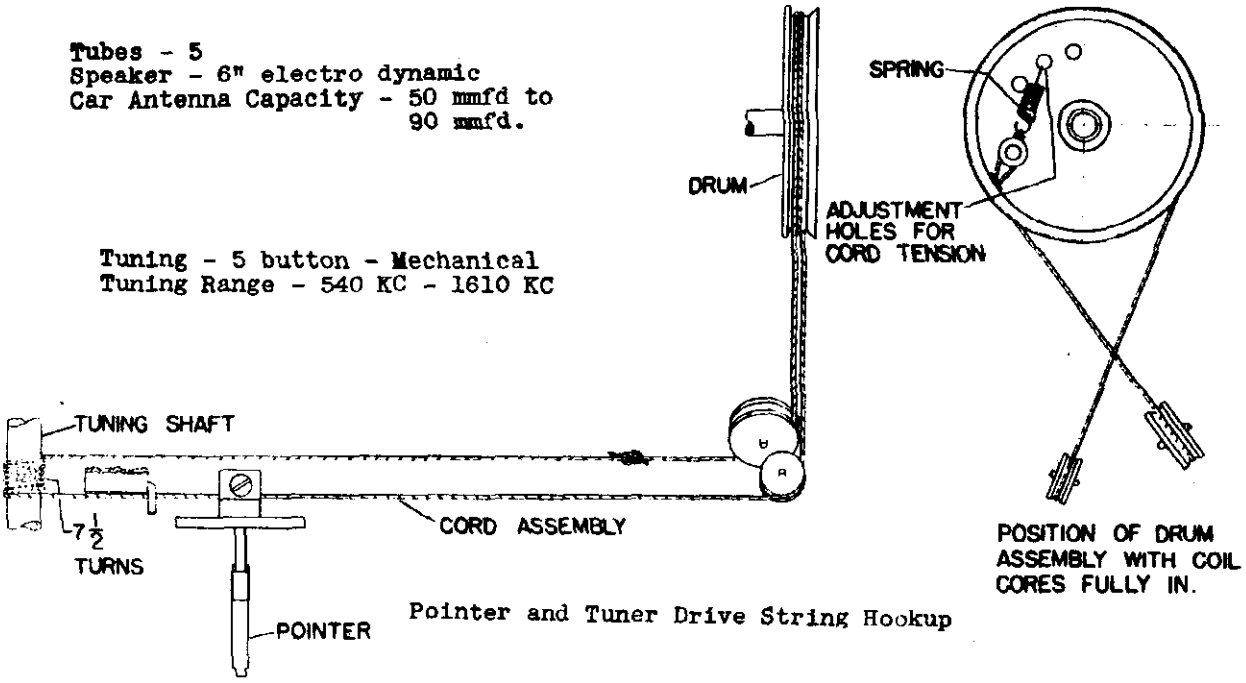
UNITED MOTORS SERVICE

Pontiac 1942 Master Radio - Model 983910

Date: 7-23-41

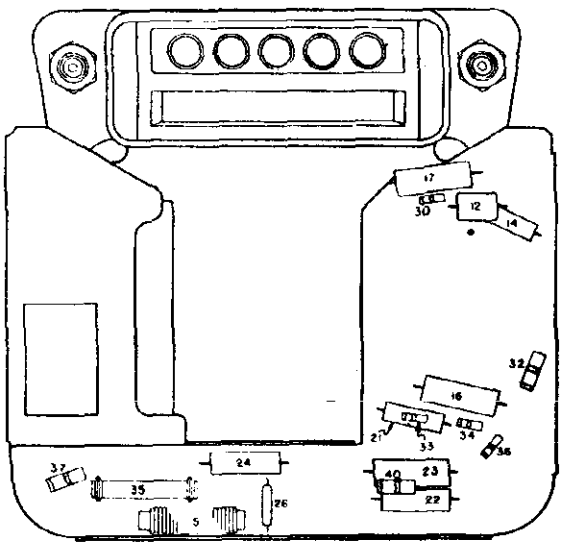
Tubes - 5
Speaker - 6" electro dynamic
Car Antenna Capacity - 50 mmfd to 90 mmfd.

Tuning - 5 button - Mechanical
Tuning Range - 540 KC - 1610 KC

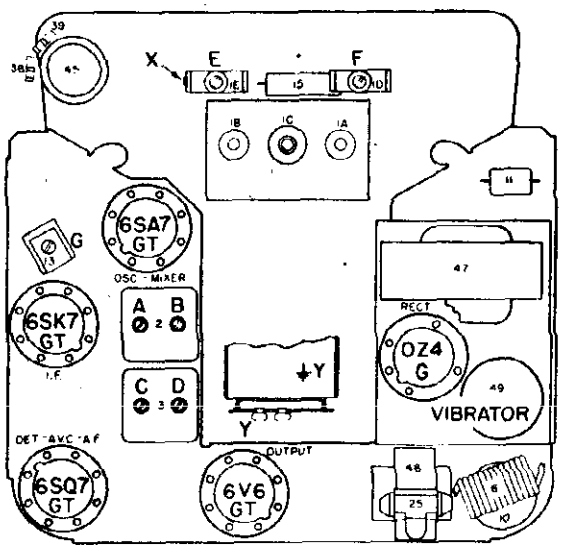


Pointer and Tuner Drive String Hookup

PUSH BUTTON SET UP - Turn counter-clockwise - Tune manually - Depress loosened button - Turn button clockwise to tighten.



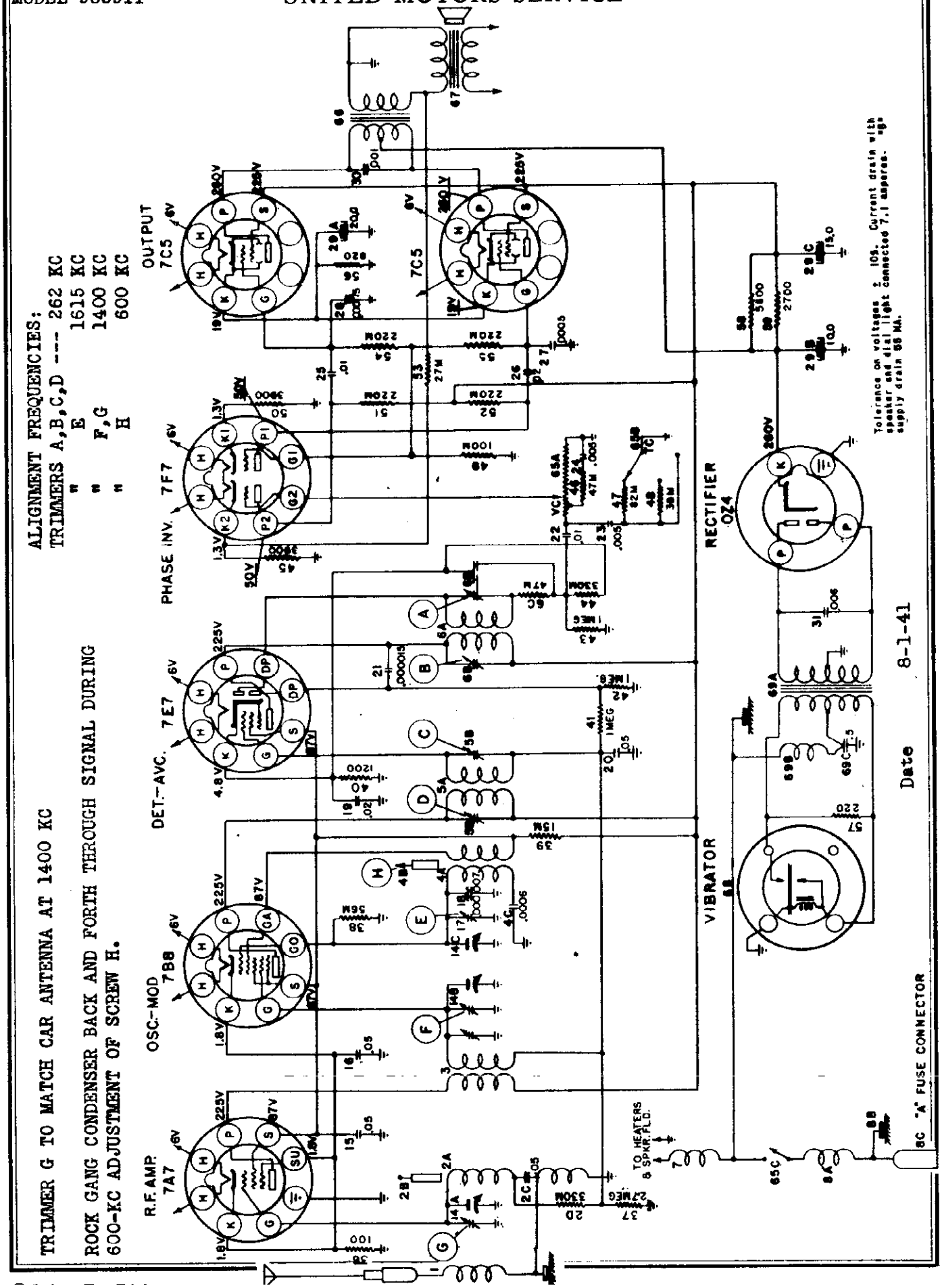
Chassis View

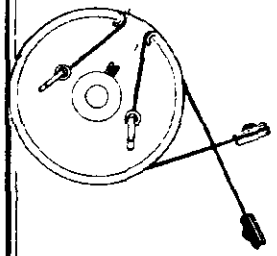


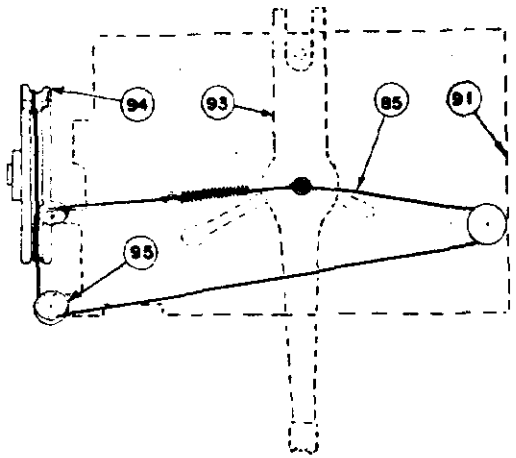
Tube View

MODEL 983911

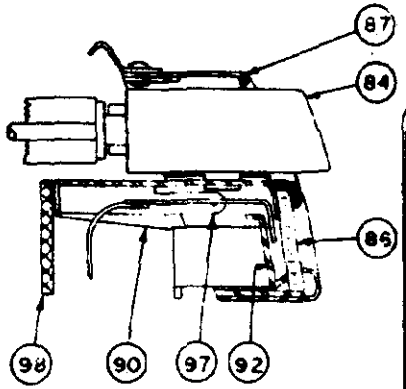
UNITED MOTORS SERVICE



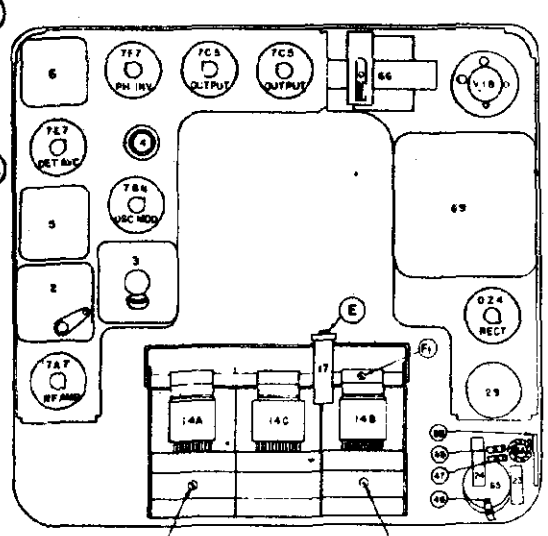




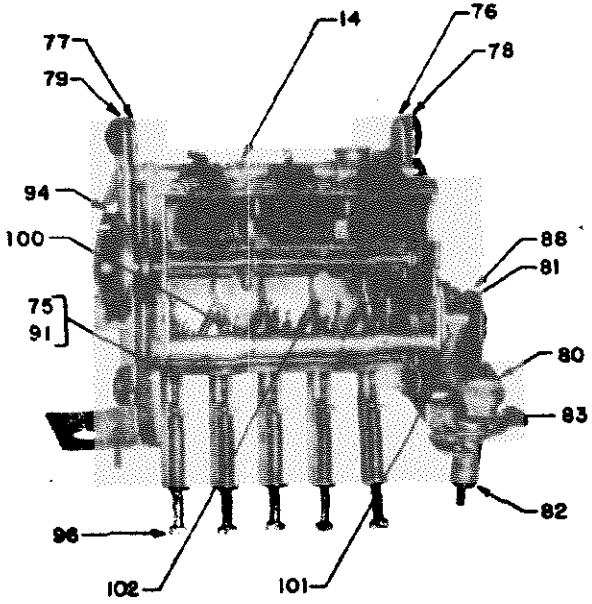
POINTER CORD ASSEMBLY



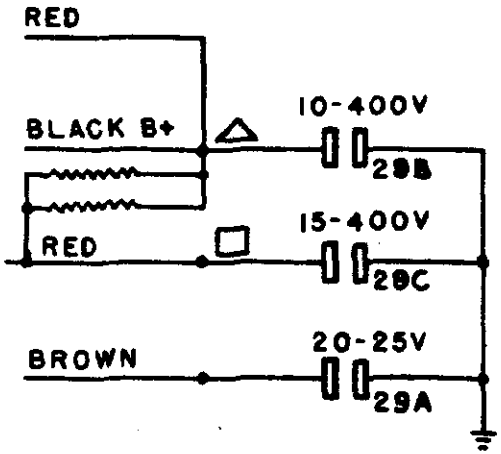
ESCUTCHEON CROSS SECTION



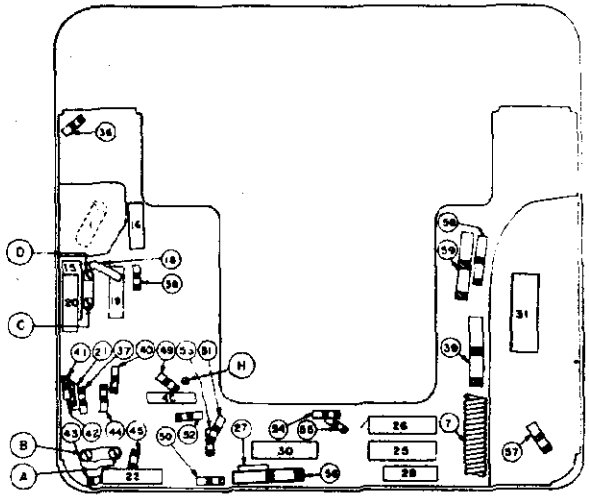
PARTS LAYOUT - TUBE VIEW



TUNER PICTURE



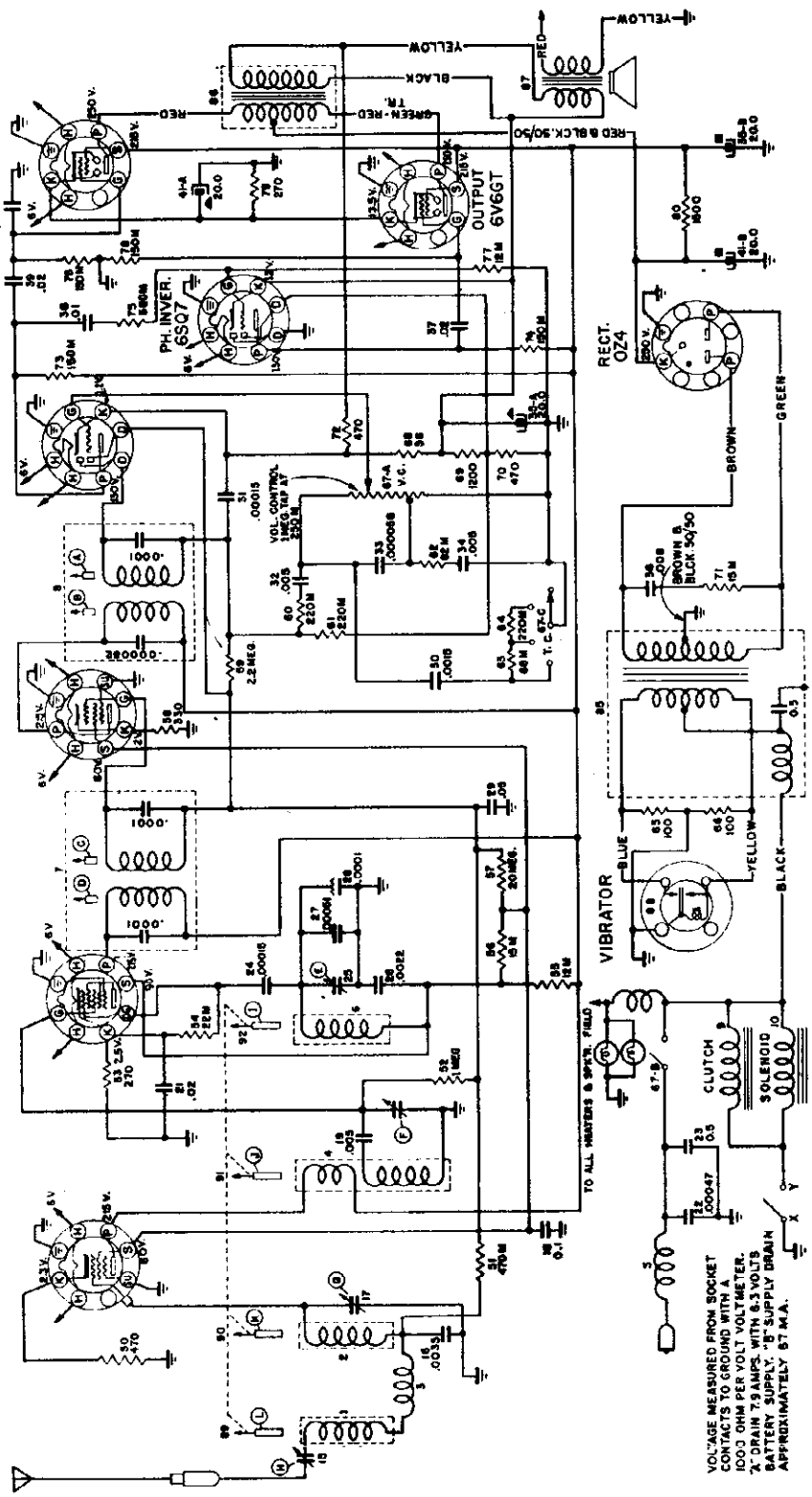
FILTER CONDENSER



PARTS LAYOUT - CHASSIS VIEW

MODEL 983912

UNITED MOTORS SERVICE



Alignment

Volume Control maximum. Signal Generator output minimum for satisfactory output indication.

Series Condenser Dummy Antenna	Connect to	Signal Generator Frequency	Tune Receiver To	Adjust Screws in Order
.1 Mfd.	6SK7 Grid	260 K.C.	No Broadcast Signal	A, B
.1 Mfd.	6SA7 Grid	260 K.C.	No Broadcast Signal	C, D
*.000072	Antenna	1,645 K.C.	Extreme High Freq. End	E, F, G, H
.000072	Antenna	1,620 K.C.	Extreme High Freq. End	I, J, K, L
.000072	Antenna	1,200 K.C.	Signal Generator	J, K, L
.000072	Antenna	600 K.C.	Signal Generator	F, G, H
.000072	Antenna	1,200 K.C.	Signal Generator	J, K, L

Before making this adjustment, turn core screws, I, J, K, L several turns in a counter clockwise direction until the threaded stud extends 5/8" through the core bar (Illus. 94) The purpose of this adjustment is to completely remove the tuning cores from the coils for the initial trimmer adjustments. Adjust trimmer (H) to match car antenna (1,200 K.C.) when radio is installed.

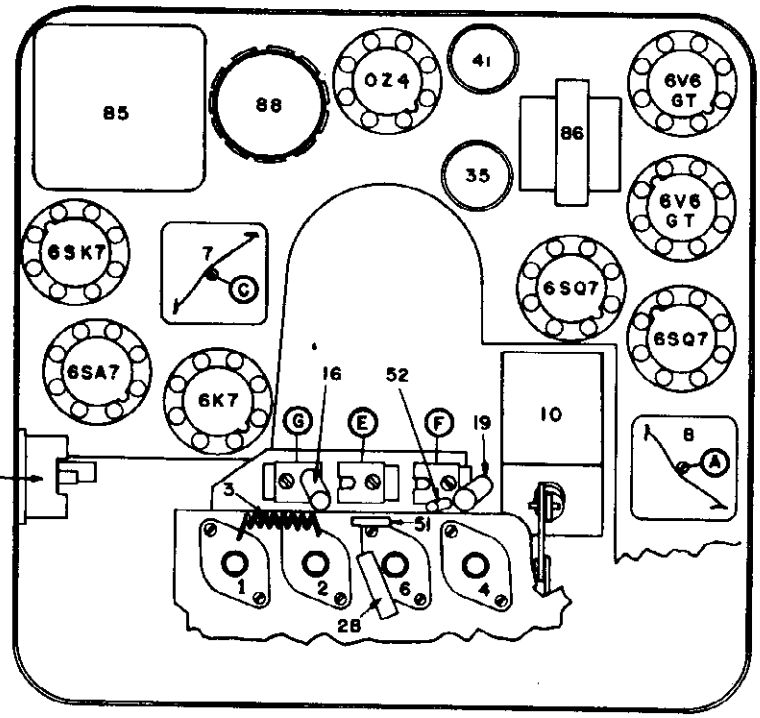
UNITED MOTORS SERVICE

Tuner Mechanical Parts

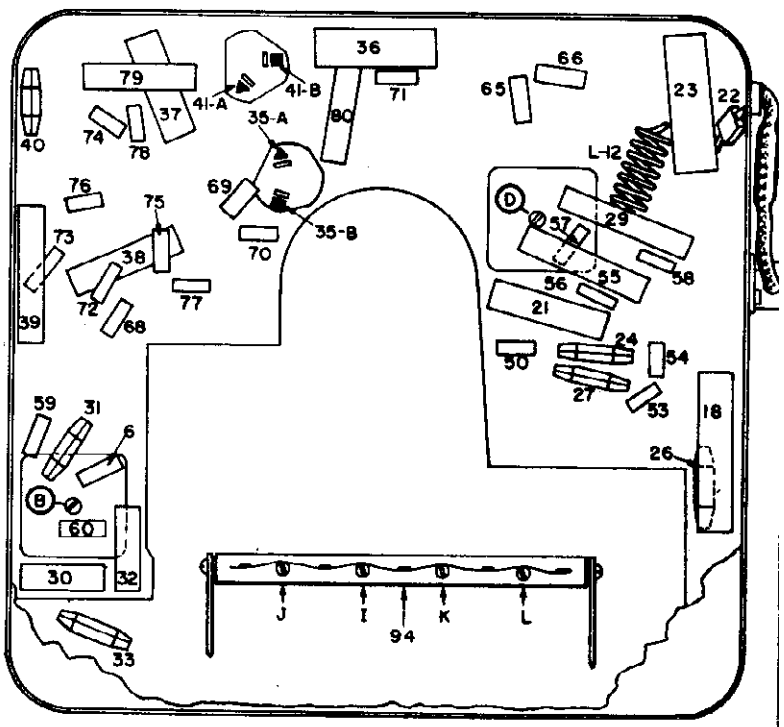
	145635	Ball—For worm gear
94	1214461	Bar—Coil core draw
	1214484	Bar—Contact latch
	1214458	Bar—Rocker and gear
95	1214447	Bar—Solenoid draw and link
96	1215812	Bracket—Clutch and bearing assembly
	1214481	Bracket—Push button guide
97	1214478	Bushing—Tuning shaft
98	1215813	Button—Push
99	1215814	Button—Set-up
100	1215815	Can—Coil shield
101	1215816	Cord—Pointer cord and long link
102	1214508	Cord—Pointer cord and short link
	1215817	Dial—Tuning
	7235945	Disc—Rubber disc for clutch
103	1214468	Drum—Drive drum and clutch disc (rubber)
	1215818	Escutcheon—Dial
104	1216092	Gear—Drive gear and clutch friction disc assembly
105	1214842	Gear—Worm gear—less set screw
	1215819	Grommet—Rubber grommet for antenna or R.F. coils
	1215820	Grommet—Rubber grommet for oscillator coil
	1214462	Link—Coil draw bar
	1305217	Nut—Locknut for solenoid pole piece
	1214821	Nut—Locknut for worm gear bearing screw
	1309864	Nut—Mounting nut for tuning shaft bushing
	1215821	Pawl—Switch finger
106	1215822	Plate—L.H. end
107	1215823	Plate—R.H. end
108	1215824	Plate—Bottom plate with pulleys
	1215825	Plate—Dial back
	1214443	Plate—Front bearing
	1214444	Plate—Rear bearing
	1214460	Plate—Set-up button stop plate and switch rear contact
109	1214475	Plunger—Solenoid plunger and stud
	1215826	Pointer—Dial pointer and holder
110	1214452	Pole Piece—Solenoid
	1214822	Retainer—Solenoid draw bar retaining clip
	1214503	Retainer—Tuning dial
	1215827	Rod—Push rod and cam assembly
	132688	Screw—Dial back plate mounting
	1214845	Screw—Dial escutcheon
	1215121	Screw—Set screw for drive drum
	127555	Screw—Set screw for worm gear
	7240316	Screw—Set screw for worm gear bearing
	1214483	Shaft—Contact latch bar, and switch finger pawl shaft
111	1214477	Shaft—Flexible tuning shaft—less bushing
	1214469	Shaft—Solenoid draw bar
	1214464	Shell—Clutch coil cover
112	1215828	Spindle—Clutch spindle and gear assembly
	1214465	Spring—Clutch
	1214843	Spring—Coil draw bar link
	1214831	Spring—Coil draw bar
	1214835	Spring—Contact latch bar
113	1216208	Spring—Pointer cord
	1214482	Spring—Push button retaining spring strip
	1214844	Spring—Push rod return
	1215235	Spring—Rocker bar gear
114	1216118	Spring—Set-up button
	1214826	Spring—Solenoid draw bar
	1214824	Spring—Switch finger pawl
	7236121	Spring—Tension spring for drive gear
	1216209	Spring—Tension spring for rocker bar
	7236001	Washer—"C" washer for flexible shaft
	1214836	Washer—Felt washer for push rods
	7235892	Washer—Fibre washer for worm gear thrust
	1214837	Washer—Flat washer for solenoid draw bar
	1214823	Washer—Spring washer for worm gear thrust

Pontiac 983912

Date 6-18-41



Tube View



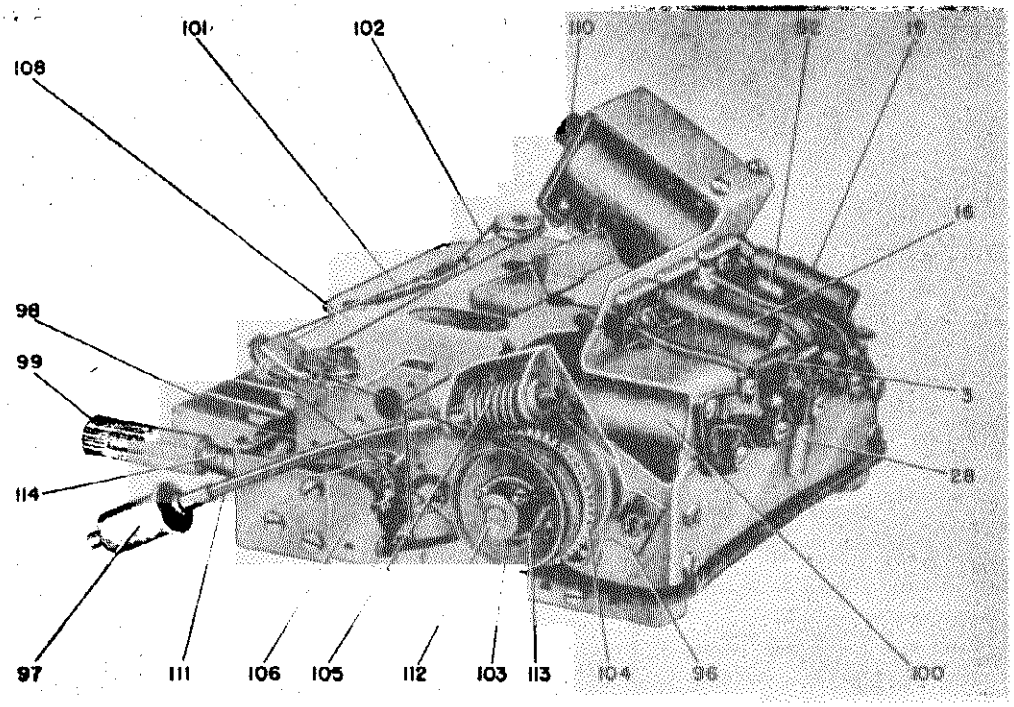
Chassis View

Push Button Set-Up

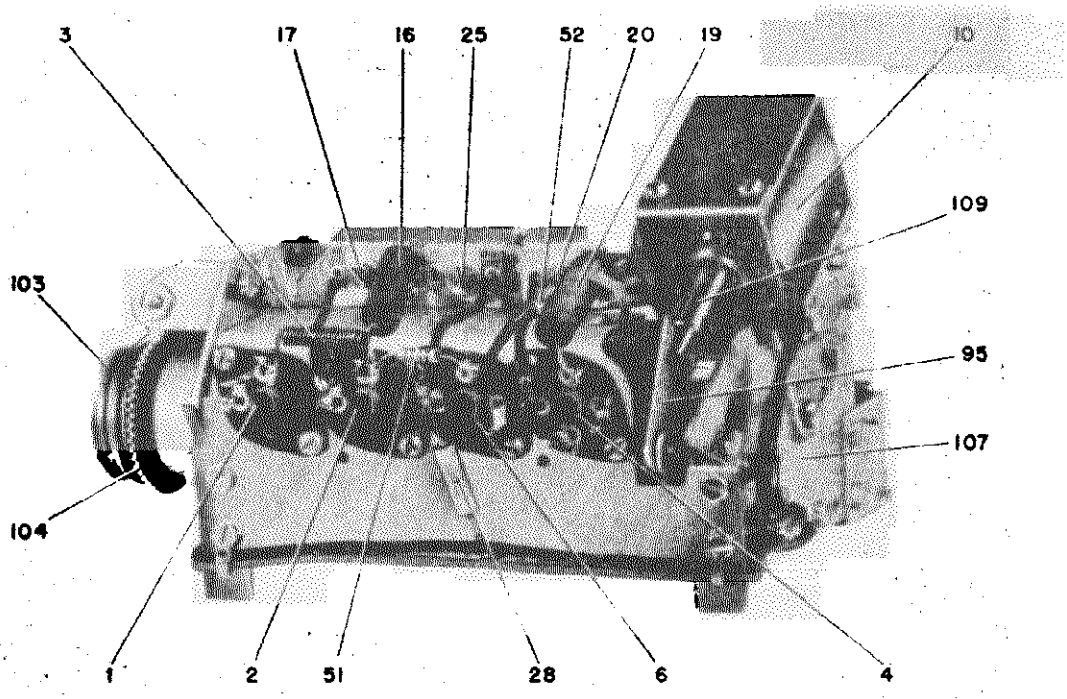
Remove button cover to expose the set-up button. Push button all the way in and release. Tune in the desired Station. Replace button cover.

MODEL 983912

UNITED MOTORS SERVICE



Tuner Side View



Tuner Coil View

General

MOUNTING—Instrument Panel

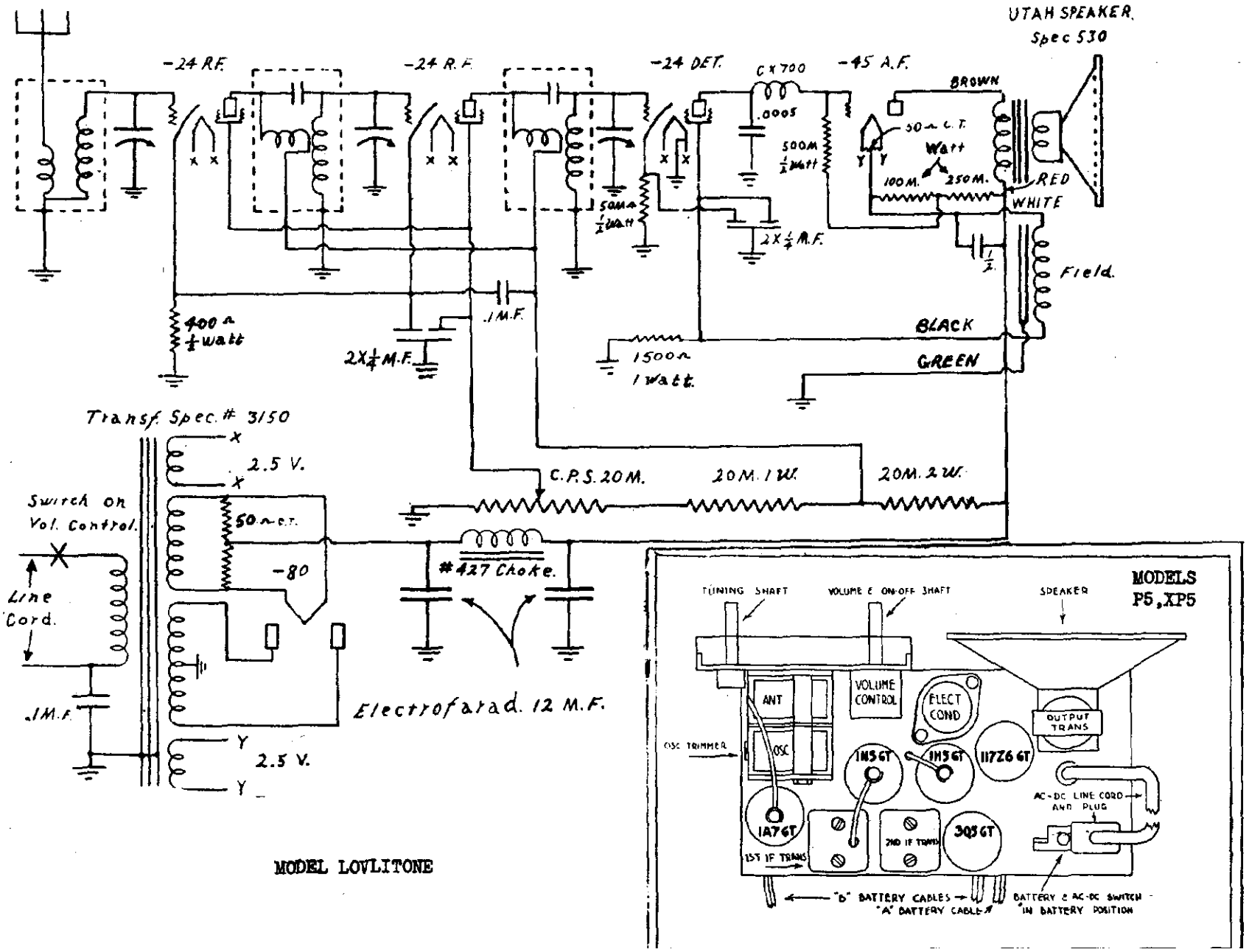
TUBES—Eight

SPEAKER—6" x 9" Elliptical Dynamic

TUNING—Manual and 6 P. B. Electrical

CAR ANTENNA CAPACITY—.000072 Mfd.

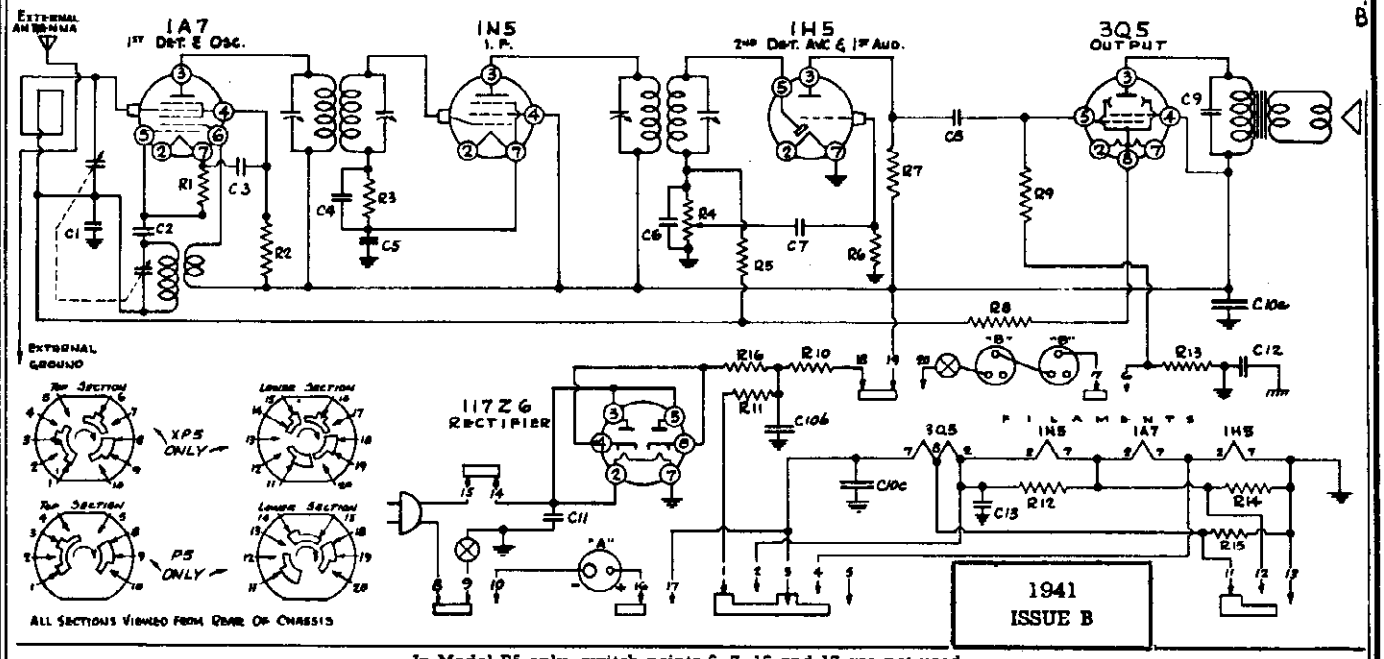
TUNING RANGE—540-1,600 K.C.



MODEL LOVLITONE

MODELS P5, XP5

WALGREEN CO.



In Model P5 only, switch points 6, 7, 16 and 17 are not used. Switch point 5 is not used in either model.

RESISTORS

No.	Ohms	Watts	No.	Ohms	Watts
R1	200,000	½	R9	2,000,000	½
R2	50,000	½	R10	3,500—10%	½
R3	5,000,000	½	R11	2,600—10%	5
R4	1,000,000	V.C.	R12	300—10%	½
R5	3,000,000	¼	R13	440—10%	½
R6	15,000,000	½	R14	300—10%	½
R7	1,000,000	½	R15	3,000—10%	½
R8	10,000,000	¼	R16	30	½

CONDENSERS

No.	Capacity (Mfd.)	Volts	No.	Capacity (Mfd.)	Volts
C1	.05	200	C9	.002	600
C2	.00005	Mica	C10a	50. Elect.	150
C3	.01	400	C10b	30. Elect.	150
C4	.001	Mica	C10c	100. Elect.	25
C5	.1	200	C11	.05	400
C6	.00025	Mica	C12	.05	400
C7	.001	200	C13	100. Elect.	10
C8	.001	400			

I.F. Sig.Gen. at 455 Kc. thru .05 cond. Align I.F. trim. to peak on output meter.

B.C. Sig.Gen. at 1600Kc. Set gang. cond. to min., adj. osc. trim. to receive signal. When using external ant. conn., max. sensitivity will be found at H.F. end.

FIRST I.F.TRANSFORMER (Part no. P4859)

Pri.-Red white, B+; blue White, plate-Res..7.5ohms. Sec. white, grid; black white, AVC-Res..17.3ohms.

SEC.I.F. Transformer

Pri.-Blue White, plate; red white B+-Res..17.8 ohms Sec.-white, grid; black white, AVC-Res..13.1 ohms

SPEAKER(P4829)5"PM Type

D.C. voice coil res.3.2 ohms. Voice coil imped. at 400 cycles..3.5 ohms.

Oscillator Coil (Part No. P5020)

Looking at the connection end in a clockwise direction starting at the chassis the terminals are No. 1, grid; No. 2, plate; No. 3, B+; No. 4, ground.

Primary—No. 2 and No. 3—Resistance.....2.2 ohms
Secondary—No. 4 and No. 1—Resistance.....4.9 ohms

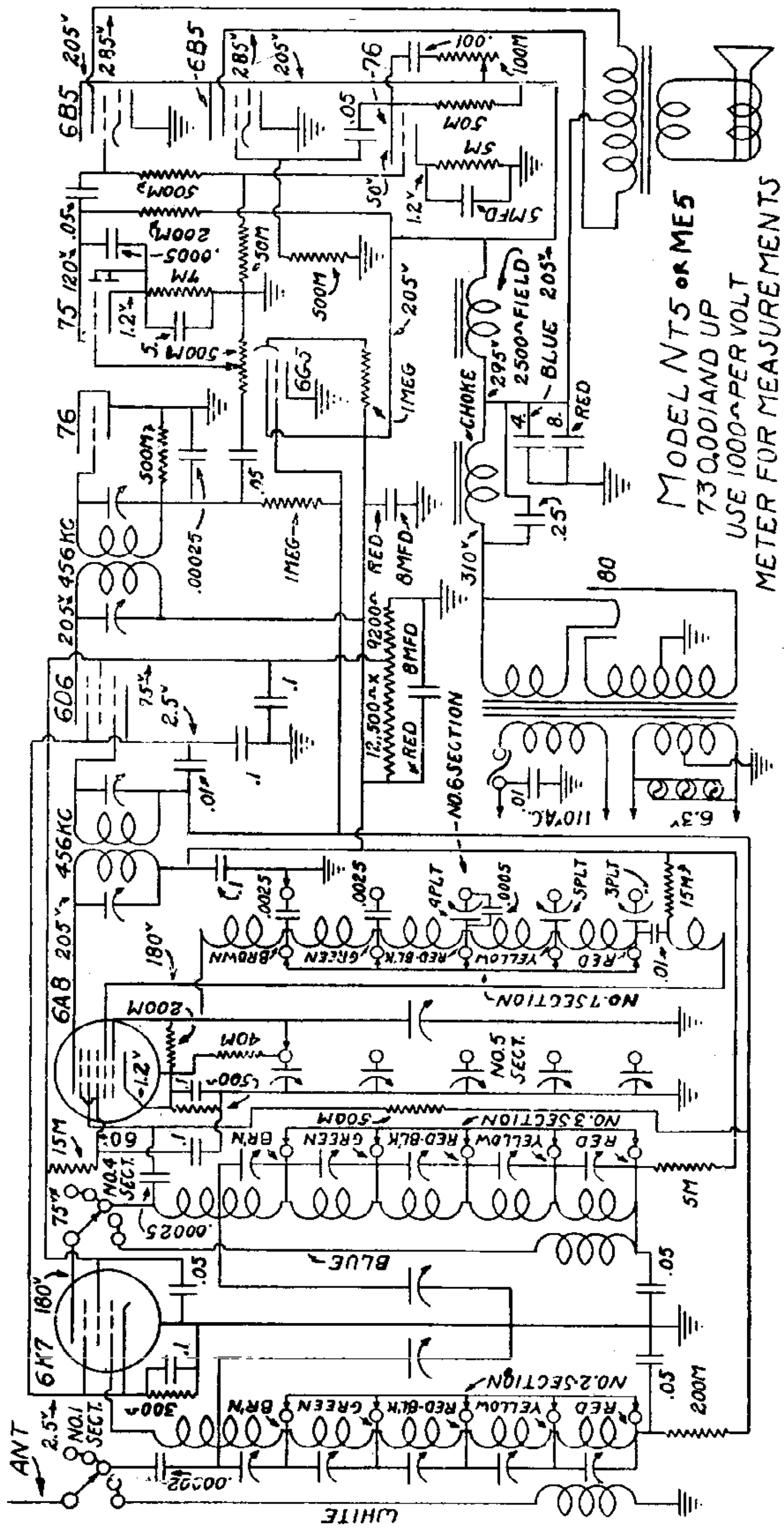
SERVICE INFORMATION

Voltages—Line 117.5 Volts AC—Power Consumption 25 Watts.

Volume control maximum and no signal tuned in. Meter 1000 ohms per volt, 150 volt scale.

Plate (3) of 1A7 tube to common ground	100	volts
Screen (4) of 1A7 tube to common ground	62	volts
Anode grid (6) of 1A7 tube to common ground	100	volts
Filament (2) to (7) of 1A7 tube	1.35	volts
Plate (3) of 1N5 tube to common ground	100	volts
Screen (4) of 1N5 tube to common ground	102	volts
Filament (2) to (7) of 1N5 tube	1.3	volts
Plate (3) of 1H5 tube to common ground	38	volts
Filament (2) to (7) of 1H5 tube	1.35	volts
Plate (3) of 3Q5 tube to common ground	98	volts
Screen (4) of 3Q5 to common ground	102	volts
Filament (7) to (8) of 3Q5 tube	1.3	volts
Filament (2) to (8) of 3Q5 tube	1.35	volts
Plate (3) or (5) of 117Z6 tube to common ground	117.5v.	(AC)
Cathode (4) or (8) of 117Z6 tube to common ground	128	volts
Filament (2) to (7) of 117Z6 tube	117.5v.	(AC)

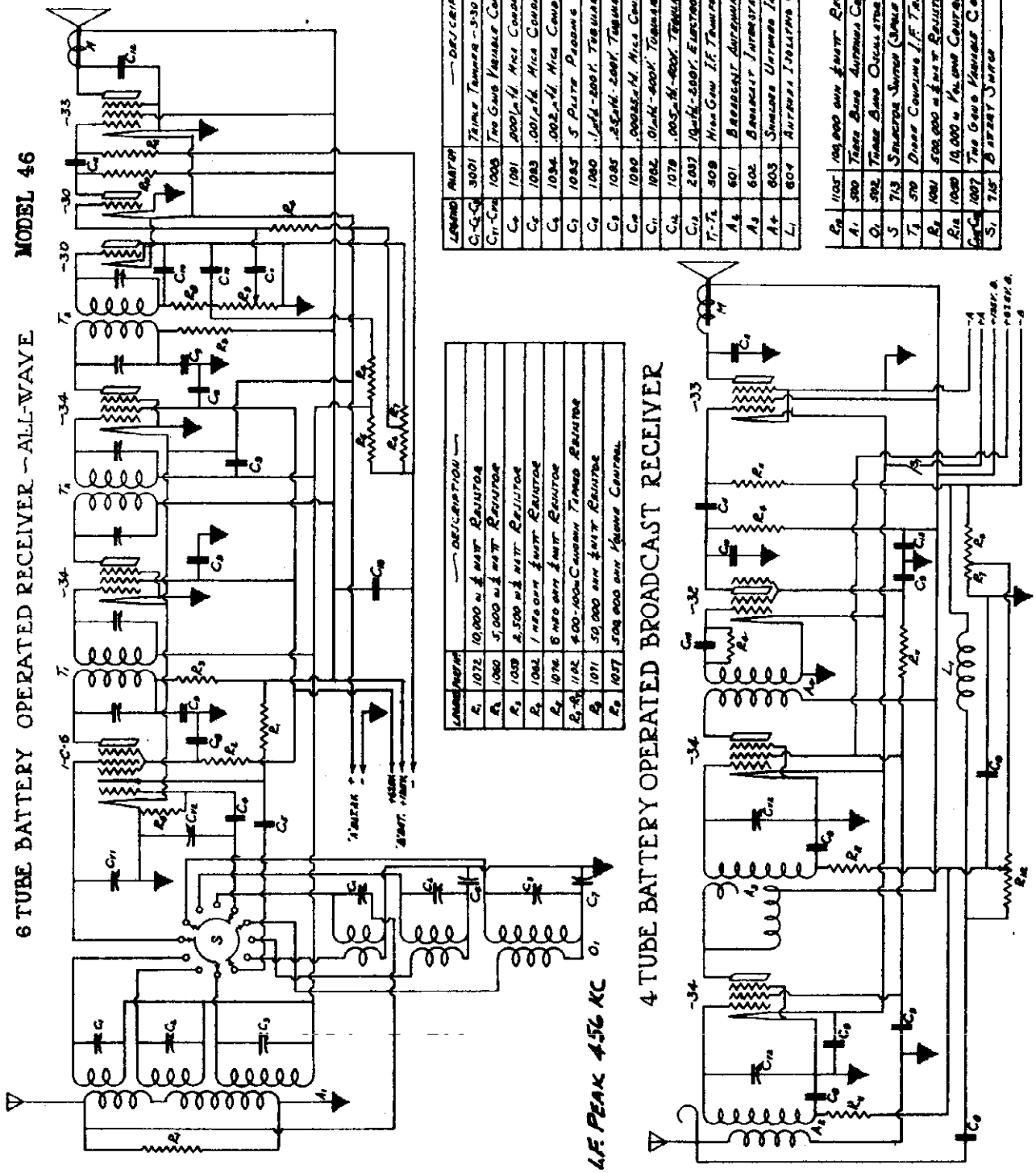
WALGREEN CO.


MODEL NT5 OR ME5
730,001 AND UP
USE 1000~PER VOLT
METER FOR MEASUREMENTS

MODEL 46

MODEL 4-Tube Battery

WALGREEN CO.

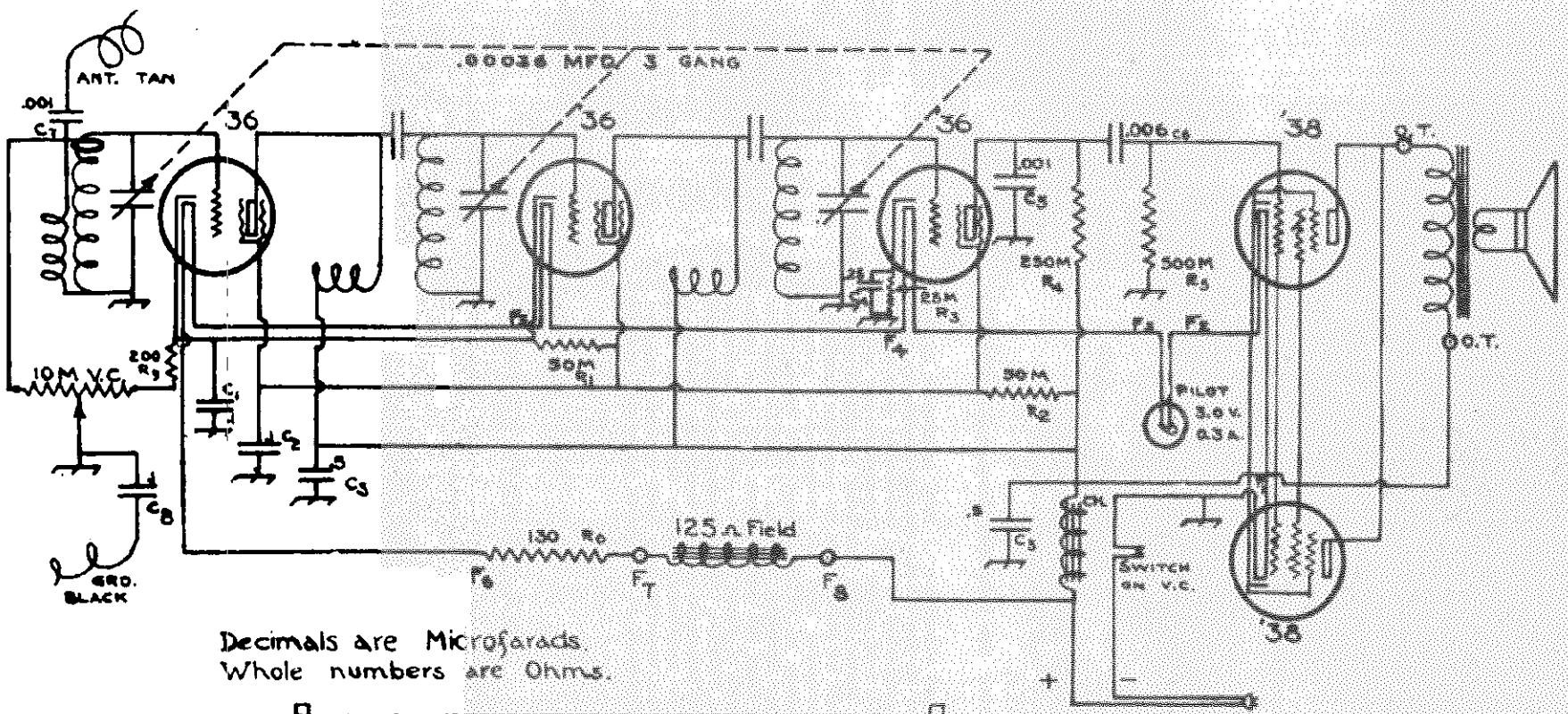


LABEL	PART#	DESCRIPTION
C_1-C_3-C_5	3001	Triple Tuners – 3-30 mmfd. each Section
C_{11}-C_{12}	1009	Two Gang Variable Cond. – 420 mmfd. each
C_4	1081	200 µµfd. Mica Condenser
C_6	1083	001 µfd. Mica Condenser
C_8	1094	.002 µfd. Mica Condenser
C_7	1085	5 Plate Padding Condenser
C_9	1080	.1 µfd.-200 V. Tubular Condenser
C_{10}	1085	.25 µfd.-200 V. Tubular Condenser
C_{13}	1090	.00025 µfd. Mica Cond.
C_{14}	1082	.01 µfd.-400 V. Tubular Condenser
C_{15}	1078	.005 µfd.-400 V. Tubular Condenser
C_{16}	2037	10 µfd.-250 V. Electrolytic Condenser
T_1-T_2	309	Hi-Gain I.F. Transformers (456 K.C.)
A_1	601	Broadcast Antenna Coil
A_2	602	Broadcast Intermediate Coil
A_4	603	Shielded Antenna Interstage Coil
L_1	604	Antenna Isolating Choke

LABEL	PART#	DESCRIPTION
R_1	1072	10,000 ω ½ watt Resistor
R_2	1060	5,000 ω ½ watt Resistor
R_3	1059	2,500 ω ½ watt Resistor
R_4	1084	1 meg ohm ½ watt Resistor
R_5	1076	6 meg ohm ½ watt Resistor
R_6-R_7	1102	400-100 M Ohms Tapped Resistor
R_8	1071	50,000 ohm ½ watt Resistor
R_9	1057	500,000 ohm Volume Control

LABEL	PART#	DESCRIPTION
R_{10}	1105	100,000 ohm ½ watt Resistor
A_1	580	Tuned Band Antenna Coil
O_1	582	Tuned Band Oscillator Coil
S	713	Selector Switch (3 Bank - 3 Position)
T_1	570	Diode Coupling I.F. Transformer
R_{11}	1061	250,000 ω ½ watt Resistor
R_{12}	1060	10,000 ω Volume Control
C_{17}-C_{18}	1007	Two Gang Variable Condenser
S_1	715	Battery Switch

MODEL 500



Decimals are Microfarads.
Whole numbers are Ohms.

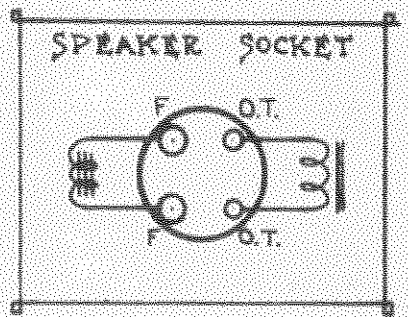
100 - 125 Volts
Direct Current

VOLTAGES

All readings from chassis frame to circuit points.

Line 115 Volts		Volume Control Full On	
'36 R.F. PL.	110	'38 F_1	6.8
'36 DET. PL.	43	PILOT F_3	16.7
'36 SC. GR.	35	'36 F_4	22.4
'36 R.F. CA.	2	'36 F_5	29.0
'36 DET. CA.	6	'36 F_6	35.7
'38 PL.	105	FIELD F_7	73.0
'38 CA. F_2	14	FIELD F_8	113.0

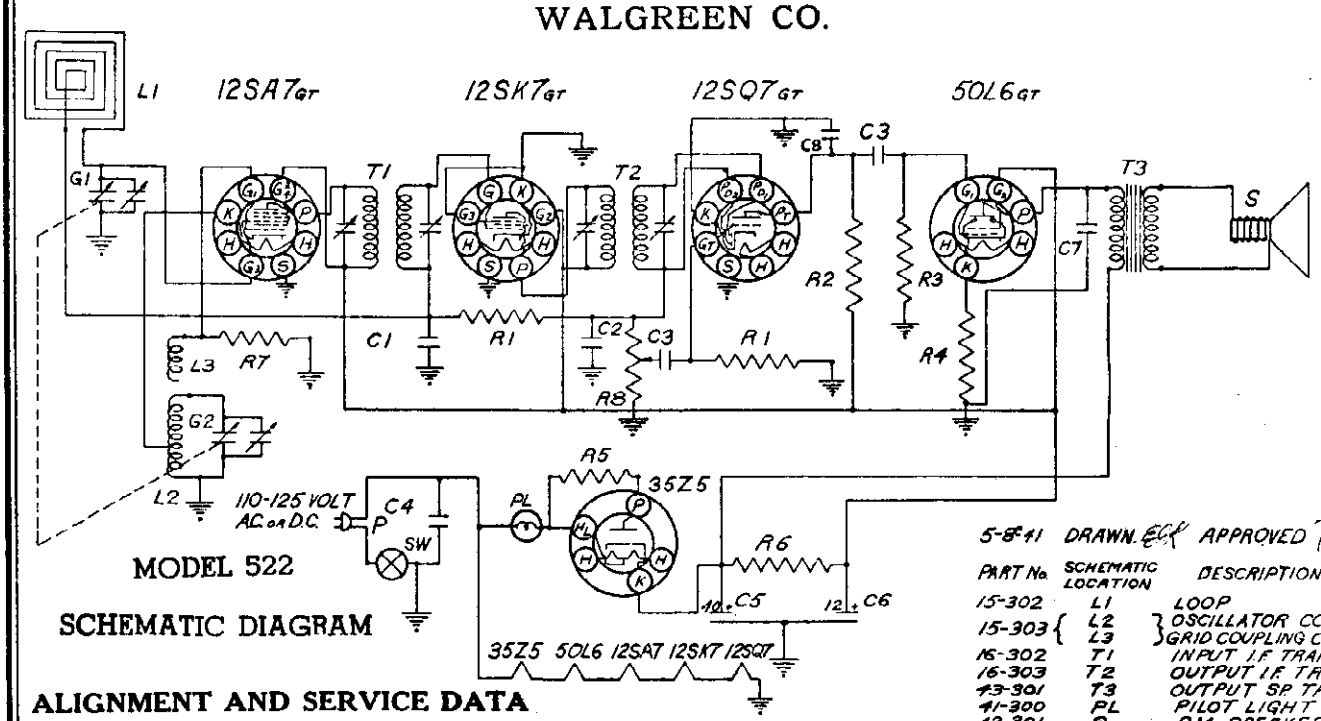
Voltages subject to variations due to differences in tubes, line voltage, and resistor values. 311x



311030

MODEL 522

WALGREEN CO.



MODEL 522

SCHEMATIC DIAGRAM

5-8-41 DRAWN ECK APPROVED

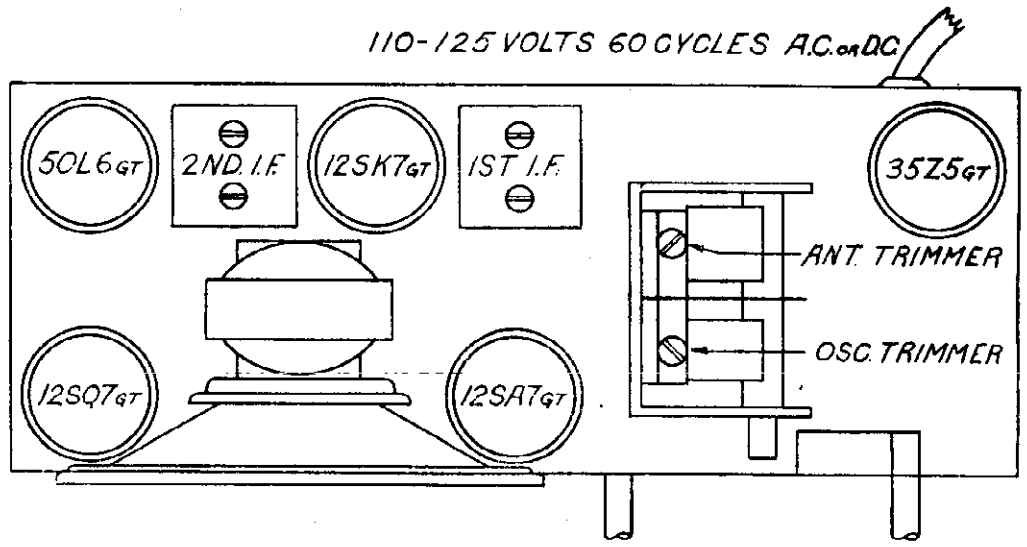
PART No.	SCHEMATIC LOCATION	DESCRIPTION
15-302	L1	LOOP
15-303	L2	OSCILLATOR COIL
	L3	GRID COUPLING COIL
16-302	T1	INPUT I.F. TRANS.
16-303	T2	OUTPUT I.F. TRANS.
43-301	T3	OUTPUT SP. TRANS.
41-300	PL	PILOT LIGHT #47
43-301	S	P.M. SPEAKER
40-301	12SA7GT	OSCILLATOR MIXER
	12SK7GT	I.F. AMPLIFIER
	12SQ7GT	DETECTOR-AUDIO
	50L6GT	AUDIO AMPLIFIER
	35Z5GT	RECTIFIER
34-5	P	LINE CORD
5-301	SW	SWITCH ON VOL. CON.

3-2	R1	2 MEGOHM RESISTOR ½W 20%
3-6	R2	1 MEGOHM " ½W 20%
3-1	R3	.5 MEGOHM " " "
3-31	R4	200 OHMS " " "
3-174	R5	50 OHMS " " "
3-120	R6	5000 OHMS " " "
3-26	R7	30000 OHMS " " "
5-301	R8	1 MEG. VOL CON & SWITCH
10-301	G1, G2	GANG CONDENSER
6-12	C1	.05 MFD. 200V. COND.
6-8	C2	.0001 MFD. MICA "
6-3	C3	.01 MFD 400V. "
6-14	C4	.05 MFD. 400V. "
7-301	C5	40 MFD. ELECTROLYTIC
	C6	12 MFD. ELECTROLYTIC
6-306	C7	.005 MFD. 600V. COND.
6-305	C8	.0006 MFD. 400V. "

ALIGNMENT AND SERVICE DATA

A signal generator is required having the following frequencies: 456KC, 1400KC, 1720KC.

First Step: Connect the generator lead through a .1 mfd. condenser to the terminal lug next to the Antenna trimmer on top of the tuning condenser. The ground lead from the generator may be connected to any convenient spot on the metal chassis. Adjust generator to 456KC and adjust IF trimmer screws until a maximum reading is noted on the output meter which has been connected across the speaker. The tuning condenser should be turned out to complete minimum capacity when aligning the IF. With generator lead still connected to antenna trimmer terminal, adjust generator frequency to 1720KC, and with tuning condenser still at minimum, adjust oscillator trimmer till the 1720KC signal is tuned in. Next, remove generator leads from set and connect both to a transmitting loop. This loop can be made with 2 turns of wire about 6 inches in diameter. Adjust generator frequency to 1400KC. Turn tuning condenser until the signal is tuned in and adjust antenna trimmer until a maximum reading is noted. No further adjustment should be necessary, unless the set has been damaged, as the coils and condenser in this receiver have been specially handled at the factory so as to insure proper alignment at the lower frequency end of the dial.



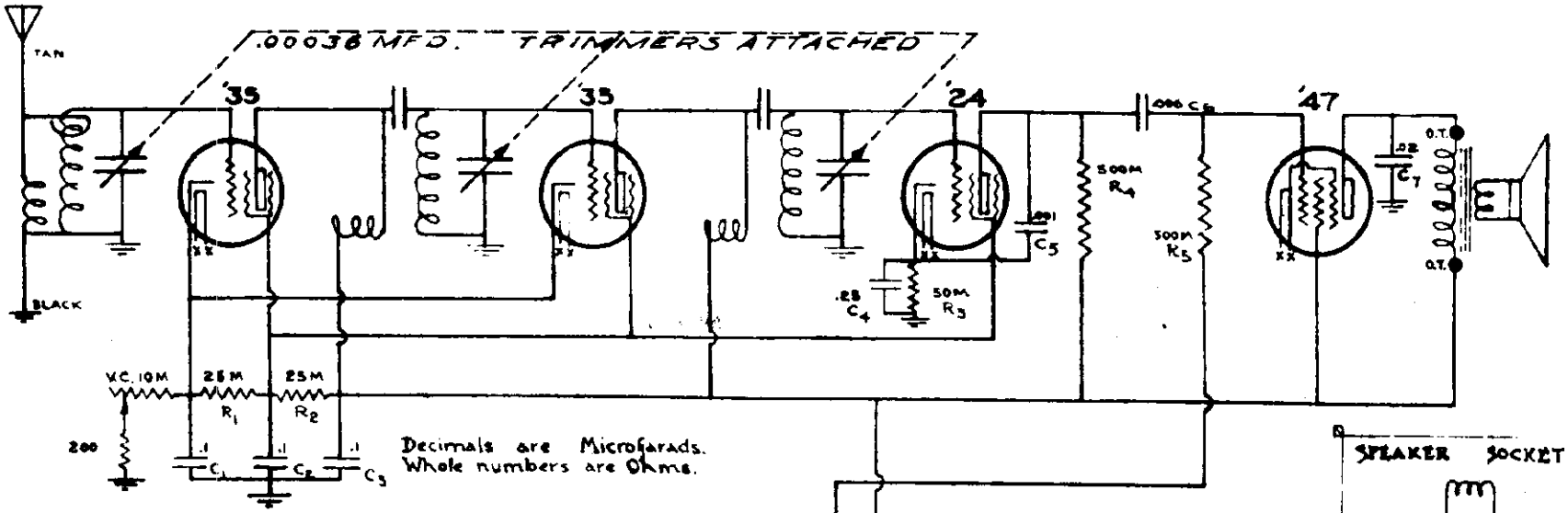
TUBE AND TRIMMER LOCATION

VOLUME CONTROL & OFF-ON SWITCH

TUNING SHAFT

MODEL 560 AND MODEL 525.

60 cycle 25 cycle



VOLTAGES

All readings from chassis frame to circuit points.

'35 PL.	220
'24 PL.	110
'47 PL.	210
'35 S.G.	95
'24 S.G	95
'35 CA.	2
'24 CA.	6
FIELD 2	140
FIELD 1	15

Volume Control Full On

Voltages subject to variations due to differences in tubes, line voltage and resistor values

311016 (B)

WALGREEN CO.

WALGREEN PAGE
MODELS 525 560

Taken with volume control on full -- Dial set at 100.

MODELS AC 560 and AC 525.

TYPE TUBE	TUBE POSIT.	"A" VOLTS	"B" VOLTS	"C" VOLTS	SCREEN VOLTS	SCREEN CURR. A.M.	CATHODE VOLTS	NORMAL VOLTS	GRID TEST M.A.
235	1st. Radio Freq.	2.15	220	2.0	95	.85	2.25	5.2	9
235	2nd Radio Freq.	2.15	220	2.0	95	.85	2.25	5.4	9.1
224	Detect	2.15	90	6.0	60	.05	7.	.1	.3
247	1st. Audio Freq.	2.15	210	-1.	220	-5.	3.	24	42.
280	Rect.	4.7						25.per	anode

MODEL 525 AC - 110 volts 25 cycle alternating current.
Tubes - 2 - #235, 1 - #224, 1 - 247,
1 - #280

MODEL 560 AC - 110 volts 60 cycle alternating current.
Tubes - 2 - #235, 1 - #224, 1 - #247
1 - #280

MODEL DC 500.

TYPE TUBE	TUBE POSIT.	"A" VOLTS	"B" VOLTS	"C" VOLTS	SCREEN VOLTS	SCREEN CURR. A.M.	CATHODE VOLTS	NORMAL M.A.	GRID TEST M.A.
236	1st Radio Freqq	6.1*	110	60	45	.5	-31.5	2.2	3.2
236	2nd radio Freq.	6.2*	110	59	45	.5	-25	2.2	3.2
236	Detect	5.9*	60	52	45	.05	-18	.12	.37
238	Audio Freq.	6.3*	100	100	110	1.35		4.4	11.5
238	Audio Freq.	6.4*	100	100	110	1.35		4.4	11.5

* Filament readings taken by leads from D.C. meter separate from any chassis connection.

MODEL 500 DC - 110 volts direct current.
Tubes - 3 - #236, 2 - #238

Antenna ----------Tan
Ground ----------Black
Resistors ----------The standard R.M.A. code has been used throughout. The values and colors below are the ones used in the receivers.

Resistance	Body Color	End Color	Dot Color
25000 ohms	Red	Black	Orange
50000 ohms	Green	Black	Orange
250000 ohms	Red	Black	Yellow
500000 ohms	Green	Black	Yellow

By-pass condenser block ----one white--.25MFD to cathode of Detector.
two blue--.1 MFD each, one to RF cathodes and one to RF screen grids.
one red --.1 MFD to B plus terminal on back of variable condenser.

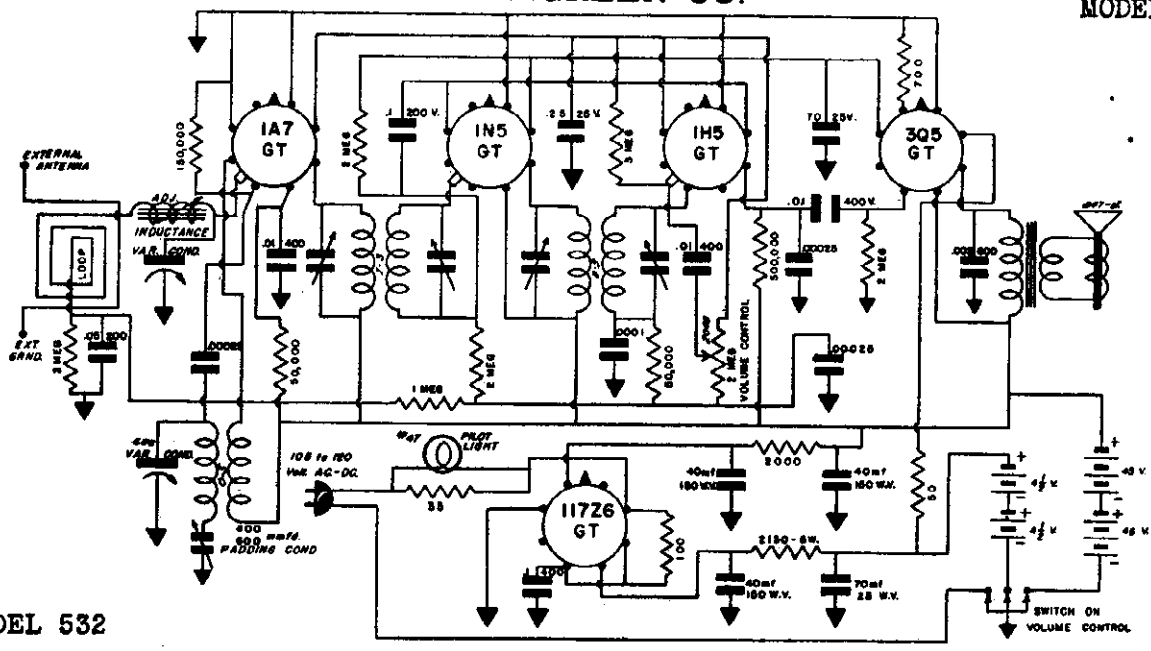
Electrolytic filter condenser-
Long leads ----------Yellow to speaker socket and C.T. of power transformer s econdary.
Red to B plus in 80 socket.
Short leads ----------Black to resistor s trip and speaker socket
Red to B plus in 80 socket.

COUPLING CONDENSERS: capacities printed directly on covers.

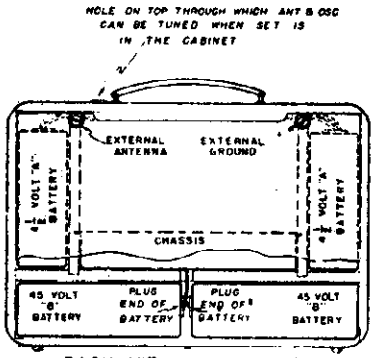
Voltages other than those shown, within the limits specified, will indicate the probable source of trouble. After the necessary repairs or replacements have been made we want to caution the service man not to realign the condenser trimmers as this has been carefully performed at the factory with calibrated precision equipment. However, in rare cases where the radio frequency coils have been replaced, realignment will be found necessary. This can best be done with a calibrated oscillator and an output meter, preferably not on a broadcast signal, however, where an oscillator is not available a weak broadcast signal around 1400 KC on the dial should be used to check by.

MODEL 532
MODEL 300

WALGREEN CO.

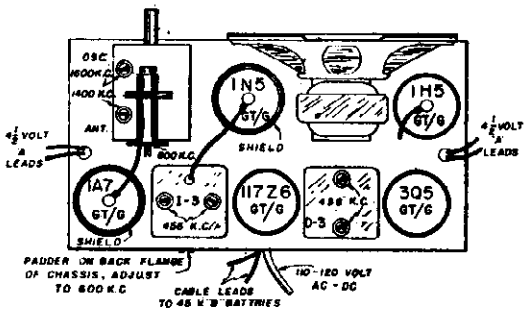


MODEL 532

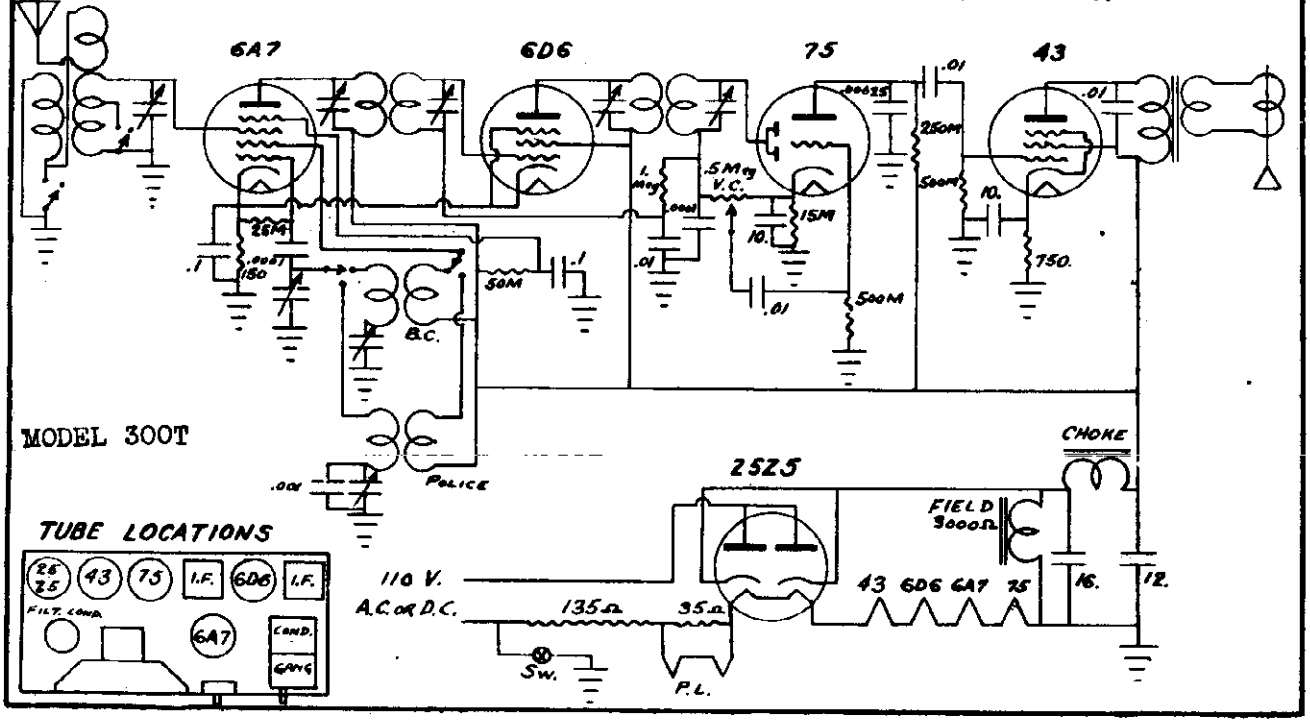


BACK VIEW OF CABINET

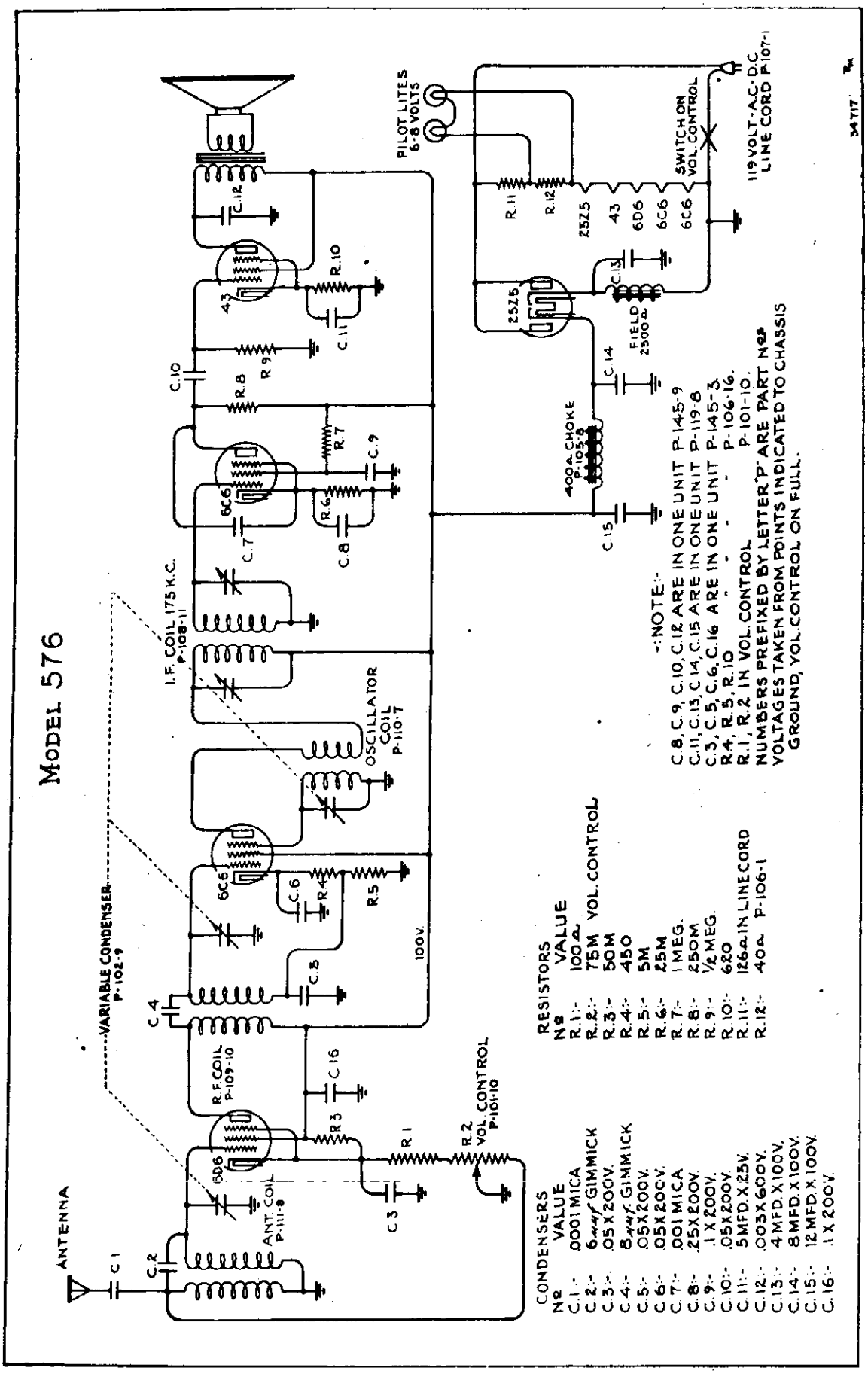
CHASSIS LAYOUT & TUBE LOCATION

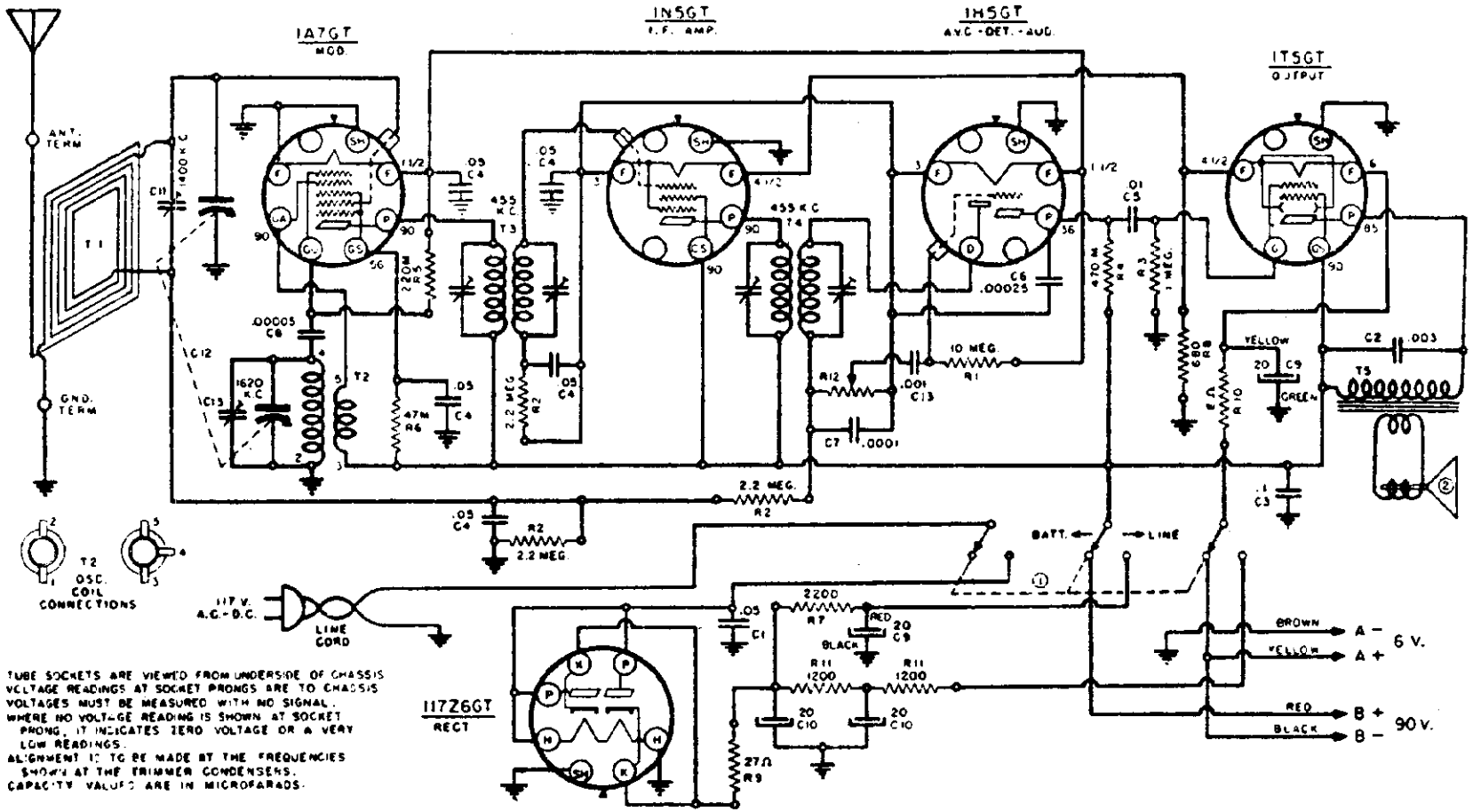


5 TUBE · DUAL WAVE · A.C.-D.C. SUPERHETERODYNE.



MODEL 576





CODE	PART NO.	DESCRIPTION
C1	1607	.05 MFD. 400 V. TUBULAR COND
C2	16-139	.003 - - - -
C3	16-115	.1 - 200 V - -
C4	1622	.05 - - - -
C5	16-121	.01 - - - -
C6	1504	.00025 MFD. MICA CONDENSER
C7	1501	.0001 - - -
C8	1503	.00005 - - -
C9	18-203	20 x 20 - 150 W.V. ELECTROLYTIC
C10	18-202	20 x 20 - 150 W.V. -
C11	20-129	TRIMMER ON LOOP
C12	19-172	2 GANG VARIABLE COND. ALSO C13
C13	16-124	.001 MFD. 400 V. TUBULAR COND.

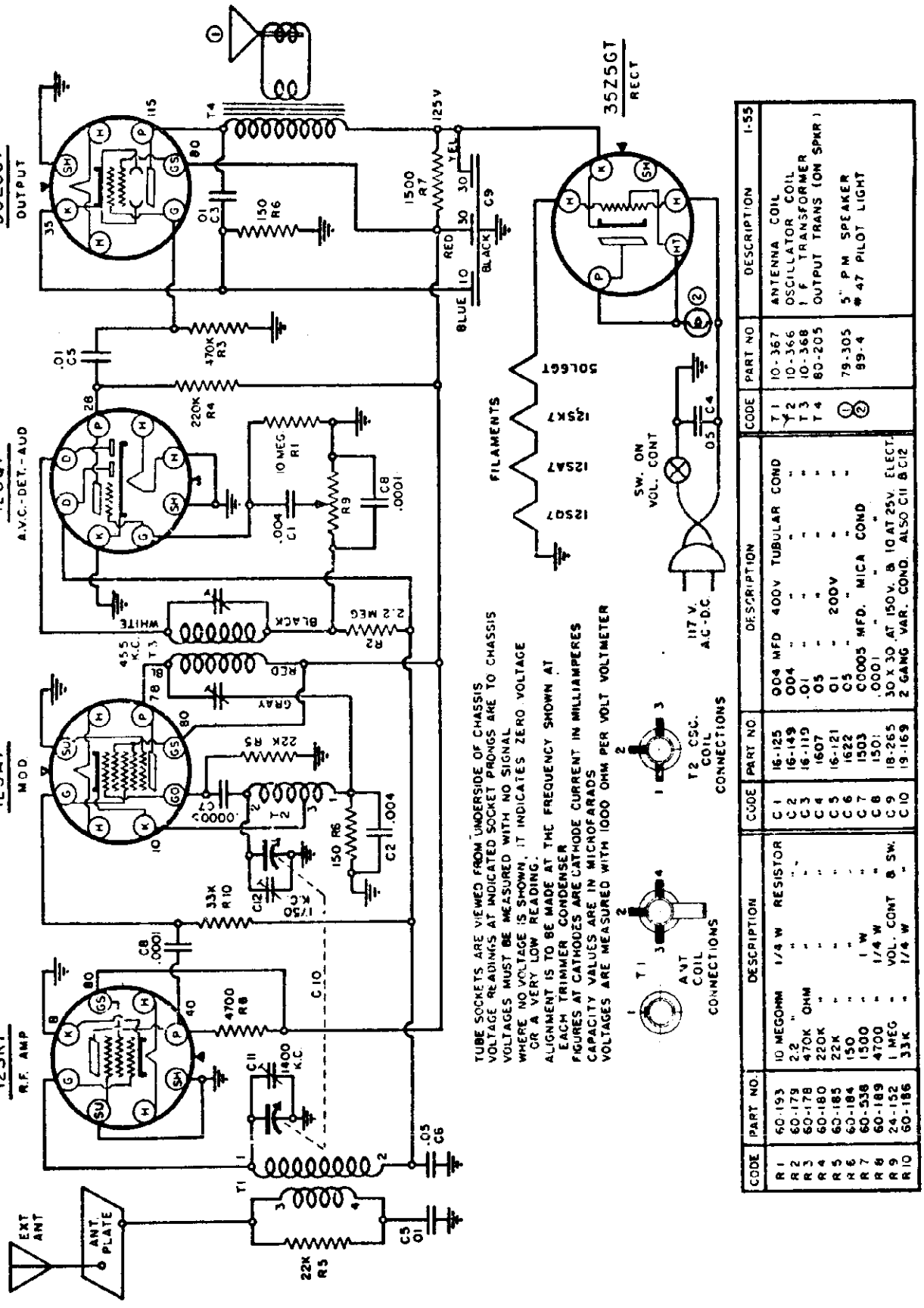
CODE	PART NO.	DESCRIPTION
R1	60-193	10 MEGOHM 1/4 W. RESISTOR
R2	60-179	2.2 - - -
R3	60-195	1 - - -
R4	60-178	470 M OHM - -
R5	60-180	220 M - - -
R6	60-177	47 M - - -
R7	60-383	2200 - - -
R8	60-379	680 - - -
R9	60-220	27 - - -
R10	60-128	8 - 1/2 W -
R11	60-642	1200 - .3 W. -
R12	24-150	1 MEGOHM VOLUME CONTROL

CODE	PART NO	DESCRIPTION
T1	82-25	LOOP ANTENNA
T2	10-310	OSCILLATOR COIL
T3	10-379	1 ST. I.F. TRANSFORMER
T4	10-343	2 ND - -
T5	-------	OUTPUT TRANSFORMER
1	69-151	POWER SWITCH
2	79-314	5" P.M. SPEAKER

FOR OTHER DATA SEE INDEX

MODELS 1-550 to
1-559 incl. Ch.1-55

WARWICK MFG. CORP.

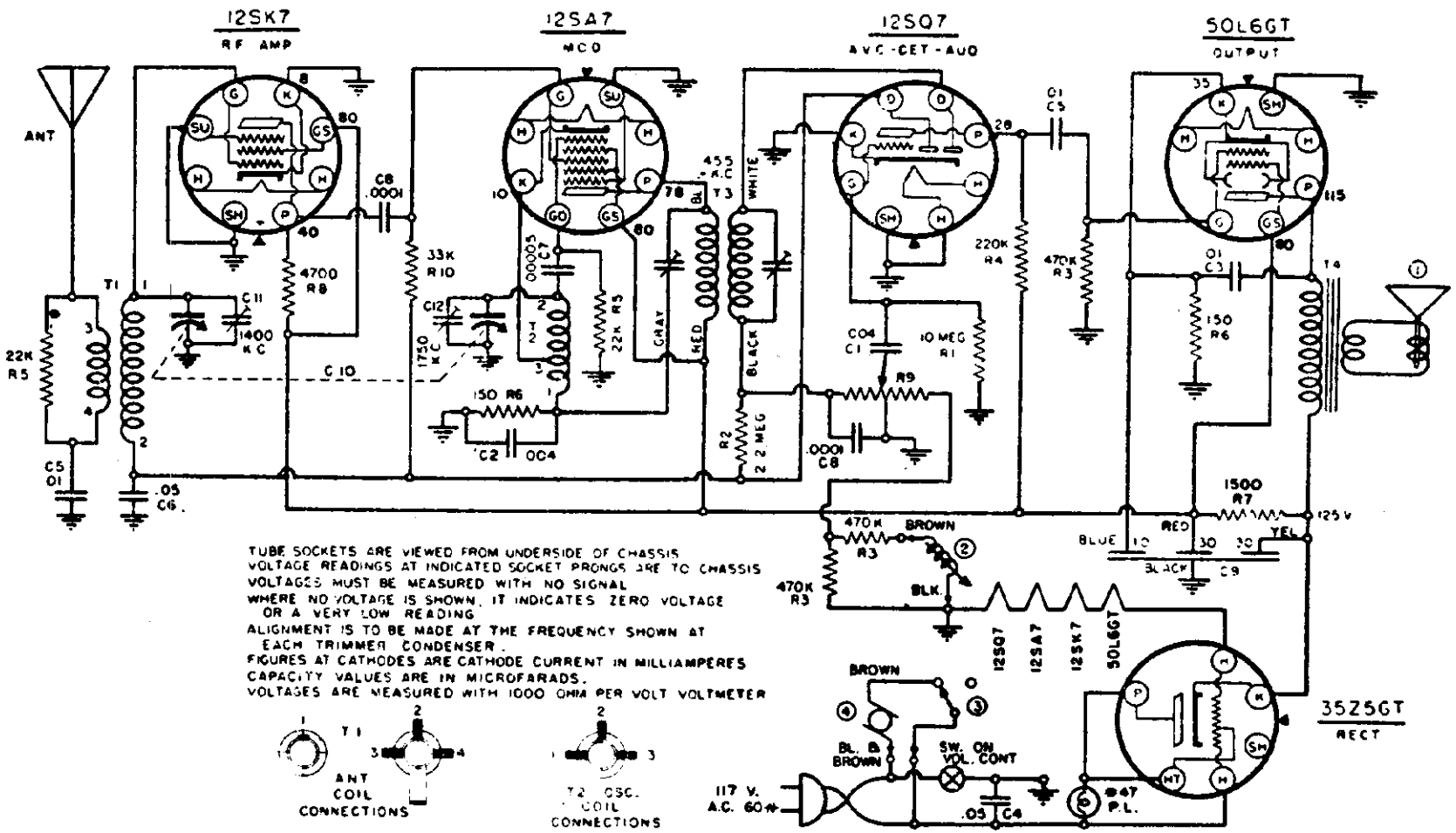


CODE	PART NO.	DESCRIPTION
R 1	60-193	10 MEGOHM 1/4 W RESISTOR
R 2	60-179	2.2 " " "
R 3	60-178	470K OHM " "
R 4	60-180	220K " " "
R 5	60-185	22K " " "
R 6	60-184	150 " " "
R 7	60-538	1500 " 1 W "
R 8	60-189	4700 " 1/4 W "
R 9	24-152	1 MEG " VOL. CONT & SW.
R 10	60-186	33K " 1/4 W "

CODE	PART NO	DESCRIPTION
C 1	16-125	004 MFD 400V TUBULAR COND
C 2	16-149	004 " " " "
C 3	16-119	.01 " " " "
C 4	1607	05 " " " "
C 5	16-121	01 " 200V " "
C 6	1622	05 " " " "
C 7	1503	.00005 MFD. MICA COND
C 8	1501	.0001 " " "
C 9	18-265	30 X 30 AT 150 V. & 10 AT 25V. ELECT.
C 10	19-169	2 GANG VAR. COND. ALSO C11 & C12

CODE	PART NO	DESCRIPTION
T 1	10-367	ANTENNA COIL
T 2	10-366	OSCILLATOR COIL
T 3	10-368	I F TRANSFORMER
T 4	80-205	OUTPUT TRANS (ON SPKR)
①	79-305	5" P M SPEAKER
②	99-4	#47 PILOT LIGHT

FOR OTHER DATA SEE INDEX



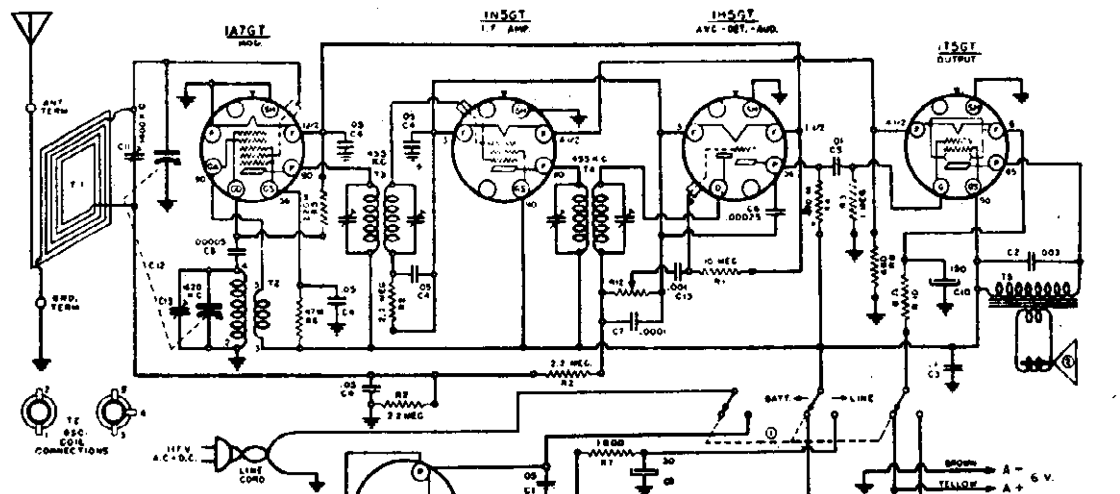
TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS
VOLTAGES MUST BE MEASURED WITH NO SIGNAL
WHERE NO VOLTAGE IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING
ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES
CAPACITY VALUES ARE IN MICROFARADS.
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER

CODE	PART NO	DESCRIPTION	CODE	PART NO	DESCRIPTION	CODE	PART NO	DESCRIPTION 1-56
R 1	60-193	10 MEGOHM 1/4 W RESISTOR	C 1	16-125	004 MFD 400V TUBULAR COND	T 1	10-367	ANTENNA COIL
R 2	60-179	2.2 " "	C 2	16-149	004 " "	T 2	10-366	OSCILLATOR COIL
R 3	60-178	470K OHM " "	C 3	16-119	.01 " "	T 3	10-368	I F TRANSFORMER
R 4	60-180	220K " "	C 4	1607	.05 " "	T 4	80-205	OUTPUT TRANS ION SPKR)
R 5	60-185	22K " "	C 5	16-121	.01 " 200V "		79-305	5 P M SPEAKER
R 6	60-184	150 " "	C 6	1622	.05 " " "		83-216	PHONO PICKUP
R 7	60-538	1500 " 1 W. "	C 7	1503	.00005 MFD M-CA COND		69-153	MOTOR SWITCH
R 8	60-189	4700 " 1/4 W "	C 8	1501	.0001 " "		59-4	PHONO MOTOR
R 9	24-156	2 MEG. " VOL. CONT & SW.	C 9	18-265	30 X 30 AT 150V & 10 AT 25V ELECT.			
R 10	60-186	33 K " 1/4 W "	C 10	19-169	2 GANG VAR. COND ALSO C11 & C12			

CHASSIS 2-54
CHASSIS 2-70

WARWICK MFG. CORP.

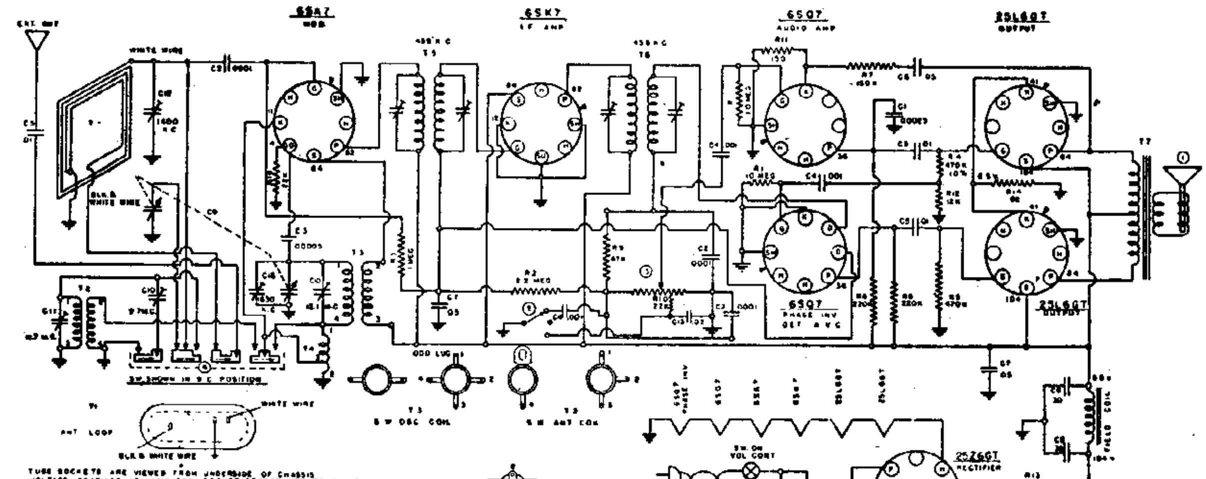
CHASSIS 2-54



TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS
VOLTAGE READINGS AT SOCKET PRONGS ARE TO CHASSIS
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS.
CAPACITY VALUES ARE IN MICROFARADS

CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION	CODE	PART NO	DESCRIPTION 2-54
C1	1607	.05 MFD 400 V. TUBULAR COND.	R1	60-193	10 MEGOHM 1/4 W RESISTOR	T1	92-25	LOOP ANTENNA
C2	14-159	.003 " " " "	R2	60-179	2.2 " " "	T2	10-310	OSCILLATOR COIL
C3	16-115	1 " 200 V. " "	R3	60-195	1 " "	T3	10-379	1 ST. I.F. TRANSFORMER
C4	1622	.05 " " " "	R4	60-179	470 M OHM "	T4	10-343	2 ND " "
C5	16-121	.01 " " " "	R5	60-180	220 M "	T5	....	OUTPUT TRANSFORMER
C6	1504	.00075 MFD MICA CONDENSER	R6	60-177	47 M " " "			
C7	1501	.0001 " " "	R7	60-257	1000 " "	1	69-151	POWER SWITCH
C8	1503	.00005 " " "	R8	60-179	680 " " "	2	79-314-A	5" P.M. SPEAKER
C9	18-266	30-30 " 150 W.V. ELECTROLYTIC	R9	60-451	27 " " "			
C10	18-271	150 " 25 W V "	R10	60-178	8 " 1/2 W "			
C11	20-129	TRIMMER ON LOOP	R11	60-652	2200 " 8 W. "			
C12	19-178	2 GANG VARIABLE COND. ALSO C13	R12	24-150	1 MEGOHM VOLUME CONTROL			
C13	16-124	.001 MFD. 400 V. TUBULAR COND.						

CHASSIS 2-70



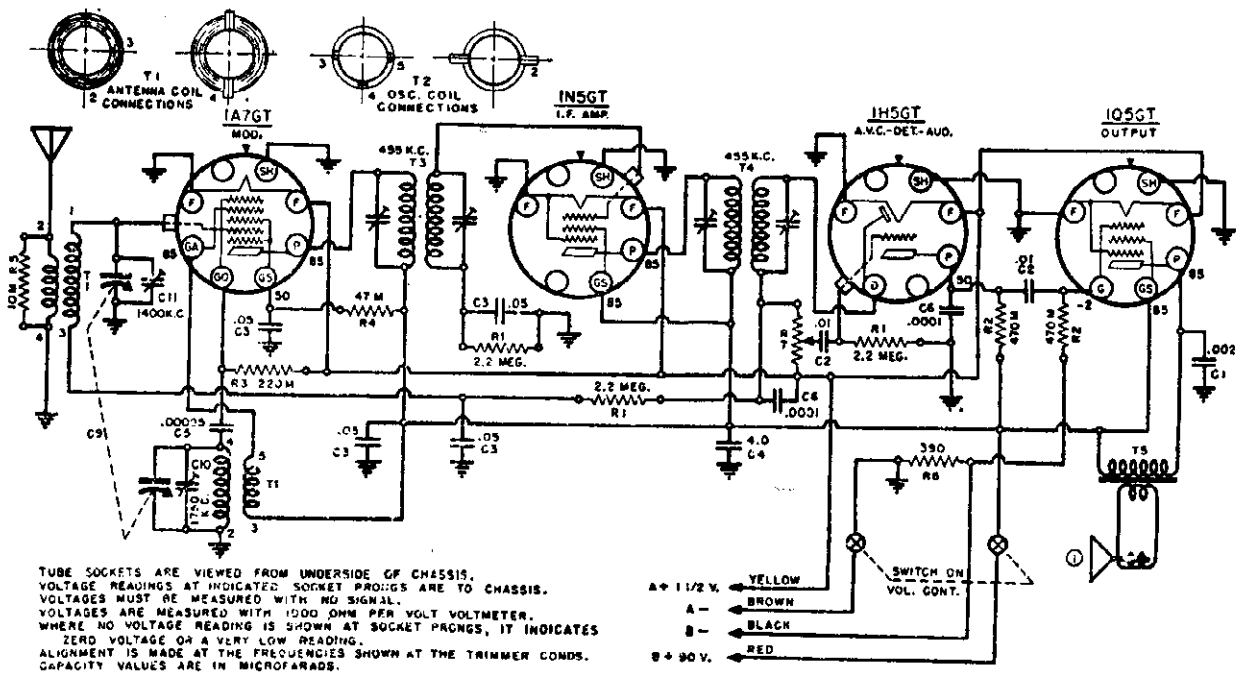
TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS
VOLTAGES MUST BE MEASURED WITH NO SIGNAL
WHERE NO VOLTAGE IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING
ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES
CAPACITY VALUES ARE IN MICROFARADS
VOLTAGES ARE MEASURED WITH 1000 OHMS PER VOLT VOLTMETER

CODE	PART NO	DESCRIPTION	CODE	PART NO	DESCRIPTION	CODE	PART NO	DESCRIPTION 2-70
R1	60-193	10 MEGOHM 1/4 WATT RESISTOR	C1	1504	.00075 MFD MICA CONDENSER	T1	92-33	LOOP ANTENNA
R2	60-179	2.2 " " "	C2	1501	.0001 " " "	T2	10-399	ANTENNA COIL S.W
R3	60-195	1 " "	C3	1503	.00005 " "	T3	10-398	OSCILLATOR COIL S.W
R4	60-407	470K OHM "	C4	16-100	.001 MFD 600 V TUBULAR CONDENSER	T4	10-387	" " B.C
R5	60-178	" " "	C5	16-115	.01 " 400 V " "	T5	10-401	1ST. I.F. TRANSFORMER
R6	60-180	220K " "	C6	1607	.05 " "	T6	10-402	2ND. I.F. "
R7	60-402	150K "	C7	1622	.05 200 V " "	T7		OUTPUT TRANSFORMER (ON SPKR.
R8			C8	18-266	30 X 30 MFD 150 W.V. ELECTROLYTIC			
R9	60-177	47K " "	C9	95-16	2 GANG VARIABLE CONDENSER (ALSO C16)	1	79-323	4" X 6" DYNAMIC SPEAKER
R10	60-185	22K " "	C10	20-131	TRIMMER BANK (2 SECTIONS)	2	69-160	TONE CONTROL
R11	60-184	150 " "	C11	20-133	TRIMMER	3	24-160	VOLUME CONTROL
R12	60-390	12K "	C12	20-129	TRIMMER ON LOOP)	4	69-180	BAND SWITCH
R13	60-651	27 "	C13	16-123	.02 MFD 200 V TUBULAR CONDENSER			
R14	60-426	82 " 1/2 WATT	C14					
R15	60-654	16 1/2 " 3 "	C15					
R16	60-433	60 " 4 "						

FOR OTHER DATA SEE INDEX

WARWICK MFG. CORP.

MODELS 2-400 TO 2-409



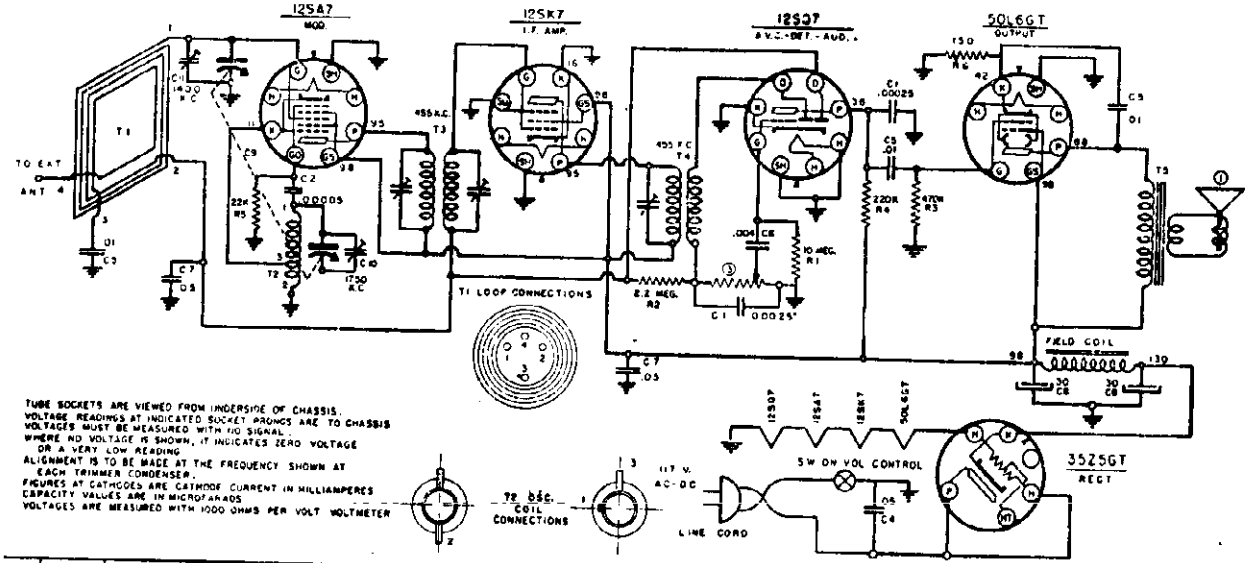
TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONGS, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDS.
CAPACITY VALUES ARE IN MICROFARADS.

CODE	PART NO.	DESCRIPTION
R1	60-179	2.2 MEGOHM 1/4 W. RESISTOR
R2	60-178	470M OHM " " "
R3	60-180	220M " " "
R4	60-177	47M " " "
R5	60-215	10M " " "
R6	60-221	390 " " "
R7	24-154	1 MEGOHM VOLUME CONTROL

CODE	PART NO.	DESCRIPTION
C1	18-138	.002 MFD. 400V. TUBULAR COND.
C2	16-121	.01 " 200V. " "
C3	1622	.05 " " " "
C4	18-250	4.0 " 130 W.V. ELECTROLYTICS
C5	1503	.00005 MFD. MICA CONDENSER
C6	1501	.0001 " " "
C9	19-177	2 GANG VAR. COND. ALSO C10 & C11

CODE	PART NO.	DESCRIPTION 2-40
T1	10-396	ANTENNA TRANSFORMER
T2	10-395	OSCILLATOR " "
T3	10-342	1ST. I.F. "
T4	10-343	2 ND. I.F. "
T5	-------	OUTPUT TRANS. (OM SPKR.)
1	79-322	" P.M. SPEAKER

MODELS 2-500 TO 2-509



TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
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ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES
CAPACITY VALUES ARE IN MICROFARADS
VOLTAGES ARE MEASURED WITH 1000 OHMS PER VOLT VOLTMETER

CODE	PART NO.	DESCRIPTION
R1	60-193	10 MEGOHM 1/4 WATT RESISTOR
R2	60-179	2.2 " " "
R3	60-178	470K OHM " "
R4	60-180	220K " "
R5	60-185	22K " "
R6	60-184	150 " "
R7	60-	
R8	60-	
R9		
R10		

CODE	PART NO.	DESCRIPTION
C1	1504	.00025 MFD. MICA CONDENSER
C2	1503	.00005 " " "
C3		
C4	1607	.05 MFD. 400 V TUBULAR CONDENSER
C5	16-119	.01 " " " "
C6	16-123	.006 " " " "
C7	1622	.05 " 200 V. " "
C8	16-266	30 X 40 MFD 150 W.V. ELECTROLYTIC
C9	19-173	2 GANG VARIABLE CONDENSER (ALSO C10,

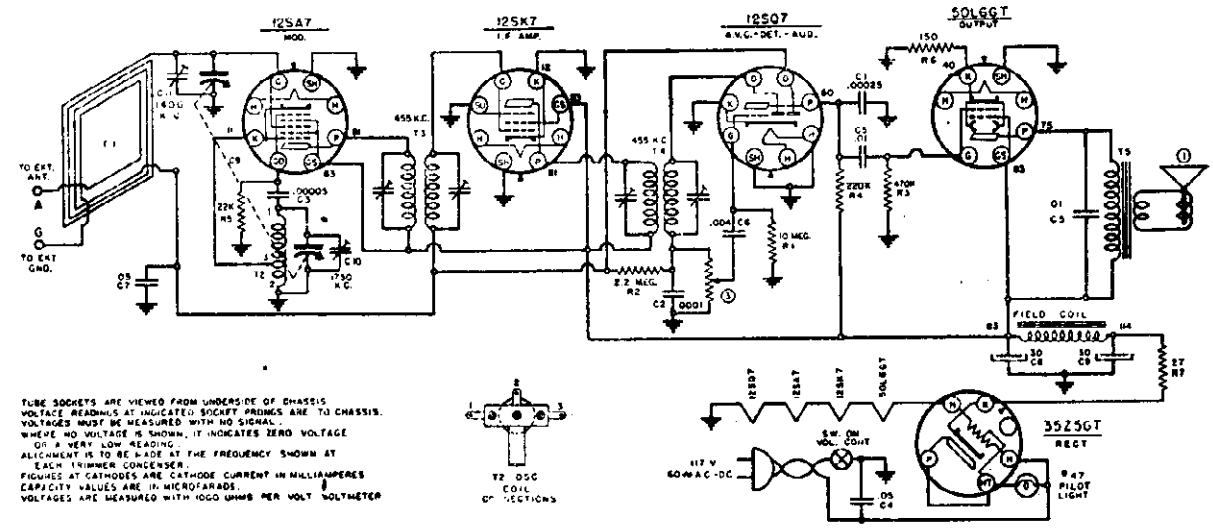
CODE	PART NO.	DESCRIPTION 2-50
T1	82-31	LOOP ANTENNA
T2	10-381	OSCILLATOR COIL
T3	10-382	1ST I.F TRANSFORMER
T4	10-356	2ND I.F TRANSFORMER
T5		OUTPUT TRANS. (ON SPEAKER)
F	79-321	4" DYN SPEAKER
R	24-157	1 MEGOHM VOLUME CONTROL (WITH SW)

FOR OTHER DATA SEE INDEX

MODELS 2-530 to 2-539
Chassis 2-53
MODELS 2-550 to 2-559
Chassis 2-55

WARWICK MFG. CORP.

MODELS 2-530 TO 2-539



TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
WHERE NO VOLTAGE IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
CAPACITY VALUES ARE IN MICROFARADS.
VOLTAGES ARE MEASURED WITH 1000 OHMS PER VOLT VOLTMETER.

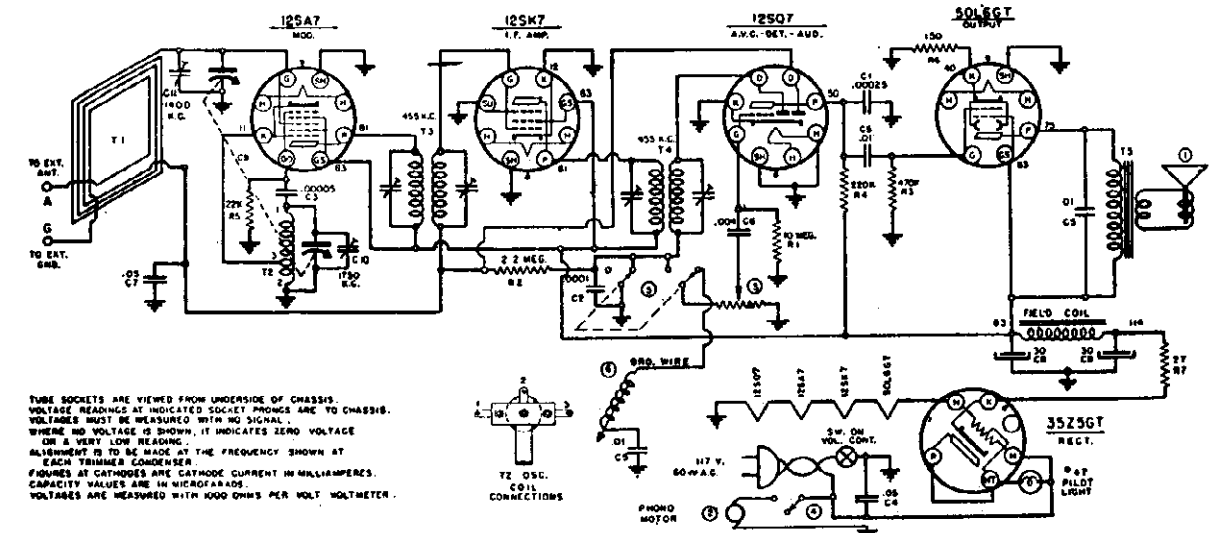
CODE	PART NO.	DESCRIPTION
R1	60-193	10 MEGOHM 1/4 WATT RESISTOR
R2	60-178	2.2 " " "
R3	60-178	470K OHM " "
R4	60-180	220K " " "
R5	60-185	92K " " "
R6	60-186	150 " " "
R7	60-851	27 " " "

CODE	PART NO.	DESCRIPTION
C1	1504	.00025 MFD. MICA CONDENSER
C2	1501	.0001 " " "
C3	1505	.00005 " " "
C4	1607	.05 MFD. 400 V. TUBULAR CONDENSER
C5	16-119	.01 " " " "
C6	16-125	.004 " " " "
C7	1622	.05 " 200 V. "
C8	18-266	30 - 30 MFD. 150 W.V. ELECTROLYTIC
C9	19-177	2 GANG VARIABLE CONDENSER (ALSO C10 & C11)

CODE	PART NO.	DESCRIPTION
T1	82-30	LOOP ANTENNA
T2	10-394	OSCILLATOR COIL
T3	10-369	1ST I.F. TRANSFORMER
T4	10-370	2ND I.F. TRANSFORMER
T5		OUTPUT TRANSFORMER (ON SPKR.)
1	79-319	5" DYN. SPEAKER
2		
3	24-153	500K OHM VOLUME CONTROL (WITH SW.)

2-53

MODELS 2-550 TO 2-559



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CAPACITY VALUES ARE IN MICROFARADS.
VOLTAGES ARE MEASURED WITH 1000 OHMS PER VOLT VOLTMETER.

CODE	PART NO.	DESCRIPTION
R1	60-193	10 MEGOHM 1/4 WATT RESISTOR
R2	60-178	2.2 " " "
R3	60-178	470K OHM " "
R4	60-180	220K " " "
R5	60-185	92K " " "
R6	60-186	150 " " "
R7	60-851	27 " " "

CODE	PART NO.	DESCRIPTION
C1	1504	.00025 MFD. MICA CONDENSER
C2	1501	.0001 " " "
C3	1505	.00005 " " "
C4	1607	.05 MFD. 400 V. TUBULAR CONDENSER
C5	16-119	.01 " " " "
C6	16-125	.004 " " " "
C7	1622	.05 " 200 V. "
C8	18-266	30 & 30 MFD. 150 W.V. ELECTROLYTIC
C9	19-177	2 GANG VARIABLE CONDENSER (ALSO C10 & C11)
P	83-216	PHONO PICK-UP

CODE	PART NO.	DESCRIPTION
T1	82-32	LOOP ANTENNA
T2	10-394	OSCILLATOR COIL
T3	10-369	1ST. I.F. TRANSFORMER
T4	10-370	2 ND. I.F. TRANSFORMER
T5		OUTPUT TRANSFORMER (ON SPKR.)
1	79-319	5" DYN. SPEAKER
2	59-4	PHONO MOTOR
3	24-153	500K OHM VOLUME CONTROL (with SW.)
A	69-183	MOTOR SWITCH
S	69-182	PHONO SWITCH

2-55

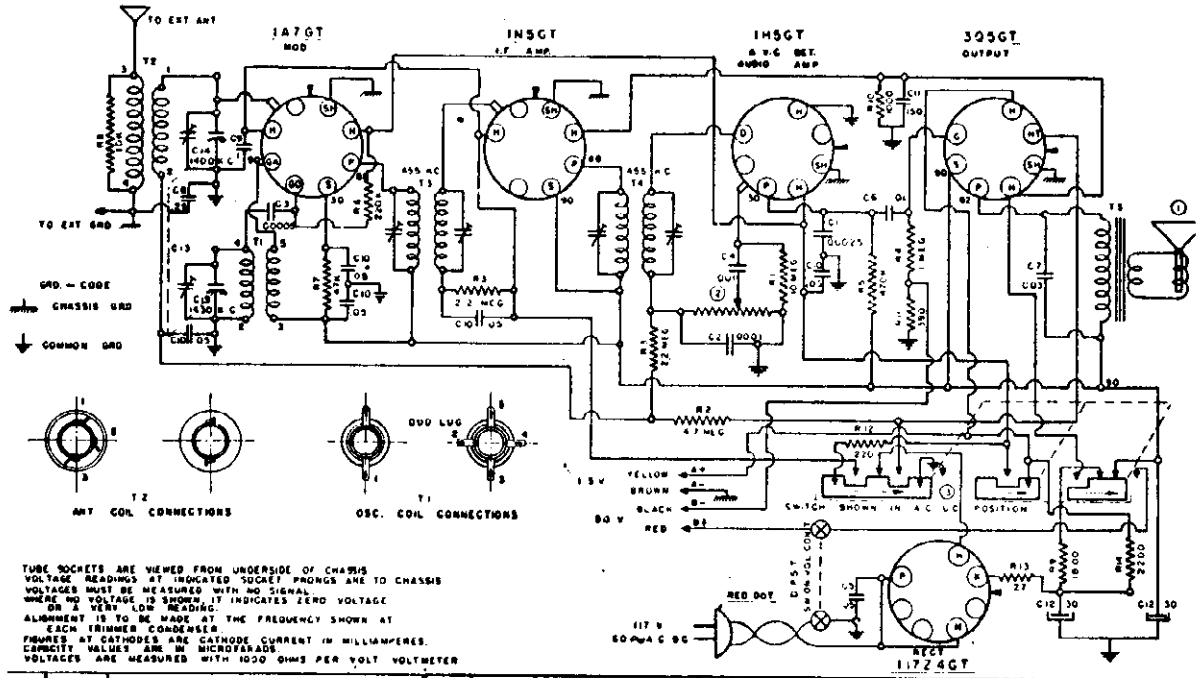
FOR OTHER DATA SEE INDEX

MODEL 2-553 USES NEW PRODUCTS 301 RECORD CHANGER. FOR DATA SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

WARWICK MFG. CORP.

MODELS 2-560 TO 2-569

MODELS 2-560 to 2-56
Chassis 2-56
MODELS 2-610 to 2-61
Chassis 2-61



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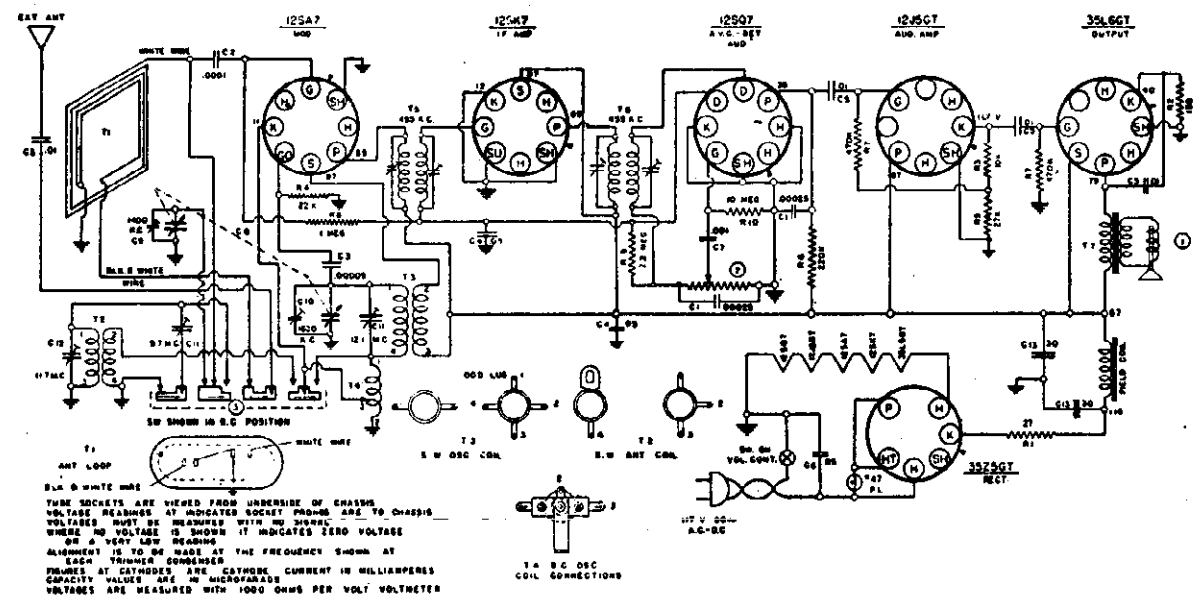
CODE	PART NO.	DESCRIPTION	CODE	PART NO	DESCRIPTION	CODE	PART NO	DESCRIPTION 2-56
R1	60-193	10 MEGOHM 1/2 WATT RESISTOR	C1	1504	.00025 MFD MICA CONDENSER	T1	10-395	OSCILLATOR COIL
R2	60-268	4.7 " " "	C2	1501	.0001 " " "	T2	10-396	ANTENNA COIL
R3	60-179	2.2 " " "	C3	1503	.00005 " " "	T3	10-342	1ST I.F. TRANSFORMER
R4	60-195	1 " " "	C4	16-106	.01 MFD 600V TUBULAR CONDENSER	T4	10-405	2ND I.F. TRANSFORMER
R5	60-178	470K OHM " " "	C5	1507	.05 " 400V " "	T5		OUTPUT TRANSFORMER (ON SPKR.)
R6	60-180	220K " " "	C6	16-119	.01 " " " "			
R7	60-177	47K " " "	C7	16-139	.005 " " " "			
R8	60-215	10K " " "	C8	16-120	.25 " 200V " "	1	75-326	5" P.M. SPEAKER
R9	60-257	1000 " " "	C9	16-115	1 " " " "	2	24-162	1 MEGOHM VOLUME CONTROL (with Sw.)
R10	60-301	1000 " " "	C10	1502	.05 " " " "	3	69-150	SWITCH (A.C.-D.C.-BATTERY)
R11	60-281	330 " " "	C11	16-271	150 MFD 25 W.V. ELECTROLYTIC			
R12	60-190	220 " " "	C12	16-266	30 & 30 " 150 W.V. ELECTROLYTIC			
R13	60-851	27 " " "	C13	16-176	3 GANG VARIABLE CONDENSER (ALSO C14 & C15)			
R14	60-832	2700 OHM 2 WATT RESISTOR						

MODELS 2-610 TO 2-619



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CAPACITY VALUES ARE IN MICROFARADS
VOLTAGES ARE MEASURED WITH 1000 OHMS PER VOLT VOLTMETER

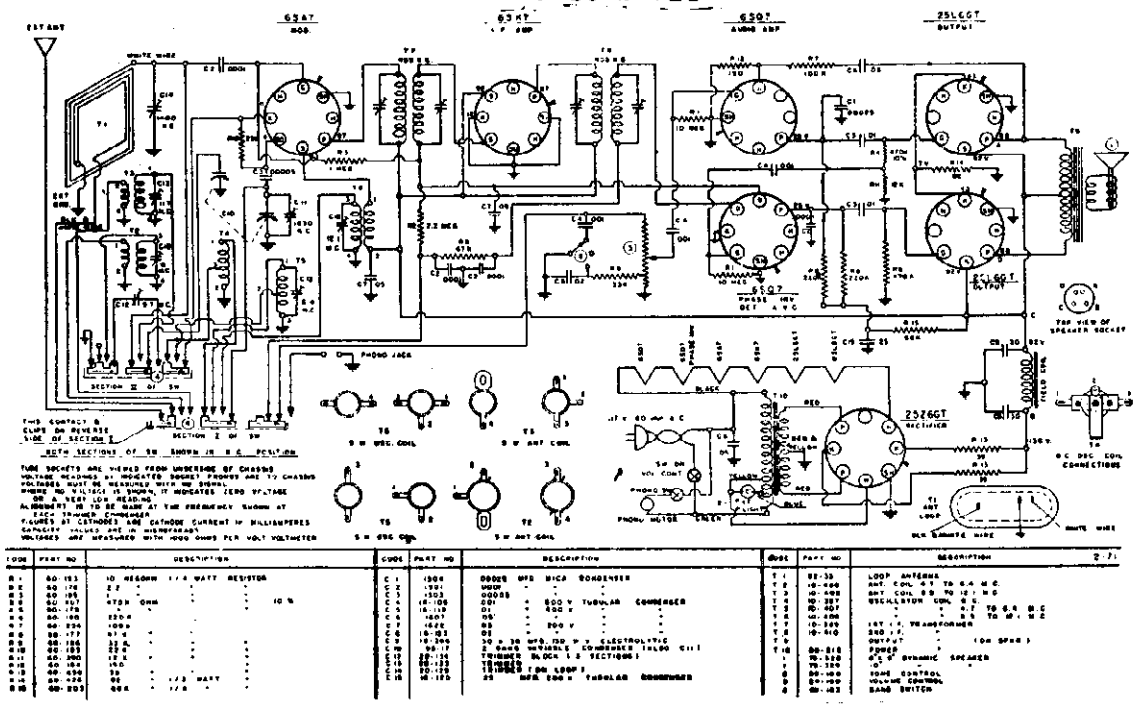
CODE	PART NO	DESCRIPTION	CODE	PART NO	DESCRIPTION	CODE	PART NO	DESCRIPTION 2-61
R 1	60-851	27 OHMS 1/2 WATT RESISTOR	C 1	1504	.00025 MFD MICA CONDENSER	T 1	82-32	ANTENNA LOOP
R 2	60-184	150 " " "	C 2	1501	.0001 " "	T 2	10-398	S.W. ANTENNA COIL
R 3	60-389	10 M " " "	C 3	1503	.00005 " "	T 3	10-399	S.W. OSCILLATOR COIL
R 4	60-195	22 M " " "	C 4	16-106	.05 MFD 200 V	T 4	10-400	B.C. " "
R 5	60-354	33 M " " "	C 5	16-119	.01 " 400 V	T 5	10-369	1ST I.F. TRANSFORMER
R 6	60-190	220 K " " "	C 6	1507	.05 " 400 V	T 6	10-370	2ND " "
R 7	60-179	470 K " " "	C 7	16-108	.001 " 500 V	T 7		OUTPUT TRANSFORMER (ON SPKR.)
R 8	60-188	1 MEG " " "	C 8	16-178	VARIABLE CONDENSER (ALSO C9 & C10)			
R 9	60-178	2.2 MEG " " "	C 9	29-121	TRIMMER (DOUBLE)	1	75-326	5" DYN. SPEAKER
R 10	60 193	10 MEG " " "	C 10	20-453	TRIMMER	2	24-161	VOLUME CONTROL 500 K OHM
			C 13	16-266	30 & 30 MFD 150 V ELECTROLYTIC	3	69-161	BAND SWITCH

FOR OTHER DATA SEE INDEX

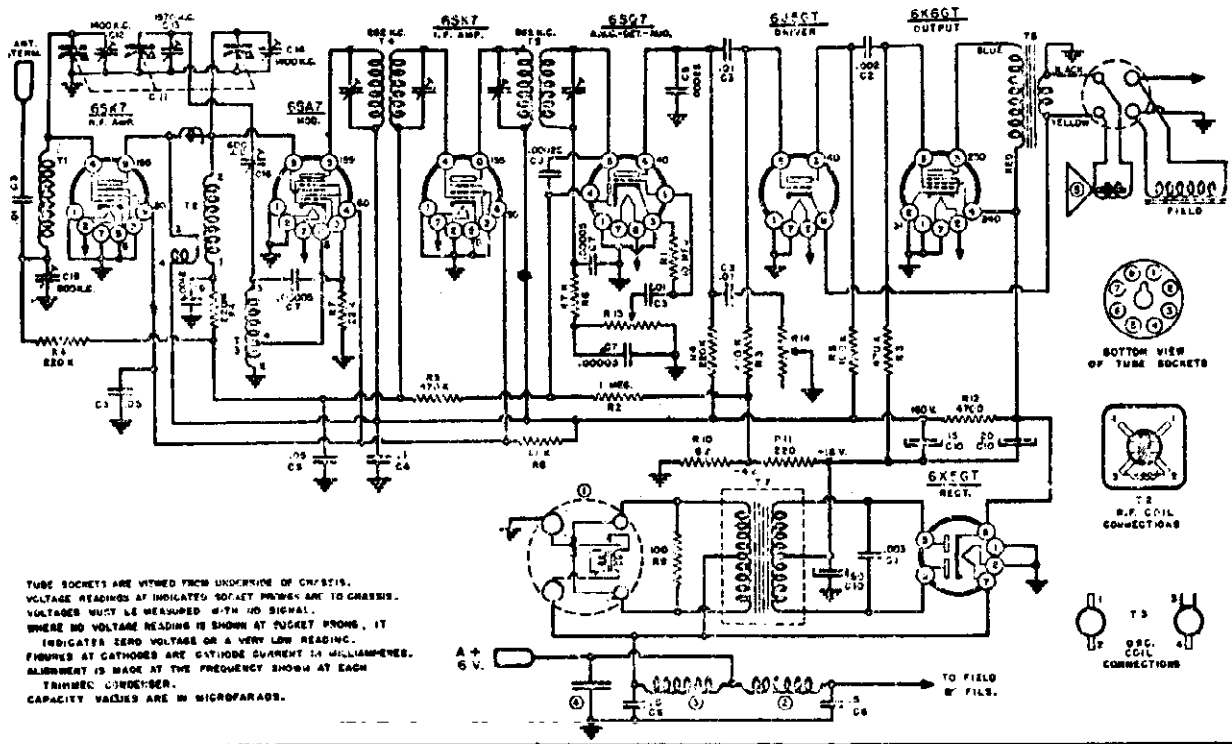
MODELS 2-711 to 2-714
CHASSIS 10-72

WARWICK MFG. CORP.

MODELS 2-711 TO 2-714



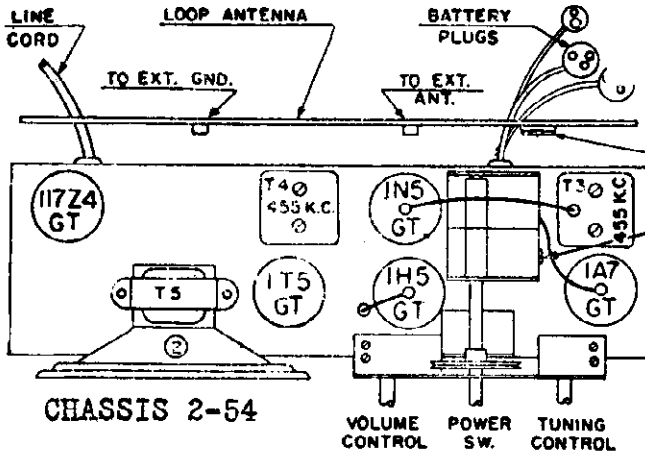
CHASSIS 10-72



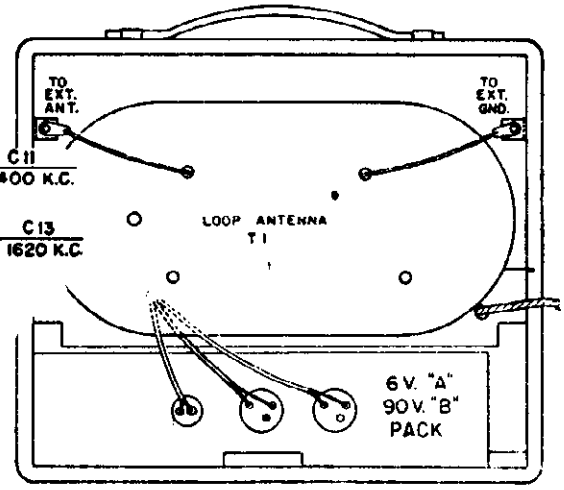
CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION 10-72
R1	60-193	10 MEGOHM 1/4 WATT RESISTOR	C1	16-147	.003 MFD. 1600 V. BUFFER COND.	T1	10-208	ANTENNA COIL
R2	60-195	1 " " " "	C2	16-138	.002 " 400 V. TUBULAR CONS.	T2	10-361	R.F. COIL
R3	60-178	470 K " " " "	C3	16-113	.01 " " " "	T3	10-335	OSCILLATOR COIL
R4	60-180	220 K " " " "	C4	16-115	.1 " " " "	T4	10-340	1ST. I.F. TRANSFORMER
R5	60-184	100 K " " " "	C5	1822	.05 " 600 V. " "	T5	10-218	2ND. I.F. "
R6	60-187	47 K " " " "	C6	16-112	.5 " " OVAL CONDENSER	T6	60-201	OUTPUT TRANSFORMER
R7	60-393	22 K " " " "	C7	1303	.000025 " MICA CONDENSER	T7	60-202	VIBRATOR TRANSFORMER
R8	60-215	10 K " " " "	C8	1304	.002-25 " " "			
R9	60-182	100 " " 1/2 WATT "	C9	16-109	.0012 " " "	J	34-104	VIBRATOR
R9A	60-485	82 " " " "	C10	19-864	(20 " 450 W.V. ELECTROLYTIC	F	33-210	FILAMENT CHOKE
R11	60-831	220 " 1 WATT "			(15 " 500 W.V. "	S	33-211	VIBRATOR CHOKE
R12	60-844	4700 " 2 WATT "			(50 " 25 W.V. "	4	80-1	SPARK PLATE
R13	58-1103	500 K " VOLUME CONTROL	C11	19-192	3 GANG VARIABLE COND. (ALSO CR, C13, & C14)	5	73-302	8" DYNAMIC SPEAKER
R14	58-1103	500 K " TONE CONTROL	C15	20-116	PADDING CONDENSER 600 - 1200 MMFD.			
			C16	20-130	PADDING CONDENSER 330 - 550 MMFD.			

FOR OTHER DATA SEE INDEX

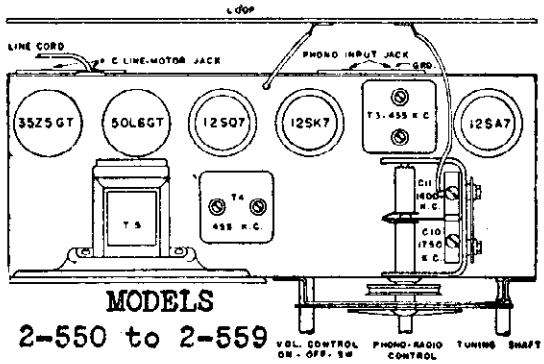
WARWICK MFG. CORP.



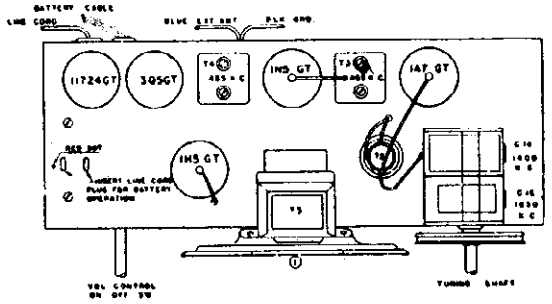
CHASSIS 2-54



CHASSIS 2-54

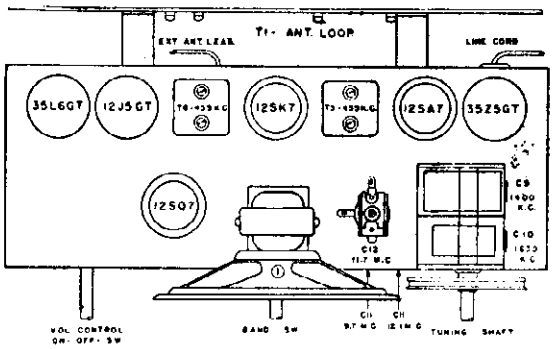


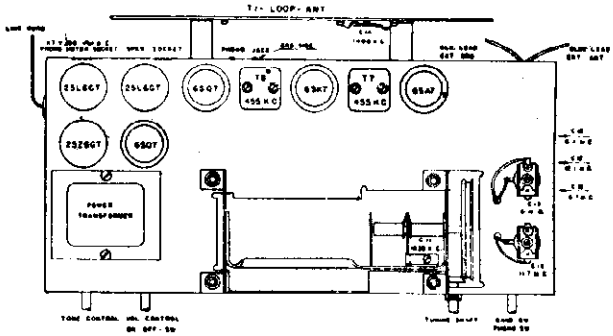
MODELS
2-550 to 2-559



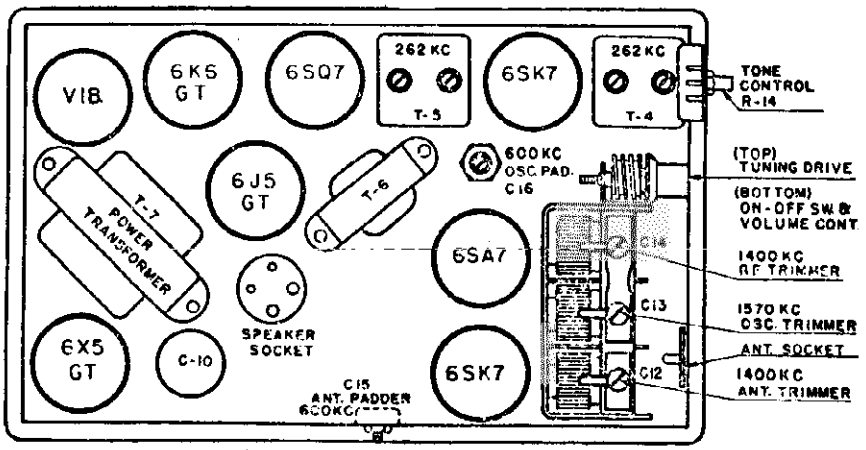
MODELS 2-560 to 2-569

MODELS 2-610 to 2-619





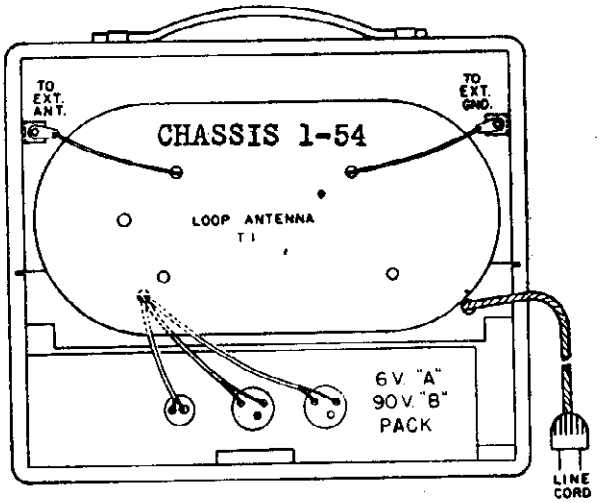
MODELS
2-711 to 2-714

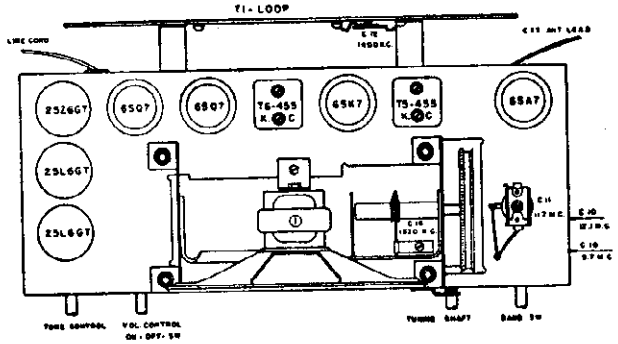


CHASSIS 10-72

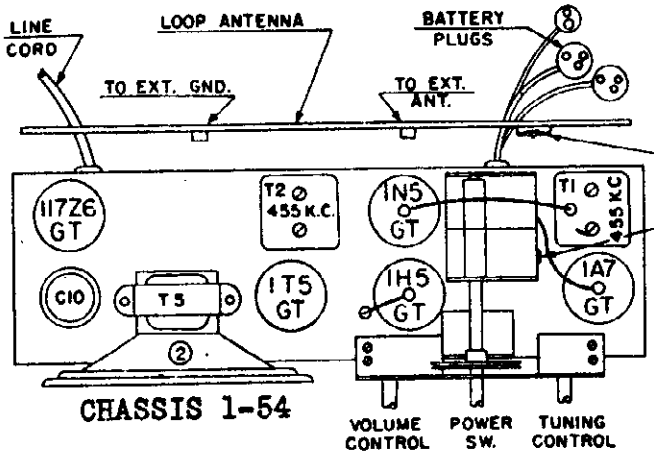
MODELS SEE BELOW

WARWICK MFG. CORP.

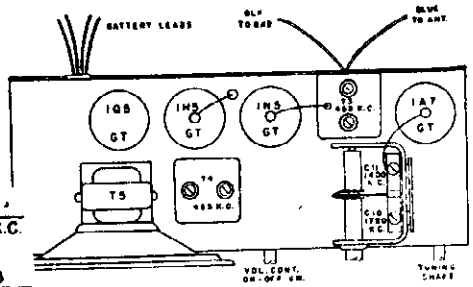




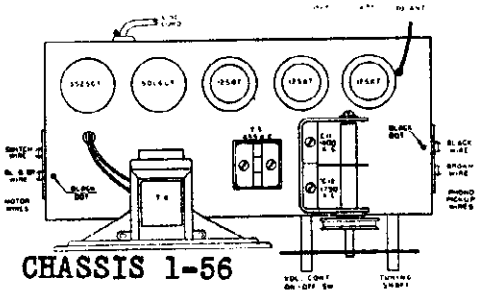
2-70 CHASSIS

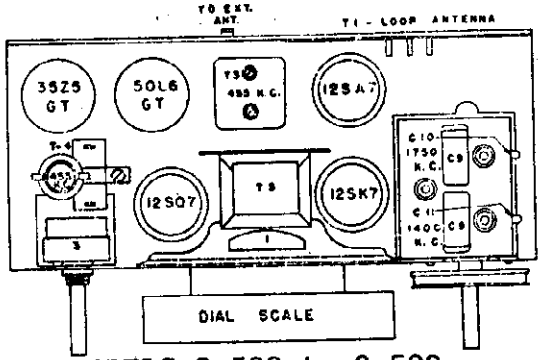


CHASSIS 1-54

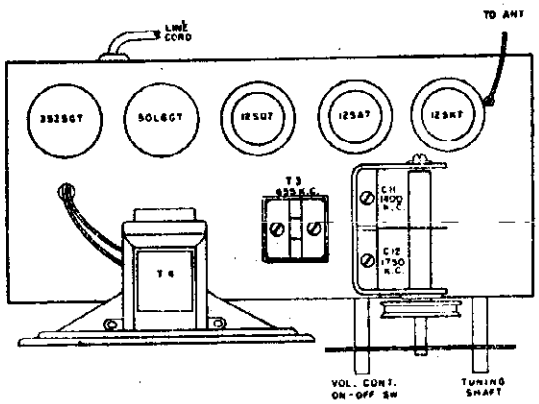


MODELS 2-400 to 2-409

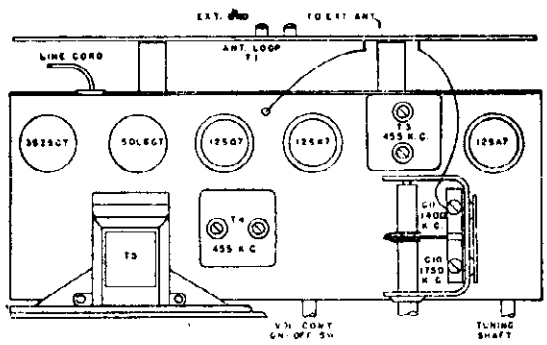




MODELS 2-500 to 2-509

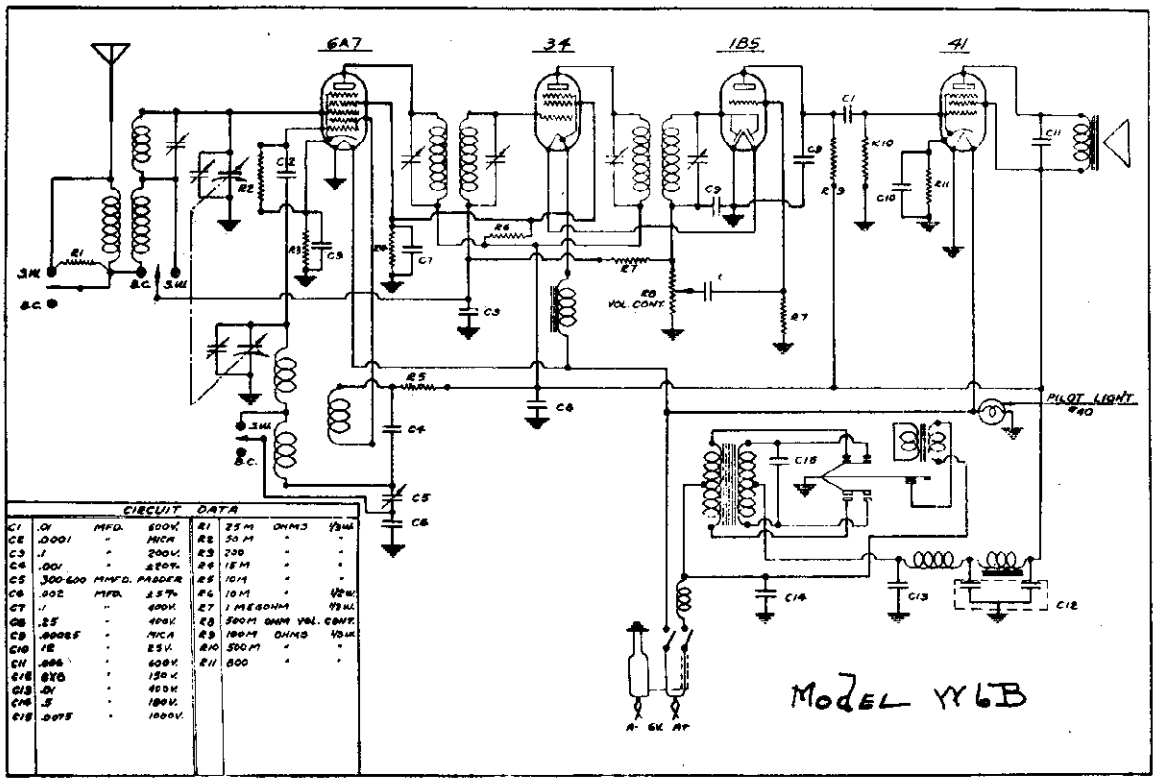


MODELS 1-550 to 1-559



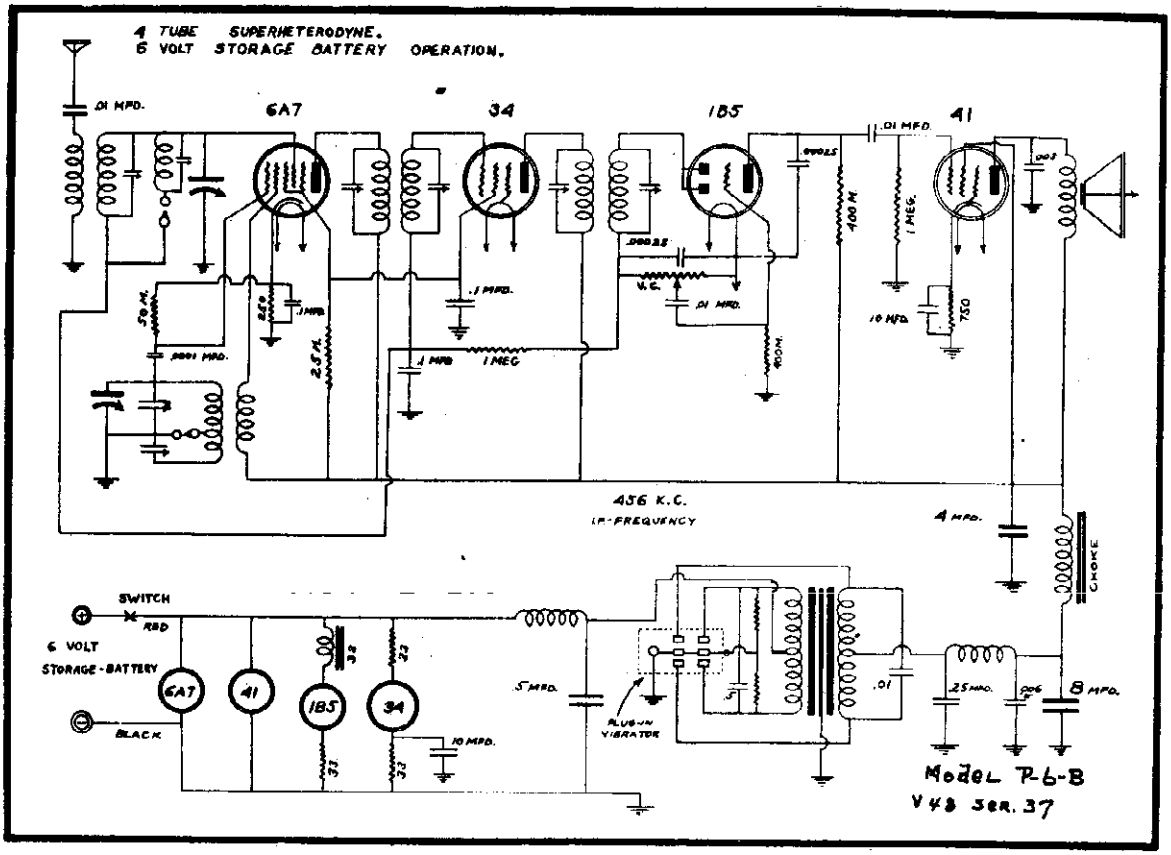
MODELS 2-530 to 2-539

WATTERSON RADIO MFG. CO.



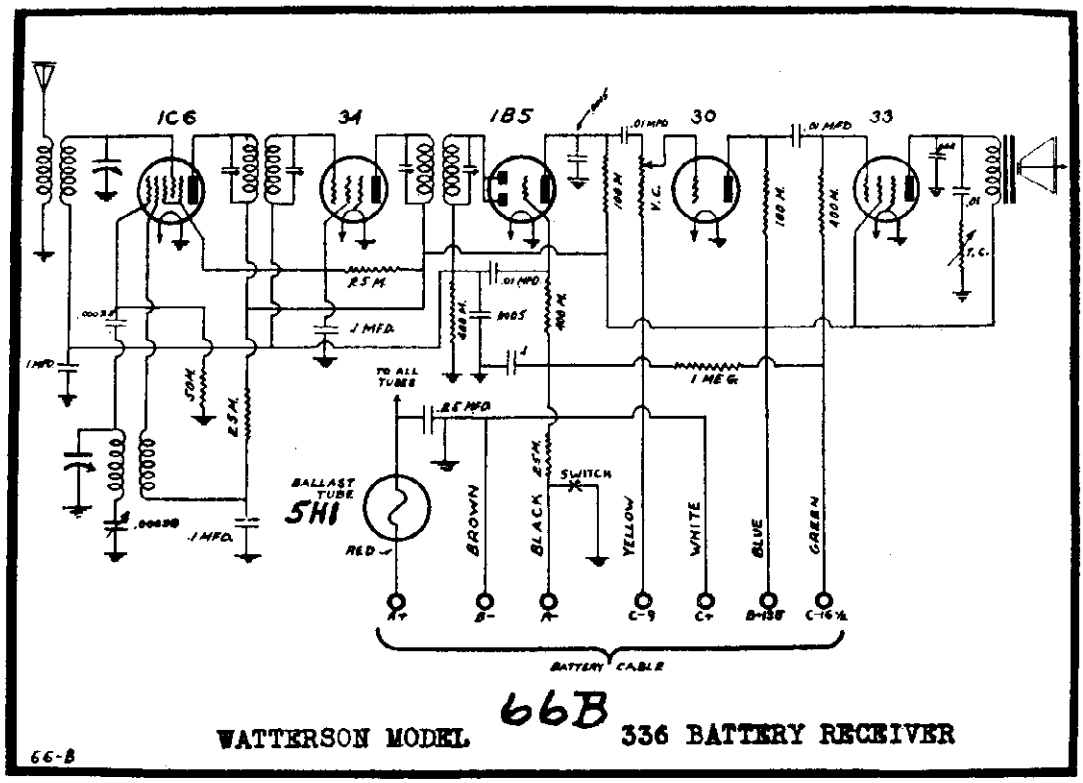
CIRCUIT DATA

C1	.01	MFD.	600V.	R1	25 M	OHMS	1/2 W.
C2	.0001	"	MICA	R2	50 M	"	"
C3	.1	"	200V.	R3	250	"	"
C4	.001	"	±20%	R4	1.5 M	"	"
C5	300-600	MMFD.	PADDER	R5	10 M	"	"
C6	.002	MFD.	±5%	R6	10 M	"	1/2 W.
C7	.1	"	400V.	R7	1 MEGOHM		1/2 W.
C8	.25	"	400V.	R8	500 M	OHM	VOL. CONT.
C9	.00025	"	MICA	R9	100 M	OHMS	1/2 W.
C10	1.2	"	25 V.	R10	500 M	"	"
C11	.006	"	600V.	R11	800	"	"
C12	8X8	"	150 V.				
C13	.01	"	400 V.				
C14	.5	"	1000 V.				
C15	.005	"	1000 V.				

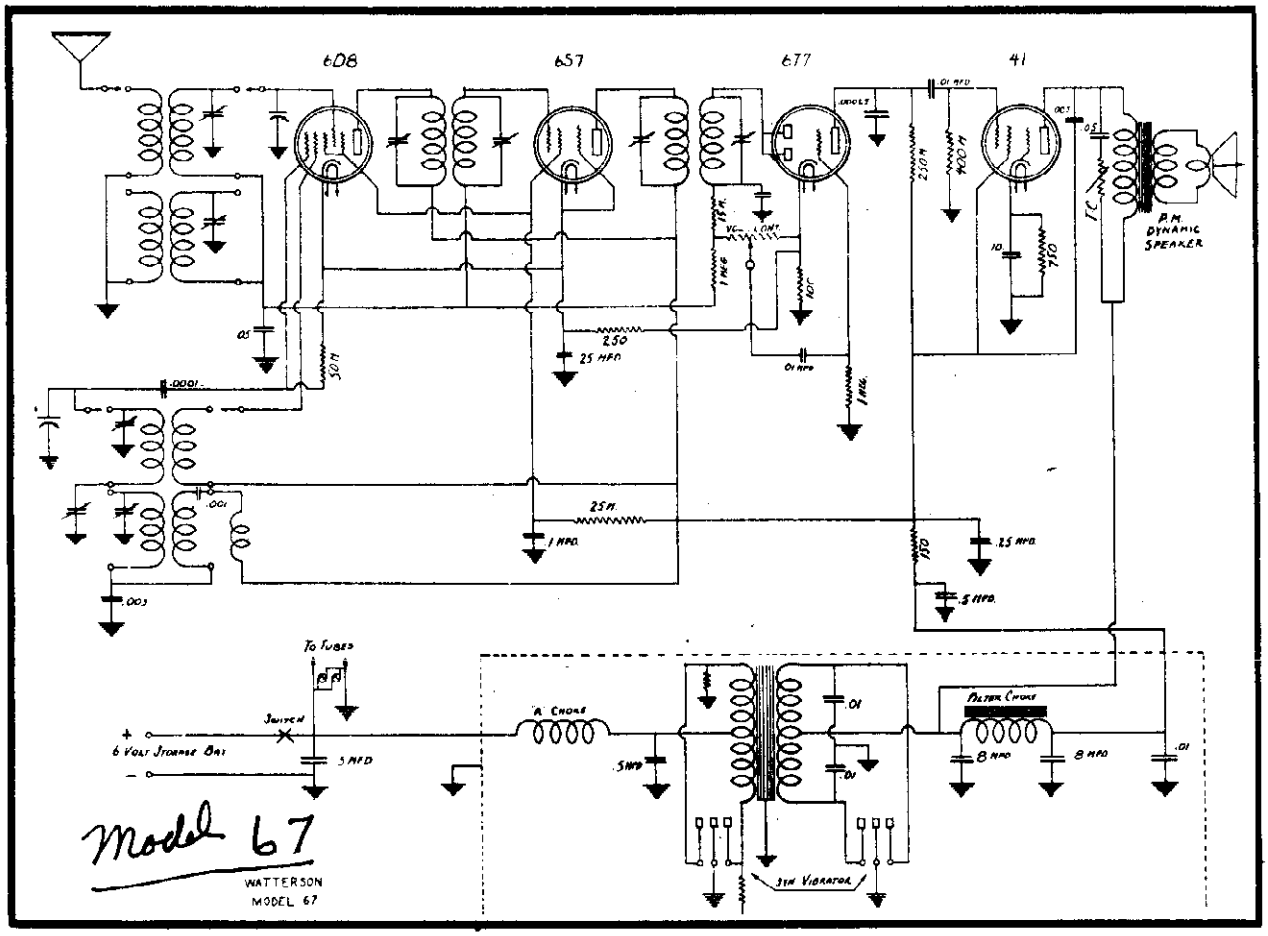


MODEL 66B
MODEL 67

WATTERSON RADIO MFG. CO.

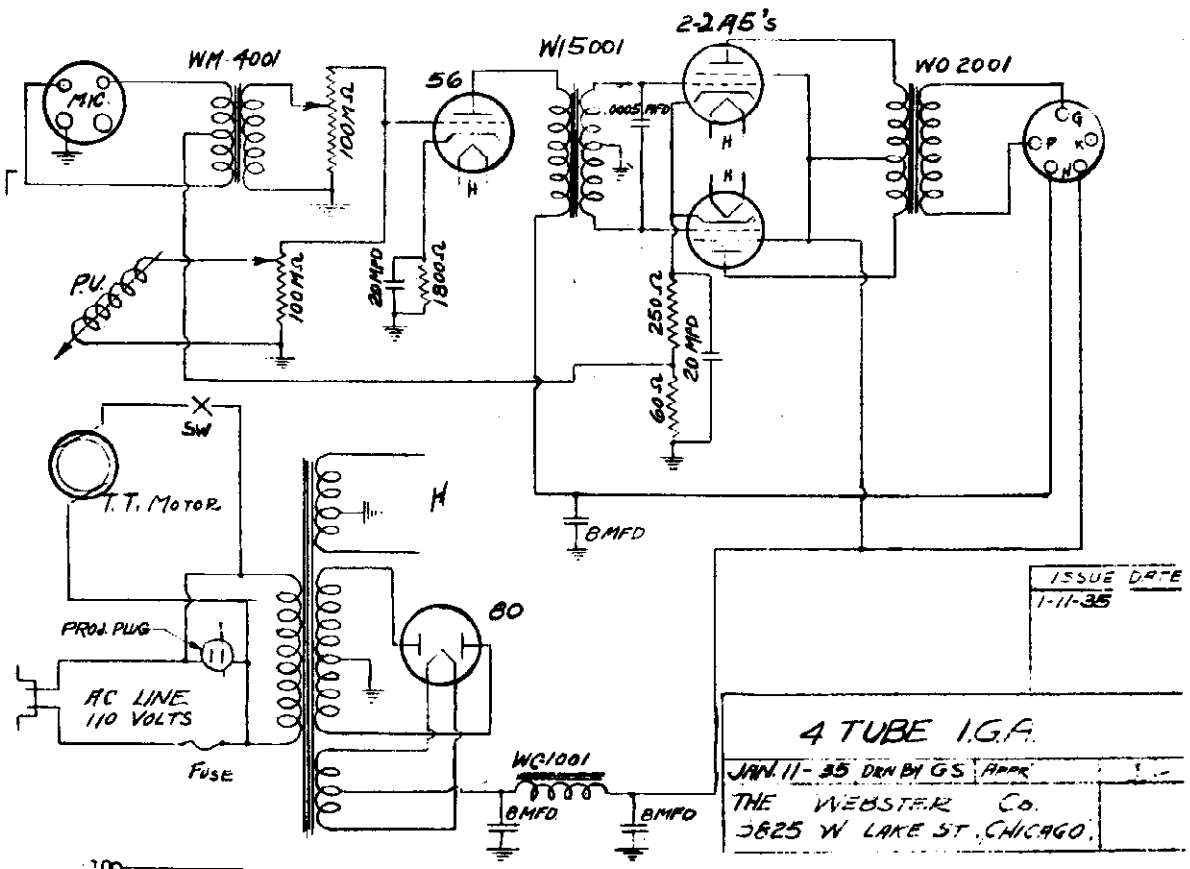


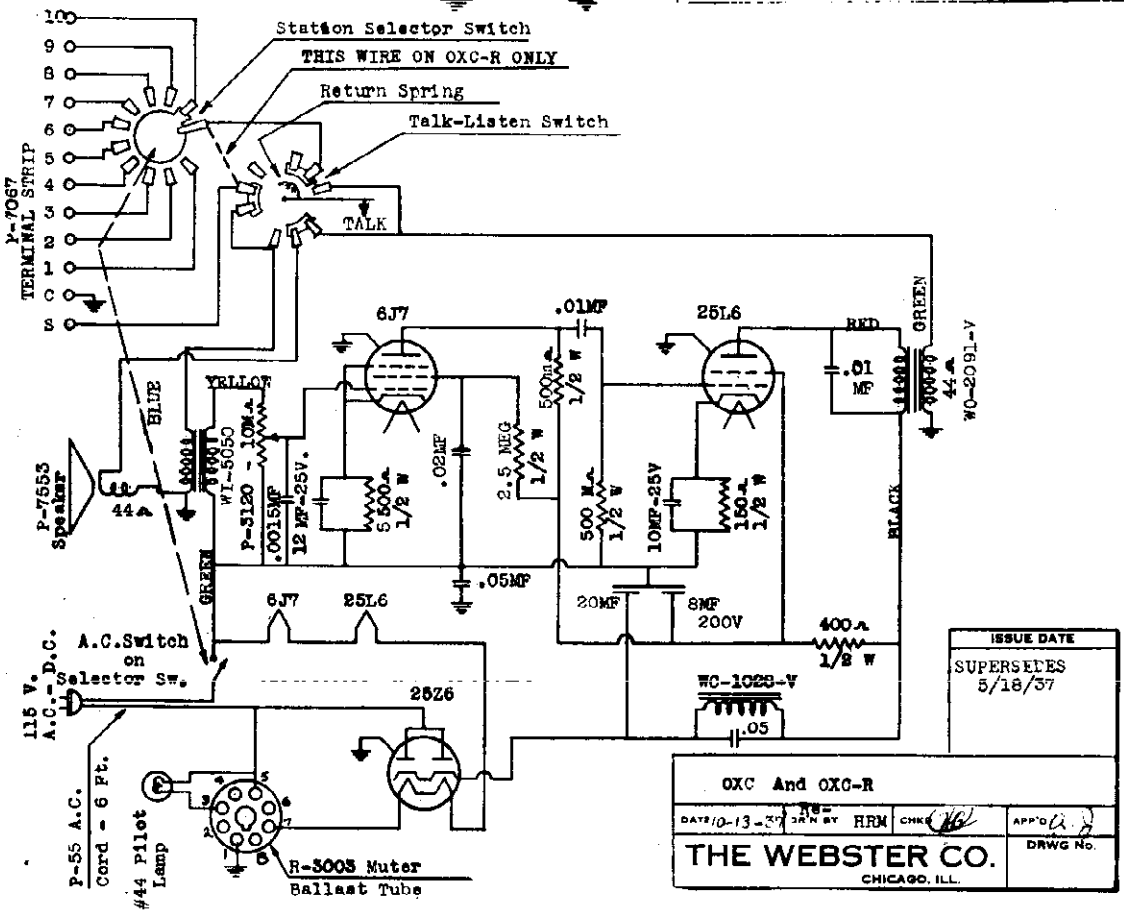
WATTERSON MODEL 66B 336 BATTERY RECEIVER



MODEL 4-Tube IGA
MODELS OXC, OXC-R

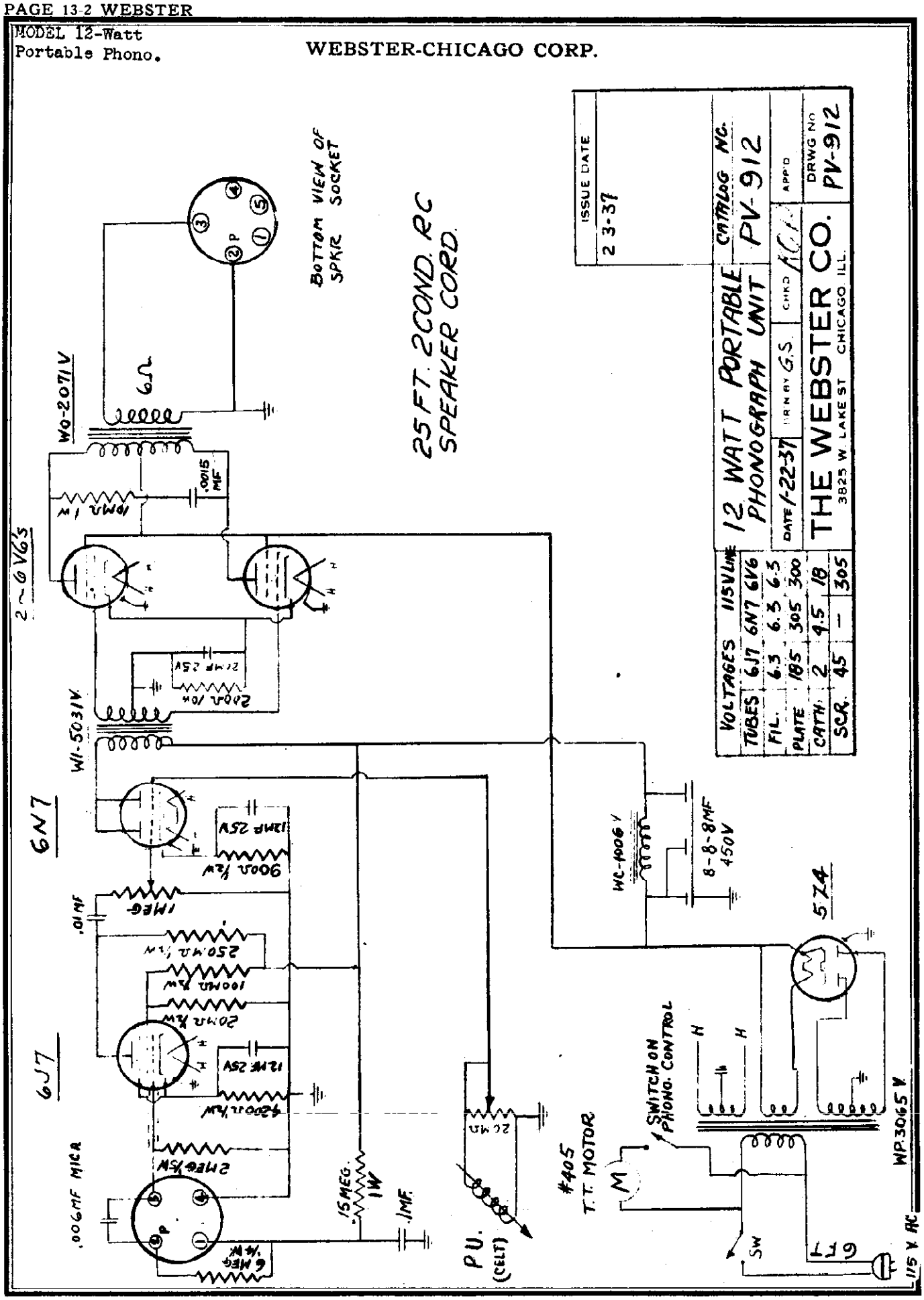
WEBSTER-CHICAGO CORP.





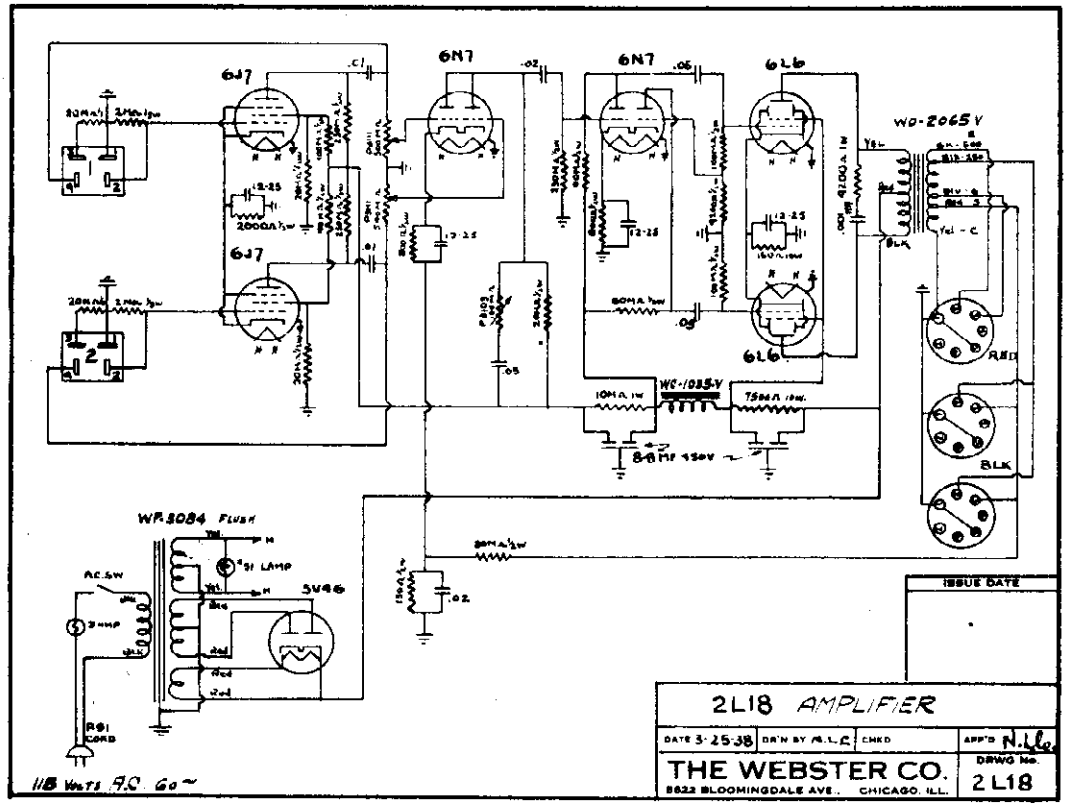
MODEL 12-Watt
Portable Phono.

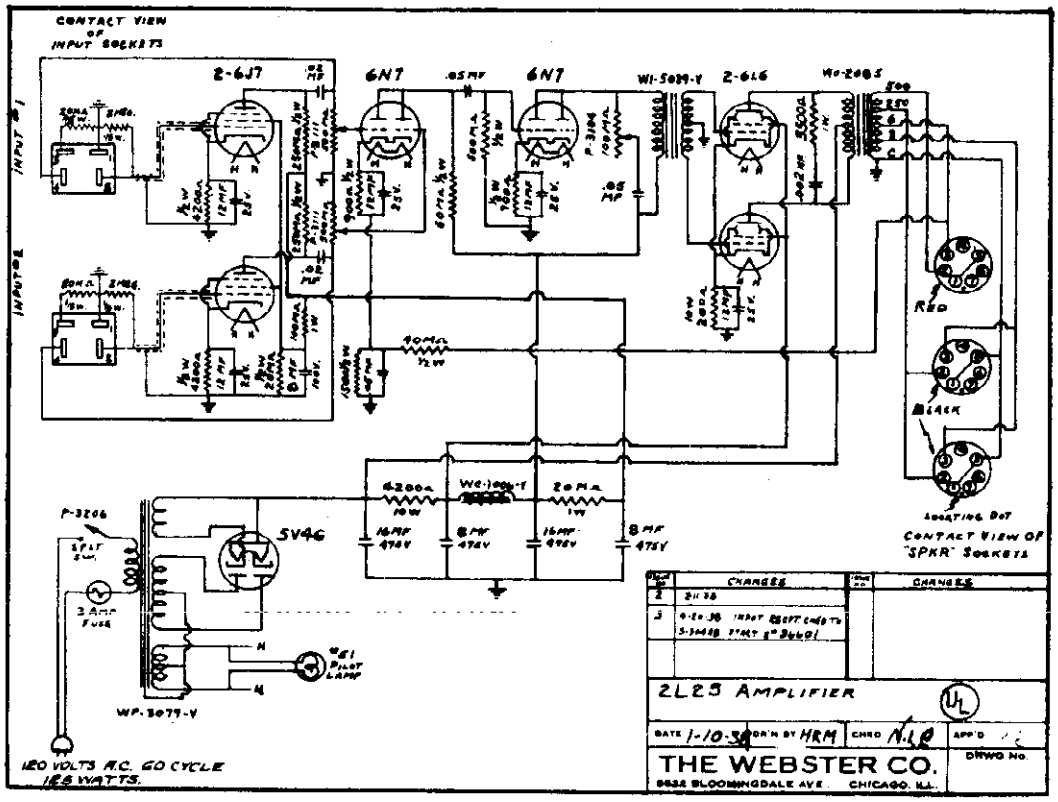
WEBSTER-CHICAGO CORP.



MODEL 2L18
MODEL 2L25

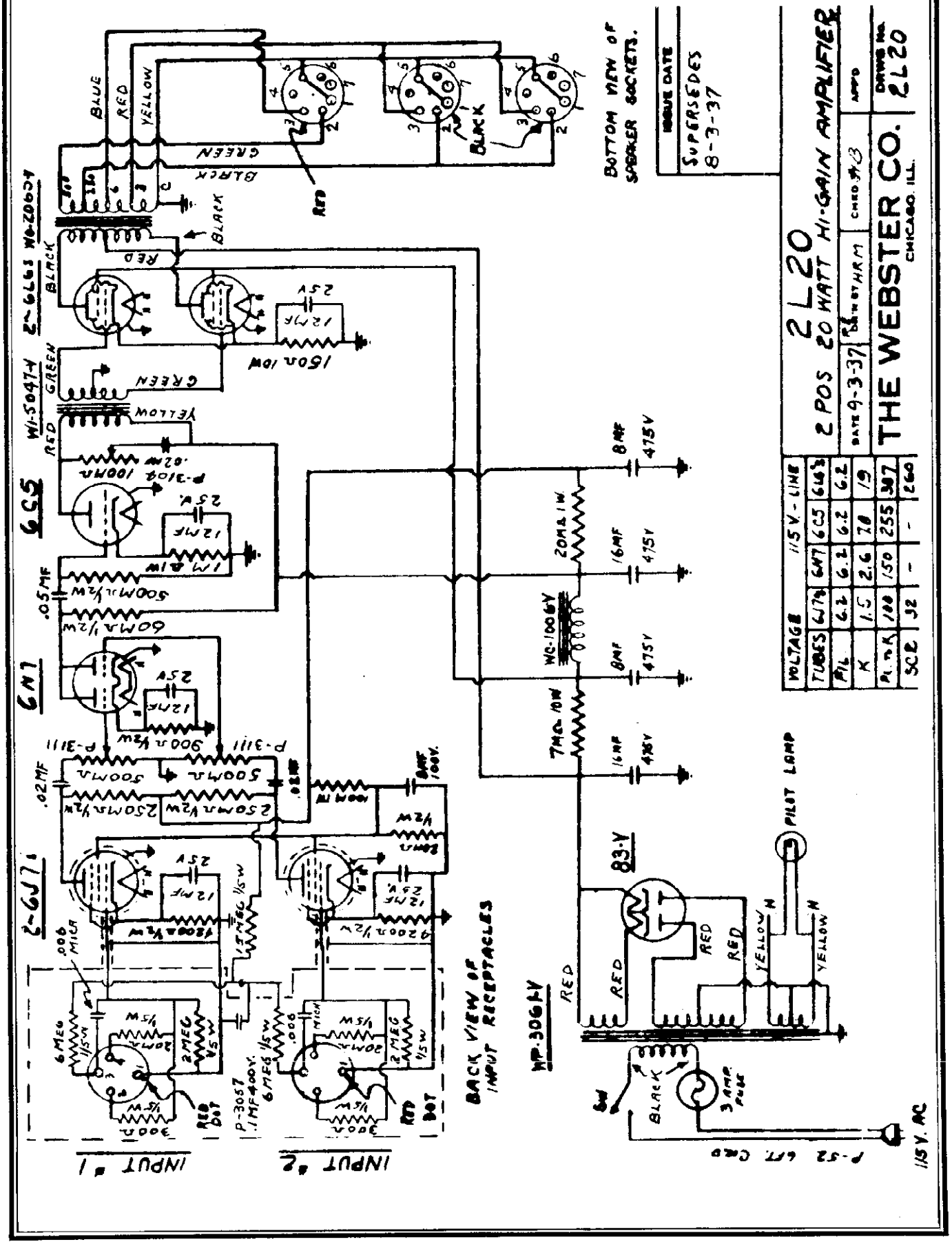
WEBSTER-CHICAGO CORP.





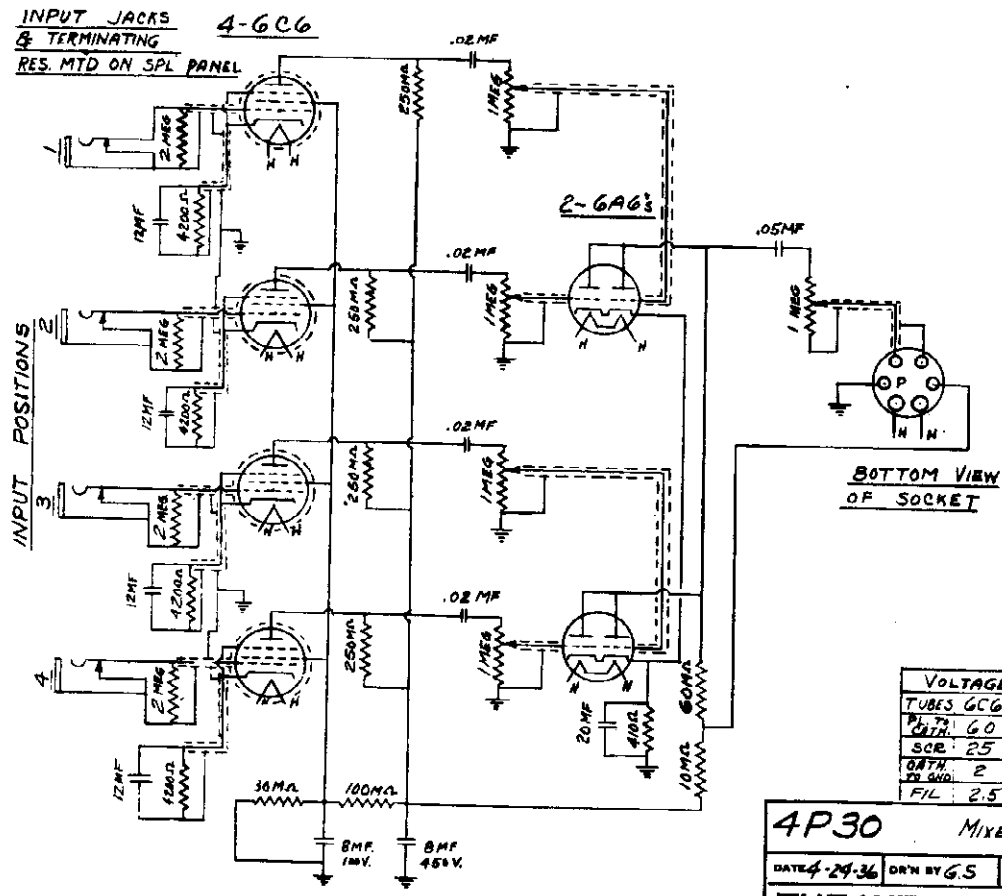
MODEL 2L20

WEBSTER-CHICAGO CORP.



MODEL 4P30
Mixer, Amplifie

WEBSTER-CHICAGO CORP.



VOLTAGES		
TUBES	6C6	6A6
PLATE	60	40
SCR	25	—
CATH TO GND	2	1.5
FIL	2.5	2.5

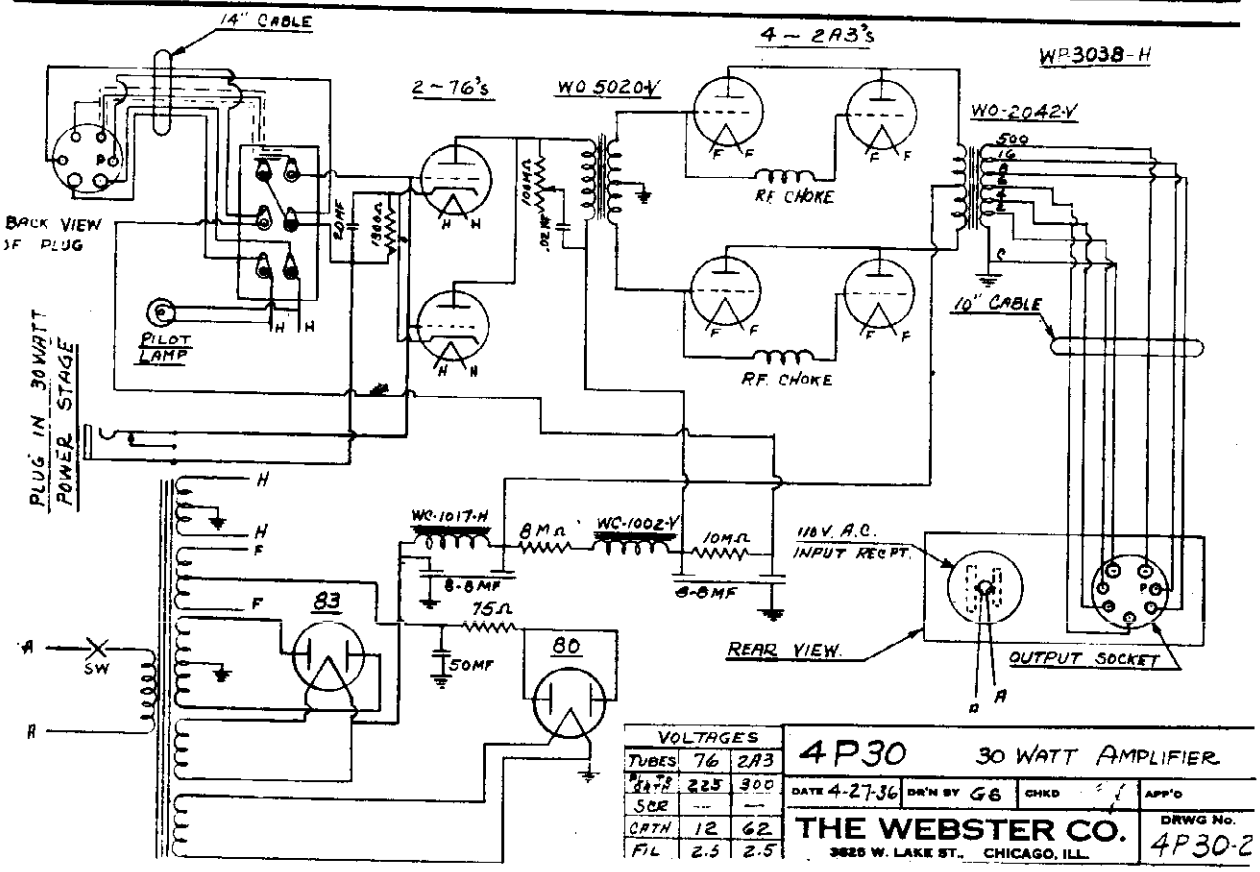
ISSUE DATE 4-29-36

4P30 MIXER CIRCUIT

DATE 4-29-36 | DR'N BY G.S | CHK'D | APP'D

THE WEBSTER CO. 3825 W. LAKE ST., CHICAGO, ILL.

DRWG No. 4P30-1



VOLTAGES		
TUBES	76	2A3
PLATE	225	300
SCR	—	—
CATH	12	62
FIL	2.5	2.5

4P30 30 WATT AMPLIFIER

DATE 4-27-36 | DR'N BY G6 | CHK'D | APP'D

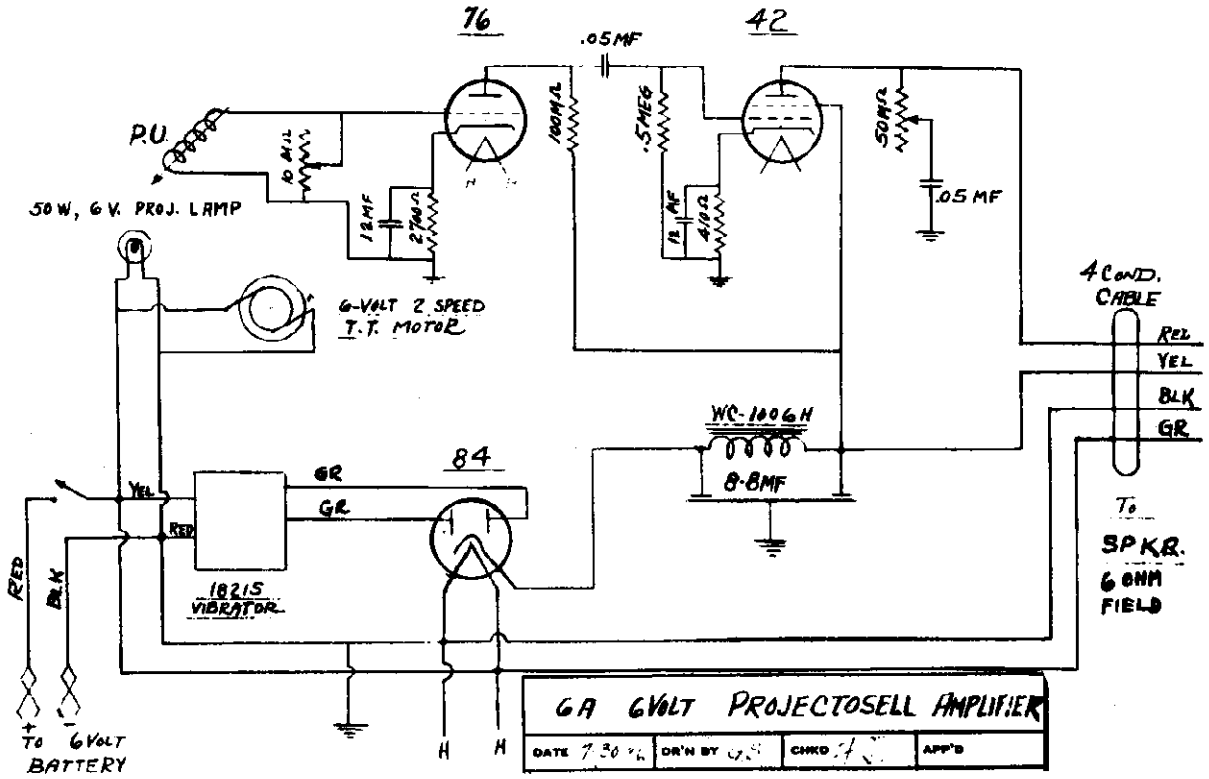
THE WEBSTER CO. 3825 W. LAKE ST., CHICAGO, ILL.

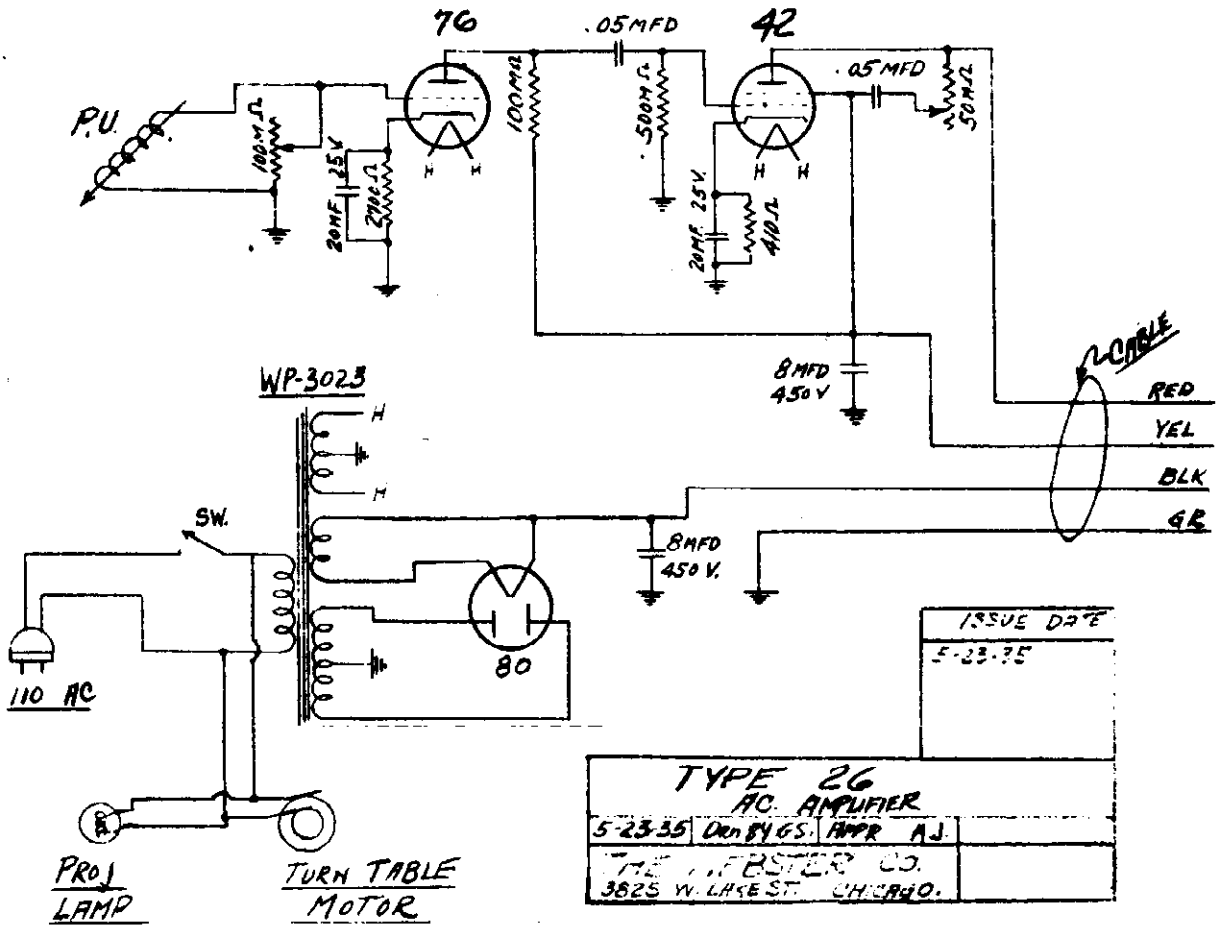
DRWG No. 4P30-2

MODEL 6A,6V
Projectosell Ampl.

WEBSTER-CHICAGO CORP.

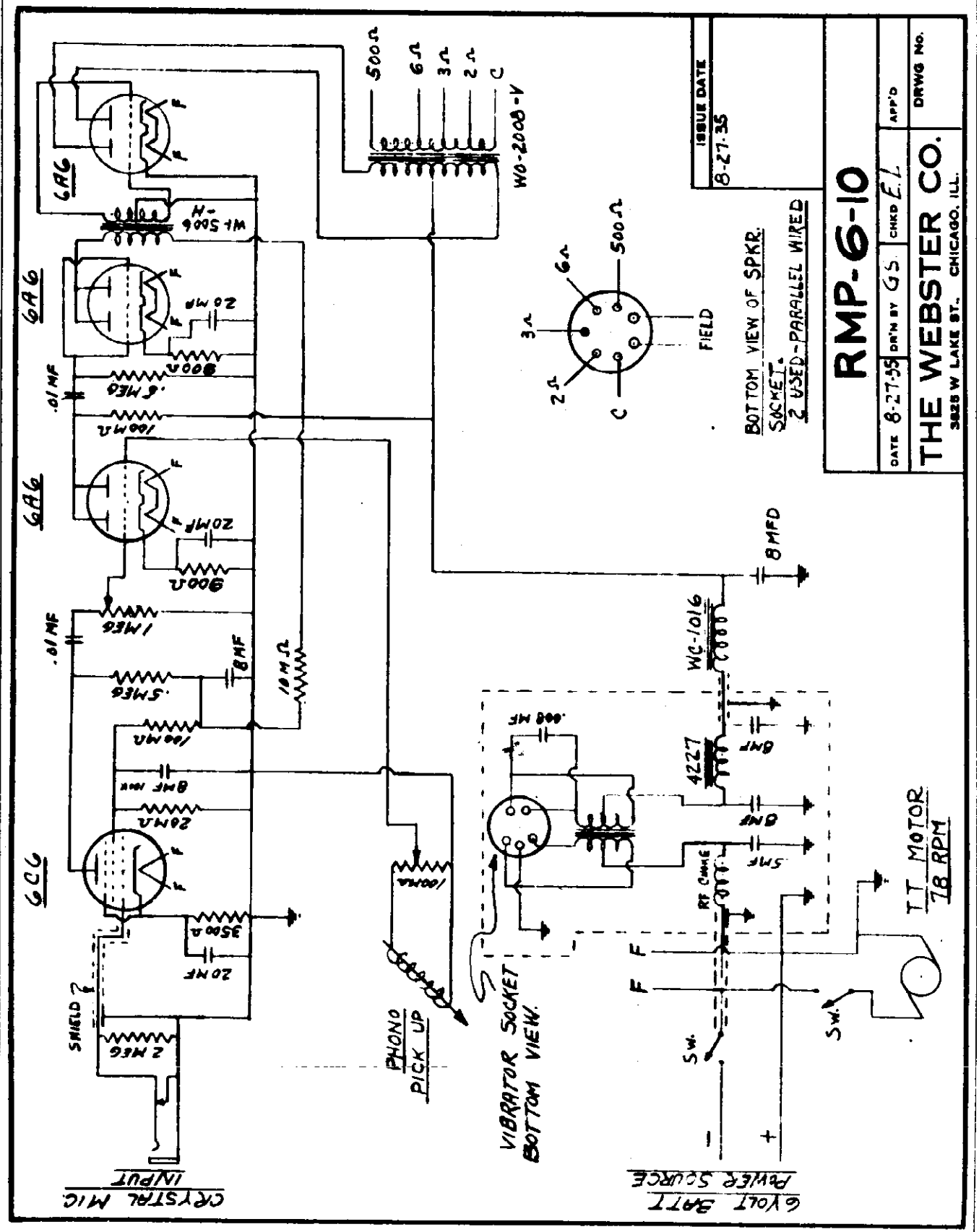
MODEL 26 A-G
Amplifier





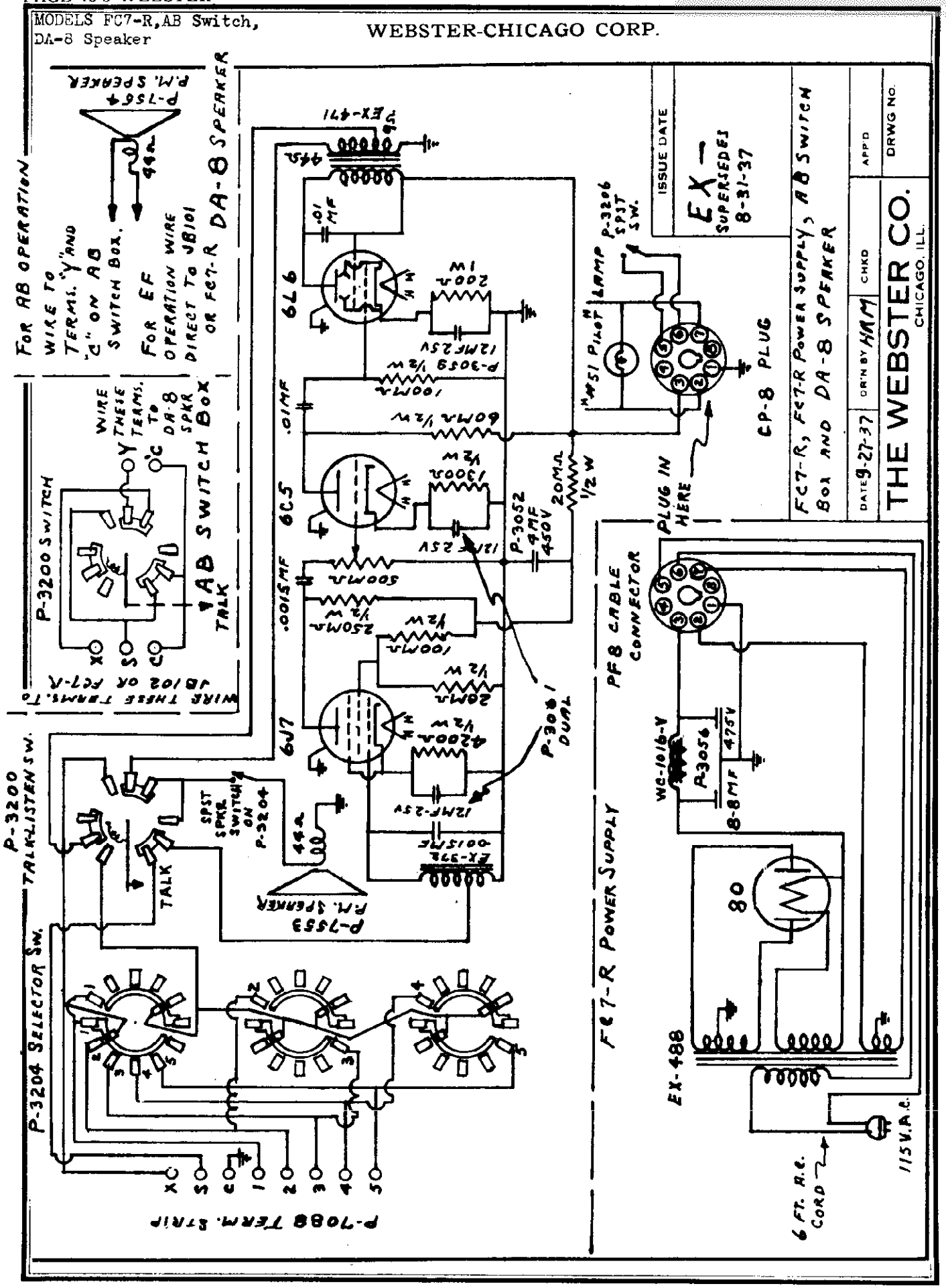
MODEL. RMP-6-10

WEBSTER-CHICAGO CORP.



MODELS FC7-R,AB Switch, DA-8 Speaker

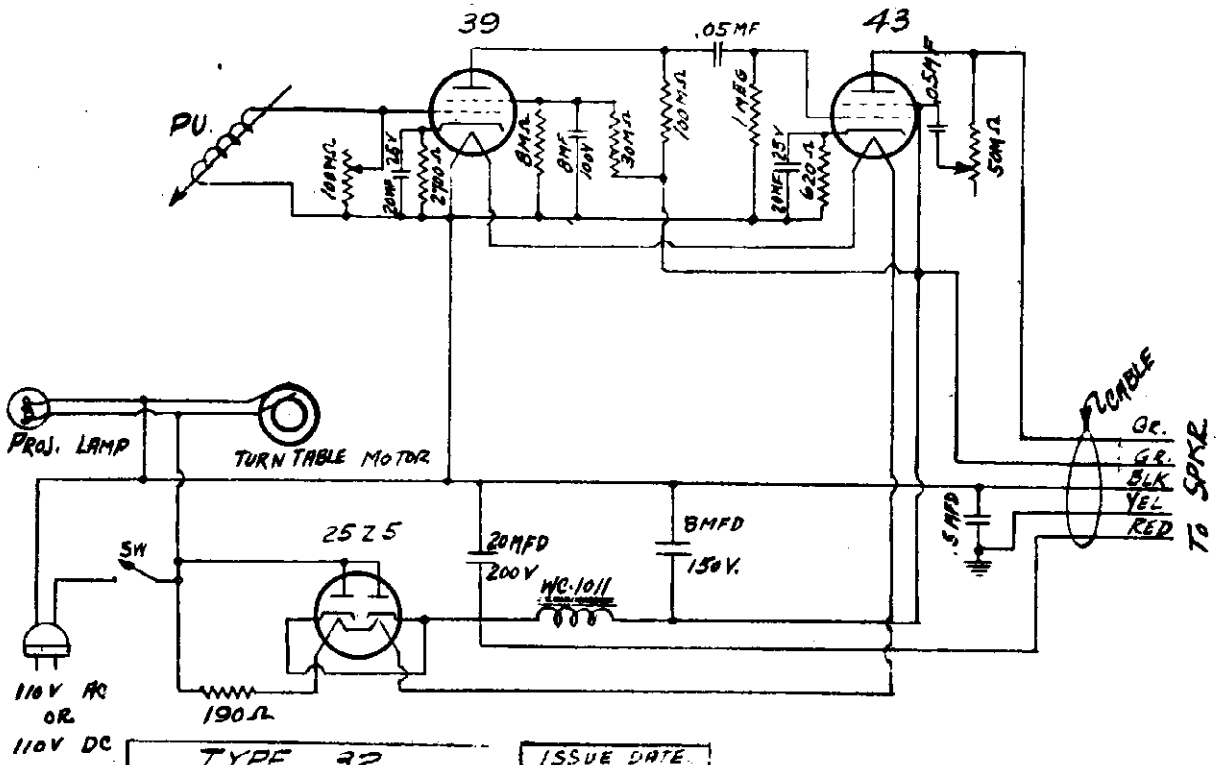
WEBSTER-CHICAGO CORP.



MODEL 32 AC-DC
Amplfier

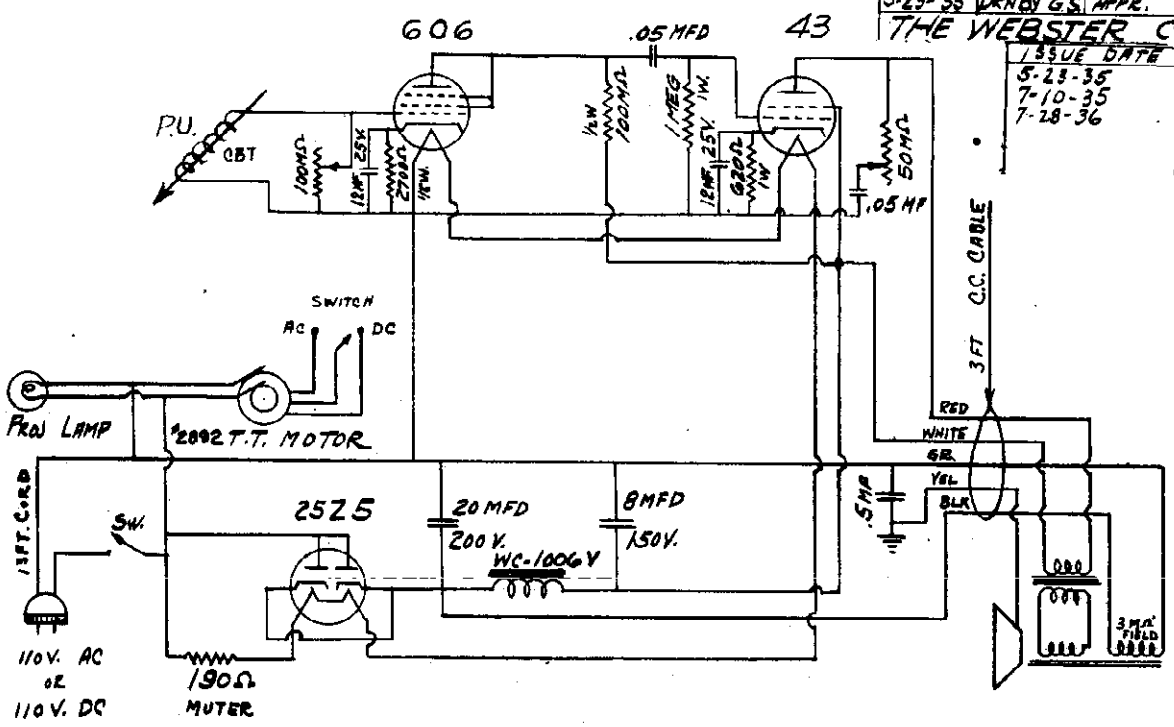
WEBSTER-CHICAGO CORP.

MODEL AP-32 AC-D
Amplifier



TYPE 32 AC-DC AMPLIFIER		
5-23-35	DRN BY GS	APPR. A.J.
THE WEBSTER CO. 3825 W. LAKE ST., CHICAGO.		

ISSUE DATE
5-23-35



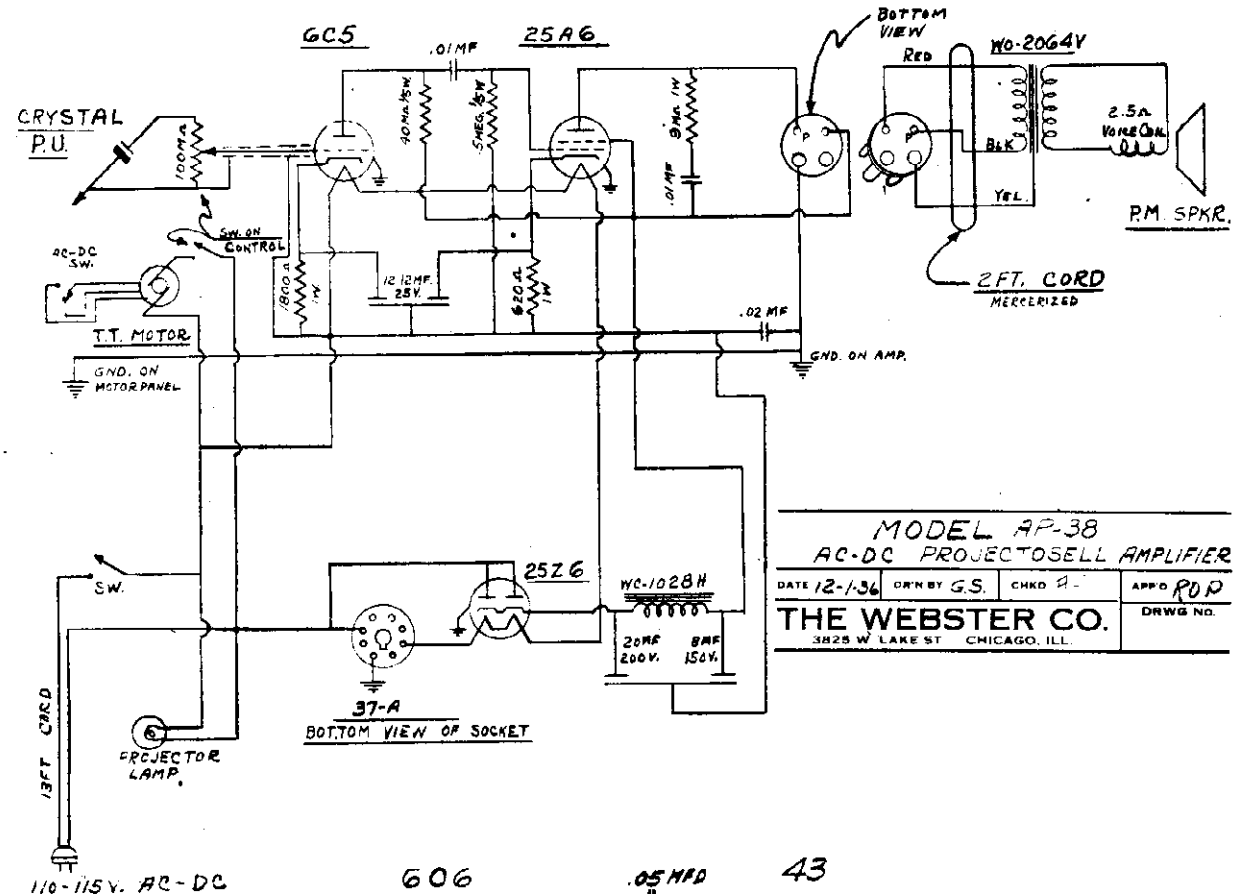
TYPE AP-32 AC-DC AMPLIFIER		
5-23-35	DRN BY GS	APPR.
THE WEBSTER CO		

ISSUE DATE
5-23-35
7-10-35
7-28-36

MODEL AP-38 AC-DC
Projectosell Ampl.

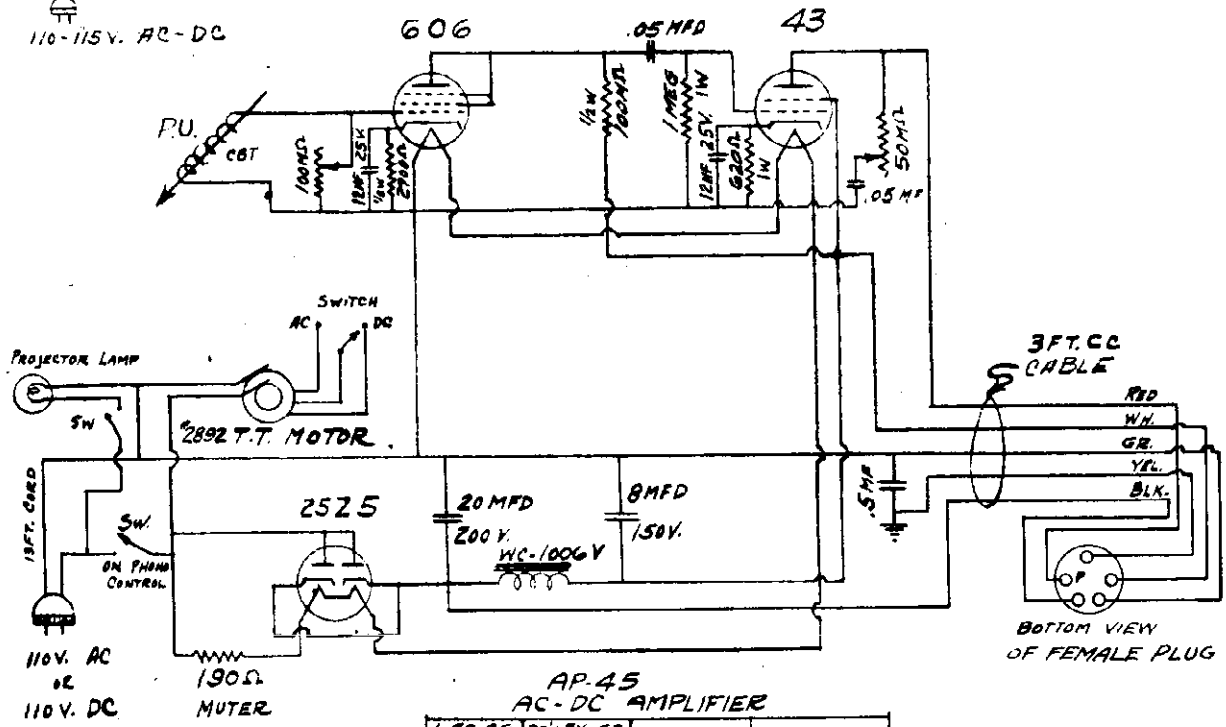
WEBSTER-CHICAGO CORP.

MODEL AP-45 AC-DC
Amplifier



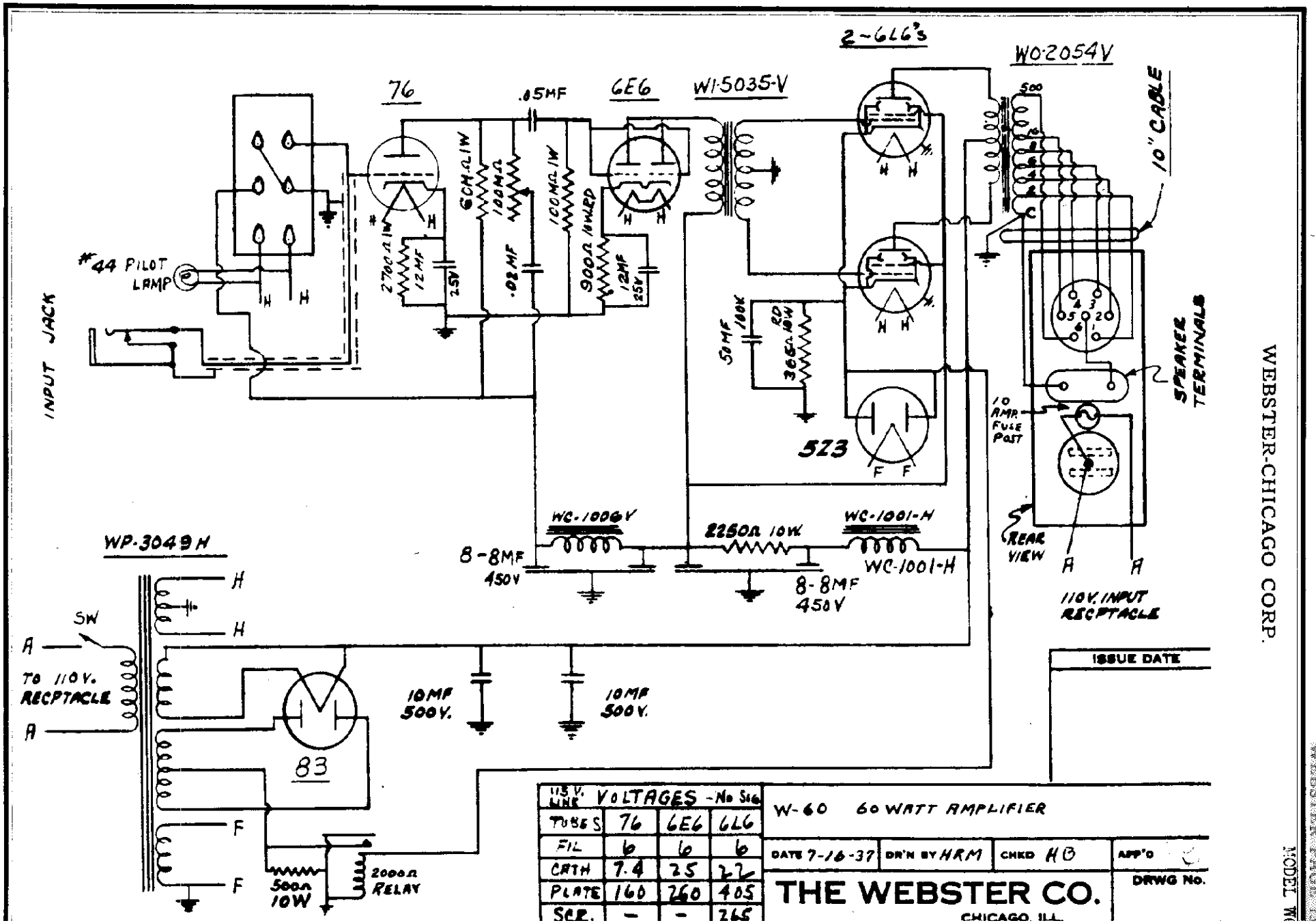
MODEL AP-38
AC-DC PROJECTOSELL AMPLIFIER

DATE 12-1-36	DR'N BY G.S.	CHKD A-	APP'D RDP
THE WEBSTER CO. 3825 W. LAKE ST. CHICAGO, ILL.			DRWG NO.



AP-45
AC-DC AMPLIFIER

1-20-38	DR'N BY-GS	
THE WEBSTER CO. 3825 W. LAKE ST. CHICAGO.		



115 V. LINE	VOLTAGES - No Sig		
TUBES	76	6E6	6L6
FIL.	6	6	6
CATH.	7.4	25	27
PLATE	160	260	405
SCR.	—	—	265

W-60 60 WATT AMPLIFIER

DATE 7-16-37	DR'N BY HRM	CHKD HB	APP'D

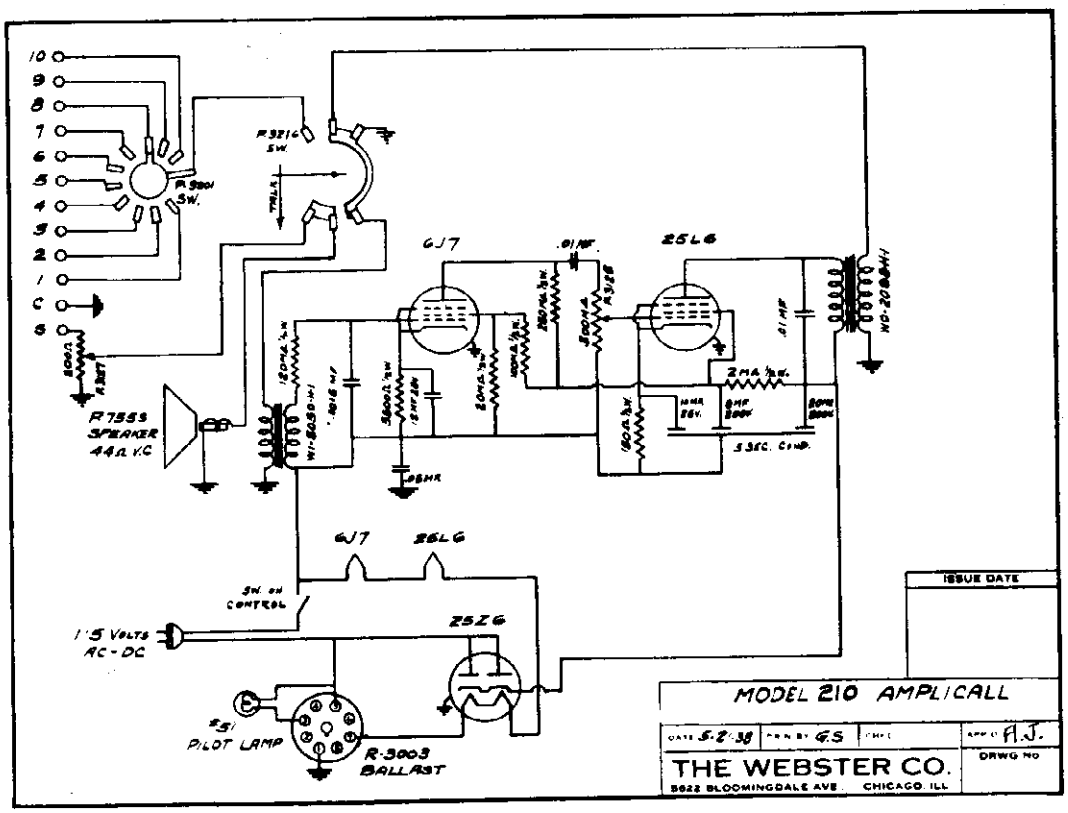
DRWG No.

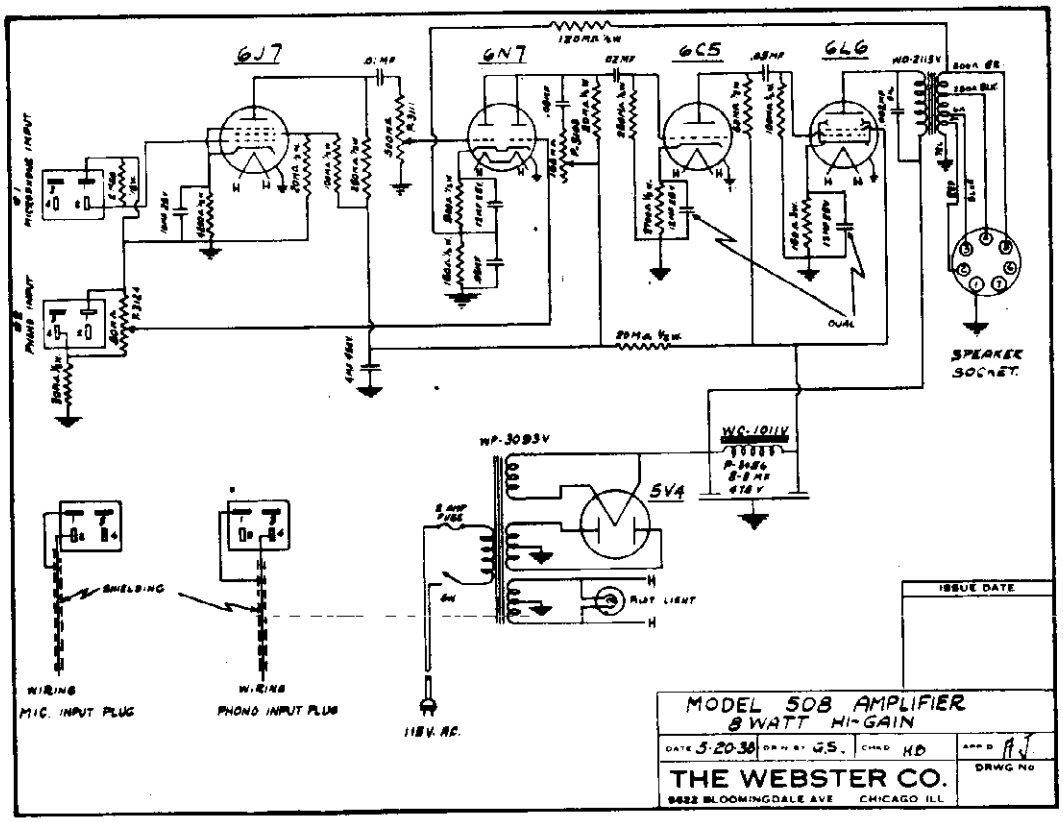
THE WEBSTER CO.
CHICAGO, ILL.

WEBSTER-CHICAGO CORP.

MODEL 210 Amplicall
MODEL 508 Amplifier

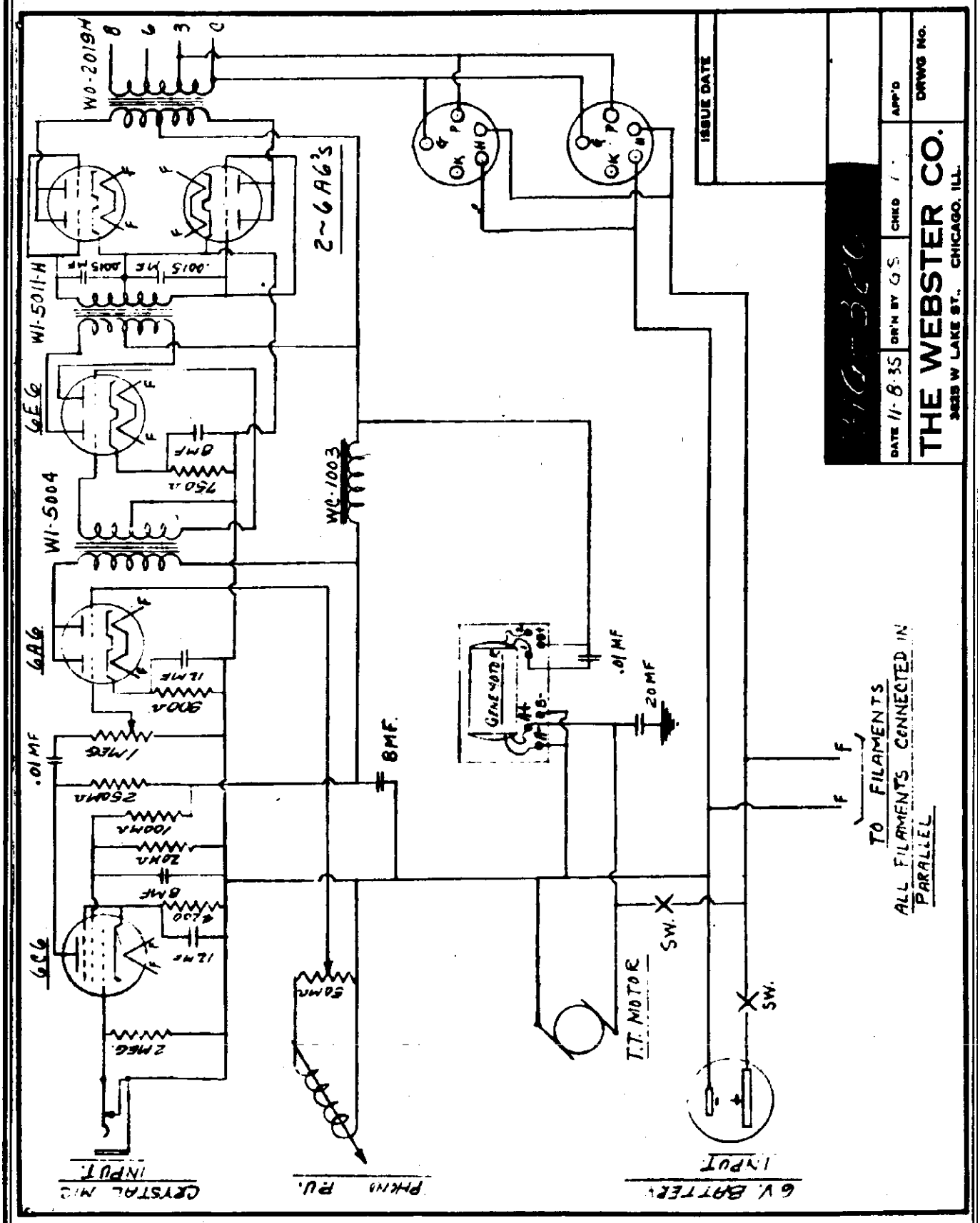
WEBSTER-CHICAGO CORP.





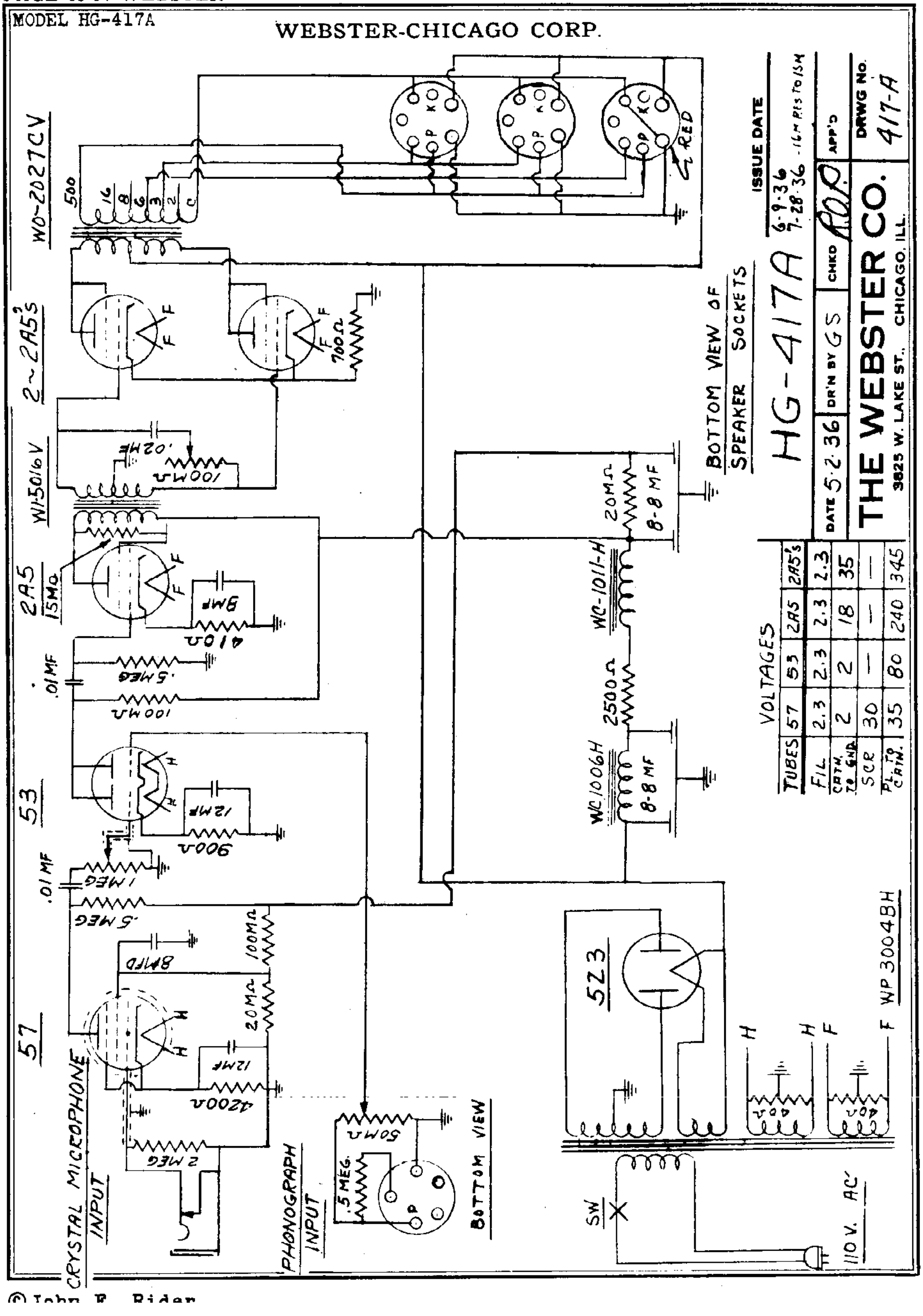
MODEL HG-320

WEBSTER-CHICAGO CORP.



MODEL HG-417A

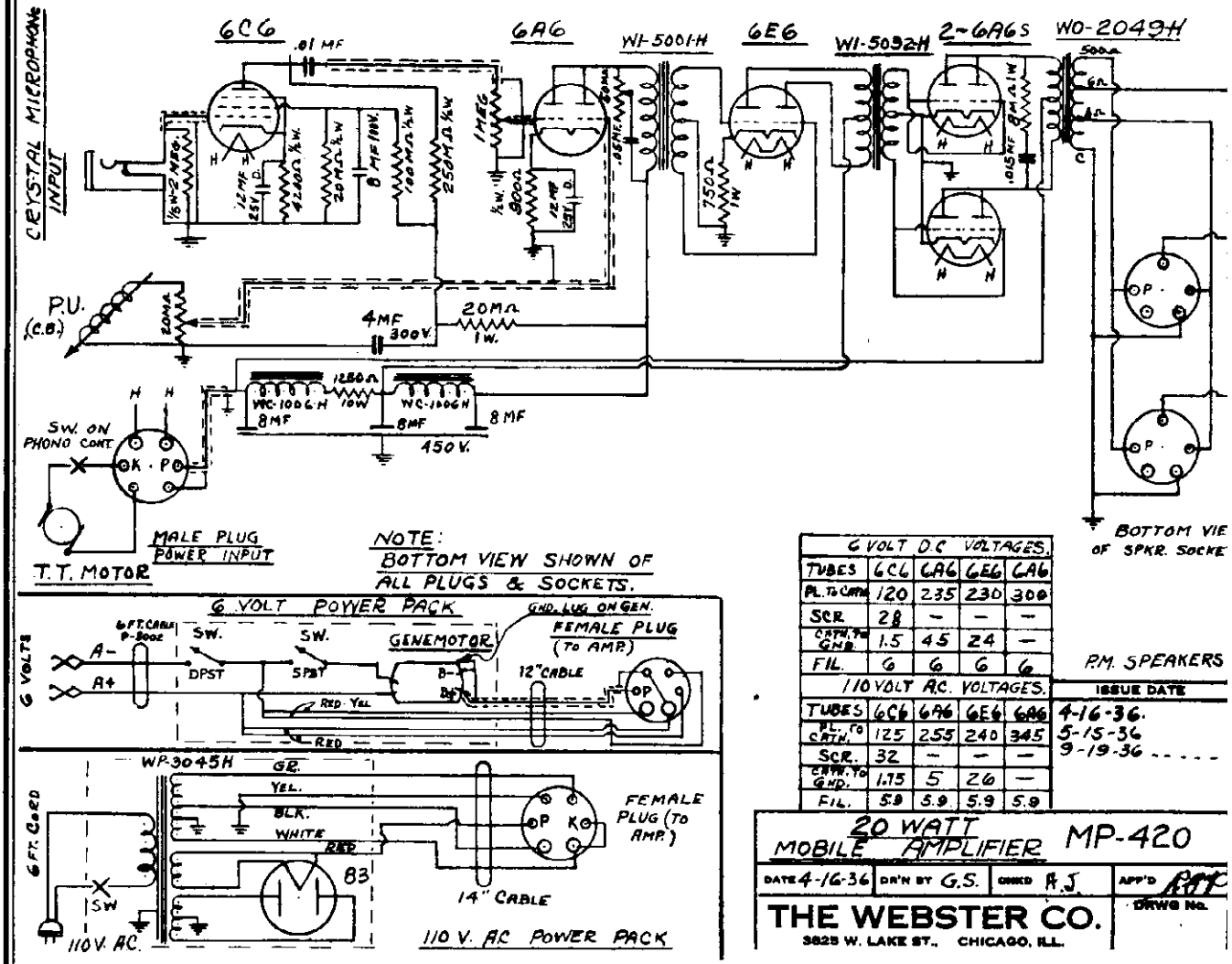
WEBSTER-CHICAGO CORP.


WO-2027CV
500
16
8
6
3
2
C
2~2A5's
700Ω
W1-5016V
.02MF
100MΩ
2A5
15MΩ
8MF
410Ω
.01MF
.5MEG
100MΩ
53
12MF
900Ω
.01MF
1MEG
.5MEG
57
8MFD
100MΩ
20MΩ
12MF
4200Ω
2MEG
CRYSTAL MICROPHONE INPUT
50MΩ
.5MEG.
P
PHONOGRAPH INPUT
BOTTOM VIEW
P
K
RED
BOTTOM VIEW OF SPEAKER SOCKETS
20MΩ
8-8MF
WC-1011-H
2500Ω
WL1006H
8-8MF
5Z3
H
H
F
F
40Ω
40Ω
SW
110V. AC
WP3004BH
ISSUE DATE
6-9-36
7-28-36 -16M RES TO 15M
HG-417A
DATE 5-2-36
DR'N BY GS
CHKD
APP'D
DRWG No. 417-A
THE WEBSTER CO.
3825 W. LAKE ST., CHICAGO, ILL.

VOLTAGES

TUBES	57	53	2A5	2A5's
FIL	2.3	2.3	2.3	2.3
CATH. TO GND.	2	2	18	35
SCR	30	—	—	—
PL. TO CATH.	35	80	240	345

WEBSTER-CHICAGO CORP.



6 VOLT D.C VOLTAGES.				
TUBES	6C6	6A6	6E6	6A6
PL. TO CATH.	120	235	230	300
SCR.	28	—	—	—
CATH. TO GND.	1.5	45	24	—
FIL.	6	6	6	6

110 VOLT A.C. VOLTAGES.				
TUBES	6C6	6A6	6E6	6A6
PL. TO CATH.	125	255	240	345
SCR.	32	—	—	—
CATH. TO GND.	1.15	5	26	—
FIL.	5.9	5.9	5.9	5.9

ISSUE DATE
4-16-36.
5-15-36
9-19-36 - - - - -

20 WATT MOBILE AMPLIFIER MP-420

DATE 4-16-36 | DR'N BY G.S. | CHK'D R.J. | APP'D RJC | DRWG No.

THE WEBSTER CO.
3825 W. LAKE ST., CHICAGO, ILL.

REPLACEMENT PARTS

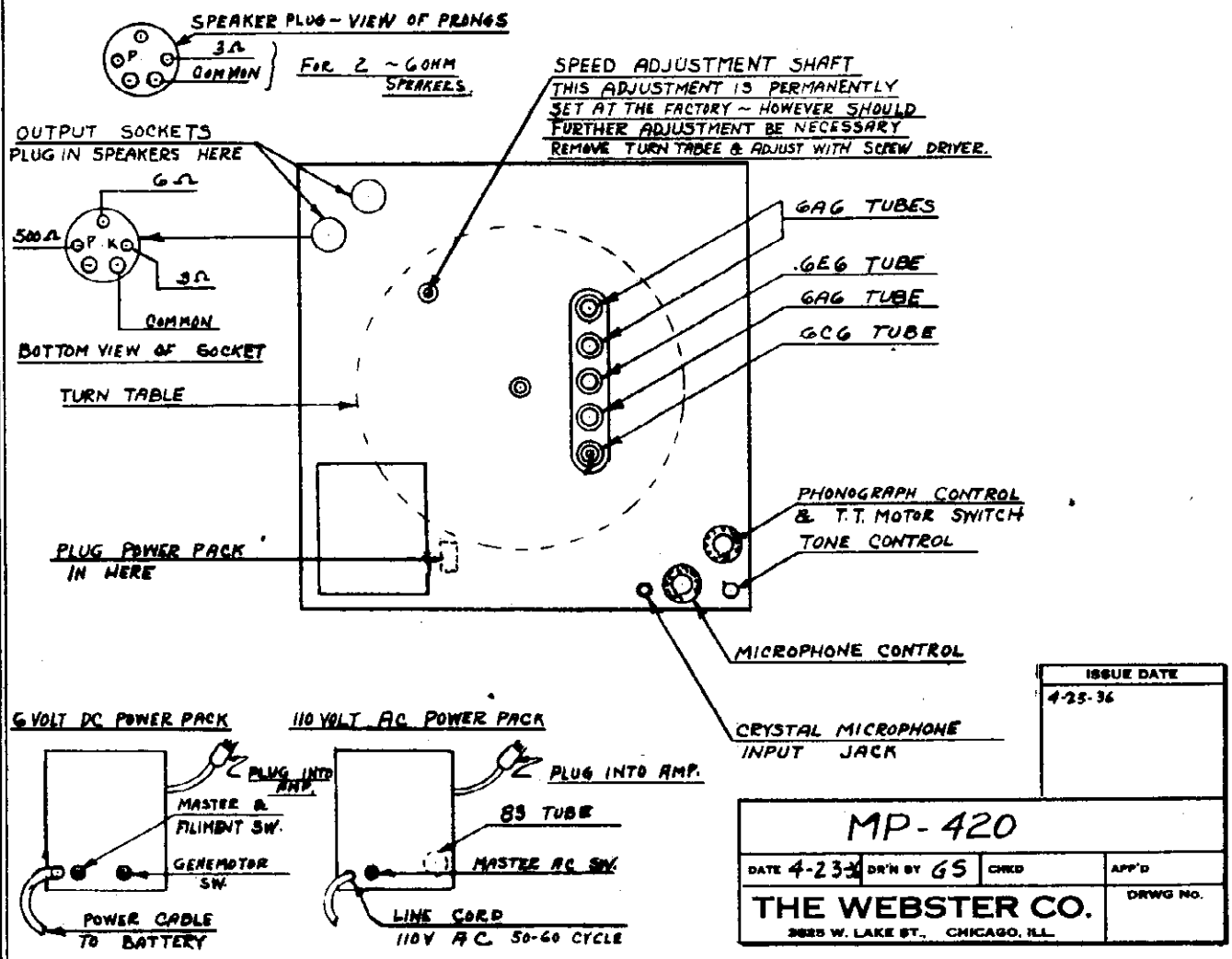
Part		List Price	Part		List Price
WO-2049H	Output Transformer	$5.20	20 M	Resistor 1 W Carbon	$ .20
WI-5001H	Coupling Transformer	5.70	8 M	Resistor 1 W Carbon	.20
WI-5032H	Coupling Transformer	4.65	1250	Resistor 10 W RD	.50
WP-3045H	Power Transformer	9.90	8-8-8 MF	450V Condenser 3 Sec.	3.85
WC-1006H	Choke	2.30	12-12 MF	25V Condenser Dual	1.10
20 M	Phono Control W/Switch	1.60	8 MF	100V Condenser	1.10
1 Meg	Microphone Control	1.20	4 MF	300V Condenser	1.10
50 M	Tone Control	1.20	.015 MF	600V Condenser	.25
750	Resistor 1 W Carbon	.20	.05 MF	600V Condenser	.30
100 M	Resistor ½ W Carbon	.20	.01 MF	600V Condenser	.25
250 M	Resistor ½ W Carbon	.20	2 A	Jack (Carter)	.72
900	Resistor ½ W Carbon	.20	#411	Turntable Motor Genemotor (E-2)	40.00
4200	Resistor ½ W Carbon	.20		Phono Pickup	7.50
20 M	Resistor ½ W Carbon	.20			
2 Meg	Resistor 1/5 W Carbon	.15			

In ordering Replacement Parts give Model and Serial Number of Amplifier.

THE WESTER COMPANY
3825 WEST LAKE STREET,
CHICAGO, ILLINOIS.

MODEL MP-420

WEBSTER-CHICAGO CORP.



ISSUE DATE
4-25-36

MP-420			
DATE 4-23-36	DR'N BY GS	CHK'D	APP'D
THE WEBSTER CO. 3825 W. LAKE ST., CHICAGO, ILL.			DRWG NO.

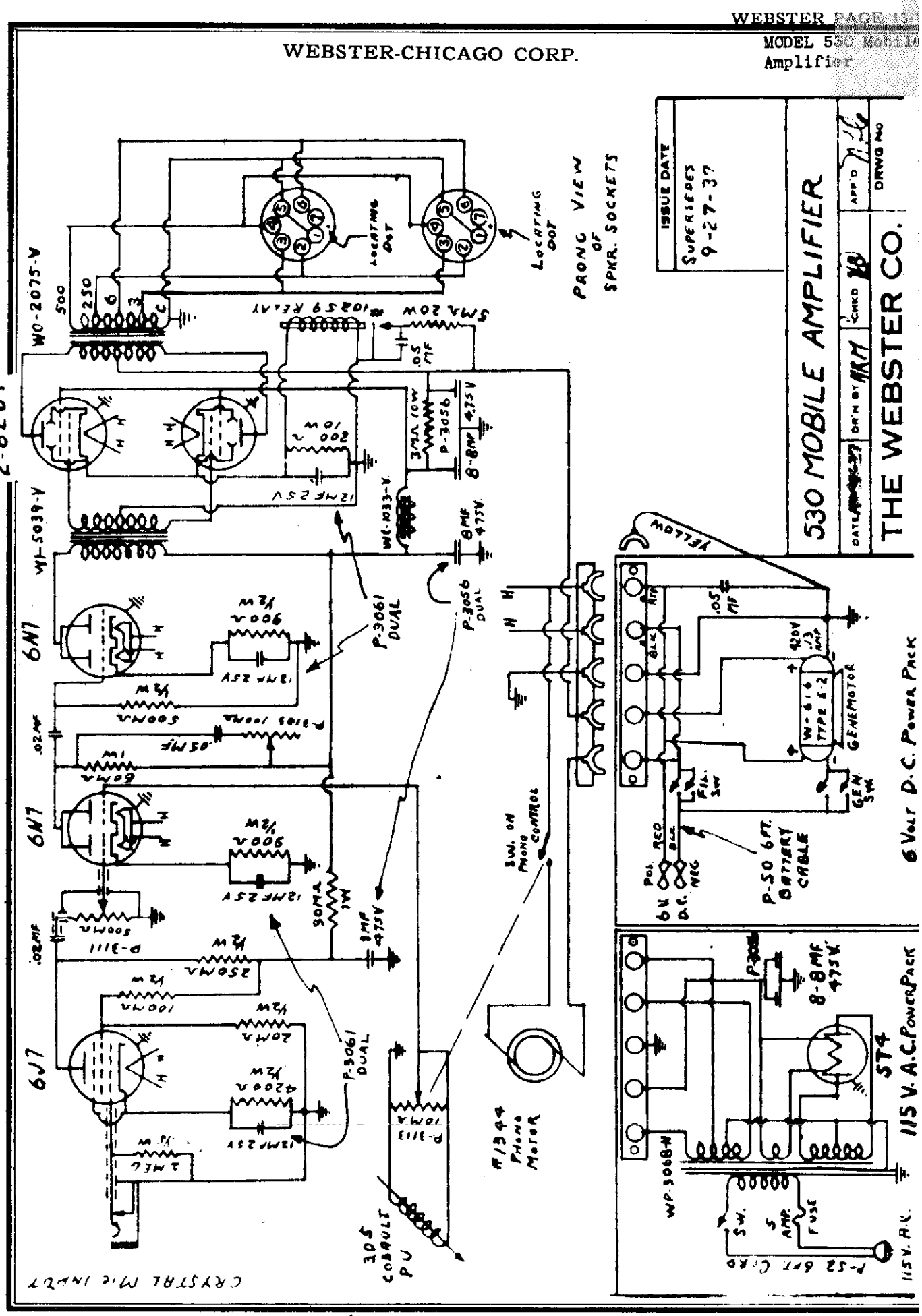
Two plug-in power packs are available for the Model MP-420 adaptable for either 6 volts dc or 110 volts ac, requiring 66 watts for the former and 98 watts for the latter.

6-volt power pack: Two switches are mounted on this pack, one marked "Gen On" and the other "Fil". The former controls the genemotor, which should be on only when equipment is in operation. The other switch controls the filaments and acts also as master switch. With all other switches "off" this switch may be left "on keeping the filaments heated for intermittent work where instant response is required. This arrangement effects a saving of battery current.

110-volt a-c power pack: One a-c switch controls the entire amplifier and acts also as a master switch. The change from one pack to another is accomplished as follows: remove phonograph turntable, remove 4 screws holding pack in place, lift out and remove plug. Plug-in other pack, slide back into place and replace the 4 mounting screws.

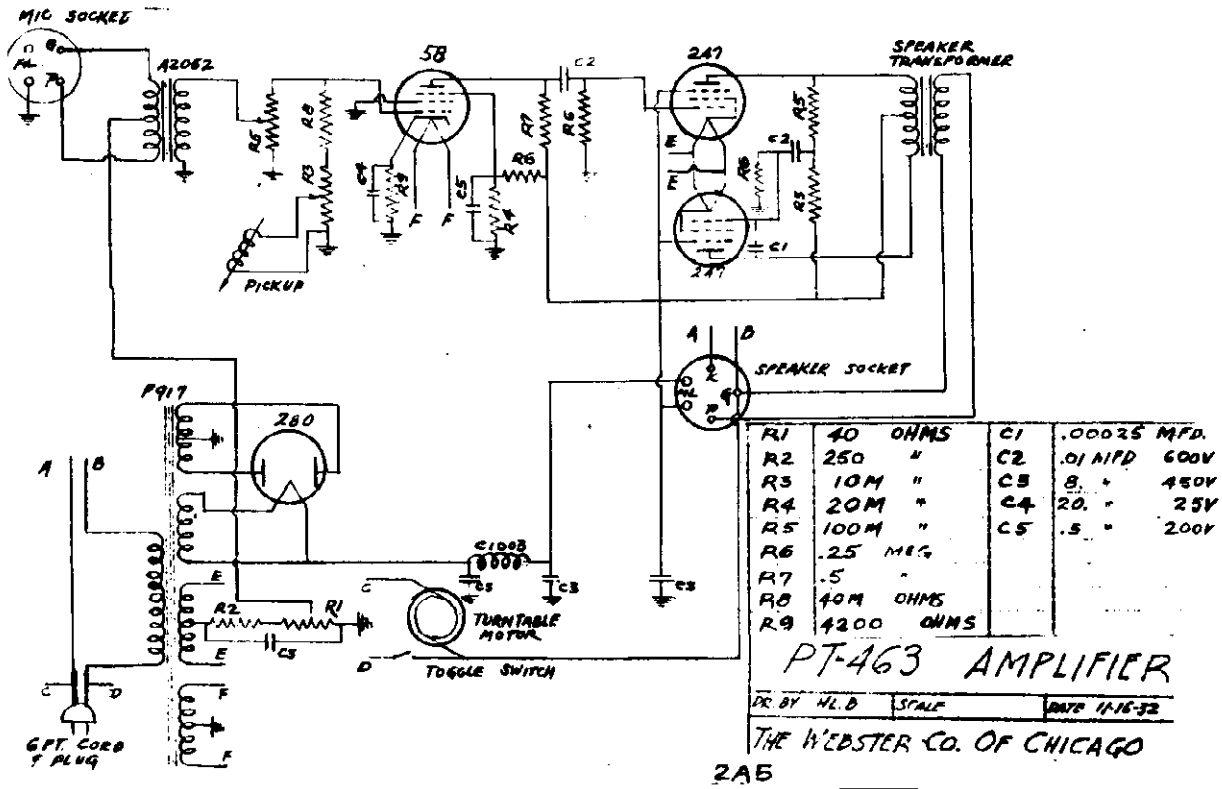
When used on ac the steel case of the amplifier should be grounded to assure stable operation; likewise when it is used in an automobile it is sometimes necessary to connect the steel case of the amplifier to the frame of the car.

Note from the schematic that the output transformer has 3,6, and 500-ohm taps. This system is normally supplied with two 6-ohm speakers, which connect to the 3-ohm tap. If only one 6-ohm speaker is used, it should be connected to the 6-ohm tap. The 500-ohm tap is provided for use when the speakers are located more than 50 feet from the amplifier, in which case a matching transformer should be used at the speaker location.


WEBSTER-CHICAGO CORP.
530 MOBILE AMPLIFIER
THE WEBSTER CO.
ISSUE DATE
SUPERSEDES 9-27-37
DRWG NO
PRONG VIEW OF SPKR. SOCKETS
LOCATING DOT
W0-2075-V
W1-5039-V
W1-1033-V
10259 RELAY
5MA 20W
.05 MF
200Ω 10W
3MA 10W
P-3056
8-8MF 475V
12MF 25V
8MF 475V
P-3061 DUAL
P-3056 DUAL
6N1
6N7
6J7
900Ω ½W
500Ω ½W
250Ω ½W
100Ω ½W
20Ω ½W
4200Ω ½W
2MEG ½W
60MA 1W
.05MF
.02MF
P-3105 100MA
P-3111 500MA
P-3113 10MA
30MA 1W
1MF 475V
13MF 25V
12MF 25V
13MF 25V
SW. ON PHONO CONTROL
#1344 PHONO MOTOR
305 CROSLEY PU
CRYSTAL MIC INPUT
YELLOW
.05 MF
420V .3 AMP
W-816 TYPE E-2
GENEMOTOR
FIL. SW
GEN SW
POL. RED BLK
6V D.C. NEG
P-50 6FT. BATTERY CABLE
6 VOLT D.C. POWER PACK
P-3068
8-8MF 475V
ST4
WP-3068-H
SW.
5 AMP. FUSE
P-52 6FT CORD
115V. A.C.
115 V. A.C. POWER PACK

MODEL PT-463 MODEL PA-566

WEBSTER-CHICAGO CORP.

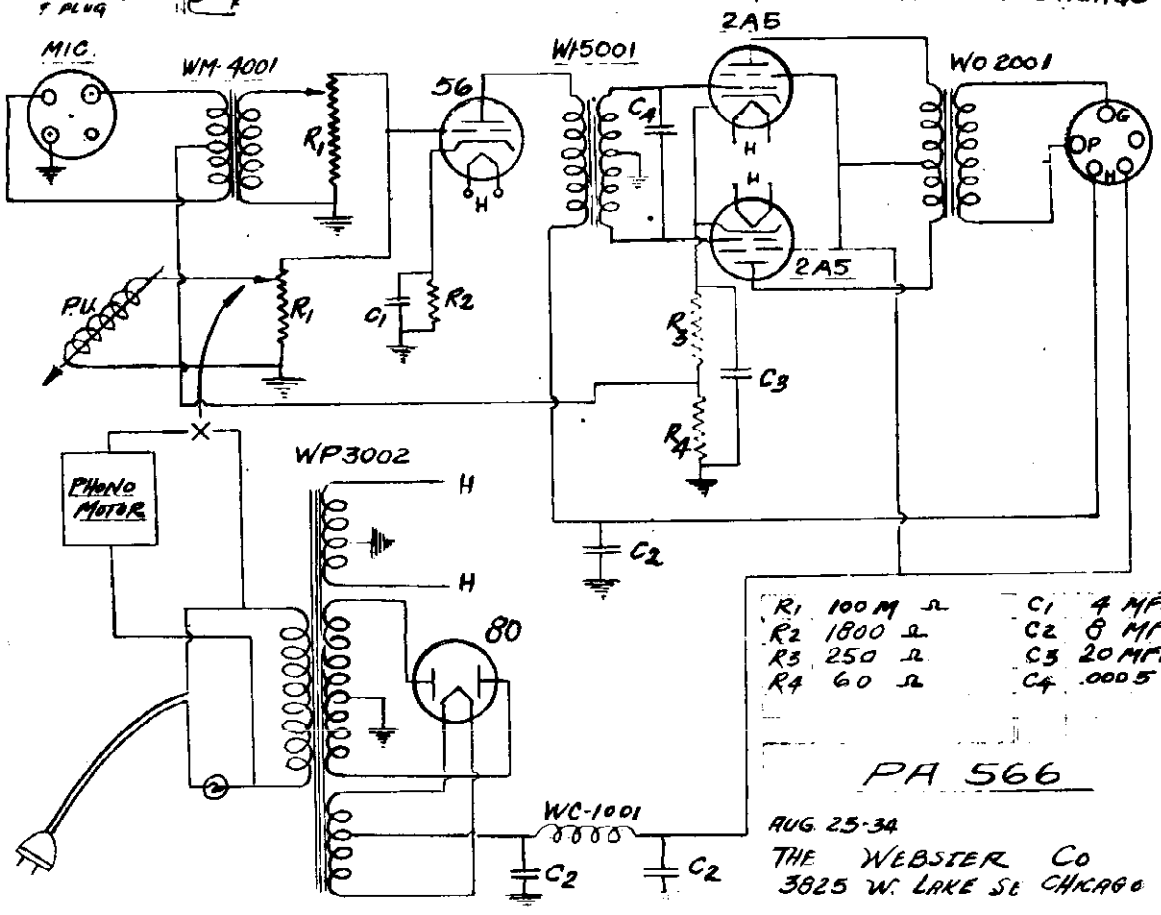


R1	40 OHMS	C1	.00025 MFD.
R2	250 "	C2	.01 MFD 600V
R3	10M "	C3	8 " 450V
R4	20M "	C4	20 " 25V
R5	100M "	C5	.5 " 200V
R6	.25 MEG		
R7	.5 "		
R8	40M OHMS		
R9	4200 OHMS		

PT-463 AMPLIFIER

DR. BY H.L.D | SCALE | DATE 11-16-32

THE WEBSTER CO. OF CHICAGO

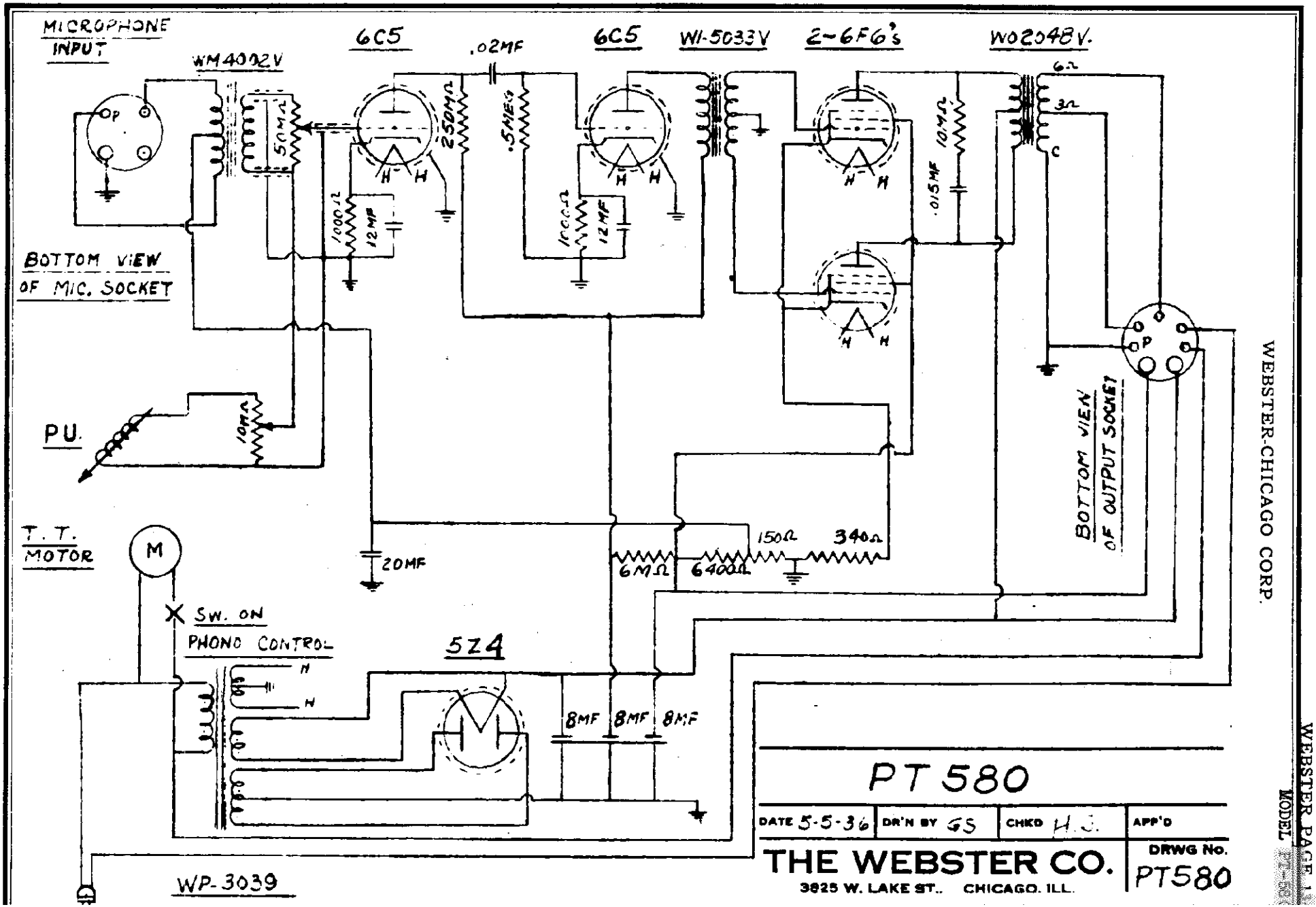


R1	100 M Ω	C1	4 MFD.
R2	1800 Ω	C2	8 MFD.
R3	250 Ω	C3	20 MFD.
R4	60 Ω	C4	.0005 MF.

PA 566

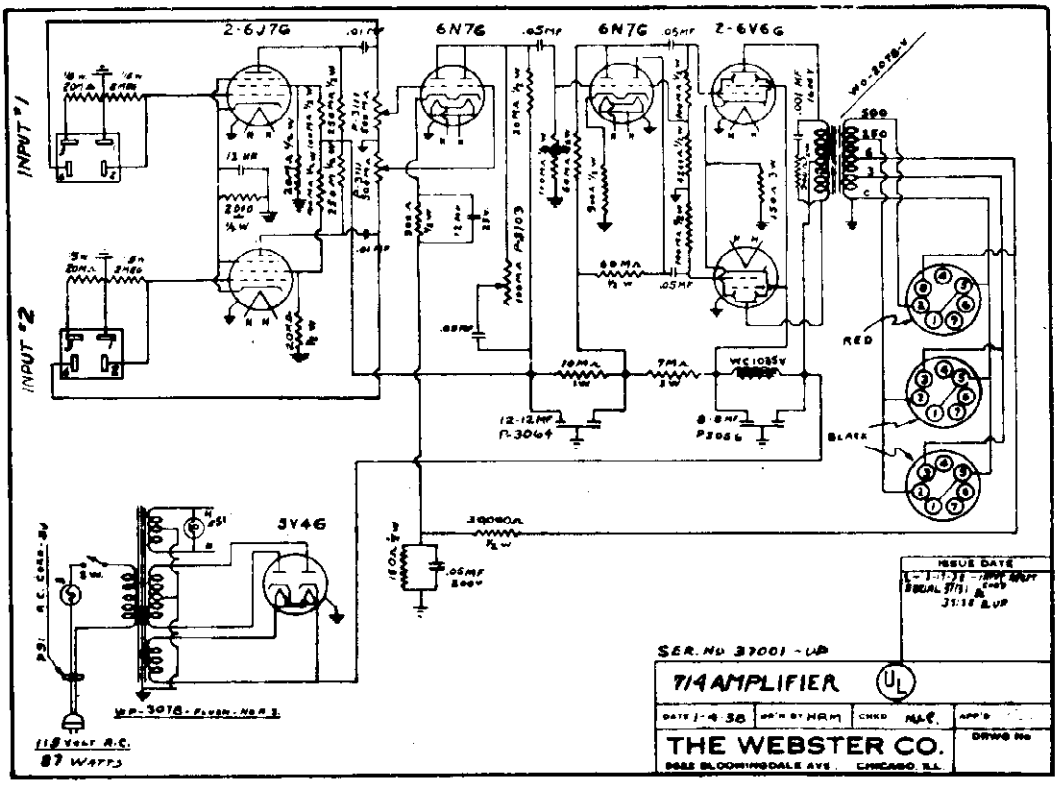
AUG. 25-34

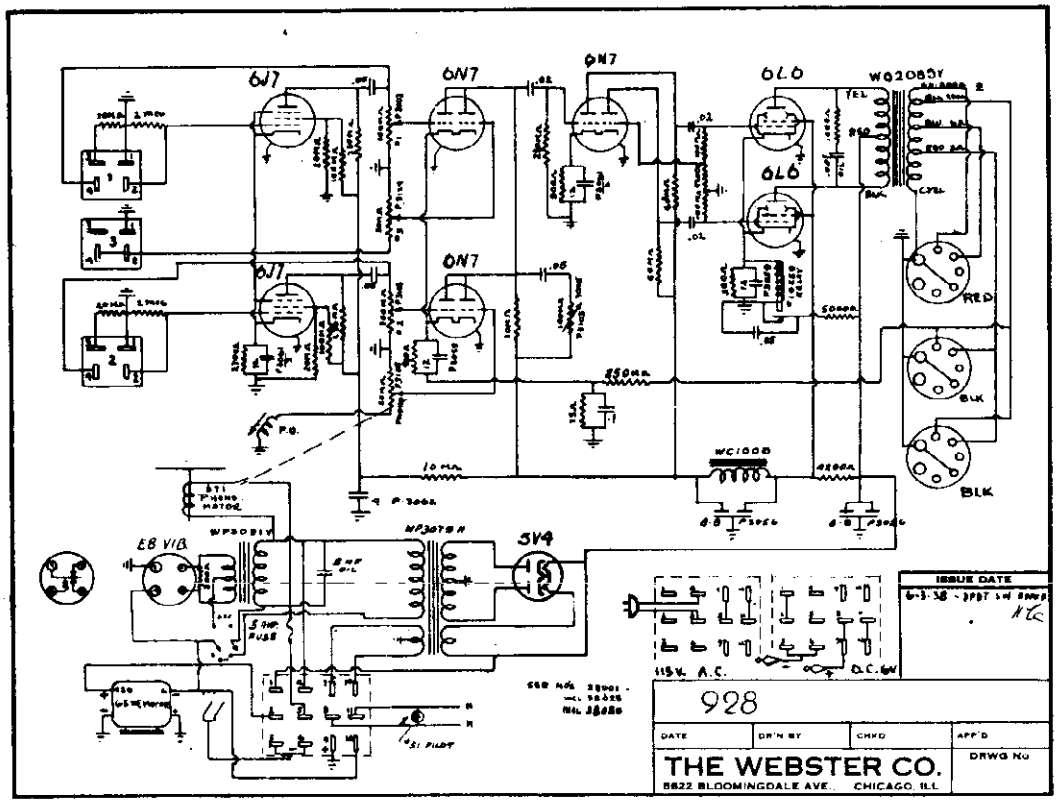
THE WEBSTER CO
3825 W. LAKE ST CHICAGO


MICROPHONE INPUT
WM4002V
6C5
.02MF
6C5
WI-5033V
2-6F6's
WO2048V.
BOTTOM VIEW OF MIC. SOCKET
PU.
T.T. MOTOR
M
SW. ON PHONO CONTROL
5Z4
20MF
8MF 8MF 8MF
6MΩ
150Ω
340Ω
BOTTOM VIEW OF OUTPUT SOCKET
WP-3039
PT 580
DATE 5-5-36
DR'N BY GS
CHK'D H.J.
APP'D
THE WEBSTER CO.
3825 W. LAKE ST., CHICAGO, ILL.
DRWG No. PT580
WEBSTER-CHICAGO CORP.
WEBSTER PAGE 1
MODEL

MODEL 714 Ampl.
MODEL 928

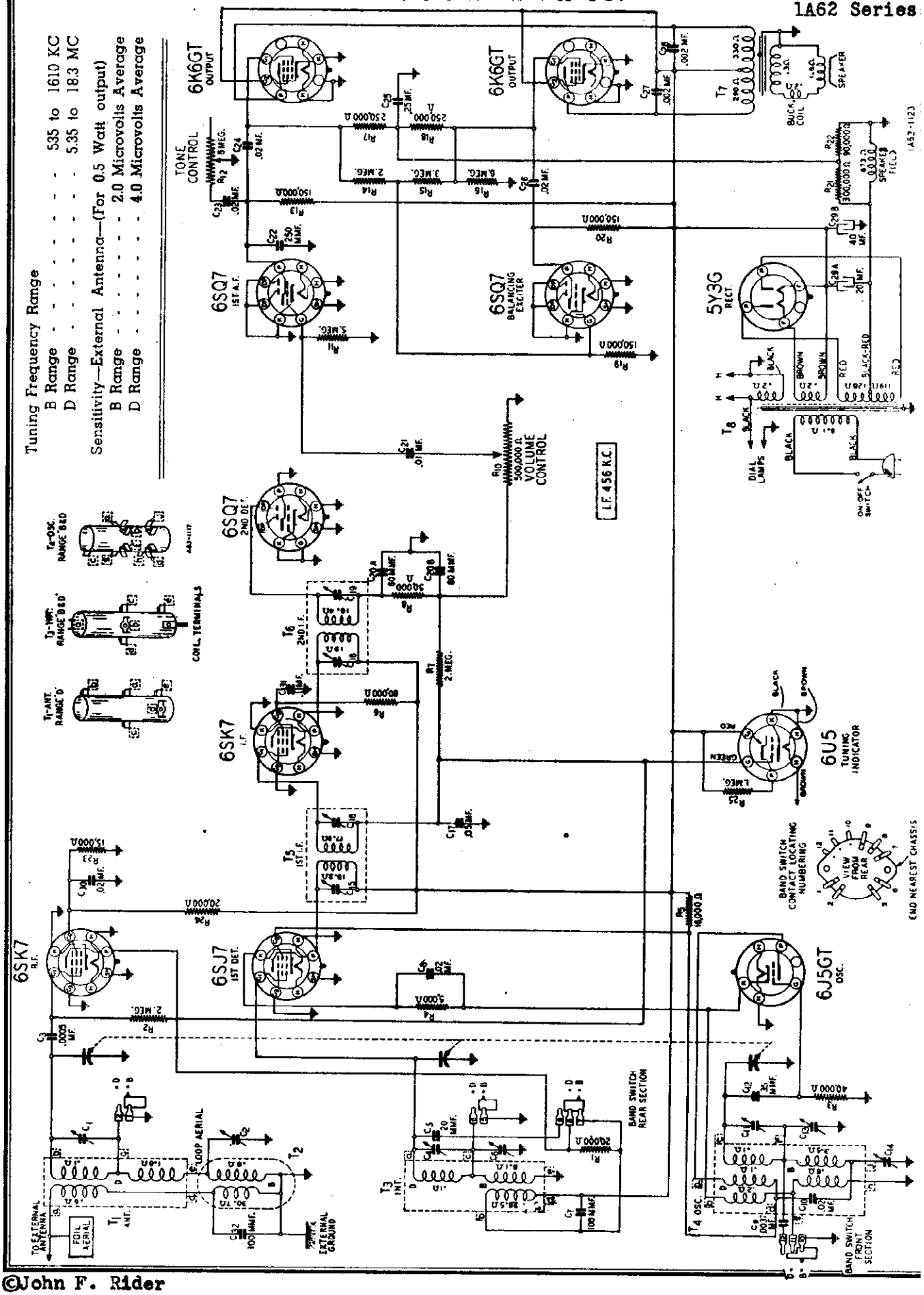
WEBSTER-CHICAGO CORP.





WELLS-GARDNER & CO.

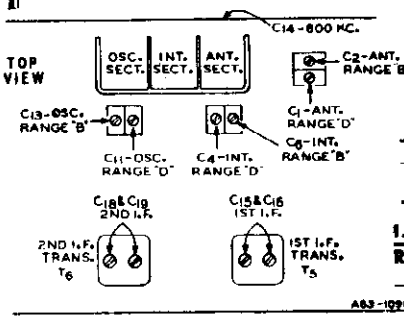
MODEL 1A62—
1A62 Series



MODEL 1A62-4
1A62 Series

WELLS-GARDNER & CO.

SERVICE DATA



NOTE A—If the pointer is not at 1400 KC on the dial, remove pointer from drive cord. Set pointer at the 1400 KC mark on the dial scale. Attach pointer to drive cord.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained

ALIGNMENT PROCEDURE

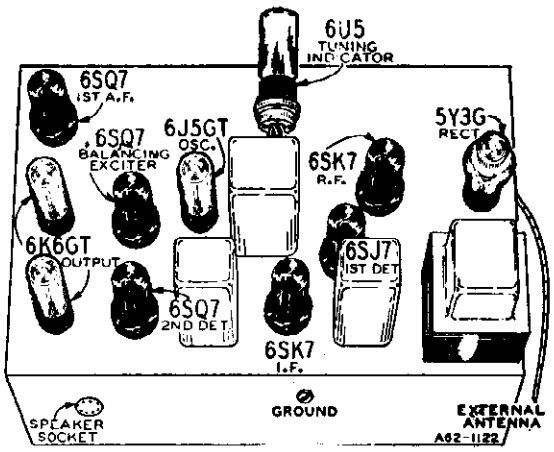
Volume Control—Maximum All Adjustments.

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., 100 mmf., and 400 ohms.

	SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I.F.	456 KC	Signal Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C15) & (C16) 2nd I.F. (C18) & (C19)
RANGE D	18,300 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C11)
	17,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C1) Int. Range D (C4) Rock Rotor—See Note B
RANGE B	1610 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C13)
	1408 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC— See Note A	Ant. Range B (C2) Int. Range B (C6)
	600 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C14) Rock Rotor—See Note B
LOOP RANGE B	1400 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output	Ant. Range B (C2)



TUBES AND DIAL LAMPS

The type and position of each tube are shown in the illustration.

The dial lamps are the bayonet pin type (bulb No. 51)

Power Consumption - 85 Watts (At 117 volts 60 cycles)

Power Output - - - - - - - - - 4 Watts Undistorted
5.5 Watts Maximum

Selectivity - - - 35 KC Broad at 1000 times Signal

Intermediate Frequency - - - - - - - - - - 456 KC

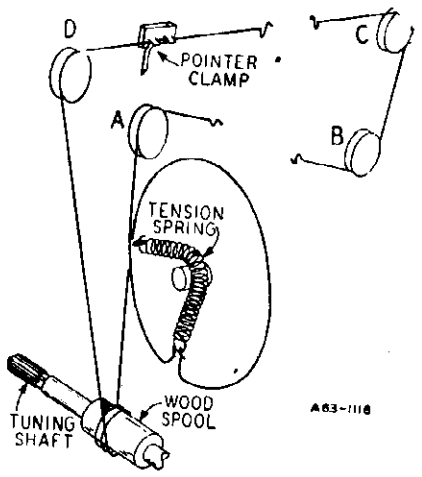
Speaker - - - - - - - - - - 10" Electro-Dynamic

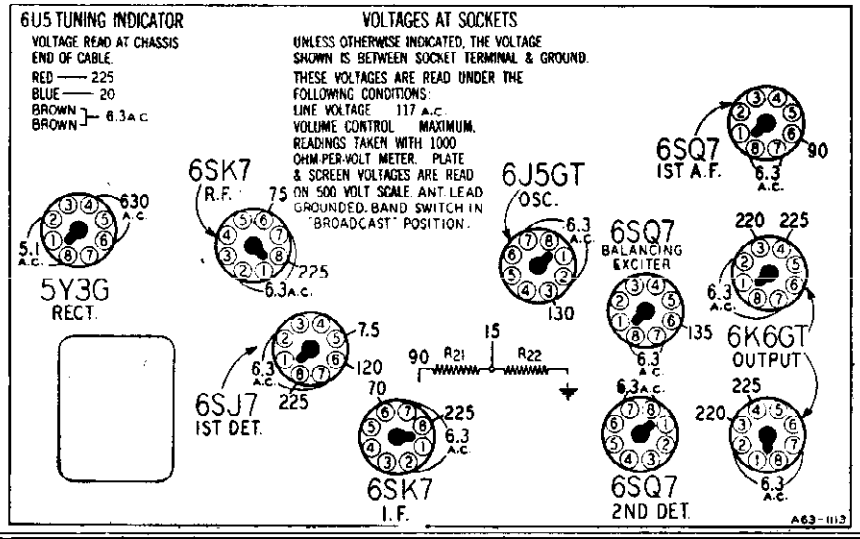
DRIVE CORD REPLACEMENT

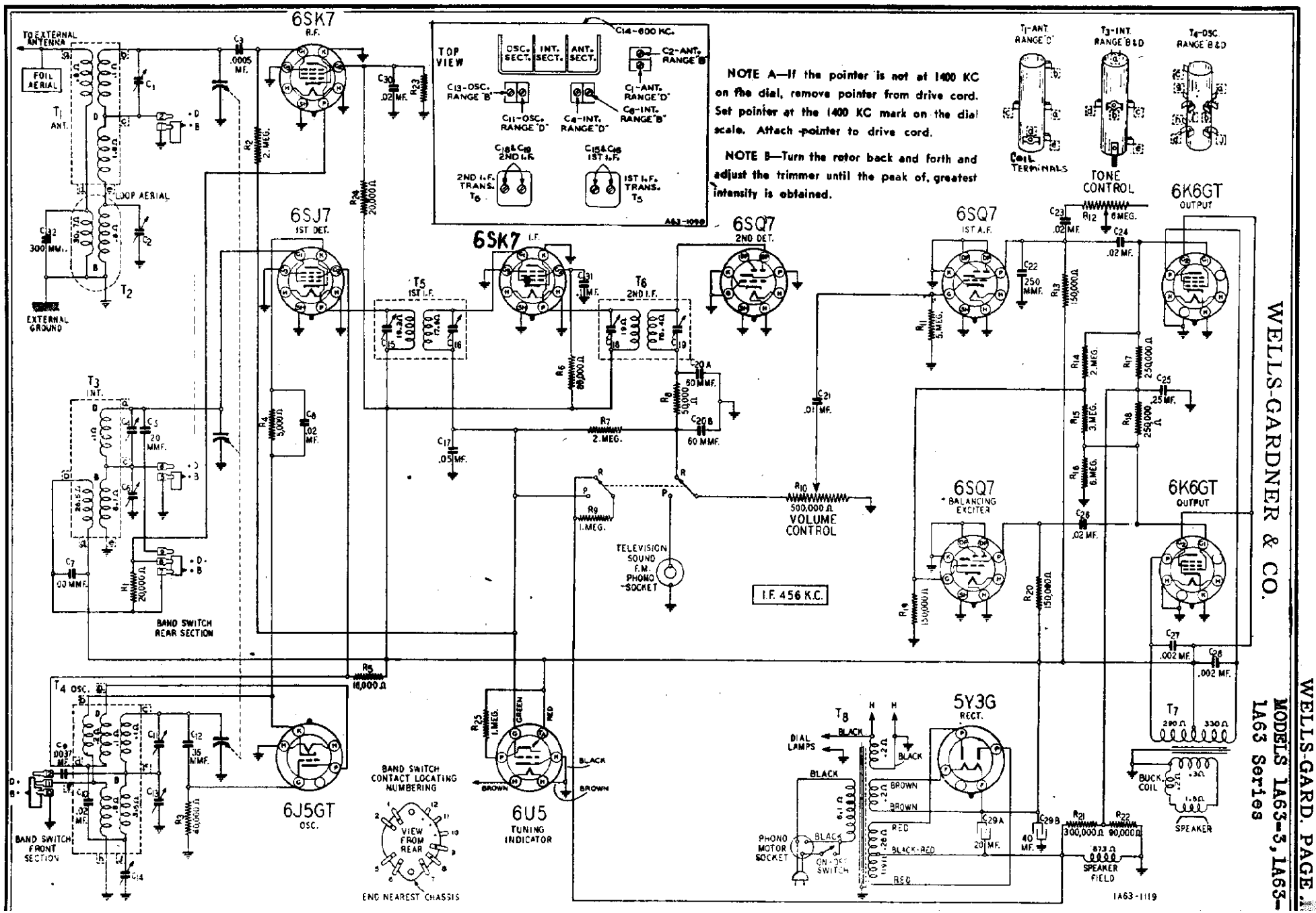
11 TUBE AC
2 BANDS

Turn gang condenser to open position. Use new drive cord 55" in length.

Secure one end of tension spring to hook on drive pulley. Bend spring around drive pulley shaft —see illustration. Pass cord through slot in pulley rim. Wind cord ¼ turn clockwise (from drive pulley end of chassis) around drive pulley. Pass cord around idler pulleys A, B, C and D as in illustration. Then wind cord 2½ turns clockwise (from front of chassis) around tuning shaft spool. These turns should progress away from chassis. Pass cord over top of drive pulley for ¾ turn clockwise (from drive pulley end of chassis) and through slot in pulley rim. Fasten cord to tension spring—see illustration.






WELLS-GARDNER & CO.
MODELS 1A63-3, 1A63-1A63 Series
WELLS-GARD. PAGE
NOTE A—If the pointer is not at 1400 KC on the dial, remove pointer from drive cord. Set pointer at the 1400 KC mark on the dial scale. Attach pointer to drive cord.
NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.
TOP VIEW
OSC. SECT.
INT. SECT.
ANT. SECT.
C14-600 KC.
C2-ANT. RANGE "B"
C1-ANT. RANGE "D"
C8-INT. RANGE "B"
C13-OSC. RANGE "B"
C11-OSC. RANGE "D"
C8-INT. RANGE "D"
C18&C19 2ND I.F.
C15A&C15 1ST I.F.
2ND I.F. TRANS. T6
1ST I.F. TRANS. T5
T1-ANT. RANGE "D"
T3-INT. RANGE "B&D"
T4-OSC. RANGE "B&D"
Coil TERMINALS
TO EXTERNAL ANTENNA
FOIL AERIAL
LOOP AERIAL
EXTERNAL GROUND
6SK7 R.F.
6SJ7 1ST DET.
6SK7 I.F.
6SQ7 2ND DET.
6SQ7 1ST A.F.
6SQ7 BALANCING EXCITER
6K6GT OUTPUT
6K6GT OUTPUT
6J5GT OSC.
6U5 TUNING INDICATOR
5Y3G RECT.
TONE CONTROL
VOLUME CONTROL
TELEVISION SOUND F.M. PHONO SOCKET
I.F. 456 K.C.
BAND SWITCH REAR SECTION
BAND SWITCH FRONT SECTION
BAND SWITCH CONTACT LOCATING NUMBERING
VIEW FROM REAR
END NEAREST CHASSIS
DIAL LAMPS
PHONO MOTOR SOCKET
ON-OFF SWITCH
BUCK COIL
SPEAKER
SPEAKER FIELD
1A63-1119

MODELS 1A63-3, 1A63-4
1A63 Series

WELLS-GARDNER & CO.

ALIGNMENT PROCEDURE

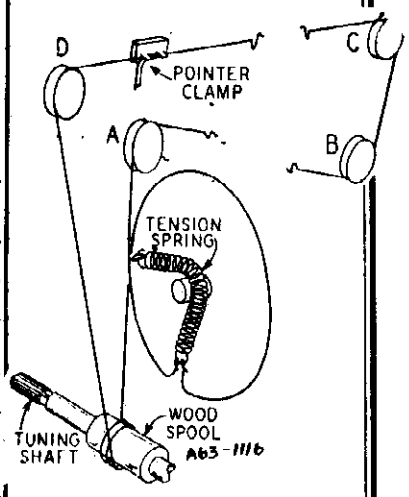
Volume Control—Maximum All Adjustments.

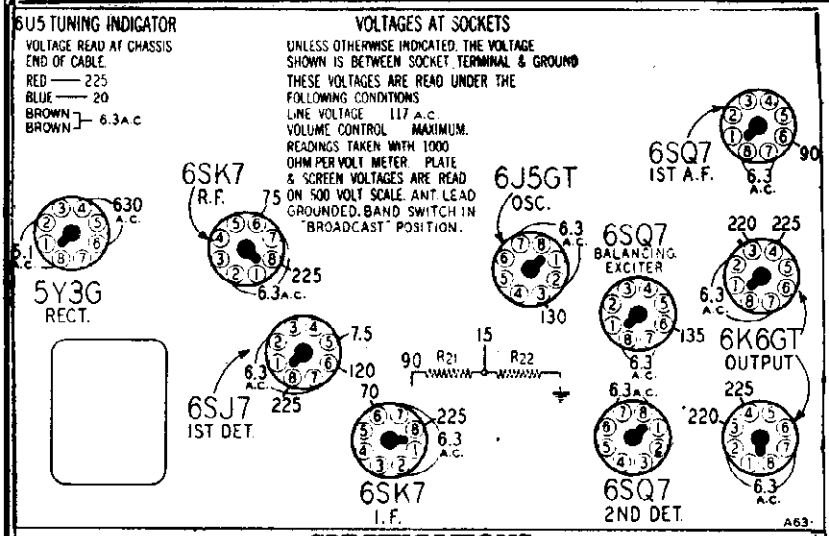
Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.

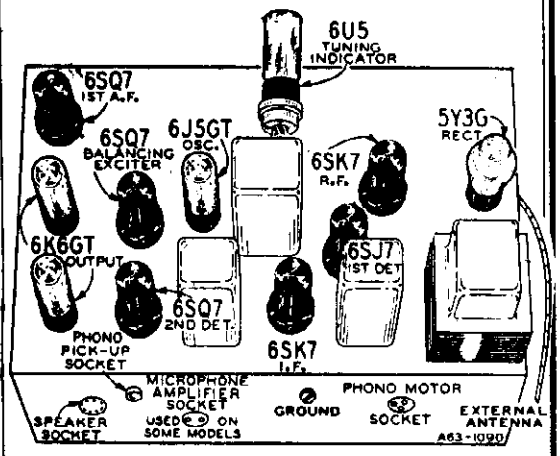
Allow Chassis and Signal Generator to "Heat Up" for several minutes.

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 Screw driver.
Dummy Antennas—.1 mf., 100 mmf., and 400 ohms.

	SIGNAL GENERATOR FREQUENCY SETTING	CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I.F.	456 KC	Signal Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C15) & (C16) 2nd I.F. (C18) & (C19)
RANGE D	18,300 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C11)
	17,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C1) Int. Range D (C4) Rock Rotor—See Note B
RANGE B	1610 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C13)
	1400 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC— See Note A	Ant. Range B (C2) Int. Range B (C6)
	600 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C14) Rock Rotor—See Note B
LOOP RANGE B	1400 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output	Ant. Range B (C2)







SPECIFICATIONS

Speaker - - - - - - - 8", 10" or 12" Electro-Dynamic
Tuning Frequency Range
B Range - - - - - - - - - 535 to 1610 KC
D Range - - - - - - - - - 5.35 to 18.3 MC

Sensitivity—External Antenna—(For 0.5 Watt output)
B Range - - - - - - - 2.0 Microvolts Average
D Range - - - - - - - 4.0 Microvolts Average

Power Consumption - 85 Watts (At 117 volts 60 cycles)
105 Watts (Phonograph Operating on Phono-Radio Combinations)

Power Output - - - - - - - - 4 Watts Undistorted
5.5 Watts Maximum

Selectivity - - - 35 KC Broad at 1000 times Signal

Intermediate Frequency - - - - - - - - - - - - 456 KC

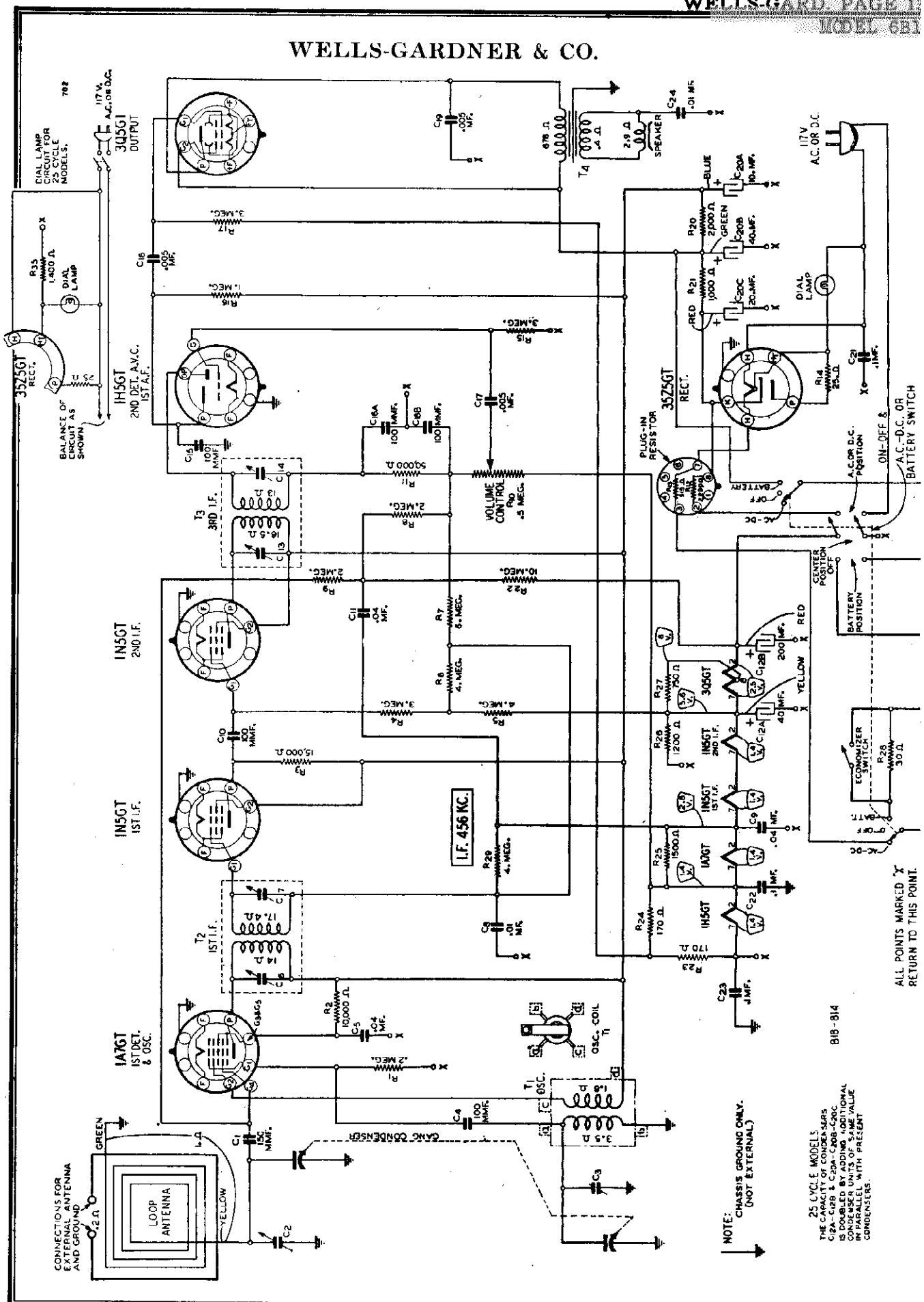
FOR GENERAL RECORD CHANGER DATA SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS"

Turn gang condenser to open position. Use new drive cord 55" in length.

Secure one end of tension spring to hook on drive pulley. Bend spring around drive pulley shaft—see illustration. Pass cord through slot in pulley rim. Wind cord ¼ turn clockwise (from drive pulley end of chassis) around drive pulley. Pass cord around idler pulleys A, B, C and D as in illustration. Then wind cord 2½ turns clockwise (from front of chassis) around tuning shaft spool. These turns should progress away from chassis. Pass cord over top of drive pulley for ¾ turn clockwise (from drive pulley end of chassis) and through slot in pulley rim. Fasten cord to tension spring—see illustration.

PROCEDURE FOR SETTING THE STATION BUTTONS

Grasp left-handed nutton at sides(depress adjacent button) and pull it out as far as it will go. A click will be heard. If it is impossible to depress button which is adjacent to button you are setting, rotate tuning knob a few turns. Now lock mechanism by pushing button all the way in until felt to lock into place. Proceed in same manner to set stations on any of remaining buttons. Any button may be used for any station you can receive, although it will be more convenient to set station so that the Kc. numbers will increase from left to right. Changing setting of one button will not affect setting of any others.


WELLS-GARDNER & CO.
3A5G1 OUTPUT
1H5GT 2ND DET. A.V.C. 1ST A.F.
1N5GT 2ND I.F.
1N5GT 1ST I.F.
1A7GT 1ST DET. & OSC.
3525GT RECT.
3025GT RECT.
T1 OSC. COIL
T2 1ST I.F.
T3 3RD I.F.
T4
I.F. 456 KC.
VOLUME CONTROL R10 .5 MEG.
PLUG-IN RESISTOR
DIAL LAMP
DIAL LAMP CIRCUIT FOR 25 CYCLE MODELS.
BALANCE OF CIRCUIT AS SHOWN
LOOP ANTENNA
CONNECTIONS FOR EXTERNAL ANTENNA AND GROUND
GANG CONDENSER
SPEAKER
117 V. A.C. OR D.C.
A.C. OR D.C. POSITION
ON-OFF & BATTERY SWITCH
BATTERY POSITION
CENTER POSITION OFF
ECONOMIZER SWITCH
ALL POINTS MARKED 'X' RETURN TO THIS POINT.
NOTE: CHASSIS GROUND ONLY. (NOT EXTERNAL)
25 CYCLE MODELS
THE CAPACITY OF CONDENSERS C20A-C20B & C20A-C20B-C20C IS OBTAINED BY ADDING ADDITIONAL CONDENSER UNITS AS NEEDED IN PARALLEL WITH PRESENT CONDENSERS.
818-814

MODEL 6B18

WELLS-GARDNER & CO.

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

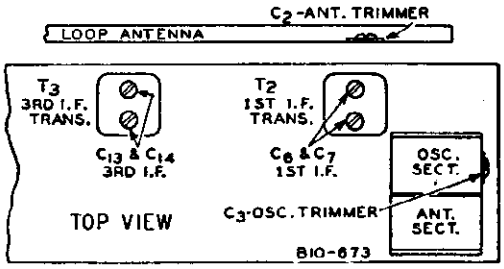
Allow Chassis and Signal Generator to "Heat Up" for several minutes.

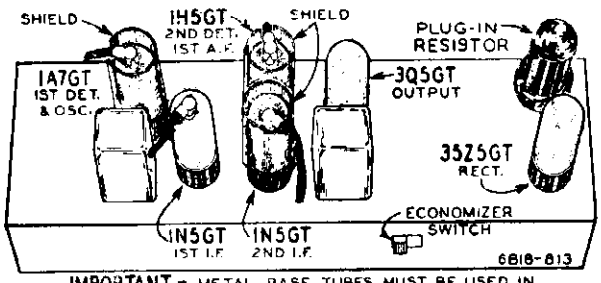
The following equipment is required for aligning:
A Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter—Non-Metallic Screwdriver.
Dummy Antennas—.1 mf., 50 mmf.

SIGNAL GENERATOR					
FREQUENCY SETTING	ANTENNA CONNECTION	GROUND CONNECTION	DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration below)
456 KC	External Antenna Clip on Loop	External Ground Clip on Loop	.1 mf.	Turn Rotor to full open	1st I.F. (C6) & (C7) 3rd I.F. (C13) & (C14)
1600 KC	External Antenna Clip	External Ground Clip	.1 mf.	Turn Rotor to full open	Oscillator (C3)
1400 KC	External Antenna Clip See Note A	External Ground Clip	50 mmf.	Turn Rotor to max. output	Antenna (C2)

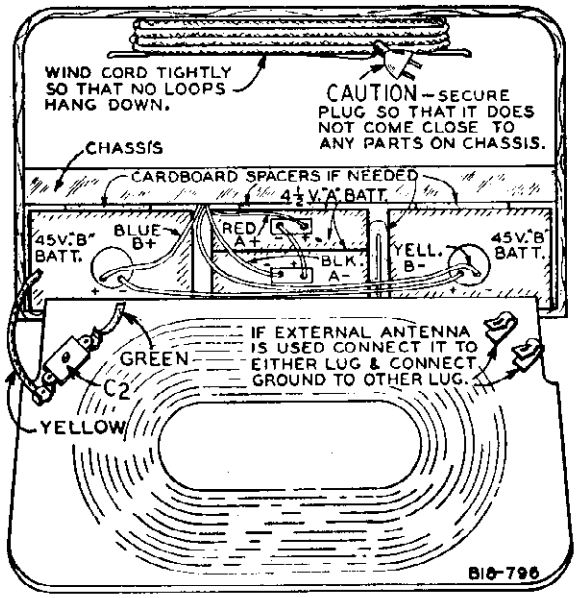
NOTE A—Re-assemble chassis in cabinet. Close back on cabinet.

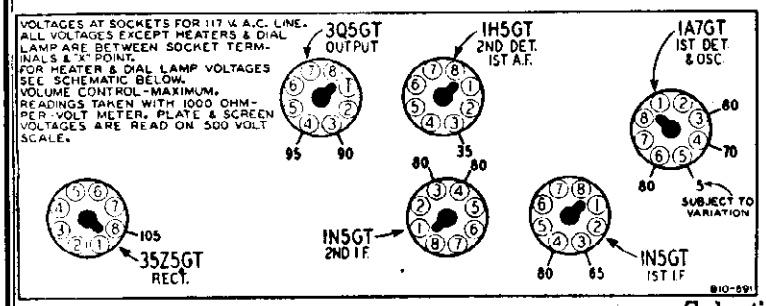
CALIBRATION—To obtain dial scale calibration, tune in an 800 KC signal. The pointer should be at the 800 KC mark on the dial. If it is not, set the pointer at the 800 KC mark. Retighten set screw.





IMPORTANT - METAL BASE TUBES MUST BE USED IN THOSE SOCKETS AT WHICH SHIELDS ARE SHOWN.





Input Voltages and Currents—Battery Operation

"A" Batteries..... 9 Volts—50 Ma.
"B" Batteries..... 90 Volts—11.5 Ma.

Power Consumption (At 117 volts AC Supply) 28 Watts

Power Output

Battery Operation - - - - 150 Mw. Undistorted, 350 Mw. Maximum
AC Operation - - - - - 200 Mw. Undistorted, 400 Mw. Maximum

Selectivity - 50 KC Broad at 1000 Times Signal

Intermediate Frequency - - - - - 456 KC

Speaker - - - - - - - - 6" P.M. Dynamic

Tuning Frequency Range - - 540 to 1600 KC

Sensitivity (For .05 Watt Output)
External Antenna - - - 10 Microvolts Average

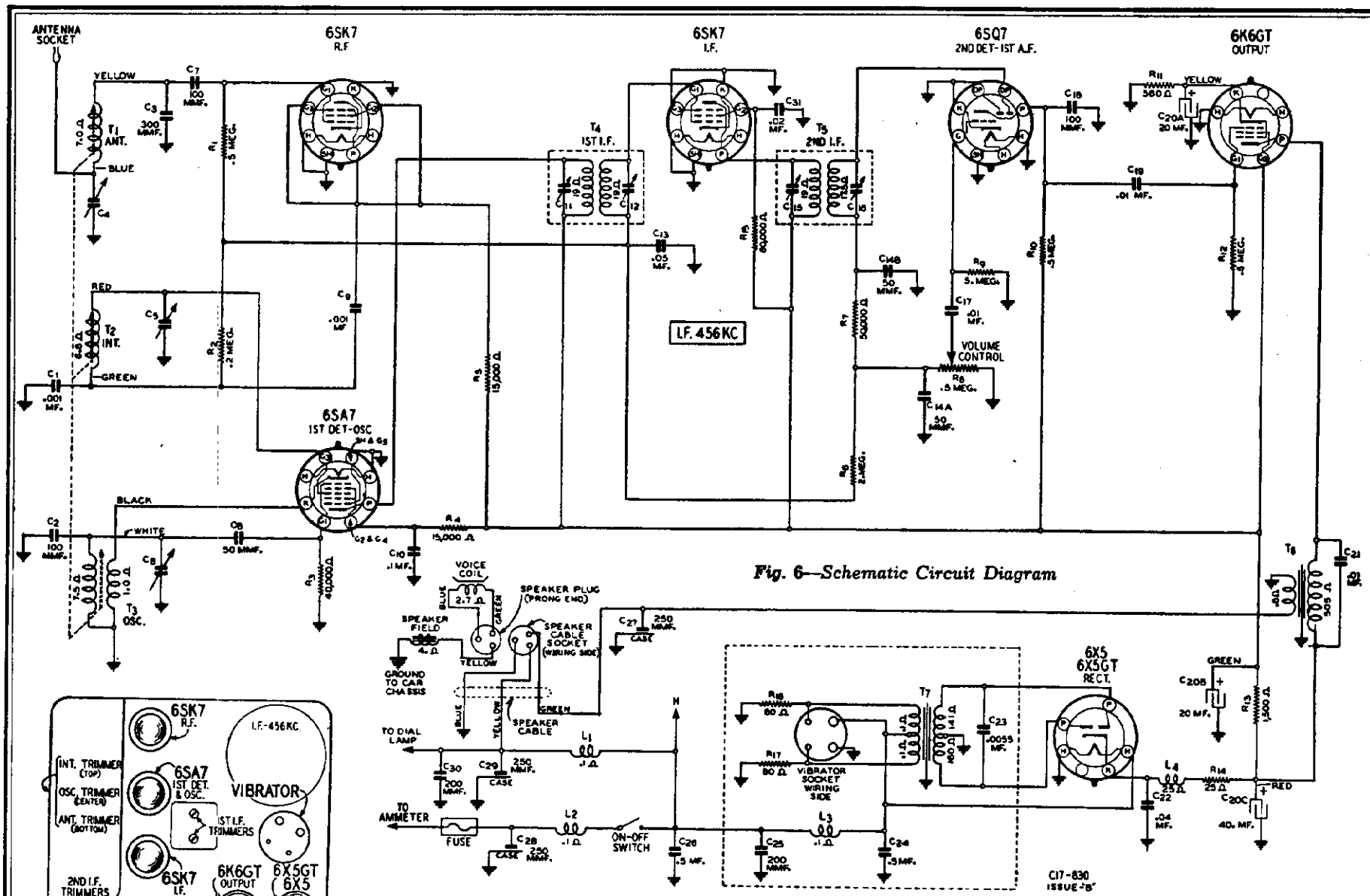


Fig. 6—Schematic Circuit Diagram

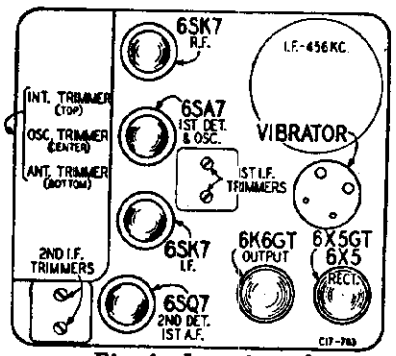


Fig. 4—Location of Tubes and Vibrator

SPECIFICATIONS

Selectivity - -	38 KC Broad at 1000 Times Signal
Tuning Frequency Range - - - -	540 to 1600 KC
Intermediate Frequency - - - - - - - -	456 KC
Speaker - - - - - - - - -	6" Electro-Dynamic
Power Consumption - -	8.2 Amperes at 6.6 Volts
Power Output (6.6 Volts) - - -	3.0 Watts Undistorted 5.5 Watts Maximum
Sensitivity - - - - -	1 Microvolt at 5 Watt Output

MODEL 6C17
MODEL 6C18

WELLS-GARDNER & CO.

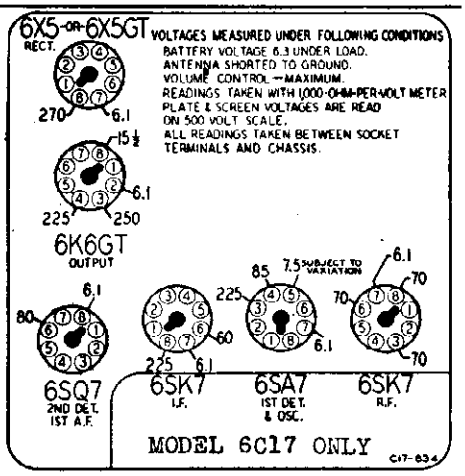
SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	IRON CORE SETTING	ADJUST TRIMMERS TO MAXIMUM (See Figs. 3 and 4)
I.F.				
456 KC	Control Grid (prong No. 8) 6SA7 1st Det. Tube	.05 mf.	Extreme Position out of Coil	1st I.F. (C11) & (C12) 2nd I.F. (C15) & (C16)
OSCILLATOR				
1600 KC	Antenna Cable See Note A	See Note A	Extreme Position out of Coil	Oscillator (C6)
1400 KC ADJUSTMENT				
1400 KC	Antenna Cable	See Note A	Tune to Max. Output with Tuning Knob	Int. (C5) Ant. (C4)

Reassemble Radio—Install in Car—Connect Car Antenna to Radio.

Car Antenna Readjustment—Tune in weak signal near 1400 KC—Readjust Antenna Trimmer C4 for maximum output.

SERIES B CHANGES

To secure improved performance, the following changes are made in issue "B" chassis: The oscillator grid resistor is increased from 20,00 ohms to 40,000 ohms. The R.F. plate resistor is decreased from 20,000 ohms to 15,000 ohms. The R.F. screen is disconnected from the modulator screen and connected to the R.F. plate. In the Series 6C18 only, the modulator screen resistor is increased from 10,000 ohms to 12,000 chms. To permit easier installation, the issue "B" chassis use a socket and plug arrangement for the speaker connection. Issue "A" chassis used pin tips and clips to connect cable to speaker.



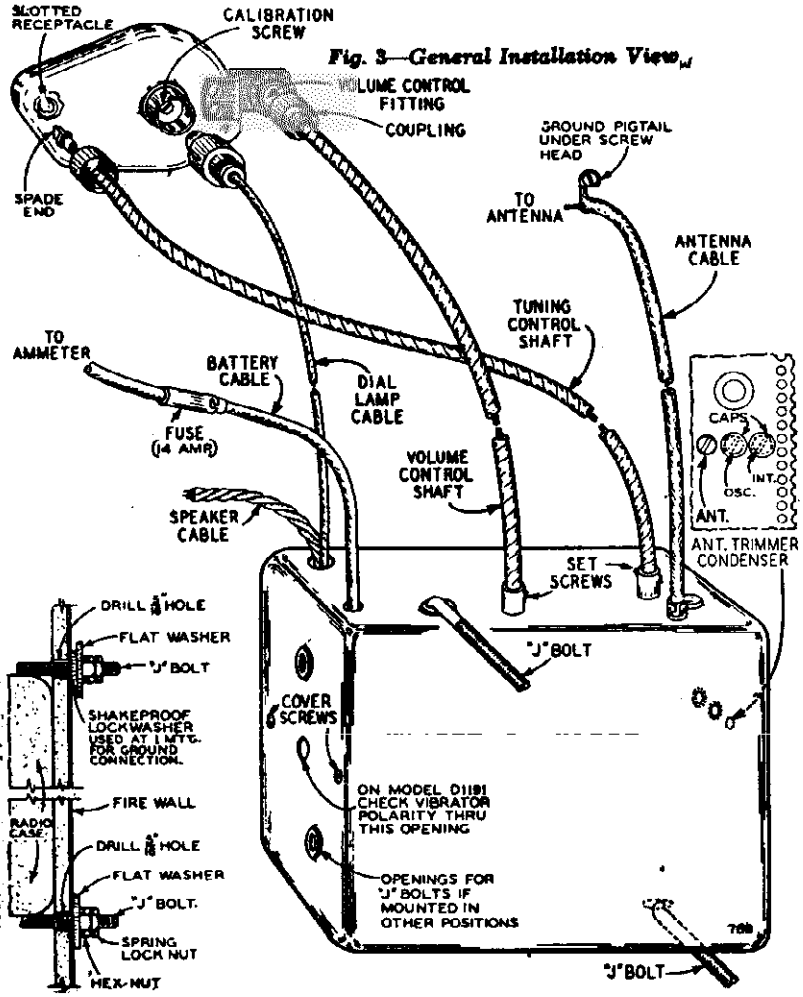


Fig. 3—General Installation View

CALIBRATION—To calibrate the radio, tune in a station of known frequency. At the back of the control unit is the calibration screw. Remove the dial lamp assembly. Insert a fine bladed screwdriver and turn this screw until the pointer on the dial scale is at the frequency of the station being received.

capacity of the antenna cable and dummy antenna should be 60 mmf. If the cable, for example, has a capacity of 30 mmf., use a 30 mmf. condenser for a dummy antenna. Connect the other end of the antenna cable through the dummy antenna capacity to the output of the signal generator.

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—Insert the antenna cable plug in the antenna socket on the chassis. The total

Alignment Procedure:Vol.Cont.Max. all adj.Connect Radio Chassis to ground post of Sig.Gen. with short heavy lead. Allow chassis and Sig. Gen. to "Heat Up" for few minutes. Following equipment is required for alignment: A sig. Gen. which will provide accurately calibrated sig. at the test frequencies. Output indicating meter-Non-metalic Screwdriver.Dummy antenna-.05mf.

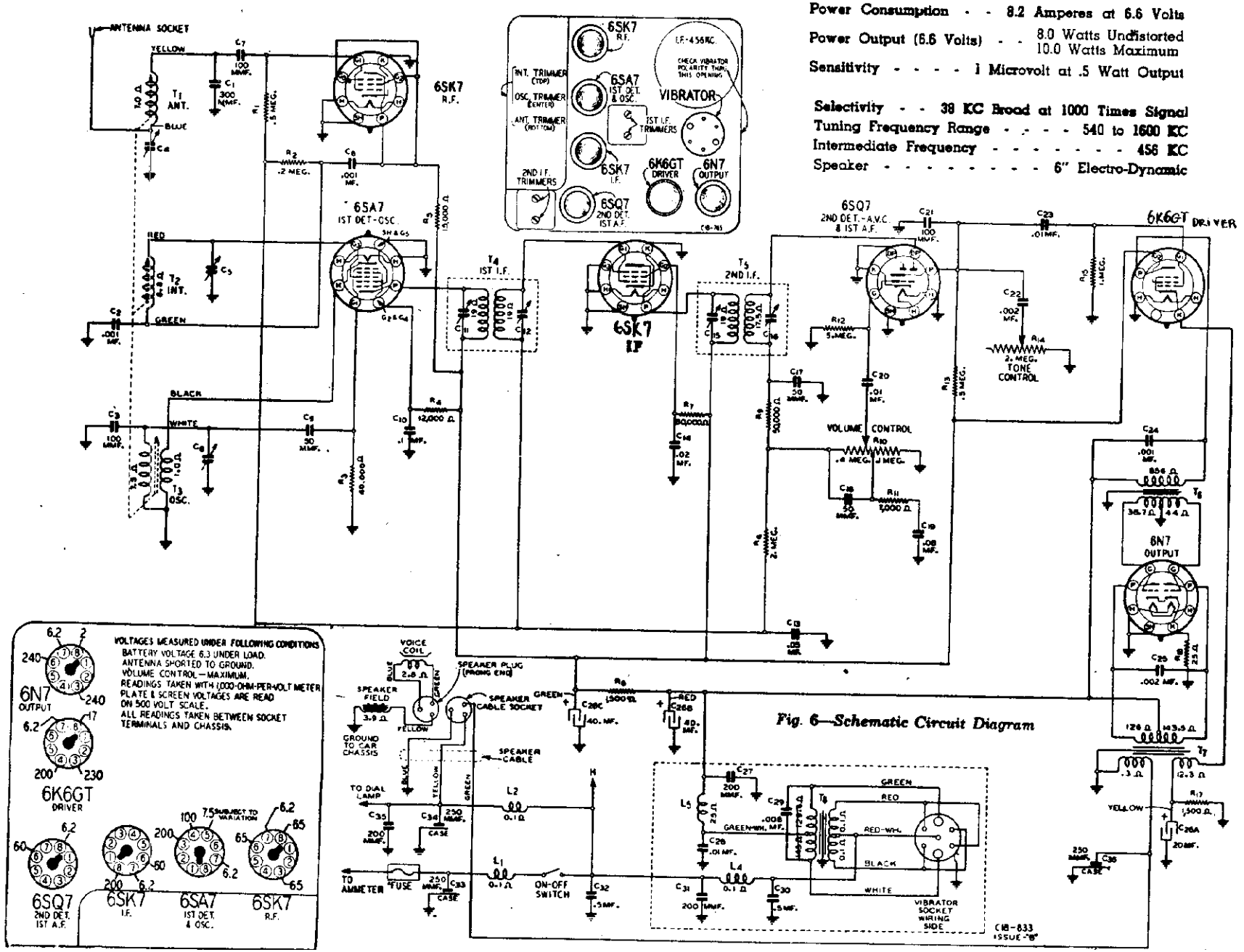
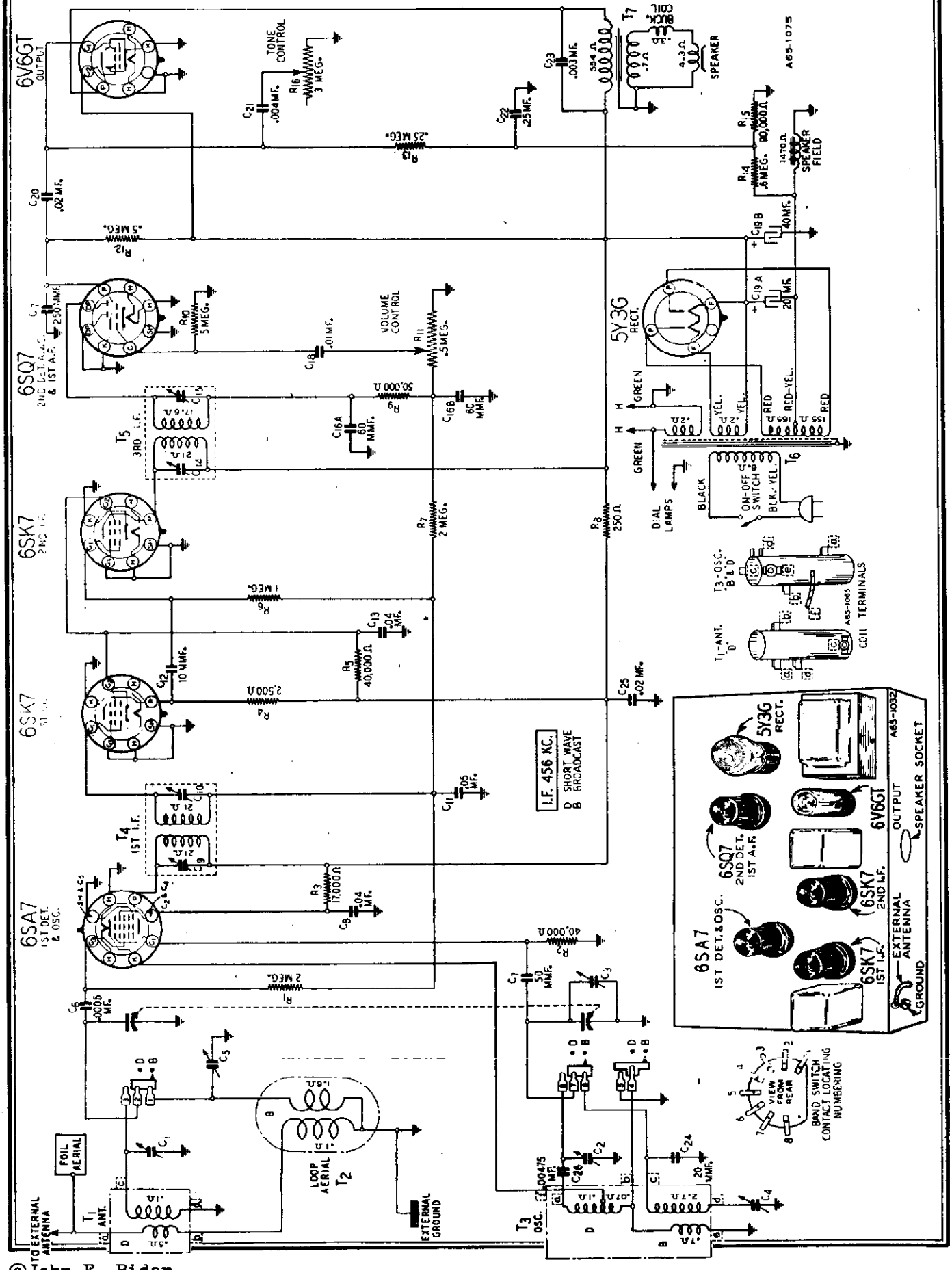


Fig. 6—Schematic Circuit Diagram

MODELS 6A65-3, 6A65-4
6A65 Series

WELLS-GARDNER & CO.



WELLS-GARDNER & CO.

ALIGNMENT PROCEDURE

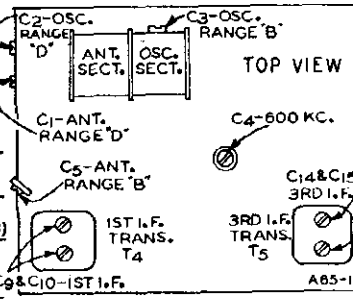
Volume Control—Maximum All Adjustments.

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.

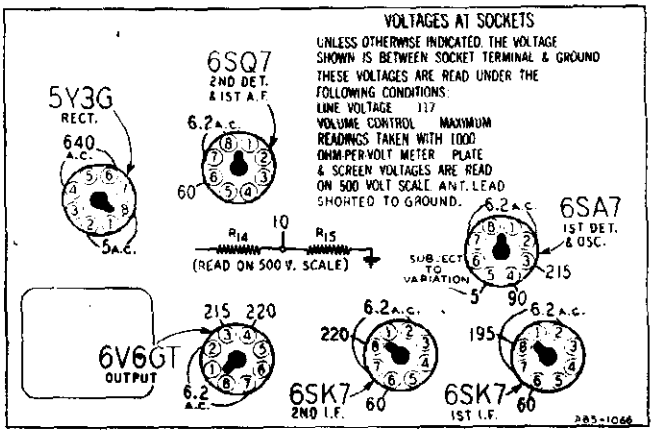
The following equipment is required for aligning:
An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter—Non-Metallic Screwdriver.
Dummy Antennas—.1 mf., 100 mmf., and 400 ohms.

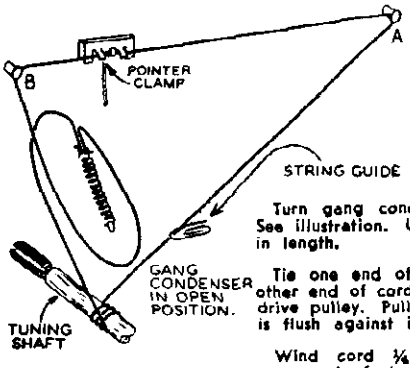
	SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I.F.	456 KC	Signal Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C9) & (C10) 3rd I.F. (C14) & (C15)
RANGE B	1600 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C3)
	1400 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC— See Note A	Ant. Range B (C5)
	600 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C4) Rock Rotor—See Note B
RANGE D	18,300 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C2)
	17,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C1) Rock Rotor—See Note B
LOOP RANGE B	1400 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output	Ant. Range B (C5)



NOTE A—If the pointer is not at 140 on the dial, remove pointer from drive cord. Set pointer at the 1400 KC mark on the scale. Attach pointer to drive cord.

NOTE B—Turn the rotor back and forth adjust the trimmer until the peak of gr intensity is obtained.





DRIVE CORD REPLACEMEN

Turn gang condenser to full open positi See illustration. Use a new drive cord 37 in in length.

Tie one end of cord to tension spring. other end of cord up through hole in groov drive pulley. Pull cord through hole until s is flush against inside of pulley rim.

Wind cord ¼ turn counter-clockwise (gang end of chassis) around drive pulley. wind 3½ turns clockwise (from front of ch around tuning control shaft. These turns s progress away from chassis. Pass cord thr wire string guide and over idler studs A a as shown, then wind cord ¾ turn counter-c wise (from gang end of chassis) around pulley. This turn should be on right side (front of chassis) of pulley groove.

Pass cord through hole in groove of pulley. Tie cord to tension spring. F other end of spring to hook on drive pul

ANTENNA AND GROUND

Two built-in aerials are incorporated in the cabinet.

One of these, the loop aerial, is used for broadcast band reception. The other, a counterpoise foil aerial, is used for reception on the short wave band. For the reception of local or nearby stations, an outside antenna and ground are usually not required.

In general, however, more stations will be heard by using an outside antenna and ground. To receive distant short wave stations, an outside antenna is essential.

If an outside antenna is used, it should be 50 to 60 feet long, including the lead-in.

A good ground connection is recommended if an outside antenna is used. A ground connection may be obtained by connecting to a water pipe, radiator, or a pipe driven into the ground.

Avoid using gas pipes or electrical conduits for grounds.

The ground connection is made under the screw (marked GND) on the back panel of the chassis base.

A wire with an antenna marker will be found coming out of the chassis. If it is desired to operate the radio using the loop and counterpoise foil antennas, do not connect this wire to anything. If it is desired to operate the radio using an outside antenna, connect this wire to the lead from the outside antenna.

The wire which is connected to the counterpoise foil antenna should never be disconnected.

SPECIFICATIONS

Power Consumption
- - - - 60 Watts (At 117 volts 60 cy

Power Output - - - - - 2.5 Watts Undist 3.5 Watts Maxim

Selectivity - - 40 KC Broad at 1000 times S

Intermediate Frequency - - - - - - 45

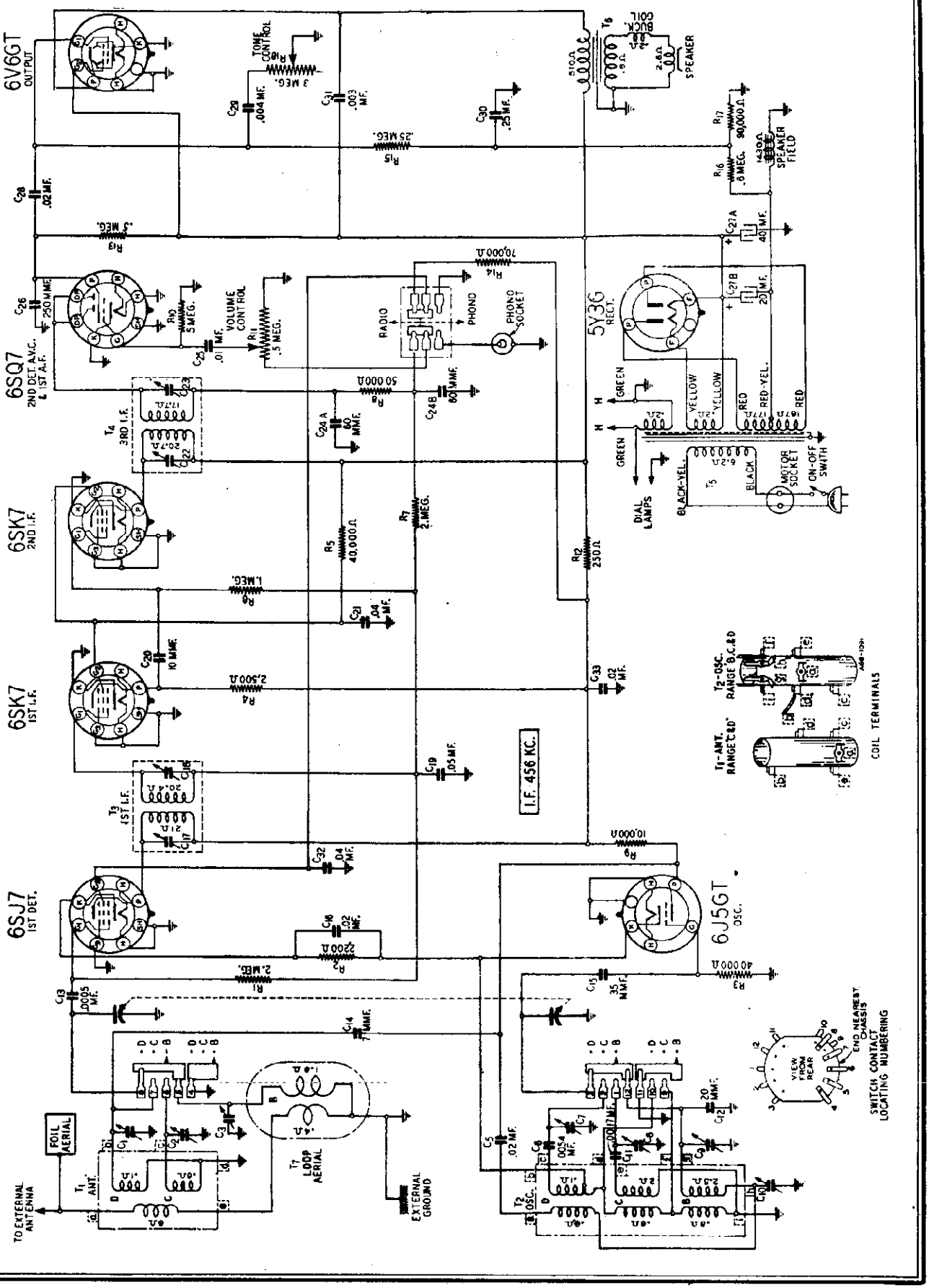
Speaker - - - - - - - 8" Electro-Dy

Tuning Frequency Range
- B Range - - - - - - 528 to 160
- D Range - - - - - - 5750 to 1830

Sensitivity—External Antenna—For 0.5 Watt
- B Range - - - - 4.0 Microvolts A
- D Range - - - - - 10 Microvolts A

MODEL 7A66-2
7A66 Series

WELLS-GARDNER & CO.



MODEL 7A66-
7A66 Series

WELLS-GARDNER & CO.

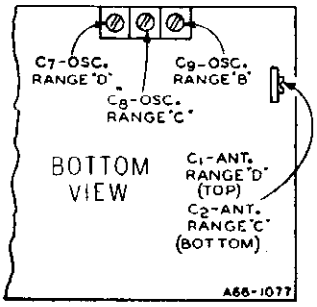
ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

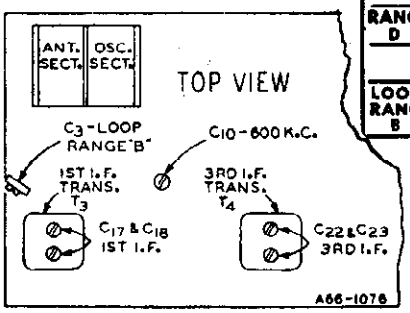
Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.

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., 100 mmf., and 400 ohms.



	SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I.F.	456 KC	Signal Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C17) & (C18) 3rd I.F. (C22) & (C23)
RANGE B	1600 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C9)
	1400 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC— See Note A	Ant. Range B (C3)
	600 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C10) Rock Rotor—See Note B
RANGE C	7000 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Full Open	Oscillator Range C (C8)
	6000 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Max. Output	Ant. Range C (C2) Rock Rotor—See Note B
RANGE D	22,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C7)
	18,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C1) Rock Rotor—See Note B
LOOP RANGE B	1400 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output	Ant. Range B (C3)

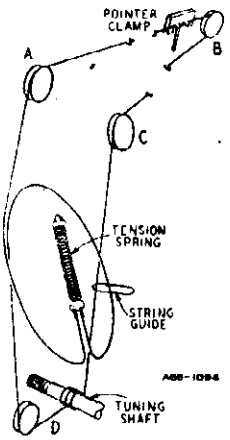


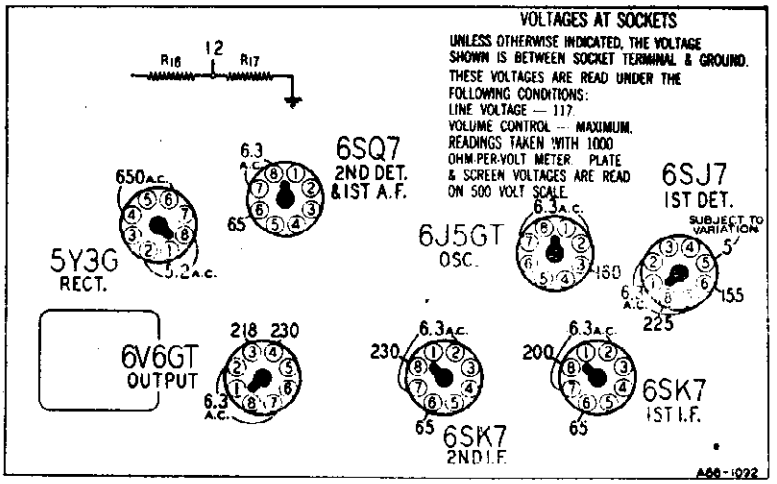
NOTE A—If the pointer is not at 1400 KC on the dial, remove pointer from drive cord. Set pointer at the 1400 KC mark on the dial scale. Attach pointer to drive cord.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

DRIVE CORD REPLACEMENT

Turn gang condenser to full closed position. Using a new drive cord 57" in length, tie one end to tension spring. Fasten other end of tension spring to hook on drive pulley. Pass cord through slot in pulley rim. Wind cord 1/3 turn clockwise (from gang end of chassis) around drive pulley; continue around idler pulleys A, B, and C as shown. Pass cord through wire string guide and wind 3 turns counter-clockwise (from front of chassis) around tuning shaft. These turns should progress away from chassis. Continue cord around idler pulley D and wind ¾ turn clockwise (from gang end of chassis) around drive pulley. Turn should be on left side of pulley groove (from front of chassis). Pass cord through slot in pulley rim. Stretch tension spring and attach free end of cord.





SPECIFICATIONS

Power Consumption - - - - 60 Watts (At 117 volts 60 cycles)

Power Output - - - - - 2.5 Watts Undistorted
3.5 Watts Maximum

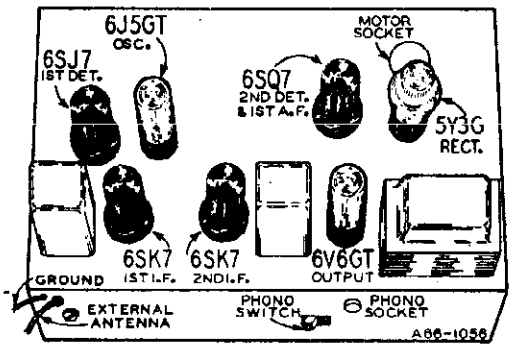
Selectivity - - - 40 KC Broad at 1000 Times Signal

Intermediate Frequency - - - - - - 456 KC

Speaker - - - - - - - 6" Electro-Dynamic

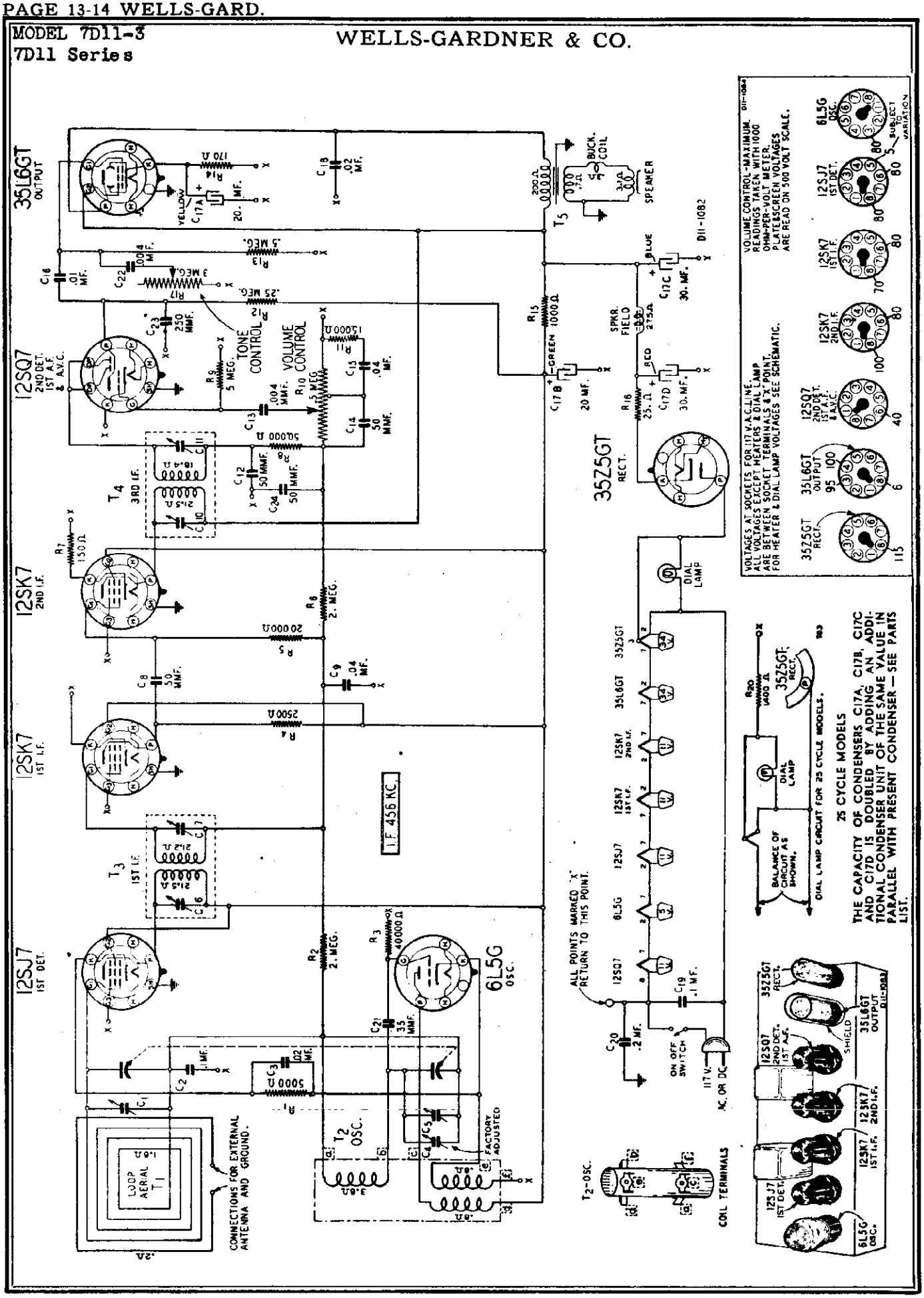
Tuning Frequency Range
B Range - - - - - - - - 528 to 1600 KC
C Range - - - - - - - - - 2.2 to 7.0 KC
D Range - - - - - - - - - 7.0 to 22.0 MC

Sensitivity—External Antenna—For 0.5 Watt output
B Range - - - - - - 4 Microvolts Average
C Range - - - - - - - 7 Microvolts Average
D Range - - - - - - 8 Microvolts Average



MODEL 7D11-3
7D11 Series

WELLS-GARDNER & CO.



WELLS-GARDNER & CO.

MODEL 7D11-
7D11 Series
MODEL 7T5-4

SPECIFICATIONS

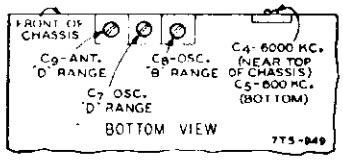
Power Consumption - - - - - 1.60 Amperes at 36 Volts DC
Power Output - - - - - - - - .17 Watt Undistorted
.40 Watt Maximum
Selectivity - - - - - 30 KC Broad at 1000 times Signal
Sensitivity (For .05 watt output)
B Range - - - - - - - 6.0 Microvolts Average
D Range - - - - - - - 8.0 Microvolts Average

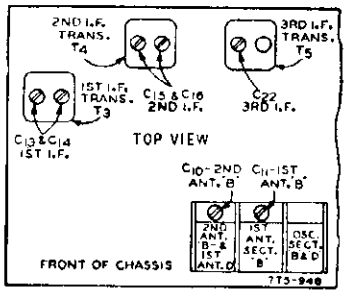
Intermediate Frequency - - - - - - - - - 456 K
Speaker - - - - - - - 6" or 8" Electro-Dynam
Tuning Frequency Range
B Range - - - - - 535 to 1610 KC (Kilocycle
D Range - - - - - 5750 to 18300 KC (Kilocycle

ALIGNMENT PROCEDURE

Volume Control—Maximum 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 provid
an accurately calibrated signal at the test fre
quencies as listed.
Output Indicating Meter—Non-Metallic Screwdriver
Dummy Antennas—.1 mf., 200 mmf., and 400 ohms





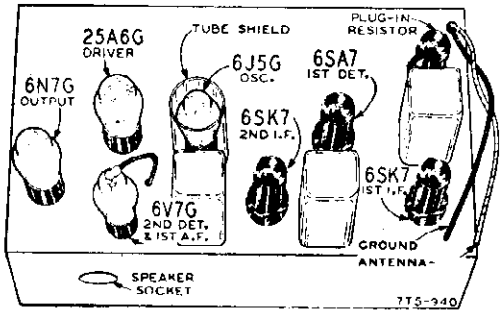
SIGNAL GENERATOR FREQUENCY SETTING	CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I. F.					1st I.F. (C13) & (C14) 2nd I.F. (C15) & (C16) 3rd I.F. (C22)
456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	
RANGE B					
1610 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C8)
1500 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1500 KC— See Note A	1st Ant. Range B (C11) 2nd Ant. Range B (C10)
600 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C5) Rock Rotor—See Note B
RANGE D					
18,300 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C7
16,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C9) Rock Rotor—See Note B
6000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	6000 KC (C4) Rock Rotor—See Note B

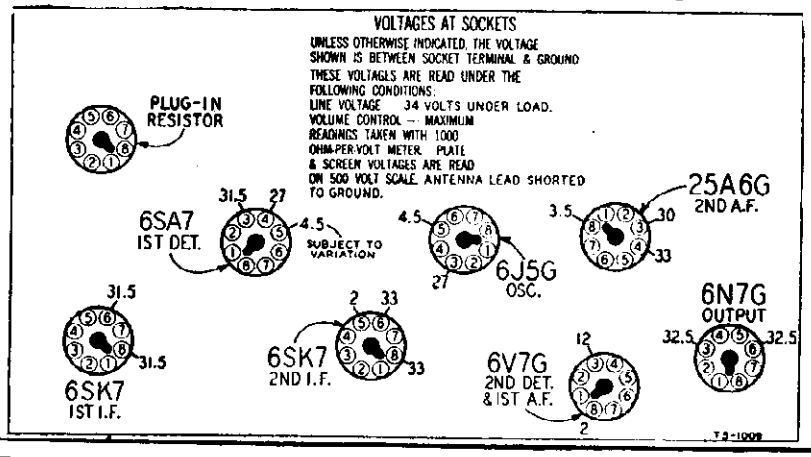
After each range is completed, repeat the procedure as a final check.
NOTE A—If the pointer is not at 1500 KC on the dial, remove pointer from drive cord. Set pointer at the 1500 KC mark on the dial scale. Attach pointer to drive cord.
NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

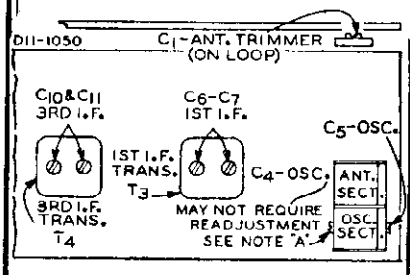
LINE VOLTAGE RANGE

The radio will operate satisfactorily within a line voltage range of 25 to 42 volts. 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.

7T5-4







SPECIFICATIONS

Power Consumption ..... 28 Watts
(At 117 volts AC Supply)
Power Output ..... .75 Watt Undistorted
1.3 Watts Maximum
Selectivity ..49 KC Broad at 1000 times Signal
Intermediate Frequency ..... 456 KC
Speaker ..... 5" Electro-Dynamic
Tuning Frequency Range 528 to 1610 KC
Sensitivity (For .05 watt output)—External Ant. 9 Microvolts Average

7D11, 7D11-3

ALIGNMENT PROCEDURE

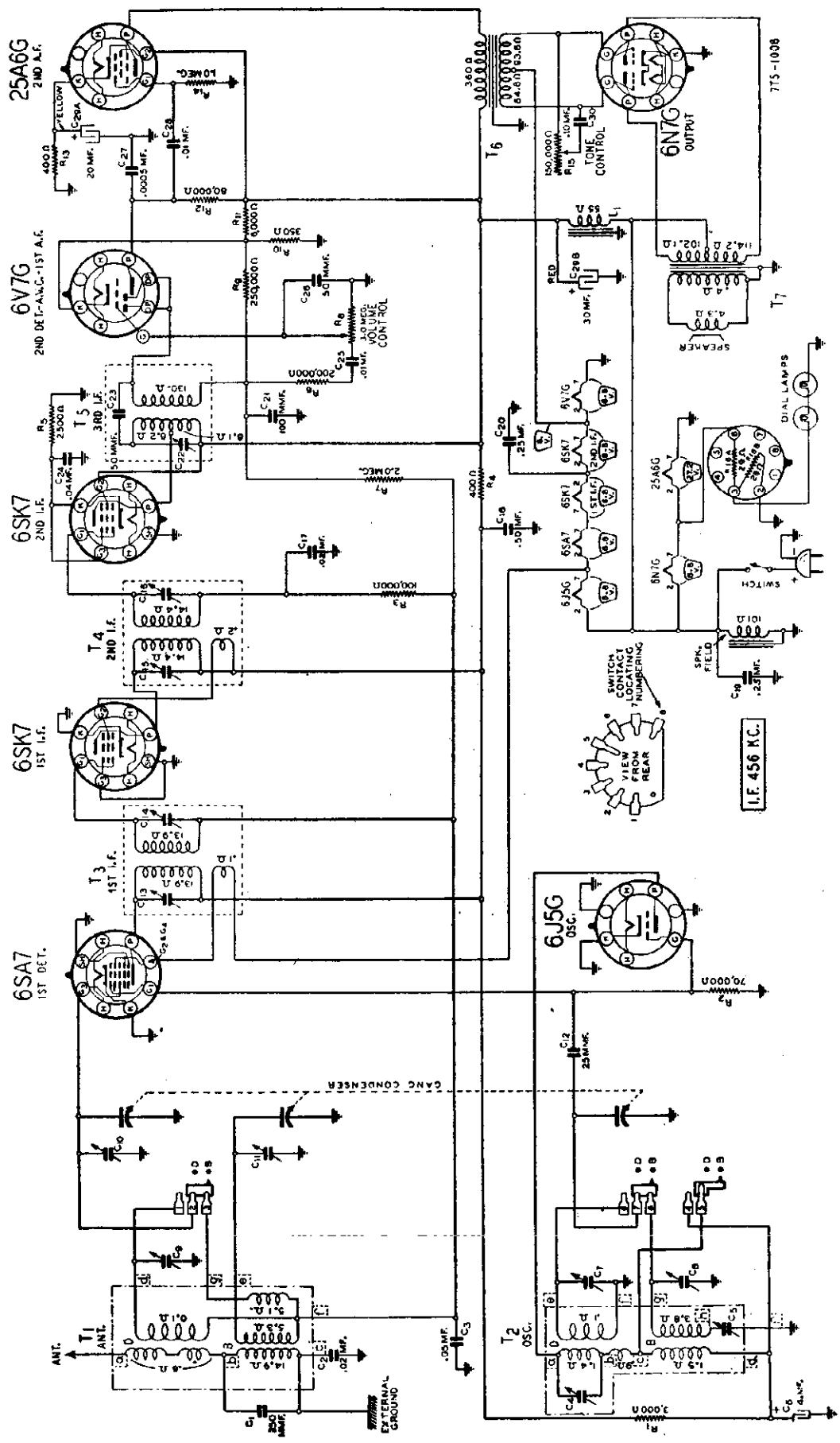
Volume Control—Maximum All Adjustments.
Allow Chassis and Signal Generator to "Heat-Up" for several minutes.
The equipment in column at right is required for aligning:

Signal Generator which will provide an accurately calibrated signal at test frequencies as listed.
Output Indicating Meter; Non-Metallic Screwdriver.
Dummy Antennas—.1 mf., 200 mmf.

SIGNAL GENERATOR FREQUENCY SETTING	ANTENNA CONNECTION	GROUND CONNECTION	DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration)
I.F.					
456 KC	Signal Grid of 1st Det. Connect at Stator of Large Gang Section.	Point "X" 12SQ7— 1st A.F. Prong No. 3	.1 mf.	Turn Rotor to Full Open	1st I.F. (C6) & (C7) 3rd I.F. (C10) & (C11)
1610 KC	Signal Grid of 1st Det.	Point "X"	.1 mf.	Turn Rotor to Full Open	Oscillator (C5) See Note A
1400 KC	External Antenna Clip	External Ground Clip	200 mmf.	Turn Rotor to Max. Output Set Indicator to 1400 KC— See Note B	Antenna (C1)

MODEL 7T5-4

WELLS-GARDNER & CO.



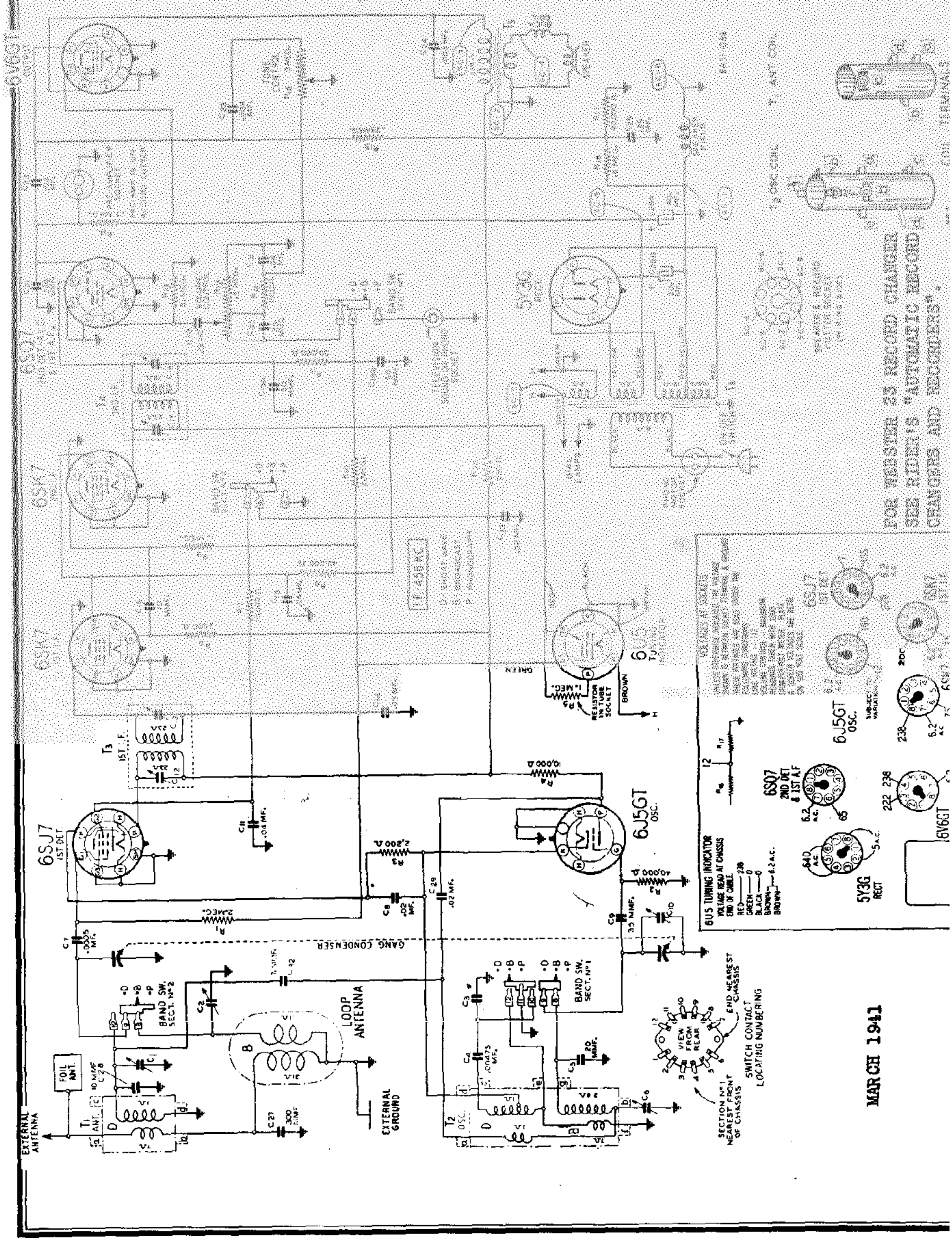
Polarity of 32 Volt Power Supply—Insert plug so that prong on same side as *ribbed* side of cord is on the positive side of the line.

If the polarity of the line is not known, insert plug. If the tubes light but no sounds are heard from the speaker after the plug has been in one minute, reverse the plug.

32 VOLT POWER SUPPLY

This radio is designed for use on farms and in those places where the power supply consists of a 32 volt direct current generating plant. The radio may not be satisfactory on plants which do not use storage batteries.

WELLS-GARDNER & CO.



FOR WEBSTER 23 RECORD CHANGER
SEE RIDER'S "AUTOMATIC RECORD
CHANGERS AND RECORDERS".

MARCH 1941

MODELS 8A51-3, 8A51-4

WELLS-GARDNER & CO.

ALIGNMENT PROCEDURE

Volume Control—Maximum 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., 100 mmf., and 400 ohms.

	SIGNAL GENERATOR			BAND		
	FREQUENCY SETTING	CONNECTION AT RADIO	DUMMY ANTENNA	SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I.F.	456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C12) & (C13) 3rd I.F. (C17) & (C18)
RANGE B	1600 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C10)
	1400 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC See Note A	Ant. Range B (C2)
	600 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C6) Rock Rotor—See Note B
RANGE D	18,300 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C3)
	17,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C1) Rock Rotor—See Note B
LOOP RANGE B	1400 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output	Ant. Range B (C2)

After each range is completed, repeat the procedure as a final check.

NOTE A—If the pointer is not at 1400 KC on the dial, remove pointer from drive cord. Set pointer at the 1400 KC mark on the dial scale. Attach pointer to drive cord.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

SPECIFICATIONS

Power Consumption - 60 Watts (At 117 volts 60 cycles)
80 Watts (Phonograph Operating)

Power Output - - - - - - - - - 2.5 Watts Undistorted
3.5 Watts Maximum

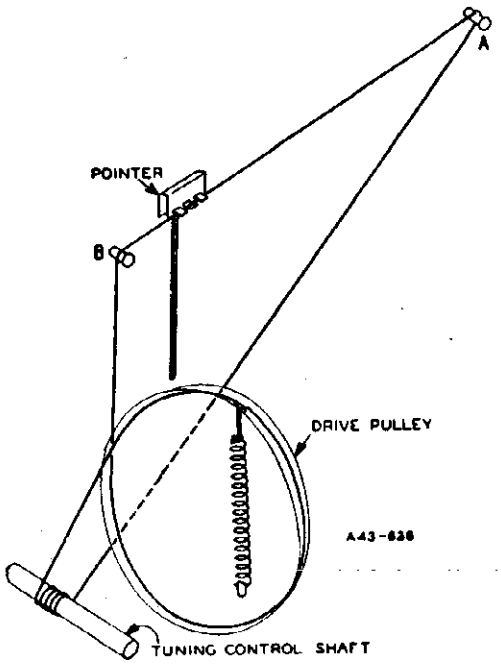
Selectivity - - - - 40 KC Broad at 1000 times Signal

Intermediate Frequency - - - - - - - - - - 456 KC

Speaker - - - - - - - 10" or 12" Electro-Dynamic

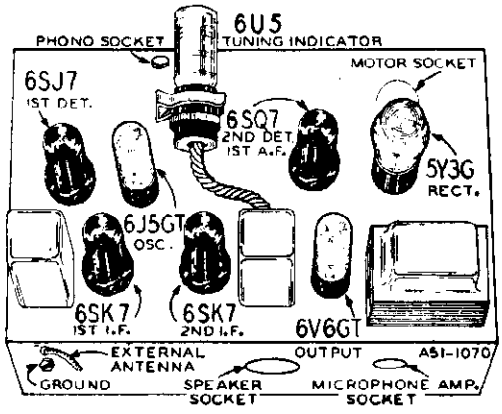
Tuning Frequency Range
B Range - - - - - - - - - 528 to 1600 KC
D Range - - - - - - - - - 5750 to 18300 KC

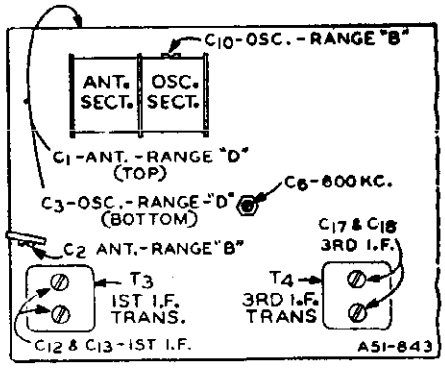
Sensitivity—External Antenna—(For 0.5 Watt output)
B Range - - - - - - - 2.0 Microvolts Average
D Range - - - - - - - 4.0 Microvolts Average

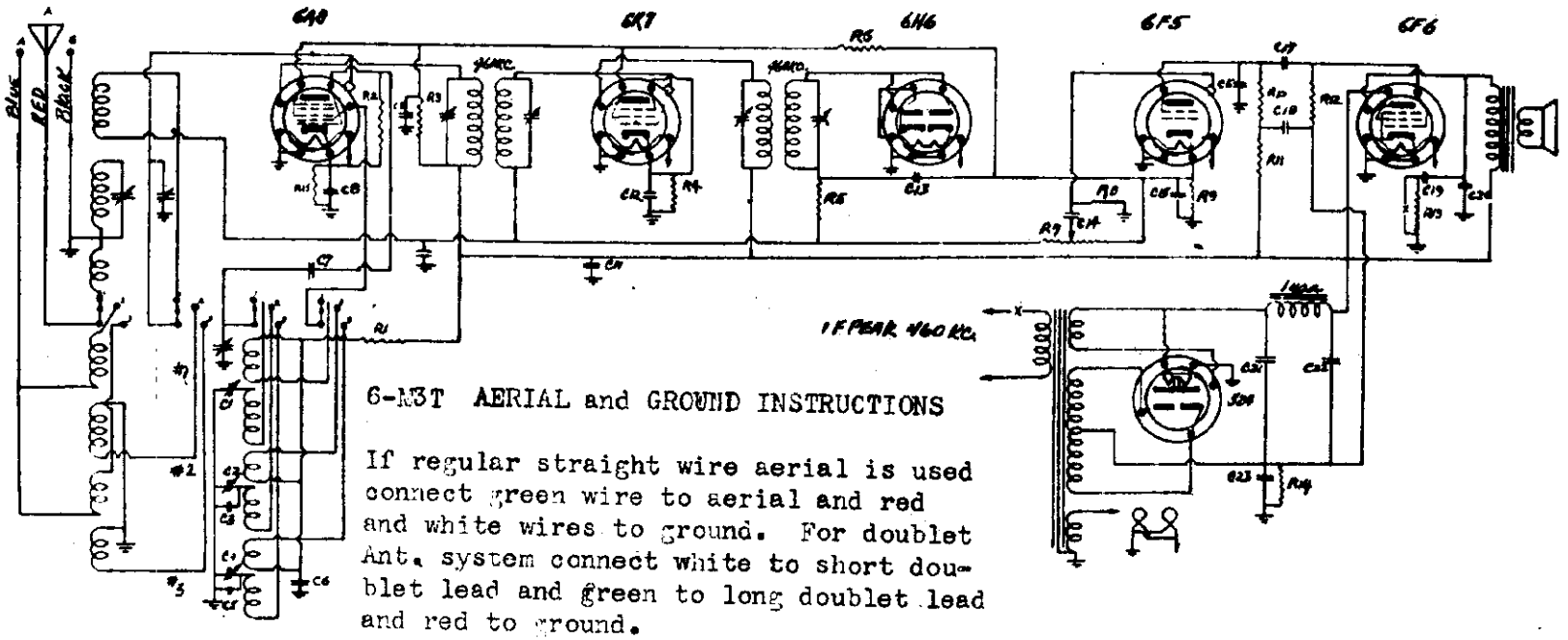


DRIVE CORD REPLACEMENT

Turn gang condenser to full open position — See illustration. Use a new drive cord 42 inches in length.







6-M3T AERIAL and GROUND INSTRUCTIONS

If regular straight wire aerial is used connect green wire to aerial and red and white wires to ground. For doublet Ant. system connect white to short doublet lead and green to long doublet lead and red to ground.

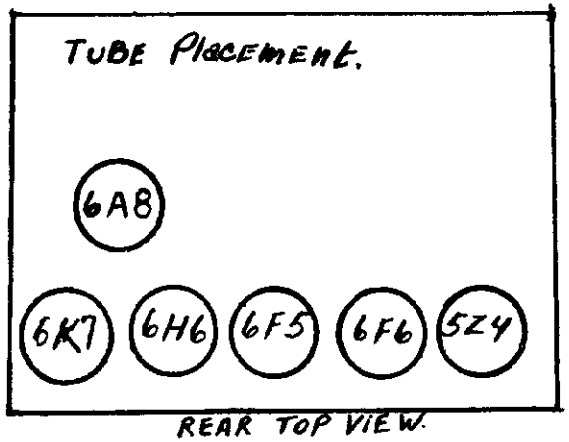
CONDENSERS

C6-C9-C11	1	MFD.	400volts
C10	.1	"	200V
C14-C17	.02	"	600V
C8-C12	.05	"	200V
C18	.25	"	400V
C23	.10	"	30V
C20	.006	"	800V
C15	.01	"	200V
C19	.03	"	600V
C3	.00075	"	Mica 3%
C5	.002	"	" 3%
C7	.0001	"	" 10%
C13	.00025	"	" 10%
C16	.001	"	" 10%

C21-C22 8Mfd.450V filter cond.
C1-C2 500 MMfd.Variable padder.
C4 1000 " " "

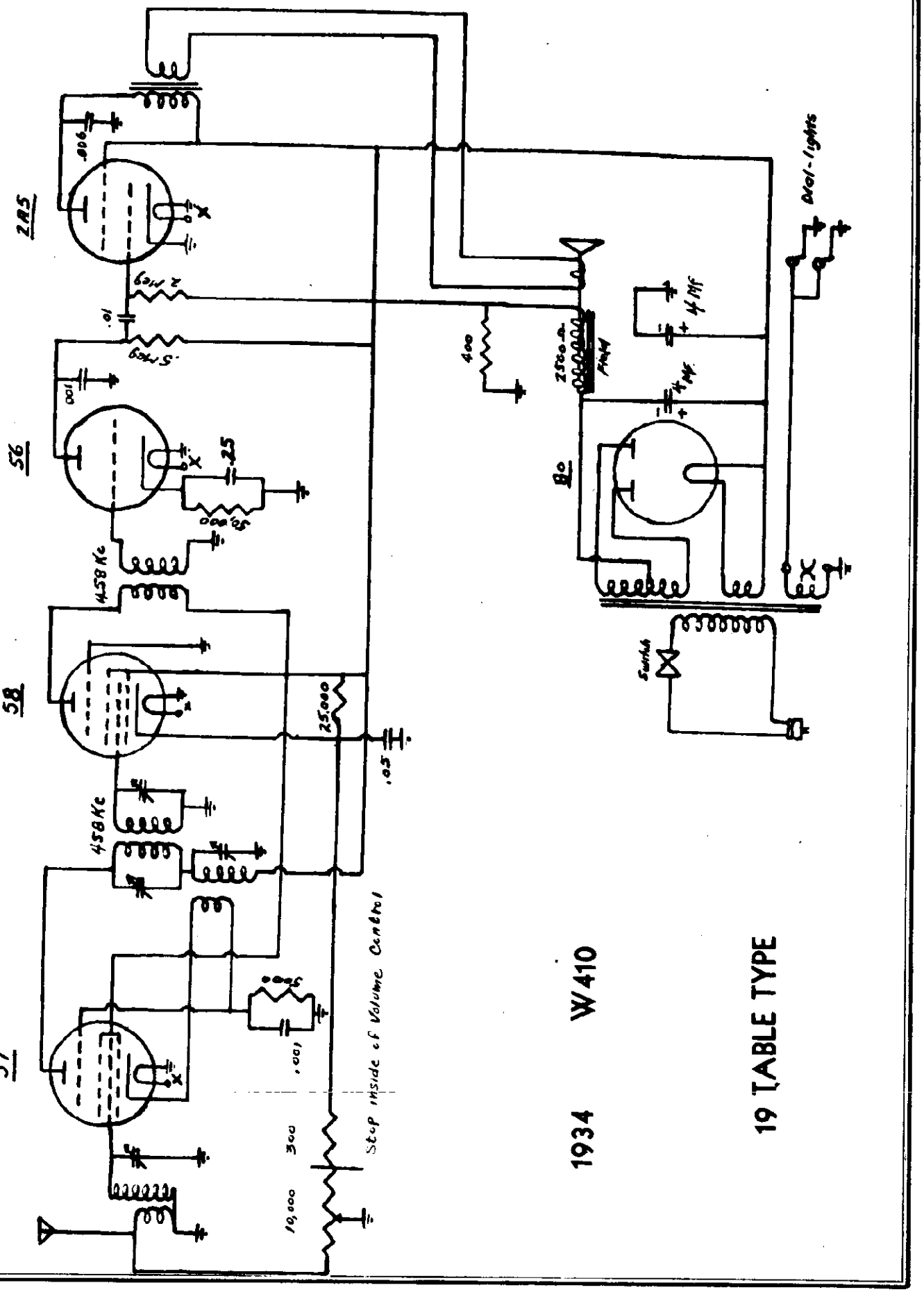
RESISTORS

R1, R13	20,000 ~	½Watt carbon
R3	10,000 ~	2watt carbon
R4, R15	200 ~	wire wound
R8	100,000 ~	1/3 watt carbon
R2	40,000 ~	" " "
R5	500000 ~	½ " "
R6	12,000 ~	1 " "
R7	200000 ~	Vol. Control
R9	100 ~	wire wound
R10, R11	70,000 ~	1/3 watt carbon
R12	1Meg.1/2	
R14	250 condohm	2 watt.



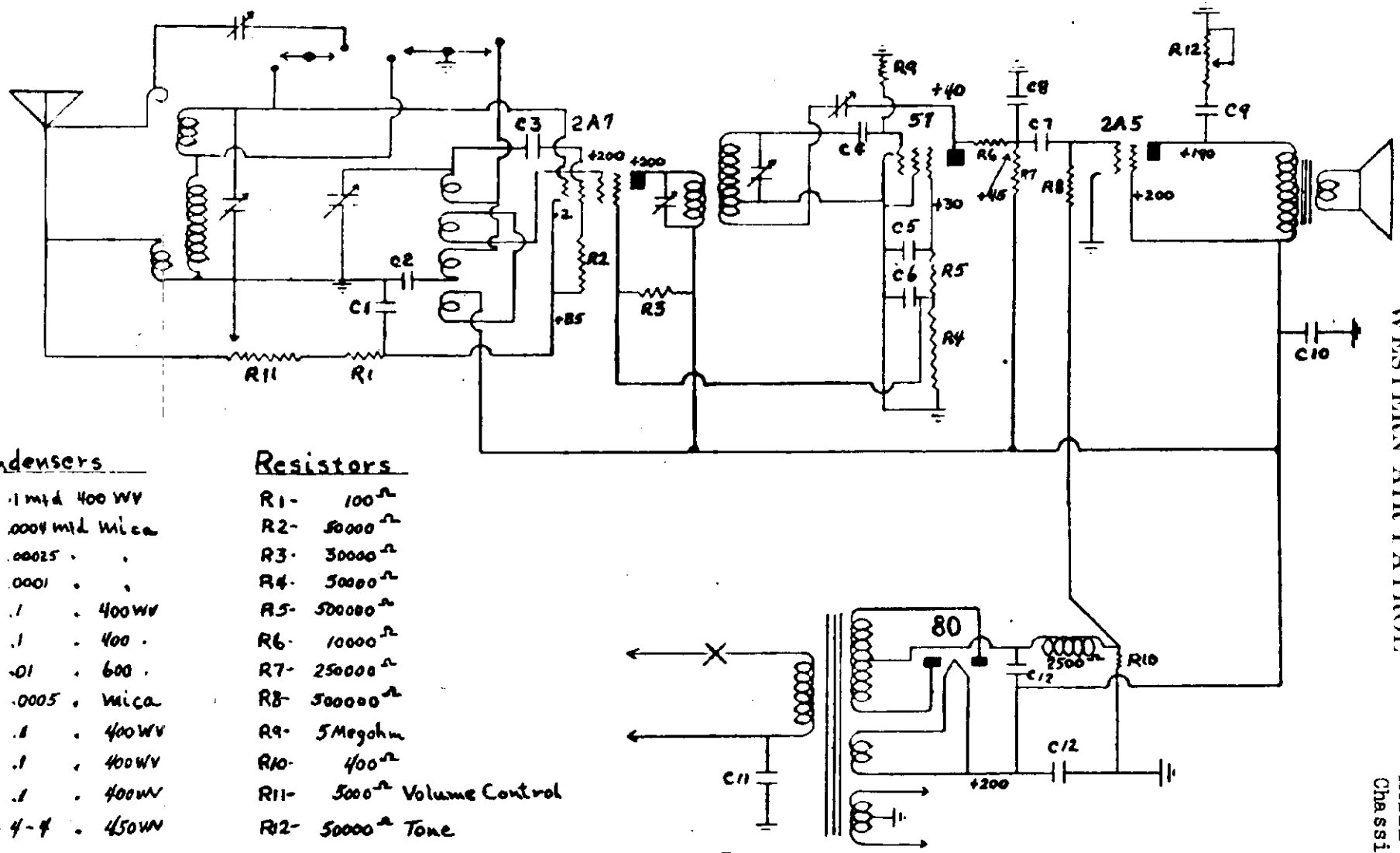
MODEL 19 Table
Chassis W140

WESTERN AIR PATROL



1934 W410

19 TABLE TYPE



Condensers

C1-	.1	mfd 400 WV
C2-	.0004	mfd Mica
C3-	.00025	" "
C4-	.0001	" "
C5-	.1	" 400WV
C6-	.1	" 400 "
C7-	.01	" 600 "
C8-	.0005	" Mica
C9-	.1	" 400WV
C10-	.1	" 400WV
C11-	.1	" 400WV
C12-	4-4	" 450WV

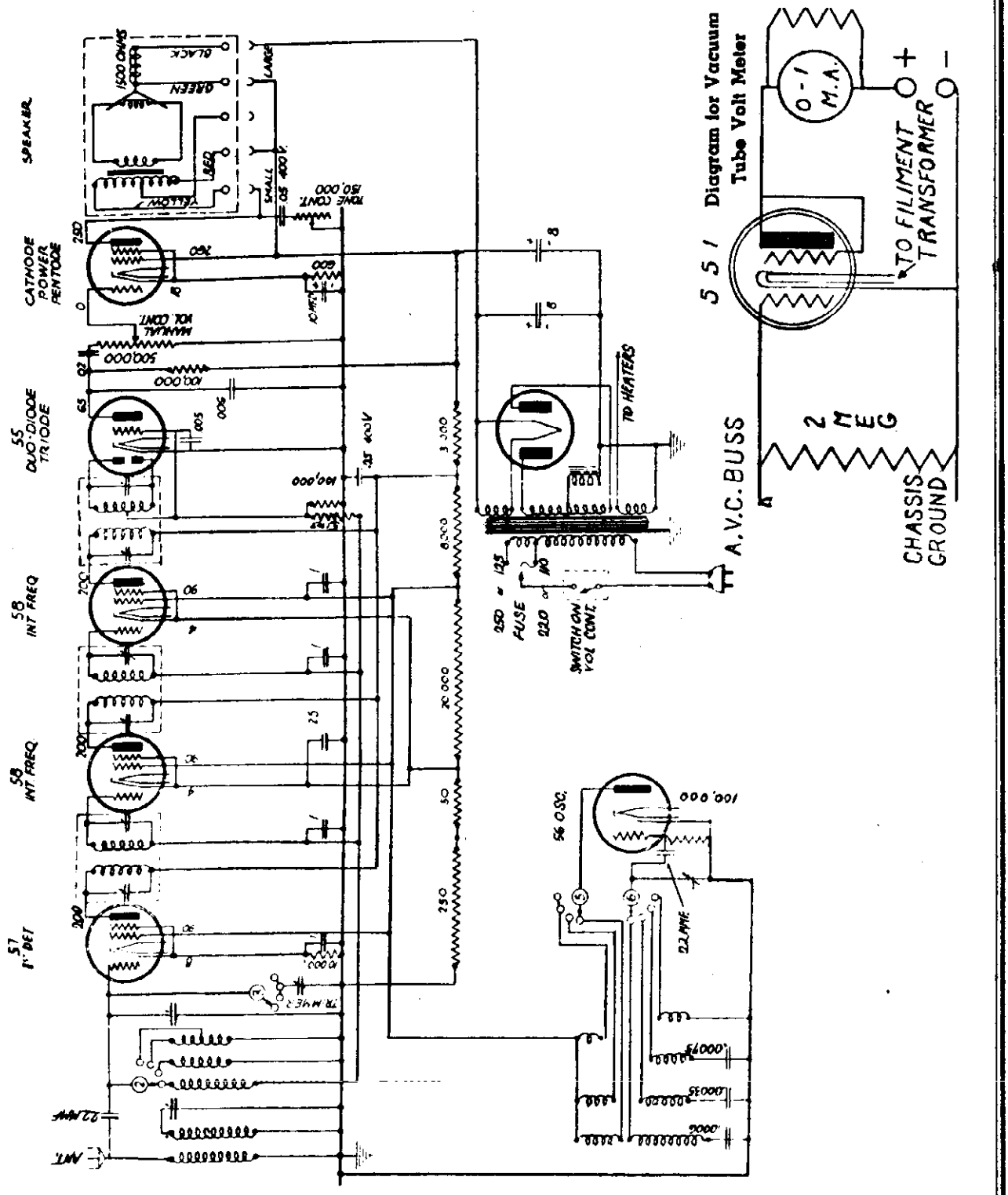
Resistors

R1-	100	Ω
R2-	50000	Ω
R3-	30000	Ω
R4-	50000	Ω
R5-	500000	Ω
R6-	10000	Ω
R7-	250000	Ω
R8-	500000	Ω
R9-	5	Megohm
R10-	400	Ω
R11-	5000	Ω Volume Control
R12-	50000	Ω Tone

Model 31 1933

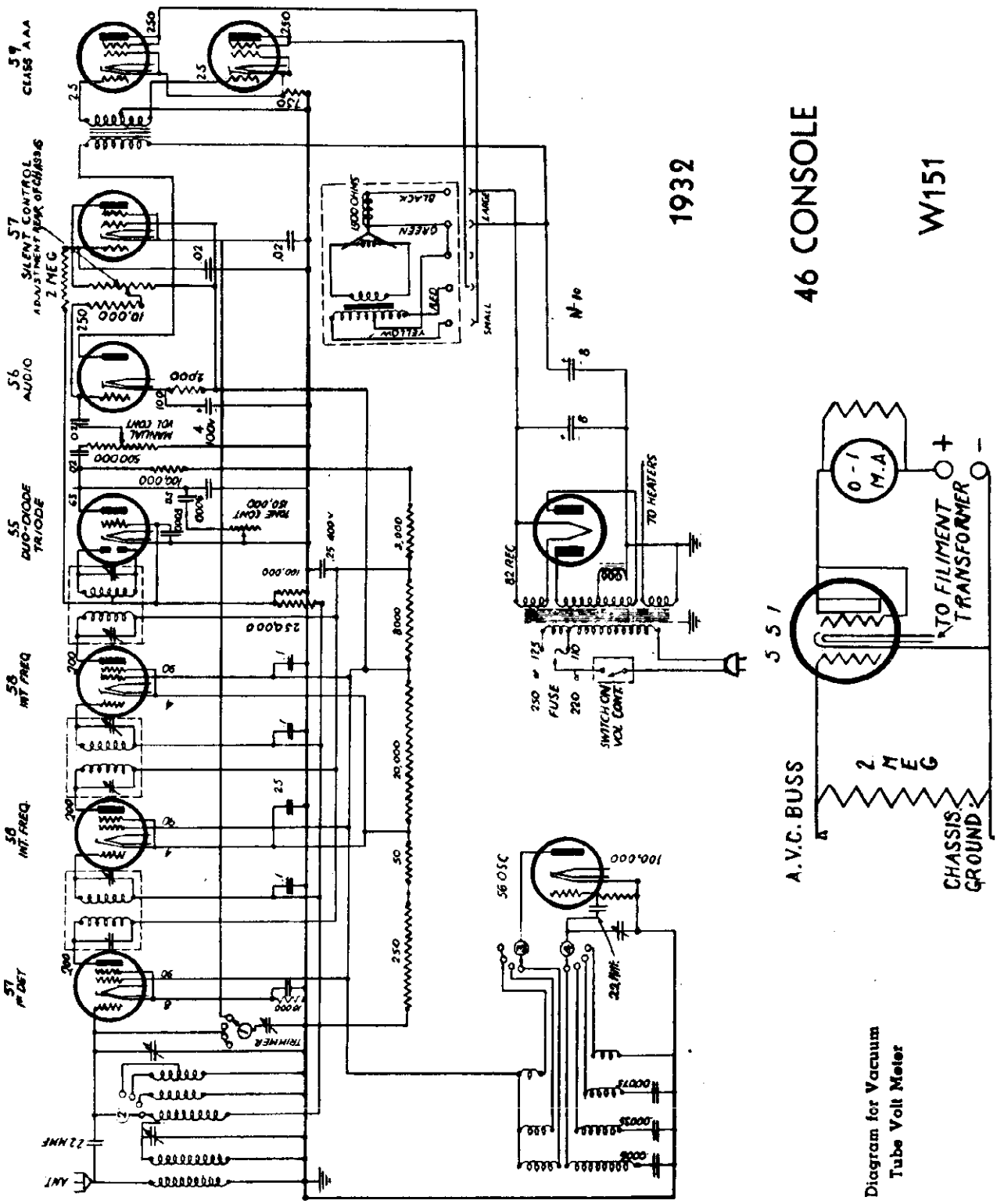
MODEL 44 Table
Chassis W157

WESTERN AIR PATROL



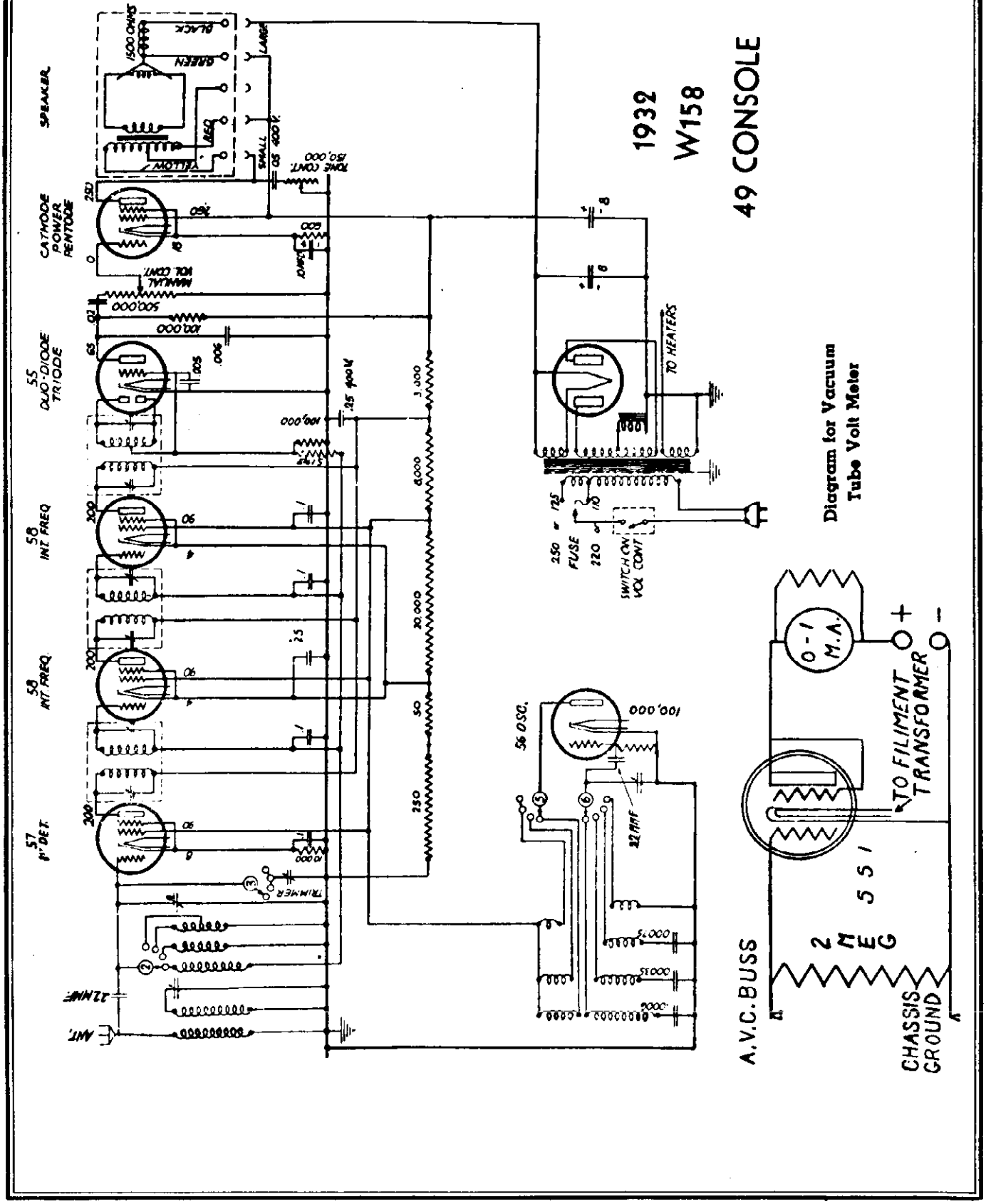
MODEL 46
Chassis W15

WESTERN AIR PATROL



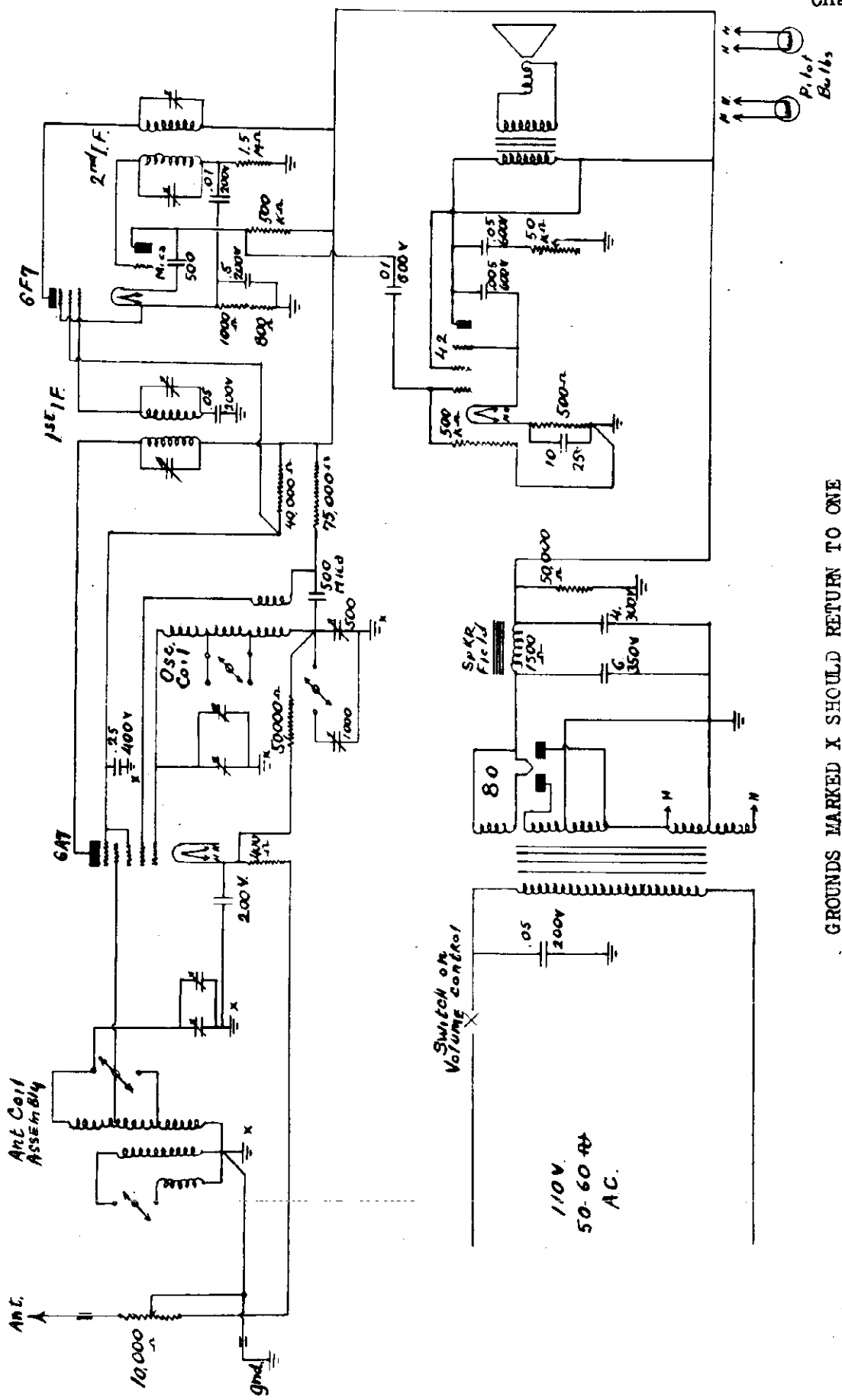
MODEL 49 Console
Chassis W158

WESTERN AIR PATROL



WESTERN AIR PATROL

MODEL 51
Chassis W40



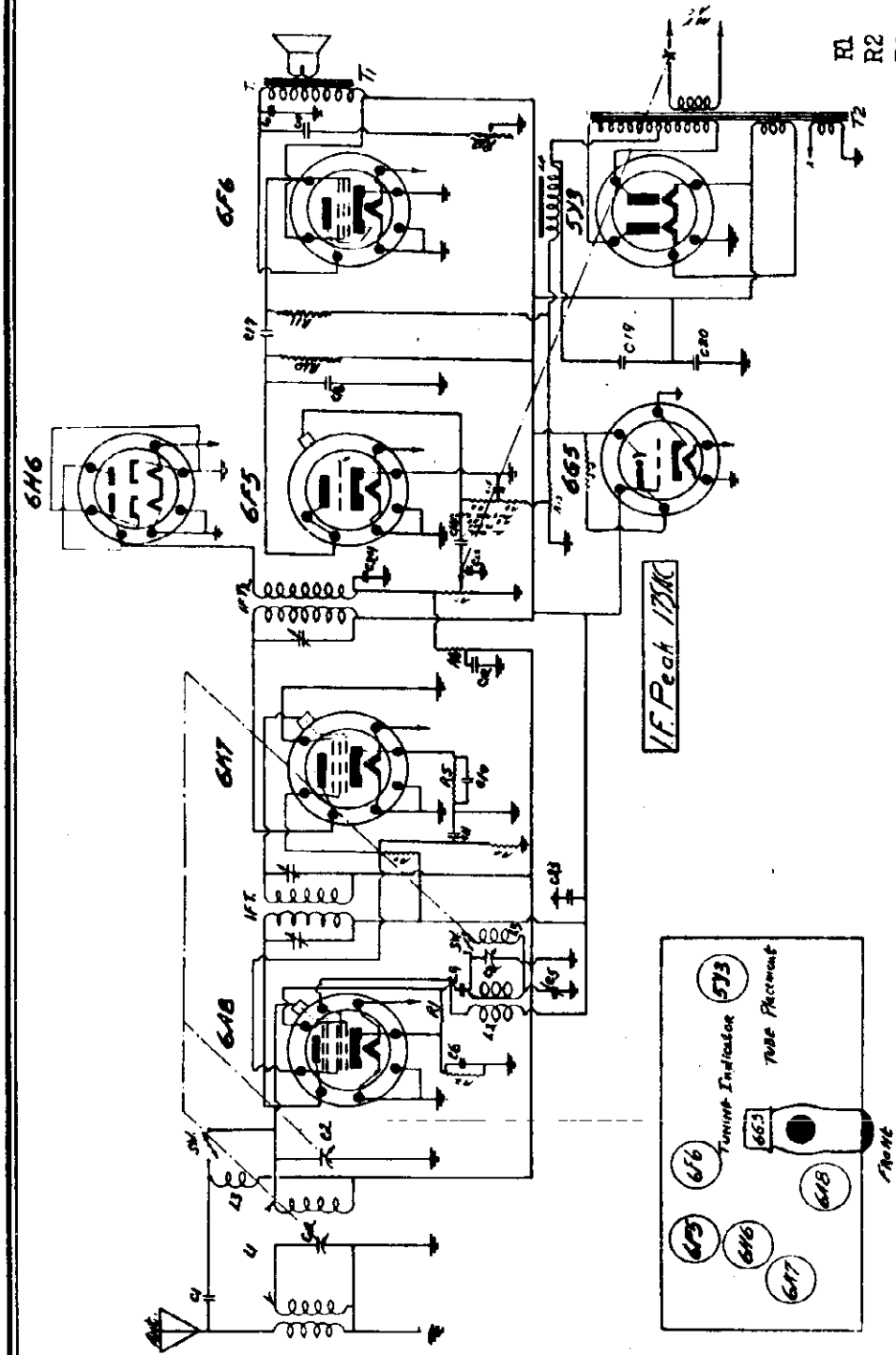
GROUNDS MARKED X SHOULD RETURN TO ONE POINT ON THE CHASSIS SHORTWAVE SWITCH SHOWN ON BROADCAST POSITION.

MODEL 66
Chassis W486

WESTERN AIR PATROL

CONDENSERS	
C1	.000022 MFD
C2	Variable Cond.
C4	.00005 MFD
C5	500 MMFD
C6	.1 MFD
C10	.1MFD
C11	.1 MFD
C12	.1MFD
C14	.02 MFD
C15	.1 MFD
C16	.0003 MFD
C17	.02 MFD
C18	.05 MFD
C19	8 MFD }
C20	4 MFD }
C21	.006 MFD
C22	.00025 MFD
C23	.25 MFD
C24	.001 MFD

RESISTORS	
R1	60,000Ω wire wound
R2	100 Ω
R3	30,000 Ω
R4	50,000 Ω
R5	100 Ω
R6	50,000 Ω
R7	500,000 Ω
R8	1 Meg.
R9	100,000 Ω
R10	250,000 Ω
R11	1 Meg.
R12	50,000Ω tone Cont.
R13	360,40 Ω
R14	1 Meg.(in tube socket)

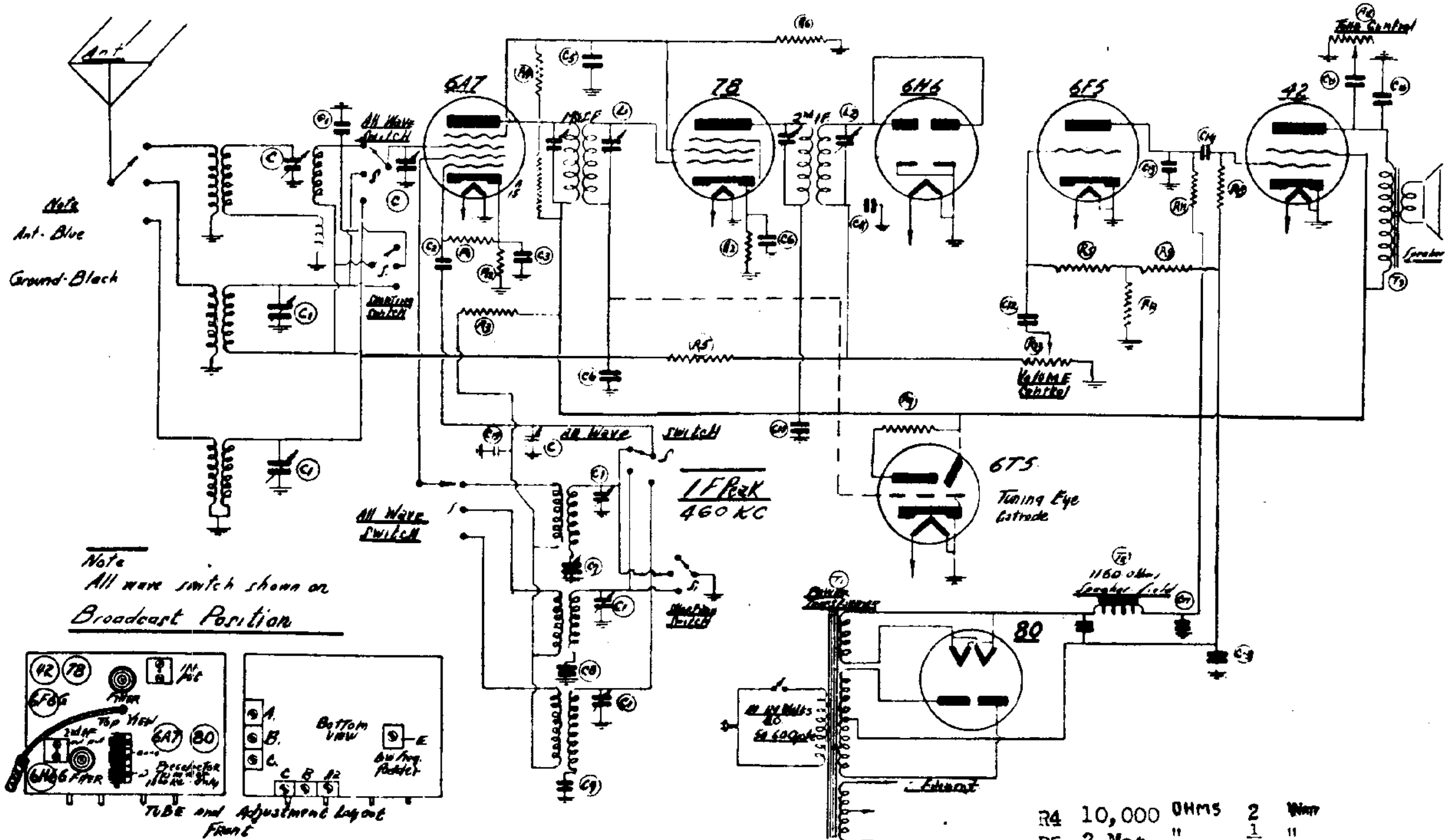


KNOB LAYOUT

1 - Band Selector
2 - Station Selector
3 - Volume Control
4 - Tone Control

Blue Wire - Antenna
Black Wire - Ground

WESTERN AIR PATROL



CODE	CONDENSERS															
C1	3-30	MMF.		C8	.003	MFD.	400V	C16	.01	MFD.	600V	R4	10,000	OHMS	2	Watt
C2	.00005	MFD.		C9	.003	"	600V	C17	8	"	450WV	R5	2 Meg.	"	1/4	"
C3	.05	"	200V	C10	.25	"	400V	C18	10	"		R6	50,000	"	1	"
C4	.0005	"		C11	.00025	"		C	Variable 3 gang. cond			R7	1 Meg.	"	1/4	"(in 6T5socket)
C5	.1	"	400V	C12	.01	"	400V	C19	.05		400V	R8	1 Meg.	"	1/4	"
C6	.05	"	200V	C13	.0001	"		R1	60,000	Ohms	1/4 watt	R9	350	"	1	"
C7	500	MMF		C14	.01	"	800V	R2	200	"	" "	R10	30	"	1/2	"
				C15	.02	"	"	R3	15,000	"	" "	R11	250	"	1/4	"
												R12	50,000	"	Tone Control	
												R13	500000	"	Volume Cont.	

MODEL 77
Chassis W481

WESTERN AIR PATROL

ALIGNMENT AND CALIBRATION

This radio was 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 460, 1715, 1300, 600, 5400, 9000, 14400, 16200, 17400 and 18000 K.C. and an output indicating meter or V.T. volt 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 proceedure is as follows:

I.F. AMPLIFYER ADJUSTMENT

Adjust signal generator to give proper output at 460 K.C. Connect the output of the signal generator to the antenna of the receiver.

Connect the ground lead of the receiver to the ground post of the signal generator.

Turn the band switch to Range A. position (Standard wave band). Connect the vacuum tube volt meter to the A.V.C. buss of the receiver and adjust trimmers in the I.F. stage to resonance.

RANGE A ALIGNMENT
525 to 1750 K.C.

Turn the rotor of the tuning condenser to full maximum position. Set both ends of pointer to true horizontal line.

1.

Turn pointer to 1712 K.C. and set signal generator output to 1712 K.C. and adjust oscillator high frequency trimmer "A1" for maximum output.

2.

Turn pointer to 600 K.C. and adjust signal generator to 600 K.C. output.

Then use low frequency trimmer "E" and adjust for maximum output.

3.

Turn pointer to 1300 K.C. and set signal generator output to 1300 K.C. and adjust modulator high frequency trimmer "A2" and "D" pre-selector stage for maximum output.

Then turn pointer to 600 K.C. and readjust trimmer E but do not adjust A2 and D at this point.

RANGE B ALIGNMENT
1700 to 5800 K.C.

1. Turn pointer to 5400 and set signal generator at 5400 K.C. and adjust high frequency trimmer "B1" to resonance of 5400 K.C. on the dial.

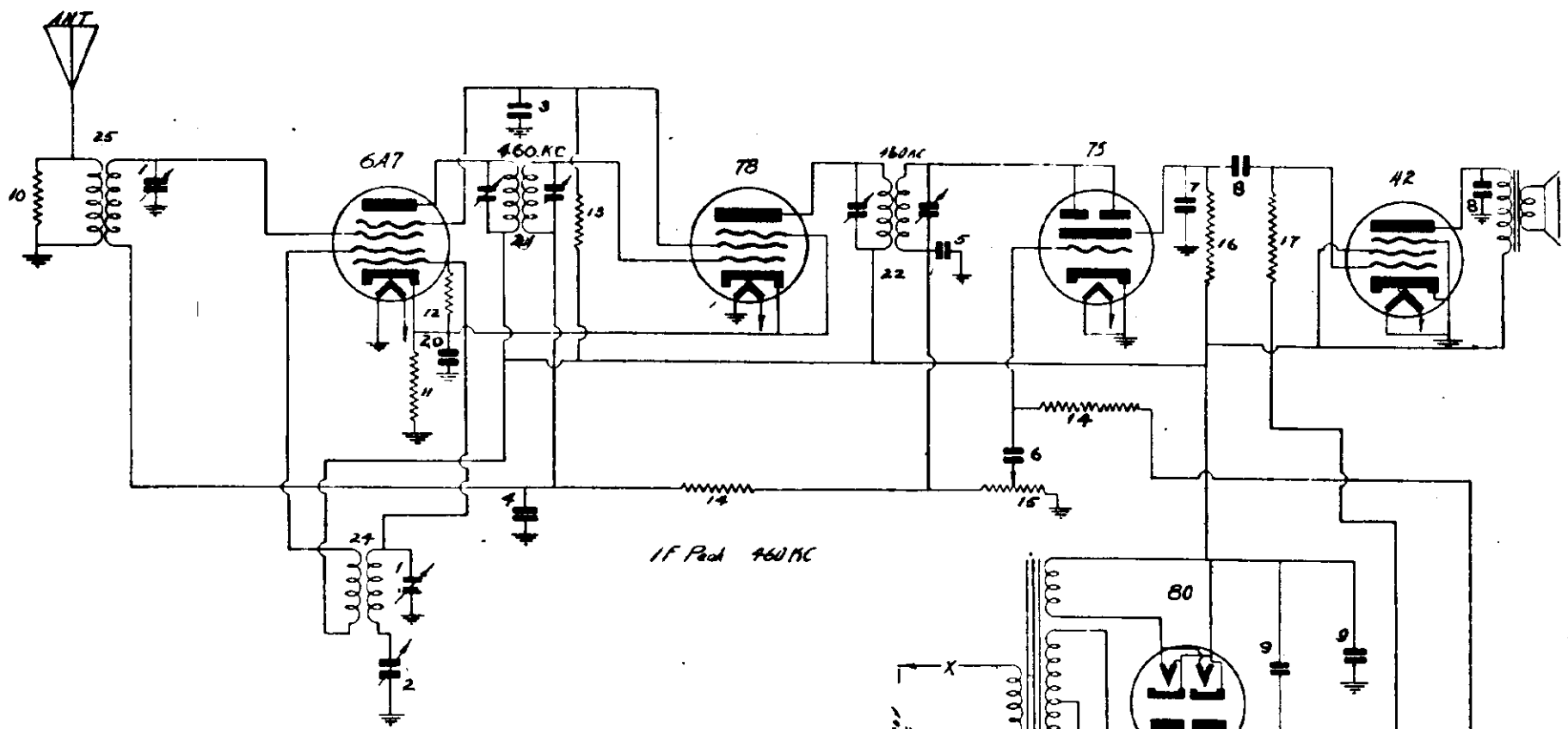
RANGE C ALIGNMENT
18000 to 5400 K.C.

1. Turn pointer to 18 Meg. and set signal generator at 18 Meg. and adjust high frequency trimmer "C1" to resonance at 18 Meg. on dial. Then adjust trimmer C for maximum output.

CAUTION

During this procedure it is very easy to set the oscillator high-frequency trimmer on the image side of signal which will give incorrect alignment. The oscillator trimmers are always turned to a frequency that is higher than that of the true signal that the receiver is receiving.

WESTERN AIR PATROL

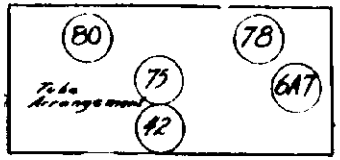


CONDENSERS

NO.	VALUE	PARTS NO.
1	Variable Condensor	A-8005
2	500 MMF	A-18005
3	.05 MFD	A-14057
4	.05 MFD	A-14056
5	.00025 MFD	A-16078
6	.01 MFD	A-14027
7	.001 MFD	A-14078
8	.01 MFD	A-14028
9	8x8 MFD	A-10005
20	.1 MFD	A-14001

RESSISTORS

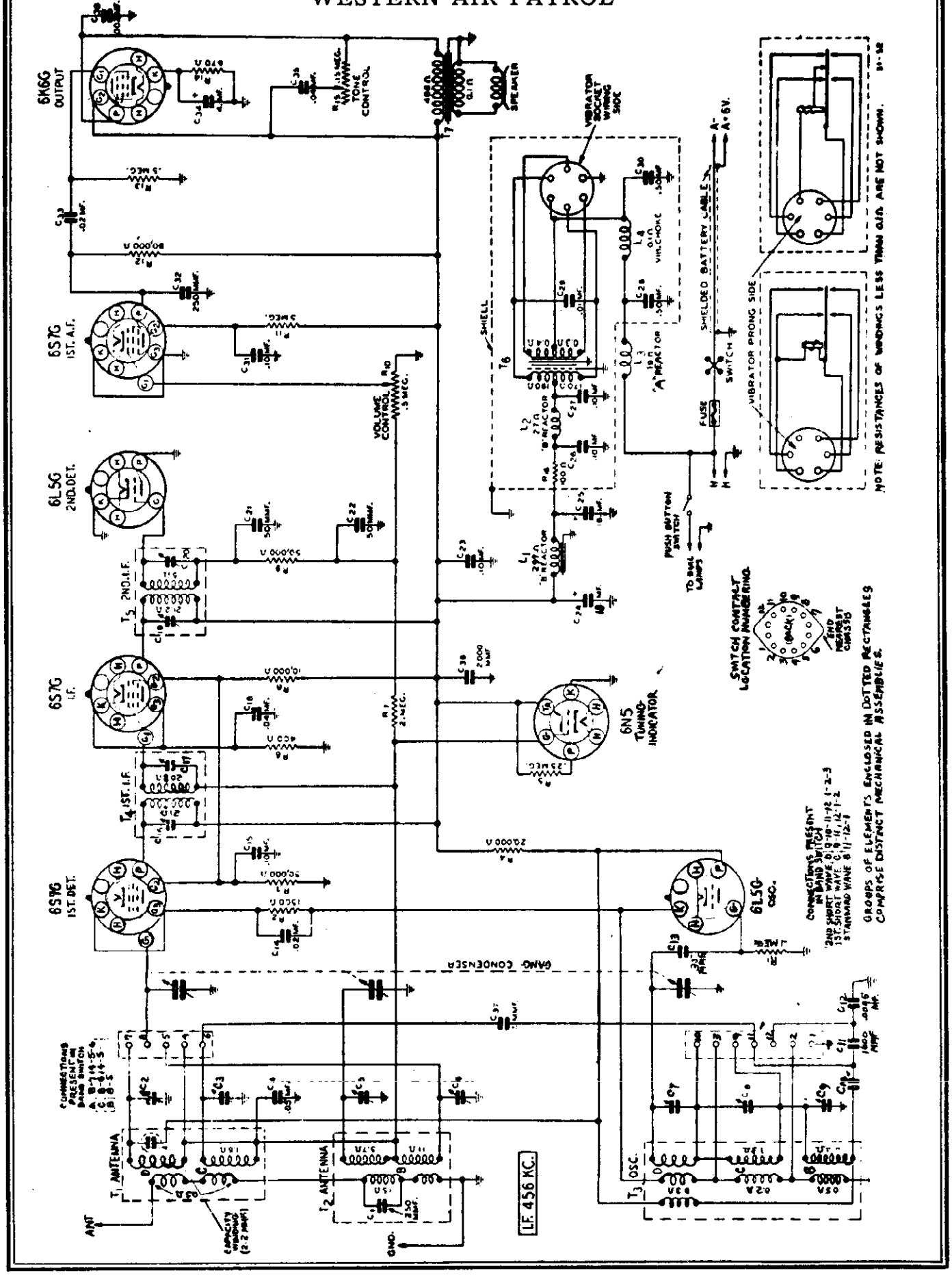
NO.	VALUE	PARTS NO.
10	25,000 ohms	A-20216
11	300 "	A-20073
12	100,000 "	A-20299
13	15,000 "	A-20502
14	2 Meg	A-20402
15	500,000 "	A-33005
16	250,000 "	A-20337
17	1 Meg.	A-20361
18	350 "	A-20479
19	30 "	A-2001Z-I



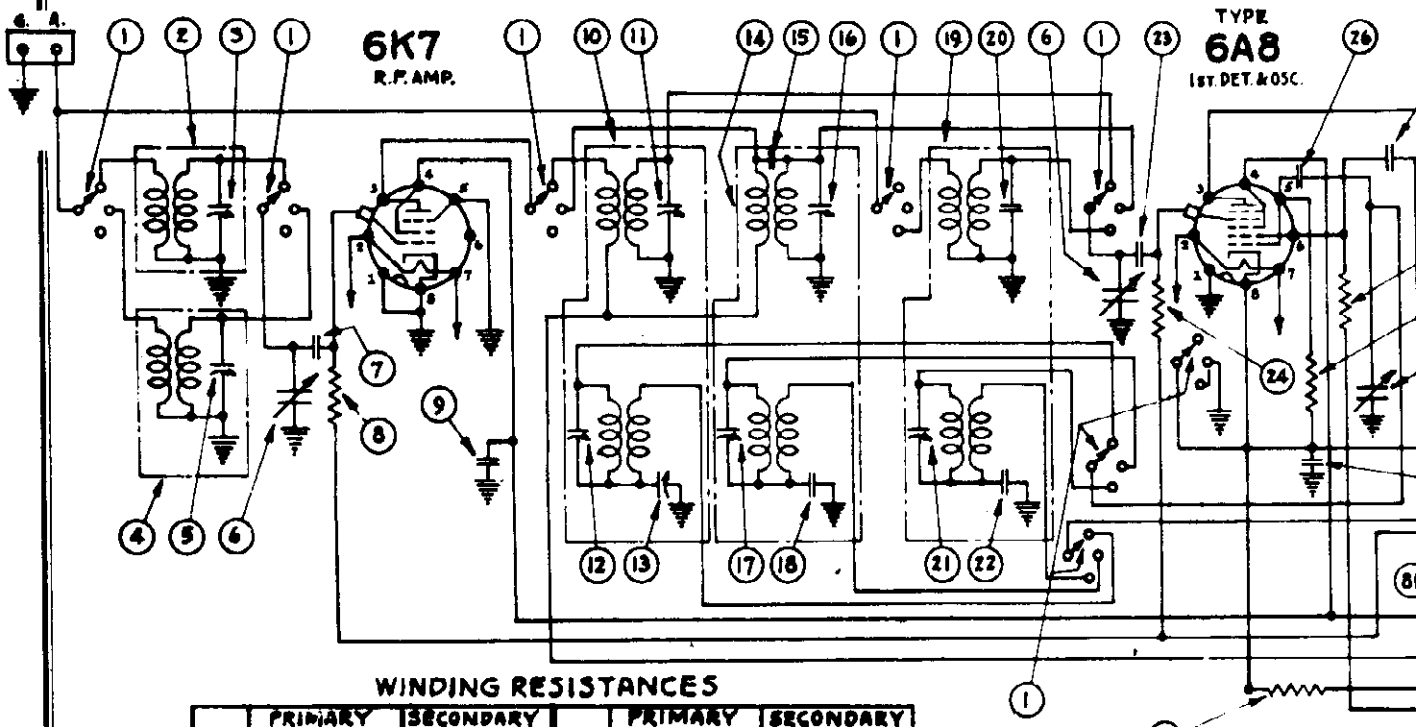
1938

MODEL 708 Table
Chassis W832

WESTERN AIR PATROL



WESTINGHOUSE R/



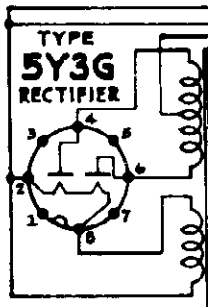
WINDING RESISTANCES

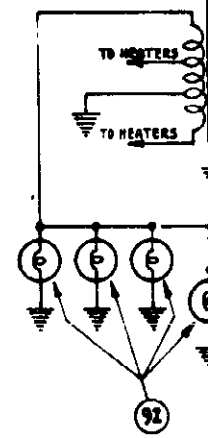
POS.	PRIMARY OHMS		SECONDARY OHMS		POS.	PRIMARY OHMS		SECONDARY OHMS	
2	18.5		3.8		71	1000			
4	.73		.09		72	560		.2	
10	1.7	R.F.	1.0	R.F.	73			1.7	VOICE COIL
	1.5	OSC.	3.1	OSC.	77	5.5		295	PLATE
14	2.3	R.F.	.03	R.F.				.11	5 V. HEATER
	.7	OSC.	.03	OSC.				.06	6.3 V. HEATER
19	2.9	ANT.	.9	ANT.					
	.5	OSC.	.9	OSC.					
32	8.8		8.8						
39	8.8		8.8						

TUBE VOLTAGES

TUBE	STAGE	FIL.	PIN NO.	PLATE	PIN NO.	SCREEN	PIN NO.	CATH.	OSC. PLATE
6K7	R.F. AMP.	6.0	2 TO 7	269	1 TO 3	100	1 TO 4		
6A8	1ST. DET.	6.0	2 TO 7	269	1 TO 3	100	1 TO 4	1.90	175
6K7	I. F. AMP.	6.0	2 TO 7	269	1 TO 3	100	1 TO 4	1.90	
6H6	2ND. DET.	6.0	2 TO 7					-3.5	
6F5	1ST. AUDIO	6.0	2 TO 7	138	1 TO 4				
6C5	INVERTER	6.0	2 TO 7	184	1 TO 3			4.5	
6F6	POWER OUTPUT	6.0	2 TO 7	261	1 TO 3	269	1 TO 4	17.2	
6F6	POWER OUTPUT	6.0	2 TO 7	261	1 TO 3	269	1 TO 4	17.2	
6U5	TUNING	6.0	1 TO 6	261	G TO 2				
5Y3	RECTIFIER	4.6	2 TO 8					379	
5Y4	RECTIFIER	4.6	7 TO 8					379	

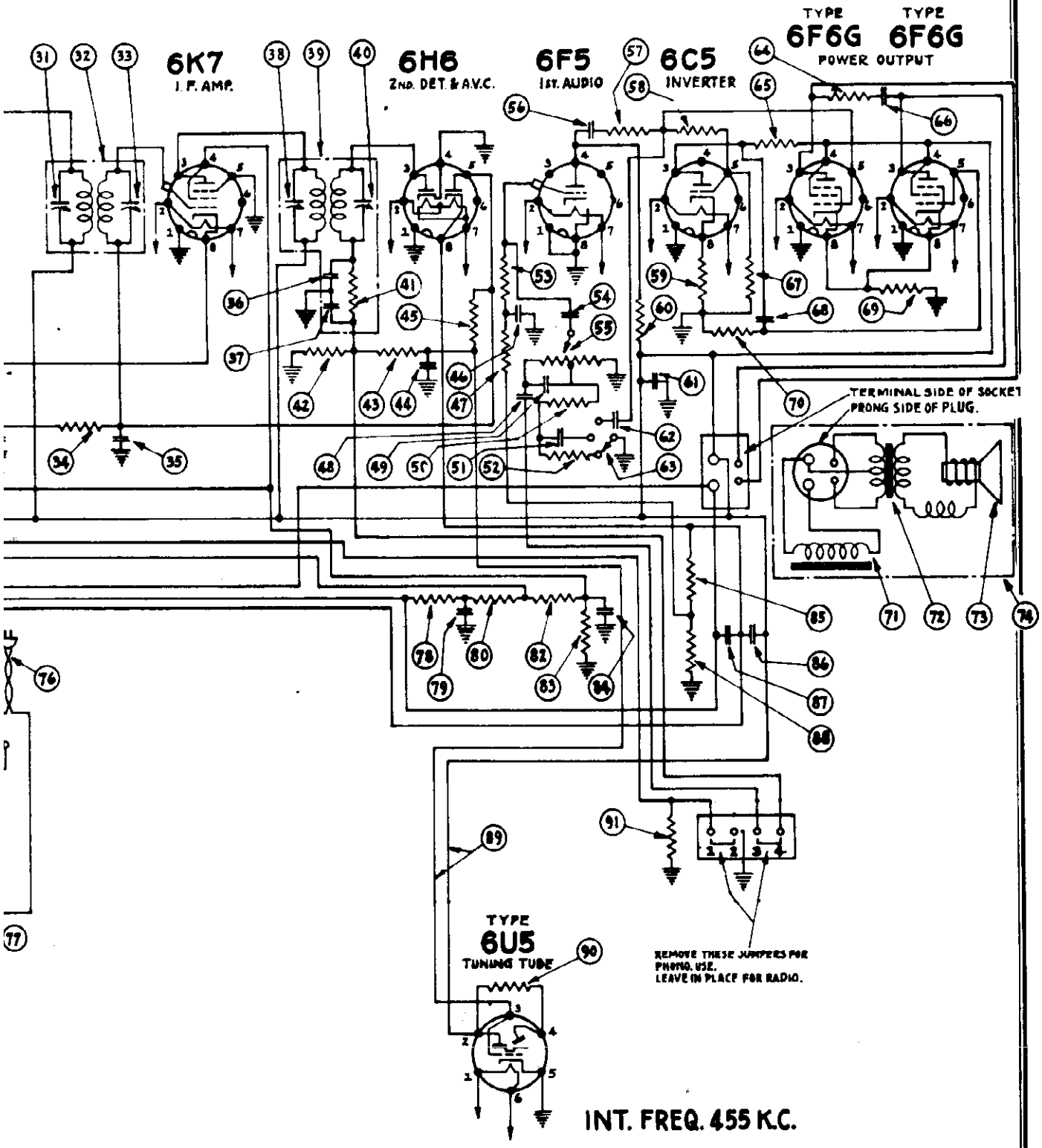
VOLTAGES TAKEN WITH BROADCAST BAND IN OPERATION.
TAKEN WITH 1,000 OHMS PER VOLT VOLTMETER.





TERNATIONAL CO.

O MODEL WR-330



Type and Number of Tubes .. 1 #6K7, 1 #6AB, 1 #6K7, 1 #6H6, 1 #6F5, 1 #6C5, 2 #6F6G, 1 #5Y3G, 1 #6U5 - Total 10

Power Supply ..... 105-125 volts, 50-60 cycle A.C.
Power Consumption ..... 100 Watts
Maximum Output ..... 10 Watts
Maximum Undistorted Output ..... 5.5 Watts
Tuning Ranges ..... (Broadcast Band 535-1,800 KC. (1st Short-wave Band 1,710-6,000 KC. (2nd Short-wave Band 5,860-18,500 KC.
Line-Up Frequencies ..... I.F. 455 KC., 1500 KC., 600 KC., 5000 KC., 16,500 KC.

Dia. #	Part #	Description of Parts	List Price
1	SW 9586	Wave change switch assembly	$ 2.00
2	RC 95311	B.C. antenna coil assembly	1.10
3		4-35 mmf. trimmer - part of RC 95311	
4	RC 95312	S.W. antenna coil assembly	.75
5		4-35 mmf. trimmer - part of RC 95312	
6	CG 9566	Variable condenser gang	5.50
7	CM 9519	.0005 mfd. mica condenser	.20
8	RE 1043	100,000 ohm, 1/2 W. resistor	.10
9	CW 4-10	.1 mfd., 400 V. condenser	.15
10	RC 95317	B.C. composite coil assembly	2.00
11		4-35 mmf. trimmer - part of RC 95317	
12		5-25 mmf. trimmer - part of RC 95317	
13		300-600 mmf. trimmer - part of RC 95317	
14	RC 95315	S.W. composite coil assembly	2.00
15		10 mmf. mica condenser - part of RC 95315.	
16-17		4-35 mmf. trimmers - part of RC 95315	
18		5400 mmf. mica condenser - part of RC 95315	
19	RC 95314	Police composite coil assembly	1.75
20		10 mmf. mica condenser - part of RC 95314	
21		4-35 mmf. trimmer - part of RC 95314	
22		1100 mmf. mica condenser - part of RC 95314	
23	CM 9519	.0005 mfd. mica condenser	.10
24	RE 1043	100,000 ohm, 1/2 W. resistor	.10
25	RE 1513	150 ohm, 1/2 W. resistor	.10
26	CM 9513	.0001 mfd. mica condenser	.10
27	CW 4-01	.01 mfd., 400 V. condenser	.15
28	RE 562412	5,600 ohm, 1 W. resistor	.12
29	RE 4733	47,000 ohm, 1/2 W. resistor	.10
30	CW 2-05	.05 mfd., 200 V. condenser	.15
31-33		80-200 mmf. trimmers - part of IC 95119	
32	IC 95119	1st I.F. transformer	1.60
34	RE 4743	470,000 ohm, 1/2 W. resistor	.10
35	CW 4-05	.05 mfd., 400 V. condenser	.15
36-37		100 mmf. mica condenser - part of IC 95121	
38-40		80-200 mmf. trimmers - part of IC 95121	
39	IC 95121	2nd I.F. transformer	1.60
41	RE 4733	47,000 ohm, 1/2 W. resistor	.10
42	RE 4743	470,000 ohm, 1/2 W. resistor	.10
43	RE 1053	1 meg., 1/2 W. resistor	.10
44	CW 4-10	.1 mfd., 400 V. condenser	.15
45	RE 1053	1 meg., 1/2 W. resistor	.10
46	CW 4-10	.1 mfd., 400 V. condenser	.15
47	RE 4743	470,000 ohm, 1/2 W. resistor	.10
48	CW 4-02	.02 mfd., 400 V. condenser	.15
49	CM 9518	75 mmf. mica condenser	.15
50	RE 1043	100,000 ohm, 1/2 W. resistor	.10
51	CW 6-002	.002 mfd., 600 V. condenser	.15
52	RE 1043	100,000 ohm, 1/2 W. resistor	.10
53	RE 2253	2.2 meg., 1/2 W. resistor	.10
54	CW 4-02	.02 mfd., 400 V. condenser	.10
55	VR 9555	2 meg. - mid tapped volume control	.90
56	CW 4-02	.02 mfd., 400 V. condenser	.15
57	RE 4733	47,000 ohm, 1/2 W. resistor	.10
58	RE 3943	390,000 ohm, 1/2 W. resistor	.10
59	RE 5613	560 ohm, 1/2 W. resistor	.10
60	RE 2243	220,000 ohm, 1/2 W. resistor	.10

Dia. #	Part #	Description of Parts	List Price
61	CW 4-10	.1 mfd., 400 V. condenser	$ .15
62	CW 4-01	.01 mfd., 400 V. condenser	.15
63	SW 9578	Tone control switch	.60
64	RE 223522	22,000 ohm, 2 W. resistor	.30
65	RE 1033	10,000 ohm, 1/2 W. resistor	.10
66	CW 6-001	.001 mfd., 600 V. condenser	.15
67	RE 6833	68,000 ohm, 1/2 W. resistor	.10
68	CW 4-02	.02 mfd., 400 V. condenser	.15
69	RE 271522	270 ohm, 2 W. resistor	.30
70	RE 4743	470,000 ohm, 1/2 W. resistor	.10
71	CL 9572	Speaker field coil	3.00
72	TR 95150	Speaker output transformer	3.00
73	DM 9528	Speaker diaphragm assembly (12")	5.00
74	SK 9585	Speaker complete (12")	11.00
75	SW 9577	Line switch	.55
76	CB 9512	Line cable and plug assembly	.50
77	TR 95121	Power transformer - 105-125 volts, 50-60 cycles	6.75
78	RE 682522	6800 ohm, 2 W. resistor	.30
79	CE 9528	8 mfd., 450 V. electrolytic condenser	.80
80	RE 103522	10,000 ohms, 2 W. resistor	.30
81	CW 4-05	.05 mfd., 400 V. condenser	.15
82	RE 1033	10,000 ohm, 1/2 W. resistor	.10
83	RE 6833	68000 ohm, 1/2 W. resistor	.10
84	CW 4-50	.5 mfd., 400 V. condenser	.30
85	RE 1803	18 ohm, 1/2 W. resistor	.10
86	CE 9562	18 mfd., 300 V. electrolytic condenser	.80
87	CE 9554	18 mfd., 450 V. electrolytic condenser	.85
88	RE 1803	18 ohm, 1/2 W. resistor	.10
89	CB 95151	Cable and socket for tuning tube	.90
90		1 meg. resistor - part of CB 95151	.10
91	RE 223522	22,000 ohm, 2 W. resistor	.30
92	LP 9510	Dial light - 6.3 V., .25 amp.	.15

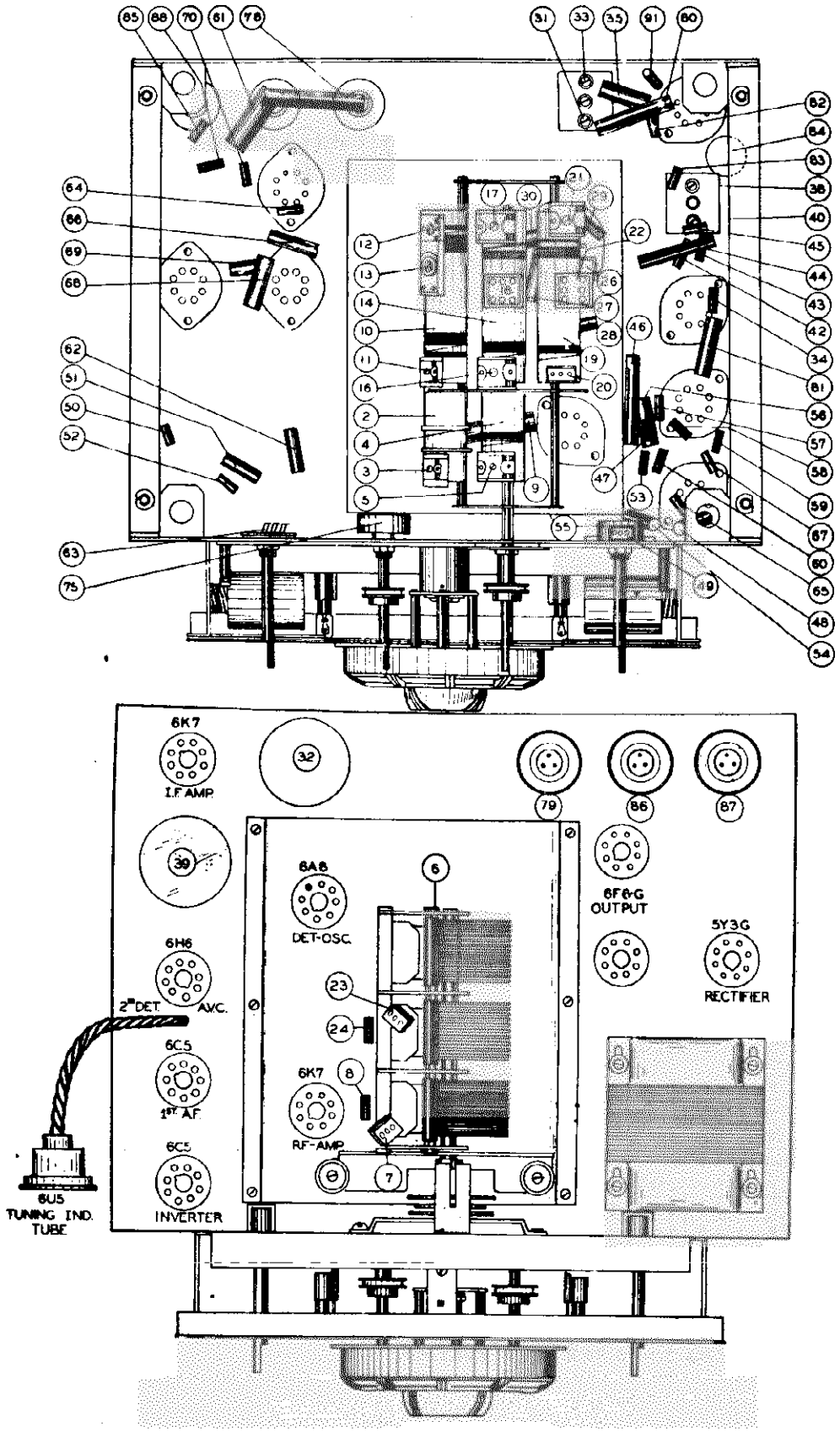
MISCELLANEOUS

BK 95182		Electrolytic condenser mounting bracket	.05
CV 95226		I.F. coil cover	.35
DS 95104		Dial scale	3.25
FP 108003		Felt washer under knobs	.05
GE 9528		Small brass drive gear	.10
GE 9531		Intermediate gear assembly (2 brass, 1 steel)	.75
HP 9523		Tuning tube holder	.20
IS 1002		Rubber mounting bushings (gang condenser)	.05
IS 9593		Antenna and ground terminal	.20
IS 95226		Phono-jack terminal	.25
IS 95234		Rubber bushing (tuning tube)	.10
KA 95101		Cabinet	
KN 95130		Tuning knob (vernier)	.35
KN 95131		Knob - push on type	.15
KN 95135		Knob - set-screw type	.15
NT 958		3/8" Pal nut	.05
PL 95113		Escutcheon dial plate	5.00
PL 95136		Large tuning knob	1.25
PR 97160		Indicator drive cord	per yard .05
PU 9534		Indicator drive pulleys	.40
SA 107257		Socket (speaker)	.10
SH 9565		Brass drive shaft	.20
SH 9568		Large gear and steel shaft	1.75
SH 9559		2 large gears, shaft and pointer bracket assembly	1.50
SH 9561		Wave change switch shaft	.80
SI 9580		Dial pointer	.20
SI 9588		Wave band indicator	.60
SI 9590		On-Off indicator	.60
SO 956		Socket (octal 9 used)	.20
SO 9537		Dial lamp socket	.15
SP 9544		Spring (indicator drive cord)	.05
SP 9564		Gang drive spring and collar	.40
TU 95172		Insullation for electrolytic condenser	.05

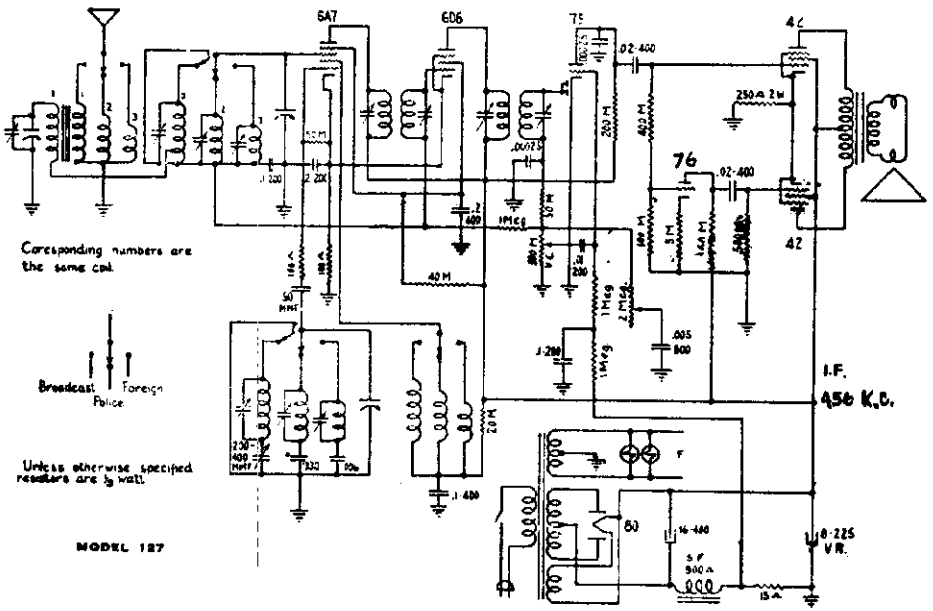
PRICES SUBJECT TO CHANGE WITHOUT NOTICE

MODEL WR330

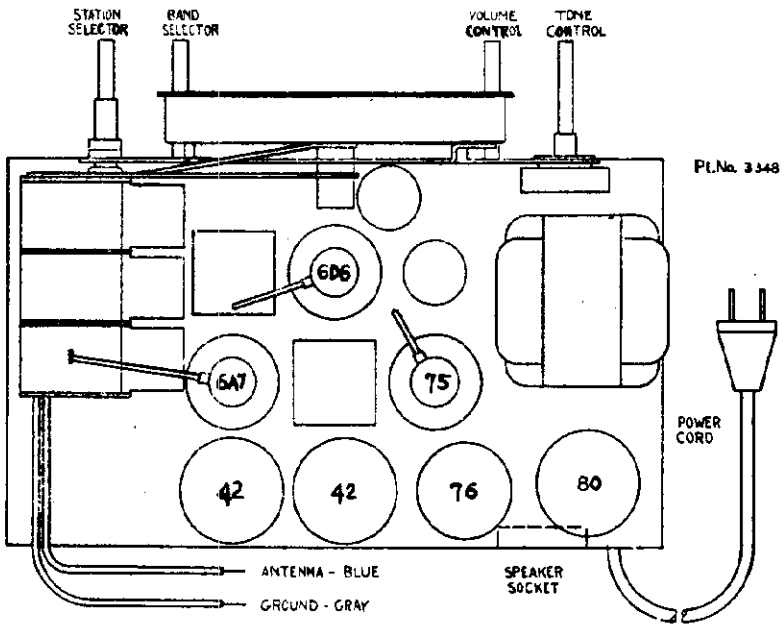
WESTINGHOUSE ELEC. INTERNATIONAL CO.

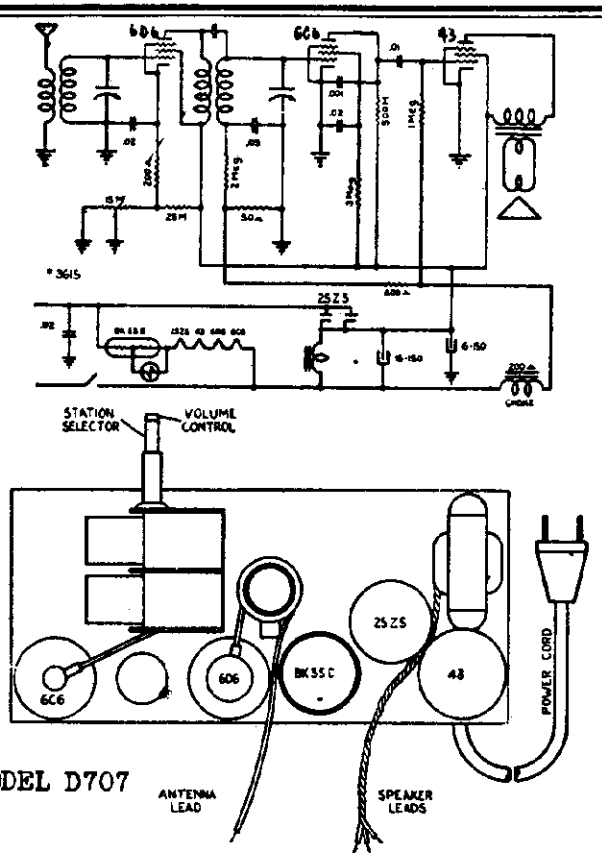


CIRCUIT DIAGRAM MODELS D700, D723



TUBE LAYOUT





OPERATION INSTRUCTIONS

This receiver is designed to operate on **105** to **125** volts, direct or alternating current. Do not connect to any other source unless designated on instruction card. Connect attachment plug to light socket. See that all tubes are properly inserted in sockets as per chart showing top view of chassis. The aerial furnished with the receiver should be strung around a picture molding or under the edge of a rug. Turn operating switch on by turning the volume knob to the right. Continue to turn volume control in clock-wise direction as far as it will go and allow an interval of time for tubes to become heated. Turn the station selector knob slowly until station is heard clearly and reduce volume to desired intensity by turning volume control knob to the left.

This receiver covers a continuous range from **540** to **1725** KC. Standard and experimental broadcast stations will be received between **540** and **1800** KC. Many police stations can be received near **1700** KC.

The following tubes are used in this receiver:

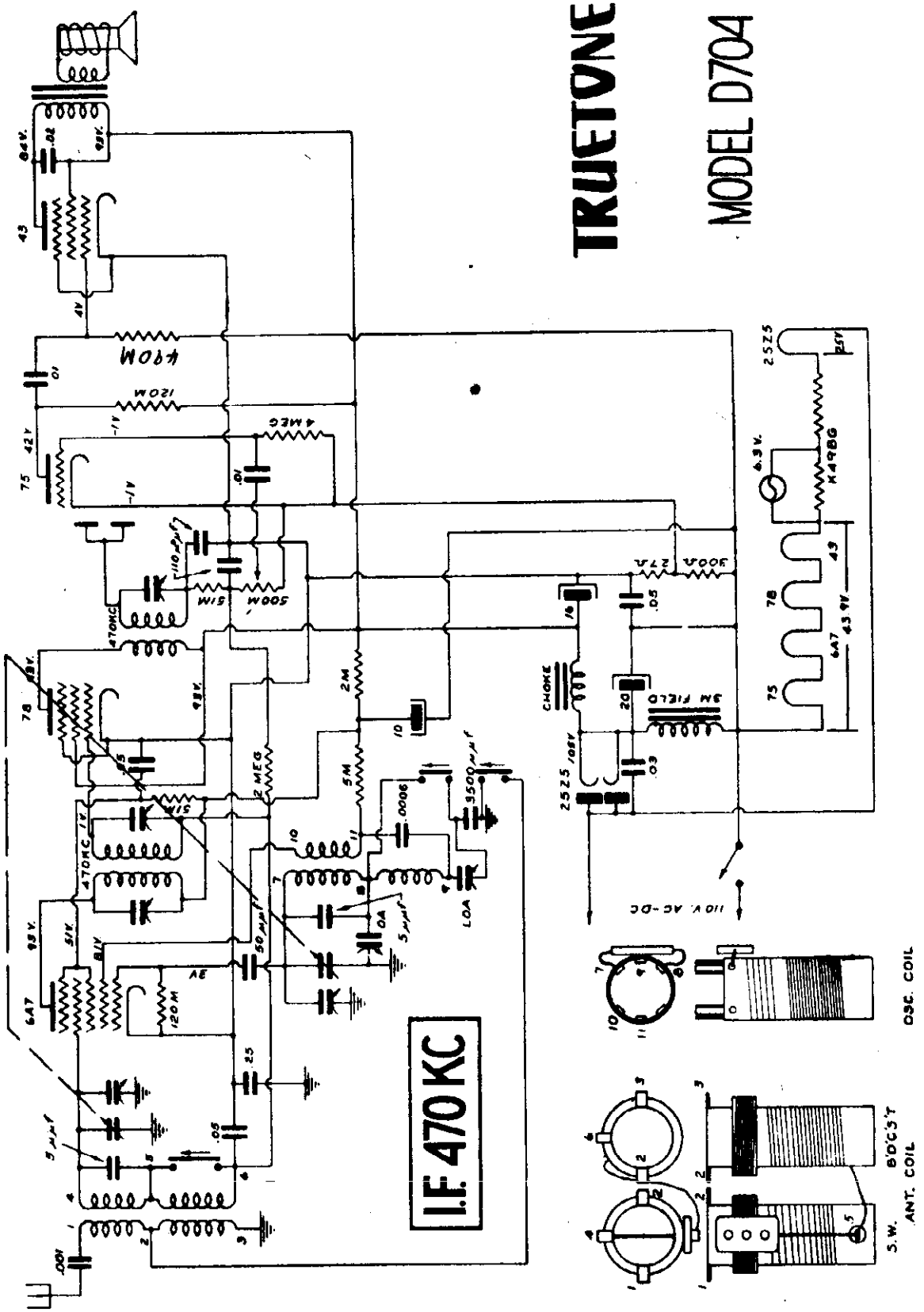
1—No. 6D6 R. F. Amplifier
1—No. 6C6 Detector
2—No. 43 Power Output
1—No. 25Z5 Rectifier
1—BK 55B Regulator

If this receiver should fail to operate when connected to direct current, reverse the attachment plug in the light socket.

WESTERN AUTO SUPPLY CO.
(1937)
MODEL D-707

MODEL D704

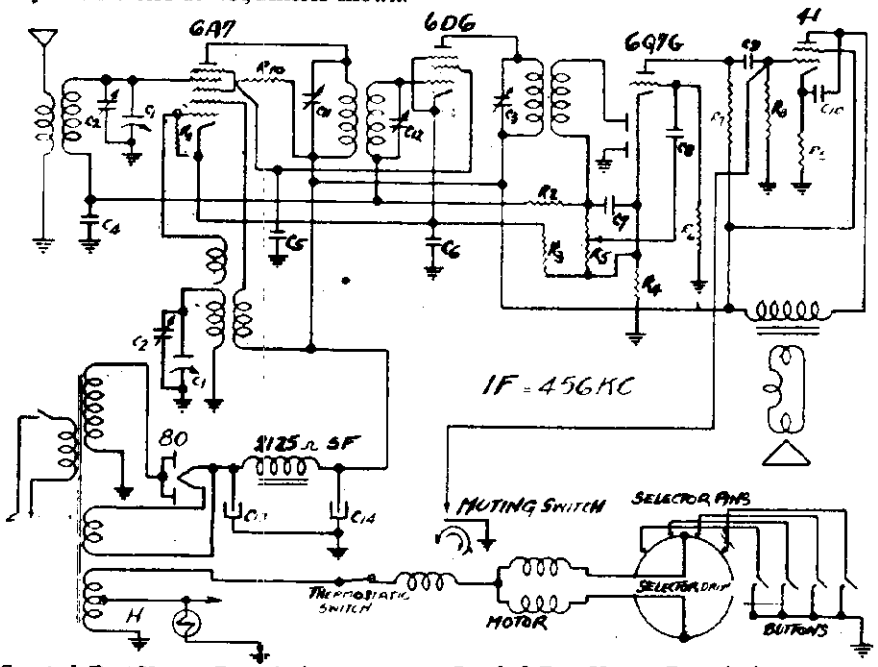
WESTERN AUTO SUPPLY CO.



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 aline transformer No. 2. Connect generator to grid of 6A7 tube and aline transformer No. 1.

R.F. Using a 200 MMF. condenser in series with the high side of the generator, adjust trimmers at frequencies shown.

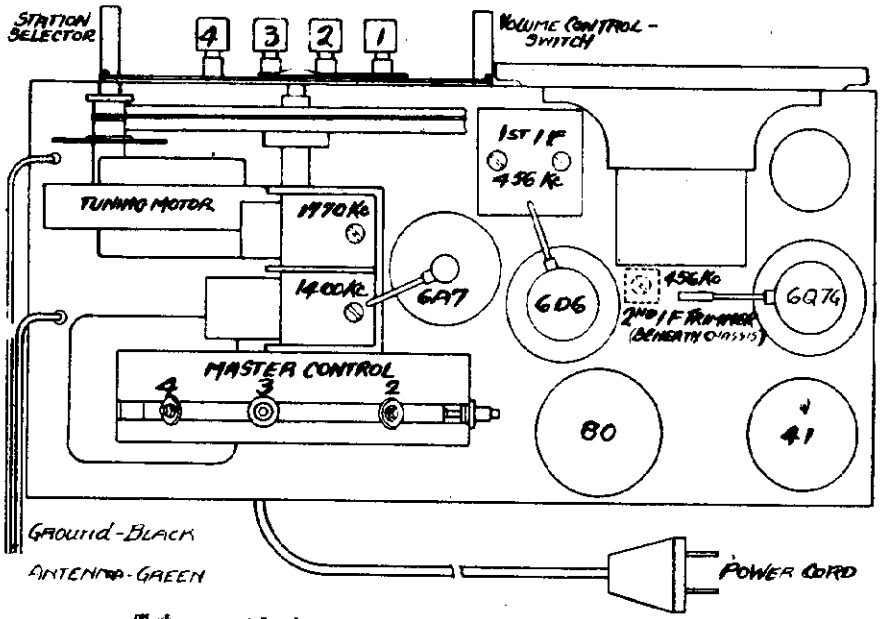


Symbol	Part No.	Description	Symbol	Part No.	Description
C1	4974	345-160 mmfd Variable	R4	2689	100 Ohm 1/3 Watt
C2		Trimmer on variable	R5	4982	500M Volume Control
C3	1611	I.F. Trimmer			and Switch
C4,5	580	.05 200 V.	R7	599	150M 1/3 Watt
C6	2792	.2 200 V.	R8	615	500M 1/3 Watt
C7	4810	.0005 400 V.	R9	634	500 Ohm 1/3 Watt
C8,9	568	.01 400 V.	R10	636	40M 1/3 Watt
C10	2601	.01 600		4975	Power Transformer
C13)	5006	10 mfd 300 W.V.		4979	Motor Assembly
C14)		6 mfd 250 W.V.		4976	Speaker
R1	631	50M 1/3 Watt		4875	Oscillator Coil
R2,6	624	1 meg. 1/3 Watt		5005	Antenna Coil
R3	2605	200 Ohm 1/3 Watt		5004	Second I.F. Transformer

Tubes required are:

1—6A7 Oscillator-Translator
1—6D6 Intermediate Frequency Amplifier.
1—6Q7G Detector-Automatic Volume Control—First Audio
1—41 Power Output
1—80 Rectifier

TUBE LAYOUT and CONNECTION DIAGRAM



Tubes must be in proper position and connected as shown.

How to set up the Automatic Tuner: On the tube location chart, observe the relative positions of the push buttons and the MASTER CONTROL; button No. 1 controls selector pin No. 1, etc. The selector pins on the Master Control may be moved around the drum by sliding them along the slot—no tools are necessary. Note that there is a paint dot on the rim of the bakelite drum directly opposite the break between the contact ribbons.

List four favorite local stations, calling the highest frequency station (the one nearest the 1700 kc. end of the dial) the No. 1 station, the next lowest No. 2, etc.

Using the manual station selector, tune in the No. 1 station, then move the No. 1 selector pin opposite the paint dot so that the contact rests between the two ribbons. As a means of checking the accuracy of this setting, a spring clip is provided on one of the pilot light leads so that the lead may be disconnected from the chassis and attached to the selector pin. With the clip fastened to the pin, the lamp will glow until the contact is properly set. DO NOT LEAVE THE PILOT LIGHT LEAD CONNECTED TO THE PIN. As soon as the station has been set up, RECONNECT THE PILOT LIGHT LEAD TO THE CHASSIS so that the lamp glows normally.

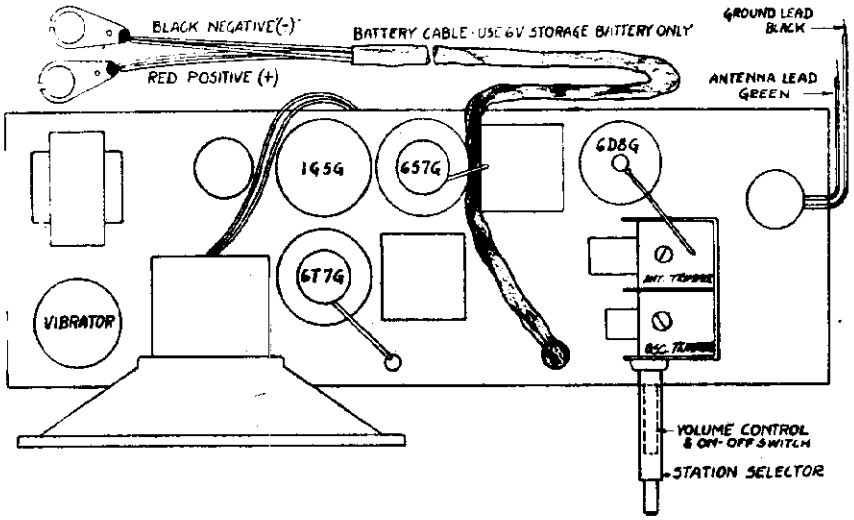
Using similar procedure, set up the other three stations.

When all four stations are set up, locate their call letters on the sheets furnished, punch out the tabs and insert in proper buttons. Thereafter any of the four stations may be tuned in by merely pressing the button bearing the call letters of the desired station.

Be sure that your stations are listed in the proper order according to frequency or position on the dial. Do not confuse frequency (kilocycles) with wave length (meters).

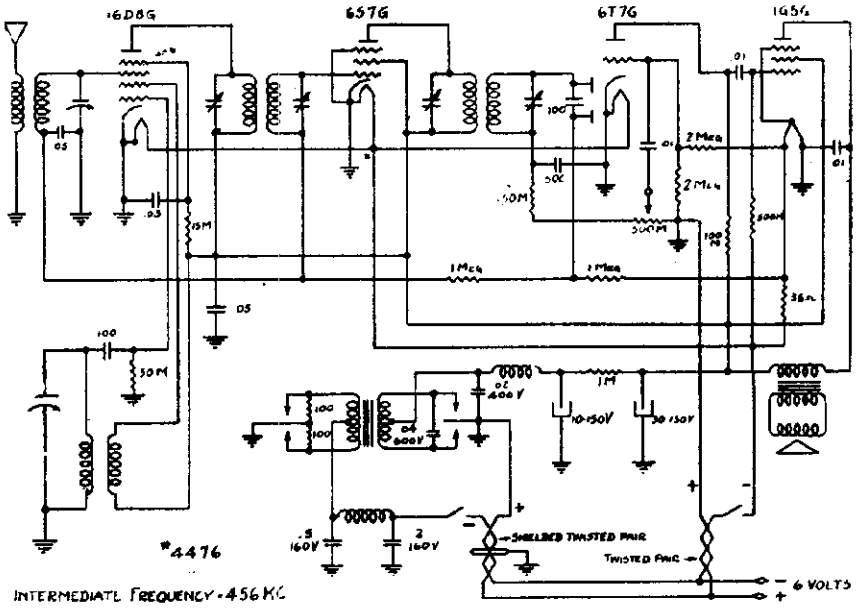
Be sure that your stations are tuned in exactly before setting the contact pins.

Do not set up weak stations, or distant stations too weak to afford clear reception at all times.



TUBE LAYOUT *and* CONNECTION DIAGRAM

Model D-719



For models D-719, D-900, D-901

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.

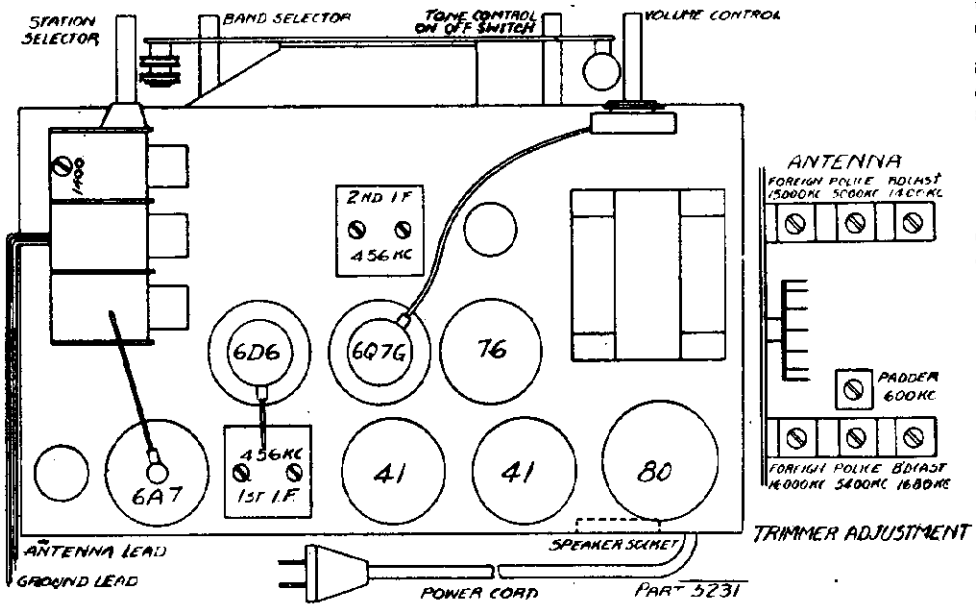
IF. Connect generator ground to receiver ground. Using .1 mfd condenser in series with "high" side of generator, apply 456 kc signal to grid of 6S7G and adjust second IF transformer; same for first IF, applying signal to grid of 6D8G.+ (See diagram for location of tubes and transformers.)

RF. 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 antenna trimmer.

* 6D6 for models D-900, D-901

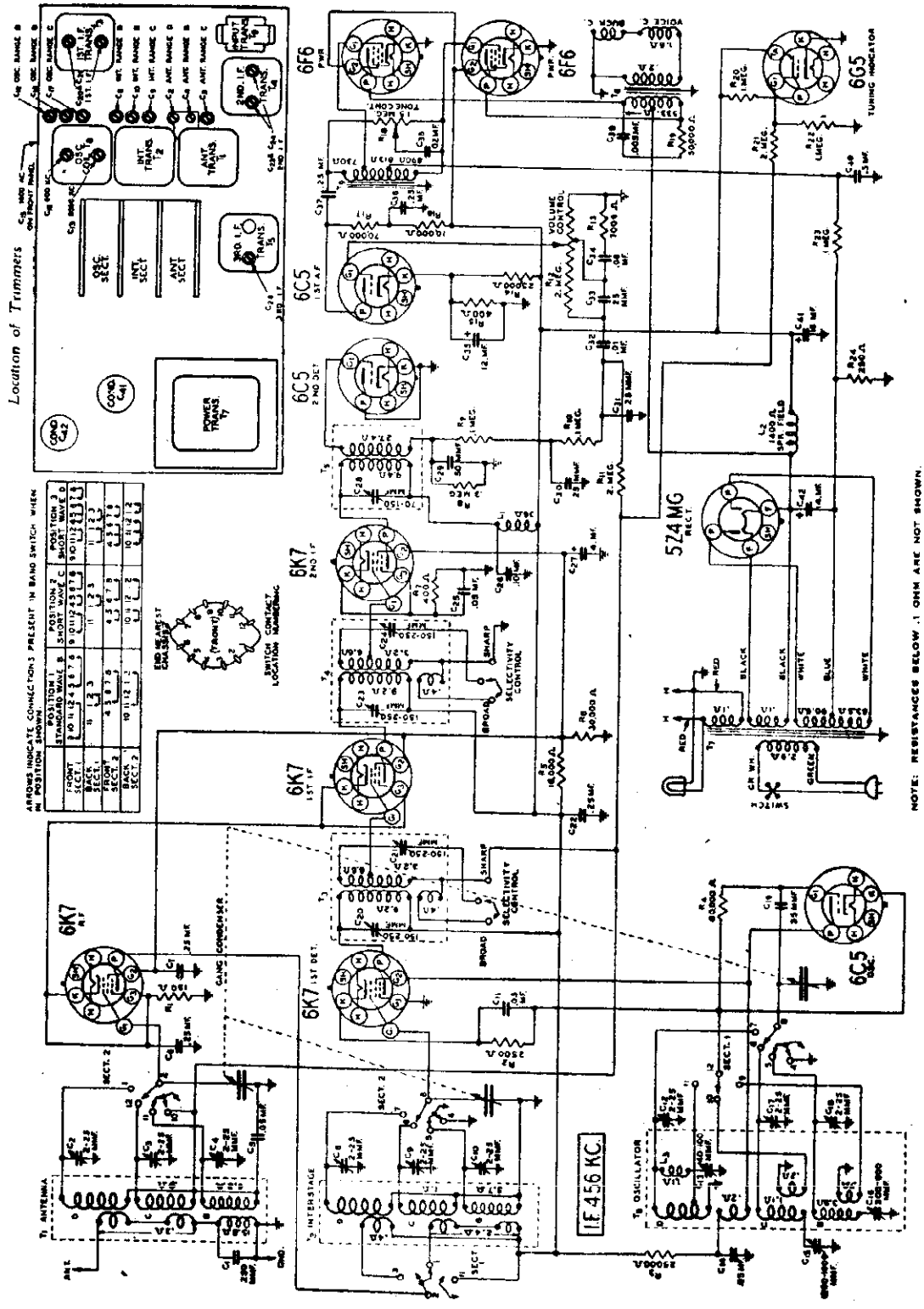
\+ 6A7 " " " "

Δ 1680 " " " "



Socket layout for Model D-900 only.

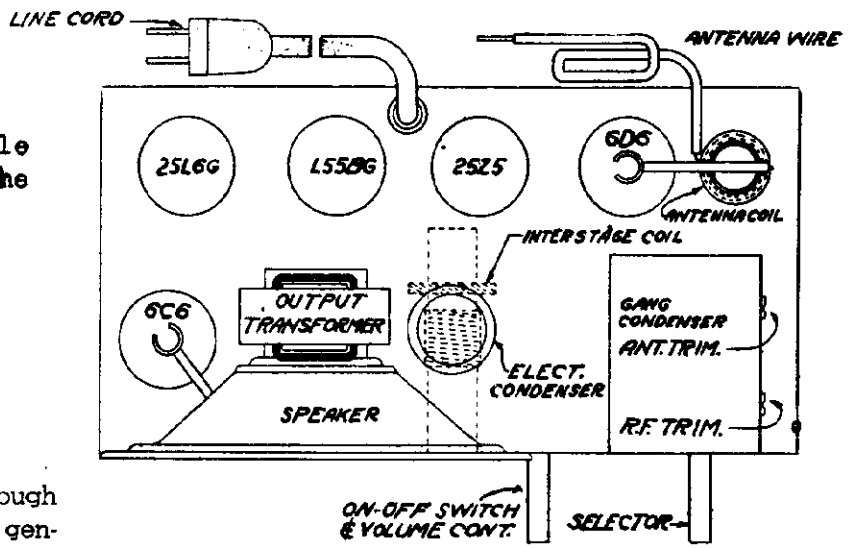
WESTERN AUTO SUPPLY CO.



TRUETONE MODEL D722

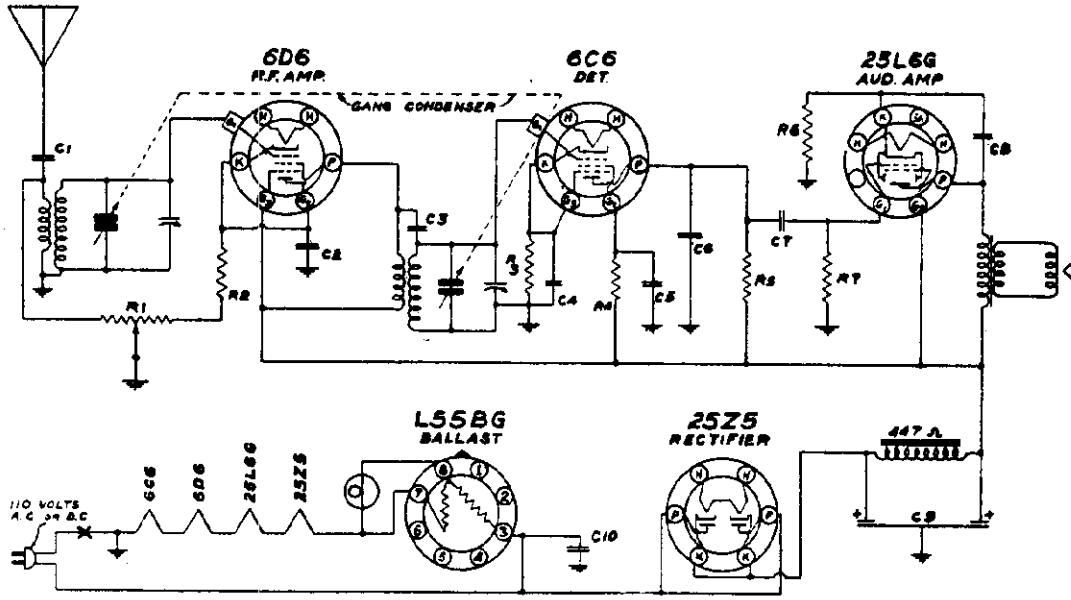
POWER SUPPLY: This receiver is designed to operate from any AC (alternating current) or D.C.(Direct current) power supply main of 105-125 volts,60 cycle If tme receiver fails to operate on D.C. reverse the power line plug.

FOR CONVENTIONAL ALIGNMENT SEE
SPECIAL SECTION RIDER'S VOL.VIII



ALIGNMENT DATA AND SERVICING

Connect a signal generator to the antenna lead of the receiver through a 100 Mmf. condenser. Set the dial pointer at 1400 KC. Set the generator at 1400 KC. Now adjust the antenna and RF trimmers of the gang condenser to maximum output.

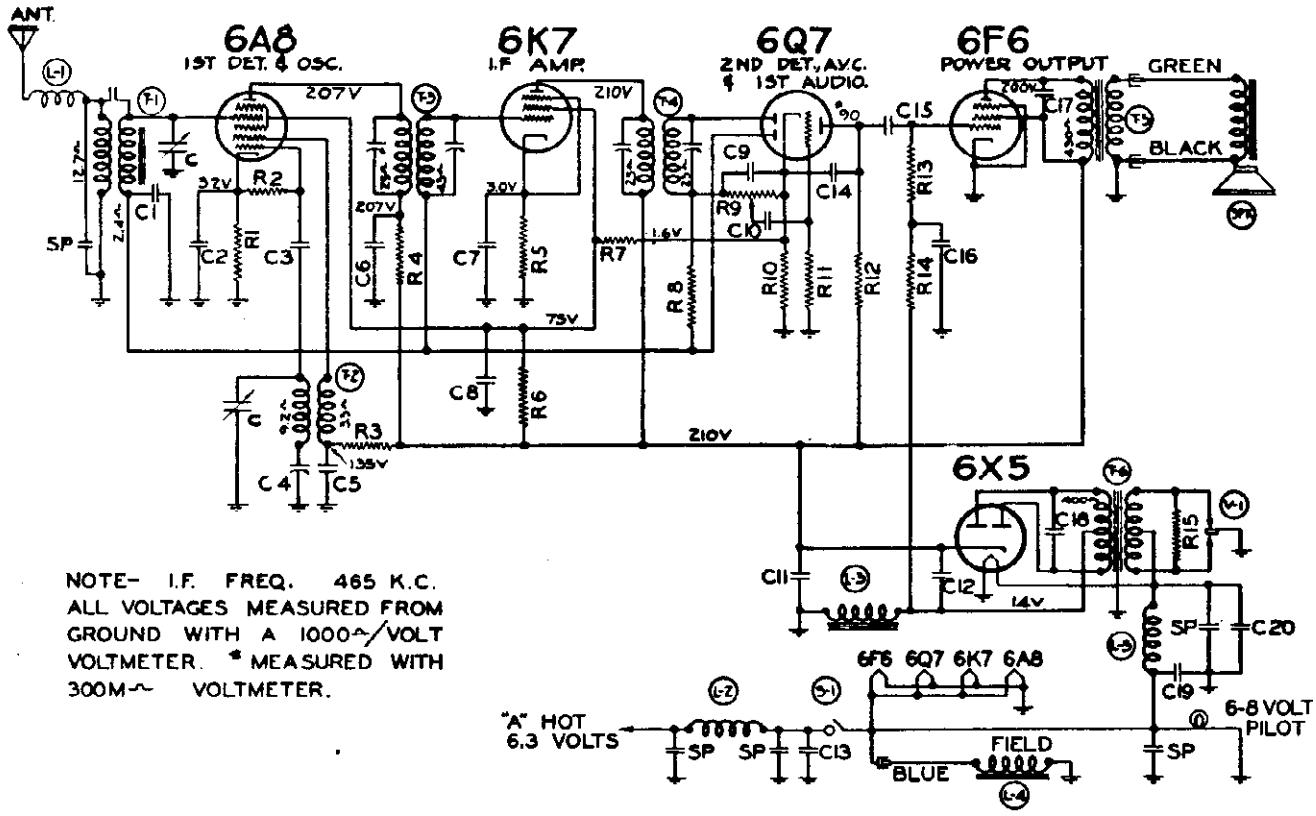


This receiver is designed operate over three tuning ranges. The broadcast range which extends from 540 to 1700 Kc. (175 to 550 meters), Police and Aviation Band which extends from 1700 to 5000 Kc. (52 to 175 meters) and the international short wave band which extends from 5800 to 15,200 Kc. (18.5 to 52 meters). This short wave range is the one which includes the four internationally assigned bands-the 19, 25, 31 and 49 meter bands.

CONDENSERS		
NO	CAPACITY	TYPE
C1	.082 MFD.	400 V.
C2	.1 "	200 V.
C3	1.5 mm.f.	GIMMIK
C4	.25 MM	200 V.
C5	.1 "	200 V.
C6	.0002 "	600 V.
C7	.01 "	400 V.
C8	.02 "	400 V.
C9	16-0-16-0-	150 V. ELECT.

RESISTORS			
NO	OHMS R.	WATTS	
R1	75,000		VOL. CONT.
R2	250	½	
R3	25,000	½	
R4	2,000,000	½	
R5	500,000	½	
R6	110	½	WIRE WOUND
R7	500,000	½	
C10	.1 MFD.	400 V.	

WESTERN AUTO SUPPLY CO.

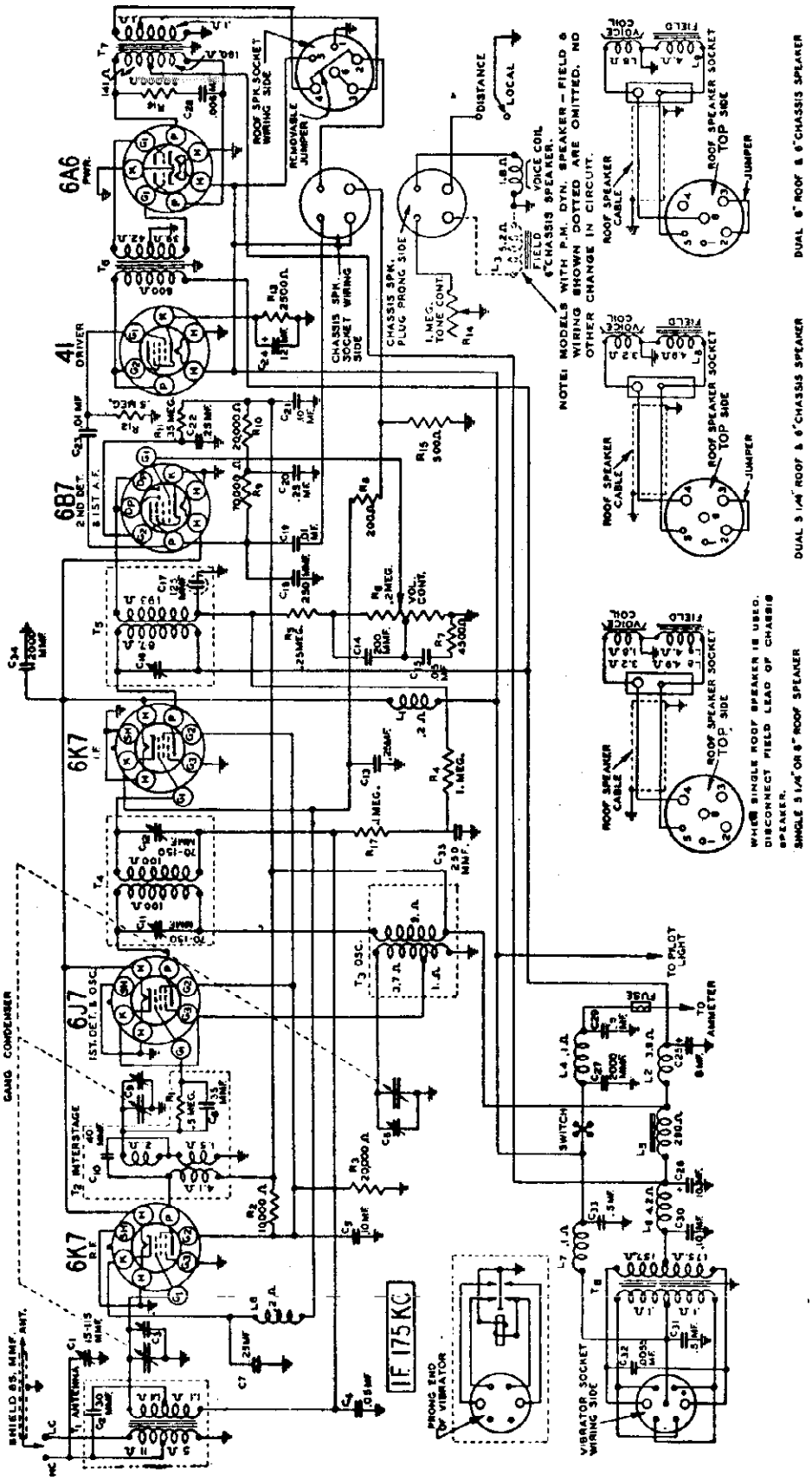


TRUETONE MODEL D734

No.	Part No.	Description
		CONDENSERS
C	102-27	2 Gang Variable Condenser
C1	100-59	.05 x 200 25%
C2	116-21	.05 x 200 (Yellow lead) 20%
C3	129-12	.00025 Mica 20%
C4	124-37	Series Pad 350 mmf. w. v.
C5	116-21	.1 x 400 (Red lead) 20%
C6	116-21	.1 x 400 (Green lead) 20%
C7	116-21	.05 x 200 (Black lead) 20%
C8	100-60	.25 x 200 25%
C9	129-12	.00025 Mica 20%
C10	100-55	.01 x 400 25%
C11	119-33	8 mfd. Lytic 300 w. v.
C12	119-33	4 mfd. Lytic 300 w. v.
C13	100-31	.5 x 120 10 - 50%
C14	129-5	.0001 Ceramicon 20%
C15	100-11	.01 x 400 25%
C16	100-60	.25 x 200 25%
C17	100-54	.006 x 600 v. 25%
C18	100-58	.005 x 1200 - 20 - 10%
C19	100-31	.5 x 120 10 - 50%
C20	100-31	.5 x 120 10 - 50%
		4 Spark Plates
		C2, C5, C6 and C7 in same block
		C11, C12 in same block
		C8, C16 in same block
		RESISTORS
R1	103-54	500 ohm—1/3 w.—20%
R2	130-162	50M ohm—1/3 w.—20%
R3	130-164	30M ohm—⅓ w.—20%
R4	130-137	1500 ohm—1/3 w.—20%
R5	130-24	400 ohm—1/3 w.—20%
R6	130-30	25M ohm—1 w.—20%
R7	130-139	40M ohm—1/3 w.—20%
R8	130-142	1 meg ohm—1/3 w.—20%
R9	101-41	500 M ohm Volume Control
R10	130-153	700 ohm—1/3 w.—20%
R11	130-19	1 meg ohm—1/3 w.—20%
R12	130-141	250M ohm—1/3 w.—20%
R13	130-5	300M ohm—1/3 w.—20%
R14	130-11	250M ohm—1/3 w.—20%
R15	130-84	200 ohm—1/3 w.—20%
		PARTS
T1	111-70	Antenna Coil Complete
T2	110-57	Oscillator Coil Complete
T3	108-96	Input I.F. Complete
T4	108-95	Output I.F. Complete
T5	105-37	Output Transformer
T6	104-82	Power Transformer
L1	111-76	Antenna filter choke
L2	105-26	"A" Choke
L3	105-39	"B" Filter choke (335 ohms)
L4	114-59	Speaker field—4 ohm
L5	105-19	"A" Choke
Spkr.	114-59	Speaker
S1		Switch on Volume Control
V1	126-1	Vibrator

MODEL D745

WESTERN AUTO SUPPLY CO.



WESTERN AUTO SUPPLY CO.

MODEL D748

MODEL D748
MODEL D1091

WESTERN AUTO SUPPLY CO.

ALIGNMENT PROCEDURE D-1091

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	IRON CORE SETTING	ADJUST TRIMMERS TO MAXIMUM
I.F.				
456 KC	Control Grid (prong No. 8) 6SA7 1st Det. Tube	.05 mf.		1st I.F. (C11) & (C12) 2nd I.F. (C15) & (C16)
OSCILLATOR				
1560 KC	Antenna Cable See Note A	See Note A	Extreme Position out of Coil	Oscillator (C6)
1000 KC ADJUSTMENT				
1000 KC	Antenna Cable	See Note A	Tune to Max. Output with Tuning Knob	Int. (C5) Ant. (C4)

Reassemble Radio—Install in Car—Connect Car Antenna to Radio.

Car Antenna Readjustment—Tune in weak signal near 1000 KC—Readjust Antenna Trimmer C4 for maximum output.

Remove Grille, Speaker, Trimmer Caps and Rear Cover From Chassis Case—

Volume Control—Maximum All Adjustments.

Local-Distance Switch—"Distance" Position.

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:

A Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

Output Indicating Meter—Non-Metallic Screwdriver.

Dummy Antenna—.05 mf., See Note A.

NOTE A—Insert the antenna cable plug in the antenna socket on the chassis. The total capacity of the antenna cable and dummy antenna should be 60 mmf. If the cable, for example, has a capacity of 30 mmf., use a 30 mmf. condenser for a dummy antenna. Connect the other end of the antenna cable through the dummy antenna capacity to the output of the signal generator.

CALIBRATION—To calibrate the radio, tune in a station of known frequency. At the back of the control unit is the calibration screw. Remove the dial lamp assembly. Hold the tuning knob. Insert a fine bladed screwdriver and turn this screw until the pointer on the dial scale is at the frequency of the station being received.

Alignment Procedure D-748

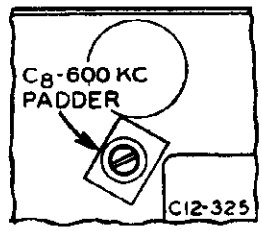


Fig. 7—600 KC Padder

Set the signal generator for 456 KC and connect the output of the signal generator through a .05 mf. condenser to the stator of the interstage section (middle) of the tuning condenser. Connect the ground lead of the signal generator to the chassis. Set the volume control at maximum and the L-D switch in the distance position. Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC. Then adjust the 4 I.F. trimmers until maximum output is obtained—See Fig. 4.

Insert the antenna cable plug in the antenna socket on the chassis. The total capacity of the antenna cable and dummy antenna should be 60 mmf. If the cable, for example, has a capacity of 30 mmf., use a 30 mmf. condenser for a dummy antenna. Connect the other end of the antenna cable through the dummy antenna capacity to the output of the signal generator.

Set the signal generator for 1560 KC. Turn the rotor of the tuning condenser to the full open position. Adjust the trimmer of the oscillator section of the gang condenser until maximum output is obtained. See Fig. 4 for location of this trimmer.

Set the signal generator for 1400 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained. Adjust the interstage and antenna 1400 KC trimmers for maximum output. Do not change the setting of the oscillator trimmer.

Set the signal generator for 600 KC.

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. 7) until the peak of greatest intensity is obtained.

Readjusting Antenna 1400 KC Trimmer—After the radio is installed and the car antenna is connected, it will be necessary to readjust the antenna 1400 KC (Fig. 3) trimmer. This trimmer can be reached through an opening in the chassis case. Tune in a weak signal at approximately 1400 KC with the volume control about three-fourths on. Turn the adjusting screw of the antenna 1400 KC trimmer up or down until maximum output is obtained.

If a distinct peak cannot be reached, it may be due to the fact that the antenna capacity is not properly matched to the antenna input circuit of the radio. An extension adapter cable may be required or if one is being used it may not be required—see article on antenna in this instruction manual.

Calibration—To calibrate the radio, first turn the tuning knob 9 complete turns in either direction. Then tune in a station of known frequency. Remove the dial lamp assembly from the back of the dial unit. The calibration screw is at the bottom of the dial lamp tube. Hold the tuning knob. Insert a fine blade screwdriver and turn this screw until the pointer is at the frequency of the station being received.

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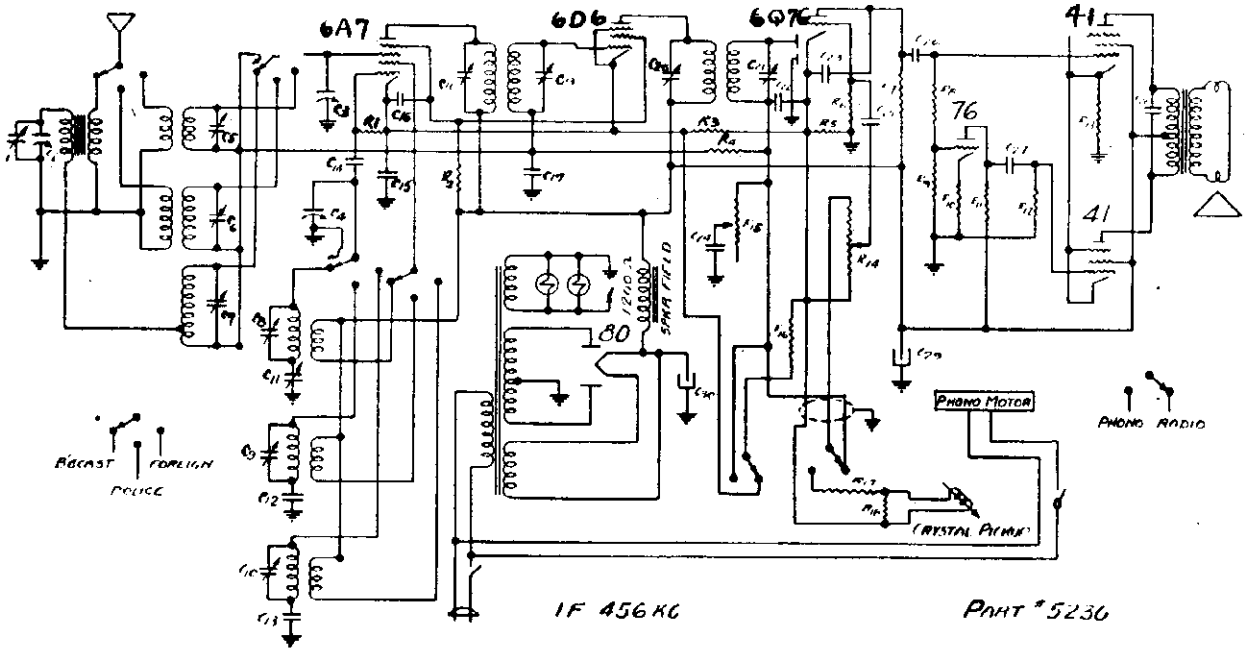

FOR ALIGNMENT SEE INDEX

PARTS LIST

No orders for parts will be accepted unless part number, description and chassis model number are given.

Part No.	*Description*	*Symbol*
2883	5M 1/3 W 10%	C1
2731	500M 1/3 W 10%	C2, 3, 4
5184	310 Ohm 1 W 5%	C5, 8, 10
5100	500M Volume Control	C6, 7, 9
5099	2 Meg. Tone control	C11
2605	200 Ohm 1/3 W 10%	C12
5091	Power Transformer	C13
3463-8	1st I.F. Transformer	C14
3463-9	2nd I.F. Transformer	C15
2724	Band Switch	C16, 17
2771	Antenna Coil	C18, 19, 20, 21
2772	Oscillator Coil	C22, 23
2845	Broadcast Antenna Coil	C24
5026	Pointer	C25
5228	Dial Chart	C26, 27
5034	Escutcheon	C28
5240	Radio-Phono Switch	C29
5232	Phonograph Motor	C30
5233	Turn Table	R1, 11, 18
5234	Phono Pick Up	R2
5185	8" Speaker	R3
3391	Tuning Knob	R4, 6
3392	Volume control knob	R5
3661	Tone control knob	R7
3393	Band switch knob	R8
3466	Radio-Phono knob	R9

Part No.	*Description*	*Symbol*
	Trimmer on tuning condenser	R10
5227	Variable condenser	R12, 17
1611	3-35 MMF trimmer	R13
2597	1-10 MMF trimmer	R14
2560	200-500 MMF padder	R15
2741	1330 MMF Mica 5%	R16
2793	.006 5% 600 V.	
2780	50 MMF Mica	
2792	.2 200 V.	
572	.1 200 V.	
	I F trimmer	
4810	.0005 400 V.	
2695	.003 600 V.	
568	.01 400 V.	
576	.02 400 V.	
824	.002 600 V.	
5101	16 MF 225 V. Electrolytic	
3285	16 MF 350 V. Electrolytic	
631	50M 1/3 W	
636	40M 1/3 W	
4529	10M 1/3 W	
624	1 Meg 1/3 W	
2689	100 Ohm 1/3 W 10%	
2730	100M 1/3 W 10%	
2881	400M 1/3 W 10%	
2880	100M 1/3 W 10%	

MODEL D901

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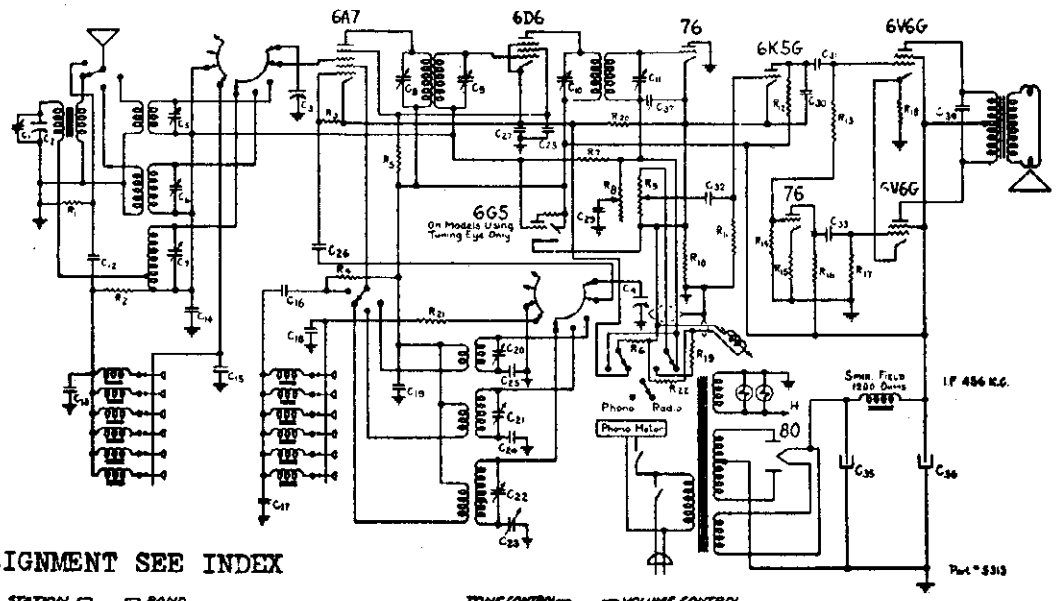
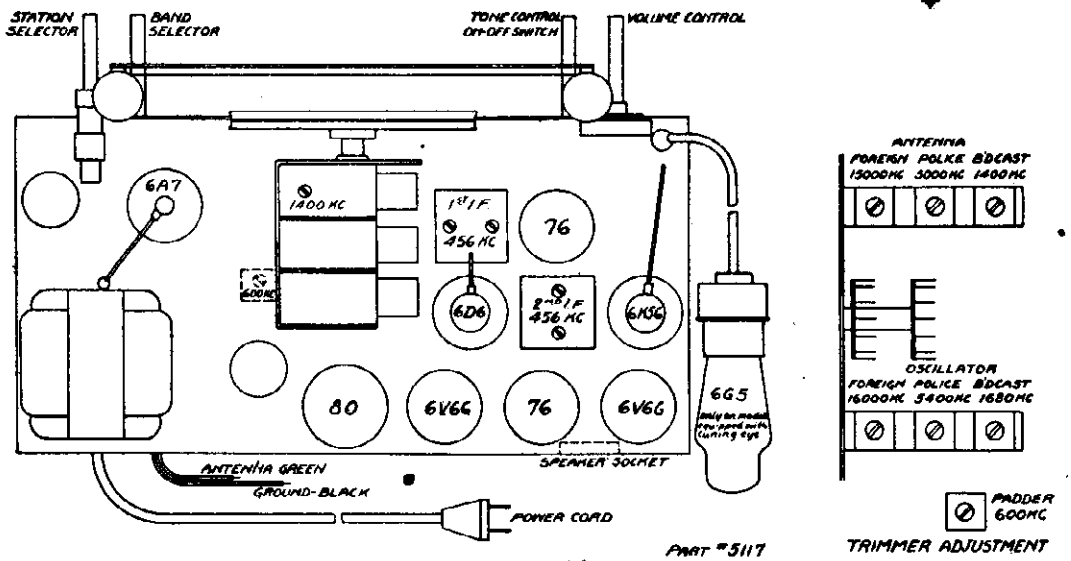


FOR ALIGNMENT SEE INDEX



PART #5117

PARTS LIST

Symbol	Part No.	Description
C1		Trimmer on variable
C2, 3, 4	5092	3-gang 362 mmfd. variable
C5, 20, 22	1611	3-35 mmfd. trimmer
C6, 7, 21	2597	1-10 mmfd. trimmer
C8, 9, 10, 11		I.F. Trimmers
C12, 30, 37	4810	.0005 400 V.
C13	5193	.002 Special 5%
C14, 28	572	.1 200 V.
C15		492 mmfd. Special 1%
C16, 31, 33	576	.02 400 V.
C17	5192	.001 Special 5%
C18		285 mmfd. Special 1%
C19	563	.05 400 V.
C23	2560	350 mmfd. Var. Padder
C24	2741	1330 mmfd. Mica
C25	2793	.006 600 V.
C26	2780	50 mmfd. Mica
C27	2792	.2 200 V.
C29	2695	.003 600 V.
C32	568	.01 400 V.
C34	824	.002 600 V.
C35	3285	16 mfd. 350 W.V. Elect.
C36	5101	16 mfd. 225 W.V. Reg. Elect.
R1	617	20M 1/3 W.
R2, 7, 11	624	1 meg. 1/3 W.
R3, 16	631	50M 1/3 W.
R4, 20	4529	10M 1/3 W.
R5	636	40M 1/3 W.
R6, 21	2605	200 ohms 1/3 W.
R8	5099	2 meg. tone control
R9	5100	500M Volume Control
R10	2689	100 ohm 1/3 W.
	2647	50 ohm 1/3 W. on models using tuning eye
R12	2730	200M 1/3 W.
R13	2881	400M 1/3 W. 10%
R14	2880	100M 1/3 W. 10%
R15	2883	5M 1/3 W. 10%
R17, 22	2731	500M 1/3 W.
R18	3353	250 ohm 5% Flexohm
	5091	Power Transformer
	3463-5	1st I.F. Transformer
	3463-6	2nd I.F. Transformer
	5096	Oscillator Coils
	5095	Antenna Coils
	2845	B.C. Antenna Coil
	2163	Drive Cable
	5312	Speaker 12"
	5097	Push Button Tuning Assembly Complete. (Replacement of individual component parts not recommended.)
	5240	Radio-Phono Switch

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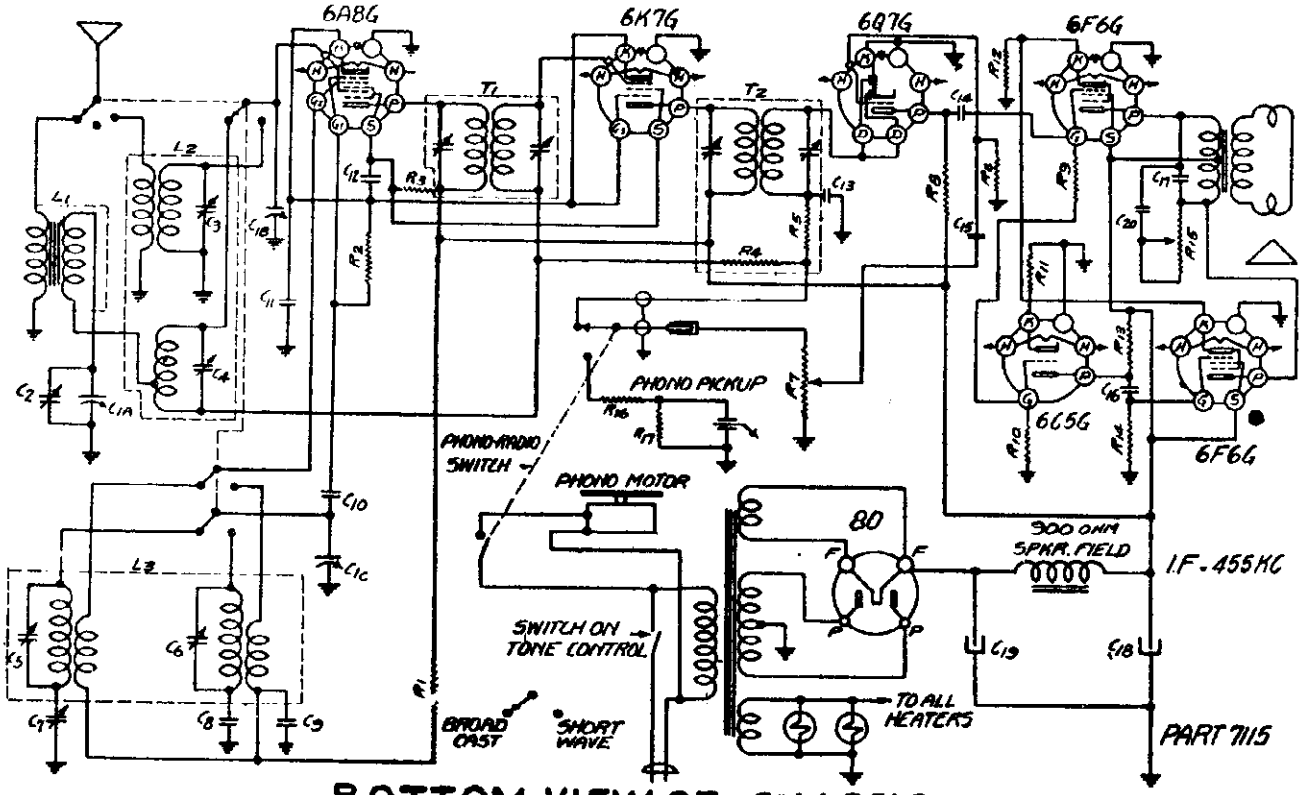
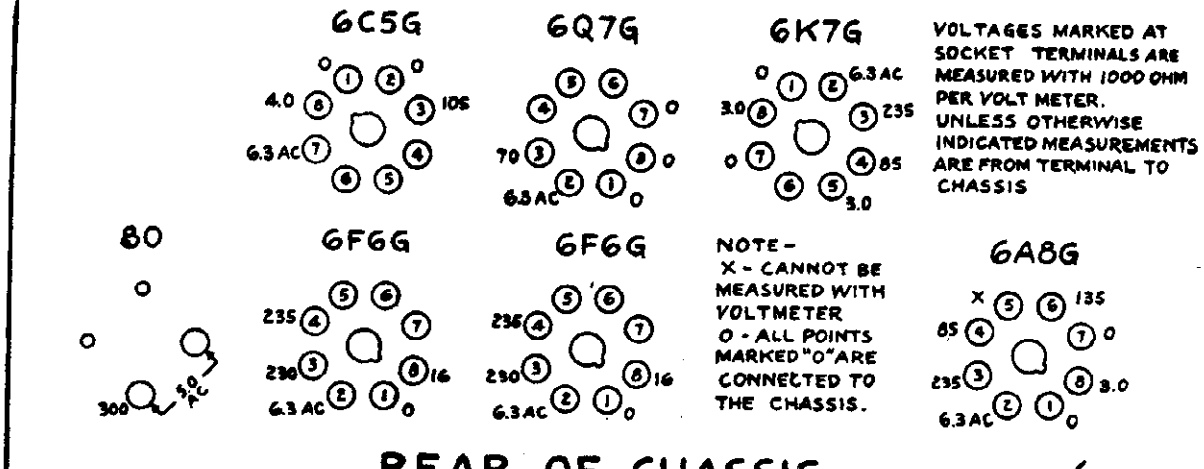


BOTTOM VIEW OF CHASSIS



REAR OF CHASSIS

Part Number	Circuit Diagram Location	Description	List Price Each
		CONDENSERS	
7114	C1a,b,c, C2	Variable Condenser	$2.00
		Trimmer on Variable Condenser	
1611	C3,4,5,6	3-35 mmf Trimmer	.20
2560	C7	B. C. Oscillator Padder 250-500 mmf	.35
2793	C8	.006 600 Volt 10% tolerance	.20
568	C9,15	.01 400 Volt	.20
2780	C10	50 mmf Mica	.20
2792	C11	.2 mf. 200 Volt	.25
3352	C12	.2 mf. 400 Volt	.25
1286	C13	250 mmf. Mica	.25
576	C14,16	.02 mf. 400 Volt	.20
824	C17	.002 mf. 600 Volt	.20
7113	C18,19	16 MF. 400 V Electrolytic	.75
2600	C20	.02 mf. 600 Volt	.20

		RESISTORS	
7121	R1	20 M 1-3 Watt	.15
6720	R2,5	50 M 1-3 Watt	.15
7120	R3	40 M 1-3 Watt	.15
6723	R4	1 Meg 1-3 Watt	.15
6724	R6	5 Meg 1-3 Watt	.15
5100	R7	Volume Control	.75
6721	R8	200 M 1-3 Watt	.15
7123	R9	400M 1-3 Watt 10%	.15
7124	R10	60 M 1-3 Watt 10%	.15
7125	R11	5 M 1-3 Watt 10%	.15
3353	R12	250 Ohm 1 Watt wire wound	.25
7122	R13	100 M 1-3 Watt 10%	.15
6722	R14	500 M 1-3 Watt	.15
5511	R15	Tone Control & Switch	1.00
6722	R16	500 M 1-3 Watt	.15
6721	R17	200 M 1-3 Watt	.15

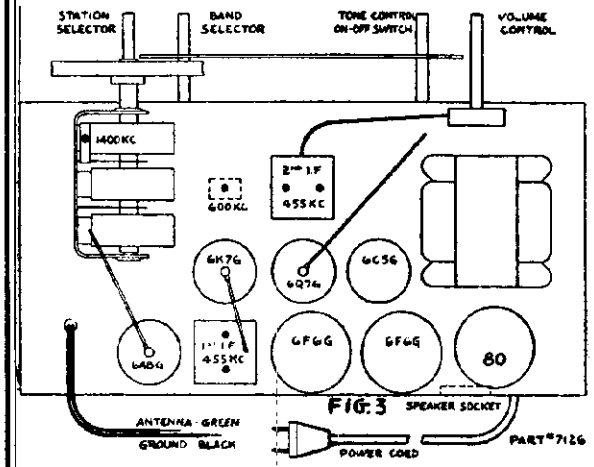


FIG. 3

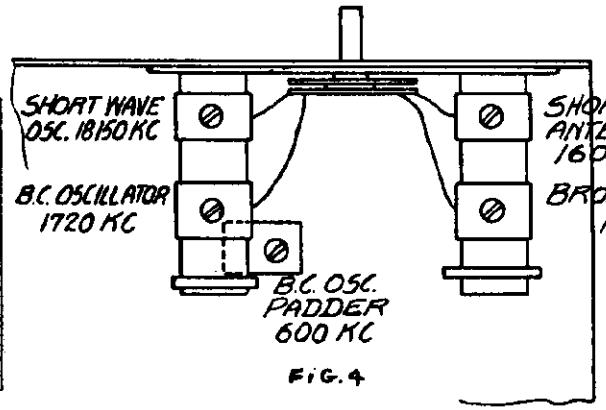
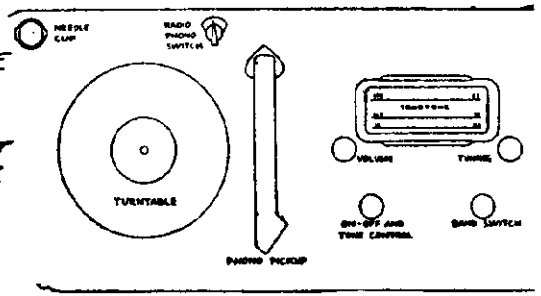


FIG. 4

TRIMMER ADJUSTMENTS



TUBES:

1—6A8G Converter (Oscillator and First Detector).
1—6K7G I. F. Amplifier.
1—6Q7G Detector-First Audio Amplifier.
1—6C5G Phase Inverter.
2—6F6G Push Pull Power Output.
1—80 Rectifier.

ALIGNMENT PROCEDURE

The diagrams below should be studied carefully as they show the location of all trimming and padding condensers. The following equipment is necessary to properly align this chassis:

1. An all Wave Signal Generator which will provide an accurately calibrated signal at the frequencies listed.
2. An Output Meter.
3. A non-metalic screwdriver.
4. Dummy Antenna— .1mfd., 200 mmf., 400 ohms.

Set the volume control near the maximum volume position, Connect the signal generator ground to the receiver chassis, Connect the proper value of dummy antenna in series with the generator output. Connect the output meter either across the primary of the output transformer or across the speaker voice coil. Allow the signal generator and the chassis to heat up for several minutes.

BAND	SIGNAL GENERATOR FREQUENCY SETTING	DUMMY ANTENNA	BAND SWITCH POSITION	VARIABLE CONDENSER SETTING	TRIMMER LOCATON	TRIMMER FUNCTON	CONNECTION	ADJUSTMENT
I. F.	455 kc.	.1 mfd.	Broadcast	Minimum Capacity	Trimmers on top see Fig. 3.	2nd I. F.	grid of 6K7G	Adjust to maximum output
I. F.	455 kc.	.1 mfd.	Broadcast	Minimum Capacity	Trimmers on top see Fig. 3.	1st I. F.	grid of 6A8G	Adjust to maximum output
BROAD-CAST BAND	1720 kc.	200 mmf.	Broadcast	Minimum Capacity	See Fig. 4.	Broadcast oscillator	Antenna lead	Adjust to maximum output
	1400 kc. approx.	200 mmf.	Broadcast	Tune in signal	Trimmer on Ant. coil. (Fig. 4.)	Broadcast pre-selector	Antenna lead	Adjust to maximum output
	1400 kc. approx.	200 mmf.	Broadcast	Tune in signal	Trimmer on Var. Condenser. (Fig. 4).	Broadcast Antenna	Antenna lead	Adjust to maximum output
	600 kc.	200 mmf.	Broadcast	Tune in signal	See Figs. 3 & 4.	Broadcast osc. pad.	Antenna lead	Rock thru signal adjust for Max. output
REPEAT ABOVE PROCEDURE AS FINAL CHECK.								
SHORT WAVE BAND	18150 kc.	400 ohm.	Short Wave	Minimum Capacity	Trimmer on Osc. coil. (Fig. 4).	Short Wave Oscillator	Antenna lead	Adjust to maximum output
	17000 kc.	400 ohm.	Short Wave	Tune in signal	Trimmer on Ant. coil. (Fig. 4).	Short Wave Antenna	Antenna lead	Rock back and forth thru signal & adjust for Max. output.
REPEAT ABOVE PROCEDURE AS FINAL CHECK.								

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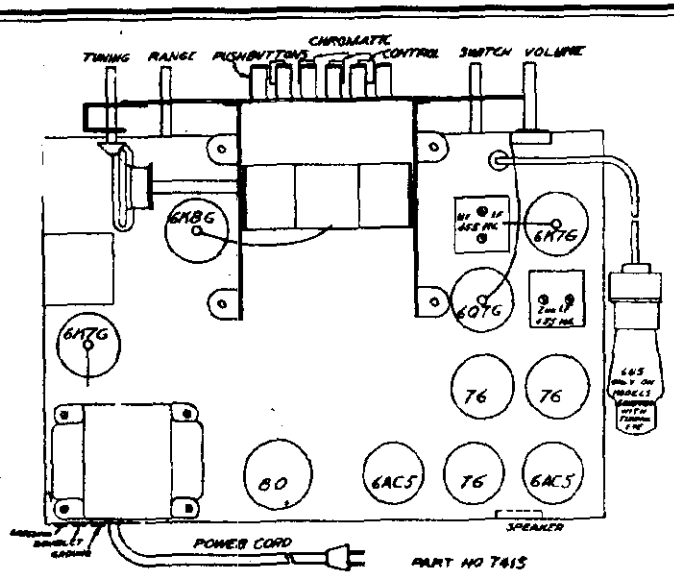
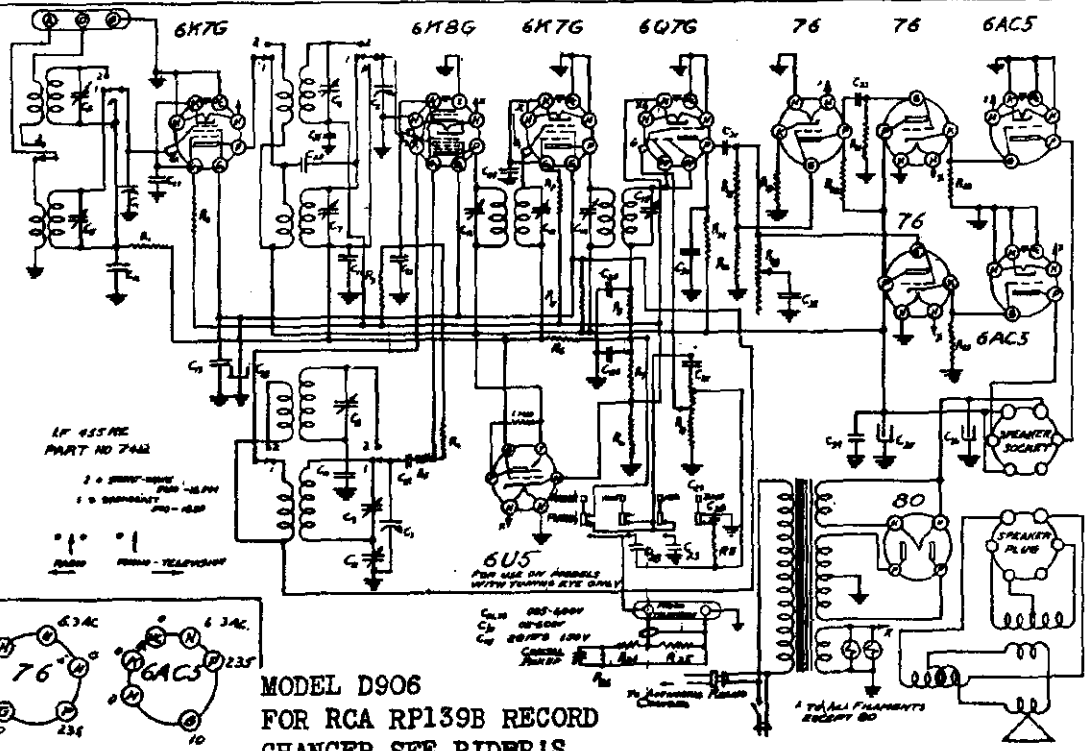
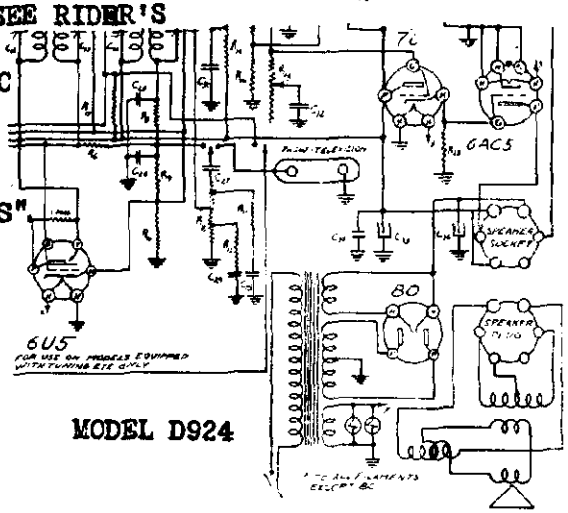


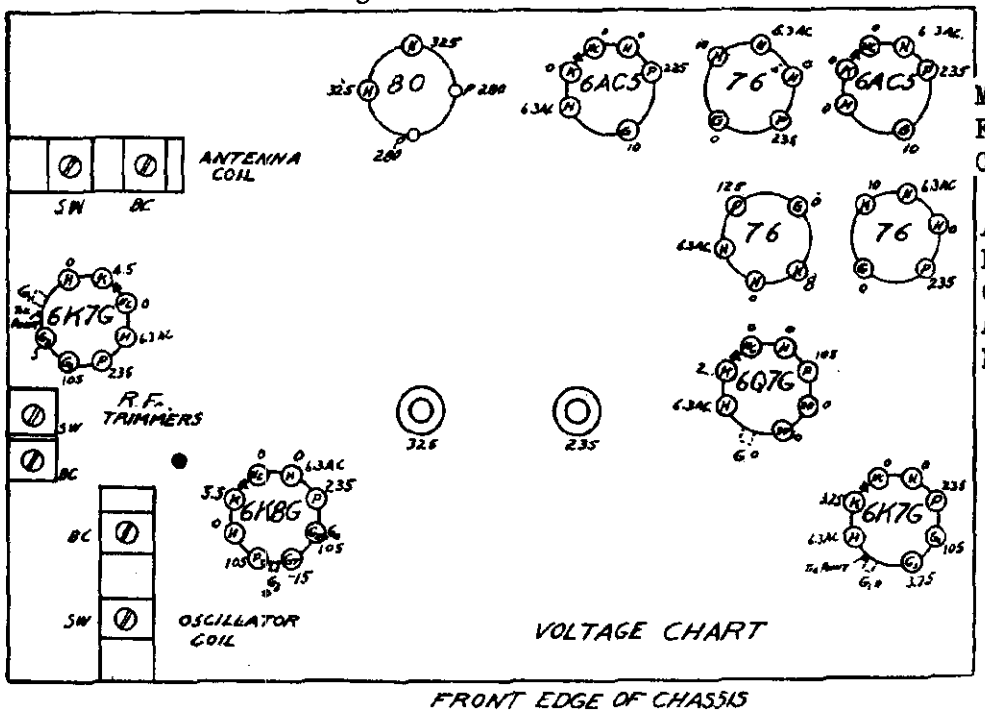
Fig. 2



MODEL D906
FOR RCA RP139B RECORD
CHANGER SEE RIDER'S
AUTOMATIC
RECORD
CHANGERS
AND
RECORDERS"



MODEL D924



Model 924 is same as Model 906 with the exceptions shown in the accompanying

MODEL D906
MODEL D924

WESTERN AUTO SUPPLY CO.

PARTS LIST AND PRICE

MODELS D906 and D924

7177		Bracket—Cond. Support (left hand)	$0.15
7155		Bracket—Cond. Support (right hand)	.15
7156		Bracket—Indicator Drive Pulley	.15
7157		Bracket—Tuning Shaft	.15
2719		Bracket—Vol. Control	.15
7281		Bracket—Chassis Mounting	.10
2163		Cable—Drive Approx. 50" Tot.	.15
7407		Can—Coil RF	.25
7283		Coil—Antenna	1.50
7284		Coil—R. F.	1.50
7285		Coil—Oscillator	1.50
7196	R13	Control Volume	.90
1286	C28	Condenser—Mica, .00025	.20
7257	C1, 2,3	Condenser—Var. (Mech. Tuner)	5.50
572	C23, 24	Condenser—Paper, .1-200v	.20
1285	C30	Condenser—Mica, .0001	.20
575	C19, 34	Condenser— Paper, .1-400v	.20
580	C16, 17, 21	Condenser—Paper, .05-200v	.20
7197	C4, 5, 6, 7, 8, 9	Condenser—Trimmer	.25
7313	C10	Condenser—Padder, 3300 M.M.F.	.35
7314	C11	Condenser—Padder	.35
7400	C35, 36	Condenser—16 MFD, Elec.	1.00
824	C29, 38	Condenser—Elec., 20 M.F.D. 150v	.60
5780	C18	Condenser—Elec., 20 M.F.D 150v	.60
2780	C22	Condenser—Mica, .00005	.20
7167		Disc—Friction Drive	.05
7170		Drum—Drive	.15
7176		Drum—Indicator Drive	.40
2782	1	Condenser, .005-600	.20
7154		Frame—Indicator	.40
7209	4	Grommet—Cond. Mtg.	.05
7161		Hub—Drive Pulley	.10
6158		Lamp—Pilot	.10
7199		Plate—Diffusing Celluloid	.40
6243		Pointer	.20
7166		Pulley—Friction Drive	.15
7165		Pulley—Idler (Wood)	.10
1207		Retainer	.01
7318	R10	Resistor—1/3w, 70r + or — 10%	.15
6721	R11, 14, 26	Resistor—1/3w, 200M, + or — 20%	.15
7123	R15	Resistor—1/3w, 400M, + or — 10%	.15
7240	R12,,22, 23	Resistor—1/3w, 25M, + or — 10%	.15
6723	R6	Resistor—1/3w, 1 Meg., + or — 20%	.15
6722	R21, 24, 25	Resistor—1/3w, 500 M, + or — 10%	.15
7122	R16	Resistor—1/3w, 100M + or — 10%	.15
6718	R5	Resistor—1/3w, 100r +or M 20%	.15
6720	R4, 20	Resistor—1/3w, 50M + or — 10%	.15
6890	R4, 20	Resistor—1/3w, 300r + or — 10%	.15
7125	R19	Resistor—1/3w, 5M + or — 10%	.15
7408	R7	Resistor—1/3w, 400r + or — 10%	.15
6719	R1	Resistor—1/3w, 10M + or — 10%	.15
7290	R17	Resistor—3 w, 10 M + or — 10%	.25
7160		Shaft—Drive	.05
2541		Shield—Tube	.10
2562		Shield—Grid	.05
7201		Socket—Pilot Lamp	.15
5619		Spring—Drive	.05
7255		Spring—Drive Shaft	.02
7203		Strip—Phono-Television	.15
2711		Studs—Cond. Mounting	.05
6247		Stud—Idler Pulley	.05
7292		Switch—Band	2.00
7259		Switch—Tone	1.25
7416		Switch—On-Off	.40
7293		Transformer 1st I. F.	1.75
7294		Transformer 2nd I. F.	2.00
7295		Transformer, Power	4.00
7425		Book—Instruction	.20
4313		Bracket—Tuning Tube	.02
7146		Buttons	.10
7417		Button—"Phono"	.05
7418		Button—"Voice"	.05
7419		Button—"Med."	.05
7420		Button—"Bass"	.05
7263	1	Cabinet	
4314		Clamp—Tapped	.02
4315		Clamp—Plain	.02
2981		Cable—Tuning Eye	.60
7040		Escutcheon—Dial	1.50
7252		Indicator—Dial	.80
7183		Escutcheon—Button	.50
5573		Escutcheon—Tuning Tube	.10
3839		Knob—Tuning	.15
3848		Knob—Volume	.15
7423		Knob—Switch, On-Off	.15
7299		Knob—Band Switch	.15
7087	1	Record Changer (complete with turntable)	45.00
4316		Screw—Wing	.05
7426		Sheet—Record Changer Instr.	.10
7190		Sheet—Call Letter	.20
7300		Speaker—10" Dynamic	7.00
6721	1	Resistor—1/3w, 200M + or — 20%	.15

TUBES:

1—6K7G RF Amplifier.
1—6K8G Converter (Oscillator and First Detector).
1—6K7G IF Amplifier.
1—6Q7G Second Detector and First Audio Amplifier.
2—76 Driver Tubes.
1—76 Phase Inverter.
2—6AC5 Output Tubes.
1—80 Rectifier.
1—6U5 Tuning Indicator.

ADDITIONAL PARTS FOR MODEL D924 ONLY

7195	R18	Control—Tone and Switch	1.00
7357	R13	Control—Volume	.90
2601	C32	Condenser—Paper, .01-660v	.20
7257	C1,2,3	Condenser—Var. (Mech. Tuner)	5.50
3285	C36	Condenser—Elec. Wet., 16 mfd.	.80
5101	C35	Condenser—Elec. Wet., regulator	.80
7409	R11	Resistor—1/3 w., 300M + or — 20%	.15
7122	R16	Resistor—1/3 w., 100M + or — 10%	.15
7318	R11	Resistor—/3 w., 70r + or — 10%	.15
572	C23,24	Condenser—Paper, .1-200v	.20
1285	C30	Condenser—Mica .0001	.20
575	C19,34	Condenser—Paper, .1-400 v.	.20
580	C16,17,21	Condenser—Paper, .05-200 v.	.20
7197	C4,5,6,7,8,9	Condenser—Trimmer	.25
7313	C10	Condenser—Padder, 3300 mmf.	.35
7314	C11	Condenser—Padder, 450 mmf., adjustable	.35
5780	C18	Condenser—Elec., 20 mfd., 150v.	.60
4072	C29	Condenser—Paper, .03-200v	.20
824	C27,28	Condenser—Paper, .002-600v	.20

WESTERN AUTO SUPPLY CO.

ALIGNMENT PROCEDURE

The following equipment is necessary to properly align this chassis:

1. An all Wave Signal Generator which will provide an accurately calibrated signal at the frequencies listed.
2. An Output Meter.
3. A non-metallic screwdriver.
4. Dummy Antenna—.1 mfd., 200 mmf., 400 ohms.

Set the volume control near the maximum volume position, connect the signal generator ground to the receiver chassis, connect the proper value of dummy antenna between the high side of the generator output and the point in the receiver indicated in the table below. Connect the output meter either across the primary of the output transformer or across the speaker voice coil. Allow the signal generator and the the chassis to heat for several minutes.

BAND	SIGNAL FREQUENCY SETTING	GENERATOR CONNECTED TO	DUMMY ANTENNA	BAND SWITCH POSITION	VARIABLE CONDENSER SETTING	TRIMMER LOCATION	TRIMMER FUNCTION	ADJUSTMENT
I. F.	455 kc.	Grid of 6K7G (I.F.)	.1 mmfd.	Short wave	Minimum capacity	On top. See Fig. 2	2nd I. F.	Adjust to maximum output
I. F.	455 kc.	Grid of 6K8G	.1 mmfd.	Short wave	Minimum capacity	On top. See Fig. 2	1st I. F.	Adjust to maximum output
BROAD-CAST BAND	1400 kc. exact	Antenna terminal	200 mmf.	Broadcast	Set pointer to indicate 1400 kc.	Underneath chassis on oscillator coil See Fig. 6	Broadcast oscillator	Adjust to maximum output
BROAD-CAST BAND	1400 kc. exact	Antenna terminal	200 mmf.	Broadcast	As above	Underneath chassis on RF coil See Fig. 6	Broadcast RF amplifier	Adjust to maximum output
BROAD-CAST BAND	1400 kc.	Antenna terminal	200 mmf.	Broadcast	As above	Underneath chassis on Ant. coil See Fig. 6	Broadcast antenna	Adjust to maximum output
BROAD-CAST BAND	600 kc. approx.	Antenna terminal	200 mmf.	Broadcast	Tune in signal	Under chassis See Fig. 6	Broadcast padder	Adjust to maximum output while rocking gang condenser

REPEAT ABOVE BROADCAST ALIGNING PROCEDURE AT LEAST ONCE MORE

SHORT WAVE BAND	16,000 kc. exact	Ant. Terminal	400 ohms	Short wave	Set pointer to indicate 16,000 kc.	Underneath chassis on osc. coil See Fig. 6	Short wave oscillator	Adjust to maximum output. *See note 1
	16,000 kc. exact	Ant. Terminal	400 ohms	Short wave	As above	Underneath chassis on RF. coil See Fig. 6	Short wave RF. amplifier	Adjust to maximum output while rocking the tuning-condenser slightly.
	16,000 kc. exact	Ant. Terminal	400 ohms	Short wave	As above	Underneath chassis on Ant. coil See Fig. 6	Short wave Antenna	Adjust to maximum output while rocking the tuning-condenser slightly.

REPEAT ABOVE PROCEDURE AS FINAL CHECK

NOTE 1.—Exercise care to see that the oscillator is tuned to a frequency higher than the signal since it is very easy to mistakenly set the oscillator on the wrong side of the signal at this high frequency.

BAND SWITCH:

The Band Switch, lower right hand knob, serves to make the necessary changes in connections so that reception may be obtained on the short wave band instead of the broadcast band or vice versa as desired.

In the left hand, or counterclockwise position, connections are made for receiving stations in the range 540 to 1800 KC., which range includes the American broadcast band (540 to 1670 KC.) a large number of municipal police stations (1600 to 1712 KC.) and a number of amateur stations (above 1712 KC.).

In the right hand, or clockwise position, connections are made for reception of short wave stations in the range 5500 to 18,000 KC. (5.5 to 18 megacycles). An extra scale has been provided for the short wave range, calibrated in meters (54.5 to 17) for the convenience of the user.

There are 6 buttons on the automatic tuning dial by means of which 6 stations may be set for quick tuning.

Make a list of your favorite stations, those which you tune in regularly

It is better to list the station with the lowest kilocycle number first, the station with the next higher kilocycle number next, and so on.

Any button may be used for any station you can receive, although it will be better to set the stations so that the kilocycle numbers increase from left to right.

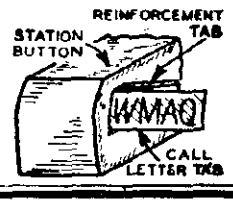
SETTING A STATION BUTTON:

Pull the button at the extreme left off the shaft. When this is done, the locking screw under the shaft will be exposed.

Loosen this screw with a small screwdriver by turning several turns in a counterclockwise direction. Continue to press in firmly on the screwdriver, thus holding the station button shaft depressed. Select the first station from the lis you have prepared and carefully tune in this station by means of the manual tuning knob.

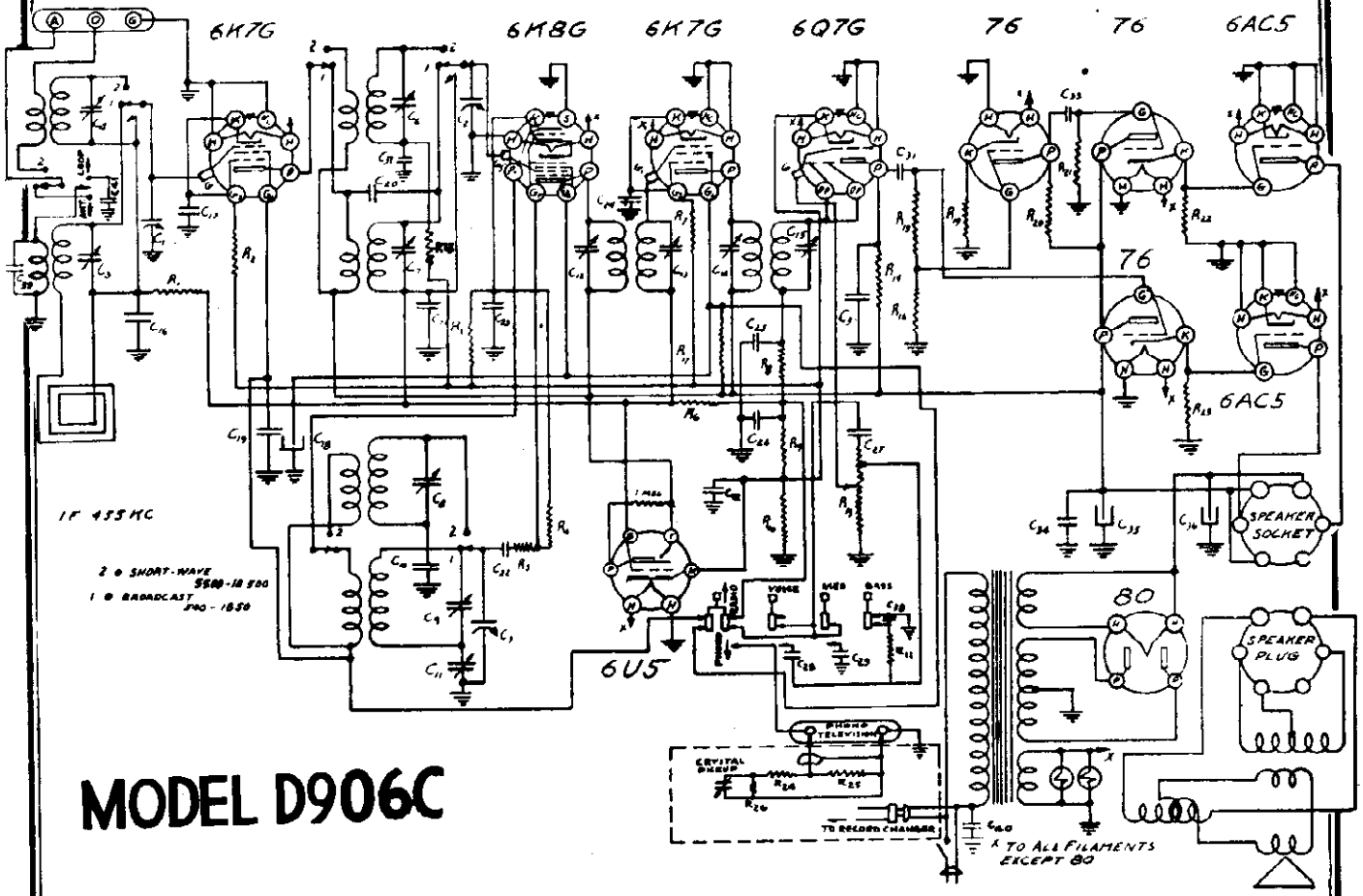
Continue to press in firmly on the screwdriver and lock the mechanism by turning the locking screw in a clockwise direction until it is tight. The station is now set on this button.

Proceed in the same manner to set any additional stations on your list on the remaining station buttons.



MODEL 906C

WESTERN AUTO SUPPLY CO.



MODEL D906C

6719	R1	Resistor, 1/3W 10,000
6890	R2,3	Resistor, 1/3W 300
6720	R4,20	Resistor, 1/3 W 50,000
7119	R5	Resistor, 1/3W 200
6725	R6	Resistor, 1/3W 1,000,000
7109	R7	Resistor, 1/3W 400
	R8	Resistor, 1/3W 50,000 in IF Trans.
	R9	Resistor, 1/3W 1,000,000 in IF
7118	R10	Resistor, 1/3W 70
7196	R13	Volume Control, 1/3W 3,000,000
6721	R14,29	Resistor, 1/3W 200,000
7123	R15	Resistor, 1/3W 400,000
7122	R16	Resistor, 1/3W 100,000
7290	R17	Resistor, 3W 10,000
7253	R18	Resistor, 1/3W 75,000
7125	R19	Resistor, 1/3W 5,000
6722	R21,24,25	Resistor, 1/3W 500,000
7240	R22,23	Resistor, 1/3W 25,000
C1,2,3,		Condenser, Mech. Tuner
C4,5,6,7,8,9,		Condenser Trimmer 3-20 MMF
C10		Condenser Padder 3300 MMF
C11		Condenser Adj. Padder
C12,13,14,15		Condenser, I.F. Trimmer
C16,17,21		Condenser .05-200
C18		Condenser Electrolytic 20 MFD 150
C19		Condenser paper .1-400
C20		Condenser (Wire) 2.5 MMF
C22,39		Condenser, Mica 50 MMF
C23,24		Condenser, paper .1-200
C25,26		Cond. Mica, 100 MMF in I.F.
C27,29,38		Condenser, paper .002-600
C28,41		Condenser, Mica, 250 MMF
C30		Condenser, Mica 100 MMF
C31,33		Condenser, paper .005-600
C32		Condenser, Electrolytic 250 MFD 2 volt
C34		Condenser, paper .2-400
C35,36		Condenser, Electrolytic 16 MFD-400
C37		Condenser, paper, .02-600
C40		Condenser, Mica .001 to .002

BAND	SIGNAL FREQUENCY SETTING	GENERATOR CONNECTED TO	DUMMY ANTENNA	BAND SWITCH POSITION	VARIABLE CONDENSER SETTING	TRIMMER LOCATION	TRIMMER FUNCTION	ADJUSTMENT
I. F.	455 kc	Grid of 6K7G (I.F.)	.1 mmfd.	Short wave	Minimum capacity	On top.	2nd I. F.	Adjust to maximum output
I. F.	455 kc.	Grid of 6K8G	.1 mmfd.	Short wave	Minimum capacity	On top.	1st I. F.	Adjust to maximum output
BROAD-CAST BAND	1400 kc. exact	Antenna terminal	200 mmf.	Broadcast	Set pointer to indicate 1400 kc.	Underneath chassis on oscillator coil	Broadcast oscillator	Adjust to maximum output
BROAD-CAST BAND	1400 kc. exact	Antenna terminal	200 mmf.	Broadcast	As above	Underneath chassis on RF coil	Broadcast RF amplifier	Adjust to maximum output
BROAD-CAST BAND	1400 kc.	Antenna terminal	200 mmf.	Broadcast	As above	Underneath chassis on Ant. coil	Broadcast antenna	Adjust to maximum output
BROAD-CAST BAND	600 kc. approx.	Antenna terminal	200 mmf.	Broadcast	Tune in signal	Under chassis	Broadcast padder	Adjust to maximum output while rocking gang condenser

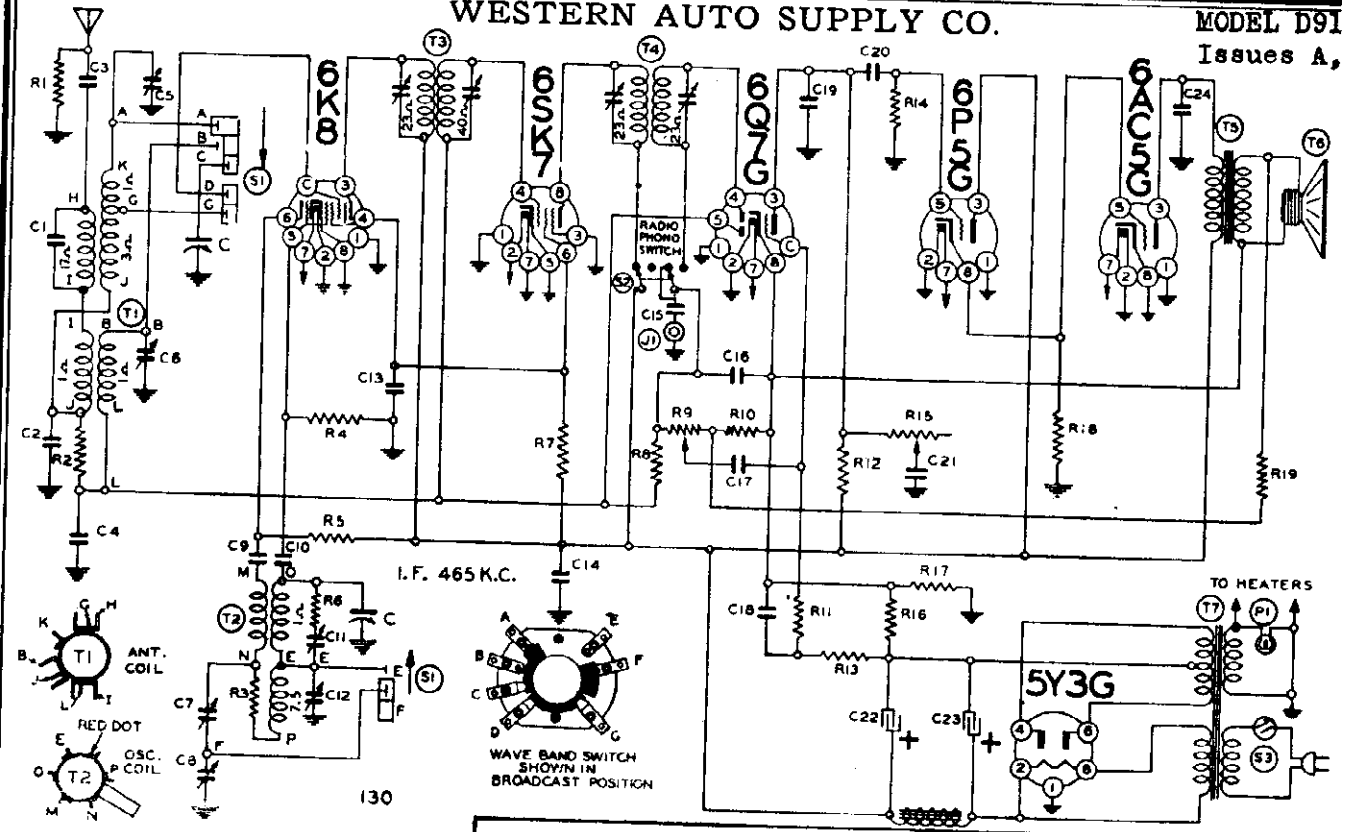
REPEAT ABOVE BROADCAST ALIGNING PROCEDURE AT LEAST ONCE MORE

SHORT WAVE BAND	16,000 kc. exact	Ant. Terminal	400 ohms	Short wave	Set pointer to indicate 16,000 kc.	Underneath chassis on osc. coil	Short wave oscillator	Adjust to maximum output.
	16,000 kc. exact	Ant. Terminal	400 ohms	Short wave	As above	Underneath chassis on RF. coil	Short wave RF. amplifier	Adjust to maximum output while rocking the tuning-condenser slightly.
	16,000 kc. exact	Ant. Terminal	400 ohms	Short wave	As above	Underneath chassis on Ant. coil	Short wave Antenna	Adjust to maximum output while rocking the tuning-condenser slightly.

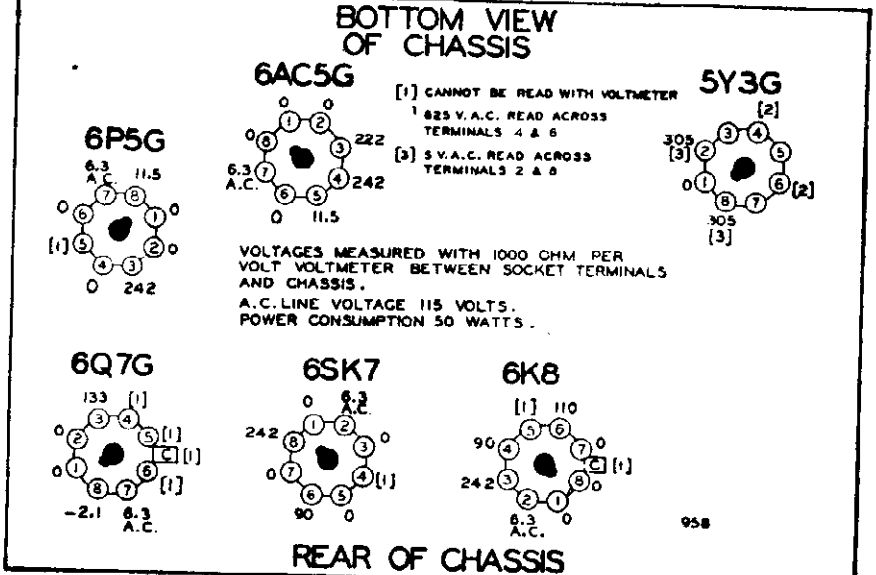
REPEAT ABOVE PROCEDURE AS FINAL CHECK

WESTERN AUTO SUPPLY CO.

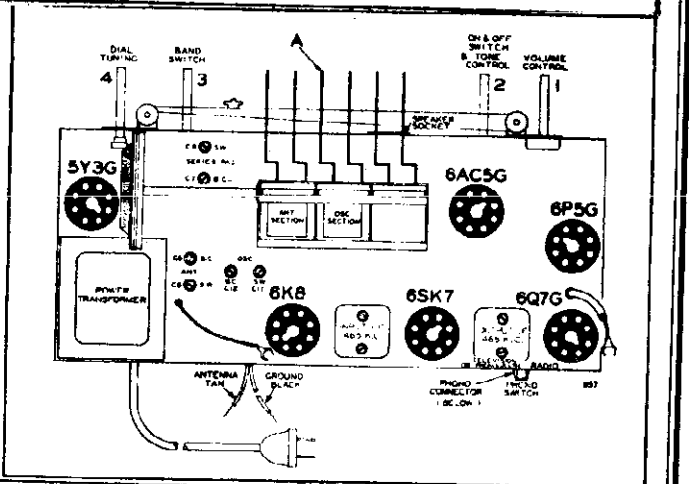
MODEL D91
Issues A,



BOTTOM VIEW OF CHASSIS



REAR OF CHASSIS



Circuit Diagram Ref. No. | **Part No.** | **Description**

RESISTORS

R1	13017	10M ohm—½ w.
R2	13011	250M ohm—½ w.
R3	130174	50 ohm—½ w.
R4	13012	50M ohm—½ w.
R5	130243	25M ohm—1 watt
R6	130174	50 ohm—½ w.
R7	13065	30M ohm—1 watt
R8	1304	3 megohm—½ w.
R9	101187	Volume Control (1 Megohm)
R10	130272	10 ohm—½ w.
R11	13019	1 megohm—½ w.
R12	1309	200M ohm—½ w.
R13	1303	500M ohm—½ w.
R14	13019	1 megohm—½ w.
R15	101189	Tone Control (1 Megohm)
R16	130203	40 ohm—½ w.
R17	130203	40 ohm—½ w.
R18	1301	25M ohm—½ w.
R19	130168	100 ohm—½ w.

CONDENSERS

C	102115	2 gang variable condenser
C1	129132	.000125 Mica
C2	129131	.002775 Mica
C3	10011	.01 x 400 v.
C4	1009	.05 x 200 v.
C5	12475	B.C. Antenna Trimmer
C6	12475	S.W. Antenna Trimmer
C7	124101	B.C. Series Pad
C8	124101	S.W. Series Pad
C9	10025	.002 x 600 v.
C10	12939	.00005 Mica
C11	124102	S.W. Oscillator Trimmer
C12	124102	B.C. Oscillator Trimmer
C13	1001	.1 x 400 v.
C14	1001	.1 x 400 v.
C15	10020	.1 x 200 v.
C16	1295	.0001 Mica
C17	10011	.01 x 400 v.
C18	10020	.1 x 200 v.
C19	1292	.0005 Mica
C20	10011	.01 x 400 v.
C21	*10026	.02 x 400 v.
C22	11980	12 mfd.—450 w.v. lytic
C23	11980	12 mfd.—450 w.v. lytic
C24	*100113	.0025 x 600 v.

C5 and C6 in same unit C7 and C8 in same unit
C11 and C12 in same unit

*issue A only C21-10071 .004M.F.-600V.
C24-10019 .006M.F. 600 V.

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- 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 frequencie as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mf., 200 mmf. and 400 ohms.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (In Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6SK7	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6K8	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1750 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Trimmer (C12) (See Fig. 4)	Broadcast oscillator	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set Dial at 1400 Kc.	Trimmer (C5) (See Fig. 4)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set Dial at 600 Kc.	Trimmer (C7) (See Fig. 4)	Broadcast oscillator series pad	Adjust to maximum rock dial. (See note "A")
SHORT WAVE BAND	17 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Set Dial at 17 MC.	Trimmer (C11) (See Fig. 4)	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Dial Set at 17 MC.	Trimmer (C6) (See Fig. 4)	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Set Dial at 6 MC.	Trimmer (C8) (See Fig. 4)	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "A")

NOTE "A." Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

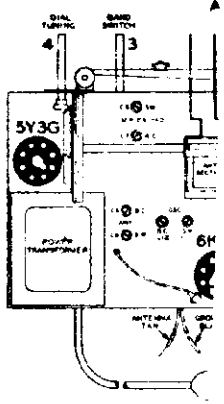
After each band is completed, repeat the procedure as a final check.

BAND SWITCH	BAND	FREQUENCY RANGE
Extreme right rotation	Short Wave	5.2 to 18.3 MC.
Extreme left rotation	Broadcast	540 to 1750 KC.

Power Consumption.....60 Watts (At 115 volts 50-60 cycles)

Power Output.....3 Watts Undistorted, 5 Watts Maximum

INTERMEDIATE FREQUENCY.....465 KC.



TUBES:

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

The type and function of each tube is as follows:

1—Type 6K8 Converter (Oscillator and First Detector).

1—Type 6SK7 Remote Cut-Off Pentode, I. F. Amplifier (465 K. C.).

1—Type 6Q7G Duplex Diode Triode Second Detector, A.V.C. and First Audio.

1—Type 6P5G Driver Amplifier.

1—Type 6AC5G Positive Grid Triode Output Amplifier.

1—Type 5Y3G 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 110, 130, and 230 volts, (see parts list.)

PROCEDURE FOR SETTING THE AUTOMATIC STATION PUSHBUTTONS:

Press any one of the automatic pushbuttons all the way in. Hold the push button in **firmly** and with a screw driver inserted through the opening in the escutcheon loosen the locking screw directly above the pushbutton which is being held in (See "C" Fig. 3). Three or four complete turns will be sufficient.

Now, while **still holding** the pushbutton in **firmly**, tune in very carefully by means of the dial tuning knob the station **you wish this pushbutton to represent.** You will note that in order to tune the station, the dial tuning knob will have to **be pressed in.** The knob is equipped with a spring which partially disengages the control from the drive mechanism when dial tuning knob is not being used.

Turn the dial tuning knob back and forth **very slowly** until the station is heard clearly and with maximum volume.

Now, while **still holding** the pushbutton in **firmly**, tighten the locking screw above **this** pushbutton. Turn the screw until it is **just tight.** Do not use force. **Release** the pushbutton. This pushbutton is now **set up and locked.**

Press in another **pushbutton and** holding it in **firmly**, loosen the locking screw above **this** pushbutton. Carefully tune in another station while **still holding** the pushbutton in **firmly.** After the station has been tuned in, tighten the locking screw above the pushbutton **which is being held in.**

Follow this procedure until you have selected all of your favorite stations.

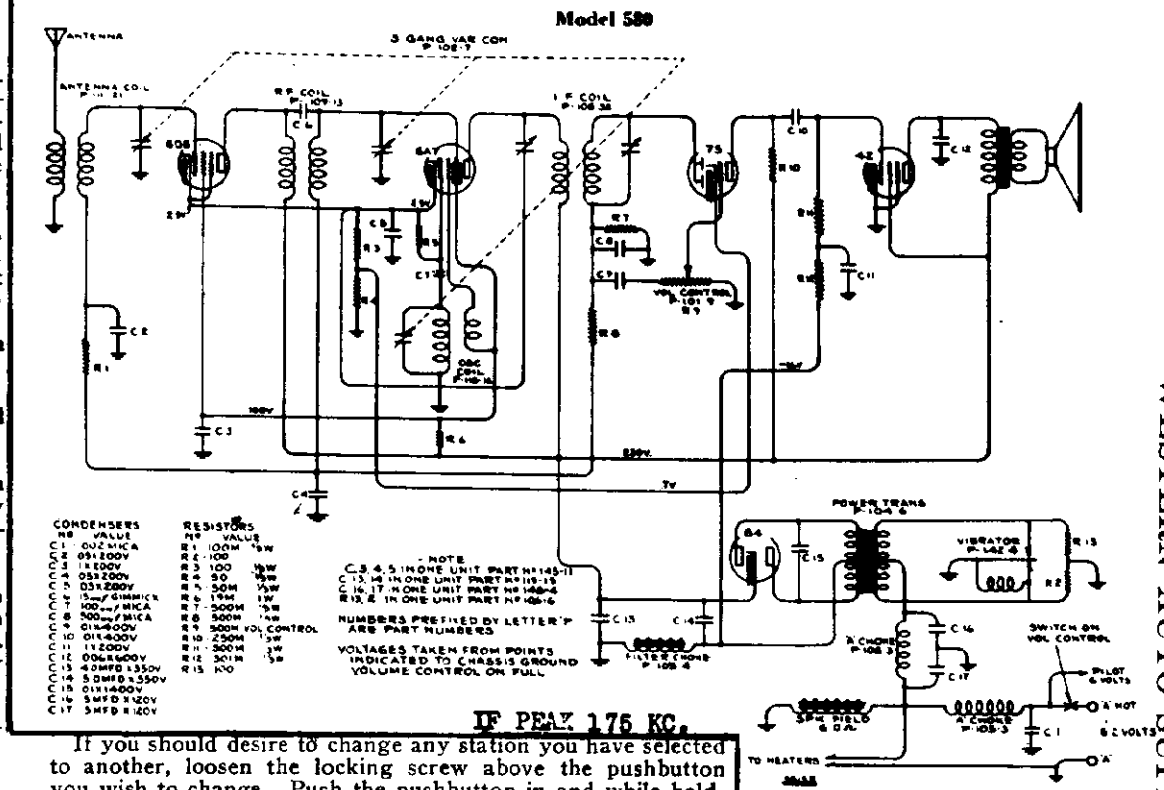
It is **very important that the locking screw** for each pushbutton is tightened, otherwise the stations will not remain set up accurately for pushbutton tuning.

If you find you have made an error in setting a station or a station is not accurately tuned due to the pushbutton not being held in firmly while tightening the locking screw for this particular pushbutton, repeat the setting procedure for this pushbutton again.

Each pushbutton has its own locking screw and the pushbuttons are entirely independent of one another.

Punch out from the set of station call letter tabs supplied, the call letters of the stations you have set up for pushbutton tuning.

Insert the call letter tabs in the rectangular openings above each of the pushbuttons over the pushbutton locking screws. One of the small celluloid tabs supplied should be snapped into place over each of the station call letter tabs, (See "B", Fig. 2).



If you should desire to change any station you have selected to another, loosen the locking screw above the pushbutton you wish to change. Push the pushbutton in and while holding it in firmly tune in the new station by means of the dial tuning knob. After the station is carefully tuned in, tighten the locking screw while still holding the pushbutton in. Insert the new station call letter tab and the celluloid protective cover. The radio is now set up for automatic tuning.

ALIGNING INSTRUCTIONS:

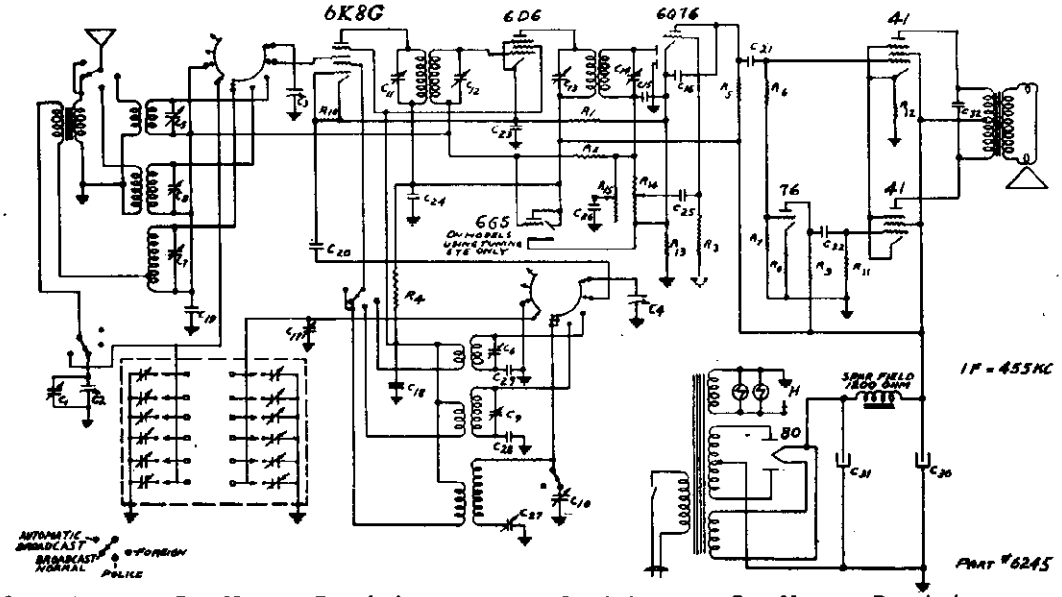
CAUTION:—No aligning adjustments should be attempted without first thoroughly checking over all other possible causes of trouble, such as poor installations, open or grounded antenna systems, low line voltages, defective tubes, condensers and resistors. In order to properly align this chassis, an oscillator (generator) is absolutely necessary. No aligning adjustments should be attempted with the chassis in the cabinet.

To remove the chassis from the cabinet, remove the four chassis mounting bolts which are used to hold the chassis to the cabinet bottom; take the knobs off their shafts, the tuning knob is held on by means of a set screw; the volume control,

Model D-910
Issue A, and B

MODEL D911

WESTERN AUTO SUPPLY CO.



Symbol	Part No.	Description
C1		Trimmer on variable
C2, 3, 4	5092	3-gang 362 mmfd. variable
C5, 6	1611	3-35 mmfd. trimmer
C7, 8, 9, 10	2597	1-10 mmfd. trimmer
C11, 12, 13, 14		I.F. Trimmers
C15, 16	4810	.0005 mfd. 400 V. paper
C17	3157	1-10 mmfd. isolantite trimmer
C18, 19	572	.1 mfd. 200 V. paper
C20	2780	50 mmfd. Mica
C21, 22	576	.02 mfd. 400 V.
C23, 24	2792	.2 mfd. 200 V.
C25	568	.01 mfd. 400 V.
C26	2695	.003 mfd. 600 V.
C27	2560	350 mmfd. Var. padder
C28	2741	1330 mmfd. padder
C29	2793	.006 mfd. 600 V. padder
C30	5101	16 mfd. 225 W.V. reg. elect.
C31	3285	16 mfd. 350 W.V. elect.
C32	824	.002 mfd. 600 V. paper
R1	2605	200 ohm 1/3 W.
R2, 3	624	1 meg. 1/3 W.

Symbol	Part No.	Description
R4	6299	10M ohm 1 W.
R5	2730	200M ohm 1/3 W.
R6	2881	400M ohm 1/3 W.
R7	2880	100M ohm 1/3 W.
R8	2883	5M ohm 1/3 W.
R9, 10	631	50M ohm 1/3 W.
R11	2731	500M ohm 1/3 W.
R12	5184	315 ohm 1 W. 5% Flexohm
R13	2689	100 ohm 1/3 W.
	2647	(50 ohm 1/3 W. in models equipped with tuning eye)
R14	5100	500M ohm volume control
R15	5099	2 meg. tone control
	5091	Power transformer
	3463-5	1st I.F. transformer
	3463-6	2nd I.F. transformer
	2845	Broadcast antenna coil
	5095	Short wave antenna coils
	5096	Oscillator coils
	5185	8-inch speaker
	6249	Push button trimmer tuner
	2163	Drive cable
	5121	Call letter sheet

Model 277

ANTENNA

For best results, it is recommended that a good outdoor antenna be installed. Do not use an old antenna as most of the older installations were not intended for reception of short waves, and many are not suitable for good broadcast reception.

The average length of a single wire antenna, including lead-in, should be not less than fifty feet. In locations near powerful broadcast stations, this length may be shortened to thirty-five feet. In more favorable locations, seventy-five feet should be used.

Regardless of its length, the antenna and lead-in should be spaced well away from the roof, sides of the building, trees, and power lines. Stand-off insulators should be used to hold the lead-in wire at least six inches from the building, and the lead should be brought into the building through a porcelain tube insulator. The receiver should be located as near to the point where the lead-in is brought through the wall as is conveniently possible.

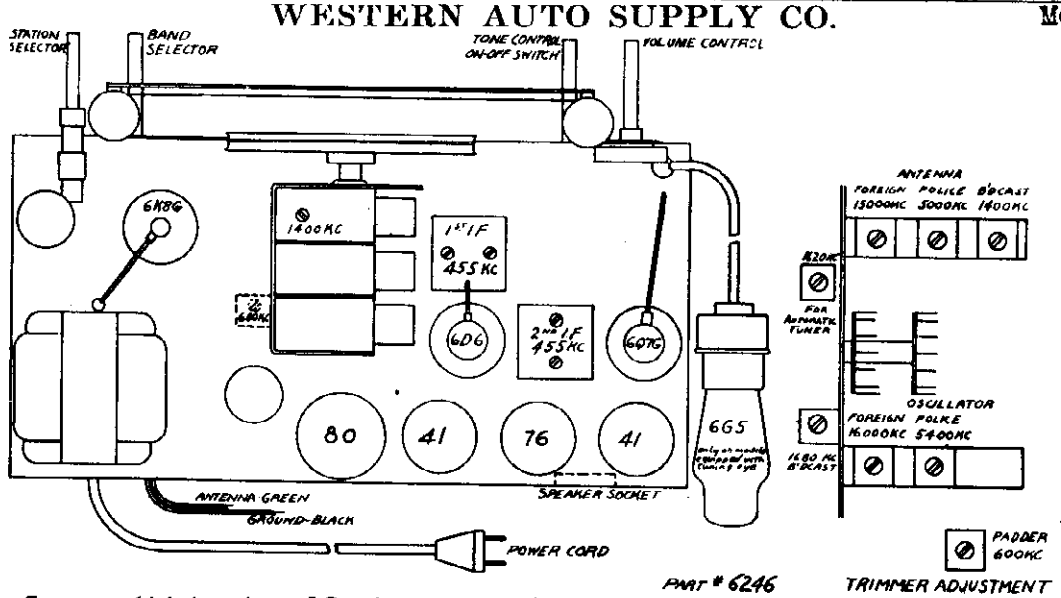
Indoor antennae will give good broadcast reception except in steel frame buildings. However, foreign reception will not be satisfactory unless an outdoor antenna is provided.

When a lightning arrestor is used, it must be of a special low-capacity type so that foreign reception will not be impaired.

TUBES

Tubes required are:

1—6K8G Oscillator-translator
1—6D6 Intermediate Frequency Amplifier
1—6Q7G Detector AVC—First Audio Amplifier
1—76 Driver—Phase Inverter
2—41 Power Output
1—80 Rectifier
1—6G5 Cathode Ray Tuning Tube (on models equipped with "eye" tuning indicator)



PART # 6246 TRIMMER ADJUSTMENT

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.

IF. Connect the generator ground to receiver chassis. Using .1 mfd. condenser in series with high side of the generator, apply 455 kc. signal to the grid of the 6D6 IF amplifier tube and aline second IF transformer trimmers. Repeat for first IF transformer, applying signal to grid of the 6K8G tube. (See above diagram for location of tubes and transformers.)

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 position "B," tuning condenser to minimum capacity, feed 1680 kc. signal to antenna terminal and adjust broadcast oscillator trimmer for top frequency. Set generator frequency at some point around 1400-1500 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 alinement.

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 "P" position, adjust the oscillator top frequency for 5400 kc., then aline the antenna trimmer at about 5000 kc. With the band selector in the extreme right position, adjust the top frequency of the high frequency band to 16,000 kc., and aline the antenna trimmer at about 15,000 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 trimmer 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.

Turn the wave switch to the extreme left or automatic tuning position and depress the extreme left push button. Apply a signal at 1620 kc. to the receiver antenna lead through a 200 mmfd. condenser and unscrew the adjustment screw of the depressed push button to within about one turn of its limit in this direction. Then adjust the isolantite trimmer on the wave switch bracket, shown in the above drawing, until the signal is heard. This is the only service alinement necessary for the automatic tuner and stations may now be set up according to the instructions given elsewhere in this book.

Setting Up the Push Button Station Selector

First select six favorite local or strong nearby stations, listing them according to frequency or position on the dial. Setting up weak or distant stations is not recommended. Call the station nearest the left hand end of the dial (nearest 1600 kc.) the No. 1 station and number the other five stations consecutively as they are tuned in on the dial, tuning from left to right. For example assume your selected stations operate on frequencies of 1500 kc., 1300 kc., 1100 kc., 900 kc., 700 kc., and 600 kc. The 1500 kc. station should be listed as No. 1, the 1300 kc. station would be No. 2, and so on through the list with the 600 kc. station becoming No. 6. In setting up the buttons, the 1500 kc. station should be set up on No. 1 button, or the first button from the left, the 1300 kc. station on the second button from the left, and so on until the 600 kc. station is finally set up on the button farthest to the right.

With the band selector set at "B", or the second position from the left, tune in station No. 1. Observe the program in progress, then turn the band selector knob to the extreme left position (A). Push the No. 1 button in as far as it will go; when the proper operating position is reached the button will lock in. Then insert the screw driver through the opening directly above the No. 1 button and turn the larger headed screw until the same program is heard. ***Do not force this screw. It should turn very easily and if the station is not heard when the screw is turned all the way in one direction, reverse the direction of rotation until the station is found.*** When the station is located, turn the screw back and forth through the station slowly and observe when the station is accurately tuned in, indicated by a minimum of noise or hiss, or by watching the tuning eye on the models so equipped. Inserted in one side of the larger screw head is a smaller screw. This screw is for fine adjustment, and should be turned in and out until position of least hiss is found, or until the tuning eye, on models so equipped, shows the least shadow. It will not be necessary to turn this small screw more than one full turn from the factory adjusted position.

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- 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-metalic screwdriver.
- Dummy antennas—.1 mf., 200 mmf., and 400 ohms.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Pushbutton Indicated Below Pushed "In"	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6K7 I.F Tube	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6K8G	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
SHORT WAVE BAND	17 Mc.	400 ohms	Antenna lead	Short Wave	Set dial at 17 MC	Trimmer (C22) (See Fig. 1)	Short wave oscillator	Adjust to maximum output
	17 Mc.	400 ohms	Antenna lead	Short Wave	Set dial at 17 MC	Trimmer (C10) (See Fig. 1)	Short wave antenna	Adjust to maximum output
MEDIUM WAVE BAND	5 Mc.	400 ohms	Antenna lead	Med. Wave	Set dial at 5 MC	Trimmer (C23) (See Fig. 1)	Medium wave oscillator	Adjust to maximum output
	5 Mc.	400 ohms	Antenna lead	Med. Wave	Dial set at 5 MC	Trimmer (C11) (See Fig. 1)	Medium wave antenna	Adjust to maximum output
BAND BROAD-CAST	1600 Kc.	200 mmf.	Antenna lead	Broadcast	Rotor full open (Plates out of mesh)	Trimmer (C24) (See Fig. 1)	Broadcast oscillator	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Broadcast	Set dial at 1400 Kc.	Trimmer (C12) (See Fig. 1)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna lead	Broadcast	Set dial at 600 Kc.	Trimmer (C18) (See Fig. 4)	Broadcast oscillator series pad	Adjust to maximum rock dial. (See note "A")
IMAGE REJECTION ADJUST-MENTS	1930 Kc.	200 mmf.	Antenna lead	Broadcast	Pick up signal at 1000 Kc. on dial	Trimmer (C9) (See Fig. 1)	Image rejection	Adjust for minimum output (See note "B")

NOTE "A". Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

NOTE "B". 1930 Kc. is the image frequency of 1000 Kc. Adjust Trimmer (C9) until a minimum output is obtained.

Attentuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each band is completed, repeat the procedure as a final check.

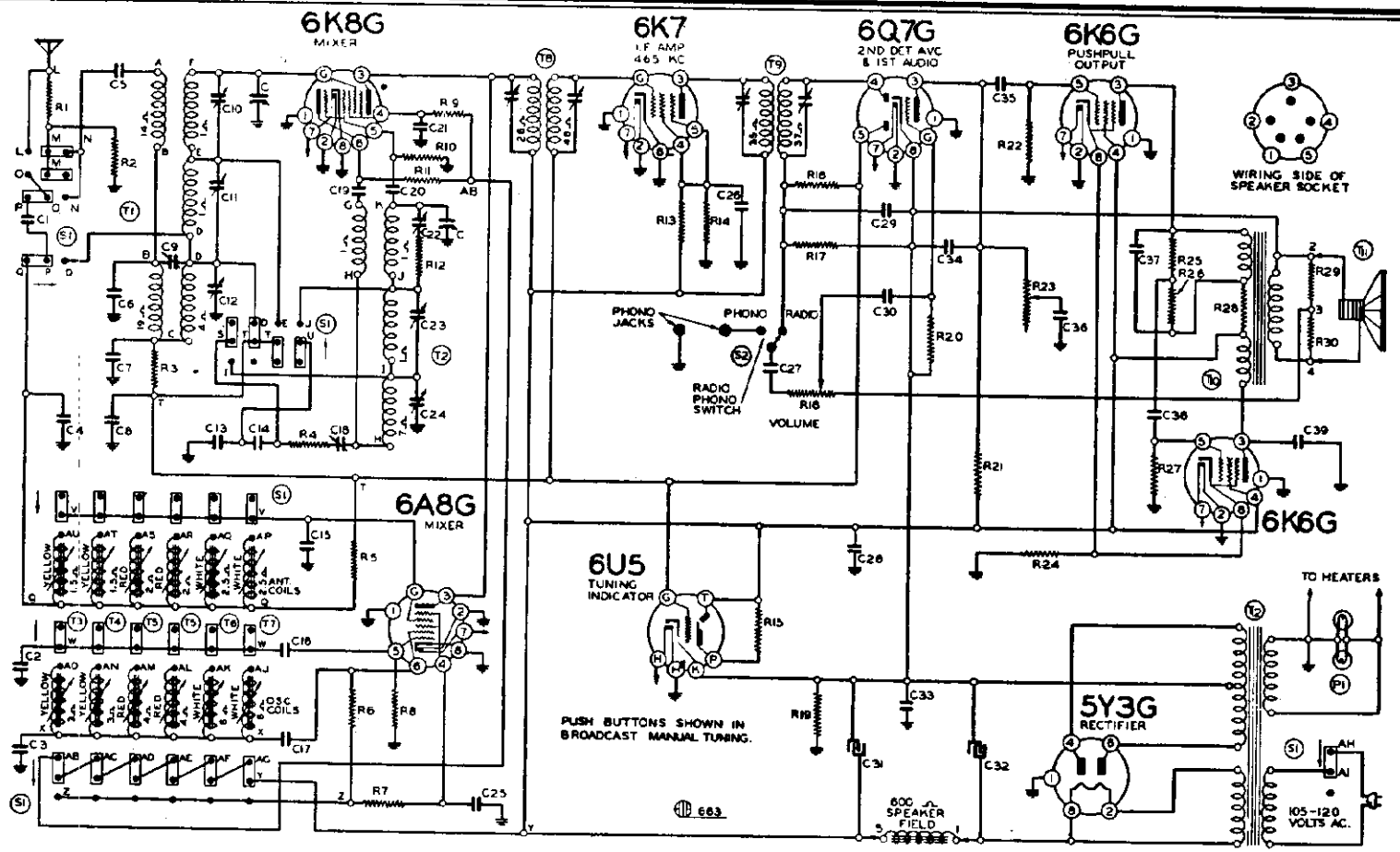
BAND	FREQUENCY RANGE
Broadcast	535 to 1600 Kc.
Medium Wave	1.58 to 5.5 MC.
Short Wave	5.0 to 18.3 MC.

Power Consumption—75 Watts (At 115 volts 50-60 cycles)
Power Output—4.5 Watts Undistorted, 6.5 Watts Maximum
Intermediate Frequency—465 KC.

BAND	DIAL SCALE	FREQUENCY RANGE
Broadcast	Lower Scale "BC"	535 to 1600 KC. (Kilocycles)
Medium Wave	Center Scale "MW"	1.58 to 5.5 MC. (Megacycles)
Short Wave	Upper Scale "SW"	5.0 to 18.3 MC. (Megacycles)

WESTERN AUTO SUPPLY CO.

MODEL D



Cir. Dia. Ref. No.	Part No.	Description
		RESISTORS
R1	13041	800 ohm—½ w.
R2	13017	10M ohm—½ w.
R3	130103	100M ohm—½ w.
R4	130231	75 ohm—½ w.
R5	1309	200M ohm—½ w.
R6	130149	15M ohm—½ w.
R7	13012	50M ohm—½ w.
R8	13012	50M ohm—½ w.
R9	13057	35M ohm—½ w.
R10	13012	50M ohm—½ w.
R11	13065	30M ohm—1 watt
R12	130174	50 ohm—½ w.
R13	130103	100M ohm—½ w.
R14	13012	50M ohm—½ w.
R15	130110	1 megohm—in tuning indicator socket
R16	1304	3 megohm—½ w.
R17	1303	500M ohm—½ w.
R19	130240	30 ohm—½ w.
R20	130225	15 megohm—½ w.
R21	1309	200M ohm—½ w.
R22	1303	500M ohm—½ w.
R23	101134	300M ohm tone control
R24	130220	300 ohm—1 watt
R25	1303	500M ohm—½ w.
R26	13064	3500 ohm—½ w.
R27	1303	500M ohm—½ w.
R28	130255	500 ohm—1 watt
R29	130215	25 ohm—½ w.
R30	130168	100 ohm—½ w.
		CONDENSERS
C	10283	2 gang variable
C1	10025	.002 x 600 v.
C2	129110	.000307 mica (0-Temperature Coefficient)
C3	129123	.0008 mica (0-Temperature Coefficient)
C4	12971	.002 mica
C5	12987	.000105 mica
C6	129126	.00007 mica
C7	10077	.00304 x 600 v.
C8	10093	.05 x 200 v.
C10	12459	S. W. Antenna trimmer
C11	12459	M. W. Antenna trimmer
C12	12459	B. C. Antenna trimmer
C13	129125	.00422 compression type mica
C14	129124	.00125 compression type mica
C15	129111	.000484 mica (0-Temperature Coefficient)
C16	12912	.00025 mica
C17	10025	.002 x 600 v.
C18	12444	Series Pad
C19	10025	.002 x 600 v.
C20	12939	.00005 mica
C21	10013	.05 x 400 v.
C22	12458	S. W. Oscillator trimmer
C23	12458	M. W. Oscillator trimmer
C24	12458	B. C. Oscillator trimmer
C25	10013	.05 x 400 v.
C26	10013	.05 x 400 v.
C27	10026	.02 x 400 v.
C28	1001	.1 x 400 v.
C29	12921	.0002 mica
C30	10071	.004 x 600 v.
C31	11964	10 mfd. lytic—350 v.
C32	11964	15 mfd. lytic—400 v.
C35	10026	.02 x 400 v.
C36	10013	.05 x 400 v.
C37	10012	.003 x 600 v.
C38	10026	.02 x 400 v.
C39	10012	.003 x 600 v.
		C31 and C32 in same unit

IF PEAK
465 KC

PROCEDURE FOR SETTING THE AUTOMATIC STATION PUSHBUTTONS:

Important: Allow the radio to "warm up" for about 15 minutes before setting the station adjustment screws for the pushbuttons.

Only a single adjustment for each station is required in setting up your favorite stations for automatic pushbutton operation. These adjustments are located at the front of the chassis shown in Fig. 3 and are accessible through the station call letter tab holes. The only equipment needed is a small screw driver to make the adjustments.

Make a list of your favorite local stations, those which you tune in regularly. Put down the frequency (kilocycle number) of these stations. There may be 2, 3, 5 or any number up to and including six in this list.

If you do not know the broadcasting frequencies, consult your local newspaper or a radio log book. They can also be obtained by pressing the button marked "Broadcast" on the right hand side of the pushbutton assembly and tuning in the stations manually, noting the numbers on the dial at which they are received.

The automatic station pushbuttons are grouped to cover specific frequency ranges.

The range of the frequencies covered by each button are given below and are also shown in Fig. 3. Only stations within the frequency ranges given can be obtained on a particular button. Counting the station buttons from left to right, looking at the front of the set, the frequency ranges are as follows:

1. 1600 to 1050 Kilocycles.
2. 1600 to 1050 Kilocycles.
3. 1100 to 750 Kilocycles.
4. 1100 to 750 Kilocycles.
5. 800 to 530 Kilocycles.
6. 800 to 530 Kilocycles.

This means that any station which has a kilocycle number lying between 1600 and 1050 K.C. can be set up on either Button 1 or Button 2. Any station which has a kilocycle number lying between 1100 and 750 K.C. can be set on either Button 3 or Button 4. Any station which has a kilocycle number lying between 800 and 530 K.C. can be set on either Button 5 or Button 6.

After you have made up your list of stations, press button marked "Broadcast" and tune set manually until station selected having the highest frequency is tuned in and the program noted. Press button covering frequency range in which station is located (See Fig. 3). Adjust screw through station tab opening above button pressed until the same station is heard clearly and tuning indicator indicates that it is correctly tuned.

Press pushbutton marked "Broadcast" and tune in next station selected. Press button covering frequency range in which station is located. Adjust screw through station tab opening above button pressed until the same station is heard clearly and with maximum volume.

Follow this procedure for each button until you have selected all of your stations. The automatic buttons are now set up for quick tuning and no further adjustment is necessary.

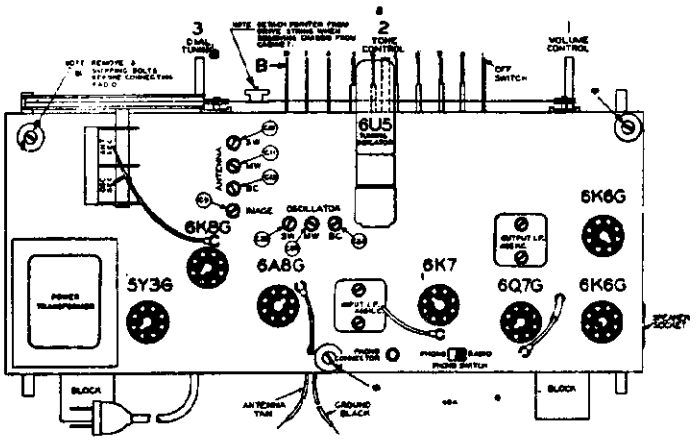


FIG. 1—TOP VIEW

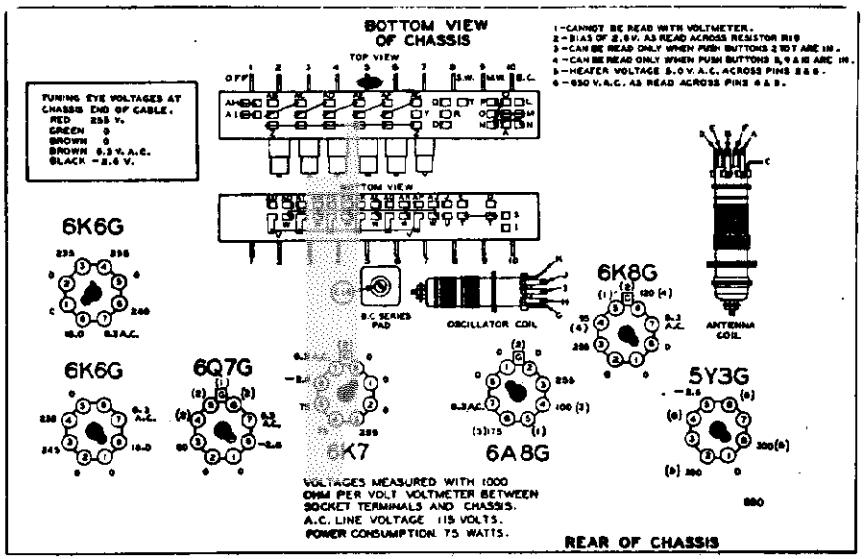


FIG. 4

MODELS D913
D913, Issue

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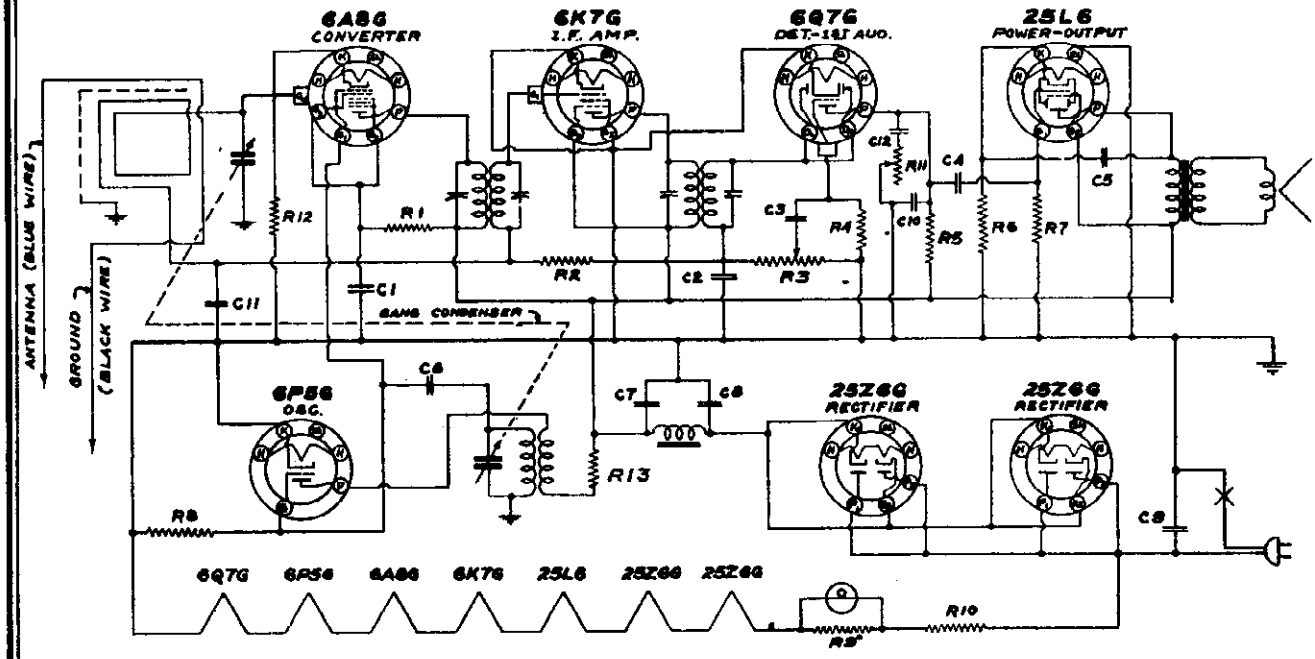


CAPACITORS

NO	Mfds.	VOLTS	NO	Mfds.	VOLTS
C1	.01	400	C8	20.0	150
C2	.00025	MICA	C9	.05	400
C3	.01	400	C10	.0005	MICA
C4	.01	400	C11	.05	200
C5	.005	600	C12	.005	600
C6	.00005	MICA			
C7	20.0	150			

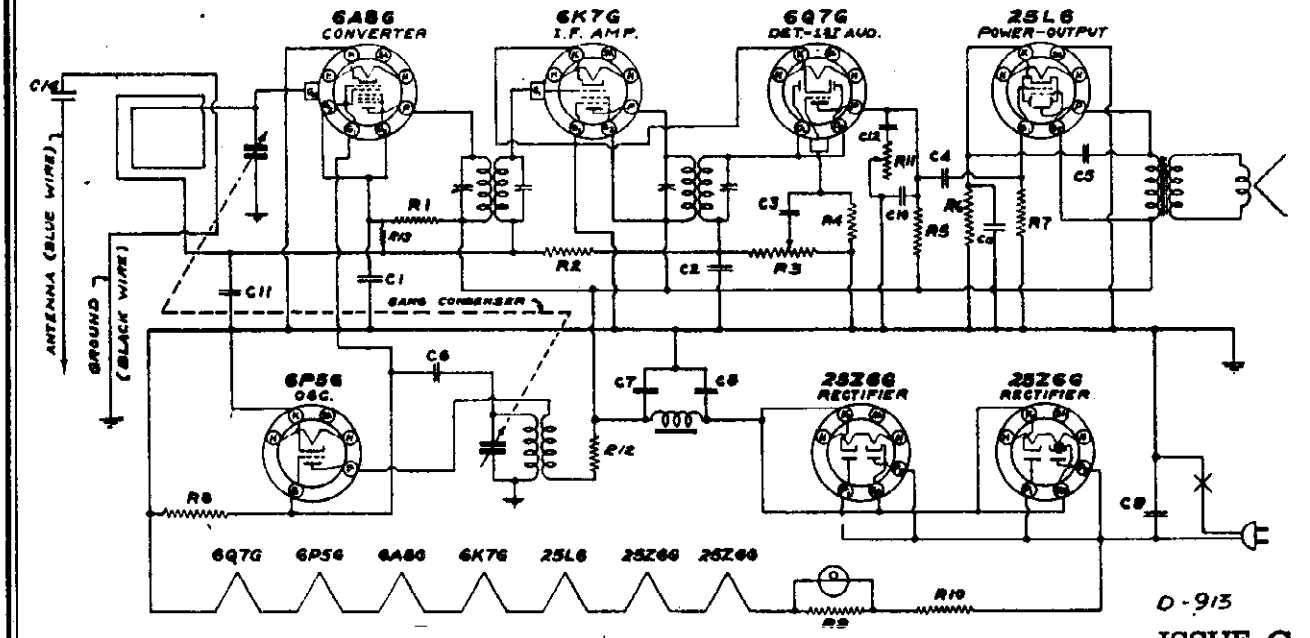
RESISTORS

NO	OHMS	WATTS	NO	OHMS	WATTS
R1	20,000.	½	R7	½ MEG	½
R2	2 MEG.	½	R8	50,000	½
R3	½ MEG.	VOL. CONT.	R9	42	7
R4	5 MEG.	½	R10	42	7
R5	250,000.	½	R11	500,000	TONE C.
R6	150	½	R12	60	½
			R13	2000	½

I.F. – 455 K.C.

D - 913

SCHEMATIC DIAGRA



CAPACITORS

NO	Mfds.	VOLTS	NO	Mfds.	VOLTS
C1	.01	400	C8	20.0	150
C2	.00025	MICA	C9	.05	400
C3	.01	400	C10	.0005	MICA
C4	.01	400	C11	.05	200
C5	.005	600	C12	.005	600
C6	.00005	MICA	C13	20.0	25
C7	20.0	150	CM	.001	400

RESISTORS

NO	OHMS	WATTS	NO	OHMS	WATTS
R1	10,000	½	R7	½ MEG	½
R2	2 MEG.	½	R8	50,000	½
R3	½ MEG.	VOL. CONT.	R9	30	7
R4	5 MEG.	½	R10	42	7
R5	250,000.	½	R11	500,000	TONE C.
R6	150	½	R12	1000	½
			R13	15 MEG	½

I.F. – 455 K.C.

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OCT. 1939

SCHEMATIC DIAGRAM

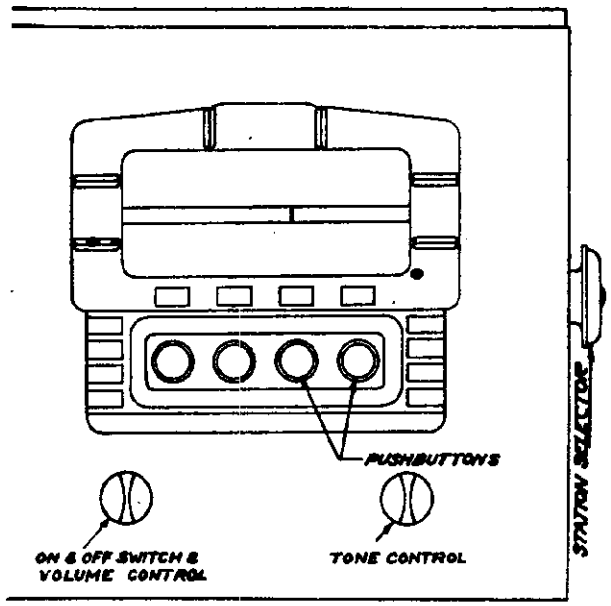


Fig. 1—Front View

PROCEDURE FOR SETTING UP PUSH BUTTONS

There are four push buttons by means of which four stations may be selected Make a list of four stations tuned in regularly. Loosen one of the push buttons by turning the push button knob counter clockwise a half turn or less and push it in; while holding the button in, tune in a desired station by means of the station selector wheel. Turn the selector very slowly back and forth until the signal is clearest. Now while holding the push button in, tighten it by turning clockwise. Release the push button and turn the station selector to one end of the dial; then check the button by pushing it in and if the station is tuned to the center of the area on the dial covered by the station the adjustment is correct.

Release the push button and loosen another push button and repeat the above procedure, doing this for the remaining buttons.

If it is desired to change a button to a different station simply loosen the push button and re-set.

Punch the correct station call letter tabs from the set of sheets supplied and insert them into the recesses above the push buttons.

The dial is now set up for quick tuning and all that is necessary is to push the button under the desired station all the way in and then release.

POWER SUPPLY

This receiver is designed to operate from any AC (Alternating Current) or DC (Direct Current) power supply main of 105-125 volts, 60 cycle. If the receiver fails to operate on DC (Direct Current), reverse the power line plug.

SERVICE DATA

SERVICE NOTES MODEL D-913, D-914

Voltages taken from the different points of the circuit to chassis are measured with volume control in maximum position, all tubes in their sockets and with a volt meter having a resistance of 1000 ohms per volt, on the 150 volt scale. These voltages are clearly indicated on the voltage chart.

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.

SERVICE NOTES MODEL D-915

Voltages taken from the different points of the circuit to chassis are measured with volume control in maximum position, all tubes in their sockets and with a volt meter having a resistance of 20,000 ohms per volt. These voltages are clearly indicated on the voltage chart.

All voltages should be measured with 117.5 volts A.C. input to receiver. Resistance and actual connections of coils and transformers, electrolytic condenser information and speaker data are given under Service Information.

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.

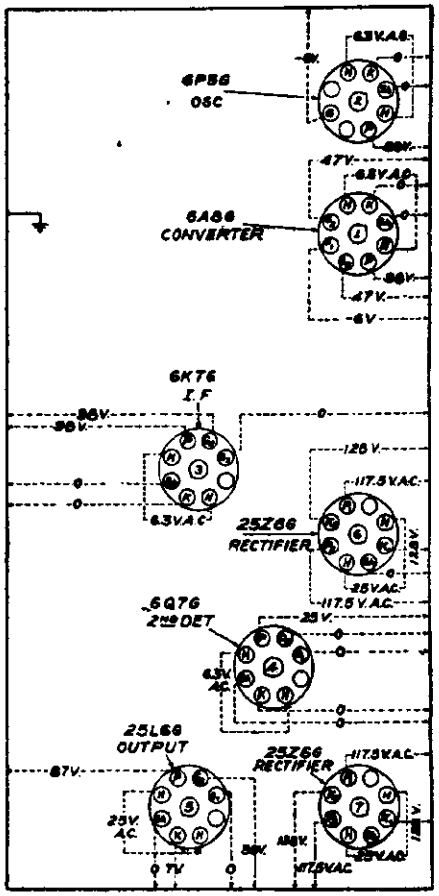
Failure to operate, noisy or weak reception is usually due to defective tubes, the tubes making poor contact with sockets or grid clips making poor contact with the caps of the tubes. Tubes may be checked very easily by replacing with other tubes which are known to be good.

ALIGNING INSTRUCTIONS

All of the adjustments have been very carefully set with signal generators at the factory and require no further adjustment, unless it becomes necessary to replace a coil or transformer, or if the adjustments have been tampered with in the field. Under no circumstances attempt any adjustments without first making certain that adjustment is necessary and only after voltages, tubes and condensers have been checked and found to be normal. To properly re-align this receiver, a signal generator as well as an output meter, must be used.

VOLTAGE FOR
MODEL D-913
D-914

VOLTAGES AT SOCKETS



Bottom View of Chassis

WESTERN AUTO SUPPLY CO.

MODELS D913,D913
Issue C

SERVICE INFORMATION

Oscillator Coil (Part No. P3205) (Red Dot) MODEL D913

Looking at the connection end (with dot) in a clockwise direction starting at the chassis the terminals are No. 1, grid; No. 2, plate; No. 3, B+; No. 4, ground.

Speaker (Part No. P3284)

Field resistance	450	ohms
D.C. voice coil resistance	4.6	ohms
Voice coil impedance at 400 cycles	5	ohms

Oscillator Coil (Part No. P3682) MODEL D913, Issue C

Looking at the connection end (with dot) in a clockwise direction starting at the chassis the terminals are No. 1, grid;

Primary—No. 2 and No. 3—Resistance 1.5 ohms.

Secondary—No. 4 and No. 1—Resistance 4.5 ohms.

First I.F. Transformer (Part No. P3282)

Primary—Blue white, plate; red white B+—Resistance 24.2 ohms.

Secondary—White, grid; black white, AVC—Resistance 23.6 ohms.

Second I.F. Transformer (Part No. P3283)

Primary—Blue white, plate; red white, B+—Resistance 11.9 ohms.

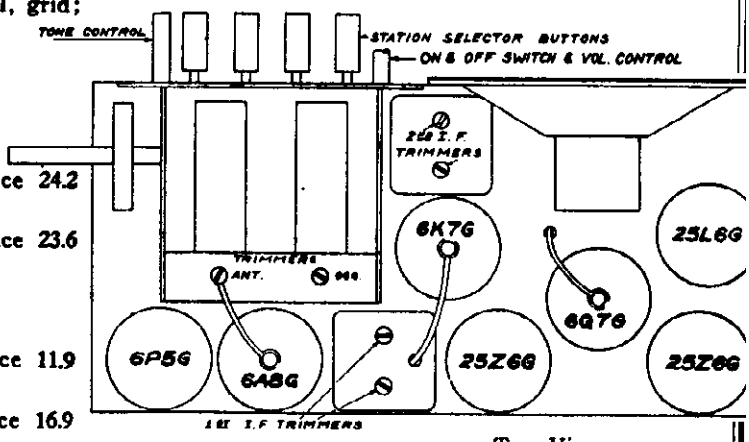
Secondary—White, grid; black white, AVC—Resistance 16.9 ohms.

Electrolytic Condenser (Part No. P3531)

Red, 20 mfd., 150 volt; green, 20 mfd., 150 volt; yellow, 20 m 25 volt; black, negative for all three sections.

Loop Antenna

Since the loop antenna acts also as the antenna coil set will not operate with the loop antenna disconnected.



-Top View

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- 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 mfd., 200 mmf.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (In Order Shown)	Trimmer Function	Adjustment
I. F.	455 KC.	.1 MFD.	Grid of 6K7G I.F. tube	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 2)	Output I.F.	Adjust to maximum output
	455 KC.	.1 MFD.	Grid of 6A8G tube	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 2)	Input I.F.	Adjust to maximum output
BROADCAST	1730 KC.	200 mmf.	Antenna lead	Rotor full open (Plates out of mesh)	Trimmer—Top of Left section of gang (See Fig. 2)	Oscillator	Adjust to maximum output
	1400 KC.	200 mmf.	Antenna lead	Set dial at 1400 KC.	Trimmer—Top of Right section of gang (See Fig. 2)	Antenna	Adjust to maximum output

This is all that is necessary for the alignment unless the plates of the gang have been bent out of shape. In case of bent plates, set the signal generator and receiver to 600 KC and bend the plates into the position for maximum output.

Attenuate the signal from the signal generator to prevent the leveling off-action of the AVC. After each band is completed, repeat the procedure as a final check.

FREQUENCY RANGE

540 to 1630 KC

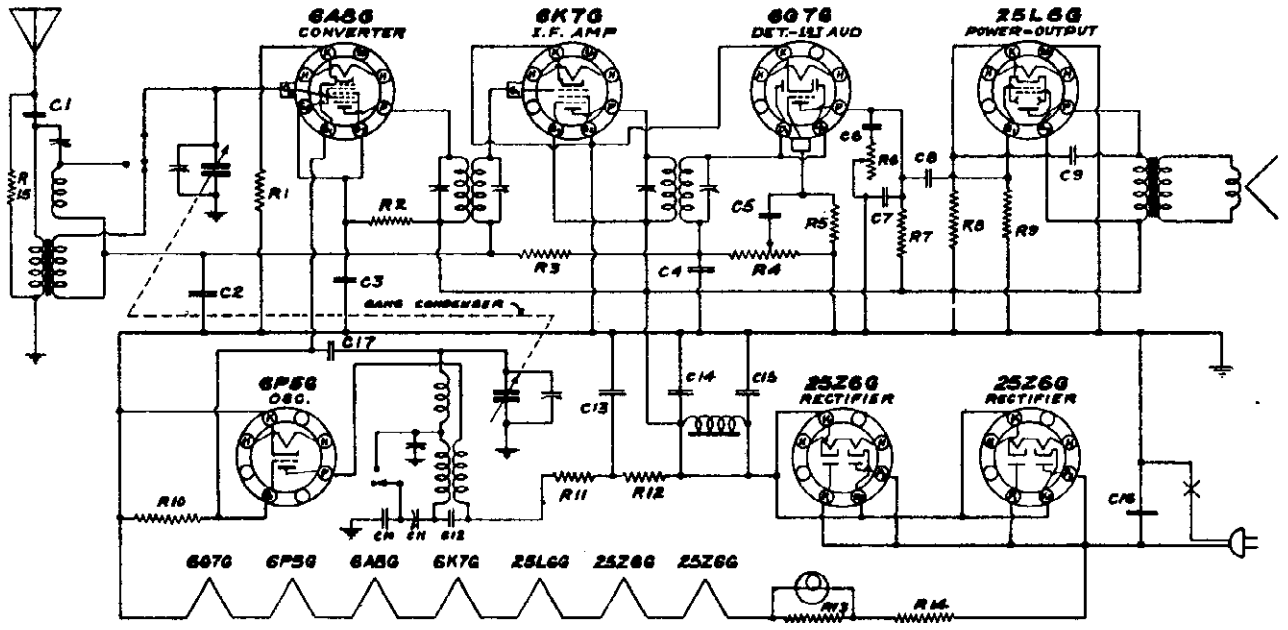
Power output 1 watt undistorted—1.7 watts maximum.

Intermediate Frequency 455 KC.

Power Consumption—50 watts.

MODEL D914
MODEL D914,
Issue C

WESTERN AUTO SUPPLY CO.



CAPACITORS

No.	Mfds.	Volts	No.	Mfds.	Volts
C1	.002	600	C10	.0022 ±5% MICA	
C2	.05	400	C11	.00062 VAR. PAD.	
C3	.01	400	C12	.005	600
C4	.00025	MICA	C13	5.0	150
C5	.01	400	C14	25.0	150
C6	.005	600	C15	25.0	150
C7	.0005	MICA	C16	.05	400
C8	.01	400	C17	.00005	MICA
C9	.005	600			

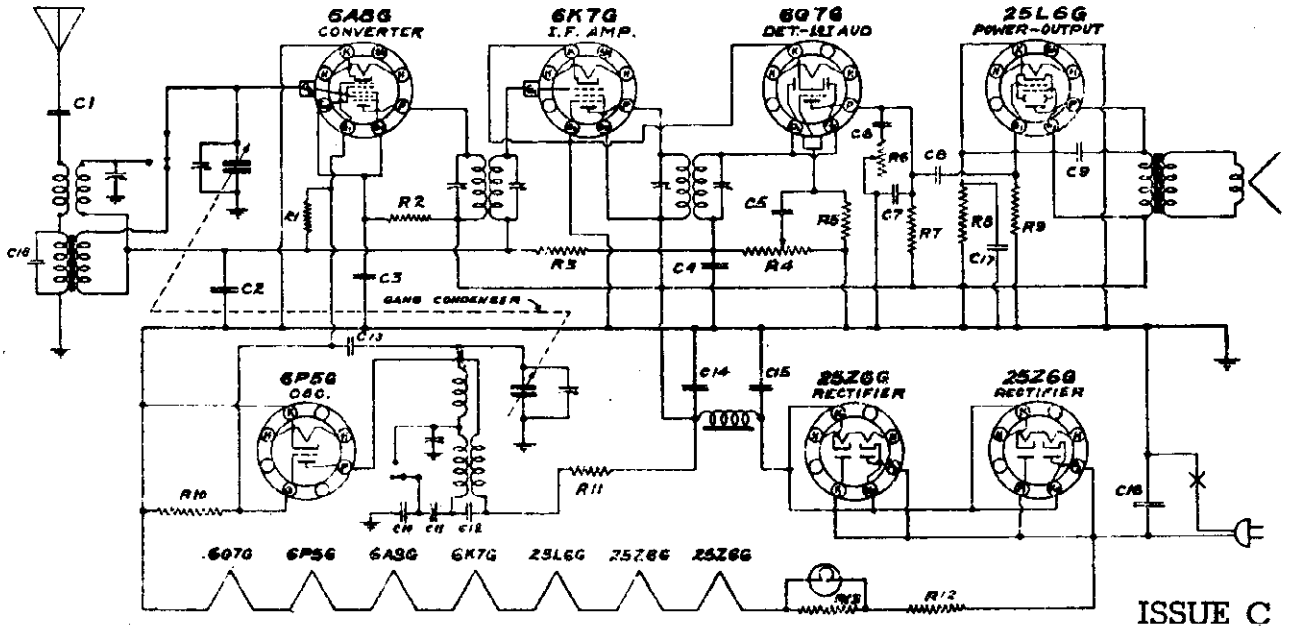
RESISTORS

No.	Ohms	Watts	No.	Ohms	Watts
R1	60	½	R8	150	½
R2	20,000	½	R9	½ MEG.	½
R3	2 MEG.	½	R10	50,000	½
R4	½ MEG.	V.C.	R11	10,000	½
R5	5 MEG	½	R12	10,000	½
R6	½ MEG.	T.C.	R13	42	7
R7	¼ MEG.	½	R14	42	7
			R15	25,000	½

SWITCHES IN BROADCAST POSITION

I.F. 455 K.C.

SCHEMATIC DIAGRAM



ISSUE C
OCT. 1939

CAPACITORS

No.	Mfds.	Volts	No.	Mfds.	Volts
C1	.002	600	C10	.0022 ±5% MICA	
C2	.05	400	C11	.00062 VAR. PAD.	
C3	.01	400	C12	.005	600
C4	.00025	MICA	C13	.00005	Mica
C5	.01	400	C14	25.0	150
C6	.005	600	C15	25.0	150
C7	.0005	MICA	C16	.05	400
C8	.01	400	C17	20.0	25
C9	.005	600	C18	.00005	Mica

RESISTORS

No.	Ohms	Watts	No.	Ohms	Watts
R1	15 Meg.	½	R8	150	½
R2	10K.	½	R9	½ Meg.	½
R3	2 Meg.	½	R10	30K	½
R4	½ Meg.	V.C.	R11	10K	½
R5	5 Meg.	½	R12	42	7
R6	½ Meg.	T.C.	R13	30	7
R7	¼ Meg.	½			

SWITCHES IN BROADCAST POSITION

I.F. 455 K.C.

SCHEMATIC DIAGRAM

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- 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 mfd., 200 mmf., 400 ohms.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (In Order Shown)	Trimmer Function	Adjustment
I. F.	455 KC.	.1 Mfd.	Grid of 6K7G I.F. tube	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 2)	Output I. F.	Adjust to maximum output
	455 KC.	.1 Mfd.	Grid of 6A8G tube	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 2)	Input I. F.	Adjust to maximum output
SHORT WAVE	18,100 KC.	400 ohms	Antenna lead	Rotor full open (Plates out of mesh)	Trimmer—Top of left section of gang (See Fig. 2)	Short Wave Oscillator	Adjust to receive signal
	16,000 KC.	400 ohms	Antenna lead	Tune signal	Trimmer—On right side of chassis, 3rd from front	Short Wave Antenna	Adjust to maximum output
BROAD-CAST	1730 KC.	200 Mmf.	Antenna lead	Rotor full open (Plates out of mesh)	Trimmer—On right side of chassis, 2nd from front	Broadcast Oscillator	Adjust to maximum output
	1400 KC.	200 Mmf.	Antenna lead	Set dial at 1400 KC.	Trimmer—Top of right section of gang (See Fig. 2)	Broadcast Antenna	Adjust to maximum output
	600 KC.	200 Mmf.	Antenna lead	Set dial at 600 KC.	Trimmer—On right side of chassis, 1st from front	Oscillator Series Pad.	Adjust to maximum rock dial See Note 'A

Note "A"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of intensity is obtained.

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

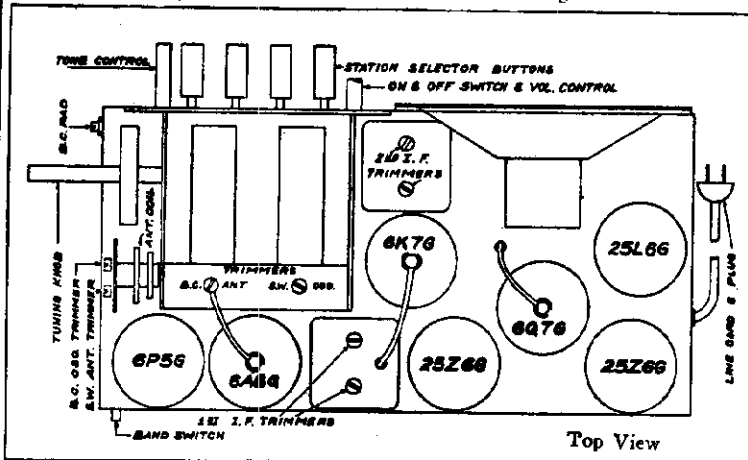
Do not bend variable condenser to correct tracking.

Frequency Range — 535 to 1730 and 5,700 to 18,100 K.C.

Power output 1 watt undistorted—1.7 watts maximum.

Intermediate Frequency 455 K.C.

Power Consumption—50 watts.



Top View

SERVICE INFORMATION

Speaker (Part No. P3284) Model D-914

Field resistance	450 ohms
D.C. voice coil resistance	4.6 ohms
Voice coil impedance at 400 cycles	5 ohms

Antenna Coil (Part No. G5960).

Looking at the connection end starting at the mounting strip in a clockwise direction the terminals are: No. 1, (not used); No. 2, AVC; No. 3, grid; No. 4, antenna; No. 5, ground (grounded directly to mounting strip).

Primary—No. 4 and No. 5—Resistance 26 ohms.

Secondary—No. 2 and No. 3—Resistance 2 ohms.

Short Wave Antenna Coil (Part No. 3294).

Resistance—.1 ohm.

Oscillator Coil (Part No. P3293).

Looking at the end with mounting strip, starting at the mounting strip in a clockwise direction the terminals are: No. 1, padder; No. 2, B+; No. 3, (not used); No. 4, switch; No. 5, plate; No. 6, grid.

Primary—No. 2 and No. 5—Resistance .85 ohm
Short Wave Secondary—No. 4 and No. 6—Resistance .07 ohm
Broadcast Secondary—No. 1 and No. 4—Resistance 5.1 ohms.

First I.F. Transformer (Part No. P3282)

Primary—Blue, white, plate; red white B+—Resistance 24.2 ohms.

Secondary—White, grid; black white, AVC—Resistance 23.6 ohms.

Second I.F. Transformer (Part No. P3283)

Primary—Blue white, plate; red white, B+—Resistance 11.9 ohms.

Secondary—White, grid; black white, AVC—Resistance 16.9 ohms.

Electrolytic Condenser (Part No. P3169)
Red, 25 mfd., 150 volt; red and white, 25 mfd., 150 volt; blue, 5 mfd., 150 volt; black, negative for all three sections.

SERVICE INFORMATION

Short Wave Antenna Coil (Part No. P3702)
Looking at the connection end starting at the mounting strip in a clockwise direction the terminals are: No. 1, grid; No. 2, ant.; No. 3, ground; No. 4 (on other end), AVC.
Primary—No. 2 and No. 3—Resistance .03 ohm
Secondary—No. 1 and No. 4—Resistance .1 ohm

Oscillator Coil (Part No. P3700)
Looking at the end with mounting strip, starting at the mounting strip in a clockwise direction the terminals are: No. 1, padder; No. 2, B+; No. 3, (not used); No. 4, switch; No. 5, plate; No. 6, grid.
Primary—No. 2 and No. 5—Resistance .85 ohm
Short Wave Secondary—No. 4 and No. 6—Resistance .07 ohm
Broadcast Secondary—No. 1 and No. 4—Resistance 5.1 ohms.

Electrolytic Condenser (Part No. P3531)
Red, 20 mfd., 150 volt; green, 20 mfd., 150 volt; yellow, 20 mfd., 25 volt; black, negative for all three sections.

Speaker (Part No. P3638)

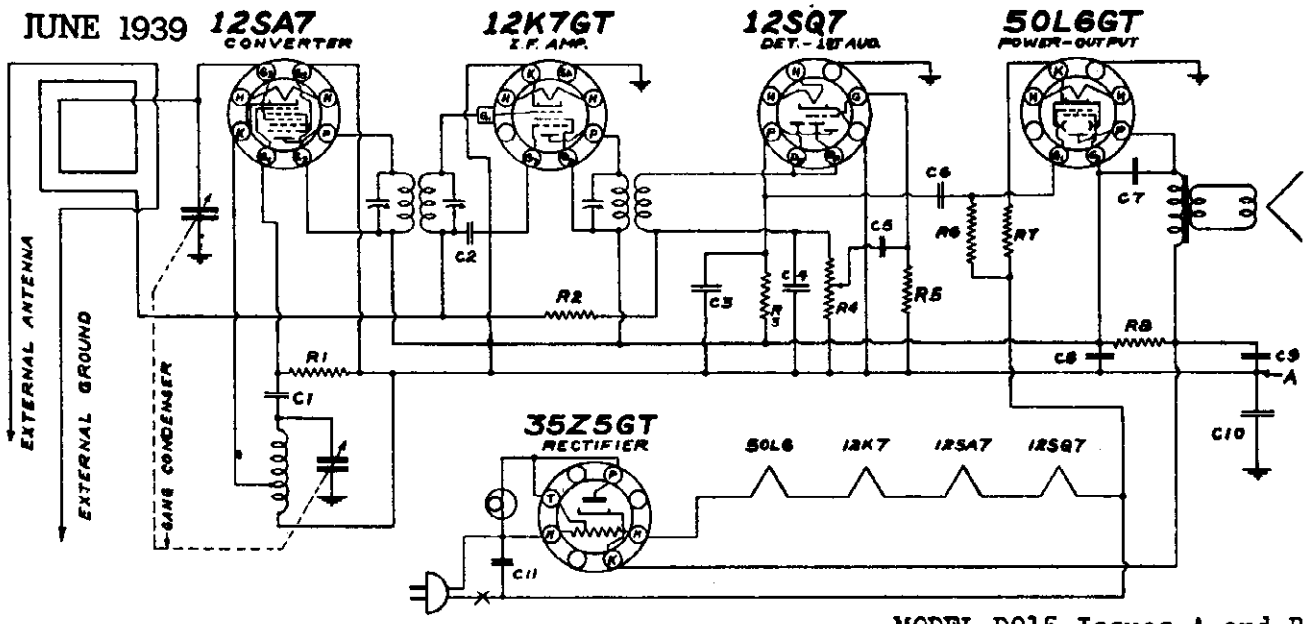
Field resistance	300 ohms
D.C. voice coil resistance	4.6 ohms
Voice coil impedance at 400 cycles	5 ohms

MODEL D915
Issues A,B,
MODEL D915
Issue C

WESTERN AUTO SUPPLY CO.

ISSUE B
OCT. 1939

ISSUE A
JUNE 1939



MODEL D915, Issues A and B

RESISTORS					
NO	OHMS	WATTS	NO	OHMS	WATTS
R1	20,000	½	R6	500,000	½
R2	2 MEG.	½	R7	150 ± 10%	½
R3	250,000	½	R8	1,000	1
R4	500,000	V.C.			
R5	5 MEG.	½			

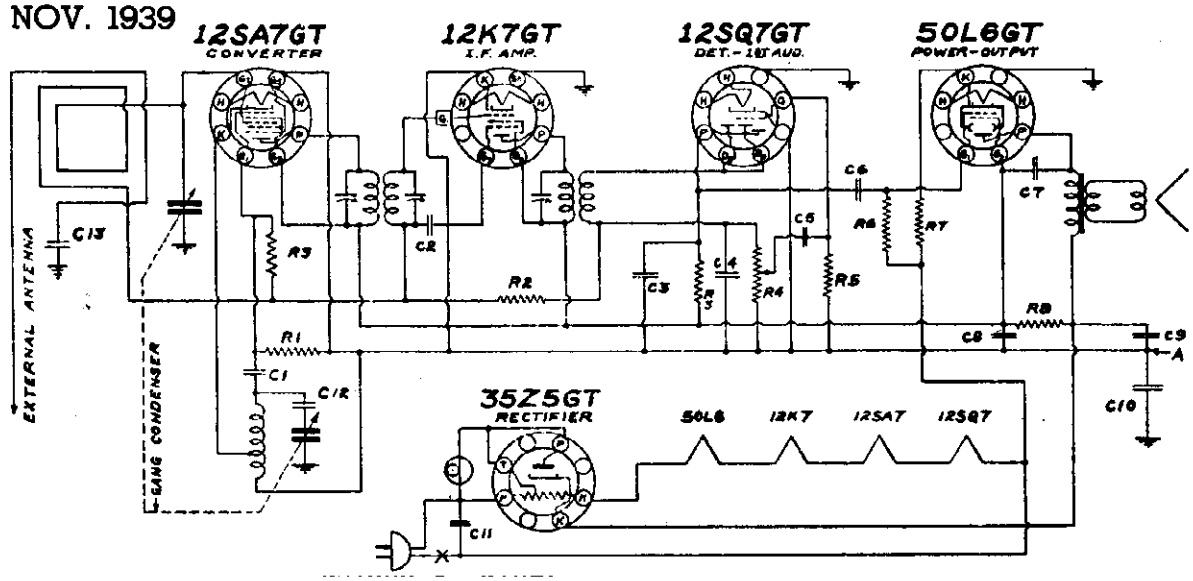
CAPACITORS					
NO	MFD.	VOLTS	NO	MFD.	VOLTS
C1	.0001	MICA	C7	.01	400
C2	.02	400	C8	20.0	150
C3	.0005	MICA	C9	30.0	150
C4	.00025	MICA	C10	.25	200
C5	.01	400	C11	.05	400
C6	.002	600			

I.F. 455 K.C.

TUBES SHOW BOTTOM VIEW

C10 USED ON MODEL 5QL ONLY. ON MODEL 5Q, POINT "A" IS CONNECTED TO CHASSIS.

ISSUE C
NOV. 1939



RESISTORS					
NO	OHMS	WATTS	NO	OHMS	WATTS
R1	20,000	½	R6	500,000	½
R2	2 MEG.	½	R7	150 ± 10%	½
R3	250,000	½	R8	1,000	1
R4	500,000	V.C.	R9	15 MEG.	½
R5	5 MEG.	½			

CAPACITORS					
NO	MFD.	VOLTS	NO	MFD.	VOLTS
C1	.0001	MICA	C7	.01	400
C2	.02	400	C8	20.0	150
C3	.0005	MICA	C9	30.0	150
C4	.00025	MICA	C10	.25	200
C5	.01	400	C11	.05	400
C6	.002	600	C12	.02	400
			C13	.001	600

I.F. 455 K.C.

TUBES SHOW BOTTOM VIEW

MODEL D915, Issue C

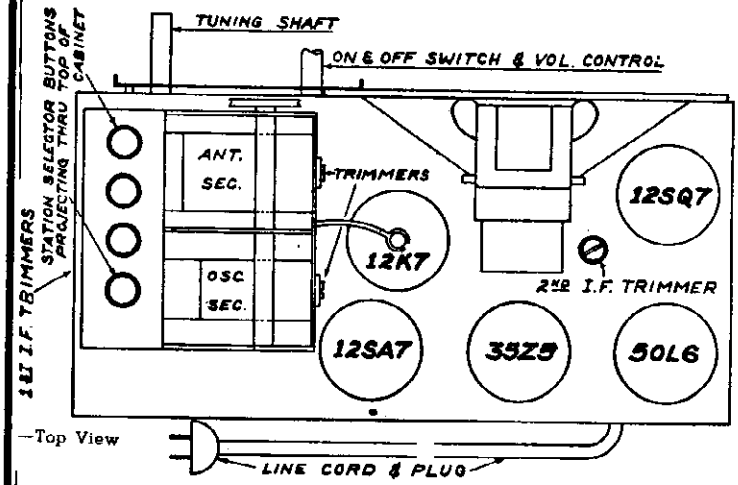
C10 and C12 used in model 5QL only. On model 5Q point "A" is connected to chassis.

WESTERN AUTO SUPPLY CO.

VOLTAGE CHART

All voltages measured with a 20,000 ohm per volt meter on the 150 volt scale. Line voltage 117½ volts A.C.

	Volts
12SA7 Tube	
Plate—P—to ground	87
Screen—G2—to ground	87
Osc. grid—G1—to ground	—5
Cathode—K—to ground	0
Control grid—G3—to ground	—1
Suppressor grid—G5—to ground	0
12K7GT Tube	
Plate—P—to ground	87
Screen—G—to ground	87
Suppressor grid—G3—to ground	0
Control grid—G1—to ground	—1
12SQ7 Tube	
Plate—P—to ground	54
Grid—G—to ground	—1
50L6GT Tube	
Plate—P—to ground	10
Screen—G2—to ground	8
Cathode—K—to ground	—
Grid—G1—to ground	
35Z5GT Tube	
Cathode—K—to ground	10



—Top View

SERVICE INFORMATION

(Spkr. Part no. P 3553) only on Model D-915

Speaker (Part No. P3356) 5" PM Type (issue (

D.C. voice coil resistance.....3.4 ohm
Voice coil impedance at 400 cycles.....3.8 ohm

Oscillator Coil (Part No. P3347)

Looking at the connection end in a clockwise directio starting at the chassis the terminals are No. 1, end winding; No. 2, start of winding; No. 3 tap.

No. 2 and No. 1—Resistance 4.8 ohms.

No. 3 and No. 1—Resistance 4.2 ohms.

First I.F. Transformer (Part No. P3345)

Primary—Blue, plate; red, B+—Resistance 32.1 ohm
Secondary—White, grid; black, AVC—Resistance 33 ohms.

Second I.F. Transformer (Part No. P3364)

Primary—Blue, plate; red B+—Resistance 24.2 ohm
Secondary—White, grid; black, AVC—Resistance 24. ohms.

Electrolytic Condenser (Part No. P3355)

Red, 30 mfd., 150 volt; green, 20 mfd., 150 volt; blacl negative for both sections.

Loop Antenna

Since the loop antenna acts also as the antenna co the set will not operate with the loop antenna disco nected.

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- 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., 100 mmf.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (In Order Shown)	Trimmer Function	Adjustment
I. F.	455 KC.	.1 MFD.	Grid of 12K7 I.F. tube	Rotor full open (Plates out of mesh)	One trimmer on top (See Fig. 1)	Output I.F.	Adjust to maximum output
	455 KC.	.1 MFD.	Grid of 12SA7 tube	Rotor full open (Plates out of mesh)	Two trimmers on side (See Fig. 1)	Input I.F.	Adjust to maximum output
BROADCAST	1730 KC.	100 mmf.	Antenna lead	Rotor full open (Plates out of mesh)	Trimmer—Side of rear section of gang (See Fig. 1)	Oscillator	Adjust to maximum output
	1400 KC.	100 mmf.	Antenna lead	Set dial at 1400 KC.	Trimmer—Side of front section of gang (See Fig. 1)	Antenna	Adjust to maximum output

This is all that is necessary for the alignment unless the plates of the gang have been bent out of shape. In case of bent plates, set the signal generator and receiver to 600 KC and bend the plates into the position for maximum output.

Attenuate the signal from the signal generator to prevent the leveling off-action of the AVC. After each band is completed, repeat the procedure as a final check.

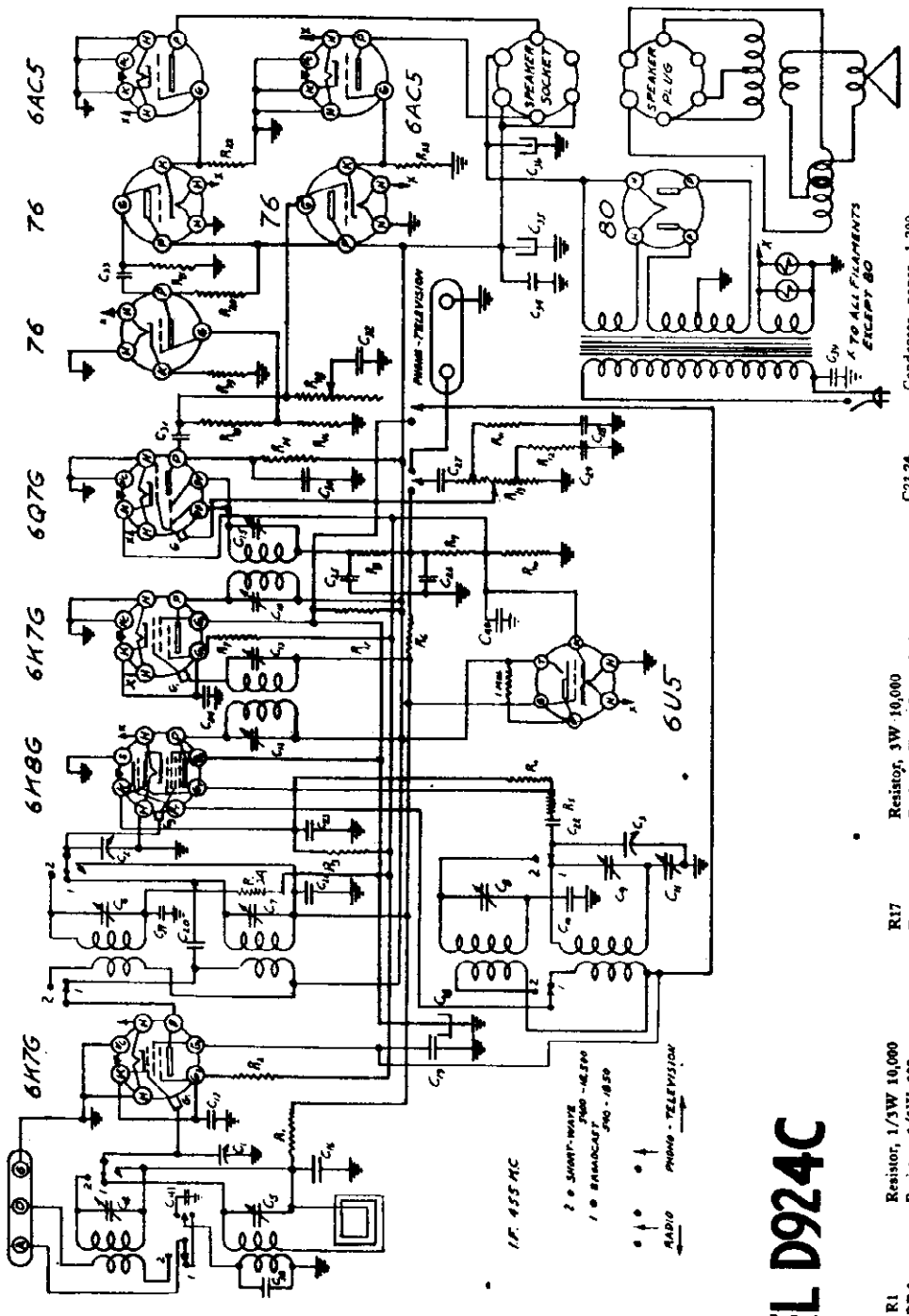
Frequency Range

540 to 1730 K.C.

Power output 1.2 watts undistorted—2 watts maximum. Intermediate Frequency 455 K.C.—Power Consumption 30 watts.

MODEL D924C

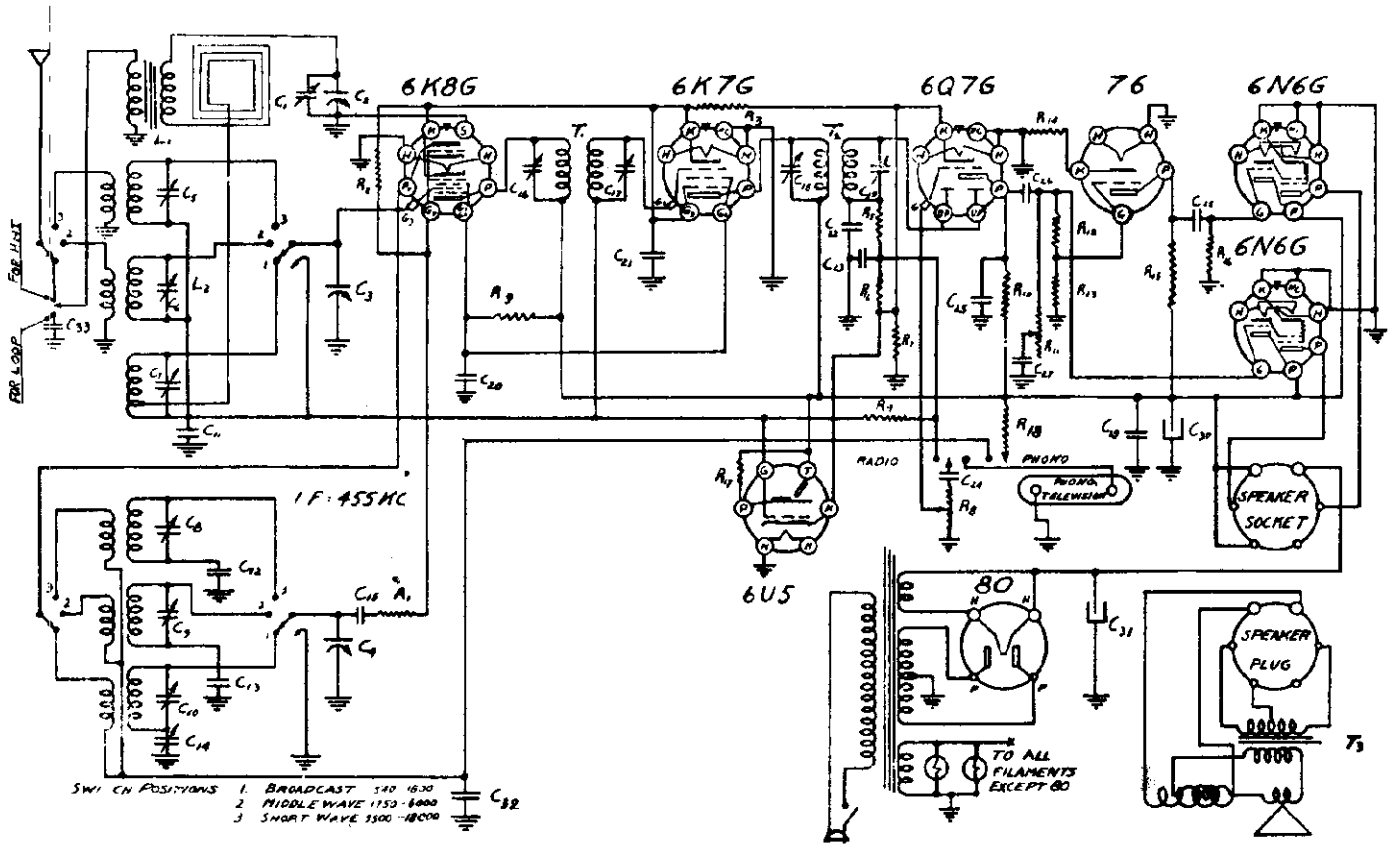
WESTERN AUTO SUPPLY CO.



MODEL D924C

R1	Resistor, 1/3W 10,000	R17	Resistor, 3W 10,000	C23,24	Condenser, paper .1-200
R2,3	Resistor, 1/3W 300	R18	Resistor, Tone Control, 500,000	C25,26	Cond. Mica, 100 MMF in I.F.
R4,20	Resistor, 1/3W 50,000	R19	Resistor, 1/3W 5,000	C27,28	Condenser, paper .002-600
R5	Resistor, 1/3W 200	R21	Resistor, 1/3W 500,000	C29	Condenser, paper .03-200
R6	Resistor, 1/3W 2,000,000	R24	Resistor, 1/3W 75,000	C30	Condenser, Mica 100 MMF
R7	Resistor, 1/3W 400	C1,2,3,	Condenser, Mech. Tuner	C31,33	Condenser, paper .005-600
R8	Resistor, 1/3W 50,000 in IF	C4,5,6,7,8,9	Condenser Trimmer 3-20 MMF	C32	Condenser, paper, .01-600
R9	Resistor, 1/3W 1,000,000 in IF	C10	Condenser Padder 3300 MMF	C34	Condenser, paper .2-400
R10	Resistor, 1/3W 70	C11	Condenser Adj. Padder	C35	Condenser, Elect. Wet 16 MFD
R11	Resistor, 1/3W 300,000	C12,13,14,15	Condenser, I.F. Trimmer	C36	Condenser Elect. Wet. regulator
R12,22,23	Resistor, 1/3W 25,000	C16,17,21	Condenser .05-200	C37	Condenser, paper, .02-600
R13	Volume Control, 1/3W 3,000,000	C18	Condenser Electrolytic 20 MFD 150	C39	Condenser, Mica, .0012
R14	Resistor, 1/3W 200,000	C19	Condenser paper .1-400	C40	Condenser, Elect. Dry, 250 MFD 2V
R15	Resistor, 1/3W 400,000	C20	Condenser (Wire) 2.5 MMF	C41	Condenser, Elect. Dry, 250 MFD 2V
R16	Resistor, 1/3W 100,000	C22,38	Condenser, Mica 50 MMF		

C1	Trimmer	C22,23	100 MMF Mica	R1	100 1/3 Watt		
C2,3,4	Gang Condenser & Mechanical Turner	C24	.002-600 Volt	R2,15	50,000 1/3 Watt		
C5,6,7,8,9,10	Trimmers	C24	100 MMF Mica	R3	200 1/3 Watt		
C11	.05 MFD—200 volt	C26,28	.005-600 Volt	R4	1,000,000 1/3 Watt	R12	400,000 1/3 Watt
C12	3300 MMF Tubular Padder	C27	.01-400 Volt	R5	50,000 1/3 Watt	R13	100,000 1/3 Watt
C13	1440 MMF Tubular Padder	C30	16 MFD—225 Volt Regulating	R6	1,000,000 1/3 Watt	R14	5,000 1/3 Watt
C14	400 MMF Adjustable Padder		Wet Electrolytic	R7	100 1/3 Watt	R16	500,000 1/3 Watt
C15	50 MMF Mica	C31	16 MFD—350 Volt Wet Electrolytic	R8	3,000,000 Volume Control	R17	1,000,000 1/3 Watt
C16,17,18,19	IF Trimmer	C32	.02-600 Volt	R9	15,000 1 Watt		
C20,29	.1 MFD 400 Volt	C33	250 MMF Mica	R10	200,000 1/3 Watt		
C21	.2MFD 200 Volt			R11	500,000 Tone Control and Switch		



WESTERN AUTO SUPPLY CO.

TRUETONE PAGE 15
MODEL D922
Issue B

MODEL D925
Issue A

WESTERN AUTO SUPPLY CO.

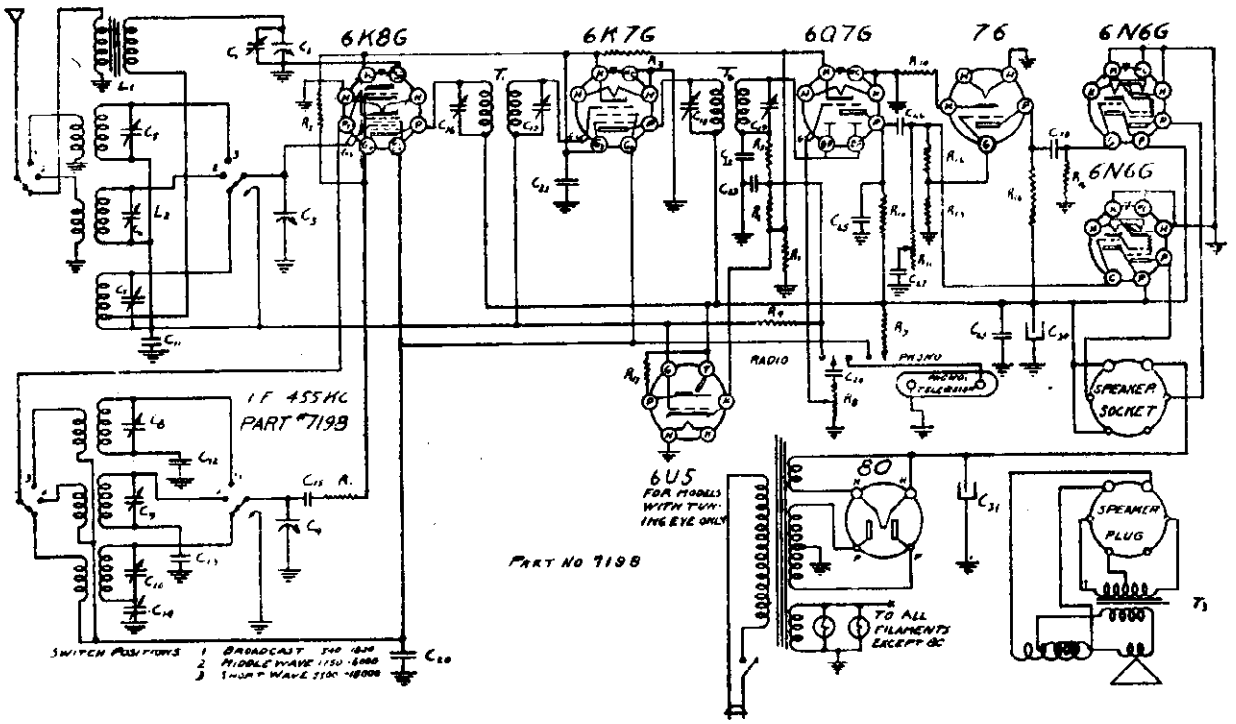
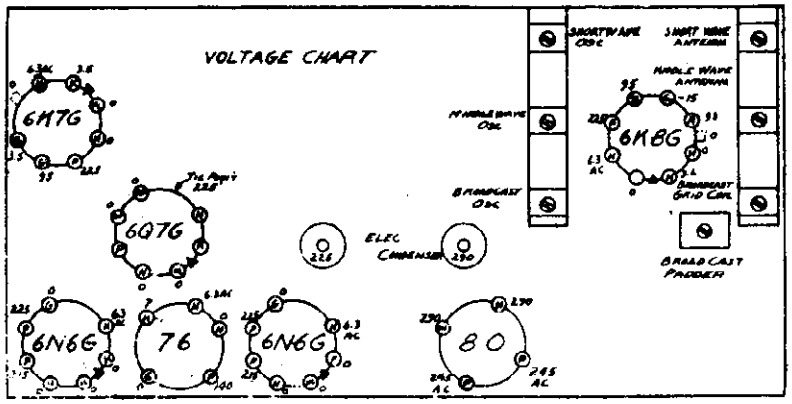


Fig. 4. Circuit Diagram

Schematic D-925 Issue A



FOR SIMILAR PUSH BUTTON DATA SEE Vol. XII D-934 TRUETONE.

PARTS

	C	Trimmer	On Gang Cond.				
7171	C2,3,4	Gang Condenser & Mechanical Turner	$5.75				
7197	C5,6,7,8,9,10	Trimmers	.20			RESISTORS	
580	C11	.05 MFD—200 volt	.20	6718	R1	100 1/3 Watt	.15
7313	C12	3300 MMF Tubular Padder	.25	6720	R2,15	50,000 1/3 Watt	.15
7312	C13	1440 MMF Tubular Padder	.25	7119	R3	200 1/3 Watt	.15
7314	C14	400 MMF Adjustable Padder	.25	6723	R4	1,000,000 1/3 Watt	.15
2780	C15	50 MMF Mica	.20		R5	50,000 1/3 Watt	in IF Trans.
	C16,17,18,19	IF Trimmer	in IF Trans.		R6	1,000,000 1/3 Watt	in IF Trans.
575	C20,29	.1 MFD 400 Volt	.20	7318	R7	70 1/3 Watt	.15
2792	C21	.2 MFD 200 Volt	.25	7196	R8	3,000,000 Volume Control	.75
	C22,23	100 MMF Mica	in IF Trans.	7317	R9	15,000 1 Watt	.20
2600	C24,26,28	.02-600 Volt	.20	7262	R10	200,000 1/3 Watt	.15
1285	C25	100 MMF Mica	.20	7195	R11	500,000 Tone Control and Switch	1.00
568	C27	.01—400 Volt	.20	7123	R12	400,000 1/3 Watt	.15
5101	C30	16 MFD—225 Volt Regulating		7122	R13	100,000 1/3 Watt	.15
		Wet Electrolytic	.70	7125	R14	5,000 1/3 Watt	.15
3285	C31	16 MFD—350 Volt Wet Electrolytic	.80	6722	R16	500,000 1/3 Watt	.15

WESTERN AUTO SUPPLY CO.

MODELS D9
Issues A,

ALIGNMENT PROCEDURE

The diagrams below should be studied carefully as they show the location of all trimming and padding condensers
The following equipment is necessary to properly align this chassis:

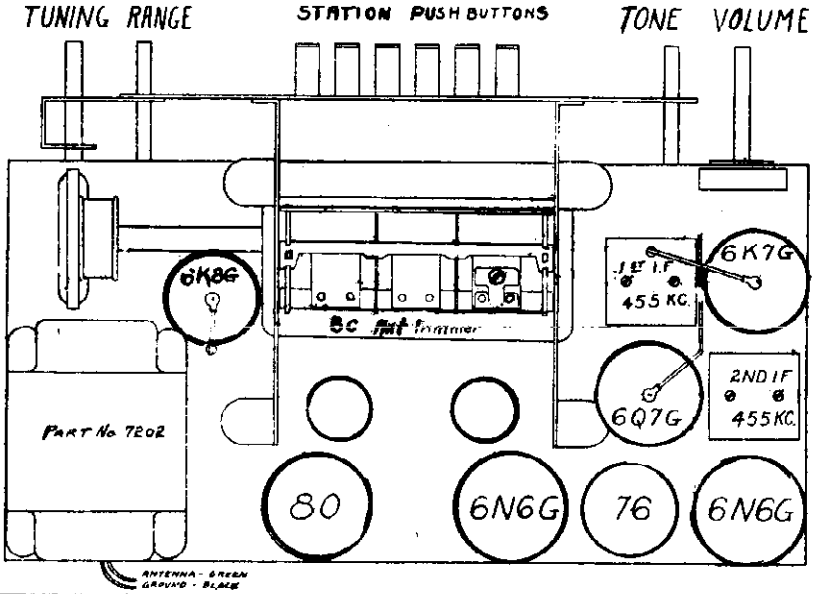
1. An all Wave Signal Generator which will provide an accurately calibrated signal at the frequencies listed.
2. An Output Meter.
3. A non-metallic screwdriver.
4. Dummy Antennae—.1 mfd., 200 mmf., 400 ohms.

Set the volume control near the maximum volume position, connect the signal generator ground to the receiver ch connect the proper value of dummy antennae in series with the generator output. Connect the output meter either a the primary of the output transformer or across the speaker voice coil. Allow the signal generator and the chassis to up for several minutes.

BAND	SIGNAL FREQUENCY SETTING	GENERATOR CONNECTED TO	DUMMY ANTENNA	BAND SWITCH POSITION	VARIABLE CONDENSER SETTING	TRIMMER LOCATION	TRIMMER FUNCTION	ADJUSTME
I. F.	455 kc.	Grid of 6K7G	.1 mfd.	Short wave	Minimum capacity	On top.	2nd I. F.	Adjust to maximum outp
I. F.	455 kc.	Grid of 6K8G	.1 mfd.	Short wave	Minimum capacity	On top.	1st I. F.	Adjust to maximum outp
BROAD-CAST BAND	1400 kc. exact	Antenna lead	200 mmf.	Broadcast	Set pointer to indicate 1400 kc.	Underneath chassis on oscillator coil	Broadcast oscillator	Adjust to maximum outp
BROAD-CAST BAND	1400 kc. exact	Antenna lead	200 mmf.	Broadcast	As above	Underneath chassis on ant. coil	Broadcast Translator	Adjust to maximum outp
BROAD-CAST BAND	1400 kc.	Antenna lead	200 mmf.	Broadcast	As above	On gang condenser	Preselector coil	Adjust to maximum outp
BROAD-CAST BAND	600 ks. approx.	Antenna lead	200 mmf.	Broadcast	Tune in signal	Under chassis	Broadcast padder	Adjust to maximum outp while rocking gang condens

REPEAT ABOVE BROADCAST ALIGNING PROCEDURE AT LEAST ONCE MORE

MIDDLE WAVE BAND	5,000 kc. exact Ant. Lead	400 ohms	Middle wave	Set pointer to indicate 5000 kc.	Under chassis on osc. coil	Middle wave oscillator	Adjust to maximum output
	5,000 kc. exact Ant. Lead	400 ohms	Middle wave	As above	Underneath chassis on Ant. coil	Middle wave Antenna	Adjust to maximu output while rocki the tuning con-denser slightly
SHORT WAVE BAND	16,000 kc. exact Ant. Lead	400 ohms	Short wave	Set pointer to indicate 16,000 kc.	Underneath chassis on osc. coil	Short wave oscillator	Adjust to maximu output.
	16,000 kc. exact Ant. Lead	400 ohms	Short wave	As above	Underneath chassis on ant. coil.	Short wave Antenna	Adjust to maximu output while rocki the tuning con-denser slightly.



TRUETONE MODEL D925

TUBES: 1—6K8G converter (Oscillator and First Detector).
1—6K7G IF amplifier.
1—6Q7G Detector—First Audio Amplifie
1—76 Phase inverter.
2—6N6 Push Pull Power Output.
1—80 Rectifier.

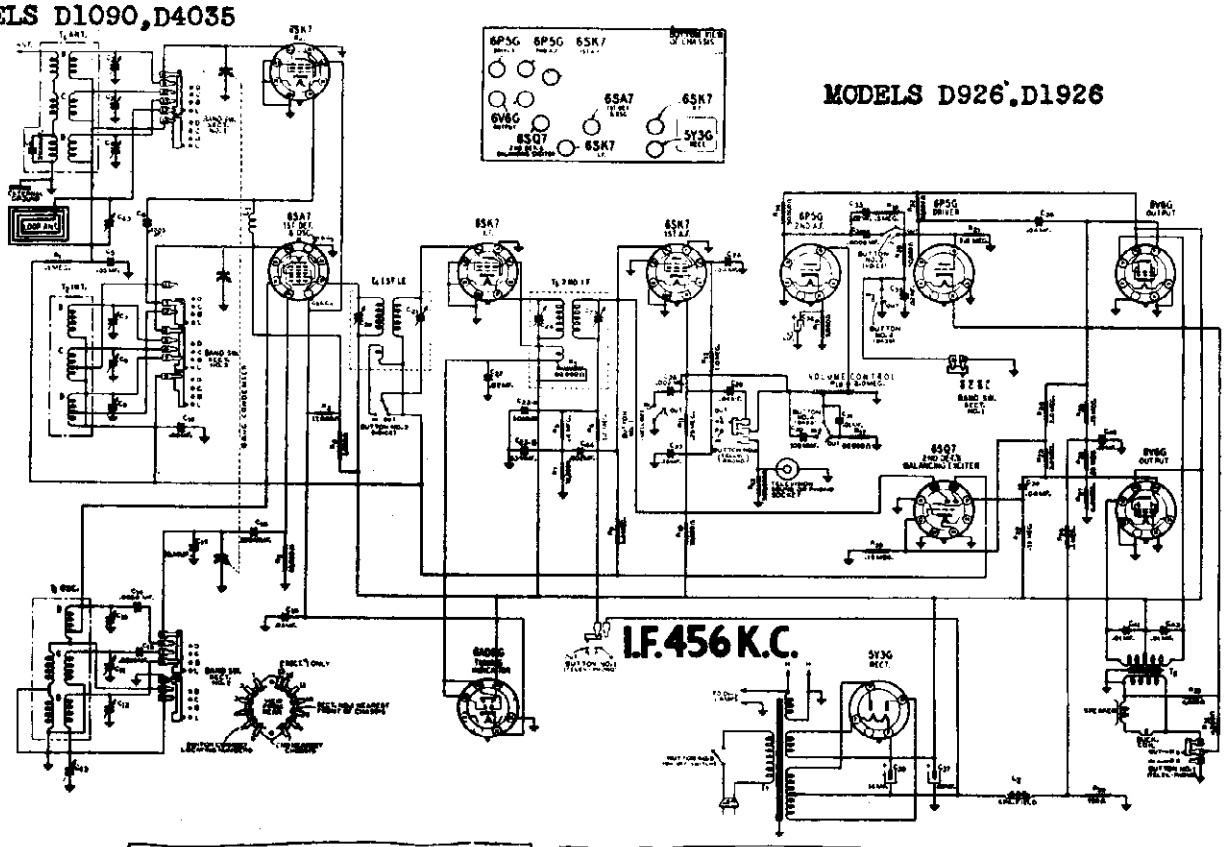
POWER TRANSFORMERS: Power transformers are available and receivers are sometives equipped with them for operation on 25 or 40 cycles.

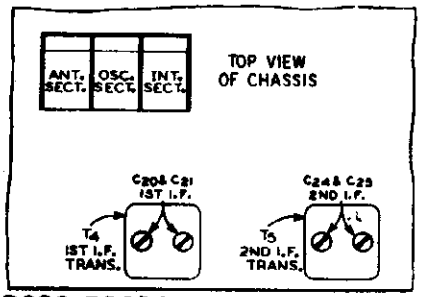
ISSUE A

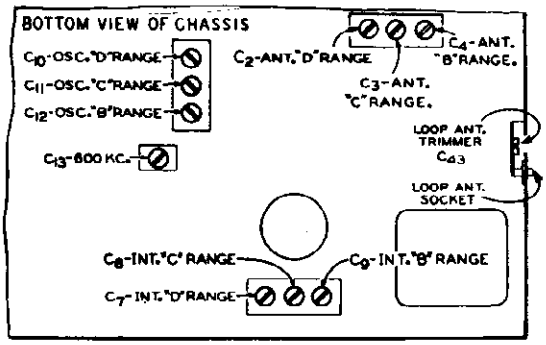
September 1939

MODELS D926,D1926
MODELS D926,D1926
Issues A,B
MODELS D1090,D4035

WESTERN AUTO SUPPLY CO.







MODELS D926,D1926; D926,D1926,Issues A,B

Power Consumption - 103 Watts (At 117 volts 60 cycles)

Power Output - - - - - - - 8 Watts Undistorted
9 Watts Maximum

Selectivity - 29.5 KC Broad at 1000 times Signal (Sharp)

Intermediate Frequency - - - - - - - 456 KC

Speaker - - - - - - - 12" Electro-dynamic

Tuning Frequency Range

B Range	528 to 1730 KC
C Range	2200 to 7000 KC
D Range	7000 to 22000 KC

Sensitivity (For 0.5 Watt output)

B Range	1.0 Microvolt Average
C Range	1.0 Microvolt Average
D Range	3.0 Microvolts Average

MODELS D1090,D4035

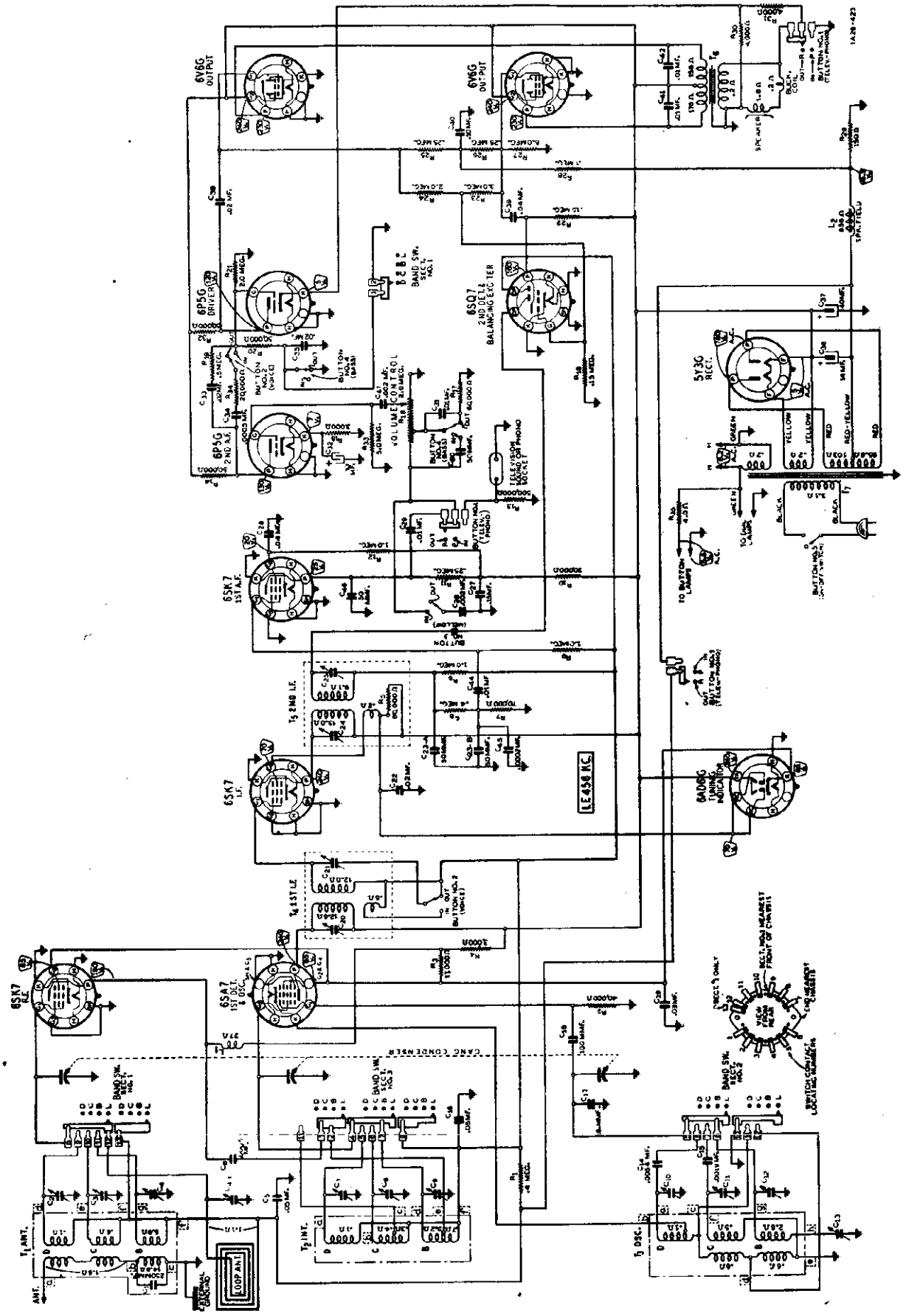
SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	IRON CORE SETTING	ADJUST TRIMMERS TO MAXIMUM (See Figs. 3 and 5)
I.F.				
456 KC	Control Grid — (prong No. 8) 6SA7 1st Det. Tube	.05 mf.		1st I.F. (C11) & (C12) 2nd I.F. (C15) & (C16)
OSCILLATOR				
1560 KC	Antenna Cable See Note A	See Note A	Extreme Position out of Coil	Oscillator (C6)
1000 KC ADJUSTMENT				
1000 KC	Antenna Cable	See Note A	Tune to Max. Output with Tuning Knob	Int. (C5) Ant. (C4)

Reassemble Radio—Install in Car—Connect Car Antenna to Radio.

Car Antenna Readjustment—Tune in weak signal near 1000 KC—Readjust Antenna Trimmer C4 for maximum output.

WESTERN AUTO SUPPLY CO.

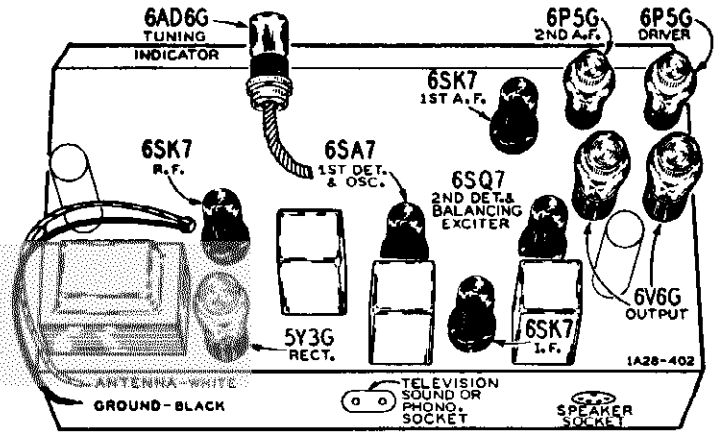
MODELS D926,D1926
Issue A



MODELS D926,D1926,
Issues A,B

WESTERN AUTO SUPPLY CO.

Model D 926, D 1926



Power Supply

CAUTION—Unless otherwise marked, this radio must be operated on a 105-125 volt, 50 to 60-cycle AC supply only. Do not insert the plug of the power cord in the receptacle unless all tubes and the speaker plug are in their proper sockets. The power rating of this radio is shown on the tube arrangement label. Receivers of this model which are to be used on 25 cycle, 230 volt, or other service are so marked on this label. If there is any doubt regarding the voltage and frequency of the power supply, consult the local power company before inserting the plug.

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Button No. 2 (Voice)—pulled out 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.

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I. F.					
456 KC	Grid of 1st I.F. Tube	.1 mf.	B Range	Turn Rotor to Full Open	2nd I.F. (C24) & (C25)
456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C20) & (C21)
RANGE B					
1730 KC	Antenna Lead	200 mmf.	B Range Ext. Ant.	Turn Rotor to Full Open	Oscillator Range B (C12)
1500 KC	Antenna Lead	200 mmf.	B Range Ext. Ant.	Turn Rotor to Max. Output	Ant. Range B (C4) Int. Range B (C9)
600 KC	Antenna Lead	200 mmf.	B Range Ext. Ant.	Turn Rotor to Max. Output	600 KC (C13) Rock Rotor—See Note A
RANGE C					
7000 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Full Open	Oscillator Range C (C11)
6000 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Max. Output	Antenna Range C (C3) Int. Range C (C8)
RANGE D					
22,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C10)
21,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C2) Int. Range D (C7)
LOOP RANGE B					
1500 KC See Note B	None—See Note B		Loop	Turn Rotor to Max. Output	See Note C Loop Trimmer (C43)
RANGE "D" MODEL D926, ISSUE A					
22,000 KC	Antenna Lead	400 Ohm	D Range	Keep rotor at full open position	Ant. Range D (C2) Int. Range D (C7)

ISSUE A JULY 1939

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.

CALIBRATION—Chassis must be in cabinet. If it is necessary to re-calibrate the radio, remove pointer from drive cord—See drive cord illustration. Tune in a 1500 KC signal. Set pointer at the 1500 KC mark on the dial scale. Attach pointer to drive cord.

NOTE A—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

NOTE B—Re-install set in cabinet. Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. Place signal generator so that this loop is between 3 and 10 feet from Stratoscope loop in cabinet.

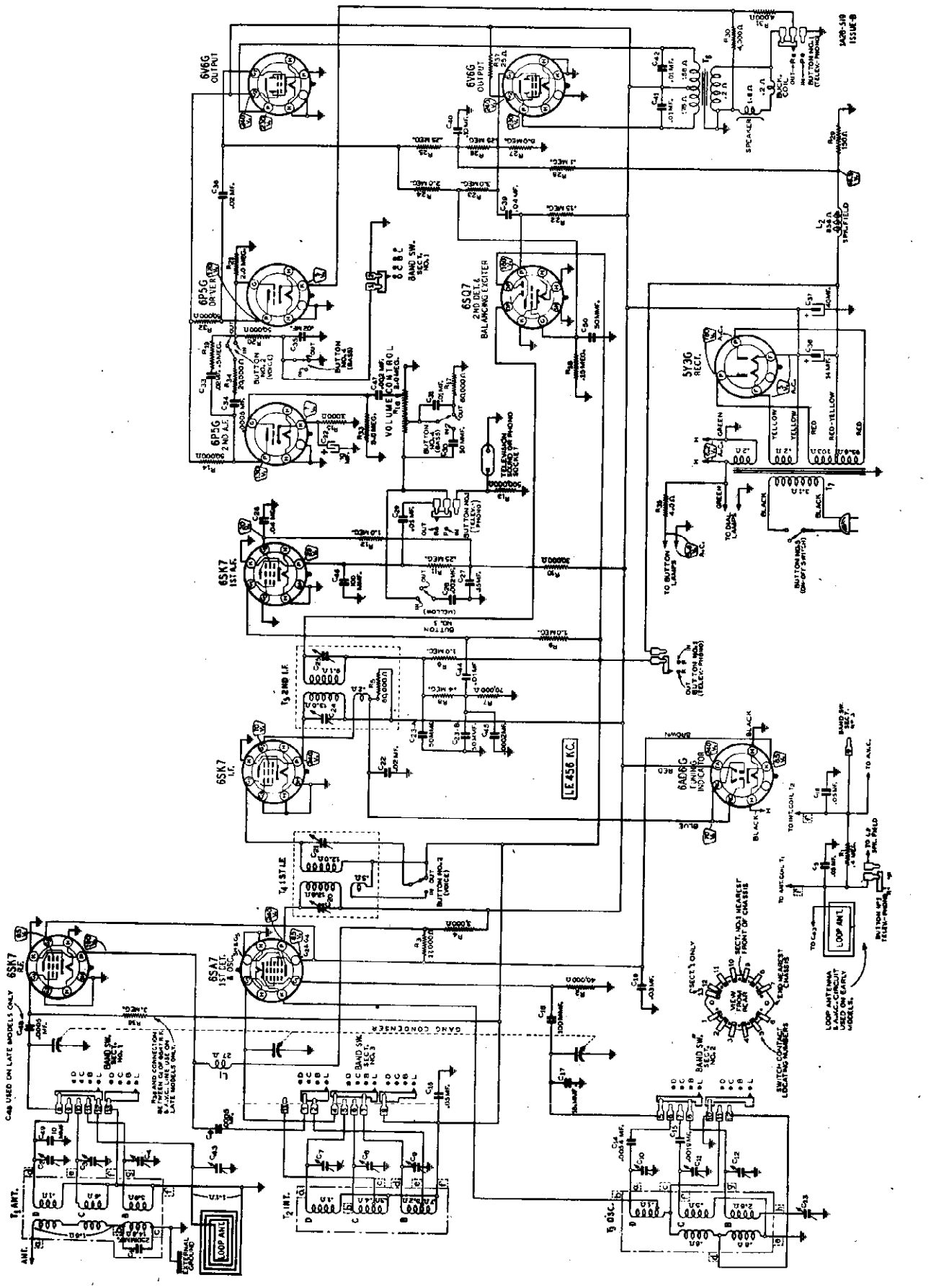
NOTE C—Turn knob of Stratoscope loop until output is maximum.

ISSUE B NOVEMBER 1939

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.

MODELS D926,D192
ISSUE B

WESTERN AUTO SUPPLY CO.



MODELS D926,D1926
Issue B

WESTERN AUTO SUPPLY CO.

CHANGES FOR "B" ISSUE

The following Electrical Changes are made in the "B" issue of this series:
The AVC line is now connected through a 3 megohm resistor directly to the control grid of the 6SK7 R.F. tube.

The loop antenna and the common lead of the antenna secondary coils are now grounded.

Condenser C5 (.05 mf.), Resistor R1 (.40 megohm), and the connecting wire between them have been removed.

The radio-phono switch remains connected to the AVC line.

A .0005 mf. condenser has been added between the control grid of the 6SK7 R.F. tube and the band switch.

The following mechanical change is made in the "B" issue of this series:
A new type of retainer spring is employed to hold the lower row of push buttons on the plunger shafts. In order to replace the tone scale lamps or to remove the chassis from the cabinet, it is necessary to remove the lower row of push buttons in the manner described in the instruction manual for this series and issue.
The 50 mmf. condenser (C46), from the plate of the 6SK7 1st A.F. tube to ground, was changed to 100 mmf.

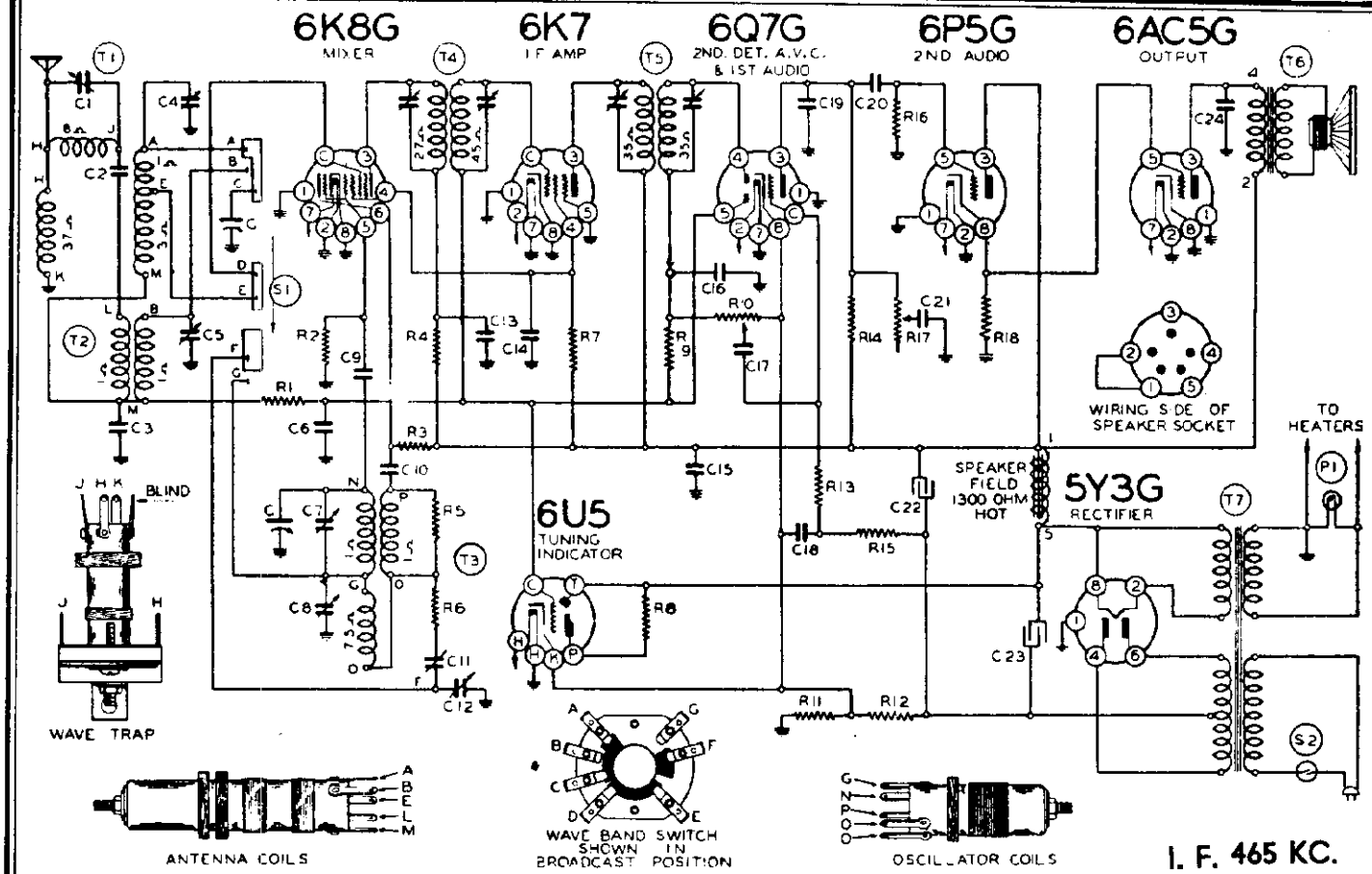
A 50 mmf. condenser (C50) was added between the grid of the 6SQ7 Balancing Exciter tube and ground.

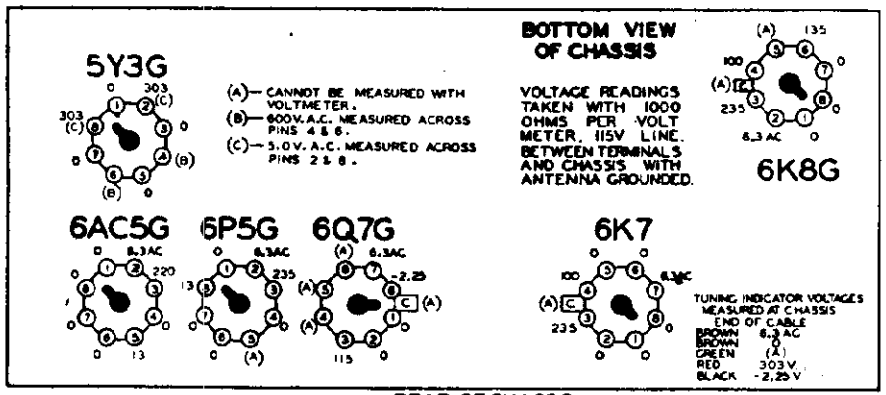
A 25 ohm resistor was connected in series with the screen grid of the 6V6G Output tube. This is the output tube which is driven by the 6SQ7 Balancing Exciter tube.
The following additional NEW PARTS are used in issue "B" chassis:

NO.	CODE	DESCRIPTION	PRICE
47X57	C46	100 mmf., Molded Condenser.....	$0.10
47X56	C50	50 mmf., Molded Condenser.....	.10
A85250	R37	25 Ohm, Carbon Resistor.....	.10
9A1207	T1	Antenna Transformer Assembly.....	$2.10
46X282	C48	.0005 mf., 360 volt, Tubular Condenser....	.10
A85305	R36	3 Megohm, 0.2 Watt, Carbon Resistor.....	.10
7A108		Lamp Socket Assembly for Tone Scale (2 Sockets with Wire).....	.20
28X262		Retainer Springs for Tone, On-Off, and Phono-Television Sound Buttons.....Doz	.10
26A202		Bracket Assembly complete with 2 Tone Scale Lamps.....	.60

The following parts are NOT used in issue "B" chassis:

47X56	C46	50 mmf., Molded Condenser.....	$0.10
9A1138	T1	Antenna Transformer Assembly.....	$2.10
46X253	C5	.05 mf., 180 Volt, Tubular Condenser.....	.10
A85404	R1	400,000 Ohm, 0.2 Watt, Carbon Resistor....	.15
7A98		Lamp Socket Assembly for Tone Scale (2 Sockets with Bracket and Wire).....	.25
28X259		Retainer Springs for Tone, On-Off, and Phono-Television Sound Buttons.....Doz	.25
25X634		Bracket for Semi Drum.....	.20





CONDENSERS

C	10065	2 gang variable condenser
C1	12451	Wave Trap adjustable trimmer
C2	10011	.01 x 400 v.
C3	129129	.0025 mica
C4	12473	B.C. Antenna Trimmer
C5	12473	S.W. Antenna Trimmer
C6	1009	.05 x 200 v.
C7	12472	S.W. Oscillator Trimmer
C8	12472	B.C. Oscillator Trimmer
C9	12939	.00005 mica
C10	10025	.002 x 600 v.
C11	12466	B. C. Oscillator Series Pad
C12	12466	S.W. Oscillator Series Pad
C13	10026	.02 x 400 v.
C14	1001	.1 x 400 v.
C15	10013	.05 x 400 v.
C16	1295	.0001 mica
C17	10019	.006 x 600 v.
C18	10020	.1 x 200 v.
C19	1292	.0005 mica
C20	10011	.01 x 400 v.
C21	10019	.006 x 600 v.
C22	11980	12 mfd. lytic—450 w. v.
C23	11980	12 mfd. lytic—450 w. v.
C24	10019	.006 x 600 v.

RESISTORS

R1	13011	250M ohm—⅓ w.
R2	13012	50M ohm—⅓ w.
R3	1301	25M ohm—⅓ w.
R4	13023	2000 ohm—⅓ w.
R5	130235	1500 ohm—⅓ w.
R6	130240	30 ohm—⅓ w.
R7	13076	30M ohm—⅓ w.
R8	130110	1 megohm—in tuning indicator socket
R9	1304	3 megohm—⅓ w.
R10	101137	1 megohm volume control
R11	130203	40 ohm—⅓ w.
R12	130203	40 ohm—⅓ w.
R13	13019	1 megohm—⅓ w.
R14	1309	200M ohm—⅓ w.
R15	1303	500M ohm—⅓ w.
R16	13019	1 megohm—⅓ w.
R17	101157	250M ohm tone control
R18	1301	25M ohm—⅓ w.

PARTS

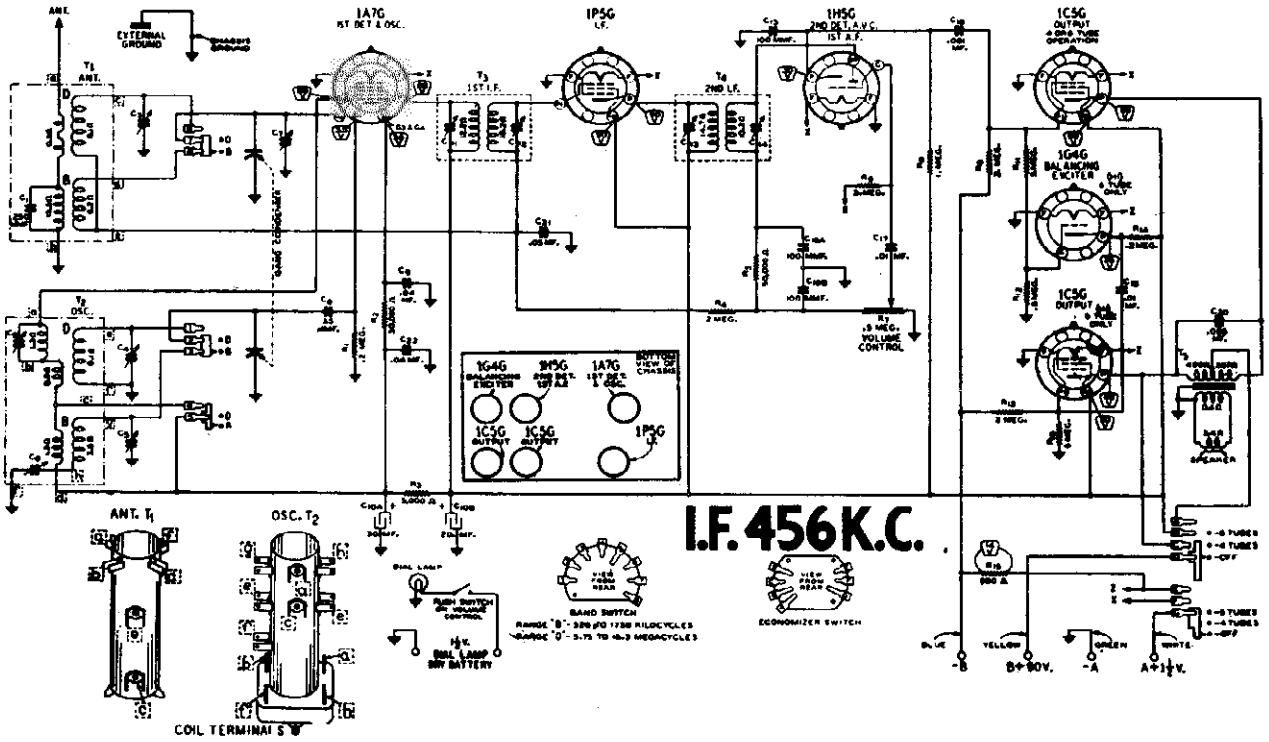
T1	108124	Wave Trap
T2	111115	Antenna Coils
T3	110104	Oscillator Coils
T4	108122	Input I. F.—465 kc.
T5	108106J	Output I. F.—465 kc.
T6	114148	10 in. Dynamic Speaker (Field Resis. 1300 ohms)
T7	104139B	Power Transformer
S1	12569	Wave Band Switch
S2		Off-on switch on tone control
P1	10794	6-8 v. pilot light

MODEL D929

WESTERN AUTO SUPPLY CO.

TRUETONE PAGE 13-MODEL D92

WESTERN AUTO SUPPLY CO.



ALIGNMENT PROCEDURE

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER OR DIAL SETTING	ADJUST TRIMMERS TO MAXIMUM
I. F. 456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	2nd I.F. (C13) & (C14) 1st I.F. (C11) & (C12)
RANGE B 1730 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C5)
1500 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1500 KC—See Note A	Ant. Range B (C7)
600 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C6), Rock Rotor—See Note B
RANGE D 18,300 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C4)
17,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C3) Rock Rotor—See Note B
6000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	6000 KC (C2) Rock Rotor—See Note B

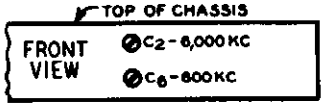
Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

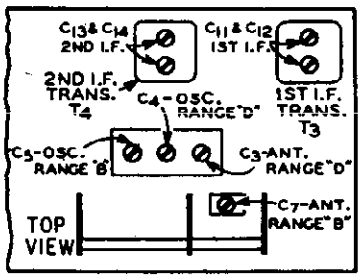
After each range is completed, repeat the procedure as a final check.

NOTE A—If the pointer is not at 1500 KC on the dial, slip the drive cord out from under one of the end clamps on the pointer head. Move pointer to 1500 KC on the dial and replace drive cord under end clamp.

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 15,000 KC. The signal will then be heard at 15,000 KC 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 on the dial. It may be necessary to increase the input signal to hear the image.

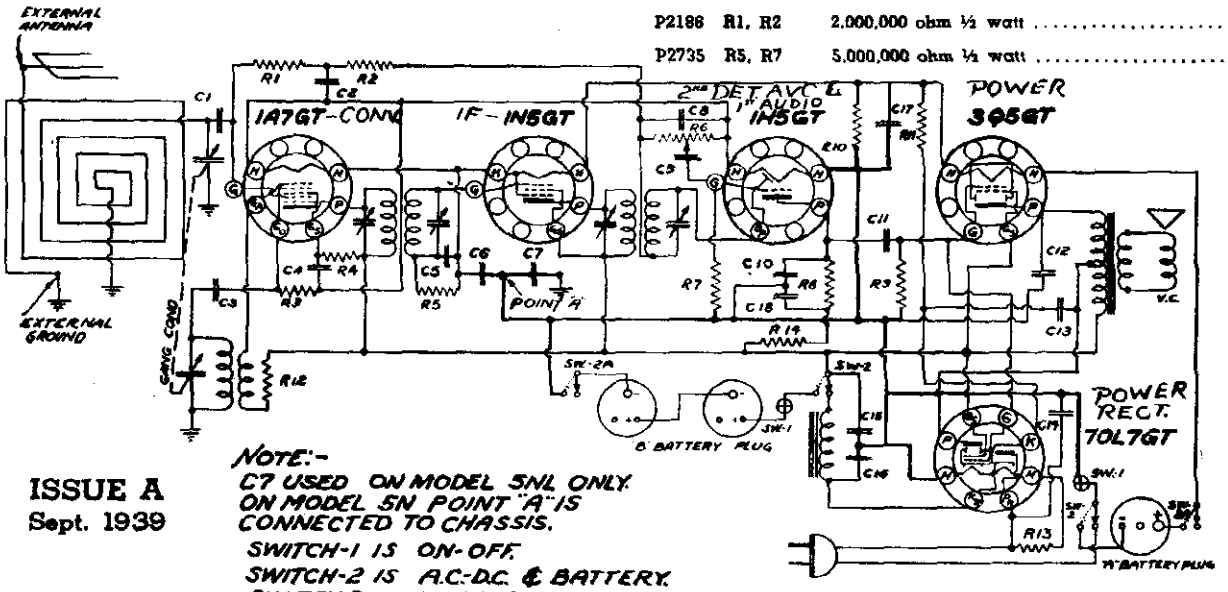




WESTERN AUTO SUPPLY CO.

Part No.	Circuit Reference	Description	List Price
		PAPER CONDENSERS	
P1193	C1, C5, C12	.002 mfd. 600 volt	$ .15
P164	C9, C11, C13	.01 mfd. 400 volt	.25
P334	C2, C4, C14	.05 mfd. 400 volt	.30
P142	C18	.1 mfd. 200 volt	.20
		MICA CONDENSERS	
P1382	C3	.00005 mfd.	.15
P817	C8, C10	.00025 mfd.	.15
		ELECTROLYTIC CONDENSERS	
P3562	C8	40 mfd., 25 volt	.95
	C17	40 mfd., 25 volt	
P3563	C15,	20 mfd., 150 volt	1.15
	C16	30 mfd., 150 volt	

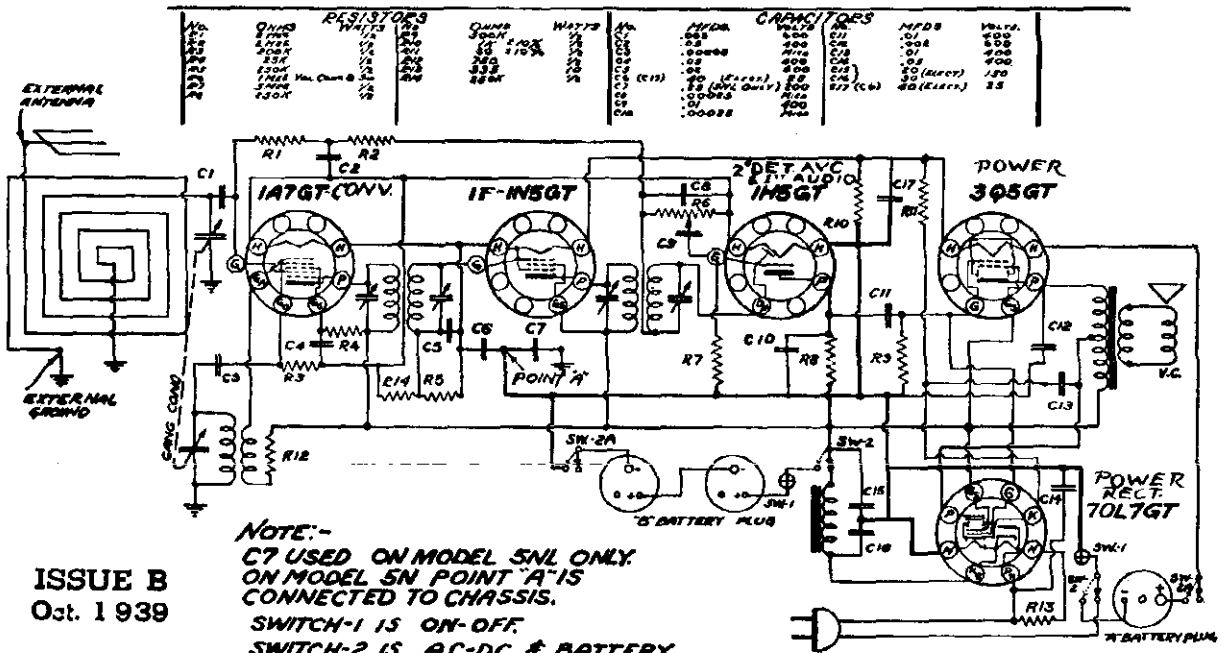
Part No.			List Price
		VARIABLE CONDENSERS	
P3554		Gang Condenser	2.90
P3330		Trimmer Condenser	.40
		RESISTORS	
P2436	R11	30 ohm ½ watt 10% (wire wound)	.15
P3658	R13	335 ohm 10 watt	.50
P376	R12	750 ohm ½ watt	.15
P1973	R10	1,000 ohm ½ watt 10%	.15
P2731	R4	25,000 ohm ½ watt	.15
P1305	R14	100,000 ohm ½ watt	.15
P2187	R3	200,000 ohm ½ watt	.15
P2344	R8	250,000 ohm ½ watt	.15
P137A	R9	500,000 ohm ½ watt	.15
P2186	R1, R2	2,000,000 ohm ½ watt	.15
P2735	R5, R7	5,000,000 ohm ½ watt	.15



ISSUE A
Sept. 1939

NOTE:-
C7 USED ON MODEL 5NL ONLY.
ON MODEL 5N POINT "A" IS CONNECTED TO CHASSIS.
SWITCH-1 IS ON-OFF.
SWITCH-2 IS A.C.-D.C. & BATTERY.
SWITCH-2 SHOWN FOR A.C.-D.C.
I.F. 455 K.C.
ON MODEL 5N SWITCH, SWITCH 2A NOT USED.

SCHEMATIC DIAGRAM



ISSUE B
Oct. 1939

NOTE:-
C7 USED ON MODEL 5NL ONLY.
ON MODEL 5N POINT "A" IS CONNECTED TO CHASSIS.
SWITCH-1 IS ON-OFF.
SWITCH-2 IS A.C.-D.C. & BATTERY.
SWITCH-2 SHOWN FOR A.C.-D.C.
I.F. 455 K.C.
ON MODEL 5N SWITCH, SWITCH 2A NOT USED.

SCHEMATIC DIAGRAM

SERVICE INFORMATION

Speaker (Part No. P3564) 5" PM Type

D.C. voice coil resistance.....2.3 ohms
Voice coil impedance at 400 cycles.....2.7 ohms

Oscillator Coil (Part No. P3318) (Brown Dot)

Looking at the connection end (with dot) starting at the chassis in a clockwise direction the terminals are: No. 1, grid; No. 2, plate; No. 3, B+; No. 4, ground.
Primary—No. 2 and No. 3—Resistance 1.7 ohms.
Secondary—No. 4 and No. 1—Resistance 4.9 ohms.

First I.F. Transformer (Part No. P3559)

Primary—Red white, B+; blue white, plate—Resistance 12.1 ohms.
Secondary—White, grid; black white, AVC—Resistance 24.9 ohms.

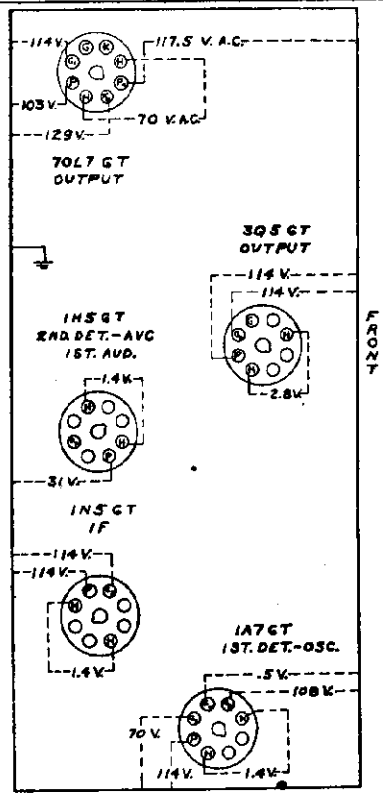
Second I.F. Transformer (Part No. P2606)

Primary—Blue white, plate; red white, B+—Resistance 15.1 ohms.
Secondary—White, grid; black white, AVC—Resistance 11.8 ohms.

Loop Antenna Since the loop antenna acts also as the antenna coil the set will not operate with the loop antenna disconnected.

POWER SUPPLY

This receiver is designed to operate from the self contained batteries or from any AC (Alternating Current) or DC (Direct Current) power supply main of 105 to 125 volts, 60 cycle. To operate this receiver from a power line of 115 volts 60 cycle AC or 115 volts DC, open the door in the back of the cabinet, extend the power line cord and plug it into the nearest outlet. Then turn the center knob on the front of the cabinet to the left (counter-clockwise). The radio will then operate from the power line after warming up for about one minute. If the radio fails to operate after a few minutes on DC, reverse the power line plug.



Bottom view of chassis

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- 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.

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (In Order Shown)	Trimmer Function	Adjustment
I. F.	455 KC.	.1 MFD.	Grid of 1N5GT tube	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I.F.	Adjust to maximum output
See Note "A"	455 KC.	.1 MFD.	Grid of 1A7GT tube	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I.F.	Adjust to maximum output
BROAD-CAST	1550 KC.	200 mmf.	Antenna Connection	Rotor full open (Plates out of mesh)	Trimmer—Left rear of chassis	Oscillator	Adjust to maximum output
See Note "B"	1400 KC.	200 mmf.	Antenna Connection	Set dial at 1400 KC.	Trimmer—Next to AVC clip	Antenna	Adjust to maximum output

This is all that is necessary for the alignment unless the plates of the gang have been bent out of shape. In case of bent plates, set the signal generator and receiver to 600 KC and bend the plates into the position for maximum output.

Attenuate the signal from the signal generator to prevent the leveling off-action of the AVC. After each band is completed, repeat the procedure as a final check.

NOTE "A"—Use battery operation for all adjustments.

NOTE "B"—Align broadcast band with chassis in cabinet and loop antenna connected.

Frequency Range
540 to 1550 K.C.

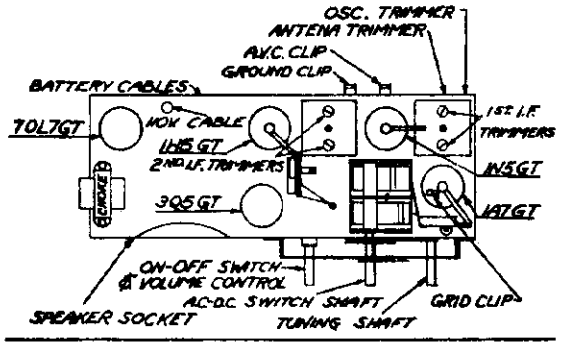
Power output (on batteries) .27 watt undistorted—.35 watt maximum.

Power output (AC-DC) 1 watt undistorted—1.7 watts maximum.

Intermediate Frequency 455 K.C. Power consumption 28 watts.

VOLTAGE CHART

All voltages measured with a 1,000 ohm per volt meter on 150 volt scale. Line voltage 117.5 volts AC.



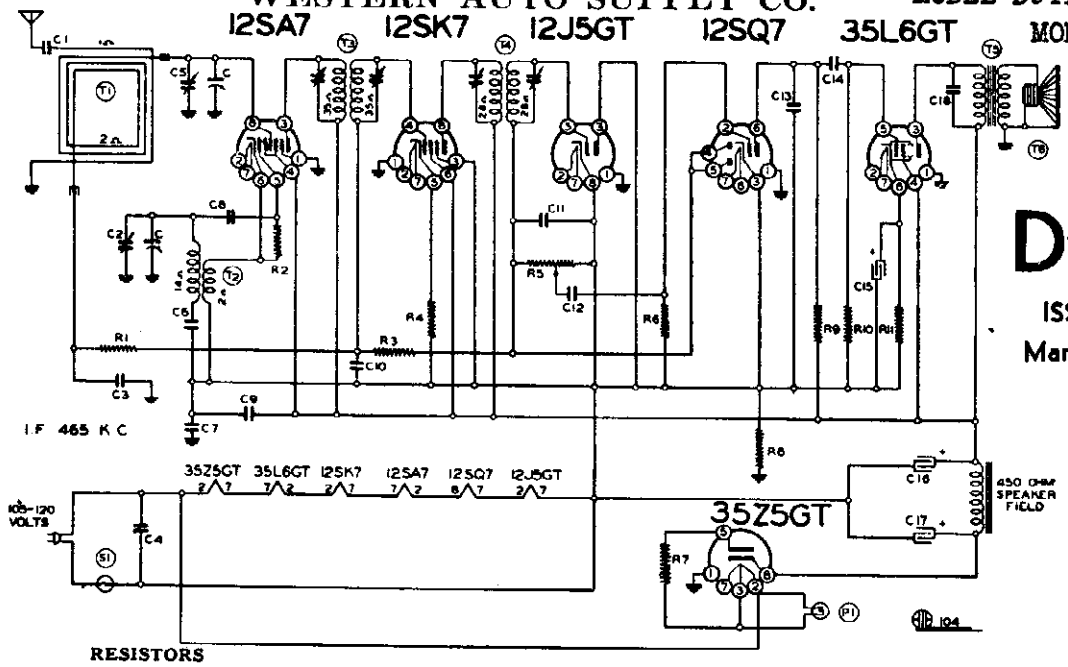
—Top View

WESTERN AUTO SUPPLY CO.

MODEL D941, Issue A

MODEL D941, Issue B

12SA7 12SK7 12J5GT 12SQ7 35L6GT



D941

ISSUE A

March 1939

RESISTORS

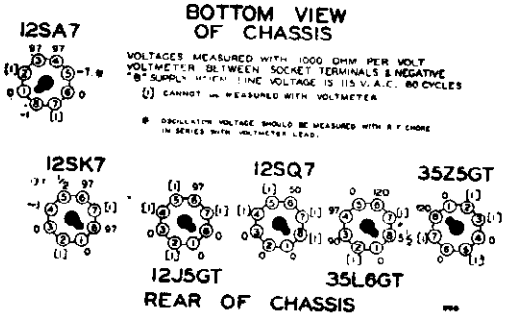
R1	130100	150M ohm—½ w.
R2	130176	20M ohm—½ w.
R3	1304	3 megohm—½ w.
R4	130174	50 ohm—½ w.
R5	101108	1 megohm volume control
R6	130225	15 megohm—½ w.
R7	130215	25 ohm—½ w.
R8	1309	200M ohm—½ w.
R9	1309	200M ohm—½ w.
R10	1305	300M ohm—½ w.
R11	130166	150 ohm—½ w.

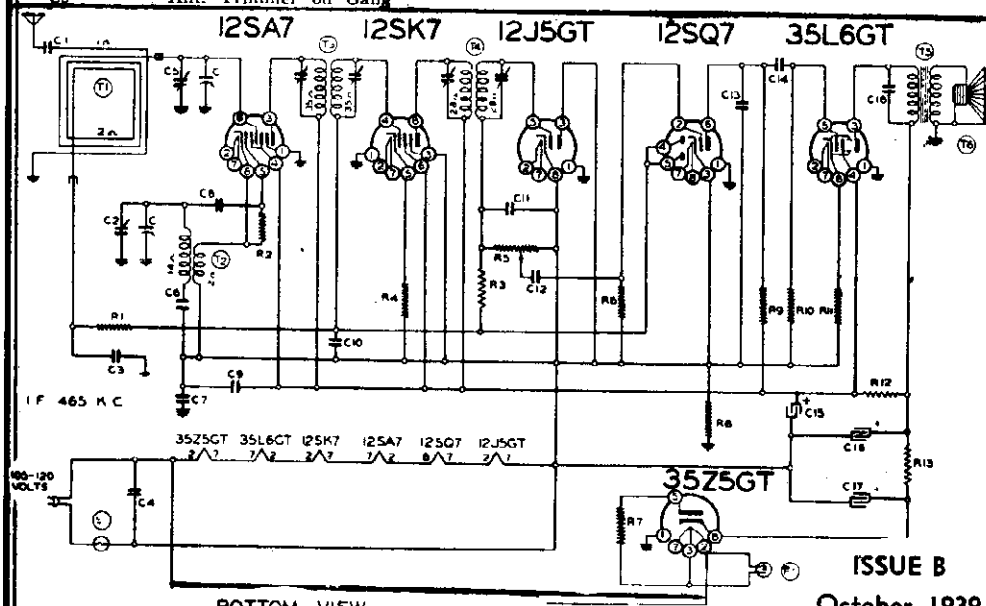
CONDENSERS

C	102105	2 gang Variable Condenser
C1	1295	.0005 mfd. mica
C2		Osc. Trimmer on Gang
C3	1009	.05 x 200 v.
C4	1001	.1 x 400 v.
C5		Ant. Trimmer on Gang
C6	100105	.02 x 400 v.
C7	10091	.15 x 400 v.
C8	12912	.00025 mfd. Mica
C9	1009	.05 x 200 v.
C10	1009	.05 x 200 v.
C11	1295	.0001 mica
C12	10025	.002 x 600 v.
C13	12912	.00025 mfd. Mica
C14	10011	.01 x 400 v.
C15	11953D	40 mfd. x 25 w. v. lytic
C16	11953D	30 mfd. lytic
C17	11953D	30 mfd. lytic
C18	10026	.02 x 400

C15, C16 and C17 in same unit

BOTTOM VIEW OF CHASSIS





ISSUE B

October 1939

RESISTORS

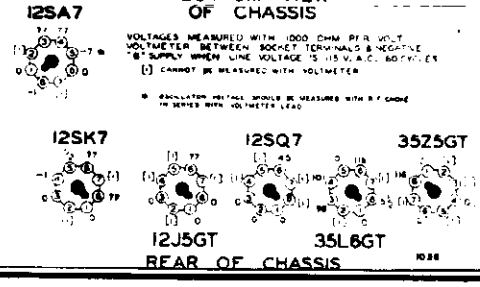
R1	130100	150M ohm—½ w.
R2	13094	50M ohm—½ w.
R3	1304	3 megohm—½ w.
R4	130174	50 ohm—½ w.
R5	101108	1 megohm volume control
R6	130257	5 megohm—½ w.
R7	130215	25 ohm—½ w.
R8	1309	200M ohm—½ w.
R9	1309	200M ohm—½ w.
R10	1303	500M ohm—½ w.
R11	130166	150 ohm—½ w.
R12	130287	1200 Ohm—1 Watt
R13	130296	200 Ohm—1 Watt

CONDENSERS

C	102105	2 gang Variable Condenser
C1	1292	.0005 mfd. mica
C2		Osc. Trimmer on Gang
C3	1009	.05 x 200 v.
C4	1001	.1 x 400 v.
C5		Ant. Trimmer on Gang
C6	100105	.02 x 400 v.
C7	10091X	.15 x 400 v.
C8	12912	.00025 mfd. Mica
C9	1009	.05 x 200 v.
C10	1009	.05 x 200 v.
C11	1295	.0001 mica
C12	10025	.002 x 600 v.
C13	12912	.00025 mfd. Mica
C14	10011	.01 x 400 v.
C15	11994	20 mfd. x 150 w. v. lytic
C16	11994	20 mfd. lytic
C17	11994	40 mfd. lytic
C18	10026	.02 x 400

C15, C16 and C17 in same

BOTTOM VIEW OF CHASSIS



SERVICE NOTES:

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.

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.

MODELS D941, Issues A,B

WESTERN AUTO SUPPLY CO.

MODELS D976 Issues A,B

TUBES:

1—Type 12SA7 Mixer, First Detector-oscillator.
1—Type 12SK7 I. F. Amplifier.
1—Type 12J5GT Second Detector, A.V.C.
1—Type 35L6GT Beam Output Amplifier.
1—Type 35Z5GT High Vacuum Rectifier.

DESCRIPTION:

The tube complement of this chassis consists of the following octal base glass and metal tubes.

The type and function of each tube is as follows:

ALIGNMENT PROCEDURE

IMPORTANT:—See alignment instructions on page 3.

- Volume control—Maximum all adjustments.
- Connect B - of radio chassis to ground post of signal generator through .1 Mfd. condenser.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning:

- An all wave signal generator.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 Mfd.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 12SA7	Rotor full open (Plates out of mesh)	Four Trimmers on Top (See Fig. 1)	Output and Input I.F.	Adjust to maximum output
BROADCAST BAND	1650 Kc.	.1 MFD.	Grid of 12SA7	Rotor full open (Plates out of mesh)	Trimmer bottom of front section of gang. (See bottom of radio)	Broadcast Oscillator	Adjust to maximum output
	1400 Kc.	See Note "A"		Set dial at 1400 Kc.	Trimmer bottom of rear section of gang. (See bottom of radio)	Broadcast Antenna	Adjust to maximum output

NOTE "A" Lay the output lead from the generator in back of the loop antenna. Turn up the output of the generator, picking up the energy in the loop antenna without any electrical connection from the generator.

FREQUENCY RANGE 530 to 1650 K.C.

Power Consumption.....40 Watts
Power Output.....850 Milliwatts Undistorted, 1.4 Watts Maximum
Intermediate Frequency.....465 K.C.

For general P.B. Data see D-723 Western Auto

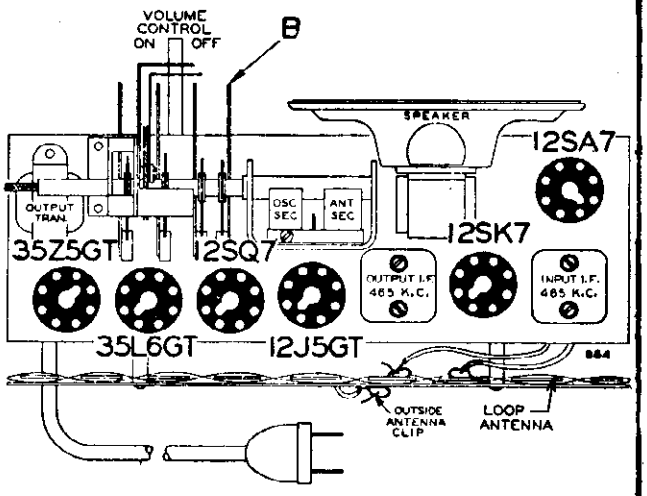


FIG. 1—TOP VIEW

Model 941 A & B

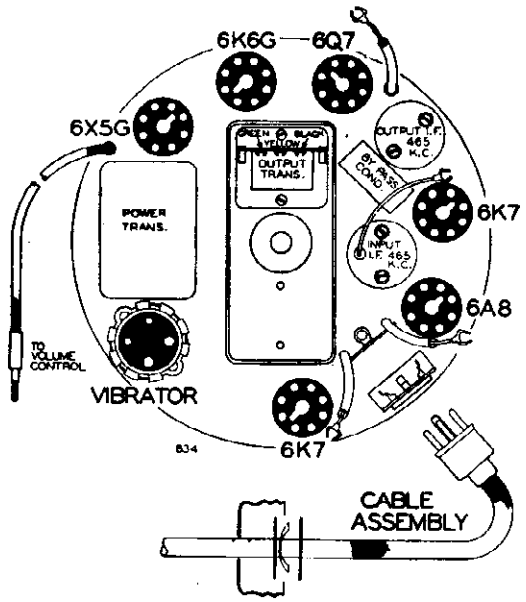
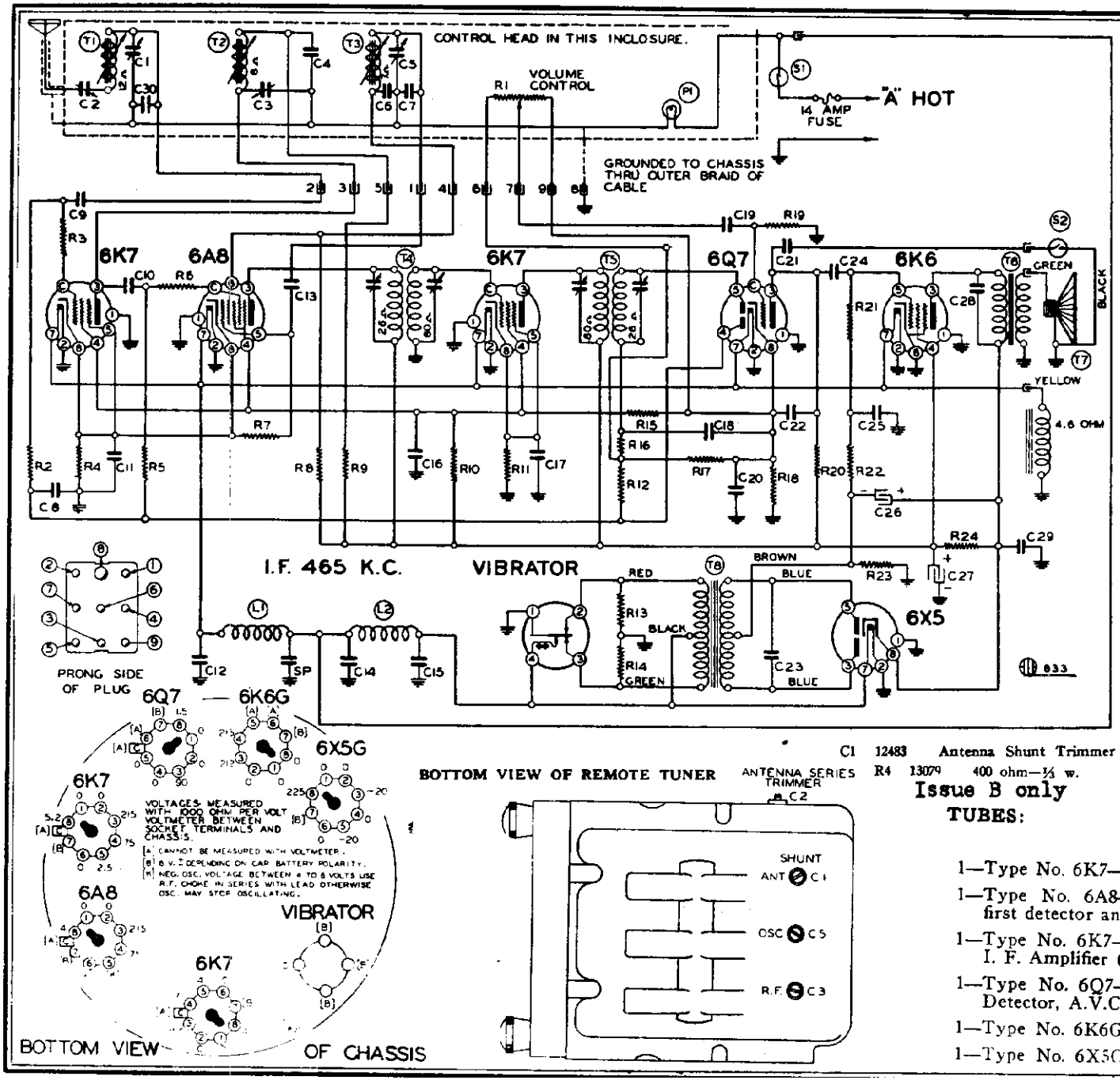


Fig. 3—Top View of Chassis

Model 976 A and B

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Remote Tuner Dial Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6K7 I. F. Tube	Set dial at 1400 Kc.	Two trimmers on top (See Fig. 3)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6A8	Set dial at 1400 Kc.	Two trimmers on top (See Fig. 3)	Input I. F.	Adjust to maximum output
BROADCAST BAND	1565 Kc.	125 mmf.	Antenna lead	Set dial at 1565 Kc.	Trimmer C5 (See Fig. 4)	Oscillator	Adjust to maximum output
	1400 Kc.	125 mmf.	Antenna lead	Set dial at 1400 Kc.	Trimmers C1, C3 (See Fig. 4)	Antenna and R. F.	Adjust to maximum output
	600 Kc.	125 mmf.	Antenna lead	Set dial at 600 Kc.	Trimmer C2 (See Fig. 4)	Antenna series adj.	See note "A"



No.	Part No.	Description
		RESISTORS
R1	101161	1.2 megohm volume control
R2	13019	1 megohm—⅓ w.
R3	13054	500 ohm—⅓ w.
R4	13054	500 ohm—⅓ w.
R5	13019	1 megohm—⅓ w.
R6	13054	500 ohm—⅓ w.
R7	13012	50M ohm—½ w.
R8	13012	50M ohm—½ w.
R9	13021	20M ohm—½ w.
R10	13065	30M ohm—1 watt
R11	130235	1500 ohm—⅓ w.
R12	13019	1 megohm—⅓ w.
R13	13056	700 ohm—⅓ w.
R14	13056	100 ohm—⅓ w.
R15	130208	40M ohm—⅓ w.
R16	13020	100M ohm—½ w.
R17	130118	600M ohm—¼ w.
R18	130101	600 ohm—⅓ w.
R19	13019	1 megohm—⅓ w.
R20	13011	250M ohm—½ w.
R21	1305	300M ohm—½ w.
R22	13011	250 ohm—⅓ w.
R23	130274	360 ohm—1 watt
R24	130273	900 ohm—1 watt
		CONDENSERS
C1	12480	Antenna Shunt Trimmer
C2	12481	Antenna Series Trimmer
C3	12480	R. F. Shunt Trimmer
C4	100102	.15 x 400 v.
C5	12480	Oscillator Shunt Trimmer
C6	129137	.0005 Mica
C7	129136	.00017 Mica
C8	10022	.05 x 200 v.
C9	12939	.00005 Mica
C10	1292	.0005 Mica
C11	10022	.05 x 200 v.
C12	1296	.002 Mica
C13	12912	.00025 Mica
C14	10031	.5 x 120 v.
C15	10031	.5 x 120 v.
C16	11626	.25 x 400 v.
C17	1009	.05 x 200 v.
C18	1295	.0001 Mica
C19	10011	.01 x 400 v.
C20	10026	.02 x 400 v.
C21	10037	.003 x 600 v.
C22	1295	.0001 Mica
C23	100100	.008 x 1600 v.
C24	10011	.01 x 400 v.
C25	11626	.25 x 200 v.
C26	11981	16 mfd.
C27	11981B	16 mfd.
C28	10089	.008 x 800 v.
C29	10074	.1 x 400 v.
C30	12997	.00005 Mica—5%

Issue B only

C1	12483	Antenna Shunt Trimmer
R4	13079	400 ohm—⅓ w.

TUBES:

1—Type No. 6K7—R. F. Amplifier.

1—Type No. 6A8—Pentagrid Converter (composite first detector and oscillator).

1—Type No. 6K7—Remote Cut-off Pentode as an I. F. Amplifier (465 K. C.)

1—Type No. 6Q7—Duplex Diode Triode Second Detector, A.V.C. and First Audio.

1—Type No. 6K6G—Output Amplifier.

1—Type No. 6X5G—Rectifier.

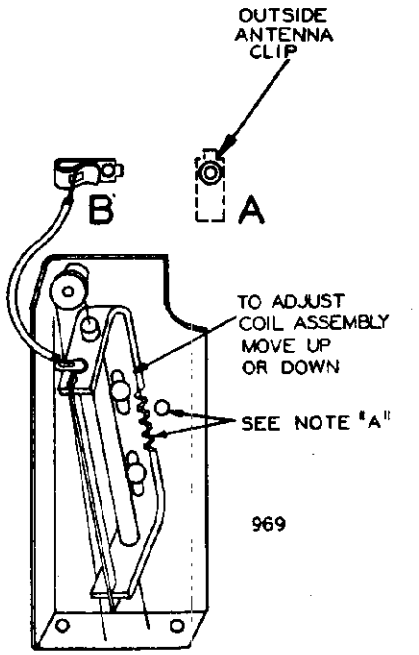
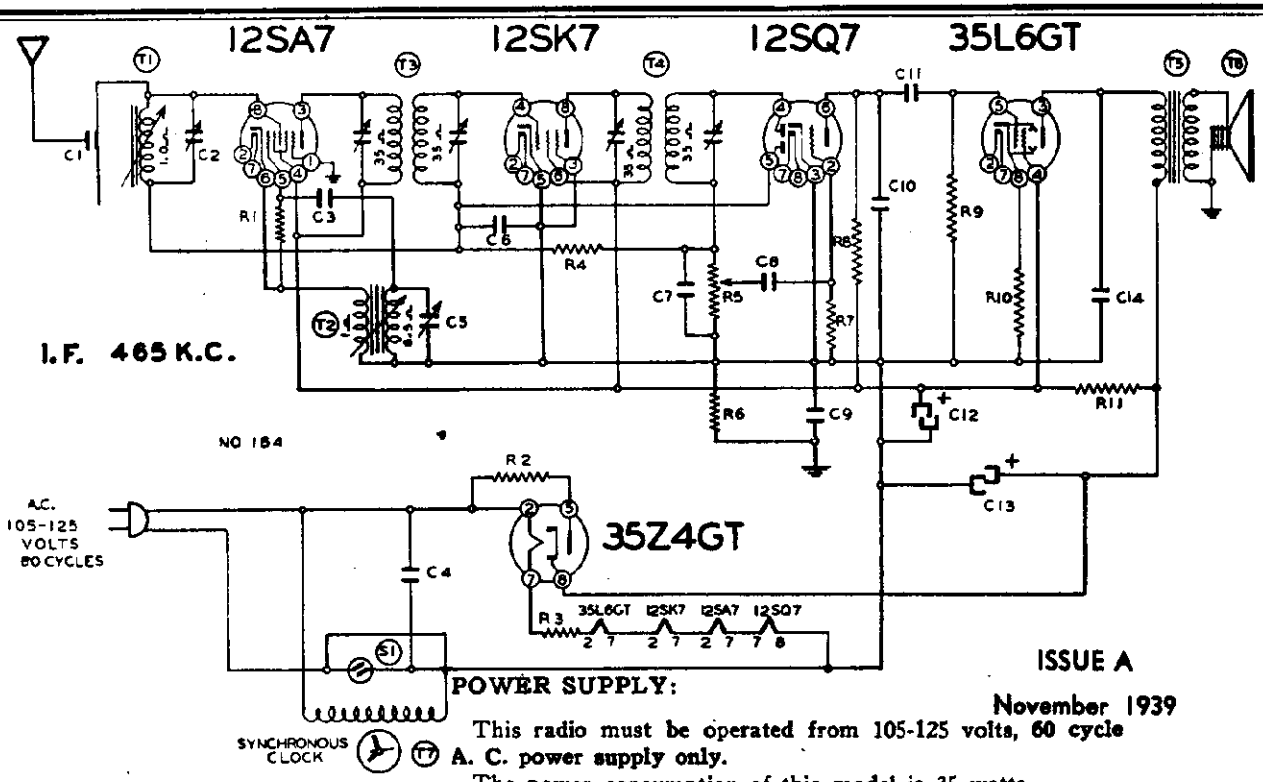


FIG. 4



POWER SUPPLY:

This radio must be operated from 105-125 volts, 60 cycle A. C. power supply only.

The power consumption of this model is 35 watts.

ISSUE A

November 1939

BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS & NEGATIVE "B" SUPPLY.

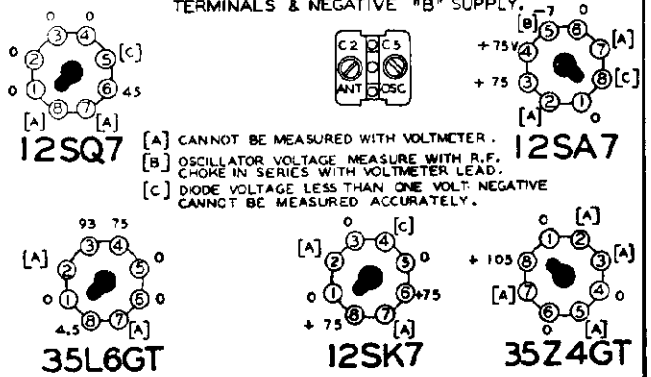


FIG. 3—BOTTOM VIEW

Circuit Diagram Ref. No.	Part No.	Description
		RESISTORS
R1	130176	20M ohm—½ w.
R2	130215	25 ohm—½ w.
R3	130288	50 ohm—1½ w.
R4	1304	3 Megohm—½ w.
R5	101209	Volume Control—½ Meg.
R6	130100	150M ohm—½ w.
R7	130257	5 Megohm—½ w.
R8	130100	150M ohm—½ w.
R9	13011	250M ohm—½ w.
R10	130166	150 ohm—½ w.
R11	130199	1500 ohm—1 w.
		CONDENSERS
C1	131262	.0002 Washer Condenser (Ant. Clip on Ant. Plate)
C2	124100	Ant. Section Dual Trimmer
C3	12939	.00005 Mica
C4	1001	.1 x 400 v.
C5	124100	Osc. Section Dual Trimmer
C6	10013	.05 x 400 v.
C7	1295	.0001 Mica
C8	10025	.002 x 600 v.
C9	10091	.15 x 400 v.
C10	1292	.0005 Mica
C11	10071	.004 x 600 v.
C12	11992	20 Mfd. 'Lytic
C13	11992	40 Mfd. 'Lytic.
C14	10011	.01 x 400 v.
		C2 and C5 in one unit.
		C12 and C13 in one unit.
		PARTS
T1	111136	Antenna Coil Complete
T2	110126	Oscillator Coil
T3	108157D	Input I. F. Coil—465 Kc.
T4	108157E	Output I. F. Coil—465 Kc.
T5	105106	Output Transformer
T6	114187	4" Speaker—P.M.
T7	104188	Electric Clock Complete
S1		On-Off Switch on Volume Control

ALIGNMENT PROCEDURE

IMPORTANT: See Aligning Instructions on Page 4.

- Volume control—Maximum all adjustments.
- Connect —B of radio chassis to ground post of signal generator through .1 Mfd. Condenser.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- 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 mfd. and 200 mmf.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Iron Cores (Dial Setting)	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Connect to Terminal "B" (See Fig. 4)	Iron Cores All the way out	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Connect to Terminal "B" (See Fig. 4)	Iron Cores All the way out	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1720 Kc.	.1 MFD.	Connect to Terminal "B" (See Fig. 4)	Iron Cores All the way out	Trimmer (C5) (See bottom of Radio, Fig. 3)	Oscillator	Adjust to maximum output
	1720 Kc.	200 MMF.	Connect to Terminal "A" (See Fig. 4)	Iron Cores All the way out	Trimmer (C2) (See bottom of Radio, Fig. 3)	Antenna	Adjust to maximum output
	1400 Kc.	200 MMF.	Connect to Terminal "A" (See Fig. 4)	Turn Dial to 1400 Kc.	Adjust position of antenna coil up or down (see Fig. 4)	Antenna Coil Adjustment	Adjust to maximum output (See Note "A")
	1720 Kc.	200 MMF.	Connect to Terminal "A" (See Fig. 4)	Turn Dial to 1720 Kc.	Adjust trimmer (C2) (See Fig. 3)	Antenna	Check for tracking (See Note "B")

NOTE "A"—The antenna coil assembly is made so that it is movable up or down. When making the adjustment as given in the alignment procedure move the coil assembly very slowly. It can be moved by hand or by pivoting one edge of the blade of a screwdriver in the hole and engaging the blade in the gear teeth of the coil form.

NOTE "B"—After the antenna coil has been tracked at 1400 Kc. it is necessary to check the antenna trimmer (C2) adjustment again at 1720 Kc. If no appreciable change in trimmer adjustment is made the coil is in track; if the trimmer requires considerable change, it will be necessary to again adjust the position of the antenna coil at 1400 Kc. These two adjustments should be tried several times until no change of trimmer adjustment is required at 1720 Kc.

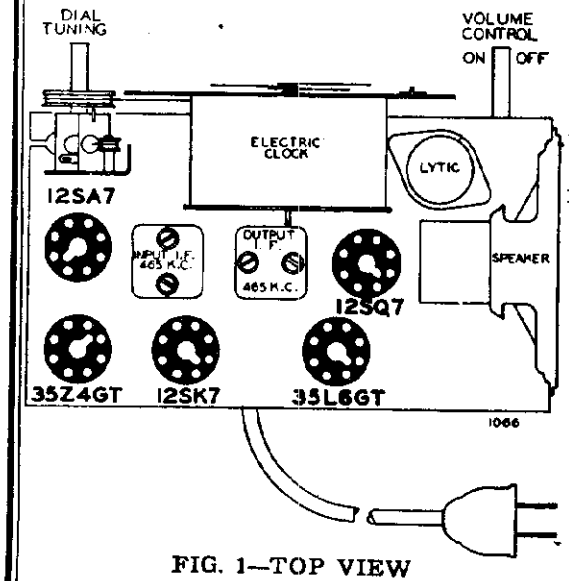


FIG. 1—TOP VIEW

FREQUENCY RANGE
540 to 1720 K.C.

Power Consumption ..... 35 Watts
Power Output ..... 800 Milliwatts Undistorted, 1.2 Watts Maximum
Intermediate Frequency ..... 465 K.C.

TUBES:

The tube complement of this chassis consists of the following octal base glass and metal tubes.

The type and function of each tube is as follows:

1—Type 12SA7 Mixer, First Detector-oscillator.

1—Type 12SK7 I. F. Amplifier.

1—Type 12SQ7 Second Detector, A.V.C. and First Audio.

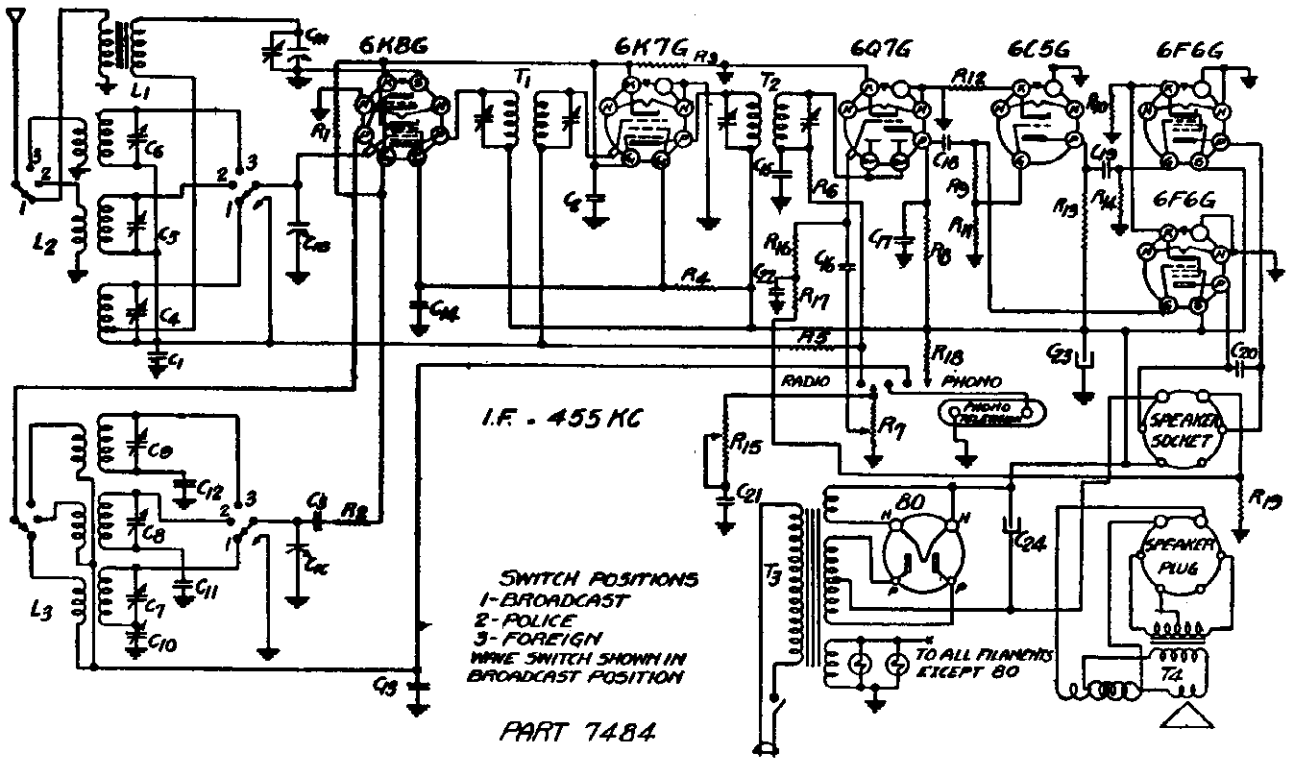
1—Type 35L6GT Beam Output Amplifier.

1—Type 35Z4GT Rectifier.

Voltages from points of Ckt.to -B are measured with tubes in sockets and Spk.conn.with volt meter having res.of 1000 ohms per volt. Voltages on chart measured with 117V.A.C. line. To check open by-pass cond. shunt each cond.with another cond.of same cap,and good volt. rating,'til defective unit is found.Excessive hum, stutterin low vol.and reduction in D.C. volt.is caused by shorted electl.cond;open by-pass cond. cause osc.and distorted tone.

MODEL D1002

WESTERN AUTO SUPPLY CO.



Part No.	Circuit Diagram Location	Description	List Price Each
		CONDENSERS	
7483	C1a,b,c	Variable Condenser	$2.00
572	C1,22	.1 mf. 200 Volt	.20
2792	C2	.2 mf. 200 Volt	.20
2780	C3	50 mmf Mica	.20
2597	C4,5,8	1-10 mmf Trimmer	.20
1611	C6,9	3-35 mmf. Trimmer	.20
3157	C7	2-25 mmf Trimmer	.25
2560	C10	200-500 mmf B.C. Osc Padder	.35
2741	C11	1330 mmf 5% Mica	.30
2793	C12	.006 600 Volt 10%	.20
575	C13	.1 mf. 400 Volt	.20
3352	C14	.2 mf. 400 Volt	.25
1286	C15,17	250 mmf Mica	.25
565	C16	.01 mf. 200 Volt	.20
576	C18,19	.02 mf. 400 Volt	.20
824	C20	.002 mf. 600 Volt	.20
591	C21	.005 mf. 600 Volt	.20
7113	C23,24	16 mf. 450 Volt Electrolytic	.75
		RESISTORS	
6720	R1,6,13	50 M 1/3 Watt	.15
6718	R2,3	100 Ohm 1/3 Watt	.15
6299	R4	10 M 1 Watt	.25
6723	R5,16,17	1 Meg 1/3 Watt	.15
2726	R7	500 M Volume Control and Switch	1.00
7262	R8	200 M 1/3 Watt	.15
7123	R9	400 M 1/3 Watt	.15
3353	R10	250 Ohm 2 Watt	.25
7122	R11	100 M 1/3 Watt	.15
7125	R12	5 M 1/3 Watt	.15
6722	R14	500 M 1/3 Watt	.15
2737	R15	2 Meg Tone Control	.75
7121	R18	20 M 1/3 Watt	.15
2882	R19	15 Ohm 1/3 Watt	.15

TUBES:
1-6K8G Converter (Osc. and first Detector)
1-6K7G I.F. Amplifier
1-6Q7G Det.-first Audio Amplifier.
1-6C6G Phase Inverter.
2-6F6G Push Pull Power Output
1-80 Rectifier.

POWER TRANSFORMERS
Power Transformers are available and these receivers are sometimes equipped with them for operation on 25,40 or 60 cycles.

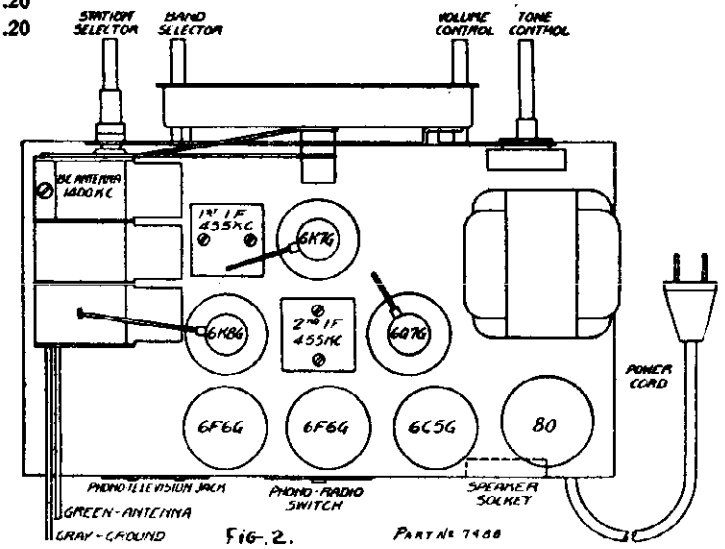


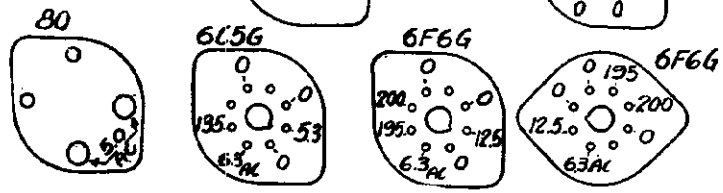
Fig. 2. Part No. 7488

BAND	SIGNAL GENERATOR FREQUENCY SETTING	DUMMY ANTENNA	BAND SWITCH POSITION	VARIABLE CONDENSER SETTING	TRIMMER LOCATION	TRIMMER FUNCTION	CONNECTION	ADJUSTMENT
I. F.	455 kc.	.1 mfd.	Broadcast "B" (Extreme Left)	Minimum Capacity	Trimmers on top see Fig. 3.	2nd I. F.	grid of 6K7G	Adjust to maximum output
I. F.	455 kc.	.1 mfd.	Broadcast "B" (Extreme Left)	Minimum Capacity	Trimmers on top see Fig. 3.	1st I. F.	grid of 6K8G	Adjust to maximum output
BROAD-CAST BAND	1720 kc.	200 mmf.	Broadcast "B" (Extreme Left)	Minimum Capacity	See Fig. 4.	Broadcast oscillator	Antenna lead	Adjust to maximum output
	1400 kc. approx.	200 mmf.	Broadcast "B" (Extreme Left)	Tune in signal	Trimmer on Ant. coil. (Fig.4.)	Broadcast pre-selector	Antenna lead	Adjust to maximum output
	1400 kc. approx.	200 mmf.	Broadcast "B" (Extreme Left)	Tune in signal	Trimmer on Var. Condenser. (Fig. 4.)	Broadcast Antenna	Antenna lead	Adjust to maximum output
	600 kc.	200 mmf.	Broadcast "B" (Extreme Left)	Tune in signal	See Figs. 3 & 4.	Broadcast osc. pad.	Antenna lead	Rock thru signal adjust for Max. output
REPEAT ABOVE PROCEDURE AS FINAL CHECK.								
POLICE BAND	5825 kc.	400 ohm.	"P" (Center)	Minimum Capacity	Trimmer on Osc. coil. (Fig. 4.)	Short Wave Oscillator	Antenna lead	Adjust to maximum output
	5000 kc.	400 ohm.	"P" (Center)	Tune in signal	Trimmer on Ant. coil. (Fig. 4.)	Short Wave Antenna	Antenna lead	Rock back and forth thru signal & adjust for Max output.
REPEAT ABOVE PROCEDURE AS FINAL CHECK.								
FOREIGN BAND	18125 kc.	400 ohm.	"F" (Extreme Right)	Minimum Capacity	Trimmer on Osc. coil. (Fig. 4.)	Short Wave Oscillator	Antenna lead	Adjust to maximum output
	1700 kc.	400 ohm.	"F" (Extreme Right)	Tune in signal	Trimmer on Ant. coil. (Fig. 4.)	Short Wave Antenna	Antenna lead	Rock back and forth thru signal & adjust for Max. output.
REPEAT ABOVE PROCEDURE AS FINAL CHECK.								

BOTTOM VIEW OF CHASSIS

VOLTAGES MARKED AT SOCKET TERMINALS ARE MEASURED WITH 1000 OHM PER VOLT METER, ON 117 VOLT LINE WITH NO SIGNAL (ANTENNA LEAD SHORTED TO CHASSIS)

NOTE - X - CANNOT BE MEASURED WITH VOLTMETER. POINTS MARKED "0" ARE CONNECTED TO CHASSIS



REAR OF CHASSIS

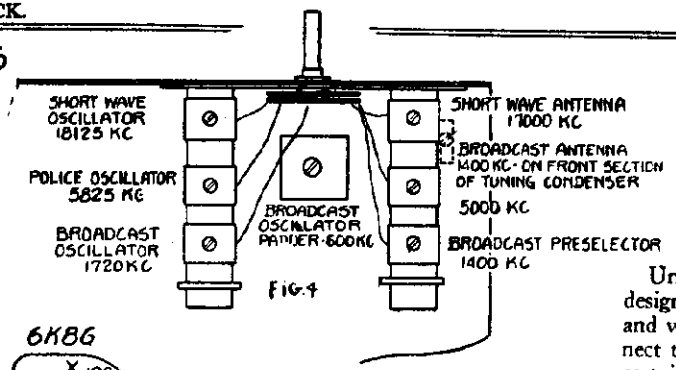


FIG. 4

TRIMMER ADJUSTMENTS

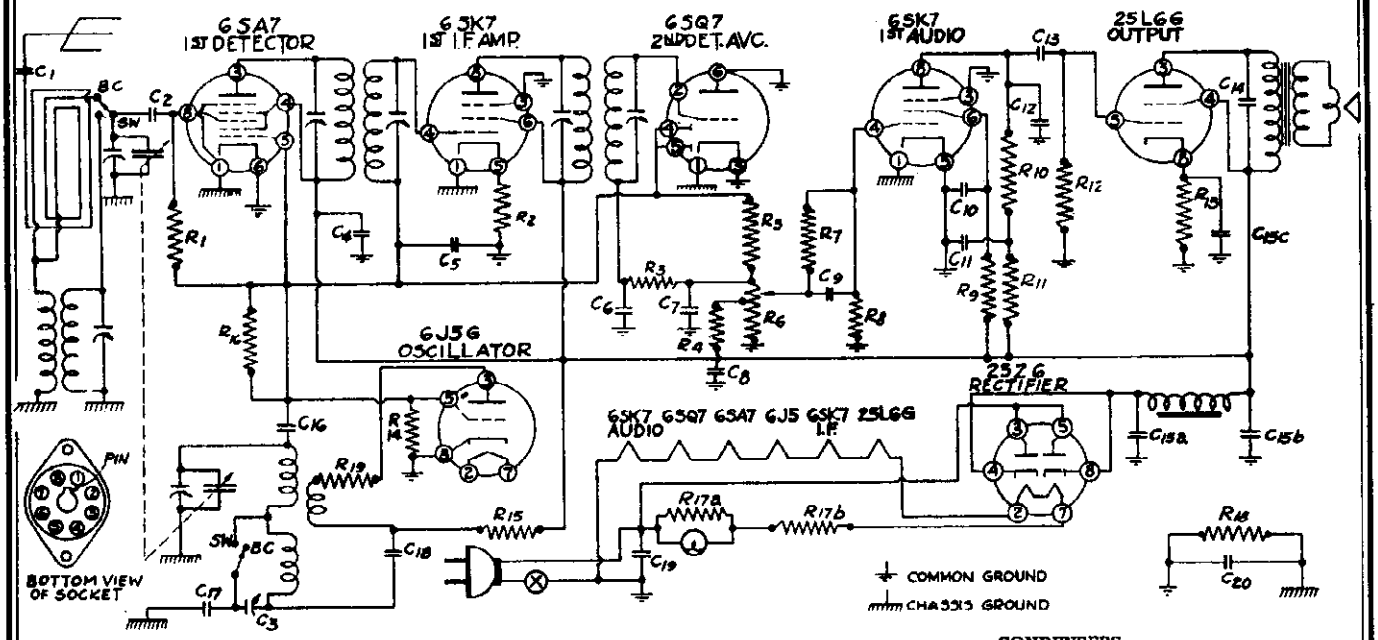
POWER SUPPLY:

Unless specifically stated otherwise these receivers are designed to operate on 117 volts 60 cycle alternating current and will operate properly on 105 to 125 volts. Do not connect the power cord to any receptacle until it has been made certain that the voltage and frequency of the power available is the same as that called for on the license plate on the rear of the chassis. A telephone call to the local power company will eliminate all doubt as to the nature of the power supply.

BAND	DIAL SCALE	FREQUENCY RANGE
Broadcast	Upper	540 to 1720 KC.
Police	Center	1670 to 5825 KC.
Foreign	Lower	5560 to 18125 KC.

MODELS D1013, D1014
Issue A

WESTERN AUTO SUPPLY CO.



RESISTORS

No.	Ohms	Watts	No.	Ohms	Watts
R1	500,000	½	R11	50,000	¼
R2	100	¼	R12	500,000	¼
R3	50,000	¼	R13	200—10%	¼
R4	8,000	¼	R14	20,000	¼
R5	2,000,000	¼	R15	5,000	¼
R6	500,000	V.C.	R16	10,000,000	¼
R7	1,000,000	¼	R17a	30—10%	3
R8	1,000,000	¼	R17b	106—10%	9
R9	1,000,000	¼	R18	150,000	¼
R10	200,000	¼	R19	200	¼

CONDENSERS

No.	Capacity (Mfd.)	Volts	No.	Capacity (Mfd.)	Volts
C1	.001	600	C12	.0005	Mica
C2	.0001	Mica	C13	.01	400
C3	.00035 to .0006	Pad	C14	.02	400
C4	.1	200	C15a	30.	150
C5	.05	200	C15b	30.	150
C6	.0001	Mica	C15c	20.	25
C7	.00025	Mica	C16	.00005	Mica
C8	.05	200	C17	.003—5%	Mica
C9	.01	400	C18	.005	400
C10	.1	200	C19	.05	400
C11	.1	200	C20	.2	200

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- 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 mfd., 200 mmf., 400 ohms.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (In Order Shown)	Trimmer Function	Adjustment
I. F.	455 KC.	.1 Mfd.	Grid of 6SK7 I.F. tube	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	455 KC.	.1 Mfd.	Grid of 6SA7 tube	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
BROADCAST	1,630 KC.	200 Mmf.	Antenna lead	Rotor full open (Plates out of mesh)	Trimmer—Top of left section of gang (See Fig. 1)	Oscillator	Adjust to maximum output
	1,400 KC.	200 Mmf.	Antenna lead	Set dial at 1400 KC.	Trimmer—Top of right section of gang (See Fig. 1)	Broadcast Antenna	Adjust to maximum output
	600 KC.	200 Mmf.	Antenna lead	Set dial at 600 KC.	Trimmer—Right top chassis nearest gang (See Fig. 1)	Oscillator Series Pad.	Adjust to maximum rock dial See Note 'A'
SHORT WAVE	16,000 KC.	400 ohms	Antenna lead	Tune signal	Trimmer—Top of chassis nearest right side (See Fig. 1)	Short Wave Antenna	Adjust to maximum output

Note "A"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of intensity is obtained.
Attenuate the signal from the signal generator to prevent the leveling-off action of the A.V.C.
Do not bend variable condenser to correct tracking.

Frequency Range — 535 to 1630 and 5,450 to 17,100 K.C.
Power output 1 watt undistorted — 1.7 watts maximum.
Intermediate Frequency 455 KC.
Power Consumption—55 watts.

WESTERN AUTO SUPPLY CO.

ISSUE A
APRIL 1940

POWER SUPPLY

This receiver is designed to operate from any AC (Alternating Current) power supply main of 105 to 125 volts, 60 cycles or DC (Direct Current) power supply main of 105-125 volts. If the receiver fails to operate on DC (Direct Current), reverse the power line plug.

On AC only the line plug should be tried both ways and left in the position that gives minimum hum.

SERVICE INFORMATION

Speaker (Part No. P4107) 5 inch Dynamic

Field resistance	300 ohms
D. C. voice coil resistance	4.6 ohms
Voice coil impedance at 400 cycles	5 ohms

Short Wave Antenna Coil (Part No. P3786)

Starting with the mounting end (nearest chassis) the connections are: No. 1, ground; other end in a clockwise direction starting at the mounting lug side, No. 2, grid; No. 3, ant.

Primary—No. 3 and No. 1—Resistance .26 ohm
Secondary—No. 2 and No. 1—Resistance .07 ohm

Oscillator Coil (Part No. P3789)

Starting at the mounting bracket in a clockwise direction the connections are: No. 1, sec. tap; No. 2, open; No. 3, B+; No. 4, pad; on other end No. 5, grid; No. 6, plate.

Primary—No. 3 and No. 6—Resistance	.92 ohm
S.W. Secondary—No. 1 and No. 5—Resistance	.07 ohm
B.C. Secondary—No. 1 and No. 4—Resistance	5.1 ohms

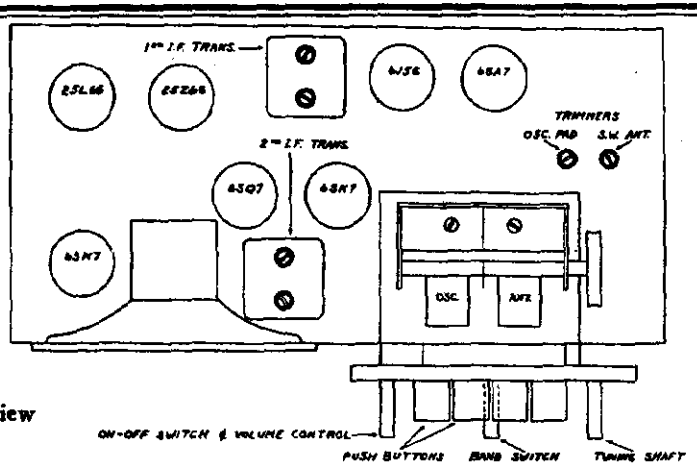
First I.F. Transformer (Part No. P4108)

Primary—Blue, plate; red, B+—Resistance	18.2 ohms
Secondary—White, grid; black, AVC—Resistance	15.1 ohms

Second I.F. Transformer (Part No. P4109)

Primary—Blue, plate; red B+—Resistance	20.8 ohms
Secondary—White, diode; black, AVC—Resistance	17.4 ohms

Electrolytic Condenser (Part No. P4106)

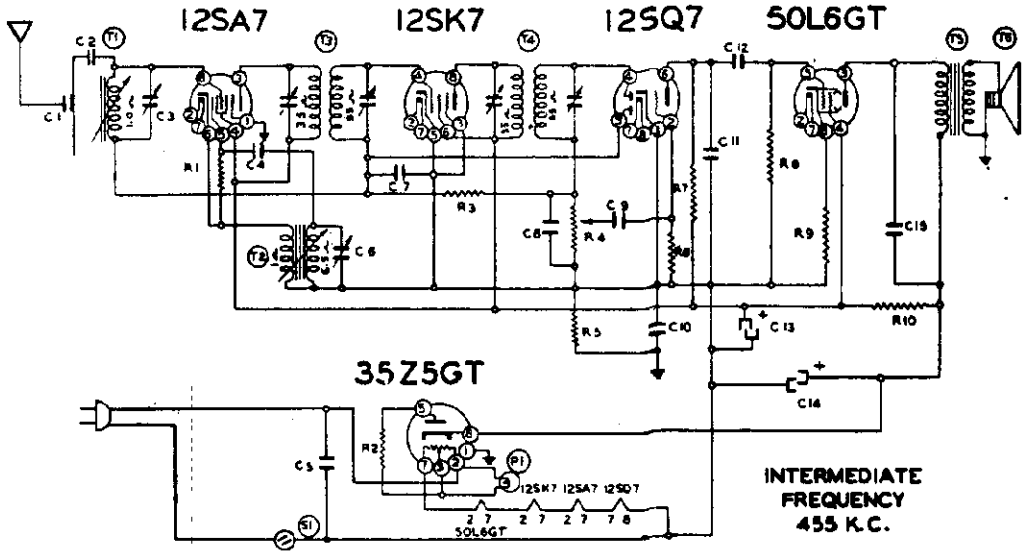


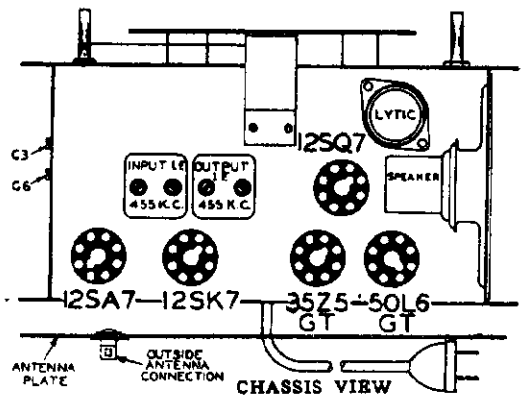
—Top View

VOLTAGE CHART

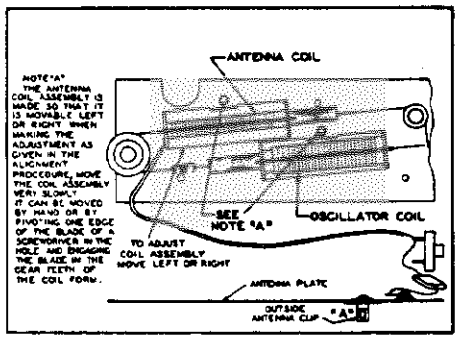
All voltages measured with a 1,000 ohm per volt meter on the 150 volt scale. Line voltage 117½ volts A.C. Volume control maximum and no signal tuned in.

	Volts
6SA7 TUBE	
Plate (3) to common ground	108
Screen (4) to common ground	110
6J5G TUBE	
Plate (3) to common ground	90
6SK7 (IF) TUBE	
Plate (8) to common ground	108
Screen (6) to common ground	110
6SK7 (AF) TUBE	
Plate (8) to common ground	9
Screen (6) to common ground	6½
25L6G TUBE	
Plate (3) to common ground	101
Screen (4) to common ground	110
Cathode (8) to common ground	7
25Z6G TUBE	





CHASSIS VIEW



COIL ASSEMBLY VIEW

INTERMEDIATE FREQUENCY 455 K.C.

RESISTORS

R1	130232	25M ohm—½ w.
R2	130284	25 ohm—½ w.
R3	130170	3 megohm—½ w.
R4	101230	Volume Control—½ megohm
R5	13080	150M ohm—½ w.
R6	130257	5 megohm—½ w.
R7	13080	150M ohm—½ w.
R8	1805	300M ohm—½ w.
R9	130166	150 ohm—½ w.
R10	130199	1500 ohm—1 w.

CONDENSERS

C1	131262	.00001 washer cond. (ant. clip on ant. plate)
C2	12912	.00025 mica
C3	124136	Antenna section dual trimmer
C4	12938	.00005 mica
C5	1001	.1 x 400 v.
C6	124136	Osc. Section dual trimmer
C7	1009	.05 x 200 v.
C8	12912	.00025 mica
C9	10025	.002 x 600 v.
C10	10091	.15 x 400 v.
C11	129160	.0004 mica
C12	10078	.01 x 200 v.
C13	11992	20 mfd. lytic
C14	11992	40 mfd. lytic
C15	10011	.01 x 400 v.

C13 and C14 in one unit C3 and C6 in one unit

PARTS

T1, T2	112827	Antenna and Oscillator Coil Assembly (Permeability Tuning)
T3	108157	Input I.F. Coil—455 kc.
T4	108157K	Output I.F. Coil—455 kc.
T5	105117	Output Transformer
T6	114213	4 in. speaker—P. M.
S1		On-off switch on volume control
P1	107349	Pilot light bulb T47

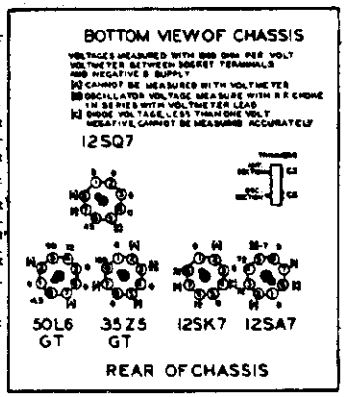
ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect B— of radio chassis to ground post of signal generator through .1 Mfd. condenser.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- 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 Mfd., and 200 Mmf.

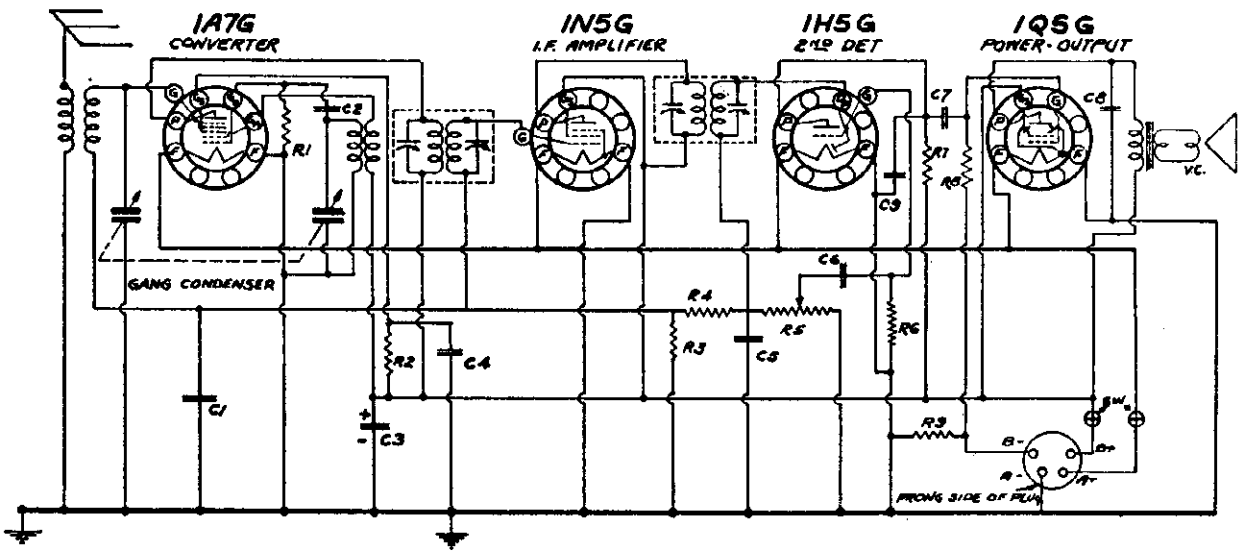
BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Iron Cores (Dial Setting)	Trimmers Adjusted (In Order Shown)	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Connect to Grid of 12SA7	Iron Cores All the way out	Two trimmers on top of output I. F. can	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Connect to Grid of 12SA7	Iron Cores All the way out	Two trimmers on top of input I. F. can	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1720 Kc.	.1 MFD.	Connect to Grid of 12SA7	Iron Cores All the way out	Trimmer (C8) (See chassis view)	Oscillator	Adjust to maximum output
	1720 Kc.	200 MMF.	Connect to Outside Antenna Clip	Iron Cores All the way out	Trimmer (C3) (See chassis view)	Antenna	Adjust to maximum output
	1400 Kc.	200 MMF.	Connect to Outside Antenna Clip	Turn Dial to 1400 Kc.	Adjust position of antenna coil (See coil assembly view)	Antenna Coil Adjustment	Adjust to maximum output (See Note "A")
	1720 Kc.	200 MMF.	Connect to Outside Antenna Clip	Turn Dial to 1720 Kc.	Adjust trimmer (C3) (See chassis view)	Antenna	Check for tracking (See Note "B")



NOTE "A"—The antenna coil assembly is made so that it is movable. When making the adjustment as given in the alignment procedure move the coil assembly very slowly. It can be moved by hand or by pivoting one edge of the blade of a screwdriver in the hole and engaging the blade in the gear teeth of the coil form.

NOTE "B"—After the antenna coil has been tracked at 1400 Kc. it is necessary to check the antenna trimmer (C3) adjustment again at 1720 Kc. If no appreciable change in trimmer adjustment is made the coil is in track, if the trimmer requires considerable change it will be necessary to again adjust the position of the antenna coil at 1400 Kc. These two adjustments should be tried several times until no change of trimmer adjustment is required at 1720 Kc.

WESTERN AUTO SUPPLY CO.



CAPACITORS					
No.	MFDS	VOLTS	No.	MFDS	VOLTS
C1	.05	200	C6	.01	400
C2	.00005	MICA	C7	.01	400
C3	4.0 (ELECT.)	150	C8	.002	400
C4	.05	200	C9	.00025	MICA
C5	.00025	MICA			

RESISTORS					
No.	OHMS	WATTS	No.	OHMS	WATTS
R1	200,000	1/2	R6	2,000,000	1/2
R2	70,000	1/2	R7	300,000	1/2
R3	2,000,000	1/2	R8	1,000,000	1/2
R4	2,000,000	1/2	R9	440	1/2
R5	500,000	V.C.			

I.F. 455 K.C.

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- 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.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (In Order Shown)	Trimmer Function	Adjustment
I. F.	455 K.C.	.1 MFD.	Grid of 1N5G tube	Rotor full open (Plates out of mesh)	Two Trimmers on top (See Fig. 1)	Output I.F.	Adjust to maximum output
	455 K.C.	.1 MFD.	Grid of 1A7G tube	Rotor full open (Plates out of mesh)	Two Trimmers on top (See Fig. 1)	Input I.F.	Adjust to maximum output
BROAD-CAST	1610 KC.	200 mmf.	Antenna Lead	Rotor full open (Plates out of mesh)	Trimmer—Left rear of chassis	Oscillator	Adjust to maximum output
	1400 KC.	200 mmf.	Antenna Lead	Set dial at 1400 KC.	Trimmer—Next to Osc. trimmer	Antenna	Adjust to maximum output

This is all that is necessary for the alignment unless the plates of the gang have been bent out of shape. In case of bent plates, set the signal generator and receiver to 600KC and bend the plates into the position for maximum output.

Attenuate the signal from the signal generator to prevent the leveling off-action of the AVC. After each band is completed, repeat the procedure as a final check.

Frequency Range

535 to 1730 K.C.

Power output .27 watt undistorted—.35 watt maximum.

Intermediate Frequency 455 K.C.

POWER SUPPLY

This receiver is designed to operate on a single unit Wizard D235, Ray-O-Vac No. AB-82, Burgess 17G-D60, Eveready 748 or General 60DL-11L Battery. No other batteries are required as this battery is a combination 90 volt "B" battery and a 1½ volt "A" battery.

(Note: There is a battery compartment in the rear of the cabinet which will house the power supply unit.)

SERVICE INFORMATION

Speaker (Part No. P3465) 5" PM Type

D.C. voice coil resistance.....4.5 ohms
Voice coil impedance at 400 cycles.....5 ohms

Antenna Coil (Part No. G6041)

Looking at the connection end starting at the chassis in a clockwise direction the terminals are: No. 1, AVC; No. 2, grid; No. 3, Ant.; No. 4, ground. No. 4 is grounded to the mounting bracket.

Primary—No. 3 and No. 4—Resistance 24.6 ohms.

Secondary—No. 1 and No. 2—Resistance 2.1 ohms.

A gimmik coil of 5.5 mmfd. connects to terminals No. 2 and No. 3.

Oscillator Coil (Part No. P3575)

Looking at the connection end starting at the chassis in a clockwise direction the terminals are:

No. 1, grid; No. 2, plate; No. 3, B+; No. 4, ground.

Primary—No. 2 and No. 3—Resistance 1.7 ohms.

Secondary—No. 4 and No. 1—Resistance 4.9 ohms.

First I.F. Transformer (Part No. P3048)

Primary—Red white, B+; blue white, plate—Resistance 12.1 ohms.

Secondary—White, grid; black white, AVC—Resistance 24.9 ohms.

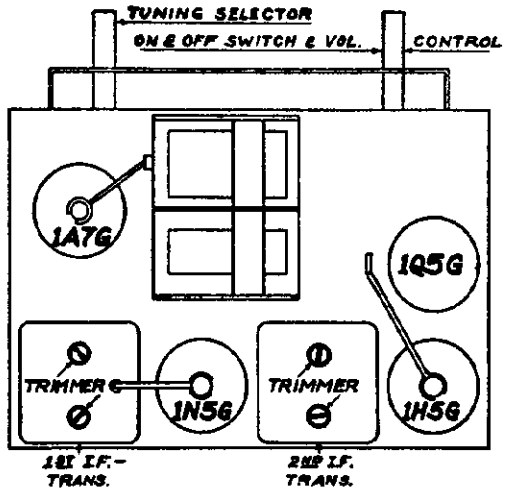
Second I.F. Transformer (Part No. P2606)

Primary—Blue white, plate; red white, B+—Resistance 15.1 ohms.

Secondary—White, grid; black white, AVC—Resistance 11.8 ohms.

—Top View

ISSUE A
OCT. 1939



VOLTAGE CHART

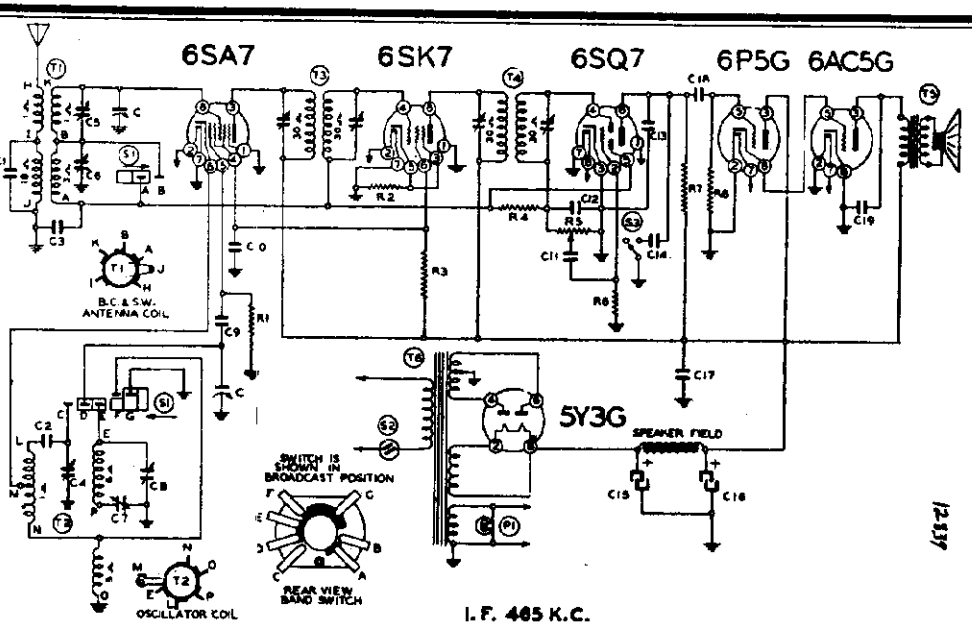
All voltages measured with a 1,000 ohm per volt meter on 150 volt scale. For the following voltages the "B" section of the battery should read 93½ volts under load.

1A7 TUBE	Volts
Plate—P—to ground	88
Screen—G3 & G5—to ground	33½
Grid—G1—to ground	—2½
Grid—G2—to ground	88

1N5G	
Plate—P—to ground	88
Screen—G2—to ground	88

1H5G	
Plate—P—to ground	15½

1Q5G	
Plate—P—to ground	82
Screen—G2—to ground	88
Grid—G—to ground	—1



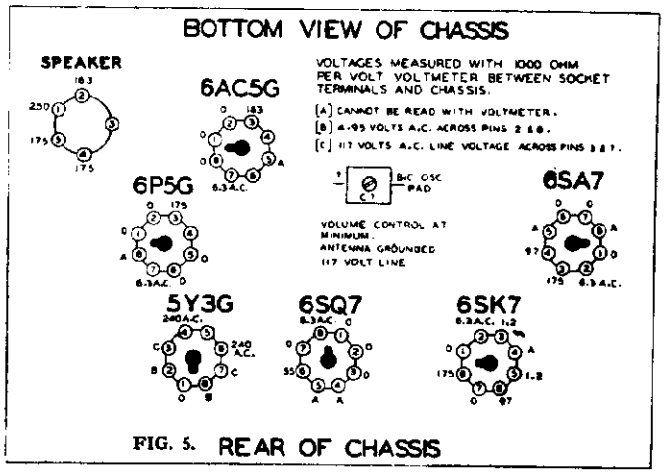


FIG. 5. REAR OF CHASSIS

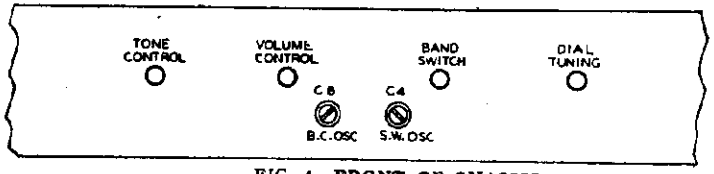


FIG. 4.—FRONT OF CHASSIS

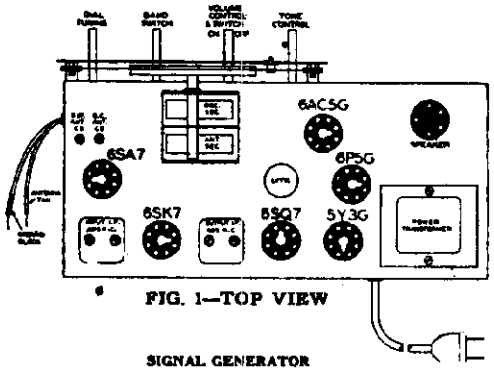


FIG. 1—TOP VIEW

CONDENSERS

C	102124	2 gang variable condenser
C1	1295	.0001 mica
C2	12964	.00275 mica
C3	10022	.05 x 200 v.
C4	124121	Dual Adjustable Condenser (S.W. Osc.)
C5	124122	Dual Adjustable Condenser (S.W. Ant.)
C6	124122	Dual Adjustable Condenser (Bc. Ant.)
C7	129151	.000468 comp. condenser (Bc. Osc. Pad)
C8	124121	Dual Adjustable Condenser (Bc. Osc.)
C9	12939	.00005 mica
C10	10013	.05 x 400 v.
C11	10071	.004 x 600 v.
C12	1295	.0001 mica
C13	1292	.0005 mica
C14	10012	.003 x 600 v.
C15	119102	10 mfd. lytic condenser
C16	119102	30 mfd. lytic condenser
C17	1001	.1 x 400 v.
C18	10026	.02 x 400 v.
C19	10012	.003 x 600 v.

C5 and C6 in one unit
C4 and C8 in one unit
C15 and C16 in one unit

R1	130008	400M ohm—½ w.
R2	130168	100 ohm—½ w.
R3	130006	7500 ohm—1 watt
R4	1304	3 megohm—½ w.
R5	101208	Volume Control and Switch (1 Megohm)
R6	130257	5 megohm—½ w.
R7	13011	250M ohm—½ w.
R8	13019	1 megohm—½ w.

ISSUE A
November 1939

SIGNAL GENERATOR

BAND	Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6SK7	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6SA7	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
SHORT WAVE BAND	18.3 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Rotor full open (Plates out of mesh)	Trimmer (C4) (See Fig. 4)	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Dial Set at 17 MC.	Trimmer (C5) (See Fig. 3)	Short Wave antenna	Adjust to maximum output
BROAD-CAST BAND	1720 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Trimmer (C8) (See Fig. 4)	Broadcast oscillator	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set Dial at 1400 Kc.	Trimmer (C6) (See Fig. 3)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set Dial at 600 Kc.	Trimmer (C7) (See Fig. 5)	Broadcast oscillator series pad (Bottom of chassis)	Adjust to maximum rock dial.

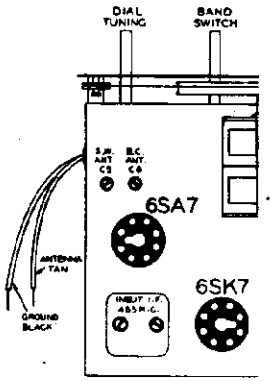
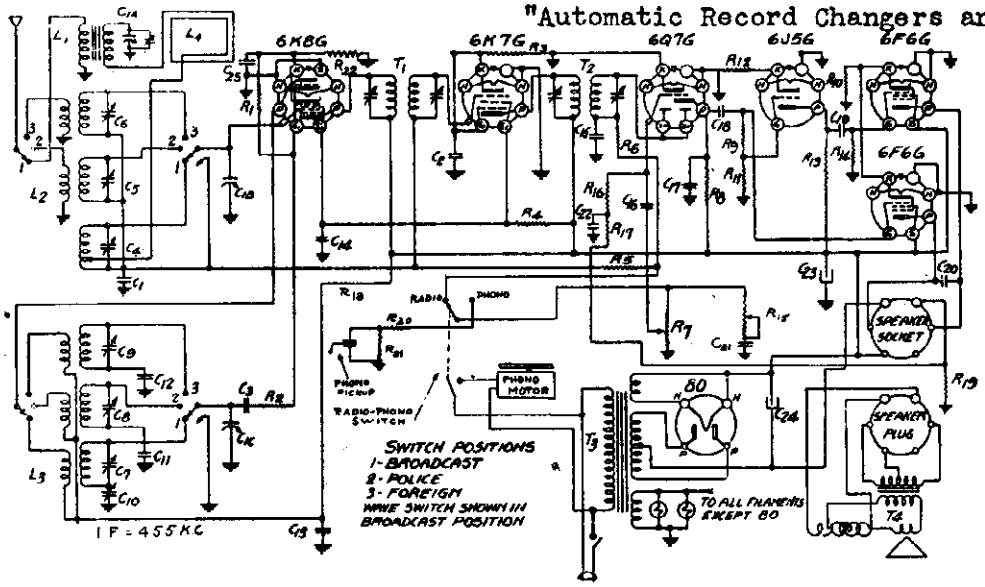


FIG. 3. TOP VIEW

MODEL D1075 DC

WESTERN AUTO SUPPLY CO.

FOR RCA RP139B Record changer, see Rider's "Automatic Record Changers and Recorders".

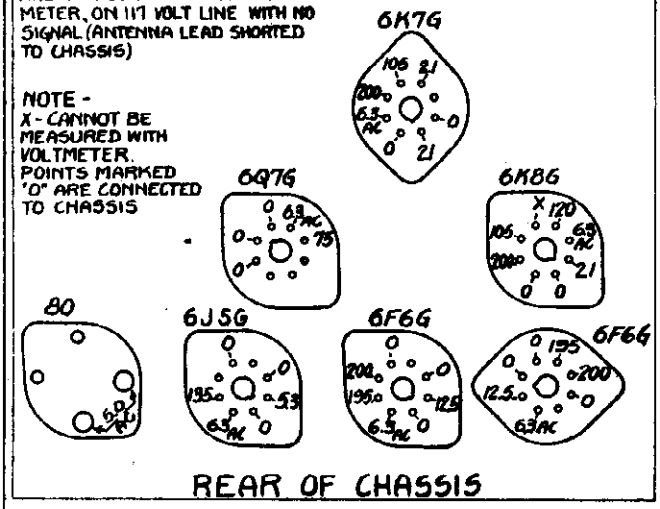


C1a,b,c	Variable Condenser
C1,22	.1 mf. 200 Volt
C2	.2 mf. 200 Volt
C3	50 mmf Mica
C4,5,8	1-10 mmf Trimmer
C6,9	3-35 mmf. Trimmer
C7	2-25 mmf Trimmer
C10	200-500 mmf B.C. Osc Padder
C11	1330 mmf 5% Mica
C12	.006 600 Volt 10%
C13	.1 mf. 400 Volt
C14	.2 mf. 400 Volt
C15,17	250 mmf Mica
C16	.01 mf. 200 Volt
C18,19	.02 mf. 400 Volt
C20	.002 mf. 600 Volt
C21	.005 mf. 600 Volt
C23,24	16 mf. 450 Volt Electrolytic
C25	.05 mf. 200 Volt

BOTTOM VIEW OF CHASSIS

VOLTAGES MARKED AT SOCKET TERMINALS ARE MEASURED WITH 1000 OHM PER VOLT METER, ON 117 VOLT LINE WITH NO SIGNAL (ANTENNA LEAD SHORTED TO CHASSIS)

NOTE - X - CANNOT BE MEASURED WITH VOLTMETER. POINTS MARKED "O" ARE CONNECTED TO CHASSIS



RESISTORS

R1,6,15	50 M 1/3 Watt
R2,3	100 Ohm 1/3 Watt
R4	10 M 1 Watt
R5,16,17	1 Meg 1/3 Watt
R7	500 M Volume Control
R8,20,21	200 M 1/3 Watt
R9	400 M 1/3 Watt
R10	300 Ohm 2 Watt
R11	100 M 1/3 Watt
R12	5 M 1/3 Watt
R14	500 M 1/3 Watt
R15	2 Meg Tone Control
R18	20 M 1/3 Watt
R19	15 Ohm 1/3 Watt

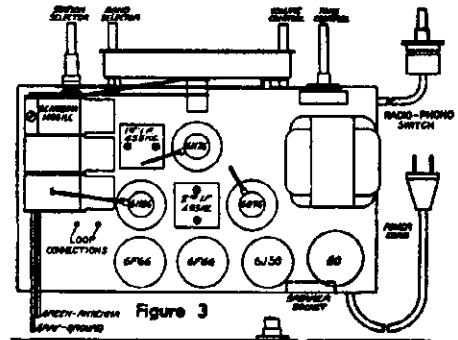


Figure 3

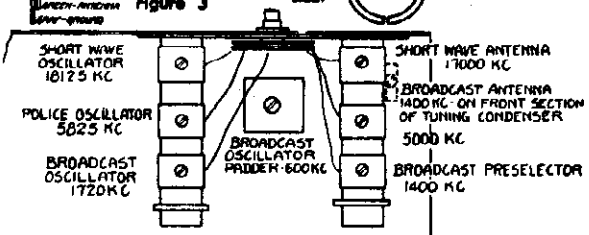
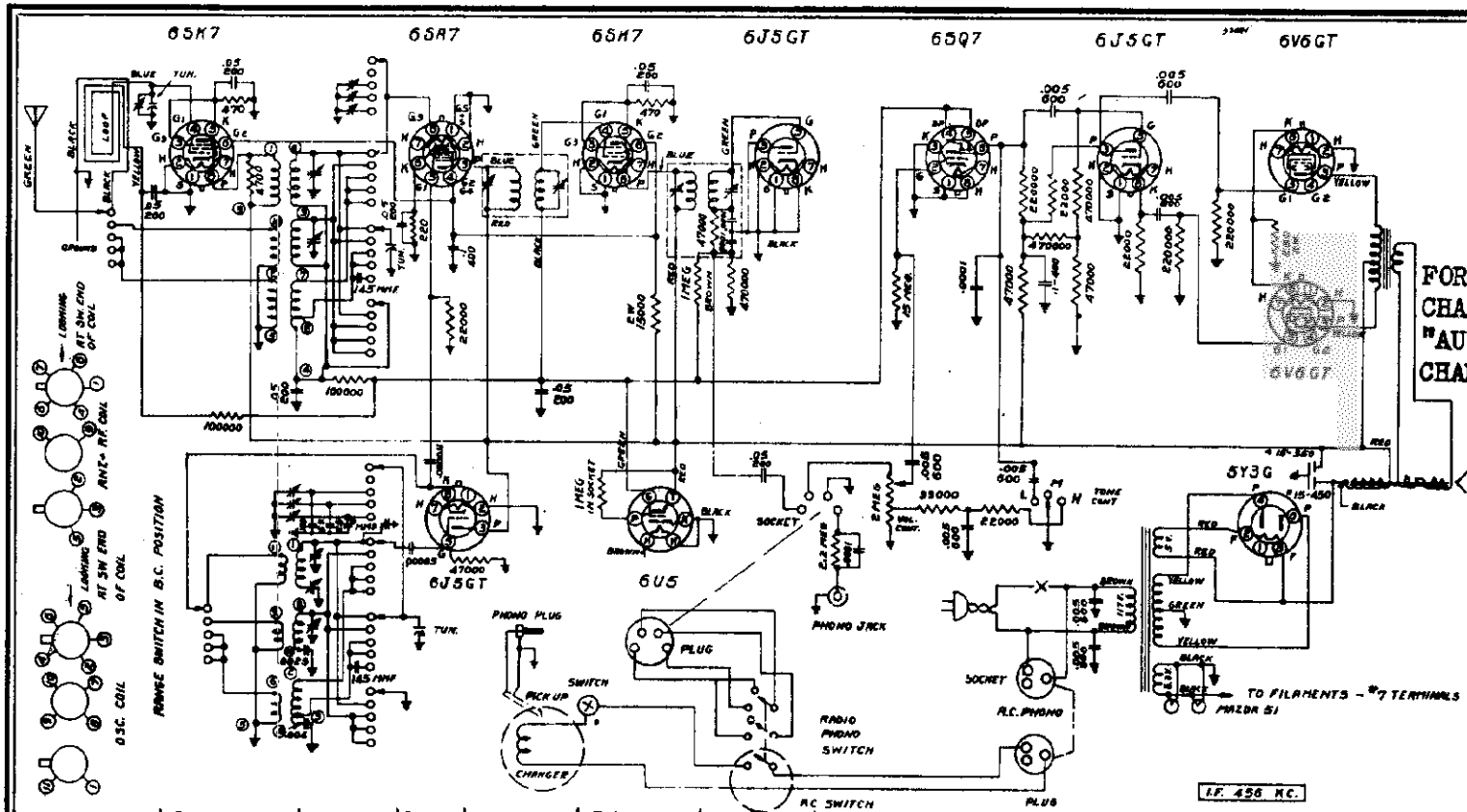


Figure 4

BAND	SIGNAL GENERATOR FREQUENCY SETTING	DUMMY ANTENNA	BAND SWITCH POSITION	VARIABLE CONDENSER SETTING	TRIMMER LOCATION	TRIMMER FUNCTION	CONNECTION	ADJUSTMENT
I. F.	455 kc.	.1 mfd.	Broadcast "B" (Extreme Left)	Minimum Capacity	Trimmers on top see Fig. 3.	2nd I. F.	grid of 6K7G	Adjust to maximum output
I. F.	455 kc.	.1 mfd.	Broadcast "B" (Extreme Left)	Minimum Capacity	Trimmers on top see Fig. 3.	1st I. F.	grid of 6K8G	Adjust to maximum output
BROADCAST BAND	1720 kc.	200 mmf.	Broadcast "B" (Extreme Left)	Minimum Capacity	See Fig. 4.	Broadcast oscillator	Antenna lead	Adjust to maximum output
	1400 kc. approx.	200 mmf.	Broadcast "B" (Extreme Left)	Tune in signal	Trimmer on Ant. coil. (Fig.4.)	Broadcast pre-selector	Antenna lead	Adjust to maximum output
	1400 kc. approx.	200 mmf.	Broadcast "B" (Extreme Left)	Tune in signal	Trimmer on Var. Condenser. (Fig. 4.)	Broadcast Antenna	Antenna lead	Adjust to maximum output
	600 kc.	200 mmf.	Broadcast "B" (Extreme Left)	Tune in signal	See Figs. 3 & 4.	Broadcast osc. pad.	Antenna lead	Rock thru signal adjust for Max. output
REPEAT ABOVE PROCEDURE AS FINAL CHECK.								
POLICE BAND	5825 kc.	400 ohm.	"P" (Center)	Minimum Capacity	Trimmer on Osc. coil. (Fig. 4.)	Short Wave Oscillator	Antenna lead	Adjust to maximum output
	5000 kc.	400 ohm.	"P" (Center)	Tune in signal	Trimmer on Ant. coil. (Fig. 4.)	Short Wave Antenna	Antenna lead	Rock back and forth thru signal & adjust for Max output.
REPEAT ABOVE PROCEDURE AS FINAL CHECK.								
FOREIGN BAND	18125 kc.	400 ohm.	"F" (Extreme Right)	Minimum Capacity	Trimmer on Osc. coil. (Fig. 4.)	Short Wave Oscillator	Antenna lead	Adjust to maximum output
	1700 kc.	400 ohm.	"F" (Extreme Right)	Tune in signal	Trimmer on Ant. coil. (Fig. 4.)	Short Wave Antenna	Antenna lead	Rock back and forth thru signal & adjust for Max. output.



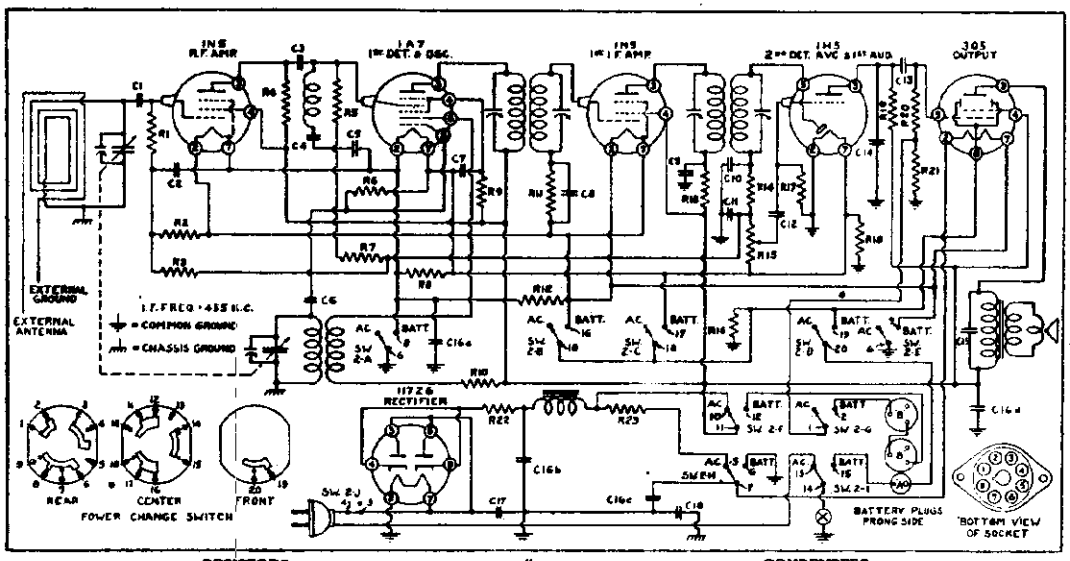
FOR SEEBURG J RECORD CHANGER, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS"

Note "A"- If the pointer is not at 1400 KC with a 1400 KC sig. it may be loosened from the dial cord and moved to correct the calibration. This should be checked across the band to arrive at the optimum condition.

Generator	Connection at Radio	Dummy Antenna	Range Switch	Dial	Trimmers to Tune	Sensitivity	Remarks
I.F. 456 K.C.	Center Stator of Variable	.1 MFD.	A	H.F. End	I.F. Transformers	65-70MV.	Tune to Max.
B.C. 1725 K.C.	Antenna	200 MMF.	A	H.F. Limit of Travel	B.C. Oscillator		Set Band Limit
1400 K.C.	Antenna	200 MMF.	A	1400	B.C. Antenna and Loop	3-5 MV.	See Note A
600 K.C.	Antenna	200 MMF.	A	Rock Rotor	Padder	3-5 MV.	
P.B. 6.0 M.C.	Antenna	400 Ohm	B	6.0 M.C.	P.B. Osc. P.B. Ant.	25 MV.	See Note B
2.2 M. C.	Antenna	400 Ohm	B	2.2 M.C.	Check	40 MV.	See Note B

Note "B"- Care should be taken not to align on the image frequency. This may be checked by rotating the dial of the signal generator. Another signal should be heard at dial frequency plus 912 KC. This signal should be checked carefully on all short wave bands, making sure the lowest frequency signal agrees with the dial setting in frequency and that it is strongest of two.

Generator	Connection at Radio	Dummy Antenna	Range Switch	Dial	Trimmers to Tune	Sensitivity	Remarks
31M. 9.6 M.C.	Antenna	400 Ohm	C	9.6 M.C.	31M. Ant. 31M. Osc.	25MV.	See Note B
25M. 11.8 M.C.	Antenna	400 Ohm	D	11.6 M.C.	25M. Ant. 25M. Osc.	30 MV.	See Note B
19M. 15.2 M.C.	Antenna	400 Ohm	E	15.2 M.C.	19M. Ant. 19M. Osc.	40 MV.	See Note B



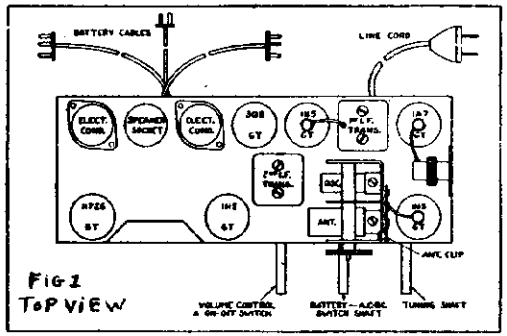


FIG 1
TOP VIEW

VOLTAGE CHART

All voltages measured with a 1,000 ohm per volt meter on the 150 volt scale. Line voltage 117½ volts A.C. Volume control maximum and no signal tuned in.

	Volts
1N5 (RF) TUBE	
Plate (3) to common ground	94
Screen (4) to common ground	102
Filament (2) to (7)	1.4
1A7 TUBE	
Plate (3) to common ground	100
Screen (4) to common ground	62
Anode grid (6) to common ground	100
Filament (2) to (7)	1.4
1N5 (IF) TUBE	
Plate (3) to common ground	95
Screen (4) to common ground	102
Filament (2) to (7)	1.38
1H5 TUBE	
Plate (3) to common ground	38
Filament (2) to (7)	1.4
3Q5 TUBE	
Plate (3) to common ground	98
Screen (4) to common ground	102
Filament (7) to (8)	1.38
Filament (2) to (8)	1.33
117Z6 TUBE	
Plate (3) or (5) to common ground	117.5 (AC)
Cathode (4) or (8) to common ground	128
Filament (2) to (7)	117.5 (AC)

Second I.F. Transformer (Part No. P4420)

Primary—Blue white, plate; red white B+—Resistance 15.1 ohms.

Secondary—White, grid; black white, AVC—Resistance 11.8 ohms.

Power Change Switch

The power change switch connects the tube filaments in series (9 volt) on AC-DC operation and parallel (1½ volt) on battery operation.

RESISTORS

No.	Ohms	Watts	No.	Ohms	Watts
R1	1,000,000	½	R13	5,000	½
R2	5,000,000	½	R14	70,000	½
R3	5,000,000	½	R15	1,000,000	V.C.
R4	10,000	½	R16	1,500	½
R5	250,000	½	R17	5,000,000	½
R6	200,000	½	R18	150	½
R7	1,000,000	½	R19	250,000	½
R8	300	½	R20	1,000,000	½
R9	80,000	½	R21	400—10%	½
R10	500	½	R22	30	½
R11	15,000,000	½	R23	1,950	5
R12	700	½			

CONDENSERS

No.	Capacity (Mfd.)	Volts	No.	Capacity (Mfd.)	Volts
C1	.00025	Mica	C12	.01	400
C2	.01	200	C13	.01	400
C3	.00005	Mica	C14	.00025	Mica
C4	.00006	Mica	C15	.002	400
C5	.01	200	C16a	40.	25
C6	.00005	Mica	C16b	20.	150
C7	.01	400	C16c	40.	25
C8	.01	200	C16d	30.	150
C9	.05	200	C17	.05	400
C10	.00005	Mica	C18	.2	200
C11	.00005	Mica			

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (In Order Shown)	Trimmer Function	Adjustment
I. F.	455 KC.	.1 MFD.	Grid of 1N5GT I.F. tube	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I.F.	Adjust to maximum output
See Note "A"	455 KC.	.1 MFD.	Grid of 1A7GT tube	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I.F.	Adjust to maximum output
BROAD-CAST	1550 KC.	200 mmf.	Antenna Connection	Rotor full open (Plates out of mesh)	Trimmer—Top of gang-rear	Oscillator	Adjust to maximum output
See Note "B"	1400 KC.	200 mmf.	Antenna Connection	Set dial at 1400 KC.	Trimmer—Top of gang-front	Antenna	Adjust to maximum output

This is all that is necessary for the alignment unless the plates of the gang have been bent out of shape. In case of bent plates, set the signal generator and receiver to 600 KC and bend the plates into the position for maximum output.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC. After each band is completed, repeat the procedure as a final check.

NOTE "A"—Use battery operation for all adjustments.

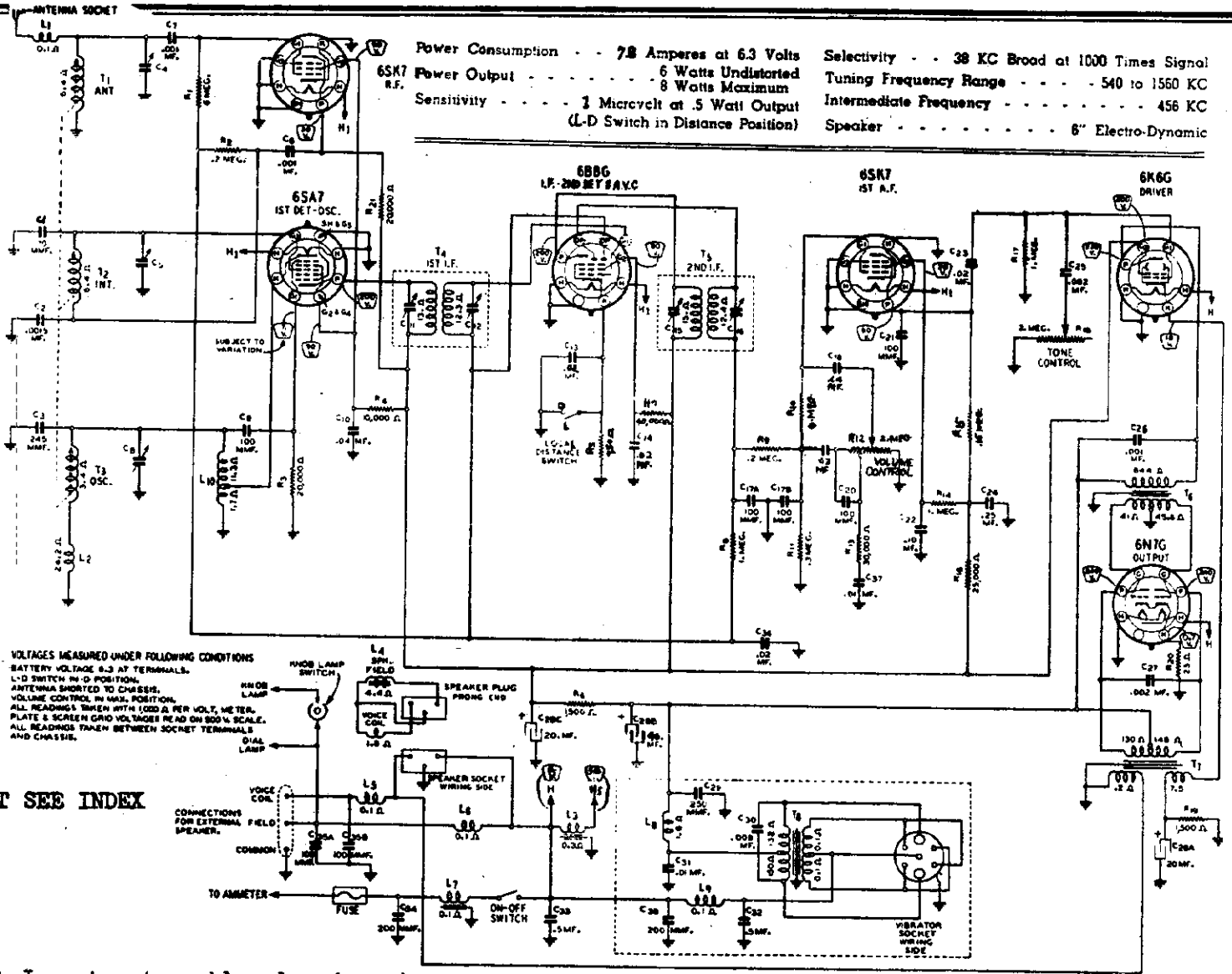
NOTE "B"—Align broadcast band with chassis in cabinet and loop antenna connected.

Frequency Range
540 to 1550 K.C.

Power output (on batteries) .27 watt undistorted—.35 watt maximum.

Power output (AC-DC) .27 watt undistorted—.35 watts maximum.

Intermediate Frequency 455 K.C. Power consumption 25 watts.



Power Consumption	7.8 Amperes at 6.3 Volts	Selectivity	38 KC Broad at 1000 Times Signal
Power Output	6 Watts Undistorted, 8 Watts Maximum	Tuning Frequency Range	540 to 1560 KC
Sensitivity	1 Microvolt at .5 Watt Output (L-D Switch in Distance Position)	Intermediate Frequency	456 KC
		Speaker	6" Electro-Dynamic

FOR ALIGNMENT SEE INDEX

Note A-Insert ant. cable plug in ant. socket on chassis. The total capcity of ant. cable and dummy ant. should be 60mmf. If cable, for example, has a capacity of 30mmf; use a 30mmf. cond. for dummy ant. connect other end of ant. cable thru dummy ant. capacity to output of signal generator.
CALIBRATION:-To calibrate radio, tune in a station of known frequency. At back of cont. unit is the calibration screw. Remove dial lamp assembly. Hold tuning knob, insert fine bladed screwdriver and turn until pointer on dial scale is at frequency of station being received.

MODELS D1090,D4035
Issues A,C

WESTERN AUTO SUPPLY CO.

SPECIFICATIONS

Power Consumption	7.8 Amperes at 6.3 Volts	Selectivity	38 KC Broad at 1000 Times Signal
Power Output	6 Watts Undistorted 8 Watts Maximum	Tuning Frequency Range	540 to 1560 KC
Sensitivity	1 Microvolt at .5 Watt Output (L-D Switch in Distance Position)	Intermediate Frequency	456 KC
		Speaker	6" Electro-Dynamic

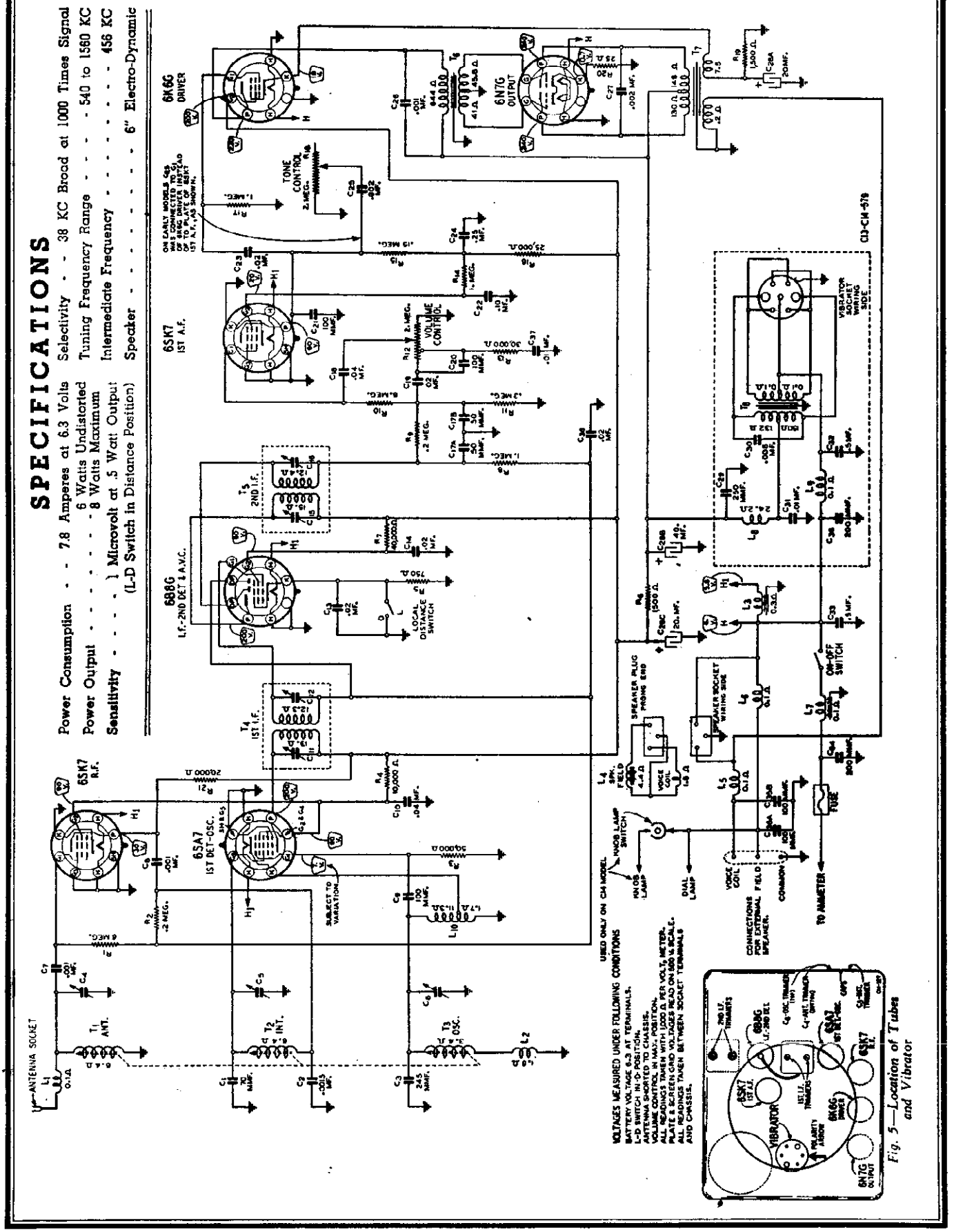
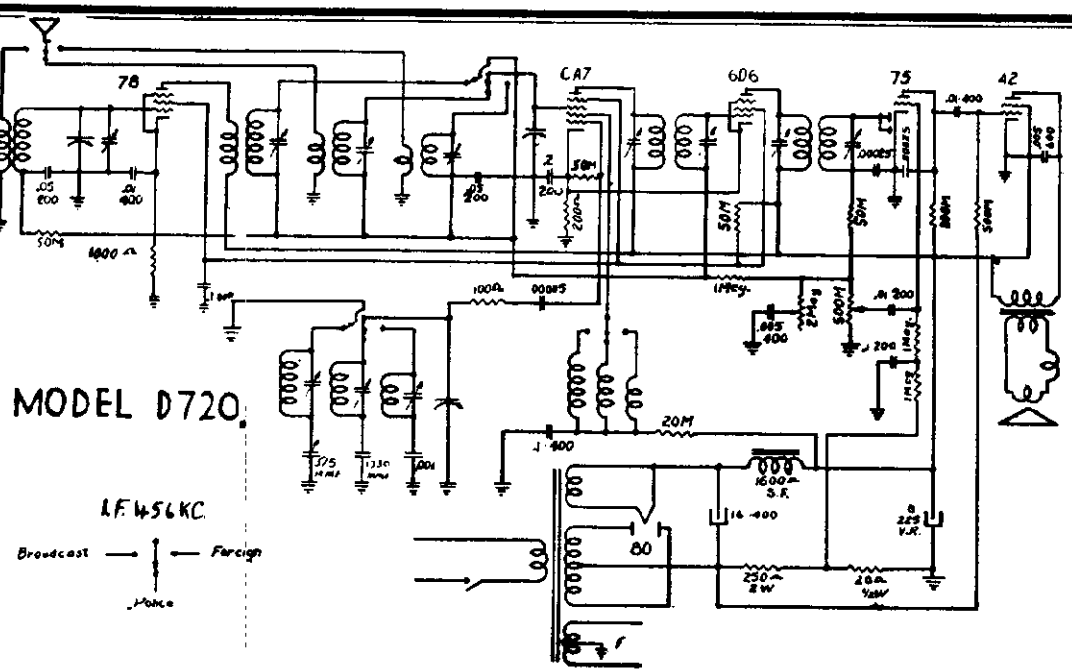
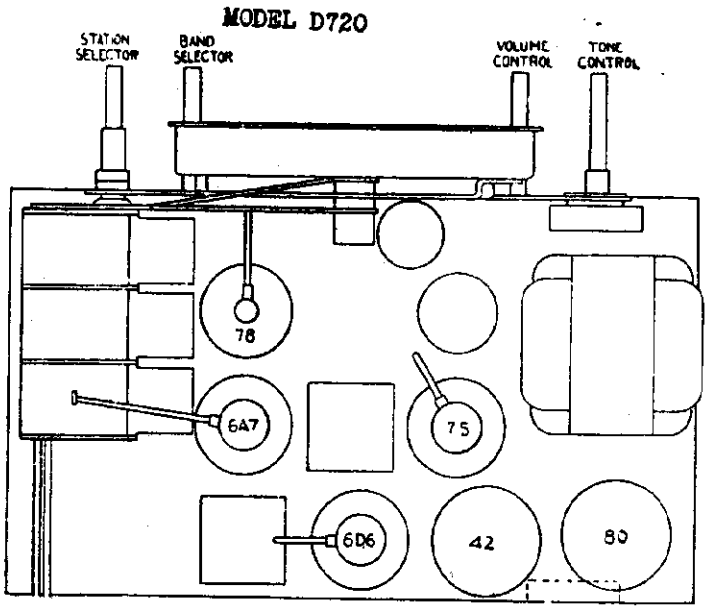


Fig. 5—Location of Tubes and Vibrator

WESTERN AUTO SUPPLY CO.

MODELS D1090,D4035
Issues A,C
MODEL D720
MODELS D1191,D4140
Issues A,B



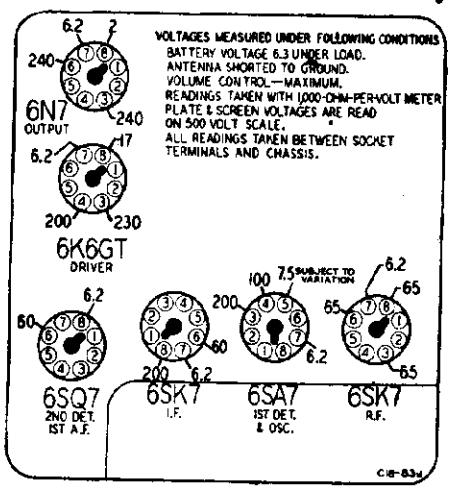


NOTE A—Insert the antenna cable plug in the antenna socket on the chassis. The total capacity of the antenna cable and dummy antenna should be 60 mmf. If the cable, for example, has a capacity of 30 mmf., use a 30 mmf. condenser for a dummy antenna. Connect the other end of the antenna cable through the dummy antenna capacity to the output of the signal generator.

CALIBRATION—To calibrate the radio, tune in a station of known frequency. At the back of the control unit is the calibration screw. Remove the dial lamp assembly. Hold the tuning knob. Insert a fine bladed screwdriver and turn this screw until the pointer on the dial scale is at the frequency of the station being received.

ISSUE A DECEMBER 1940 **ISSUE B MARCH 1941**

MODELS 1191,D4140,Issue B only



Output Indicating Meter—Non-Metallic Screwdriver.
Dummy Antenna—.05 mf., See Note A.

ALIGNMENT FOR MODELS D1090,D4035(A,C)D1191,D4140(A,B),D4240

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	IRON CORE SETTING	ADJUST TRIMMERS TO MAXIMUM
I.F.			*MODEL D-1191*	
	Control Grid (prong No. 8)		Extreme Position	1st I.F. (C11) & (C12)
456 KC	6SA7 1st Det. Tube	.05 mf.	out of Coil	2nd I.F. (C15) & (C16)
OSCILLATOR *1600 KC FOR MODEL D-1191*				
	Antenna Cable		Extreme Position	
1560 KC	See Note A	See Note A	out of Coil	Oscillator (C6)
1000 KC ADJUSTMENT *1400 KC For Model D-4240 & D-1191*				
			Tune to Max. Output	Int. (C5)
1000 KC	Antenna Cable	See Note A	with Tuning Knob	Ant. (C4)

Reassemble Radio—Install in Car—Connect Car Antenna to Radio.

Car Antenna Readjustment—Tune in weak signal near 1000 KC—Readjust Antenna Trimmer C4 for maximum output.
1400 KC for Model D-4240 & D-1191

MODELS D1091,D4040
Issue A

WESTERN AUTO SUPPLY CO.

WG&C SERIES 6C14

SPECIFICATIONS

Power Consumption - - - 7.8 Amperes at 6.3 Volts	Selectivity - - - 38 KC Broad at 1000 Times Signal
Power Output - - - - - - - - 6 Watts Undistorted	Tuning Frequency Range - - - - - 540 to 1560 KC
- - - - - - - - 8 Watts Maximum	Intermediate Frequency - - - - - - - - - - 455 KC
Sensitivity - - - - 1 Microvolt at .5 Watt Output	Speaker - - - - - - - - - - 6" Electro-Dynamic
(L-D Switch in Distance Position)	

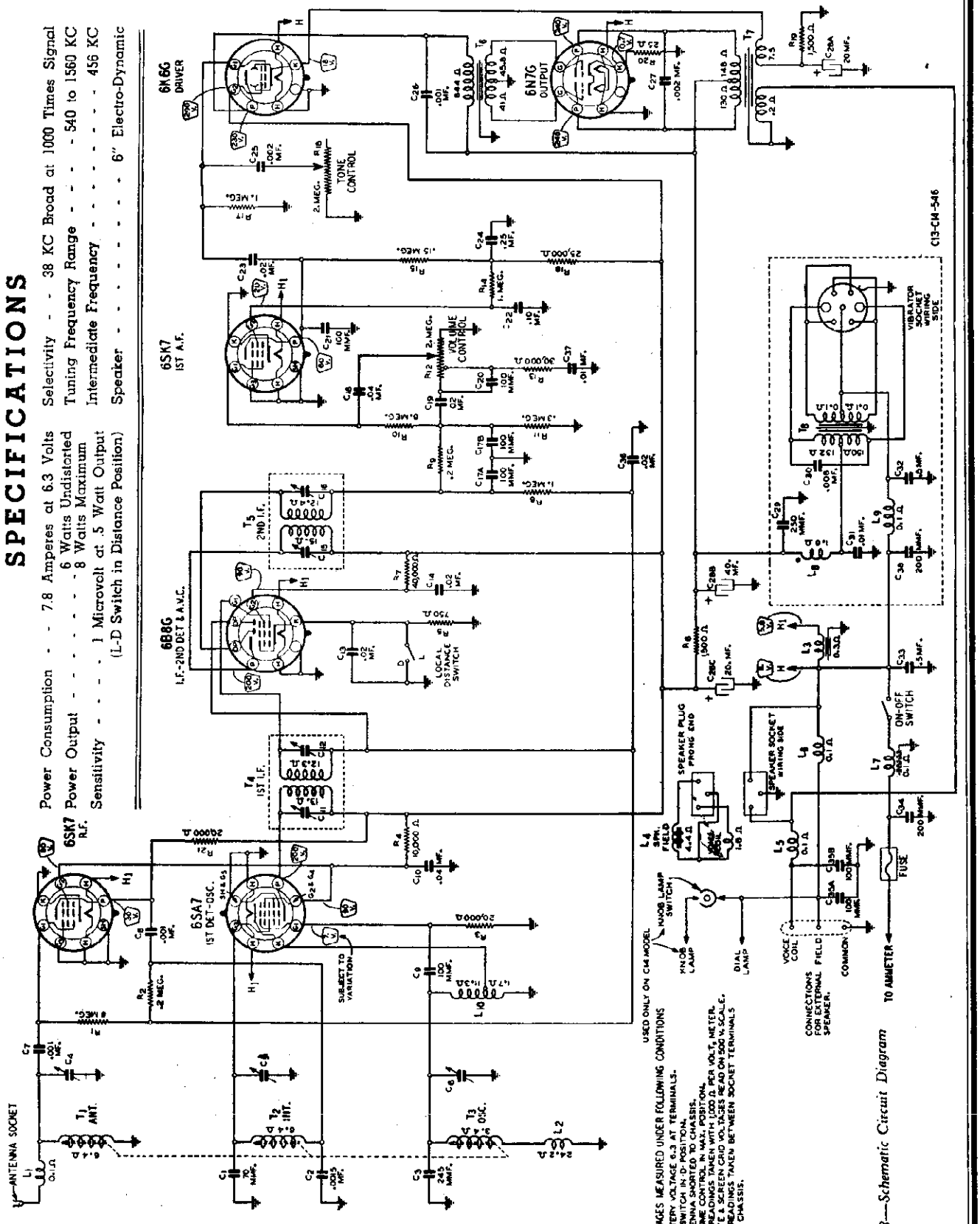


Fig. 8—Schematic Circuit Diagram

WESTERN AUTO SUPPLY CO.

Procedure for Setting the Stations

MODELS D1091,D4040

There are 6 positions of the Automatic Station Mechanism. Five of these are Automatic Station positions and one is the Manual Tuning position. A sixth station may be tuned in with the Manual Tuning Knob. If the position of this knob is not disturbed, the sixth station will be automatically tuned in when the Automatic Station Mechanism is in the Manual Tuning position.

The different positions are reached by pushing the Automatic Station Knob firmly and gently all the way in and releasing this knob so that it snaps all the way back. Pushing in the knob once in this manner will advance the mechanism to the next position, twice will move it to the second position, etc.

When the radio is in the Manual Tuning position, the Automatic Station Knob is dark. When it is in any of the 5 station setting positions, the Automatic Station Knob is illuminated.

Five stations may be set for Automatic Tuning. A sixth station may also be automatically tuned in at the Manual Tuning position as explained above.

Make a list of your favorite stations, those which you tune in regularly. There may be any number up to and including 6 in this list.

It is better to list the stations in frequency order.

Any station setting position may be used for any station you can receive although it is better to put the stations on your list in frequency order.

First get the mechanism in the Manual Tuning position. If the Automatic Station Knob is dark, it is already in this position. If the Automatic Station Knob is illuminated, depress this knob one or more times until it is dark.

Select the first station from the list you have made and carefully tune in this station by rotating the Manual Tuning Knob. Determine what program is being broadcast.

Then advance the mechanism to position No. 1 by depressing the Automatic Station Knob once. As shown in Fig. 3, there are 5 small holes in the chassis case through which the station setting screws are reached.

Insert a small bladed screwdriver in the opening for setting screw No. 1 and turn this screw in or out until the desired station (the one previously tuned in) is heard. Turning the screw in (clockwise) will tune in stations with lower kilocycle numbers while turning the screw out (counter-clockwise) will tune in stations with higher kilocycle numbers.

There is a card supplied with the radio on which is a frequency scale. Using the screwdriver as a guide, this scale will show the approximate frequency (kilocycle number) at which the setting screw is set.

Be sure not to tune in some other station broadcasting the same program. Turn the screw slowly back and forth until this station is carefully tuned in to the clearest and loudest point. The final motion of the setting screw should be to the right (clockwise). The station is now set for position No. 1.

Next advance the mechanism to position No. 2 by depressing the Automatic Station Knob once more. Tune in the second station on your list by adjusting setting screw No. 2 as explained above.

If you have difficulty in knowing when this station is tuned in, push the Automatic Tuning Knob 4 times to reach the Manual Tuning position. Then tune in this station with the Manual Tuning Knob, noting the program that is being broadcast. Push in the Automatic Station Knob twice to get the mechanism back into position No. 2 and again tune in this station by carefully adjusting setting screw No. 2 until the station is clearest and loudest.

Proceed in like manner to set any remaining stations on your list.

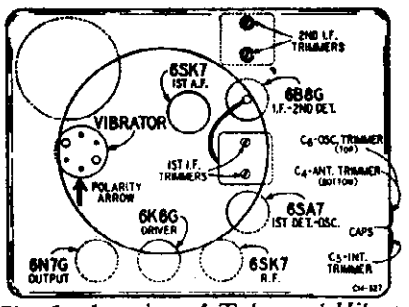


Fig. 5—Location of Tubes and Vibrat

SPECIFICATIONS MODELS D1145,D1176

Power Consumption — 60 Watts (At 117 volts 60 cycles) 80 Watts (Phonograph Operating)

Power Output - - - - - - - 2.5 Watts Undistorted 3.5 Watts Maximum

Selectivity - - 40 KC Broad at 1000 times Signal

Intermediate Frequency - - - - - - 456 KC

Speaker - - - - 6" and 8" Electro-Dynamic

Tuning Frequency Range

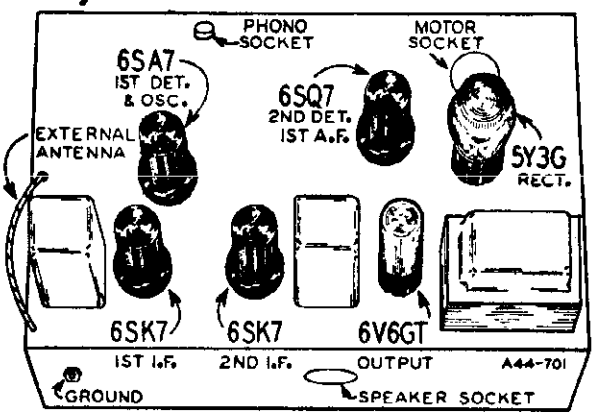
B Range - - - - - - - - - 528 to 1600 KC

D Range - - - - - - - - - 5750 to 18300 KC

Sensitivity —External Antenna—(For 0.5 Watt output)

B Range - - - - - - - 4.0 Microvolts Average

D Range - - - - - - - 10 Microvolts Average



MODELS D1118,D1202,
D2127,D2224

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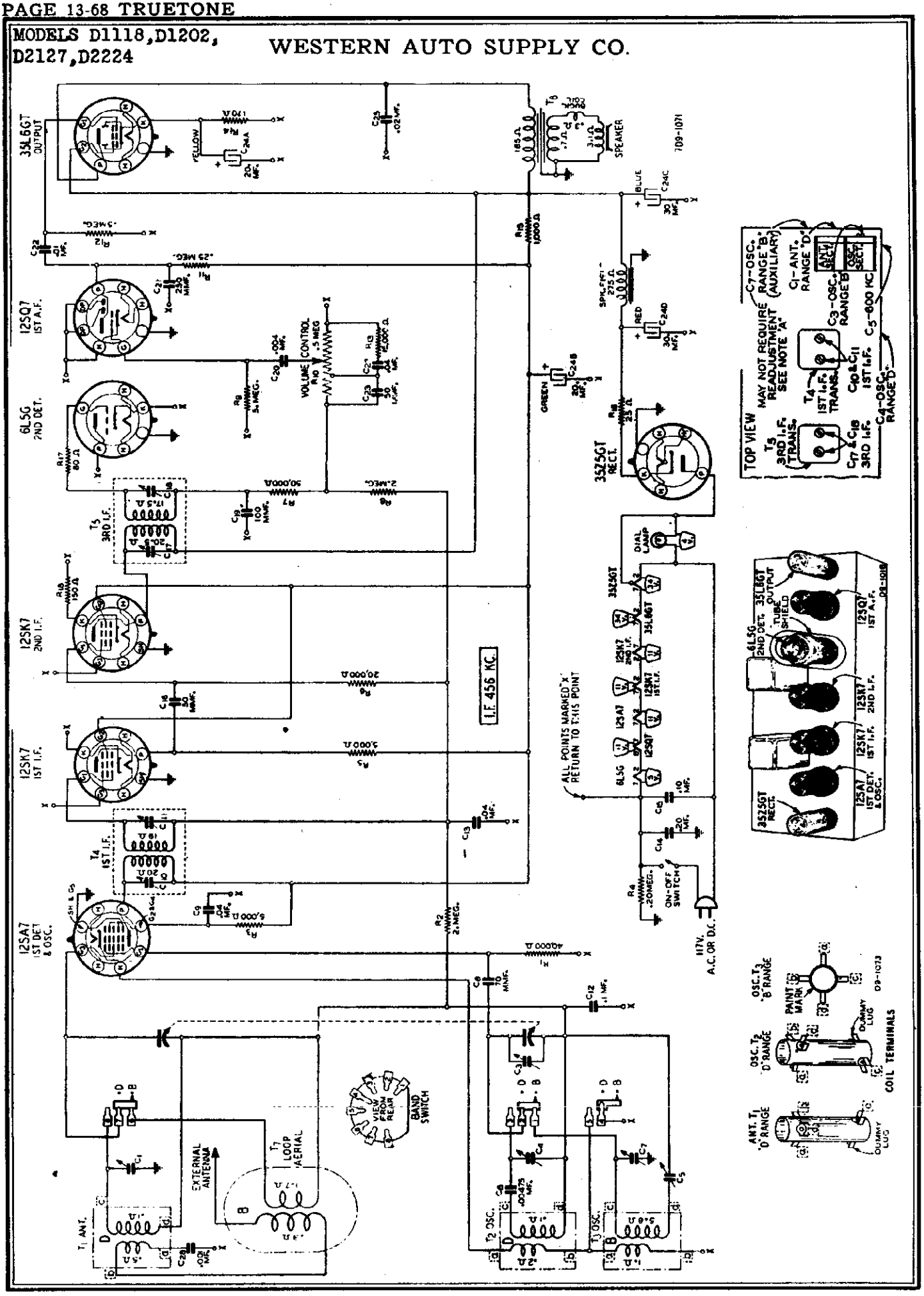


ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The equipment in column at right is required for aligning:

Signal Generator which will provide an accurately calibrated signal at test frequencies as listed.

Output Indicating Meter; Non-Metallic Screwdriver.

Dummy Antennas—.1 mf., 200 mmf., and 400 ohm.

SIGNAL GENERATOR						
FREQUENCY SETTING	ANTENNA CONNECTION	GROUND CONNECTION	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration)
I.F. 456 KC	Signal Grid of 1st Det. Connect at Stator of Large Gang Section.	Point "X" { 12SQ7—1st A.F. Prong No. 3 }	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C10) & (C11) 3rd I.F. (C17) & (C18)
RANGE B 1600 KC	Signal Grid of 1st Det.	Point "X"	.1 mf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C3) See Note A
600 KC	External Antenna Clip	Point "X"	200 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C5) Rock Rotor—See Note C
RANGE D 18,300 KC	External Antenna Clip	Point "X"	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C4)
17,000 KC	External Antenna Clip	Point "X"	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C1)

DRIVE CORD REPLACEMENT

Turn gang condenser to full open position. Using a new drive cord 50" in length, attach one end to tension spring. Fasten other end of tension spring to hook on drive pulley. Pass cord through slot in pulley rim and around idler pulleys A, B and C as shown. Wind 2 turns counter-clockwise (from front of chassis) around tuning shaft spool. Turns should progress away from chassis—See illustration.

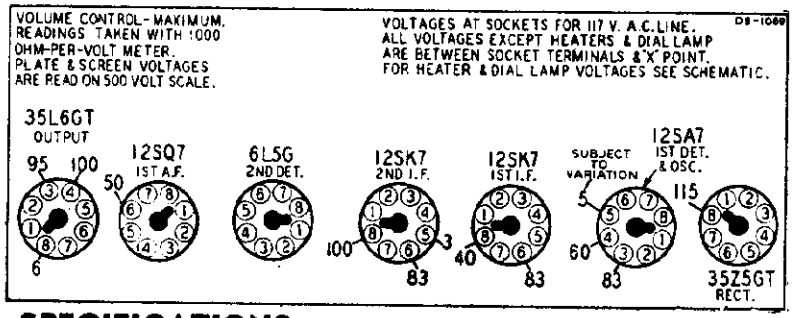
Pass cord through string guide. Wind 1¼ turns counter-clockwise (from front of chassis) around drive pulley. This turn should be on the left side of the pulley rim (from gang end of chassis). Continue cord through slot in pulley rim. Stretch tension spring and tie free end of cord to spring.

After each range is completed, repeat the procedure as a final check.

NOTE A—Adjust Oscillator Range B (C3) trimmer on gang condenser. Oscillator Range B (C7) auxiliary trimmer on side of chassis is adjusted at factory and ordinarily need not be readjusted in the field.

NOTE B—If the pointer is not at 1400 KC on the dial, set pointer at this mark on the dial scale.

NOTE C—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.



SPECIFICATIONS

Power Consumption .....28 Watts (At 117 volts AC Supply)

Power Output.....75 Watt Undistorted 1.3 Watts Maximum

Selectivity...49 KC Broad at 1000 times Signal

Intermediate Frequency.....456 KC

Speaker .....5" Electro-Dynamic

Tuning Frequency Range

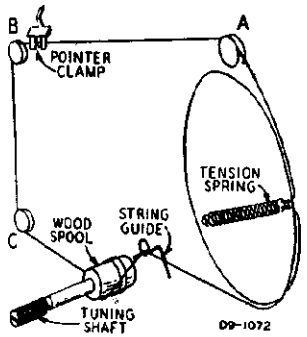
B Range..... 528 to 1600 KC

D Range.....5750 to 18,300 KC

Sensitivity (For .05 watt output)—External Ant.

B Range..... 9 Microvolts Average

D Range.....30 Microvolts Average



MODELS D1118, D1202, D2127, D2224

MODEL D1180

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Allow Chassis and Signal Generator to "Heat Up" for several minutes.

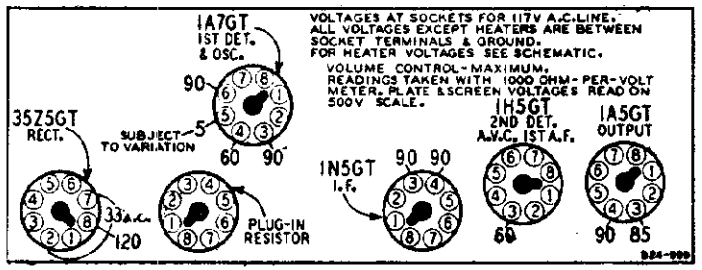
The equipment in column at right is required for aligning:

A 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., 100 mmf.

MODEL D1180



SIGNAL GENERATOR					
FREQUENCY SETTING	ANTENNA CONNECTION	GROUND CONNECTION	DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
Remove chassis from cabinet					
456 KC	Signal Grid of 1st Det. (Top Cap)	Chassis base thru .1 mf. Condenser	.1 mf.	Turn Rotor to full open	1st I.F. (C9) & (C10) 2nd I.F. (C13) & (C14)
1600 KC	Signal Grid of 1st Det.	Same as Above	.1 mf.	Turn Rotor to full open	Oscillator (C1)
Reassemble chassis in cabinet.					
1400 KC	External Antenna Clip	External Ground Clip	100 mmf.	Turn Rotor to max. output	Antenna (C2)

MODEL D1124
MODEL D1182

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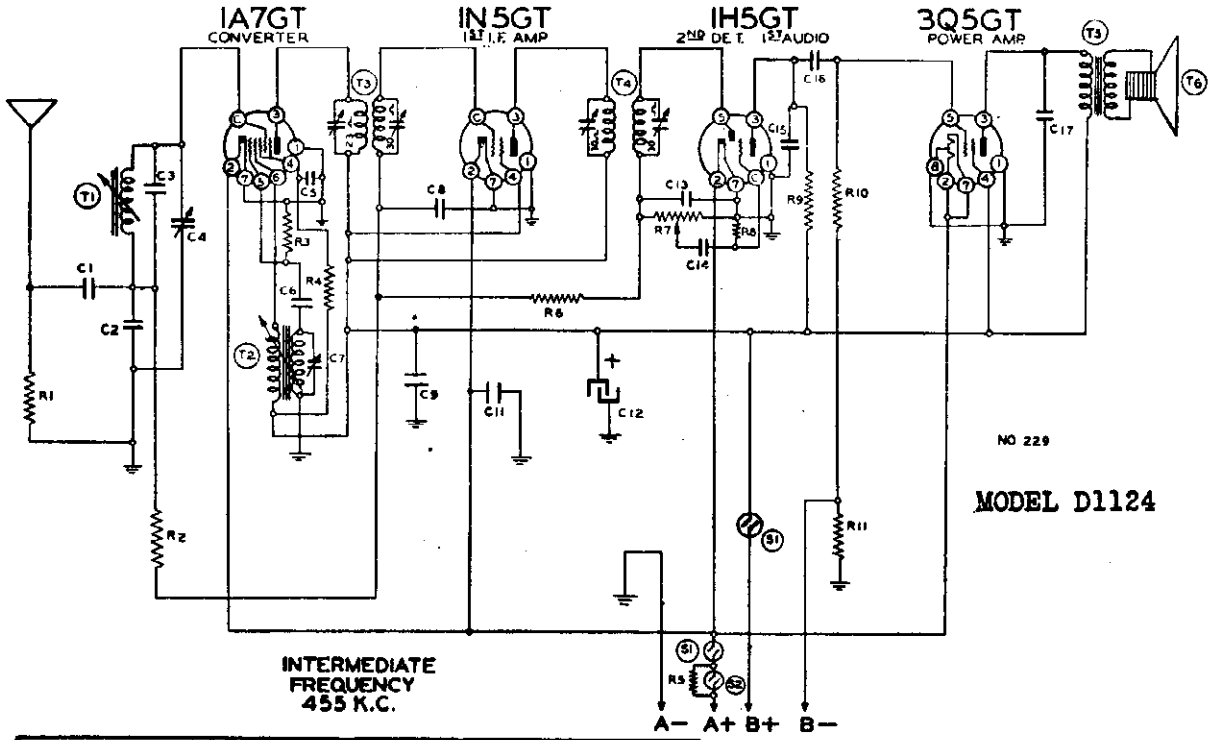
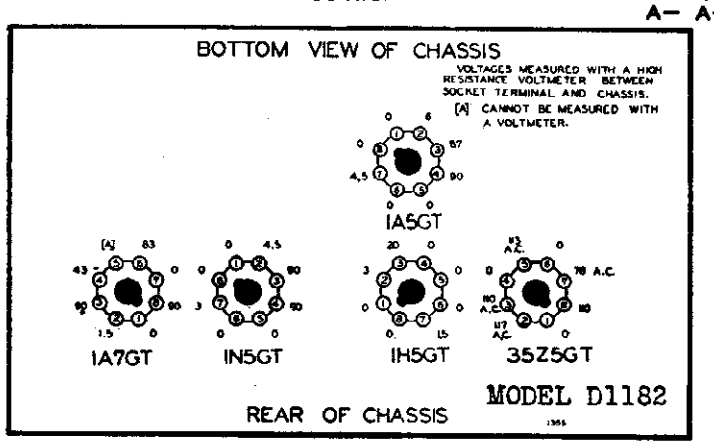
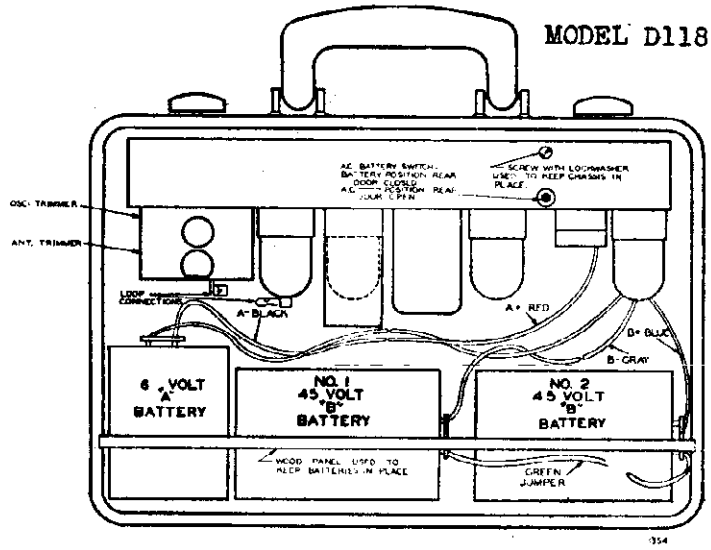


MODEL D1124



MODEL D1182



BATTERY CONNECTIONS—When replacing batteries connect cables as shown above.

MODEL D1124

Code No.	Part No.	Description
		RESISTORS
R1	13082	10M ohm—½ w.
R2	1304	3 megohm—½ w.
R3	1309	200M ohm—½ w.
R4	130194	35M ohm—½ w.
R5	130346	.56 ohm—½ w. wire wound
R6	1304	3 megohm—½ w.
R7	101210	1 megohm—volume control and switch—½ w.
R8	130257	5 megohm—½ w.
R9	13068	1 megohm—½ w.
R10	130146	2 megohm—½ w.
R11	13079	400 ohm—½ w.
		CONDENSERS
C1	129114	.0003 mica
C2	100112	.001 x 200 v.
C3	129177	.000045—ceramicon
C4	124165	Antenna trimmer
C5	10022	.05 x 200 v.—condenser
C6	12912	.00025 mica
C7	124165	Oscillator trimmer
C8	10022	.05 x 200 v. condenser
C9	1006	.25 x 200 v. condenser
C11	10017	.5 x 120 v.
C12	119117	10 mfd. x 150 v. lytic
C13	12940	.0001 mica
C14	10012	.003 x 600 v. condenser
C15	12940	.0001 mica
C16	10026	.02 x 400 v. condenser
C17	1007	.005 x 600 v.
		C4 and C7 are in same unit.
		PARTS
T1	13613	Antenna coil permeability tuning assem. complete
T2	13613	Oscillator coil permeability tuning assem. complete
T3	108202B	Input I.F. coil 455 Kc.
T4	108153C	Output I.F. coil 455 Kc.
T5	10591C	Output transformer
T6	114213	4" PM speaker
S1		Switch-on volume control
S2	12588B	Battery potential switch

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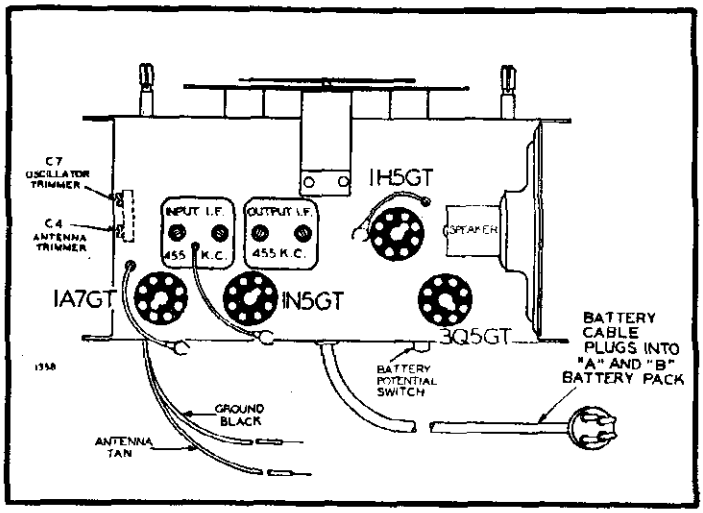
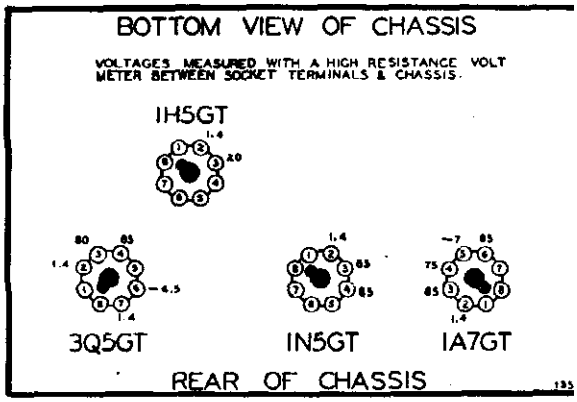
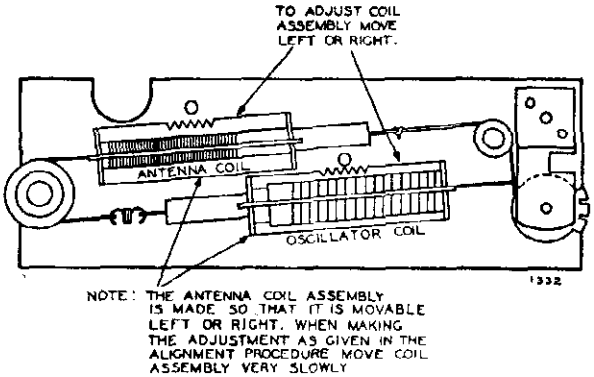


CHASSIS VIEW



TECHNICAL DATA



NOTE: THE ANTENNA COIL ASSEMBLY IS MADE SO THAT IT IS MOVABLE LEFT OR RIGHT. WHEN MAKING THE ADJUSTMENT AS GIVEN IN THE ALIGNMENT PROCEDURE MOVE COIL ASSEMBLY VERY SLOWLY

COIL ASSEMBLY VIEW

Sensitivity for 50 Milliwatt Output:
45 Microvolts Average

Tuning Frequency Range - - - 540 to 1700 KC

Power Consumption - A—.250 Amp. B .014 Amps
Power Output - - - - 160 Milliwatts Undistorted
Selectivity - 48 KC at 1000 Times Signal at 1000 KC

ALIGNMENT PROCEDURE

The following equipment is required for aligning.

- Dummy antenna .1 mfd. and 200 mmf.
- Volume control—Maximum all adjustments.
- Connect ground lead of radio chassis to ground post of signal gener

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Iron Cores (Dial Setting)	Trimmers Adjusted (in Order Shown)	Trimmer Function	Ajustment
455 Kc. I. F.	455 Kc.	.1 MFD.	Connect to Grid of 1A7	Iron Cores All the way out	Two trimmers on top of output I. F. can	Output I. F.	maximum outp
	455 Kc.	.1 MFD.	Connect to Grid of 1A7	Iron Cores All the way out	Two trimmers on top of input I. F. can	Input I. F.	maximum outp
BROAD-CAST BAND	1700 Kc.	.1 MFD.	Connect to Grid of 1A7	Iron Cores All the way out	Trimmer (C7) (See chassis view)	Oscillator	maximum outp
	1700 Kc.	200 MMF.	Connect to Antenna Clip	Iron Cores All the way out	Trimmer (C4) (See chassis view)	Antenna	maximum outp
	1400 Kc.	200 MMF.	Connect to Antenna Clip	Turn Dial to 1400 Kc.	djust position of antenna coil (See coil assembly view)	Antenna Coil Adjustment	maximum outp (See Note "A
	1700 Kc.	200 MMF.	Connect to Antenna Clip	Turn Dial to 1700 Kc.	Adjust Trimmer (C4) (See chassis view)	Antenna	Check for track (See Note "B

NOTE "A"—The antenna coil assembly is made so that it is movable. When making the adjustment as given in the alignment procedure move the coil assembly very slowly. It can be moved by hand or by pivoting one edge of the blade of a screwdriver in the hole and engaging the blade in the gear teeth of the coil form.

NOTE "B"—After the antenna coil has been tracked at 1400 Kc. i necessary to check the antenna trimmer (C4) adjustment again 1700 Kc. If no appreciable change in trimmer adjustment is made coil is in track, if the trimmer requires considerable change it wil necessary to again adjust the position of the antenna coil at 1400 These two adjustments should be tried several times until no cha of trimmer adjustment is required at 1700 Kc.

MODEL D1143, Issue A
MODEL D1175

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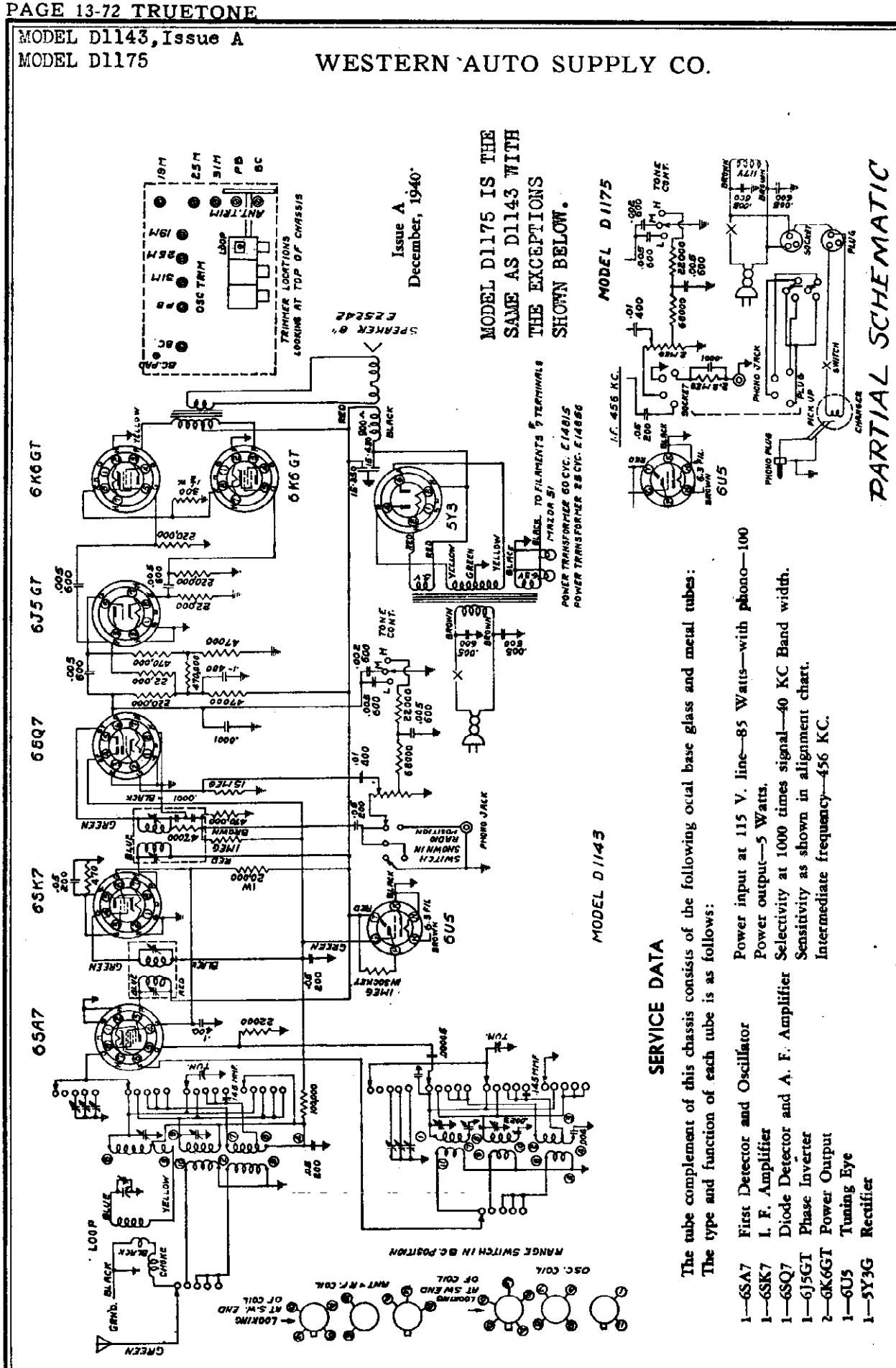

PARTIAL SCHEMATIC

SERVICE DATA

The tube complement of this chassis consists of the following octal base glass and metal tubes:
The type and function of each tube is as follows:

1—6SA7	First Detector and Oscillator	Power input at 115 V. line—85 Watts—with phono—100
1—6SK7	I. F. Amplifier	Power output—5 Watts.
1—6SQ7	Diode Detector and A. F. Amplifier	Selectivity at 1000 times signal—40 KC Band width.
1—6J5GT	Phase Inverter	Sensitivity as shown in alignment chart.
2—6K6GT	Power Output	Intermediate frequency—456 KC.
1—6U5	Tuning Eye	
1—5Y3G	Rectifier	

The following chart will give ample data for aligning this receiver. The generator and receiver should be allowed to warm up for several minutes. An accurately calibrated generator should be used and dummy antennas of 200 MMF, 400 Ohms and .1 MFD should be available as well as an output indicating device. The volume control setting is maximum and sensitivities given are for .5 Watt output.

SEE CIRCUIT DIAGRAM FOR TRIMMER LOCATIONS

Generator	Connection at Radio	Dummy Antenna	Range Switch	Dial	Trimmers to Tune	Sensitivity	Remarks
I. F. 456 K.C.	Center Stator of Variable	.1 MFD.	A	H. F. End	I. F. Transformers	65—70MV.	Tune to Max.
B. C. 1725 K.C.	Antenna	200 MMF.	A	H. F. Limit of Travel	B. C. Oscillator		Set Band Limit
1400 K.C.	Antenna	200 MMF.	A	1400	B. C. Antenna and Loop	5-10 MV.	See Note A
600 K.C.	Antenna	200 MMF.	A	Rock Rotor	Padder	10-15 MV.	
P.B. 6.0 M.C.	Antenna	400 Ohm	B	6.0 M.C.	P. B. Osc. P. B. Ant.	25 MV.	See Note B
2.2 M.C.	Antenna	400 Ohm	B	2.2 M.C.	Check	40 MV.	See Note B
31M. 9.6 M.C.	Antenna	400 Ohm	C	9.6 M.C.	31M. Ant. 31M. Osc.	25 MV.	See Note B
25M. 11.8 M.C.	Antenna	400 Ohm	D	11.8 M.C.	25M. Ant. 25M. Osc.	30 MV.	See Note B
19M. 15.2 M.C.	Antenna	400 Ohm	E	15.2 M.C.	19M Ant. 19M. Osc.	40 MV.	See Note B

MODELS D1143 and D1175

Note "A"-If the pointer is not at 1400 KC with a 1400KC sig. it may be loosen from the dial cord and moved to correct the calibration.This should be checked across the band to arrive at the optimum condition.

Note "B"-Care should be taken not to align on image frequency.This may be checked by rotating the dial of sig. gen. Another sig. should be heard at dial frequency plus 912 KC.This sig. should be checked carefully on all short wave bands, making sure the lowest frequency sig. agrees with dial setting in frequency and that it is the strongest of the two.

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- 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., 175 mmf.

MODEL DE3000

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6K7G I.F. Tube	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 2)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6A8G	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 2)	Input I. F.	Adjust to maximum output
BROADCAST BAND 1550	1725 Kc.	175 200 mmf.	Antenna lead	Rotor full open (Plates out of mesh)	Trimmer—Top of Middle section of gang (See Fig. 2)	Oscillator	Adjust to maximum output
	1400 Kc.	175 200 mmf.	Antenna lead	Set dial at 1400 Kc.	Trimmers—Top of front and rear section of gang (See Fig. 2)	Antenna and R. F.	Adjust to maximum output
	600 Kc.	175 200 mmf.	Antenna lead	Set dial at 600 Kc.	B.C. Series Pad (See Fig. 2)	Oscillator series pad	Adjust to maximum rock dial. (See note "A")

NOTE "A" Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained. Trimmer is located on top of chassis along side of gang.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each band is completed, repeat the procedure as a final check.

Do not bend plates of variable condenser to correct tracking.

FREQUENCY RANGE
530 to 1550 Kc.

Power Output ..... 2 Watts Undistorted, 3.5 Watts Maximum

Intermediate Frequency ..... 465 KC.

Power Consumption ..... 6 Amperes at 6.3 Volts

MODELS D1145,D1176

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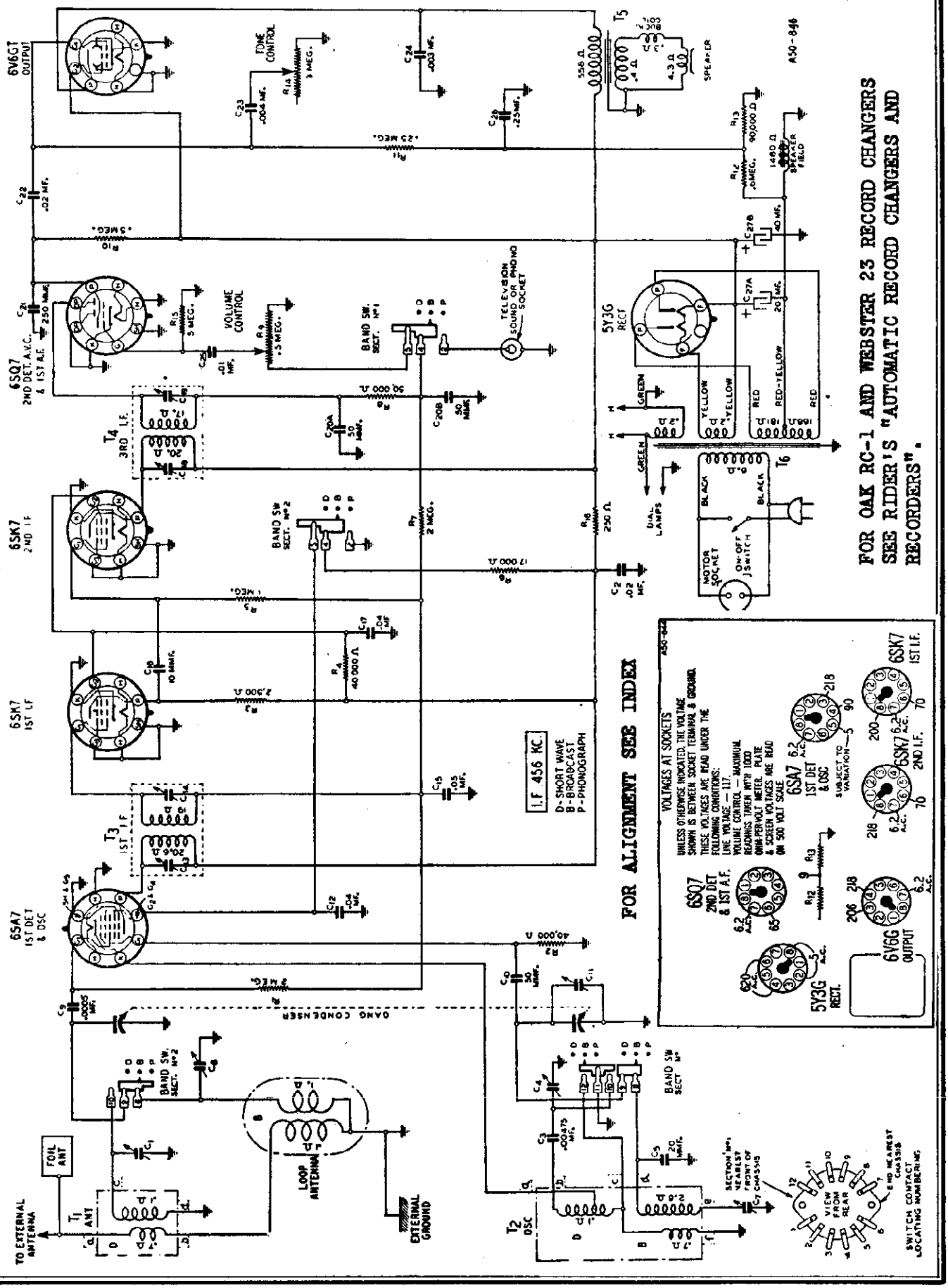


VOLTAGE CHART

All voltages measured with a 1,000 ohm per volt meter on the 150 volt scale. Line voltage 117 volts A.C. Volume control maximum and no signal tuned in. Power consumption 30 watts, radio only, with changer 48 watts.

12SA7 TUBE

	Volts
Plate (3) to ground	93
Screen (4) to ground	95

12SK7 TUBE

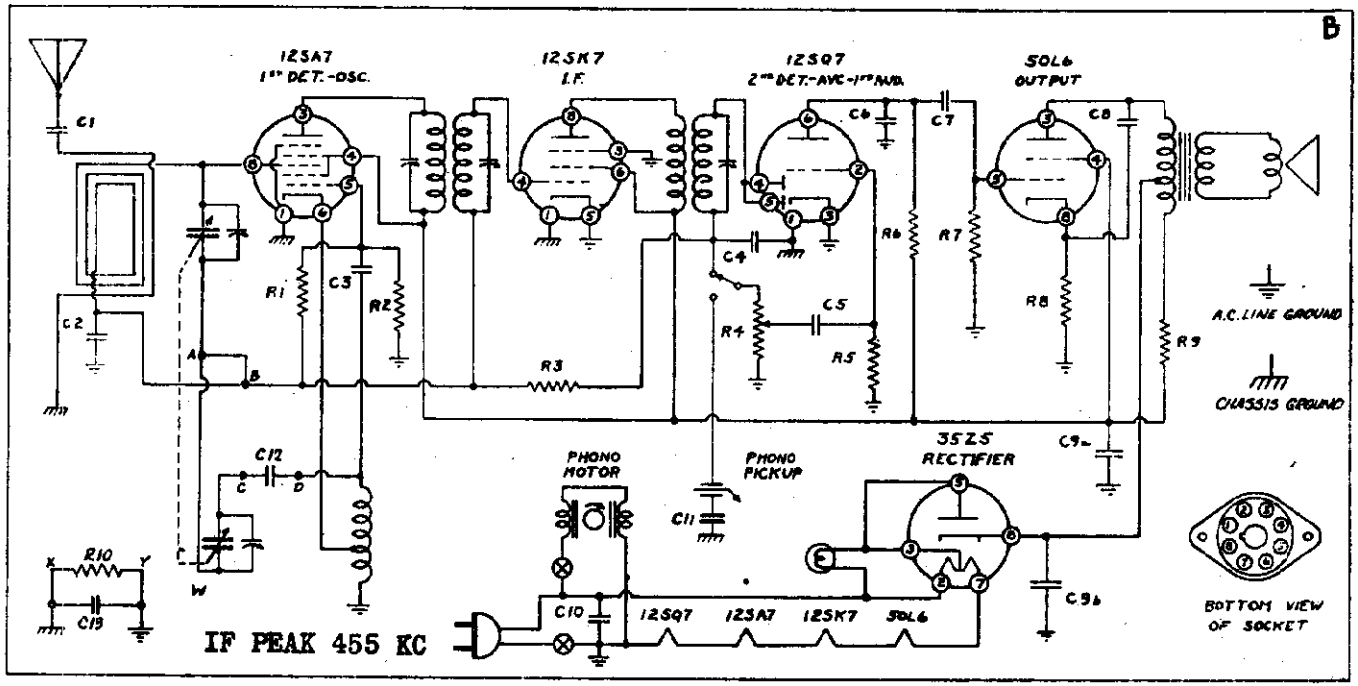
Plate (6) to ground	93
Screen (5) to ground	95

50L6 TUBE

Plate (3) to ground	118
Screen (4) to ground	95
Cathode (8) to ground	5.5

35Z5 TUBE

Filament (8) to ground	122



In model M5-PH only, connect points w, x, and y together. R10 and C13 are not used. Also C12 is not used, and point C connects to D. Disconnect points A and B.

RESISTORS

No.	Ohms	Watts	No.	Ohms	Watts
R1	10,000,000	½	R6	250,000	¼
R2	25,000	½	R7	500,000	¼
R3	2,000,000	¼	R8	150-10%	¼
R4	500,000	V.C.	R9	1,000	½
R5	5,000,000	¼	R10	150,000	½

CONDENSERS

No.	Capacity (Mfd.)	Volts	No.	Capacity (Mfd.)	Volts
C1	.001	600	C8	.02	400
C2	.05	200	C9a	50. Elect.	150
C3	.00005	Mica	C9b	30. Elect.	150
C4	.00025	Mica	C10	.05	400
C5	.005	600	C11	.2	400
C6	.0005	Mica	C12	.02	400
C7	.01	400	C13	.16	200

MODEL D1171, Issue B

WESTERN AUTO SUPPLY CO.

SERVICE INFORMATION

Speaker (Part No. P4792) 5" PM Type.

D.C. voice coil resistance.....3.5 ohms
Voice coil impedance at 400 cycles.....3.8 ohms

Oscillator Coil (Part No. P4780) Used in M5-PH only.

Looking at the connection end in a clockwise direction starting at the chassis the terminals are No. 1, end of winding; No. 2, start of winding; No. 3, tap.

No. 2 and No. 1—Resistance 4.9 ohms.
No. 3 and No. 1—Resistance 4.3 ohms.

Oscillator Coil (Part No. P4941) XM5-PH only

Looking at the connection end in a clockwise direction, starting at the chassis, the terminals are No. 1, tap; No. 2, dummy; No. 3, end; No. 4, start.

No. 4 and No. 3—Resistance.....4.8 ohms
No. 1 and No. 3—Resistance.....4.3 ohms

First I.F. Transformer (Part No. P3923)

Primary—Blue, plate; red, B+ Resistance.....20.4 ohms
Secondary—White, grid; Black, AVC Resistance.....20.3 ohms

Second I.F. Transformer (Part No. P3924)

Primary—Blue, plate; red B+ Resistance.....22.2 ohms
Secondary—White, diode; black, AVC Resistance.....22.1 ohms

POWER SUPPLY

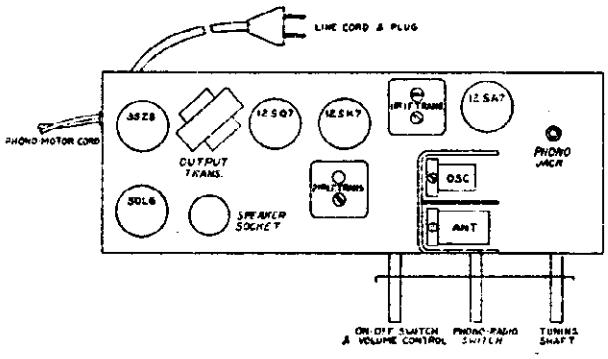
This receiver is designed to operate from a power supply main of 110-120 volts, 60 cycle alternating current (A.C.). Never plug in a D.C. outlet.

ISSUE B

APRIL, 1941

FOR RADIO PRODUCTS RC-50 RECORD CHANGER, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

–Top View



ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- 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 mfd., 200 mmf.

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (In Order Shown)	Trimmer Function	Adjustment
I. F.	455 KC.	.1 Mfd.	Grid of 12SK7 I.F. tube	Rotor full open (Plates out of mesh)	One trimmer on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	455 KC.	.1 Mfd.	Grid of 12SA7 tube	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
BROADCAST	1,630 KC.	200 Mmf.	Antenna lead	Rotor full open (Plates out of mesh)	Trimmer—Top of gang	Oscillator	Adjust to maximum output
	1,400 KC.	200 Mmf.	Antenna lead	Set dial at 1400 KC.	Trimmer—Top of gang	Broadcast Antenna	Adjust to maximum output

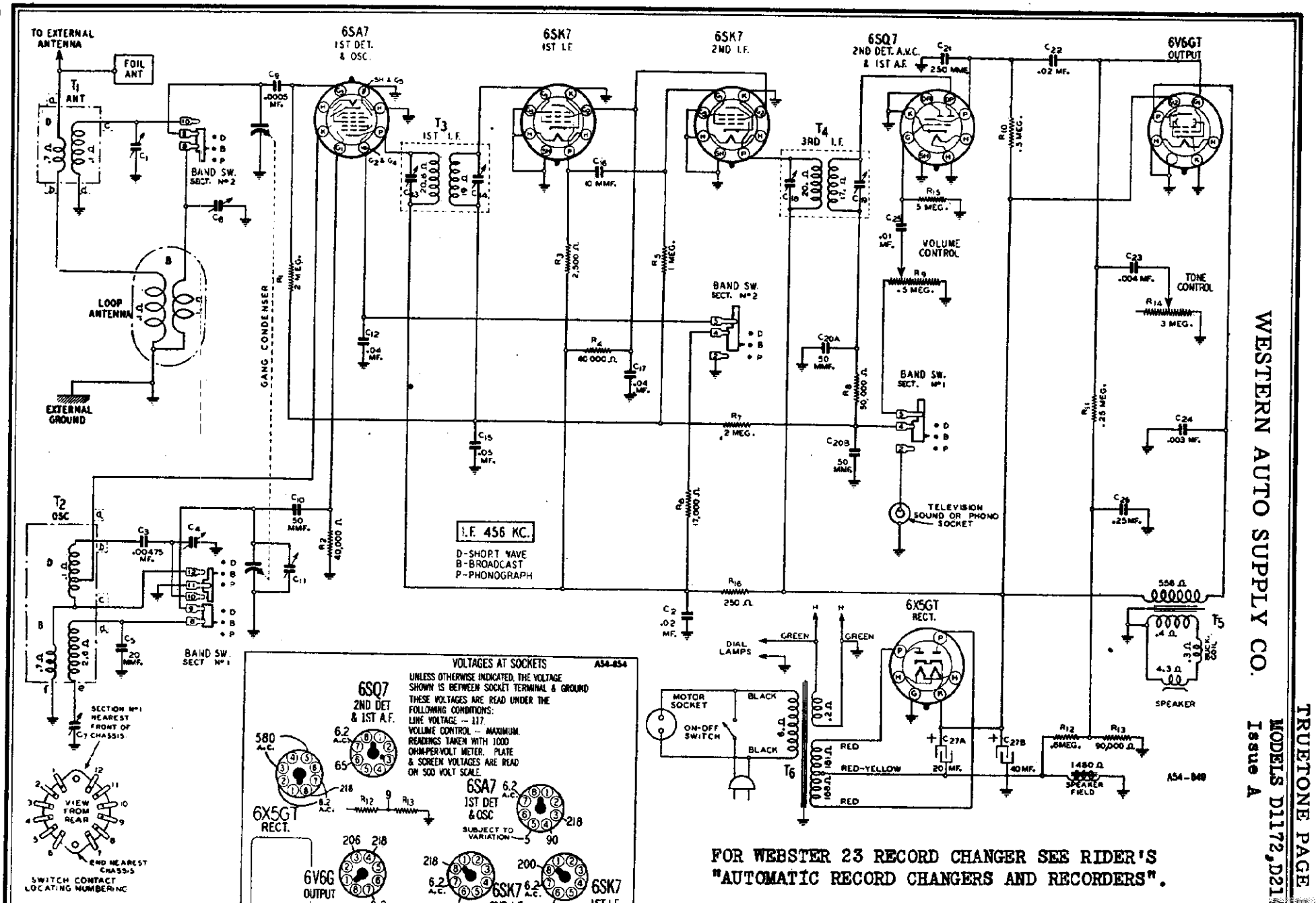
Frequency Range—535 to 1630 K.C.

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

Power output 1.3 watts undistorted—2.0 watts maximum.

Intermediate Frequency 455 K.C.

Total Power Consumption—48 watts.



FOR WEBSTER 23 RECORD CHANGER SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

WESTERN AUTO SUPPLY CO.

TRUETONE PAGE

MODELS D1172, D21

Issue A

MODELS D1172,D2149
Issue A

WESTERN AUTO SUPPLY CO.

MODELS D1145,D1176

ALIGNMENT PROCEDURE FOR MODELS D1172,D2149,D1145,D1176

Volume Control—Maximum 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.

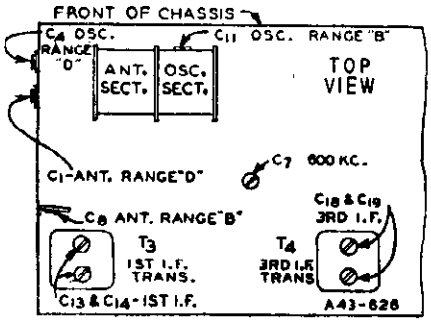
The following equipment is required for aligning:

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., 100 mmf., and 400 ohms.

SIGNAL GENERATOR FREQUENCY SETTING	CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I.F.					
456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Ope.	1st I.F. (C13) & (C14) 3rd I.F. (C18) & (C19)
RANGE B					
1600 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C11)
1400 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC—See Note A	Ant. Range B (C8)
600 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C7) Rock Rotor—See Note B
RANGE D					
18,300 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C4)
17,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C1) Rock Rotor—See Note B
LOOP RANGE B					
1400 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output	Ant. Range B (C8)



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—If the pointer is not at 1400 KC on the dial, remove pointer from drive cord. Set pointer at the 1400 KC mark on the dial scale. Attach pointer to drive cord.

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 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 on the dial It may be necessary to increase the input signal to hear the image.

DRIVE CORD REPLACEMENT

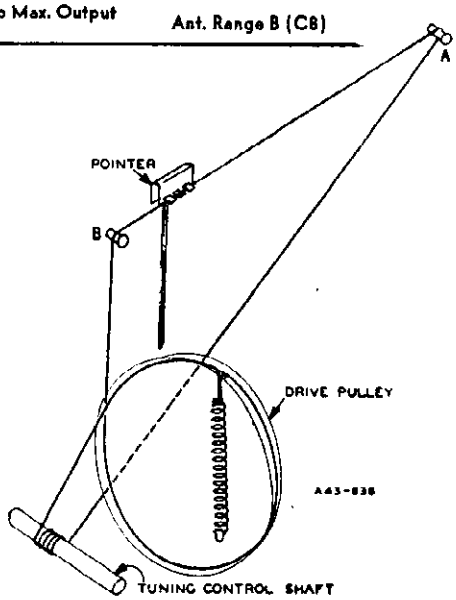
Turn gang condenser to full open position—See illustration. Use a new drive cord 42 inches in length.

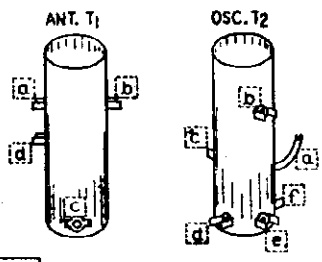
Tie one end of cord to tension spring. Pass other end of cord up through hole in groove of drive pulley. Pull cord through hole until spring is flush against inside of pulley rim.

Wind cord ¼ turn counter-clockwise (from pulley side of chassis) around drive pulley. Then wind 4½ turns clockwise (from front of chassis) around tuning control shaft. These turns should progress toward chassis. Pass cord over idler studs A and B as shown, then wind cord ¾ turn counter-clockwise (from pulley side of chassis) around drive pulley. This turn should be on left side (from front of chassis) of pulley groove.

Pass cord through hole in groove of drive pulley. Tie cord to tension spring. Fasten other end of spring to hook on drive pulley.

DIAL POINTER ATTACHMENT—Tune in a signal of known frequency. Set pointer at this frequency mark on dial scale. Fasten pointer to drive cord—See illustration.





Power Consumption 60 Watts (At 117 volts 60 cycles)
80 Watts (Phonograph Operating)

Power Output - - - - - - 2.5 Watts Undistorted
3.5 Watts Maximum

Selectivity - - 40 KC Broad at 1000 times Signal

Intermediate Frequency - - - - - - 456 KC

Speaker - - - - 6" and 8" Electro-Dynamic

Tuning Frequency Range

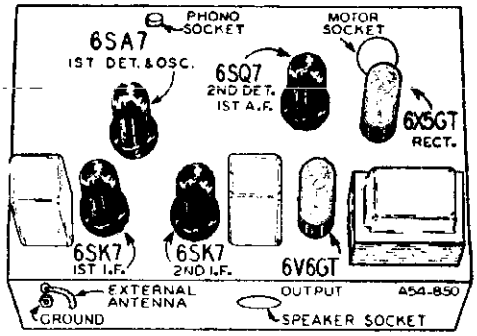
B Range - - - - - - - - - 528 to 1600 KC

D Range - - - - - - - - - 5750 to 18300 KC

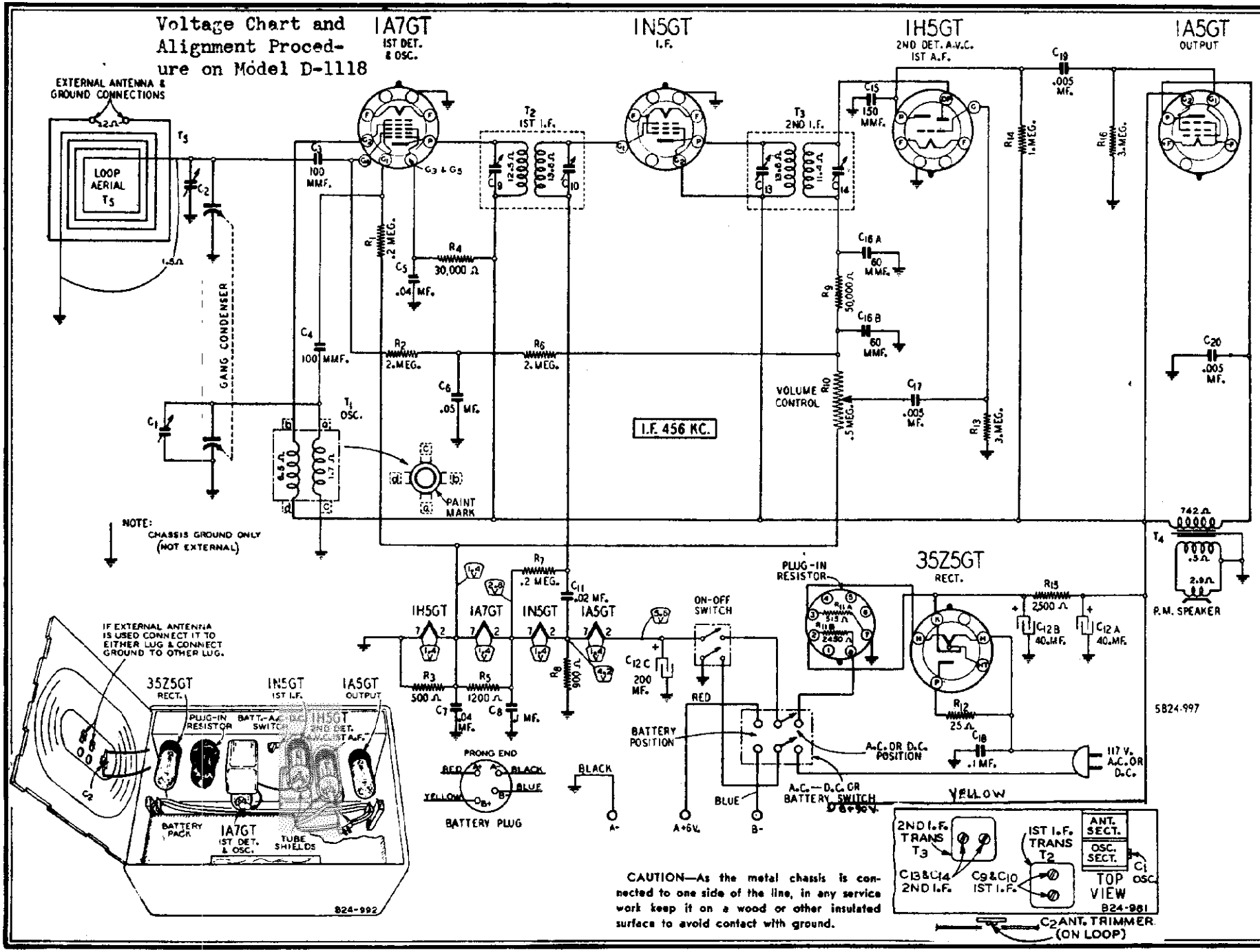
Sensitivity —External Antenna—(For 0.5 Watt output)

B Range - - - - - - - 4.0 Microvolts Average

D Range - - - - - - - 10 Microvolts Average



Voltage Chart and Alignment Procedure on Model D-1118

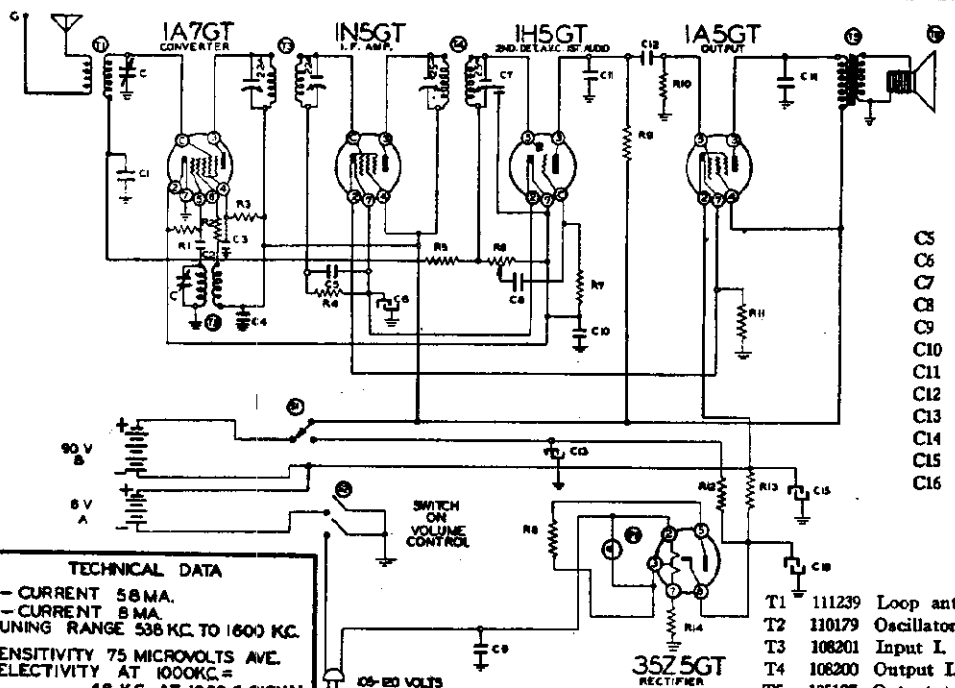


CAUTION—As the metal chassis is connected to one side of the line, in any service work keep it on a wood or other insulated surface to avoid contact with ground.

WESTERN AUTO SUPPLY CO.

MODELS D1180, D3115

TRUETONE PAGE 13-79



TECHNICAL DATA

A – CURRENT 58 MA.
B – CURRENT 8 MA.
TUNING RANGE 538 KC. TO 1600 KC.

SENSITIVITY 75 MICROVOLTS AVE.
SELECTIVITY AT 1000KC. =
48 KC. AT 1000 X SIGNAL

OUTPUT 180MW UNDISTORTED 3 OHM VOICE COIL

I.F 455 K.C.

CONDENSERS

C	102141	Gang condenser
C1	1009	.05 x 200 v. condenser
C2	1295	.0001 mica
C3	100128	.05 x 120 v. condenser
C4	100135	.25 x 120 v. condenser
C5	100127	.01 x 120 v. condenser
C6	119123	20.0 mfd.—50 w. v. Lytic
C7		Approximately 100 mfd. in I.F. can
C8	100134	.006 x 120 v. condenser
C9	10013	.05 x 400 v. condenser
C10	100133	.1 x 120 v. condenser
C11	1295	.0001 mica
C12	100127	.01 x 120 v. condenser
C13	119123	40.0 mfd.—150 w. v. Lytic
C14	10025	.002 x 600 v. condenser
C15	119123	200.0 mfd.—10 w. v. Lytic
C16	119123	40.0 mfd.—150 w. v. Lytic

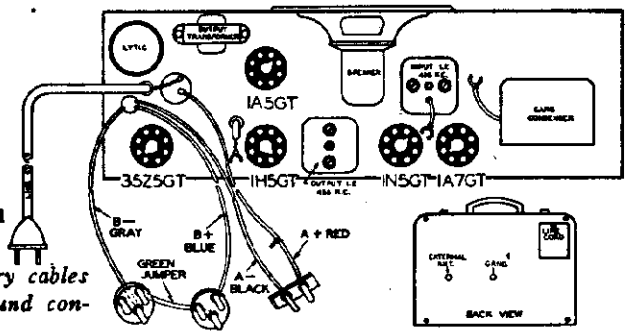
C6, C13, C15 and C16 are in one unit

RESISTORS

Code No.	Part No.	Description
R1	1309	200M ohm—½ w.
R2	130193	3M ohm—½ w.
R3	130305	65M ohm—½ w.
R4	130225	15 megohm—½ w.
R5	1304	3 megohm—½ w.
R6	101252	1 megohm—Volume control
R7	130223	10 megohm—½ w.
R8	130197	20 ohm—½ w.
R9	13019	1 megohm—½ w.
R10	1304	3 megohm—½ w.
R11	130345	1M ohm—½ w.
R12	130129	2500 ohm—½ w.
R13	130344	1975 ohm—6 watt
R14	130343	545 ohm—14 watt

PARTS

T1	111239	Loop antenna assembly
T2	110179	Oscillator coil
T3	108201	Input I. F. coil
T4	108200	Output I. F. coil
T5	105127	Output transformer
T6	114241	Speaker 5" P.M.
S1	125153	A. C. Battery switch
S2	101252	Switch on Volume control
P1	107362	Pilot Lite bulb—T47



CHASSIS VIEW showing tube location and battery cables —INSET back view, shows external ant. and ground connections.

ALIGNMENT PROCEDURE

The following equipment is required for aligning.

- Dummy antenna .1 mfd. and 200 mmf.
- Volume control—Maximum all adjustments.
- Connect ground lead of radio chassis to ground post of signal generator.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Iron Cores (Dial Setting)	Trimmers Adjusted (In Order Shown)	Trimmer Function	Adjustment
455 Kc. I. F.	455 Kc.	.1 MFD.	Connect to Grid of 1A7	Rotor full open (Plates out of mesh)	Trimmers on top of I. F. cans	Output and input I. F.	maximum output (See Note "A")
BROAD-CAST BAND	1600 Kc.	.1 MFD.	Connect to Grid of 1A7	Rotor full open (Plates out of mesh)	Trimmer on gang (See chassis view)	Oscillator	maximum output (See Note "A")
	1400 Kc.	200 MMF.	Connect to Antenna Clip	Set dial at 1400 Kc.	Trimmer on gang (See chassis view)	Antenna	maximum output (See Note "B")

NOTE "A"—The loop antenna need not be connected to the radio when making these adjustments, but a 1. Meg. Resistor must be substituted across the loop clips. The ground of the signal generator is connected to the chassis and the other lead from the signal generator in series with .1 MFD. dummy to the grid of the 1A7GT tube.

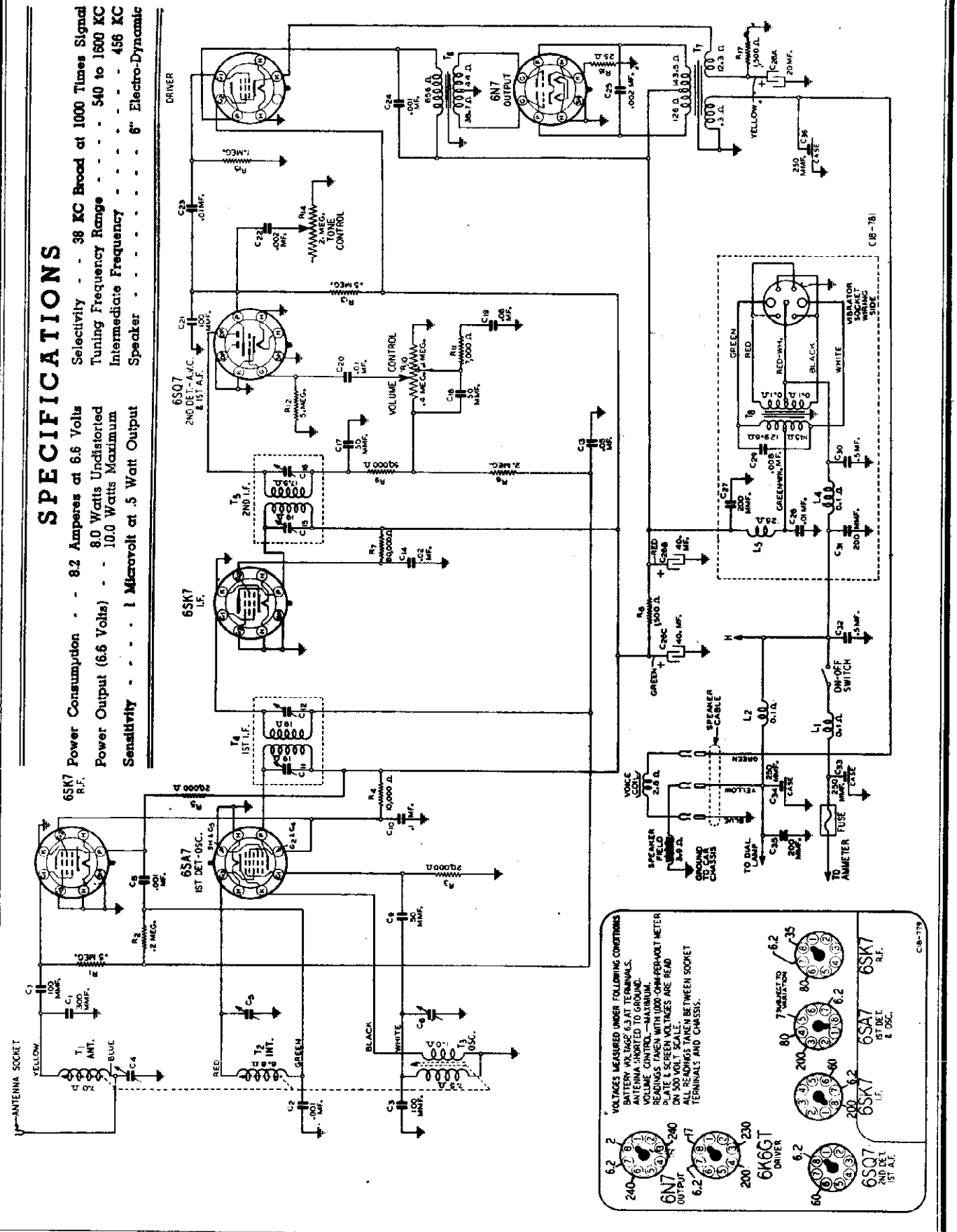
NOTE "B"—This adjustment should be made with the ground lead of the signal generator connected to the external ground terminal. The other lead of the signal generator is connected in series with a 200 Mmf. dummy to the external antenna terminal.

WESTERN AUTO SUPPLY CO.

MODELS D1191, D4140
Issue A

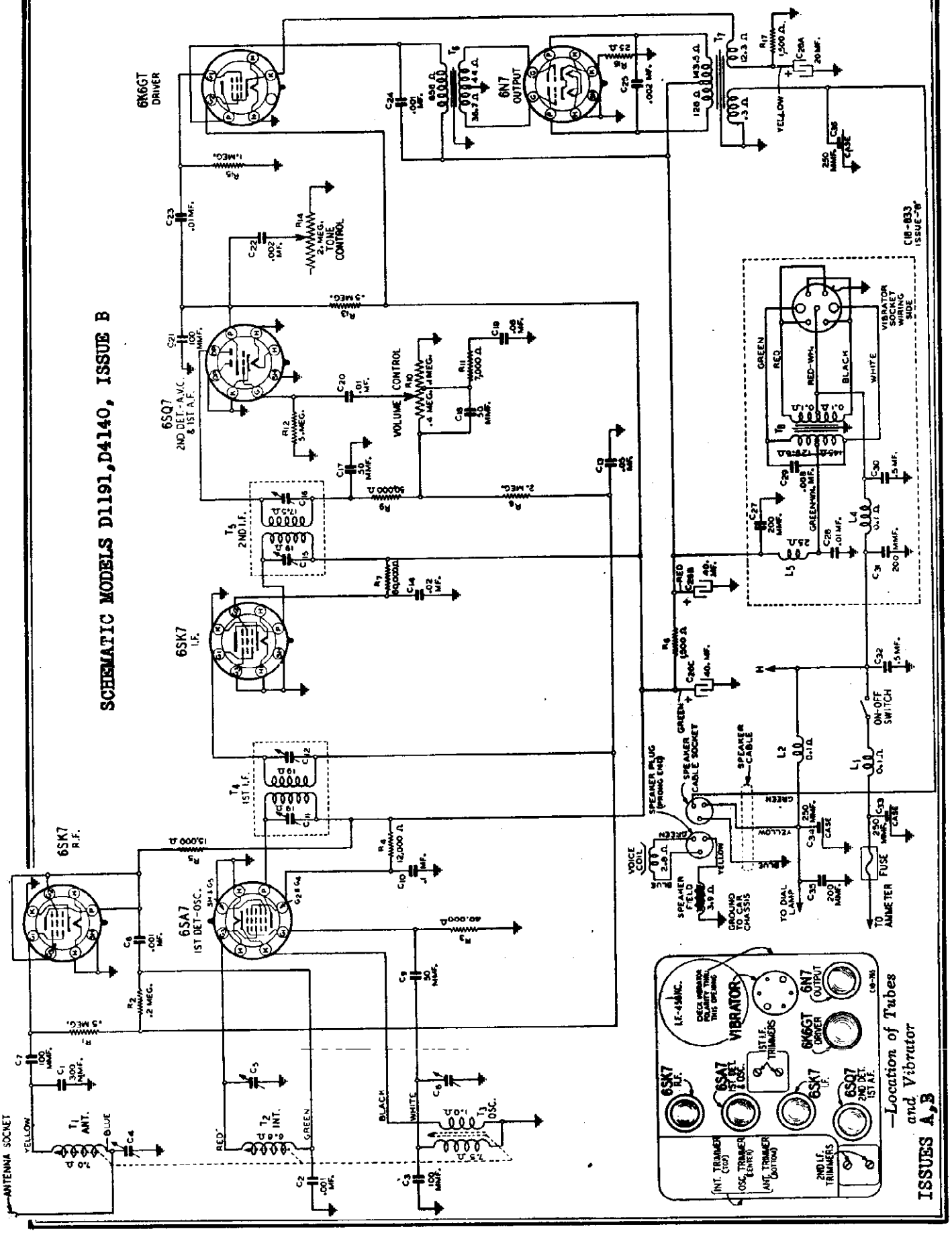
SPECIFICATIONS

Power Consumption - - -	8.2 Amperes at 6.6 Volts	Selectivity - - -	38 KC Broad at 1000 Times Signal
Power Output (6.6 Volts) - -	8.0 Watts Undistorted	Tuning Frequency Range - - - - - - - -	540 to 1600 KC
	10.0 Watts Maximum	Intermediate Frequency - - - - - - - -	456 KC
Sensitivity - - - - -	1 Microvolt at .5 Watt Output	Speaker - - - - - - - - - - - -	6" Electro-Dynamic



MODELS D1191,D4140
Issue B

WESTERN AUTO SUPPLY CO.



ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning:

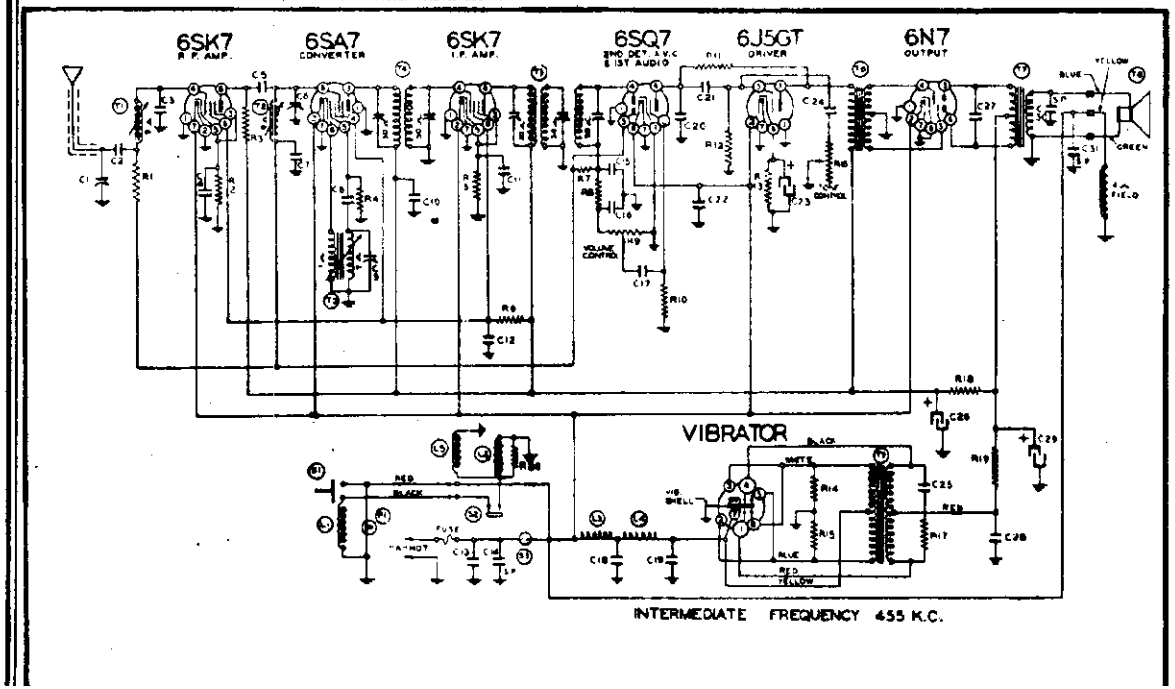
- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 mf., 35 mmf.

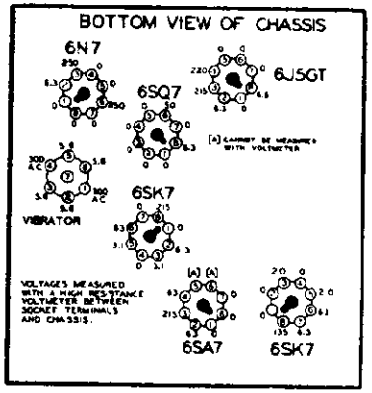
BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Remote Tuner Dial Setting	Trimmers Adjusted (In Order Shown)	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Grid of 6SK7 I. F. Tube	Set dial at 1400 Kc.	See Chassis View	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 6SA7 I. F. Tube	Set dial at 1400 Kc.	See Chassis View	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1600 Kc.	35 mmf.	Antenna lead	Set dial at 1600 Kc.	Trimmer C9, C8, C1 Chassis View	Oscillator R. F. antenna	Adjust to maximum output
	1400 Kc.	35 mmf.	Antenna lead	Set dial at 1400 Kc.	Rotate cores of antenna and R. F. coils	Antenna and R. F.	Adjust to maximum output

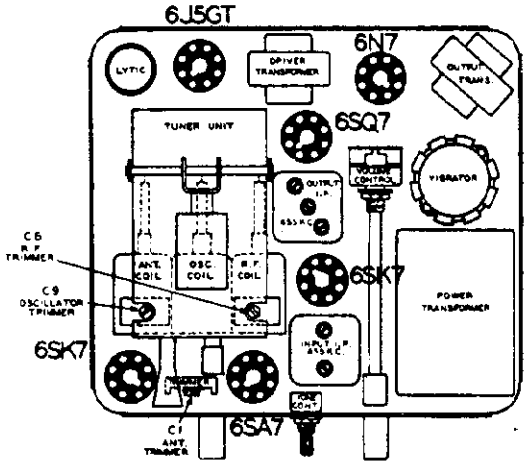
Schematic Diagram

Ref. No.	Part No.	Description
RESISTORS		
R1	130330	220M ohm—½ w.
R2	130332	250 ohm—½ w.
R3	130331	15M ohm—½ w.
R4	130329	47M ohm—½ w.
R5	130316	900 ohm—½ w.
R6	130196	30M ohm—1 w.
R7	130319	1 megohm—½ w.
R8	130329	47M ohm—½ w.
R9	101242	500M ohm volume control
R10	130357	5 megohm—½ w.
R11	130102	500M ohm—½ w.
R12	130102	500M ohm—½ w.
R13	13092	1M ohm—½ w.
R14	130168	100 ohm—½ w.
R15	130168	100 ohm—½ w.
R16	101245	1 megohm tone control
R17	13092	1M ohm—½ w.
R18	130199	1500 ohm—1 w.
R19	130328	75 ohm—½ w.
R20	13060	100 ohm—½ w.
CONDENSERS		
C1	124157	Antenna trimmer
C2	100127	.01 x 120 v.
C3	129172	.0001 ceramicon
C4	100128	.05 x 120 v.
C5	129145	.00001 ceramicon
C6	124159	R.F. trimmer
C7	100129	.02 x 120 v.
C8	129172	.0001 ceramicon
C9	124158	Oscillator trimmer
C10	1001	.1 x 400 v.
C11	100128	.05 x 120 v.
C12	10053	.25 x 400 v.
C13	10031	.5 x 120 v.
C14	115697	Spark plate
C15	129165B	.00005 mica
C16	129165B	.00005 mica
C17	100127	.01 x 120 v.
C18	10031	.5 x 120 v.
C19	10031	.5 x 120 v.
C20	100130	.00025 x 400 v.
C21	100130	.02 x 400 v.
C22	1292	.0005 mica
C23	119118	20.0 mfd. x 25 v. lytic
C24	10011	.01 x 400 v.
C25	10098	.005 x 1600 v.
C26	119118	20 mfd. x 400 v. lytic
C27	100126	.006 x 800 v.
C28	1001	.1 x 400 v.
C29	119118	20 mfd. x 400 v. lytic
C30	115710	Spark plate
C31	115710	Spark plate

C15 and C16 are in same unit
C20 and C21 are in same unit
C23, C26 and C29 are in same unit

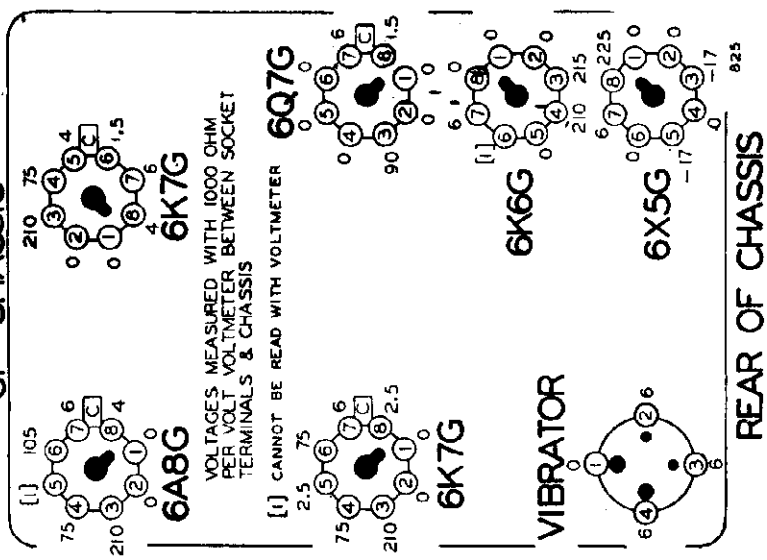


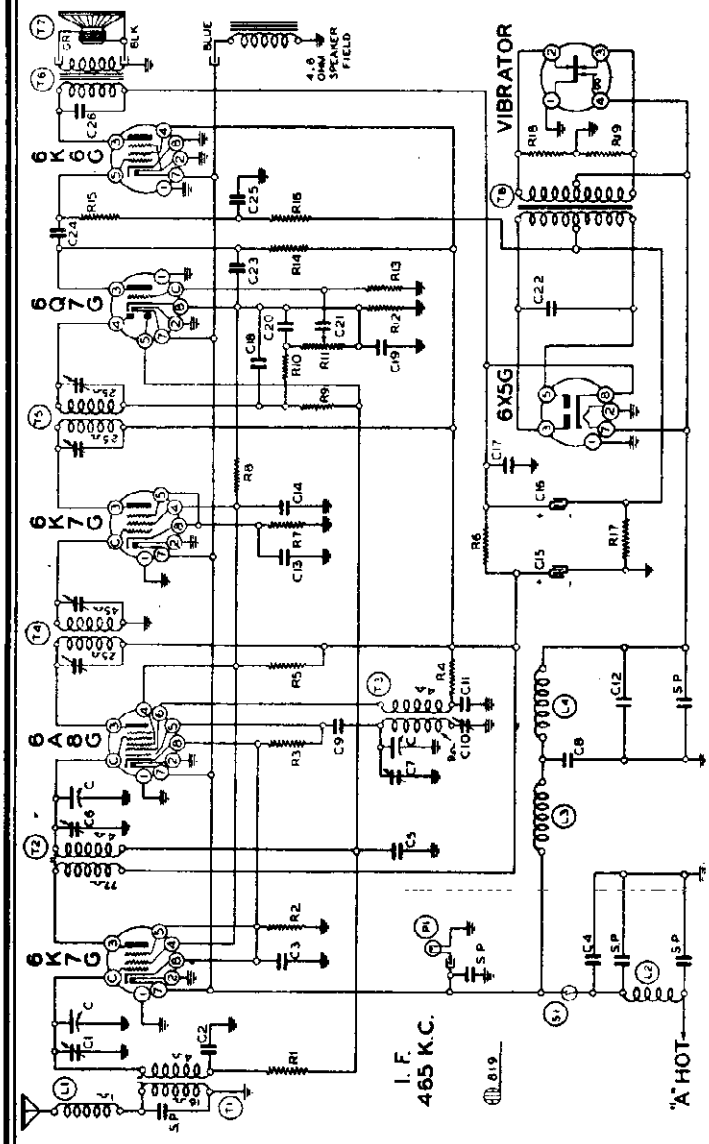




MODEL DE3000

WESTERN AUTO SUPPLY CO.





DE3000

Circuit Diagram Reference	Part No.	Description
		RESISTORS
R1	13020	100M ohm—½ w.
R2	13054	500 ohm—½ w.
R3	130162	50M ohm—½ w.
R4	130208	40M ohm—½ w.
R5	13030	25M ohm—1 watt
R6	130279	1M ohm—1 watt
R7	13079	400 ohm—½ w.
R8	130139	40M ohm—½ w.
R9	13019	1 megohm—½ w.
R10	13012	50M ohm—½ w.
R11	10141	500M ohm volume control
R12	130153	700 ohm—½ w.
R13	13019	1 megohm—½ w.
R14	130141	250M ohm—½ w.
R15	130278	300M ohm—½ w.
R16	13011	250M ohm—½ w.
R17	130277	400 ohm—1 watt
R18	13060	100 ohm—½ w.
R19	13060	100 ohm—½ w.
		CONDENSERS
C	10226	3 gang variable condenser
C1		Antenna Trimmer on gang
C2	10063	.05 x 200 v.
C3	10063	.1 x 200 v.
C4	10031	.5 x 120 v.
C5	10022	.05 x 200 v.
C6		R. F. Trimmer on Gang
C7		Oscillator Trimmer on Gang
C8	10031	.5 x 120 v.
C9	12912	.00025 mica
C10	12437	350 mmfd. W C. Series Pad
C11	10020	.1 x 200 v.
C12	10031	.5 x 120 v.
C13	10020	.1 x 200 v.
C14	10053	.25 x 400 v.
C15	11965C	16 mfd. lytic—350 w. v.
C16	11965C	16 mfd. lytic—350 w. v.
C17	10011	.01 x 400 v.
C18	1295	.0001 Mica
C19	10011	.01 x 400 v.
C20	1295	.0001 Mica
C21	10011	.01 x 400 v.
C22	100100	.008 x 1600 v.
C23	1295	.0001 Mica
C24	10011	.01 x 400 v.
C25	10020	.1 x 200 v.
C26	10054	.006 x 600 v.
		C2 and C3 in same unit
		PARTS
T1	11171	Antenna Coil
T2	10935	R. F. Coil
T3	11057	Oscillator Coil
T4	10896B	Input I. F.—465 kc.
T5	10898	Output I. F.—465 kc.
T6	10537	Output Transformer
T7	11459	5" Dynamic Speaker (4.6 Ohm Field)
T8	104159B	Power Transformer
L1	11176	Antenna Filter Choke
L2	10526	"A" Choke
L3	10524	"A" Choke
L4	10519	"A" Choke
P1	10797	6-8 v. pilot light
S1		Off-on switch on volume control

WESTERN AUTO SUPPLY CO.

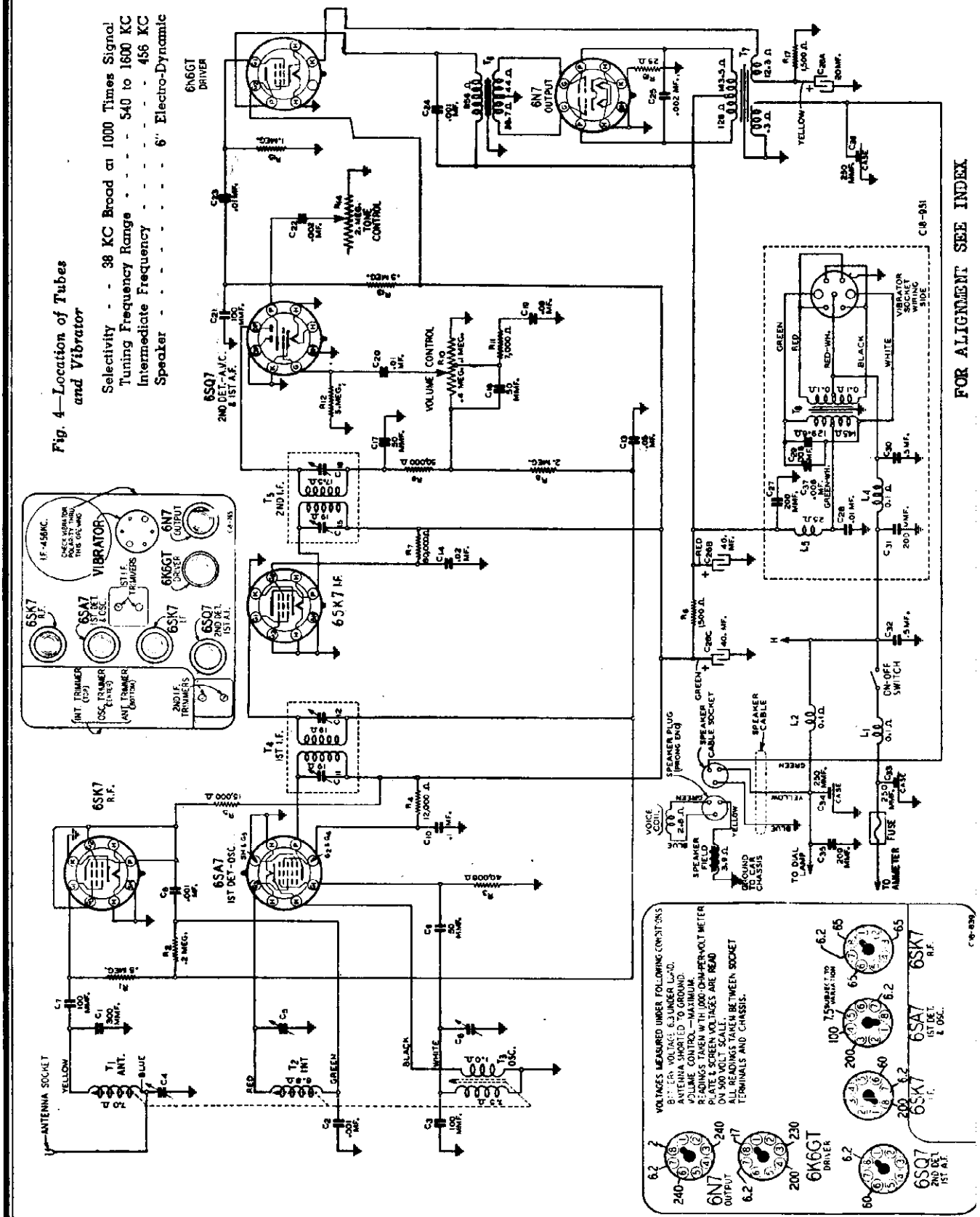
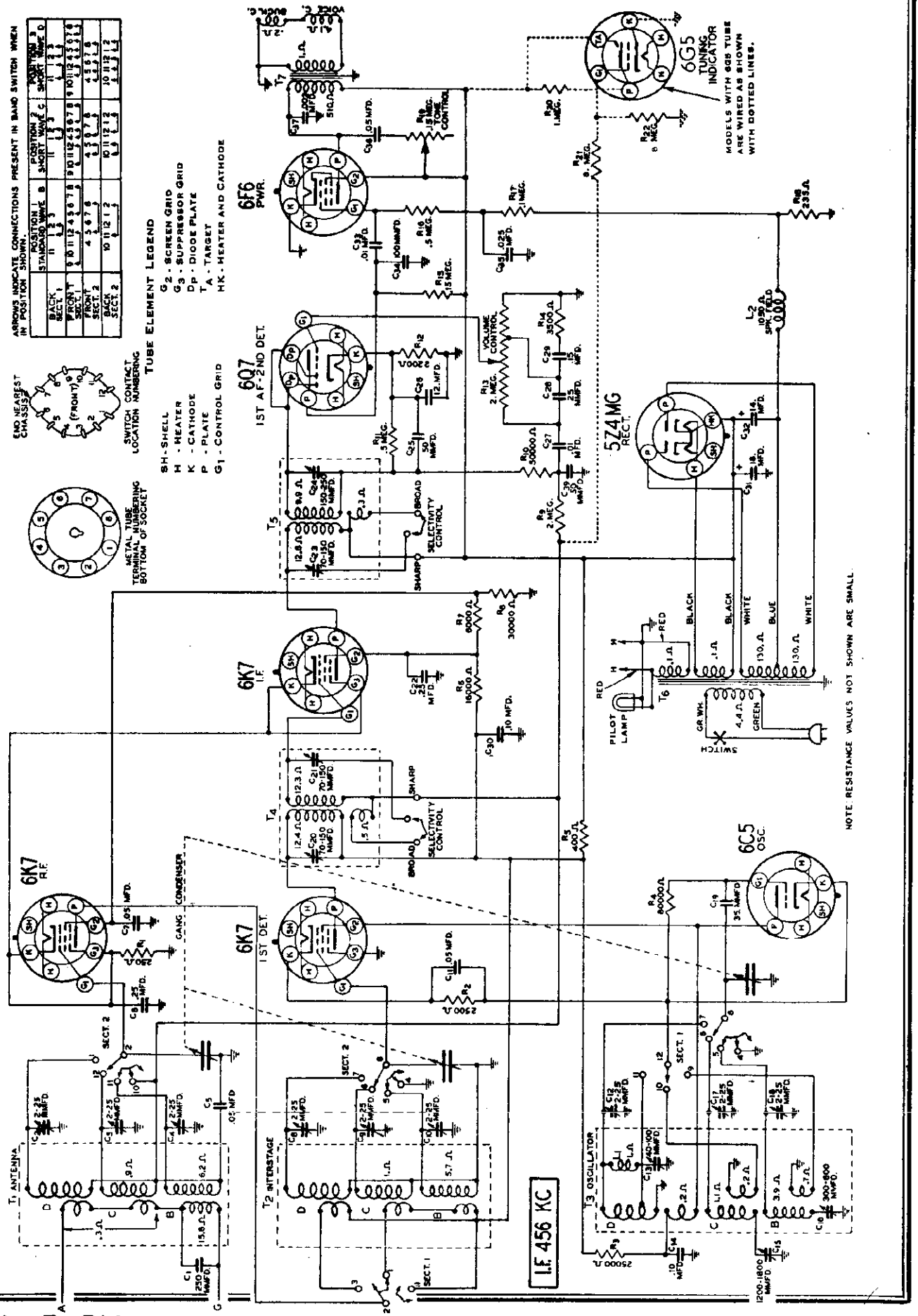


Fig. 4—Location of Tubes and Vibrator

FOR ALIGNMENT SEE INDEX

MODEL D701

WESTERN AUTO SUPPLY CO.



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 socket) is shown in Fig. 5. 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.

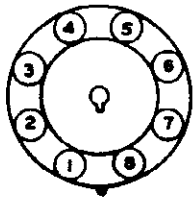


Fig. 5—Metal tube terminal numbering (bottom of socket)

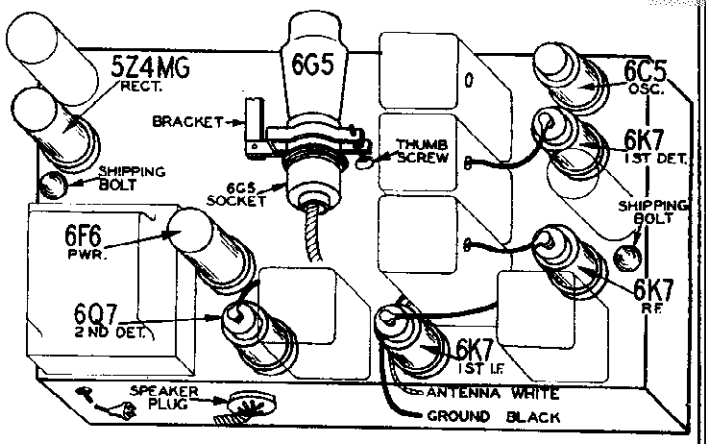


Fig. 6—Location of Tubes

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 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 456, 1730, 1500, 600, 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 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.

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 selector in the standard wave position.

MODEL D701

WESTERN AUTO SUPPLY CO.

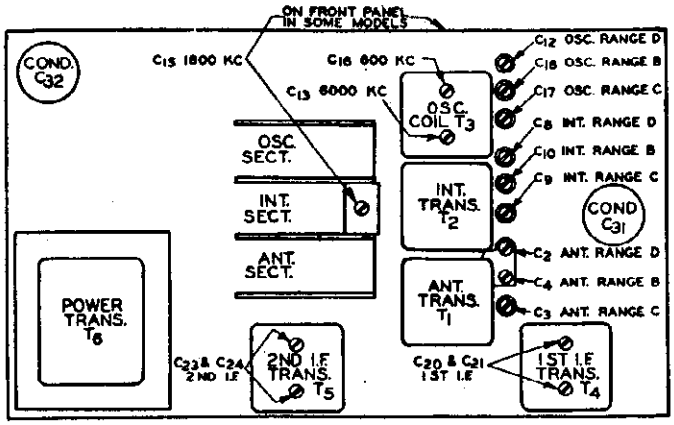


Fig. 3—Location of Trimmers

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 (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 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 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 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.

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.

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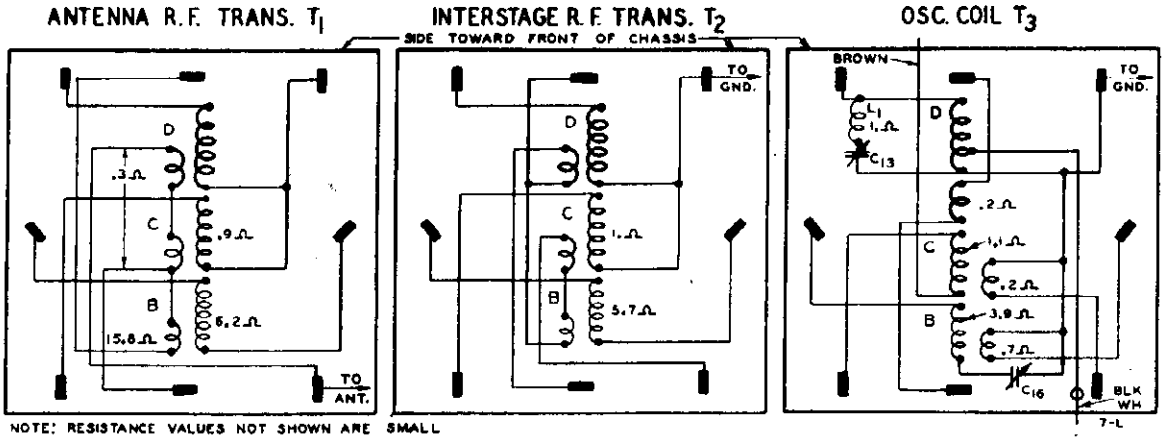

Fig. 4—R. F. and Oscillator Coil Base Terminal Arrangement and D. C. Resistance of Windings

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.

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. Unsolder the .01 mf. condenser C27 from the volume control.

Strip about 2¾ 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 connected 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 mf. 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.

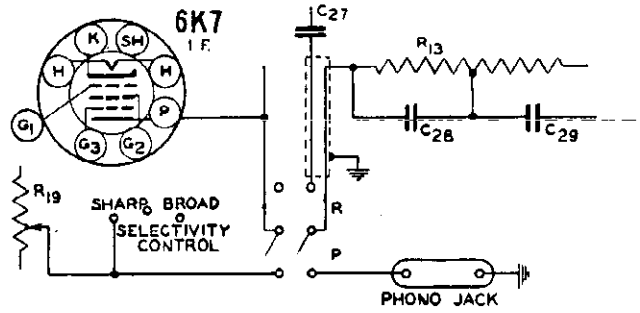

Fig. 7—Phonograph Connections

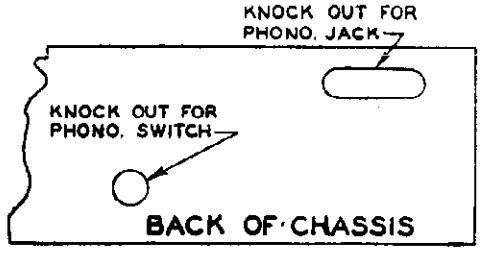

Fig. 8—Location of Phono Knockouts

MODEL D716

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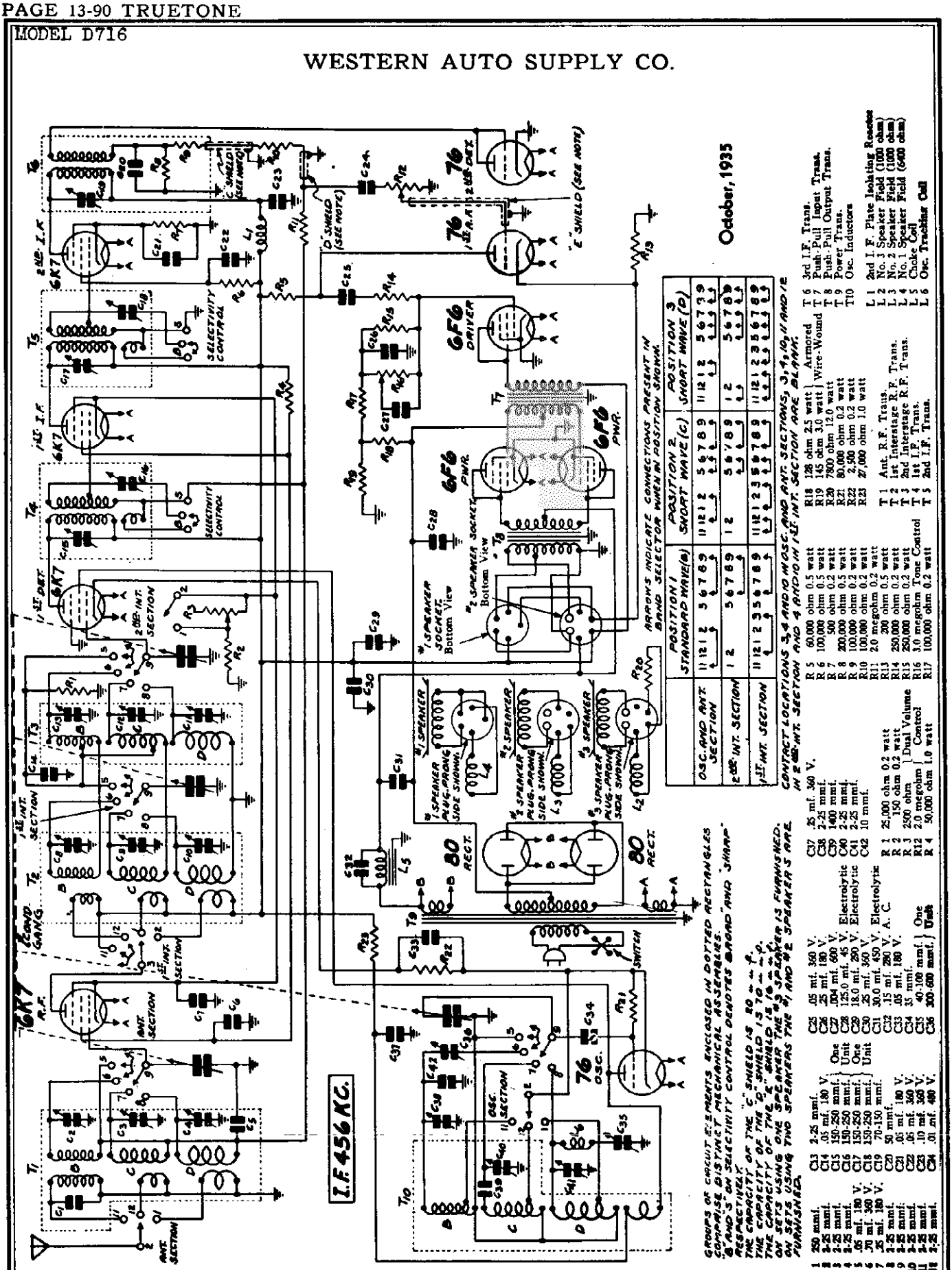

	POSITION 1 STANDARD WAVE(B)	POSITION 2 SHORT WAVE(C)	POSITION 3 SHORT WAVE(D)
OSC. AND ANT. SECTION	11 12 1 2 5 6 7 8 9	11 12 1 2 5 6 7 8 9	11 12 1 2 5 6 7 8 9
2ND INT. SECTION	1 2 5 6 7 8 9	1 2 5 6 7 8 9	1 2 5 6 7 8 9
1ST INT. SECTION	11 12 1 2 3 5 6 7 8 9	11 12 1 2 3 5 6 7 8 9	11 12 1 2 3 5 6 7 8 9

C1	250 mmf.	C13	2-25 mmf.	C25	.05 mf. 360 V.	C37	.25 mf. 360 V.	
C2	2-25 mmf.	C14	.05 mf. 180 V.	C26	.25 mf. 180 V.	C38	2-25 mmf.	
C3	2-25 mmf.	C15	150-250 mmf. One	C27	.004 mf. 600 V.	C39	1400 mmf.	
C4	2-25 mmf.	C16	150-250 mmf. Unit	C28	125.0 mf. 45 V. Electrolytic	C40	2-25 mmf.	
C5	.05 mf. 180 V.	C17	150-250 mmf. One	C29	18.0 mf. 290 V. Electrolytic	C41	2-25 mmf.	
C6	.05 mf. 180 V.	C18	150-250 mmf. Unit	C30	.25 mf. 360 V.	C42	10 mmf.	
C7	.25 mf. 180 V.	C19	70-150 mmf.	C31	30.0 mf. 450 V. Electrolytic			
C8	2-25 mmf.	C20	50 mmf.	C32	.15 mf. 290 V. A. C.	R 1	25,000 ohm 0.2 watt	
C9	2-25 mmf.	C21	.05 mf. 180 V.	C33	.05 mf. 180 V.	R 2	150 ohm 0.2 watt	
C10	2-25 mmf.	C22	.05 mf. 360 V.	C34	33 mmf.	R 3	2500 ohm	Dual Volume
C11	2-25 mmf.	C23	.05 mf. 360 V.	C35	40-100 mmf. One	R12	2.0 megohm	Control
C12	2-25 mmf.	C24	.01 mf. 400 V.	C36	300-600 mmf. Unit	R 4	50,000 ohm 1.0 watt	

R 5	60,000 ohm 0.5 watt	R18	128 ohm 2.5 watt	Armored	T 6	3rd I.F. Trans.	L 1	2nd I.F. Plate Isolating Reactor
R 6	100,000 ohm 0.5 watt	R19	145 ohm 3.0 watt	Wire-Wound	T 7	Push-Pull Input Trans.	L 2	No. 3 Speaker Field (1000 ohm)
R 7	500 ohm 0.2 watt	R20	7800 ohm 12.0 watt		T 8	Push-Pull Output Trans.	L 3	No. 2 Speaker Field (1000 ohm)
R 8	200,000 ohm 0.5 watt	R21	80,000 ohm 0.2 watt		T 9	Power Trans.	L 4	No. 1 Speaker Field (6400 ohm)
R 9	100,000 ohm 0.2 watt	R22	2,500 ohm 0.2 watt		T10	Osc. Inductors	L 5	Choke Coil
R10	100,000 ohm 0.2 watt	R23	27,000 ohm 1.0 watt				L 6	Osc. Trackstar Coil
R11	2.0 megohm 0.2 watt							
R13	200 ohm 0.5 watt	T 1	Ant. R.F. Trans.					
R14	250,000 ohm 0.2 watt	T 2	1st Interstage R.F. Trans.					
R15	250,000 ohm 0.2 watt	T 3	2nd Interstage R.F. Trans.					
R16	3.0 megohm Tone Control	T 4	1st I.F. Trans.					
R17	100,000 ohm 0.2 watt	T 5	2nd I.F. Trans.					

Alignment and Calibration

Correct alignment is extremely important in connection with all wave receivers. 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, 5800, 5000, 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. If a station is tuned in with the selectivity control in the broad position and this control is then turned to the sharp position, the station may disappear. This is not an indication that the receiver is out of alignment.

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 to the grid of the 1st detector through a 0.1 MF condenser.

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 selectivity control to the sharp position and keep it in this position for all adjustments.

Turn the volume control to the maximum position.

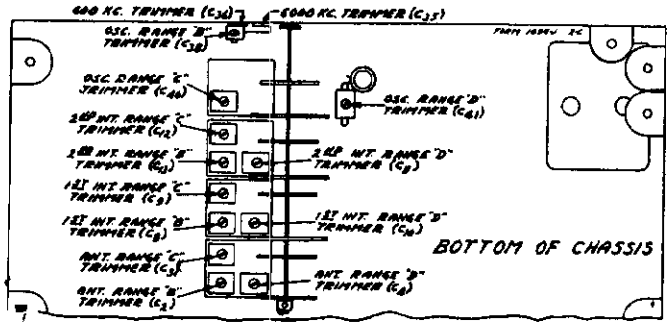

Fig. 3 — Location of Trimmers

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. 5.

Range B Alignment

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 selector 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 A.V.C. action.

Adjust the oscillator Range B trimmer (C38) 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 1st and 2nd interstage Range B trimmers (C8 and C13) 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 6000 KC trimmer until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Use a non-metallic screwdriver for this adjustment

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.

Part No.	Winding	Ohms
P-9A418	Antenna R. F. Transformer T1	
	Range B Primary Winding	21.4
	Range C Primary Winding	0.3
	Range D Primary Winding	0.2
	Range B Secondary Winding	6.1
	Range C Secondary Winding	2.1
	Range D Secondary Winding	Small
P-9A411	1st Interstage R. F. Transformer T2	
	Range B Primary Winding	3.6
	Range C Primary Winding	2.4
	Range D Primary Winding	0.5
	Range B Secondary Winding	5.8
	Range C Secondary Winding	2.1
	Range D Secondary Winding	Small
P-9BK24	Audio Input Transformer T7	
	Primary Winding	913.0
	Secondary Winding	
	Center Tap to Inside	211.7
	Center Tap to Outside	288.5
P-9AK26	Audio Output Transformer T8	
	Primary Winding	
	Center Tap to Inside	135.5
	Center Tap to Outside	155.3
	Secondary Winding	
	Tap to Upper Side	0.35
	Tap to Ground Side	0.12
P-9AK22	Power Transformer (115 Volt-60 Cycle) ... T9	
	Primary Winding	1.7
	Tube Filament Secondary (A-A)	Small
	Tube Filament Secondary (B-B), (80)	Small
	High Voltage Secondary Winding	
	Center Tap to Inside	97.9
	Center Tap to Outside	106.4
P-9A427	Oscillator Coils T10	
	Range B Grid Coil	
	Red White Tap to White	2.1
	Red White Tap to Ground	0.7
	Range C Grid Coil	
	Green White Tap to Green	1.7
	Green White Tap to Ground	0.5
	Range D Grid Coil	
	Black White Tap to Black	Small
	Black White Tap to Ground	Small
	Oscillator Plate Coil	0.2
P-9A400	2nd I. P. Plate Isolating Resistor L1	35.7
P-12A204	12" Dynamic Speaker (No. 1—See Fig. 2)	
	Speaker Field L4	6400.
	Voice Coil	Small
P-12A205	12" Dynamic Speaker (No. 2—See Fig. 2)	
	Speaker Field L3	1000.
	Voice Coil	Small
P-12A226	12" Dynamic Speaker (No. 3—See Fig. 2)	
	Speaker Field L2	1000.
	Voice Coil	Small
P-12X39	Reactor Assembly L5	142.5
P-9A391	High Frequency Oscillator Tracking Coil .. L6	1.0
P-9A412	2nd Interstage R. F. Coils T3	
	Range B Section	
	Long Portion	5.9
	Short Portion	0.2
	Range C Section	
	Long Portion	1.6
	Short Portion	0.2
	Range D Section	Small
P-9A413	1st I. P. Transformer T4	
	Primary Winding	4.4
	Coupling Winding	0.3
	Secondary Winding	
	Tap to Condenser Side	2.3
	Tap to Switch Side	2.1
P-9A414	2nd I. P. Transformer T5	
	Primary Winding	4.3
	Coupling Winding	0.3
	Secondary Winding	
	Tap to Condenser Side	2.3
	Tap to Switch Side	2.3
P-9A415	3rd I. P. Transformer T6	

MODEL D716

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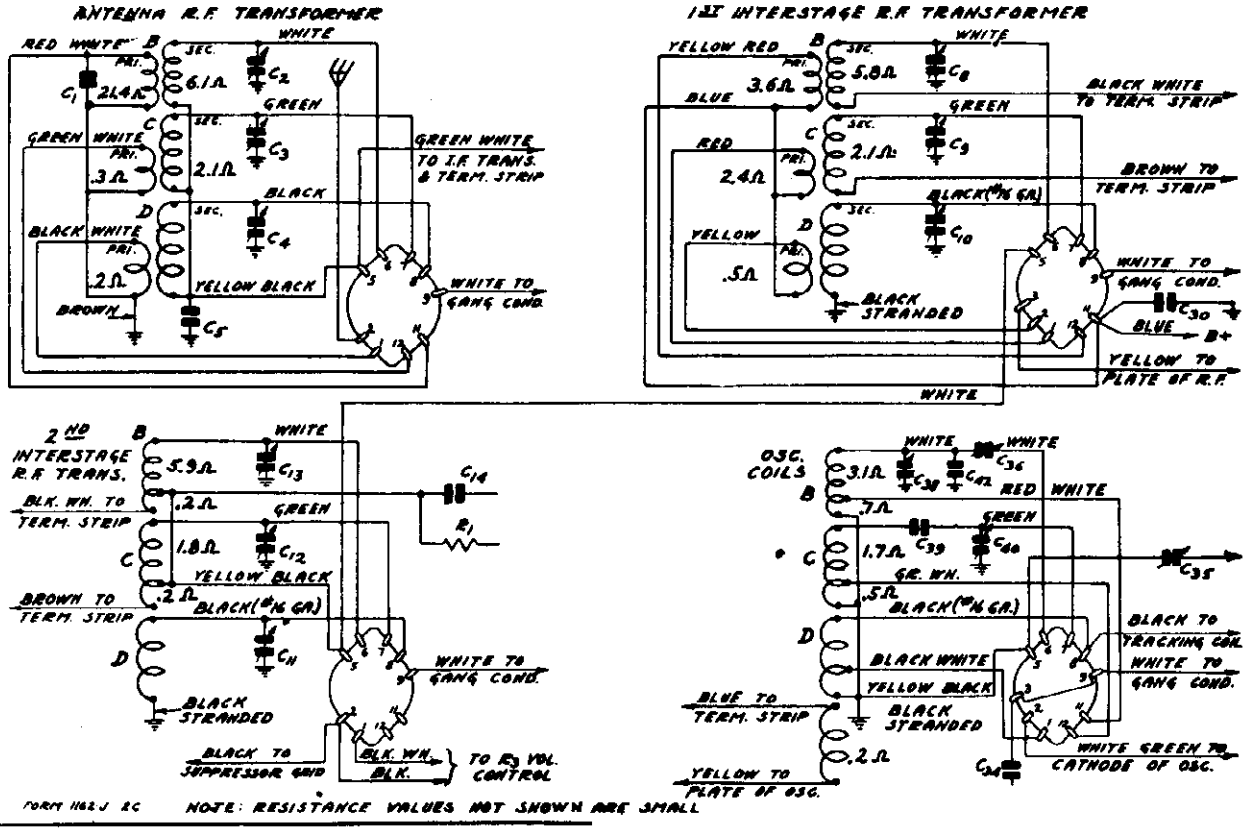


Fig. 4—Color Coding of Coil Wires and D. C. Resistance of Windings. (Also see complete D. C. Resistance List)

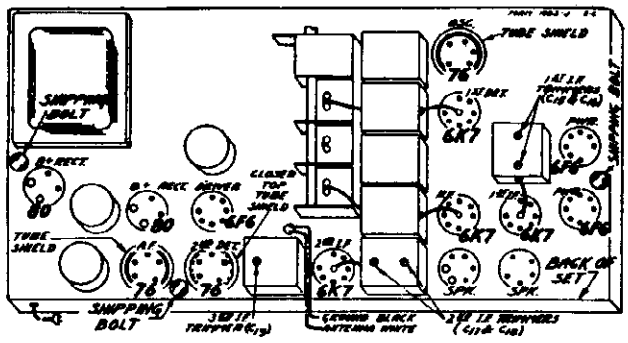


Fig. 5—Location of Tubes

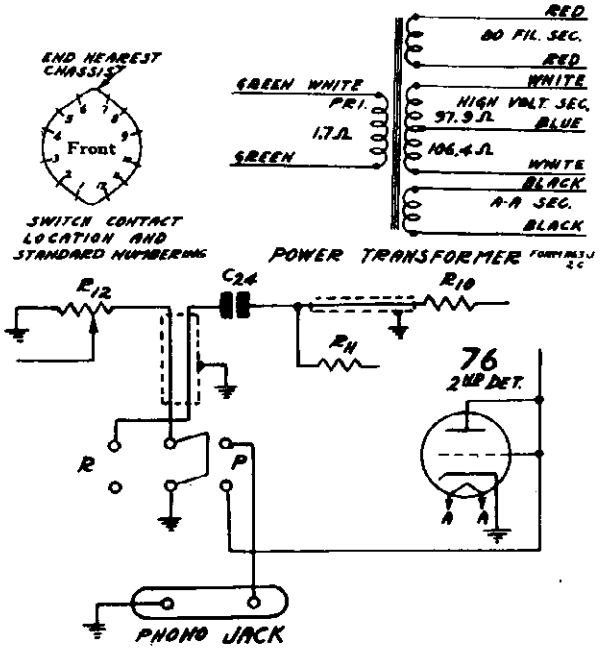


Fig. 7—Phonograph Connections

VOLTAGES AT SOCKETS
Line Voltage 115 - Antenna Shorted to Ground
Volume Control at Maximum

Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cath. to Ground	Cath. M A
6K7	R. F.	6.2	245	80	2.8	7.6
6K7	1st Det.	6.2	245	90	6.5	2.6
76	Osc.	6.2	90			5.3
6K7	1st I. F.	6.2	245	80	2.8	7.6
6K7	2nd I. F.	6.2	245	74	3.9	7.0
76	2nd Det.	6.2				
76	1st A. F.	6.2	110		5.6	2.1
6F6	Driver	6.2	235	230	20.0(1)	27.0
6F6	Power	6.2	345	345	38.0(2)	22.5
80	Rectifier	5.1	500(3)			140.0(4)

(1) As read across R19
(2) Grid to Ground
(3) Plate to Center Tap
(4) Two tubes in parallel

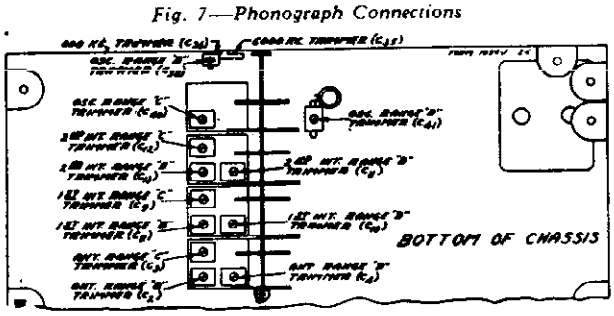
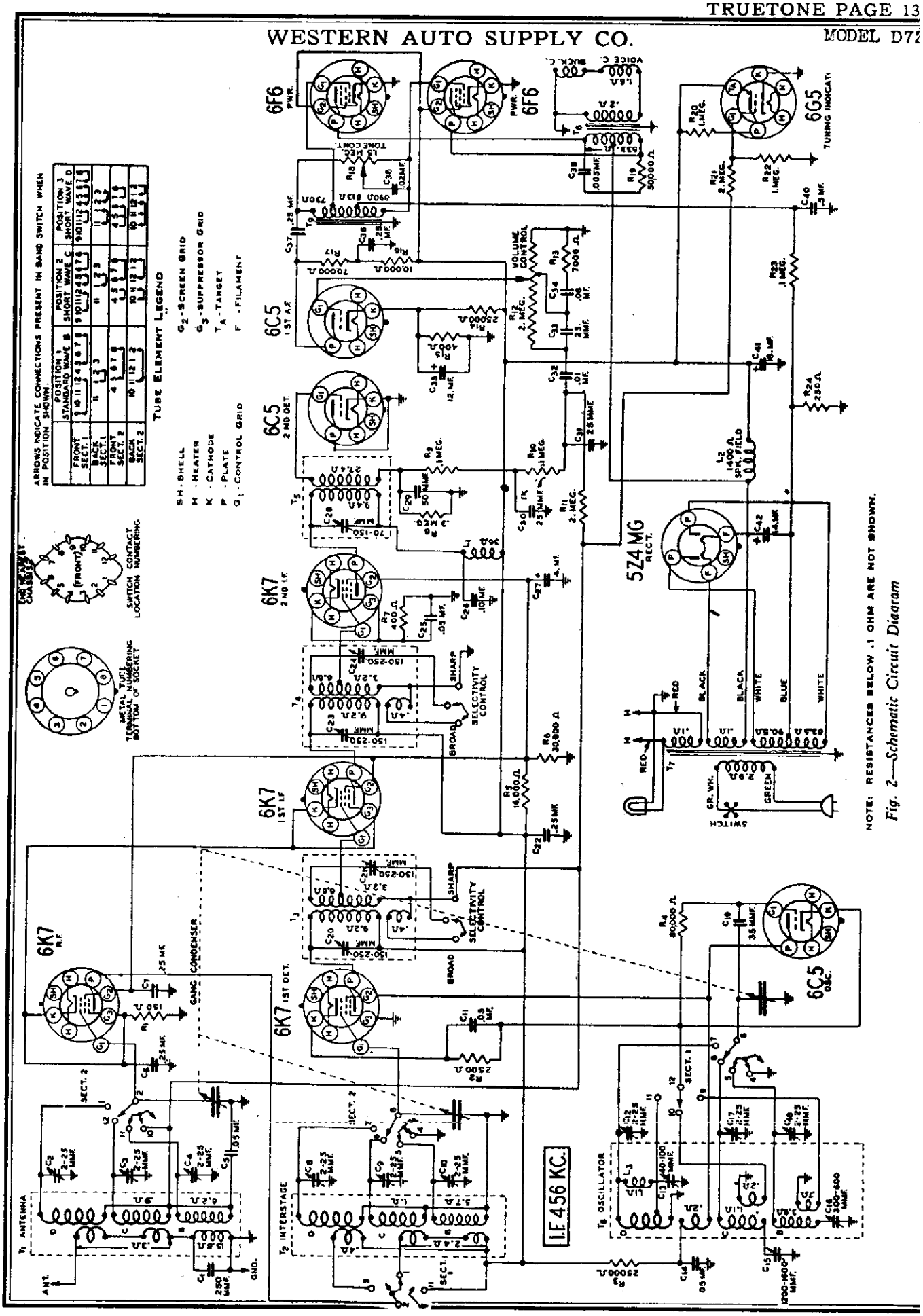


Fig. 3—Location of Trimmers



NOTE: RESISTANCES BELOW .1 OHM ARE NOT SHOWN.

Fig. 2—Schematic Circuit Diagram

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 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 (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. Re-tighten 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. Re-tighten 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 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 (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.

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 switch to the Range D position (second 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 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. 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.

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 condenser 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

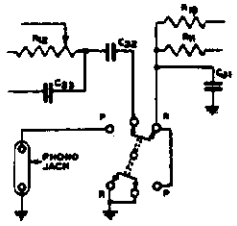


Fig. 7—Phonograph Connections

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 6C5 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 6F6 power tube nearest 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 socket) is shown in Fig. 5 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.

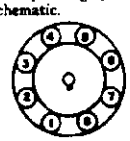


Fig. 5—Metal Tube Terminal numbering (bottom of socket)

WESTERN AUTO SUPPLY CO.

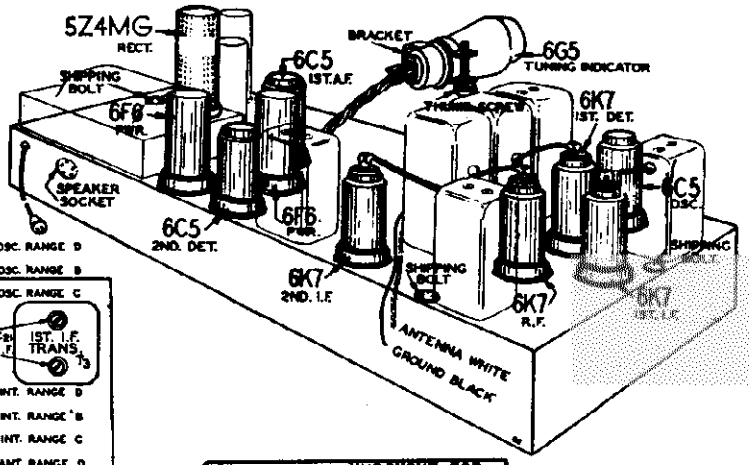


Fig. 6—Location of Tubes

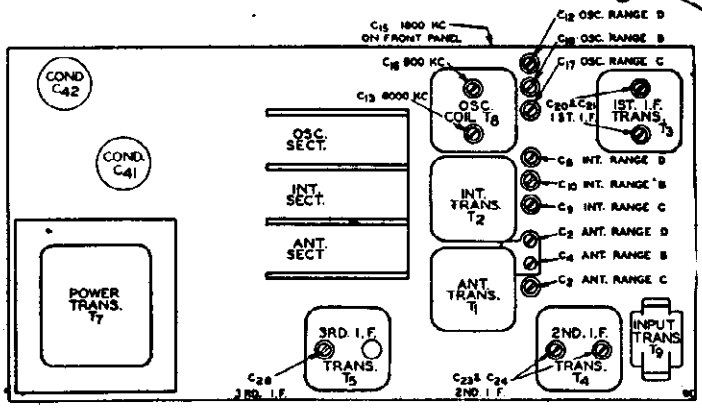


Fig. 5—Location of Trimmers

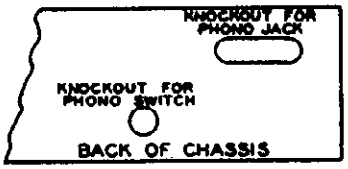
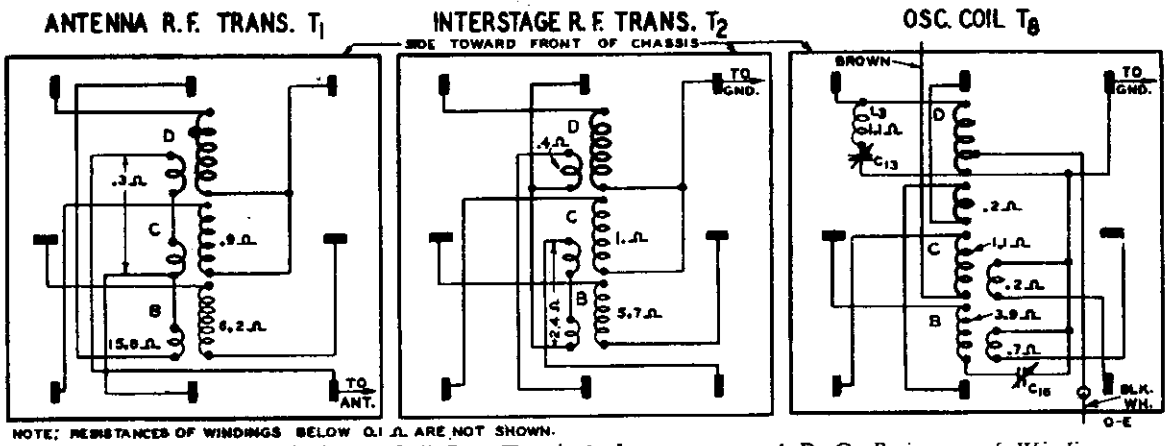


Fig. 8—Location of Phono Knockouts



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.	

(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.

MODEL D725

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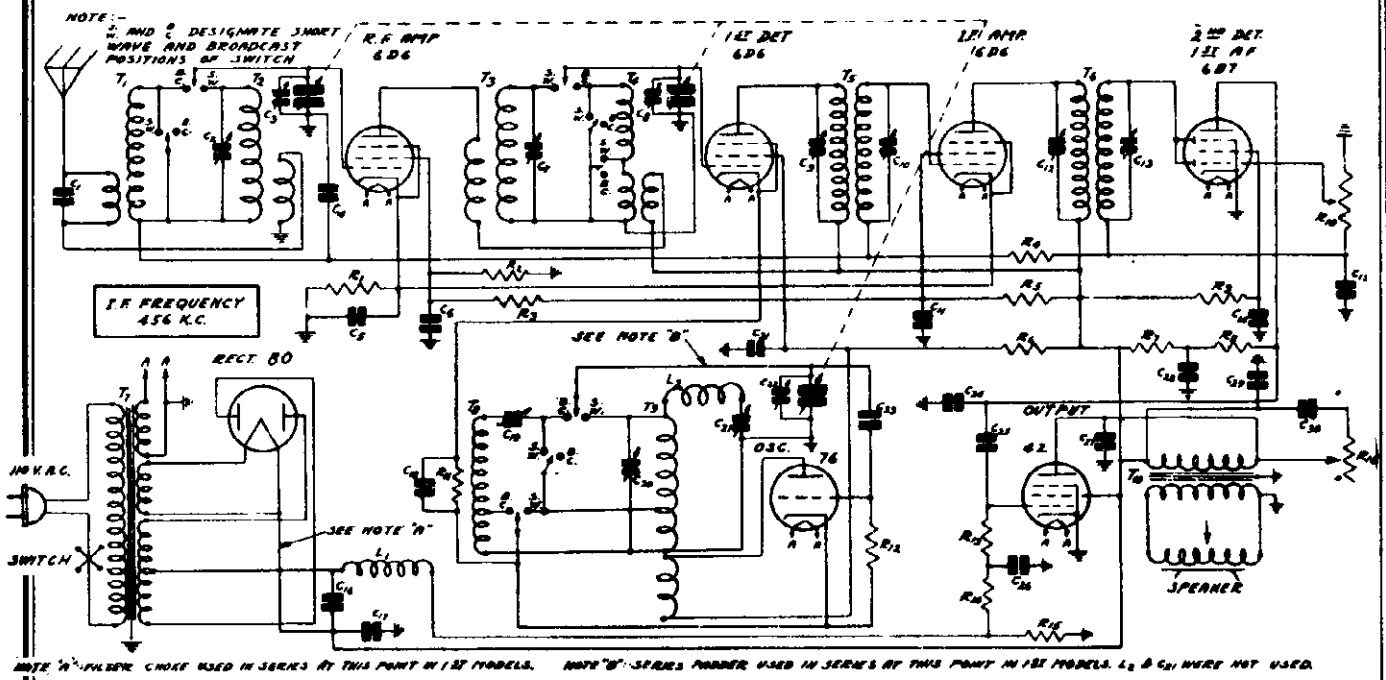


Fig. 1—Schematic Circuit Diagram

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 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 of 456 K. C. and accurately calibrated signals over the broadcast and short wave bands, 530-1740 K. C. and 5.8-18.3 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 ground lead from the signal generator goes to the ground lead of the receiver. The volume control should be at the maximum position. Attenuate the signal so that A. V. C. action is not obtained.

Then adjust the four I. F. trimmer condensers until maximum output is obtained. The adjusting screws for these condensers are reached from the top of the chassis and are in the round I. F. cans—See Fig. 2. The openings to the trimmer condensers are covered over by a small cover plate which is held in position by a screw. Loosen these screws until the cover plates can be swung around.

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 is in this instance connected to the antenna lead of the receiver. Attenuate the signal so that A. 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 1500 K. C. Turn the rotor until maximum output is obtained. Loosen the pointer screw and set the pointer at the 1500 K. C. mark on broadcast band scale. Retighten pointer screw. Then adjust the antenna and 1st detector broadcast trimmers until maximum output is obtained.

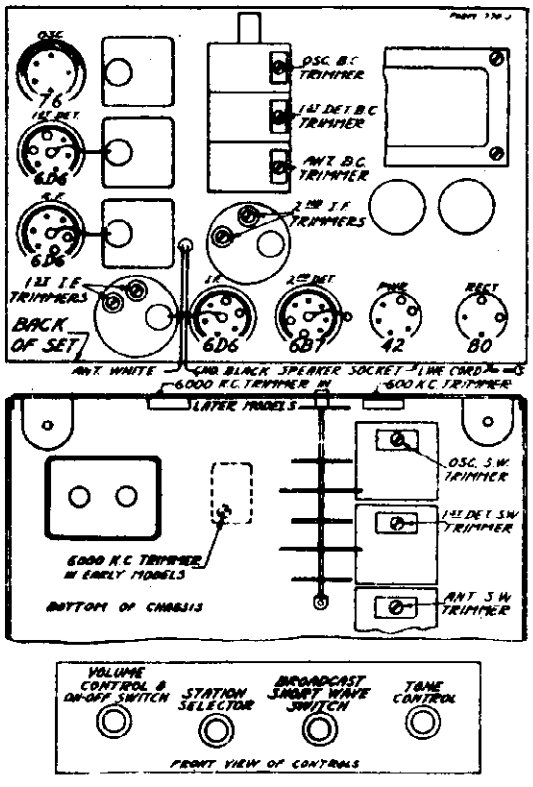


Fig. 2—Tube Arrangement and Location of Trimmers

Next 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. 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.

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.

Turn the broadcast short wave switch to the short wave position. Turn the rotor to the full open position. As explained above, the volume control should be at the maximum position and the signal should be attenuated to prevent A. V. C. action. Set the signal generator for 18,300 K. C. Then adjust the oscillator short wave trimmer for maximum output. This trimmer is reached from under the chassis and its position is shown in Fig. 2.

Next set the signal generator for 15,000 K. C. Turn the rotor until the dial pointer is at the 15,000 K. C. mark on the short wave portion of the dial scale. Then adjust the antenna and 1st detector short wave trimmers until maximum output is obtained.

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 points 912 K. C. apart. That is, if the receiver is tuned to 15,000 K. C. a signal will be heard when the signal generator is set at 15,000 K. C. and again at approximately 15,912 K. C. This is due to image reception or 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 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.

Next set the signal generator for 6000 K. C. and adjust the 6000 K. C. trimmer. In the first models of this receiver, this condenser was located at the point shown in Fig. 2 in dashed lines. In the later models it is reached through a hole in the front panel of the chassis as shown in the same illustration. 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 6000 K. C. trimmer screw until the highest output is obtained. In the early models this adjustment is broad while in the later models it is more critical.

Caution

The can of electrolytic condenser C16 is not at ground potential. Therefore in any work on the chassis, care should be taken not to touch this can and any other grounded point such as the other electrolytic condenser can.

Replacing Drive Cord

Remove chassis from cabinet.

Take off the pilot light assembly by lifting off 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. 3.

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. 3. Insert one end of the drive cord from the outside through the hole in the eyelet in the drive drum.

Voltages at Sockets

LINE VOLTAGE — 115
ANTENNA SHORTED TO GROUND

Type of Tube	Function	Across Fila. or Heater	Plate to Cath.	Screen to Cath.	Control Grid to Cath.	Normal Plate M. A.
6D6	R. F.	6.3	246	100	3.6(1)	5.3
6D6	1st Det.	6.3	237	97	8.0(2)	3.4
76	Osc.	6.3	115		0	4.8
6D6	I. F.	6.3	246	130	3.6(1)	8.3
6B7	2nd Det.	6.3	50(3)	40(3)	0	2.7
42	Power	6.3	230	245	17.0(4)	33.0
80	Rectifier	5.0				37.0 per plate

(1) Cathode to ground
(2) Subject to variation
(3) Read with 1,000,000 ohm meter
(4) As read across R15

Tie the end of the cord which has been inserted in the hole to one end of the tension spring.

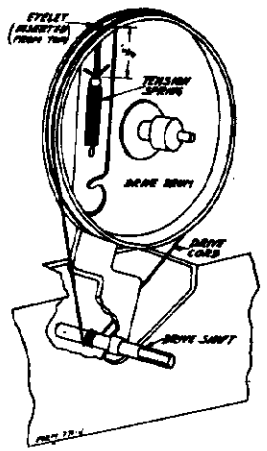


Fig 3—Drive Cord Replacement

Wrap the cord in a clockwise direction (facing front of chassis) around the drive drum approximately one-half turn.

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 the drive shaft as shown in Fig. 3.

Then bring this cord up from the drive shaft and wrap it around the drive drum approximately one and one fifth 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 of the spring, when hanging free, should be approximately ¼" from the flange of the drum as shown in Fig. 3. Cut off the surplus length of cord after it is knotted.

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 may be reinstalled in the cabinet.

Changes in Early Models

There are two points at which the early models of this receiver differ from the present models. These points are indicated in Fig. 1 and described below.

Power Unit

In the early models a separate filter choke was used in series at the point indicated in note A in Fig. 1. The values of the two filter condensers C16 and C17 were less than as used at present. The values of the old and new condensers are shown in the parts list. A different power transformer was also used with the early filter system and this is likewise shown in the parts list.

The two power transformers are not interchangeable and care must be taken in ordering for replacement purposes to order the correct one. The original chassis can be identified by the separate filter choke.

Short Wave Oscillator

Referring to Fig. 1 it will be noted that there is a tracking coil L2 and a trimmer condenser C21 connected in series between the short wave oscillator coil and ground. In the first models of this receiver these two units, which are required for tracking the short wave oscillator, are not used. Instead a series padding condenser was used at the point in the circuit indicated by note B in Fig. 1.

At the time this change was made a change was also made in the oscillator assembly and care must be taken in ordering for replacement purposes to order the correct one. Early models with the original oscillator assembly have no spot of paint or a green spot of paint on the 80 socket rivet. Later models with the new oscillator assembly and new tracking system have a red spot of paint on the 80 socket rivet.

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 110-220 Volt, 40-60 cycle Power Transformer is also available for this model.

REPAIR PARTS LIST FOR 7 TUBE BROADCAST AND SHORT WAVE RECEIVER

When ordering parts be sure and give the part number. Also give the series number which will be found in the License Notice label. If there is a spot of paint on the chassis, give this color.

Part No.	Item	List Price
P-1661	Double Mounting Strip	.10
P-1421	Single Mounting Strip	.10
P-2060	Knob Small	.30
P-2062	Knob Large	.35
P-10337	Small Tone & Volume Control Disc	.10
P-20973	Pointer, Large	.20
P-3012	Pilot Light Bulb 6-8 volt	.15
P-10272	Rubber Mounting Feet	.10
P-10438	Glass Crystal	.15
P-20833	Crystal Retainer Ring	.10
P-2209	6" Speaker Mantel Sets I.1 - 1250 ohm	6.00
P-2997	6" Speaker (Console Sets I.1 - 1250 ohm 8" Black Drive Cord (V. C. or T. C. Ind.) 39" Black Drive Cord (Cond. Drive)	6.75 .85 .10
P-2136	Pilot Lamp Socket & Clip Assembly	.10
P-2131	Broadcast-Short Wave Switch	1.00

Part No.	Item	List Price
P-1005	No. 6D6 Socket	$ .15
P-3022	No. 76 Socket	.15
P-1944	No. 6B7 Socket	.15
P-1004	No. 42 Socket	.15
P-3023	No. 80 Socket	.15
P-1631	Speaker Socket	.10
P-40445	Tube Shield for 6D6 & 6B7 Tubes	.15
P-40444	Tube Shield for 76 Tube	.15
P-40443	Tube Shield Bases	.10
*P-30634	Power Transformer 115 Volts, 60 Cycles	3.00
*P-30635	Power Transformer 115 Volts, 25 Cycles	4.50
*P-30636	Power Transformer 115-220 Volts, 40-60 Cycles	3.25
†P-30646	Power Transformer 115 Volts, 60 Cycles	3.00
†P-30647	Power Transformer 115 Volts, 25 Cycles	4.50
†P-30648	Power Transformer 115-220 Volts, 40-60 Cycles	3.75
*P-30637	Filter Reactor	.00
P-30599 A	Output Transformer T 10	1.15
P-3176	Antenna R.F. Trans. less can T1 & T2	1.00
P-3177	Inter Stage R. F. Trans. less can T3 & T4	1.75
*P-3178	Oscillator Coil Assembly Less can T8 & T9	1.70
†P-3178	Oscillator Coil Assembly Less can T8 & T9	1.70
P-40435	Cans for the above Assemblies	.15
†P-3190	High Frequency Oscillator Tracking Coil L2	.35
P-3179	1st I. F. Assembly Complete with Can T5	2.15
P-3180	2nd I. F. Assembly Complete with Can T6	1.75
P-30342 A	Grid Cap Only	.10
P-70202	AC Cord & Plug	.20
P-1504	8 Terminal Mounting Strip	.30

Part No.	Code	Resistance	Watts	Type	List Price
P-90016	R1	300 ohm	.2	Flex. Wire Wound	$ .15
P-393300	R2	30,000 ohm	.5	Carbon	.20
P-394002	R3	6,000 ohm	.5	Carbon	.15
P-A95305	R4	2.0 megohm	.2	Carbon	.15
P-90820	R5	16,000 ohm	1.5	Armored	
	R6	25,000 ohm	1.0	wire wound	.65
P-A94203	R7	30,000 ohm	.2	Carbon	.15
P-394603	R8	60,000 ohm	.5	Carbon	.15
P-394254	R9	250,000 ohm	.5	Carbon	.15
P-90014	R10	500,000 ohm		Vol. Control & Switch	1.05
P-A94252	R11	2,300 ohm	.2	Carbon	.15
P-A94106	R12	100,000 ohm	.2	Carbon	.15
P-A95306	R13	500,000 ohm	.2	Carbon	.20
P-A94104	R14	100,000 ohm	.2	Carbon	.15
P-90015	R15	235 ohm	2.0	Flex. Wire Wound	.35
P-97011	R16	150,000 ohm		Tone Control	.75

Part No.	Code	Capacity	Volts	Type	List Price
P-80919	C1	.00025 mfd.		Moulded	$ .20
P-2102	C2	3-40 mmfd.		Ant. S.W. Trimmer	.15
	C3	(See 3 Gang Cond.)		Gang Trimmer	
P-80862	C4	.05 mfd.	200V.	Tubular	.15
P-80888	C5	.25 mfd.	200V.	Tubular	.25
P-80890	C6	.01 mfd.	400V	Tubular	.20
P-2102	C7	3-40 mmfd.		1st Det.S.W. Trim	.15
	C8	(See 3 Gang Cond.)		Gang Trimmer	
P-1386 B	C9	90+30 mmfd.		Dual Trimmer	
	C10	90+30 mmfd.		Part of I. F. Assem.	
P-81039	C11	.25 mfd.	400V	Tubular	.30
P-1386 B	C12	90+30 mmfd.		Dual Trimmer	
	C13	90+30 mmfd.		Part of I. F. Assem.	
P-81040	C14	.25 mfd.	400V.	Tubular	.35
P-80977	C15	.0004 mfd.		Moulded	.20
†P-81043	C16	18.0 mfd.	30V.	Electrolytic Wet	1.30
*P-80916	C16	8.0 mfd.	450V.	Electrolytic Wet	1.25
*P-81032	C17	8.0 mfd.	500V.	Electrolytic Wet	1.30
†P-81042	C17	14.0 mfd.	400V.	Electrolytic Wet	1.45
P-80862	C18	.05 mfd.	200V.	Tubular	.15
P-2112	C19	300-300 mmfd.		600 K.C. Trimmer	.45
P-2102	C20	3-40 mmfd		Osc. S.W. Trimmer	.15
†P-1685	C21	70+30 mmfd.		6000 K.C. Trimmer	.35
	C22	(See 3 Gang Cond.)		Gang Trimmer	
P-81005	C23	.000035 mfd.		Moulded	.15
P-80914	C24	.002 mfd.	600V.	Tubular	.20
P-80981	C25	.01 mfd.	400V.	Tubular	.20
P-81044	C26	.03 mfd.	400V.	Tubular	.15
P-80914	C27	.002 mfd.	600V.	Tubular	.20
P-81033	C28	.25 mfd.	400V.	Tubular	.35
P-80887	C29	.1 mfd.	400V.	Tubular	.20
P-80890	C30	.05 mfd.	400V.	Tubular	.20
P-80892	C31	.1 mfd.	400V.	Tubular	.20
P-81027 B	3 Gang Condenser				3.3.
*P-2113		600-1300 mmfd		6000 K.C. Trimmer	.61

* Used in early Models. See Article on changes in this Manual.
† Used in Later Models. See Article on changes in this Manual.

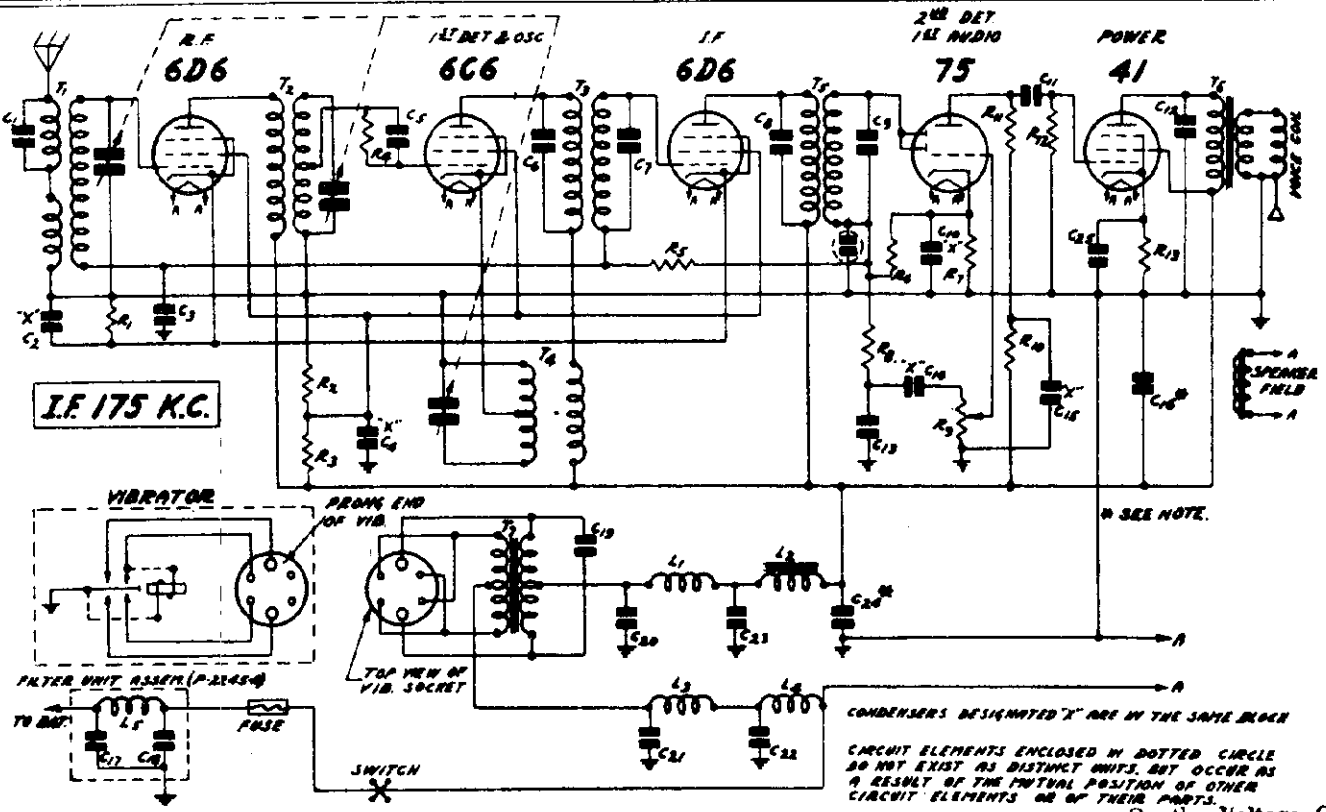


Fig. 1—*Schematic Circuit Diagram*

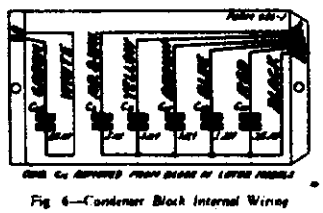


Fig. 6—*Condenser Block Internal Wiring*

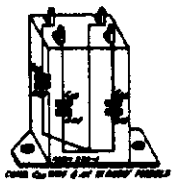


Fig. 7—*Electrolytic Block Internal Wiring*

Dec, 1934

CONDENSERS

Part No.	Code	Capacity	Voltage	Type
P-81814	C1	250 mmf.		Part of Antenna Coil Assembly
P-82600D	C2	.50 mf.	200V.	Bypass Block
	C4	.10 mf.	140V.	
	C10	.25 mf.	140V.	
	C14	.05 mf.	300V.	
	C15	.10 mf.	200V.	
P-81116	C3	.05 mf.	200V.	Tubular
P-81815	C5	.35 mmf.		Part of Grid Leak Assembly
P-81806	C6	70 mmf.		Part of 1st I. F. & Osc. Coil Assembly
	C7	70 mmf.		
P-81806	C8	70 mmf.		Part of 2nd I. F. Coil Assembly
	C9	70 mmf.		
P-81115	C11	.05 mf.	300V	Tubular
P-81114	C12	.006 mf.	600V.	Tubular
P-81814	C13	.250 mmf		Moulded
P-81132	C16	.10 mf.	300V.	Tubular
	C17	.01 mf.	120V.	In Choke Condenser Unit
	C18	.01 mf.	120V.	
P-81120	C19	.007 mf.	1600V.	Tubular
P-81122	C20	.10 mf.	300V.	Tubular
P-81121	C21	.50 mf.	140V	Tubular
P-81816	C22	.002 mf.		Moulded
P-82002	C23	4.0 mf.	250V.	Dry Electrolytic Block
	C24	2.0 mf.	250V.	
	C25	4.0 mf.	25V.	
P-82500	Gang Condenser			

RESISTORS

Part No.	Code	Resistance	Wattage	Type
P-B94351ww	R1	350 Ohm	.5	Flexible Wire Wound
P-B95253	R2	25,000 Ohm	.5	Carbon
P-B95103	R3	10,000 Ohm	.5	Carbon
P-A95105	R4	1 Megohm	.2	Carbon
P-A95105	R5	1 Megohm	.2	Carbon
P-A95504	R6	500,000 Ohm	.2	Carbon
P-A94752	R7	7,500 Ohm	.2	Carbon
P-A95104	R8	100,000 Ohm	.2	Carbon
P- 96017	R9	2 Megohm		Volume Control and Switch
P-A95503	R10	50,000 Ohm	.2	Carbon
P-A95204	R11	200,000 Ohm	.2	Carbon
P-A95504	R12	500,000 Ohm	.2	Carbon
P-B94801ww	R13	800 Ohm	.5	Flexible Wire Wound

In the first models of this receiver a bypass condenser block (P-82600) containing condensers: C2, C4, C10, C14, C15 and C16 was used. Condenser C16 was removed in the later models and added as a separate tubular condenser (P-81132) while the other condensers remained in the block (P-82600-D).

A second condenser change from the earlier models was in the electrolytic filter block (P-82002). In this block section C24 was changed from an 8 mfd., 250 volt to a 2 mfd., 250 volt condenser.

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 at the bayonet connector.

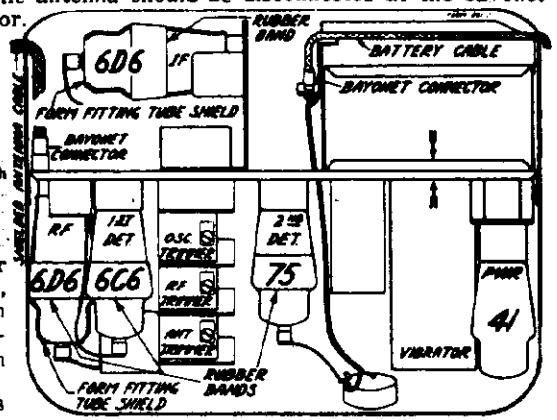


Fig. 2—*Location of Tubes and Vibrator*

WESTERN AUTO SUPPLY CO.

Condenser Alignment

Misalignment or mistracking 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 attemped 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 output meter are required for indicating the effect of adjustments.

First remove the cover of the box. Leave the antenna and battery cables connected to the chassis.

Disconnect the car antenna and connect antenna cable lead to the lead from the signal generator.

Set the signal generator for 1650 K. C. Turn the rotor to the full open position. The antenna lead from the signal generator adjustment is 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.

Now 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 calibrate the receiver, tune in a station of known frequency at about the center of the dial. Remove the escutcheon plate and glass. The pointer is held in position by friction. Grasp the pointer at the center and turn it until it points to the frequency of the station being received.

The use of the cut plate type of condenser eliminates the necessity of a 600 K. C. padder and, therefore, no adjustment at this frequency is required.

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 K. C. with the volume control about three-fourths on. Drop the chassis from the cover. The location of the antenna trimmer is shown in 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.

Removing Chassis From Case

First unsolder the black, brown, yellow, and green speaker leads which connect to the terminal strip adjacent to the vibrator unit. Next, notice the small length of braided shielding which is soldered to the solder lug that is secured to the chassis case between the dial scale and the station selector control shaft. Unsolder this shielding at the lug.

Remove the 4 screws which hold the chassis in the case — 2 are in the side and 2 on the speaker panel of the chassis case. (Do not remove the four speaker mounting screws.)

Remove the two control knobs by pulling them off of the shaft.

Next remove the volume control. To do this first loosen the hexagonal nut on the inside of the case with a flat wrench. Then unscrew and remove the round knurled nut from the front.

The chassis may then be taken out.

Replacing Vibrator Unit

The vibrator unit is plugged in in the same manner as a tube. This unit may, in case of failure, be readily replaced. CAUTION—Polarity, as explained in the label on the unit and in the label on the metal box in the chassis, must be observed when plugging in vibrator unit.

In replacing the vibrator unit be sure to replace the corrugated cardboard pad, which prevents the unit from working its way out of the socket.

When servicing this receiver, a new vibrator unit should be tried out in the same manner as a new set of tubes would be tried out.

One or more vibrator units should be kept on hand for replacement purposes.

Replacing Volume Control

To remove the volume control and the switch, first pull the knob from the volume control shaft. Next loosen the hexagonal nut on the inside of the case with a flat end wrench. Then unscrew and remove the round knurled nut from the front.

The old volume control and switch connections may now be unsoldered and the new unit put in its place and the leads resoldered.

Fasten the volume control to the case in the reverse order in which it was removed.

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.	Item	Code	D.C. Resistance in Ohms
P-[illegible]	Antenna Trans. Pri. in Series	T1	17.50
	Antenna Trans. Sec.	T1	3.75
P-[illegible]	R. F. Interstage Trans. Pri.	T2	2.11
	R. F. Interstage Trans. Sec.	T2	
	(Center Tap to Inside)		3.2[illegible]
	(Center Tap to Outside)		3.[illegible]
P-[illegible]	1st I. F. Trans. Primary	T3	100.00
	1st I. F. Trans. Secondary	T3	100.00
	Oscillator Cathode Coil (Total)	T4	4.50
	Oscillator Plate Coil	T4	9.00
P-[illegible]	2nd I. F. Trans. Pri.	T5	100.00
	2nd I. F. Trans. Sec.	T5	100.00
P-[illegible]	Power Trans. Pri.	T7	0.36
	Power Trans. Sec.	T7	[illegible]
P-[illegible]	"B" R. F. Choke	L1	1.48
P-[illegible]	Power Choke	L2	300.00
P-[illegible]	"A" Choke	L3	Small
P-[illegible]	Line Choke	L4	Small
P-[illegible]	Choke Coil	L5	Small
P-[illegible]	Output Trans. Pri.	T6	400.00
	Output Trans. Sec. and Voice Coil in Par.		0.[illegible]
	Speaker Field		6.00

When ordering parts be sure and give the part number. Also give the complete serial number which includes the Series No.

Part No.	Item
P-[illegible]	6D6 Tube Socket
P-[illegible]	6C6 Tube Socket
P-1775	75 Tube Socket
P-[illegible]	41 Tube Socket
P-[illegible]	Antenna Coil Assembly Less Can
P-[illegible]B	Can for above assembly Part of Gang Condenser Assembly
P-[illegible]	R. F. Inter-stage Coil Assembly Less Can
P-[illegible]C	Can for above assembly—Part of Chassis Assembly
P-[illegible]	1st I. F. and Oscillator Coils and Can Assembly
P-[illegible]	2nd I. F. Coil and Can Assembly
P-[illegible]	Dynamic Speaker
P-[illegible]	Carboard Baffle for Speaker
P-[illegible]	Vibrator Unit
P-[illegible]	Vibrator Socket
P-[illegible]	Power Transformer
P-[illegible]	R. F. "A" Choke Coil
P-[illegible]	R. F. "B" Choke Coil
P-[illegible]	Power Choke Coil Assembly
P-[illegible]	Filament Choke Coil
P-[illegible]	2 Half Tube Shields with Clamping Ring
P-[illegible]	Grid Leak and Condenser Assembly
P-[illegible]	Knobs
P-[illegible]	Thumb Screws
P-[illegible]	Glass Crystal
P-[illegible]	Gasket for Glass Crystal
P-[illegible]A	Grid Clip only
P-[illegible]	Wide Rubber Bands for Tubes
P-[illegible]	Shielded Antenna Cable
P-[illegible]	"A" Battery Cable
P-[illegible]	Single Lug Terminal Strip
P-[illegible]	Double Insulated Terminal Strip
P-[illegible]	Five Lug Terminal Strip
P-[illegible]	Couch Terminal Lug
P-[illegible]	Drive Tension Spring
P-[illegible]	Horse-shoe Lock (Washer)
P-[illegible]	Dial Strip
P-[illegible]	Dial Pointer

Replacing Drive Cord

The drive cord in this receiver may be replaced as follows:

Fig. 3—Cord Drive—Top View

First remove the chassis from the case as explained on page 4.

Some of the first models did not have two fibre "end" washers on the drive shaft to protect the drive cord as shown in Fig. 3. If this is the case, these washers should be put on as follows:

Separate and take off the horse-shoe lock washer which holds the drive shaft in position. This may be done with a fine pointed long nose plier.

Now pull the drive shaft out just far enough to permit the two fibre washers to be slipped over the end of the shaft.

Then slip the shaft back into place and replace the horse-shoe lock washer.

Knot one end of the new drive cord and with the condenser plates in a completely closed position, slip the drive cord through the small hole "A" in the drive drum — see Fig. 4. The knot will then be on the inside of the drum.

Now wrap the cord around the lower half of the drive drum as indicated and bring it up to the drive shaft. Proceed by wrapping it in a clockwise direction (from front) around the drive shaft three and one-quarter turns between the two fibre washers, progressing towards the front of the chassis. Be sure that the condenser plates are kept in a closed position and that the cord is held tight.

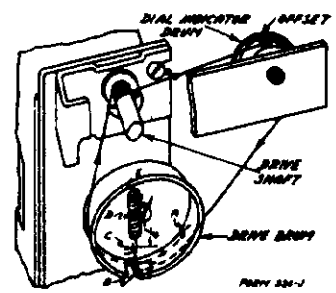


Fig. 4—Cord Drive Replacement

Set the dial indicator drum so that the offset is at the top or a little to the right of the center — see Fig. 4.

Wrap the cord from the drive shaft once around the offset in the dial indicator drum and then approximately one and one-half turns around the drum itself in a clockwise direction, progressing toward the back.

From the dial indicator drum draw the cord over the lower right hand quarter of drive drum as shown in Fig. 4.

Fig. 5—Drive "Take-up" Spring

Then bring the cord inside of the drum by way of the turned-in portion of the flange at "B".

The drive tension spring "D" to the loose end of the cord at the point "C" just above the top edge of the lip "B" as shown in the illustration. This should be done so that the lower hook of spring "D" at point "C" will be between ¼" and ⅜" from top edge of the turned-in portion of the flange "B" in the flange of the drive drum. After the spring is hooked and the drive turned over several times the tension in the cord will cause this distance to become about ⅛".

Now, by applying a tension on the drive spring "D", hook the other end of the spring into the small hole "E" near the top of the drive drum. Hook spring from the inside out.

After the cord has been put on it may be necessary to calibrate the receiver as explained in the article on condenser alignment.

All of the earlier models did not have drive shaft "take-up" springs. This spring will prevent any tendency toward change of setting should the receiver be subjected to vibration. To insert these springs and fibre washers on the drive shaft proceed as follows:

Remove the station selector knob by pulling it off of the shaft.

Slip the small fibre washer over the shaft and clip the "take-up" spring to the drive bracket as shown in Fig. 5.

The chassis may now be replaced into the case in the reverse order of the manner in which it was removed.

VOLTAGES AT SOCKETS

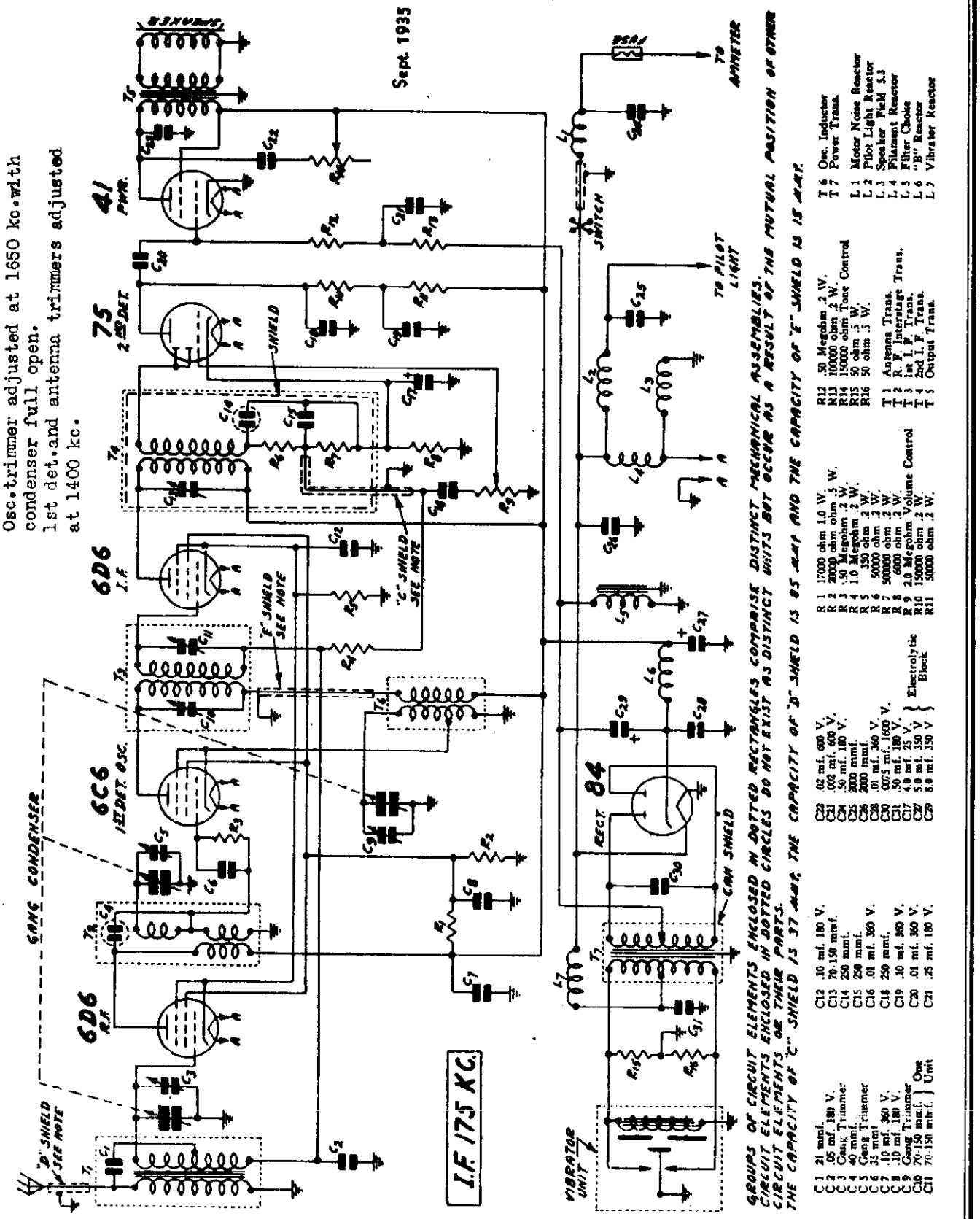
Input 6.3 Volts—Antenna Disconnected at Connector

Type of Tube	Function	Volts at Heater	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate M.A.
6D6	R. F.	6.2	154	95	3.0	5.2
6C6	1st Det. & Osc.	6.2	160	97	0	3.0
6D6	I. F.	6.2	154	95	3.0	5.2
75	2nd Det. & 1st A. F.	6.2	110	—	1.	.25
41	Power	6.2	143	146	14.	13.0

MODEL D737

WESTERN AUTO SUPPLY CO.

Sept. 1935



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.	C12	.10 mf. 180 V.	C23	.02 mf. 600 V.	R 1	17000 ohm 1.0 W.
C2	.05 mf. 180 V.	C13	70-150 mmf.	C24	.002 mf. 600 V.	R 2	20000 ohm .5 W.
C3	Gang Trimmer	C14	250 mmf.	C25	.50 mf. 180 V.	R 3	.50 Megohm .2 W.
C4	40 mmf.	C15	250 mmf.	C26	2000 mmf.	R 4	1.0 Megohm .2 W.
C5	Gang Trimmer	C16	.01 mf. 360 V.	C27	2000 mmf.	R 5	350 ohm .2 W.
C6	.33 mmf	C17	.10 mf. 360 V.	C28	.01 mf. 360 V.	R 6	50000 ohm .2 W.
C7	.10 mf. 360 V.	C18	250 mmf.	C29	.005 mf. 1600 V.	R 7	500000 ohm .2 W.
C8	.10 mf. 180 V.	C19	.10 mf. 360 V.	C30	.50 mf. 180 V.	R 8	6000 ohm .2 W.
C9	Gang Trimmer	C20	.01 mf. 360 V.	C31	4.0 mf. 25 V.	R 9	2.0 Megohm Volume Control
C10	70-150 mmf. } One	C21	.25 mf. 180 V.	C32	5.0 mf. 350 V.	R10	150000 ohm .2 W.
C11	70-150 mmf. } Unit			C33	8.0 mf. 350 V.	R11	50000 ohm .2 W.

Electrolytic Block

R12	.50 Megohm .2 W.	T 6	Osc. Inductor
R13	100000 ohm .2 W.	T 7	Power Trans.
R14	150000 ohm Tone Control		
R15	50 ohm .5 W.	L 1	Motor Noise Reactor
R16	50 ohm .5 W.	L 2	Pilot Light Reactor
		L 3	Speaker Field 5.3
T 1	Antenna Trans.	L 4	Filament Reactor
T 2	R.F. Interstage Trans.	L 5	Filter Choke
T 3	1st I.F. Trans.	L 6	"B" Reactor
T 4	2nd I.F. Trans.	L 7	Vibrator Reactor
T 5	Output Trans.		

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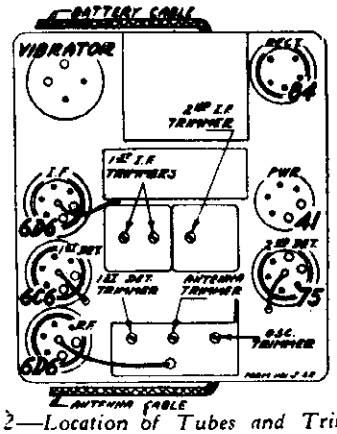


Fig. 2—Location of Tubes and Trimmers

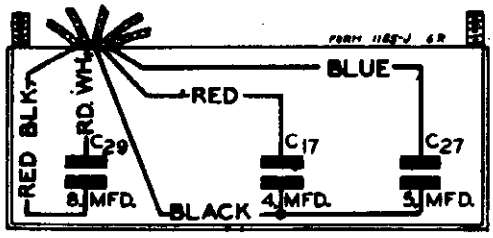
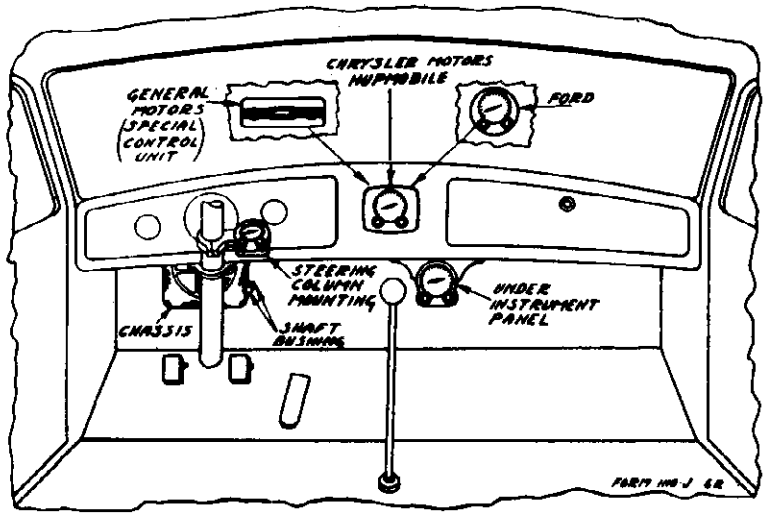


Fig. 4—Condenser Block—Internal Wiring



Power Consumption - - 6.5 Amperes at 6.3 Volts
Power Output - - - - - 3 Watts Undistorted

Tuning Frequency Range - - - - 530-1650 KC

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	I. 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.

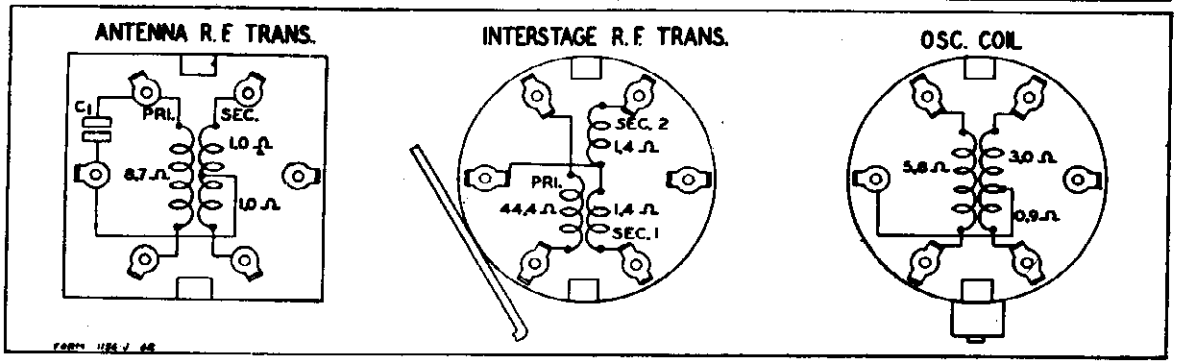


Fig. 3—R. F. and Oscillator Coil Base Terminal Arrangement and D. C. Resistance of Windings

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.

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

MODEL D745

WESTERN AUTO SUPPLY CO.

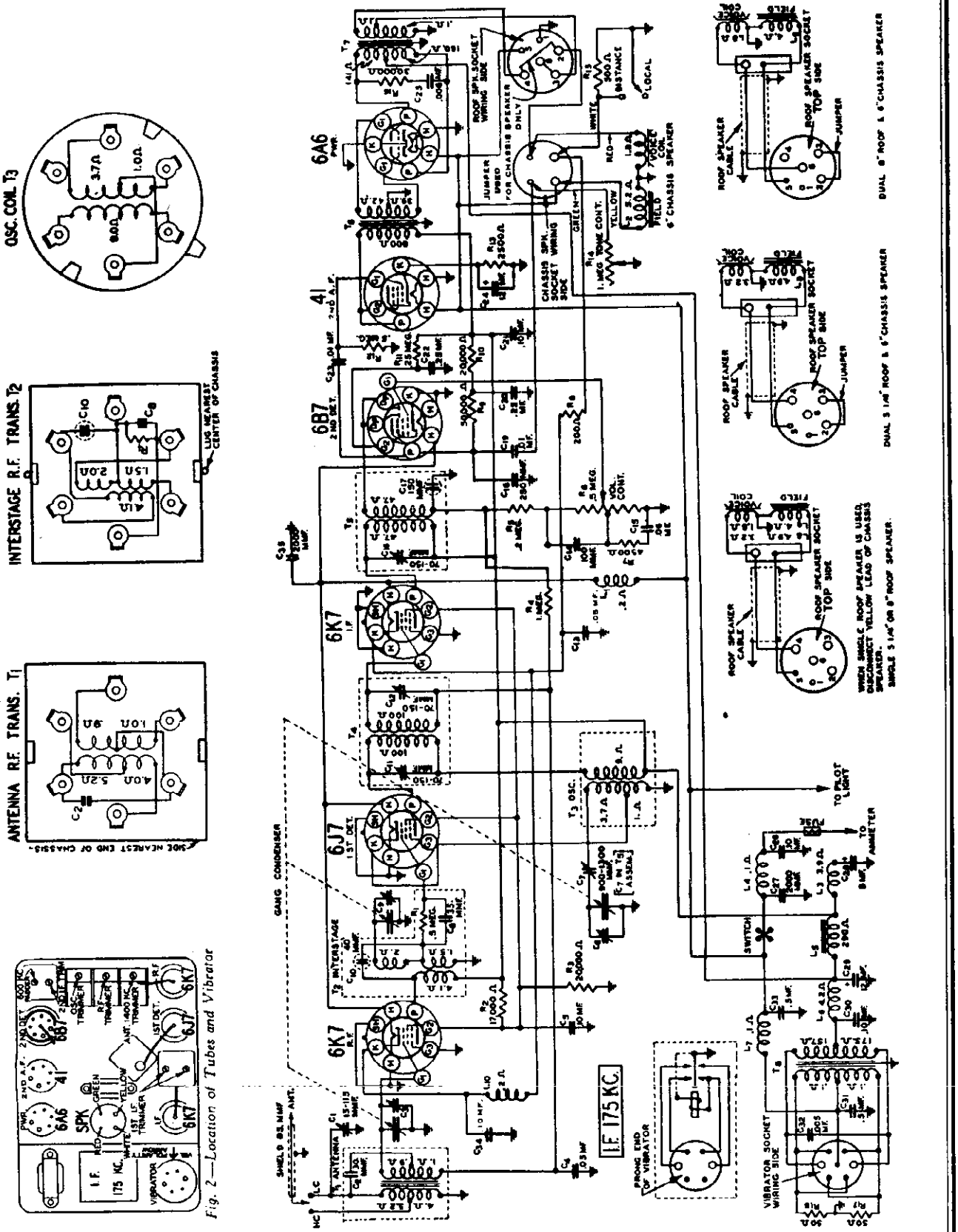


Fig. 2—Location of Tubes and Vibrator

June 1936

6 Tube Synchronous Vibrator Automobile Radio

VOLTAGES AT SOCKETS

Antenna Plug Withdrawn — L-D Switch in Distant Position — Battery 8.2 Volts under Load

Type of Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cathode to Ground
6K7	R.F.	5.6	260	110	3
6J7	1st Det.	5.6	260	110	
6K7	I.F.	5.6	260	110	3
6B7	2nd Det.	5.6	55	50	
41	2nd A.F.	5.7	255	55	30
6A6	Pwr.	5.7	275		

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 ground.

Turn the Local-Distance switch to 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 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.

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.) The antenna plug must be correctly inserted, dependent on the capacity of the antenna used.

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.

Connect the output of the signal generator through a .05 mf. condenser to the control grid of the 6K7 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

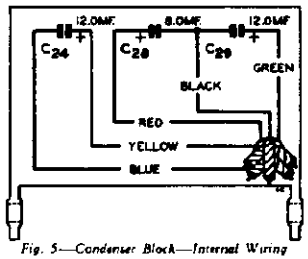


Fig. 5—Condenser Block—Internal Wiring

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.

As shown in this illustration, the antenna plug is inserted in one of two ways, depending on whether the car has a high or low capacity antenna. Full instructions are in the installation manual packed with each radio.

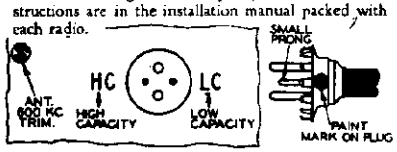


Fig. 3—Antenna Plug Insertion

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. 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.

Replacement Parts

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

Part No.	Description	List Price
P-3A223	6J7 Tube Socket	$0.15
P-3A211	6K7 Tube Socket	.15
P-3A205	6A6 Tube Socket	.15
P-3A116	41 Tube Socket	.10
P-3A120	6B7 Tube Socket	.15
P-3A229	6 Prong Socket (External Speaker)	.15
P-3A226	Antenna Socket	.10
P-3A228	Vibrator Socket	.15
P-3A231	4 Prong Socket (Internal Speaker)	.10

SPEAKER

P-12A342	6" Dynamic Speaker	$4.35

Part No.	Code	Description	List Price
P-9A188	L6	"A" Line Reactor	.70
P-62A45	L5	"B" Reactor	.80
P-9A886	L5	"B" Reactor	.80
P-9A887	L7	Vibrator Reactor	.60
P-9A634	L10	Filament Choke	.70

RESISTORS

CARBON

Part No.	Code	Resistance	Wattage	List Price
P-AM604	R1	600,000 Ohms	0.2	$0.15
P-CM175	R2	17,000 Ohms	1.0	.15
P-BM281	R3	20,000 Ohms	0.5	.15
P-AB105	R4	1 Megohm	0.2	.10
P-AB304	R5	300,000 Ohms	0.2	.10
P-AM482	R7	4,500 Ohms	0.2	.15
P-AM281	R8	200 Ohms	0.2	.10
P-BM883	R9	50,000 Ohms	0.5	.10
P-AM203	R10	20,000 Ohms	0.2	.10
P-AM284	R11	250,000 Ohms	0.2	.10
P-AM604	R12	600,000 Ohms	0.2	.10
P-BM252	R13	2,500 Ohms	0.5	.10
P-BM181	R15	500 Ohms	0.5	.10
P-CM388	R16	30,000 Ohms	1.0	.10
P-BM502	R17	50 Ohms	0.5	.10
P-BM804	R18	80 Ohms	0.5	.10

VARIABLE

P-36X217	R6	500,000 Ohms	Volume Control & Switch	1.80
P-40X212	R14	1 Megohm	Tone Control	.70

CONDENSERS

TUBULAR

Part No.	Code	Capacitance	Voltage	List Price
P-46X88	C36	.05 mf.	100	$0.15
P-46X181	C37	.1 mf.	240	.15
P-46X88	C18	.05 mf.	100	.15
P-46X186	C15	.06 mf.	160	.15
P-46X161	C19	.01 mf.	600	.15
P-46X189	C20	.25 mf.	360	.15
P-46X188	C21	.10 mf.	360	.15
P-46X143	C22	.25 mf.	360	.30
P-46X128	C23	.01 mf.	360	.15
P-46X181	C25	.006 mf.	600	.15
P-46X98	C26	.10 mf.	180	.20
P-46X108	C28	.10 mf.	360	.20
P-46X135	C31	.5 mf.	180	.40
P-46X163	C32	.0005 mf.	1,600	.20
P-46X135	C33	.5 mf.	180	.40
P-46X98	C34	.10 mf.	180	.20

ELECTROLYTIC

P-40X211	C24	12 mf.	25	Electrolytic Block	2.70
	C28	8 mf.	450		
	C29	12 mf.	450		

MOLDED

P-47X66	C2	30 mmf.	.15
P-47X53	C5	35 mmf.	.10
P-47X57	C14	100 mmf.	.10
P-47X66	C16	250 mmf.	.15
P-47X41	C27	2,000 mmf.	.20
P-47X01	C35	2,000 mmf.	.20

TRIMMER

P-17A40	C1	25-415 mmf. Antenna Trimmer	.20
	C3	Antenna Trimmer—Part of Gang Condenser	
	C4	Oscillator Trimmer—Part of Gang Condenser	
P-17A44	C13	900-1,300 mmf. 600 KC Oscillator Padding Cond.	.55
	C16	70-150 mmf. 2nd I. F. Primary Trimmer	
	C9	Interstage Trimmer Part of Gang Condenser	
P-17A33	C10	70-150 mmf.	.40
	C12	70-150 mmf. 1st I. F. Trimmer	

MISCELLANEOUS

	C18	40 mmf. Integral Part of Interstage Transformer Assembly
	C17	180 mmf. Integral Part of 2nd I. F. Transformer Assembly
P-14A81		Three Section Gang Condenser Assembly complete with Drive Gears $4.50

Part No.	Description	List Price
P-19A26	Vibrator Unit	$4.10
Specify Name and Model of Receiver	Chassis Case Only	2.80
	Chassis Case Cover Only	3.65
	Spring Clamp Button	.10
	Tone Control Knob	.10
	Local-Distance Switch Knob	.10
	8-32 x 3/16" Headless Cup Point Set Screw Doz.	.15
P-30X14	Grid Clip only—Glass Tube	.10
P-30X44	Grid Clip only—Metal Tube	.10
P-32X30	Tube Shield Base	.10
P-32X58	Tube Shield	.15
P-2A54	Local-Distance Switch	.40

TRANSFORMERS AND COILS

Part No.	Code	Description	List Price
P-1A588	T1	Antenna Transformer & Can Assembly	$1.60
P-1A581	T2	Interstage Transformer & Can Assembly	1.65
P-1A582	T3	Oscillator Coil & Can Assembly	.85
P-1A583	T4	1st I. F. Coil & Can Assembly	1.45
P-1A584	T5	2nd I. F. Coil & Can Assembly	1.80
P-56X32	T6	Input Transformer	1.30
P-81A43	T7	Output Transformer	1.60
P-53X134	T8	Power Transformer	3.10
P-9A586	L1	Filament Reactor	.55
	L2	R.F. "B" Reactor — One Assembly	

CABLE AND FLEXIBLE SHAFT ASSEMBLIES

Part No.	Quan. Used	Description	List Price
P-18A40	2	20" Volume Control or Tuning Control Flexible Drive Shaft ea.	$1.40
P-18A42	2	25" Volume Control or Tuning Control Flexible Drive Shaft ea.	1.50
P-18A44	2	36" Volume Control or Tuning Control Flexible Drive Shaft ea.	1.65
P-13X252	1	Pilot Light Cable less Lamp	.60
P-13X253	1	48" Antenna Cable & Plug	.75
P-13X227	1	Battery Cable (long section with fuse receptacle)	.35
P-13X234	1	"A" Cable—Short Section Connected to Chassis (Part of Chassis Assembly)	.25

MOUNTING BOLT ASSEMBLY

P-20X59	1	Double End Hex Bolts for Mounting Chassis to Dash ea.	.10
	3	S 15"—18 Spring Lockwr for above Mounting Assembly doz.	.10
P-19X18	6	Fiber Washers for above Mounting Assembly doz.	.15
	6	S 15"—18 Hex Nuts for above Mounting Assembly doz.	.15
	1	S 15" Shakeproof Lockwasher to Ground Chassis Case to Metal Dash Surface on Engine Side doz.	.10

MISCELLANEOUS MOUNTING ITEMS

P-7A32	1	Pilot Light Bulb	.20
P-14X14	1	20 Ampere Fuse	.60
P-15X3	1	Fuse Shield	.10
P-21A6	1	Distributor Suppressor	.35
P-48X27	1	Generator Condenser	.45
P-21A6	1	Choke Condenser Unit (Not Shipped with Set)	1.20
P-21A7		Spark Plug Suppressors (Not Shipped with Set) ea.	.35

CONTROL HEAD AND PLATE ASSEMBLY

Part No.	Quan. Used	Description	List Price
*P-28A27	1	No. 6 Control Head only with ¾" Hex Nut	3.00
*P-28A38	1	Volume Control Fitting complete with Retaining Spring, ¾" Hex Nut and Lock Washer	.25
"	1	Dial Scale (Specify Name and Model of Radio)	.10
*P-15X46	1	Pointer	.10
"	1	Pointer Screw 3-48 x 5/16" doz.	.10
†P-17X13	1	Dial Crystal	.25
†		Control Knobs—Specify Car, Year and Model ea.	.35

NOTE: Prices of Instrument Panel Plate Kits are shown in Chart on Page 5.

* Shipped with each Set
†Shipped with Panel Kit

ROOF MOUNTING SPEAKER KITS

1936 BUICK, CHEVROLET, PONTIAC, OLDSMOBILE

Part No.	Description	List Price
P-21A27	SPEAKER KIT ASSEMBLY COMPLETE includes	$5.35
P-12A234	5½" Dynamic Speaker	1.85
P-29A56	Mounting Kit—Includes Trim Ring, Speaker Housing, Self Tapping Screws & Clamp Springs	2.00
P-13X248	Speaker Cable Assembly Complete	1.85
P-21A28	SPEAKER KIT ASSEMBLY COMPLETE includes	9.85
P-12A233	8" Dynamic Speaker	5.65
P-28A57	Mounting Kit—Includes Trim Ring and Self Tapping Screws	2.20
P-13X248	Speaker Cable Assembly Complete	1.85

1936 FORD—STANDARD AND DELUXE

Part No.	Description	List Price
P-21A29	SPEAKER KIT ASSEMBLY COMPLETE includes	4.15
P-12A234	5½" Dynamic Speaker	1.85
P-28A58	Mounting Kit—Includes Hex Nuts, Lockwashers and Bolts	.40
P-13X248	Speaker Cable Assembly Complete	1.85

MODEL D748

WESTERN AUTO SUPPLY CO.

ALIGNMENT Adjust IF trimmers at 175 KC thru .05 mf dummy. Adjust Osc. trimmer at 1581 KC thru 120 mmf dummy if 60 inch cable 70 mmf is used - or thru 25 mmf dummy if 30 inch cable 35 mmf dummy is used. Adjust Interstage and Antenna trimmers at 1400 KC. Readjust Antenna trimmer C2 at 1400 KC.

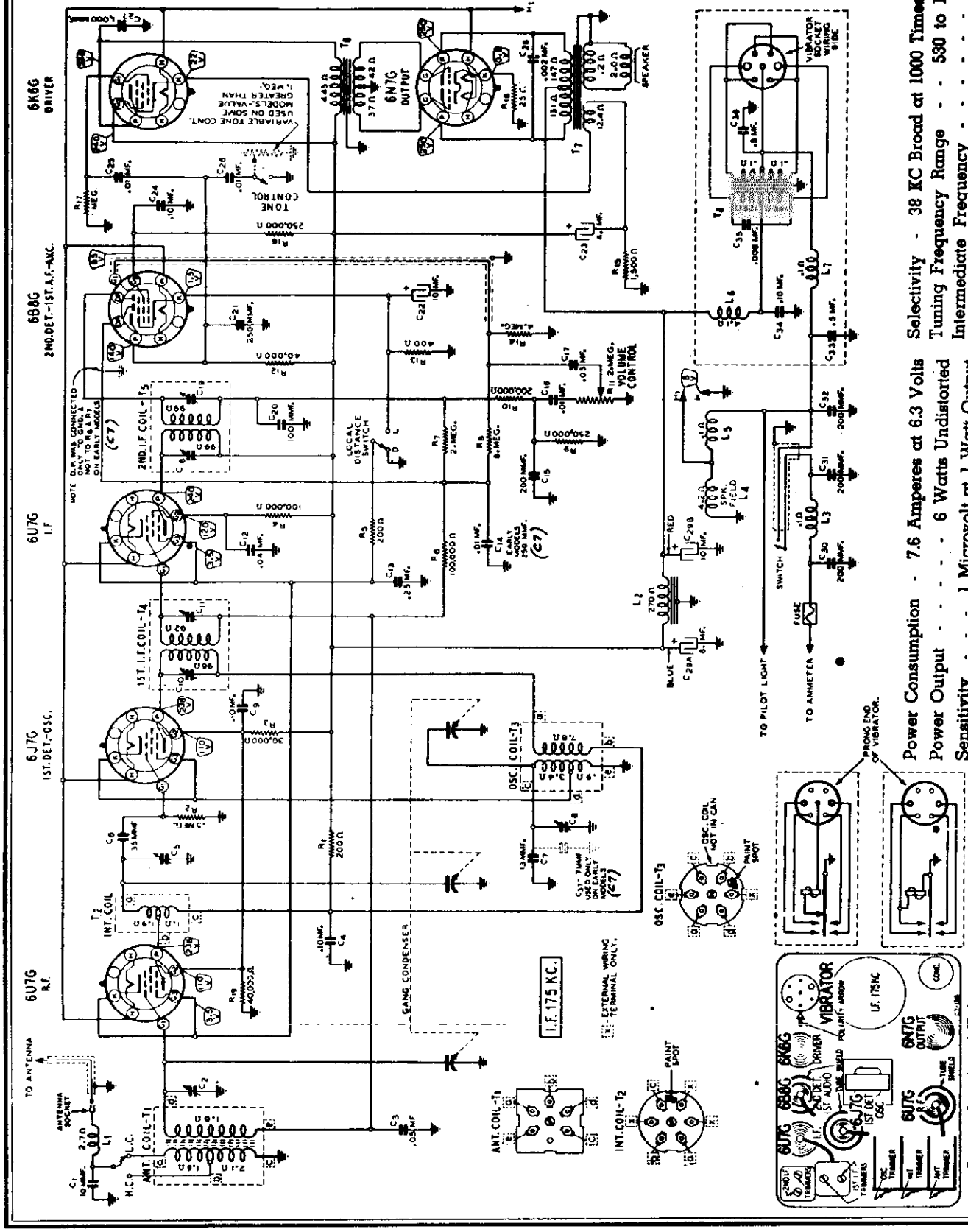
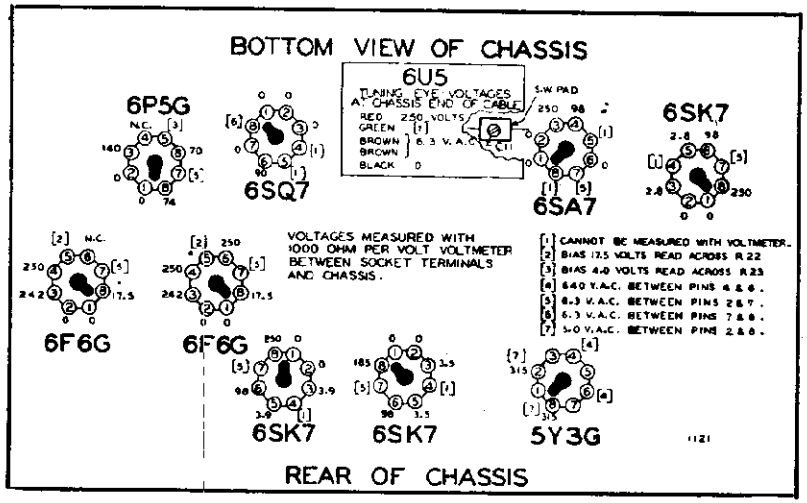
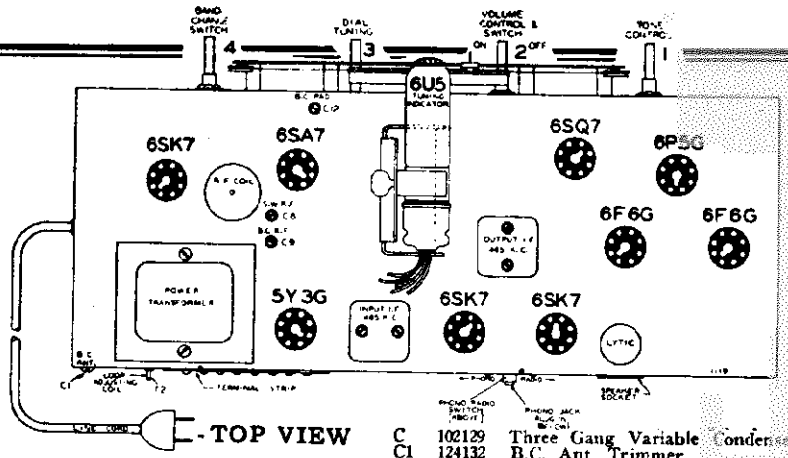


Fig. 1—Location of Tubes and Vibrator





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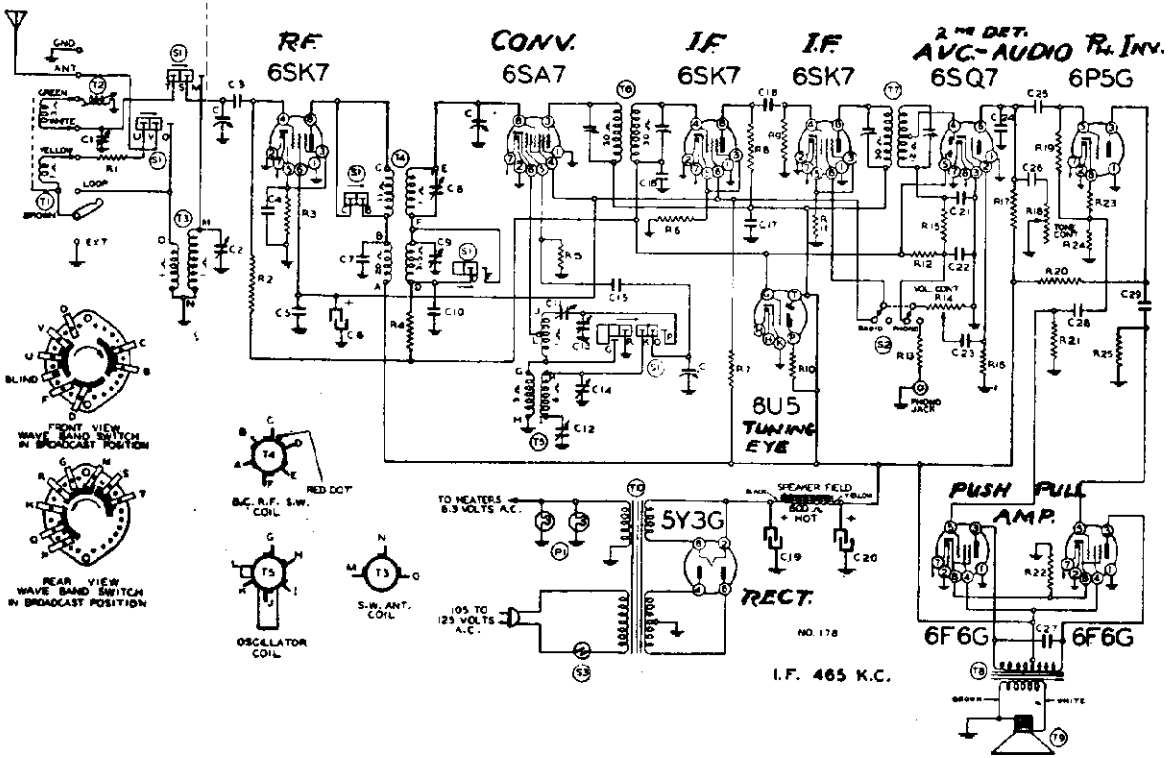


C	102129	Three Gang Variable Condenser
C1	124132	B.C. Ant. Trimmer
C2	124117	SW Antenna Trimmer
C3	1292	.0005 Mica
C4	10020	.1 x 200 v.
C5	100117	.25 x 400 v.
C6	119106	10 mfd. lytic—350 w. v.
C7	129160	.0004 mica
C8	124131	S.W. R.F. Trimmer
C9	129131	B.C. R.F. Trimmers
C10	10026	.02 x 400 v.
C11	129156	.0024 Compression S.W. Pad
C12	129157	.000525 Compression B.C. Pad
C13	124130	S.W. Oscillator trimmer
C14	124130	B.C. Oscillator trimmer
C15	12939	.00005 Mica
C16	10026	.02 x 400 v.
C17	100117	.25 x 400 v.
C18	1292	.0005 mica
C19	119106	10 mfd. lytic—450 w. v.
C20	119106	15 mfd. lytic—450 w. v.
C21	1295	.0001 mica
C22	1295	.0001 mica
C23	10025	.002 x 600 v.
C24	12912	.00025 mica
C25	10026	.02 x 400 v.
C26	10011	.01 x 400 v.
C27	10071	.004 x 600 v.
C28	1009	.05 x 200 v.
C29	10013	.05 x 400 v.
		C6, C19 and C20 in one unit
		C8 and C9 in one unit
		C13 and C14 in one unit
R1	13024	400 ohm—½ w.
R2	13019	1 megohm—½ w.
R3	13099	300 ohm—½ w.
R4	1305	300M ohm—½ w.
R5	130208	40M ohm—½ w.
R6	13054	500 ohm—½ w.
R7	130304	12M ohm—2 watt
R8	130263	12M ohm—½ w.
R9	13020	100M ohm—½ w.
R10		1 megohm—in eye socket
R11	13054	500 ohm—½ w.
R12	130170	3 megohm—½ w.
R13	13019	1 megohm—½ w.
R14	101214	Volume Control (500M ohm)
R15	13012	50M ohm—½ w.
R16	130225	15 megohm—½ w.
R17	13011	250M ohm—½ w.
R18	101213	Tone Control—(1 Megohm)
R19	13019	1 megohm—½ w.
R20	13020	100M ohm—½ w.
R21	1303	500M ohm—½ w.
R22	130311	300 ohm—1 watt
R23	13022	5M ohm—½ w.
R24	13020	100M ohm—½ w.

WESTERN AUTO SUPPLY CO.

Power Consumption - - 110 Watts (At 117 Volts 60 Cycles)

Power Output - - - - - - - - - 5 Watts Undistorted
7 Watts Maximum

Sensitivity (for .5 Watts Output) - - - -
Broadcast Band—10 Microvolts Average
Shortwave Band—10 Microvolts Average

Selectivity - - 35 KC Broad at 1000 Times Signal at 1000 KC

Tuning Frequency Range - - - - - - - 540 to 1580 KC
5.5 to 18.5 MC

Intermediate Frequency - - - - - - - - - 465 KC

Speaker - - - - - - - - - 10 in. Electro Dynamic

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6SK7 I. F.	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 2)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6SA7 Mixer	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 2)	Input I. F.	Adjust to maximum output
SHORT WAVE BAND (See Note A)	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C13 (See Fig. 4)	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmers C8, C2 (See Figs. 5 & 4)	Short Wave R. F. and S. W. Antenna	Adjust to maximum output
	6 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 6 Mc.	Trimmer C11 (See Fig. 6)	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "C")
BROAD-CAST BAND (See Note A)	1580 Kc.	200 mmf.	Grid of 6SK7 R. F. Tube	Broadcast	Rotor full open (Plates out of mesh)	Trimmer C14 (See Fig. 4)	Broadcast oscillator	Adjust to maximum output
	540 Kc.	200 mmf.	Grid of 6SK7 R. F. Tube	Broadcast	Set Dial at 540 Kc. (Plates in Mesh)	Trimmer C12 (See Fig. 5)	Broadcast oscillator series pad	Adjust to maximum output
	1400 Kc.	200 mmf.	Grid of 6SK7 R. F. Tube	Broadcast	Set Dial at 1400 Kc.	Trimmer C9 (See Fig. 5)	Broadcast R. F.	Adjust to maximum output
LOOP ALIGN-MENT (See Note B)	1400 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 1400 Kc.	Trimmer C1 (See Fig. 5)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 600 Kc.	Trimmer T2 (See Fig. 5)	Iron Core Tracking Coil	Adjust to maximum output

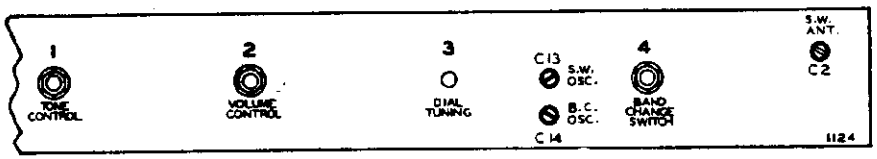
NOTE "A"—The signal generator is connected to the "ANT." and "GND." terminals on the rear of the chassis when aligning the **Short Wave Band** and to the grid of the 6SK7 R.F. Tube and ground terminal when setting the **Broadcast Band** oscillator end frequencies, (1580 and 540 K. C.).

The loop antenna need not be connected to the radio when making these adjustments.

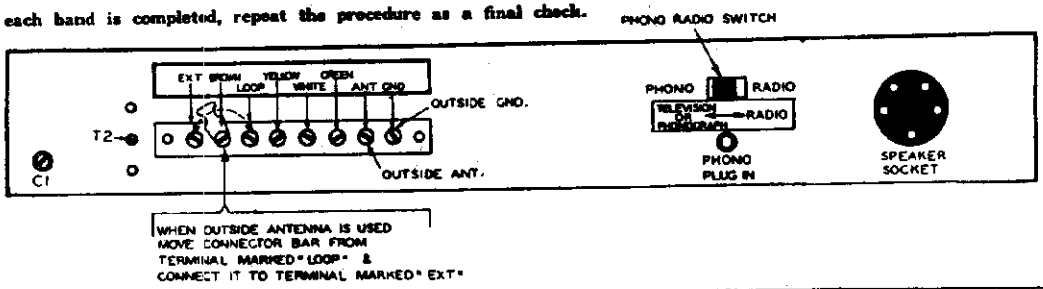
NOTE "B"—Loop alignment is made with the chassis mounted in the cabinet and the loop antenna connected to the terminal board. The signal generator is connected to the "ANT." and "GND." terminals and the jumper on the terminal board connected to "EXT." terminal. (See Fig. 1).

NOTE "C"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.
Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each band is completed, repeat the procedure as a final check.



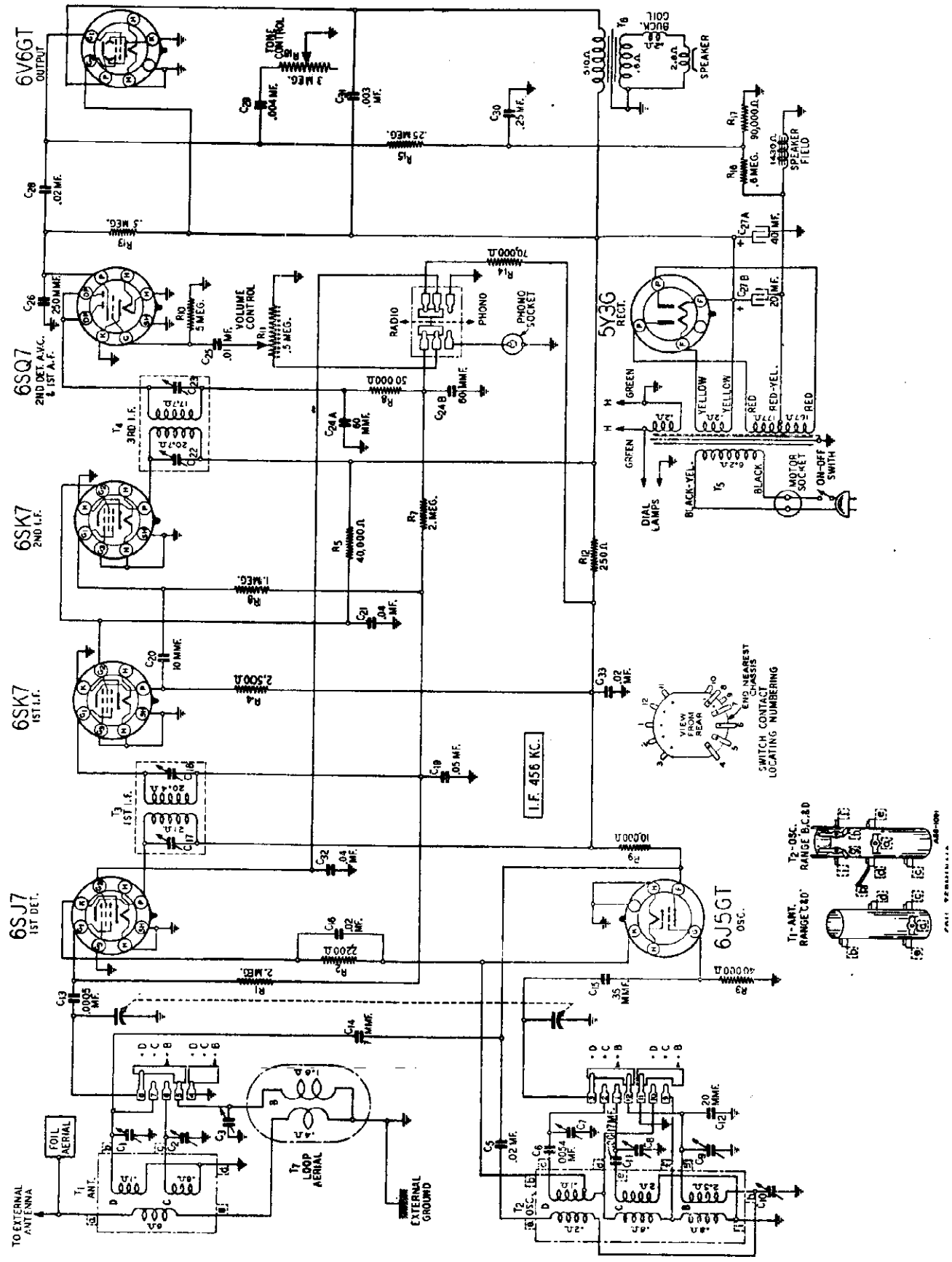
—FRONT OF CHASSIS



It is important during loop **alignment** that the loop antenna and the chassis be installed in the cabinet.

To remove the chassis from the cabinet, remove the two chassis mounting bolts which are used to hold the chassis to the cabinet shelf; take the knobs off their shafts and disconnect the loop antenna.

WESTERN AUTO SUPPLY CO.



ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.

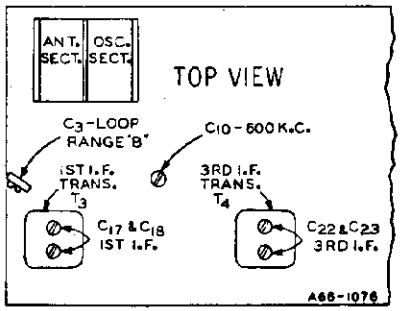
Allow Chassis and Signal Generator to "Heat Up" for several minutes.

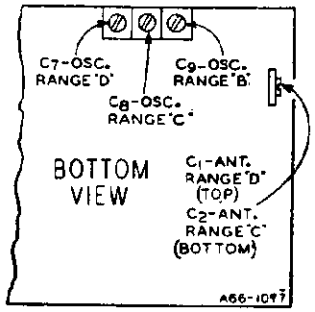
The following equipment is required for aligning:
An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter—Non-Metallic Screwdriver.
Dummy Antennas—.1 mf., 100 mmf., and 400 ohms.

	SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I.F.	456 KC	Signal Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C17) & (C18) 3rd I.F. (C22) & (C23)
RANGE B	1600 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C9)
	1400 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC— See Note A	Ant. Range B (C3)
	600 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C10) Rock Rotor—See Note B
RANGE C	7000 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Full Open	Oscillator Range C (C8)
	6000 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Max. Output	Ant. Range C (C2) Rock Rotor—See Note B
RANGE D	22,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C7)
	18,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C1) Rock Rotor—See Note B
LOOP RANGE B	1400 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output	Ant. Range B (C3)

NOTE A—If the pointer is not at 1400 KC on the dial, remove pointer from drive cord. Set pointer at the 1400 KC mark on the dial scale. Attach pointer to drive cord.

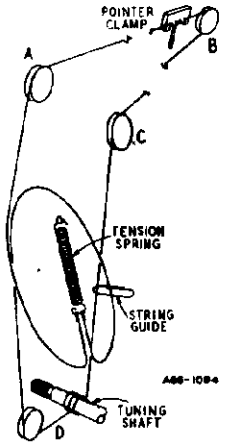
NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

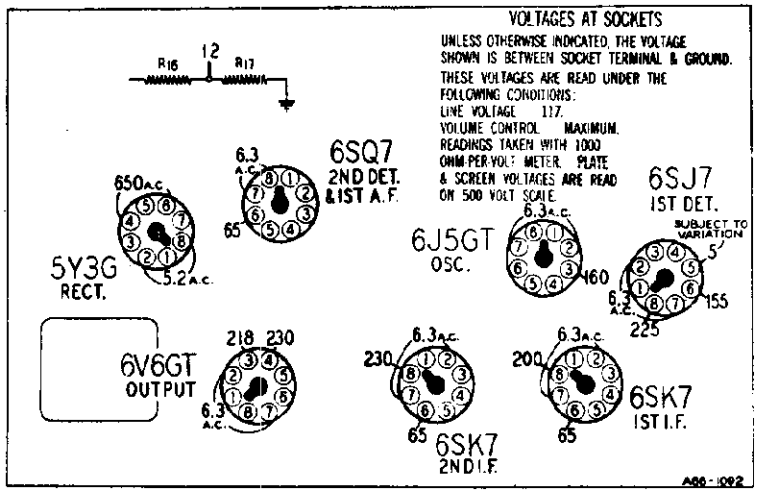


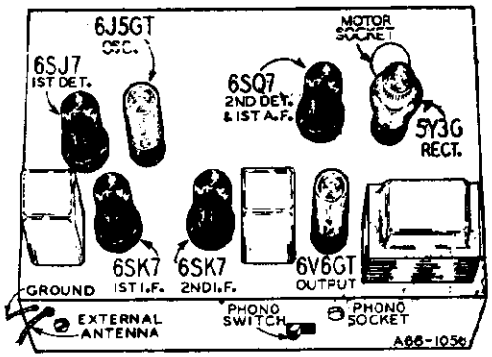


DRIVE CORD REPLACEMENT

Turn gang condenser to full closed position. Using a new drive cord 57" in length, tie one end to tension spring. Fasten other end of tension spring to hook on drive pulley. Pass cord through slot in pulley rim. Wind cord 1/3 turn clockwise (from gang end of chassis) around drive pulley; continue around idler pulleys A, B, and C as shown. Pass cord through wire string guide and wind 3 turns counter-clockwise (from front of chassis) around tuning shaft. These turns should progress away from chassis. Continue cord around idler pulley D and wind ¾ turn clockwise (from gang end of chassis) around drive pulley. Turn should be on left side of pulley groove (from front of chassis). Pass cord through slot in pulley rim. Stretch tension spring and attach free end of cord.







SPECIFICATIONS

Power Consumption - - - - 60 Watts (At 117 volts 60 cycles)
Power Output - - - - - 2.5 Watts Undistorted
3.5 Watts Maximum
Selectivity . . 40 KC Broad at 1000 Times Signal
Intermediate Frequency - - - - - 456 KC
Speaker - - - - - - - 6" Electro-Dynamic
Tuning Frequency Range
B Range - - - - - - - - 528 to 1600 KC
C Range - - - - - - - - - 2.2 to 7.0 KC
D Range - - - - - - - - 7.0 to 22.0 MC
Sensitivity—External Antenna—For 0.5 Watt output
B Range - - - - - - 4 Microvolts Average
C Range - - - - - - 7 Microvolts Average
D Range - - - - - 8 Microvolts Average

WESTERN AUTO SUPPLY CO.

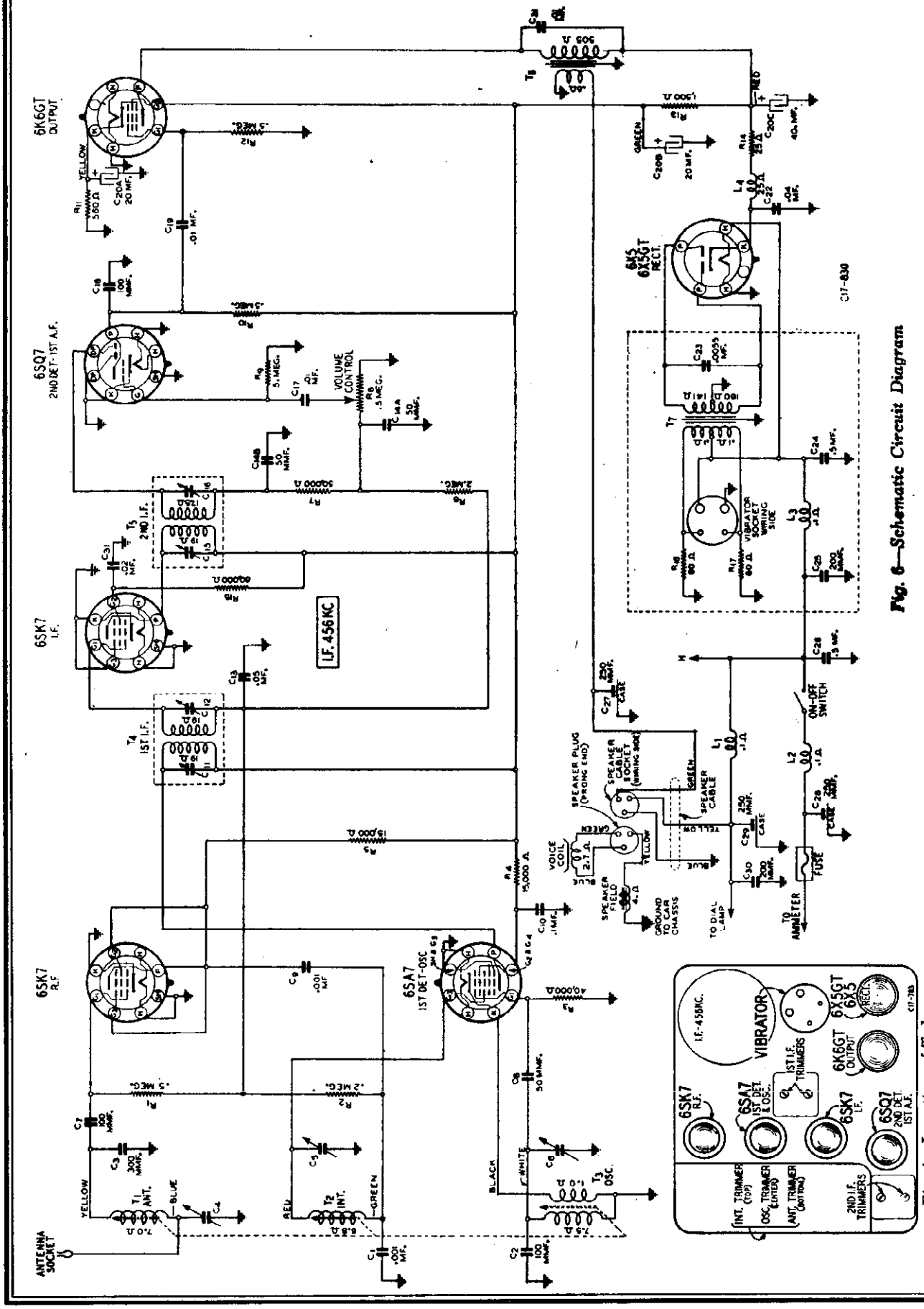


Fig. 6—Schematic Circuit Diagram

Fig. 4—Location of Tubes and Vibrator

ALIGNMENT PROCEDURE

Volume Control—Maximum 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:

A Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

Output Indicating Meter—Non-Metallic Screwdriver.

Dummy Antenna—.05 mf., See Note A.

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	IRON CORE SETTING	ADJUST TRIMMERS TO MAXIMUM (See Figs. 3 and 4)
I.F.				
456 KC	Control Grid (prong No. 8) 6SA7 1st Det. Tube	.05 mf.	Extreme Position out of Coil	1st I.F. (C11) & (C12) 2nd I.F. (C15) & (C16)
OSCILLATOR				
1600 KC	Antenna Cable See Note A	See Note A	Extreme Position out of Coil	Oscillator (C6)
1400 KC ADJUSTMENT				
1400 KC	Antenna Cable	See Note A	Tune to Max. Output with Tuning Knob	Int. (C5) Ant. (C4)

Reassemble Radio—Install in Car—Connect Car Antenna to Radio.

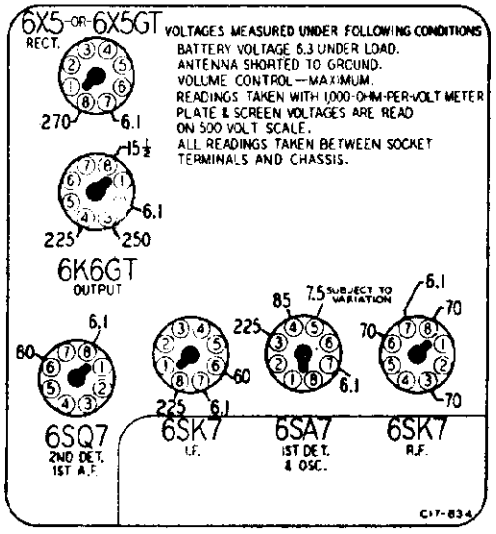
Car Antenna Readjustment—Tune in weak signal near 1400 KC—Readjust Antenna Trimmer C4 for maximum output.

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.

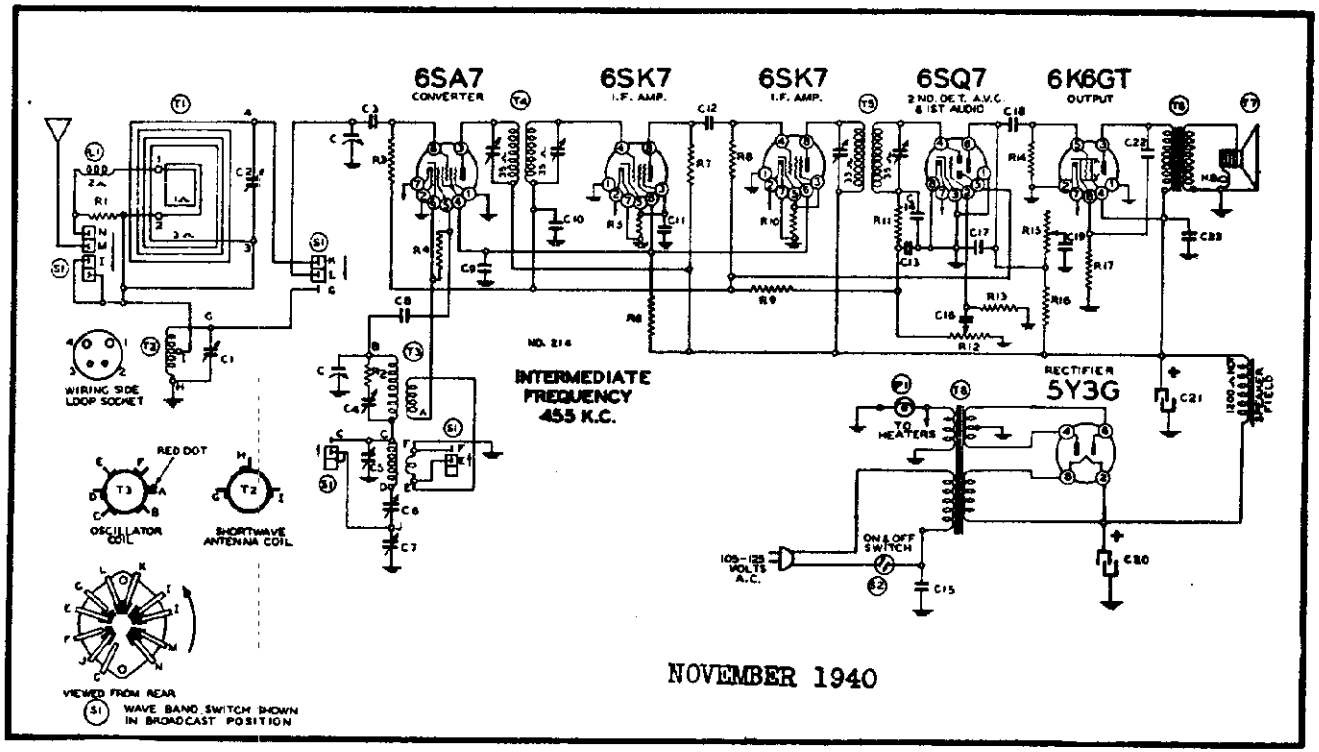
NOTE A—Insert the antenna cable plug in the antenna socket on the chassis. The total capacity of the antenna cable and dummy antenna should be 60 mmf. If the cable, for example, has a capacity of 30 mmf., use a 30 mmf. condenser for a dummy antenna. Connect the other end of the antenna cable through the dummy antenna capacity to the output of the signal generator.

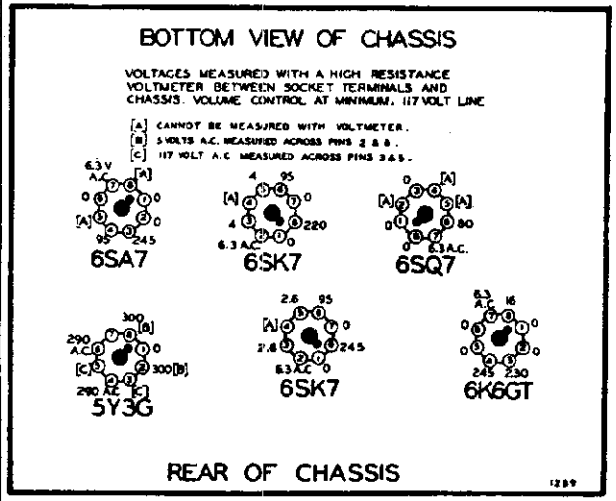
CALIBRATION — To calibrate the radio, see article "Calibrating the Radio" on page 4.



SPECIFICATIONS

Power Consumption - -	8.2 Amperes at 6.6 Volts
Power Output (6.6 volts) - - -	3.0 Watts Undistorted 5.5 Watts Maximum
Sensitivity - - - -	1 Microvolt at .5 Watt Output
Selectivity - - -	38 KC Broad at 1000 Times Signal
Tuning Frequency Range - - - -	540 to 1600 KC
Intermediate Frequency - - - - - - - - -	456 KC
Speaker - - - - - - - - -	6" Electro-Dynamic





Setting the Pushbuttons

Make a list of your 6 favorite stations. Push out the call letters of these stations from the call letter sheets supplied. Insert a call letter in the front of each pushbutton.

Next push one of the pushbuttons all the way in as far as it will go and hold it there. Now tune in the station you want with the tuning knob—Tune back and forth until the station is clear and distinct, then release the button. Continue setting each pushbutton in the same way. Now rotate the tuning knob to the right (clockwise) as far as it will turn.

Looking at the back of the cabinet note the **reset lock screw** on the left hand side of the chassis, (see chassis view).

Rotate the **reset lock screw** to the **right** (clockwise) by means of the pin thru the shaft.

It is **very important** that this locking screw is **turned until it is absolutely tight.**

This screw will lock in place all the stations you have selected on the automatic tuner pushbuttons. Pressing the proper button will now tune the station you want. (NOTE: Locking screw is loose when radio is shipped from factory).

To change stations simply loosen the reset lock screw and repeat the procedure above.

Code No.	Part No.	Description
		RESISTORS
R1	13071	4M ohm—½ w.
R2	130197	20 ohm—½ w.
R3	13019	1 megohm—½ w.
R4	130236	30M ohm—½ w.
R5	130283	750 ohm—½ w.
R6	130298	19M ohm—1½ w.
R7	130218	5M ohm—½ w.
R8	13020	100M ohm—½ w.
R9	1304	3 megohm—½ w.
R10	130222	350 ohm—½ w.
R11	13012	50M ohm—½ w.
R12	101240	1 megohm volume control
R13	130223	10 megohm—½ w.
R14	1303	500M ohm—½ w.
R15	101241	1 megohm tone control
R16	13011	250M ohm—½ w.
R17	130255	500 ohm—1 w.
		CONDENSERS
C	102128	2 gang variable condenser
C1	124116	S.W. antenna trimmer
C2	124141	B.C. antenna trimmer
C3	1292	.0005 mica
C4	124142	S.W. oscillator trimmer
C5	124142	B.C. oscillator trimmer
C6	124146	B.C. padding condenser
C7	124146	S.W. padding condenser
C8	12960	150 mfd. mica
C9	10013	.05 x 400 v.
C10	1009	.05 x 200 v.
C11	1009	.05 x 200 v.
C12	1292	.0005 mica
C13	129161	.0001 mica
C14	129161	.0001 mica
C15	10061	.02 x 600 v.
C16	10025	.002 x 600 v.
C17	12912	.00025 mica
C18	10026	.02 x 400 v.
C19	10071	.004 x 600 v.
C20	119115	16 mfd. x 400 w.v. lytic
C21	119115	16 mfd. x 400 w.v. lytic
C22	10019	.006 x 600 v.
C23	1001	.1 x 400 v.

C4 and C5 are in same unit
C13 and C14 are in same unit
C6 and C7 are in same unit
C20 and C21 are in same unit

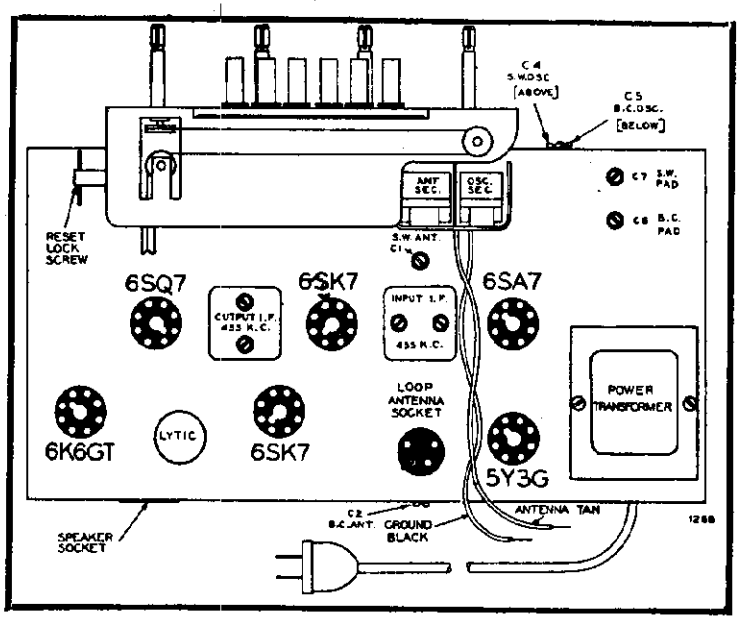
ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect radio ground to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- 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., 400 ohms.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (In Order Shown)	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD	Grid of 6SA7	Broadcast	Rotor full open (Plates out of mesh)	Trimmers on top (See Chassis View)	Input and Output I. F.	Adjust to maximum output
SHORT WAVE BAND	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C4	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C1	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 6 Mc.	Trimmer C7	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "A")
BROAD-CAST BAND	1600 Kc.	200 mmf.	Grid of 6SA7	Broadcast	Rotor full open (Plates out of mesh)	Trimmer C5	Broadcast oscillator	Adjust to maximum output
	1400 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 1400 Kc.	Trimmer C2 (See Chassis View)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 600 Kc.	Trimmer C6 (See Chassis View)	Broadcast oscillator series pad	Adjust to maximum output and rock dial (See note "A")



CHASSIS VIEW

The loop antenna should be connected to the radio when making all R. F. adjustments.

NOTE "A"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

Attenuate the signal from the signal generator to prevent the leveling-off action of the A.V.C.
After each band is completed, repeat the procedure as a final check.

Tuning Frequency Range Broadcast Band - 535 to 1600 KC
Shortwave Band - 5.43 to 18.3 MC

Intermediate Frequency - - - - - - - - 455 KC

Speaker - - - - - - - 8 in. Electro Dynamic

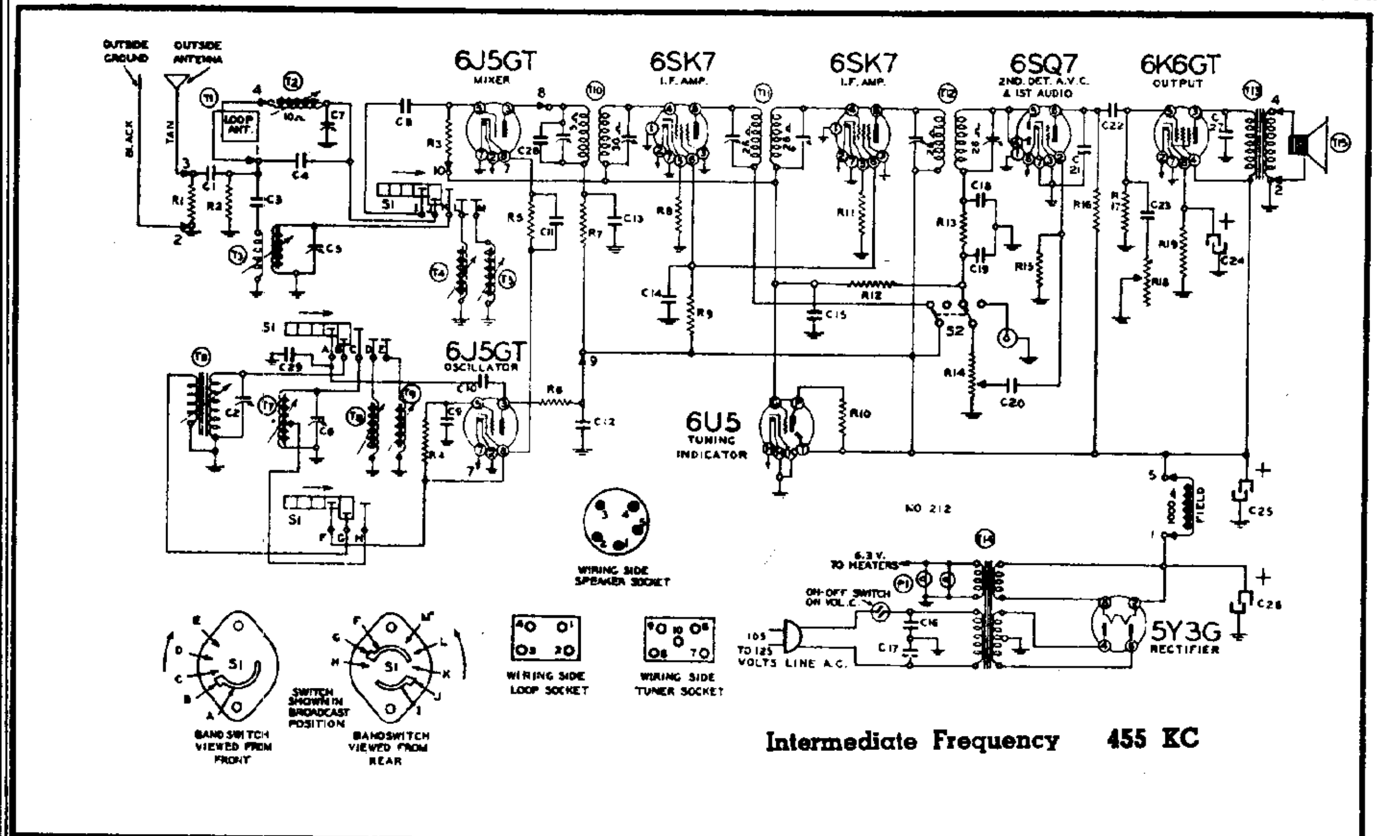
Power Consumption - - - - - - - - 55 Watts

Power Output - - - - - - 2.2 Watts Undistorted

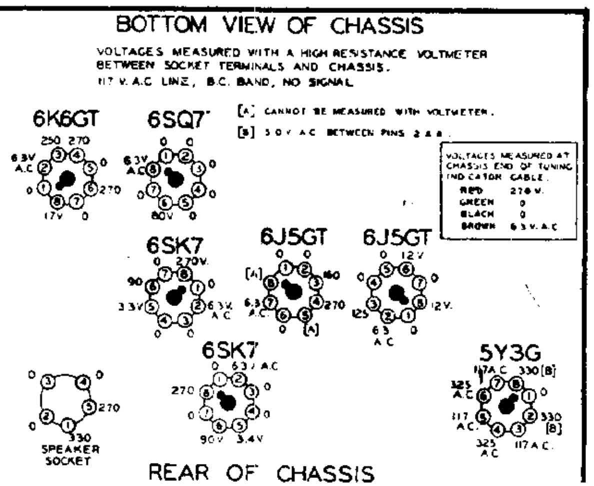
Sensitivity for 500 Milliwatt Output: 15 Microvolts Average

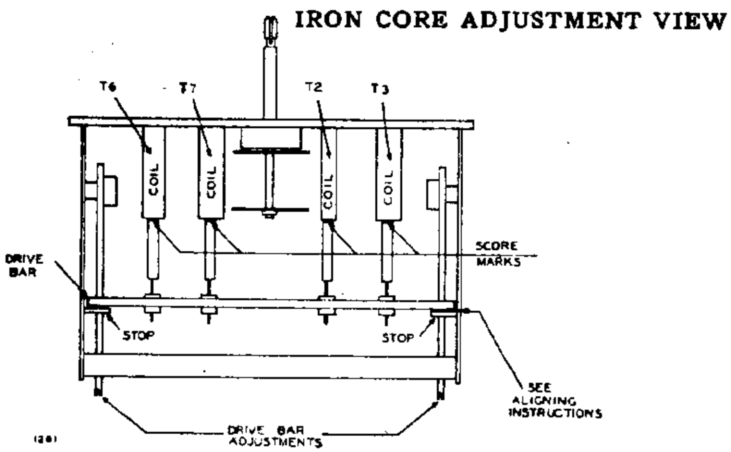
Selectivity - 47 KC Broad at 1000 Times Signal at 1000 KC

WESTERN ROYAL



Intermediate Frequency 455 KC





CONDENSERS

C1	1292	.0005 mica
C2	124144	B.C. oscillator trimmer
C3	100112	.001 tubular
C4	129102	.00002 ceramicon
C5	124154	9 mc. ant. trimmer
C6	124145	9 mc. osc. trimmer
C7	124154	B.C. antenna trimmer
C8	1292	.0005 mica
C9	1292	.0005 mica
C10	129158	.0002 mica
C11	10022	.05 x 200 v.
C12	10074	.1 x 400 v.
C13	10026	.02 x 400 v.
C14	10024	.25 x 400 v.
C15	10026	.02 x 400 v.
C16	10061	.02 x 600 v.
C17	10061	.02 x 600 v.
C18	129161	.0001 mica
C19	129161	.0001 mica
C20	10078	.01 x 200 v.
C21	12912	.00025 mica
C22	10026	.02 x 400 v.
C23	10019	.006 x 600 v.
C24	11997	40.0 x 25 w.v. lytic
C25	11997	15.0 x 400 w.v. lytic
C26	11997	15.0 x 450 w.v. lytic
C27	10019	.006 x 600 v.
C28	129171	.0022 mica in coil 108186
C29	129167	.0002 silver mica

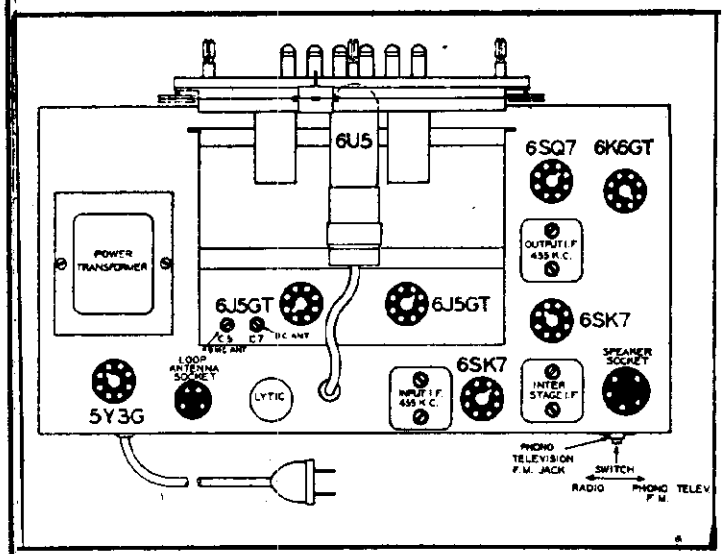
RESISTORS

R1	130232	25M ohm—⅓ w.
R2	130232	25M ohm—⅓ w.
R3	13038	2 megohm—⅓ w.
R4	13094	50M ohm—⅓ w.
R5	130157	12M ohm—⅓ w.
R6	130219	20M ohm—1 w.
R7	130103	100M ohm—⅓ w.
R8	13079	400 ohm—⅓ w.
R9	130291	50M ohm—1 w.
R10		1 megohm in tuning indicator cable
R11	13083	300 ohm—⅓ w.
R12	13019	1 megohm—⅓ w.
R13	13012	50M ohm—⅓ w.
R14	101239	500M ohm volume control
R15	130257	5 megohm—⅓ w.
R16	13011	250M ohm—⅓ w.
R17	13019	1 megohm—⅓ w.
R18	125140	1 megohm tone control
R19	13093	450 ohm—⅓ w.
T1	111226	Loop antenna assembly
T2	111222	B.C. antenna coil
T3	111223	9 mc. antenna coil
T4	111224	12 mc. antenna coil
T5	111225	15 mc. antenna coil
T6	110170	B.C. oscillator coil

- Tone control—Treble
- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- 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.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Dial Pointer Setting	Trimmers Adjusted In Order Shown	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Grid of 6SK7 (2nd I.F.)	Broadcast	Set Dial at 1600 Kc.	Two Trimmers on Top	Output I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 6SK7 (1st I.F.)	Broadcast	Set Dial at 1600 Kc.	Two Trimmers on Top	Interstage I. F.	Adjust to maximum output
	455 Kc.	.1 MFD.	Grid of 6J5 (Mixer)	Broadcast	Set Dial at 1600 Kc.	Two Trimmers on Top	Input I. F.	Adjust to maximum output
31 METER BAND	9.6 Mc.	400 ohms	Antenna lead	31M	Set Dial at 9.6 Mc.	(See Trimmer View) C6 (See Trimmer on Top) C5	Osc. Ant.	Adjust to maximum output
25 METER BAND	11.8 Mc.	400 ohms	Antenna lead	25M	Set Dial at 11.8 Mc.	(See Trimmer View) T8 (See Trimmer View) T4	Osc. Ant.	Adjust to maximum output
19 METER BAND	15.2 Mc.	400 ohms	Antenna lead	19M	Set Dial at 15.2 Mc.	(See Trimmer View) T9 (See Trimmer View) T5	Osc. Ant.	Adjust to maximum output
BROAD-CAST BAND	1600 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1600 Kc.	(See Trimmer View) C2 (See Trimmer on Top) C7	Osc. Ant.	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Broadcast	Set Dial at 1400 Kc.	Rotate Core T2 (See Iron Core Adjustment View)	Ant.	Adjust to maximum output



CHASSIS VIEW

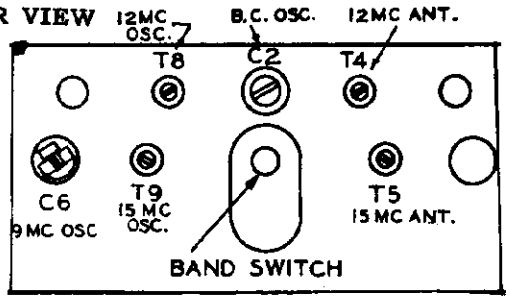
Setting the Pushbuttons

Make a list of your 6 favorite stations. Push out the call letters of these stations from the call letter sheets supplied. Insert a call letter in the slot on top of each pushbutton.

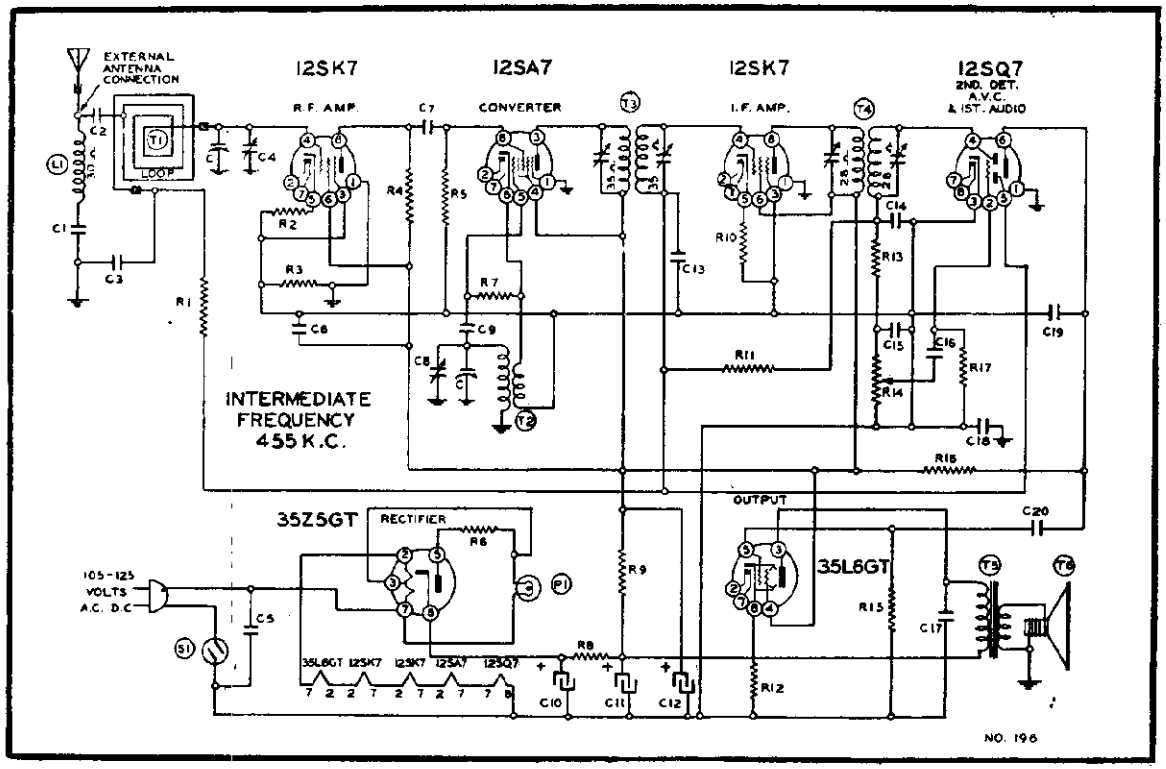
Next pull one of the pushbuttons all the way out as far as it will come (pull, with fingers on top and bottom of button). Now tune in the station you want with the tuning knob—Tune back and forth until the station is clear and distinct. Now push the button hard all the way in to lock the station in place, (push directly on front of button). Continue setting each pushbutton in the same way. Pressing the proper button will now tune the station you want. If it does not do so you did not push the button hard enough to lock it in place when setting up the station.

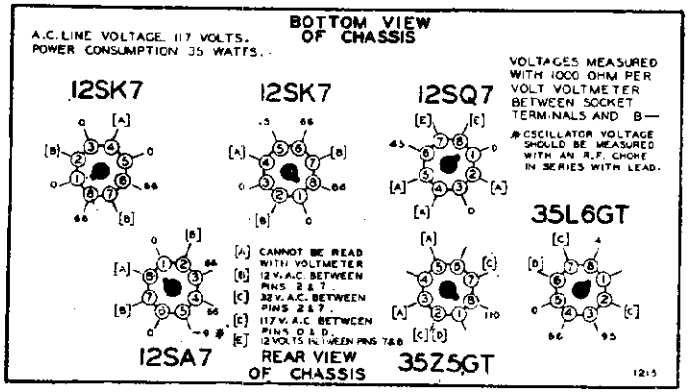
To change stations simply repeat the procedure above.

TRIMMER VIEW



Power Consumption.....80 Watts
Power Output...2 1/2 watts Un-Distorted.
Sensitivity for 500 Milliwatt O.P. 10 Microvolts Average.
Selectivity-35KC Broad at 1000 Times Sig. at 1000 KC.
Tuning Frequency Range Broadcast Band-540 to 1600 KC
31M Band 9.1 to 10 MC
25M Band 11.4 to 12.1 MC
19M Band 14.9 to 15.4 MC





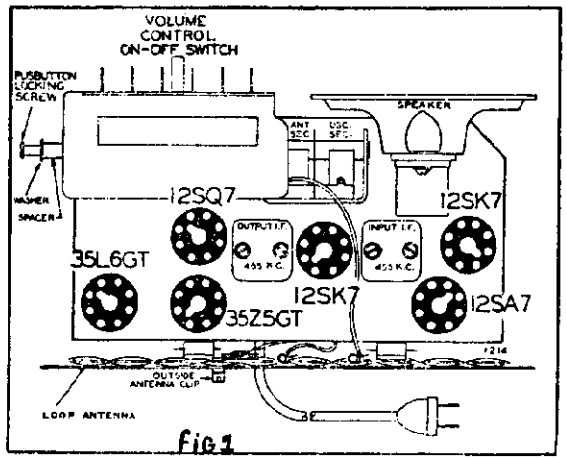


Fig 1

CONDENSERS

C	102116	2 gang variable condenser
C1	10011	.01 x 400 v.
C2	129132	.000125 mica
C3	10026	.02 x 400 v.
C4		B.C. Antenna Trimmer
C5	1001	.1 x 400 v.
C6	1006	.25 x 200 v.
C7	1295	.0001 mica
C8		B.C. Oscillator Trimmer
C9	1295	.0001 mica
C10	11994	40 mfd.—150 w.v. lytic
C11	11994	20 mfd.—150 w.v. lytic
C12	11994	20 mfd.—150 w.v. lytic
C13	1009	.05 x 200 v.
C14	1295	.0001 mica

Code No.	Part No.	Description
C15	12939	.00005 mica
C16	10025	.002 x 600 v.
C17	10026	.02 x 400 v.
C18	100110	.2 x 400 v.
C19	1295	.0001 mica
C20	100106	.004 x 600 v.

C10, C11 and C12 are in same unit

RESISTORS

Code No.	Part No.	Description
R1	130100	150M ohm—½ w.
R2	130168	100 ohm—½ w.
R3	130100	150M ohm—½ w.
R4	130218	5M ohm—½ w.
R5	13020	100M ohm—½ w.
R6	130215	25 ohm—½ w.
R7	13094	50M ohm—½ w.
R8	130296	200 ohm—1 w.
R9	130287	1200 ohm—1 w.
R10	130248	40 ohm—½ w.
R11	1304	3 megohm—½ w.
R12	130166	150 ohm—½ w.
R13	13012	50M ohm—½ w.
R14	101193	1 megohm volume control
R15	1303	500M ohm—½ w.
R16	1309	200M ohm—½ w.

Code No.	Part No.	Description
R17	130257	5 megohm—½ w.

ALIGNMENT PROCEDURE

IMPORTANT:—See alignment instructions

- Volume control—Maximum all adjustments.
- Connect B - of radio chassis to ground post of signal generator through .1 Mfd. condenser.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning:

- An all wave signal generator.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 Mfd.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD.	Grid of 12SA7	Rotor full open (Plates out of mesh)	Four Trimmers on Top (See Fig. 1)	Output and Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1600 Kc.	.1 MFD.	Grid of 12SA7	Rotor full open (Plates out of mesh)	Trimmer rear section of gang.	Broadcast Oscillator	Adjust to maximum output
	1400 Kc.	See Note "A"		Set dial at 1400 Kc.	Trimmer front section of gang	Broadcast Antenna	Adjust to maximum output

NOTE "A" Lay the output lead from the generator in back of the loop antenna. Turn up the output of the generator, picking up the energy in the loop antenna without any electrical connection from the generator.

FREQUENCY RANGE 535 to 1600 K.C.

Power Consumption ..... 35 Watts

Power Output ..... .1 Watt Undistorted, 1.5 Watts Maximum

Intermediate Frequency ..... 455 K.C.

PROCEDURE FOR SETTING THE AUTOMATIC TUNER PUSH BUTTONS

1. Make a list of six stations you tune in regularly. There are six push buttons on the front of the radio by means of which six stations may be tuned automatically. (See "B," Fig. 2.)

2. Punch out the call letters of the stations you have selected from the set of station call letter tabs supplied.

On the front of each automatic tuner button an opening is provided for inserting the call letter tabs, (See "A" Fig. 2).

Insert the call letter tabs in the rectangular openings in each of the automatic tuner push buttons.

3. Stations may be set up in any sequence desired. Press any one of the automatic tuner push buttons down-all the way.

4. Hold the push button down firmly, and tune set very carefully to station desired, until station is heard clearly and with maximum volume.

Release the push button.

5. Press down another automatic tuner push button. Hold it down FIRMLY and carefully tune in next station desired. Release this push button.

Follow this procedure until you have selected all of your favorite stations.

6. Now rotate the tuning knob to the right (clockwise) as far as it will turn, and with a coin (quarter), tighten the special locking screw ("C") in the center of the tuning knob, (See Fig. 2).

It is VERY IMPORTANT that this locking screw is turned until it is ABSOLUTELY TIGHT.

This screw will lock in place all the stations you have selected on the automatic tuner push buttons. (Note: Locking screw "C" is loose when radio is shipped from factory.)

CHANGING STATIONS:

If you should desire to change any station you have selected to another, hold the tuning knob securely and with a coin loosen the locking screw "C" one or two turns. Hold down push button on which the station is to be changed and tune in new station desired. Release the push button.

Be sure to retighten the locking screw, otherwise the stations you have previously selected will not stay adjusted to the push buttons.

The set is now set up for automatic tuning.

TUBES:

The tube complement of this chassis consists of the following octal base glass and metal tubes.

The type and function of each tube is as follows:

1—Type 12SK7 R. F. Amplifier.
1—Type 12SA7 Mixer, First Detector-Oscillator.
1—Type 12SK7 I. F. Amplifier.
1—Type 12SQ7 Second Detector, A.V.C. and First Audio.
1—Type 35L6GT Beam Output Amplifier.
1—Type 35Z5GT High Vacuum Rectifier.

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 voltage, defective tubes, condensers and resistors. In order to properly align this radio, the chassis should be removed from the cabinet.

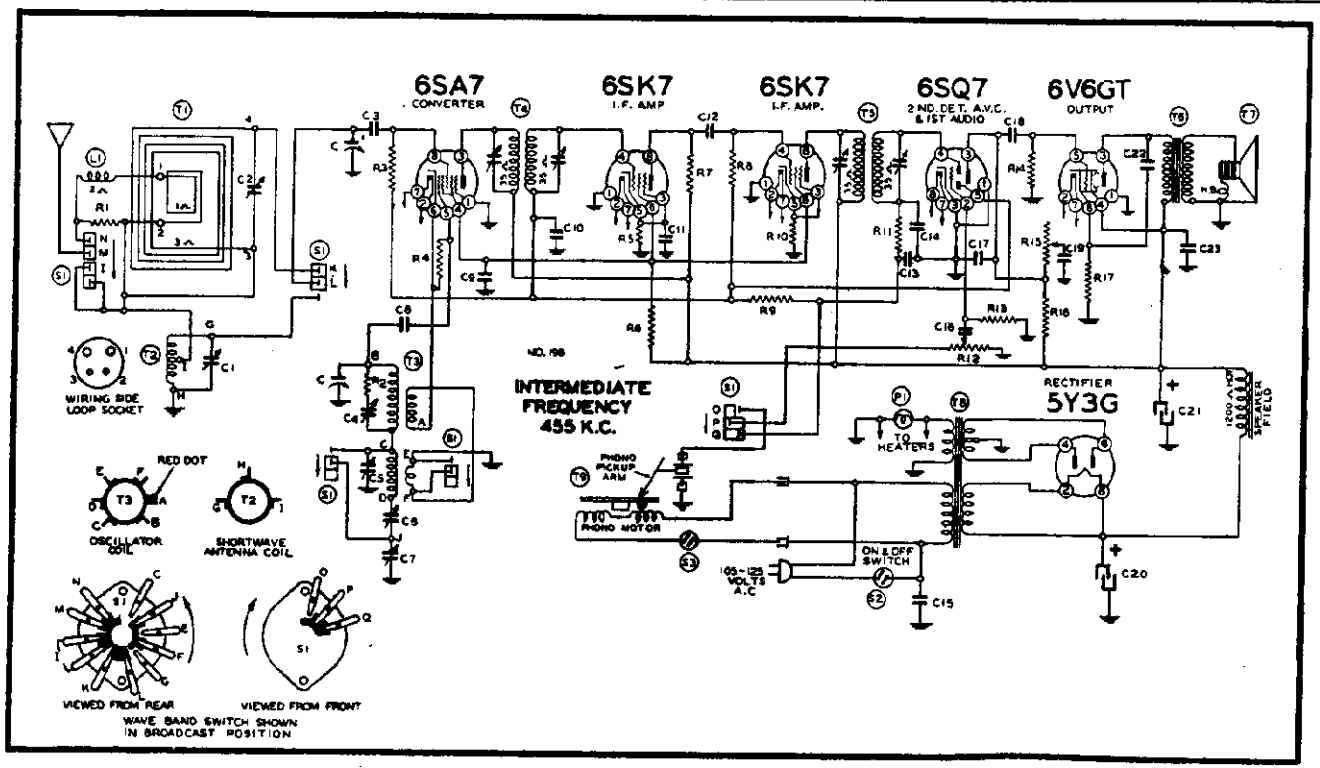
It is important during alignment that the same distance between the loop antenna and the chassis be maintained as when the chassis is installed in the cabinet.

Slight adjustments to the oscillator and antenna circuits can be made without removing the chassis from the cabinet through two holes which are provided on the bottom of the cabinet.

The two adjustments on the variable gang condenser can be reached wih a long insulated type screw driver through these two holes.

Code No.	Part No.	Description
		RESISTORS
R1	13071	4000 ohm—½ w.
R2	130128	20 ohm—½ w.
R3	13019	1 megohm—½ w.
R4	130236	30M ohm—½ w.
R5	130283	750 ohm—½ w.
R6	130324	18M ohm—1 watt
R7	130218	5M ohm—½ w.
R8	13020	100M ohm—½ w.
R9	130170	3 megohm—½ w.
R10	130222	350 ohm—½ w.
R11	13012	50M ohm—½ w.
R12	101232	1 megohm volume control
R13	130223	10 megohm—½ w.
R14	1303	500M ohm—½ w.
R15	101231	1 megohm tone control
R16	130172	250M ohm—½ w.
R17	130323	270 ohm—1 watt
		CONDENSERS
C	102137	Two gang variable condenser
C1	124149	S. W. Antenna trimmer
C2	124149	B. C. Antenna trimmer
C3	1292	.0005 mica
C4	124142	S. W. Oscillator trimmer
C5	124142	B. C. Oscillator trimmer
C6	124146	B. C. Padding Condenser
C7	124146	S. W. Padding Condenser
C8	12960	150 mmfd. mica
C9	10013	.05 x 400 v.
C10	10022	.05 x 200 v.
C11	1009	.05 x 200 v.
C12	1292	.0005 mica
C13	129161	.0001 mica
C14	129161	.0001 mica
C15	10061	.02 x 600 v.
C16	10025	.002 x 600 v.
C17	12912	.00025 mica
C18	10026	.02 x 400 v.
C19	10071	.004 x 600 v.
C20	119115	16 mfd. x 400 w. v. lytic
C21	119115	16 mfd. x 400 w. v. lytic
C22	10019	.006 x 600 v.
C23	1001	.1 x 400 v.

C1 and C2 are in same unit C4 and C5 in same unit
C6 and C7 are in same unit C13 and C14 in same unit
C20 and C21 are in same unit

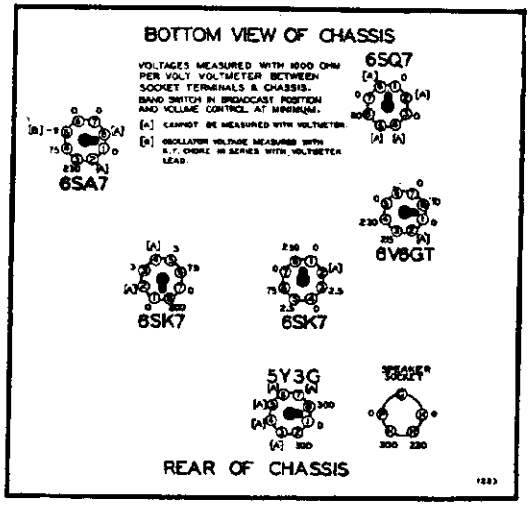


ALIGNING INSTRUCTIONS

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 voltage, defective tubes, condensers and resistors.

PARTS

T1	111208	Loop antenna assembly
T2	111184	S. W. Antenna Coil
T3	110154	B. C. and S. W. Oscillator Coil
T4	108169E	Input I. F. Coil—455 kc.
T5	108106U	Output I.F. Coil—455 kc.
T6	105118	Output Transformer
T7	114216	8" Electro Dynamic Speaker
T8	104225B	60 cycle power transformer
and	104238B	25 cycle power transformer
T9	104228	60 cycle Seeburg Record Changer and Phono Assembly
and	104229	25 cycle Seeburg Record Changer and Phono Assembly
S1	125132	Phono-band switch
S2		Switch on volume control
S3		Switch on record changer
L1	12312	R. F. Choke coil
P1	10794	Pilot light bulb No. T-44



FOR SEEBURG J RECORD CHANGER SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

- Volume control—Maximum all adjustments.
- Connect radio ground to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- 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., 400 ohms.

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (In Order Shown)	Trimmer Function	Adjustment
I. F.	455 Kc.	.1 MFD	Grid of 6SA7 Mixer	Broadcast	Rotor full open (Plates out of mesh)	Trimmers on top (See Top View)	Input and Output I. F.	Adjust to maximum output
SHORT WAVE BAND (See Note A)	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C4	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 17 Mc.	Trimmer C1	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 Ohms	External Antenna and Ground	Short Wave	Set Dial at 6 Mc.	Trimmer C7	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "C")
BROAD-CAST BAND (See Note A)	1600 Kc.	200 mmf.	Grid of 6SA7	Broadcast	Rotor full open (Plates out of mesh)	Trimmer C5	Broadcast oscillator	Adjust to maximum output
	530 Kc.	200 mmf.	Grid of 6SA7	Broadcast	Rotor full closed	Trimmer C6	Broadcast oscillator series pad	Adjust to maximum output
LOOP ALIGN-MENT (See Note B)	1400 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 1400 Kc.	Trimmer C2 (See Top View)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	External Antenna and Ground	Broadcast	Set Dial at 600 Kc.	Trimmer C6 (See Top View)	Broadcast oscillator series pad	Adjust to maximum output

NOTE "A"—The signal generator is connected to the "ANT." and "GND" leads when aligning the Short Wave Band and to the grid of the 6SA7 tube and ground terminal when setting the Broadcast Band oscillator end frequencies, (1600 and 530 K. C.).

The loop antenna should be connected to the radio when making these adjustments.

NOTE "B"—Loop alignment is made with the chassis mounted in the cabinet and the loop antenna connected. The signal generator is connected to the "ANT." and "GND." leads.

NOTE "C"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

Attehuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each band is completed, repeat the procedure as a final check.

TECHNICAL DATA—Model No. W-671

Power Consumption Radio Only - - - - - 70 Watts
Motor Only - - - - - 20 Watts

Power Output - - - - - - - - 2.1 Watts Undistorted

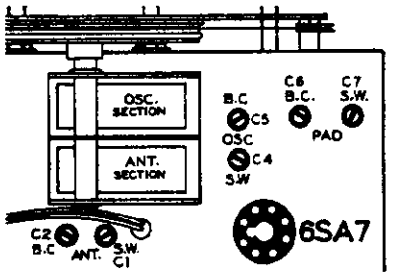
Sensitivity for 500 Milliwatt Output: 15 Microvolts Average

Selectivity - 51 KC Broad at 1000 Times Signal at 1000 KC

Tuning Frequency Range Broadcast Band - 530 to 1600 KC
Shortwave Band - 5.46 to 18.3 MC

Intermediate Frequency - - - - - - - - - 455 KC

Speaker - - - - - - - - - 8 in. Electro Dynamic



TRIMMER VIEW

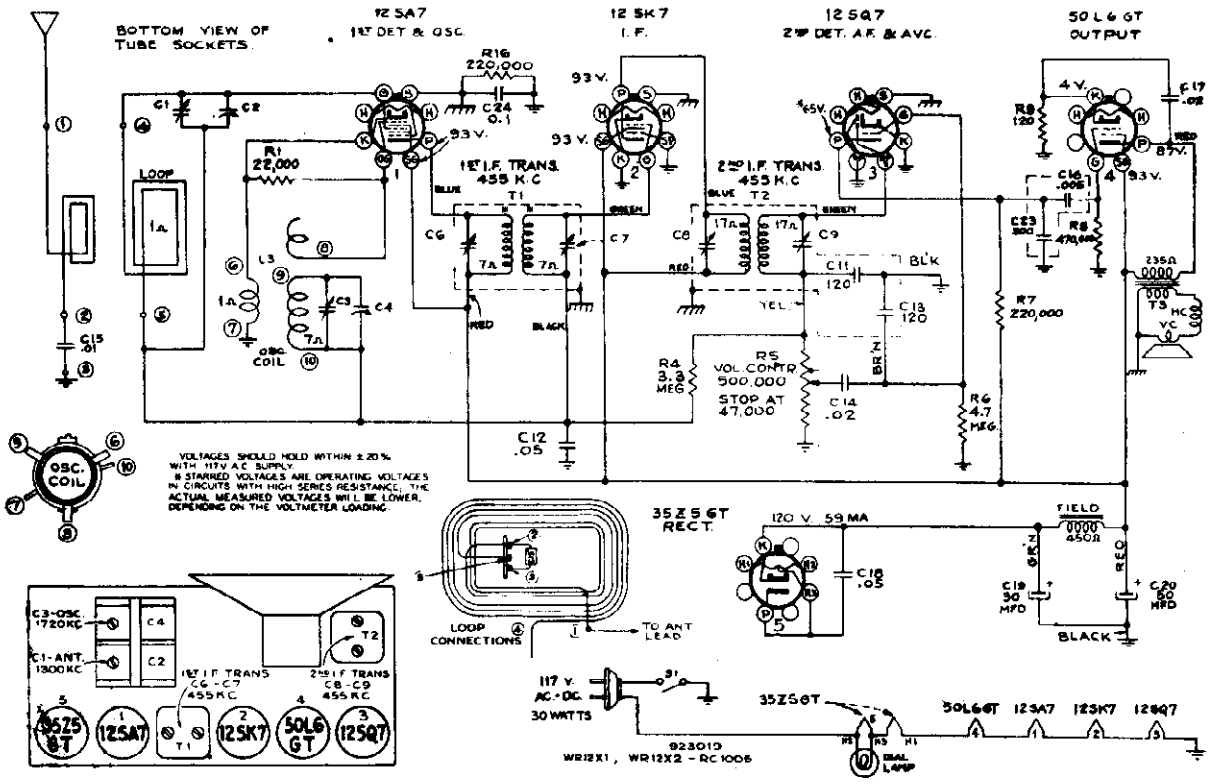
Service Notes

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

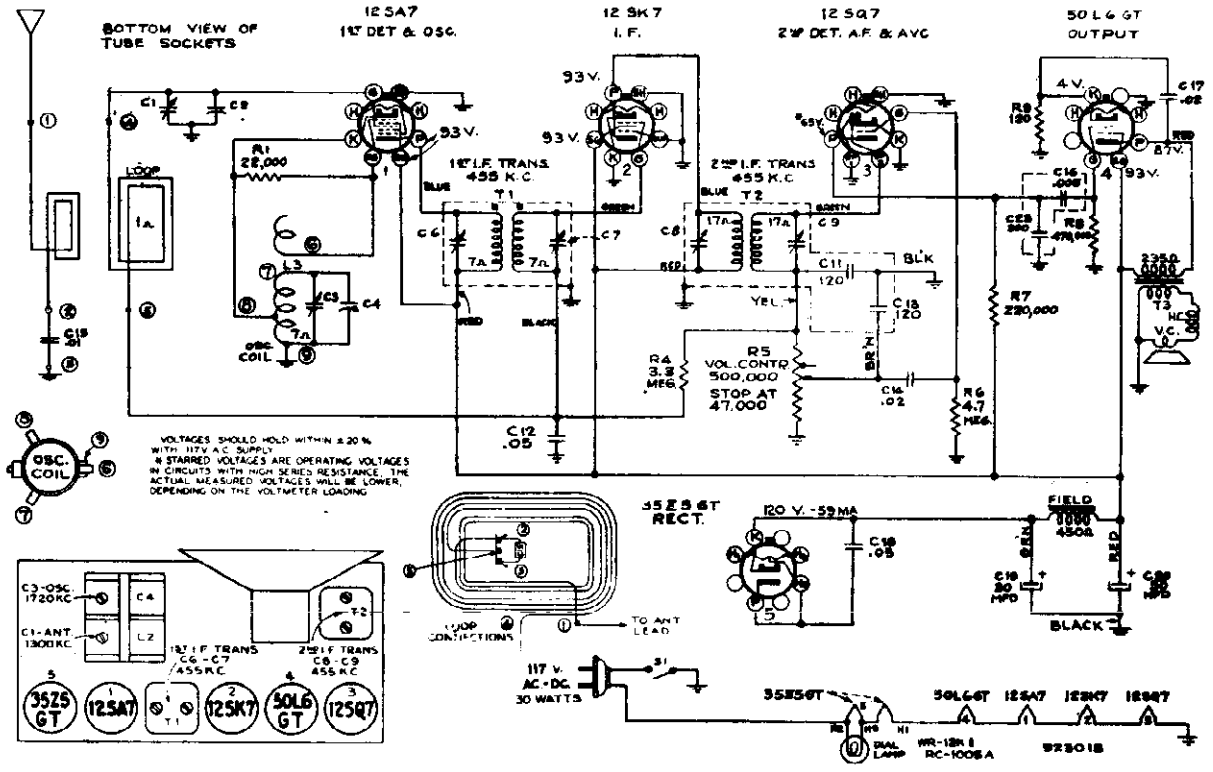
Resistances of coil windings are indicated in ohms on the schematic cir cuit diagram.

MODELS WR12X1
WR12X2
MODEL WR12K1

WESTINGHOUSE ELEC. SUPPLY CO., INC.



Schematic Circuit Diagram Model WR-12X1 & WR-12X2



Schematic Circuit Diagram Model WR-12K1

FOR ALIGNMENT SEE INDEX

MODELS WR12X3
WR12X5, WR12X6

WESTINGHOUSE ELEC. SUPPLY CO., INC.

Electrical and Mechanical Specifications

FREQUENCY RANGE ..... 530-1,720 kc
Intermediate Frequency ..... 455 kc

POWER SUPPLY RATINGS
105-125 volts, direct current, or 50-60 cycles ..... 30 watts

POWER OUTPUT (125 volts, 60 cycle supply)
Undistorted .....0.8 watts Maximum .....1.2 watts

LOUDSPEAKER (86A-3) ..... 5-inch Electrodynamic
V.C. Impedance ..... 4 ohms at 400 cycles

PILOT LAMP ..... Mazda No. 51, 6.8 volts, 0.2 amp.

CABINET DIMENSIONS	WR-12X3	WR-12X5, WR-12X6
Height	7⅜ in.	6¼ in.
Width	11⅜ in.	10¼ in.
Depth	6⅝ in.	6⅝ in.
Weight (Net)	7½ lbs.	6¼ lbs.
Weight (Shipping)	9¼ lbs.	8¼ lbs.

Tuning Drive Ratio ..... 12 to 1

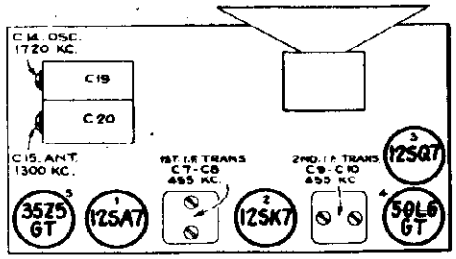
TUBE COMPLEMENT
(1) RCA-12SA7 ..... 1st Det.—Osc.
(2) RCA-12SK7 ..... I-F Amplifier
(3) RCA-12SQ7 ..... 2nd Det., A.V.C. and A-F Amplifier
(4) RCA-50L6-GT ..... Power Output
(5) RCA-35Z5-GT ..... Rectifier

Alignment Procedure

Output Meter Alignment.—If this method is used connect the meter across the voice coil and turn the receiver volume control to maximum.

Test Oscillator.—Connect the low side of the test oscillator to the receiver chassis through a .01 mfd. capacitor. With the output meter alignment method the test oscillator output should be kept as low as possible.

Calibration Scale.—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the dial backing plate for quick reference during alignment.



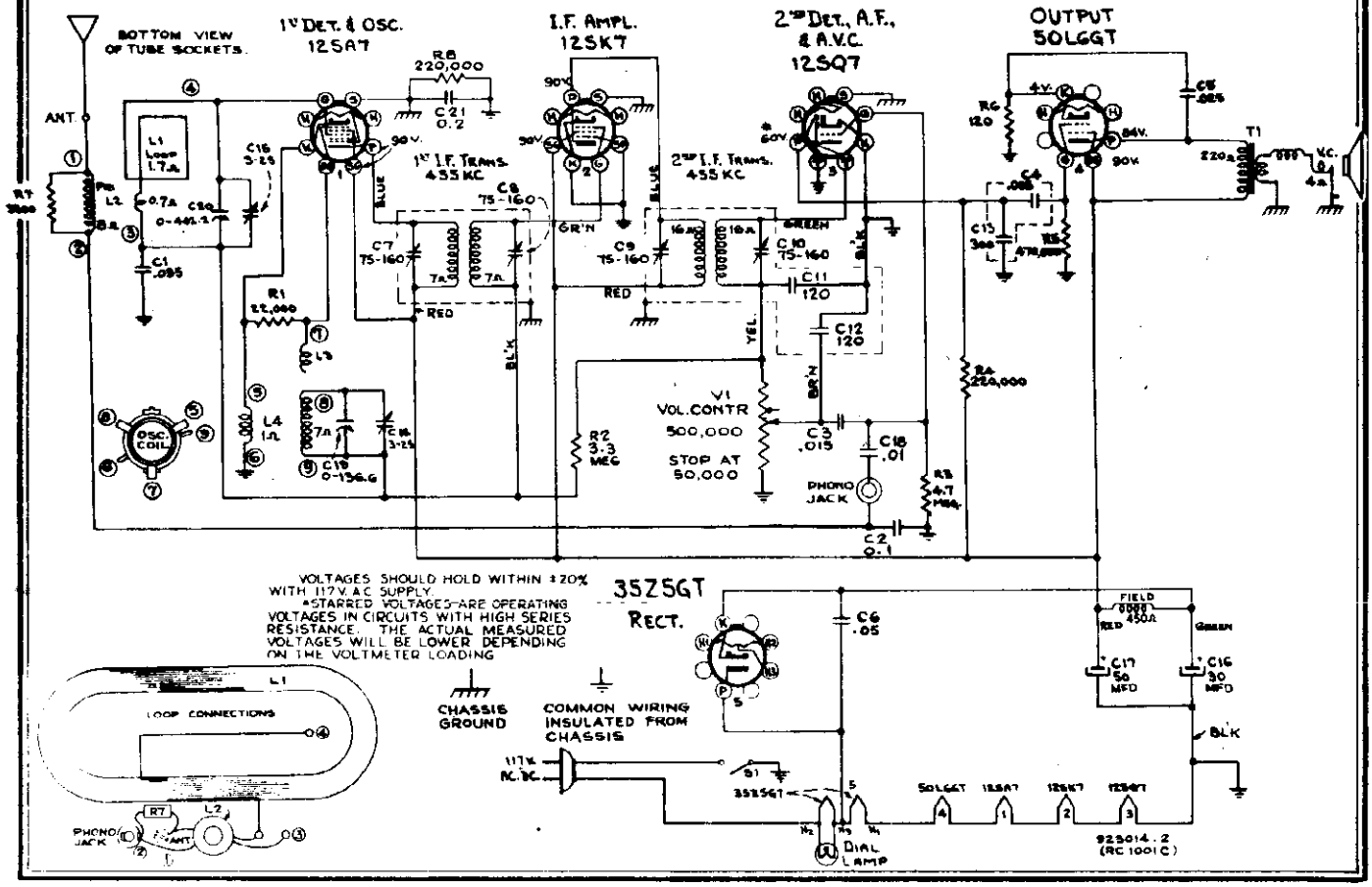
Tube and Trimmer Locations

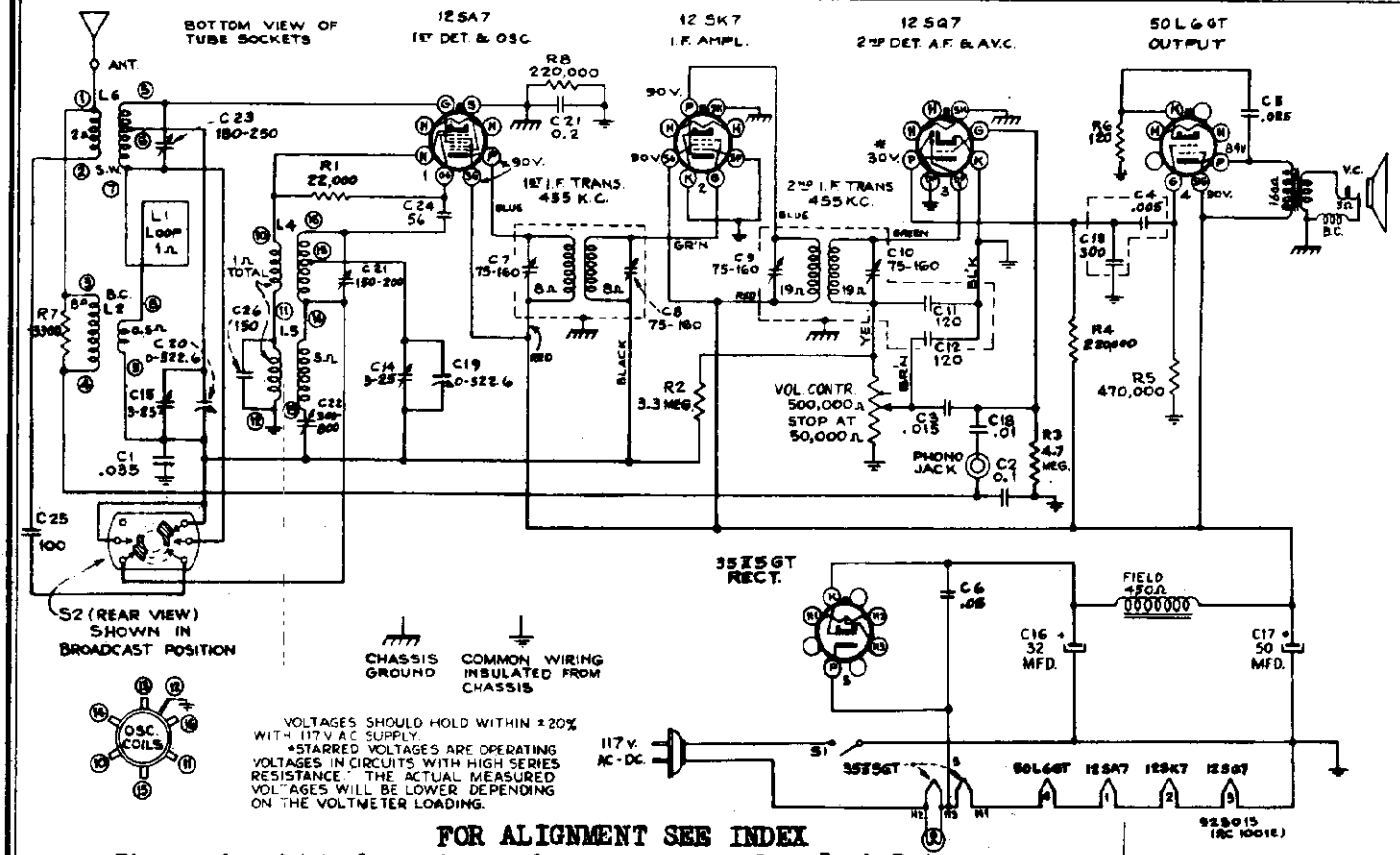
Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	1-F grid, in series with .01 mfd.	455 kc	Quiet point 1,600 kc end of dial	C10, C9 2nd I-F Transformer
2	1st Det. grid in series with .01 mfd.			C8, C7 1st I-F Transformer
3	Ant. terminal in series with 100 mmfd.	1,720 kc	Gang at minimum	C14 (osc.)
4	Radiated signal 1,300 kc		Signal frequency	C15 (ant.)
5	Repeat steps 3 and 4.			

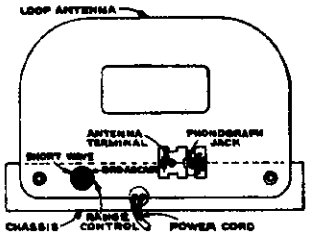
Record Player.—A jack is provided on the rear of the set for attaching a Record Player. The cable from the Record Player should be terminated in a Stock No. 31048 plug to fit the jack.

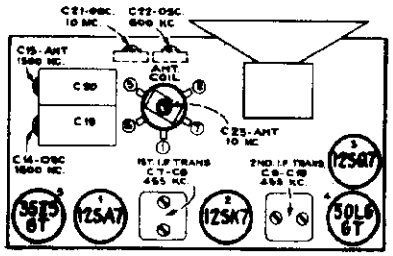
For phono operation, tune the receiver to a quiet point on the dial, turn the radio volume control to minimum, and use the control on the Record Player to regulate volume.

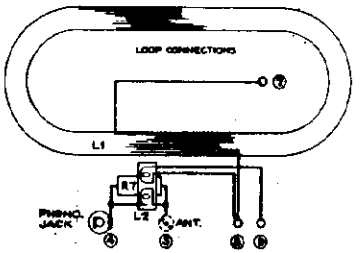
For radio operation, always remove the record-player plug from the jack.

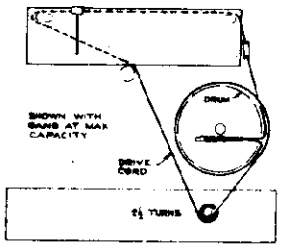












FOR ALIGNMENT SEE INDEX

Electrical and Mechanical Specifications

Frequency Range

Broadcast Band..... 540-1,720 kc
Short Wave Band..... 9 mc to 12 mc.

Intermediate Frequency..... 455 kc

Tube Complement

(1) RCA-12SA7..... 1st Det.—Osc.
(2) RCA-12SK7..... I-F Amplifier
(3) RCA-12SQ7..... 2nd Det., A.V.C., and A-F Amplifier
(4) RCA-50L6-GT..... Power Output
(5) RCA-35Z5-GT..... Rectifier

Pilot Lamp..... Mazda No. 51, 6-8 volts, 0.2 amp.

Power Output

Undistorted..... .9 watts
Maximum..... 1.3 watts

Loudspeaker (RL-86A-3)

Type..... 5-inch Electrodynamic
V.C. Impedance..... 3.3 ohms at 400 cycles

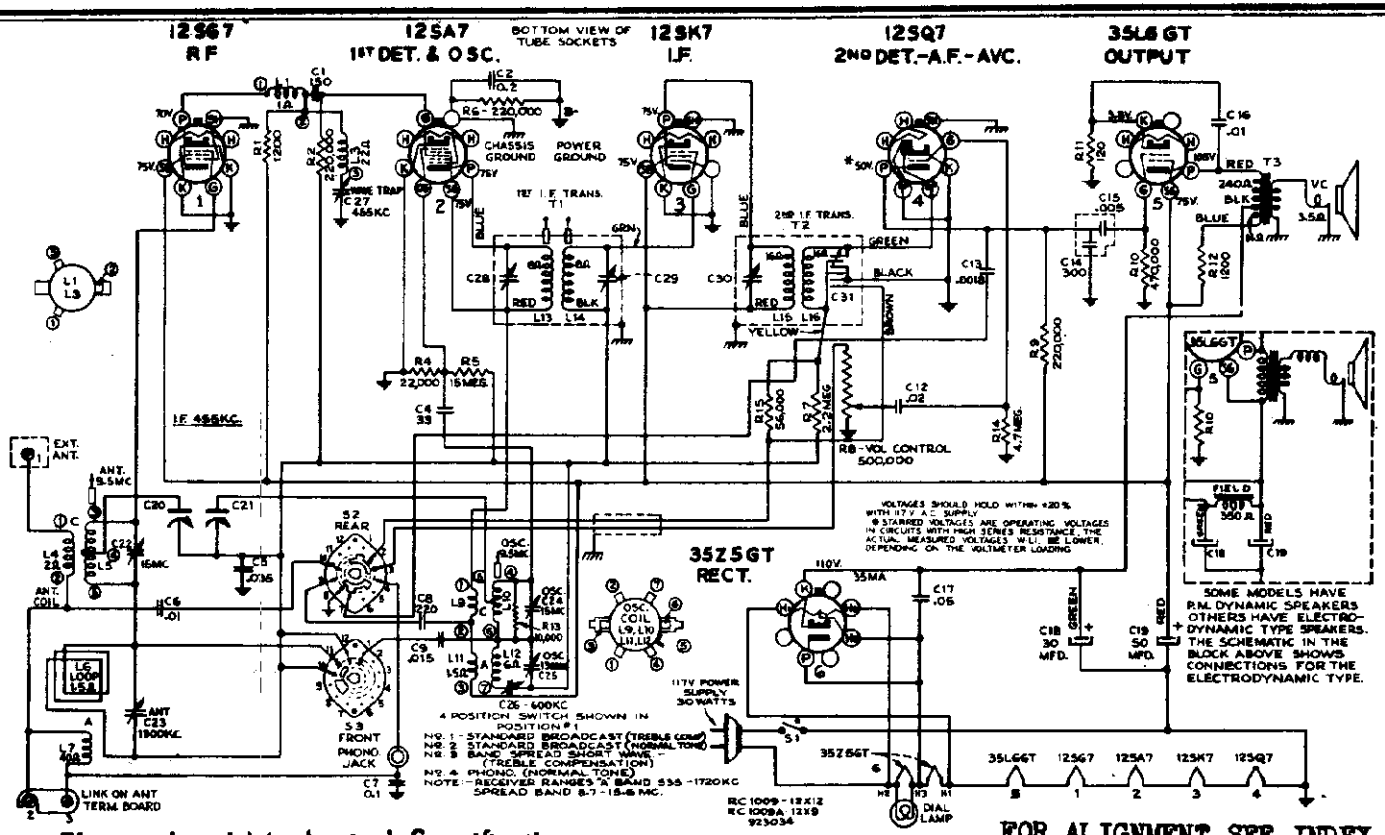
Power Supply Rating

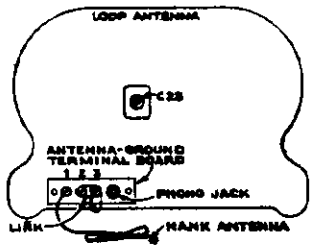
105-125 volts, AC 50 or 60 cycles, or DC..... 30 watts

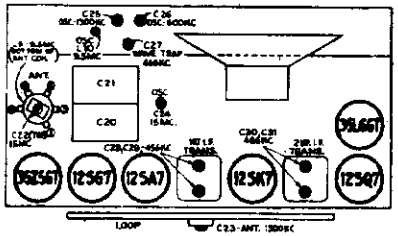
Precautionary Lead Dress.—

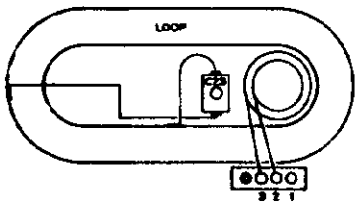
1. Dress the power cable to switch on the volume control close to the chassis and away from all grid and diode leads and condensers.
2. Dress capacitors in the 12SQ7 grid circuit away from all wiring.
3. Green and black phono wires should be twisted and dressed away from other parts and leads.
4. 50L6-GT filament wires should be dressed to rear of chassis and away from the second I-F transformer leads.
5. Dress brown lead from second I-F transformer to 12SQ7 away from power cable.
6. Dress wire to No. 1 grid of the 12SA7 away from pilot lamp leads.
7. Dress wire from loop to variable condenser away from chassis.
8. Dress all capacitors, leads, etc. which come close to oscillator coil rigidly and as far as possible from it.

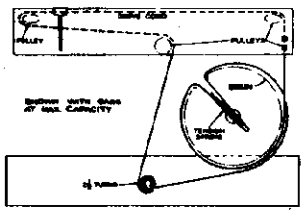
Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.











Electrical and Mechanical Specifications

FREQUENCY RANGE

Broadcast	535-1,750 kc
Short Wave	8.7-15.6 mc

INTERMEDIATE FREQUENCY ..... 455 kc

TUBE COMPLEMENT

(1) RCA-12SG7	R-F Amplifier
(2) RCA-12SA7	1st Det.—Osc.
(3) RCA-12SK7	I-F Amplifier
(4) RCA-12SQ7	2nd Det., A.V.C., and A-F Amplifier
(5) RCA-35L6-GT	Power Output
(6) RCA-35Z5-GT	Rectifier

PILOT LAMP ..... Mazda No. 51, 6-8 volts, 0.2 amp.

POWER OUTPUT

Undistorted	0.9 watts
Maximum	1.4 watts

LOUDSPEAKER

Type RL-81B2	5-inch permanent-magnet dynamic
Type RL-86B1	5-inch electrodynamic
V.C. Impedance	4 ohms at 400 cycles

POWER SUPPLY RATING

105-125 volts, AC, 50 or 60 cycles, or DC ..... 25 watts

Precautionary Lead Dress

1. Dress output tube plate lead to speaker and output bypass condenser away from terminal board and yellow lead in cable.
2. Dress brown and yellow leads from 2nd I.F. transformer away from output plate and bypass condenser.
3. Dress .02 capacitor C12 away from output capacitor C16.
4. Dress all leads or parts as far as possible away from oscillator coil.
5. Dress lead from C13 to band switch down along front apron of chassis.
6. Dress lead from trimmer condenser on loop to S.W. Ant. coil around outside of rectifier tube. Other leads between rectifier and R.F. tube.

Combination Range, Tone and Phonograph Control

1. Extreme counter-clockwise position (Broadcast reception high tones emphasized).
2. Full tone (Broadcast Reception).
3. Band Spread Short Wave Reception.
4. Phonograph Attachment operation with full tones.

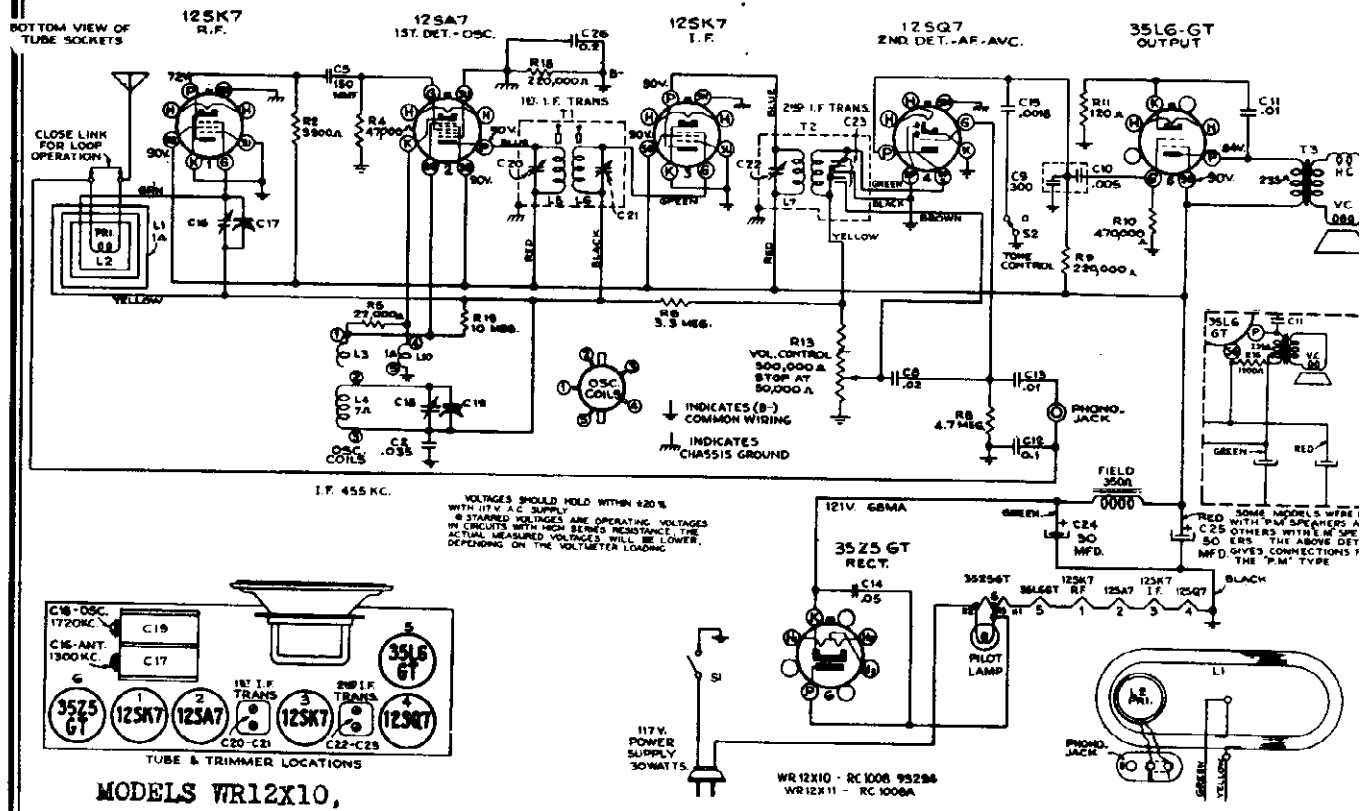
Power Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

FOR ALIGNMENT SEE INDEX

WESTINGHOUSE ELEC. SUPPLY CO., INC.

MODELS WR12X10
WR12X11
MODEL WR12X14

MODELS WR12X10, WR12X11

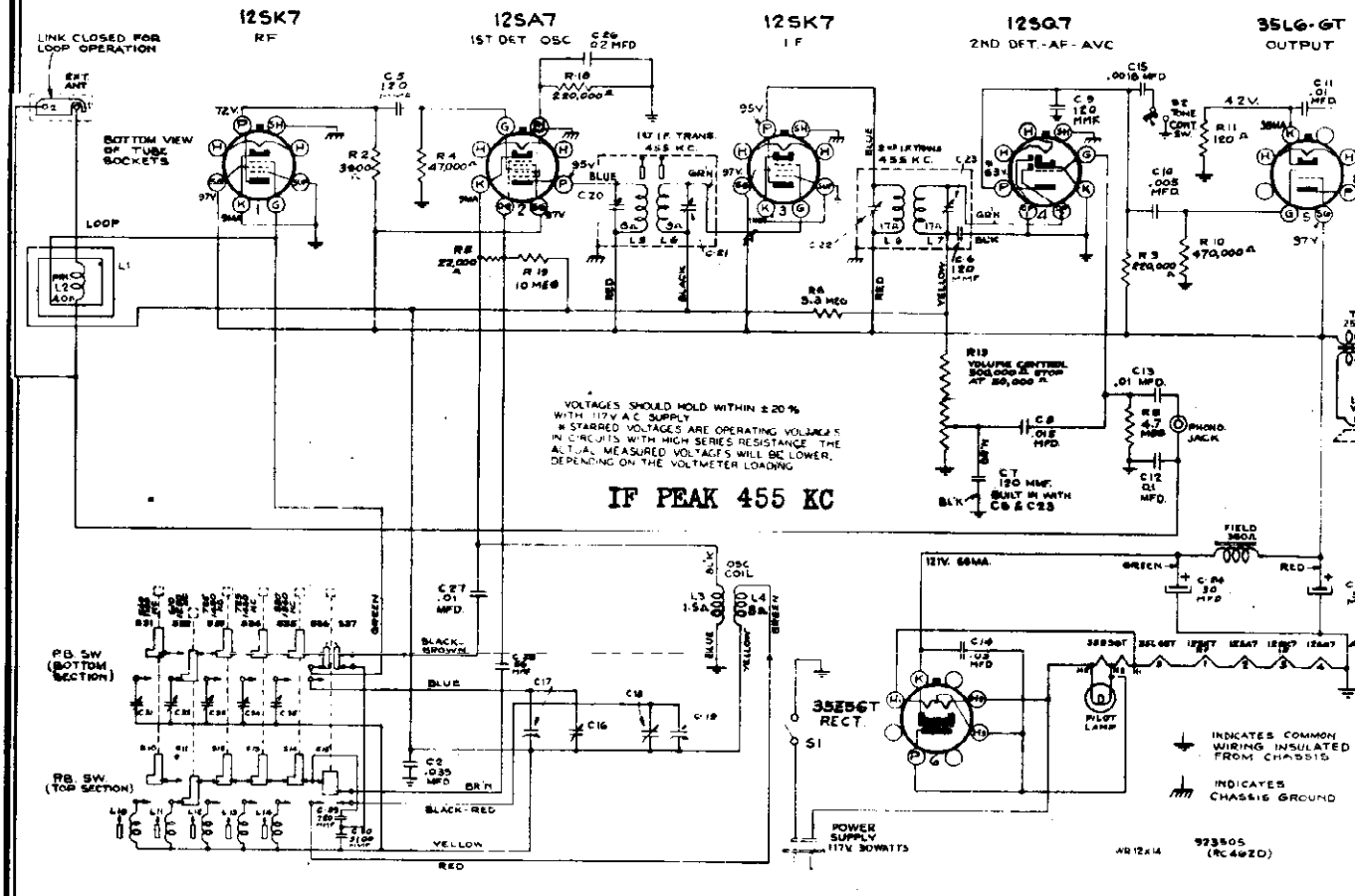


VOLTAGES SHOULD HOLD WITHIN ±20% WITH 117V A.C. SUPPLY
* STARRED VOLTAGES ARE OPERATING VOLTAGES IN CIRCUITS WITH HIGH SERIES RESISTANCE. THE ACTUAL MEASURED VOLTAGES WILL BE LOWER, DEPENDING ON THE VOLTMETER LOADING

TUBE & TRIMMER LOCATIONS

MODELS WR12X10, WR12X11, WR12X14

MODEL WR12X14



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MODELS WR12X10, WR12X11

WESTINGHOUSE ELEC. SUPPLY CO., INC.

MODEL WR12X14
MODEL WR12X15

Alignment Procedure FOR MODELS WR12X10, 12X11, WR12X14

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—Connect the low side of the test-oscillator to the receiver chassis, through a .01 mfd. capacitor, and keep the output as low as possible.

Calibration Scale.—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the dial backing plate for quick reference during alignment.

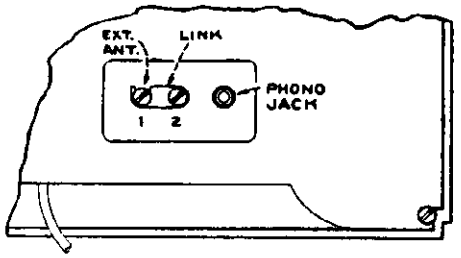
Antenna.—The set is equipped with a built-in loop antenna. If an outdoor antenna is used, it should be connected to the blue antenna lead on the rear of the chassis.

Precautionary Lead Dress:

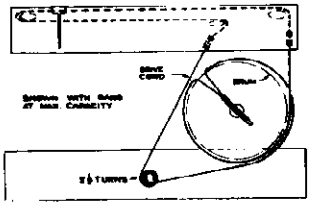
1. .01 mfd. capacitor from output plate to cathode to be dressed as far as possible away from .015 mfd. 1st audio grid condenser and volume control terminals to eliminate audio howl.
2. Filament lead to pin No. 7 on 35L6-GT socket to be dressed away from 1st audio grid.
3. Dress B+ lead on 12SK7 I.F. socket across bottom of socket between grid and plate contacts to aid reduction of grid plate capacitance.
4. Dress excess lead lengths of I.F. transformer, grid and plate leads into cans to aid shielding.
5. Dress filament leads of 35L6-GT around 12SQ7 socket and into chassis corner to reduce hum.

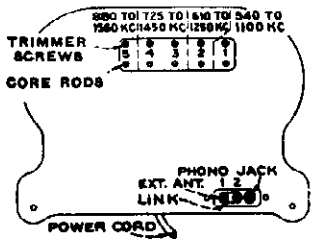
Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio to—	Adjust the following for maximum peak output
1	12SK7 I-F grid, in series with 0.1 mfd.	455 kc	Quiet Point at 1,700 kc end of dial	C23, C22 2nd I-F transformer
2	12SA7 1st det. grid, in series with 0.1 mfd.			C21, C20 1st I-F transformer
3	12SK7 R-F grid, in series with 0.1 mfd.	1,720 kc	1,720 kc	C18 (osc.)
4	Radiated signal 1,300 kc		Signal frequency	C16 (ant.)
5	Repeat steps 3 and 4.			

MODELS WR12X10, WR12X11



MODEL WR12X14 ONLY





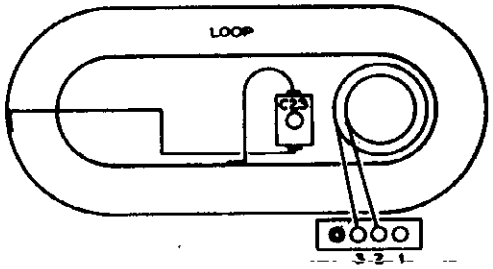
Push Button Adjustment:

1. Make a list of the five desired stations, arranged in order from low to high frequencies, push in Dial Tuning button, allow at least a five minute warm-up period, and manually tune-in the first station on this list.
2. Push in station button No. 1 (extreme left) and adjust No. 1 oscillator core to receive the station.
3. Adjust antenna trimmer for maximum output. Clockwise core and trimmer adjustment tunes circuits to lower frequencies.
4. Adjust for each of the four remaining stations in a similar manner.
5. Make a final careful re-adjustment of oscillator cores and antenna trimmers.

MODEL WR12X15

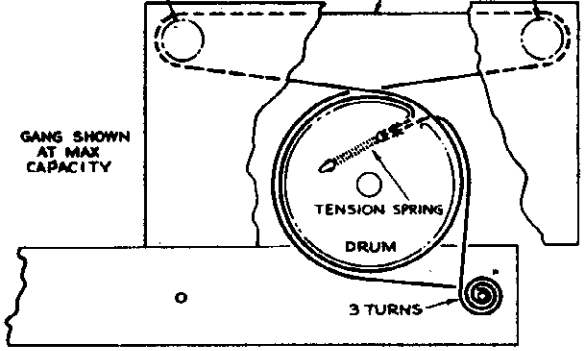
Precautionary Lead Dress

1. Dress output tube plate lead to speaker and output bypass condenser away from terminal board and yellow lead in cable.
2. Dress brown and yellow leads from 2nd I.F. transformer away from output plate and bypass condenser.
3. Dress .02 capacitor C12 away from output capacitor C16.
4. Dress all leads or parts as far as possible away from oscillator coil.
5. Dress lead from C13 to band switch down along front apron of chassis.
6. Dress lead from trimmer condenser on loop to S.W. Ant. coil around outside of rectifier tube. Other leads between rectifier and R.F. tube.



Loop Connections

Power Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.



Drive Cord Arrangement

Record Player.—A jack is provided on the rear of the set for attaching a Record Player. The cable from the Record Player should be terminated in a Part No. 31048 plug to fit the jack.

Electrical and Mechanical Specifications

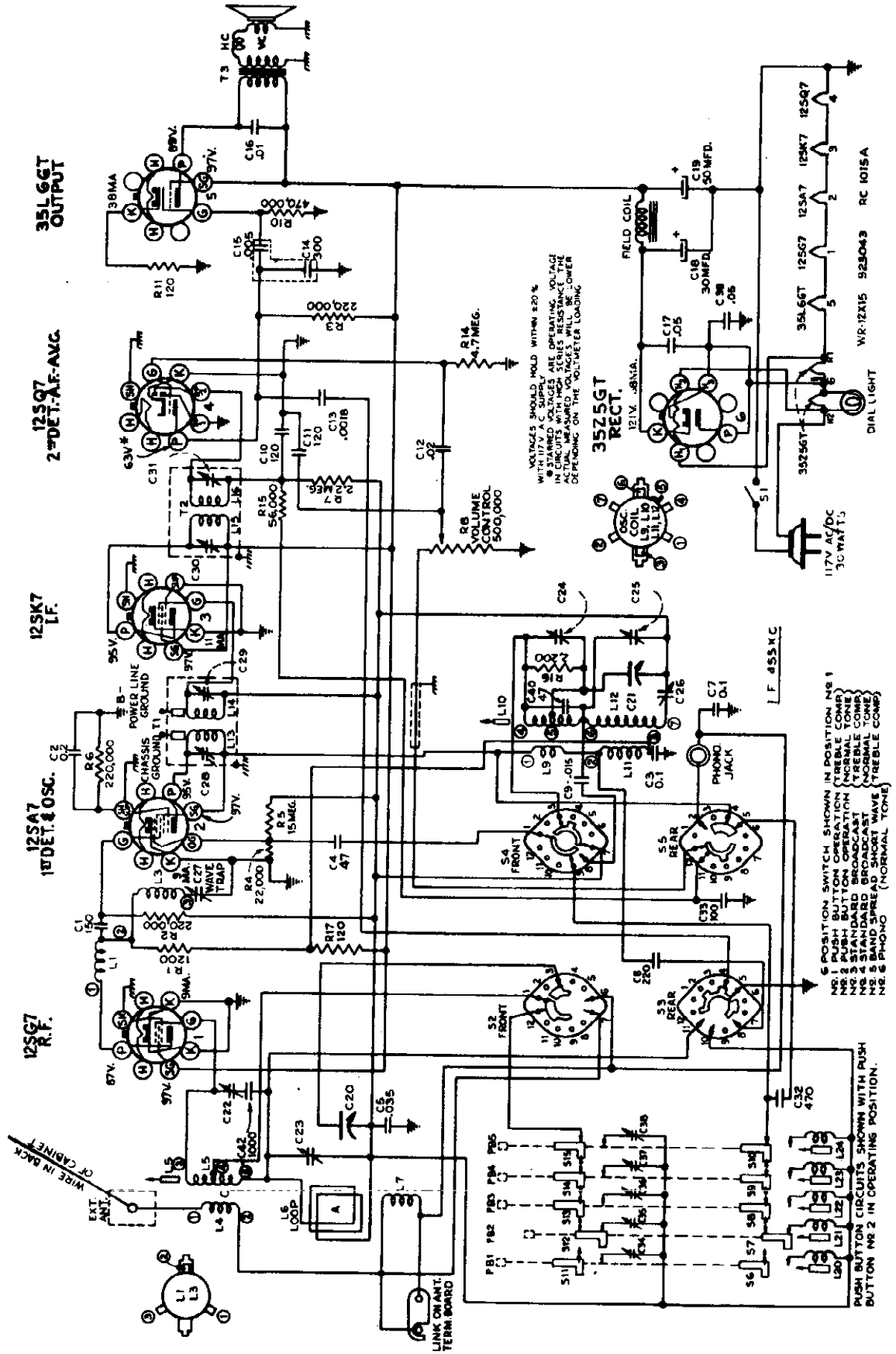
FREQUENCY RANGE

Broadcast	540-1,600 kc
Short Wave	9-15.5 mc
INTERMEDIATE FREQUENCY	455 kc
PILOT LAMP	Mazda No. 51, 6-8 volts, 0.2 amp.

POWER OUTPUT

Undistorted	0.9 watts
Maximum	1.4 watts

WESTINGHOUSE ELEC. SUPPLY CO., INC.



MODEL WR12X15
MODEL WR12X16

WESTINGHOUSE ELEC. SUPPLY CO., INC.

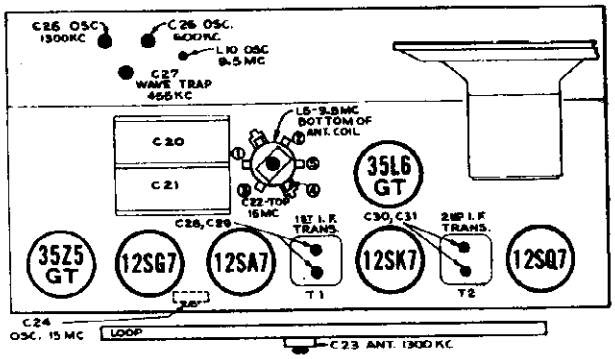
MODEL WR12X15 — Alignment Procedure

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test Oscillator.—For all alignment operations, keep the output as low as possible to avoid a.v.c. action.

Calibration Scale.—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the dial backing plate for quick reference during alignment.

With gang in full mesh, move the dial pointer to the last mark at the left-hand end of the dial scale.



Tube and Trimmer Locations

Steps	Connect high side of the test oscillator to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	I.F. grid in series with 0.1 mfd.	455 kc	Quiet Point at 1,700 kc end of dial	C-30, C-31
2	1st det. grid in series with 0.1 mfd.			C-28, C-29
3	R.F. grid in series with 0.1 mfd.			C27**
4	Ant. terminal in series with 47 mmf. (link open)	15 mc	15 mc "C" Band	C-24 (osc.)* C-22 (ant.)
5		9.5 mc	9.5 mc "C" Band	L-10 (osc.) L-5 (ant.)
6	Repeat steps 4 and 5.			
7	Ant. terminal in series with 220 mmf. (link open)	1,300 kc	1,300 kc "A" Band	C-25 (osc.) C-23 (ant.)
8		600 kc	600 kc "A" Band	C-26 (osc.)
9	Repeat steps 7 and 8.			

*Use minimum capacity peak if two peaks can be obtained.

**Adjust C-27 for *minimum* signal with 455 kc applied to R.F. grid.

Note.—Oscillator tracks 455 kc above signal on all bands.

MODEL WR12X15 — Push Button Adjustment

The station push buttons connect to separate magnetite-core oscillator coils and separate antenna trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool such as Part No. 31031. Allow at least five minutes warm-up period before making adjustments.

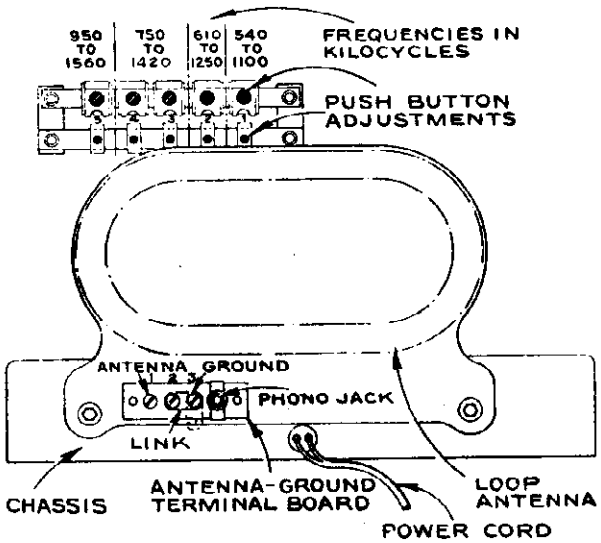
In the event that the receiver is to be used with an external antenna use one or two feet of wire (as an antenna) to ensure sharp peaking during the final adjustment procedure. For loop operation, the link should be strapped across terminals on back of set. In either case the procedure is as follows:

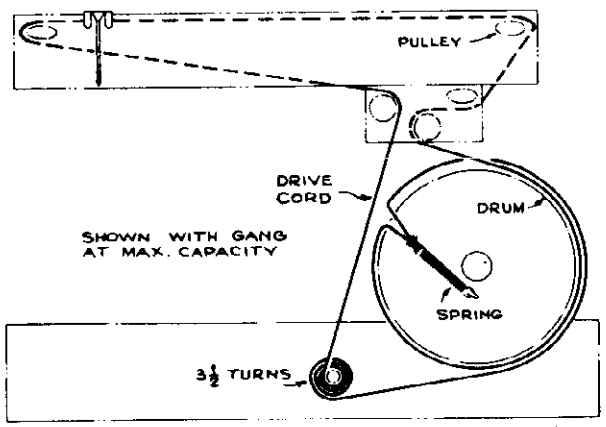
1. Make a list of the desired stations, arranged in order from low to high frequencies.
2. Turn the range selector to dial position, and manually tune in the first station on the list.
3. Turn range selector to "PB" position, push in station button No. 1 (extreme left). Then adjust the No. 1 oscillator core to receive the station.
4. After oscillator core is set correctly, adjust No. 1 antenna trimmer for maximum output.
   Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.
5. Adjust for each of the remaining stations in the same manner.
6. Make a final careful adjustment of the oscillator cores and antenna trimmers.

On the 950 to 1,560 kc push-button, the higher frequency stations may be received with L24 either in or out (oscillator frequency either 455 kc below or 455 kc above the station frequency). The adjustment with this core in its out position (oscillator frequency 455 kc above the station frequency) is the correct one.

PUSH-BUTTON RANGES

One station between approximately	540-1,100 kc
One station between approximately	610-1,250 kc
Two stations between approximately	750-1,420 kc
One station between approximately	950-1,560 kc



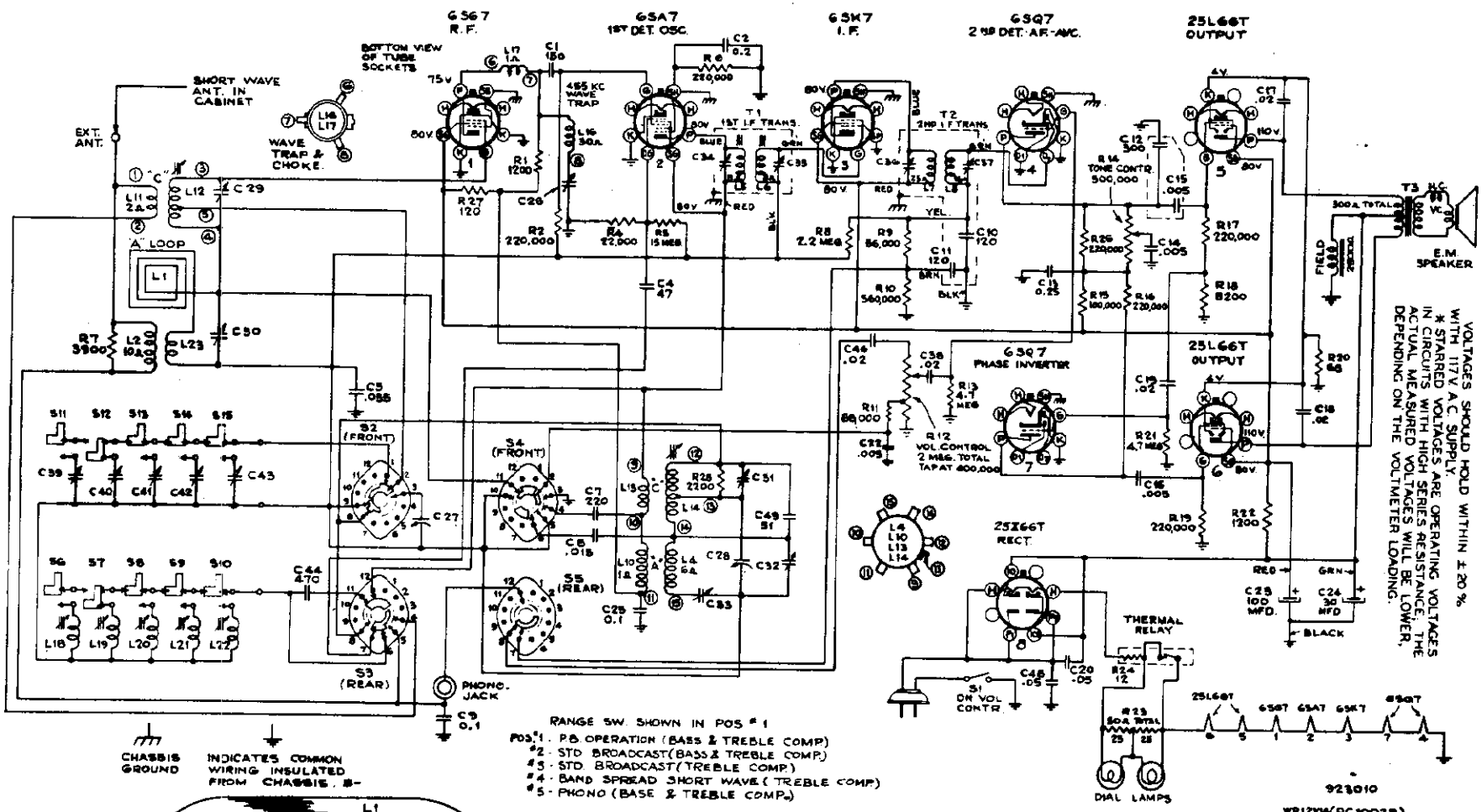


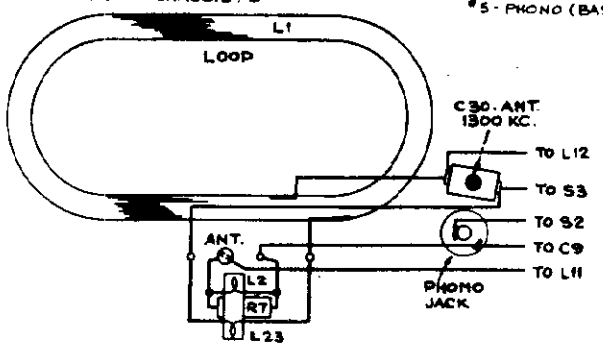
Model WR-12X16

Drive and Indicator Cord Arrangement

Phono Attachment.—A jack is provided on the rear of cabinet for connecting a Phono Attachment into the audio-amplifying circuit. The cable from the Phono Attachment should be terminated in a Part No. 31048 plug to fit the jack.

Power-Supply Polarity.—For operation on d.c. the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.





Loop Connections

Critical Lead Dress

1. Dress all AC filament and power wiring down close to chassis and as far as possible from all audio grid or plate wiring.
2. Dress all leads or parts as far as possible away from oscillator coil.
3. Dress audio coupling capacitor C38 from volume control to grid of 6SQ7 away from filament wire connecting No. 8 pin socket 5 and No. 8 pin socket 7.
4. Dress lead from trimmer condenser on loop to S.W. ant. coil between rectifier and R.F. tube and away from other coil leads.
5. Dress I-F plate and grid leads back into the shield can to keep exposed length as short as possible.

MODEL WR12X16

WESTINGHOUSE ELEC. SUPPLY CO., INC.

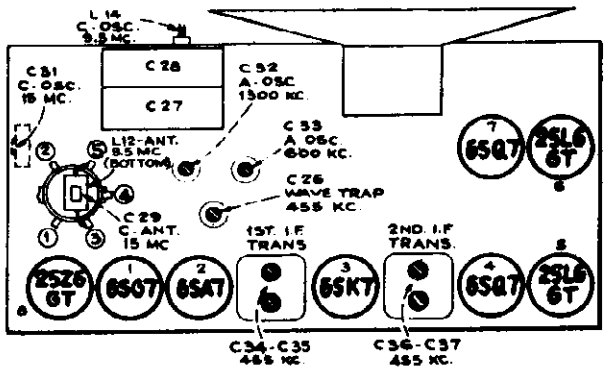
Alignment Procedure

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—Connect the low side of the test-oscillator to the receiver chassis through a .01 mfd. capacitor, and keep the output as low as possible.

Antenna.—The set is equipped with a built-in loop antenna. If an outdoor antenna is used, it may be connected to the "ANT" terminal on rear of cabinet. It should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

Dial Pointer Adjustment.—The dial pointer should be set at the left-hand end dial marks, with the gang in full mesh.



Tube and Trimmer Locations

Steps	Connect the high side of test osc. to—	Tune test. osc. to—	Range Switch to—	Turn radio dial to—	Adjust the following for max. peak output
1	I-F grid in series with .01 mfd.	455 kc	A	Quiet Point near middle of dial	C-36, C-37 2nd I-F trans.
2	Det. grid in series with .01 mfd.				C-34, C-35 1st I-F trans.
3	Ant. lead in series with 50 mmfd.	15 mc	C	15 mc	C-31 (osc.)* C-29 (ant.)
4		9.5 mc	C	9.5 mc	L-14 (osc.) L-12 (ant.)
5	Repeat steps 3 and 4.				
6	Antenna terminal in series with 200 mmfd.	1,300 kc	A	1,300 kc	C-32 (osc.) C-30 (ant.)
7		600 kc	A	600 kc	C-33 Rock in
8	Repeat steps 6 and 7.				
9	R-F grid in series with .01 mfd.	455 kc	A	low end of dial	C-28**

* Oscillator should track on high frequency side of signal.

If two peaks are obtained use high frequency (minimum capacity peak).

** Feed a high signal level of 455 kc into R.F. grid and adjust C-26 for minimum signal.

Electrical and Mechanical Specification

FREQUENCY RANGES

Standard Broadcast	540-1,600 kc
Short Wave	9-15 mc
Intermediate Frequency	455 kc

TUBE COMPLEMENT

(1)	RCA-6SG7	R-F Amplifier
(2)	RCA-6SA7	1st Det.-Osc.
(3)	RCA-6SK7	I-F Amplifier
(4)	RCA-6SQ7	2nd Det., A.V.C., A.F. Amp.
(5)	RCA-6SQ7	Phase Inverter
(6)	RCA-25L6GT	Power Output
(7)	RCA-25L6GT	Power Output
(8)	RCA-25Z6GT	Rectifier

Dial Lamp (2) ..... Mazda 44, 6.3 V., 0.25 A.

LOUDSPEAKER

Type	9¼ inch elliptical electrodynamic
V.C. Impedance	3 ohms at 400 cycles

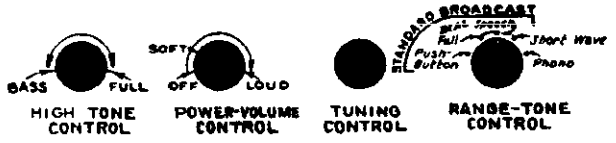
POWER OUTPUT RATING

Undistorted	2.5 watt
Maximum	4.0 watt

POWER SUPPLY RATING

105-125 A.C. 50-60 cy. or D.C. ..... 60 watts

	Height	Width	Depth
Cabinet Dimensions (inches)	12¼	16¼	10
Chassis Base Dimensions (inches)	2¾	12¾	6
Overall Chassis Height			9¼
Weight (Net)			14 lbs.
Tuning drive ratio			26 to 1



Location of Controls

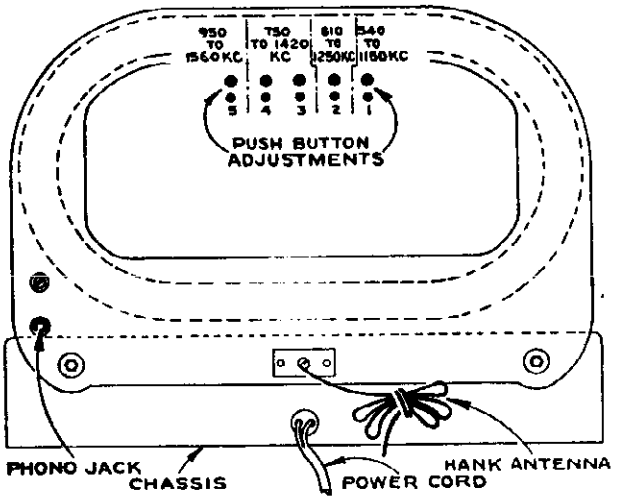
Push Button Adjustment

The station push buttons connect to separate magnetite-core oscillator coils and separate antenna trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool such as Part No. 31031. Allow at least five minutes warm-up period before making adjustments.

In the event that the receiver is to be used with an external antenna use one or two feet of wire (as an antenna) to ensure sharp peaking during the final adjustment procedure.

1. Make a list of the desired stations, arranged in order from low to high frequencies.
2. Turn the range selector to "A" band, and manually tune in the first station on the list.
3. After turning range selector to "PB" position, push in station button No. 1 (extreme left). Then adjust the No. 1 oscillator core to receive the station. It may be necessary to maintain approximate tracking between antenna and oscillator to receive weak stations.
4. After oscillator core is adjusted properly, adjust antenna trimmer No. 1 for maximum output.
   Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.
5. Adjust for each of the five remaining stations in the same manner.
6. Make a final careful adjustment of the oscillator cores and antenna trimmers.

On push-button No. 5, the higher frequency stations may be obtained with the oscillator core No. 5 either in or out. (Oscillator frequency either 455 kc below or above the signal.) The out position should be used so the oscillator is 455 kc above the signal.



Rear of Chassis—Push Button Adjustment

MODELS WR12X9, WR12X12

WESTINGHOUSE ELEC. SUPPLY CO., INC.

MODELS WR12X1 WR12X2, WR12K1 MODEL WR12X8

Alignment Procedure MODEL WR12X8

Output Meter Alignment.—If this method is used connect the meter across the voice coil and turn the receiver volume control to maximum.

Test Oscillator.—Connect the low side of the test oscillator to the receiver chassis through a .01 mfd. capacitor. With the output meter alignment method the test oscillator output should be kept as low as possible.

Calibration Scale.—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the dial backing plate for quick reference during alignment.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	12SK7 grid in series with 0.1 mfd.	455 kc	Quiet Point at 1,600 kc end of dial	C10, C9 2nd I-F Transformer
2	12SA7 grid in series with 0.1 mfd.			C8, C7 1st I-F Transformer
3	Antenna term. in series with 47 mmf.	10 mc*	10 mc	C21 (osc.)** C23 (ant.)
4	Antenna term. in series with 200 mmfd.	1,600 kc	1,600 kc	C14 (osc.)
5	Radiation Loop	1,300 kc	Resonance on Signal	C15 (ant.)
6	Radiation Loop	600 kc	600 kc	C22 Osc. Rock in

* It is recommended that this step be repeated using a received station of known frequency.

** Use minimum capacity if two peaks can be obtained.

Alignment Procedure

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—Connect the low side of the test-oscillator to the receiver chassis, through a .01 mfd. capacitor, and keep the output as low as possible.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	I-F grid, in series with .01 mfd.	455 kc	Quiet point 1,700 kc end of dial	C8 and C9 2nd I-F Transformer
2	1st Det. grid in series with .01 mfd.			C6 and C7 1st I-F Transformer
3	Ant. terminal in series with 200 mmfd.	1,720 kc	Gang at minimum	C3 (osc.)
4	Radiation loop consisting of two turns of wire 18 inches in diameter located 4 to 6 feet from receiver	1,300 kc	Signal Frequency	C1 (ant.)
5	Repeat steps 3 and 4			

WR-12X1, WR-12X2 and WR-12K1

Antenna.—The set is equipped with a built-in loop antenna. If an out-door antenna is used, it may be connected to the "ANT." terminal on rear of cabinet. It should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

Power-Supply Polarity.—For operation on d.c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a.c, reversal of the plug may reduce hum.

Precautionary Lead Dress:

1. Dress 1st I-F plate and grid leads against chassis and away from each other. Dress plate lead from 12SK7 close to chassis.
2. Dress leads from terminal board on loop support away from loop.

MODELS WR12X9, WR12X12 Alignment Procedure

Output Meter Alignment.—If this method is used, connect th meter across the voice coil, and turn the receiver volume control t maximum.

Test Oscillator.—For all alignment operations, keep the output low as possible to avoid a.v.c. action.

Calibration Scale.—The glass tuning dial may be easily remove from the cabinet and temporarily attached to the dial backing pla for quick reference during alignment.

With gang in full mesh, move the dial pointer to the last mark the left-hand end of the dial scale.

Steps	Connect high side of the test oscillator to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	I.F. grid in series with 0.1 mfd.	455 kc	Quiet Point at 1,700 kc end of dial	C30, C31
2	1st det. grid in series with 0.1 mfd.			C-28, C-29
3	R.F. grid in series with 0.1 mfd.			C-27**
4	Ant. terminal in series with 47 mmf. (link open)	15 mc	15 mc "C" Band	C-24 (osc.)* C-22 (ant.)
5		9.5 mc	9.5 mc "C" Band	L-10 (osc.) L-5 (ant.)
* 6		Repeat steps 4 and 5.		
7	Ant. terminal in series with 220 mmf. (link open)	1,300 kc	1,300 kc "A" Band	C-25 (osc.) C-23 (ant.)
8		600 kc	600 kc "A" Band	C-26 (osc.)
9		Repeat steps 7 and 8.		

*Use minimum capacity peak if two peaks can be obtained.

**Adjust C-27 for *minimum* signal with 455 kc applied to R.F grid.

Note.—Oscillator tracks 455 kc above signal on all bands.

MODELS WR12X1, WR12X2, WR12K1

Electrical and Mechanical Specifications

FREQUENCY RANGE ..... 540-1,720 kc

INTERMEDIATE FREQUENCY ..... 455 kc

TUBE COMPLEMENT

(1) RCA-12SA7 ..... 1st-Detector—Oscillator
(2) RCA-12SK7 ..... 1-F Amplifier
(3) RCA-12SQ7 ..... 2nd-Detector, 1st A-F, and A.V.C.
(4) RCA-50L6GT ..... Power Output
(5) RCA-35Z5GT ..... Half-Wave Rectifier

DIAL LAMP ..... Mazda 51, 7.5 volts, 0.2 amp.

POWER SUPPLY RATINGS

A-C Rating ..... 105-125 volts, 50-60 cycles, 30 watts
D-C Rating ..... 105-125 volts, direct current, 30 watts

POWER OUTPUT (125 volts, 60 cycle supply)

Undistorted ..... 0.75 watts
Maximum ..... 1.2 watts

LOUDSPEAKER

Type ..... 5-inch Electrodynamic

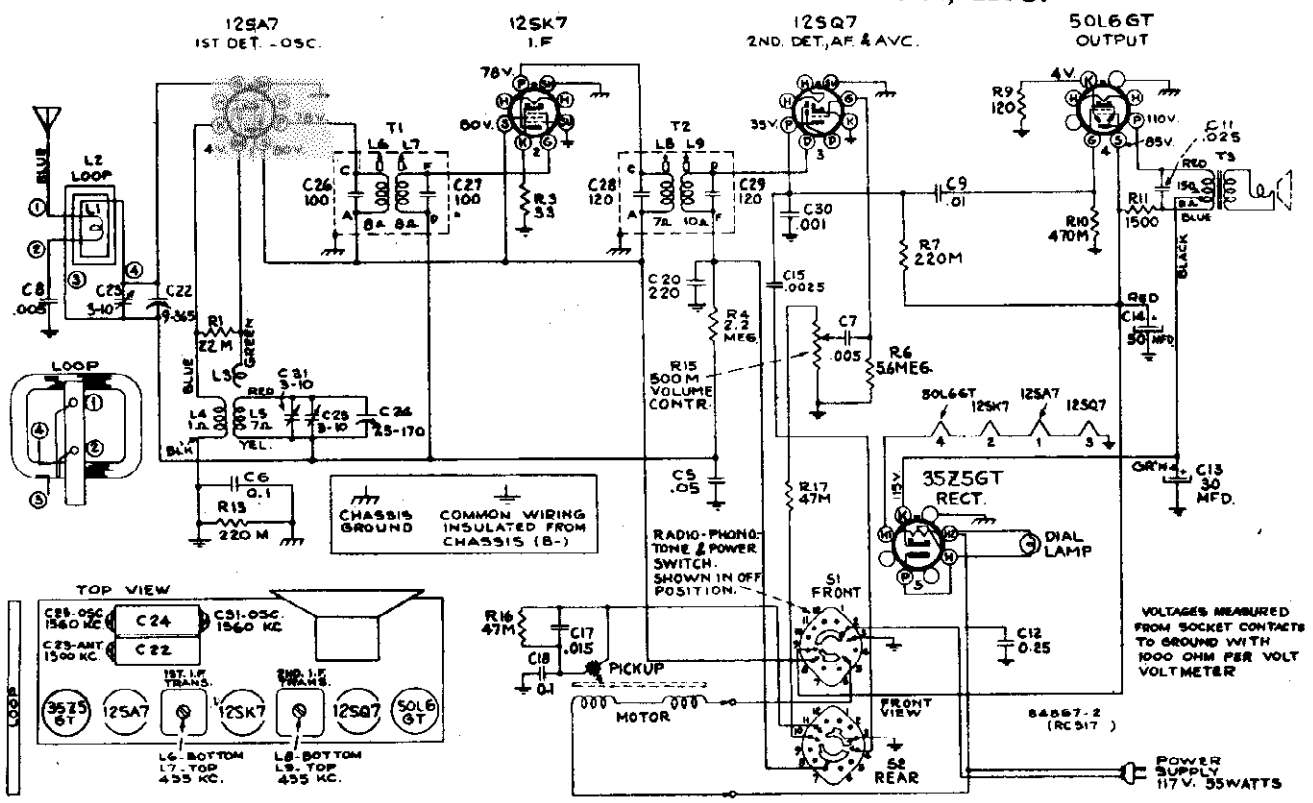
	Height	Width	Depth
Over-all Dimensions	7 inches	9¼ inches	6¾ inches

Weight ..... 9 pounds (shipping)

These models are identical with the exception of minor circuit changes—see schematic diagram and parts list.

MODEL WR42X1

WESTINGHOUSE ELEC. SUPPLY CO., INC.



Alignment Procedure

Power Supply.—Although this model employs an ac-dc chassis, it is not suitable for use on d.c., as this would damage the motor.

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—Connect the low side of the test-oscillator to the receiver chassis, through a .01 mfd. capacitor, and keep the output as low as possible.

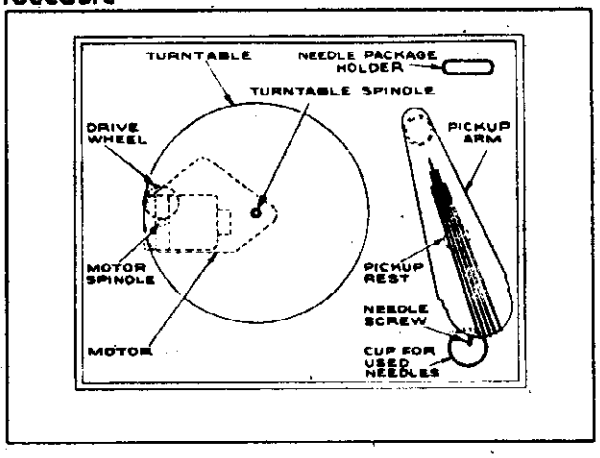
Antenna.—The set is equipped with a built-in loop antenna. If an outdoor antenna is used, it should be connected to the blue antenna lead on the rear of the chassis.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	I-F grid, in series with .01 mfd.	455 kc	Quiet point 1,600 kc end of dial	L8 and L9 2nd I-F Transformer
2	1st Det. grid in series with .01 mfd.			L6 and L7 1st I-F Transformer
3	Ant. terminal in series with 200 mmfd.	1,650 kc	Gang at minimum	C25 (osc.) C31 (osc.)
4	Radiated signal 1300 kc		Signal Frequency	C23 (ant.)
5	Repeat steps 3 and 4.			

Controls

The phonograph motor is a self-starting, constant-speed induction type. It should be lubricated every six months by applying a few drops of light machine oil to the top and bottom motor spindle bearings, to the turntable spindle and to the turntable drive wheel bearing.

CAUTION: Keep oil away from drive bushing on top of motor spindle and from rubber driving tire on turntable drive wheel.

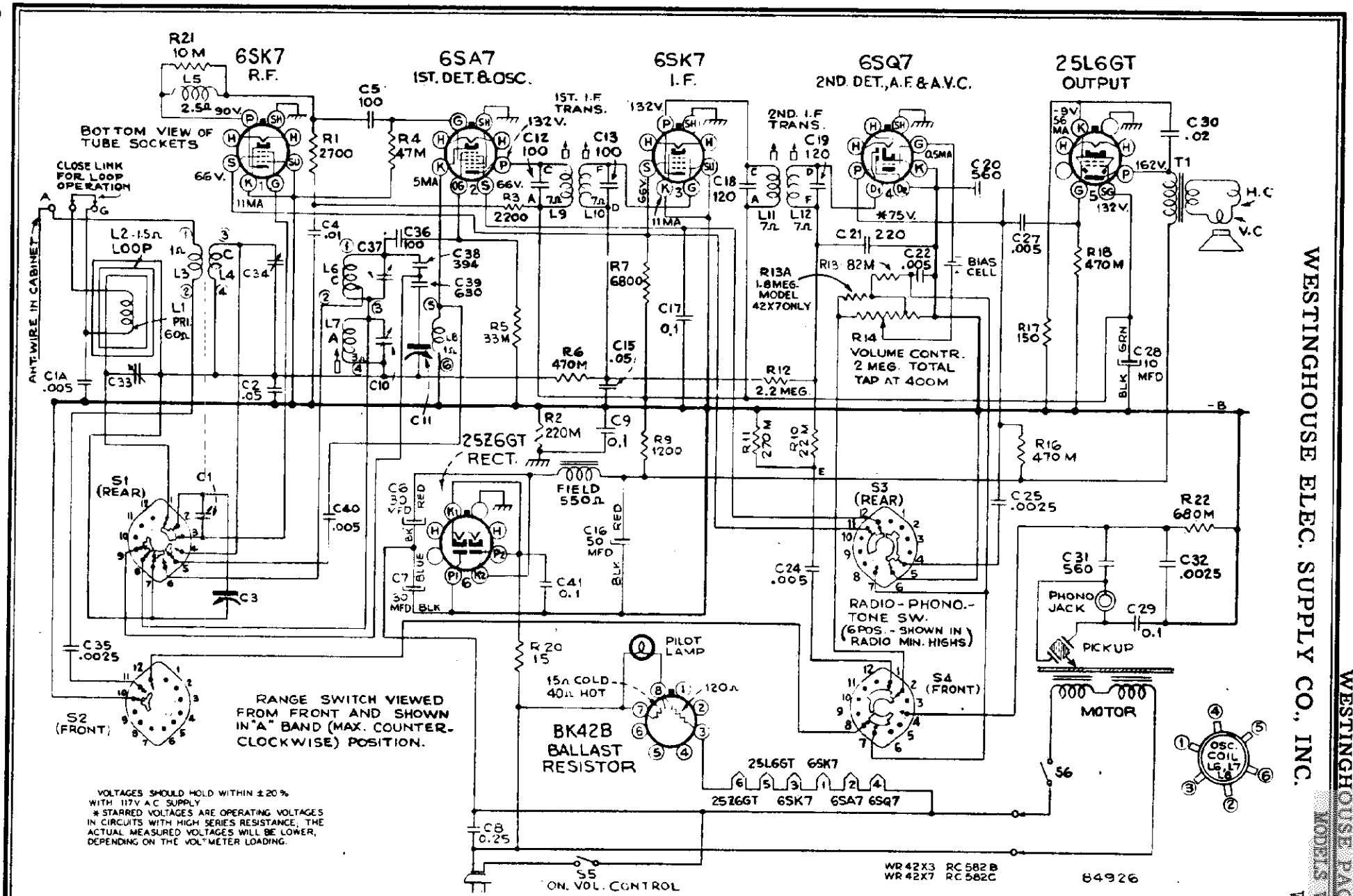


Phonograph

Frequency Range	540-1,650 kc
Intermediate Frequency	455 kc
Tube Complement	
(1) RCA-12SA7	1st Detector-Oscillator
(2) RCA-12SK7	I-F Amplifier
(3) RCA-12SQ7	2nd Detector, 1st A-F, and A.V.C.
(4) RCA-50L6GT	Power Output
(5) RCA-35Z5GT	Half-Wave Rectifier
Dial Lamp (1)	Mazda 51, 7.5 volts, 0.2 amp

Power Output (125 volt, 60 cycle supply)	**Radio**	**Phonograph**
Undistorted	0.9 watts	1.5 watts
Maximum	1.2 watts	2.2 watts

Power Supply Ratings	
A-C Rating	105-125 volts, 60 cycles 55 watts
Loudspeaker (RL-81-B4)	
Type	8-inch permanent-magnet dynamic
Voice-Coil Impedance	4 ohms at 400 cycles
Phonograph	Synchronous (self-starting)
Records	10-inch and 12-inch, 78 r.p.m.
Pickup	Crystal, 100,000 ohms at 1,000 c.p.s.
Average Output of Pickup	1½ volts at 1,000 c.p.s. across ¼ meg. load
Cabinet Dimensions (inches)	Height 10⅝, Width 16⅛, Depth 13⅜
Weight	18 lbs. (net) 22 lbs. (shipping)
Tuning Drive Ratio	10—1



FOR RCA RP-158 RECORD CHANGER SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

WESTINGHOUSE ELEC. SUPPLY CO., INC.

MODELS WR42X3, WR42X7

WESTINGHOUSE ELEC. SUPPLY CO., INC.

Alignment Procedure

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the common negative wiring, and keep the output as low as possible to avoid a-v-c action.

Calibration Scale.—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the chassis for quick reference during alignment. In the event that only the chassis is returned for service, and the cabinet with its tuning dial is left in the customer's home, the calibration scale printed full size in this service note can be used as an accurate and convenient substitute for the regular dial.

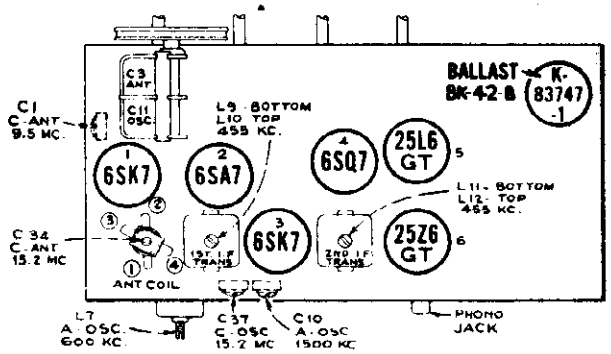
Each method is described below.

Using Tuning Dial.—

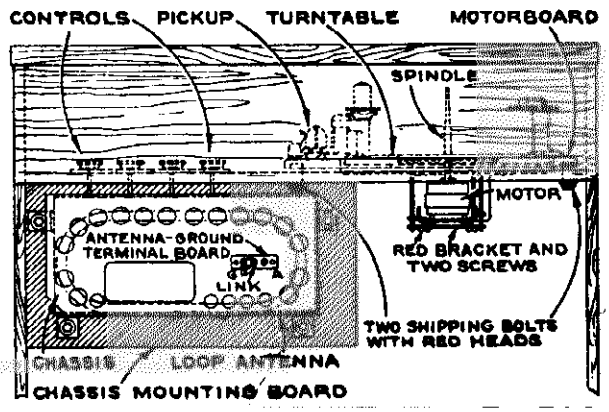
1. Remove the glass dial from the cabinet.
2. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.
3. Place the glass dial under the pointer so that the extreme left scale graduations coincide with the pointer. Use scotch tape to hold the glass dial in this position.
4. After completion of alignment, replace the glass dial in cabinet.

Using Calibration Scale.—

1. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.
2. Temporarily fasten the dial scale drawing in this service note, to the dial backing plate with scotch tape, so that the extreme left scale graduation coincides with the pointer.



Tube and Trimmer Location



Back View Model WR-42X3

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output—
1	I-F Grid in series with .01 mfd.	455 kc	"A" Band 540 kc	L11, L12 (2nd I-F Trans.)
2	1st-Det. Grid in series with .01 mfd.			L9, L10 (1st I-F Trans.)
3	"A" terminal on ant. terminal board in series with 47 mmf. (link open)	15.2 mc	"C" Band 15.2 mc	C37 (osc.)* C34 (ant.)
4		9.5 mc	"C" Band 9.5 mc	C1 (ant.) (Rock Gang)
5		Repeat steps 3 and 4.		
6	Middle terminal on ant. terminal board in series with 200 mmf. (link open)	1,500 kc	"A" Band 1,500 kc	C10 (osc.) C33 (ant.) (on loop)
7		600 kc	"A" Band 600 kc	L7 (Rock Gang)
8		Repeat steps 6 and 7.		

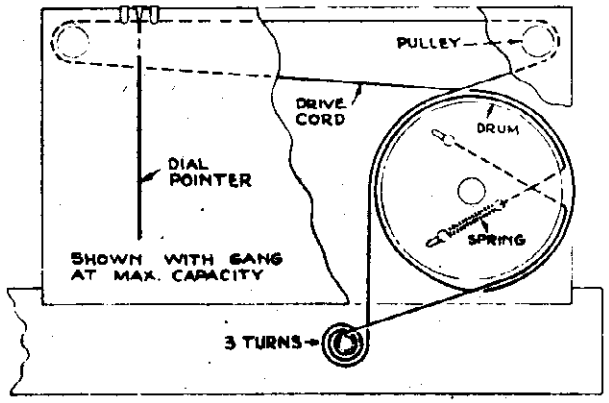
*Use minimum capacity peak.

Oscillator tracks 455 kc above signal on both bands.

Dial Pointer Adjustment.—After the chassis is replaced in cabinet move the dial pointer (if necessary) so that it is at the left-hand graduation on the dial with the gang in full mesh.

Critical Lead Dress

(1) Dress bias cell up from chassis and away from A.C. switch.
(2) Dress R13 (volume control compensation circuit) close to front apron.
(3) Dress C9 between osc. coil and side apron.
(4) Black lead from AC switch should be kept away from tone control leads and switch.
(5) Dress R22, C32 (pickup compensation circuit) close to front apron.
(6) Blue lead to antenna terminal board should be dressed in back of I-F'S.
(7) Dress brown lead from volume control to tone switch close to front apron.
(8) Dress R18 (output grid circuit) away from A.C. switch and A.C. leads.
(9) Dress lead to phono socket up from chassis.



Dial-Indicator and Drive Mechanism

POWER OUTPUT RATING

Undistorted	3 watts
Maximum	5 watts

LOUDSPEAKER (RL-70-N2)

Type	12 inch electrodynamic
V.C. Impedance	2.2 ohms at 400 cycles

POWER SUPPLY RATING

105-125 volts, 60 cycles	80 watts total

FREQUENCY RANGE

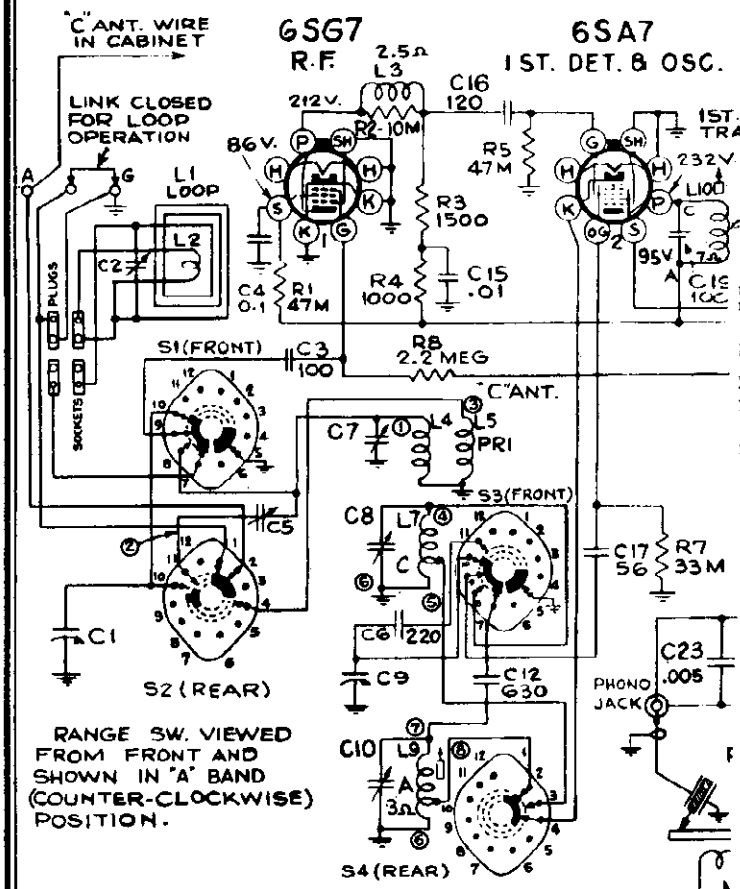
Standard Broadcast (A)	540-1,600 kc
Short Wave (C)	9.4-15.4 mc
Intermediate Frequency	455 kc

(1) RCA-6SK7	R-F Amplifier
(2) RCA-6SA7	1st Det. Oscillator
(3) RCA-6SK7	I-F Amplifier
(4) RCA-6SQ7	2nd Det., A.V.C., A-F Amplifier
(5) RCA-25L6-GT	Power Output
(6) RCA-25Z6-GT	Rectifier

WESTINGHOUSE ELEC. SUPPLY CO., INC.

MODELS WR42X
WR42X1
MODELS WR62K
WR62K

PARTIAL SCHEMATIC SHOWING REMOVAL OF PUSH-BUTTON TUNER. OTHERWISE SAME AS MODEL WR42X5



Schematic Circuit Diagram Model WR-42X4 & WR-42X14

MODELS WR62K1, WR62K2
Alignment Procedure

Output Meter Alignment.—If this method is used, connect meter across the voice coil, and turn the receiver volume control maximum.

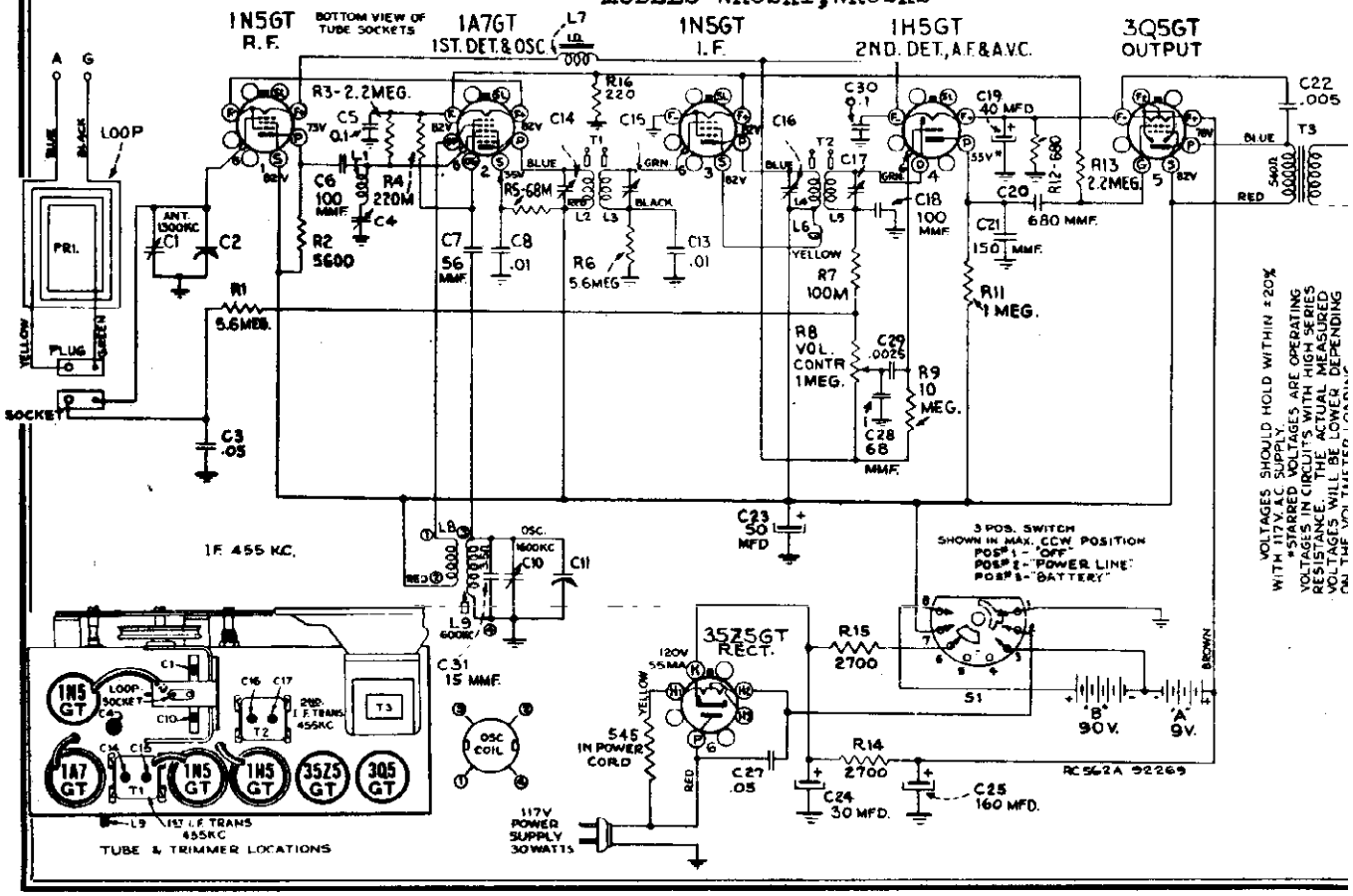
Test-Oscillator.—For all alignment operations, keep the output low as possible to avoid a-v-c action.

Precautionary Lead Dress.—

1. Keep green grid leads above chassis away from each other.
2. All filament wires should be dressed close to chassis.
3. Keep blue leads from I-F transformers close to chassis.

Steps	Connect the high side of test-osc. to—	Tune test osc. to—	Turn radio dial to—	Adjust the followi for max. peak outp
1	1N5GT I-F grid cap, in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C16, C17 (2nd I-F transform
2	1A7GT 1st Det. grid cap, in series with .01 mfd.			C14, C15 (1st I-F transform
3	Antenna terminal in series with 200 mmfd.			C4 Wave trap for *minimum* outpu
4		600 kc	600 kc	L9 (osc.) (Rock in)
5		1,600 kc	1,600 kc	C10 (osc.)
6		1,300 kc	1,300 kc	C1 (ant.)
7	Repeat steps 4, 5 and 6 until aligned			
8	With chassis in cabinet and batteries connected repeat step			

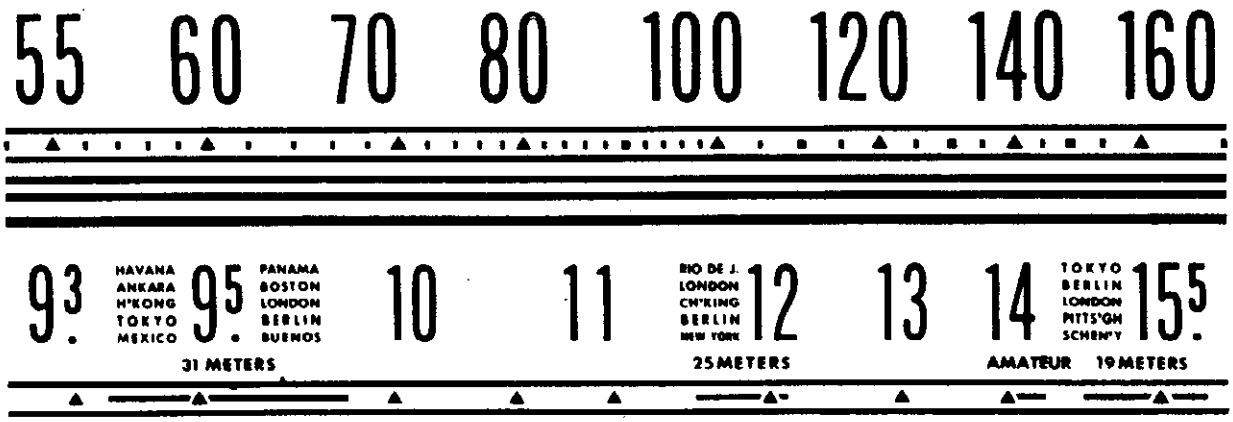
MODELS WR62K1, WR62K2



MODELS WR42X4, WR42X14

WESTINGHOUSE ELEC. SUPPLY CO., INC.

MODELS WR42X5, WR42X15



The dial scale drawing shown is a full size reproduction. It can be used as a direct substitute for regular dial scale in alignment procedure.

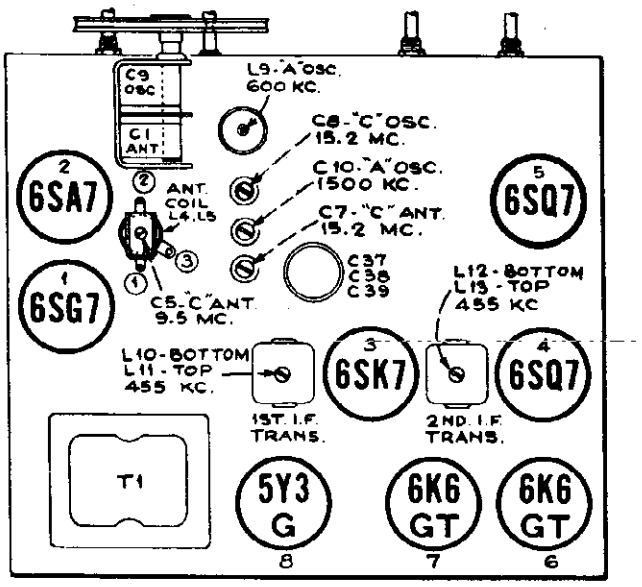
Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration Scale.—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the chassis for quick reference during alignment. In the event that only the chassis is returned for service, and the cabinet with its tuning dial is left in the customer's home, the scale printed in this service note can be used as an accurate and convenient substitute for the regular dial.

Critical Lead Dress:

1. Bus from "C" oscillator coil to range switch must be held to length and dressed close to coil.
2. C30 (audio coupling capacitor to volume control) should be dressed close to front apron.
3. A.C. cord and motor leads must be dressed away from phono and F.M. jack.
4. Excess trans. leads to be dressed between trans. and rectifier socket.
5. Keep R5, C16 bus (in grid circuit of 6SA7 tube) as short as possible.
6. Dress C28 (in plate circuit of 1st A.F.) close to socket.
7. Keep R15 (grid resistor) C34 (coupling capacitor of output tube) close to socket.
8. Keep C23 (tone compensating capacitor) close to back apron.
9. Keep R15, C48 (in tone compensating circuit) close to front apron.
10. Dress green lead from osc. coil to trimmer close to oscillator coil.
11. Dress cable from phono. socket to phono. switch up away from base.
12. Dress red A.C. leads away from I.F. trans. and 6SQ7 socket.
13. RF choke in plate of 6SG7 must be dressed toward back apron.



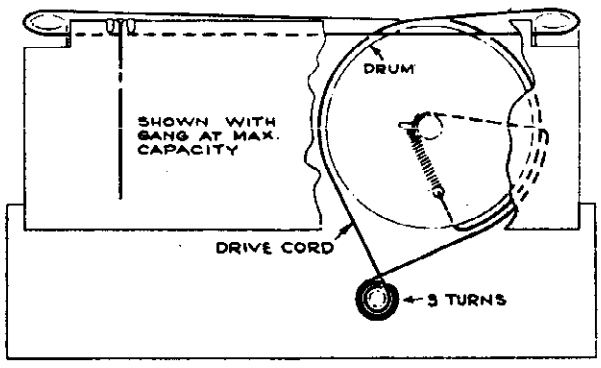
Using Tuning Dial.—

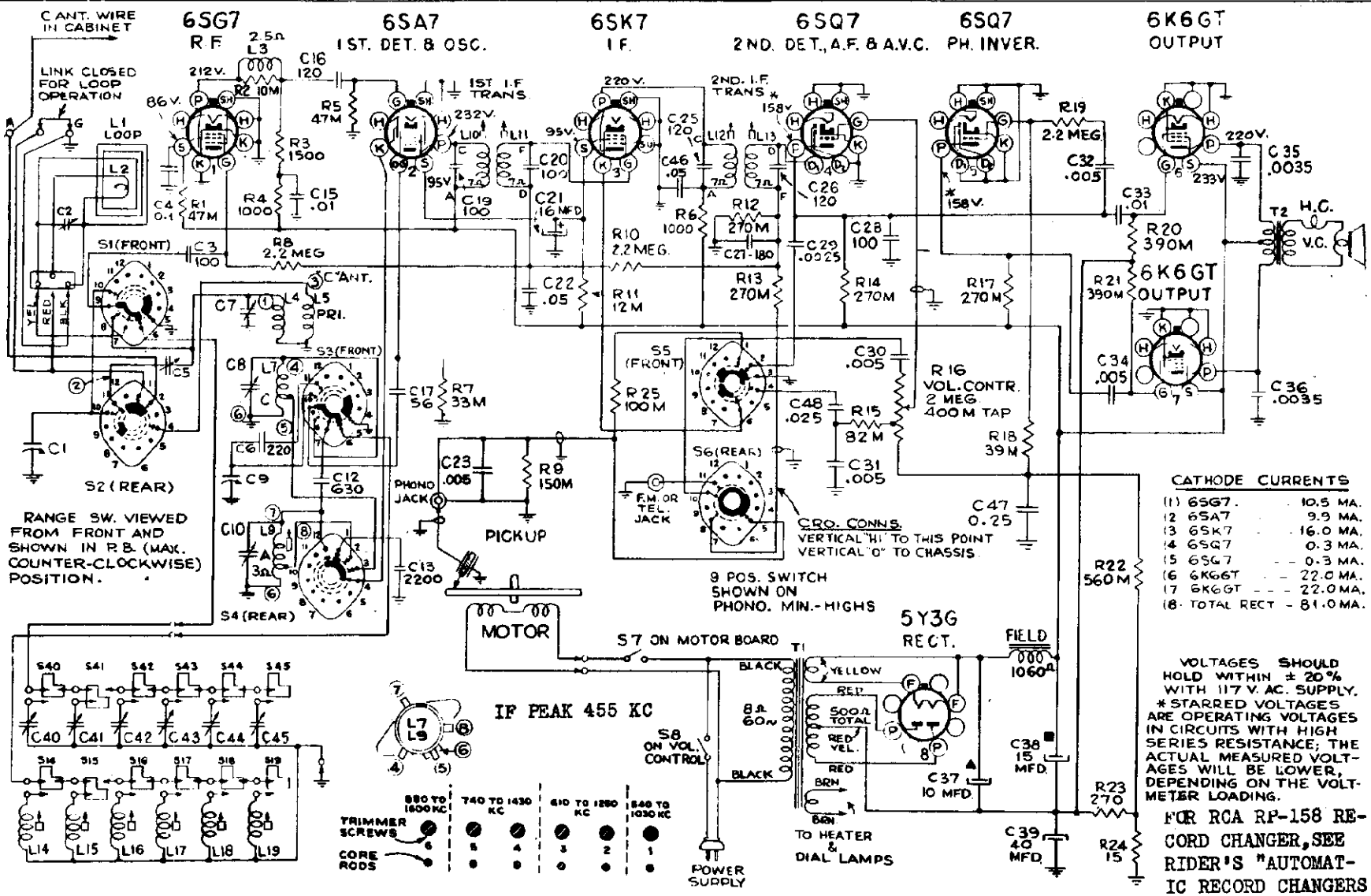
1. Remove glass dial from the cabinet.
2. With gang in full mesh, move the dial pointer to a point 1/16 inch to left of reference mark at left hand end of the dial backing plate.
3. Place the glass dial under the pointer so that the extreme left scale graduation coincides with the pointer. Use scotch tape to hold the glass dial in place.

"C" Band Reception.—For best reception on "C" band with an outside antenna, adjust the trimmer screw on the RF coil on the chassis. Turn screw carefully with a special screwdriver (Part No. 31031) while the receiver is tuned to a station in the 31-meter band, and make setting for best reception. If returning to internal antenna at any time, close the link on the center terminal and adjust "C" band antenna trimmer for best reception on 31-meter band.

Steps	Connect test-osc. output to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output—
1	I-F grid in series with .01 mfd.	455 kc	"A" band 540 kc	L12 and L13 (2nd I-F trans.)
2	1st Det. grid in series with .01 mfd.			L10 and L11 (1st I-F trans.)
3	A-Terminal in series with 47 mmfd. (link closed)	15.2 mc	"C" band 15.2 mc	C8 (osc.)* C7 (ant.)
4		9.5 mc	"C" band 9.5 mc	C5 (ant.) (Rock gang)
5	Repeat steps 3 and 4			
6	Yellow loop lead in series with 200 mmfd. (link closed)	1,500 kc	"A" band 1,500 kc	C10 (osc.)
7		600 kc	"A" band 600 kc	L9 (osc.)
8	Repeat steps 6 and 7			
9	Install and connect chassis in cabinet with antenna link closed. Tune in a radiated oscillator signal at 1,500 kc. and peak the "A" band trimmer C2 (on loop). Rock in L9 for peak output at 600 kc.			

* Use minimum capacity peak if two peaks can be obtained. Oscillator tracks 455 kc. above signal on all bands.





CATHODE CURRENTS

(1)	6SG7	10.5 MA.
(2)	6SA7	9.9 MA.
(3)	6SK7	16.0 MA.
(4)	6SQ7	0.3 MA.
(5)	6SQ7	0.3 MA.
(6)	6K6GT	22.0 MA.
(7)	6K6GT	22.0 MA.
(8)	TOTAL RECT	81.0 MA.

VOLTAGES SHOULD HOLD WITHIN ± 20% WITH 117 V. AC. SUPPLY.
*STARRED VOLTAGES ARE OPERATING VOLTAGES IN CIRCUITS WITH HIGH SERIES RESISTANCE; THE ACTUAL MEASURED VOLTAGES WILL BE LOWER, DEPENDING ON THE VOLTMETER LOADING.

FOR RCA RP-158 RECORD CHANGER, SEE RIDER'S "AUTOMATIC RECORD CHANGERS AND RECORDERS".

The push buttons (Models WR-42X5 and WR-42X15) connect to separate magnetite-core oscillator coils and separate ant. circuit trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool such as Part No. 31031. Allow about five minutes warm-up period before making adjustments.

The procedure is as follows:

1. Make a list of the desired stations, arranged in order from low to high frequencies.
2. Turn the range switch to the broadcast position and manually tune in the first station on the list.

Push Button Adjustments

3. Turn range switch to push-button position and press in the left-hand button.
4. Adjust No. 1 oscillator core to receive the first station. To secure the best adjustment, rotate the set for least pickup, and adjust core for peak output.
5. Adjust No. 1 antenna trimmer capacitor for peak output on the first station.
6. Proceed in the same manner to adjust for the remaining stations.

On the 880 to 1,600 kc push-button, the higher frequency stations may be received with osc. core either in or out (oscillator frequency either 455 kc below or 455 kc above the station frequency). The adjustment with this core in its out position (oscillator frequency 455 kc above the station frequency) is the correct one.

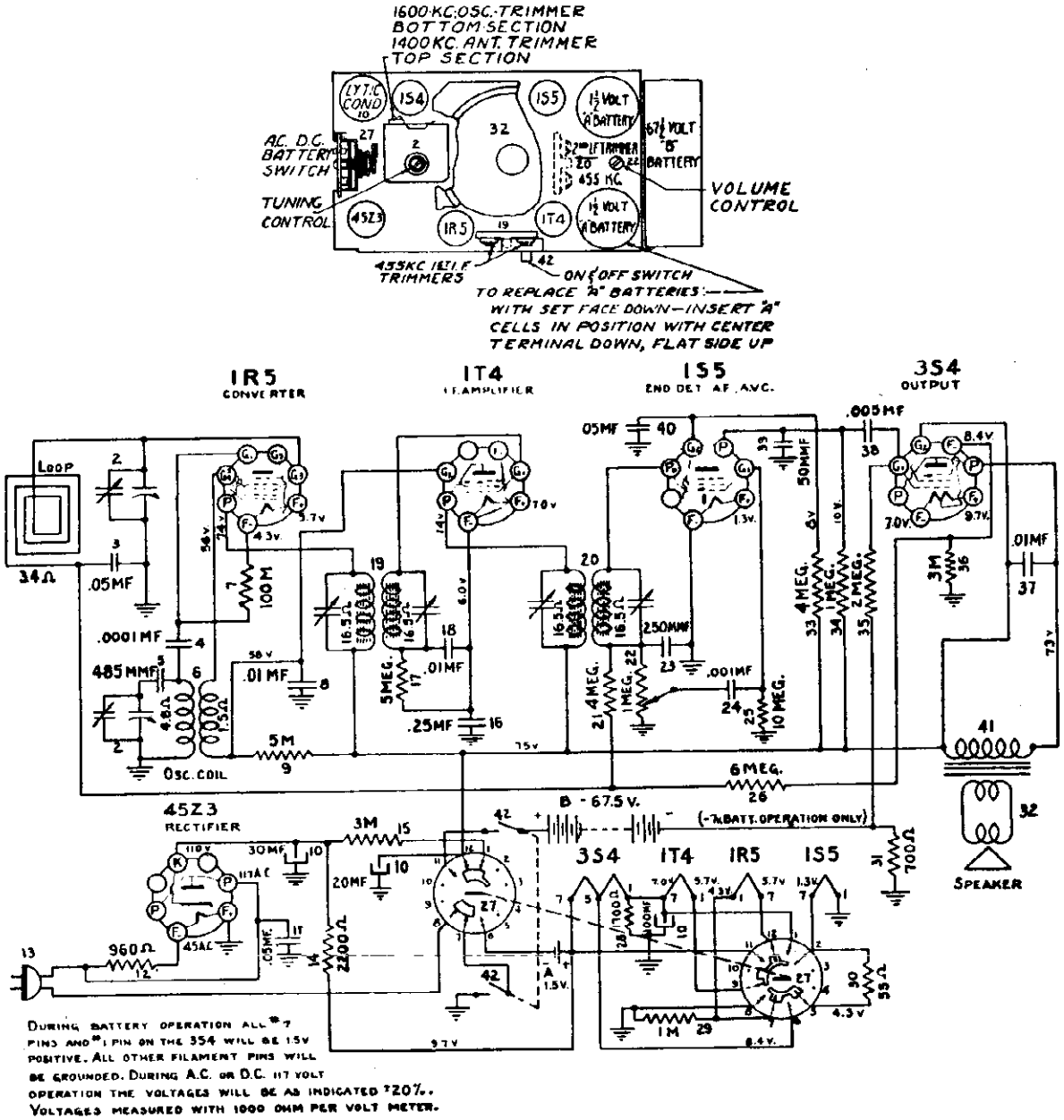
NOTE: Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.

MODEL WR62K3 WESTINGHOUSE ELEC. SUPPLY CO., INC.

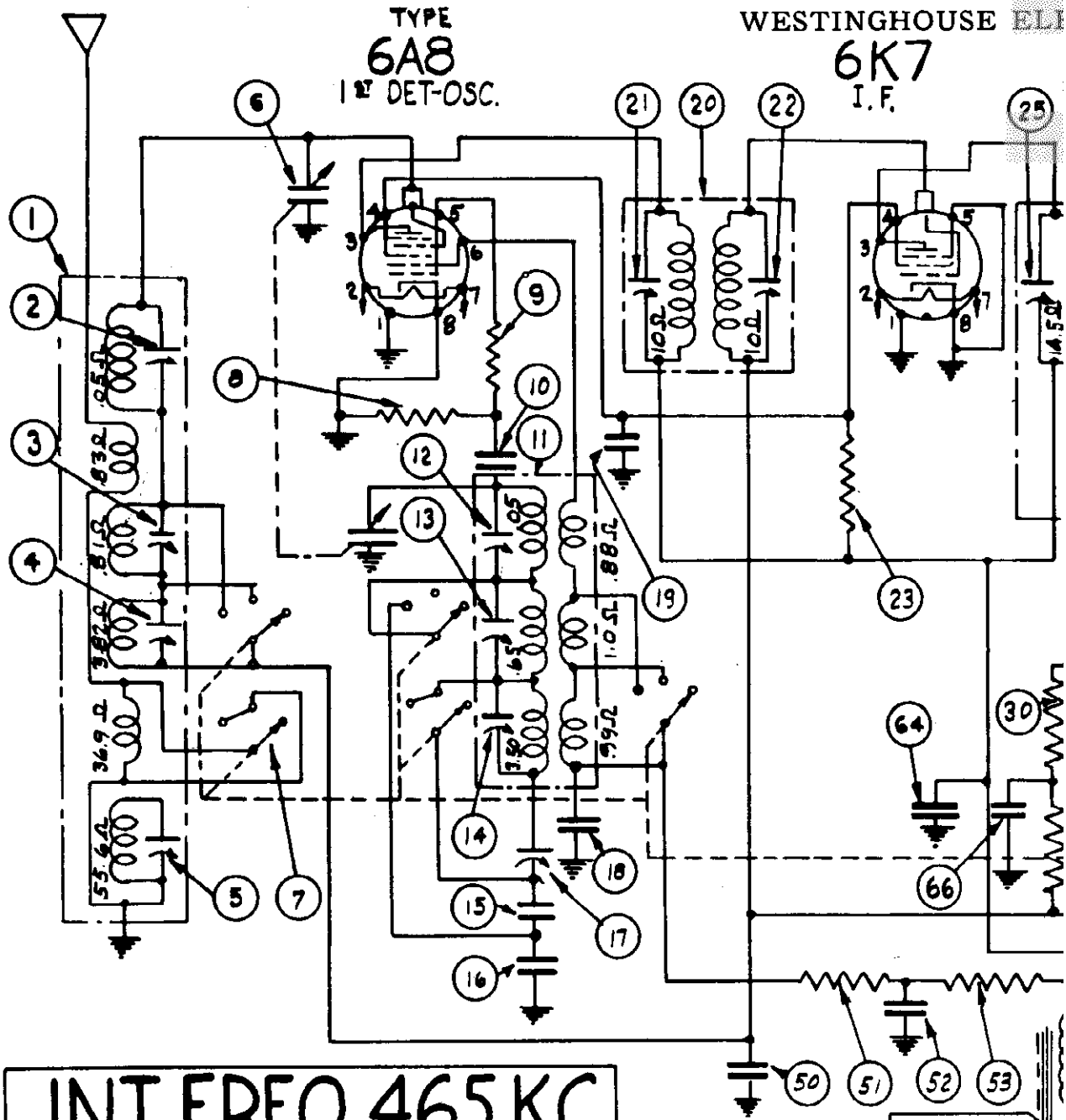
Output Meter: Connect across voice coil and turn receiver volume control to maximum.

Test Oscillator: For all alignment operation, keep the output as low as possible to avoid A.V.C. action.

Steps	Test Oscillator	Tune Test Osc. to	Turn Radio Dial to	Adjust the following for max. output
1	To antenna section of tuning condenser stator through 0.1 mfd	455 kc	Quiet point at 1600 kc end of dial	Transformers 19 and 20 Four Trimmers
2	Radiate signal	1610 kc	Full counter-clockwise (gang open)	Oscillator Trimmer On Gang
3	Radiate signal	1400 kc	Tune to signal	Antenna Trimmer On Gang
4	Repeat steps 1, 2, and 3			



Calibration: To make dial calibrate, close tuning condenser, then install knob so that it points to 54. The tuning shaft is knurled so that the knob will slide on in any position.



SOCKET VOLTAGES - LINE = 115 VOLTS TAKEN FROM BOTTOM OF SOCKETS

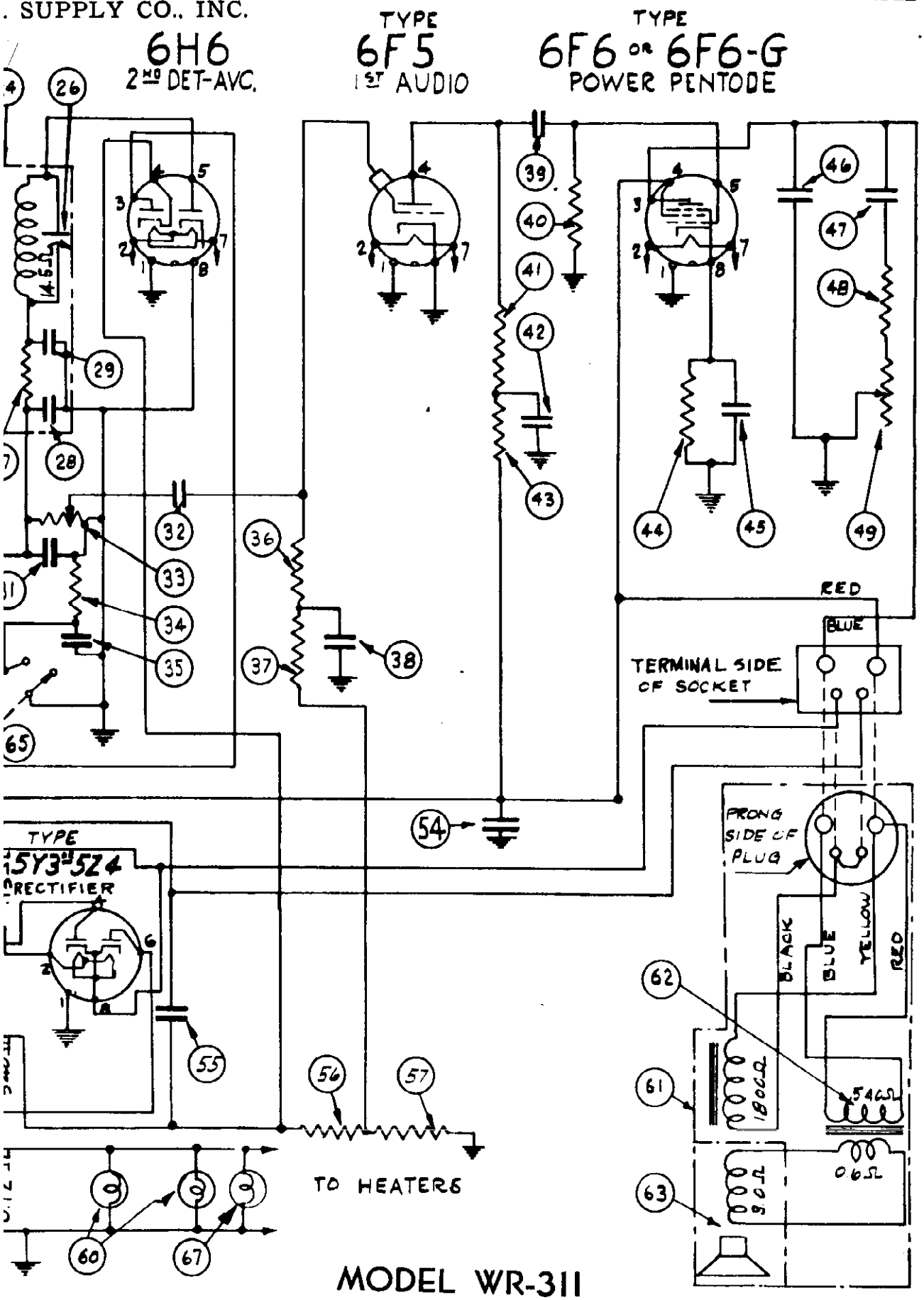
MEASUREMENTS MADE WITH 1000 OHMS PER VOLT VOLTMETER AND WITH WAVE CHANGE SWITCH IN BROADCAST BAND POSITION.

TUBE	STAGE	FIL.	PIN NOS	PLATE	PIN NOS	SCREEN	PIN NOS	BIAS	PIN NOS
6A8	1ST DET-OSC.	6.3 5	2-7	298 DET. 135 OSC.	3-1 2-1	62	4-1	⊗ SEE NOTE	
6K7	I F	6.3 5	2-7	298	3-1	62	4-1	⊗ SEE NOTE	
6H6	2ND DET. A.V.C.	6.3 5	2-7					-4.5	4-1
6F5	1ST AUDIO	6.3 5	2-7	*113	4-1			-1.5 ACROSS	5 7
6F6	POWER PEN.	6.3 5	2-7	283	3-1	298	4-1	213	8-1
5Y3	RECTIFIER	5.15	2-8	395	8-1				

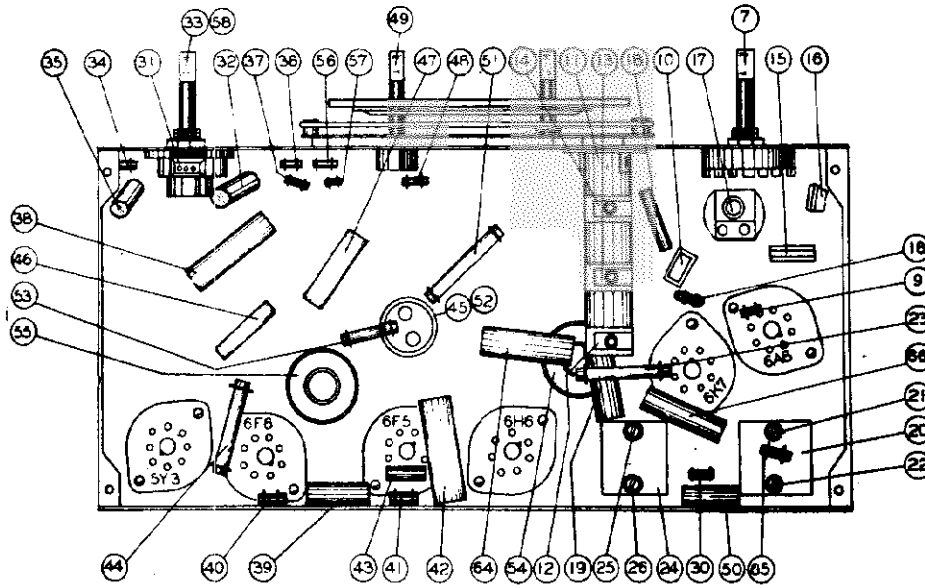
⊗ THE CONTROL GRID BIAS ON THE 6K7 & 6A8 TUBES EQUAL TO APPROX. SIX-TENTHS THE VOLTAGE FROM PINS 5-1 ON THE 6H6 TUBE SOCKET

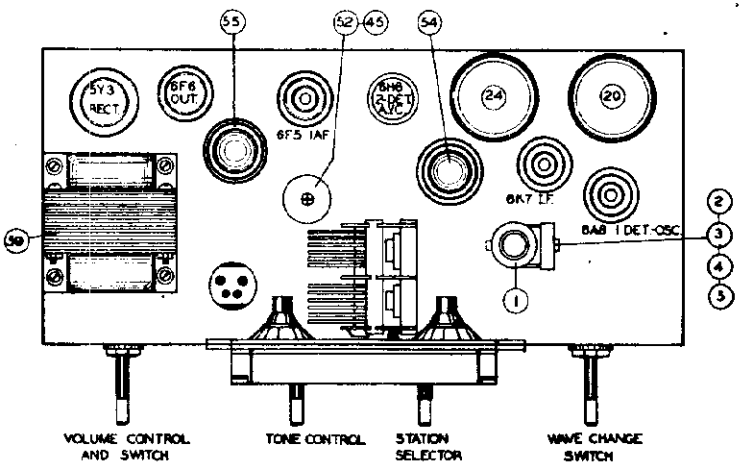
* 600 VOLT SCALE.

. SUPPLY CO., INC.



MODEL WR-311





GENERAL DESCRIPTION

This model is a six-tube, three-band, superheterodyne receiver whose circuits employ all-metal tubes. The circuit employs a type 6A8 tube as a combined first detector-oscillator, a type 6K7 tube as an intermediate frequency amplifier, a type 6H6 tube as a second detector and automatic volume control, a type 6F5 tube as a first audio frequency amplifier, a type 6F6 as an output amplifier, and a type 5Y3 tube as a rectifier.

LINE-UP CAPACITOR ADJUSTMENTS

To align the circuits 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 circuits of the receiver are brought into alignment. A conventional output meter should 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.

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 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.

ADJUSTMENT OF I.F. (465 KC.)

1. Set volume control to maximum position, tone control to treble, wave change switch on Broadcast (White) and indicator at approximately 600 KC.
2. Connect output meter across voice coil of speaker.
3. Set test oscillator to 465 KC., and apply signal to grid of 6K7 I.F. tube through a 0.5 mfd. blocking condenser.
4. Adjust trimmers #25 and #26 to maximum output, reducing output of test oscillator as required.
5. Apply test signal to grid of 6A8 first detector-oscillator tube and adjust trimmers #21 and #22 to maximum output.
6. Apply test signal to antenna of receiver.
7. Adjust trap coil trimmer #5 to minimum output.

ADJUSTMENT OF BROADCAST BAND (540 to 1550 KC.)

1. Set wave change switch to standard broadcast band position.
2. Set test oscillator and dial indicator to 1400 KC.
3. Apply the test signal to the antenna of the receiver through a .0002 mfd. condenser and adjust the oscillator trimmer condenser #14 until the signal is received.
4. Adjust the preselector trimmer #4 to maximum output.
5. Set the test oscillator and dial indicator to 600 KC. and adjust the oscillator series condenser #17 until the signal is received. Tune the variable condenser to a slightly lower frequency and readjust trimmer #17 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 GREEN BAND

1. Set the wave change switch to the green band position.
2. Set the test oscillator and dial indicator to 4000 KC. and adjust the oscillator trimmer condenser #13 until the signal is tuned in.
3. Adjust the preselector trimmer condenser #3 to maximum output.
4. Check the sensitivity and calibration over scale.

ADJUSTMENT OF RED BAND

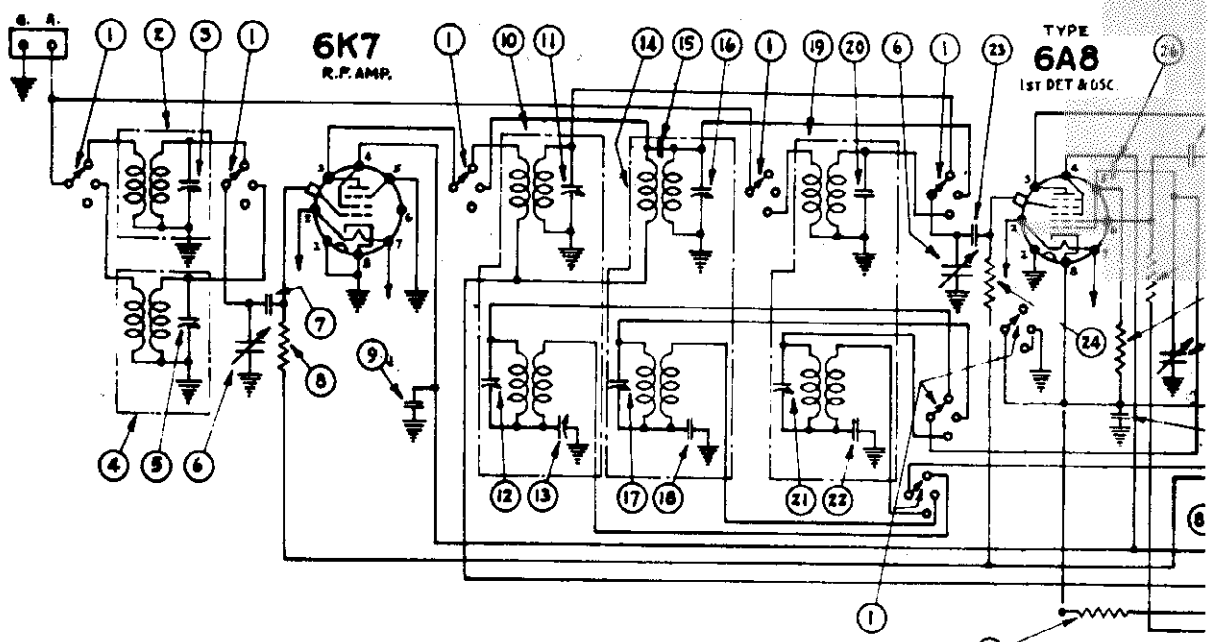
1. Set the wave change switch to the red band position.
2. Set the test oscillator and dial indicator to 15000 KC. and adjust the oscillator trimmer condenser #12 until the signal is received. Two positions may be found at which the signal may be tuned in. Use the position with the lower capacity trimmer setting or with the alignment screw turned farther out.
3. Adjust the preselector trimmer #2 to maximum output.
4. Check the receiver over scale for calibration and sensitivity.

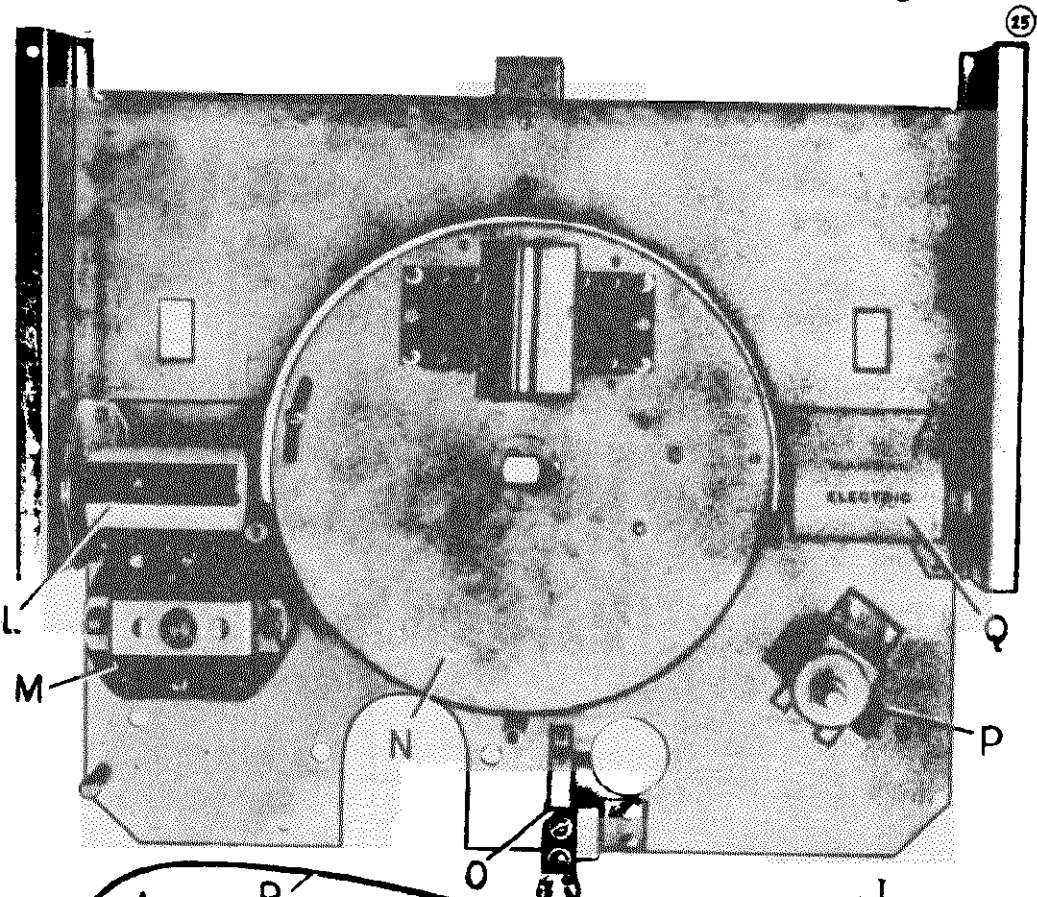
Type and Number of Tubes	1 #6A8, 1 #6K7, 1 #6H8, 1 #6F5, 1 #6F6, 1 #5Y3 - Total 6
Power Supply Characteristics	105-125 volts, 50-60 cycle A.C.
Power Consumption	62 Watts
Maximum Output	3.5 Watts
Maximum Undistorted Output	2.6 Watts
Tuning Ranges	(White Band - 540 to 1550 KC. (Green Band - 1500 to 4500 KC. (Red Band - - 5500 to 16500 KC.
Line-Up Frequencies	I.F. 465 KC., 1400 KC., 600 KC., 4000 KC.

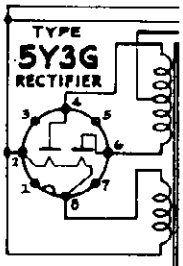
MODEL WR311

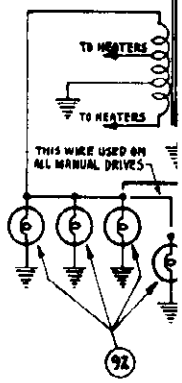
WESTINGHOUSE ELEC. SUPPLY CO., INC.

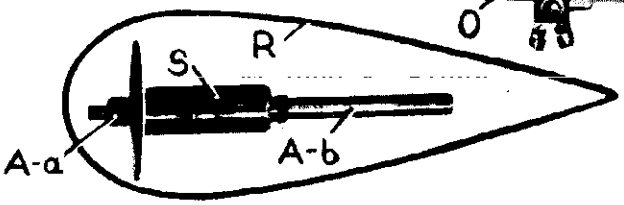
Dia. #	Part #	Description of Parts	List Price
1	RC 95202	Antenna coil assembly	$ 2.25
2		4-25 mmf. trimmer condenser - part of RC 95202	
3		1.5-10 mmf. trimmer condenser - part of RC 95202	
4		1.5-10 mmf. trimmer condenser - part of RC 95202	
5		30-60 mmf. trimmer condenser - part of RC 95202	
6	CG 9549	Variable condenser (2 gang)	2.50
7	SW 9548	Wave change switch	1.00
8	RE 9575	50,000 ohm, 1/4 W. resistor	.15
9	RE 9582	200 ohm, 1/4 W. resistor	.15
10	CM 9511	.000065 mfd. mica condenser	.15
11	RC 95203	Oscillator coil assembly	1.75
12		4-25 mmf. trimmer condenser - part of RC 95203	
13		1.5-10 mmf. trimmer condenser - part of RC 95203	
14		1.5-10 mmf. trimmer condenser - part of RC 95203	
15	CM 9525	.0027 mfd. mica condenser	.30
16	CM 9524	.0034 mfd. mica condenser	.35
17	CS 9545	300-600 mmf. osc. series condenser	.40
18	CW 4005	.005 mfd., 400 V. condenser	.15
19	CW 2-10	.1 mfd., 200 V. condenser	.15
20	IC 9572	I.F. coil assembly (first) 465 KC.	1.35
21		45-135 mmf. trimmer condenser - part of IC 9572	
22		45-135 mmf. trimmer condenser - part of IC 9572	
23	SA 99957	40,000 ohm, 1 W. resistor	.25
24	IC 9574	I.F. coil assembly (second) 465 KC.	1.75
25		30-100 mmf. trimmer condenser - part of IC 9574	
26		30-100 mmf. trimmer condenser - part of IC 9574	
27		50,000 ohm, 1/8 W. resistor - part of IC 9574	
28		.0001 mfd. mica condenser - part of IC 9574	
29		.0001 mfd. mica condenser - part of IC 9574	
30	RE 9574	1 meg., 1/4 W. resistor	.15
31	CM 9519	.0005 mfd. mica condenser	.20
32	CW 4-02	.02 mfd., 400 V. condenser	.15
33	VR 9535	.5 meg. volume control	1.10
34	RE 9527	5,000 ohm, 1/4 W. resistor	.10
35	CW 2-05	.05 mfd., 200 V. condenser	.15
36	RE 9574	1 meg., 1/4 W. resistor	.15
37	RE 9575	50,000 ohm, 1/4 W. resistor	.15
38	CW 2-25	.25 mfd., 200 V. condenser	.20
39	CW 4-02	.02 mfd., 400 V. condenser	.15
40	RE 9572	.5 meg., 1/4 W. resistor	.15
41	RE 9531	.25 meg., 1/8 W. resistor	.10
42	CW 2-10	.1 mfd., 200 V. condenser	.15
43	RE 9581	50,000 ohm, 1/4 W. resistor	.15
44	SA 107391	500 ohm, 1 W. resistor	.20
45	CE 9537	10 mfd., 25 V. electrolytic cond.	1.25
46	CW 4-005	.005 mfd., 400 V. condenser	.15
47	CW 4-05	.05 mfd., 400 V. condenser	.15
48	RE 9550	2000 ohm, 1/4 W. resistor	.15
49	VR 9534	20,000 ohm, tone control	.55
50	CW 2-05	.05 mfd., 200 V. condenser	.15
51	RE 95116	50,000 ohm, 1 W. resistor	.20
52		4 mfd., 450 V. electrolytic cond. - part of CE 9537.	.20
53	SA 100825	10,000 ohm, 1/2 W. resistor	.15
54	CE 9535	16 mfd., 300 V. electrolytic condenser	.75
55	CE 9536	12 mfd., 450 V. electrolytic condenser	.80
56	RE 9537	50 ohm, 1/4 W. resistor	.10
57	RE 9556	25 ohm, 1/4 W. resistor	.15
58		On & Off switch - part of VR 9535	
59	TR 9557	Power transformer 105-125 V., 50-60 cycle	$ 4.00
60	LP 951	Dial light (6-8 V., .20 amp.)	.20
61	SK 9512	Speaker assembly	10.75
62	TR 9515	Output transformer	1.85
63	DM 956	Diaphragm and voice coil assembly	1.25
64	CW 4-10	.1 mfd., 400 V. condenser	.15
65	RE 9574	1 meg., 1/4 W. resistor	.15
66	CW 2-10	.1 mfd., 200 V. condenser	.15
67	LP 9510	Dial light (6.3 V.,.25 amp.)	.15
68	CB 9512	Line cable assembly	.50



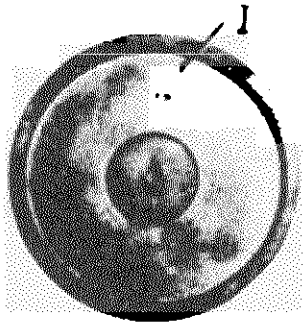


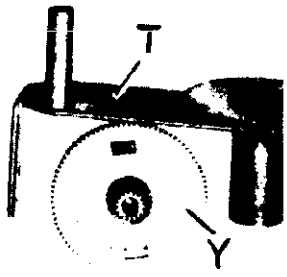






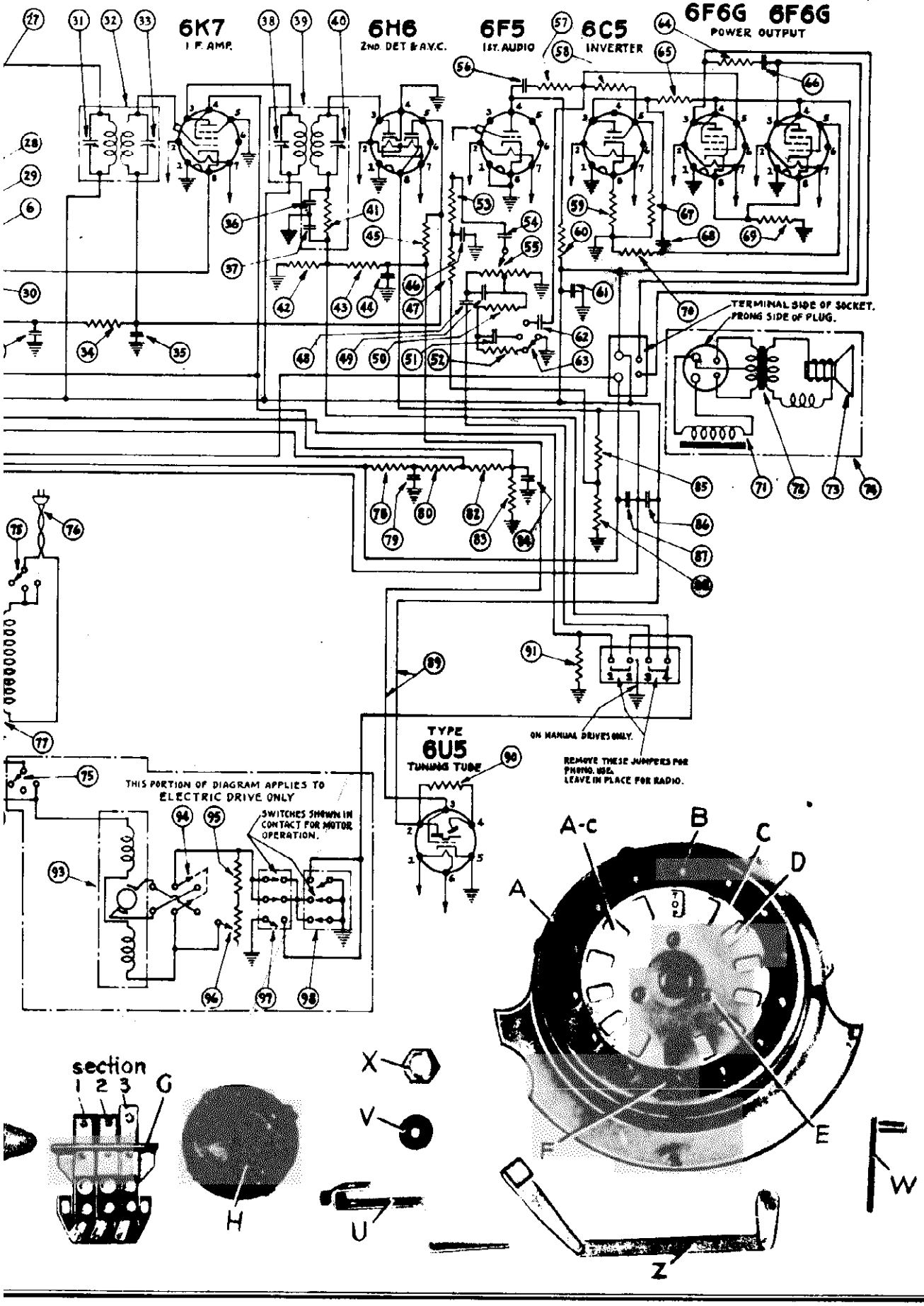
INT. FREQ. 455 K.C.





C. SUPPLY CO., INC.

MODELS WR330, WR332
MODEL WR336



GENERAL DESCRIPTION OF ELECTRIC TUNER

The electric tuning mechanism consists essentially of a group of adjustable levers attached to their respective push buttons. Mounted adjacent to these levers is a rotating disc driven by a reversible electric motor through a belt and gear mechanism. Attached to this disc is the tuning condenser (through a reducing gear), reversing stops and a mechanical stop.

The levers may be turned or adjusted to allow a specific band of frequency, as outlined in the instruction book, to be tuned in. The gate contacts any depressed button and stops the disc, thus stopping the tuning condenser at the desired station. Associated with the gate are three pairs of contacts arranged to perform the following functions: Remove power from the motor when the button drops into the gate, and short out a resistor which mutes or silences the set during tuning. On the twelve-tube set, a third pair of contacts on the gate removes a short-circuit from the A.F.C.

For manual tuning, a switch (red button) is provided, which cuts out the motor, removes the mute, etc., allowing normal operation of the set. The reversing stops on the disc engage a lever attached to a reversing switch that reverses the motor field winding, thus changing the direction of rotation of the motor.

A lever attached to the manual-electric switch controls the belt tension through an idler pulley which makes manual tuning easier.

ELECTRIC DRIVE SERVICE SUGGESTIONS

MOTOR DRIVE DOES NOT OPERATE:

1. With receiver turned "on", turn manual electric switch back and forth and note dial indicator lamp at right side of scale. If lamp lights on electric position, the switch is making contact, and there is voltage to the field of the motor (see diagram).

2. Turn receiver "off" and remove right-hand dial indicator lamp, and with some button other than the red button depressed, but without contact in gate, check for continuity from the upper left-hand field terminal #2 of the motor to ground.

3. If the circuit is open, disconnect one wire from the motor speed control resistor #96 or #126 and check from the same field terminal #2 to both armature terminals #1 and #4, at the same time operating the motor reversing switch "P" by hand. If no reading is obtained on continuity meter, either the reversing switch or the field of the motor is open. Check each individually. If reading is obtained when manipulating the reversing switch, check for bad brush contacts or open circuit armature.

4. Check between #1 and #2 (top) terminals of mute switch "O". Open circuit indicates bad contacts on switch.

5. Check between #2 terminal of mute switch "O" and ground for open circuit. This will indicate the condition of the gate switch "G", section #1.

MECHANISM DOES NOT TUNE IN STATION:

1. Motor speed set too slow. Increase the speed of the motor slightly by turning the motor speed adjustment on the rear of the chassis in a clockwise direction (when facing the chassis from the rear).

2. Mute section of gate switch "G" does not close. With some dial contact button engaged in the gate in a normal manner, check the pair of contacts, section #1, of the gate plate for continuity. (Normally should read closed, while sections #1 and #2 should read open.)

3. Bar attached to the red button is off position on long leaf of mute switch "O". Re-set position.

MOTOR CONTINUES TO RUN AFTER TUNING:

1. Motor circuits on gate switch "G" not open. With dial button contact in gate, check sections #1 and #2 of gate switch (should read open).

On the ten-tube chassis, both pairs of contacts are associated with the motor circuit, while on the twelve-tube set, one pair of contacts are associated with the motor circuit and the remaining pair cuts out the A.F.C. while the motor is performing the tuning function.

2. Dial button contact comes to brass section of switch but does not drop into slot. Motor speed too slow. Increase speed of motor slightly.

RECEIVER DOES NOT MUTE (NOT SILENT WHILE MOTOR IS IN OPERATION) WHILE TUNING, CAUSING MOTOR NOISE AND OTHER INTERFERENCE:

1. Check bottom contacts on mute switch "O" and section #3 on gate switch "G" (not opening properly).

DIAL POINTER WILL NOT REVERSE AFTER REACHING THE END OF SCALE:

1. Check lever on reversing switch "P", making sure that it is tight and in the correct position. On the rim of the gate plate there is a bolt in a slot. This has been set at the factory to give the proper amount of rotation of the dial, and should not be changed unless it has become loosened.

2. Check reversing switch "P" in both positions for continuity.

PUSHING A BUTTON AFFECTS THE ADJACENT BUTTON:

1. The levers connected to the odd-number buttons (counting the button at the left of the red button as #1) point to the hub of the assembly, while the levers connected to the even-number buttons point to the rim of the assembly. By having loosened the button sleeve too much and forcing the small screw, the lever may have become turned in the wrong sequence. This condition is overcome as follows:

a. Turn the dial pointer as far away from the button being re-set as possible.

b. Remove the button cap and loosen the button sleeve about one turn.

c. Insert a small screw driver into the button and push and turn the small screw at the same time, until the position of the lever is corrected.

d. Set the button to the desired station, as described in the operating instructions.

If a button has been loosened too many turns, it may be found that it cannot be re-tightened. Place a long screw driver in back of the lever button assembly and press forward, at the same time turning the button sleeve until the thread catches.

DEPRESSING RED BUTTON CAUSES MOTOR TO START:

1. Check lever on end of red button (grounding top contact of mute switch "O").

Referring to the diagram, it will be seen that the various switches associated with the motor make a complete circuit to ground. Thus, if the motor continues to operate, check for grounds in the circuit.

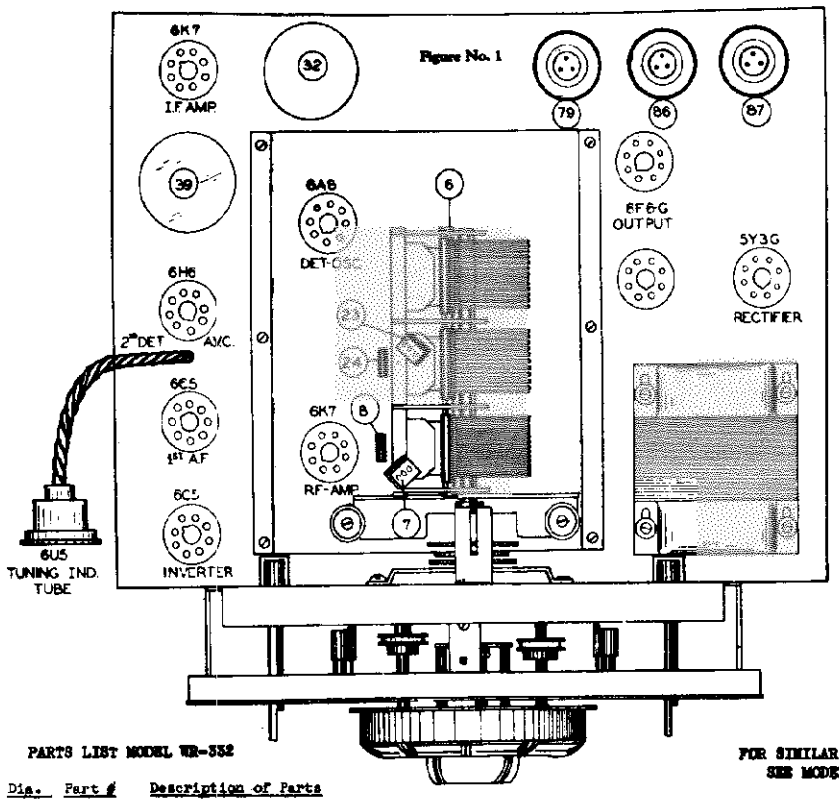
If the electric drive appears to operate too noisely, check the position of the idler pulley which may be touching the large pulley. The correct position of this pulley is approximately 1/4" away from the large pulley when the manual-electric switch is in the electrical position.

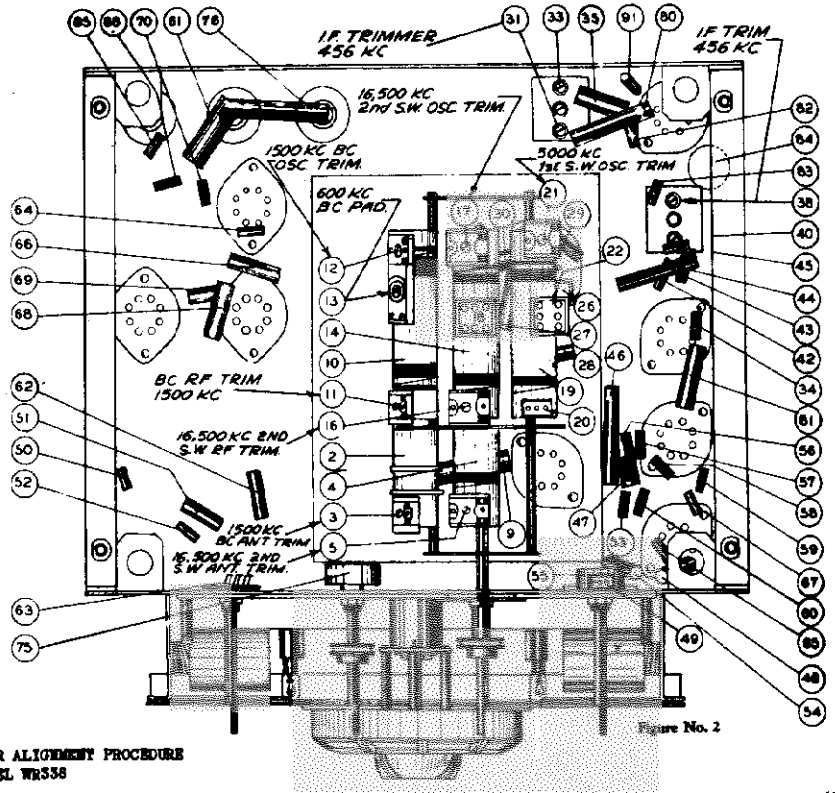
(used with speed

VR	9557	Motor speed control ...	.90
RE	95142	45 ohm, 8 W. resistor...	.50
PU	9536	Motor pulley	.10
BK	95296	Motor holding bracket.	.05
NT	105795	Motor holding nut	.05
WR	951	Setting-up tool	.10

	Part #		List Price
A	CU 9527	Control head assembly	$ 15.00
B	PG 9554	Station button cap - 12 used	.05
C	PL 95142	Window cover over station call letters	.45
D	DC 9511	Celluloid cover over station call letters.....	.10
E	SP 1014	Spring button	.05
F	PG 9555	Red button cap	.05
G	SW 9599	Three-contact switch on gate plate	1.25
H	KN 95130	Tuning knob	.35
I	PU 9537	Bakelite drive pulley - 3½" dia.	.45
J	IT 954	Insert for tuning knob	.10
K	SI 9580	Dial pointer	.20
L	SI 9588	Wave band indicator	.60
M	MO 951	Electric motor	5.00
N	PL 95145	Gate and plate assembly	1.25
O	SW 9584	Six-contact mute switch	1.10
P	SW 9582	Motor reversing switch	1.65
Q	SI 9589	Indicator, manual-electric	.60
R	SP 9561	Drive belt	.10
S	SH 9558	Shaft and gear assembly	1.75
T	SH 9559	Shaft lever and gear assembly	1.50
U	LE 957	Reversing switch lever	.10
V	PU 9541	Idler pulley	.10
W	LE 9513	Idler pulley lever	.10
X	NT 10303	Nut	.05
Y	GE 9531	Intermediate gear - 1-15/16" dia. with do attached	.75
Z	LE 9511	Idler pulley lever assembly	.35
A-s	GE 9528	Pinion gear	.10
A-b	SH 9555	Tuning shaft	.20
A-c	DC 9510	Paper disc	.05

WESTINGHOUSE ELEC. SUPPLY CO., INC.

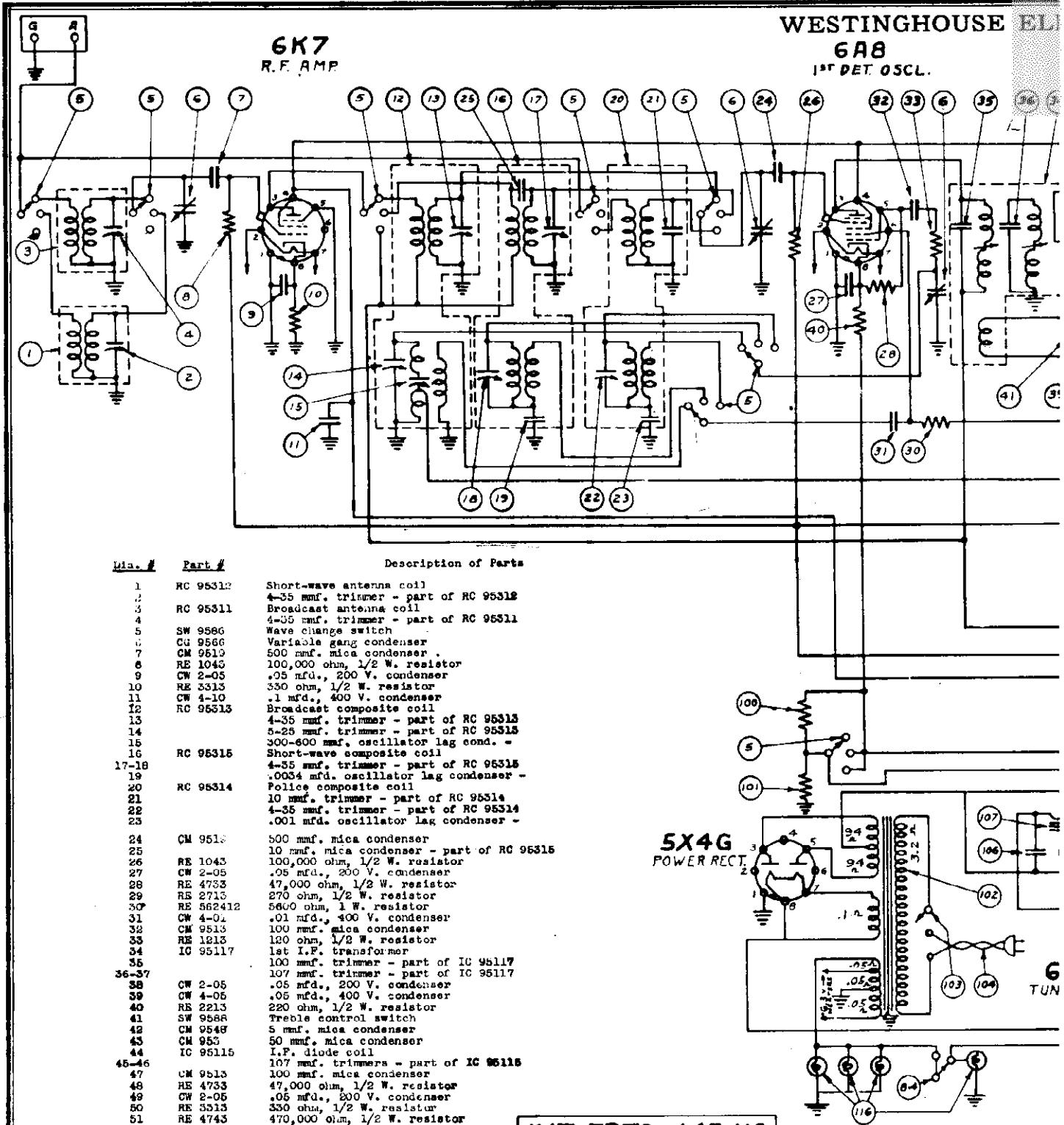




PARTS LIST MODEL WR-332

FOR SIMILAR ALIGNMENT PROCEDURE SEE MODEL WR336

Dia.	Part #	Description of Parts	
1	SW 9586	Wave change switch assembly	2.00
2	RC 95311	B.C. antenna coil assembly	1.10
3		4-35 mmf. trimmer - part of RC 95311	
4	RC 95312	S.W. antenna coil assembly	.75
5		4-35 mmf. trimmer - part of RC 95312	
6	CG 9566	Variable condenser gang	5.50
7	CM 9519	.0005 mfd. mica condenser	.20
8	RE 1043	100,000 ohm, 1/2 W. resistor	.10
9	CW 4-10	.1 mfd., 400 V. condenser	.15
10	RC 95317	B.C. composite coil assembly	2.00
11		4-35 mmf. trimmer - part of RC 95317	
12		5-25 mmf. trimmer - part of RC 95317	
13		300-600 mmf. trimmer - part of RC 95317	
14	RC 95315	S.W. composite coil assembly	2.00
15		10 mmf. mica condenser - part of RC 95315	
16-17		4-35 mmf. trimmers - part of RC 95315	
18		3400 mmf. mica condenser - part of RC 95315	
19	RC 95314	Police composite coil assembly	1.75
20		10 mmf. mica condenser - part of RC 95314	
21		4-35 mmf. trimmer - part of RC 95314	
22		1100 mmf. mica condenser - part of RC 95314	
23	CM 9519	.0005 mfd. mica condenser	.10
24	RE 1043	100,000 ohm, 1/2 W. resistor	.10
25	RE 1513	150 ohm, 1/2 W. resistor	.10
26	CM 9518	.0001 mfd. mica condenser	.10
27	CW 4-01	.01 mfd., 400 V. condenser	.15
28	RE 562412	5,600 ohm, 1 W. resistor	.12
29	RE 4733	47,000 ohm, 1/2 W. resistor	.10
30	CW 2-05	.05 mfd., 200 V. condenser	.15
31-33		80-200 mmf. trimmers - part of IC 95119	
32	IC 95119	1st I.F. transformer	1.60
34	RE 4743	470,000 ohm, 1/2 W. resistor	.10
35	CW 4-05	.05 mfd., 400 V. condenser	.15
36-37		100 mmf. mica condenser - part of IC 95121	
38-40		80-200 mmf. trimmers - part of IC 95121	
39	IC 95121	2nd I.F. transformer	1.80
41	RE 4733	47,000 ohm, 1/2 W. resistor	.10
42	RE 4743	470,000 ohm, 1/2 W. resistor	.10
43	RE 1053	1 meg., 1/2 W. resistor	.10
44	CW 4-10	.1 mfd., 400 V. condenser	.15
45	RE 1053	1 meg., 1/2 W. resistor	.10
46	CW 4-10	.1 mfd., 400 V. condenser	.15
47	RE 4743	470,000 ohm, 1/2 W. resistor	.10
48	CW 4-02	.02 mfd., 400 V. condenser	.15
49	CM 9518	75 mmf. mica condenser	.15
50	RE 1043	100,000 ohm, 1/2 W. resistor	.10
51	CW 6-002	.002 mfd., 600 V. condenser	.15
52	RE 1043	100,000 ohm, 1/2 W. resistor	.10
53	RE 2253	2.2 meg., 1/2 W. resistor	.10
54	CW 4-02	.02 mfd., 400 V. condenser	.10
55	YR 9555	2 meg. - mid tapped volume control	.90
56	CW 4-02	.02 mfd., 400 V. condenser	.15
57	RE 4733	47,000 ohm, 1/2 W. resistor	.10
58	RE 3943	390,000 ohm, 1/2 W. resistor	.10
59	RE 5613	560 ohm, 1/2 W. resistor	.10
60	RE 2243	220,000 ohm, 1/2 W. resistor	.10
61	CW 4-10	.1 mfd., 400 V. condenser	.15
62	CW 4-01	.01 mfd., 400 V. condenser	.15
63	SW 9576	Tone control switch	.60
64	RE 223622	22,000 ohm, 2 W. resistor	.30
65	RE 1033	10,000 ohm, 1/2 W. resistor	.10
66	CW 6-001	.001 mfd., 600 V. condenser	.15
67	RE 6833	68,000 ohm, 1/2 W. resistor	.10
68	CW 4-02	.02 mfd., 400 V. condenser	.15
69	RE 271522	270 ohm, 2 W. resistor	.30
70	RE 4743	470,000 ohm, 1/2 W. resistor	.10
71	CL 9572	Speaker field coil	3.00
72	TR 95150	Speaker output transformer	3.00
73	DM 9528	Speaker diaphragm assembly (12")	5.00
74	SK 9585	Speaker complete (12")	11.00
76	SW 9577	Line switch	.50
76	CB 9512	Line cable and plug assembly	.50
77	TR 95121	Power transformer - 105-125 volts, 50-60 cycle	6.75
78	RE 682522	6800 ohm, 2 W. resistor	.30
79	CE 9528	8 mfd., 450 V. electrolytic condenser	.80
80	RE 103522	10,000 ohms, 2 W. resistor	.30
81	CW 4-05	.05 mfd., 400 V. condenser	.15
82	RE 1033	10,000 ohm, 1/2 W. resistor	.10
83	RE 6833	68000 ohm, 1/2 W. resistor	.10
84	CW 4-50	.5 mfd., 400 V. condenser	.50
85	RE 1803	18 ohm, 1/2 W. resistor	.10
86	CE 9562	18 mfd., 300 V. electrolytic condenser	.80
87	CE 9554	18 mfd., 450 V. electrolytic condenser	.85
88	RE 1803	18 ohm, 1/2 W. resistor	.10
89	CB 95151	Cable and socket for tuning tube	.90
90		1 meg. resistor - part of CB 95151	.10
91	RE 223622	22,000 ohm, 2 W. resistor	.30
92	LP 9510	Dial light - 6.3 V., .25 amp.	.15



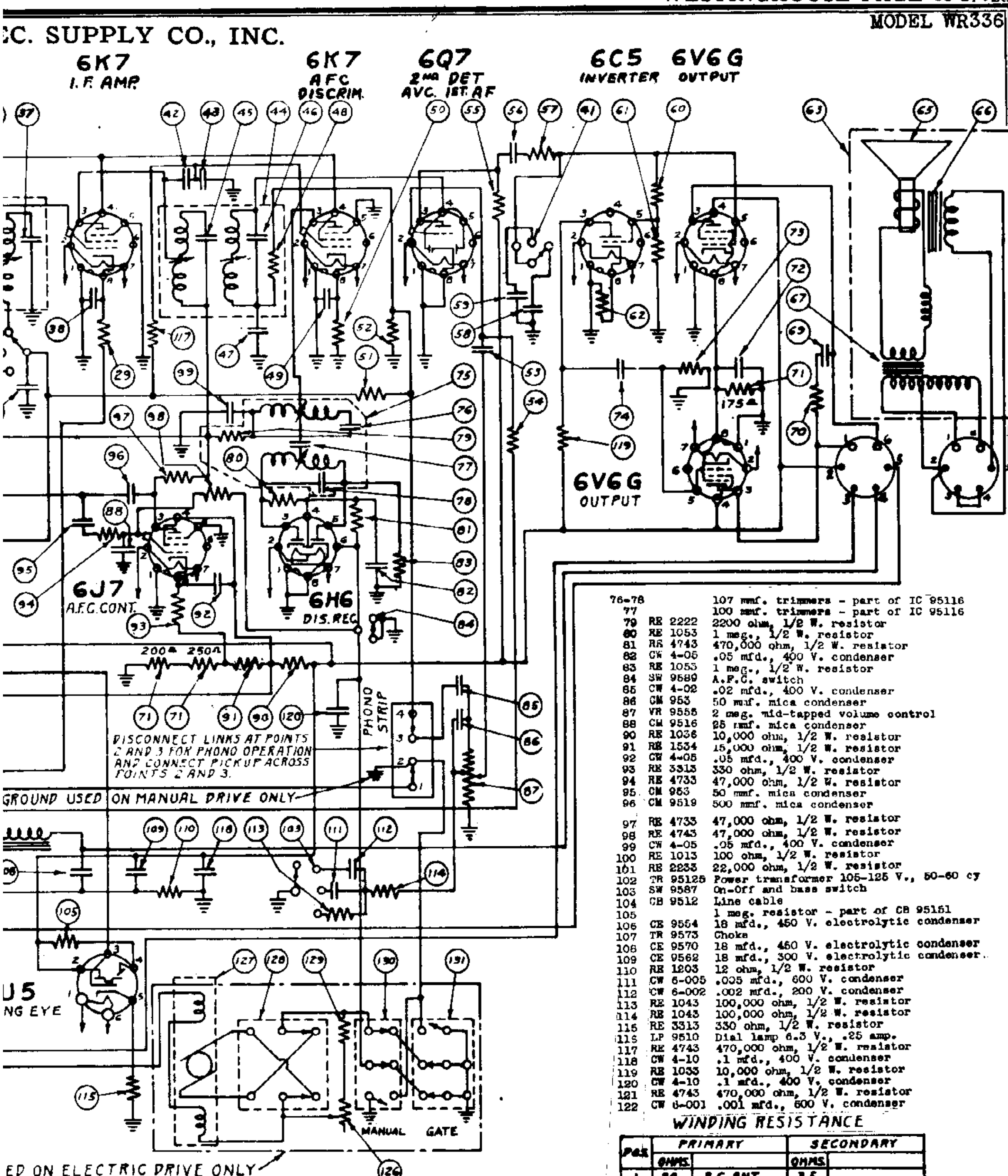
Dia. #	Part #	Description of Parts
1	RC 95312	Short-wave antenna coil
2		4-35 mmf. trimmer - part of RC 95312
3	RC 95311	Broadcast antenna coil
4		4-35 mmf. trimmer - part of RC 95311
5	SW 9586	Wave change switch
6	CG 9566	Variable gang condenser
7	CM 9519	500 mmf. mica condenser .
8	RE 1045	100,000 ohm, 1/2 W. resistor
9	CW 2-05	.05 mfd., 200 V. condenser
10	RE 3313	330 ohm, 1/2 W. resistor
11	CW 4-10	.1 mfd., 400 V. condenser
12	RC 95313	Broadcast composite coil
13		4-35 mmf. trimmer - part of RC 95313
14		5-25 mmf. trimmer - part of RC 95313
15		300-600 mmf. oscillator lag cond. -
16	RC 95315	Short-wave composite coil
17-18		4-35 mmf. trimmer - part of RC 95315
19		.0034 mfd. oscillator lag condenser -
20	RC 95314	Police composite coil
21		10 mmf. trimmer - part of RC 95314
22		4-35 mmf. trimmer - part of RC 95314
23		.001 mfd. oscillator lag condenser -
24	CM 9513	500 mmf. mica condenser
25		10 mmf. mica condenser - part of RC 95315
26	RE 1043	100,000 ohm, 1/2 W. resistor
27	CW 2-05	.05 mfd., 200 V. condenser
28	RE 4733	47,000 ohm, 1/2 W. resistor
29	RE 2713	270 ohm, 1/2 W. resistor
30	RE 562412	5600 ohm, 1 W. resistor
31	CW 4-01	.01 mfd., 400 V. condenser
32	CM 9513	100 mmf. mica condenser
33	RE 1213	120 ohm, 1/2 W. resistor
34	IC 95117	1st I.F. transformer
35		100 mmf. trimmer - part of IC 95117
36-37		107 mmf. trimmer - part of IC 95117
38	CW 2-05	.05 mfd., 200 V. condenser
39	CW 4-05	.05 mfd., 400 V. condenser
40	RE 2213	220 ohm, 1/2 W. resistor
41	SW 9588	Treble control switch
42	CM 9548	5 mmf. mica condenser
43	CM 953	50 mmf. mica condenser
44	IC 95115	I.F. diode coil
45-46		107 mmf. trimmers - part of IC 95115
47	CM 9513	100 mmf. mica condenser
48	RE 4733	47,000 ohm, 1/2 W. resistor
49	CW 2-05	.05 mfd., 200 V. condenser
50	RE 3313	330 ohm, 1/2 W. resistor
51	RE 4743	470,000 ohm, 1/2 W. resistor
52	RE 4743	470,000 ohm, 1/2 W. resistor
53	CW 4-02	.02 mfd., 400 V. condenser
54	RE 4743	470,000 ohm, 1/2 W. resistor
55	RE 2243	220,000 ohm, 1/2 W. resistor
56	CW 4-02	.02 mfd., 400 V. condenser
57	RE 4733	47,000 ohm, 1/2 W. resistor
58	CW 6-005	.005 mfd., 600 V. condenser
59	CW 6-001	.001 mfd., 600 V. condenser
60	RE 3943	390,000 ohm, 1/2 W. resistor
61	RE 6833	68,000 ohm, 1/2 W. resistor
62	RE 5613	560 ohm, 1/2 W. resistor
63	SK 9584	Speaker
66	DM 9528	Speaker diaphragm assembly
66	CL 9570	Speaker field coil
67	TR 95151	Speaker output transformer
69	CW 6-001	.001 mfd., 600 V. condenser
70	RE 225415	22,000 ohm, 1 W. resistor
71	RE 95141	200-250 ohm - voltage divider resistor
72	CE 9569	12 mfd., 50 V. electrolytic condenser
73	RE 4743	470,000 ohm, 1/2 W. resistor
74	CW 4-02	.02 mfd., 400 V. condenser
75	IC 95116	Descriminator coil

SOCKE

TUBE	STAGE	FIL.	PINS	PLATE
6K7	R.F.AMP.	6.3	2-7	255
6A8	1ST DET OSC.	"	"	"
6K7	I.F. AMP.	"	"	"
6Q7	2ND DET	"	-	120
6C5	INVERTER	"	"	180
6V6G	OUTPUT	"	"	250
6V6G	"	"	"	"
6N6	DISC. REC.	"	"	—
6J7	A.F.C. CONT	"	"	180
5X4G	POW. REC.	5	7-8	—
6U5	EYE	6.3	1-6	255

MODEL WR336

:C. SUPPLY CO., INC.



DISCONNECT LINKS AT POINTS 2 AND 3 FOR PHONO OPERATION AND CONNECT PICKUP ACROSS POINTS 2 AND 3.

GROUND USED ON MANUAL DRIVE ONLY

ED ON ELECTRIC DRIVE ONLY

76-78		107 mmf. trimmers - part of IC 95116
77		100 mmf. trimmers - part of IC 95116
79	RE 2222	2200 ohm, 1/2 W. resistor
80	RE 1053	1 meg., 1/2 W. resistor
81	RE 4743	470,000 ohm, 1/2 W. resistor
82	CW 4-05	.05 mfd., 400 V. condenser
83	RE 1053	1 meg., 1/2 W. resistor
84	SW 9589	A.F.C. switch
85	CW 4-02	.02 mfd., 400 V. condenser
86	CM 953	50 mmf. mica condenser
87	VR 9555	2 meg. mid-tapped volume control
88	CM 9516	25 mmf. mica condenser
90	RE 1036	10,000 ohm, 1/2 W. resistor
91	RE 1534	15,000 ohm, 1/2 W. resistor
92	CW 4-05	.05 mfd., 400 V. condenser
93	RE 3313	330 ohm, 1/2 W. resistor
94	RE 4733	47,000 ohm, 1/2 W. resistor
95	CM 953	50 mmf. mica condenser
96	CM 9519	500 mmf. mica condenser
97	RE 4733	47,000 ohm, 1/2 W. resistor
98	RE 4743	47,000 ohm, 1/2 W. resistor
99	CW 4-05	.05 mfd., 400 V. condenser
100	RE 1013	100 ohm, 1/2 W. resistor
101	RE 2233	22,000 ohm, 1/2 W. resistor
102	TR 95125	Power transformer 105-125 V., 50-60 cy
103	SW 9587	On-Off and bass switch
104	CB 9512	Line cable
105		1 meg. resistor - part of CB 95151
106	CE 9554	18 mfd., 450 V. electrolytic condenser
107	TR 9573	Choke
108	CE 9570	18 mfd., 450 V. electrolytic condenser
109	CE 9562	18 mfd., 300 V. electrolytic condenser
110	RE 1203	12 ohm, 1/2 W. resistor
111	CW 6-005	.005 mfd., 600 V. condenser
112	CW 6-002	.002 mfd., 200 V. condenser
113	RE 1043	100,000 ohm, 1/2 W. resistor
114	RE 1043	100,000 ohm, 1/2 W. resistor
115	RE 3313	330 ohm, 1/2 W. resistor
116	LP 9510	Dial lamp 6.3 V., .25 amp.
117	RE 4743	470,000 ohm, 1/2 W. resistor
118	CW 4-10	.1 mfd., 400 V. condenser
119	RE 1033	10,000 ohm, 1/2 W. resistor
120	CW 4-10	.1 mfd., 400 V. condenser
121	RE 4743	470,000 ohm, 1/2 W. resistor
122	CW 6-001	.001 mfd., 600 V. condenser

WINDING RESISTANCE

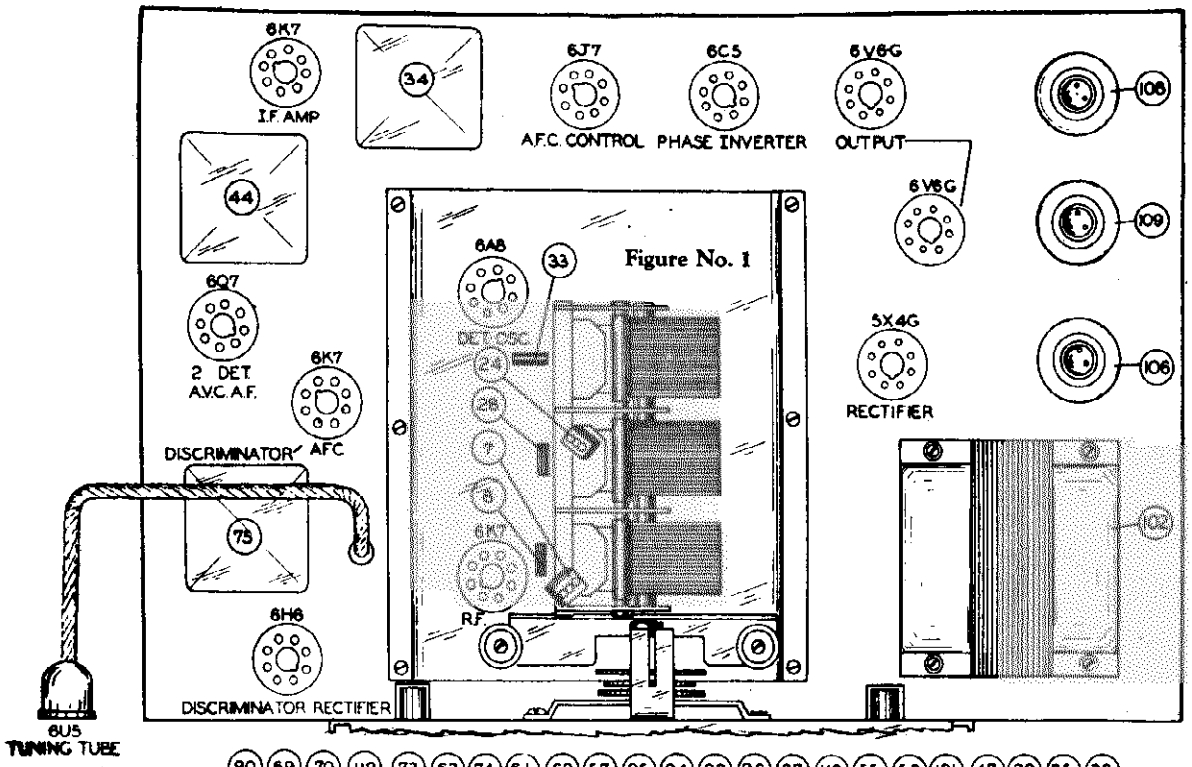
POS.	PRIMARY		SECONDARY	
	OHMS		OHMS	
1	20	B.C. ANT	3.5	
3	.5	RED ANT	.03	
12	1.5	B.C. R.F.	13	
12	1.3	B.C. OSCL.	[illegible]	HIGH END TO TAP LOW END TO TAP
16	2	POLICE R.F.	.03	
16	.5	REP OSCL.	.03	
20	1.5	POLICE ANT	.6	
20	.5	" OSCL.	1.2	
34	9	1ST I.F.	45	LINK 3 OHMS
44	5 TO TAP	DIODE TRANS.	10	
75	5 TO TAP	DISCRIM. "	10	
107	92	CHOKE		
[illegible]	2	VOICE COIL		
67	225	OUTPUT TR.	.05	
66	400	SPK FIELD		

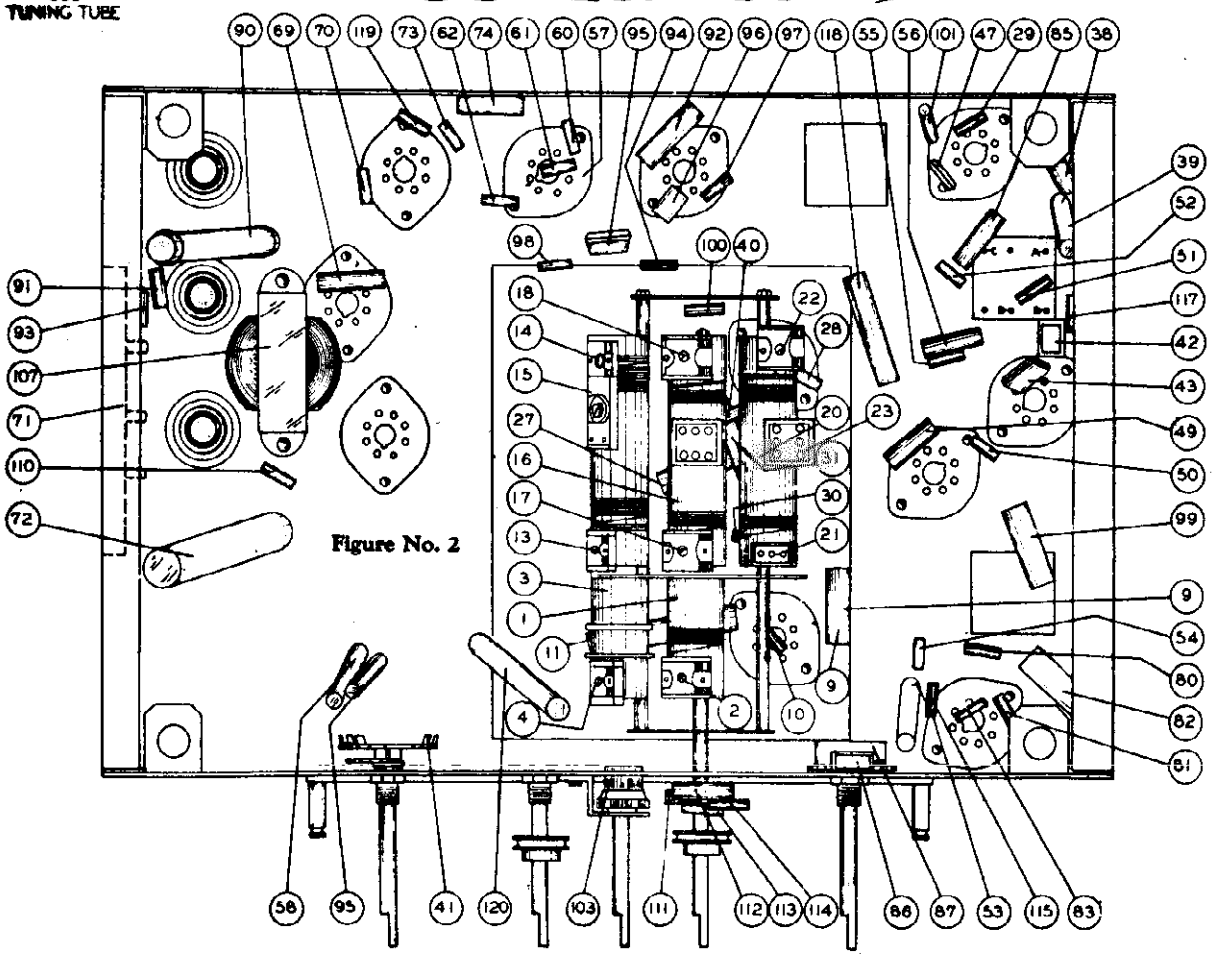
VOLTAGES

PIN NO.	SCREEN	PIN NO.	BIAS	CATH	OSCL. PL. VOL.
TO 3	107	1 TO 4	—	3.2	
"	"	"	—	5.8 RO. / 17-5.W	220
"	"	"	—	4.5 RO / 17-5.W	
"	—	—	-1.8	—	
"	—	—	—	4	
"	255	1 TO 4	—	13.5	
"	"	"	—	"	
—	—	—	—	—	
TO 3	107	1 TO 4	—	4.4	
—	—	—	—	390	
—	—	—	—	175	

FOR TUNER DATA SEE INDEX

WESTINGHOUSE ELEC. SUPPLY CO., INC.





WR-336

GENERAL DESCRIPTION

This model is a twelve tube, three band superheterodyne receiver. Among the many desirable features are, controlled bass and treble compensation, high fidelity and automatic frequency control of the broadcast band.

The tubes, in the order mentioned under the heading "type and number of tubes", function as follows: RF amplifier, 1st detector-oscillator, I.F. amplifier, 2nd detector A.V.C. 1st audio, phase inverter, output, rectifier, limiter, discriminator rectifier, A.F.C. control and tuning indication.

The R.F. amplifier and detector oscillator with the associated parts including the gang condenser, coils, trimmer and lag condensers and wave change switch, is mounted on the chassis as a unit.

LINE-UP CAPACITOR ADJUSTMENT

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 should be connected across the speaker voice coil terminals to indicate proper alignment. The sensitivity of the output meter must be sufficient to give a satisfactory reading with a low input signal.

A zero center micro-ammeter with an approximate 0-30 scale is absolutely essential for the proper alignment of the discriminator circuit.

Before attempting to align the receiver, the circuit, position of alignment adjustments and chassis layout should be familiarized. The top and bottom views of the chassis are shown in figures #1 and #2.

ADJUSTMENT OF THE I.F. DIODE COIL 465 KC.

1. Refer to bottom view of chassis and connect a 20,000 ohm resistor between points "C" and "D" under 2nd I.F. coil #44.

2. Turn the receiver "ON" and to the position immediately after set is turned on. Set volume control on full. Set A.F.C. switch in "OFF" position. Set high fidelity control in a left hand or MINIMUM position. Set wave change switch to broadcast position.

3. Connect the output meter across the speaker voice coil.

4. Set the test oscillator to 465 KC. and adjust the output to give a readable deflection of the output meter when the signal is applied to the grid of the 6K7 I.F. tube through a .5 mfd. blocking condenser.

5. Adjust the bottom adjustment screw on coil #44 for maximum output.

6. Remove the 20,000 ohm resistor from points "C" and "D" and connect between points "A" and "B".

7. Adjust the top adjustment screw on coil #44 for maximum output.

8. Remove the 20,000 ohm resistor.

ALIGNMENT OF DISCRIMINATOR COIL

1. Connect the micro-ammeter between the #4 terminal of the 6H6 discriminator rectifier tube and ground.

2. With test signal still applied to the I.F. tube increase the signal output of the oscillator.

3. Adjust the bottom screw on the discriminator coil #75 for maximum deflection of the micro-ammeter (either direction).

4. Adjust the top screw on the discriminator coil until a zero reading on the micro-ammeter is reached. To check this alignment, vary the I.F. signal slightly to each side of the 465 setting and the micro-ammeter should show a deflection first on one side then the other of the zero point.

ADJUSTMENT OF 1ST I.F. COIL 465 KC.

1. Apply the test signal to the grid of the 6A8 detector-oscillator tube through a .5 mfd. blocking condenser.

2. Adjust first the bottom, second the middle and third the top alignment screws on I.F. coil #34 for maximum output.

ADJUSTMENT OF THE BROADCAST BAND

1. With the gang condenser completely in mesh, check the position of the dial pointer which should be at the end horizontal line of the scale.

2. Set the test oscillator and dial pointer to 1500 KC.

3. Adjust the oscillator trimmer #14.

4. Connect the test oscillator to the antenna terminal of the receiver through a .0002 mfd. condenser.

5. Adjust the R.F. and antenna trimmers #13 and #4 for maximum output.

6. Set the test oscillator and dial pointer to 600 KC.

7. Adjust the oscillator series (lag) condenser #15 at the same time turning the gang condenser slightly back and forth until a maximum is reached.

8. Return the test oscillator and dial pointer to the 1500 KC. setting and recheck trimmers #14, #13 and #4.

9. Check sensitivity and calibration over the scale.

NOTE: In adjusting the two remaining bands, a .0002 mfd. condenser and a 400 ohm resistor connected in series should be inserted between the test oscillator and the antenna terminal of the receiver. This combination is the approximate equivalent of a short wave antenna.

DJUSTMENT OF THE GREEN BAND

1. Turn the wave change switch to the green band position.

2. Set the test oscillator and dial pointer at 5000 KC.

3. Adjust the oscillator trimmer #22.

4. Check sensitivity and calibration over the scale.

ADJUSTMENT OF THE RED BAND

1. Turn the wave change switch to the red band position.

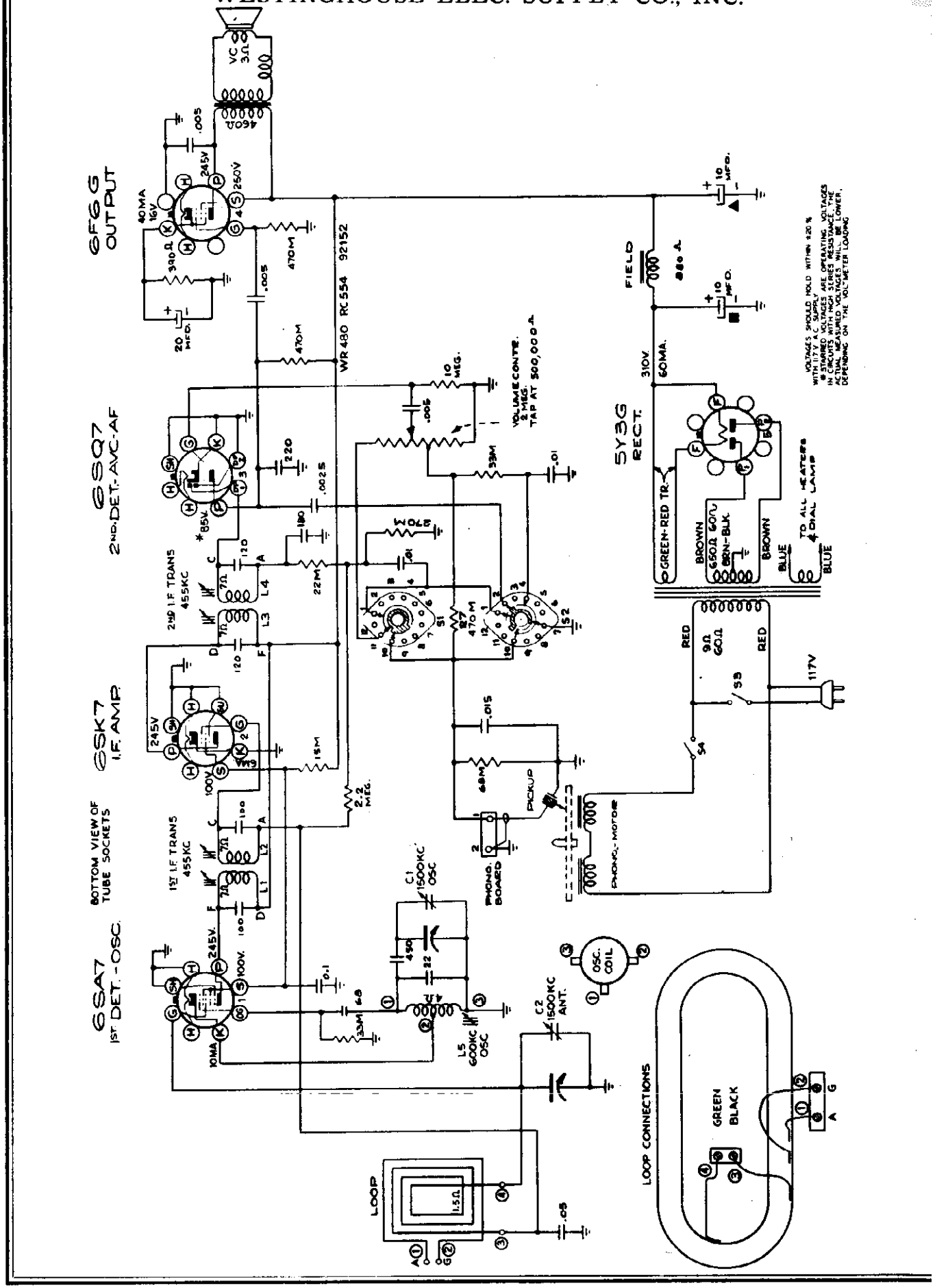
2. Set the test oscillator and dial pointer at 16,000 KC.

3. Adjust the oscillator trimmer #18. Two positions may be found at which the signal can be heard. Use the one with the least capacity or with the trimmer farther out.

4. Adjust the R.F. and antenna trimmers #17 and #2 for maximum output.

5. Check calibration and sensitivity over the scale.

WESTINGHOUSE ELEC. SUPPLY CO., INC. MODEL WR480



MODEL WR480

WESTINGHOUSE ELEC. SUPPLY CO., INC.

Alignment Procedure

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max peak output—
1	I-F grid, in series with .01 mfd.	455 kc	Quiet Point at H-F end of dial	L3 and L4 (2nd I.F. Trans.
2	1st det. grid, in series with .01 mfd.			L1 and L2 (1st I.F. Trans.
3	Antenna term. of ant. loop in series with 100 mmfd.	1,500 kc	1,500 kc	C1 (oscillator) C2 (antenna)
4		600 kc	600 kc	L5 (oscillator)
5	Repeat steps 3 and 4.			

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—Connect the low side of the test-oscillator to the receiver ground, and keep the output as low as possible.

Precautionary Lead Dress

1. Dress 1st I-F plate and grid leads against chassis and away from each other. Dress plate lead from 6SK7 close to chassis.
2. Dress leads from terminal board on loop support away from loop.

Electrical and Mechanical Specifications

Frequency Range ..... 540-1,720 kc

Intermediate Frequency ..... 455 kc

Tube Complement

(1) RCA-6SA7 ..... First Detector-Oscillator
(2) RCA-6SK7 ..... I-F Amplifier
(3) RCA-6SQ7 ..... Second Detector A-F Amplifier and A.V.C.
(4) RCA-6F6G ..... Power Output
(5) RCA-5Y3G ..... Rectifier

Power Output

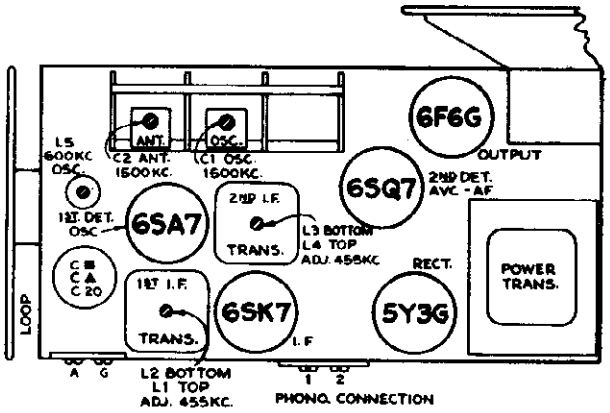
Undistorted ..... 2.0 watts
Maximum ..... 4.0 watts

Power Supply Rating

105-125 volts, 50-60 cycles ..... 55 watts

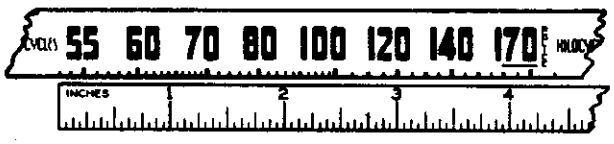
Loudspeaker (RL 79 B3)

Type ..... 6-inch Electrodynamic
Voice Coil Impedance ..... 3.4 ohms at 400 cycles



Tube and Trimmer Locations

Calibration Scale.—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the chassis for quick reference during alignment. Or, if necessary, the calibration scale printed in this service note can be used in conjunction with an ordinary 6-inch ruler as an accurate and convenient substitute for the regular dial.



Receiver Dial Scale and Corresponding Calibration Scale

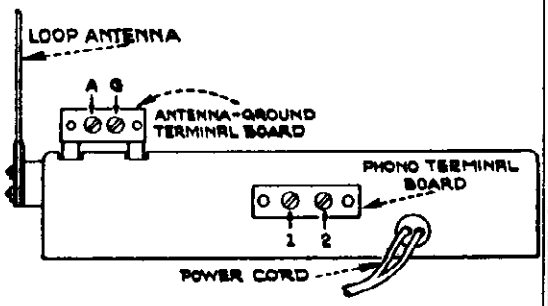
Using Calibration Scale.—

1. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.

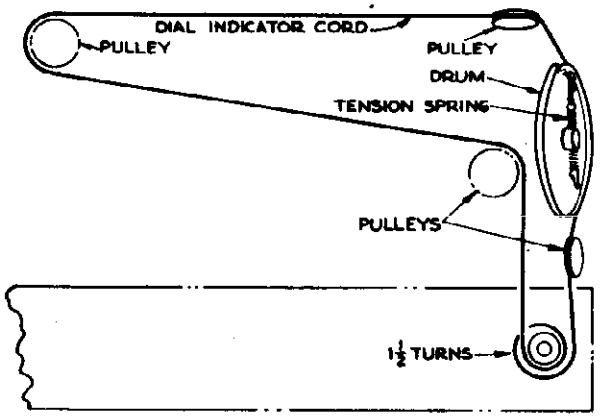
2. Place a flat 6-inch ruler on the dial backing plate so the left-end of ruler is at the reference mark at left-end of backing plate. Temporarily fasten the ruler with scotch tape to the backing plate.

3. Refer to calibration scale printed in this service note. This is a reduced reproduction of the dial with an inch-scale drawn at the bottom. To find the correct pointer position in inches for any desired frequency, draw a vertical line through this frequency on the calibration scale. For example 1,500 kc is approximately 3¾ inches from the reference mark.

Dial-Pointer Adjustment.—After the chassis is replaced in cabinet, move the dial pointer (if necessary) so that it is at the left-hand graduation on the dial with the gang in full mesh.



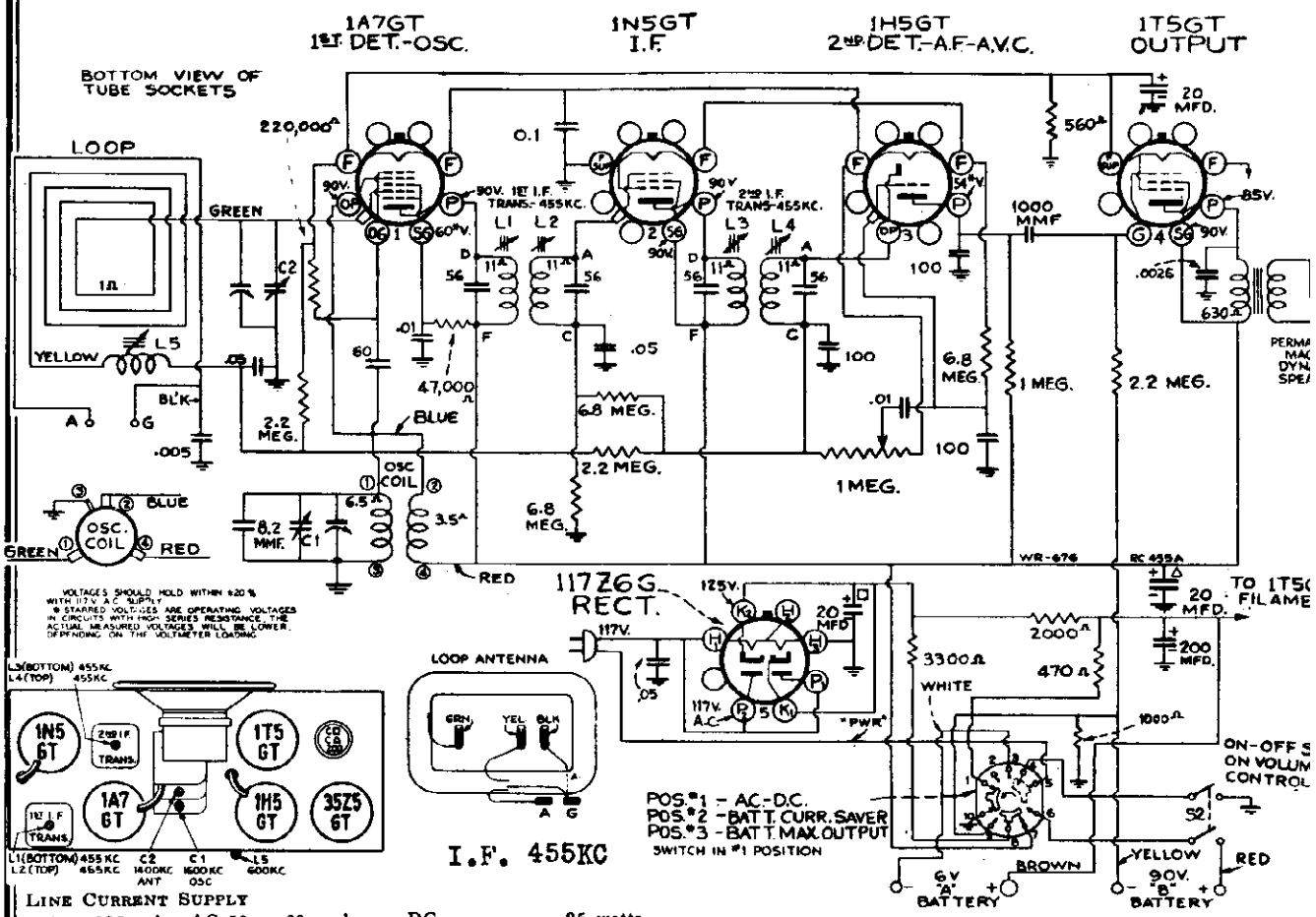
Back of Chassis



Dial-Indicator and Drive Mechanism

WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR6



Line Current Supply

110 to 125 volts, AC 50 or 60 cycles, or DC..... 25 watts

Batteries Required

"A" one 6 volt dry plug-in type (Eveready No. 747 or equivalent)
"B" two 45 volt dry plug-in type (Eveready No. 482 or equivalent)

Current Consumption

"A," 0.05 ampere—"B," 10.5 milliamperes full power;
6.0 milliamperes save power.

Power Output

Undistorted..... 0.08 wa
Maximum..... 0.17 wa

Loudspeaker

Type..... 5-inch permanent-magnet dynam
Voice-coil Impedance..... 4.5 ohms at 400 cycl

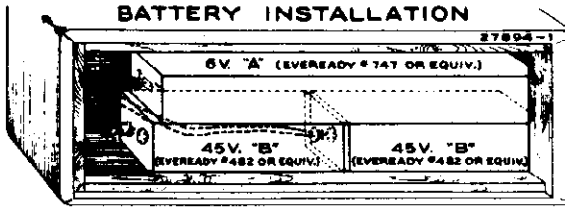
Alignment Procedure

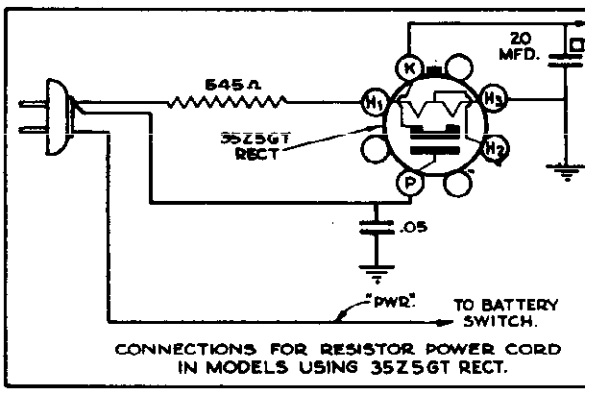
Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, keep the output as low as possible to avoid a-v-c action.

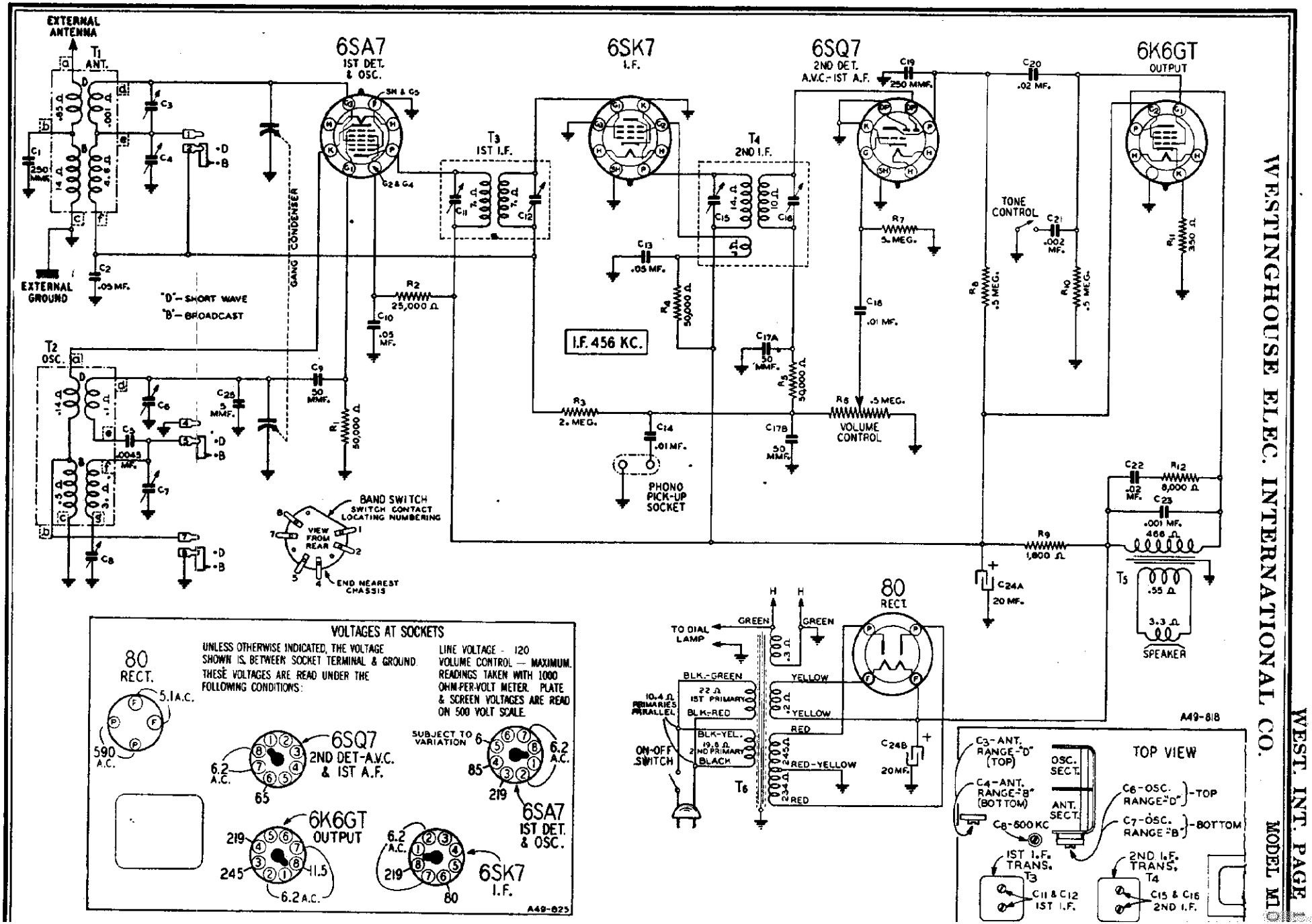
Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	1A7GT 1st-Det. grid cap, in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	L1, L2, L3, L4 (1st and 2nd I-F transformers)
2		1,600 kc	1,600 kc	C1 osc.
3	radiated signal near 600 kc		signal frequency	L5
4	radiated signal near 1,400 kc		signal frequency	C2
5	radiated signal near 600 kc		signal frequency	L5

For steps 3, 4, and 5 the chassis must be in the cabinet and the batteries in place and connected. L-5 is then reached through the small hole in the cabinet which is normally covered with a small plug located farthest away from C-2 and C-2 is reached through an eyelet in the speaker grille. If a broadcast signal is used it should be weak to avoid a-v-c action. Turning loop in minimum pickup position will sometimes be helpful. If no broadcast signal is available connect test oscillator output to a suitable radiation loop located several feet away from receiver.





CONNECTIONS FOR RESISTOR POWER CORD IN MODELS USING 35Z5GT RECT.


WESTINGHOUSE ELEC. INTERNATIONAL CO.
MODEL M
WEST. INT. PAGE 1
EXTERNAL ANTENNA
T1 ANT.
6SA7 1ST DET. & OSC.
6SK7 I.F.
6SQ7 2ND DET. A.V.C.-1ST A.F.
6K6GT OUTPUT
T3 1ST I.F.
T4 2ND I.F.
GANG CONDENSER
EXTERNAL GROUND
"D"-SHORT WAVE
"B"-BROADCAST
T2 OSC.
I.F. 456 KC.
TONE CONTROL
VOLUME CONTROL
PHONO PICK-UP SOCKET
BAND SWITCH
SWITCH CONTACT LOCATING NUMBERING
VIEW FROM REAR
END NEAREST CHASSIS
80 RECT.
TO DIAL LAMP
ON-OFF SWITCH
SPEAKER
A49-818
VOLTAGES AT SOCKETS
UNLESS OTHERWISE INDICATED, THE VOLTAGE SHOWN IS BETWEEN SOCKET TERMINAL & GROUND. THESE VOLTAGES ARE READ UNDER THE FOLLOWING CONDITIONS:
LINE VOLTAGE - 120
VOLUME CONTROL — MAXIMUM.
READINGS TAKEN WITH 1000 OHM-PER-VOLT METER. PLATE & SCREEN VOLTAGES ARE READ ON 500 VOLT SCALE.
5.1 A.C.
590 A.C.
6.2 A.C.
65
SUBJECT TO VARIATION
85
219
245
11.5
80
TOP VIEW
OSC. SECT.
ANT. SECT.
IST I.F. TRANS. T3
2ND I.F. TRANS. T4
A49-825

MODEL M101

WESTINGHOUSE ELEC. INTERNATIONAL CO.

ALIGNMENT PROCEDURE

Volume Control—Maximum 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—Small Screwdriver.

Dummy Antennas—.1 mf., 200 mmf., and 400 ohm carbon resistor.

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	RANGE SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
It is not necessary to remove chassis from cabinet if a short screwdriver is used for the I.F. adjustments. CAUTION—Align S.W. (Range D) *before* aligning Broadcast (Range B).					
I.F.					
456 KC	Antenna Lead	.1 mf.	Broadcast (to left)	Turn Rotor to Full Open	1st I.F. (C11) & (C12) 2nd I.F. (C15) & (C16)
S.W. (RANGE D)					
18,000 KC	Antenna Lead	400 Ohm	Shortwave (to right)	Turn Rotor to Full Open	Oscillator Shortwave (C6)
17,000 KC	Antenna Lead	400 Ohm	Shortwave (to right)	Turn Rotor to Max. Output	Ant. Shortwave (C3) Rock Rotor—See Note B
BROADCAST (RANGE B)					
1600 KC	Antenna Lead	200 mmf.	Broadcast (to left)	Turn Rotor to Full Open	Oscillator Broadcast (C7)
1400 KC	Antenna Lead	200 mmf.	Broadcast (to left)	Turn Rotor to Max. Output Set Pointer to 1400 KC—See Note A	Ant. Broadcast (C4)
600 KC	Antenna Lead	200 mmf.	Broadcast (to left)	Turn Rotor to Max. Output	600 KC (C8) Rock Rotor—See Note B

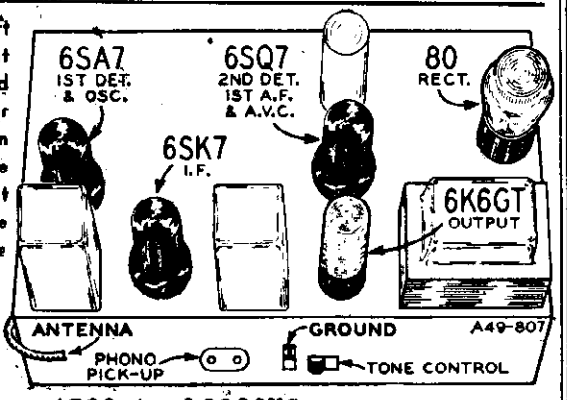
Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

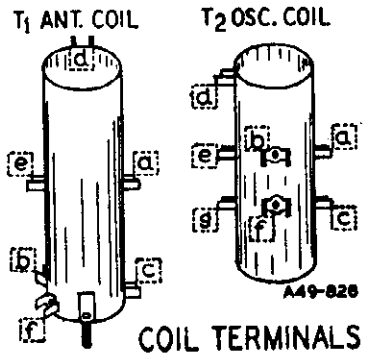
After each range is completed, repeat the procedure as a final check.

NOTE A—If the pointer is not at 1400 KC on the dial when maximum output is obtained, move the pointer to the 1400 KC mark on the dial scale.

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 15,000 KC. The signal will then be heard at 15,000 on the dial of the radio. The image signal will be heard at 15,000 less 912 KC, or 14,088 KC on the dial. It may be necessary to increase the input signal to hear the image.



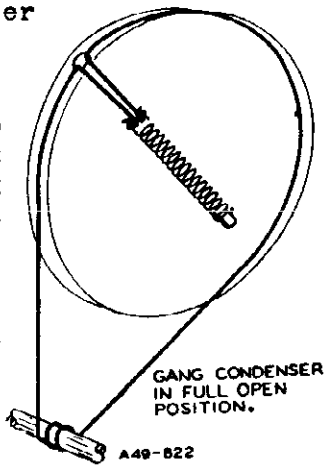


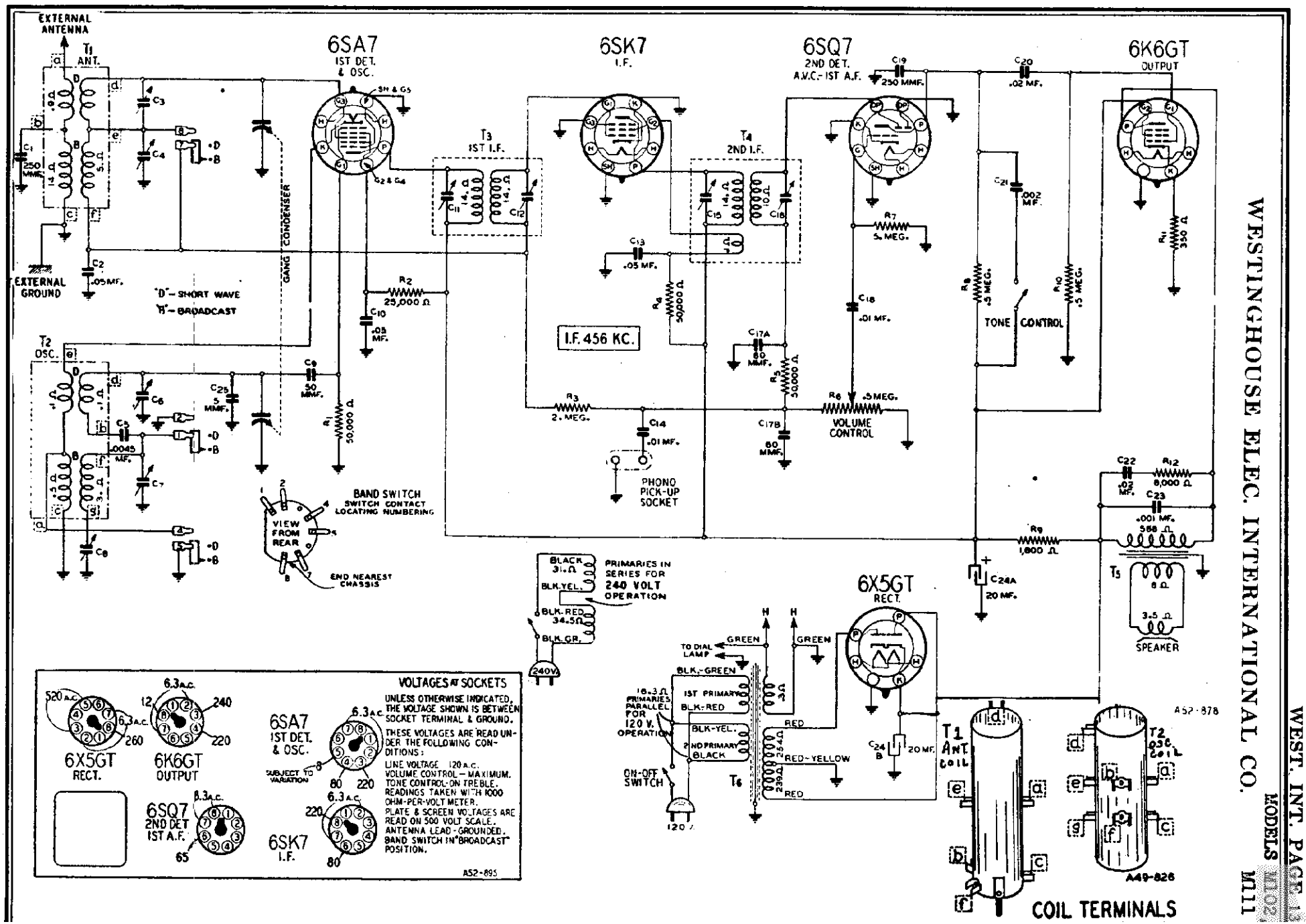
Tuning Frequency Range Broadcast Range-540 to 1600KC; Short Wave Range--4700 to 18000KC Sensitivity-(for 0.5 W. output) Broadcast Range--20 Microvolts Average; Short Wave Range--60 Microvolts Average; Power Consumption-45 W. (at 120 v.60 cycles) Power Output--1.5 W. Undistorted; 3.0 W. Max. Selectivity--37 KC Broad at 1000 times Sig. Intermediate Frequency--456 KC; Speaker Voice Coil Impedance at 400 cycles..3½Ohms.

DRIVE CORD REPLACEMENT

To replace drive cord, first remove dial scale mounting plate from chassis as follows: Pull dial scale pointer off its shaft. Remove dial lamp socket assembly from mounting plate. Take out the 2 screws in the bottom mounting brackets and the screw in the top brace bracket.

Tie both ends of new drive cord to same end of tension spring, so that doubled drive cord measures 10¾" from knots to looped end of cord. Secure spring to hook on pulley — see illustration. Turn gang condenser to full open position. Thread doubled cord through hole in pulley groove. Wind one section of cord approximately 2½ turns counter-clockwise (from front of chassis) around tuning control shaft. Turns should progress away from chassis. Stretch tension spring and wind remaining section of cord around drive pulley.




WESTINGHOUSE ELEC. INTERNATIONAL CO.
WEST. INT. PAGE 15
MODELS M102 M111
EXTERNAL ANTENNA
T1 ANT.
6SA7 1ST DET. & OSC.
6SK7 I.F.
6SQ7 2ND DET. A.V.C.-1ST A.F.
6K6GT OUTPUT
T3 1ST I.F.
T4 2ND I.F.
GANG CONDENSER
EXTERNAL GROUND
"D"-SHORT WAVE
"B"-BROADCAST
T2 OSC.
I.F. 456 KC.
TONE CONTROL
VOLUME CONTROL
PHONO PICK-UP SOCKET
BAND SWITCH
SWITCH CONTACT LOCATING NUMBERING
VIEW FROM REAR
END NEAREST CHASSIS
PRIMARIES IN SERIES FOR 240 VOLT OPERATION
6X5GT RECT.
TO DIAL LAMP
GREEN
BLK.-GREEN
IST PRIMARY
BLK.-RED
BLK.-YEL.
2ND PRIMARY
BLACK
RED
RED-YELLOW
ON-OFF SWITCH
120 V.
T6
T5
SPEAKER
T1 ANT. COIL
T2 OSC. COIL
A49-826
A52-878
COIL TERMINALS
VOLTAGES AT SOCKETS
UNLESS OTHERWISE INDICATED, THE VOLTAGE SHOWN IS BETWEEN SOCKET TERMINAL & GROUND.
THESE VOLTAGES ARE READ UNDER THE FOLLOWING CONDITIONS:
LINE VOLTAGE 120 A.C.
VOLUME CONTROL-MAXIMUM.
TONE CONTROL-ON TREBLE.
READINGS TAKEN WITH 1000 OHM-PER-VOLT METER.
PLATE & SCREEN VOLTAGES ARE READ ON 500 VOLT SCALE.
ANTENNA LEAD-GROUNDED.
BAND SWITCH IN "BROADCAST" POSITION.
SUBJECT TO VARIATION
A52-895

MODELS M102, M111 WESTINGHOUSE ELEC. INTERNATIONAL CO.

Power Consumption 45 Watts (At 120 volts 60 cycles)
Power Output .....1.5 Watts Undistorted
3.0 Watts Maximum
Selectivity.....37 KC Broad at 1000 times Signal
Intermediate Frequency .....456 KC
Speaker Voice Coil Impedance at
400 cycles .....3½ Ohms

Tuning Frequency Range
Broadcast Range ..... 540 to 1600 KC
Shortwave Range .....4700 to 18000 KC

Sensitivity—(For 0.5 Watt output)
Broadcast Range.....20 Microvolts Average
Shortwave Range.....60 Microvolts Average

120 OR 240 VOLT POWER TRANSFORMER CONNECTIONS

All radios except those for use on 25 cycles are equipped with a dual voltage power transformer which may be connected for 120 volts or 240 volts operation on 50-60 cycles. See diagram on page 3.

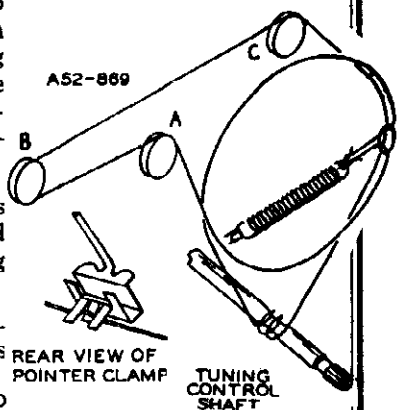
DRIVE CORD REPLACEMENT

Turn gang condenser to completely closed position. Using a new drive cord 45" in length, tie one end to tension spring. Pass other end through hole in rim of drive pulley. Pull spring flush against inside of pulley rim. Wind cord around drive pulley and pass over idler pulleys "A," "B," and "C"—See illustration.

Continue cord around drive pulley to tuning control shaft. Cord should be on right side of pulley groove (from gang condenser end of chassis). Wind drive cord 2 turns around section of tuning control shaft directly below drive pulley—See illustration.

Continue cord around drive pulley. Pass cord through hole in pulley rim. Tie cord to tension spring. Stretch tension spring and secure free end to hook on pulley.

Turn tuning knob counterclockwise until extreme high frequency position is reached (gang condenser to full open) Slip pointer on the dial cord and move to the high frequency end of scale. Carefully align pointer with the 18 MC dial mark and clamp securely into position.



ALIGNMENT PROCEDURE

Before aligning make certain that the dial pointer is adjusted properly as instructed under "Drive Cord Replacement."
Volume Control—Maximum 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—Small Screwdriver.
Dummy Antennas—.1 mf., 200 mmf., and 400 ohm carbon resistor.

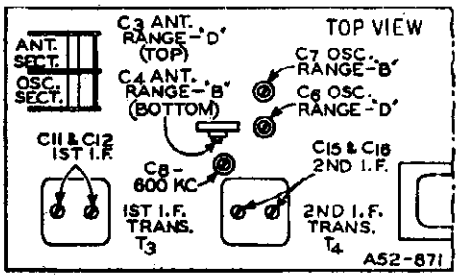
SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	RANGE SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
It is not necessary to remove chassis from cabinet if a short screwdriver is used for the I.F. adjustments. CAUTION—Align S.W. (Range D) *before* aligning Broadcast (Range B).					
I.F.					
.456 KC	Antenna Lead	.1 mf.	Broadcast (to left)	Turn Rotor to Full Open	1st I.F. (C11) & (C12) 2nd I.F. (C15) & (C16)
S.W. (RANGE D)					
18,000 KC	Antenna Lead	400 Ohm	Shortwave (to right)	Turn Rotor to Full Open	Oscillator Shortwave (C6)
17,000 KC	Antenna Lead	400 Ohm	Shortwave (to right)	Turn Rotor to Max. Output	Ant. Shortwave (C3) Rock Rotor—See Note B
BROADCAST (RANGE B)					
1600 KC	Antenna Lead	200 mmf.	Broadcast (to left)	Turn Rotor to Full Open	Oscillator Broadcast (C7)
1400 KC	Antenna Lead	200 mmf.	Broadcast (to left)	Turn Rotor to Max. Output Set Pointer to 1400 KC—	Ant. Broadcast (C4)
600 KC	Antenna Lead	200 mmf.	Broadcast (to left)	Turn Rotor to Max. Output	600 KC (C8) 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 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 15,000 KC. The signal will then be heard at 15,000 on the dial of the radio. The image signal should be heard at 15,000 less 912 KC, or 14,088 KC on the dial. It may be necessary to increase the input signal to hear the image.



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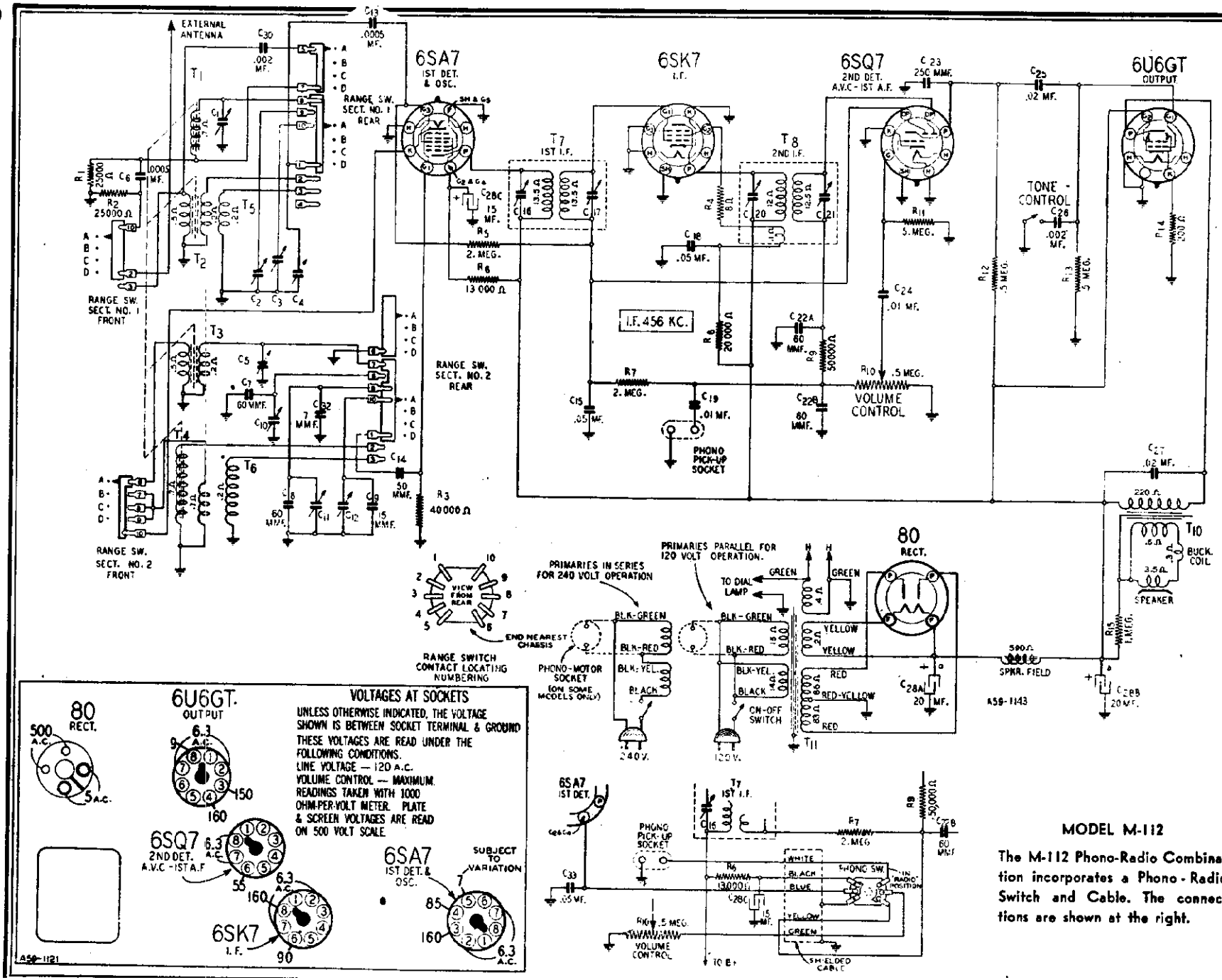

MODEL M-112

The M-112 Phono-Radio Combination incorporates a Phono-Radio Switch and Cable. The connections are shown at the right.

MODELS M103, M112, M116

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ALIGNMENT PROCEDURE

Before aligning make certain that dial pointer is adjusted properly as instructed under "Drive Cord Replacement" on page 5.
Volume Control—Maximum 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. (Connect in series with Antenna lead.)

	SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	POINTER SETTING	ADJUST TRIMMERS TO MAXIMUM.
I. F.	456 KC	Antenna Lead	.1 mf.	A Range	Turn Tuning Knob until Extreme High Frequency Position Is Reached	2nd I.F. (C20) & (C21) 1st I.F. (C16) & (C17)
RANGE D	21.8 MC	Antenna Lead	400 Ohm	D Range	Same as Above	Oscillator Range D (C12)
	Reset to 20.0 MC	Antenna Lead	400 Ohm	D Range	Turn Tuner to Max. Output	Antenna Range D (C4) Rock Tuner—See Note A
RANGE C	12.05 MC	Antenna Lead	400 Ohm	C Range	Extreme High Frequency Position	Oscillator Range C (C11)
	Reset to 11.5 MC	Antenna Lead	400 Ohm	C Range	Turn Tuner to Max. Output	Antenna Range C (C3) Rock Tuner—See Note A
RANGE B	7.4 MC	Antenna Lead	400 Ohm	B Range	Extreme High Frequency Position	Oscillator Range B (C10)
	Reset to 7.0 MC	Antenna Lead	400 Ohm	B Range	Turn Tuner to Max. Output	Antenna Range B (C2) Rock Tuner—See Note A
RANGE A	1610 KC	Antenna Lead	200 mmf.	A Range	Extreme High Frequency Position	Oscillator Range A (C5) Antenna Range A (C1)

WAVE RANGES

BROADCAST RANGE

A Range 535 to 1610 Kilocycles

This range is calibrated in kilocycles and meters. Standard Broadcast stations are tuned in on this range.

SHORT WAVE RANGES

B Range 3.2 to 7.4 Megacycles
C Range 8.3 to 12.05 Megacycles
D Range 15.1 to 21.8 Megacycles

The Short Wave ranges are calibrated in megacycles and meters. Short Wave broadcasts will be heard best on the D range during the day and on the B and C ranges at night.

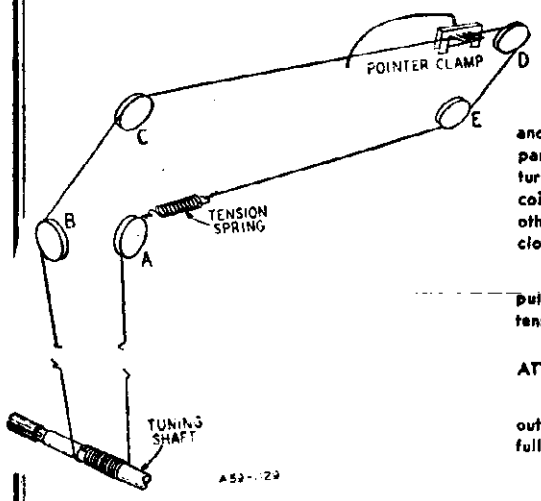
Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each range is completed, repeat the procedure as a final check.

CAUTION—When aligning the short wave ranges, 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 on the dial. It will be necessary to increase the input signal to hear the image. The image frequency must always be 912 KC LESS than the frequency at which the set is aligned. This is true of all the short wave ranges.

It is very important that the bandspread ranges (B, C and D) be aligned at the precise frequencies given. If the accuracy of the signal generator is not known, it is always best to first calibrate the signal generator by using a receiver that is in good condition. First tune in a station of known frequency close to 12.05 MC. Then tune the signal generator until it "beats" with the station, carefully marking the setting of the generator. Proceed in the same manner for all the other alignment frequencies.

NOTE A—Turn tuner back and forth and adjust trimmer until peak of greatest intensity is reached.



DRIVE CORD REPLACEMENT

Turn drive shaft until cores are entirely within coil form. Pass cord through hole in tuning shaft and bring two ends together evenly. CAUTION—Cord must remain centered on shaft. Wind one part of cord two turns on tuning shaft in a counterclockwise direction (from front of chassis). These turns should progress away from chassis. Hold both parts of cord and withdraw cores from within coils slowly by turning the tuning shaft. One part of cord should progress towards chassis and the other away from the chassis. Unwind the inside cord from shaft. Then wind this cord two turns in a clockwise direction (from front of chassis). These turns should progress towards rear of chassis.

Pass this cord over idler pulley A—see illustration. Pass outer cord on tuning shaft over idler pulleys B, C, D and E, attaching it to tension spring. Secure other end of cord to opposite end of tension spring. This spring should be slightly stretched for tension.

ATTACHING DIAL POINTER

Turn tuning knob clockwise until extreme high frequency position is reached. (Cores completely out of coils.) Slip the pointer on the dial cord and move to high frequency end of dial scale. Carefully align pointer with end of printed scales and clamp securely into position.

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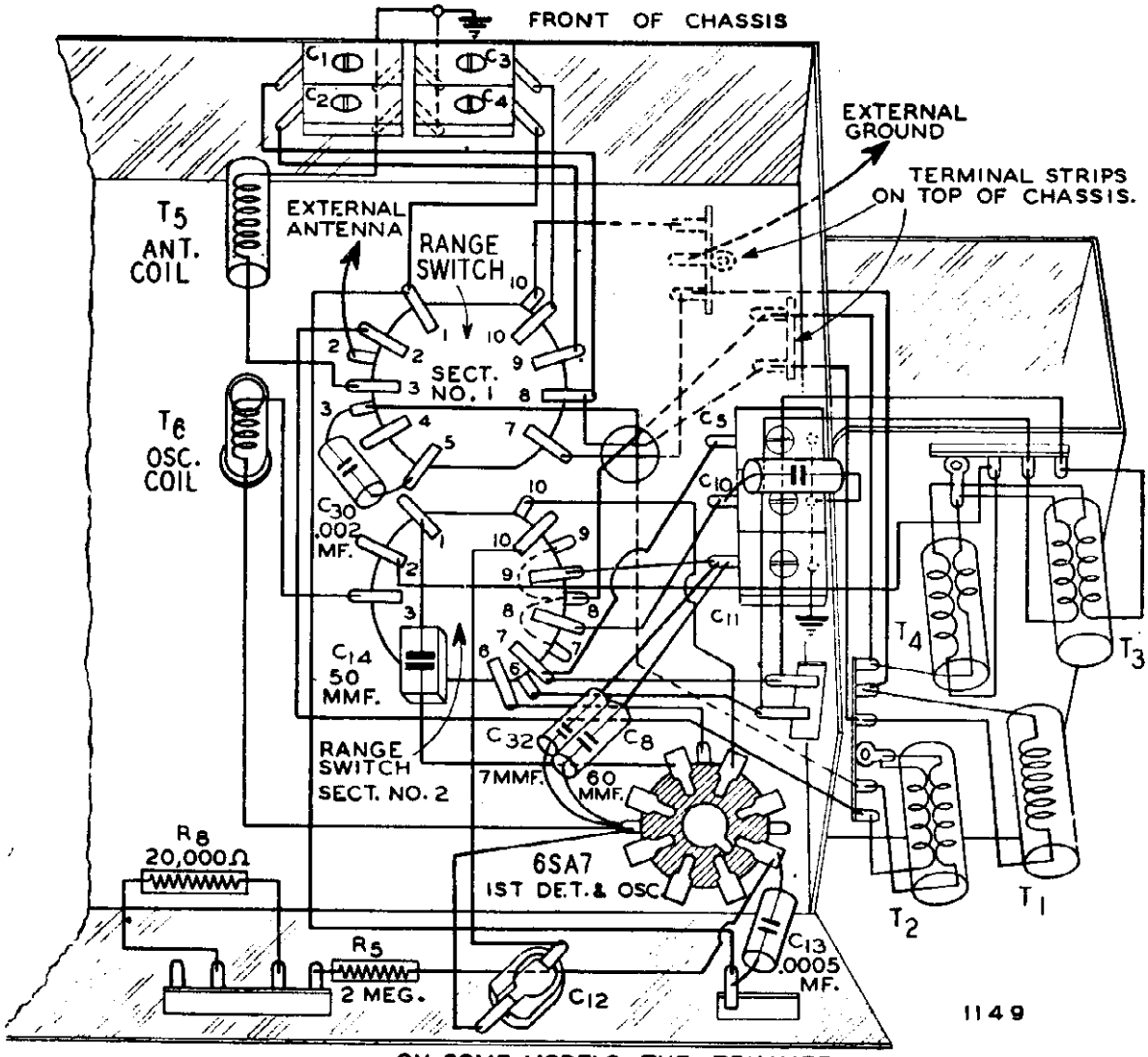
MODELS M103, M112, M116



ON SOME MODELS THE TRIMMER C_{12} IS REPLACED BY AN AIR TRIMMER MOUNTED NEAR THE OSCILLATOR TRIMMER STRIP. (ADJACENT TO C_{11})

Wiring Diagram for Coil System

SPECIFICATIONS

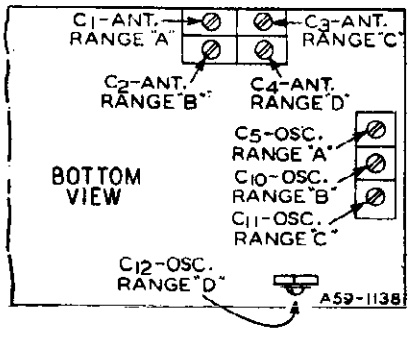
Power Consumption	60 Watts (at 120 volts 60 cycles) 75 Watts (motor operating) on Phono Combination Models
Power Output	2.7 Watts Undistorted 4.0 Watts Maximum
Selectivity	38 KC Broad at 1000 times Signal
Intermediate Frequency	456 KC
Speaker	6" Electro-Dynamic

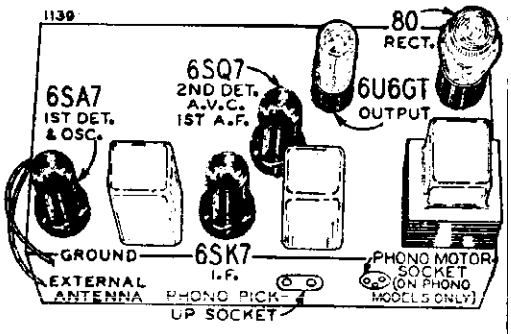
Tuning Frequency Range

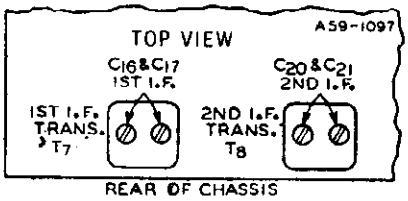
A Range	535 to 1610 KC
B Range	3.2 to 7.4 MC
C Range	8.3 to 12.06 MC
D Range	15.1 to 21.8 MC

Sensitivity (For 0.5 Watt Output)

A Range	25 Microvolts Average
B Range	40 Microvolts Average
C Range	35 Microvolts Average
D Range	25 Microvolts Average







ELECTRICAL SPECIFICATIONS

Type and Number of Tubes ..... 1 #6A7, 1 #6D6, 1 #75, 1 #43, 1 #25Z5, 1 #K49C - 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 1550 and 1500 to 3200 KC.
Maximum Output ..... .75 Watt
Maximum Undistorted Output ..... 1 Watt
Line-Up Frequencies ..... I.F. 465 KC., 1400 KC.

LINE-UP CAPACITOR ADJUSTMENTS

ADJUSTMENT OF I.F. (465 KC.)

1. Set volume control on full, the wave-change switch on the Broadcast (treble position) 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 6D6 I.F. tube through a .5 mfd. blocking condenser.
4. Adjust #24 (see Fig. #2) to maximum output, reducing output of test oscillator as required.
5. Apply test signal to grid of 6A7 first detector-oscillator tube and adjust #13 and #15 (Fig. #1) to maximum output.
6. With test signal still on the grid of 6F7 tube, repeat the above adjustments for greatest sensitivity.
7. Apply strong 465 KC. signal to the antenna and adjust trap coil trimmer #3 to a minimum output.

ADJUSTMENT OF BROADCAST BAND

1. Apply test signal on grid of 6A7 tube and set the test oscillator to 1400 KC.
2. 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.
3. Adjust trimmer #7 to maximum output.
4. 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, set test oscillator and station indicator to 1700 KC., and apply test signal to antenna lead. 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 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.

Dia. #	Part #	Description of Parts	List Price
1	CM 9519	.0005 mfd., mica condenser	$ .20
2	RC 95165	Antenna coil assembly	1.50
3		30-60 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		Trimmer condenser - part of CG 9547	
8		Trimmer condenser - part of CG 9547	
9	SA 106417	.0001 mfd. mica condenser	.20
10	RE 9581	50,000 ohm, 1/4 W. resistor	.15
11	CG 9547	Variable condenser - 2 gang	2.50
12	CM 9522	.00048 mfd. mica condenser	.20
13		35-130 mmf. trimmer condenser - part of IC 9586	
14	IC 9586	First I.F. coil - 465 KC.	2.00
15		35-130 mmf. trimmer condenser - part of IC 9586	
16	RE 9536	20,000 ohm, 1/4 W. resistor	.10
17	CW 2-10	.1 mfd., 200 V. condenser	.15
18	SA 105249	5000 ohm, 1/4 W. resistor	.15
19	RC 95166	Oscillator coil assembly	.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		30-60 mmf. trimmer condenser - part of IC 9595	
25	IC 9595	Second I.F. coil - 465 KC.	1.60
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	.15
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	.5 meg., 1/4 W. resistor	.15
34	CW 9525	.1 mfd., 100 V. condenser	.40
35	CW 2-05	.05 mfd., 200 V. condenser	.15
36	CW 4-006	.005 mfd., 400 V. condenser	.15
37	TR 9583	Output transformer	1.25
38	DM 9514	Diaphragm and voice coil assembly	1.15
39	SK 9544	Speaker	4.50
40	RE 9572	.5 meg., 1/4 W. resistor	.15
41	CW 2-10	.1 mfd., 200 V. condenser	.15
42	RE 9572	.5 meg., 1/4 W. resistor	.15
43	CW 2-10	.1 mfd., 200 V. condenser	.15
44	LP 9516	Dial lamp, 6.3 V., .15 amp.	.20
45		On-off switch - part of VR 957	
46	CB 9512	Line cable	.50
47	RE 9564	25 ohm, 1/2 W. resistor	.20
48		Field coil	
49	SA 105311	Choke coil assembly	.95
50	CE 9545	20 mfd., 150 V. electrolytic condenser	.85
51	CE 9546	12 mfd., 150 V. electrolytic condenser	.85
52	RE 9566	25 ohm, 1/4 W. resistor	.15
53	SA 105277	75,000 ohm, 1/4 W. resistor	.15

MAIN ASSEMBLIES

CH 95148	Chassis assembly	
SK 9544	Speaker	$ 4.50
KA 9569	Cabinet	

CABLES

CB 95128	Antenna cable	.10
PR 97160	Dial drive cable - 18"	.05 Per Yard

TUBE SOCKETS & TUBE SHIELDS

CV 9560	Tube shield - plain top	.05
CV 9559	Tube shield - slotted top	.05
FP 105947	Tube shield ring	.05
SA 105461	Tube socket - 7 prong	.20
SA 104617	Tube socket - 6 prong	.20
SO 956	Tube socket - 8 prong	.20
BE 9536	Tube shield base	.05

SCREWS

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-A is the same as the Model WR 103, except for the following items:

Power Tube 25B6G
Power Consumption ..... 48 Watts
Maximum Output ..... 1.5 Watts
Maximum Undistorted Output ..... 1 Watt

Part #	Description of Parts	List Price
CH 95180	Chassis assembly	
SK 9549	Speaker	$ 4.50

Dia. #	Part #	Description of Parts	List Price
35	CW 2-10	.1 mfd., 200 V. condenser	$ .15
37	TR 9590	Output transformer	1.25
39	SK 9549	Speaker	4.50
47		Omitted	
50	CE 9553	40 mfd., 150 V. electrolytic condenser	.80
55	RE 95121	13 ohm, 1/2 W. resistor	.10
56	CM 952	.00001 mfd. mica condenser	.20
57	RE 95119	4 meg., 1/2 W. resistor	.10

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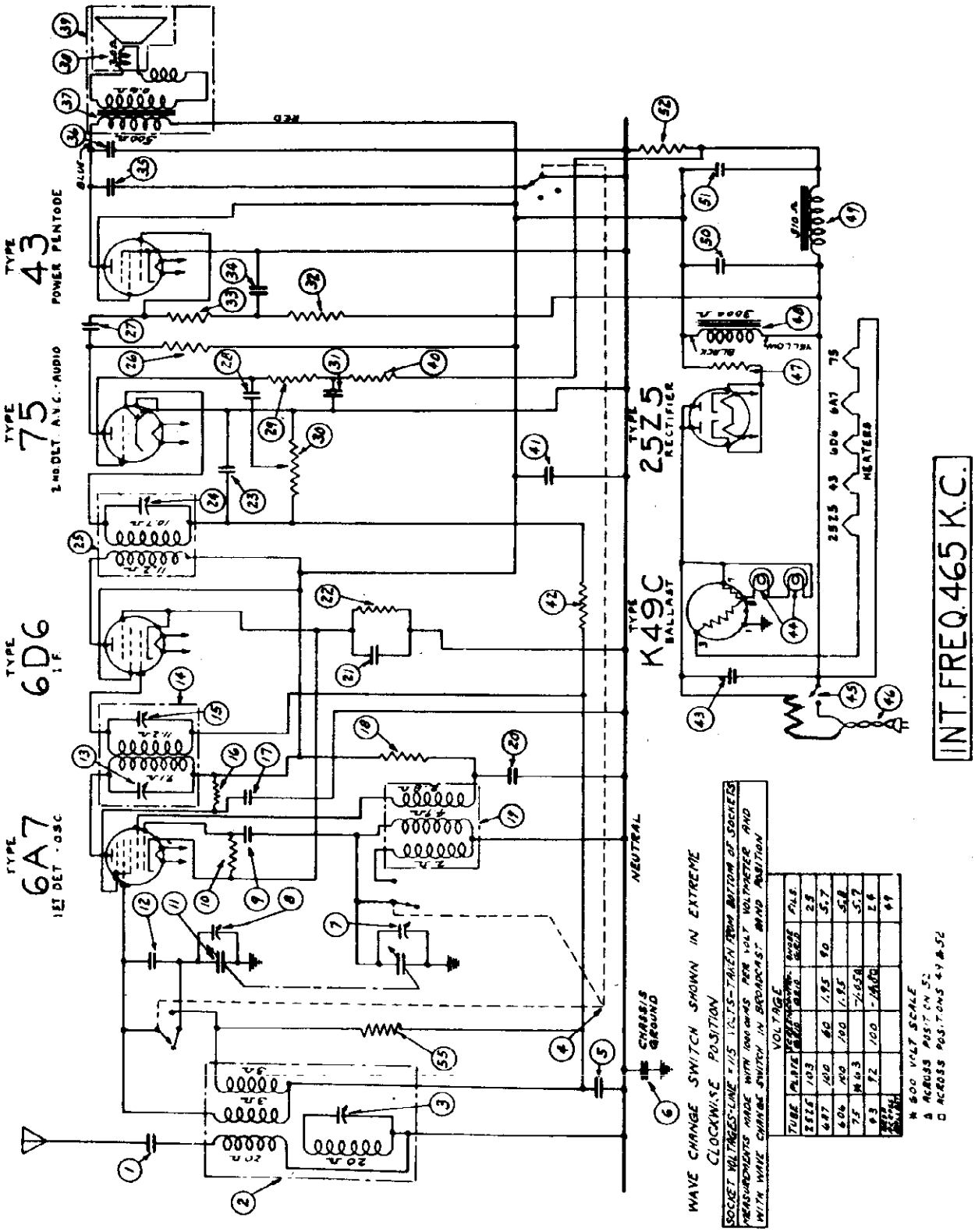

MODEL WR103

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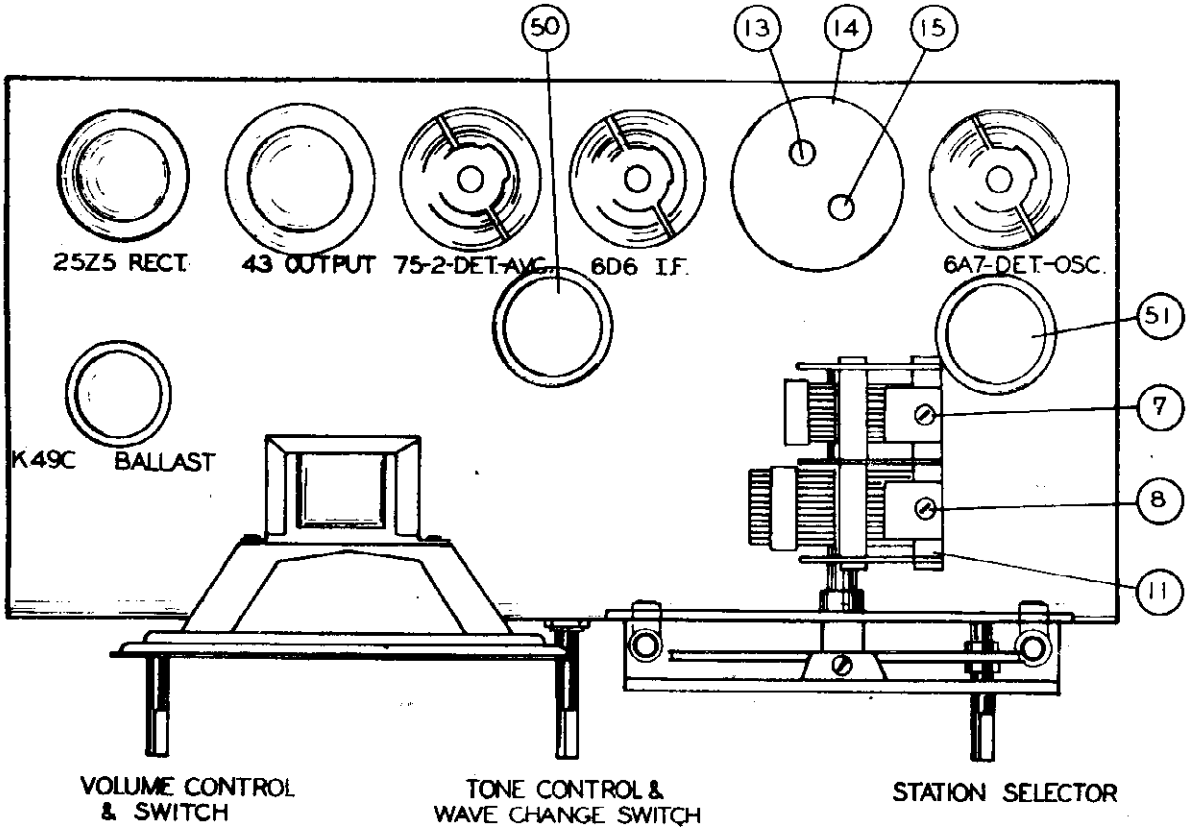

Figure No. 1

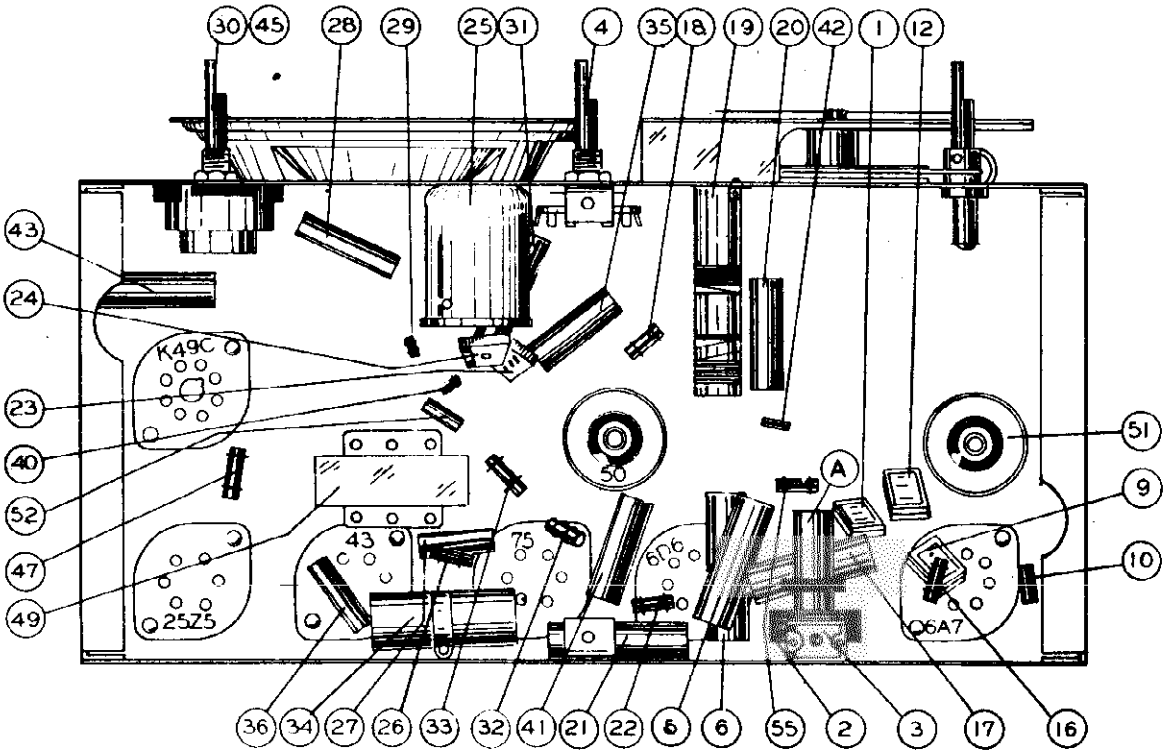

Figure No. 2

MODEL M108

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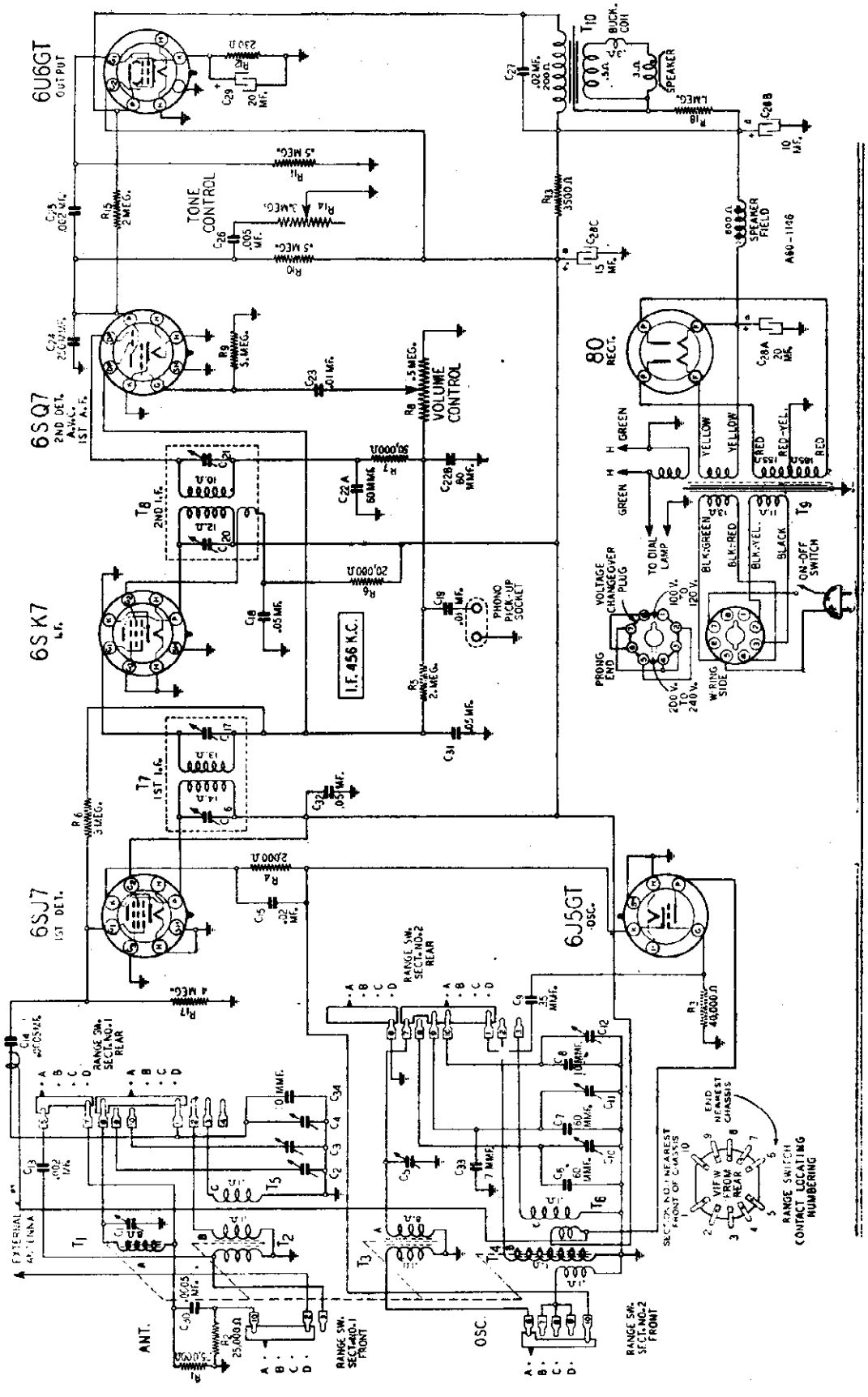

SPECIFICATIONS

Power Consumption—(At 120 volts 60 cycles) - 65 Watts
Power Output - - - - - - - - - - - 5 Watts Undistorted
7 Watts Maximum
Selectivity - - - - - - 38 KC Broad at 1000 times Signal
Intermediate Frequency - - - - - - - - - - 456 KC
Speaker - - - - - - - - - 6" Electro-Dynamic

Range	Tuning Frequency Range	Sensitivity (For 0.5 Watt output)
A Range	535 to 1610 KC	10 Microvolts Average
B Range	3.2 to 7.4 MC	12 Microvolts Average
C Range	8.32 to 12.05 MC	12 Microvolts Average
D Range	15.0 to 22.0 MC	18 Microvolts Average

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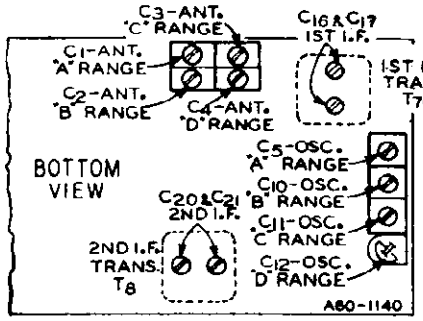
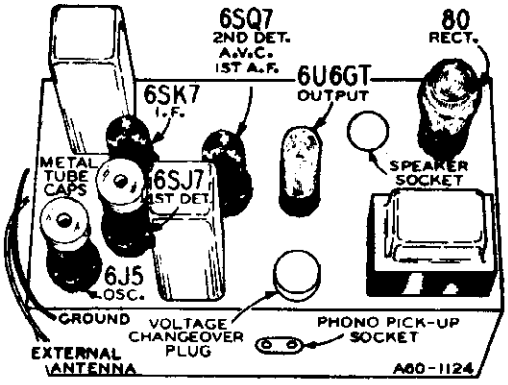


6 TUBE AC
4 RANGES

B Range	3.2	to	7.4	Megacycles
C Range	8.32	to	12.05	Megacycles
D Range	15.0	to	22.0	Megacycles



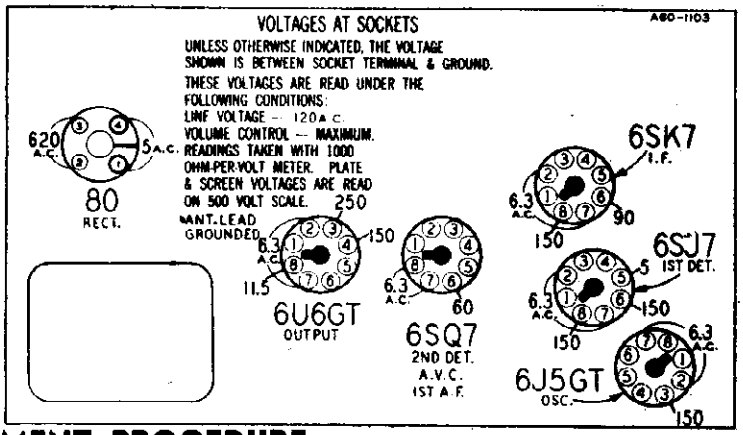
Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each range is completed, repeat the procedure as a final check.

CAUTION—When aligning the short wave ranges, 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 on the dial. It will be necessary to increase the input signal to hear the image. The image frequency must always be 912 KC LESS than the frequency at which the set is aligned. This is true of all the short wave ranges.

It is very important that the bandspread ranges (B, C and D) be aligned at the precise frequencies given. If the accuracy of the signal generator is not known, it is always best to first calibrate the signal generator by using a receiver that is in good condition. First tune in a station of known frequency close to 12.05 MC. Then tune the signal generator until it "beats" with the station, carefully marking the setting of the generator. Proceed in the same manner for all the other alignment frequencies.

NOTE A—Turn tuner back and forth and adjust trimmer until peak of greatest intensity is reached.



ALIGNMENT PROCEDURE

Before aligning make certain that dial pointer is adjusted properly as instructed under "Drive Cord Replacement" on page 5.
Volume Control—Maximum 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. (Connect in series with Antenna lead.)

	SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	POINTER SETTING	ADJUST TRIMMERS TO MAXIMUM
I. F.	456 KC	Antenna Lead	.1 mf.	A Range	Turn Tuning Knob until Extreme High Frequency Position is Reached	2nd I.F. (C20) & (C21) 1st I.F. (C16) & (C17)
RANGE D	21.8 MC	Antenna Lead	400 Ohm	D Range	Same as Above	Oscillator Range D (C12)
	Reset to 20.0 MC	Antenna Lead	400 Ohm	D Range	Turn Tuner to Max. Output	Antenna Range D (C4) Rock Tuner—See Note A
RANGE C	12.05 MC	Antenna Lead	400 Ohm	C Range	Extreme High Frequency Position	Oscillator Range C (C11)
	Reset to 11.5 MC	Antenna Lead	400 Ohm	C Range	Turn Tuner to Max. Output	Antenna Range C (C3) Rock Tuner—See Note A
RANGE B	7.4 MC	Antenna Lead	400 Ohm	B Range	Extreme High Frequency Position	Oscillator Range B (C10)
	Reset to 7.0 MC	Antenna Lead	400 Ohm	B Range	Turn Tuner to Max. Output	Antenna Range B (C2) Rock Tuner—See Note A
RANGE A	1610 KC	Antenna Lead	200 mmf.	A Range	Extreme High Frequency Position	Oscillator Range A (C5) Antenna Range A (C1)

ADJUSTMENT TO VARIOUS LINE VOLTAGES

An accurate AC voltmeter should be used to measure the line voltage before installing the radio.

CAUTION—Never make any of the following power transformer adjustments without first withdrawing the plug on the end of the power cord from the receptacle.

OPERATION ON LINE VOLTAGE OF 200 TO 250 VOLTS, 50-60 CYCLES

When shipped from the factory, these radios are adjusted for a line voltage of 200 to 250 volts.

Care should be taken to see that the voltage changer plug (see tube arrangement illustration) is so inserted in the voltage changer socket that the white dot is adjacent to the "220 Volt" marking on the chassis.

TO ADJUST THE RECEIVER FOR A LINE VOLTAGE OF 100 TO 125 VOLTS, 50-60 CYCLES

Remove the voltage changer plug and reinsert it so that the white dot is adjacent to the "110 Volt" marking on the chassis.

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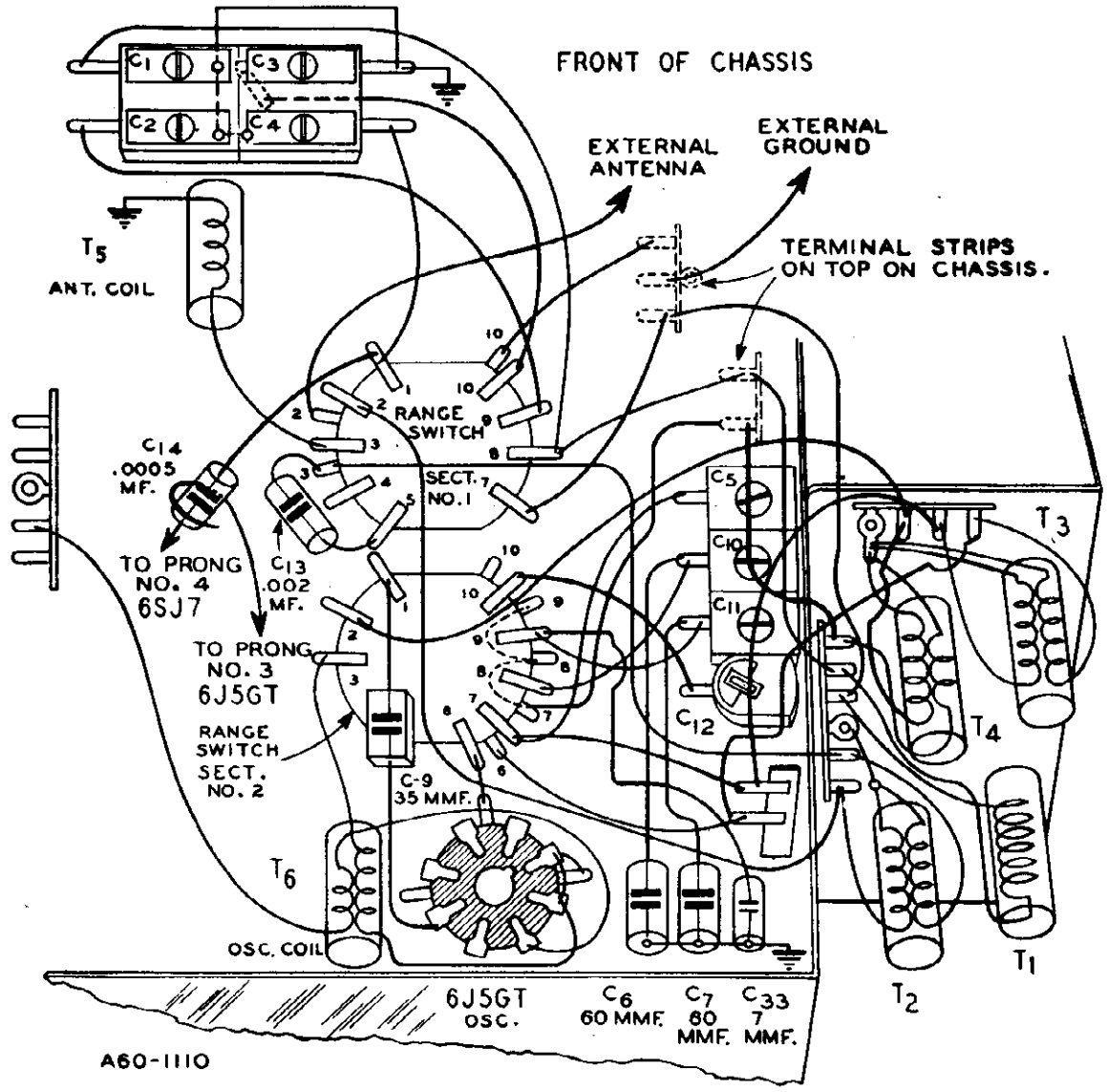


Wiring Diagram for Coil System

DRIVE CORD REPLACEMENT

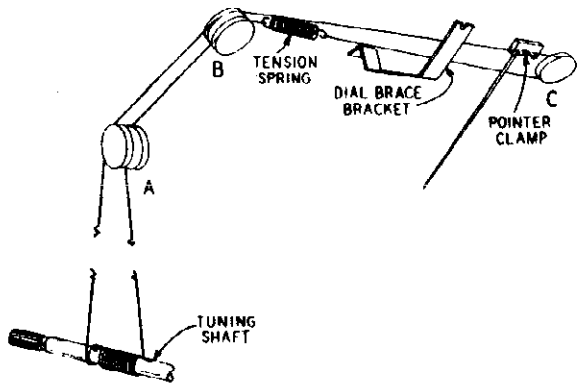
Turn drive shaft until cores are entirely within coil forms. Pass cord through hole in tuning shaft and bring two ends together evenly. CAUTION—Cord must remain centered on shaft. Wind one part of cord two turns on tuning shaft in a counter-clockwise direction (from front of chassis). These turns should progress away from chassis. Hold both parts of cord and withdraw cores from within coils slowly by turning the tuning shaft. One part of cord should progress towards chassis and the other away from the chassis. Unwind the inside cord from shaft. Then wind this cord two turns in a clockwise direction (from front of chassis). These turns should progress towards rear of chassis.

Pass cord, progressing away from chassis, over inside idler pulley A and outside idler pulley B—See illustration. Wind cord around dial brace bracket. Pass the outside cord from tuning shaft to outside idler pulley A to inside idler pulley B and over idler pulley C. Attach tension spring to end of cord.

Unwind cord from dial brace bracket and attach to other end of spring. The spring should be slightly stretched for tension.

ATTACHING DIAL POINTER

Turn tuning knob clockwise until high frequency position is reached. (Cores completely out of coils.) Slip pointer on the dial cord and move to high frequency end of dial scale. Carefully align pointer with the round dots at the end of each scale and clamp it securely into position.



MODELS M110, M114

WESTINGHOUSE ELEC. INTERNATIONAL CO.

Power Consumption—(At 110 volts 60 cycles)
M-110 - - - - - - 100 Watts
M-114 - - - - - - 110 Watts
Power Output - - - - - - - 10.0 Watts Undistorted
14.0 Watts Maximum
Selectivity - - - - 30 KC Broad at 1000 times Signal
Intermediate Frequency - - - - - - - - - 456 KC
Speaker - - - - M-110....10" Electro-Dynamic
M-114....12" Electro-Dynamic

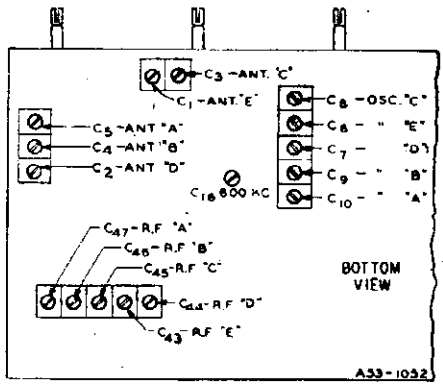
Range	Tuning Frequency Range	Sensitivity (For 0.5 Watt output)
A Range....	528 to 1610 KC.....	3 Microvolts Average
B Range....	2.3 to 7.5 MC.....	3 Microvolts Average
C Range....	8.4 to 12.0 MC.....	3 Microvolts Average
D Range....	12.5 to 15.40 MC.....	3 Microvolts Average
E Range....	17.6 to 21.8 MC.....	5 Microvolts Average

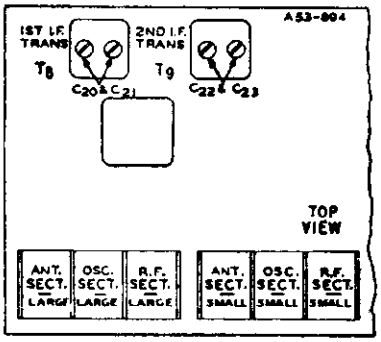
ALIGNMENT PROCEDURE

Volume Control—Maximum Alt Adjustments.
Never align with Selectivity Switch (on Tone Control) in Hi-Fidel. position.
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.

SIGNAL GENERATOR FREQUENCY SETTING	CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I. F. 456 KC	Stator of R.F. Section on Large Gang Condenser	.1 mf.	A Range	Turn Rotor to Full Open	2nd I.F. (C22) & (C23) 1st I.F. (C20) & (C21)
RANGE A 1610 KC	Antenna Lead	200 mmf.	A Range	Turn Rotor to Full Open	Oscillator Range A (C10)
1400 KC	Antenna Lead	200 mmf.	A Range	Turn Rotor to Max. Output Set Indicator to 1400 KC— See Note A	Ant. Range A (C5) R.F. Range A (C47)
600 KC	Antenna Lead	200 mmf.	A Range	Turn Rotor to Max. Output	600 KC (C16) Rock Rotor—See Note B
RANGE B 7000 KC	Antenna Lead	400 Ohm	B Range	Set Dial to 7.0 MC	Oscillator Range B (C9)
7000 KC	Antenna Lead	400 Ohm	B Range	Leave Dial at 7.0 MC.	Ant. Range B (C4) R.F. Range B (C46) Rock Rotor—See Note B
RANGE C 12,000 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Full Open	Oscillator Range C (C8)
11,900 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Max. Output	Ant. Range C (C3) R.F. Range C (C45) Rock Rotor—See Note B
RANGE D 15,400 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C7)
15,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C2) R.F. Range D (C44) Rock Rotor—See Note B
RANGE E 21,800 KC	Antenna Lead	400 Ohm	E Range	Turn Rotor to Full Open	Oscillator Range E (C6)
21,500 KC	Antenna Lead	400 Ohm	E Range	Turn Rotor to Max. Output	Ant. Range E (C1) R.F. Range E (C43) 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—If the pointer is not at 1400 KC on the dial, remove cord clamp, correct pointer position, then replace cord clamp astride pointer on both drive cords.

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 ranges, 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 on the dial. It will be necessary to increase the input signal to hear the image. The image frequency must always be 912 KC LESS than the frequency at which the set is aligned. This is true of all the shortwave ranges.

It is very important that the bandspread ranges (C, D and E) be aligned at the precise frequencies given. If the accuracy of the signal generator is not known, it is always best to first calibrate the signal generator by using a receiver that is in good condition. First tune in a station of known frequency close to 11,900 KC. Then tune the signal generator until it "beats" with the station, carefully marking the setting of the generator. Proceed in the same manner for the other alignment frequencies: 12000, 15000, 15400, 21500 and 21800 KC.

SHORT WAVE RANGES

B Range 2.3 to 7.5 Megacycles
C Range 8.4 to 12.0 Megacycles
D Range 12.5 to 15.4 Megacycles
E Range 17.6 to 21.8 Megacycles

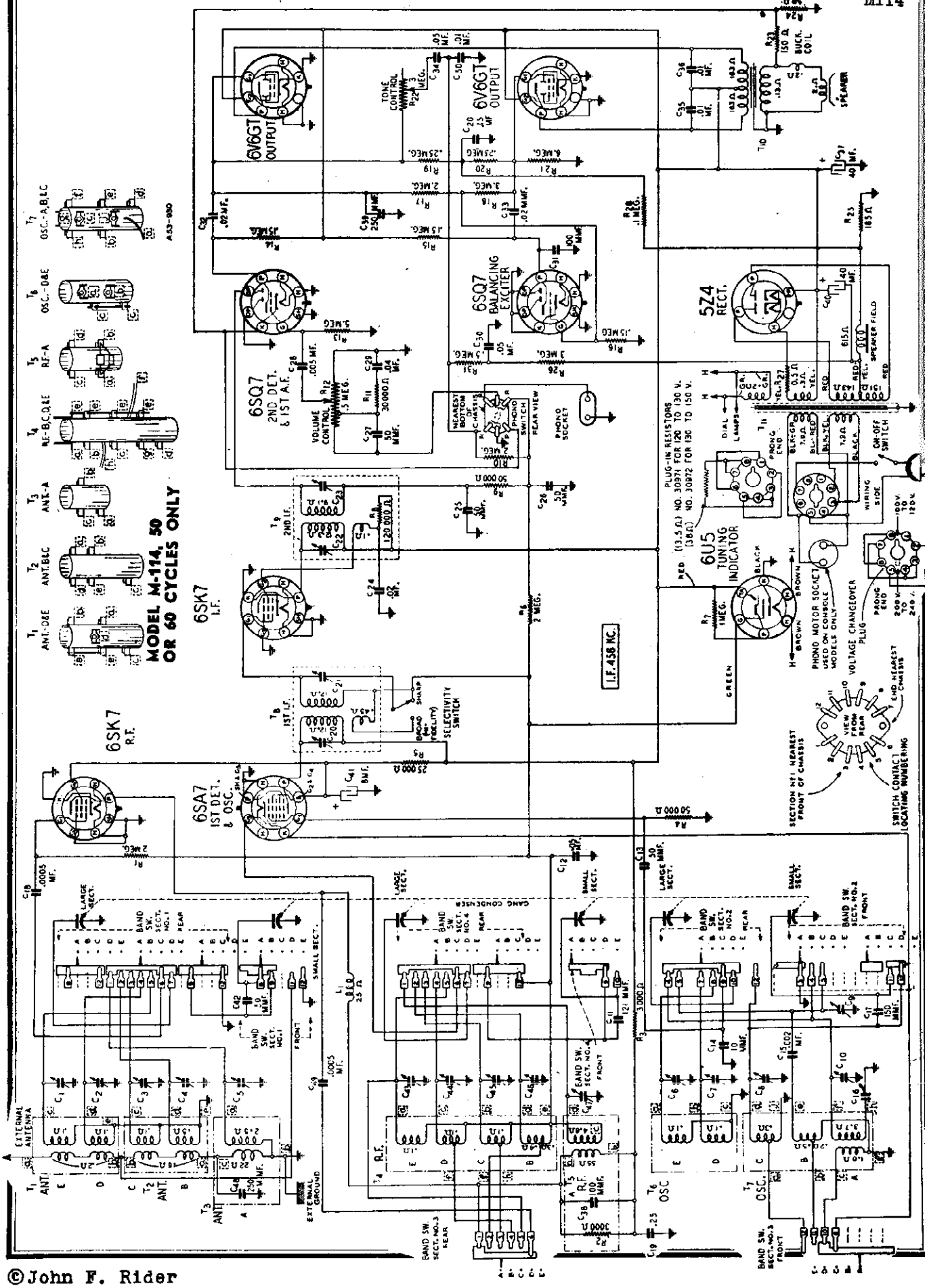
MODEL M-110 WITH 110-220 VOLT TRANSFORMER

An accurate AC voltmeter should be used to measure the line voltage before installing the radio.

CAUTION—Never make any of the following power transformer adjustments without first withdrawing the plug on the end of the power cord from the receptacle.

WESTINGHOUSE ELEC. INTERNATIONAL CO.

MODELS M110, M114



MODELS M110, M114

WESTINGHOUSE ELEC. INTERNATIONAL CO

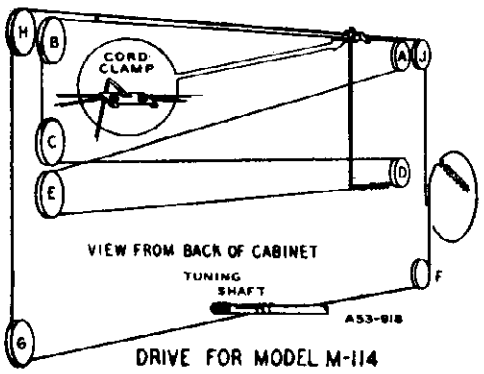
DRIVE CORD REPLACEMENT

MODEL M-110

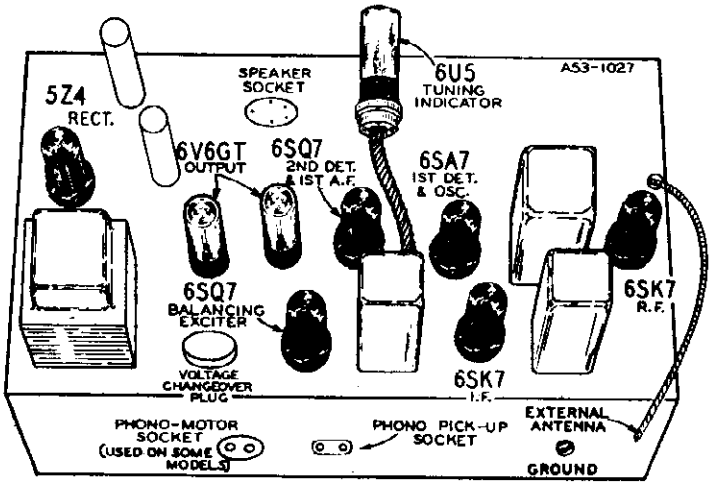
TO REPLACE DRIVE CORD AT BACK OF DIAL MOUNTING PLATE—Tie one end of new drive cord to each end of tension spring (length of doubled cord should be 29½ inches). Place cord over pulleys A and B so that tension spring is between these pulleys—See illustration. Continue left-hand section of cord around pulleys C and D. Loop remainder of cord over pulley E.

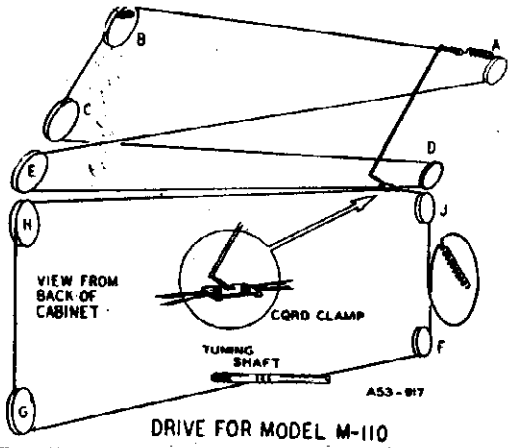
TO REPLACE DRIVE CORD AT FRONT OF CHASSIS—Turn gang condenser to closed position. Tie both ends of new drive cord to one end of tension spring (length of doubled drive cord should be 38½ inches). Hook free end of spring in hole just below and to left of hub on gang condenser drive pulley. Pass cord through slot in pulley rim. Wind one section of cord around drive pulley toward front of chassis and continue under pulley F. Wind 3 turns counter-clockwise (from front of chassis) around tuning shaft. Turns should progress away from chassis. Continue cord over pulleys G, H and J. Stretch tension spring. Wind remainder of cord around the gang condenser drive pulley.

Calibration—Tightly fasten top of pointer to drive cord at left of tension spring on dial mounting plate. Tune in a station of known frequency. Move pointer to correct frequency by moving dial plate cord. Tightly fasten bottom of pointer to dial plate cord only. Assemble cord clamp on both cords as shown in illustration.

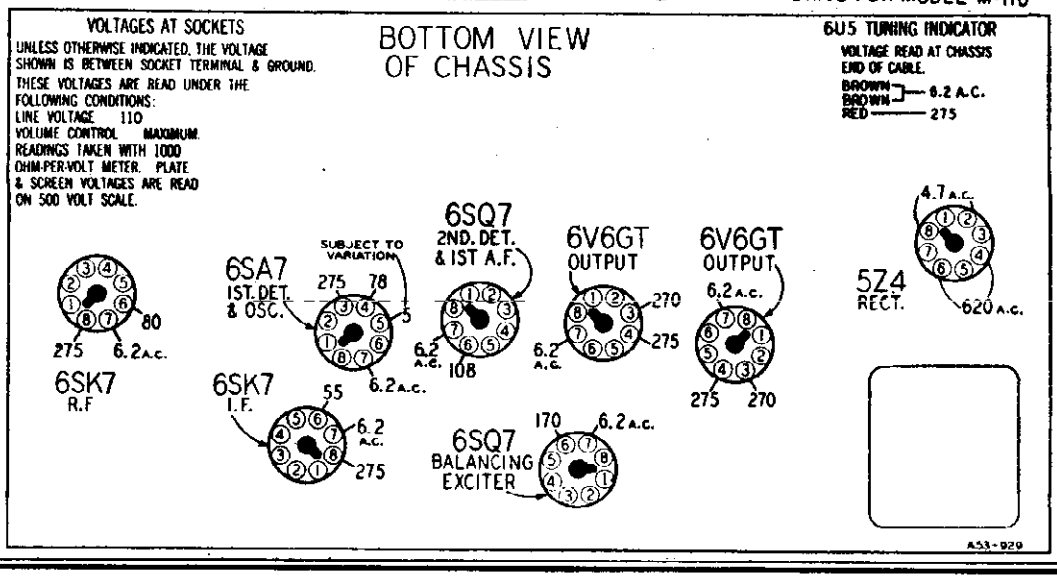


DRIVE FOR MODEL M-114





DRIVE FOR MODEL M-110



WESTINGHOUSE ELEC. INTERNATIONAL CO.

GENERAL DESCRIPTION

This model is a ten-tube, A.C. three-band superheterodyne receiver, designed for complete coverage from 535 to 18,500 KC.

The circuits of the receiver comprise an R.F. amplifier, a combined detector-oscillator, an I.F. amplifier, a combined 2nd detector and automatic volume control, an audio amplifier, an inverter, power output, a rectifier and a tuning tube.

The R.F. amplifier and detector-oscillator with the associated parts, including the gang condenser, coils, trimmer and lag condensers and wave-change switch, is mounted on the chassis as a unit.

The radio circuit proper is the same for the manual and electric drive models.

LINE-UP CAPACITOR ADJUSTMENTS

To align the circuits 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 circuits of the receiver are brought into alignment. A conventional output meter should 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.

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 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.

ADJUSTMENT OF I.F. (455 KC.)

1. Set the volume control on full, the wave-change switch to the broadcast position and the dial indicator to approximately 600 KC.

2. Set test oscillator to 455 KC., and adjust its output to produce a measurable reading on output meter when test signal is applied to grid of detector-oscillator tube through a .5 mfd. blocking condenser.

3. Set test oscillator to 455 KC., and adjust its output to produce a measurable reading on output meter when test signal is applied to grid of detector-oscillator tube through a .5 mfd. blocking condenser.

4. Adjust I.F. trimmers #31, #33, #38, and #40 to maximum output, reducing output of test oscillator as required.

ADJUSTMENT OF BROADCAST BAND

1. With the gang condenser fully in mesh, check the dial pointer, which should be at the horizontal line on the end of the scale.

2. Set test oscillator and dial indicator to 1500 KC.

3. With signal still applied to grid of detector-oscillator tube, adjust oscillator trimmer #12.

4. Apply test signal to antenna terminal of chassis through a .0002 mfd. series condenser and adjust R.F. and antenna trimmers #11 and #3.

5. Set test oscillator and dial indicator to 600 KC., and adjust oscillator series (lag) condenser #13, at the same time tuning the gang back and forth slightly, until a maximum is reached.

6. Set the test oscillator and dial indicator at 1500 KC., and recheck the oscillator, R.F. and antenna trimmers #12, #11 and #3.

7. Check sensitivity and calibration over the scale.

NOTE: In adjusting the two short-wave bands, a .0002 mfd. condenser and a 400 ohm resistor in series should be inserted between the antenna terminal and the high side of the test oscillator. This combination is the approximate equivalent of a short-wave antenna.

ADJUSTMENT OF 1st SHORT-WAVE BAND

1. Set wave-change switch to 1st short-wave position.

2. Set test oscillator and dial indicator to 5000 KC.

3. With the condenser-resistor combination connected to the chassis antenna terminal, adjust oscillator trimmer #21.

ADJUSTMENT OF 2nd SHORT-WAVE BAND

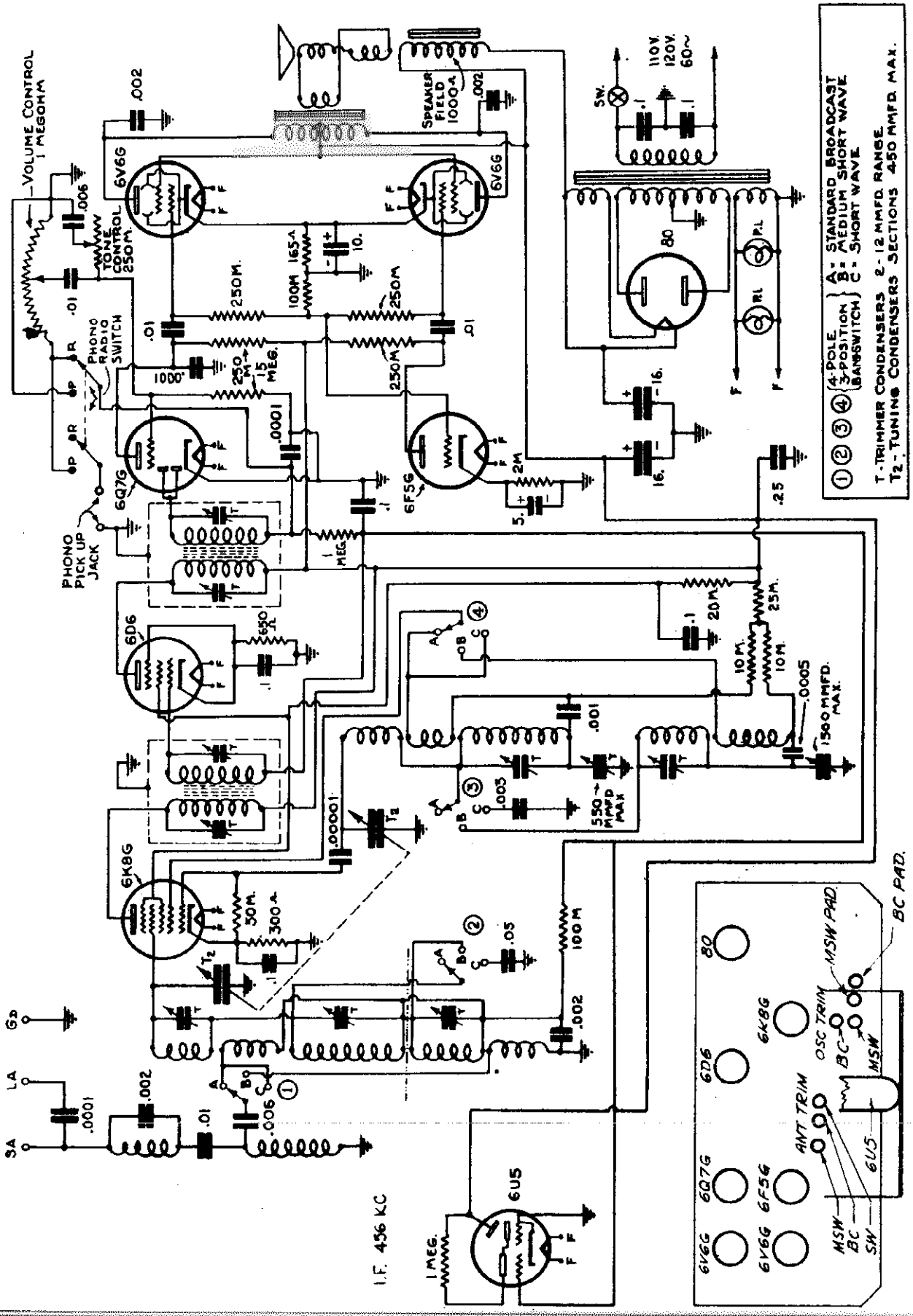
1. Set wave-change switch to the 2nd short-wave position.

2. Set test oscillator and dial indicator to 16,500 KC., and adjust oscillator trimmer #17. Two positions on the trimmer condenser may be found where the signal is heard. Use the one with the least capacity or with the trimmer screw farther out.

3. Adjust the R.F. and antenna trimmers #16 and #5.

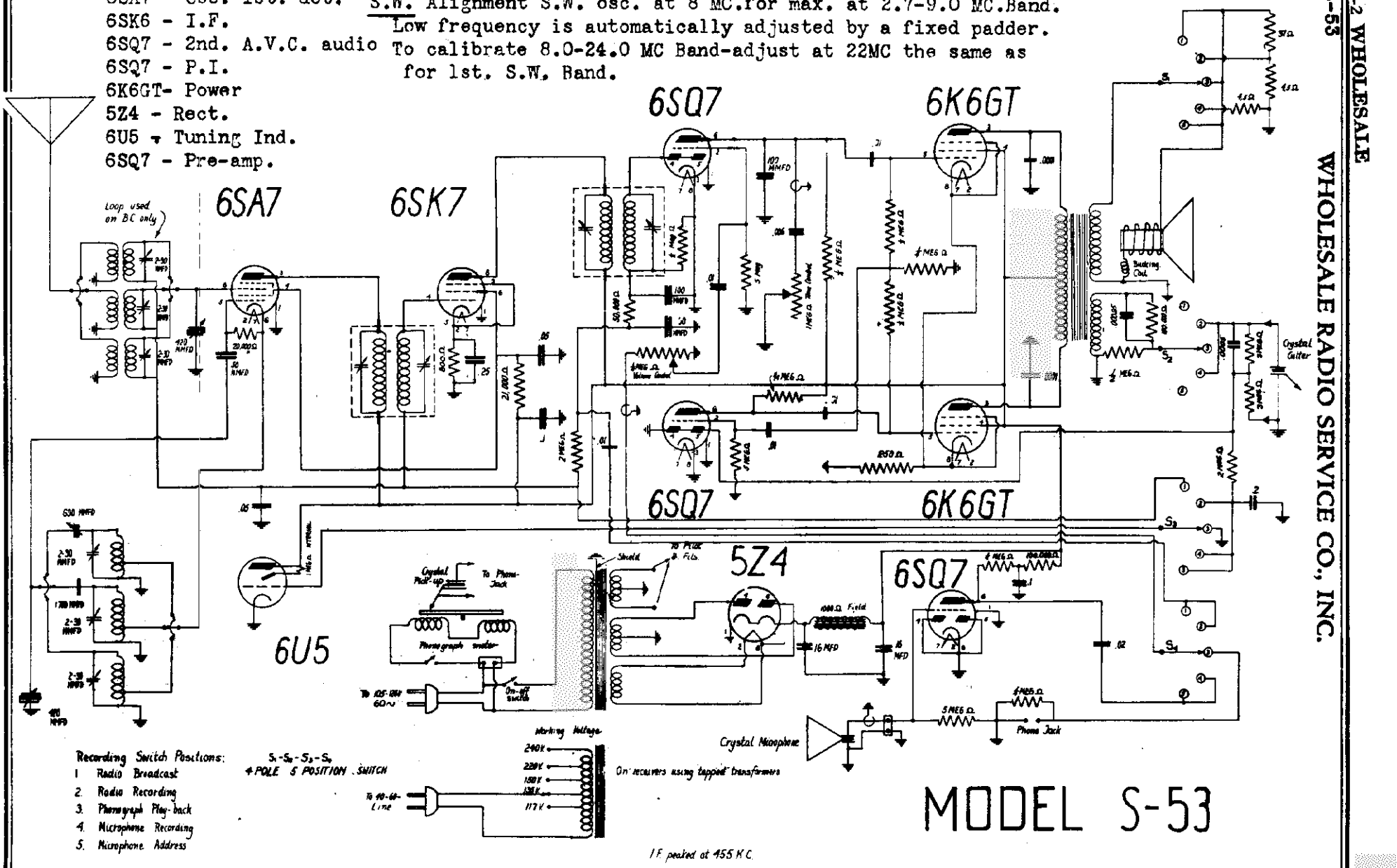
4. Check sensitivity and calibration over the scale.

WHOLESALE RADIO SERVICE CO., INC.

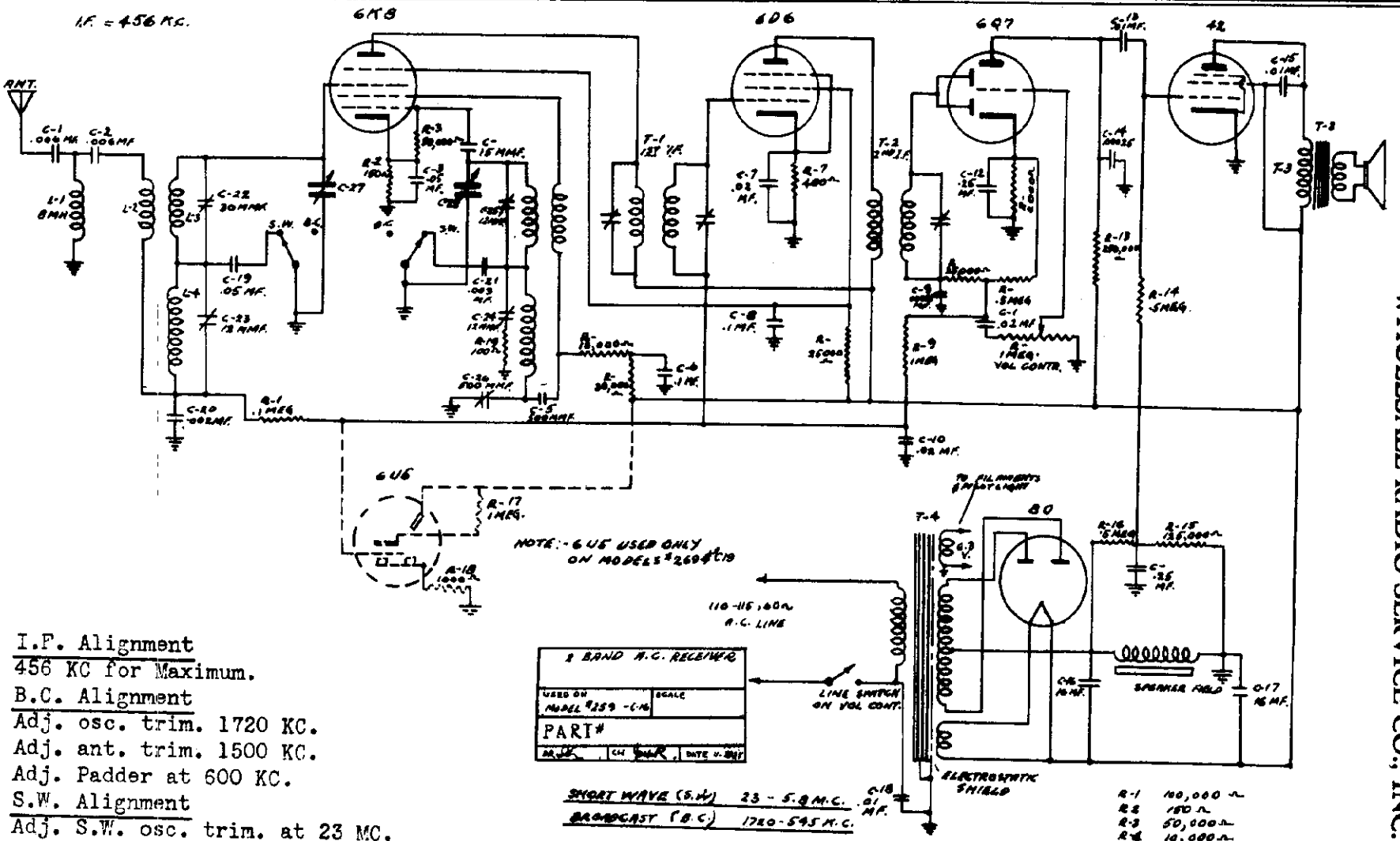


I.F. Alignment -455 KC for Maximum.
B.C. Alignment -1500 MC osc. Trim. for Maximum.
Padder at 600 KC Maximum.
S.W. Alignment S.W. osc. at 8 MC.for max. at 2.7-9.0 MC.Band.
Low frequency is automatically adjusted by a fixed padder.
To calibrate 8.0-24.0 MC Band-adjust at 22MC the same as for 1st. S.W. Band.

TUBES
6SA7 - Osc. 1st. det.
6SK6 - I.F.
6SQ7 - 2nd. A.V.C. audio
6SQ7 - P.I.
6K6GT- Power
5Z4 - Rect.
6U5 - Tuning Ind.
6SQ7 - Pre-amp.



MODEL S-53



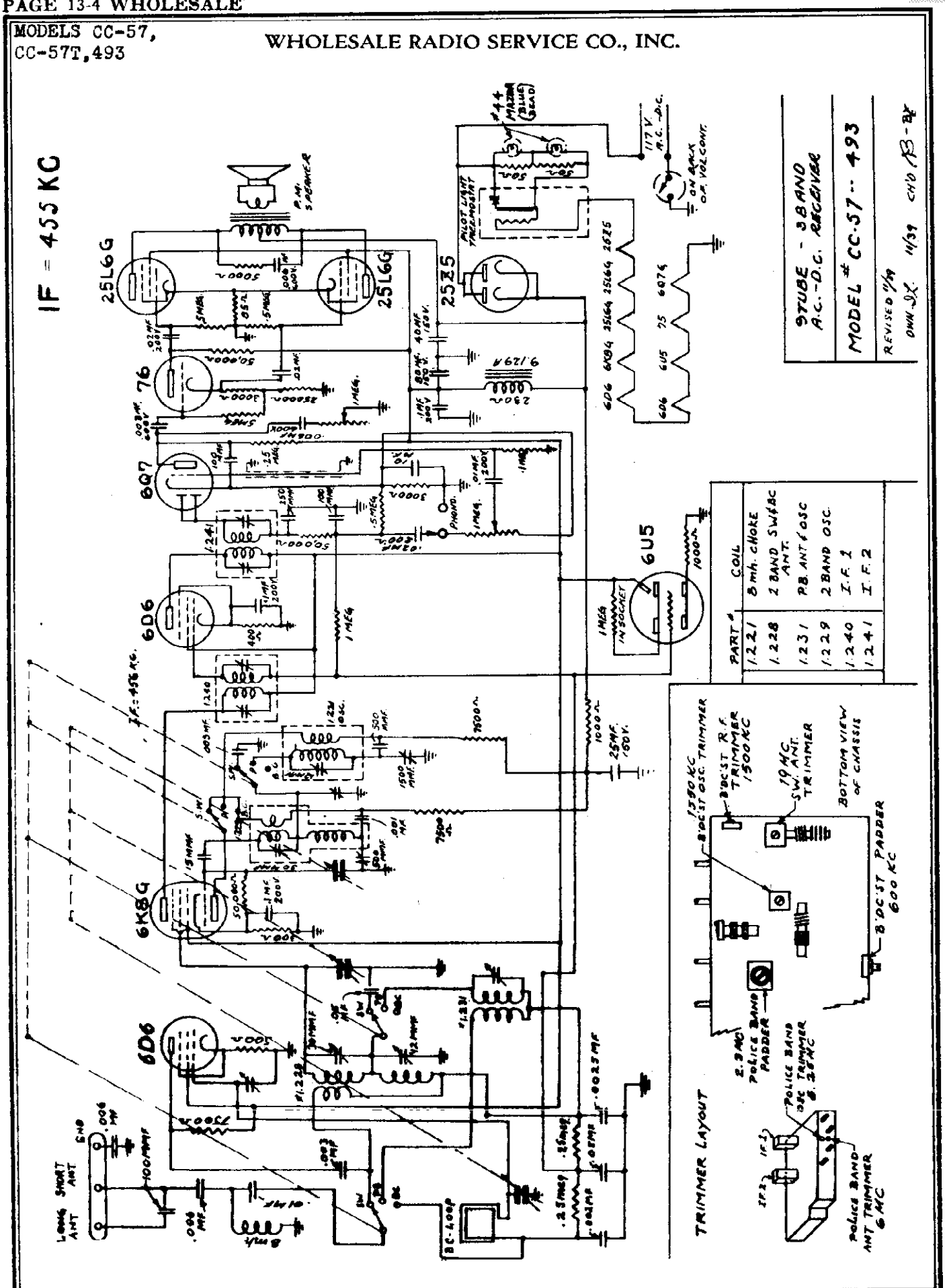
I.F. Alignment
456 KC for Maximum.
B.C. Alignment
Adj. osc. trim. 1720 KC.
Adj. ant. trim. 1500 KC.
Adj. Padder at 600 KC.
S.W. Alignment
Adj. S.W. osc. trim. at 23 MC. through 250 MMF cond. and 400 res. open trim. cond. further opened (cap. reduced) until second response is heard. This response (trim at low cap.) is correct response to use. Other is image.

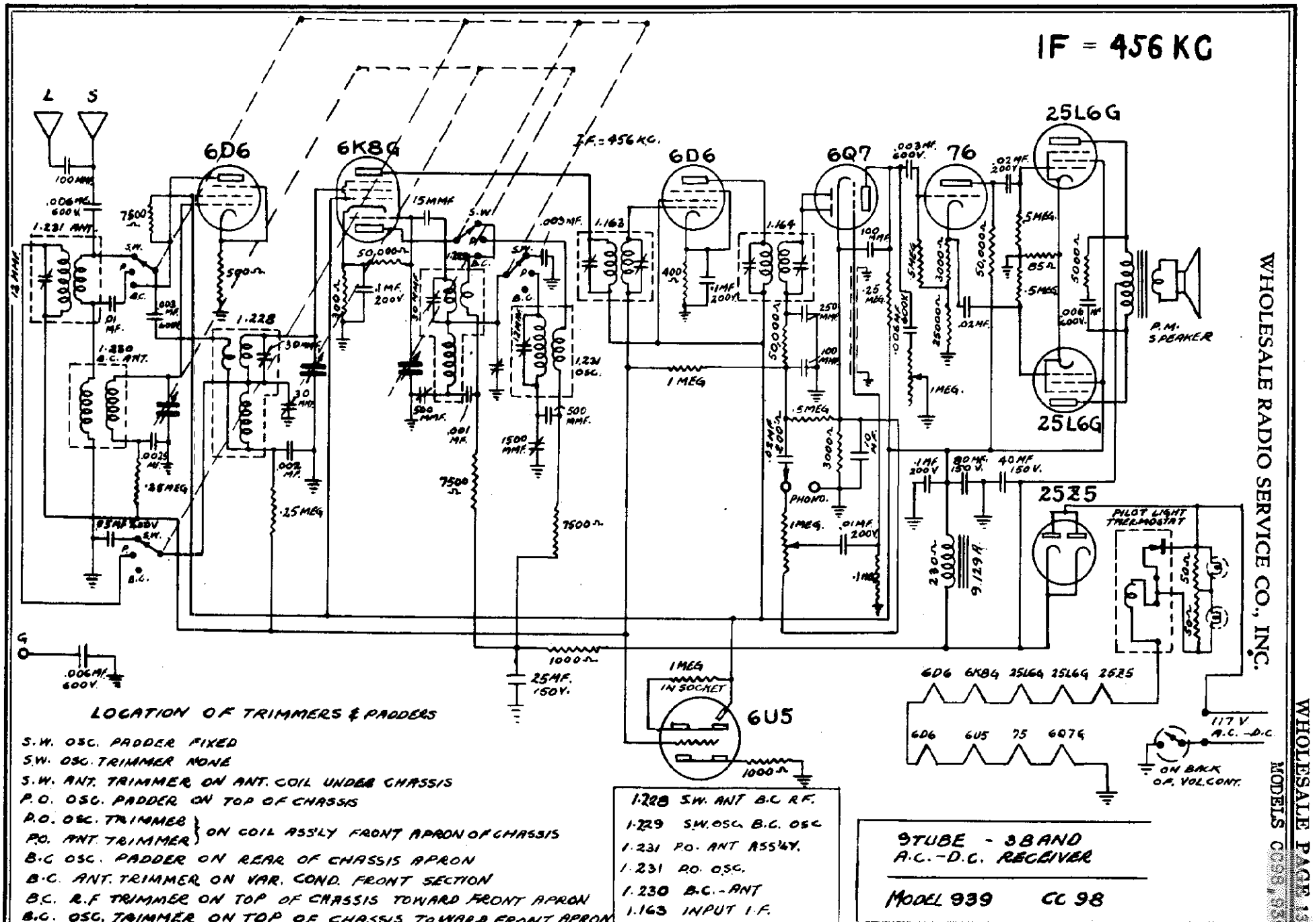
C-1	.006 MF. 600 V.	C-16	16 MF. 450 W. V.
C-2	.006 MF. 600 V.	C-17	16 MF. 450 W. V.
C-3	.05 MF. 200 V.	C-18	.01 MF. 400 V.
C-4	15 MMF. MICA	C-19	.05 MF. 200 V.
C-5	500 MMF. MICA	C-20	.002 MF. ±5% MICA
C-6	.1 MF. 400 V.	C-21	.003 MF. ±5% MICA
C-7	.02 MF. 200 V.	C-22	30 MMF. TRIMMER
C-8	.1 MF. 400 V.	C-23, C-24	DUAL 12 MMF. TRIMMER COND.
C-9	250 MMF. MICA	C-25	18 MMF. TRIMMER COND.
C-10	.02 MF. 200 V.	C-26	500 MMF. PADDER COND.
C-11	.02 MF. 400 V.	C-27, C-28	2 GANG 450 MMF VAR. COND # 2-136
C-12	.25 MF. 200 V.		
C-13	.01 MF. 400 V.		
C-14	250 MMF. MICA		
C-15	.01 MF. 400 V.		

R-1	100,000 Ω	R-10	.5 MEG
R-2	100 Ω	R-11	2000 Ω
R-3	50,000 Ω	R-12	1 MEG VOL. CONTR. #B-1398
R-4	10,000 Ω	R-13	250,000 Ω
R-5	30,000 Ω	R-14	.5 MEG.
R-6	25,000 Ω 1 WATT	R-15	125,000 Ω
R-7	400 Ω	R-16	.5 MEG
R-8	25000 Ω	R-17	1 MEG. IN 6U8 SOCKET
R-9	1 MEG	R-18	1000 Ω (OPTIONAL)
R-10	.5 MEG	R-19	100 Ω

MODELS CC-57,
CC-57T,493

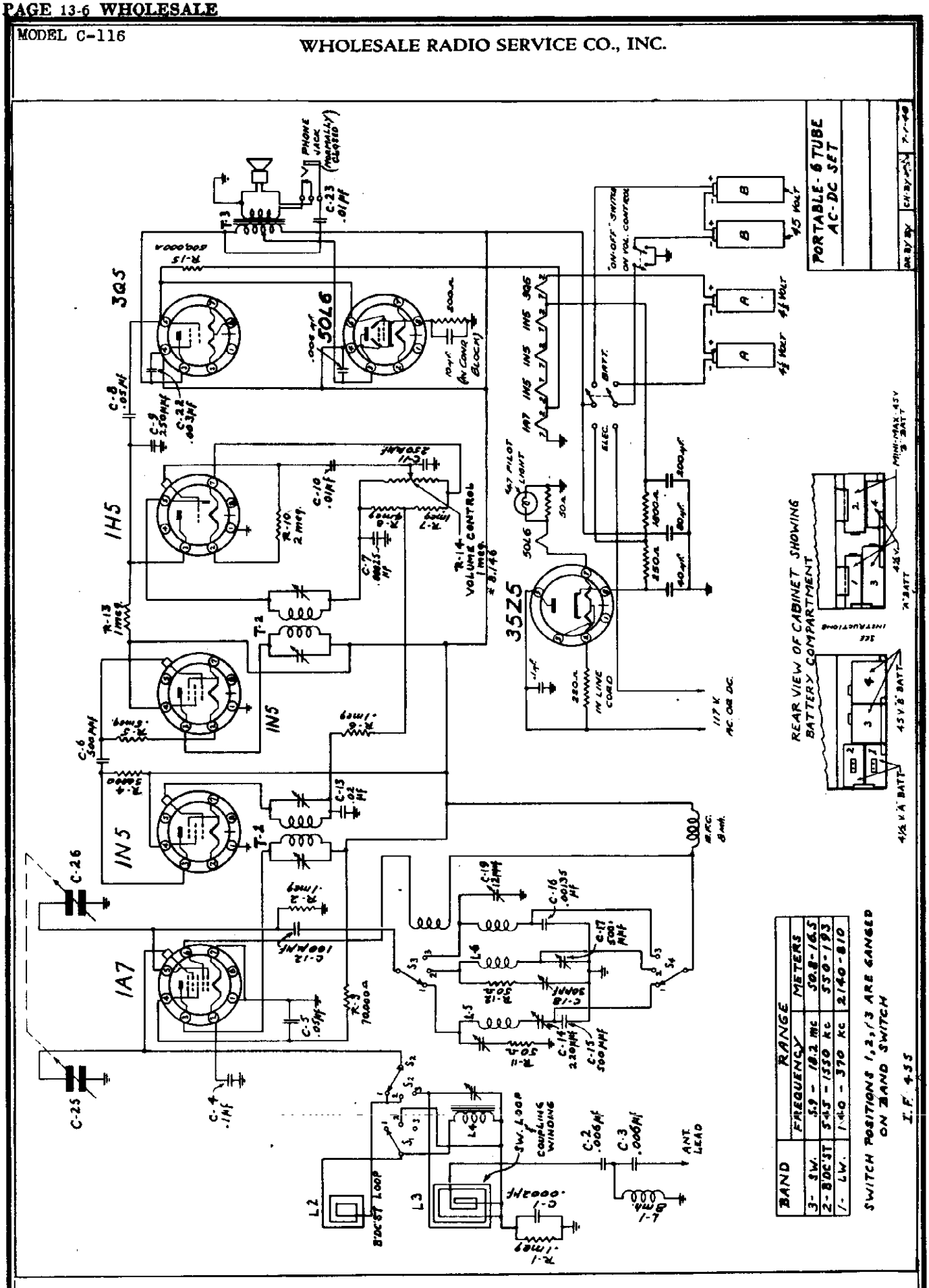
WHOLESALE RADIO SERVICE CO., INC.




IF = 456 KC
L
S
6D6
6K8G
I.F. = 456 KC.
6D6
6Q7
76
25L6G
25L6G
25Z5
6U5
P.M. SPEAKER
PHONO.
PILOT LIGHT THERMOSTAT
117 V. A.C.-D.C.
ON BACK O.P. VOL. CONT.
6D6 6K8G 25L6G 25L6G 25Z5
6D6 6U5 75 6Q7G
1 MEG IN SOCKET
1.228 S.W. ANT B.C. R.F.
1.229 S.W. OSC. B.C. OSC.
1.231 P.O. ANT ASS'LY.
1.231 P.O. OSC.
1.230 B.C. - ANT
1.163 INPUT I.F.
LOCATION OF TRIMMERS & PADDERS
S.W. OSC. PADDER FIXED
S.W. OSC. TRIMMER NONE
S.W. ANT. TRIMMER ON ANT. COIL UNDER CHASSIS
P.O. OSC. PADDER ON TOP OF CHASSIS
P.O. OSC. TRIMMER
P.O. ANT. TRIMMER
} ON COIL ASS'LY FRONT APRON OF CHASSIS
B.C. OSC. PADDER ON REAR OF CHASSIS APRON
B.C. ANT. TRIMMER ON VAR. COND. FRONT SECTION
B.C. R.F. TRIMMER ON TOP OF CHASSIS TOWARD FRONT APRON
B.C. OSC. TRIMMER ON TOP OF CHASSIS TOWARD FRONT APRON
9 TUBE - 3 BAND
A.C.-D.C. RECEIVER
MODEL 939 CC 98

MODEL C-116

WHOLESALE RADIO SERVICE CO., INC.



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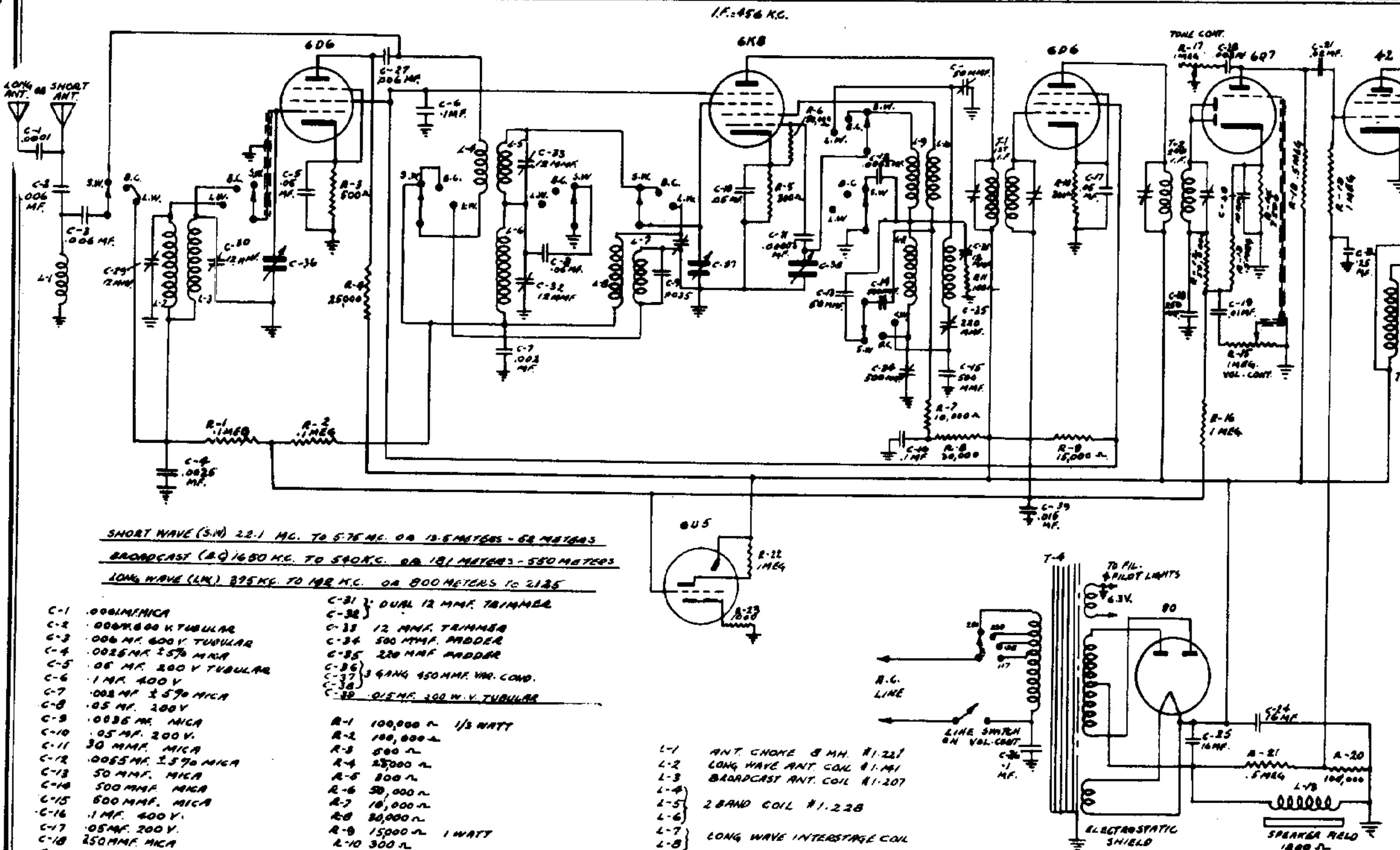
MODELS C34,3790



SHORT WAVE (S.W.) 22.1 MC. TO 5.75 MC. OR 13.5 METERS - 52 METERS

BROADCAST (B.C.) 1650 K.C. TO 540 K.C. OR 181 METERS - 550 METERS

LONG WAVE (L.W.) 395 KC. TO 142 K.C. OR 800 METERS TO 2125

C-1	.0001 MF. MICA
C-2	.006 MF. 600 V. TUBULAR
C-3	.006 MF. 600 V. TUBULAR
C-4	.0025 MF. ± 5% MICA
C-5	.05 MF. 200 V. TUBULAR
C-6	.1 MF. 400 V.
C-7	.002 MF. ± 5% MICA
C-8	.05 MF. 200 V.
C-9	.0035 MF. MICA
C-10	.05 MF. 200 V.
C-11	30 MMF. MICA
C-12	.0055 MF. ± 5% MICA
C-13	50 MMF. MICA
C-14	500 MMF. MICA
C-15	600 MMF. MICA
C-16	.1 MF. 400 V.
C-17	.05 MF. 200 V.
C-18	250 MMF. MICA
C-19	.01 MF. 200 V.
C-20	10 MF. 25 V.
C-21	.02 MF. 400 V. TUBULAR
C-22	.25 MF. 200 V. TUBULAR
C-23	.01 MF. 400 V.
C-24	16 MF. 450 W.V. PART # 5.338
C-25	16 MF. 450 W.V. PART # 5.336
C-26	.1 MF. 400 V.
C-27	.006 MF. 600 V. MICA
C-28	.002 MF. 600 V. MICA
C-29, C-30	DUAL 12 MMF. TRIMMER
C-31, C-32	DUAL 12 MMF. TRIMMER
C-33	12 MMF. TRIMMER
C-34	500 MMF. PADDER
C-35	220 MMF. PADDER
C-36, C-37, C-38	3 GANG 450 MMF. VAR. COND.
C-39	.015 MF. 200 W.V. TUBULAR

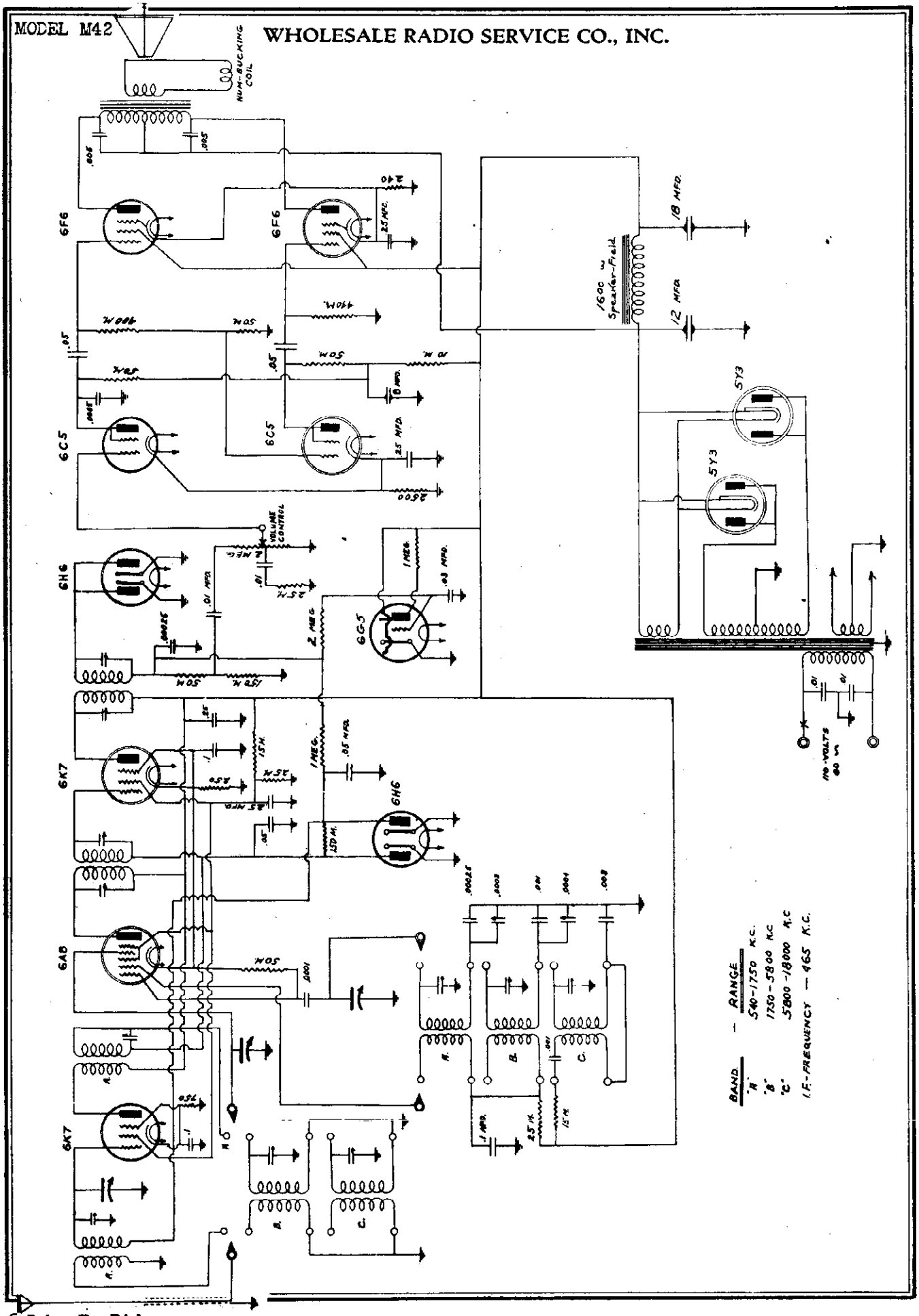
R-1	100,000 Ω 1/3 WATT
R-2	100,000 Ω
R-3	500 Ω
R-4	25,000 Ω
R-5	300 Ω
R-6	50,000 Ω
R-7	10,000 Ω
R-8	30,000 Ω
R-9	15,000 Ω 1 WATT
R-10	300 Ω
R-11	100 Ω
R-12	60,000 Ω
R-13	.5 MEG
R-14	600 Ω
R-15	1 MEG. VOL. CONTR. # 8.139 B
R-16	1 MEG.
R-17	1 MEG TONE CONTR. # 8.140
R-18	.5 MEG.
R-19	.1 MEG.
R-20	100,000 Ω
R-21	500,000 Ω
R-22	1 MEG IN TUBE SOCKET
R-23	1000 Ω

L-1	ANT. CHOKE 8 MH. # 1.221
L-2	LONG WAVE ANT. COIL # 1.141
L-3	BROADCAST ANT. COIL # 1.207
L-4, L-5, L-6	2 BAND COIL # 1.228
L-7, L-8	LONG WAVE INTERSTAGE COIL
L-9, L-10, L-11	2 BAND OSC. COIL # 1.229
L-12	LONG WAVE OSC. COIL # 1.209
L-13	SPEAKER FIELD 1800 Ω
L-14	

T-1	INPUT I.F. D.T. # 1.163
T-2	OUTPUT I.F.T. # 1.164
T-3	OUTPUT TRANS. ON SPEAKER
T-4	POWER TRANS. # 9.157

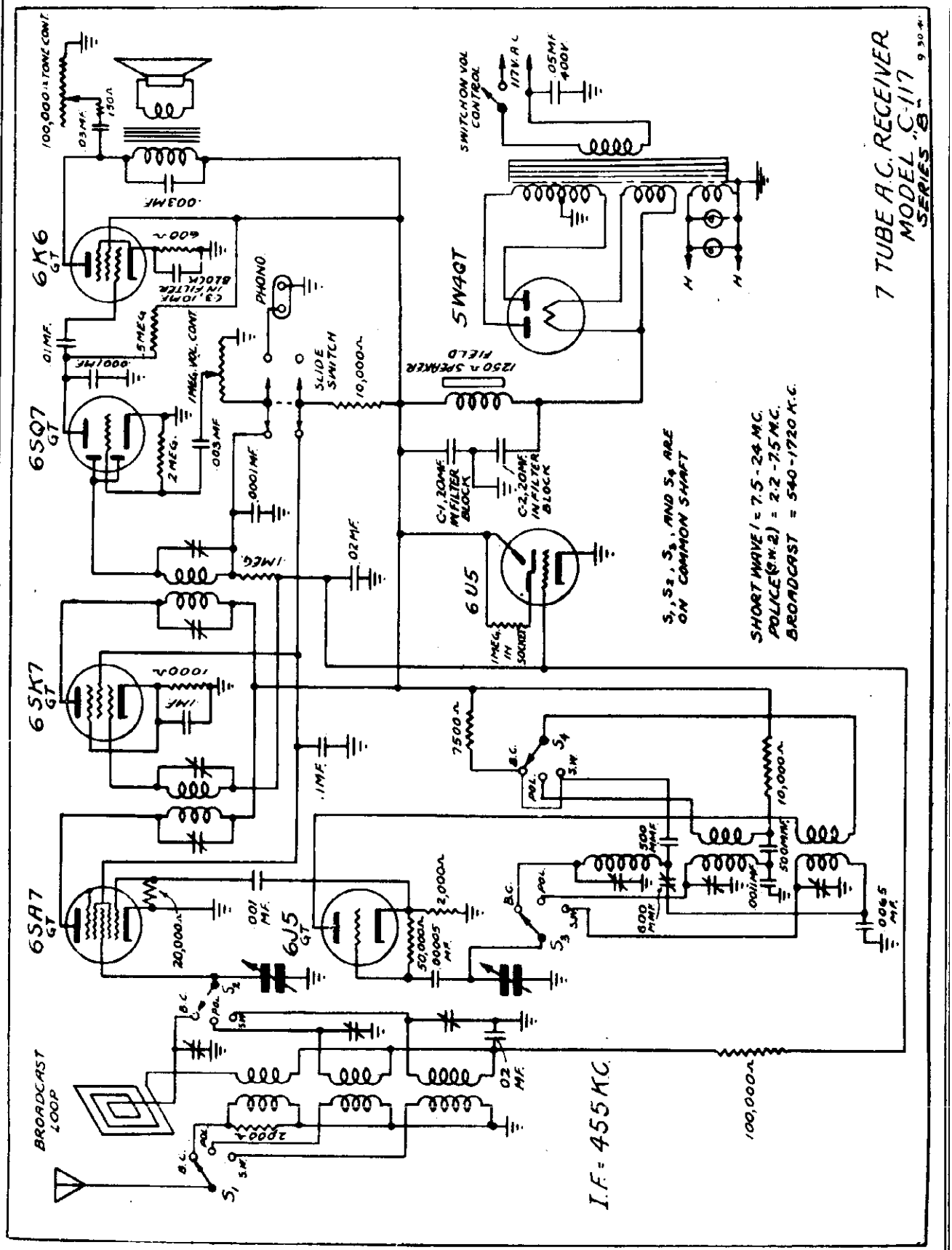
MODEL M42

WHOLESALE RADIO SERVICE CO., INC.



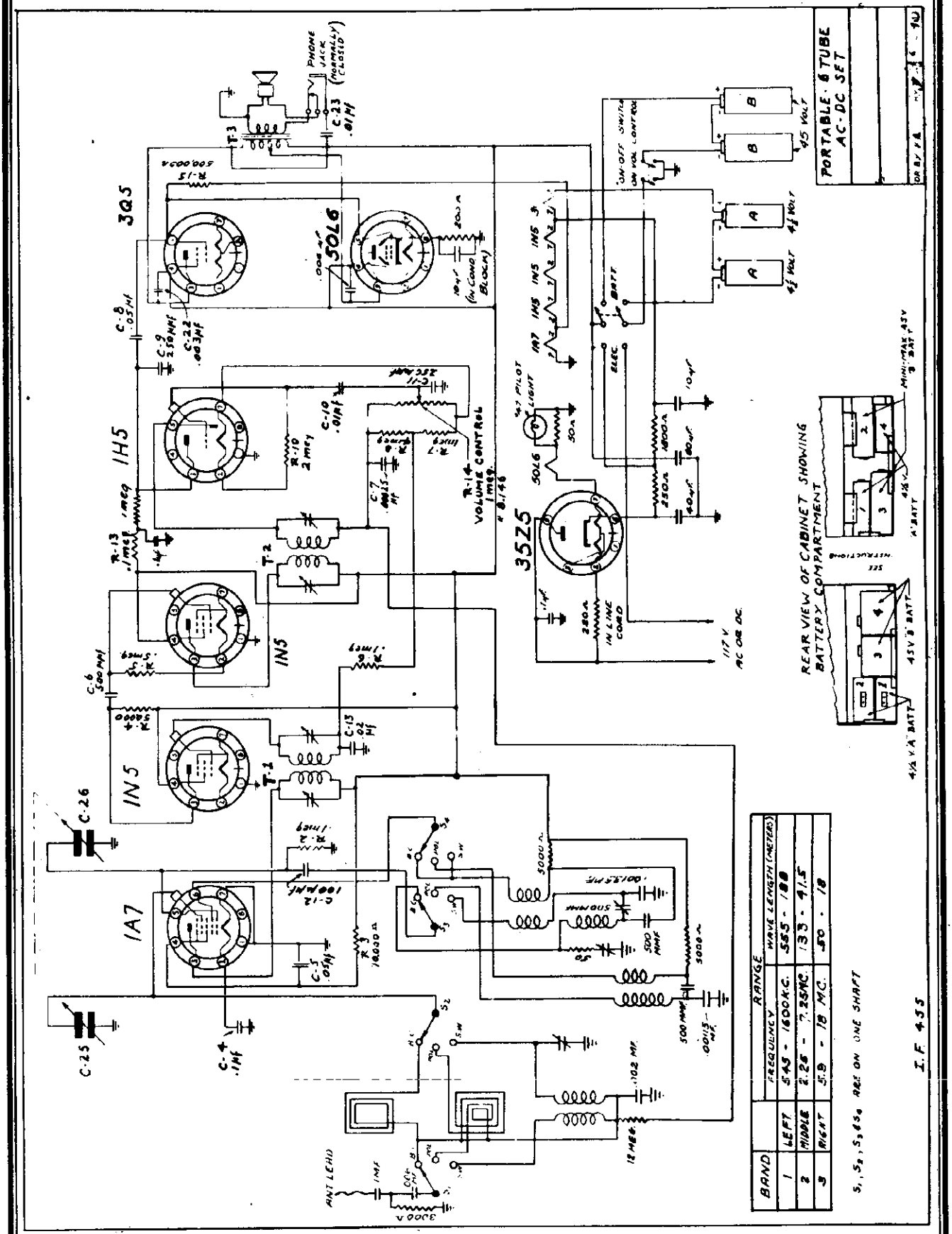
WHOLESALE RADIO SERVICE CO., INC.

MODEL C117
Series B



MODEL C125

WHOLESALE RADIO SERVICE CO., INC.

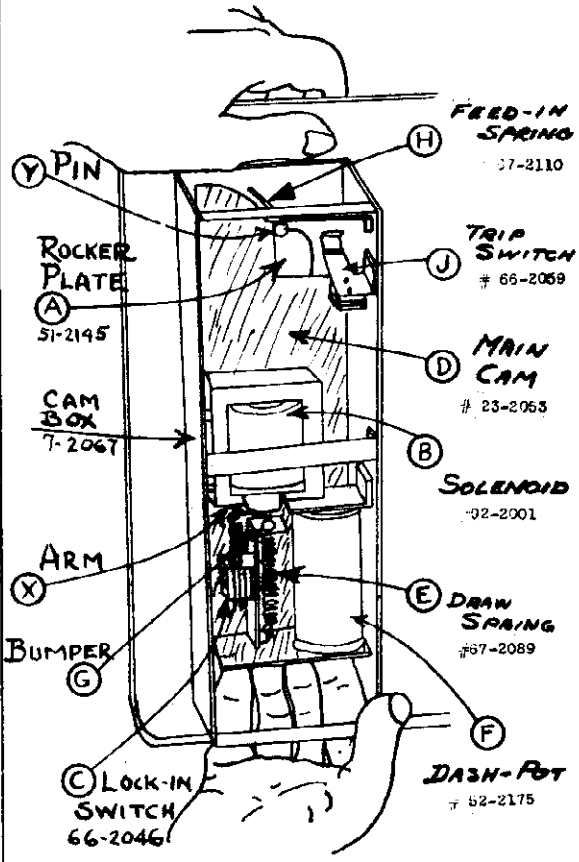


WILCOX-GAY CORP.

Phonograph Mechanism

Models

A-105 A-111 A-112 A-113 A-113B A-114 A-115 A-115B



Foreword

The Wilcox-Gay INSTA-MATIC Record Changer is truly an innovation because its operation does not depend upon an assembly of gears and levers, and no power is taken from the motor in actuating the automatic changing mechanism.

Since the power to operate the changer is derived from a separate source other than the turntable rotating mechanism, it has been possible to design the unit to operate rapidly without putting demand for power on one source. This feature eliminates the necessity for a series of reduction gears which are both costly and complicated, and has permitted unique design with respect to changing from 10" to 12" records, using but one cam and set of adjustments for both record sizes.

Description of Trip Mechanism

1. The eccentric groove on the record causes the pickup arm to oscillate in a forward and backward motion. The trip switch "J" contact is then closed by friction of the leather contact on the knurled rocker plate "A". Closing of the trip switch energizes solenoid "B" and plunger is drawn into solenoid "B" through magnetic action of the coil. This action closes the lock-in switch "C" which still maintains closed circuit for the solenoid "B" even though trip switch "J" is now open. The main cam assembly "D" is then drawn forward by draw spring "E" against the snubbing action of the dashpot "F". At the time main cam rubber bumper "G" strikes the solenoid plunger, the lock-in switch "C" is opened by arm "X" releasing current from solenoid "B". During this inward action, pickup arm is raised by push rod and returned to replay position by the rounded section of cam on pin "Y" on rocker plate. At the same time, cam action rotates record holding knob and record selector arm finger releases bottom record to turntable. Reset pin is engaged in rocker arm return slot. Internal spring against dashpot action forces main cam "D" outward and reset pin follows rocker arm slot carrying the pickup arm to edge of record. The tone arm is automatically positioned on the record just inside the record periphery and the feed-in spring "H" acting upon the rocker plate attached to the tone arm pivot post, urges the phonograph needle, gently but positively, into the first record groove. Reset pin drops away from the rocker plate due to hold down spring.

Removing Changer From Cabinet

(1) Before removing record changer unit from cabinet, remove cutting stylus and position the recording arm near the center of the turntable to prevent damage to the follower arm in lifting the unit from the cabinet. (The arm should be returned to this position before replacing unit in cabinet.)

(2) Remove playback needle if unit is type 11-D or 11-E. If unit is type 11-F place metal guard on pickup cartridge to protect sapphire needle against injury.

(3) Remove mounting screws (one at each corner of unit base plate) and remove all plug-in connections between record changer unit and amplifier chassis.

(4) Remove record changer unit from cabinet. DO NOT TAKE HOLD OF RECORD SUPPORT POSTS. Instead, grasp the base plate of the unit, at opposite sides.

(5) Place unit on the service bench, tilted to a position that provides access to the under side of the unit. DO NOT PLACE UNIT IN UPSIDE-DOWN POSITION, as the record spindle may be sprung or bent.

Failure To Trip At End of Record

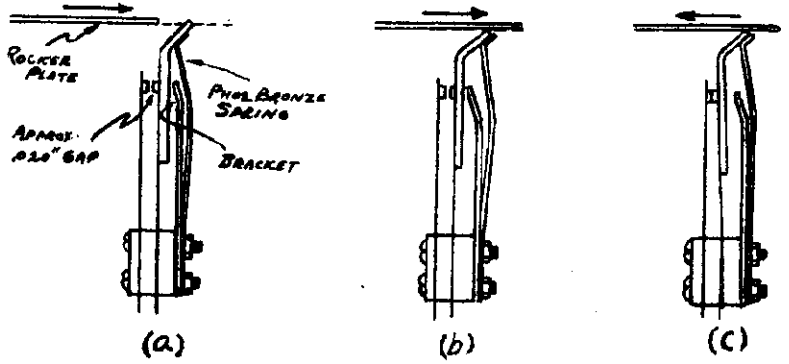
2. All commercial records manufactured in recent years have the eccentric (oscillating) type of trip groove. Make sure first that the record that does not trip the mechanism has the eccentric groove. Failure to trip is caused by lack of proper contact or friction of the leather finger on the trip switch with the knurled surface on the rocker plate. Too great an opening of the contact points will not allow the switch to close during an oscillating action. Check and set points for .020" gap when trip switch is at rest (leather finger not in contact with rocker plate). The switch can be removed by taking out the two lockwasher screws in the slotted section immediately below the clamp holding the one red and two black wires. After the contact point clearance has been set and checked, the switch should be replaced and set to the point where the leather finger just makes contact with the rocker plate. A forward and back motion of the rocker plate should move the phosphor bronze spring slightly. The phosphor bronze support spring eliminates the fatiguing of the leather finger to a semi-circular position and gives constant upward pressure on the leather finger. The trip switch should not be set too high whereby the leather and phosphor bronze spring both engage the rocker plate.

Positioning of Trip Switch

3. When the switch is correctly positioned, the switch contacts will remain normally open at all times excepting after the playback arm reaches a position near the center of the turntable. A slight reversal in the lateral movement of the arm will cause the contacts to close.

4. The contact spacing should be approximately .020" and the leather piece should just touch the stop bracket when the switch is "idle" or "at rest".

(1) Position the switch so that the leather finger just touches the rocker plate surface, and note the point of contact between the leather and the phosphor bronze spring.



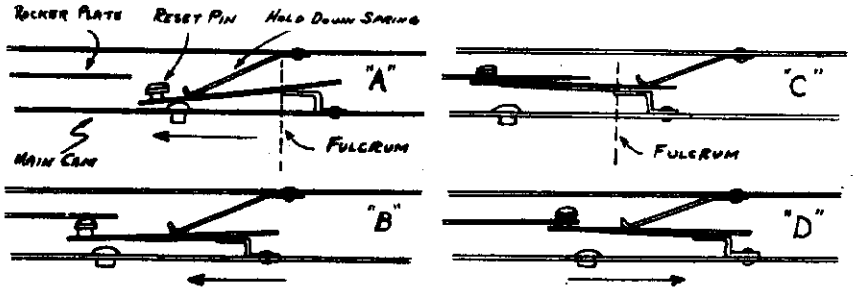
5. (2) Raise the switch vertically (toward the rocker plate) until the end of the phosphor bronze spring nearly touches the rocker plate.

(3) The correct switch position will be found to be approximately half way between these two extreme positions.

Mechanism Trips But Pickup Arm Does Not Return To Record

6. This is usually caused by failure of the lock-in switch to open when the cam assembly is at the end of its forward motion. The lock-in switch should have a clearance of approximately .025 and can be adjusted by bending forward or backward arm "X". Bending the arm so that more pressure is exerted on the fiber stub of the long contact arm increases the gap and bending the arm so that less pressure is exerted decreases the gap contact. Failure of the arm to return to the record is sometimes caused by binding action of the reset pin and rocker plate or failure of the reset pin to engage the rocker plate. This will be covered in another paragraph entitled "Adjustment of Reset Plate Hold-down Spring".

ADJUSTMENT OF RESET PLATE HOLD-DOWN SPRING



7. Illustrations (A) (B) (C) (D) show four phases of the operation of the resetting device located between the main cam and inside surface of the cam box. The resetting action can be observed by viewing the cam box assembly from the end nearest the arm pivot post. At the beginning of the change cycle the cam moves

in a direction shown by the arrow in illustration (A). The reset pin, moving with the cam, should travel beneath the rocker plate, illustration (B). Near the end of the initial cam stroke, the reset pin should snap into the enlarged opening in the rocker plate, illustration (C). With the return stroke of the cam, the reset pin should travel in the narrow slot of the rocker plate, illustration (D) and at the very end of the stroke drop out of the slot and resume position as shown in illustration (A).

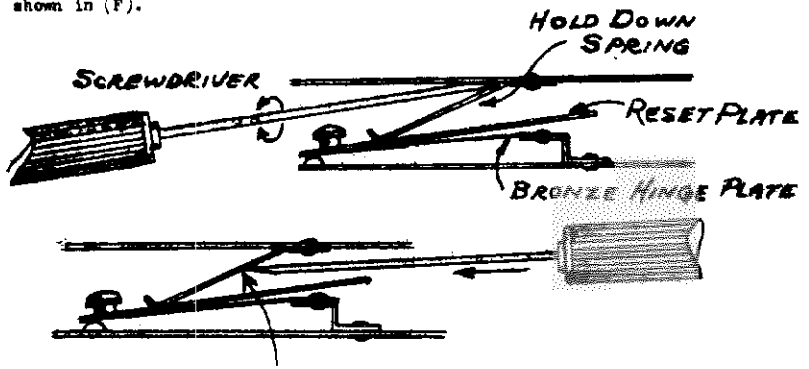
8. The function of the hold down spring is to hold the reset plate down while bearing on one side of the fulcrum point, and to hold it up when bearing on the opposite side of the fulcrum point, illustration (A) and (C).

9. It will now be obvious that insufficient pressure of the hold down spring will cause (1) the reset pin to approach the rocker plate in too high a position causing a possibility of jamming; (2) also at the end of the initial cam stroke, illustration (c), the reset pin will not protrude through the rocker plate far enough to allow proper retraction of the cam, illustration (D).

10. Pressure of the hold down spring in excess of that required to produce correct operation as described above, will not result in any better operation of the resetting device, but will only introduce a source of undesired friction.

11. Greater hold down spring pressure may be obtained by use of a long slender screwdriver as shown in (E). With the screwdriver bit held into the "V" at the junction of the hold down spring and the plate to which it is attached, rotate the screwdriver in alternately opposite directions as shown by the arrows, thus increasing the downward pressure of the spring.

12. Less hold down spring pressure may be obtained by use of the screwdriver as shown in (F).

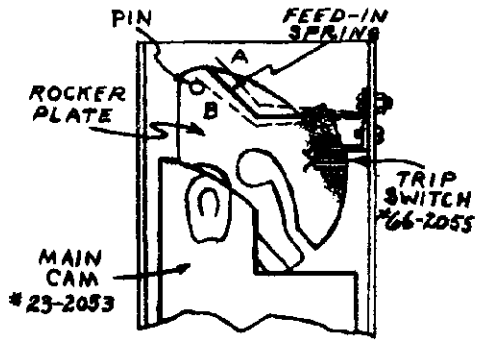


Adjustment of Pickup Arm To Set Properly On Record

13. The pickup arm when returning to the record should drop at a point half-way between the first playing groove and the edge of the record. The kick-in spring moves the pickup arm gently to the first playing groove. If the needle is dropping into the first playing groove, then loosen the screw in front of the pickup arm bracket and immediately under the pickup arm channel. Move the pickup arm bracket slightly outward and tighten the screw. If the arm is dropping at the edge of the record, loosen the screw and move the pickup arm bracket slightly inward and retighten screw.

Pick-up Feed-in Adjustment

14. The feed-in adjustment can best be made by use of a record having no spiral feed-in groove. With record on turntable and changer set for size record used, the changer is caused to cycle by either depressing the reject button or allowing the arm to trip. When operating correctly, the arm should set down on the record and move gently into the first groove. If the feed-in is too violent, resulting in groove jumping, bend the feed-in spring toward the dotted line (A). If the feed-in action is insufficient, resulting in the arm not reaching the first groove consistently, bend the spring toward dotted line (B).



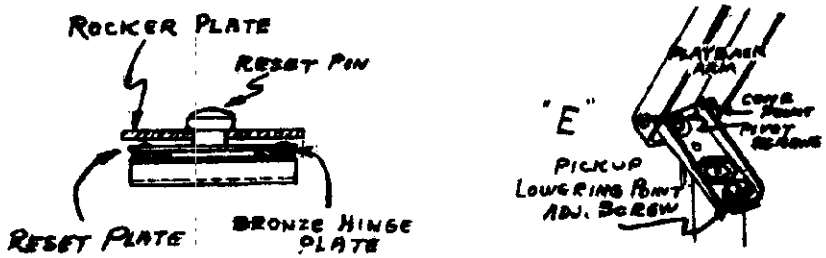
Setting Mechanism To Release Records Properly

15. Remove screw and finishing washer in top of record selector shaft. Replace so that the flat sections of the shaft engage the flat sections of the record selector finger. Install and tighten screw. Place the mechanism in the 10" operating position by rotating the Uni-point control knob so that it points directly to the turntable shaft. Place a 10" record on turntable shaft so that the edges rest on the retaining arms. The selector finger and the record should have approximately 1/16" clearance. If this clearance is not correct, loosen the two screws on the tie rod assembly (formed rod underneath turntable connecting cam box and Uni-point control post) and move selector post inward or outward so that the clearance of selector finger and record is correct. Then tighten screws in tie rod securely. Adjustment for 10" or 12" dropping of records is exactly the same and if adjustment is made for 10" record, the 12" adjustment is automatically taken care of and vice versa.

16. It is very important that the Uni-point control post be positioned in the proper manner. Sometimes this post becomes bent inward slightly which "hangs on" to a 12" record too long and causes the record to flutter down instead of dropping down with a positive action. Breakage or cracking of records sometimes results. The Uni-point control post is stationary but can be bent inward or outward by hand. The control post should be at a point where a 12" record is very near the edge of the record holding bracket.

Pickup Arm Remains Stationary At About The Center of Home Recorded Discs

17. Make sure first that the home recorded disc has a good clean groove and the proper depth of cut. Pivot posts of the pickup arm should be set to the point where very little play is evidenced but not to the binding point. The lower part of the pickup arm channel should just come flush with or a little bit lower than the top of the turntable. If the arm is above the turntable, the flat bracket immediately above the push rod in the center of the pickup arm shaft should be bent upward slightly. Positioning of the trip switch to the point where the leather finger engages the rocker arm too high sometimes causes friction which will hold the pickup arm in place when home recorded records are played. Be sure that the pickup arm cord is hanging free and is not under pickup arm bracket and arm channel.



Variation in Lowering of Pick-Up Arm

18. It will be observed that it is the retraction of the reset pin through the slot in the rocker plate, during the return stroke of the cam, that causes the arm to move from its outward position and reset onto the record. It can be seen that lost motion or "shake" in the lateral movement of the pickup arm must be at a minimum in order for the pickup lowering position to remain unchanged when records are changed automatically. To determine the cause for any variation in the position of the pickup lowering point:

(1st.) Move the main cam be the method illustrated (Page 4) and allow the cam to return to the position shown in Figure (D) page 7. The relative positions of the rocker plate and reset plate, with the reset pin engaged in the end of the slot in the rocker plate. Holding the cam in this position, take hold of the pickup arm and by lightly applying force in alternately opposite directions (laterally) observe the resulting effect on the position of the reset pin. If the reset pin can be moved excessively in making this test, this gives indication of a broken hinge plate, which condition necessitates removal of the main cam with the reset plate assembly attached, and replacement with a new one.

(2nd.) Observe that the cone point pivot screws at the heel of the pickup arm are properly adjusted so that no lost motion in the lateral movement of the arm exists. CAUTION: Do not make this adjustment too tight as abnormal friction in the vertical movement of the arm may result.

(3rd.) Note that the screw provided for adjusting the pickup lowering position (Figure E) is tightened securely.

Dash Pot

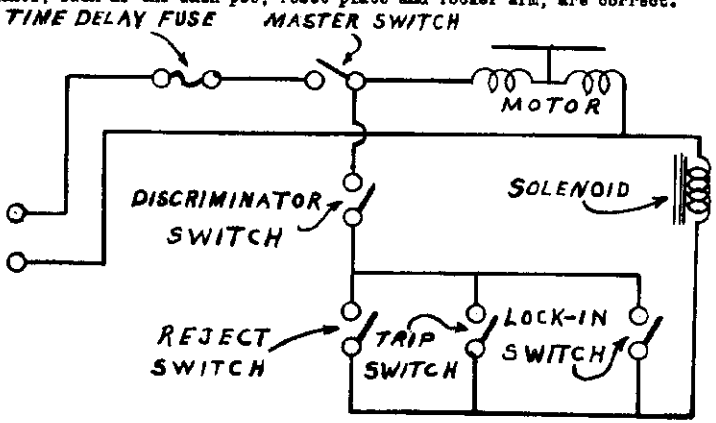
19. The dash pot, which is an air chamber with an internal spring return piston and an air release serves to govern the speed at which the main cam or changing process operates. At the start of the solenoid stroke, the contacts on the lock-in switch, which is connected in parallel with the trip switch, are closed maintaining energy in the solenoid. The draw spring then functions to pull the main cam assembly forward against the snubbing action of the dash pot. At the end of the stroke, when the lock-in switch points are opened, energy is released from the solenoid and the internal spring of the dash pot returns the main cam assembly to its original position.

20. It can readily be seen from the above that if the dash pot through some manner has lost its snubbing action, the changing process of the unit will be very erratic and in most cases damage will result through the fast action. Always replace a defective dash pot and never attempt to repair or oil the plunger. This plunger is treated by a special process and further oiling will eventually ruin the leather.

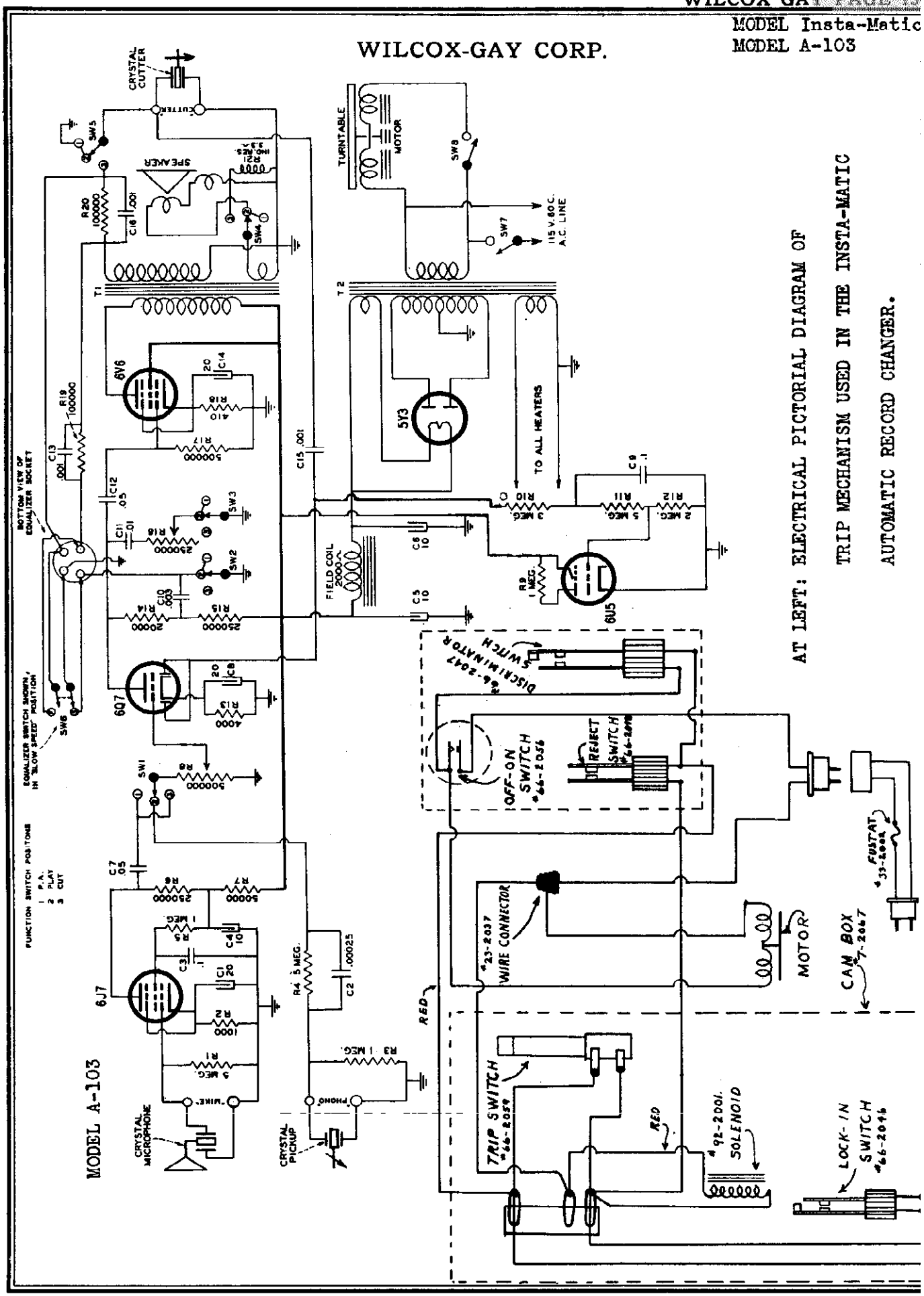
Buzzing or Weak Solenoids

21. Incorrect spacing of the lock-in switch will oftentimes cause the solenoid to buzz or chatter during the change period. If the contacts are set so that they are just touching on the solenoid stroke, vibration will cause them to open and close resulting in the solenoid being energized and de-energized at a very rapid rate. If the lock-in switch contacts are correctly set and buzzing still continues, it is usually found to be in the laminations of the solenoid and the only cure is replacement of the complete solenoid including core. The solenoid plus the core are matched at the factory and the complete assembly should be installed.

22. The solenoid on the Insta-Matic changer is designed to operate satisfactorily on line voltages 105 Volts or above. Lower line voltages will cause the mechanism to either chatter or buzz and in some cases will not operate. If the line voltage is above 105 Volts and the mechanism changes very slowly or the solenoid plunger is drawn only partway in, this is an indication of a weak solenoid and the only solution is to install a new assembly. This naturally is assuming that all other adjustments, such as the dash pot, reset plate and rocker arm, are correct.



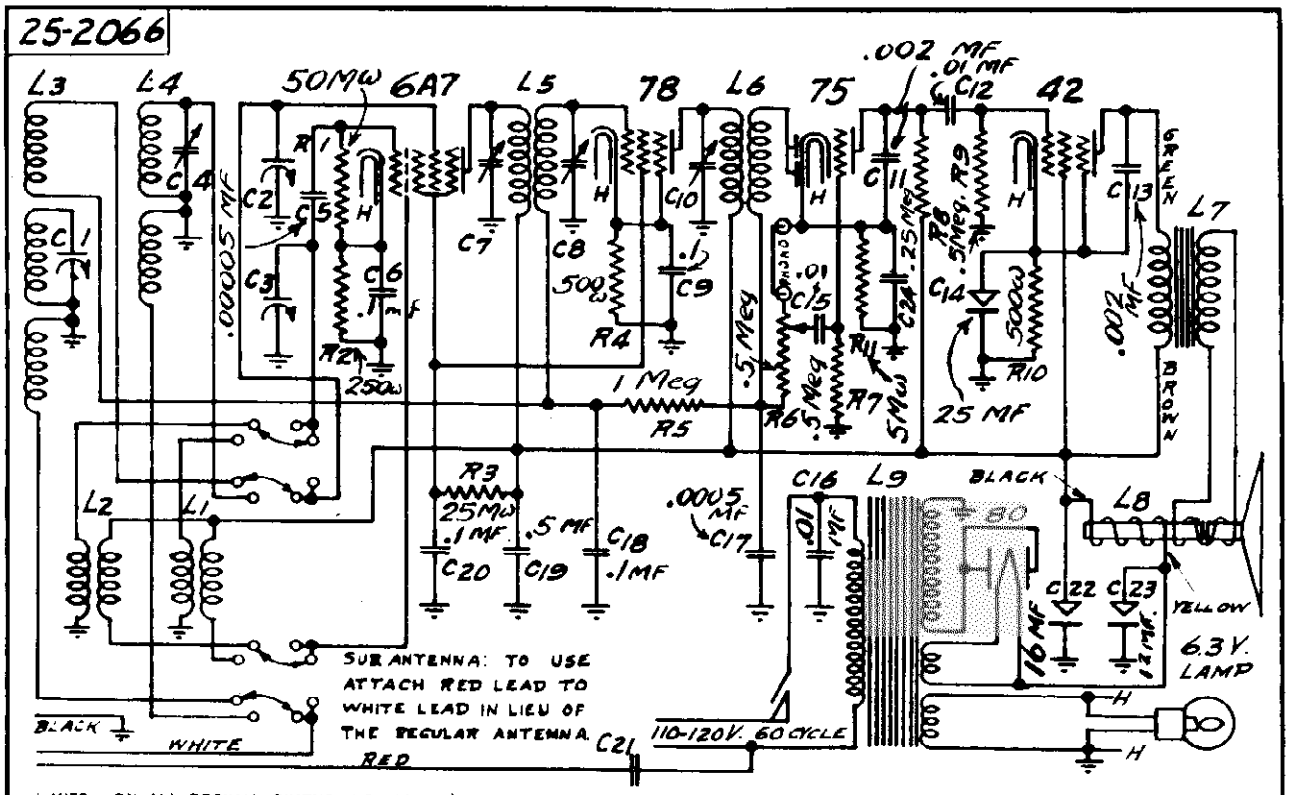
MODEL Insta-Matic
MODEL A-103



MODEL 5A6
MODEL 6AC5

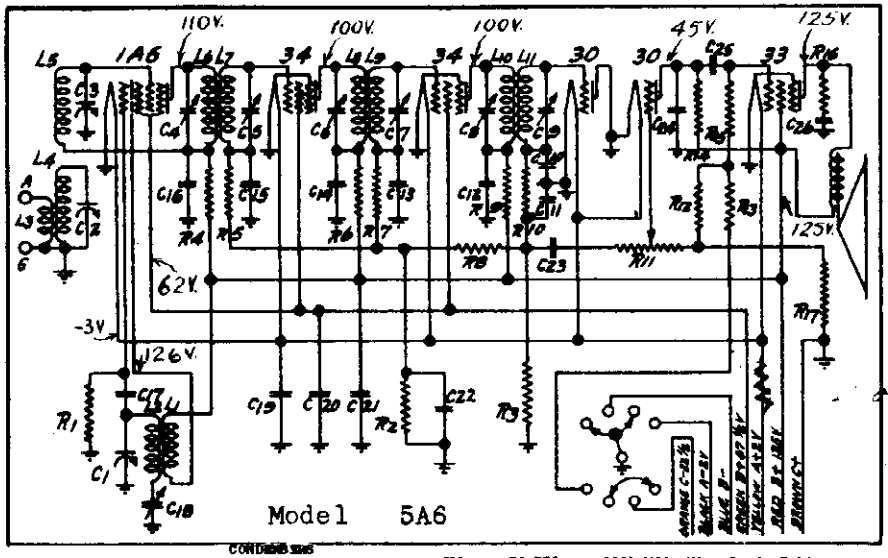
WILCOX-GAY CORP.

25-2066



LIMITS ON ALL DECIMAL DIMENSIONS ALLOW ± .003 AND ON ALL FRACTIONAL DIMENSIONS ALLOW ± .010 UNLESS OTHERWISE SPECIFIED.

CHANGES	MATERIAL	TITLE- SCHEMATIC DIAGRAM MODEL 6AC5	SCALE	DATE	PART NO.
FOR ALIGNMENT SEE INDEX			DWN. Cann	4-20-36	25-2066
			CK. [illegible]	5-[illegible]-36	
			TR. [illegible]	5-28-36	
		THE WILCOX-GAY CORP. CHARLOTTE MICHIGAN	APP. [illegible]	[illegible]-3[illegible]	
				ISSUED	OCT 2 2 1936



CONDENSERS

C1	77-1561	16-366	Oscillator Section of 3 Gang	C11	76-339	.0001 Mfd. Mica Diode Filter
C2	77-1561	16-366	First Preselector Section of 3 Gang	C12	75-269A	.01 Mfd. 400 Volt Second I.F. Plate Isolation Cond.
C3	77-1561	16-366	Second Preselector Section of 3 Gang	C13	75-269A	.01 Mfd. 400 Volt Second I.F. Grid Isolation Cond.
C4	78-1561	70-120	MMFD. First I.F. Primary Trimmer	C14	75-269A	.01 Mfd. 400 Volt First I.F. Plate Isolation Cond.
C5	78-1561	70-120	MMFD. First I.F. Secondary Trimmer	C15	75-269A	.01 Mfd. 400 Volt First I.F. Grid Isolation Cond.
C6	78-1561	70-120	MMFD. Second I.F. Primary Trimmer	C16	75-269A	.01 Mfd. 400 Volt First Detector Plate Isolation Cond.
C7	78-1561	70-120	MMFD. Second I.F. Secondary Trimmer	C17	76-264	.00005 Mfd. Mica Oscillator Coupling Cond.
C8	78-1561	70-120	MMFD. Third I.F. Primary Trimmer	C18	78-1569	450 MMFD. Oscillator Reciprocal Trimmer
C9	78-1561	70-120	MMFD. Third I.F. Secondary Trimmer	C19	75-267A	.5 Mfd. 200 Volt Filament By-Pass Condenser
C10	76-339	.0001 Mfd. Mica Diode Filter	C20	75-267A	.5 Mfd. 200 Volt Screen By-Pass Condenser	

C21	75-266	1. Mfd. 400 Volt B. Supply By-Pass Condenser	
C22	75-267A	.1 Mfd. 200 Volt A.V.C. Network By-Pass Condenser	
C23	75-269A	.01 Mfd. 400 Volt Audio Feed Condenser	
C24	76-265	.001 Mfd. Mica First Audio Plate Filter Cond.	
C25	75-269A	.01 Mfd. 400 Volt Audio Feed Condenser	
C26	75-1132	.002 Mfd. 600 Volt Tone Condenser	

INDUCTANCES

L1	17-1645	Oscillator Primary
L2	17-1645	Oscillator Secondary
L3	17-2003	Preselector Primary
L4	17-2003	Preselector First Secondary
L5	17-2003	Preselector Second Secondary
L6	17-1633	First I.F. Primary
L7	17-1633	First I.F. Secondary
L8	17-1633	Second I.F. Primary
L9	17-1633	Second I.F. Secondary
L10	17-1633	Third I.F. Primary
L11	17-1633	Third I.F. Secondary

RESISTORS

CODE	PART NO.		
R1	53-926	1 Megohm	Oscillator Grid
R2	53-926	1 Megohm	A.V.C. Network
R3	53-925	500,000 Ohm	A.V.C. Network
R4	53-919	5,000 Ohm	First Detector Plate Isolation
R5	53-923	100,000 Ohm	First I.F. Grid Isolation
R6	53-919	5,000 Ohm	First I.F. Plate Isolation
R7	53-923	100,000 Ohm	Second I.F. Grid Isolation
R8	53-926	1 Meg Ohm	A.V.C. Network
R9	53-919	5,000 Ohm	Second I.F. Plate Isolation
R10	53-896	30,000 Ohm	Diode Filter
R11	19-1317	250,000 Ohm	Volume Control
R12	53-926	1 Meg Ohm	C Bias Network 10,000
R13	53-924	250,000 Ohm	C Bias Network 2500
R14	53-923	100,000 Ohm	First Audio Plate
R15	53-925	500,000 Ohm	Output Grid
R16	53-920	10,000 Ohm	Tone Series Resistor
R17	53-925	500,000 Ohm	C Bias Network Resistor 4 000

MODELS 6AC5,7A
7AC5

WILCOX-GAY CORP.

ALIGNMENT FOR MODELS 6A5,7A5

CONNECT SIG.GEN.	FREQUENCY SIG.GEN.	DIAL AT	WAVEBAND SW. SET AT	TRIMMER NUMBER	OUTPUT SIGNAL
Remove Grid clip from 6A7					
Control Grid of 6A7	175 kc	1400 kc	Broadcast(left)	1	Max.[1]
" " " "	"	"	"	2	"
" " " "	"	"	"	3	"
Connect Grid clip to 6A7					
Antenna Lead* White Lead	Black Ground 1400 kc	1400 kc	Broadcast	4	Max[1]
" "	"	"	"	5	"
" "	"	"	"	6	"
" "	600 kc	600 kc	"	4[2]	"
" "	"	"	"	5[2]	"
" "	"	"	"	6[2]	"
" "	3.5 mc**	3.5 mc**	Police**	7	"
" "	1.75 mc**	1.75 mc**	"	7[3]	

Volume control "Full On" at all times

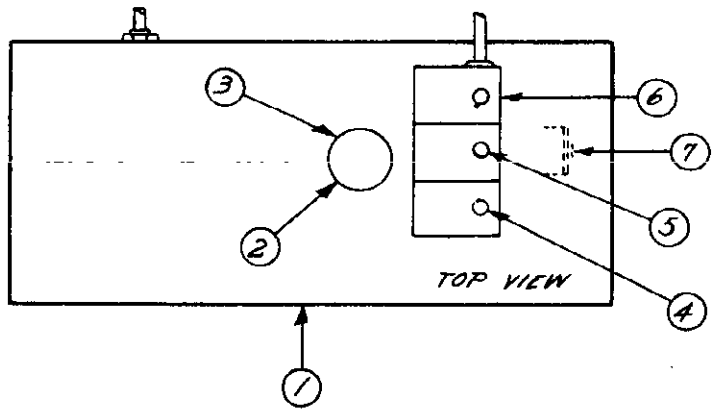
* Connect a standrad dummy antenna between signal generator and receiver.

Note 1:Signal across primary of output transformer not to be over 50 volts

Note 2:Due to formed oscillator plates, set should track. If not, bend slotted plates at this point and recheck at 1400 kc.

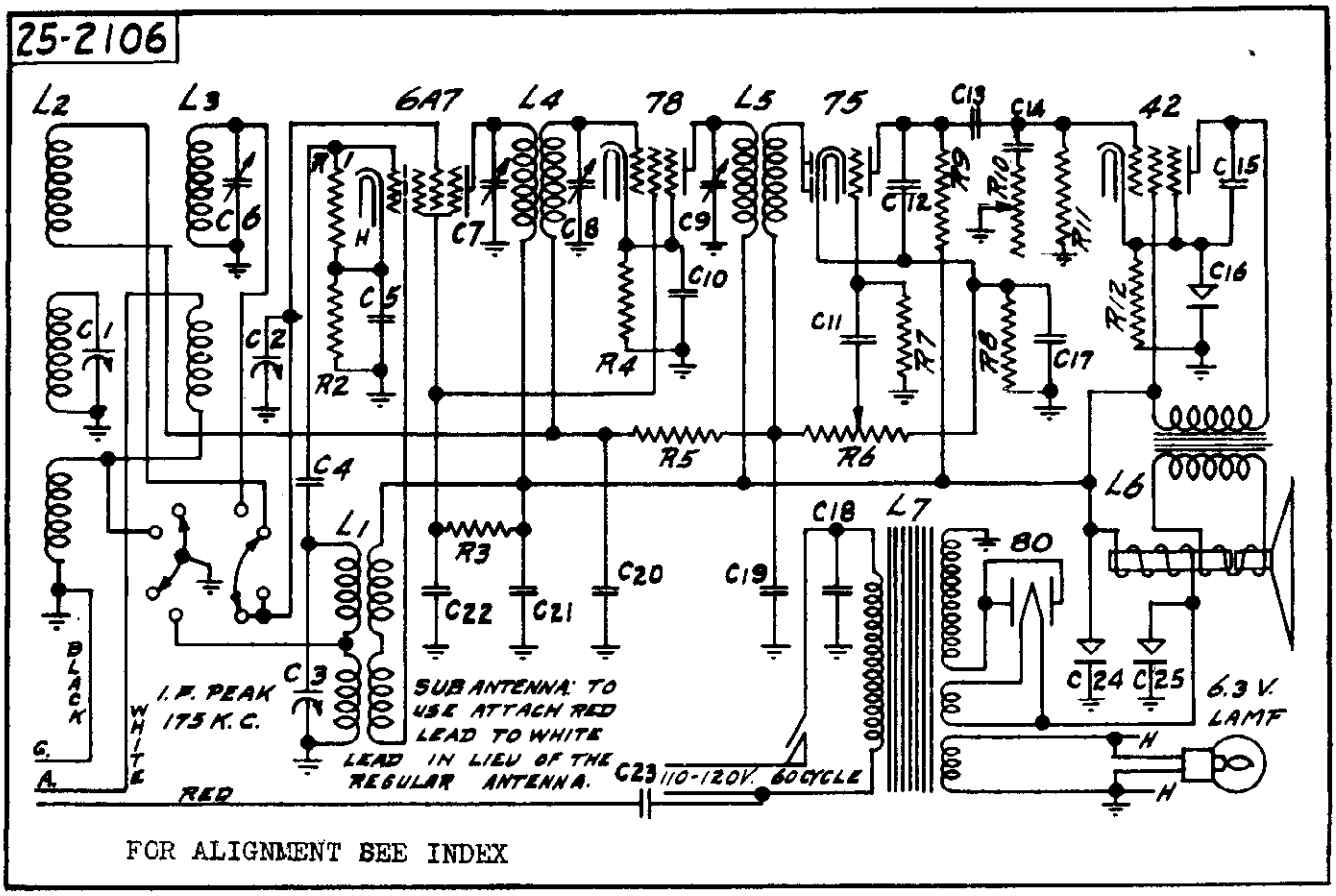
Note 3:Check ganging at this point.

** Alignment for Models 6AC5 and 7AC5 is the same up to this point, the adjustment of trimmer 7. For Models 6AC5 and 7AC5 use 15 mc for adjusting the foreign-band trimmer No.7 and 6 mc for checking the ganging, the final operation



MODEL 7A5

WILCOX-GAY CORP.



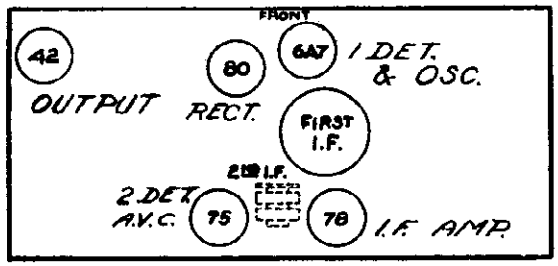
FOR ALIGNMENT SEE INDEX

CODE	PART NO.	RESISTORS
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	53-926	1 Meg Ohm A.V.C. Network Resistor
R6	19-1291	500,000 Ohm Volume Control & Switch
R7	53-925	500,000 Ohm 75 Grid Resistor
R8	53-919	5,000 Ohm 75 Cathode Resistor
R9	53-924	250,000 Ohm 75 Plate Resistor
R10	19-1317	250,000 Ohm Tone Control
R11	53-925	500,000 Ohm 42 Grid Resistor
R12	53-1063	500 Ohm 42 Cathode Resistor

CODE	PART NO.	CONDENSERS
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	76-2002	.00005 Mfd. Mica Oscillator Grid Condenser
C5	75-2006	.1 Mfd. 200 V. Paper 6A7 Cathode By-Pass Cond.
C6	78-2010	3-30 MMFD. Police Band Preselector Trimmer Cond.
C7	78-2008	First I.F. Primary Trimmer Condenser
C8	78-2011	First I.F. Secondary Trimmer Condenser
C9	78-2009	Second I.F. Trimmer Condenser
C10	75-2003	.1 Mfd. 200 V. Paper 78 Cathode By-Pass Cond.
C11	75-2003	.01 Mfd. 400 V. Paper Audio Feed Condenser
C12	76-662	.002 Mfd. Mica 75 Plate Filter Condenser
C13	75-2003	.01 Mfd. 400 V. Paper Audio Feed Condenser
C14	75-2003	.01 Mfd. 400 V. Paper Tone Control Condenser
C15	75-2001	.002 Mfd. 600 V. Paper 42 Plate Filter Cond.
C16	18-928	25 Mfd. 25 V. Dry Electrolytic Condenser
C17	75-2005	.1 Mfd. 200 V. Paper 75 Cathode By-Pass Cond.
C18	75-2003	.01 Mfd. 400 V. Paper Line By-Pass Condenser
C19	76-307	.0005 Mfd. Mica Diode Filter Condenser
C20	75-2005	.1 Mfd. 200 V. Paper A.V.C. Network By-Pass Cond.
C21	75-2011	.5 Mfd. 200 V. Paper B Supply By-Pass Condenser
C22	75-2005	.1 Mfd. 200 V. Paper 6A7 & 78 Screen By-Pass Cond.
C23	75-2003	.01 Mfd. 400 V. Paper Sub-Antenna Condenser
C24	18-2006	16 Mfd. 250 W.V. Electrolytic Condenser
C25	18-2005	12 Mfd. 325 W.V. Electrolytic Condenser

CODE	PART NO.	
L1	17-2101	Oscillator Coil Assembly
L2	17-2100	Preselector Coil Assembly
L3	17-2103	Police Band Preselector Coil Assembly
L4	68-2012	First I.F. Transformer Assembly
L5	17-2102	Second I.F. Transformer Coil Assembly
L6	64-2021	5" Speaker, 1500 Ohm field 42 Tube Transformer
L7	80-2009	Power Transformer for 110-120 V. 60 Cycle

LOCATION OF TUBES

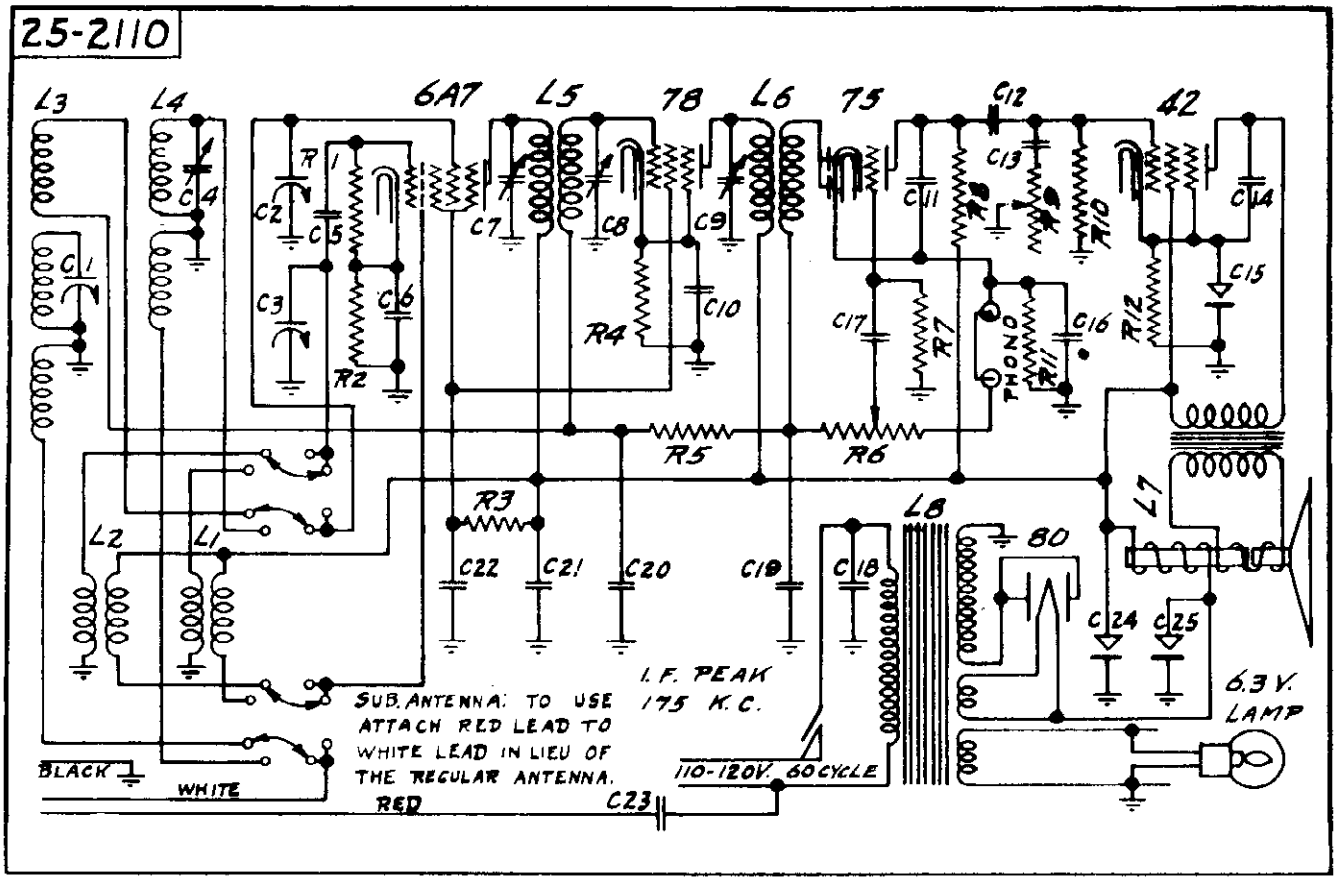


FOR USE ONLY WITH
110-120 V . 50-60 CYCLE

PILOT LIGHTS 6-8 V.
I. F. PEAK 175 K. C.

WILCOX-GAY CORP.

MODEL 6AC5
MODEL 7AC5



CODE	PART NO.	RESISTORS
R1	53-898	50,000 Ohm Oscillator Grid Resistor
R2	53-1062	250 Ohm Oscillator Cathode Resistor
R3	53-1042	25,000 Ohm 6A7 & 78 Screen Resistor
R4	53-1063	500 Ohm 78 Cathode Resistor
R5	53-926	1 Meg Ohm A.V.C. Network Resistor
R6	19-1291	500,000 Ohm Volume Control & Switch
R7	53-925	500,000 Ohm 75 Grid Resistor
R8	53-924	250,000 Ohm 75 Plate Resistor
R9	19-1317	250,000 Ohm Tone Control
R10	53-925	500,000 Ohm 42 Grid Resistor
R11	53-919	5,000 Ohm 75 Cathode Resistor
R12	53-1063	500 Ohm 42 Cathode Resistor

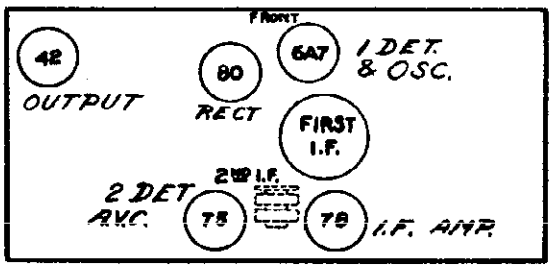
CODE	PART NO.	CONDENSERS
C1	77-833	16-366 MMFD. Preselector Section of 3 Gang Cond.
C2	77-833	16-366 MMFD. Preselector Section of 3 Gang Cond.
C3	77-833	16-328 MMFD. Oscillator Section of 3 Gang Cond.
C4	78-2010	3-30 MMFD. Foreign Band Pres. Trimmer Cond.
C5	76-2002	.00005 Mfd. Mica Oscillator Grid Condenser
C6	75-2005	.1 Mfd. 200 V. 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	78-2009	Second I.F. Trimmer Condenser.
C10	75-2005	.1 Mfd. 200 V. Paper 78 Cathode By-Pass Cond.
C11	76-662	.002 Mfd. Mica 75 Plate Filter Condenser
C12	75-2003	.01 Mfd. 400 V. Paper Audio Feed Condenser
C13	75-2003	.01 Mfd. 400 V. Paper Tone Control Condenser
C14	75-2001	.002 Mfd. 600 V. Paper 42 Plate Filter Cond.
C15	18-928	25 Mfd. 25 V. Dry Electrolytic Condenser
C16	75-2005	.1 Mfd. 200 V. Paper 75 Cathode By-Pass Cond.
C17	75-2003	.01 Mfd. 400 V. Paper Audio Feed Condenser
C18	75-2003	.01 Mfd. 400 V. Paper Line By-Pass Condenser
C19	76-307	.0005 Mfd. Mica Diode Filter Condenser
C20	75-2005	.1 Mfd. 200 V. Paper A.V.C. Network By-Pass Cond.
C21	75-2011	.5 Mfd. 200 V. Paper B Supply By-Pass Condenser
C22	75-2005	.1 Mfd. 200 V. Paper 6A7 & 78 Screen By-Pass Cond.
C23	75-2003	.01 Mfd. 400 V. Paper Sub. Antenna Condenser
C24	18-2006	16 Mfd. 250 V.V. Electrolytic Condenser
C25	18-2006	12 Mfd. 325 V.V. Electrolytic Condenser

CODE	PART NO.	INDUCTANCES
L1	17-2095	Foreign Band Oscillator Coil Assembly
L2	17-2079	Broadcast Oscillator Coil Assembly
L3	17-2100	Broadcast Preselector Coil Assembly
L4	17-2096	Foreign Band Preselector Coil Assembly
L5	68-2012	First I.F. Transformer Assembly
L6	17-2102	Second I.F. Transformer Coil Assembly
L7	64-2021	5" Speaker, 1500 Ohm Field, #42 Tube Output Trans.
L8	80-2009	Power Transformer for 110-120 V. 60 Cycle

FOR USE ONLY WITH
110-120 V . 50-60 CYCLE

PILOT LIGHTS 6-8 V.
I. F. PEAK 175 K.C.

LOCATION OF TUBES



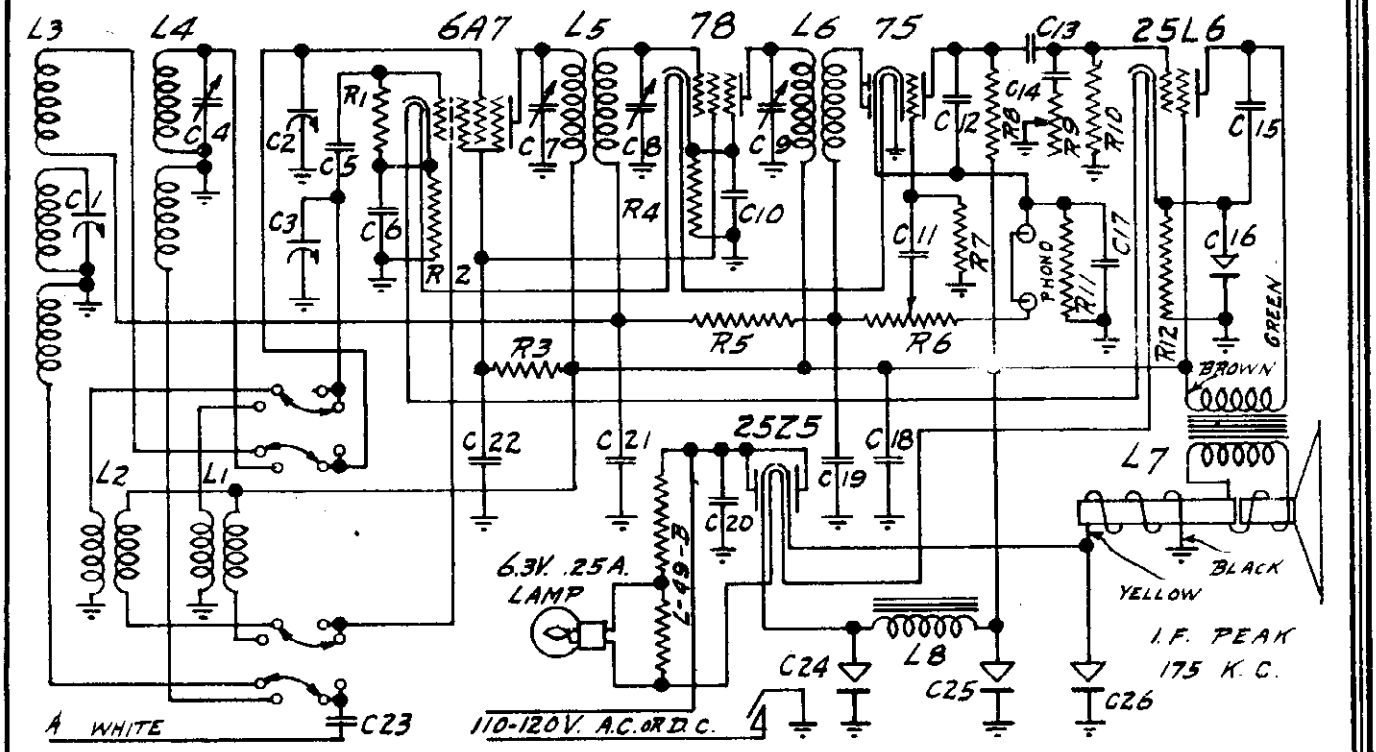
Models 6AC5 & 7AC5

FOR ALIGNMENT SEE INDEX

MODEL 7B6

WILCOX-GAY CORP.

25-2108



CODE	PART NO.	RESISTORS
R1	53-898	50,000 Ohm Oscillator Grid Resistor
R2	53-1062	250 Ohm Oscillator Cathode Resistor
R3	53-1042	25,000 Ohm 6A7 & 78 Screen Resistor
R4	53-1063	500 Ohm 78 Cathode Resistor
R5	53-926	1 Meg Ohm A.V.C. Network Resistor
R6	19-1291	500,000 Ohm Volume Control & Switch
R7	53-925	500,000 Ohm 75 Grid Resistor
R8	53-924	250,000 Ohm 75 Plate Resistor
R9	19-1317	250,000 Ohm Tone Control
R10	53-925	500,000 Ohm 25L6 Grid Resistor
R11	53-920	10,000 Ohm 75 Cathode Resistor
R12	53-2014	200 Ohm 25L6 Cathode Resistor

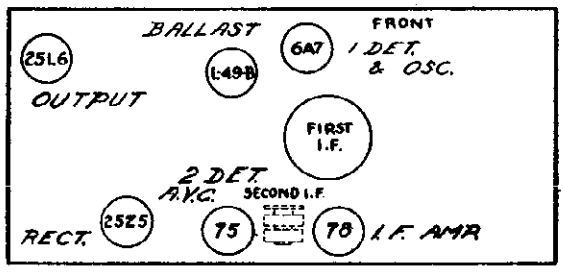
		CONDENSERS
C1	77-833	16-366 MMFD. Preselector Sect. of 3 Gang Cond.
C2	77-833	16-366 MMFD. Preselector Sect. of 3 Gang Cond.
C3	77-833	16-328 MMFD. Oscillator Sect. of 3 Gang Cond.
C4	78-2010	3-30 MMFD. Foreign Band Preselector Trimmer
C5	76-2002	.00005 Mfd. Oscillator Grid Condenser
C6	75-2005	.1 Mfd. 200 V. 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	78-2009	Second I.F. Trimmer Condenser
C10	75-2005	.1 Mfd. 200 V. Paper 78 Cathode By-Pass Cond.
C11	75-2003	.01 Mfd. 400 V. Paper Audio Feed Condenser
C12	76-662	.002 Mfd. Mica 75 Plate Filter Condenser
C13	75-2003	.01 Mfd. 400 V. Paper Audio Feed Condenser
C14	75-2003	.01 Mfd. 400 V. Paper Tone Control Condenser
C15	75-2001	.002 Mfd. 600 V. Paper 25L6 Plate Filter Cond.
C16	18-928	25 Mfd. 25 V. Dry Electrolytic Condenser
C17	75-2005	.1 Mfd. 200 V. Paper 75 Cathode By-Pass Cond.
C18	75-2011	.5 Mfd. 200 V. Paper B Supply By-Pass Cond.
C19	76-307	.0005 Mfd. Mica Diode Filter Condenser
C20	75-2005	.1 Mfd. 200 V. Paper Line By-Pass Condenser
C21	75-2005	.1 Mfd. 200 V. Paper A.V.C. Network By-Pass Cond.
C22	75-2005	.1 Mfd. 200 V. Paper 6A7 & 78 Screen By-Pass Cond.
C23	75-2003	.01 Mfd. 400 V. Paper Antenna Series Condenser
C24	18-2003	11 Mfd. 150 W.V. Dry Electrolytic Condenser
C25	18-2003	4 Mfd. 150 W.V. Dry Electrolytic Condenser
C26	18-2003	4 Mfd. 150 W.V. Dry Electrolytic Condenser

		INDUCTANCES
L1	17-2095	Foreign Band Oscillator Coil Assembly
L2	17-2079	Broadcast Oscillator Coil Assembly
L3	17-2100	Broadcast Preselector Coil Assembly
L4	17-2096	Foreign Band Preselector Coil Assembly
L5	68-2012	First I.F. Transformer Assembly
L6	17-2102	Second I.F. Transformer Coil Assembly
L7	64-2043	5" Speaker, 3000 Ohm Field, 25L6 Output Trans.
L8	14-940	20 Henry Filter Choke

FOR USE ONLY WITH
110-120 V 50-60 CYCLE
OR
110-120 V. D.C.

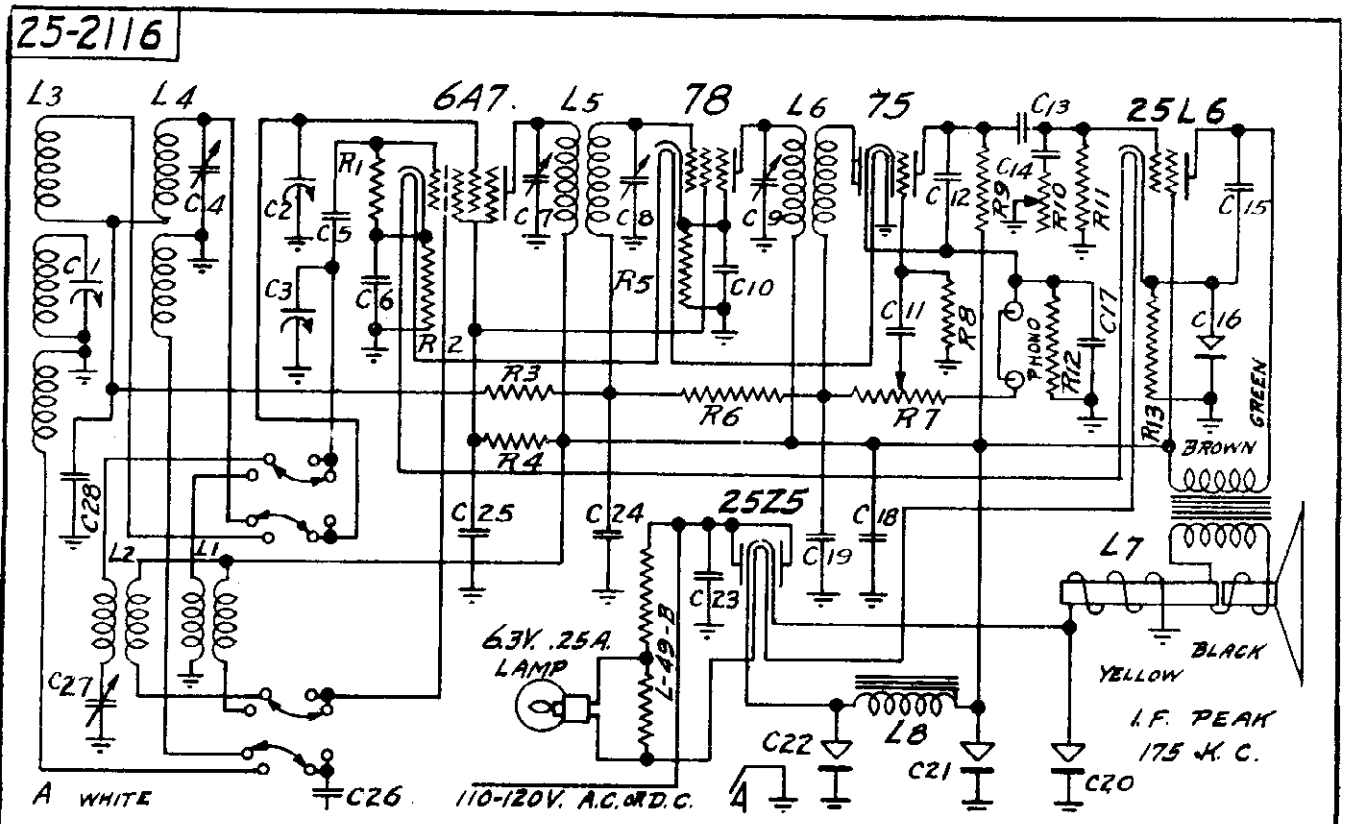
PILOT LIGHT 6-8 V.
I. F. PEAK 175 K.C.

LOCATION OF TUBES



For other data see Index

WILCOX-GAY CORP.



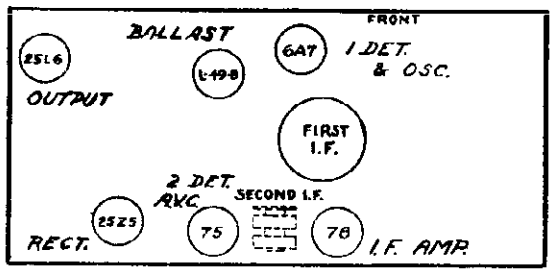
CODE	PART NO.	RESISTORS
R1	53-898	50,000 Ohm Oscillator Grid Resistor
R2	53-1062	250 Ohm Oscillator Cathode Resistor
R3	53-923	100,000 Ohm A.V.C. Network Resistor
R4	53-1042	25,000 Ohm 6A7 & 78 Screen Resistor
R5	53-1063	500 Ohm 78 Cathode Resistor
R6	53-926	1 Meg Ohm A.V.C. Network Resistor
R7	19-1291	500,000 Ohm Volume Control & Switch
R8	53-925	500,000 Ohm 75 Grid Resistor
R9	53-924	250,000 Ohm 75 Plate Resistor
R10	19-1317	250,000 Ohm Tone Control
R11	53-925	500,000 Ohm 25L6 Grid Resistor
R12	53-920	10,000 Ohm 75 Cathode Resistor
R13	53-2014	200 Ohm 25L6 Cathode Resistor
		CONDENSERS
C1	77-833	16-366 MMFD. Preselector Section of 3 Gang
C2	77-833	16-366 MMFD. Preselector Section of 3 Gang
C3	77-833	16-366 MMFD. Oscillator Section of 3 Gang
C4	78-2010	3-30 MMFD. Long Wave Preselector Trimmer
C5	76-2002	.00005 Mfd. Oscillator Grid Condenser
C6	75-2005	.1 Mfd. 200 V. Paper 6A7 Cathode By-Pass Cond.
C7	78-993	First I.F. Primary Trimmer
C8	78-1228	First I.F. Secondary Trimmer
C9	78-788	Second I.F. Trimmer
C10	75-2005	.1 Mfd. 200 V. Paper 78 Cathode By-Pass Cond.
C11	75-2003	.01 Mfd. 400 V. Paper Audio Feed Cond.
C12	76-662	.002 Mfd. Mica 75 Plate Filter Cond.
C13	75-2003	.01 Mfd. 400 V. Paper Audio Feed Cond.
C14	75-2003	.01 Mfd. 400 V. Paper Tone Control Cond.
C15	75-2001	.002 Mfd. 600 V. Paper 43 Plate Filter Cond.
C16	18-928	25 Mfd. 25 V. Dry Electrolytic Condenser
C17	75-2005	.1 Mfd. 200 V. Paper 75 Cathode By-Pass Cond.
C18	75-2011	.5 Mfd. 200 V. Paper B Supply By-Pass Cond.
C19	76-307	.0005 Mfd. Mica Diode Filter Condenser
C20	18-2003	4 Mfd. 150 W.V. Dry Electrolytic Condenser
C21	18-2003	4 Mfd. 150 W.V. Dry Electrolytic Condenser
C22	18-2003	11 Mfd. 150 W.V. Dry Electrolytic Condenser
C23	75-2005	.1 Mfd. 200 V. Paper Line By-Pass Condenser
C24	75-2005	.1 Mfd. 200 V. Paper A.V.C. Network By-Pass Cond.

CODE	PART NO.	CONDENSERS (Cont.)
C25	75-2005	.1 Mfd. 200 V. Paper 6A7 & 78 Screen By-Pass Cond
C26	75-2003	.01 Mfd. 400 V. Paper Antenna Series Condenser
C27	78-2006	Long Wave Oscillator Series Condenser
C28	75-2005	.1 Mfd. 200 V. Grid Isolation Resistor
		INDUCTANCES
L1	17-2070	Broadcast Oscillator Coil Assembly
L2	17-2070	Long Wave Oscillator Coil Assembly
L3	17-2115	Broadcast Preselector Coil Assembly
L4	17-2115	Long Wave Preselector Coil Assembly
L5	68-2022	First I.F. Transformer Assembly
L6	17-2097	Second I.F. Transformer Assembly
L7	64-2043	5" Speaker, 3000 Ohm Field, 25L6 Output Trans.
L8	14-940	20 Henry Filter Choke

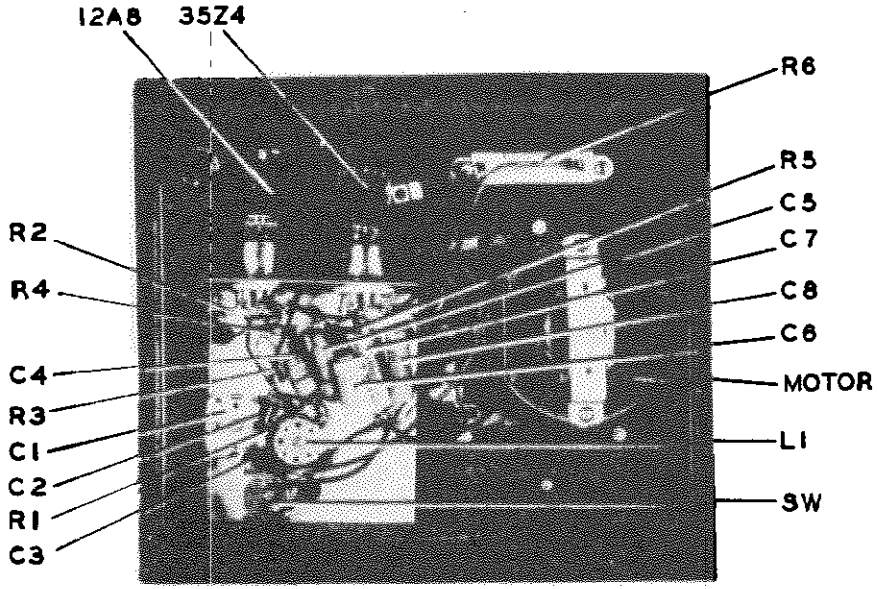
FOR USE ONLY WITH
110-120 V . 50-60 CYCLE
OR
110-120 V. D. C.

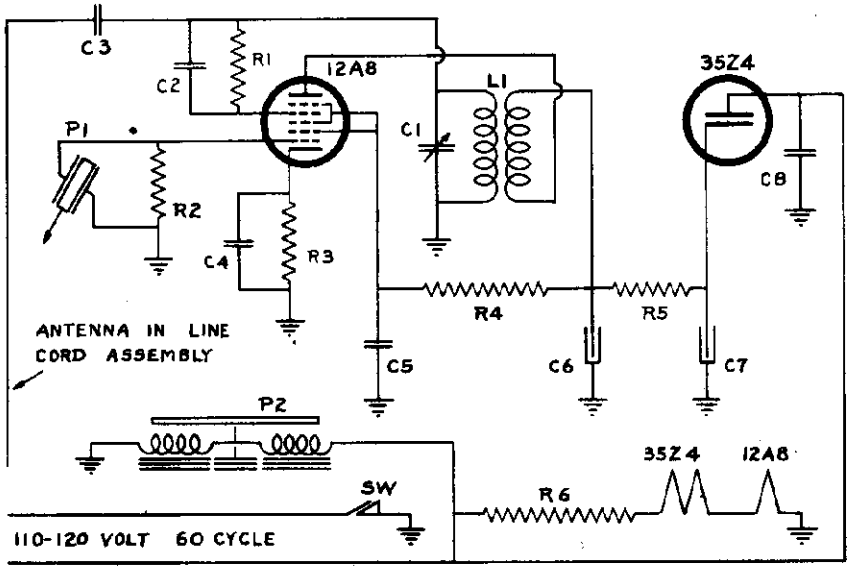
PILOT LIGHT 6-8 V.
I. F. PEAK 115 K. C.

LOCATION OF TUBES



CODE	PART NO.	NAME
	8-2206	CABINET
	7-2046	CABINET BOTTOM
L1	17-2223	COIL ASSEMBLY, OSCILLATOR
C1	78-2034	COND. TRIMMER, 40-240 MMFD.
C2	76-2002	COND. MICA, 50 MMFD.
C3	76-2005	COND. MICA, 10 MMFD.
C4	75-2006	COND. PAPER, .1 MFD. 200 V.
C5	75-2006	COND. PAPER, .1 MFD. 200 V.
C6	18-2011	COND. ELECT. 8 MFD. 150 W.V.
C7	18-2010	COND. ELECT. 16 MFD. 150 W.V.
C8	75-2006	COND. PAPER, .1 MFD. 200 V.
R1	53-920	RESISTOR, 10,000 OHM 1/4 WATT
R2	53-924	RESISTOR, 250,000 OHM 1/4 WATT
R3	53-2023	RESISTOR, 1,000 OHM 1/4 WATT
R4-R5	53-919	RESISTOR, 5,000 OHM 1/4 WATT
R6	53-2026	RESISTOR, 466 OHM 10 WATT
SW	66-2023	SWITCH, LINE, "OFF-ON"





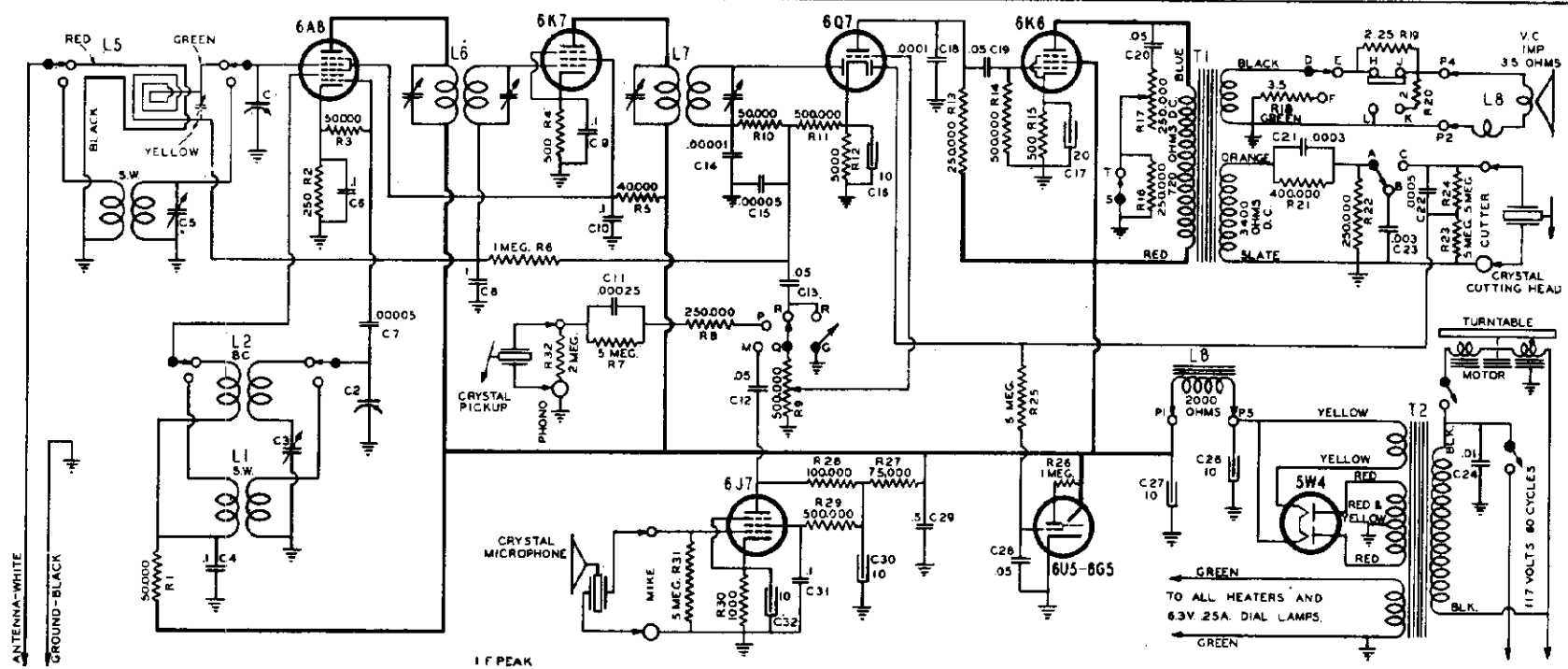
VOLTAGE DATA

Line Voltage --	115
C7 to GND. ----	150
C6 to GND. ----	110
12A8 Plate ----	110
12A8 Screen ---	90
12A8 Cathode --	6.2

40-2036	KNOB
20-2022	LINE CORD & PLUG--WITH ANT. WIRE
47-2015	MOTOR ASSEMBLY--WITH TURNTABLE
2-2012	PICK-UP ARM ASSEMBLY
5-2250	PICK-UP ARM REST
23-2024	PICK-UP CRYSTAL CARTRIDGE
57-2066	PICK-UP NEEDLE SCREW
49-2003	PHONOGRAPH NEEDLES (1 PKG.)

NOTE: An extension of the antenna contained within the line cord, and placed near the antenna lead of the radio receiver will provide sufficient signal intensity to overcome unusual static and interference conditions.

Test for oscillation: Connect low range voltmeter across R1. Use short meter leads, as long leads or high capacity to ground may cause oscillations to stop.
Meter reading..non-oscillating condition....zero.
Meter reading..oscillating condition....on the order of 0.5 volt.
Meter reading will depend upon tube characteristics, resistance of meter used, length of meter leads, and frequency to which the record player oscillator is tuned.



Tube	Position	Plate	Screen	Cathode
6A8	1st. Det. Osc.	230	75	2.2
6K7	I.F.	230	75	3.0
6Q7	2nd. Det.	90*		1.5
6J7	Mike Amp.	45 to 65*	30*	.8
6K6	Output	215	235	13.5

NOTE: This is a typical voltage analysis made by use of standard 1000 ohm per volt voltmeter, using the 300 volt scale for plate and screen voltage readings.

* Not actual voltages due to large values of resistance in circuit between supply voltage and point of measurement. These voltage values may vary considerably, depending upon the resistance of voltmeter used.

Line Voltage----------118
P5 or C26 to GND.-------350
P1 or C27 to GND.-------240
P5 to P1 (sp'kr field)--110
C30 to GND.------------150

Aerial disconnected.
All voltage measurements made against ground (chassis) except as noted.

January 1 1942

MODELS A-104,A-107

WILCOX-GAY CORP.

Alignment Data

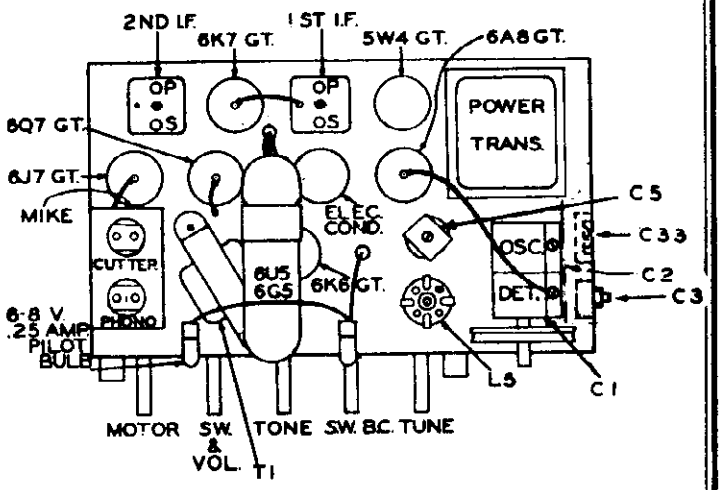
An OUTPUT METER or other indicating device should be used for accuracy in making ganging adjustments.

If an output meter is not available, the magic eye (6U5) may be used as an output indicator as follows:

(a) Depress push-button No. 4 "To Record Radio"

(b) Disconnect cutting-head from chassis.

(c) Adjust volume control to near maximum.



Connect signal generator to control grid of the 6A8 tube.

SIGNAL GENERATOR FREQUENCY	DIAL POSITION	WAVE BAND SWITCH POSITION	TRIMMER NUMBER
456 K.C.	1500 K.C.	Broadcast	2nd. I.F.--S
" "	" "	"	" " P
" "	" "	"	1st. I.F.--S
" "	" "	"	" " P
" "	550 K.C.	"	C-33 *

Connect signal generator to ANT. and GND. leads.

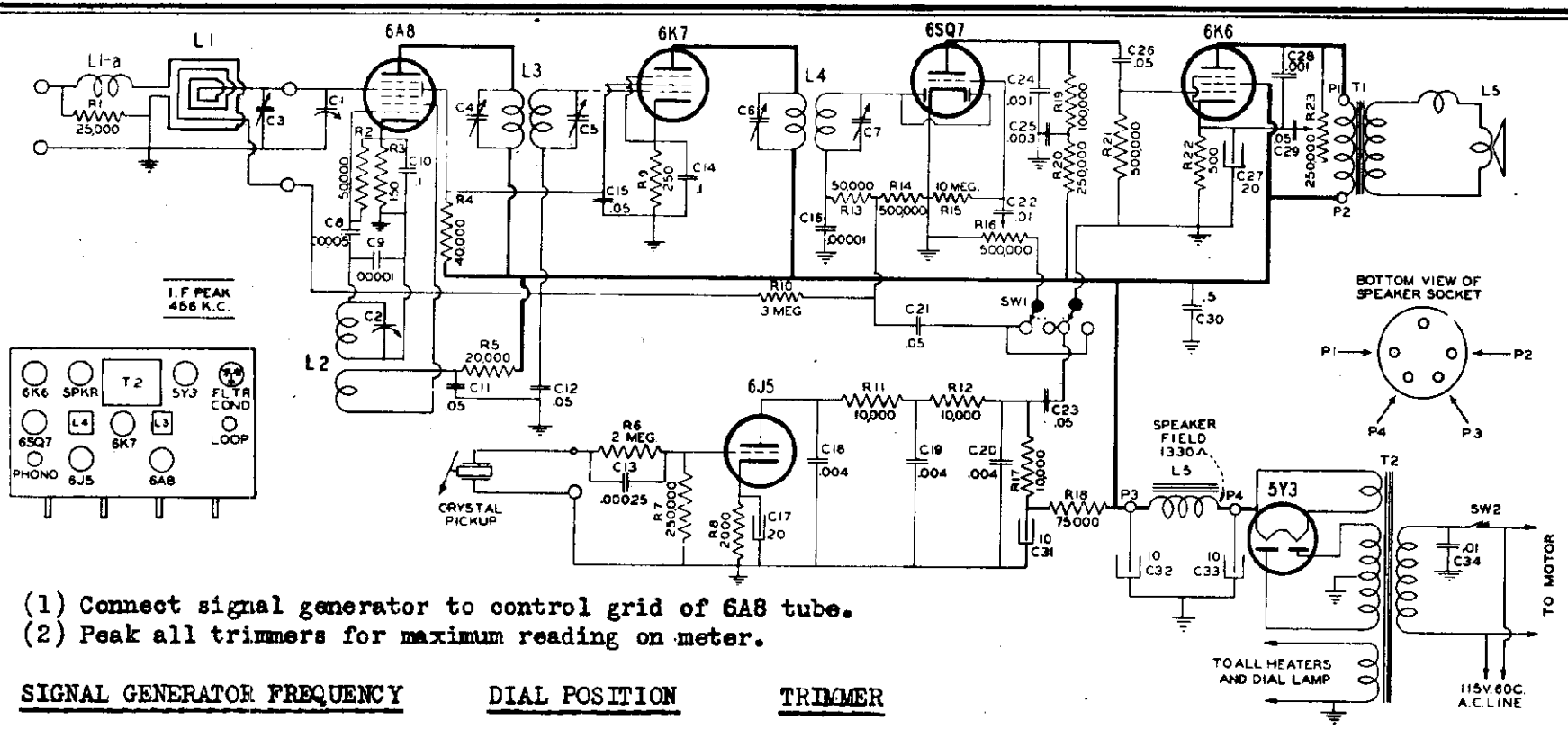
Turn condenser gang to full maximum capacity and check position of dial pointer with reference line on the scale, which is the last graduation below the 550 K.C. calibration.

600 K.C.	600 K.C.	Broadcast	L.F.Pad (C-3)
1400 K.C.	1400 K.C.	"	Osc.(C-2)
" "	" "	"	Det.(C-1)
Not used **	15-16 M.C.	Short Wave	Ant.(C-5)

The entire alignment procedure should be repeated to obtain greatest accuracy in the adjustment of the trimming condensers.

* Adjust C-33 trimmer for MINIMUM signal.

** Connect antenna to receiver, and adjust dial so that no station is received. Advance volume control until a fair volume of noise is received. Adjust trimmer for greatest noise.



(1) Connect signal generator to control grid of 6A8 tube.
(2) Peak all trimmers for maximum reading on meter.

SIGNAL GENERATOR FREQUENCY	DIAL POSITION	TRIMMER
456 K.C.	1700 K.C.	I.F. - C4
" "	" "	I.F. - C5
" "	" "	I.F. - C6
" "	" "	I.F. - C7

Check the alignment of the pointer with reference line below the 550-kc mark on the scale.

Connect signal generator to ANT. and GND. terminals.

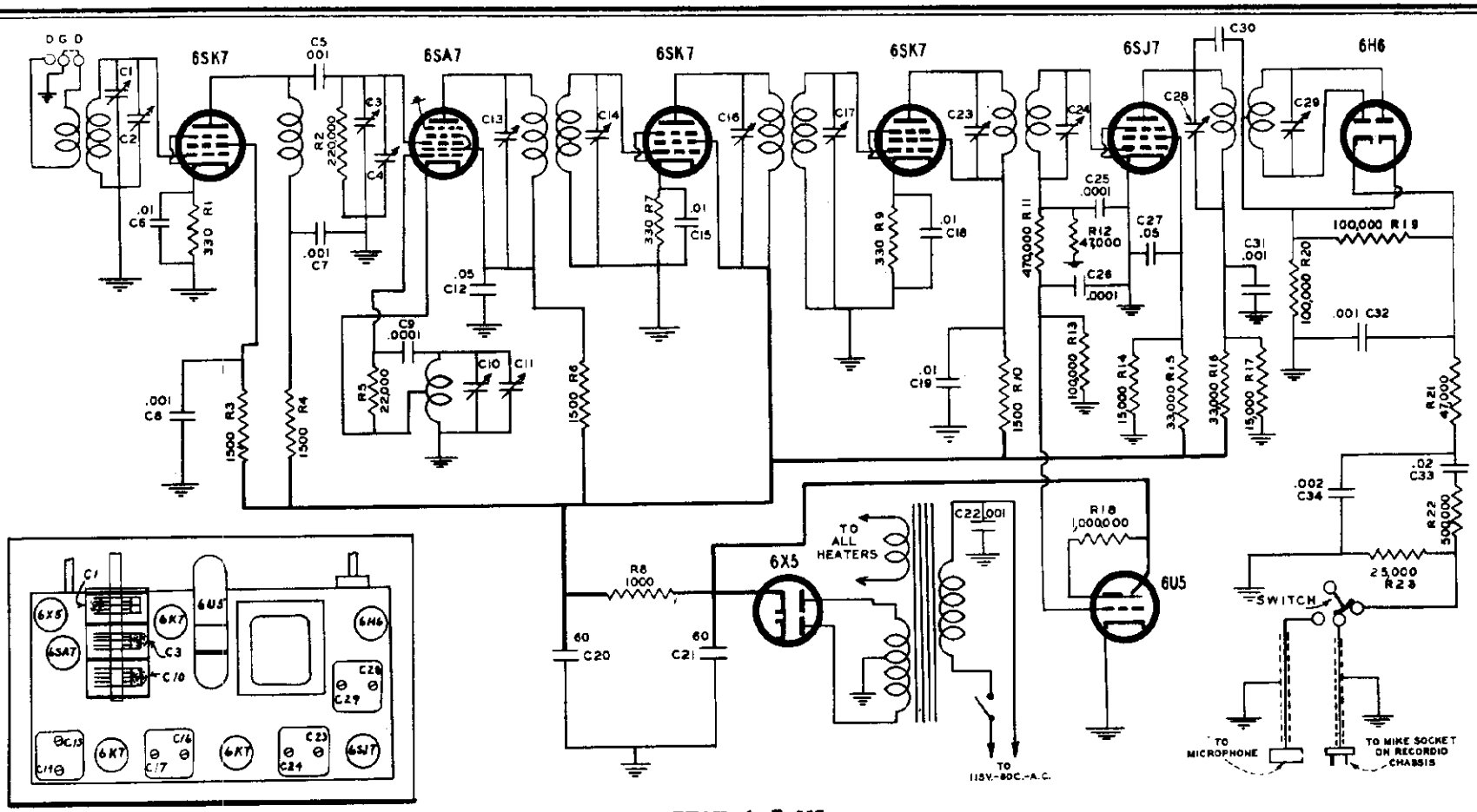
1400 K.C.	1400 K.C.	C2-Osc.
" "	" "	Trimmer on Loop - R.F.

The Oscillator trimmer C2 is on the front section of the gang condenser.

NOTE: In the event of loop antenna replacement, the R.F. alignment should be checked at 600 K.C., and if necessary, inductance of the loop may be adjusted to bring about correct alignment of the dial at 600 K.C., by dressing the end of the inside loop turn to provide more or less inductance as required.

Ad adjustment of loop inductance should be followed by re-alignment of the R.F. trimmers at 1400 K.C.

FOR DATA ON INSTA-MATIC RECORD CHANGER, SEE INDEX



IF PEAK 4.3 MC

SCHEMATIC DIAGRAM for MODEL A-106
FREQUENCY MODULATION UNIT

TUBE	DESCRIPTION	PLATE	SCREEN	CATHODE
6SK7	R-F Amplifier	105	36	3.6
6SA7	1st Det-Ocs	100	100	0
6SK7	1st I.F.	105	110	3.6
6SK7	2nd I.F.	105	110	3.0
6SJ7	Limiter	26	38	0
6H6	Discriminator	---	---	---
6U5	Tuning Eye	Term.No.4 - 163	Term.No.2 15	
6X5GT	Rectifier	0	---	163

Line Voltage----------117
Cathode Rect. to Gnd.---163

Aerial Disconnected
All Voltages Measurements made against ground (chassis)

WILCOX-GAY CORP.

WILCOX-GAY CORP.

DISCRIMINATOR ALIGNMENT

Connect the audio output leads of the F. M. unit to any convenient audio amplifier or "Phono" plug of any receiver, and connect an output meter (having a low range of 1 to 5 Volts) across the voice coil of the speaker. Temporarily increase the gain of the 6SJ7 limiter tube by shunting a 2,000 ohm resistor across the transformer, No. 01860. Apply a 4.3 mc. signal to the grid of the limiter tube through an .05 mfd. coupling condenser.

When a Frequency Modulated signal is used for aligning the Discriminator, the adjustment is made for maximum output in much the same manner as the conventional alignment of a 456 KC (AM) I. F. transformer on an AM signal, but if only an AM generator is available for aligning the Discriminator, the primary is aligned for maximum output and the secondary for balance or zero output, since one of the functions of the Discriminator is to eliminate amplitude modulated signals.

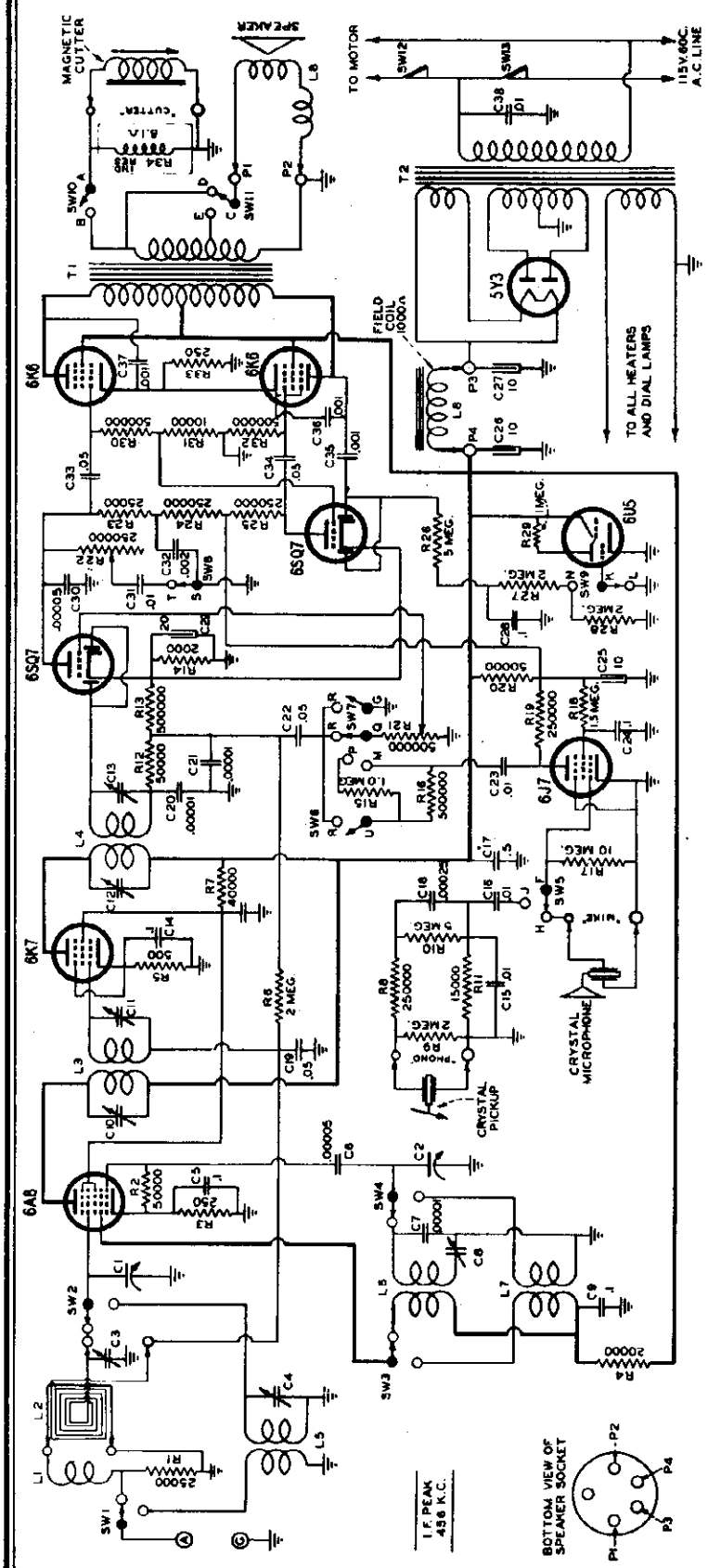
In tuning the secondary of the discriminator there are three places of minimum response; (1) out of resonance with the condenser too tight, (2) CORRECT, and (3) out of resonance, with the condenser too loose. The proper minimum has the characteristic that the signal rises very rapidly as the trimmer is turned IN EITHER DIRECTION. The other two minima mentioned above DO NOT have this characteristic and are incorrect. The trimmer farthest from the 6SJ7 tube tunes the secondary of the discriminator and by slowly rotating this trimmer the point of minimum audio response will be found and will indicate correct alignment of this trimmer. Now MISTUNE this trimmer as little as possible but enough to hear a signal and to obtain an output meter indication with which to align the primary trimmer for MAXIMUM response. Leaving the secondary trimmer mistuned, to assist in the I. F. alignment, move the signal input to the grid of the second 6SK7 I.F. amplifier tube, and align this stage, always reducing input as sensitivity increases so as to remain below the level at which the "Limiter" works. Unless this precaution is observed, the resonance indication is broadened. In the same way align the remaining I.F. transformers finishing with the signal applied to the 6SA7 grid. The SECONDARY of the discriminator may now be retuned to minimum response and the 2000 ohm shunt resistor removed, completing the I.F. alignment.

R. F. ALIGNMENT

For reasons of stability, the oscillator in the F.M. unit operates on the low side of R.F. signal. Because of the high intermediate frequency (4.3 mc) there is no possibility of aligning the oscillator on the image. If there is reason to believe that the trimmers are badly out of alignment, a very practical initial adjustment would be to adjust ALL THREE TRIMMERS to a position about one-fourth turn from maximum capacity. Then apply a 48 mc. signal (or equivalent harmonic of some lower frequency) to the antenna terminals of the Receptor through a dummy antenna of 200 to 400 ohms, set the pointer to 48 mc. and adjust the trimmer on the center (oscillator) section of the gang condenser to give the maximum response OF THE TUNING EYE. Align the antenna (front) and R.F. (rear) trimmers for maximum response and check the sensitivity at various points within the band. When properly aligned the antenna and oscillator trimmers are about one-fourth turn from maximum capacity with the R. F. trimmer about two turns from minimum.

MODELS A-111,A-112

WILCOX-GAY CORP.



Tube	Position	Plate	Screen	Cathode	G_A
6A8	Det. Oscillator	250	100	2.6	165
6K7	I. F.	250	100	4.0	
6SQ7	2nd. Det.	75*	---	1.0	
6SQ7	1st. Audio	70*	---	1.0	
6J7	Speech Amp.	40*	50*	0	
6Y6	Push Pull	240	250	20.	
6K6	Audio	240	250	20.	
5Y3	Rectifier	---	---	345.	

Line Voltage----------115
C27 to GND.----------345
C26 to GND.----------235
Speaker Field Voltage-100

Aerial Disconnected.
Volume Control - Minimum
All Voltage Measurements made from noted point to ground (chassis) except as noted.

FOR DATA ON INSTA-MATIC RECORD CHANGER, SEE INDEX

WILCOX-GAY CORP.

An OUTPUT METER or other indicating device should be used for accuracy in making ganging adjustments.

If an output meter is not available, the magic eye (6U5) may be used as an output indicator as follows:

(a) Depress push button "To Record Radio".

(b) Disconnect cutting head from chassis.

(c) Adjust volume control to near maximum.

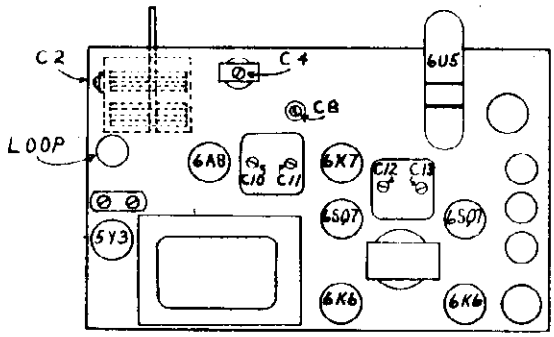


FIG. 2

(1) Connect signal generator to control grid of 6A8 tube and chassis.

SIGNAL GENERATOR FREQUENCY	DIAL POSITION	WAVE BAND SWITCH POSITION	TRIMMER NUMBER
456 K.C.	1500 K.C.	Broadcast	2nd. I.F. - Sec.* C13
" "	" "	"	" " - Pri. C12
" "	" "	"	1st. I.F. - Sec. C11
" "	" "	"	" " - Pri. C10

(2) Connect signal generator to ANT. and GND. terminals.

Turn condenser gang to full maximum capacity and check position of dial pointer with reference line on the scale, 530 K.C. calibration.

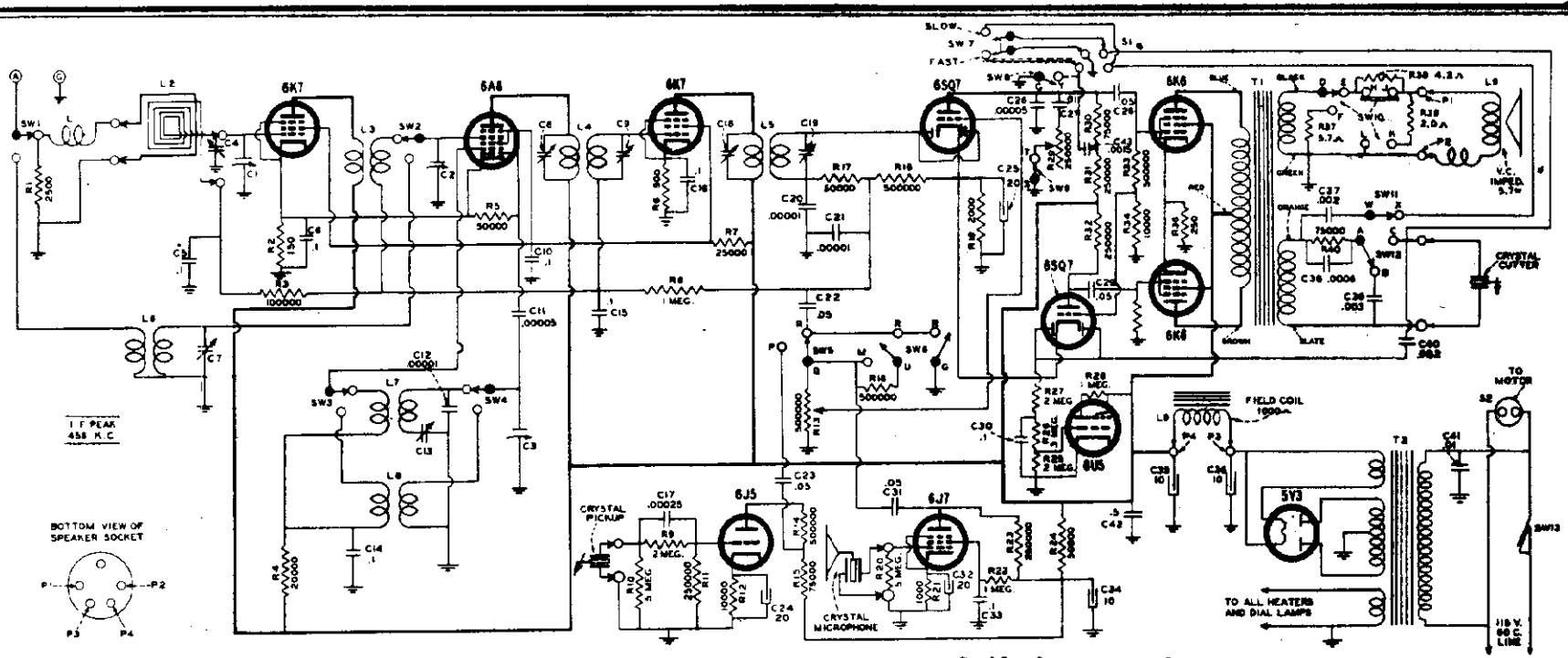
600 K.C.	600 K.C.	Broadcast	L.F. Pad. (C-8)
1400 K.C.	1400 K.C.	"	Osc. (C-2)
1400 K.C.	1400 K.C.	"	Det. Trimmer on Loop
Not Used**	15-16 M.C.	Short Wave	Trimmer (C-4)

It is advisable to repeat the entire alignment procedure to correct the slight effect one adjustment may have upon the other.

As resonance is approached by adjustment of the trimmers, the signal generator attenuator should be adjusted for a minimum signal that will provide a low reading on the output indicator.

* If the trimming condenser on the secondary of the second I.F. transformer is adjusted throughout its full range, two "peaks" will be observed. The correct peak is the one of lowest capacity in the adjustment of the trimmer. The I.F. trimming condensers when properly adjusted will rest at approximately one and one half turns from the fully closed position.

** Connect antenna to receiver, and adjust dial so that no station is received. Advance volume control until a fair volume of noise is received. Adjust trimmer for greatest noise.



Tube	Position	Plate	Screen	Cathode	GA
6K7	R. F.	235	95	2.5	
6A8	1st. Detector	235	95	2.4	140
6K7	I. F.	235	95	3.6	
6SQ7	2nd. Detector	165		-1.2	
6SQ7	1st. Audio	165		-1.2	
6J5	Phono Amp.	35*		.8	
6K6	Push Pull	225	235	20.	
6K6	Audio	225	235	20.	
5Y3	Rectifier			355.	
6J7	Speech Amp.	25*	30*	.8	

FOR DATA ON INSTA-MATIC RECORD CHANGER, SEE INDEX

Line Voltage----------115
C36 to Gnd.----------355
C35 to GND.----------255
Speaker Field Voltage----100

Aerial Disconnected.
Volume Control - Minimum
All Voltage Measurements made from noted point to ground (chassis) except as noted.

WILCOX-GAY CORP.

An OUTPUT METER or other indicating device should be used for accuracy in making gauging adjustments.

If an output meter is not available, the magic eye (6U5) may be used as an output indicator as follows:

(a) Depress push button "To Record Radio".

(b) Disconnect cutting head from chassis.

(c) Adjust volume control to near maximum.

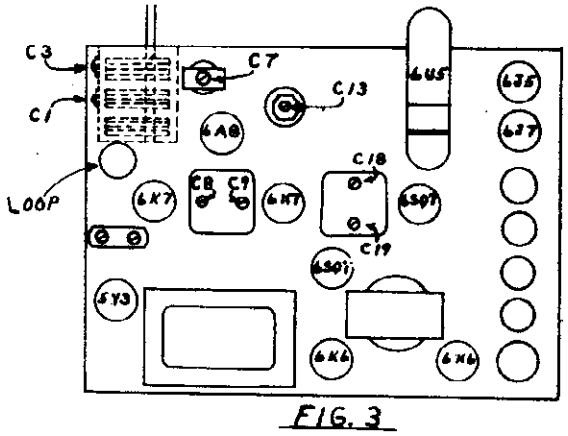


FIG. 3

Connect signal generator to control grid of 6A8 tube. Make connection to side of middle section (C3) of condenser gang. (Fig. 11)

SIGNAL GENERATOR FREQUENCY	DIAL POSITION	WAVE BAND SWITCH POSITION	TRIMMER NUMBER
456 K.C.	1500 K.C.	Broadcast	2nd I.F. - C19
" "	" "	"	" " - C18
" "	" "	"	1st I.F. - C 9
" "	" "	"	" " - C 8

Connect signal generator to ANT. and GND. terminals.

600 K.C.	600 K.C.	Broadcast	L.F. Pad (C-13)*
1400 K.C.	1400 K.C.	"	Osc. (C- 3)
1400 K.C.	1400 K.C.	"	Det. (C- 1)
1400 K.C.	1400 K.C.	"	Trimmer on Loop (P.
Not Used**	15-16 M.C.	Short Wave	R.F. (C- 7)

As resonance is approached by adjustment of the trimmers, the signal generator attenuator should be adjusted for a minimum signal that will provide a low reading on the output indicator.

It is advisable to repeat the entire alignment procedure to correct the slight effect one adjustment may have upon the other.

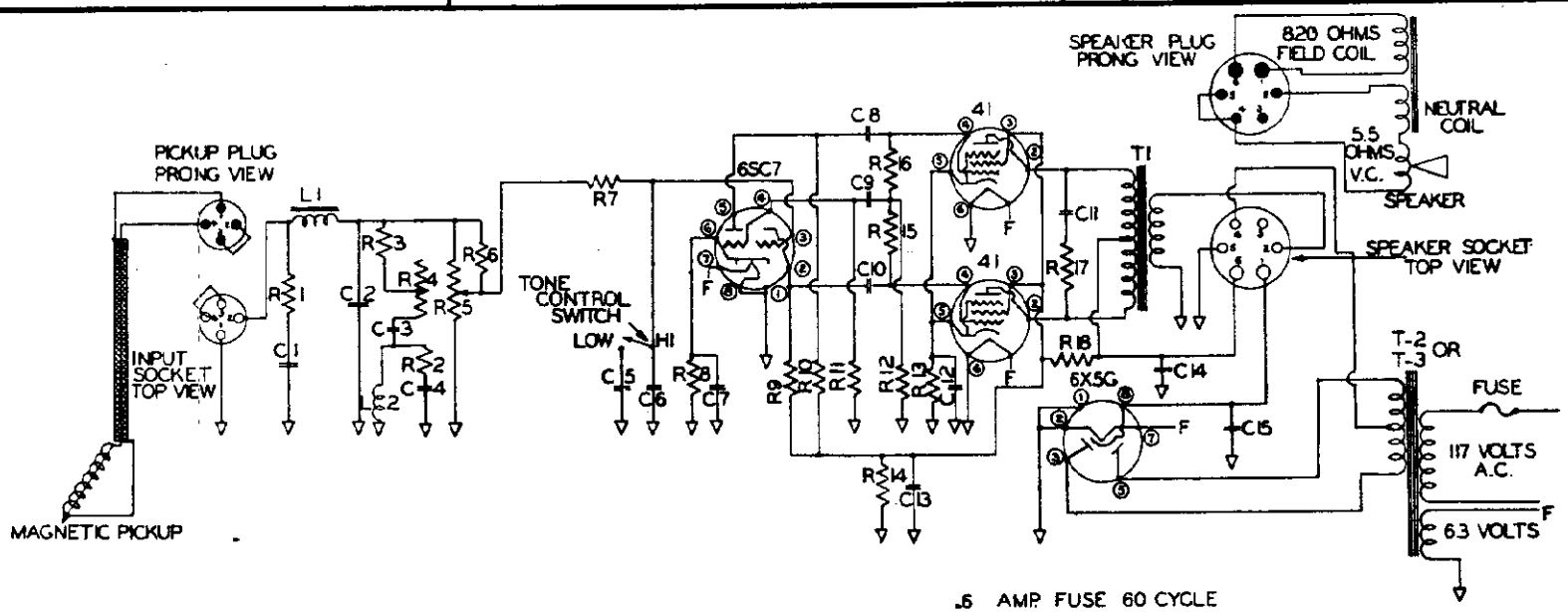
* First note the position of the dial pointer with the condenser gang turned to full maximum capacity. The left edge of the pointer should be slightly to the right of the last dial graduation.

In adjusting the L.F. Pad.(C-13) rock the condenser gang back and forth across the 600 K.C. signal and note that maximum output meter reading coincides with the 600 K.C. dial graduation. If the dial reading is other than 600 K.C., reset the dial pointer on the dial cord, to read 600 K.C. at maximum output meter indication.

** Connect antenna to receiver, and adjust dial so that no station is received. Advance volume control until a fair volume of noise is received. Adjust trimmer (C-7) for greatest noise.

SOUND SYSTEM FOR MODEL 41 — 38655

PICKUP PART NO. 34968	AMPLIFIER 0413 25 CYCLE 37263 041 50-60 CYCLE 36073	SPEAKER MAGNAVOX 35948



.6 AMP. FUSE 60 CYCLE
.75 AMP. FUSE 25 CYCLE

ITEM	PART NO.	VALUE	REMARKS
		RESISTORS	
R1	22530	1000 OHMS	± 10 % ½ WATT
R2	22530	1000 OHMS	± 10 % ½ WATT
R3	35945	100 OHMS	± 10 % ½ WATT
R4	35931	1000 OHMS	DUAL VOLUME CONTROL
R5		150000 OHMS	
R6	35946	27000 OHMS	± 10 % ½ WATT
R7	35925	82000 OHMS	± 10 % ½ WATT
R8	35926	2700 OHMS	± 10 % ½ WATT
R9	22528	220000 OHMS	± 10 % ½ WATT
R10	22528	220000 OHMS	± 10 % ½ WATT
R11	35934	560000 OHMS	± 10 % ½ WATT
R12	20855	150000 OHMS	± 10 % ½ WATT

ITEM	PART NO.	VALUE	REMARKS
		RESISTORS	
R13	35928	390 OHMS	± 10 % 1 WATT
R14	35922	82000 OHMS	± 10 % 1 WATT
R15	35923	330000 OHMS	± 10 % ½ WATT
R16	35923	330000 OHMS	± 10 % ½ WATT
R17	35929	15000 OHMS	± 10 % ½ WATT
R18	35921	4700 OHMS	± 10 % 1 WATT

ITEM	PART NO.	VALUE	REMARKS
		CONDENSERS	
C1	35940	.003 MFD	± 10 % 100 W.V.
C2	35943	.005 MFD	± 20 % 100 W.V.
C3	35941	.5 MFD	± 10 % 100 W.V.
C4	35942	.008 MFD	± 10 % 100 W.V.
C5	35927	.001 MFD	± 10 % 200 W.V.
C6	35930	.0006 MFD	± 10 % 200 W.V.
C7	36432	20. MFD	25 W.V.
C8	22850	.01 MFD	± 10 % 400 W.V.
C9	22850	.01 MFD	± 10 % 400 W.V.
C10	22850	.01 MFD	± 10 % 400 W.V.
C11	35939	.006 MFD	± 10 % 1200 W.V.
C12	35920	20. MFD	25 W.V.

ITEM	PART NO.	VALUE	REMARKS
		CONDENSERS	
C13		10. MFD	350 W.V.
C14	35920	10. MFD	350 W.V.
C15		10. MFD	450 W.V.
		CHOKES	
L1	35933	290 MILLIHNR	COIL
L2	35917	400 MILLIHNR	COIL
		TRANSFRMRS	
T1	35918		AUDIO OUTPUT
T2	35915	50-60 CYCLE	POWER
T3	37264	25 CYCLE	POWER

VOLTAGES AND CURRENTS OF MODEL 041 AMPLIFIER — ALL MEASUREMENTS MADE WITH LINE VOLTAGE 117 VOLTS 60 OR 25 CYCLES A.C.
ALL VOLTAGES MEASURED WITH 1000 OHMS PER VOLT VOLTMETER (ALL VOLTAGES OVER 50 VOLTS USE 500 VOLT SCALE)

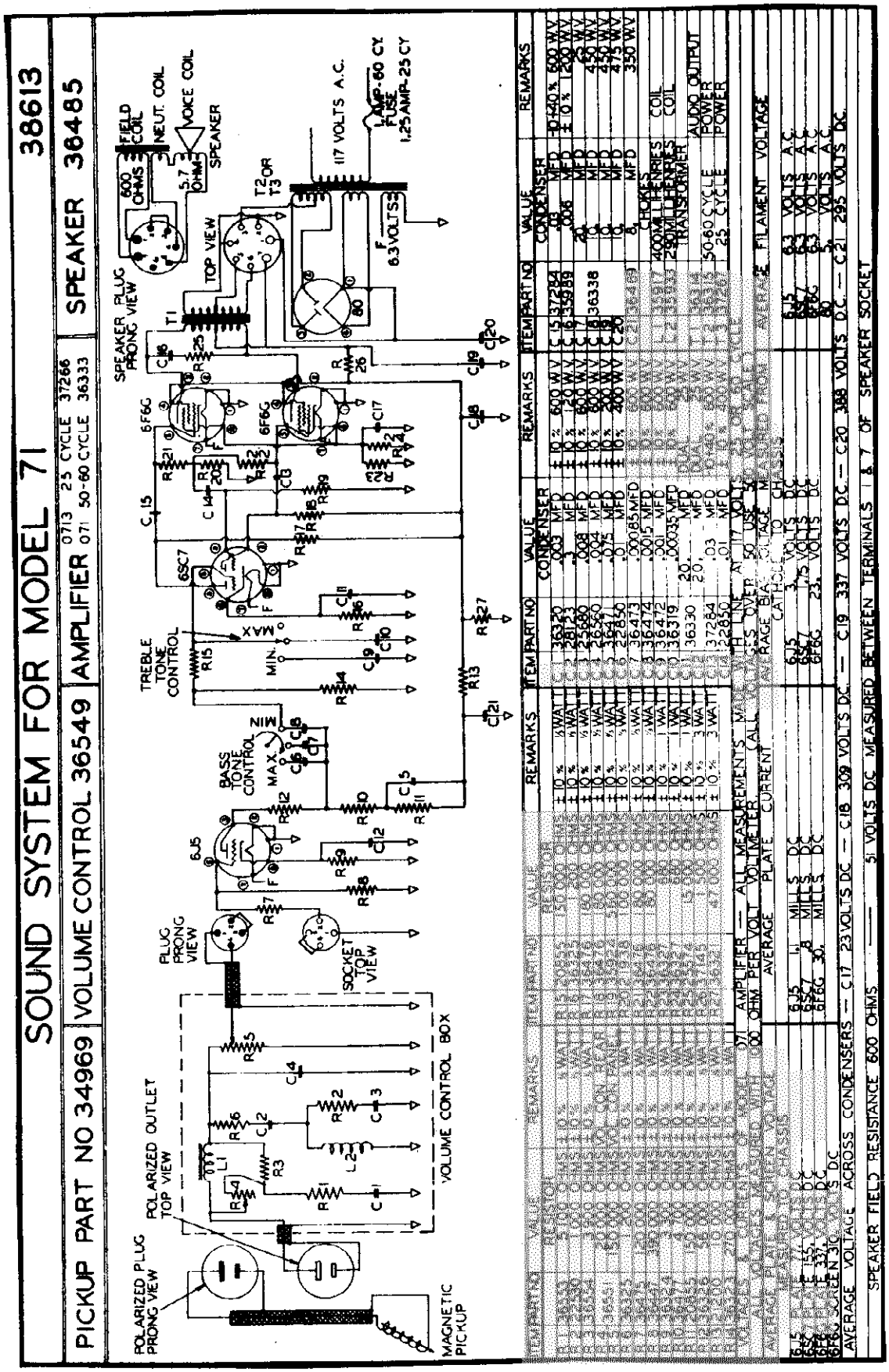
AVERAGE PLATE AND SCREEN VOLTAGE MEASURED TO CHASSIS	AVERAGE PLATE CURRENT	AVERAGE BIAS VOLTAGE MEASURED FROM CATHODE TO CHASSIS	AVERAGE FILAMENT VOLTAGE
6SC7 PLATE 149 VOLTS D.C.	6SC7 .4 MILLS. D.C.	6SC7 2.25 VOLTS D.C.	6SC7 6.3 VOLTS A.C.
41 PLATE 321 VOLT DC SCR'N 258 VOLT DC	41 23. MILLS. D.C.	41 20.5 VOLTS D.C.	41 6.3 VOLTS A.C.
			6X5G 6.3 VOLTS A.C.

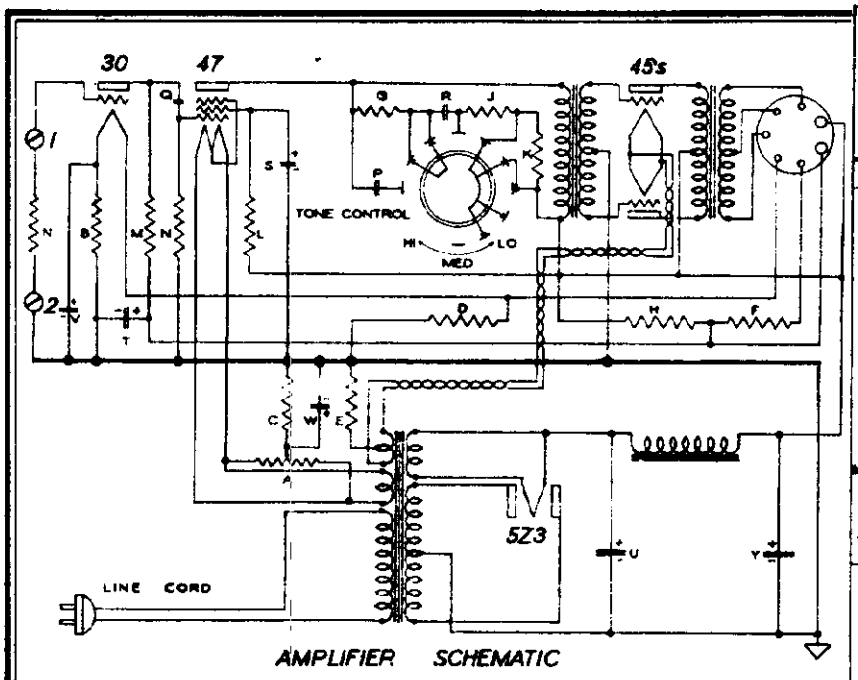
AVERAGE VOLTAGE ACROSS CONDENSER C13 267 VOLTS D.C. — CONDENSER C14 323 VOLTS D.C. — CONDENSER C15 370 VOLTS D.C.

SPEAKER FIELD 820-OHMS. BETWEEN TERMINALS 1 & 6 ON SPEAKER SOCKET 48 VOLTS D.C.

MODELS 071,0713

RUDOLPH WURLITZER CO.





AMPLIFIER SCHEMATIC

Connection
NO Connection
Ground
Ohm
Kilohm
Megohm

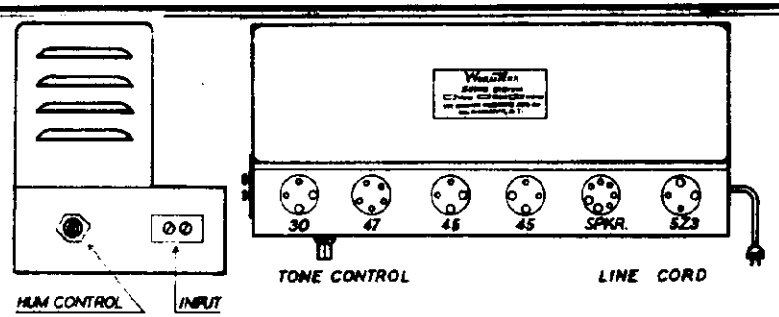
PARTS LIST

amplifier unit

A	30Ω	Hum Control
B	65Ω	w.w. res.
C	500Ω	w.w. res.
D	280Ω	volt. div.
E	775Ω	volt. div.
F	1850Ω	volt. div.
G	4800Ω	carbon.
H	7000Ω	volt. div.
J	1500Ω	carbon w/2
K	4 MΩ	carbon w/2
L	8 MΩ	carbon w/1
M	100MΩ	carbon w/4
N	0.5Ω	carbon w/4
P	.01mf.	600v paper
Q	.05mf.	400v paper
R	.3mf.	400v paper
S	2 mf.	450v. dry
T	8 mf.	200v dry
U	8 mf.	475v wet
V	10 mf.	25v. dry
W	25mf	25v. dry
Y	30mf	400v. wet

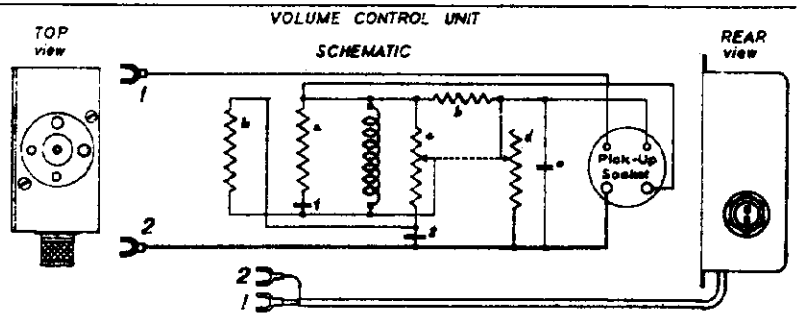
volume control unit

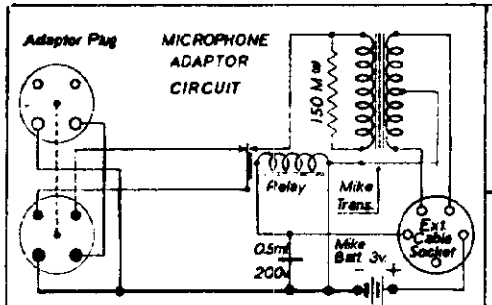
a	15MΩ	carbon w/4
b	80MΩ	carbon w/4
c	50 MΩ	dual var.
d	150MΩ	dual var.
e	0.001mf.	mica
f	0.004mf.	mica
g	.2mf.	200v. paper



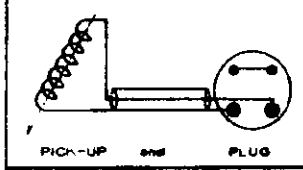
END VIEW ——— MODEL 550 AMPLIFIER ——— TOP VIEW

VOLUME CONTROL UNIT

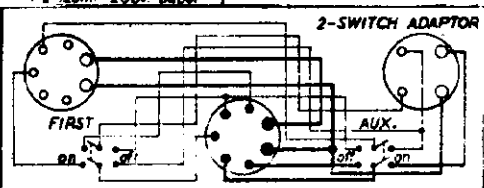


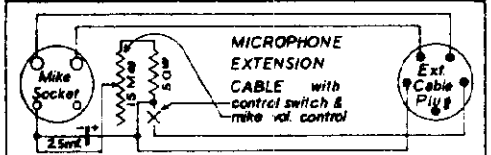


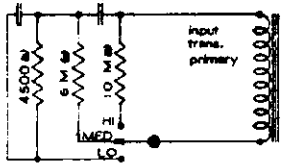
Insert adaptor plug between pick-up plug and its socket.



PICK-UP end PLUG

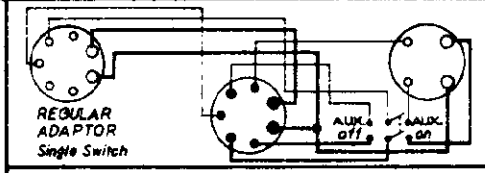


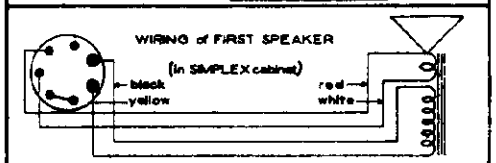


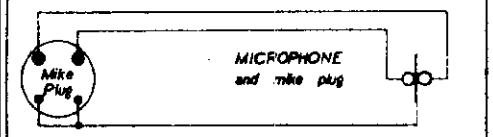


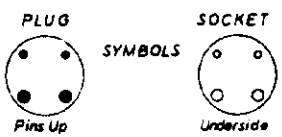
ELECTRICAL EQUIVALENT not wiring equivalent OF TONE CONTROL CIRCUITS

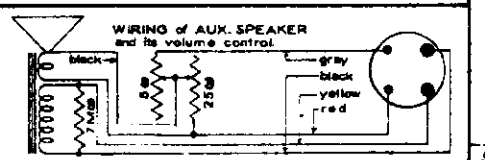
Presented only for simplicity of checking tone control operation.











NOTES

Measure all D.C. voltages from chassis with a 1000 ohm per volt meter with the line at 115volts 60 cycles.

AVERAGE D.C. VOLTAGES

45 Plates	338v.	45 Bias	57.5v
47 Plate	313v.	47 Bias	19v.
30Plate	75v.	30 Bias	4.1v
47 Screen	294v.	5Z3 Fil.	365v.
Across cond. Y	340v.	Across cond. T	170v.

Letters on circuit diagrams refer to list of values and ratings of component parts.

Terminals 1&2 of the volume control unit connect to the corresponding amplifier input terminals.

SERVICE SCHEMATIC

SIMPLEX POWER AMPLIFIER

MODEL 550

SERIAL NUMBER SERIES 5 500 001

DRAWING NUMBER 97

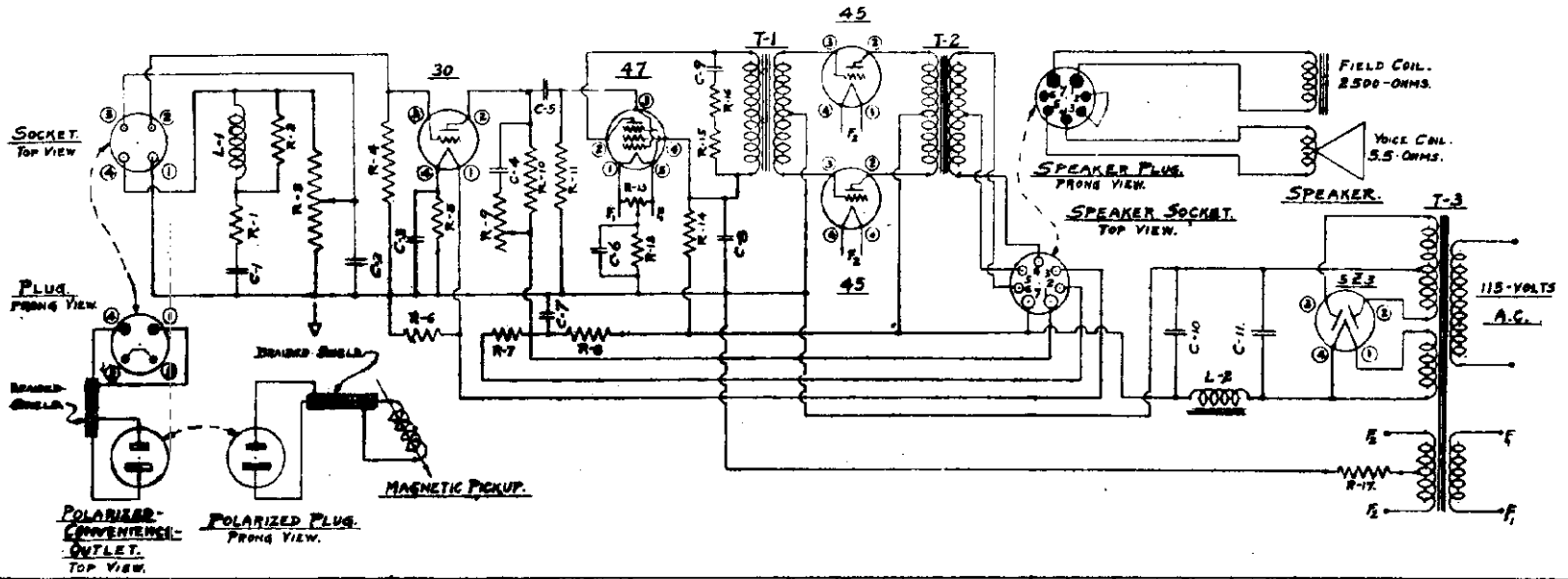
9-1-35

RUDOLPH WURLITZER CO.

WURLITZER PAGE 13-
MODEL 550

SOUND SYSTEM FOR MODEL-P-30.

PICKUP PART Nº 20141.	AMPLIFIER *-551 : 25-CYCLE *21116.-60-CYCLE *20915.	SPEAKER-PART Nº 20756.



ITEM	PART Nº	VALUE	REMARKS
		RESISTORS	
R-1	21300	10 000-OHMS	±10% ½ WATT.
R-2	21300	10 000-OHMS	±10% ¼ WATT.
R-3	20764	150 000-OHMS	VOLUME CONTROL.
R-4	20759	800 000-OHMS	±10% ½ WATT
R-5	20197	63-OHMS	±5% ½ WATT
R-6		250-OHMS	VOLTAGE DIVIDER.
R-7	20145	1850-OHMS	VOLTAGE DIVIDER.
R-8		7000-OHMS	VOLTAGE DIVIDER.
R-9	20764	150 000-OHMS	TONE CONTROL
R-10	4507	100 000-OHMS	±10% ½ WATT
R-11	20759	800 000-OHMS	±10% ½ WATT
R-12	20158	500-OHMS	±10% 2-WATT
R-13	20483	20-OHMS	HUM CONTROL
R-14	20779	1200-OHMS	±10% 10-WATT.
R-15	20264	1500-OHMS	±10% ½-WATT.
R-16	30145	4500-OHMS	VOLTAGE DIVIDER
R-17		775-OHMS	VOLTAGE DIVIDER.

ITEM	PART Nº	VALUE	REMARKS
		CONDENSERS	
C-1	20133	.25 - MFD.	+10%-20% 200-VOLT
C-2	20865	.0013 - MFD	±10%
C-3	20129	.10 - MFD	25-VOLT.
C-4	20789	.02 MFD.	+20% -10% 400-VOLT.
C-5	20131	.05 - MFD.	+20% -10% 400-VOLT.
C-6	20128	25 - MFD.	25 VOLT.
C-7	20778	8 - MFD	450 VOLT.
C-8		8 - MFD	450-VOLT.
C-9	20779	.5 MFD	±25% 400-VOLT.
C-10	20139	30 - MFD	400 VOLT.
C-11	20513	8 - MFD	475-VOLT.
C-12			
C-			

ITEM	PART Nº	VALUE	REMARKS
		TRANSFORMERS	
T-1	20590		AUDIO INPUT
T-2	20767		AUDIO OUTPUT
T-3	5041		POWER TRANSFORMER
T-4			
T-5			
		CHOKES	
L-1	20765		AIR CORE
L-2	5048		POWER FILTER CHOKE
L-3			
		SPEAKER	
	20757	FIELD - 2500-OHM	VOICE COIL - 5.5-OHMS.

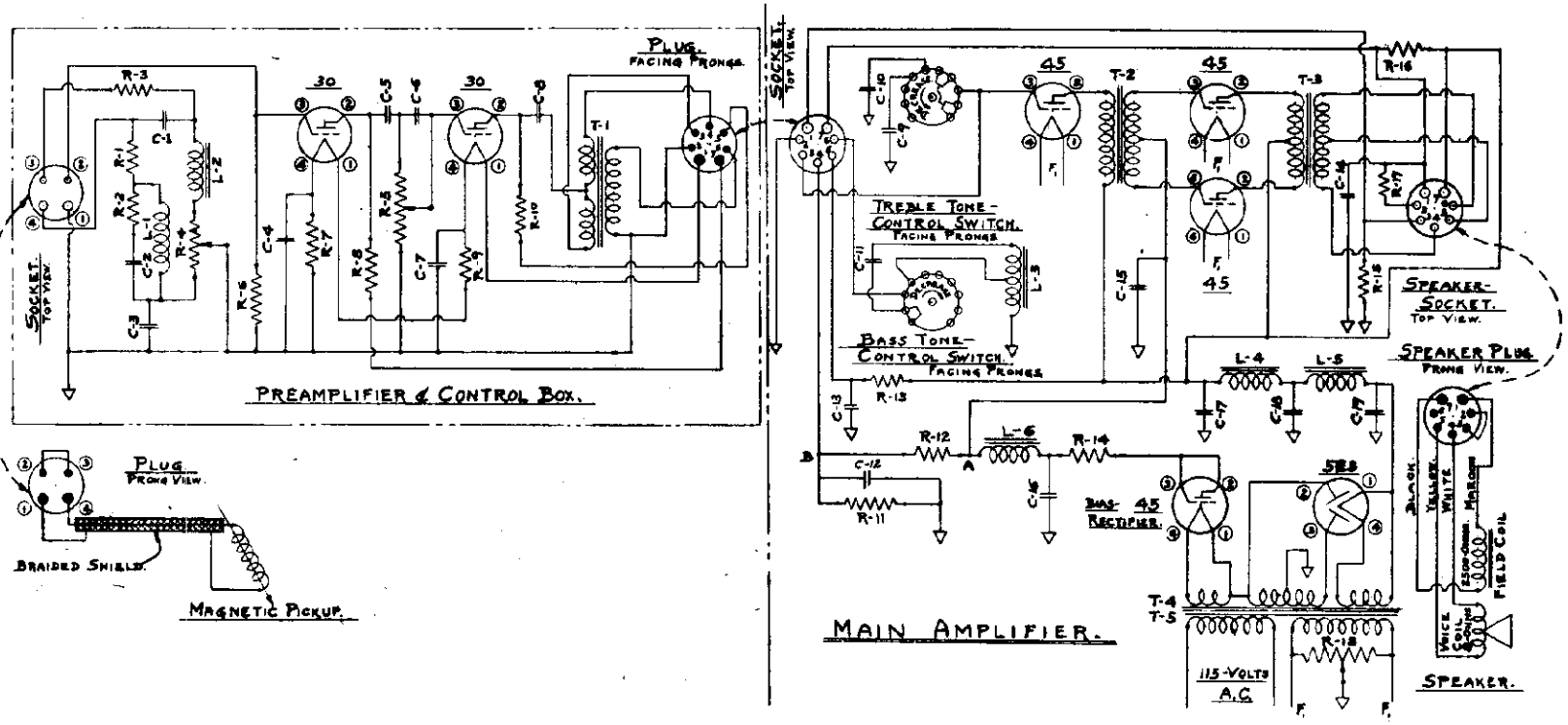
VOLTAGES AND CURRENTS OF MODEL *551-AMPLIFIER. ALL MEASUREMENTS MADE WITH LINE VOLTAGE 115-VOLTS.
ALL VOLTAGES MEASURED WITH 1,000-OHMS PER VOLT VOLTMETER.

AVERAGE PLATE VOLTAGE MEASURED FROM PLATE + TO CHASSIS −.		AVERAGE PLATE CURRENT:-		AVERAGE BIAS VOLTAGE MEASURED FROM CENTER TAP OF FILAMENT TO CHASSIS:-		AVERAGE FILAMENT VOLTAGE:-	
OUTPUT -45	388-VOLTS D.C.	OUTPUT -45	37.0-M.A.D.C.	OUTPUT -45	57.5-VOLTS D.C.	RECTIFIER 5Z3	5.0-VOLTS A.C.
DRIVER -47	313-VOLTS D.C.	DRIVER -47	32.0-M.A.D.C.	DRIVER -47	19.0-VOLTS D.C.	OUTPUT -45	2.5-VOLTS A.C.
DRIVER -30-SCREEN	294-VOLTS D.C.					DRIVER -45	2.5-VOLTS A.C.
						-30	2.0-VOLTS D.C.

AVERAGE VOLTAGES ACROSS SPEAKER FIELDS AND ELECTROLYTIC CONDENSERS.
2500-OHM SPEAKER FIELD VOLTAGE MEASURED FROM *7-CONTACT TO *1- CONTACT ON SPEAKER SOCKET 170-VOLTS D.C.
2500-OHM AUXILIARY SPEAKER FIELD (PARALLEL WITH 7,000-OHM RESISTOR) VOLTAGE MEASURED FROM *3-CONTACT TO *1- CONTACT ON SPKR. SOCKET 160-VOLTS.

C-11	ELECTROLYTIC	365-VOLTS D.C.
C-10	ELECTROLYTIC	340-VOLTS D.C.
C-7	ELECTROLYTIC	170-VOLTS D.C.

SOUND SYSTEM FOR MODEL-P-400.



MAGNETIC PICKUP - PART Nº 20141. PREAMPLIFIER - PART Nº 20700. AMPLIFIER *570 { 25-CYCLE-PART *21060. / 60-CYCLE-PART *20659. SPEAKER - PART Nº 20087.

RESISTORS.

ITEM	PART Nº	VALUE	REMARKS
R-1	20704	3,500 - OHMS	±10 % 4-WATT.
R-2	20704	3,500 - OHMS	±10 % 4-WATT.
R-3	20728	250,000 - OHMS	±20 % 4-WATT
R-4	20123	50,000 - OHMS	REAR UNIT VOL. CONTROL
R-5		150,000 - OHMS	PANEL UNIT VOL. CONTROL
R-6	20703	300,000 - OHMS	±10 % 4-WATT.
R-7	20159	65 - OHMS	± 5 % 2-WATT.
R-8	20266	75,000 - OHMS	±10 % 4-WATT
R-9	20708	50 - OHMS	± 5 % 2-WATT.
R-10	20296	50,000 - OHMS	±10 % 4-WATT.
R-11	20608	3,200 - OHMS	BIAS VOLTAGE DIVIDER.
R-12	20608	350 - OHMS	BIAS VOLTAGE DIVIDER.
R-13	20669	20,000 - OHMS	±10 % 2-WATT.
R-14	20609	6,400 - OHMS	VOLTAGE DIVIDER.
R-15		375 - OHMS	VOLTAGE DIVIDER.
R-16		7,000 - OHMS	VOLTAGE DIVIDER.
R-17		1,000 - OHMS	VOLTAGE DIVIDER.
R-18	20445	20 - OHMS.	HUM CONTROL

CONDENSERS.

ITEM	PART Nº	VALUE	REMARKS
C-1	20706	.08 — MFD.	±10 % - 200 VOLT
C-2	20257	.004 — MFD.	+10 % -20% MICA
C-3	20135	.25 — MFD.	+10%-20%-200-V.
C-4	20612	10.0 — MFD.	25-WORKING VOLTS
C-5	20707	.25 — MFD.	±15% - 400-W.V.
C-6	20705	.00025-MFD.	±15% - MICA
C-7	20612	10.0 — MFD.	25-WORKING VOLTS.
C-8	20707	.25 — MFD.	±15% - 400-W.V.
C-9	20864	.003 — MFD.	±10% - MICA.
C-10	20865	.0015 — MFD.	±10% - MICA.
C-11	20711	.18 — MFD.	±15% - 400-W.V.
C-12	20665	.25 — MFD.	±10% - 200-W.V.
C-13	20130	2.0 — MFD.	450-W.V.
C-14		8.0 — MFD.	2[illegible]
C-15	20617	16.0 — MFD.	1[illegible]
C-16	20617	16.0 — MFD.	1[illegible]
C-17	20139	30.0 — MFD.	4[illegible]
C-18	20139	30.0 — MFD.	4[illegible]
C-19	20813	8.0 — MFD.	4[illegible]

TRANSFORMERS.

ITEM	PART Nº	VALUE	REMARKS
T-1	21048		AUDIO INPUT
T-2	20590		DRIVER INPUT
T-3	20603		AUDIO OUT PUT.
T-4	20582	60 - CYCLE	POWER.
T-5	21086	25 - CYCLE	POWER.

CHOKES.

L-1	20602	540-MILLIHENRIES	CHOKE COIL.
L-2	20610	400-HENRIES.	LOADING REACTOR
L-3	20583	105-HENRIES	TONE REACTOR.
L-4	20596	1.5-HENRIES	#2-POWER FILTER
L-5	20595	6.0-HENRIES	#1-POWER FILTER
L-6	20597	70.0-HENRIES	BIAS FILTER.

VOLTAGES AND CURRENTS.

ALL VOLTAGES MEASURED WITH 1,000-OHMS PER VOLT VOLTMETER. - 115-VOLT LINE.
AVERAGE PLATE VOLTAGE MEASURED FROM PLATE + TO CHASSIS -

OUTPUT - 45	275-VOLTS D.C.
OUTPUT - 45	275-VOLTS D.C.
DRIVER - 45	255-VOLTS D.C.
- 30	128-VOLTS D.C.
- 30	60-VOLTS D.C.

AVERAGE BIAS VOLTAGE MEASURED FROM POINTS INDICATED TO CHASSIS.

OUTPUT - 45	POINT 'A'	57-VOLTS.
DRIVER - 45	POINT 'B'	51-VOLTS.
RECTIFIER-45	PLATE	185-VOLTS.

AVERAGE VOLTAGES ACROSS SPEAKER SOCKET AND ELECTROLYTICS.
CONTACT Nº7-CONTACT ON SPEAKER SOCKET-175-VOLTS D.C.
CONTACT Nº1-CONTACT ON SPKR SOCKET-98-VOLTS D.C.
1000-OHM BUS SPEAKER FIELD FROM Nº3-CONTACT ON SPKR SOCKET-98-VOLTS D.C.
C-16 ELECTROLYTIC - 320-VOLTS D.C.
C-18 ELECTROLYTIC - 305-VOLTS D.C.
C-17 ELECTROLYTIC - 280-VOLTS D.C.

AVERAGE CURRENTS:-

OUTPUT - 45	28 - M.A.
DRIVER - 45	32 - M.A.
- 30	2.1 - M.A.
- 30	.5 - M.A.

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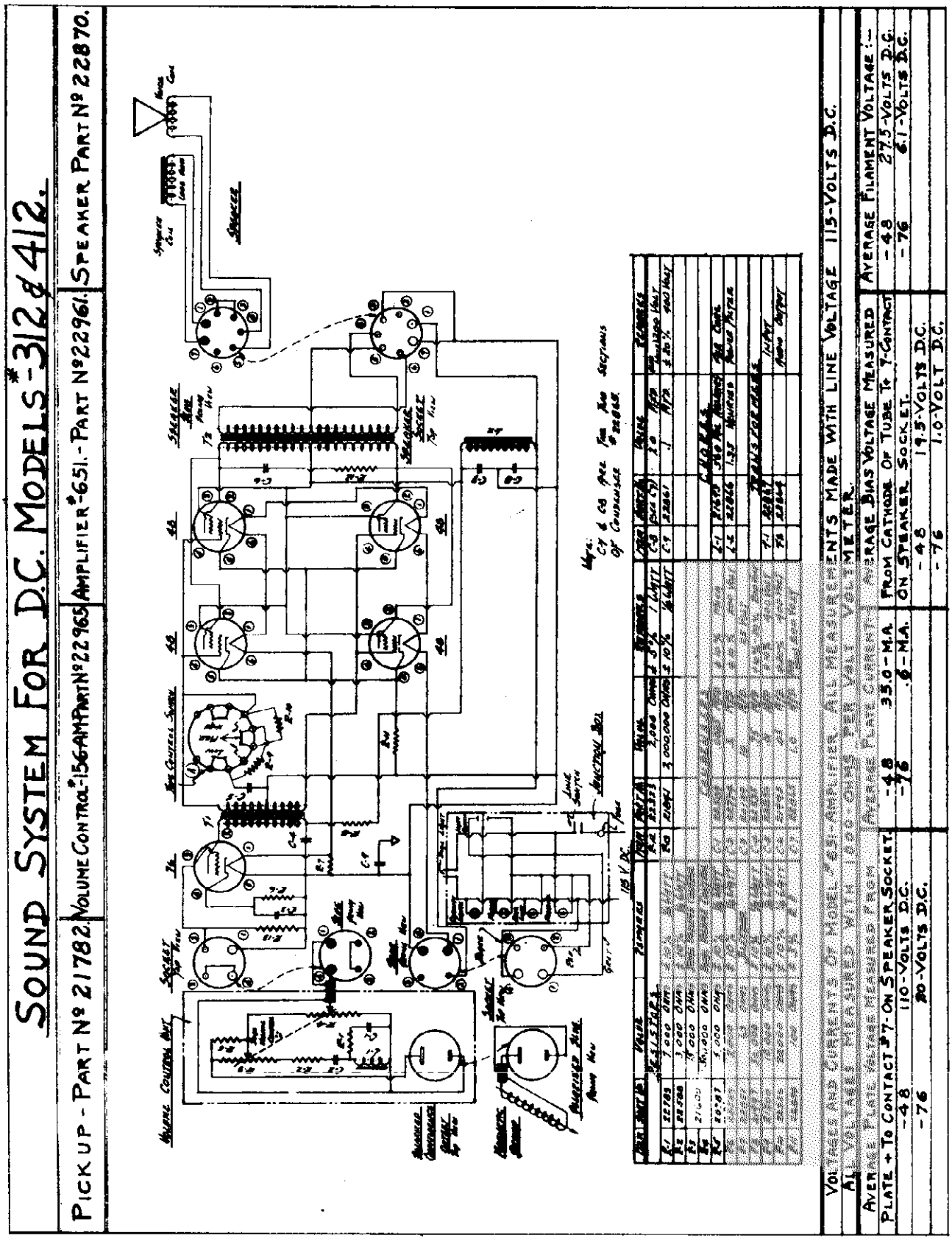
WURLITZER PAGE 1
MODEL 57

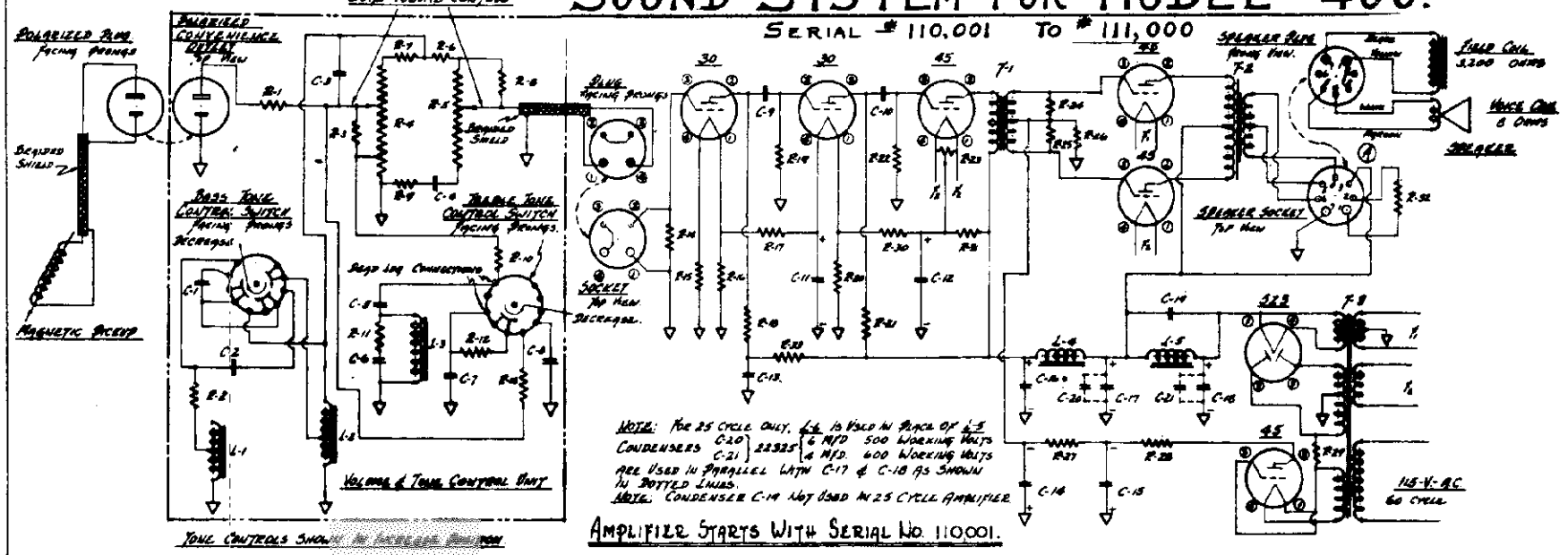
RUDOLPH WURLITZER CO.



PICKUP PART Nº 23223	VOLUME CONTROL #176-AM-PART Nº 23209	AMPLIFIER #671. 25-CYCLE #23744 60-CYCLE #23004	SPEAKER PART Nº 23089

SOUND SYSTEM FOR MODEL-400.

SERIAL # 110,001 TO # 111,000



AMPLIFIER STARTS WITH SERIAL NO. 110001.

ITEM	PART NO.	VALUE		REMARKS	ITEM	PART NO.	VALUE		REMARKS	ITEM	PART NO.	VALUE		REMARKS
RESISTORS							**CONDENSERS**			C-14	23021	8	MFD	150 VOLT
R-1	22329	2,000	OHMS	±10% ½ WATT	C-1	21490	.25	MFD.	±10% 200 VOLT	C-15		8	MFD	150 VOLT
R-2	21999	800	OHMS	±10% ½ WATT	C-2	22535	.75	MFD.	-10%+20% 200 VOLT	C-16	23020	18	MFD	450 VOLT
R-3	20867	13,000	OHMS	±10% ½ WATT	C-3	23221	.18	MFD	±10% 200 VOLT	C-17		6	MFD.	300 VOLT
R-4	23215	100,000	OHMS	±15% VOLUME CONTROL	C-4	22946	.18	MFD	±10% 200 VOLT	C-18		4	MFD	600 VOLT
R-5		150,000	OHMS	±15% VOLUME CONTROL	C-5	22544	.18	MFD	±10% 200 VOLT	C-19	22127	1.25	MFD.	±10% 200 VOLT
R-6	23208	60,000	OHMS	±10% ½ WATT	C-6	22589	.0035	MFD.	±10%	**CHOKES**				
R-7	21988	100,000	OHMS	±10% ½ WATT	C-7	22932	.009	MFD.	±10%	L-1	22314			CHOKE TONE CONTROL
R-8	20750	500,000	OHMS	±20% ½ WATT	C-8	22586	.015	MFD.	±10% 200 VOLT	L-2	23016			FILTER CHOKE
R-9	22329	2,000	OHMS	±10% ½ WATT	C-9	21993	.05	MFD	±20% 400 VOLT	L-3	23017			CHOKE ASSEMBLY
R-10	20787	5,000	OHMS	±10% ½ WATT	C-10	21736	.1	MFD.	±20% 400 VOLT	L-4	23018			2ND FILTER CHOKE
R-11	20787	5,000	OHMS	±10% ½ WATT	C-11	23010	10	MFD.	25 VOLT	L-5	23019			1ST FILTER CHOKE
R-12	20704	3,500	OHMS	±10% ½ WATT	C-12	23009	12	MFD.	150 VOLT	L-6	23746			CHOKE
R-13	20704	3,500	OHMS	±10% ½ WATT	C-13	20736	.3	MFD.	±25% 400 VOLT	**TRANSFORMERS**				
R-14	20750	500,800	OHMS	±10% ½ WATT	R-26	23013	9,000	OHMS	BLEEDER 30 WATT	T-1	21748			AUDIO INPUT
R-15	22334	65	OHMS	±5% ½ WATT	R-27		2,500	OHMS	BLEEDER 25 WATT	T-2	23014			AUDIO OUTPUT
R-16	22329	2,000	OHMS	±5% ½ WATT	R-28	23246	75,000	OHMS	±10% ½ WATT	T-3	23014			POWER TRANSFORMER

VOLTAGES AND CURRENTS OF MODEL #671-AMPLIFIER. ALL MEASUREMENTS MADE WITH LINE VOLTAGE 115-VOLTS.
ALL VOLTAGES MEASURED WITH 1,000-OHMS PER VOLT VOLTMETER.

AVERAGE PLATE VOLTAGE MEASURED FROM			AVERAGE PLATE CURRENT:-			AVERAGE GRID VOLTAGE MEASURED			AVERAGE FILAMENT VOLTAGE:-		
PLATE + TO CHASSIS —.			OUTPUT	-45	28.0-M.A.D.C.	FROM GRID TO FILAMENT.			RECTIFIER	523	5.0-VOLTS A.C.
OUTPUT	-45	355-VOLTS D.C.	DRIVER	-45	38.0-M.A.D.C.	OUTPUT	-45	87-VOLTS D.C.	OUTPUT	-45	2.5-VOLTS A.C.
DRIVER	-45	327-VOLTS D.C.		-30	2.1-M.A.D.C.	DRIVER	-45	40-VOLTS D.C.	DRIVER	-45	2.5-VOLTS A.C.
	-30	175-VOLTS D.C.		-30	1.5-M.A.D.C.					-30	2.1-VOLTS D.C.
	-30	80-VOLTS D.C.									

AVERAGE VOLTAGES ACROSS SPEAKER FIELDS AND ELECTROLYTIC CONDENSERS.
3200-OHM SPEAKER FIELD VOLTAGE MEASURED FROM #1-CONTACT TO #7-CONTACT ON SPEAKER SOCKET 205-VOLTS D.C.
2500-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-17 ELECTROLYTIC 360-VOLTS D.C.
FROM RECTIFIER -45 PLATE — TO CHASSIS + 150-VOLTS D.C.

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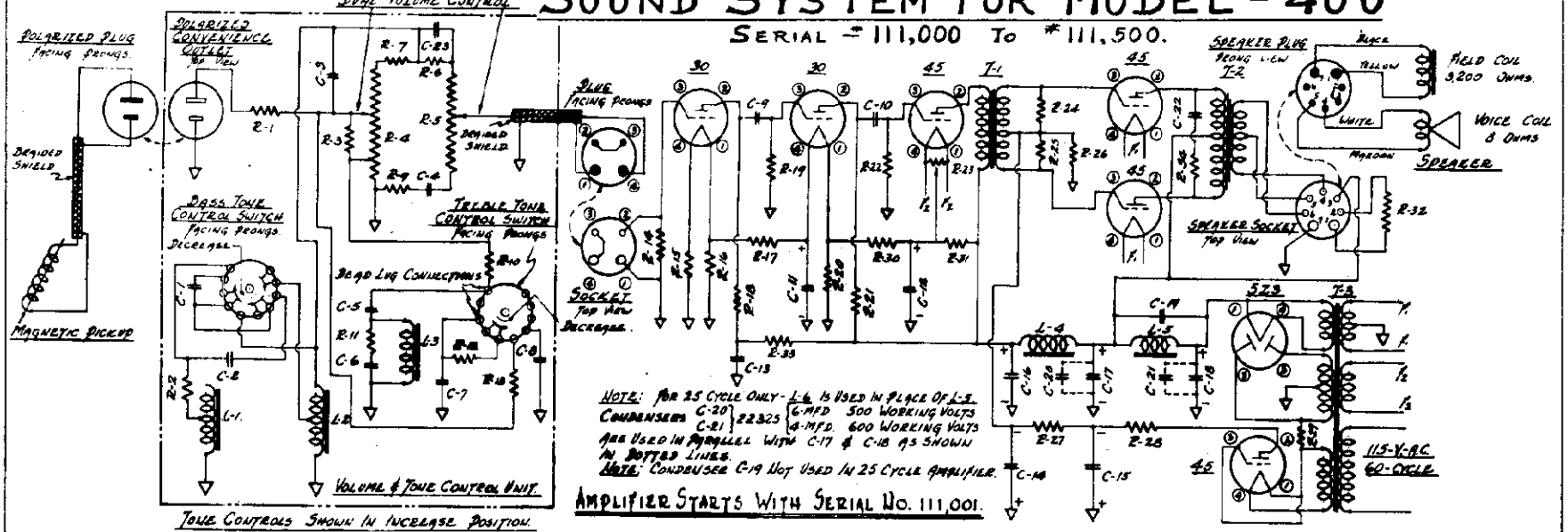
WURLITZER PAGE 1

MODEL 67

PICKUP PART Nº 23223 | VOLUME CONTROL #276-AM-PART Nº 24065 | AMPLIFIER #672-60 CYCLE-24062 | SPEAKER PART Nº 23089

SOUND SYSTEM FOR MODEL-400

SERIAL # 111,000 TO #111,500.



NOTE: FOR 25 CYCLE ONLY - L-4 IS USED IN PLACE OF L-5.
CONDENSERS C-20 } 22325 { 6-MFD 500 WORKING VOLTS
C-21 } { 4-MFD. 600 WORKING VOLTS
ARE USED IN PARALLEL WITH C-17 & C-18 AS SHOWN IN DOTTED LINES.
NOTE: CONDENSER C-19 NOT USED IN 25 CYCLE AMPLIFIER.

AMPLIFIER STARTS WITH SERIAL NO. 111,001.

ITEM	PART NO	VALUE			REMARKS		ITEM	PART NO	VALUE			REMARKS		ITEM	PART NO	VALUE			REMARKS	
		RESISTORS					R-19	20728	250,000	OHMS	±20%	½ WATT				CONDENSERS				
R-1	22588	3,000	OHMS	±10%	½ WATT		R-20	22323	2,000	OHMS	± 5%	1 WATT		C-1	21940	.25	MFD.	±10% 200 VOLT		C-19	22121	1.25 MFD	±10% 200 VOLT
R-2	21999	800	OHMS	±10%	½ WATT		R-21	23208	60,000	OHMS	±10%	½ WATT		C-2	22535	.75	MFD	-10% +20% 200 VOLT		C-20	22325	6 MFD.	300 VOLT
R-3	21998	35,000	OHMS	±10%	½ WATT		R-22	23055	150,000	OHMS	±10%	½ WATT		C-3	23221	.18	MFD	±10% 200 VOLT		C-21		4 MFD.	600 VOLT
R-4	23215	100,000	OHMS	±15% VOLUME CONTROL			R-23	20465	20	OHMS	HUM CONTROL			C-4	22584	.15	MFD	±10% 200 VOLT		C-22	24063	.015 MFD.	±10% 600 VOLT
R-5		150,000	OHMS	±15% VOLUME CONTROL			R-24	22322	25,000	OHMS	±10%	½ WATT		C-5	22544	.15	MFD	±10% 200 VOLT		C-23	22521	.003 MFD.	±10%
R-6	23084	25,000	OHMS	±10%	½ WATT		R-25	22322	25,000	OHMS	±10%	½ WATT		C-6	22589	.0025	MFD	±10%					
R-7	23084	25,000	OHMS	±10%	½ WATT		R-26	23012	5,000	OHMS	± 5%	10 WATT		C-7	22532	.004	MFD.	±10%			CHOKES		
R-8							R-27	23011	2,000	OHMS	± 5%	10 WATT		C-8	22534	.015	MFD.	±10% 200 VOLT		L-1	24145		CHOKE TONE CONTROL
R-9	20704	3,500	OHMS	±10%	½ WATT		R-28	23011	2,000	OHMS	± 5%	10 WATT		C-9	21993	.05	MFD.	±20% 400 VOLT		L-2	24318		REACTOR TONE CONTROL
R-10	20787	5,000	OHMS	±10%	½ WATT		R-29	23013	3,500	OHMS	±10%	10 WATT		C-10	21736	.1	MFD.	±20% 400 VOLT		L-3	21693		CHOKE ASSEMBLY
R-11	22783	7,000	OHMS	±10%	½ WATT		R-30		575	OHMS	BLEEDER	4 WATT		C-11	23010	.10	MFD	25 VOLT		L-4	23018		#2 FILTER CHOKE
R-12	20704	3,500	OHMS	±10%	½ WATT		R-31	23015	9,000	OHMS	BLEEDER	30 WATT		C-12	23009	.12	MFD	150 VOLT		L-5	23017	60 CYCLE ONLY	#1 FILTER CHOKE
R-13	20704	3,500	OHMS	±10%	½ WATT		R-32		2,500	OHMS	BLEEDER	33 WATT		C-13	20775	.5	MFD	±25% 400 VOLT		L-6	23746	25 CYCLE ONLY	#1 FILTER CHOKE
R-14	20750	500,000	OHMS	±10%	½ WATT		R-33	20766	75,000	OHMS	±10%	½ WATT		C-14	23021	8	MFD	150 VOLT					
R-15	22354	65	OHMS	± 5%	½ WATT		R-34	24062	7,000	OHMS	± 5%	10 WATT		C-15		8	MFD	150 VOLT		TRANSFORMERS			
R-16	22323	2,000	OHMS	± 5%	1 WATT									C-16		25	MFD.	450 VOLT		T-1	21548		AUDIO INPUT
R-17	23016	100	OHMS	± 5%	½ WATT									C-17	23020	6	MFD	300 VOLT		T-2	23019		AUDIO OUTPUT
R-18	21959	100,000	OHMS	±10%	½ WATT									C-18		4	MFD.	600 VOLT		T-3	23016		POWER TRANSFORMER

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 PLATE CURRENT:-			AVERAGE GRID VOLTAGE MEASURED FROM GRID TO FILAMENT.			AVERAGE FILAMENT VOLTAGE:-		
OUTPUT	-45	355-VOLTS D.C.	OUTPUT	-45	28.0-M.A.D.C.	OUTPUT	-45	87-VOLTS D.C.	RECTIFIER	5Z3	5.0-VOLTS A.C.
DRIVER	-45	327-VOLTS D.C.	DRIVER	-45	38.0-M.A.D.C.	DRIVER	-45	40-VOLTS D.C.	OUTPUT	-45	2.5-VOLTS A.C.
	-30	175-VOLTS D.C.		-30	2.1-M.A.D.C.				DRIVER	-45	2.5-VOLTS A.C.
	-30	80-VOLTS D.C.		-30	1.5-M.A.D.C.					-30	2.1-VOLTS D.C.

AVERAGE VOLTAGES ACROSS SPEAKER FIELDS AND ELECTROLYTIC CONDENSERS.
3200-OHM SPEAKER FIELD VOLTAGE MEASURED FROM #1-CONTACT TO #7-CONTACT ON SPEAKER SOCKET 205-VOLTS D.C.
2500-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-17	ELECTROLYTIC	360-VOLTS D.C.
C-16	ELECTROLYTIC	355-VOLTS D.C.

FROM RECTIFIER -45-PLATE- TO CHASSIS + 150-VOLTS D.C.

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SOUND SYSTEM FOR MODEL-35.

PICKUP - PART Nº 22377.	VOLUME CONTROL - PART Nº 22521	AMPLIFIER #680. #22357.	SPEAKER - PART Nº 22327

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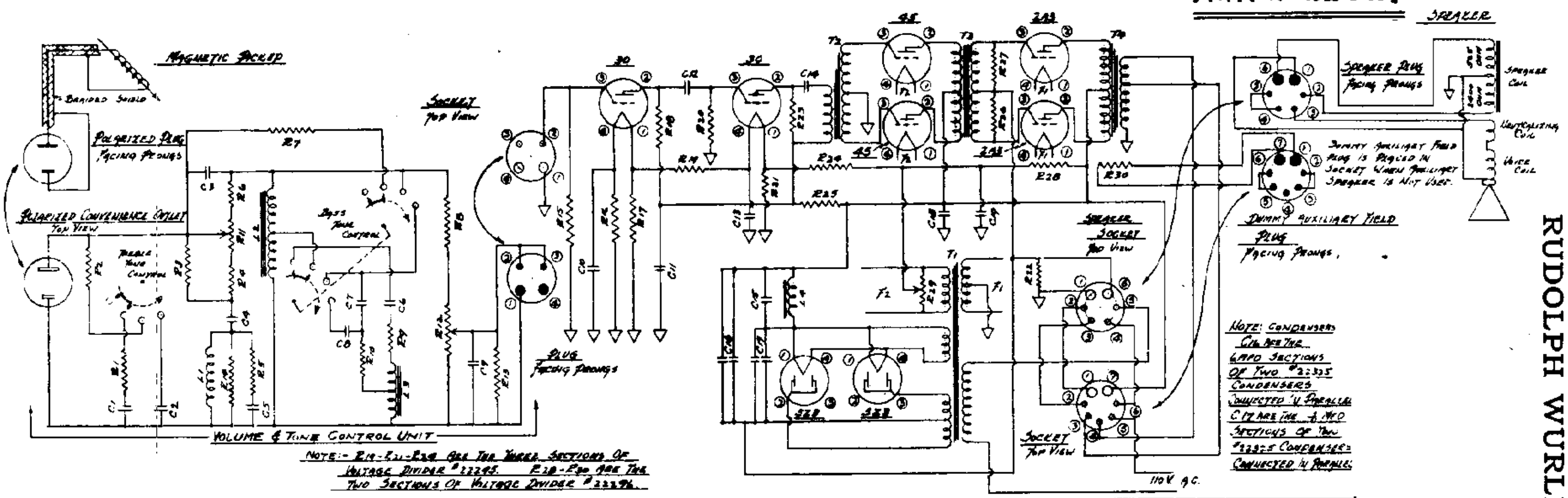

ITEM	PART No.	VALUE	REMARKS
		RESISTORS	
R1	22527	2,500 OHM	±10% - ½ WATT
R2	20787	2,000 OHM	±10% - ¼ WATT
R3	22526	20,000 OHM	±10% - ½ WATT
R4	20704	3,500 OHM	±10% - ½ WATT
R5	20704	3,500 OHM	±10% - ½ WATT
R6	22526	20,000 OHM	±10% - ½ WATT
R7	21939	50,000 OHM	±10% - ½ WATT
R8	20266	75,000 OHM	±10% - ½ WATT
R9	22529	2,000 OHM	±10% - ½ WATT
R10	22530	1,000 OHM	±10% - ½ WATT
R11	22320	50,000 OHM	DUAL V.C. REAR SECTION
R12	22370	10,000 OHM	DUAL V.C. PANEL SECTION
R13	22528	250,000 OHM	±10% - ½ WATT
R14	21937	50,000 OHM	±10% - ½ WATT
R15	22329	500,000 OHM	±10% - ½ WATT
R16	22324	45 OHM	±5% - ½ WATT

ITEM	PART No.	VALUE	REMARKS
R17	22323	2,000 OHM	±5% - 1 WATT
R18	20855	150,000 OHM	±10% - ½ WATT
R19	22295	(SECTION) 100 OHM	VOLTAGE DIVIDER
R20	20855	150,000 OHM	±10% - ½ WATT
R21	22295	(SECTION) 400 OHM	VOLTAGE DIVIDER
R22	22294	530 OHM	VOLTAGE DIVIDER
R23	22321	35,000 OHM	±10% - ½ WATT
R24	22295	(SECTION) 485 OHM	VOLTAGE DIVIDER
R25	22322	25,000 OHM	±10% - ½ WATT
R26	22322	25,000 OHM	±10% - ½ WATT
R27	22322	25,000 OHM	±10% - ½ WATT
R28	22296	(SECTION) 19,000 OHM	VOLTAGE DIVIDER
R29	20445	20 OHM	HUM CONTROL
R30	22296	(SECTION) 1,000 OHM	VOLTAGE DIVIDER
R			
R			
R			

ITEM	PART No.	VALUE	REMARKS
R			
		CONDENSERS	
C1	22532	.004 MFD	±10%
C2	22534	.015 MFD	±10% - 200 VOLT
C3	21738	.3 MFD	±10% - 200 VOLT
C4	22549	.15 MFD	±10% - 200 VOLT
C5	22531	.003 MFD	±10%
C6	22545	.03 MFD	±10% - 200 VOLT
C7	22535	.75 MFD	-10% +20% - 200 VOLT
C8	21990	.25 MFD	±10%
C9	22533	.0009 MFD	±10%
C10	20612	10. MFD	25 VOLT
C11	22309	2. MFD	500 VOLT
C12	22310	.022 MFD	±10% - 600 VOLT
C13	20612	10. MFD	25 VOLT
C14	22320	.5 MFD	+20% -10% 400 VOLT
C15	22320	.3 MFD	+20% -10% 400 VOLT

ITEM	PART No.	VALUE	REMARKS
C16	22325	6+6. MFD	(SECTION) 500 VOLT
C17	22325	4+4. MFD	(SECTION) 600 VOLT
C18	21720	25. MFD	50 VOLT
C19	21596	16. MFD	150 VOLT
C			
C			
		CHOKES	
L1	21693	560 MIL HENRIES	AIR CORE
L2	22519	100 HENRIES	TONE CONTROL
L3	22520	100 HENRIES	TONE CONTROL
L4	22312	8 HENRIES	POWER FILTER
L			
		TRANSFORMERS	
T1	22311		POWER
T2	22315		INPUT
T3	22314		DRIVER
T4	22313		OUTPUT

VOLTAGES AND CURRENTS OF MODEL-680-AMPLIFIER. ALL VOLTAGES MEASURED WITH 1000-OHMS PER VOLT VOLTMETER.
ALL MEASUREMENTS MADE WITH LINE VOLTAGE 115-VOLTS, 60-CYCLE AT THE AMPLIFIER.

PLATE VOLTAGE MEASURED FROM PLATE + TO FILAMENT −.	PLATE CURRENTS:−	GRID VOLTAGE MEASURED FROM GRID − TO FILAMENT +.	FILAMENT VOLTAGE MEASURED ACROSS FILAMENT.
	OUTPUT-2A3 37.0-M.A.D.C.		
OUTPUT 2A3 360-VOLTS D.C.	OUTPUT-2A3 37.0-M.A.D.C.	OUTPUT-2A3 74-VOLTS D.C.	OUTPUT 2A3 2.5-VOLTS A.C.
OUTPUT 2A3 360-VOLTS D.C.	-45 32.0-M.A.D.C.	2A3 74-VOLTS D.C.	OUTPUT 2A3 2.5-VOLTS A.C.
-45 275-VOLTS D.C.	-45 32.0-M.A.D.C.	-45 62-VOLTS D.C.	-45 2.5-VOLTS A.C.
-45 275-VOLTS D.C.	-30 2.5-M.A.D.C.	-45 62-VOLTS D.C.	-45 2.5-VOLTS A.C.
-30 157-VOLTS D.C.	-30 1.2-M.A.D.C.		-30 2.0-VOLTS D.C.
-30 57-VOLTS D.C.			-30 2.0-VOLTS D.C.

525-OHM SPEAKER FIELD VOLTAGE MEASURED FROM #1-CONTACT TO #6-CONTACT ON SPEAKER SOCKET. − 72.5-VOLTS D.C.
2400-OHM SPEAKER FIELD VOLTAGE MEASURED FROM #1-CONTACT TO #2-CONTACT ON SPEAKER SOCKET − 260-VOLTS D.C.

MODELS 700, 7003

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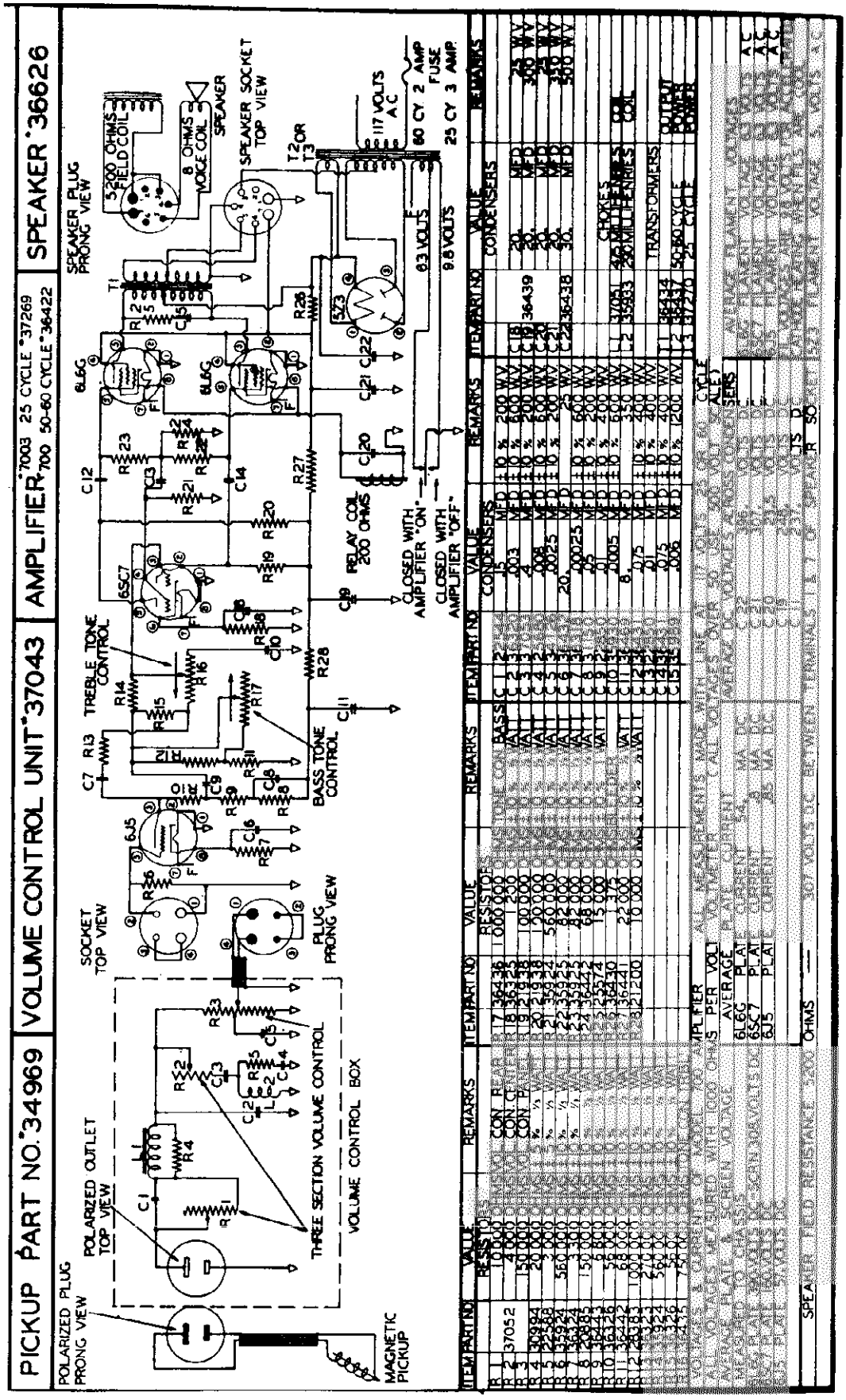
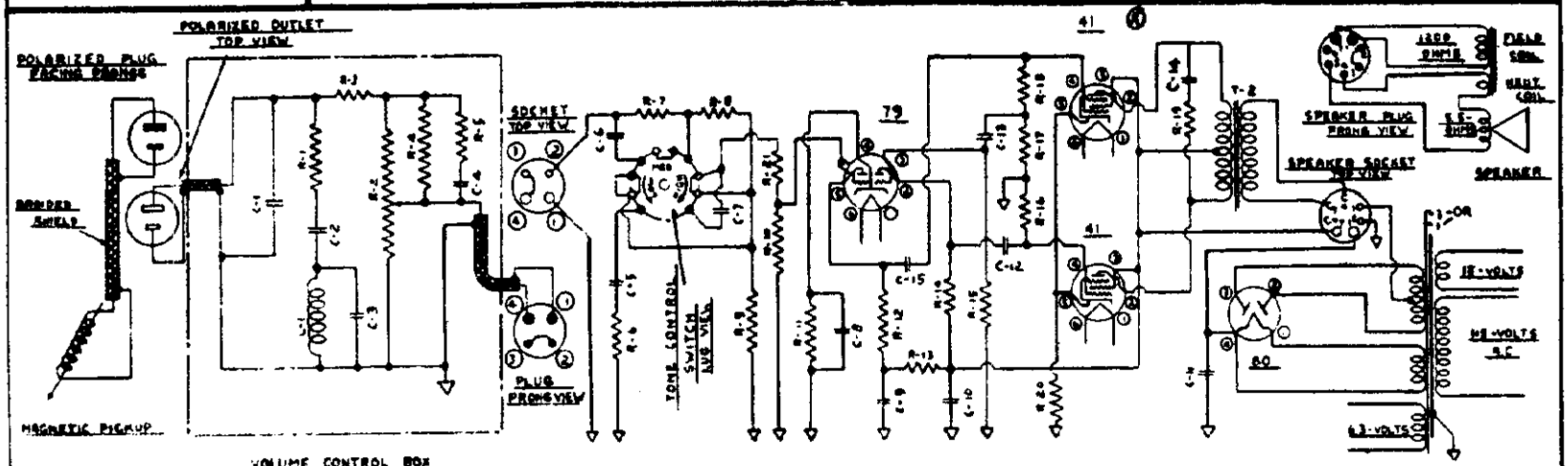


SOUND SYSTEM FOR MODEL-51

PICKUP PART Nº 25662	VOLUME CONTROL *147-AM-PART Nº 25676	AMPLIFIER -*741 25-CYCLE -*25746 60-CYCLE -*25565	SPEAKER MAGNAVOX - JENSEN - *25595 UTAH -



ITEM	PART Nº	VALUE	REMARKS
		RESISTORS	
R-1	25418	1,500 - OHMS	±10% ½ WATT
R-2	25679	100,000 - OHMS	VOLUME CONTROL
R-3	22588	3,000 - OHMS	±10% ½ WATT
R-4	21938	100,000 - OHMS	±10% ½ WATT
R-5	25575	200,000 - OHMS	±10% ½ WATT
R-6	21200	10,000 - OHMS	±10% ½ WATT
R-7	20266	75,000 - OHMS	±10% ½ WATT
R-8	21200	10,000 - OHMS	±10% ½ WATT
R-9	21938	100,000 - OHMS	±10% ½ WATT
R-10	25911	250,000 - OHMS	±10% ½ WATT
R-11	22588	3,000 - OHMS	±10% ½ WATT
R-12	25575	200,000 - OHMS	±10% ½ WATT
R-13	20266	75,000 - OHMS	±10% ½ WATT
R-14	20728	250,000 - OHMS	±20% ½ WATT
R-15	20728	250,000 - OHMS	±20% ½ WATT

ITEM	PART Nº	VALUE	REMARKS
R-16	25432	500,000 OHMS	±10% ½ WATT
R-17	21200	10,000 - OHMS	±10% ½ WATT
R-18	25432	500,000 - OHMS	±10% ½ WATT
R-19	25574	15,000 - OHMS	±10% 1 - WATT
R-20	25573	250 - OHMS	±5% 10 - WATTS
R-21	25910	50,000 - OHMS	±5% ½ - WATT

ITEM	PART Nº	VALUE	REMARKS
		CONDENSERS	
C-1	25680	.008 - MFD.	±10% 200 - W.V.
C-2	20665	.25 - MFD.	±10% 200 - W.V.
C-3	22531	.003 MFD.	±10% MICA
C-4	25680	.008 - MFD.	±10% 200 - W.V.
C-5	22589	.0025 - MFD.	±10% MICA
C-6	22532	.004 - MFD.	±10% MICA
C-7	22589	.0025 - MFD.	±10% MICA
C-8	23010	10 - MFD.	25 - W.V.
C-9	22320	.1 - MFD.	+20% 10% 400 - W.V.
C-10	25570	25 - MFD.	450 - W.V.
C-11		8 - MFD.	500 - W.V.
C-12	21993	.05 - MFD.	±10% 400 - W.V.
C-13	21993	.05 - MFD.	±10% 400 - W.V.
C-14	22531	.003 - MFD.	±10% MICA
C-15	21993	.05 - MFD.	±10% 400 - W.V.

ITEM	PART Nº	VALUE	REMARKS
		CHOKES	
L-1	25598	290 - HENRIES	CHOKE COIL
		TRANSFORMERS	
T-1	25572	60 - CYCLE	POWER
T-2	25571		AUDIO OUTPUT
T-3	25747	25 - CYCLE	POWER

VOLTAGES AND CURRENTS OF MODEL-*741 - 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:-	
79	115 - VOLTS D.C.
41	270 - VOLTS D.C.

AVERAGE PLATE CURRENT :-	
79	.35 - MILLS
41	30. - MILLS

AVERAGE BIAS VOLTAGE MEASURED FROM CATHODE TO GROUND :-	
79	APPROX 1.5-2 - VOLTS
41	18 - VOLTS

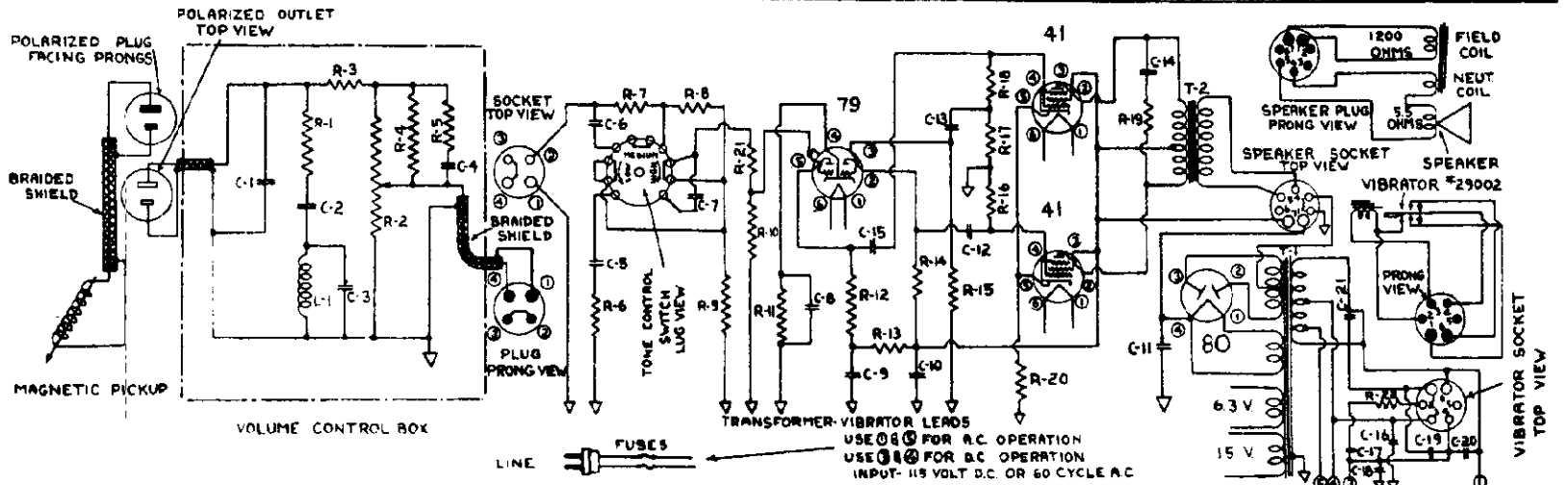
AVERAGE FILAMENT VOLTAGE :-	
79	6.3 - VOLTS A.C.
41	6.3 - VOLTS A.C.
80	50 - VOLTS A.C.

VOLTAGE ACROSS CONDENSER :- C-10 275 VOLTS D.C. C-11 360 VOLTS D.C.

SPEAKER FIELD 1200 - OHMS BETWEEN TERMINALS *1 & *7 ON SPEAKER SOCKET 90 VOLTS D.C.

SOUND SYSTEM FOR 115 VOLT D.C. VIBRATOR MODEL 51

PICKUP PART Nº25662	VOLUME CONTROL-"147-A.M-PART Nº25676	AMPLIFIER-"742- PART Nº"29166	SPEAKER-JENSEN - "25595



ITEM	PART NO	VALUE	REMARKS	ITEM	PART NO	VALUE	REMARKS	ITEM	PART NO	VALUE	REMARKS	ITEM	PART NO	VALUE	REMARKS
		RESISTORS								CONDENSERS		C-16	29016	.25 MFD	±10% 200 W.V.
R-1	25418	1500 OHMS	±10% ¼WATT	R-16	25432	500000 OHMS	±10% ¼WATT	C-1	25680	.008 MFD	±10% 200 W.V.	C-17	24329	.1 MFD	±10% 200 W.V.
R-2	25679	100000 OHMS	VOLUME CONTROL	R-17	21200	10000 OHMS	±10% ¼WATT	C-2	20665	.25 MFD	±10% 200 W.V.	C-18	29017	.01 MFD	±10% 200 W.V.
R-3	22588	3000 OHMS	±10% ¼WATT	R-18	25432	500000 OHMS	±10% ¼WATT	C-3	22531	.003 MFD	±10% MICA	C-19	24364	.5 MFD	±10% 200 W.V.
R-4	21938	100000 OHMS	±10% ¼WATT	R-19	25574	15000 OHMS	±10% 1 WATT	C-4	25680	.008 MFD	±10% 200 W.V.	C-20	24364	.5 MFD	±10% 200 W.V.
R-5	25575	200000 OHMS	±10% ¼WATT	R-20	25573	250 OHMS	±5% 10 WATT	C-5	22589	.0025 MFD	±10% MICA	C-21	29155	.1 MFD	220 W.V. A.C.
R-6	21200	10000 OHMS	±10% ¼WATT	R-21	25910	50000 OHMS	±5% ¼WATT	C-6	22532	.004 MFD	±10% MICA				
R-7	20266	75000 OHMS	±10% ¼WATT	R-22	22530	1000 OHMS	±10% ¼WATT	C-7	22589	.0025 MFD	±10% MICA			CHOKES	
R-8	21200	10000 OHMS	±10% ¼WATT					C-8	23010	.10 MFD	25 W.V.	L-1	25598	290 MILLIHENRIES	CHOKE COIL
R-9	21938	100000 OHMS	±10% ¼WATT					C-9	22320	.3 MFD	+20%-10% 400 W.V.				
R-10	25911	250000 OHMS	±10% ¼WATT					C-10	25570	.25 MFD	450 W.V.				
R-11	22588	3000 OHMS	±10% ¼WATT					C-11		.8 MFD	500 W.V.			TRANSFORMERS	
R-12	25575	200000 OHMS	±10% ¼WATT					C-12	21993	.05 MFD	±10% 400 W.V.	T-1	29149	60-CYCLE	POWER
R-13	20266	75000 OHMS	±10% ¼WATT					C-13	21993	.05 MFD	±10% 400 W.V.	T-2	25571		AUDIO OUTPUT
R-14	20728	250000 OHMS	±20% ¼WATT					C-14	22531	.003 MFD	±10% MICA				
R-15	20728	250000 OHMS	±20% ¼WATT					C-15	21993	.05 MFD	±10% 400 W.V.				

VOLTAGES AND CURRENTS OF MODEL "742 AMPLIFIER. ALL MEASUREMENTS MADE WITH LINE VOLTAGE 115 VOLTS D.C. OR 60 CYCLE A.C.
ALL VOLTAGES MEASURED WITH 1000 OHMS PER VOLT VOLTMETER

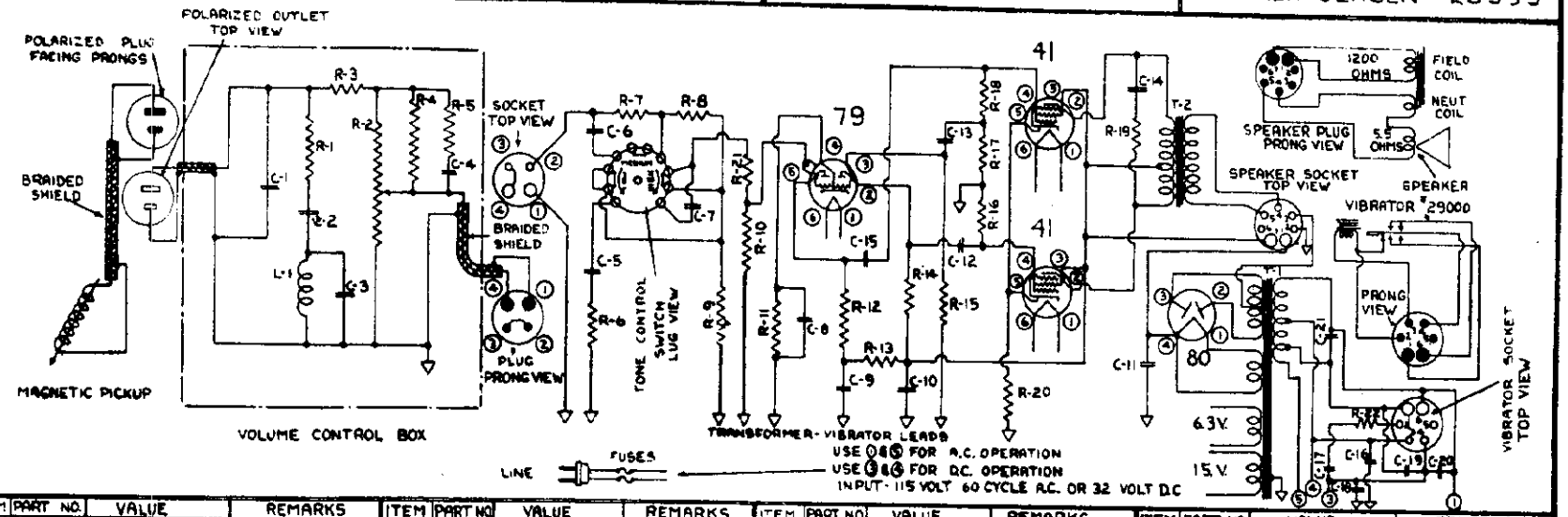
AVERAGE PLATE VOLTAGE MEASURED FROM PLATE TO CHASSIS:-		AVERAGE PLATE CURRENT		AVERAGE BIAS VOLTAGE MEASURED FROM CATHODE TO GROUND		AVERAGE FILAMENT VOLTAGES	
79	115-VOLTS D.C.	79	.35-MILLS D.C.	79	APPROX 15-2 VOLTS	79	6.3 VOLTS A.C.
41	270-VOLTS D.C.	41	30. -MILLS D.C.	41	18. VOLTS	41	6.3 VOLTS A.C.
						80	5.0 VOLTS A.C.

VOLTAGE ACROSS CONDENSER C-10 - 275 VOLTS D.C. VOLTAGE ACROSS CONDENSER C-11 360 VOLTS D.C.

SPEAKER FIELD - 1200 OHMS BETWEEN TERMINALS "1 & "7 ON SPEAKER SOCKET

SOUND SYSTEM FOR 32 VOLT D.C. VIBRATOR MODEL 51

PICKUP PART Nº25662	VOLUME CONTROL *147-A.M-PART Nº25676	AMPLIFIER - *743 PART NO. *29172	SPEAKER - JENSEN - *25595



ITEM	PART NO.	VALUE	REMARKS
		RESISTORS	
R-1	25418	1500 OHMS	±10% ¼WATT
R-2	25679	100000 OHMS	VOLUME CONTROL
R-3	22588	3000 OHMS	±10% ¼WATT
R-4	21936	100000 OHMS	±10% ¼WATT
R-5	25575	200000 OHMS	±10% ¼WATT
R-6	21200	10000 OHMS	±10% ¼WATT
R-7	20266	75000 OHMS	±10% ¼WATT
R-8	21200	10000 OHMS	±10% ¼WATT
R-9	21938	100000 OHMS	±10% ¼WATT
R-10	25911	250000 OHMS	±10% ¼WATT
R-11	22588	3000 OHMS	±10% ¼WATT
R-12	25575	200000 OHMS	±10% ¼WATT
R-13	20266	75000 OHMS	±10% ¼WATT
R-14	20728	250000 OHMS	±20% ¼WATT
R-15	20728	250000 OHMS	±20% ¼WATT
R-16	25432	500000 OHMS	±10% ¼WATT
R-17	21200	10000 OHMS	±10% ¼WATT
R-18	25432	500000 OHMS	±10% ¼WATT
R-19	25574	15000 OHMS	±10% 1 WATT
R-20	25573	250 OHMS	±5% 10 WATT
R-21	25910	50000 OHMS	±5% ¼WATT
R-22	22530	1000 OHMS	±10% ¼WATT

ITEM	PART NO.	VALUE	REMARKS
		CONDENSERS	
C-1	25680	.008 MFD	±10% 200 W.V.
C-2	20665	.25 MFD	±10% 200 W.V.
C-3	22531	.003 MFD	±10% MICA
C-4	25680	.008 MFD	±10% 200 W.V.
C-5	22589	.0025 MFD	±10% MICA
C-6	22532	.004 MFD	±10% MICA
C-7	22589	.0025 MFD	±10% MICA
C-8	23010	10. MFD	25 W.V.
C-9	22320	3 MFD	-20% 10% 400 W.V.
C-10	25570	25. MFD	450 W.V.
C-11		8. MFD	500 W.V.
C-12	21993	.05 MFD	±10% 400 W.V.
C-13	21993	.05 MFD	±10% 400 W.V.
C-14	22531	.003 MFD	±10% MICA
C-15	21993	.05 MFD	±10% 400 W.V.

ITEM	PART NO.	VALUE	REMARKS
C-16	29016	.25 MFD.	±10% 200 W.V.
C-17	24329	.1 MFD.	±10% 200 W.V.
C-18	29017	.01 MFD	±10% 200 W.V.
C-19	24364	.5 MFD.	±10% 200 W.V.
C-20	24364	.5 MFD	±10% 200 W.V.
C-21	29164	10. MFD	65 W.V. A.C.
		CHOKES	
L-1	25598	290 MILLIHENRIES	CHOKE COIL
		TRANSFORMERS	
T-1	29136	60-CYCLE	POWER
T-2	25571		AUDIO OUTPUT

VOLTAGES AND CURRENTS OF MODEL *743 AMPLIFIER ALL MEASUREMENTS MADE WITH LINE VOLTAGE 115 VOLTS 60 CYCLE A.C. OR 32 VOLTS D.C.
ALL VOLTAGES MEASURED WITH 1000 OHMS PER VOLT VOLTMETER

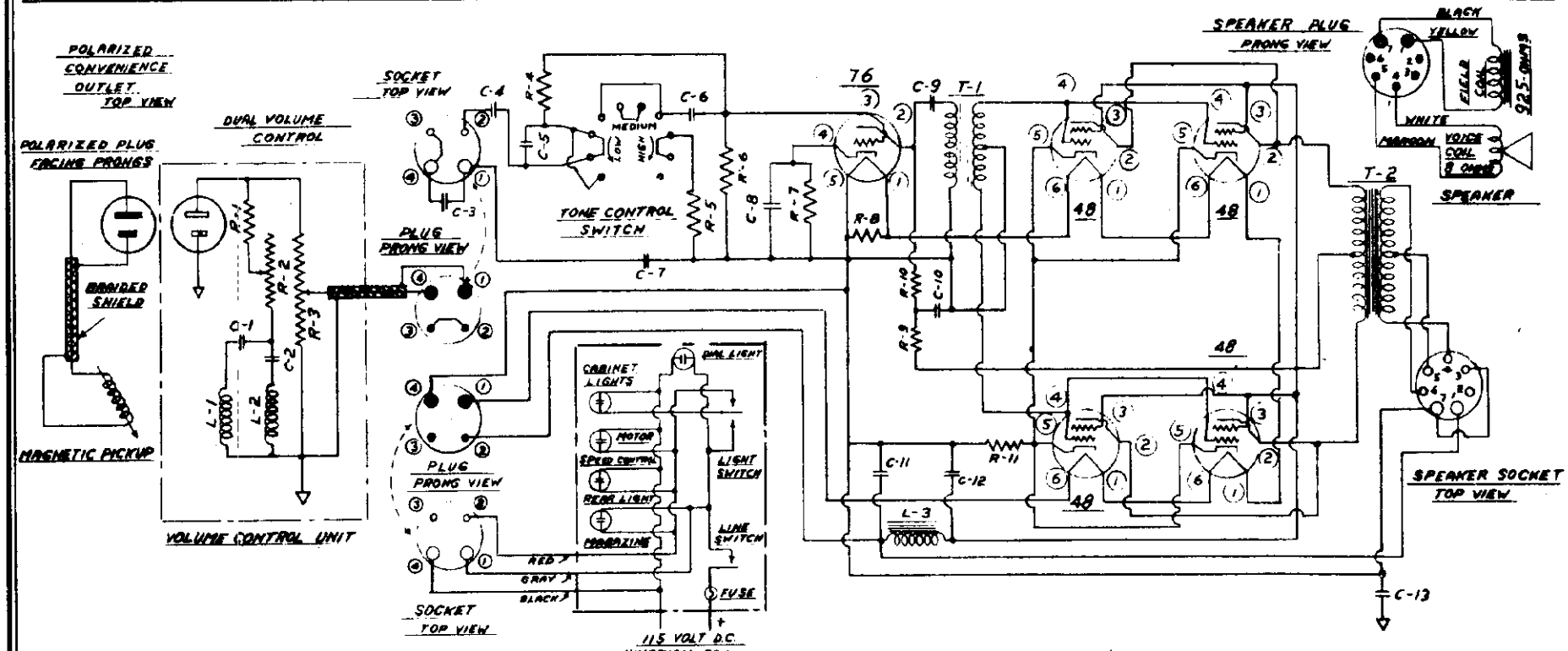
AVERAGE PLATE VOLTAGE MEASURED FROM PLATE TO CHASSIS		AVERAGE PLATE CURRENT		AVERAGE BIAS VOLTAGE MEASURED FROM CATHODE TO GROUND		AVERAGE FILAMENT VOLTAGE	
79	115 VOLTS D.C.	79	.35 MILLS D.C.	79	APPROX. 1.5-2 VOLTS	79	6.3 VOLTS A.C.
41	270 VOLTS D.C.	41	30. MILLS D.C.	41	18. VOLTS	41	6.3 VOLTS A.C.
						80	5.0 VOLTS A.C.

VOLTAGE ACROSS CONDENSER C-10 - 275 VOLTS D.C. VOLTAGE ACROSS CONDENSER C-11 360 VOLTS D.C.

SPEAKER FIELD - 1200 OHMS BETWEEN TERMINALS *1 & *7 ON SPEAKER SOCKET 90 VOLTS D.C.

SOUND SYSTEM FOR D.C. MODELS —316-416-616-716 & 616A

PICKUP-*24707	VOLUME CONTROL-*157 A.M. PART NO.* 26374	AMPLIFIER *751 PART NO.* 26367	SPEAKERS JENSEN*27676 FOR 616-A MAGNAVOX*27674	316,416 SPEAKERS 616, 716	*27156 *26394



ITEM	PART NO.	VALUE	REMARKS
	RESISTORS		
R-1	22530	1000 OHM	±10% 1/4 WATT
R-2	26378	7500 OHM	DUAL V.C. REAR SECT.
R-3		150000 OHM	DUAL V.C. PANEL SECT.
R-4	21939	50,000 OHM	±10% 1/4-WATT
R-5	21998	35,000 OHM	±10% 1/4-WATT
R-6	20855	150,000 OHM	±10% 1/4-WATT
R-7	22529	2,000 OHM	±10% 1/4-WATT
R-8	22851	63 OHM	±5% 10-WATT
R-9	21937	50,000 OHM	±10% 1/2-WATT
R-10	21938	100,000 OHM	±10% 1/4-WATT
R-11	22851	63 OHM	±5% 10 WATT

ITEM	PART NO.	VALUE	REMARKS
	CONDENSERS		
C-1	22241	.002 - MFD.	±10% MICA
C-2	20665	.25 - MFD.	±10% - 200 W. VOLTS
C-3	22241	.002 - MFD	±10% MICA
C-4	24329	.1 - MFD.	±10% 200 W. VOLTS
C-5	26372	.0075 - MFD.	±10% 200 W. VOLTS
C-6	26372	.0075 - MFD.	±10% 200 W. VOLTS
C-7	24363	1.0 - MFD	±10% 200 W. VOLTS
C-8	24279	10 - MFD	ELEC. 25 W. VOLTS
C-9	21736	.1 - MFD	±20% 400 W. VOLTS
C-10	22535	.75 - MFD	±10% 200 W. VOLTS
C-11	22865	2.0 - MFD	400 W. VOLTS
C-12		1.0 - MFD	200 W. VOLTS
C-13	21736	.1 - MFD	±20% 400 W. VOLTS

ITEM	PART NO.	VALUE	REMARKS
	CHOKES		
L-1	24305	290-MILLIHENRIES	AIR CORE
L-2	21693	540-MILLIHENRIES	AIR CORE
L-3	22866	1.35-HENRIES	POWER FILTER
	TRANSFORMERS		
T-1	22867	AUDIO	INPUT
T-2	22864	AUDIO	OUTPUT

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

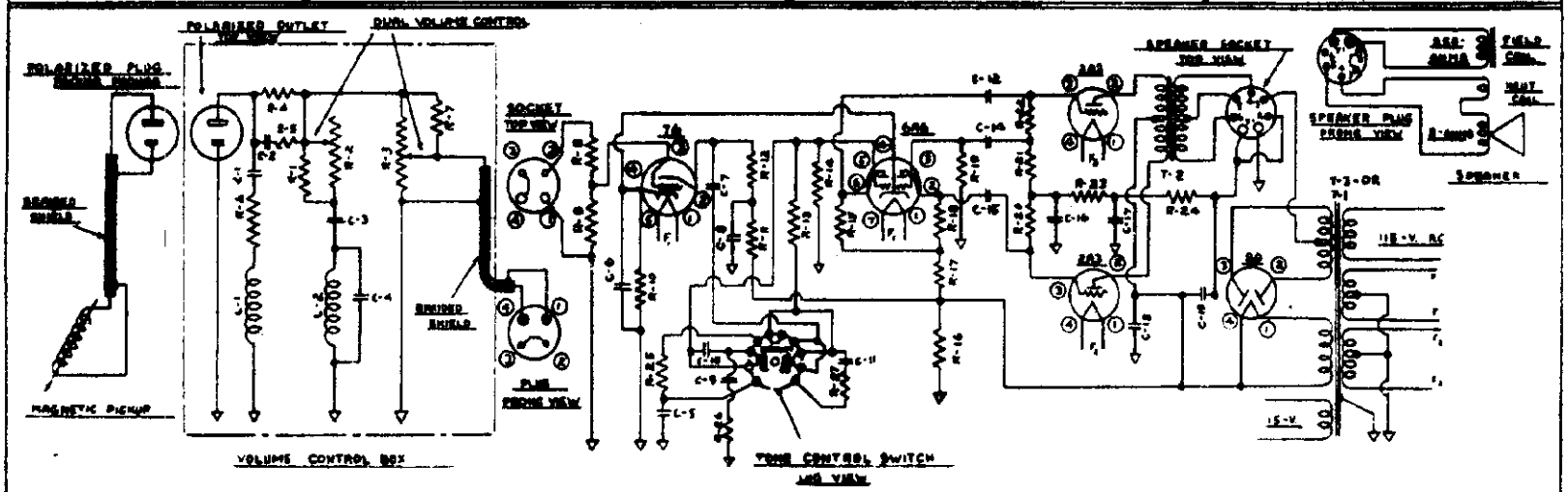
AVERAGE PLATE VOLTAGE MEASURED FROM		AVERAGE PLATE CURRENT	
PLATE + TO CONTACT -*7 ON SPEAKER SOCKET		-48	48.0-MA.
-48	110-VOLTS D.C.	-76	.6-M.A.
-76	20-VOLTS D.C.		

AVERAGE BIAS VOLTAGE MEASURED	
FROM CATHODE OF TUBE TO *7 CONTACT	
ON SPEAKER SOCKET	
-48	16.0-VOLTS D.C.
-76	1.0-VOLT D.C.

AVERAGE FILAMENT VOLTAGES:-	
-48	27.5-VOLTS D.C.
-76	6.1-VOLTS D.C.

SOUND SYSTEM FOR MODEL-50

PICKUP PART Nº 25662	VOLUME CONTROL-*257AM-PART Nº 25423	AMPLIFIER -*752 25-CYCLE -*25744 60-CYCLE-*25406	SPEAKER MAGNAVOX-JENSEN - *25593 UTAH -



ITEM	PART Nº	VALUE	REMARKS
		RESISTORS	
R-1	20787	5,000-OHMS	± 10% ½ WATT
R-2	22765	12,000-OHMS	DUAL VOLUME CONTROL
R-3		150,000-OHMS	
R-4	21200	10,000-OHMS	± 10% ½ WATT
R-5	20787	5,000-OHMS	± 10% ½ WATT
R-6	25418	1,500-OHMS	± 10% ½ WATT
R-7	20267	15,000-OHMS	± 10% ½ WATT
R-8	28624	25,000-OHMS	± 5% ½ WATT
R-9	28152	75,000-OHMS	± 5% ½ WATT
R-10	25418	1,500-OHMS	± 10% ½ WATT
R-11	20855	150,000-OHMS	± 10% ½ WATT
R-12	21939	50,000-OHMS	± 10% ½ WATT
R-13	21938	100,000-OHMS	± 10% ½ WATT
R-14	20855	150,000-OHMS	± 10% ½ WATT
R-15	20728	250,000-OHMS	± 20% ½ WATT
R-16	25557	25,000-OHMS	± 5% 20-WATT
R-17	20266	75,000-OHMS	± 10% ½ WATT
R-18	20728	250,000-OHMS	± 20% ½ WATT
R-19	20728	250,000-OHMS	± 20% ½ WATT
R-20	20750	500,000-OHMS	± 20% ½ WATT
R-21	23084	25,000-OHMS	± 10% ½ WATT
R-22	20750	500,000-OHMS	± 20% ½ WATT
R-23	20855	150,000-OHMS	± 10% ½ WATT
R-24	22614	50,000-OHMS	± 10% ½ WATT
R-25	20266	75,000-OHMS	± 10% ½ WATT
R-26	22626	25,000-OHMS	± 10% ½ WATT
R-27	20266	75,000-OHMS	± 10% ½ WATT

ITEM	PART Nº	VALUE	REMARKS
		CONDENSERS	
C-1	25427	.008-MFD.	± 5% MICA
C-2	25430	.02 -MFD.	± 10% 200-W.V.
C-3	23221	.18 -MFD.	± 10% 200-W.V.
C-4	22531	.003-MFD.	± 10% MICA
C-5	22753	.006-MFD	± 10% 400 W.V.
C-6	23010	* 10. -MFD.	25-W.V.
C-7	21993	.05 -MFD.	± 10% 400-W.V.
C-8	24321	2. -MFD.	450-W.V.
C-9	25428	.0015-MFD.	± 5% MICA
C-10	25429	.00035-MFD.	± 10% MICA
C-11	22753	.006 -MFD.	± 10% 400-W.V.
C-12	21993	.05 -MFD.	± 10% 400-W.V.
C-13			
C-14	21993	.05 -MFD.	± 10% 400-W.V.
C-15	21993	.05 -MFD.	± 10% 400-W.V.
C-16	20665	.25-MFD	± 10% 200-W.V.
C-17	25415	12. -MFD	150-W.V.
C-18		25 -MFD.	450 W.V.
C-19		8. -MFD	500-W.V.
		CHOKES	
L-1	25598	290 MILLIHENRIES	CHOKE COIL
L-2	21693	640 MILLIHENRIES	CHOKE COIL
		TRANSFORMERS	
T-1	25417	60-CYCLE	POWER
T-2	25416		AUDIO OUTPUT
T-3	25745	25-CYCLE	POWER

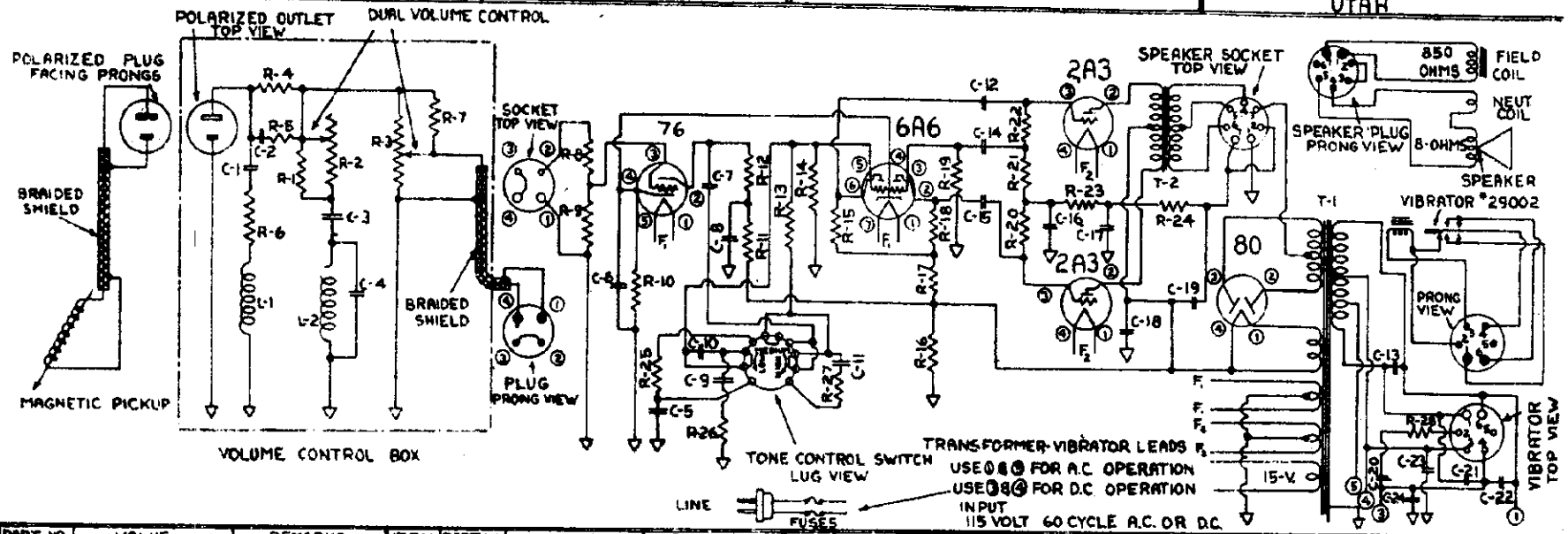
VOLTAGES AND CURRENTS OF MODEL *752 AMPLIFIER. ALL MEASUREMENTS MADE WITH LINE VOLTAGE 115 VOLTS.
ALL VOLTAGES MEASURED WITH 1,000 OHMS PER VOLT VOLTMETER.

AVERAGE PLATE VOLTAGE MEASURED FROM PLATE + TO CHASSIS:-		AVERAGE PLATE CURRENT:-		AVERAGE VOLTAGE MEASURED ACROSS CONDENSERS:-		AVERAGE FILAMENT VOLTAGE:-	
76 - PLATE TO CHASSIS	85-VOLTS D.C.	76-PLATE CURRENT	13-MILLS D.C.	C-18	345-VOLTS D.C.	76 - FIL. VOLTAGE	6.3-VOLTS A.C.
6A6 - PLATE TO CHASSIS	110-VOLTS D.C.	6A6-PLATE CURRENT	37-MILLS D.C.	C-19	420-VOLTS D.C.	6A6 - FIL. VOLTAGE	6.3-VOLTS A.C.
2A3 - PLATE TO CHASSIS	345-VOLTS D.C.	2A3-PLATE CURRENT	34.8-MILLS D.C.	C-6	25-VOLTS D.C.	2A3 - FIL. VOLTAGE	2.5-VOLTS A.C.
				C-17	70. -VOLTS D.C.	80 - FIL. VOLTAGE	5.0-VOLTS A.C.

SPEAKER FIELD 850-OHMS BETWEEN TERMINALS *1 & *7 ON SPEAKER SOCKET - 70-VOLTS D.C.

SOUND SYSTEM FOR 115 VOLT D.C. VIBRATOR MODEL 50

PICKUP PART-N°25662	VOLUME CONTROL-257-A.M.-PART-No.25423	AMPLIFIER-*753-PART NO. *29145	SPEAKER- MAGNAVOX JENSEN- UTAH *25593



ITEM	PART NO	VALUE	REMARKS
		RESISTORS	
R-1	20787	5000 OHMS	±10% ¼WATT
R-2	22765	12000 OHMS	DUAL VOLUME CONTROL
R-3		150000 OHMS	
R-4	21200	10000 OHMS	±10% ¼WATT
R-5	20787	5000 OHMS	±10% ¼WATT
R-6	25418	1500 OHMS	±10% ¼WATT
R-7	20267	15000 OHMS	±10% ¼WATT
R-8	28626	25000 OHMS	±5% ¼WATT
R-9	28152	75000 OHMS	±5% ¼WATT
R-10	25418	1500 OHMS	±10% ¼WATT
R-11	20855	150000 OHMS	±10% ¼WATT
R-12	21939	50000 OHMS	±10% ¼WATT
R-13	21938	100000 OHMS	±10% ¼WATT
R-14	20855	150000 OHMS	±10% ¼WATT
R-15	20728	250000 OHMS	±20% ¼WATT
R-16	25557	25000 OHMS	±5% 20 WATT
R-17	20266	75000 OHMS	±10% ¼WATT
R-18	20728	250000 OHMS	±20% ¼WATT
R-19	20728	250000 OHMS	±20% ¼WATT
R-20	20750	500000 OHMS	±20% ¼WATT
R-21	23084	25000 OHMS	±10% ¼WATT
R-22	20750	500000 OHMS	±20% ¼WATT
R-23	20855	150000 OHMS	±10% ¼WATT
R-24	22014	30000 OHMS	±10% ¼WATT
R-25	20266	75000 OHMS	±10% ¼WATT
R-26	22526	20000 OHMS	±10% ¼WATT
R-27	20266	75000 OHMS	±10% ¼WATT
R-28	22530	1000 OHMS	±10% ¼WATT

ITEM	PART NO	VALUE	REMARKS
		CONDENSERS	
C-1	25427	.002 MFD.	±5% MICA
C-2	25430	.02 MFD.	±10% 200 W.V.
C-3	23221	.18 MFD.	±10% 200 W.V.
C-4	22531	.003 MFD.	±10% MICA
C-5	22753	.006 MFD.	±10% 400 W.V.
C-6	23010	10. MFD.	25 W.V.
C-7	21993	.05 MFD.	±10% 400 W.V.
C-8	24321	2. MFD.	450 W.V.
C-9	25428	.0015 MFD.	±5% MICA
C-10	25429	.00035 MFD.	±10% MICA
C-11	22753	.006 MFD.	±10% 400 W.V.
C-12	21993	.05 MFD.	±10% 400 W.V.
C-13	29155	1. MFD.	220 W.V.A.C.
C-14	21993	.05 MFD.	±10% 400 W.V.
C-15	21993	.05 MFD.	±10% 400 W.V.
C-16	20665	.25 MFD.	±10% 200 W.V.
C-17	25415	12. MFD.	150 W.V.
C-18		25. MFD.	450 W.V.
C-19		8. MFD.	500 W.V.
C-20	24329	.1 MFD.	±10% 200 W.V.
C-21	24364	.5 MFD.	±10% 200 W.V.
C-22	24364	.5 MFD.	±10% 200 W.V.
C-23	29016	.25 MFD.	±10% 200 W.V.
C-24	29017	.01 MFD.	±10% 200 W.V.

		CHOKES	
L-1	25598	290 MILLIHENRIES	CHOKE COIL
L-2	21693	540 MILLIHENRIES	CHOKE COIL
		TRANSFORMERS	
T-1	29158	60 CYCLE	POWER
T-2	25416		AUDIO OUTPUT

VOLTAGES AND CURRENTS OF MODEL *753 AMPLIFIER. ALL MEASUREMENTS MADE WITH LINE VOLTAGE 115 VOLTS D.C. OR 60 CYCLE A.C.
ALL VOLTAGES MEASURED WITH 1000 OHMS PER VOLT VOLTMETER.

AVERAGE PLATE VOLTAGE MEASURED FROM PLATE + TO CHASSIS -	
76- PLATE TO CHASSIS	65-VOLTS D.C.
6A6- PLATE TO CHASSIS	110- VOLTS D.C.
2A3 - PLATE TO CHASSIS	345-VOLTS D.C.

AVERAGE PLATE CURRENT:-	
76 PLATE CURRENT 13 MILLS D.C.	
6A6 PLATE CURRENT .5 MILLS D.C.	
2A3 PLATE CURRENT 34. MILLS D.C.	

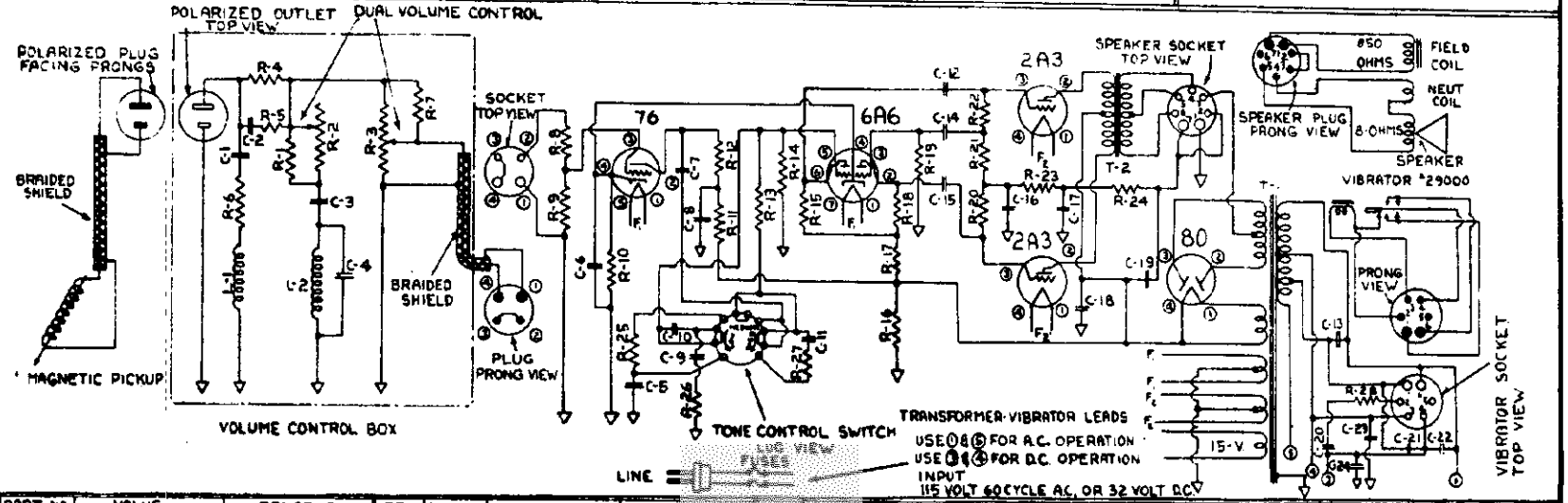
AVERAGE VOLTAGE MEASURED ACROSS CONDENSERS:-	
C-18	345 VOLTS D.C.
C-19	420 VOLTS D.C.
C-6	3.5 VOLTS D.C.
C-17	70. VOLTS D.C.

AVERAGE FILAMENT VOLTAGE:-		
76	FIL. VOLTAGE	6.3 VOLTS A.C.
6A6	FIL. VOLTAGE	6.3 VOLTS AC.
2A3	FIL. VOLTAGE	2.5 VOLTS A.C.
80	FIL. VOLTAGE	5.0 VOLTS A.C.

SPEAKER FIELD 850 OHMS BETWEEN TERMINALS *1 & *7 ON SPEAKER SOCKET- 70 VOLTS D.C.

SOUND SYSTEM FOR 32 VOLT D.C. VIBRATOR MODEL 50

PICKUP PART Nº25662	VOLUME CONTROL-257-A.M. PART Nº25423	AMPLIFIER- "754 PART No. "29162	SPEAKER- JENSEN "25593



ITEM	PART NO.	VALUE	REMARKS
		RESISTORS	
R-1	20787	5000 OHMS	±10% ¼WATT
R-2	22765	12000 OHMS	DUAL VOLUME CONTROL
R-3		150000 OHMS	
R-4	21200	10000 OHMS	±10% ¼WATT
R-5	20767	5000 OHMS	±10% ¼WATT
R-6	25418	1500 OHMS	±10% ¼WATT
R-7	20267	15000 OHMS	±10% ¼WATT
R-8	28626	25000 OHMS	±5% ¼WATT
R-9	28152	75000 OHMS	±5% ¼WATT
R-10	25418	1500 OHMS	±10% ¼WATT
R-11	20855	150000 OHMS	±10% ¼WATT
R-12	21939	50000 OHMS	±10% ¼WATT
R-13	21938	100000 OHMS	±10% ¼WATT
R-14	20855	150000 OHMS	±10% ¼WATT
R-15	20728	250000 OHMS	±20% ¼WATT
R-16	25557	25000 OHMS	±5% 20 WATT
R-17	20266	75000 OHMS	±10% ¼WATT
R-18	20728	250000 OHMS	±20% ¼WATT
R-19	20728	250000 OHMS	±20% ¼WATT
R-20	20750	500000 OHMS	±20% ¼WATT
R-21	23084	25000 OHMS	±10% ¼WATT
R-22	20750	500000 OHMS	±20% ¼WATT
R-23	20855	150000 OHMS	±10% ¼WATT
R-24	22014	30000 OHMS	±10% ¼WATT
R-25	20266	75000 OHMS	±10% ¼WATT
R-26	22526	20000 OHMS	±10% ¼WATT
R-27	20266	75000 OHMS	±10% ¼WATT
R-28	22530	1000 OHMS	±10% ¼WATT

ITEM	PART NO	VALUE	REMARKS
		CONDENSERS	
C-1	25427		
C-2	25430	.02 MFD.	±10% 200 W.V.
C-3	23221	.18 MFD.	±10% 200 W.V.
C-4	22531	.003 MFD.	±10% MICA
C-5	22753	.006 MFD	±10% 400 W.V.
C-6	23010	10. MFD	25 W.V.
C-7	21993	.05 MFD.	±10% 400 W.V.
C-8	24321	2 MFD.	450 W.V.
C-9	25428	.0015 MFD	±5% MICA
C-10	25429	.00035 MFD.	±10% MICA
C-11	22753	.006 MFD	±10% 400 W.V.
C-12	21993	.05 MFD	±10% 400 W.V.
C-13	29164	10. MFD.	65 W.V. A.C.
C-14	21993	.05 MFD.	±10% 400 W.V.
C-15	21993	.05 MFD.	±10% 400 W.V.
C-16	20665	25 MFD.	±10% 200 W.V.
C-17		12 MFD.	150 W.V.
C-18	25415	25 MFD.	450 W.V.
C-19		8 MFD.	500 W.V.
C-20	24329	1 MFD.	±10% 200 W.V.
C-21	24364	.5 MFD	±10% 200 W.V.
C-22	24364	.5 MFD.	±10% 200 W.V.
C-23	29016	.25 MFD.	±10% 200 W.V.
C-24	29017	.01 MFD.	±10% 200 W.V.
		CHOKES	
L-1	25598	290 MILLIHENRIES	CHOKE COIL
L-2	21693	540 MILLIHENRIES	CHOKE COIL
		TRANSFORMERS	
T-1	29001	60 CYCLE	POWER
T-2	25416		AUDIO OUTPUT

VOLTAGES AND CURRENTS OF MODEL "754 AMPLIFIER ALL MEASUREMENTS MADE WITH LINE VOLTAGE 115 VOLTS 60 CYCLE A.C. OR 32 VOLTS D.C.
ALL VOLTAGES MEASURED WITH 1000 OHMS PER VOLT VOLTMETER.

AVERAGE PLATE VOLTAGE MEASURED FROM PLATE + TO CHASSIS-	
76 PLATE TO CHASSIS	65 VOLTS D.C.
6A6 PLATE TO CHASSIS	110 VOLTS D.C.
2A3 PLATE TO CHASSIS	345 VOLTS D.C.

AVERAGE PLATE CURRENT:-	
76 PLATE CURRENT	1.3 MILLS D.C.
6A6 PLATE CURRENT	.5 MILLS D.C.
2A3 PLATE CURRENT	34 MILLS D.C.

AVERAGE VOLTAGE MEASURED ACROSS CONDENSERS:-	
C-18	345 VOLTS D.C.
C-19	420 VOLTS D.C.
C-6	35 VOLTS D.C.
C-17	70 VOLTS D.C.

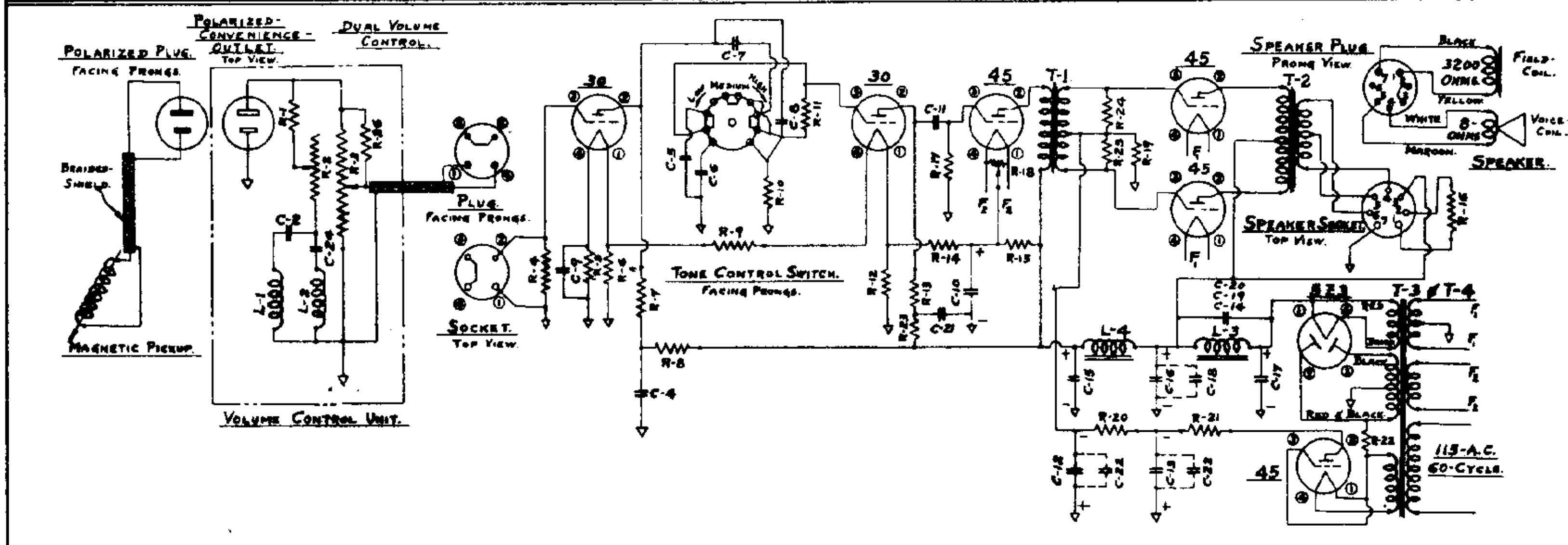
AVERAGE FILAMENT VOLTAGES		
76	FIL VOLTAGE	6.3 VOLTS A.C.
6A6	FIL VOLTAGE	6.3 VOLTS A.C.
2A3	FIL VOLTAGE	2.5 VOLTS A.C.
80	FIL VOLTAGE	5.0 VOLTS A.C.

SPEAKER FIELD - 850 OHMS BETWEEN TERMINALS "1 & "7 ON SPEAKER SOCKET- 70 VOLTS D.C.

RUDOLPH WURLITZER CO.

SOUND SYSTEM FOR MODELS-316-416-616-716 & 616-A.

PICKUP-#24707	VOLUME CONTROL-#177-AM. PART Nº 24298.	AMPLIFIER-#771. 25-CYCLE-#24368. 40-CYCLE-#24370. 60-CYCLE-#24274.	SPEAKERS FOR #616-A. JENSEN-#27359 MAGNAVOX-#27374	316; 416 SPEAKERS 616; 716. JENSEN-#26923. MAGNAVOX-#26409.



ITEM	PART Nº	VALUE	REMARKS	ITEM	PART Nº	VALUE	REMARKS
RESISTORS							
R-1	[illegible]	1,000-OHMS	±10% ½-WATT	R-19	23012	5,000-OHMS	±5% 10-WATT
R-2	22765	[illegible]	±15% VOLUME CONTROL	R-20	23011	2,000-OHMS	±5% 10-WATT
R-3	22765	[illegible]	±15% VOLUME CONTROL	R-21	23011	2,000-OHMS	±5% 10-WATT
R-4	20750	500,000-OHMS	±20% ½-WATT	R-22	23013	3,500-OHMS	±5% 10-WATT
R-5	[illegible]	65-OHMS	[illegible]	R-23	23084	25,000-OHMS	±10% ½-WATT
R-6	[illegible]	2,000-OHMS	±10% 1-WATT	R-24	26358	7,000-OHMS	±10% ½-WATT
R-7	[illegible]	100,000-OHMS	±10% ½-WATT	R-25	26358	7,000-OHMS	±10% ½-WATT
R-8	[illegible]	50,000-OHMS	[illegible]	R-26	21939	50,000-OHMS	±10% ½-WATT
R-9	[illegible]	100-OHMS	[illegible]				
R-10	[illegible]	500,000-OHMS	±20% ½-WATT				
R-11	[illegible]	75,000-OHMS	[illegible]				
R-12	[illegible]	2,000-OHMS	[illegible]				
R-13	[illegible]	[illegible]	[illegible]				
R-14		[illegible]	[illegible]				
R-15	[illegible]	[illegible]	[illegible]				
R-16		[illegible]	[illegible]				
R-17	[illegible]	[illegible]	[illegible]				
R-18	[illegible]	[illegible]	[illegible]				

ITEM	PART Nº	VALUE	REMARKS	ITEM	PART Nº	VALUE	REMARKS
CONDENSERS.				C-19	24365	1. - MFD.	FOR 25-30-CYCLE
C-1				C-20	[illegible]	.5 - MFD.	FOR 40-CYCLE
C-2	20565	.25 - MFD.	±10% 200-VOLT	C-21	[illegible]	2. - MFD.	450-VOLT
C-3				C-22	[illegible]	8 - 8 - MFD.	FOR 25-30-CYCLE
C-4	24321	2. MFD.	450-VOLT	C-23			
C-5	24280	.00075-MFD.	+40% -20% MICA	C-24	[illegible]	.002-MFD.	±10% MICA.
C-6	22241	.002 - MFD.	±10% MICA	CHOKES.			
C-7	21993	.05 - MFD.	±20% 400-VOLT	L-1	[illegible]	540-MILLIHENRIES	CHOKE COIL
C-8	26560	.004 - MFD.	±10% 600-VOLT	L-2	[illegible]	290-MILLIHENRIES	CHOKE COIL
C-9	24279	10. MFD.	25-VOLT	L-3	[illegible]	8.75-HENRIES	#1-FILTER CHOKE
C-10	24775	25. MFD.	[illegible]-VOLT	L-4	[illegible]	2-HENRIES	#2-FILTER CHOKE
C-11	21736	.1 MFD.	±20% 400-VOLT				
C-12	23021	8. MFD.	150-VOLT				
C-13	23021	8. MFD.	150-VOLT				
C-14	20565	.25 MFD.	FOR 60-CYCLE	TRANSFORMERS.			
C-15	21720	25. MFD.	450-VOLT	T-1	[illegible]		AUDIO INPUT
C-16	22325	6. MFD.	500-VOLT	T-2	[illegible]		AUDIO OUTPUT
C-17	22325	4. MFD.	500-VOLT	T-3	[illegible]	60-CYCLE	POWER.
C-18	21720	25. MFD.	FOR 25-40-CYCLE	T-4	[illegible]	25-CYCLE	POWER.

VOLTAGES AND CURRENTS OF MODEL-#771-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 PLATE CURRENT:–	AVERAGE GRID VOLTAGE MEASURED FROM GRID TO FILAMENT.	AVERAGE FILAMENT VOLTAGE:–
OUTPUT -45 [illegible]-VOLTS D.C.	OUTPUT -45 28.0-M.A.D.C.	OUTPUT -45 87-VOLTS D.C.	RECTIFIER 523 5.0-VOLTS A.C.
DRIVER -45 [illegible]-VOLTS D.C.	DRIVER -45 38.0-M.A.D.C.	DRIVER -45 40-VOLTS D.C.	OUTPUT -45 2.5-VOLTS A.C.
-30 175-VOLTS D.C.	-30 2.1-M.A.D.C.		DRIVER -45 2.5-VOLTS A.C.
-30 80-VOLTS D.C.	-30 1.5-M.A.D.C.		-30 2.1-VOLTS D.C.

AVERAGE VOLTAGES ACROSS SPEAKER FIELDS AND ELECTROLYTIC CONDENSERS.

3200-OHM SPEAKER FIELD VOLTAGE MEASURED FROM #1-CONTACT TO #7-CONTACT ON SPEAKER SOCKET 205-VOLTS D.C.

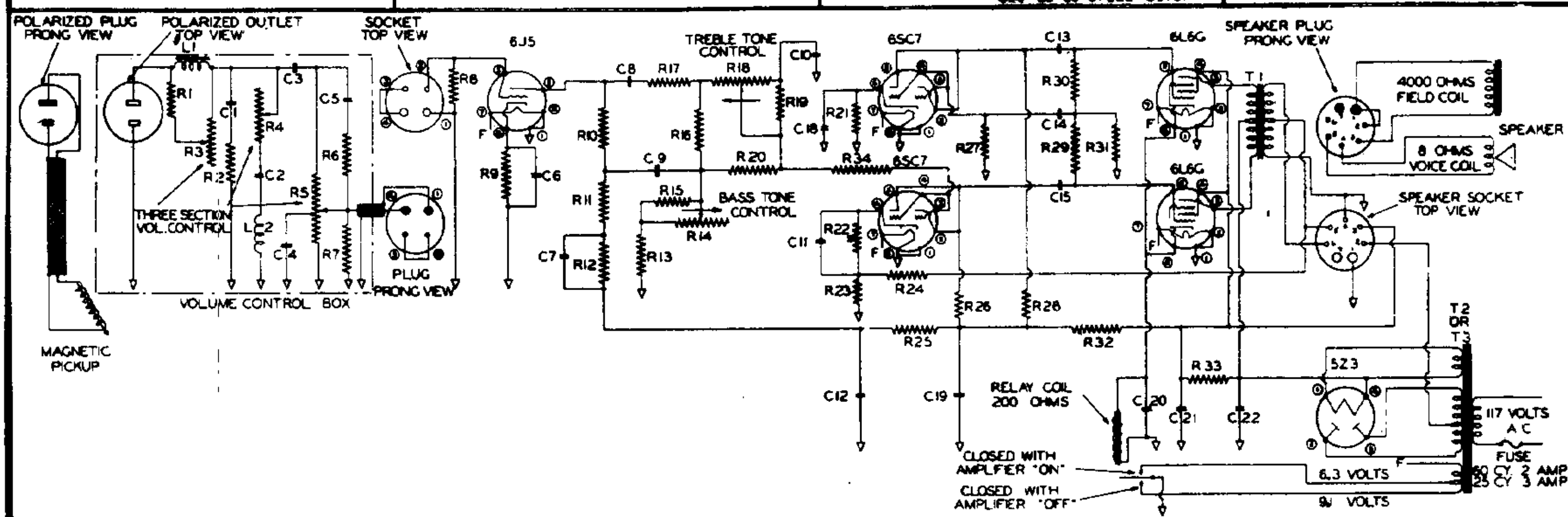
2500-OHM AUXILIARY SPEAKER FIELD VOLTAGE MEASURED FROM #1-CONTACT TO #3-CONTACT ON SPEAKER SOCKET 155-VOLTS D.C.

C-17 ELECTROLYTIC 385-VOLTS D.C.	
C-16 ELECTROLYTIC 360-VOLTS D.C.	FROM RECTIFIER -45-PLATE- TO CHASSIS + 150-VOLTS D.C.
C-15 ELECTROLYTIC 355-VOLTS D.C.	

RUDOLPH WURLITZER CO.

SOUND SYSTEM FOR MODEL 800

PICKUP PART NO. 34969	VOLUME CONTROL UNIT 37181	AMPLIFIER 8003 25 CYCLE 37273 / 800 50-60 CYCLE 36761	SPEAKER 36627



ITEM	PART NO.	VALUE (RESISTORS)	REMARKS		ITEM	PART NO.	VALUE (RESISTORS)	REMARKS	
R 1	[illegible]	3900 OHMS	± 10 %	½ WATT	R 18	[illegible]	750000 OHMS	TONE CON. TREBLE	
R 2	[illegible]	1500 OHMS	± 10 %	½ WATT	R 19	[illegible]	1000000 OHMS	± 10 %	½ WATT
R 3		150000 OHMS	VOL. CON.	REAR	R 20	[illegible]	[illegible] OHMS	± 10 %	½ WATT
R 4	37166	1500 OHMS	VOL. CON.	CENTER	R 21	[illegible]	1200 OHMS	± 10 %	½ WATT
R 5		[illegible] OHMS	VOL. CON.	FRONT	R 22	[illegible]	1200 OHMS	± 10 %	½ WATT
R 6	[illegible]	15000 OHMS	± 10 %	½ WATT	R 23	[illegible]	220 OHMS	± 10 %	½ WATT
R 7	[illegible]	270000 OHMS	± 10 %	½ WATT	R 24	[illegible]	5100 OHMS	± 10 %	1 WATT
R 8	[illegible]	560000 OHMS	± 10 %	½ WATT	R 25	[illegible]	10000 OHMS	± 10 %	½ WATT
R 9	[illegible]	3300 OHMS	± 10 %	½ WATT	R 26	[illegible]	56000 OHMS	± 10 %	½ WATT
R 10	[illegible]	10000 OHMS	± 10 %	½ WATT	R 27	[illegible]	560000 OHMS	± 10 %	½ WATT
R 11	[illegible]	6800 OHMS	± 10 %	½ WATT	R 28	[illegible]	[illegible] OHMS	± 10 %	½ WATT
R 12	[illegible]	220000 OHMS	± 10 %	½ WATT	R 29	[illegible]	82000 OHMS	± 10 %	½ WATT
R 13	[illegible]	39000 OHMS	± 10 %	½ WATT	R 30	[illegible]	82000 OHMS	± 10 %	½ WATT
R 14	[illegible]	1000000 OHMS	TONE CON.	BASS	R 31	[illegible]	68000 OHMS	± 10 %	½ WATT
R 15	[illegible]	100000 OHMS	± 10 %	½ WATT	R 32	[illegible]	22000 OHMS	± 10 %	½ WATT
R 16	[illegible]	15000 OHMS	± 10 %	½ WATT	R 33	[illegible]	1150 OHMS	BLEEDER	
R 17	[illegible]	27000 OHMS	± 10 %	½ WATT	R 34	[illegible]	39000 OHMS	± 10 %	½ WATT

ITEM	PART NO.	VALUE (CONDENSERS)		REMARKS		ITEM	PART NO.	VALUE (CONDENSERS)	REMARKS
C 1	28143	.01	MFD	± 10 %	200 WV	C 18		20 MFD	25 WV
C 2	[illegible]	.3	MFD	± 10 %	120 WV	C 19	36439	20 MFD	300 WV
C 3	[illegible]	.03	MFD	± 10 %	200 WV	C 20		20 MFD	25 WV
C 4	[illegible]	.0015	MFD	± 10 %	600 WV	C 21		20 MFD	350 WV
C 5	[illegible]	.001	MFD	± 10 %	600 WV	C 22	36438	30 MFD	300 WV
C 6	[illegible]	20.	MFD		25 WV				
C 7	[illegible]	.03	MFD	± 10 %	200 WV				
C 8	[illegible]	.00075	MFD	± 10 %	600 WV			CHOKES	
C 9	[illegible]	.01	MFD	± 10 %	400 WV	L 1	37185	920 MILLIHENRIES	COIL
C 10	[illegible]	.00075	MFD	± 10 %	600 WV	L 2	37051	475 MILLIHENRIES	COIL
C 11	[illegible]	20.	MFD		25 WV				
C 12	[illegible]	8.	MFD		350 WV			TRANSFORMERS	
C 13	[illegible]	.075	MFD	± 10 %	400 WV	T 1	36434		OUTPUT
C 14	[illegible]	.01	MFD	± 10 %	400 WV	T 2	36767	50-60 CYCLE	POWER
C 15	[illegible]	.075	MFD	± 10 %	400 WV	T 3	37274	25 CYCLE	POWER

VOLTAGES & CURRENTS OF MODEL 800 AMPLIFIER — ALL MEASUREMENTS MADE WITH LINE AT 117 VOLTS 25 OR 60 CYCLE

ALL VOLTAGES MEASURED WITH 1000 OHMS PER VOLT VOLTMETER — FOR ALL VOLTAGES OVER 50 USE 500 VOLT SCALE

AVERAGE PLATE & SCREEN VOLTAGE MEASURED TO CHASSIS	AVERAGE PLATE CURRENT			AVERAGE DC VOLTAGE ACROSS CONDENSERS		AVERAGE FILAMENT VOLTAGE
6L6G PLATE 390 VOLTS DC. SCREEN 308 VOLTS DC	6L6G	PLATE	50 MA DC	C 22	[illegible] VOLTS DC	6L6G FILAMENT 6.3 VOLTS A.C.
6SC7 PLATE 150 VOLTS DC.	6SC7	PLATE	1.3 MA DC	C 21	[illegible] VOLTS DC	6SC7 FILAMENT 6.3 VOLTS A.C.
6J5 PLATE 50 VOLTS DC.	6J5	PLATE	.7 MA DC	C 20	[illegible] VOLTS DC	6J5 FILAMENT 6.3 VOLTS A.C.
				C 19	[illegible] VOLTS DC	FILAMENT VOLTAGES ARE HI FOR ACCELERATED
				C 18	[illegible] VOLTS DC	CATHODE HEATING WHEN FILAMENTS ARE COOL
				C 12	[illegible] VOLTS DC	5Z3 FILAMENT 5 VOLTS A.C.
				C 11	2 VOLTS DC	
				C 6	2 VOLTS DC	

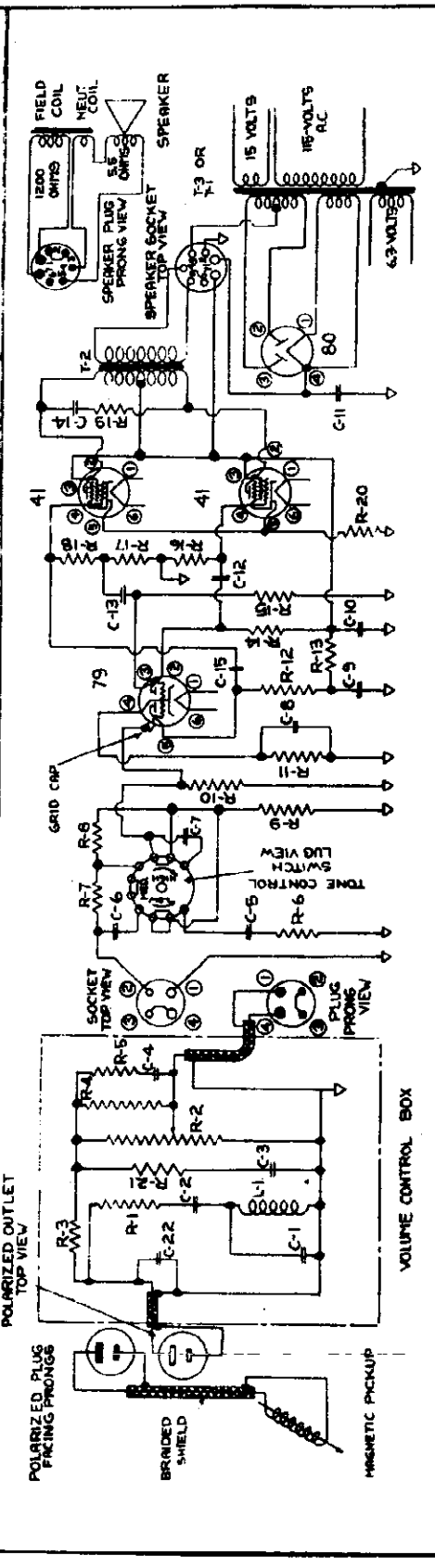
SPEAKER FIELD RESISTANCE 4000 OHMS — 307 VOLTS D.C. BETWEEN TERMINALS 1 & 3 OF SPEAKER SOCKET

MODEL 841

RUDOLPH WURLITZER CO.

SOUND SYSTEM FOR MODEL 61

PICKUP PART NO 25662 | VOLUME CONTROL *148A | PART Nº31247 | AMPLIFIER *841 25 CYCLE *31645 60 CYCLE *31245 | SPEAKER JENSEN- UTAH - *31931 *32124



ITEM	PART NO.	VALUE	REMARKS
	RESISTORS		
R-1	31144	1000 OHMS	±5% ½ WATT
R-2	25679	100000 OHMS	±5% ½ WATT
R-3	28153	15000 OHMS	VOLUME CONTROL
R-4	31644	100000 OHMS	±5% ½ WATT
R-5	31152	200000 OHMS	±5% ½ WATT
R-6	21200	10000 OHMS	±10% ½ WATT
R-7	20266	75000 OHMS	±10% ½ WATT
R-8	21200	10000 OHMS	±10% ½ WATT
R-9	21938	100000 OHMS	±10% ½ WATT
R-10	20703	300000 OHMS	±10% ½ WATT
R-11	22586	3000 OHMS	±10% ½ WATT
R-12	25575	200000 OHMS	±10% ½ WATT
R-13	20266	75000 OHMS	±10% ½ WATT
R-14	20728	250000 OHMS	±20% ½ WATT
R-15	20728	250000 OHMS	±20% ½ WATT
R-16	25432	500000 OHMS	±10% ¼ WATT
R-17	21200	10000 OHMS	±10% ¼ WATT
R-18	25432	500000 OHMS	±10% ¼ WATT
R-19	25574	15000 OHMS	±10% 1 WATT
R-20	25573	2500 OHMS	±5% 10 WATT
R-21	25910	50000 OHMS	±5% ¼ WATT

ITEM	PART NO.	VALUE	REMARKS
	CONDENSERS		
C-1	22532	.004 MFD.	±10% MICA
C-2	20665	.25 MFD.	±10% 200 W.V.
C-3	22758	.001 MFD.	±10% MICA
C-4	25680	.008 MFD.	±10% 200 W.V.
C-5	22589	.0025 MFD.	±10% MICA
C-6	22532	.004 MFD.	±10% MICA
C-7	22589	.0025 MFD.	±10% MICA
C-8	23010	10. MFD.	25 W.V.
C-9	22320	.3 MFD.	±20% 400 W.V.
C-10	25570	25. MFD.	450 W.V.
C-11		8. MFD.	500 W.V.
C-12	21993	.05 MFD.	±10% 400 W.V.
C-13	21993	.05 MFD.	±10% 400 W.V.
C-14	22531	.003 MFD.	±10% MICA
C-15	21993	.05 MFD.	±10% 400 W.V.
C-22	25680	.008 MFD.	±10% 200 W.V.

ITEM	PART NO.	VALUE	REMARKS
	CHOKES		
L-1	25598	290-MILLIHENRIES	CHOKE COIL
	TRANSFORMERS		
T-1	25572	60- CYCLE	POWER
T-2	25571		AUDIO OUTPUT
T-3	25747	25- CYCLE	POWER

VOLTAGES AND CURRENTS OF MODEL *841 AMPLIFIER. ALL MEASUREMENTS MADE WITH LINE VOLTAGE 115 VOLTS 60 OR 25 CYCLE A.C.
ALL VOLTAGES MEASURED WITH 1000 OHMS PER VOLT VOLTMETER.

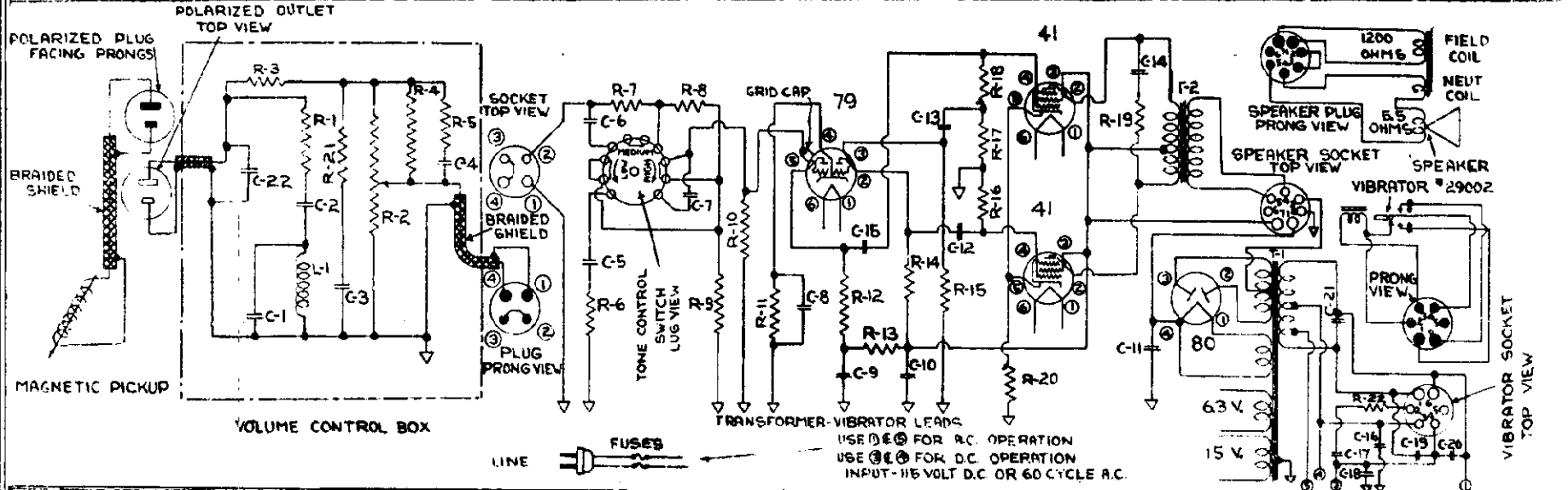
AVERAGE PLATE VOLTAGE MEASURED FROM PLATE TO CHASSIS:-	AVERAGE PLATE CURRENT	AVERAGE BIAS VOLTAGE MEASURED FROM CATHODE TO GROUND:-	AVERAGE FILAMENT VOLTAGE
115-VOLTS	35 - MILLS	APPROX. 1.5-2. VOLTS	6.3- VOLTS A.C.
79 270-VOLTS	30. - MILLS	18. VOLTS	6.3- VOLTS A.C.
41			5.0- VOLTS A.C.
80			

VOLTAGE ACROSS CONDENSER C-10 275 VOLTS D.C. VOLTAGE ACROSS CONDENSER C-11 360 VOLTS D.C.

SPEAKER FIELD 1200-OHMS BETWEEN TERMINALS "1 & "7 ON SPEAKER SOCKET 85 VOLTS D.C.

SOUND SYSTEM FOR 115 VOLT D.C. VIBRATOR MODEL 61

PICKUP PART Nº25662	VOLUME CONTROL *148-A.M-PART Nº31247	AMPLIFIER - *842 - PART Nº *31809	SPEAKER-JENSEN - * 32124 UTAH - *31931



ITEM	PART NO	VALUE	REMARKS
		REGISTORS	
R-1	31144	1000 OHMS	±5% ¼ WATT
R-2	25679	100000 OHMS	VOLUME CONTROL
R-3	28153	15000 OHMS	±5% ¼WATT
R-4	31644	100000 OHMS	±5% ¼WATT
R-5	31152	200000 OHMS	±5% ¼ WATT
R-6	21200	10000 OHMS	±10% ¼WATT
R-7	20266	75000 OHMS	±10% ¼WATT
R-8	21200	10000 OHMS	±10% ¼WATT
R-9	21938	100000 OHMS	±10% ¼WATT
R-10	20703	300000 OHMS	±10% ¼WATT
R-11	22588	3000 OHMS	±10% ¼WATT
R-12	25575	200000 OHMS	±10% ¼WATT
R-13	20266	75000 OHMS	±10% ¼WATT
R-14	20728	250000 OHMS	±20% ¼WATT
R-15	20728	250000 OHMS	±20% ¼WATT
R-16	25432	500000 OHMS	±10% ¼W
R-17	21200	10000 OHMS	±10% ¼W
R-18	25432	500000 OHMS	±10% ¼W
R-19	25574	15000 OHMS	±10% 1W
R-20	25573	250 OHMS	±5% 10W
R-21	25910	50000 OHMS	±5% ¼W
R-22	22630	1000 OHMS	±10% ¼W

ITEM	PART NO	VALUE	REMARKS
		CONDENSERS	
C-1	22532	.004 MFD.	±10% MICA
C-2	20665	.25 MFD.	±10% 200 W.V.
C-3	22758	.001 MFD.	±10% MICA
C-4	25680	.008 MFD.	±10% 200 W.V.
C-5	22589	.0025 MFD.	±10% MICA
C-6	22532	.004 MFD.	±10% MICA
C-7	22589	.0025 MFD.	±10% MICA
C-8	23010	10. MFD.	25 W.V.
C-9	22320	.3 MFD.	±20% 400 W.V.
C-10	25570	25. MFD.	450 W.V.
C-11		8. MFD.	500 W.V.
C-12	21993	.05 MFD.	±10% 400 W.V.
C-13	21993	.05 MFD.	±10% 400 W.V.
C-14	22531	.003 MFD.	±10% MICA
C-15	21993	.05 MFD.	±10% 400 W.V.

ITEM	PART NO	VALUE	REMARKS
C-16	29016	.25 MFD.	±10% 200 W.V.
C-17	24329	.1 MFD.	±10% 200 W.V.
C-18	29017	.01 MFD.	±10% 200 W.V.
C-19	24364	.5 MFD.	±10% 200 W.V.
C-20	24364	.5 MFD.	±10% 200 W.V.
C-21	29155	1. MFD.	220 W.V. A.C.
C-22	25680	.008 MFD.	±10% 200 W.V.
		CHOKES	
L-1	25598	290 MILLIHENRIES	CHOKE COIL
		TRANSFORMERS	
T-1	29149	60-CYCLE	POWER
T-2	25571		AUDIO OUTPUT

VOLTAGES AND CURRENTS OF MODEL *842 AMPLIFIER. ALL MEASUREMENTS MADE WITH LINE VOLTAGE 116 VOLTS D.C. OR 60 CYCLE A.C.
ALL VOLTAGES MEASURED WITH 1000 OHMS PER VOLT VOLTMETER

AVERAGE PLATE VOLTAGE MEASURED FROM PLATE TO CHASSIS:-		AVERAGE PLATE CURRENT		AVERAGE BIAS VOLTAGE MEASURED FROM CATHODE TO GROUND		AVERAGE FILAMENT VOLTAGES	
79	115-VOLTS D.C.	79	.35-MILLS D.C.	79	APPROX. 1.5-2. VOLTS	79	6.3 VOLTS A.C.
41	270-VOLTS D.C.	41	30. -MILLS D.C.	41	18. VOLTS	41	6.3 VOLTS A.C.
						80	5.0 VOLTS A.C.

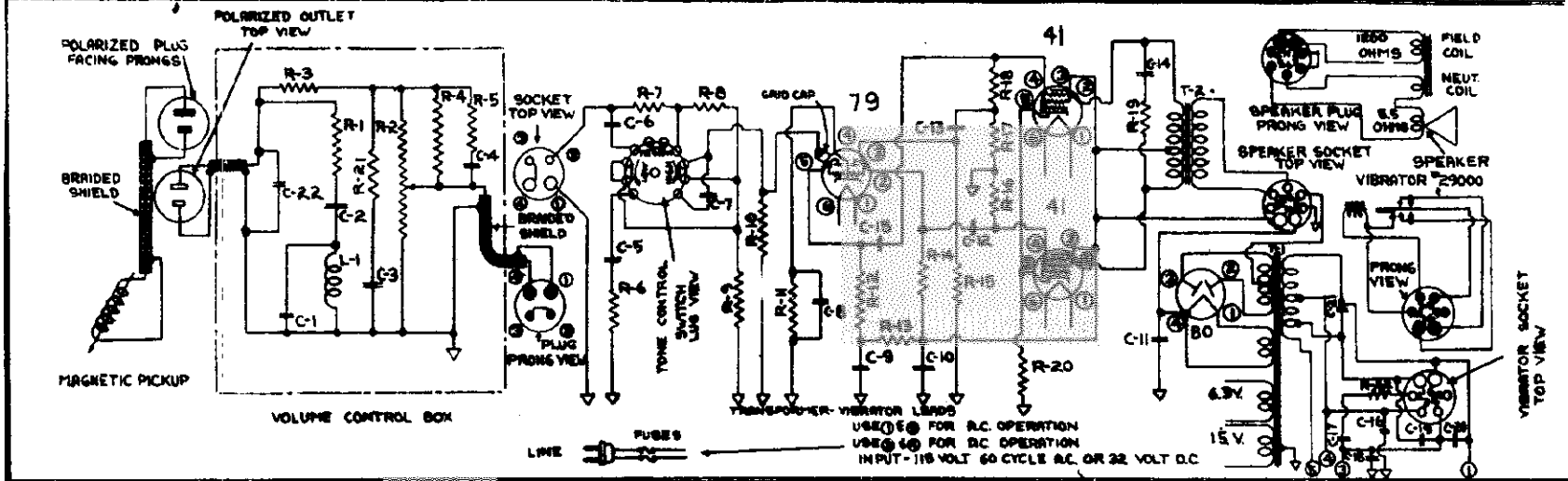
VOLTAGE ACROSS CONDENSER C-10 - 275 VOLTS D.C. VOLTAGE ACROSS CONDENSER C-11 360 VOLTS D.C.

SPEAKER FIELD - 1200 OHMS BETWEEN TERMINALS *1 & *7 ON SPEAKER SOCKET - 85 VOLTS D.C.

RUDOLPH WURLITZER CO.

SOUND SYSTEM FOR 32 VOLT D.C. VIBRATOR MODEL 61

PICKUP PART Nº *25662	VOLUME CONTROL *148-A.M-PART Nº*31247	AMPLIFIER--*843 PART NO. *31811	SPEAKER- UTAH - *31431 JENSEN - *32124



ITEM	PART NO.	VALUE	REMARKS
		RESISTORS	
R-1	31144	1000 OHMS	± 5% ¼ WATT
R-2	25679	100000 OHMS	VOLUME CONTROL
R-3	28153	18000 OHMS	± 5% ¼ WATT
R-4	31644	100 000 OHMS	± 5% ¼ WATT
R-5	31162	250 000 OHMS	± 5% ¼ WATT
R-6	21200	10 000 OHMS	± 10% ¼ WATT
R-7	20256	75000 OHMS	± 10% ¼ WATT
R-8	21200	10000 OHMS	± 10% ¼ WATT
R-9	21936	100 000 OHMS	± 10% ¼ WATT
R-10	20703	300000 OHMS	± 10% ¼ WATT
R-11	22586	3000 OHMS	± 10% ¼ WATT
R-12	21575	200000 OHMS	± 10% ¼ WATT
R-13	20266	75000 OHMS	± 10% ¼ WATT
R-14	20728	250000 OHMS	± 20% ¼ WATT
R-15	20728	250000 OHMS	± 20% ¼ WATT
R-16	25632	500000 OHMS	± 10% ½ WATT
R-17	21800	10000 OHMS	± 10% ½ WATT
R-18	25632	500000 OHMS	± 10% ½ WATT
R-19	26074	15000 OHMS	± 10% 1 WATT
R-20	26573	250 OHMS	± 5% 10 WATT
R-21	25110	50000 OHMS	± 5% ½ WATT
R-22	25630	1000 OHMS	± 10% ½ WATT

ITEM	PART NO.	VALUE	REMARKS
		CONDENSERS	
C-1	22558	.004 MFD.	± 10% MICA
C-2	20665	.25 MFD.	± 10% 200 W.V.
C-3	22758	.001 MFD.	± 10% MICA
C-4	25620	.008 MFD.	± 10% 200 W.V.
C-5	22588	.0025 MFD.	± 10% MICA
C-6	22532	.004 MFD.	± 10% MICA
C-7	22508	.0025 MFD.	± 10% MICA
C-8	23010	10. MFD.	25 W.V.
C-9	22320	.3 MFD.	600 & 800 W.V.
C-10	25570	.25 MFD.	450 W.V.
C-11		8. MFD.	500 W.V.
C-12	21993	.05 MFD.	± 10% 400 W.V.
C-13	21993	.05 MFD.	± 10% 400 W.V.
C-14	25631	.005 MFD.	± 10% MICA
C-15	21993	.05 MFD.	± 10% 400 W.V.
C-16	29016	.25 MFD.	± 10% 200 W.V.
C-17	24325	.1 MFD.	± 10% 200 W.V.
C-18	29017	.01 MFD.	± 10% 200 W.V.
C-19	24364	.5 MFD.	± 10% 200 W.V.
C-20	24364	.5 MFD.	± 10% 200 W.V.
C-21	23164	16. MFD.	65 W.V. A.C.
C-22	25650	.005 MFD.	± 10% 200 W.V.
		CHOKES	
L-1	25695	250 m.a. CHOKE	CHOKE COIL
		TRANSFORMERS	
T-1	29136	60 CYCLE	POWER
T-2	25571		AUDIO OUTPUT

VOLTAGES AND CURRENTS OF MODEL *843 AMPLIFIER. ALL MEASUREMENTS MADE WITH LINE VOLTAGE 115 VOLTS 60 CYCLE A.C. OR 32 VOLTS D.C.
ALL VOLTAGES MEASURED WITH 1000 OHMS PER VOLT VOLTMETER.

AVERAGE PLATE VOLTAGE PLATE TO CHASSIS	MEASURED FROM
79	115 VOLTS D.C.
41	270 VOLTS D.C.

AVERAGE PLATE CURRENT	
79	.35 MILLS D.C.
41	30. MILLS D.C.

AVERAGE BIAS VOLTAGE MEASURED FROM CATHODE TO GROUND	
79	APPROX. 1.5-2. VOLTS
41	18. VOLTS

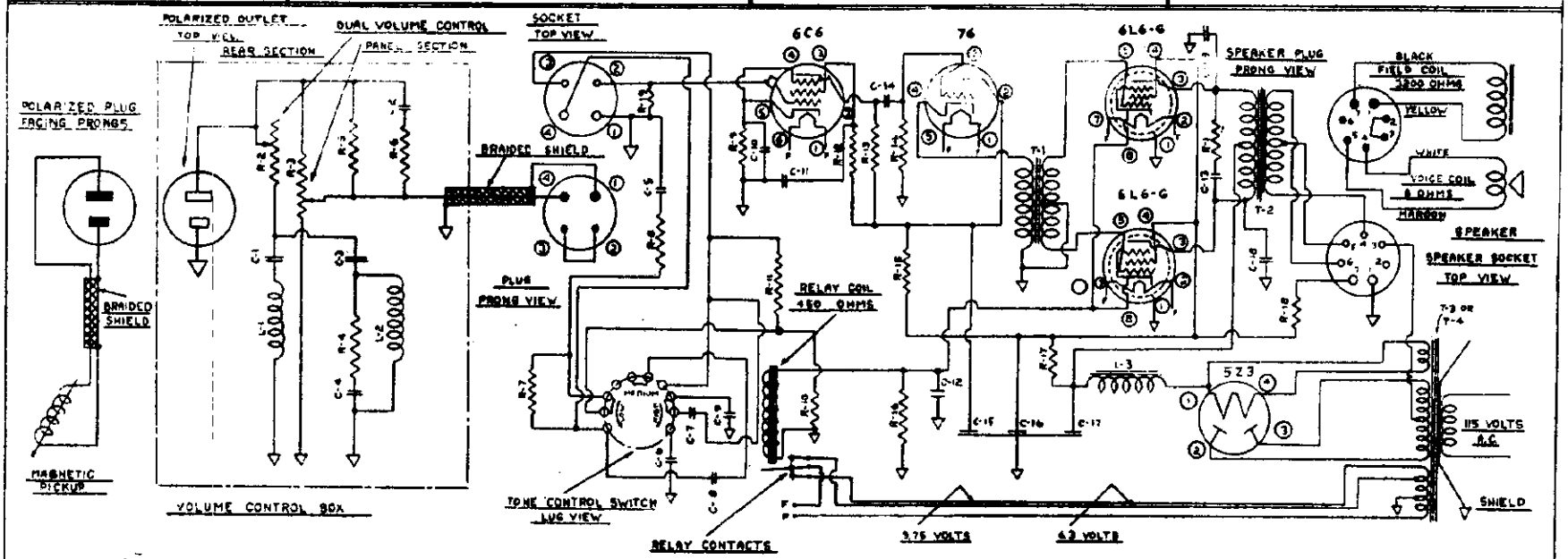
AVERAGE FILAMENT VOLTAGE	
79	6.3 VOLTS A.C.
41	6.3 VOLTS A.C.
80	5.0 VOLTS A.C.

VOLTAGE ACROSS CONDENSER C-10 - 275 VOLTS D.C.
VOLTAGE ACROSS CONDENSER C-11 - 360 VOLTS D.C.

SPEAKER FIELD - 200 OHMS BETWEEN TERMINALS *1 & *7 ON SPEAKER SOCKET - 85 VOLTS D.C.

SOUND SYSTEM FOR MODEL 24 & 24-A

PICKUP PART NO. *21423	VOLUME CONTROL *158 A.M. - PART NO *28121	AMPLIFIER *851	25 CYCLE - *28643 60 CYCLE - *28125	SPEAKER	JENSEN - *27359 MAGNAVOX - *27374



ITEM	PART NO	VALUE	REMARKS
		RESISTORS	
R-1	28145	18000 OHMS	± 10% 1 WATT
R-2	24378	7500 OHMS ± 15%	DUAL VOLUME CONTROL
R-3		150,000 OHMS	± 15 %
R-4	22783	7000 OHMS	± 10% ¼ WATT
R-5	23084	25000 OHMS	± 10% ¼ WATT
R-6	21998	35000 OHMS	± 10% ¼ WATT
R-7	28151	10000 OHMS	± 5% ½ WATT
R-8	28152	75000 OHMS	± 5% ½ WATT
R-9	28150	600 OHMS	± 5% ½ WATT
R-10	25575	200000 OHMS	± 10% ¼ WATT
R-11	28153	15000 OHMS	± 5% ½ WATT
R-12	25575	200000 OHMS	± 10% ¼ WATT
R-13	23208	60000 OHMS	± 10% ½ WATT
R-14	25432	500000 OHMS	± 10% ¼ WATT
R-15	28147	10000 OHMS	± 10% 1 WATT
R-16	28146	350 OHMS	± 5% 3 WATT
R-17	28133	950 OHMS BLEEDER	± 5% 20 WATT
R-18		1500 OHMS BLEEDER	± 5% 25 WATT
R-19	21841	2000000 OHMS	± 10% ½ WATT

ITEM	PART NO	VALUE	REMARKS
		CONDENSERS	
C-1	25427	.002 MFD.	± 5% MICA
C-2	22531	.003 MFD.	± 10% MICA
C-3	28123	.3 MFD.	± 10% 120 VOLTS
C-4	25427	.002 MFD.	± 5% MICA
C-5	22531	.003 MFD.	± 10% MICA
C-6	23052	.005 MFD.	± 10% 200 VOLTS
C-7	23052	.005 MFD.	± 10% 200 VOLTS
C-8	28145	.006 MFD.	± 10% 600 VOLTS
C-9	28143	.01 MFD.	± 10% 200 VOLTS
C-10	28141	.25 MFD.	25 VOLTS
C-11	28211	.25 MFD.	± 10% 400 VOLTS
C-12	28139	.16 MFD.	50 VOLTS
C-13	28145	.006 MFD.	± 10% 600 VOLTS
C-14	28142	.03 MFD.	± 10% 400 VOLTS
C-15	28138	.4 MFD.	350 VOLTS
C-16	28138	20 MFD.	450 VOLTS
C-17		8 MFD.	500 VOLTS
C-18	28924	.00035 MFD	± 10% 600 VOLTS
C-19	28924	.00035 MFD	± 10% 600 VOLTS
		CHOKES	
L-1	25598	290 - MILLIHENRIES	CHOKE COIL
L-2	28526	400 - MILLIHENRIES	CHOKE COIL
L-3	28137	4.1 - HENRIES ± 15%	FILTER CHOKE
		TRANSFORMERS	
T-1	28136		AUDIO INPUT
T-2	28135		AUDIO OUTPUT
T-3	28134	60 CYCLE	POWER
T-4	28470	25 CYCLE	POWER

VOLTAGES AND CURRENTS OF MODEL *851 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	
6L6-G PLATE TO CHASSIS	400 VOLTS
76 PLATE TO CHASSIS	220 VOLTS
6C6 PLATE TO CHASSIS	65 VOLTS

AVERAGE PLATE CURRENT		
6L6-G	PLATE CURRENT	51 MA. D.C.
76	PLATE CURRENT	6.5 MA. D.C.
6C6	PLATE CURRENT	2.5 MA. D.C.

AVERAGE D.C. VOLTAGES	
ACROSS 523 FILAMENT & GROUND	420 VOLTS D.C.
ACROSS C-17	405 VOLTS D.C.
ACROSS C-16	325 VOLTS D.C.
ACROSS C-12	24 VOLTS D.C.
ACROSS C-10	1.7 VOLTS D.C.

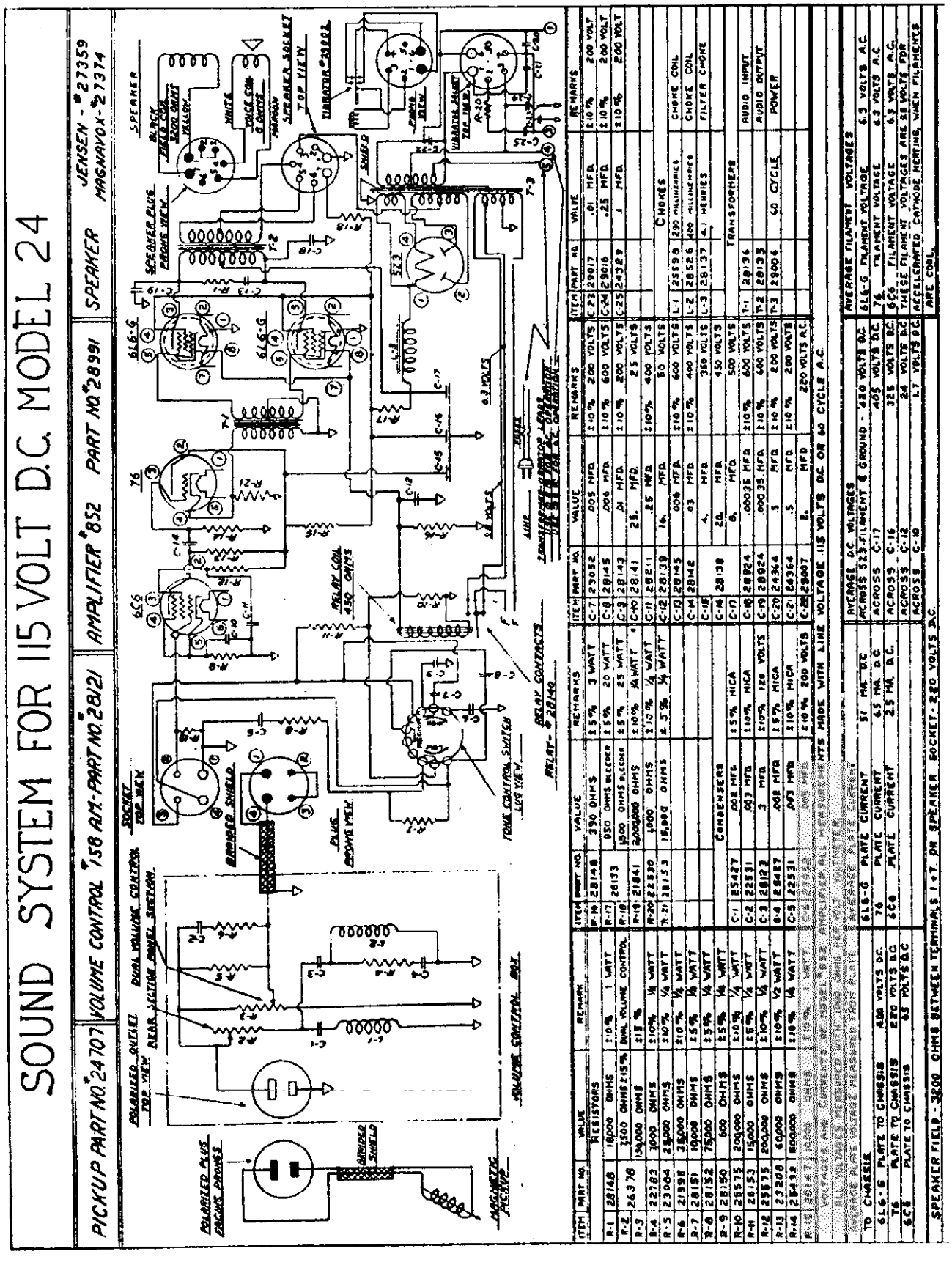
AVERAGE HEATER VOLTAGE		
6L6-G	FIL. VOLTAGE	6.3 VOLTS A.C.
76	FIL. VOLTAGE	6.3 VOLTS A.C.
6C6	FIL. VOLTAGE	6.3 VOLTS A.C.

THESE FILAMENT VOLTAGES ARE 9.8 VOLTS FOR ACCELERATED CATHODE HEATING WHEN FILAMENTS ARE COOL

SPEAKER FIELD - 3200 OHMS. BETWEEN TERMINALS 1 & T ON SPEAKER SOCKET - 220 VOLTS D.C.

MODEL 852

RUDOLPH WURLITZER CO.



ITEM	PART NO.	VALUE	REMARKS
R-1	28148	10000 OHMS	±10% 1 WATT
R-2	26378	1500 OHMS ±15%	DUAL VOLUME CONTROL
R-3		130,000 OHMS	±1%
R-4	22783	3000 OHMS	±10% ½ WATT
R-5	23084	25,000 OHMS	±10% ½ WATT
R-6	21998	35,000 OHMS	±10% ½ WATT
R-7	28151	10000 OHMS	±5% ½ WATT
R-8	28152	75,000 OHMS	±5% ½ WATT
R-9	28150	600 OHMS	±5% ½ WATT
R-10	25515	200,000 OHMS	±10% ½ WATT
R-11	28153	15,000 OHMS	±5% ½ WATT
R-12	25575	200,000 OHMS	±10% ½ WATT
R-13	23200	60,000 OHMS	±10% ½ WATT
R-14	28492	800,000 OHMS	±10% ½ WATT
R-15	28147	1200 OHMS	±10% 1 WATT
C-1	25427	.002 MFD	±5% MICA
C-2	22531	.003 MFD	±10% MICA
C-3	28122	.1 MFD	±10% 120 VOLTS
C-4	25427	.002 MFD	±5% MICA
C-5	22531	.003 MFD	±10% MICA
C-6	23082	.005 MFD	±10% 200 VOLTS
C-7	23082	.005 MFD	±10% 200 VOLTS
C-8	28145	.006 MFD	±10% 600 VOLTS
C-9	28143	.01 MFD	±10% 200 VOLTS
C-10	28141	.25 MFD	25 VOLTS
C-11	28211	.25 MFD	±10% 400 VOLTS
C-12	28139	16. MFD	50 VOLTS
C-13	28145	.006 MFD	±10% 600 VOLTS
C-14	28142	.03 MFD	±10% 400 VOLTS
C-15		4. MFD	350 VOLTS
C-16	28138	20. MFD	450 VOLTS
C-17		8. MFD	500 VOLTS
C-18	28124	.0003 MFD	±10% 600 VOLTS
C-19	28024	.0035 MFD	±10% 600 VOLTS
C-20	24364	.5 MFD	±10% 200 VOLTS
C-21	28364	.5 MFD	±10% 200 VOLTS
C-22	29007	2. MFD	220 VOLTS A.C.
C-23	29017	.01 MFD	±10% 200 VOLT
C-24	23016	.25 MFD	±10% 200 VOLT
C-25	24329	1 MFD	±10% 200 VOLT

CHOKES

ITEM	PART NO.	VALUE	REMARKS
L-1	23598	250 MILLIHENRIES	CHOKE COIL
L-2	28526	400 MILLIHENRIES	CHOKE COIL
L-3	28137	4.1 HENRIES	FILTER CHOKE

TRANSFORMERS

ITEM	PART NO.	VALUE	REMARKS
T-1	28136		RADIO INPUT
T-2	28135		AUDIO OUTPUT
T-3	29006	60 CYCLE	POWER

VOLTAGES ARE CURRENTS OF MODEL 852 AMPLIFIER ALL MEASUREMENTS MADE WITH LINE VOLTAGE 115 VOLTS DC OR 60 CYCLE A.C.

AVERAGE PLATE VOLTAGE MEASURED WITH 1000 OHMS PER VOLT VOLTMETER

ALL VOLTAGES MEASURED FROM TUBE SOCKET TERMINAL TO CHASSIS

AVERAGE PLATE VOLTAGE MEASURED FROM PLATE TO CATHODE WITH 1000 OHMS PER VOLT VOLTMETER

AVERAGE PLATE CURRENT

TO CHASSIS			
6L6-G	PLATE TO CHASSIS	405 VOLTS D.C.	65 MA. D.C.
76	PLATE TO CHASSIS	220 VOLTS D.C.	2.5 MA. D.C.
6CG	PLATE TO CHASSIS	65 VOLTS D.C.	

6L6-G	PLATE CURRENT	51 MA. D.C.	
76	PLATE CURRENT	65 MA. D.C.	
6CG	PLATE CURRENT	2.5 MA. D.C.	

AVERAGE D.C. VOLTAGES

ACROSS 523 FILAMENT & GROUND - 220 VOLTS D.C.	
ACROSS C-17	405 VOLTS D.C.
ACROSS C-16	325 VOLTS D.C.
ACROSS C-12	24 VOLTS D.C.
ACROSS C-10	1.7 VOLTS D.C.

AVERAGE FILAMENT VOLTAGES

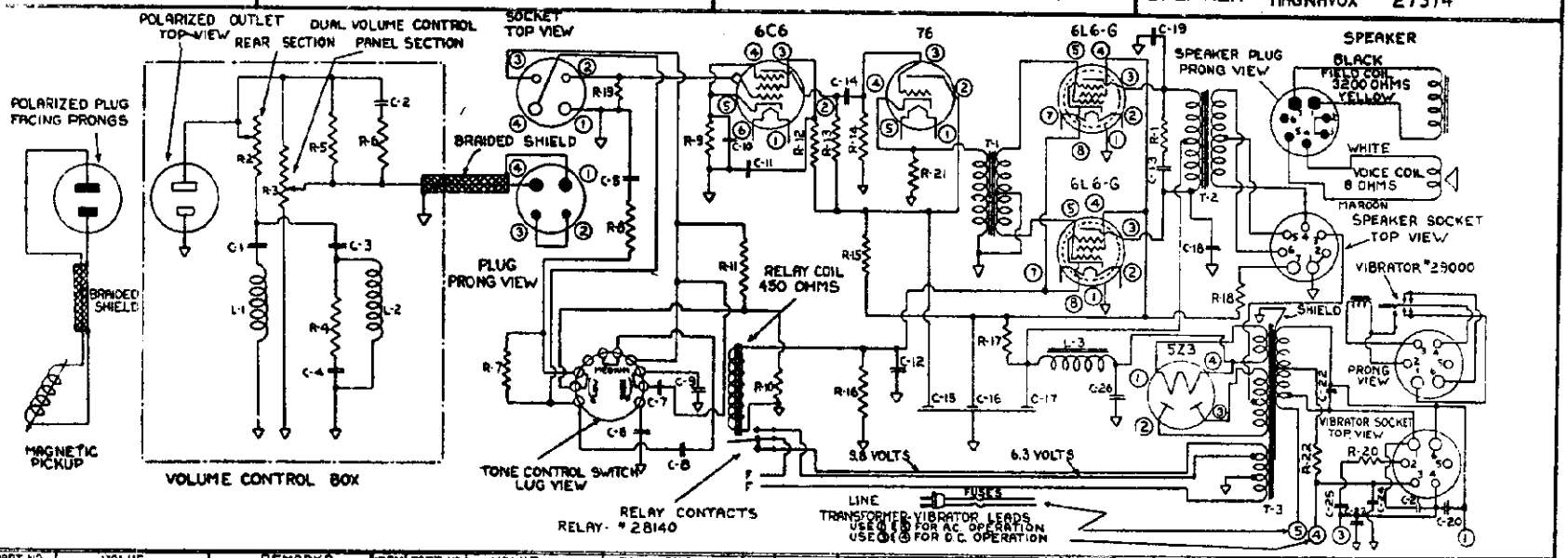
6L6-G FILAMENT VOLTAGE	6.3 VOLTS A.C.
76 FILAMENT VOLTAGE	6.3 VOLTS A.C.
6CG FILAMENT VOLTAGE	6.3 VOLTS A.C.

THESE FILAMENT VOLTAGES ARE 58 VOLTS PEAK

ACCELERATED CATHODE HEATING, WHEN FILAMENTS ARE COOL.

SOUND SYSTEM FOR 32 VOLT D.C. VIBRATOR MODEL 24

PICKUP PART NO. *24707	VOLUME CONTROL *158 A.M. PART NO. 28121	AMPLIFIER *853 PART NO. *29141	SPEAKER JENSEN - *27359 MAGNAVOX *27374



ITEM	PART NO.	VALUE	REMARKS
		RESISTORS	
R-1	28148	18000 OHMS	±10% 1 WATT
R-2	26378	7500 OHMS	±15% DUAL VOLUME CONTROL
R-3		150000 OHMS	±15%
R-4	22783	7000 OHMS	±10% ¼ WATT
R-5	23084	25000 OHMS	±10% ¼ WATT
R-6	21998	35000 OHMS	±10% ¼ WATT
R-7	28151	10000 OHMS	±5% ¼ WATT
R-8	28152	75000 OHMS	±5% ¼ WATT
R-9	28150	600 OHMS	±5% ¼ WATT
R-10	25575	200000 OHMS	±10% ¼ WATT
R-11	28153	15000 OHMS	±5% ¼ WATT
R-12	25575	200000 OHMS	±10% ¼ WATT
R-13	23208	60000 OHMS	±10% ½ WATT
R-14	25432	500000 OHMS	±10% ¼ WATT
R-15	28147	10000 OHMS	±10% 1 WATT
R-16	28146	390 OHMS	±5% 3 WATT
R-17	28133	950 OHMS BLEEDER	±5% 20 WATT
R-18		1500 OHMS BLEEDER	±5% 25 WATT
R-19	21841	2000000 OHMS	±10% ¼ WATT
R-20	22530	1000 OHMS	±10% ¼ WATT
R-21	28153	15000 OHMS	±5% ¼ WATT
R-22	30856	1 OHM	±5% 36 WATT
		CONDENSERS	
C-1	25427	.002 MFD	±5% MICA
C-2	22531	.003 MFD	±10% MICA
C-3	28123	.3 MFD.	±10% 120 VOLTS
C-4	25427	.002 MFD.	±5% MICA
C-5	22531	.003 MFD	±10% MICA
C-6	23052	.005 MFD	±10% 200 VOLTS
C-7	23052	.005 MFD	±10% 200 VOLTS
C-8	28145	.006 MFD	±10% 600 VOLTS
C-9	28143	.01 MFD	±10% 200 VOLTS
C-10	28141	.25 MFD	25 VOLTS
C-11	28211	.25 MFD	±10% 400 VOLTS
C-12	28139	16 MFD	50 VOLTS
C-13	28145	.006 MFD	±10% 600 VOLTS
C-14	28142	.03 MFD	±10% 400 VOLTS
C-15		4 MFD	350 VOLTS
C-16	28138	20 MFD	450 VOLTS
C-17		8 MFD	500 VOLTS
C-18	28924	.00035 MFD	±10% 600 VOLTS
C-19	28924	.00035 MFD	±10% 600 VOLTS
C-20	24364	.5 MFD	±10% 200 VOLTS
C-21	24364	.5 MFD	±10% 200 VOLTS
C-22	29143	20 MFD	100 VOLTS
C-23	29017	.01 MFD.	±10% 200 VOLT
C-24	29016	.25 MFD	±10% 200 VOLT
C-25	24329	.1 MFD	±10% 200 VOLT
C-26	30858	4 MFD	+20%-10% 600 VOLT
		CHOKES	
L-1	25598	290 MILLIHENRIES	CHOKE COIL
L-2	28526	400 MILLIHENRIES	CHOKE COIL
L-3	28137	41 HENRIES	FILTER CHOKE
		TRANSFORMERS	
T-1	28136		AUDIO INPUT
T-2	28135		AUDIO OUTPUT
T-3	29140	60 CYCLE	POWER

VOLTAGES AND CURRENTS OF MODEL *853 AMPLIFIER. ALL MEASUREMENTS MADE WITH LINE VOLTAGE 32 VOLTS D.C. OR 115 VOLTS 60 CYCLE A.C.
ALL VOLTAGES MEASURED WITH 1000 OHMS PER VOLT VOLTMETER

AVERAGE PLATE VOLTAGE MEASURED FROM PLATE TO CHASSIS		
6L6-G	PLATE TO CHASSIS	400 VOLTS D.C.
76	PLATE TO CHASSIS	220 VOLTS D.C.
6C6	PLATE TO CHASSIS	65 VOLTS D.C.

AVERAGE PLATE CURRENT		
6L6-G	PLATE CURRENT	51 MA. D.C.
76	PLATE CURRENT	6.5 MA. D.C.
6C6	PLATE CURRENT	2.5 MA. D.C.

AVERAGE D.C. VOLTAGES	
ACROSS 5Z3 FILAMENT & GROUND	420 VOLTS D.C.
ACROSS C-17	405 VOLTS D.C.
ACROSS C-16	325 VOLTS D.C.
ACROSS C-12	24 VOLTS D.C.
ACROSS C-10	17 VOLTS D.C.

AVERAGE FILAMENT VOLTAGES	
6L6-G FILAMENT VOLTAGE	6.3 VOLTS A.C.
76 FILAMENT VOLTAGE	6.3 VOLTS A.C.
6C6 FILAMENT VOLTAGE	6.3 VOLTS A.C.
THESE FILAMENT VOLTAGES ARE 9.8 VOLTS FOR ACCELERATED CATHODE HEATING WHEN FILAMENTS ARE COOL	

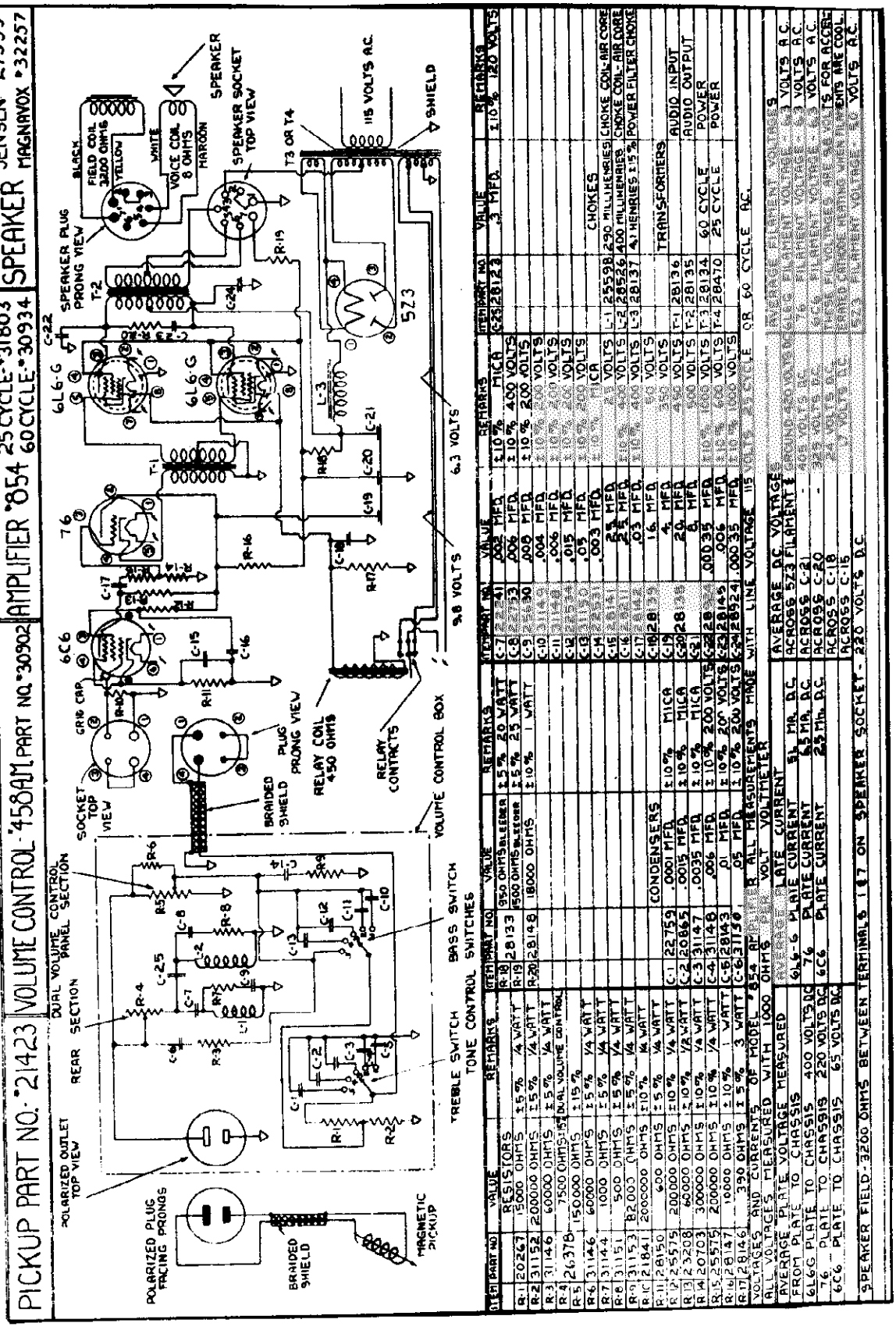
SPEAKER FIELD - 3200 OHMS BETWEEN TERMINALS *1 & *7 ON SPEAKER SOCKET - 220 VOLTS D.C.

MODEL 854

RUDOLPH WURLITZER CO.

SOUND SYSTEM FOR MODELS 500 & 500A

PICKUP PART NO. "21423 | VOLUME CONTROL "458AM PART NO. "30902 | AMPLIFIER "854 25 CYCLE-"31803 60 CYCLE-"30934 | SPEAKER JENSEN "27359 MAGNAVOX "32257



ITEM	PART NO	VALUE	REMARKS	ITEM	PART NO	VALUE	REMARKS	ITEM	PART NO	VALUE	REMARKS
		RESISTORS		R-10	28133	950 OHMS	±5% 20 WATT	C-7	22741	.002 MFD.	±10% MICA
R-1	20267	5000 OHMS	±5% ¼ WATT	R-19		500 OHMS	±5% 25 WATT	C-8	22753	.006 MFD.	±10% 400 VOLTS
R-2	31152	200000 OHMS	±5% ¼ WATT	R-20	28148	18000 OHMS	±10% 1 WATT	C-9	22790	.009 MFD.	±10% 200 VOLTS
R-3	31146	60000 OHMS	±5% ¼ WATT					C-10	31145	.004 MFD.	±10% 400 VOLTS
R-4	26378	7500 OHMS	±5% DUAL VOLUME CONTROL					C-11	31144	.006 MFD.	±10% 400 VOLTS
R-5		150000 OHMS	±15%					C-12	22754	.015 MFD.	±10% 200 VOLTS
R-6	31146	60000 OHMS	±5% ¼ WATT					C-13	31150	.05 MFD.	±10% 200 VOLTS
R-7	31144	1000 OHMS	±5% ¼ WATT					C-14	22755	.003 MFD.	MICA
R-8	31151	500 OHMS	±5% ¼ WATT					C-15	28141	.25 MFD.	450 VOLTS
R-9	31153	82000 OHMS	±5% ¼ WATT					C-16	28142	.25 MFD.	450 VOLTS
R-10	21841	2000000 OHMS	±10% ¼ WATT					C-17	28144	.03 MFD.	400 VOLTS
R-11	28150	600 OHMS	±5% ¼ WATT			CONDENSERS		C-18	28	1.6 MFD.	450 VOLTS
R-12	25575	200000 OHMS	±10% ¼ WATT	C-1	22759	.0001 MFD.	±10% MICA	C-19		4 MFD.	450 VOLTS
R-13	23208	60000 OHMS	±10% ¼ WATT	C-2	20865	.0015 MFD.	±10% MICA	C-20	28	20 MFD.	450 VOLTS
R-14	20703	300000 OHMS	±10% ¼ WATT	C-3	31147	.0035 MFD.	±10% MICA	C-21		8 MFD.	500 VOLTS
R-15	25575	200000 OHMS	±10% ¼ WATT	C-4	31148	.006 MFD.	±10% 200 VOLTS	C-22	28	.00035 MFD.	±10% 1000 VOLTS
R-16	28147	10000 OHMS	±10% 1 WATT	C-5	28143	.01 MFD.	±10% 200 VOLTS	C-23	28145	.006 MFD.	±10% 450 VOLTS
R-17	28146	390 OHMS	±5% 3 WATT	C-6	31150	.05 MFD.	±10% 200 VOLTS	C-24	28924	.00035 MFD.	±10% 1000 VOLTS

VOLTAGES AND CURRENTS OF MODEL "854 AMPLIFIER. ALL MEASUREMENTS MADE WITH LINE VOLTAGE 115 VOLTS 60 CYCLE A.C. OR 60 CYCLE D.C.
ALL VOLTAGES MEASURED WITH 1000 OHMS PER VOLT VOLTMETER

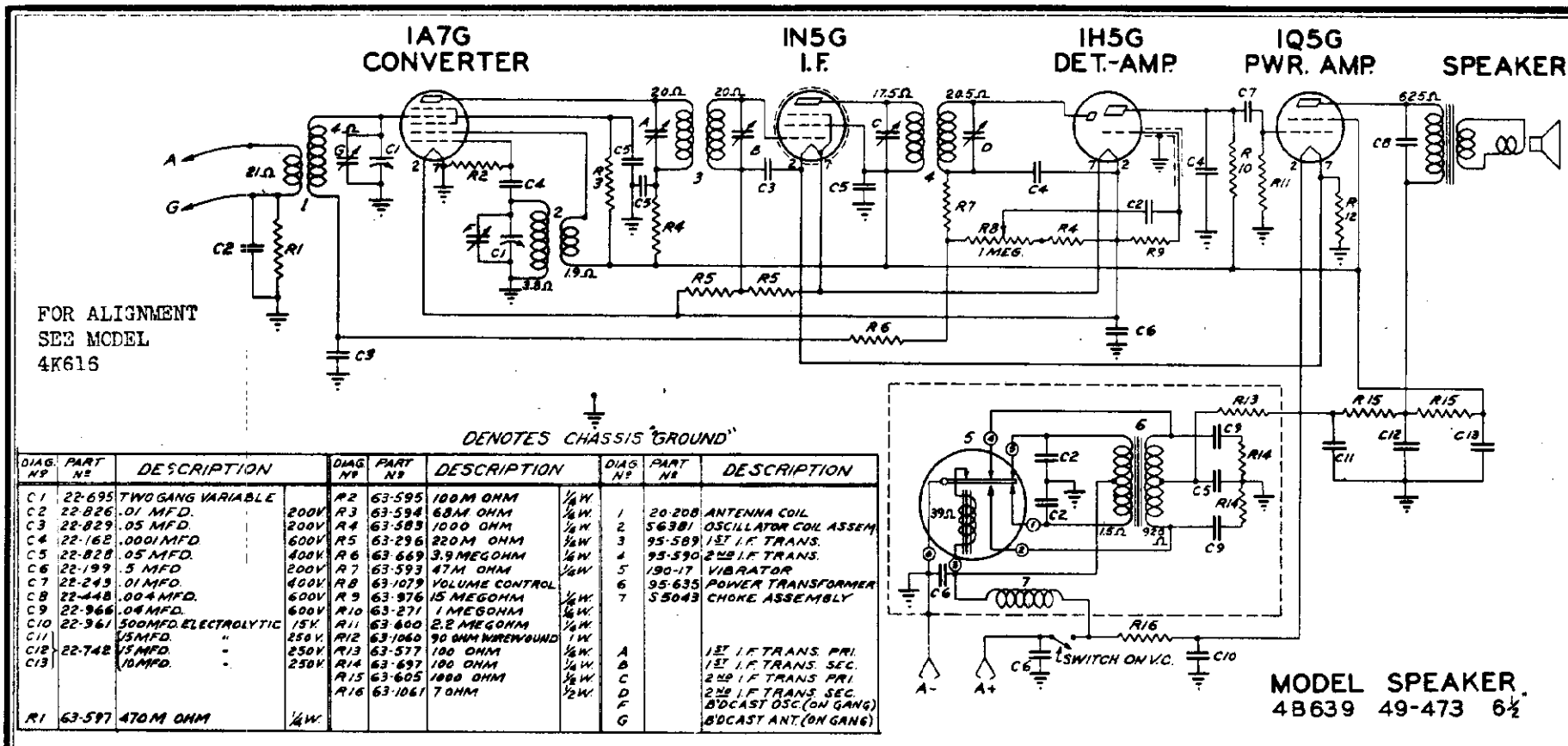
AVERAGE PLATE VOLTAGE FROM PLATE TO CHASSIS	LATE CURRENT	AVERAGE DC VOLTAGE
6L6-G PLATE TO CHASSIS 400 VOLTS DC	54 MA. PLATE CURRENT	ACROSS 523 FILAMENT 5 VOLTS A.C.
6L6G PLATE TO CHASSIS 400 VOLTS DC	54 MA. PLATE CURRENT	ACROSS C-21 - 405 VOLTS DC 76 FILAMENT VOLTAGE 6.3 VOLTS A.C.
76 - PLATE TO CHASSIS 220 VOLTS DC	6C6 PLATE CURRENT 23 Ma. D.C.	ACROSS C-20 - 405 VOLTS DC 6C6 FILAMENT VOLTAGE 6.3 VOLTS A.C.
6C6 - PLATE TO CHASSIS 65 VOLTS DC		ACROSS C-18 - 22 VOLTS DC 523 FILAMENT VOLTAGE 5 VOLTS A.C.
		ACROSS C-15 - 220 VOLTS D.C.

SPEAKER FIELD-3200 OHMS BETWEEN TERMINALS 1 & 7 ON SPEAKER SOCKET-

ITEM	PART NO	VALUE	REMARKS
		TRANSFORMERS	
T-1	28136		AUDIO INPUT
T-2	28135		AUDIO OUTPUT
T-3	28134	60 CYCLE	POWER
T-4	28470	25 CYCLE	POWER

ITEM	PART NO	VALUE	REMARKS
		CHOKES	
L-1	25598	230 MILLIHENRIES	CHOKE COIL-AIR CORE
L-2	28526	400 MILLIHENRIES	CHOKE COIL-AIR CORE
L-3	28137	4.1 HENRIES ±15%	POWER FILTER CHOKE

ITEM	PART NO	VALUE	REMARKS
C-25	28123	.1 MFD.	±10% 120 VOLTS



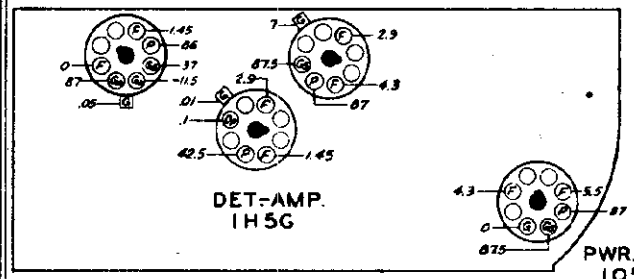
FOR ALIGNMENT
SEE MODEL
4K616

DENOTES CHASSIS "GROUND"

DIAG. Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION
C1	22-695	TWO GANG VARIABLE		R2	63-595	100M OHM	1/4 W.			
C2	22-826	.01 MFD.	200V.	R3	63-594	68M OHM	1/4 W.	1	20-208	ANTENNA COIL
C3	22-829	.05 MFD.	200V.	R4	63-583	1000 OHM	1/4 W.	2	S6381	OSCILLATOR COIL ASSEM.
C4	22-162	.0001 MFD.	600V.	R5	63-296	220M OHM	1/4 W.	3	95-589	1ST I.F. TRANS.
C5	22-828	.05 MFD.	400V.	R6	63-669	3.9 MEGOHM	1/4 W.	4	95-590	2ND I.F. TRANS.
C6	22-199	.5 MFD.	200V.	R7	63-593	47M OHM	1/4 W.	5	190-17	VIBRATOR
C7	22-249	.01 MFD.	400V.	R8	63-1079	VOLUME CONTROL		6	95-635	POWER TRANSFORMER
C8	22-448	.004 MFD.	600V.	R9	63-976	15 MEGOHM	1/4 W.	7	S5043	CHOKE ASSEMBLY
C9	22-966	.04 MFD.	600V.	R10	63-271	1 MEGOHM	1/4 W.			
C10	22-961	500MFD. ELECTROLYTIC	15V.	R11	63-600	2.2 MEGOHM	1/4 W.			
C11	22-748	15MFD.	250 V.	R12	63-1060	90 OHM WIREWOUND	1 W.			
C12		15MFD.	250V.	R13	63-577	100 OHM	1/4 W.	A		1ST I.F. TRANS. PRI.
C13		10MFD.	250V.	R14	63-697	100 OHM	1/4 W.	B		1ST I.F. TRANS. SEC.
				R15	63-605	1000 OHM	1/4 W.	C		2ND I.F. TRANS. PRI.
				R16	63-1061	7 OHM	1/2 W.	D		2ND I.F. TRANS. SEC.
								F		B'DCAST OSC. (ON GANG)
R1	63-597	470M OHM	1/4 W.					G		B'DCAST ANT. (ON GANG)

I.F. FREQUENCY 455 KC.
4 TUBE SUPERHETERODYNE
CHASSIS Nº 4B04-6V.-SINGLE BAND

CONVERTER 1A7G — I.F. 1N5G



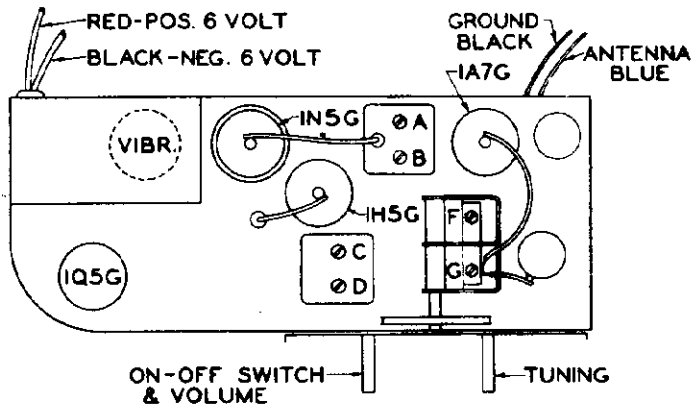
SOCKET VOLTAGES—BOTTOM VIEW

Antenna disconnected volume control full on.
Battery voltage 6 volt.
Battery consumption—.5 ampere.
Power Output—.37 watts.

Stage Gains:

Ant. to conv. grid—4.9× at 1000 Kc.
Conv. grid to I. F. grid—50× at 455 Kc.
Overall audio—448× at .050 watt —400 cycles.

Tuning range—540 Kc.—1740 Kc.



TUBE AND TRIMMER LOCATION

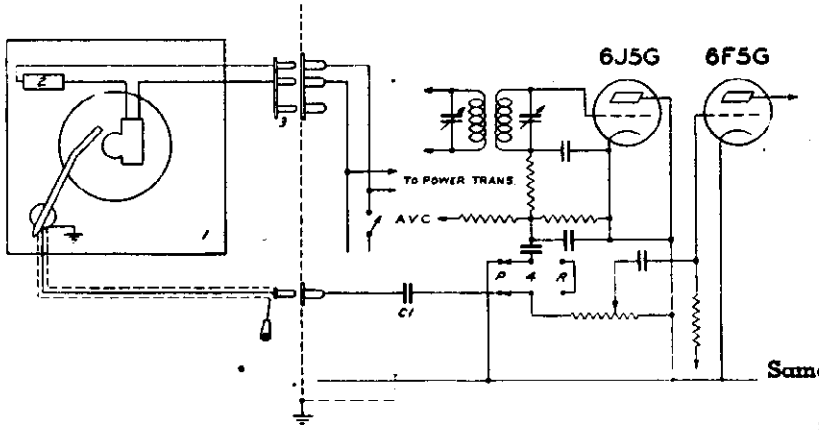
ZENITH RADIO CORP.

MODEL SPEAKER
4B639 49-473 6½

ZENITH RADIO CORP.
MODEL 4B639

MODEL 10S599, Ch. 10A2R
MODEL 4K600, Ch. 4B01

ZENITH RADIO CORP.



DIAG. NO.	PART NO.	DESCRIPTION	
C1	22-1189	.00075 MFD.	600 V
1	169-63	WEBSTER AUTOMATIC RECORD PLAYER	60 V 50 V
1	169-64		
2	85-191	A.C. SWITCH	
3	58-88	A.C. PLUG	
4	85-228	PHONO-RADIO SW	

PHONO CIRCUIT DATA
MODEL SPEAKER
10S599 49-442-14"
CHASSIS Nº10A2R

Same as 10A2 with audio compensation revised to match new pickup.

SEE ZENITH PAGE 12-23

ALIGNMENT INSTRUCTIONS

Chassis No. 4B01

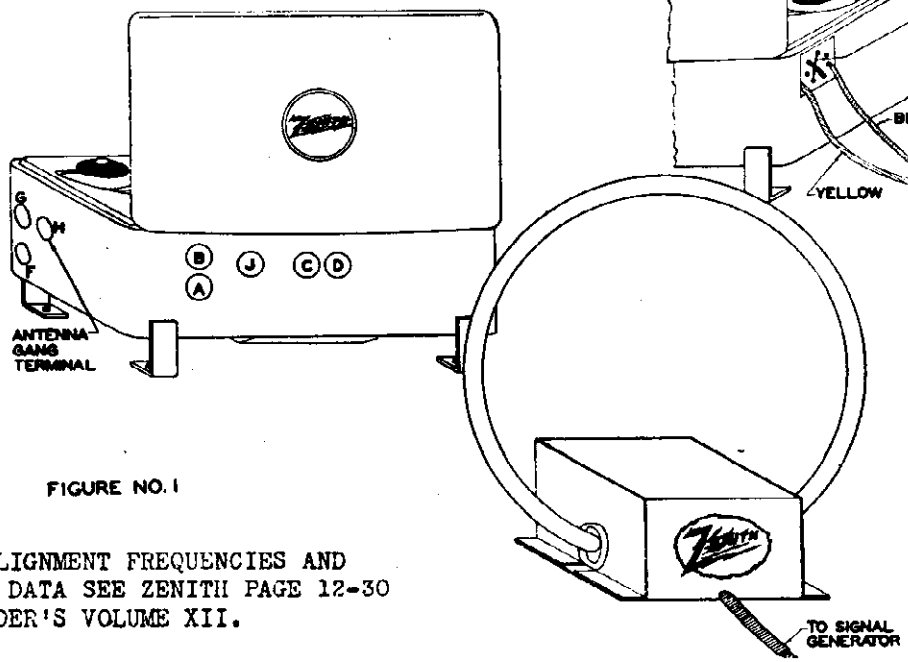


FIGURE NO. 1

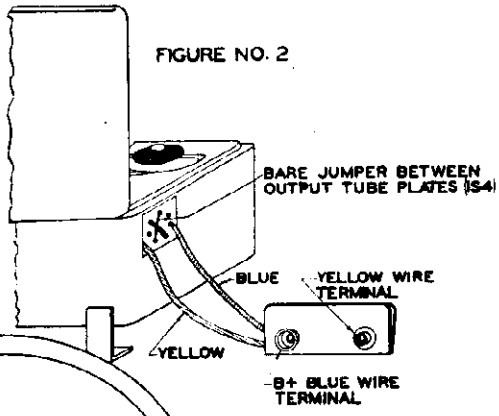


FIGURE NO. 2

FOR ALIGNMENT FREQUENCIES AND OTHER DATA SEE ZENITH PAGE 12-30 IN RIDER'S VOLUME XII.

The following ALIGNMENT PROCEDURE on Model 4K600 POKETRADIO must be carefully followed using a #MS-652 Zenith Alignment Jig to maintain actual shielding capacities during the balancing operations.

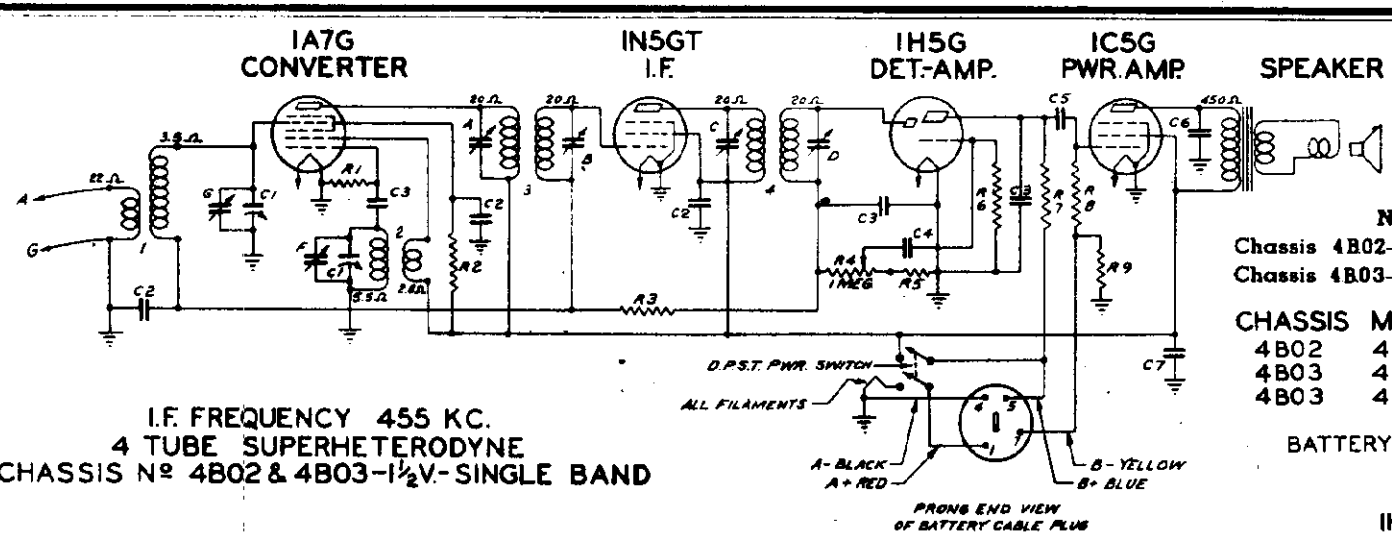
Remove back of receiver.

Remove "B" batteries.

Remove case of receiver.

To remove case; first place receiver on bench with lid down, then place screw driver under spring clips and pry up, at the same time pulling case away from chassis. After spring clips have been released the case can be lifted off chassis. Next remove clips by turning and pulling away from chassis. Do not remove "A" Batteries. Place chassis in Alignment Jig as shown in Figure 1.

Connect one lead from the output meter to the bare jumper connecting the plates of the output tube (1S4) and the other output meter lead to B+ at the battery (blue wire). CAUTION — Keep signal from generator at minimum so A.V.C. action will not give a false peak.



NOTE

Chassis 4B02—attached speaker.
Chassis 4B03—remote speaker.

CHASSIS	MODEL	SPEAKER
4B02	4K616	49-449 5"
4B03	4K635	49-450 6½"
4B03	4K658	49-461 8"

BATTERY PACK Nº Z-28

I.F. FREQUENCY 455 KC.
4 TUBE SUPERHETERODYNE
CHASSIS Nº 4B02 & 4B03-1½V.-SINGLE BAND

DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION
C1	22-1209	TWO GANG VARIABLE - 4B03		R4	63-1235	VOLUME CONTROL-4B03				
	22-1213	TWO GANG VARIABLE - 4B02			63-1240	VOLUME CONTROL-4B02				
C2	22-829	.05 MFD.	200V.	R5	63-587	4700 OHM	½ W.			
C3	22-162	.0001 MFD.	600V.	R6	63-976	15 MEGOHM	½ W.			
C4	22-826	.01 MFD.	200V.	R7	63-271	1 MEGOHM	½ W.	A		1ST I.F. TRANS. PRI.
C5	22-243	.01 MFD.	400V.	R8	63-600	2.2 MEGOHM	½ W.	B		1ST I.F. - SEC.
C6	22-448	.004 MFD.	600V.	R9	63-634	820 OHM	½ W.	C		2ND I.F. - PRI.
C7	22-684	8 MFD. ELECTROLYTIC	150V.					D		2ND I.F. - SEC.
								F		BROADCAST OSC. (6N GANG)
								G		BROADCAST ANT. (6N GANG)
R1	63-654	180 M OHM	½ W.	1	20-237	ANTENNA COIL				
R2	63-596	68 M OHM	½ W.	2	59584	OSC. COIL ASSEMBLY				
R3	63-669	3.9 MEGOHM	½ W.	3	95-814	1ST I.F. TRANSFORMER				
				4	95-815	2ND I.F.				

Tuning Range—540 Kc.—1740 Kc.

All voltages measured with a 1000 ohm per volt meter from chassis to socket contact indicated.

All voltages are positive D.C. unless marked otherwise.

Volume control on full.

Battery Z28

Power consumption—1.3 watts.

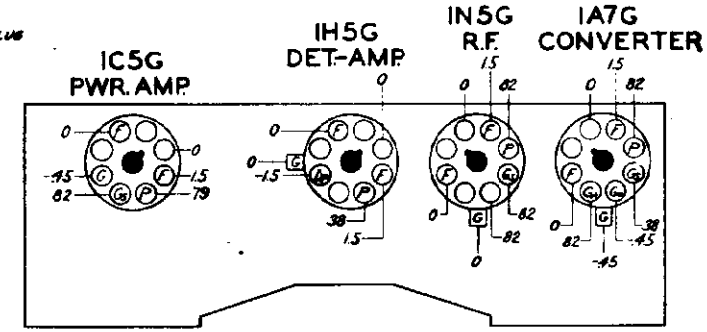
Power output—.28 watts.

Stage Gains
Bc. and I.F.

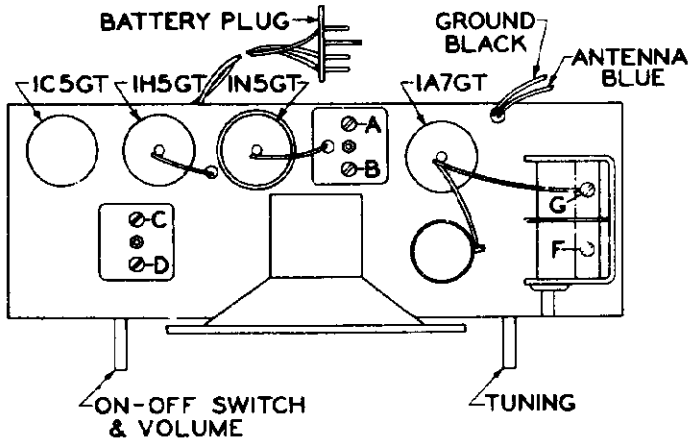
Ant. to conv. grid—5.7× at 1000 Kc.

Conv. grid to I.F. grid 69× at 455 Kc.

Overall audio 257× at .050 watt, 400 cycles.

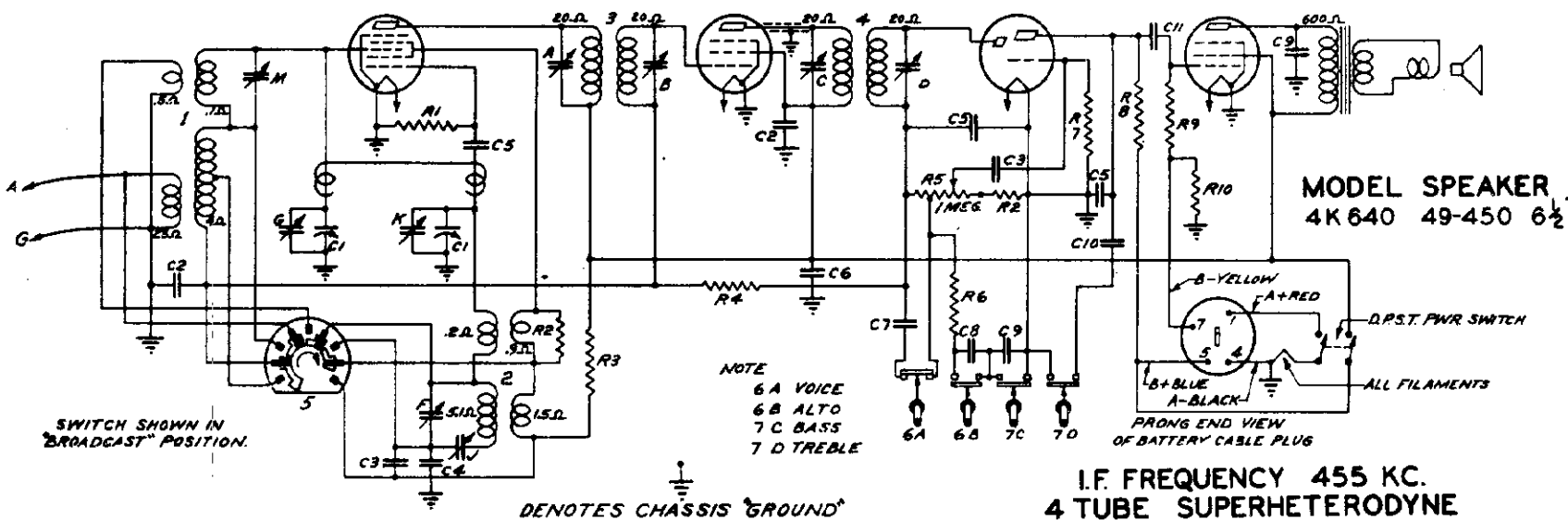


SOCKET VOLTAGES—BOTTOM VIEW



CHASSIS 4B04 **ALIGNMENT PROCEDURE** CHASSIS 4B02, 4B03

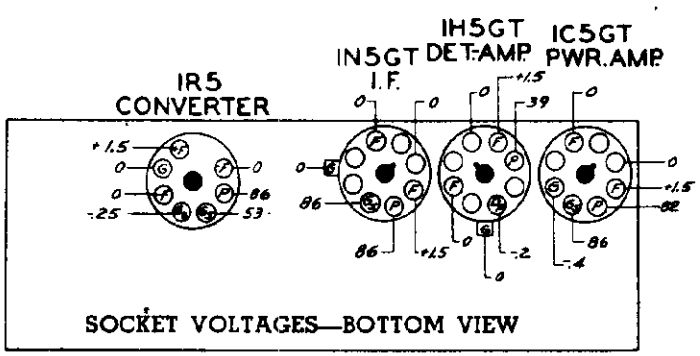
Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Adjust Trimmers	Purpose
1	Converter Grid	½ Mfd.	455 Kc.	Broadcast	600 Kc.	A, B, C, D	I. F. Alignment
2	Ant.-Gnd.	200 Mmf.	1500 Kc.	Broadcast	1500 Kc.	F	Set Oscillator to Scale
3	"	200 Mmf.	1400 Kc.	Broadcast	1400 Kc.	G	Alignment of Antenna



I.F. FREQUENCY 455 KC.
4 TUBE SUPERHETERODYNE
CHASSIS Nº 4B05-1½V.-2 BAND

FOR ALIGNMENT SEE INDEX

DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION
C1	22-1208	TWO-GANG VARIABLE		R4	63-669	3.9 MEGOHM	½ W.			
C2	22-829	.05 MFD.	200 V.	R5	63-1236	VOLUME CONTROL				
C3	22-826	.01 MFD.	200 V.	R6	63-594	68 M OHM	½ W.			
C4	22-1022	.005 MFD.	600 V.	R7	63-976	15 MEGOHM	½ W.	A		1ST I.F. TRANS. PRI.
C5	22-162	.0001 MFD.	600 V.	R8	63-271	1 MEGOHM	½ W.	B		1ST I.F. " SEC.
C6	22-684	8 MFD. ELECTROLYTIC	150 V.	R9	63-600	2.2 MEGOHM	½ W.	C		2ND I.F. " PRI.
C7	22-887	.001 MFD.	600 V.	R10	63-634	820 OHM	½ W.	D		2ND I.F. " SEC.
C8	22-448	.004 MFD.	600 V.					F		BROADCAST OSC. (SEE NOTE)
C9	22-492	.01 2 MFD.	600 V.					G		BROADCAST ANT. (ON GANG)
C10	22-182	.00025 MFD.	600 V.					J		BROADCAST PAD. (SEE NOTE)
C11	22-243	.01 MFD.	400 V.	1	S 9832	ANTENNA COIL ASSEM.		K		SHORT WAVE OSC. (ON GANG)
				2	S 9829	OSCILLATOR " "		M	22-1240	SHORT WAVE ANT.
				3	95-838	1ST I.F. TRANSFORMER				
				4	95-839	2ND I.F. "				NOTE:
R1	63-260	100 M OHM	½ W.	5	85-279	BAND SELECTOR SW.				TRIMMERS J & F
R2	63-587	4700 OHM	½ W.	6	85-284	T.C. SW. ASSEM. (LEFT)				ARE MOUNTED ON
R3	63-311	15 M OHM		7	85-288	T.C. SW. ASSEM. (RIGHT)				STRIP # 22-1239



Battery Z28

Volume control full on.

Power consumption 1.6 watts.
Power output .27 watts.

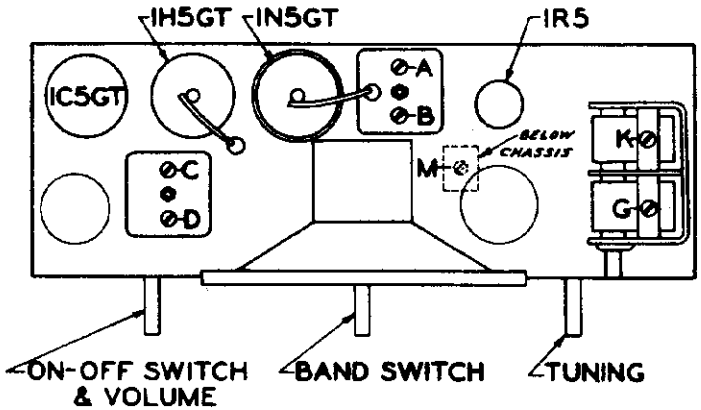
Stage Gains:

Tuning ranges— 540 Kc.–1620 Kc. –5600 Kc.—18200 Kc.

Ant. to conv. grid—6X at 1000 Kc.

Conv. grid to I. F. grid— 48X at 455 Kc.

Overall audio—340X at .050 watt, 400 cycles.



TUBE AND TRIMMER LOCATION

ZENITH RADIO CORP.

MODEL 4K640
MODEL 5R680X
MODEL 5G603
MODELS 6G638,6G660

Model 4K640 ALIGNMENT PROCEDURE Chassis No. 4B05

Operation	Conn. Test Osc. to	Dummy Ant.	Input Sig. Freq.	Band	Set Dial At	Trimmers	Purpose
1	Converter Grid	.5 Mfd.	455 Kc.	Broadcast	600 Kc.	A B C D	Align I. F.
2	Ant.—Gnd.	400 Ohms	18 Mc.	Short Wave	18 Mc.	K	Set. Osc. to Scale
3	Ant.—Gnd.	200 Mmf.	1600 Kc.	Broadcast	1600 Kc.	F	Set Osc. to Scale
4	Ant.—Gnd.	200 Mmf.	1400 Kc.	Broadcast	1400 Kc.	G	Align Ant.
5	Ant.—Gnd.	200 Mmf.	600 Kc.	Broadcast	600 Kc.	J	Rock Gang & Adj. to Max.
6	Ant.—Gnd.	400 Ohms	18 Mc.	Short Wave	18 Mc.	M	Rock Gang

Model 5G603

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Oscillator to	Band	Set Dial At	Adjust Trimmers	Purpose
1	Converter Grid	.5 mf.	455	—	600	A B C D	I. F. Alignment
2	Single Turn Loop Coupled Loosely to Wave Magnet	—	1400	—	1400	F	Set Osc. to Scale
3		—	1400	—	1400	G	Alignment of Antenna

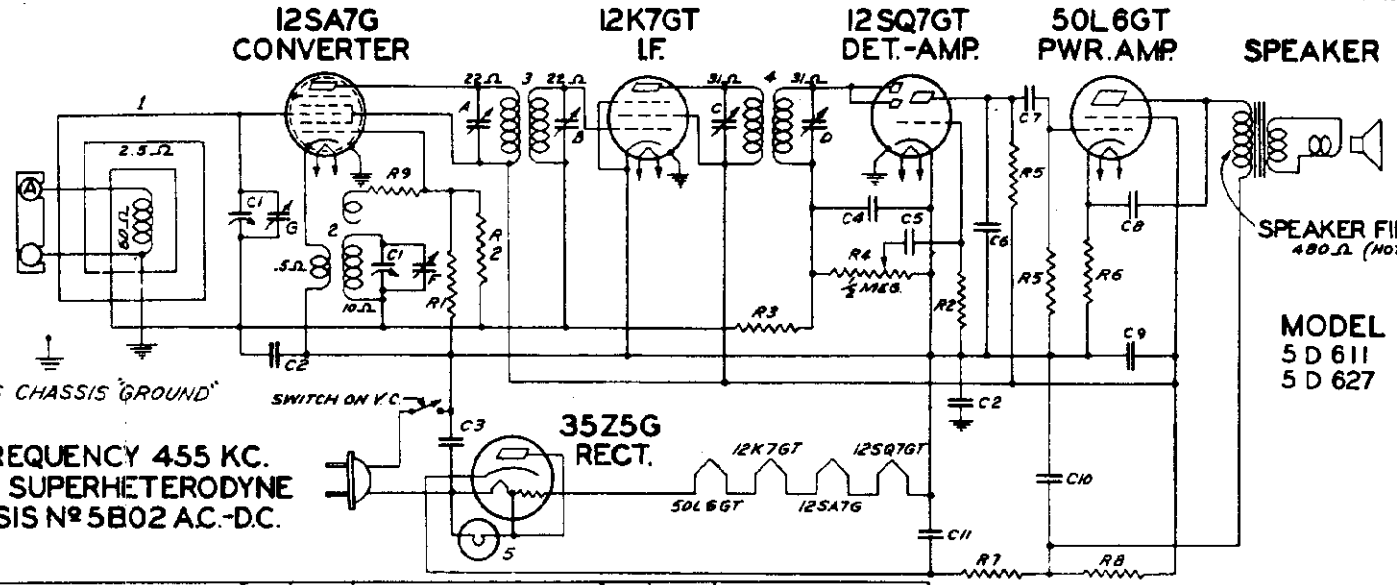
Gnd. of test osc. connected to No. 8 pin of ILA6 socket

Model 5R680X

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	band	Set Dial At	Trimmers	Purpose
1	Converter Grid	.5 mfd.	455 Kc.	BC	1600 Kc.	A. B. C. D	Align I.F.
2	Ant. & Grnd with 10 ohm shunt	.5 mfd.	1600 Kc.	"	1600 Kc.	F	Set to Scale
3	"	.5 mfd.	1400 Kc.	"	1400 Kc.	H. G	Align Ant.

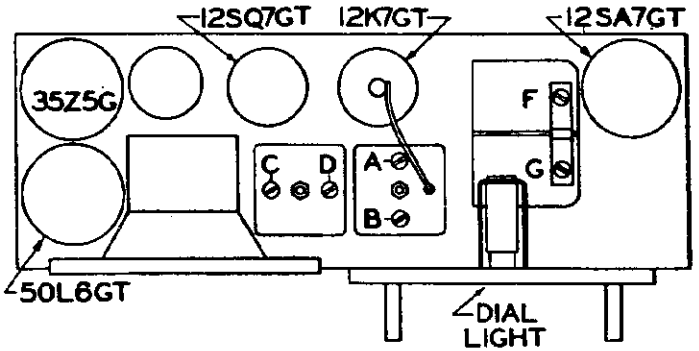
Models 6G638–6G660 Chassis No. 6B09

Operation	Conn. Test Osc. to	Dummy Ant.	Input Sig. Freq.	Band	Set Dial At	Trimmers	Purpose
1	Converter Grid	.1 Mfd.	455 Kc.	B.C.	600 Kc.	A B C D	Align I.F.
2	Ant. & Grnd with 10 ohm shunt	400 Ohm	18 Mc.	S.W.	18 Mc.	K	Set to Scale
3	"	"	16 Mc.	S.W.	16 Mc.	M	Align Ant.
4	"	"	5 Mc.	Police	5 Mc.	N	Set to Scale
5	"	"	"	"	"	Q	Align Ant.
6	"	200 mmf	1800 Kc.	B.C.	1800 Kc.	F	Set to Scale
7	"	"	1700 Kc.	"	1700 Kc.	G—H	Align R.F. & det.
8	"	"	600 Kc.	"	600 Kc.	J	Rock gang & Adj. padder
9	"	"	1800 Kc.	"	1800 Kc.	F—G—H	Repeat 6 & 7



MODEL	SPEAKER
5 D 611	49-439 4"
5 D 627	49-439 4"

DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION
C1	22-1206	TWO-GANG VARIABLE		R1	63-589	10 M OHM	⅛ W.	2	59450	OSC. COIL ASSEMBLY
C2	22-829	.05 MFD.	200 V.	R2	63-976	15 MEGOHM	⅛ W.	3	95-696	1ST I.F. TRANS.
C3	22-1017	.05 MFD.	200 V.	R3	63-600	2.2 MEGOHM	⅛ W.	4	95-794	2ND I.F. TRANS.
C4	22-953	.0002 MFD.	600 V.	R4	63-1112	VOLUME CONTROL		5	100-67	PILOT LIGHT 6.3V. .15A
C5	22-492	.002 MFD.	600 V.	R5	63-597	470 M OHM	½ W.			
C6	22-854	.0005 MFD.	600 V.	R6	63-1171	75 OHM WIREWOUND	½ W.	A		1ST I.F. TRANS. PRI.
C7	22-243	.01 MFD.	400 V.	R7	63-1172	100 OHM WIREWOUND	½ W.	B		1ST I.F. " SEC.
C8	22-1182	.01 MFD.	400 V.	R8	63-1173	1500 OHM	1 W.	C		2ND I.F. " PRI.
C9		20 MFD. ELECTROLYTIC	150 V.	R9	63-579	220 OHM	¼ W.	D		2ND I.F. " SEC.
C10	22-1186	20 MFD. "	150 V.					F		BROADCAST OSC. (ON GANG)
C11		30 MFD. "	150 V.					G		BROADCAST ANT. (ON GANG)
				1	59619	WAVEMAGNET ASSEMBLY				



Stage Gains:

Bc, and 455 Kc. I.F.

Ant. to Conv. grid 7× at 1000 Kc.

Conv. grid to I.F. grid 74× at 455 Kc.

Overall audio 225× at .05 watt. 400 cycles.

Volume control full on.

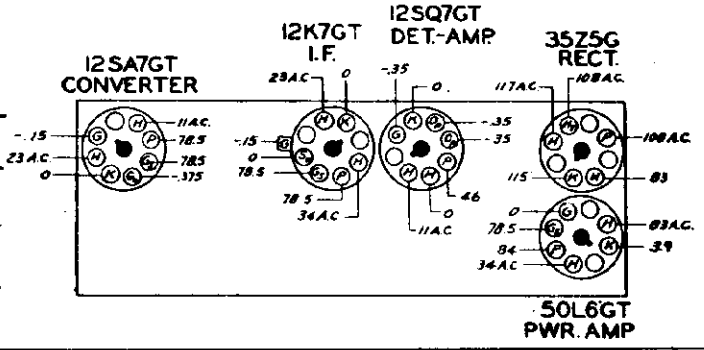
Line voltage 117 A.C. or D.C.

Power consumption 29 watts.

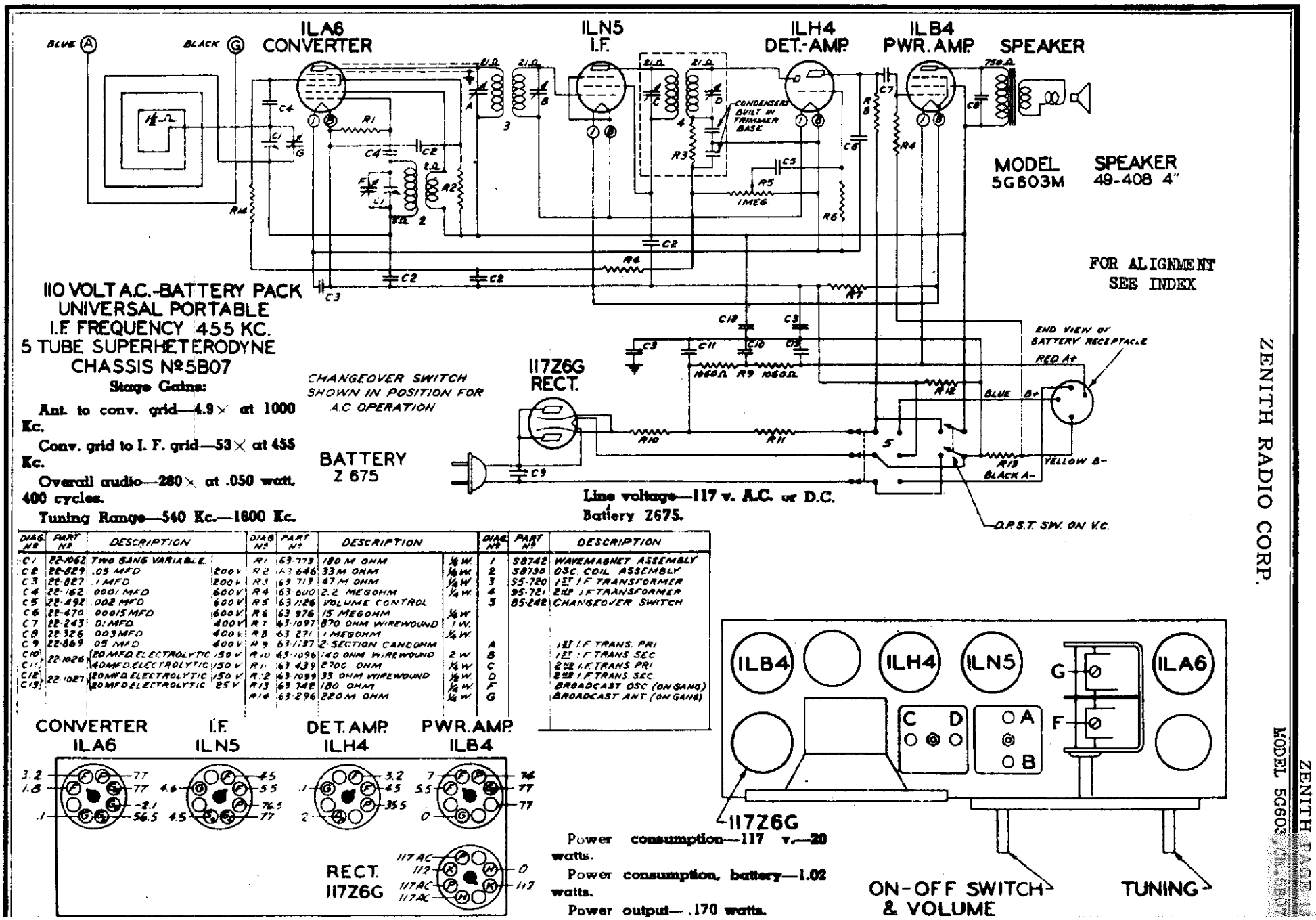
Power output 1.3 watts.

Tuning Ranges 540 Kc to 1620 Kc.

TRIMMER LOCATIONS



Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Trimmers	Purpose
1	Converter Grid	.1 mfd.	455 Kc.	—	600 Kc.	A, B, C, D	Align I. F.
2	Single Turn Loop coupled	—	1500 Kc.	—	1500 Kc.	F	Set Oscillator to Scale
3	loosely to Wave Magnet	—	1500 Kc.	—	1500 Kc.	G	Adjust for Maximum



DIAG. Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION
C1	22-1062	TWO GANG VARIABLE		R1	63-773	180 M OHM	½ W	1	58742	WAVEMAGNET ASSEMBLY
C2	22-829	.05 MFD	200 V	R2	63 646	33 M OHM	½ W	2	58790	OSC. COIL ASSEMBLY
C3	22-827	1 MFD.	200 V	R3	63 713	47 M OHM	½ W	3	55-720	1ST I.F. TRANSFORMER
C4	22-162	0001 MFD	600 V	R4	63 600	2.2 MEGOHM	½ W	4	55-721	2ND I.F. TRANSFORMER
C5	22-492	002 MFD	600 V	R5	63 1126	VOLUME CONTROL		5	85-242	CHANGEOVER SWITCH
C6	22-470	00015 MFD	600 V	R6	63 976	15 MEGOHM	½ W			
C7	22-243	01 MFD	400 V	R7	63-1097	870 OHM WIREWOUND	1 W.			
C8	22-326	003 MFD	400 V	R8	63 271	1 MEGOHM	½ W.			
C9	22-869	05 MFD	400 V	R9	63-1137	2-SECTION CANDOHM		A		1ST I.F. TRANS. PRI
C10	22-1026	20 MFD. ELECTROLYTIC	150 V	R10	63-1096	140 OHM WIREWOUND	2 W	B		1ST I.F. TRANS. SEC
C11		40 MFD. ELECTROLYTIC	150 V	R11	63 439	2700 OHM	½ W	C		2ND I.F. TRANS. PRI
C12	22-1027	20 MFD ELECTROLYTIC	150 V	R12	63 1099	33 OHM WIREWOUND	½ W	D		2ND I.F. TRANS. SEC.
C13		80 MFD ELECTROLYTIC	25 V	R13	63-748	180 OHM	½ W	F		BROADCAST OSC (ON GANG)
				R14	63-296	220 M OHM	½ W	G		BROADCAST ANT. (ON GANG)

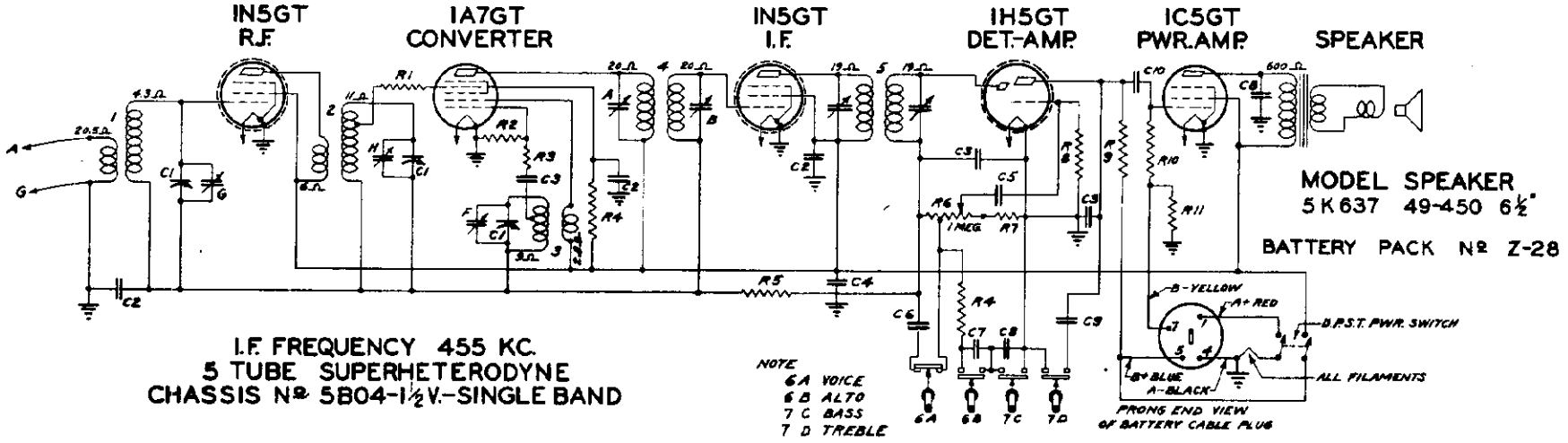
Power consumption—117 v.—20 watts.

Power consumption, battery—1.02 watts.

Power output—.170 watts.

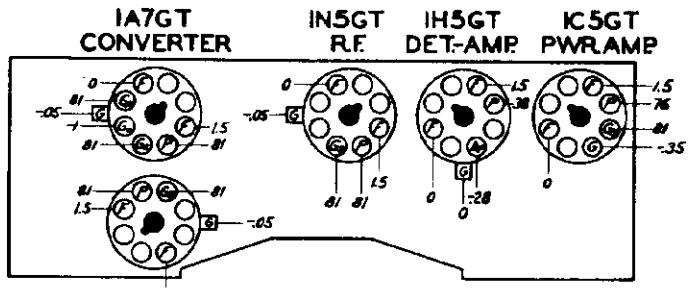
ZENITH RADIO CORP.

ZENITH PAGE
MODEL 5G603, 5B07



I.F. FREQUENCY 455 KC.
5 TUBE SUPERHETERODYNE
CHASSIS Nº 5B04-1½V.-SINGLE BAND

DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION
C1	22-1214	THREE GANG VARIABLE		R5	63-669	3.3 MEGOHM	½ W.			
C2	22-829	.05 MFD.	200 V.	R6	63-1236	VOLUME CONTROL				
C3	22-162	.0001 MFD.	600 V.	R7	63-587	4700 OHM	½ W.			
C4	22-684	8 MFD. ELECTROLYTIC	150 V.	R8	63-976	1.5 MEGOHM	½ W.	A		1ST I.F. TRANS. PRI.
C5	22-826	.01 MFD.	200 V.	R9	63-271	1 MEGOHM	½ W.	B		1ST I.F. " SEC.
C6	22-867	.001 MFD.	600 V.	R10	63-609	2.2 MEGOHM	½ W.	C		2ND I.F. " PRI.
C7	22-448	.006 MFD.	600 V.	R11	63-634	820 OHM	½ W.	D		2ND I.F. " SEC.
C8	22-492	.002 MFD.	600 V.					F		BROADCAST OSC. (ON GANG)
C9	22-182	.0008 MFD.	600 V.					G		BROADCAST ANT. (ON GANG)
C10	22-243	.01 MFD.	400 V.					H		BROADCAST DET. (ON GANG)
				1	20-239	ANTENNA COIL				
				2	59570	DETECTOR COIL ASSEM.				
				3	59746	OSCILLATOR " "				
R1	63-638	5600 OHM	½ W.	4	35-844	1ST I.F. TRANSFORMER				
R2	63-654	180M OHM	½ W.	5	35-815	2ND I.F. "				
R3	63-581	470 OHM	½ W.	6	85-289	T.C. SW. ASSEM. (LEFT)				
R4	63-594	68M OHM	½ W.	7	85-288	T.C. SW. ASSEM (RIGHT)				



Stage Gains
Bc. and I.F.

Ant. to R.F. grid 10.7× at 1000 Kc.

R.F. grid to conv. grid 3.25× at 1000 Kc.

Conv. grid to I.F. grid 40× at 455 Kc.

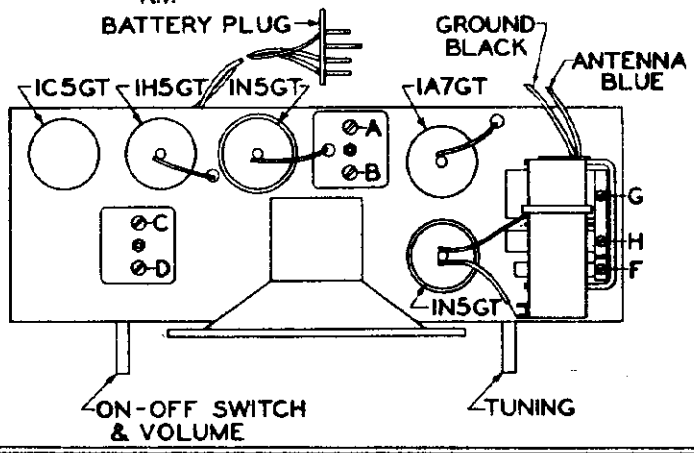
Overall audio 366× at .05 watt. 400 cycles.

Volume control full on.

Battery Z28.
Power consumption 1.3 watts.
Power output .270 watts.

Tuning Range

540 Kc. to 1620 Kc.

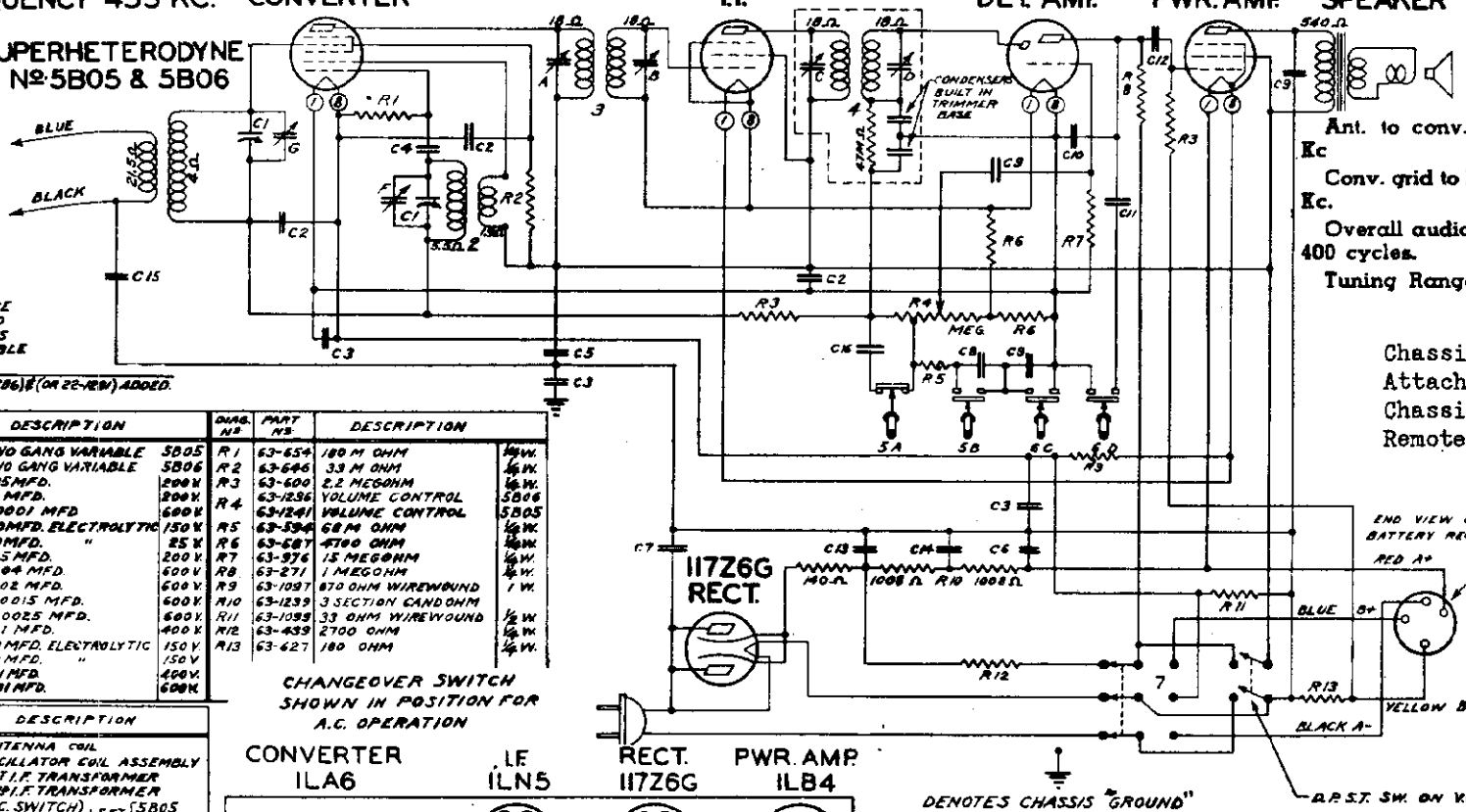


Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Adjust Trimmers	Purpose
1	Converter Grid	½ Mfd.	455 Kc.	Broadcast	600 Kc.	A, B, C, D	I. F. Alignment
2	Ant.—Gnd.	200 Mmf.	1500 Kc.	Broadcast	1500 Kc.	F	Set Oscillator to Scale
3	"	200 Mmf.	1400 Kc.	Broadcast	1400 Kc.	H. G	Align R.F. & Ant.

110 VOLT A.C.-BATTERY PACK I.F. FREQUENCY 455 KC.

5 TUBE SUPERHETERODYNE CHASSIS Nº 5B05 & 5B06

ILA6 CONVERTER | ILN5 I.F. | ILH4 DET.-AMP. | ILB4 PWR. AMP. | SPEAKER



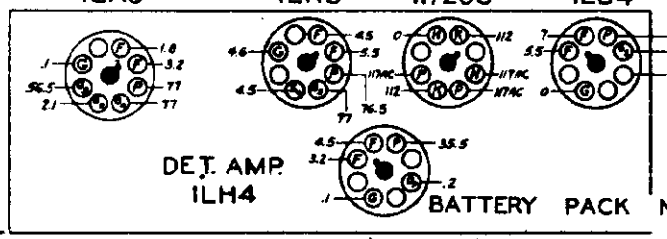
8-29-41 (OR 22-1286) E (OR 22-1287) ADDED.

DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-1215	TWO GANG VARIABLE	5B05
C1	22-1216	TWO GANG VARIABLE	5B06
C2	22-829	.05 MFD.	200 V.
C3	22-827	.1 MFD.	200 V.
C4	22-162	.0001 MFD.	600 V.
C5	22-1087 OR	20 MFD. ELECTROLYTIC	150 V.
C6	22-1286	20 MFD. "	25 V.
C7	22-1017	.05 MFD.	200 V.
C8	22-448	.004 MFD.	600 V.
C9	22-492	.002 MFD.	600 V.
C10	22-470	.00015 MFD.	600 V.
C11	22-182	.00025 MFD.	600 V.
C12	22-843	.01 MFD.	400 V.
C13	22-1016 OR	40 MFD. ELECTROLYTIC	150 V.
C14	22-1281	20 MFD. "	150 V.
C15	22-1163	.01 MFD.	400 V.
C16	22-987	.001 MFD.	600 V.

DIAG. Nº	PART Nº	DESCRIPTION	
R1	63-654	180 M OHM	1/4 W.
R2	63-646	33 M OHM	1/4 W.
R3	63-600	2.2 MEGOHM	1/4 W.
R4	63-1296	VOLUME CONTROL	5B06
	63-1241	VOLUME CONTROL	5B05
R5	63-594	68 M OHM	1/4 W.
R6	63-687	4700 OHM	1/4 W.
R7	63-976	15 MEGOHM	1/4 W.
R8	63-271	1 MEGOHM	1/4 W.
R9	63-1097	870 OHM WIREWOUND	1 W.
R10	63-1239	3 SECTION GANDOHM	
R11	63-1099	33 OHM WIREWOUND	1/2 W.
R12	63-439	2700 OHM	1/4 W.
R13	63-627	180 OHM	1/4 W.

DIAG Nº	PART Nº	DESCRIPTION
1	20-238	ANTENNA COIL
2	3-9597	OSCILLATOR COIL ASSEMBLY
3	95-816	1ST I.F. TRANSFORMER
4	95-817	2ND I.F. TRANSFORMER
5	85-285	T.C. SWITCH LEFT 5B05
	85-284	" " " 5B06
6	85-289	" " " RIGHT 5B05
	85-288	" " " 5B06
7	85-254	CHANGEOVER SWITCH
A		1ST I.F. TRANS. PRI.
B		1ST I.F. TRANS. SEC.
C		2ND I.F. TRANS. PRI.
D		2ND I.F. TRANS. SEC.
F		BROADCAST OSC. (ON GANG)
G		BROADCAST ANT. (ON GANG)

CONVERTER ILA6 | I.F. ILN5 | RECT. 117Z6G | PWR. AMP. ILB4



DET. AMP. ILH4

BATTERY PACK Nº Z-682

Ant. to conv. grid—5 at 1000 Kc

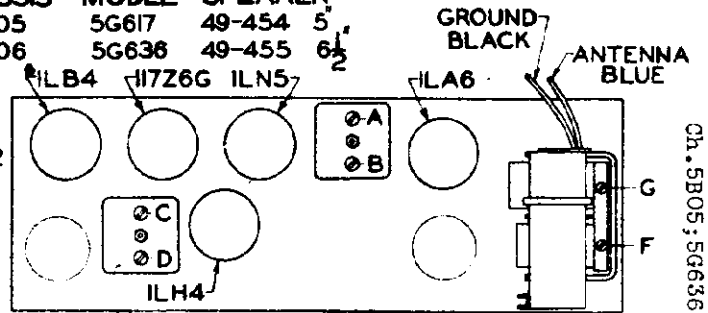
Conv. grid to I. F. grid—75 at 455 Kc.

Overall audio—260 at .050 watt, 400 cycles.

Tuning Range—540 Kc.—1740 Kc.

Chassis 5B05
Attached Speaker
Chassis 5B06
Remote Speaker

CHASSIS	MODEL	SPEAKER	
5B05	5G617	49-454	5"
5B06	5G636	49-455	6½"



Power consumption—117 v.—20 watts.

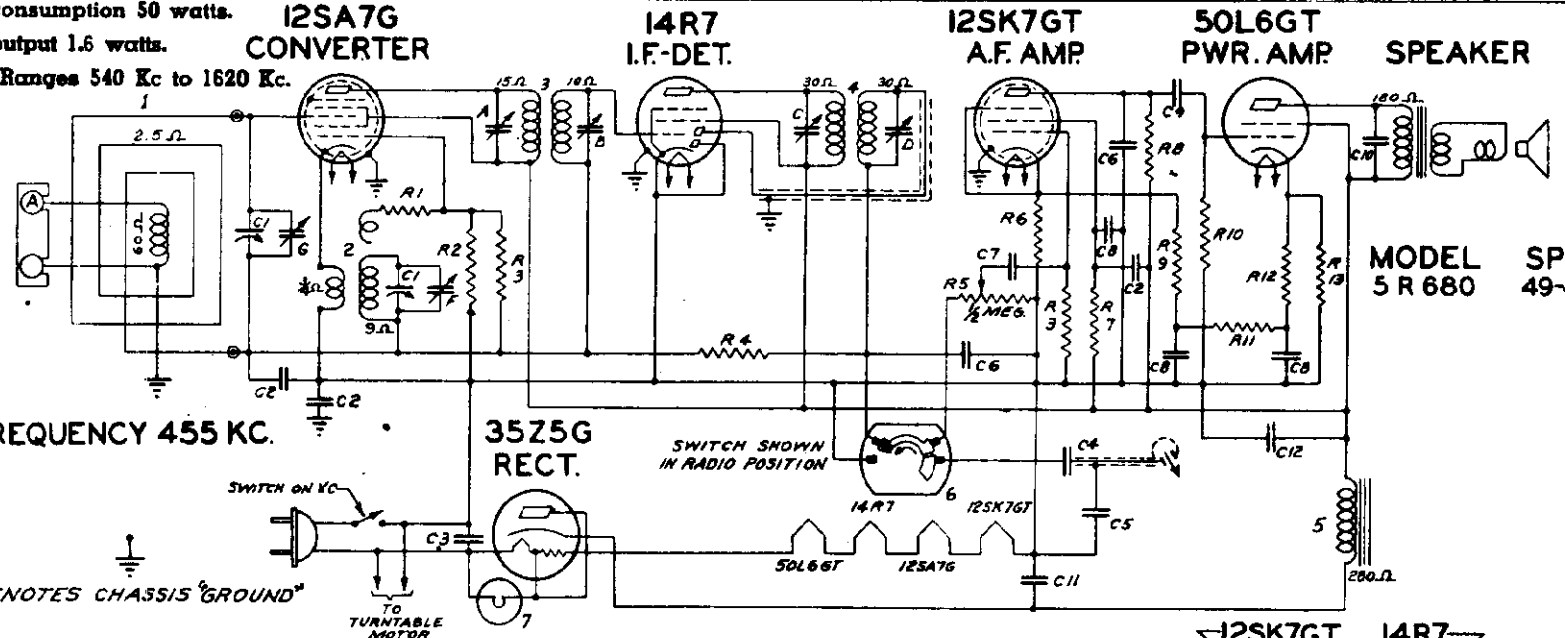
Power consumption, battery—1.02

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Oscillator to	Band	Set Dial At	Adjust Trimmers	Purpose
1	Converter Grid	.5 mmfd.	455	—	600	A B C D	I F. Alignment
2	Ant.—Gnd.	200 mmfd.	1400	—	1400	F	Set Osc. to Scale
3	" "	200 mmfd.	1400	—	1400	G	Alignment of Antenna

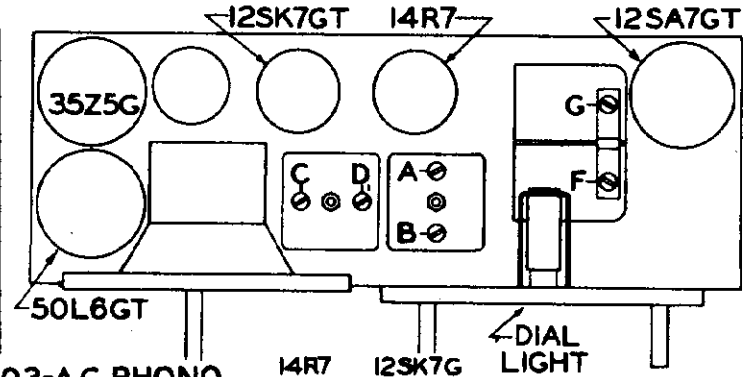
ZENITH RADIO CORP.

MODELS 5G617, 5G2617, Ch. 5B05; 5G636, Ch. 5B0

Power consumption 50 watts.
Power output 1.6 watts.
Tuning Ranges 540 Kc to 1620 Kc.



DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION
C1	22-1206	TWO-GANG VARIABLE		R3	63-976	15 MEGOHM	½ W.	3	95-811	1ST I.F. TRANSFORMER
C2	22-829	.05 MFD.	200V.	R4	63-600	2.2 MEGOHM	½ W.	4	95-812	2ND I.F. TRANSFORMER
C3	22-1017	.05 MFD.	200V.	R5	63-1112	VOLUME CONTROL		5	95-813	FILTER CHOKE
C4	22-887	.001 MFD.	600V.	R6	63-634	820 OHM	½ W.	6	85-282	PHONO-RADIO SWITCH
C5	22-327	.02 MFD.	200V.	R7	63-778	470M OHM	½ W.	7	100-67	DIAL LIGHT 6.3 V. .15 A.
C6	22-953	.0002 MFD.	600V.	R8	63-685	100M OHM	½ W.			
C7	22-492	.002 MFD.	600V.	R9	63-639	2700 OHM	½ W.			
C8	22-827	.1 MFD.	200V.	R10	63-547	470 M OHM	½ W.			
C9	22-188	.02 MFD.	400V.	R11	63-637	4700 OHM	½ W.	A		1ST I.F. TRANS. PRI.
C10	22-1182	.01 MFD.	400V.	R12	63-639	6800 OHM	½ W.	B		1ST I.F. " SEC.
C11	22-1028	20 MFD. ELECTROLYTIC	150V.	R13	63-1015	140 OHM WIREWOUND	½ W.	C		2ND I.F. " PRI.
C12		40 MFD. "	150V.					D		2ND I.F. " SEC.
								F		BROADCAST OSC. (ON GANG)
								G		BROADCAST ANT. (ON GANG)
R1	63-579	220 OHM	½ W.	1	59599	WAVEMAGNET				
R2	63-589	10M OHM	½ W.	2	59450	OSCILLATOR COIL ASSEMBLY				



CHASSIS Nº5B03-A.C. PHONO

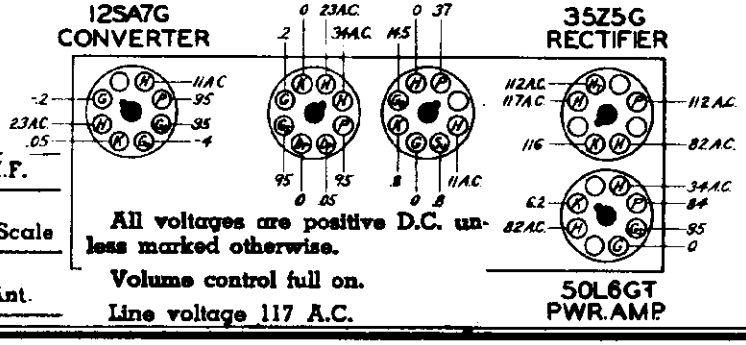
Stage Gains
Bc. and I.F.

Ant. to conv. grid—5.8× at 1000 Kc.

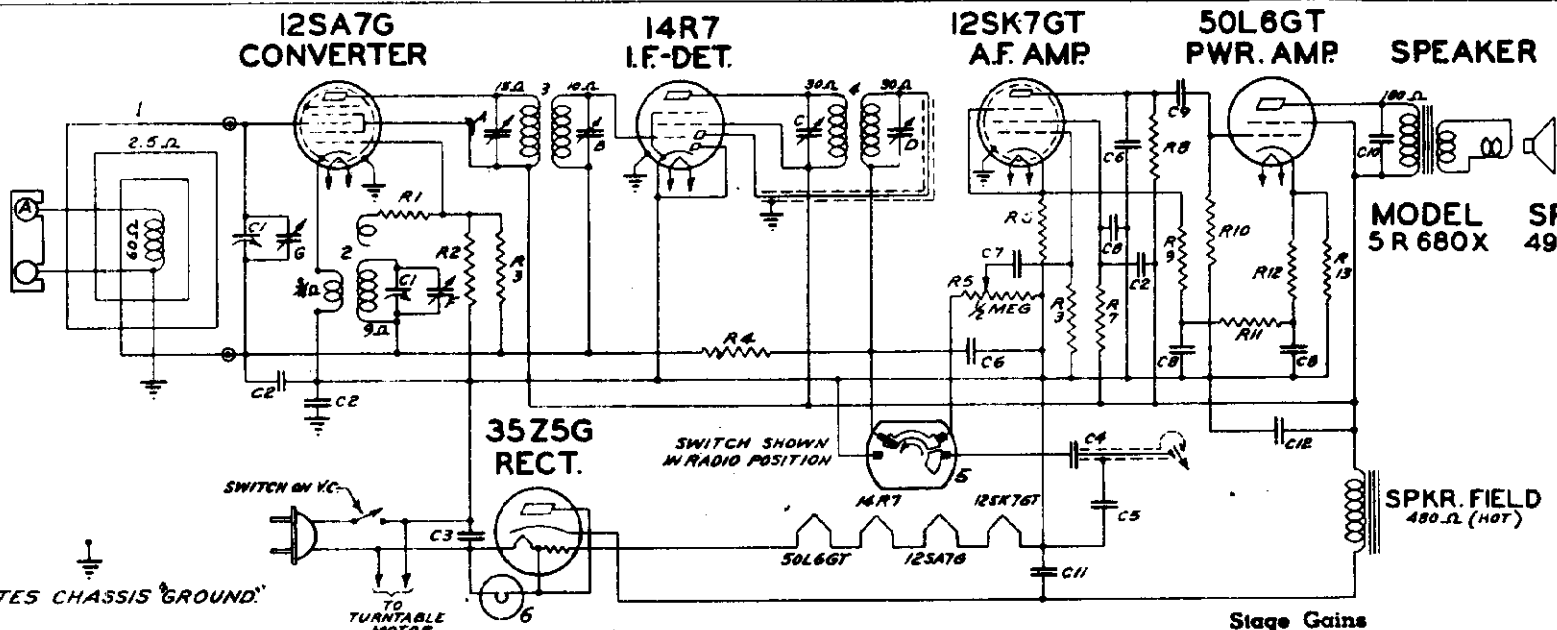
Conv. grid to I. F. grid—57× at 455 Kc.

Overall audio—222× at .35 watt, 400 cycles.

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Trimmers	
1	Converter Grid	.5 mfd.	455 Kc.	BC	1600 Kc.	A. B. C. D	Align I.F.
2	Single Turn Loop Loosely Coupled to Wave Magnet	.5 mfd.	1600 Kc.	"	1600 Kc.	F	Set to Scale
3		.5 mfd.	1400 Kc.	"	1400 Kc.	G	Align Ant.



All voltages are positive D.C. unless marked otherwise.
Volume control full on.
Line voltage 117 A.C.



DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION
C1	22-1206	TWO-GANG VARIABLE		R3	63-976	15 MEGOHM	½ W	3	95-811	1ST I.F. TRANSFORMER
C2	22-829	.05 MFD.	200V.	R4	63-600	2.2 MEGOHM	½ W	4	95-812	2ND I.F. TRANSFORMER
C3	22-1017	.05 MFD.	200V.	R5	63-1112	VOLUME CONTROL		5	85-282	PHONO-RADIO SWITCH
C4	22-887	.001 MFD.	600V.	R6	63-634	820 OHM	½ W	6	100-67	DIAL LIGHT 6.3 V. .15 A.
C5	22-327	.02 MFD.	200V.	R7	63-778	470M OHM	½ W			
C6	22-953	.0002 MFD.	600V.	R8	63-465	100M OHM	½ W			
C7	22-492	.002 MFD.	600V.	R9	63-439	2700 OHM	½ W			
C8	22-827	.1 MFD.	200V.	R10	63-597	470M OHM	½ W			
C9	22-188	.02 MFD.	400V.	R11	63-637	4700 OHM	½ W	A		1ST I.F. TRANS. PRI.
C10	22-1182	.01 MFD.	400V.	R12	63-639	6800 OHM	½ W	B		1ST I.F. " SEC.
C11	22-1026	20 MFD. ELECTROLYTIC	150V.	R13	63-1213	140 OHM	½ W	C		2ND I.F. " PRI.
C12		40 MFD. "	150V.					D		2ND I.F. " SEC.
								F		BROADCAST OSC. (ON GANG)
								G		BROADCAST ANT. (ON GANG)
R1	63-579	220 OHM	½W.	1	59599	WAVEMAGNET				
R2	63-589	10M OHM	½ W.	2	59650	OSCILLATOR COIL ASSEMBLY				

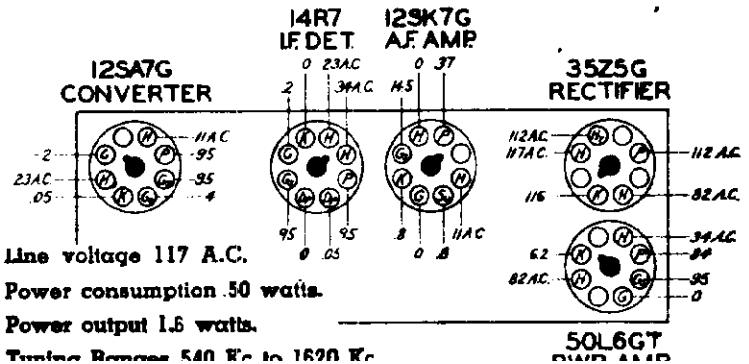
Stage Gains Bc. and I.F.

Ant. to conv. grid—5.8× at 1000 Kc.

Conv. grid to I. F. grid—57× at 455 Kc.

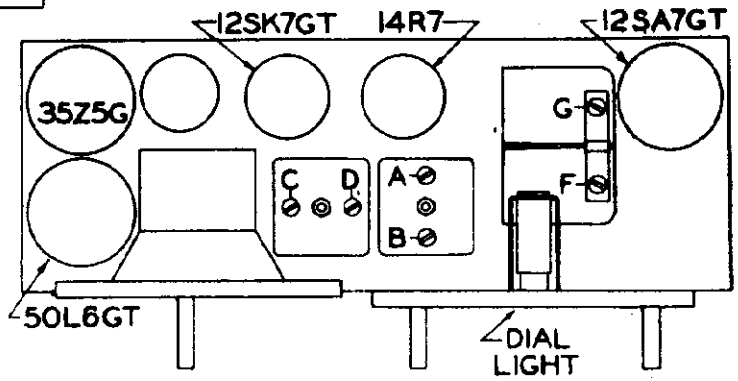
Overall audio—222× at .35 watt, 400 cycles.

I.F. FREQUENCY 455 KC.
5 TUBE SUPERHETERODYNE
CHASSIS Nº5B14-A.C. PHONO



Line voltage 117 A.C.
Power consumption 50 watts.
Power output 1.6 watts.
Tuning Ranges 540 Kc. to 1620 Kc.

FOR ALIGNMENT SEE INDEX

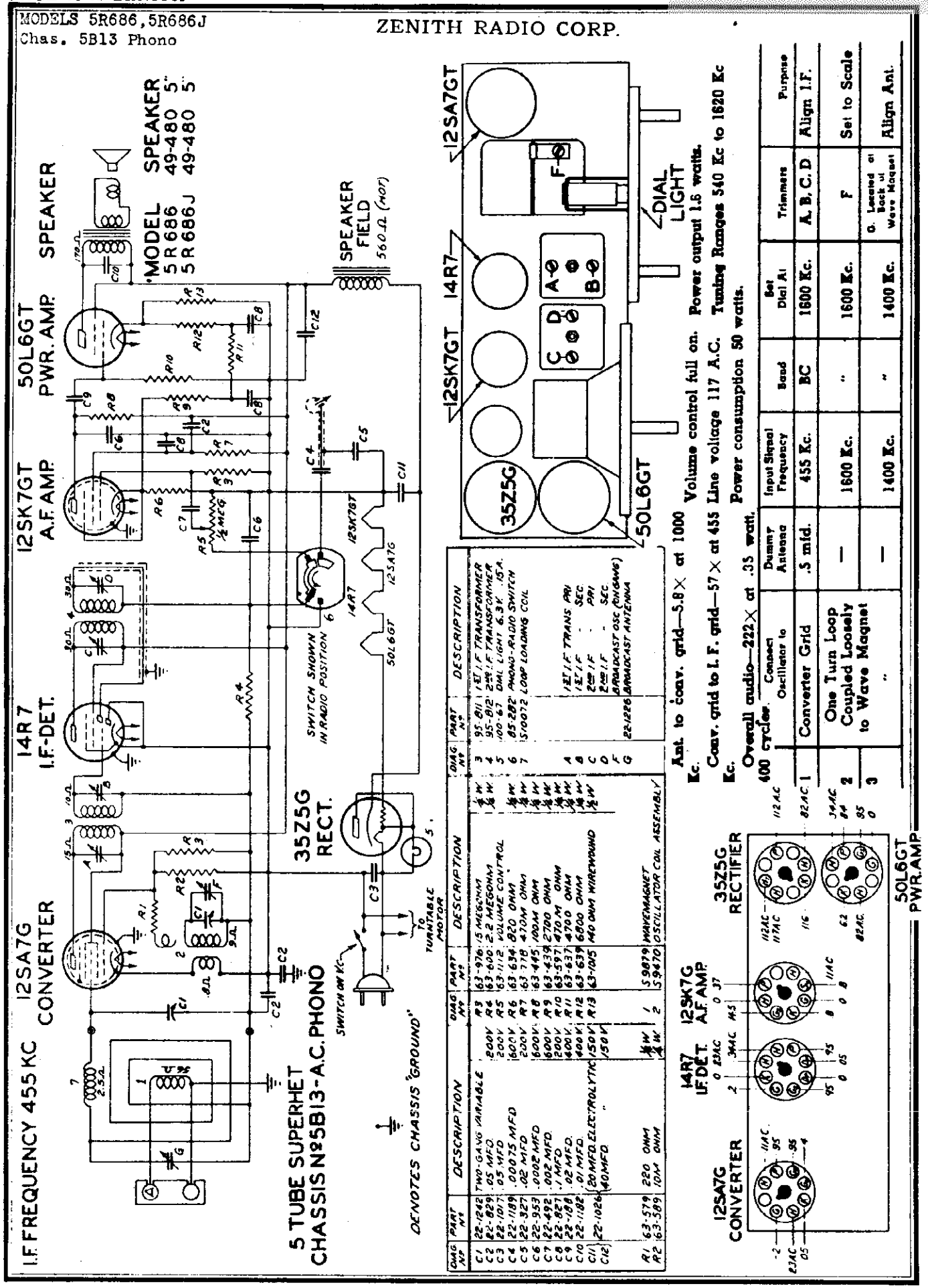


ZENITH RADIO CORP.

MODEL 5R680X, 5R680X,
Chassis 5B14

MODELS 5R686, 5R686J
Chas. 5B13 Phono

ZENITH RADIO CORP.



DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
C1	22-1242	TWO-GANG VARIABLE	R1	63-976	.15 MEGOHM
C2	22-829	.05 MFD. 200V	R2	63-600	2.2 MEGOHMS
C3	22-1017	.05 MFD. 200V	R3	63-1112	VOLUME CONTROL
C4	22-1189	.0075 MFD 600V	R4	63-634	820 OHMS
C5	22-327	.02 MFD 200V	R5	63-718	470M OHMS
C6	22-953	.0002 MFD 600V	R6	63-445	100M OHMS
C7	22-492	.002 MFD. 600V	R7	63-439	2700 OHMS
C8	22-827	.1 MFD. 200V	R8	63-597	470M OHMS
C9	22-188	.02 MFD. 400V	R9	63-637	4700 OHMS
C10	22-1182	.01 MFD. 400V	R10	63-639	6800 OHMS
C11	22-1026	20 MFD. ELECTROLYTIC 150V	R11	63-1005	140 OHMS WIREWOUND
C12		40 MFD " 150V	R12		
			R13		
R1	63-579	220 OHMS ½W	1	S9879	WAVEMAGNET
R2	63-589	10M OHMS ½W	2	S9470	OSCILLATOR COIL ASSEMBLY

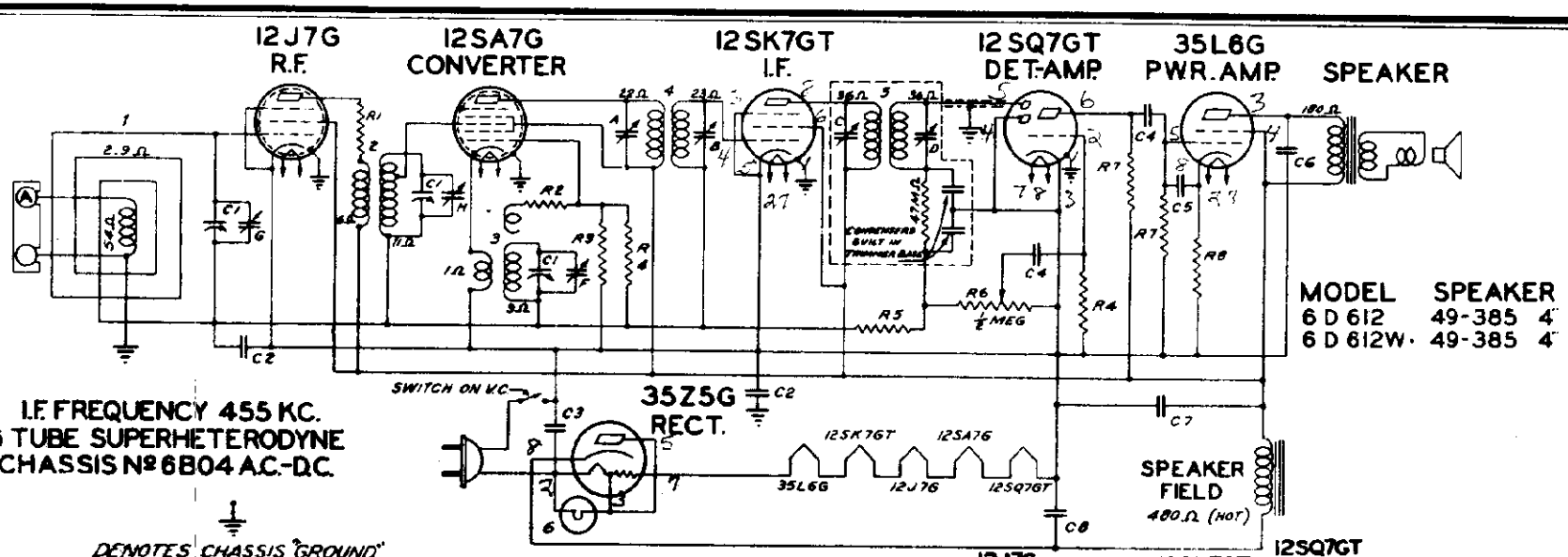
DIAG. NO.	PART NO.	DESCRIPTION
3	95-811	1ST I.F. TRANSFORMER
4	95-812	2ND I.F. TRANSFORMER
5	100-67	DIAL LIGHT 6.3V. .15A.
6	85-282	PHONO-RADIO SWITCH
7	S10072	LOOP LOADING COIL
A		1ST I.F. TRANS PRI
B		1ST I.F. " SEC
C		2ND I.F. " PRI
D		2ND I.F. " SEC
F		BROADCAST OSC (WINDING)
G	22-1226	BROADCAST ANTENNA

Ant. to conv. grid—5.8× at 1000 Kc.
Conv. grid to I. F. grid—57× at 455 Kc.
Overall audio—222× at .35 watt.
400 cycles.

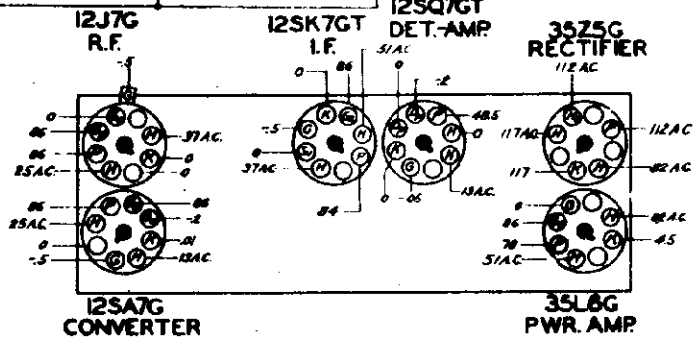
Volume control full on. Power output 1.6 watts.
Line voltage 117 A.C. Tuning Ranges 540 Kc to 1620 Kc
Power consumption 50 watts.

	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Trimmers	Purpose
82AC 1	Converter Grid	.5 mfd.	455 Kc.	BC	1600 Kc.	A, B, C, D	Align I.F.
2	One Turn Loop Coupled Loosely to Wave Magnet	—	1600 Kc.	"	1600 Kc.	F	Set to Scale
3	"	—	1400 Kc.	"	1400 Kc.	G. Located at Back of Wave Magnet	Align Ant.

12SA7G CONVERTER
14R7 I.F. DET.
12SK7G A.F. AMP
35Z5G RECTIFIER
50L6GT PWR. AMP



DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION
C1	22-1201	THREE-GANG VARIABLE		R3	63-589	10M OHM	½ W.	4	95-808	1ST I.F. TRANS.
C2	22-889	.05 MFD.	200 V.	R4	63-576	1.5 MEGOHM	½ W.	5	95-809	2ND I.F. TRANS.
C3	22-1017	.05 MFD	200 V.	R5	63-600	2.2 MEGOHM	½ W.	6	100-67	PILOT LIGHT 6.9 V. .15 A.
C4	22-243	.01 MFD.	400 V.	R6	63-1112	VOLUME CONTROL				
C5	22-854	.0005 MFD.	600 V.	R7	63-597	470M OHM	½ W.			
C6	22-1049	.03 MFD	400 V.	R8	63-686	150 OHM WIREWOUND	½ W.			
C7	22-1014	20 MFD. ELECTROLYTIC	150 V.					A		1ST I.F. TRANS. PRI.
C8		20 MFD. ELECTROLYTIC	150 V.					B		1ST I.F. TRANS. SEC.
								C		2ND I.F. TRANS. PRI.
								D		2ND I.F. TRANS. SEC.
A1	63-590	15M OHM	½ W.	1	59576	WAVEMAGNET ASSEMBLY		F		BROADCAST OSC. (ON GANG)
A2	63-579	220 OHM	½ W.	2	59570	DETECTOR COIL ASSEMBLY		G		BROADCAST ANT. (ON GANG)
				3	59571	OSCILLATOR COIL ASSEMBLY		H		BROADCAST OSC. (ON GANG)



Stage Gains
Bc. and I.F.

Ant. to R.F. grid 5.7 at 1000 Kc.

R.F. grid to conv. grid 10.5 at 1000 Kc.

Conv. grid to I.F. grid 46.4 at 455 Kc.

Overall audio 245 at .25 watt. 400 cycles.

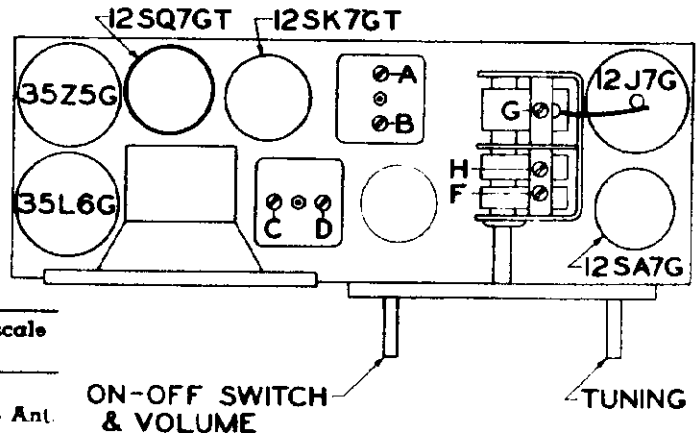
Volume control full on.

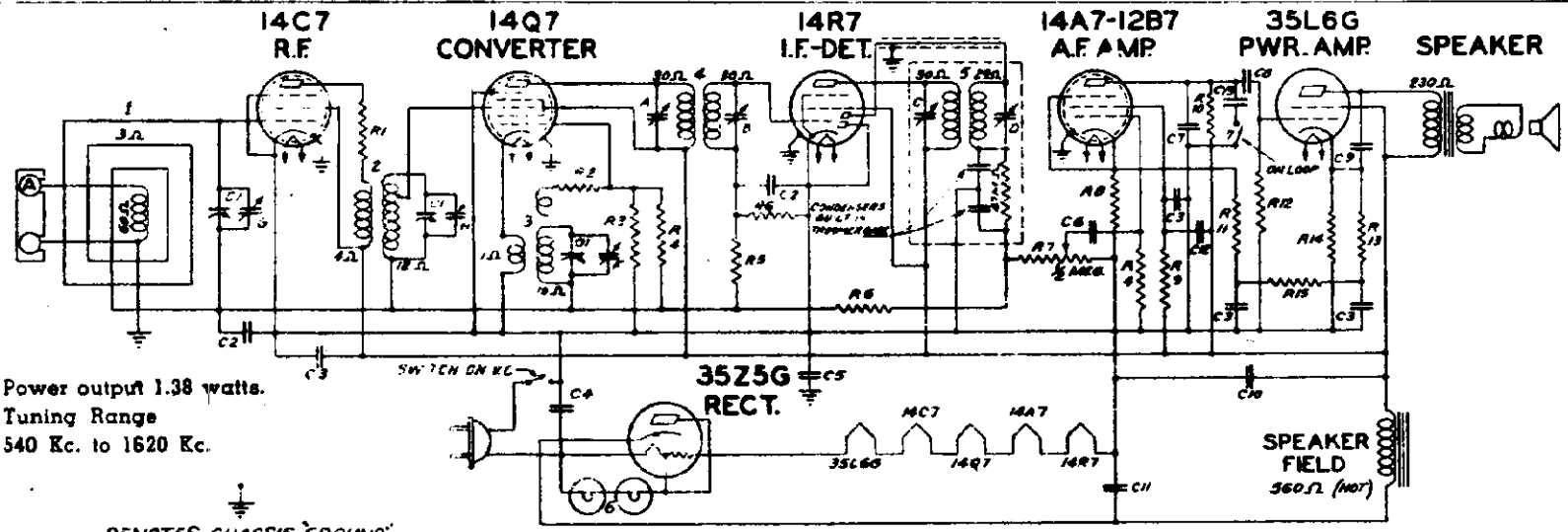
Line voltage 117 A.C. or D.C.
Power consumption 30 watts.
Power output 1.38 watts.

Tuning Range

540 Kc. to 1620 Kc.

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Trimmers	Purpose
1	Converter Grid	.5 mfd.	455 Kc.	BC	1600 Kc.	A. B. C. D	Align I.F.
2	Single Turn Loop Coupled Loosely to Wave Magnet	.5 mfd.	1600 Kc.	"	1600 Kc.	F	Set osc. to scale at 1600 Kc.
3		.5 mfd.	1400 Kc.	"	1400 Kc.	H. G	Align R.F. & Ant.

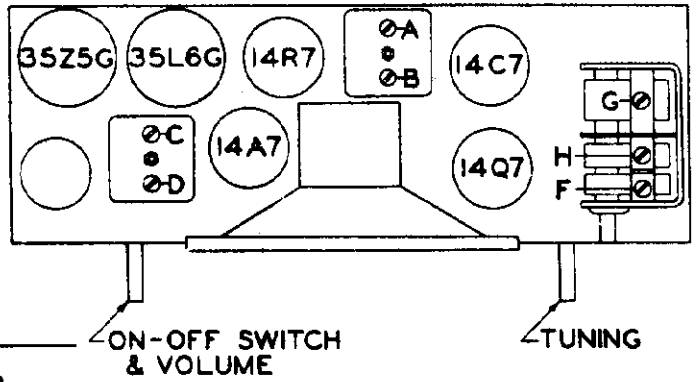




Power output 1.38 watts.
Tuning Range
540 Kc. to 1620 Kc.

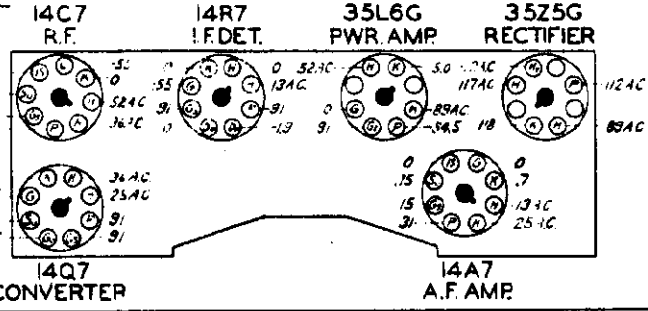
DENOTES CHASSIS "GROUND"

DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION
C1	22-1801	THREE-GANG VARIABLE		R3	63-589	10M OHM	½ W.	2	39561	DETECTOR COIL ASSEMBLY
C2	22-829	.05 MFD.	200 V.	R4	63-1093	15 MEGOHM	½ W.	3	39578	OSCILLATOR COIL ASSEMBLY
C3	22-827	.1 MFD.	200 V.	R5	63-722	2.2 MEGOHM	½ W.	4	95-806	1ST I.F. TRANS.
C4	22-1017	.05 MFD.	200 V.	R6	63-600	2.2 MEGOHM	½ W.	5	95-807	2ND I.F. TRANS.
C5	22-1207	.07 MFD.	200 V.	R7	63-1238	VOLUME CONTROL		6	100-90	PILOT LIGHT 3.2V. .15A.
C6	22-243	.01 MFD.	400 V.	R8	63-634	820 OHM	½ W.	7	85-257	TONE CONTROL SWITCH
C7	22-856	.0005 MFD.	600 V.	R9	63-659	470 M OHM	½ W.			
C8	22-188	.02 MFD.	400 V.	R10	63-860	100 M OHM	½ W.			
C9	22-1049	.03 MFD.	400 V.	R11	63-439	2700 OHM	½ W.	A		1ST I.F. TRANS. PRI.
C10	22-1016	20 MFD. ELECTROLYTIC	150 V.	R12	63-597	470 M OHM	½ W.	B		1ST I.F. TRANS. SEC.
C11		20 MFD. ELECTROLYTIC	150 V.	R13	63-755	3300 OHM	½ W.	C		2ND I.F. TRANS. PRI.
C12	22-1219	.04 MFD.	200 V.	R14	63-1237	150 OHM WIREWOUND	1 W.	D		2ND I.F. TRANS. SEC.
C13	22-492	.002 MFD.	600 V.	R15	63-637	4700 OHM	½ W.	F		BROADCAST OSC. (ON GANG)
								G		BROADCAST ANT. (ON GANG)
								H		BROADCAST DET. (ON GANG)
R1	63-590	15M OHM	½ W.							
R2	63-579	220 OHM	½ W.	1	39582	WAVE MAGNET ASSEMBLY				



Volume control full on.
Line voltage 117 A.C. or D.C.
Power consumption 40 watts.

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Trimmers	Purpose
1	Converter Grid	5 mfd.	455	BC	600	A. B. C. D	Align I.F.
2	One Turn Loop Coupled Loosely to Wave Magnet	-	1600	BC	1600	F	Set osc. to scale at 1600 Kc.
3		—	1400	BC	1400	H. G	Align det. and antenna stage



MODEL	SPEAKER
6 D 614	49-448 5"
6 D 614W	49-448 5"
6 D 629	49-448 5"

I.F. FREQUENCY 455 KC.
6 TUBE SUPERHETERODYNE
CHASSIS Nº 6B01 A.C.-D.C.

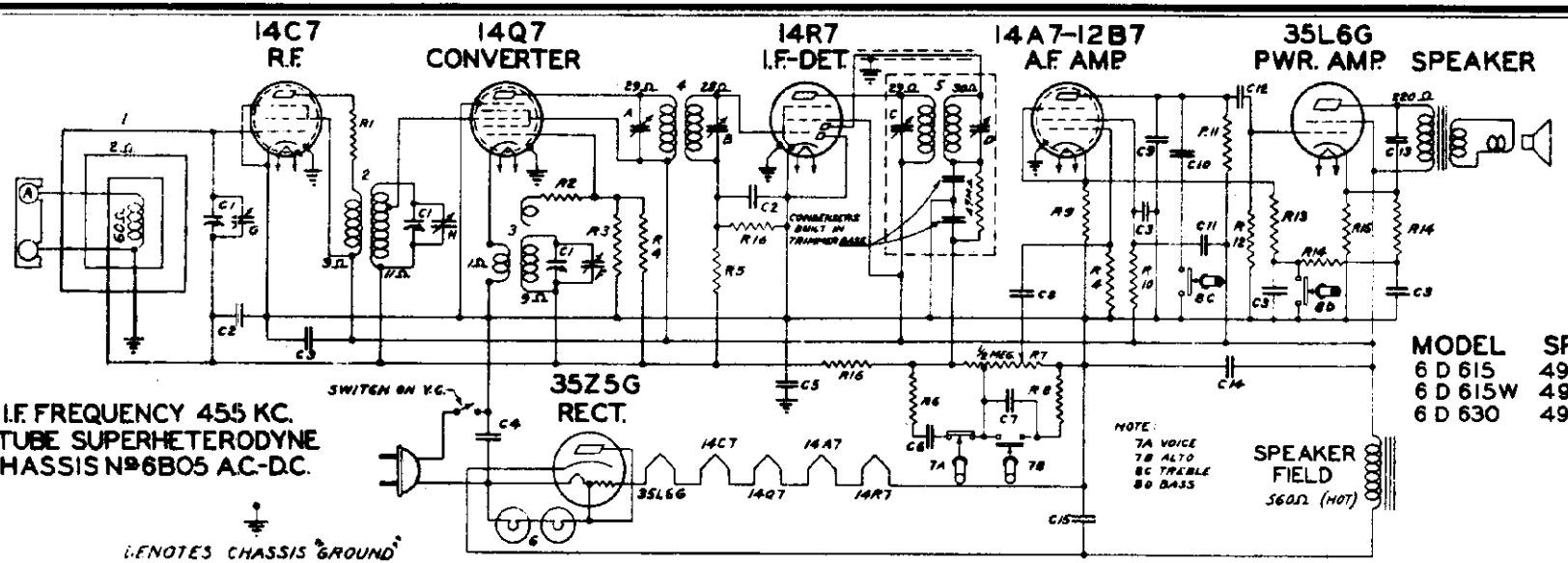
Stage Gains
Bc. and I.F.

Ant. to R.F. grid 8 at 1000 Kc.

R.F. grid to conv. grid 9.6 at 1000 Kc.

Conv. grid to I.F. grid 39 at 455 Kc.

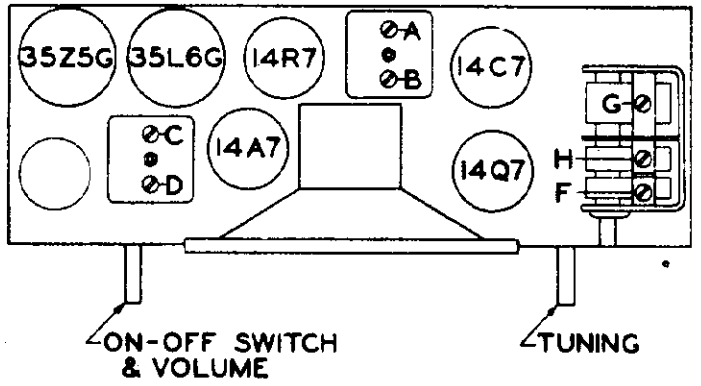
Overall audio 162 at .25 watt, 400 cycles.



I.F. FREQUENCY 455 KC.
6 TUBE SUPERHETERODYNE
CHASSIS No. 6B05 A.C.-D.C.

MODEL	SPEAKER	
6 D 615	49-448	5"
6 D 615W	49-448	5"
6 D 630	49-448	5"

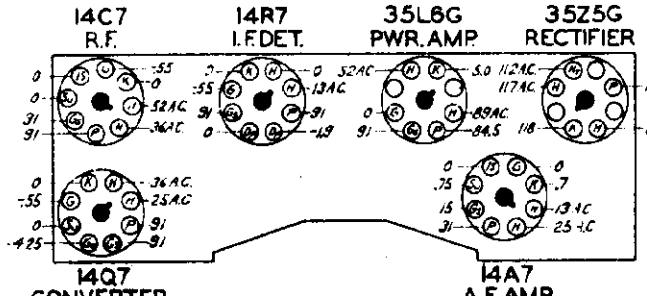
DIAG No.	PART No.	DESCRIPTION		DIAG No.	PART No.	DESCRIPTION		DIAG No.	PART No.	DESCRIPTION
C1	22-1201	THREE GANG VARIABLE		R1	63-590	15M OHM	½ W.	1	59727	WIREWAGNET ASSEMBLY
C2	22-459	.05 MFD	200 V.	R2	63-578	820 OHM	½ W.	2	59561	DETECTOR COIL ASSEMBLY
C3	22-821	.1 MFD	200 V.	R3	63-589	10M OHM	½ W.	3	59578	OSCILLATOR COIL ASSEMBLY
C4	22-1017	.05 MFD	200 V.	R4	63-1039	.15 MEGOHM	½ W.	4	95-806	1ST I.F. TRANSFORMER
C5	22-1107	.01 MFD	200 V.	R5	63-722	2.2 MEGOHM	½ W.	5	95-807	2ND I.F. TRANSFORMER
C6	22-326	.003 MFD	400 V.	R6	63-325	150M OHM	½ W.	6	100-98	DIAL LIGHT 3.2 V. .15 A.
C7	22-321	.02 MFD	200 V.	R7	63-1255	VOLUME CONTROL		7	85-264	T.C. SW. ASSEM (LEFT)
C8	22-245	.1 MFD	400 V.	R8	63-591	22M OHM	½ W.	8	85-268	T.C. SW. ASSEM (RIGHT)
C9	22-854	.0004 MFD	400 V.	R9	63-634	820 OHM	½ W.			
C10	22-847	.001 MFD	500 V.	R10	63-659	470M OHM	½ W.			
C11	22-319	.04 MFD	200 V.	R11	63-260	100M OHM	½ W.	A		1ST I.F. TRANS. PRI.
C12	22-148	.1 MFD	400 V.	R12	63-597	470M OHM	½ W.	B		1ST I.F. TRANS. SEC.
C13	22-1127	.02 MFD	400 V.	R13	63-638	2700 OHM	½ W.	C		2ND I.F. TRANS. PRI.
C14	22-1018	15 MFD. ELECTROLYTIC	150 V.	R14	63-639	6800 OHM	½ W.	D		2ND I.F. TRANS. SEC.
C15		30 MFD ELECTROLYTIC	150 V.	R15	63-1237	150 OHM WIREWOUND	½ W.	F		BROADCAST OSC. (ON GANG)
				R16	63-680	2.2 MEGOHM		6		BROADCAST ANT. (ON GANG)
								H		BROADCAST DET. (ON GANG)



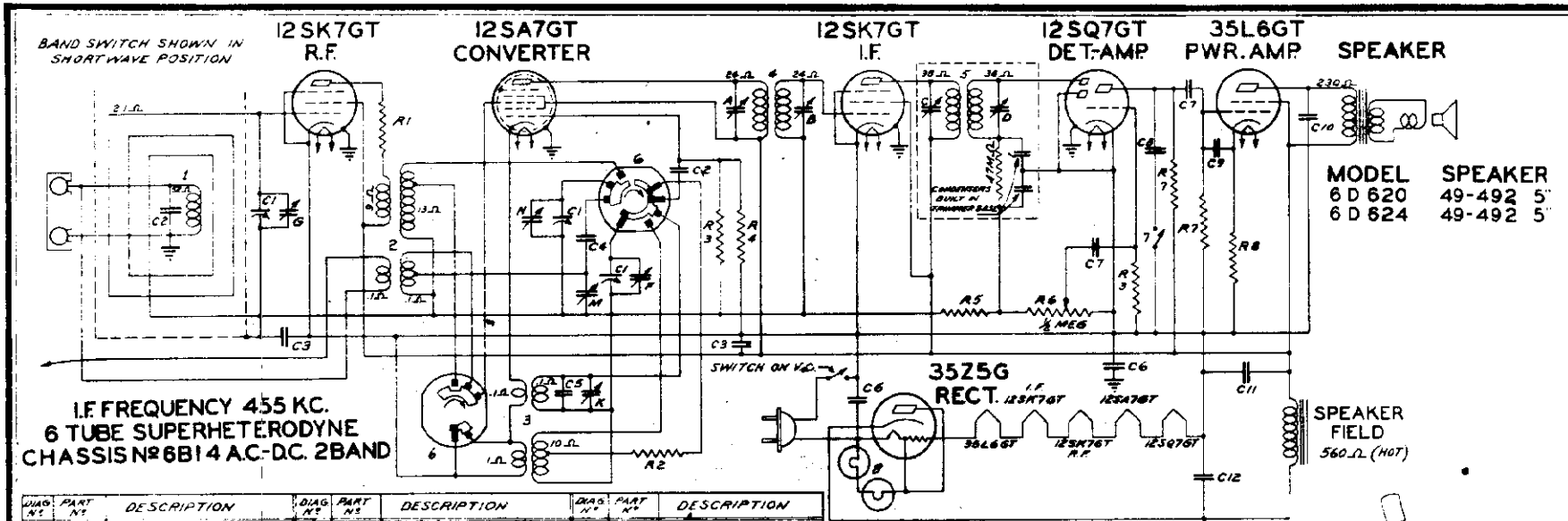
Stage Gains
Bc. and I.F.

Ant. to R.F. grid 8× at 1000 Kc.
R.F. grid to conv. grid 9.6× at 1000 Kc.
Conv. grid to I.F. grid 39× at 455 Kc.
Overall audio 162× at .25 watt, 400 cycles.

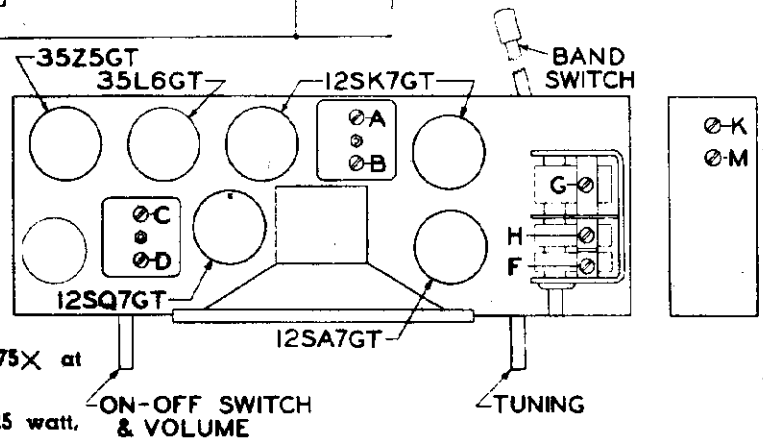
Volume control full on.
Line voltage 117 A.C. or D.C.
Power consumption 40 watts.
Power output 1.38 watts.
Tuning Range
540 Kc. to 1620 Kc.



Operation	Connect Osc. lator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Trimmers	Purpose
1	Converter Grid	.5 mfd.	455 Kc.	BC	600 Kc.	A, B, C, D	Align I.F.
2	1 turn loop made from generator or Radex Loop	———	1600 Kc.	BC	1600 Kc.	F	Set osc. to scale at 1600 Kc.
3		———	1400 Kc.	BC	1400 Kc.	H, G	Align det. and ant. stage



DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION
C1	22-1268	TRIPLE GANG VARIABLE		R2	63-579	220 OHM	½ W	7	65-257	TONE CONTROL SWITCH
C2	22-289	50 MMFD	600 V	R3	63-976	1.5 MEGOHM	½ W	8	106-90	DIAL LAMP 3.2 V. .17A.
C3	22-829	.05 MFD	200 V	R4	63-589	10 M OHM	½ W			
C4	22-1300	.00025 MFD	600 V	R5	63-600	2.2 MEGOHM	½ W			
C5	22-1279	40 MMFD COMP		R6	63-1238	VOLUME CONTROL		A		1ST I.F. TRANS. PRI.
C6	22-1017	.05 MFD	200 V	R7	63-597	470 M OHM	½ W	B		1ST I.F. " SEC.
C7	22-243	.01 MFD	400 V	R8	63-1237	150 OHM WIREWOUND	1 W	C		2ND I.F. " PRI.
C8	22-692	.002 MFD	600 V					D		2ND I.F. " SEC.
C9	22-716	.0005 MFD	600 V					F		BROADCAST OSC. (ON GANG)
C10	22-1049	.03 MFD	400 V					G		BROADCAST ANT. (ON GANG)
C11	22-1280	20 MFD ELECTROLYTIC	150 V	1	5-10134	WAVEMAGNET		H		BROADCAST DET. (ON GANG)
C12		20 MFD. "	150 V	2	5-10154	DETECTOR COIL ASSEMBLY		K		SHORTWAVE OSC. (SEE NOTE)
				3	5-10155	OSCILLATOR "		M		SHORTWAVE ANT. (SEE NOTE)
				4	95-869	1ST I.F. TRANSFORMER				NOTE:
				5	95-870	2ND I.F. "				TRIMMERS K & M ARE
R1	63-1208	8200 OHM	½ W	6	95-307	BAND SWITCH				MOUNTED ON STRIP 22-1279



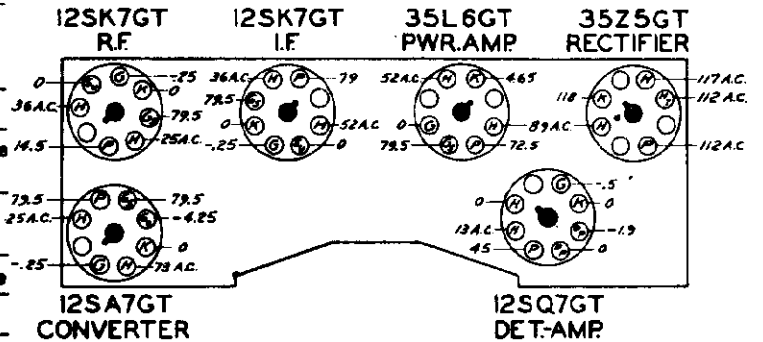
Power consumption 30 watts.

Maximum audio power output 1.25 watts.

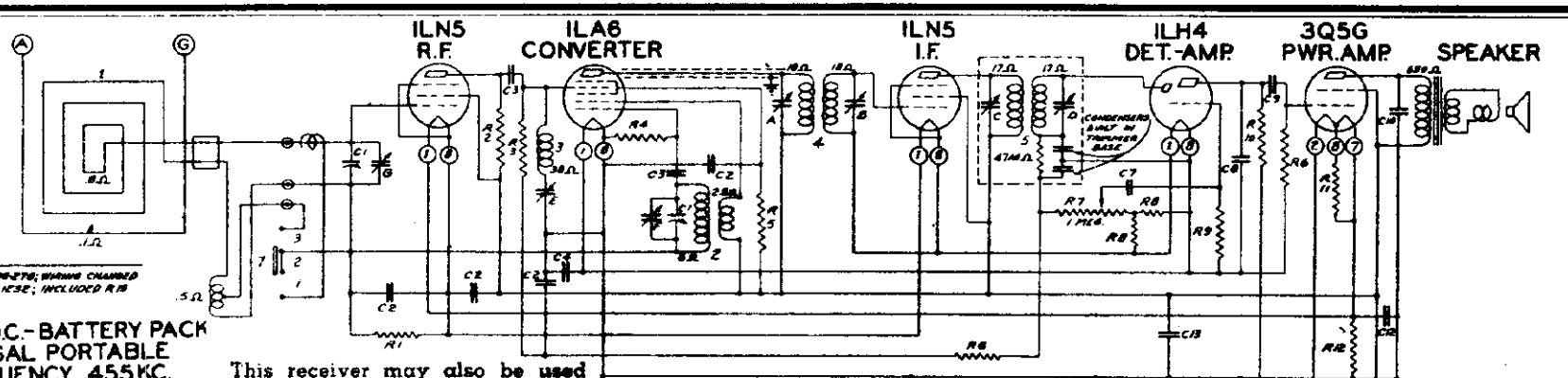
Tuning Ranges:
540 Kc. to 1620 Kc.
8.75 Mc. to 12.2 Mc.

Stage Gains
Bc. and I.F.
Ant. to R.F. grid 5× at 1000 Kc.
R.F. grid to conv. grid 3.8× at 1000 Kc.
Conv. grid to I.F. grid 75× at 455 Kc.
Overall audio 220× at .25 watt, 400 cycles.

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial at	Trimmers	Purpose
1	Conv. Grid	.5 mfd.	455 Kc.	B.C.	600 Kc.	A, B, C, D	Align I.F.
2	Single Turn Loop Loosely Coupled to Wavemagnet	—	1400 Kc.	B.C.	1400 Kc.	F	Set oscillator to scale
3		—	1400 Kc.	B.C.	1400 Kc.	H & G	Align R.F. and Ant.
4	Ant.-Gnd.	400 ohms	12 Mc.	S.W.	12 Mc.	K	Set oscillator to scale
5	Ant.-Gnd.	400 ohms	12 Mc.	S.W.	12 Mc.	M	Align Ant.



ZENITH RADIO CORP.



110 V. A.C.-D.C.-BATTERY PACK UNIVERSAL PORTABLE

I.F. FREQUENCY 455 KC.

6 TUBE SUPERHETERODYNE

CHASSIS № 6B03

This receiver may also be used with the 1,000 hour Farm battery pack Z-884 and extension cable

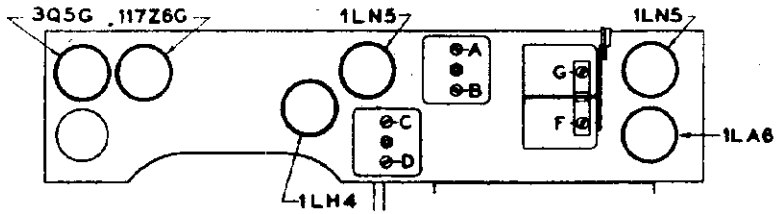
DIAG. №	PART №	DESCRIPTION		DIAG. №	S-9598 DESCRIPTION		DIAG. №	PART №	DESCRIPTION
C1	22-1200	TWO GANG VARIABLE		R1	63-396	150M OHM	1	S-9578	OSCILLATOR COIL ASSEMBLY
C2	22-829	.05 MFD.	200 V.	R2	63-599	15M OHM	2	S-9596	WAVE TRAP ASSEMBLY
C3	27-162	.0001 MFD.	600 V.	R3	63-595	100M OHM	4	95-884	1ST I.F. TRANSFORMER
C4	22-1025	.15 MFD.	200 V.	R4	63-773	180M OHM	5	95-865	2ND I.F. TRANSFORMER
C5	27-827	.1 MFD.	200 V.	R5	63-712	33M OHM	6	85-299	CHANGEOVER SWITCH
C6	22-1017	.05 MFD.	200 V.	R6	63-600	2.2 MEGOHM	7	85-225	WAVEMAGNET SWITCH
C7	22-492	.002 MFD.	600 V.	R7	63-1831	VOLUME CONTROL			
C8	22-470	.00015 MFD.	600 V.	R8	63-585	2200 OHM			
C9	22-196	.01 MFD.	600 V.	R9	63-976	15 MEGOHM			
C10	22-458	.006 MFD.	600 V.	R10	63-271	1 MEGOHM	A		1ST I.F. TRANS. PRI.
C11		20MFD ELECTROLYTIC	25 V.	R11	63-580	330 OHM	B		1ST I.F. TRANS. SEC.
C12	22-1159	40MFD ELECTROLYTIC	25 V.	R12	63-1097	870 OHM WIREWOUND	C		2ND I.F. TRANS. PRI.
C13		40MFD ELECTROLYTIC	150 V.	R13	63-1259	2 SECTION CANDOHM	D		2ND I.F. TRANS. SEC.
C14	22-1026	20MFD ELECTROLYTIC	150 V.	R14	63-1150	1800 OHM	E	S9E-A66	WAVE TRAP
C15		40MFD ELECTROLYTIC	150 V.	R15	63-1260	140 OHM WIREWOUND	F		BROADCAST OSC. (ON GANG)
							G		BROADCAST ANT. (ON GANG)
					S-9579	WAVEMAGNET ASSEMBLY			

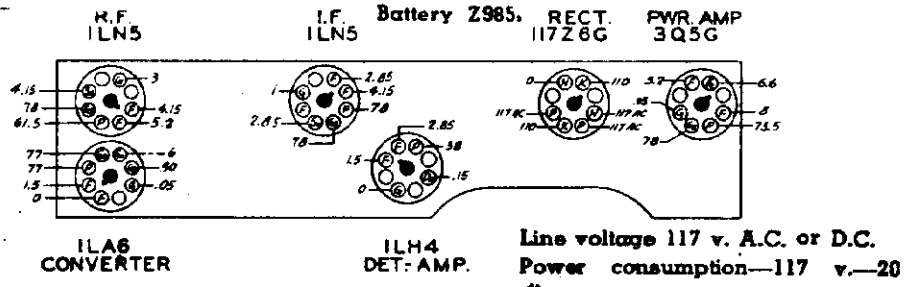
MODEL	SPEAKER	BATTERY
6G601D, 6G601L, 6G601M, 6G601MH, 6G601ML	49-445 5¢	Z985, Z884

CHANGEOVER SWITCH SHOWN IN POSITION FOR A.C. OPERATION

Volume control on full.

Battery Z985.





Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Oscillator to	Band	Set Dial At	Adjust Trimmers	Purpose
1	Converter Grid	.5 mmfd.	455	—	600	A B C D	I. F. Alignment
2	Converter Grid	.5 mmfd.	455	—	600	E	Adj. Trap Minimum
3	Single Turn Loop Coupled Loosely to Wave Magnet	—	1400	—	1400	F	Set Osc. to Scale
4		—	1400	—	1400	G	Alignment of Antenna

*Gnd of test osc. connected to No. 8 pin of 1LA6 socket

Line voltage 117 v. A.C. or D.C.

Power consumption—117 v.—20 watts.

Power output—360 milliwatts.

Stage Gains:

Ant. to R.F. grid—5 × at 1000 Kc.

R.F. grid to conv. grid.—6.5× at 1000 Kc.

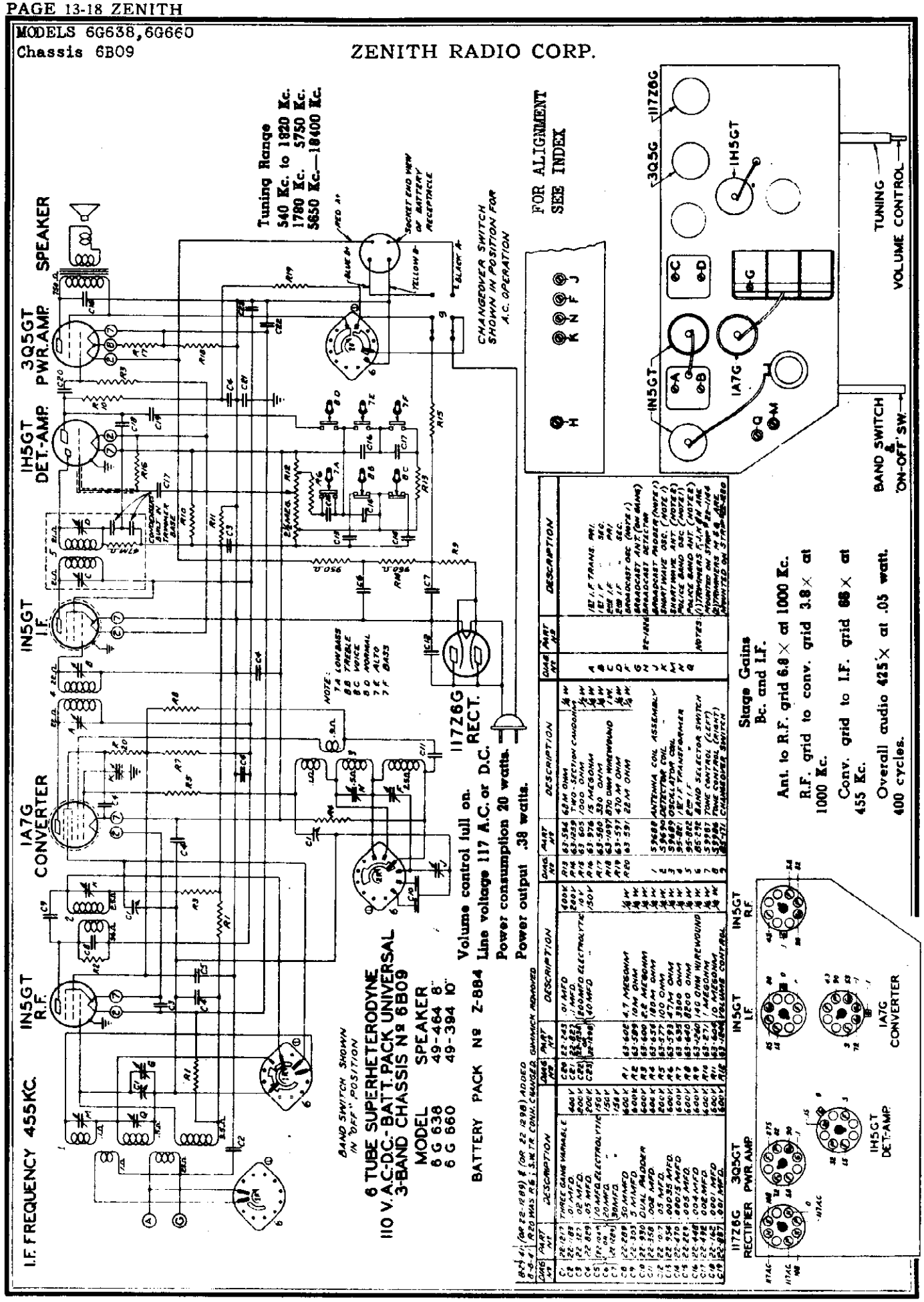
Conv. grid to I.F. grid—49.1× at 455 Kc.

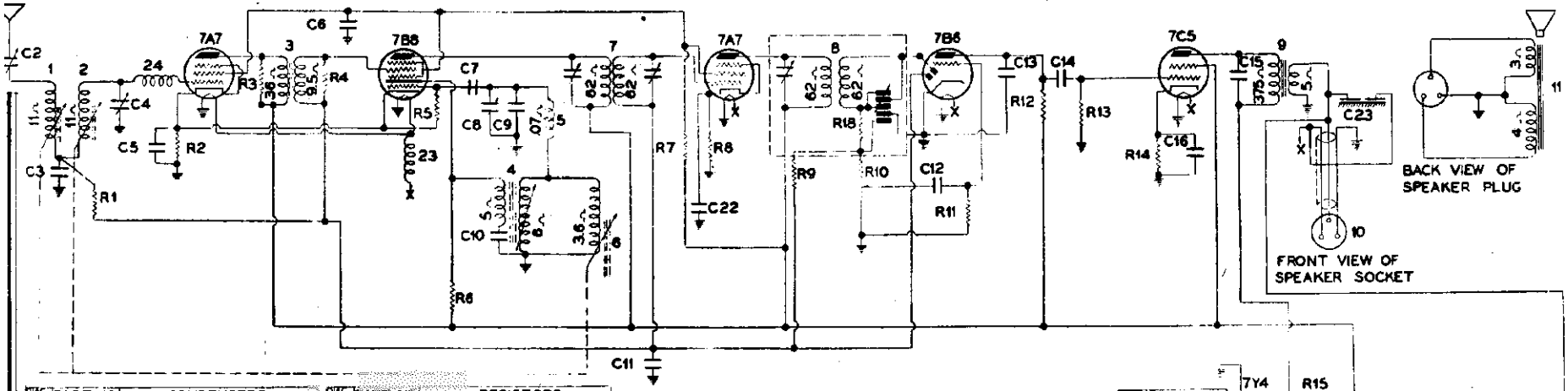
Overall audio—322× at .05 watt, 400 cycles.

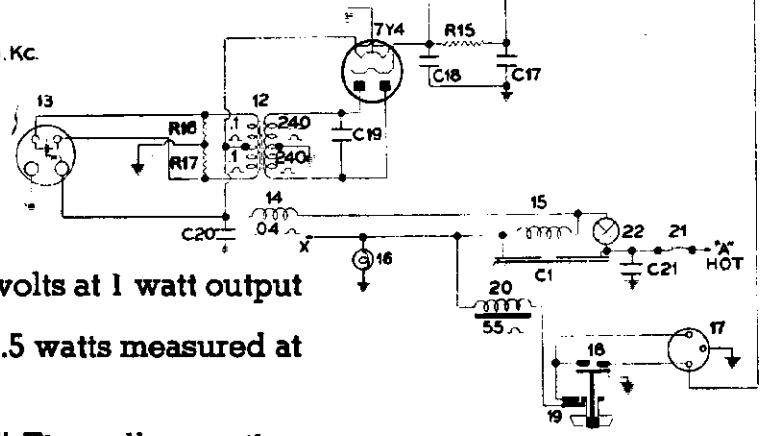
Tuning Range—540 Kc. to 1620 Kc.

MODELS 6G638, 6G660
Chassis 6B09

ZENITH RADIO CORP.







DIAG. NO.	PART NO.	CONDENSERS
C1	22-1076	LOW REACTOR DUAL 250MMFD
2	22-1249	ANT. TRIMMER PLATE 25 MMF
3	22-1244	.004 MFD. 10% MICA
4	22-1216	R.F. TRIM 3 PLATE 50MMF
5	22-100	1 MFD. 50-10% 200V
6	22-170	1 MFD. 50-10% 400V
7	22-182	250MMF 500 20% MICA
8	22-1216	OSC. TRIM 2 PLATE 50MMF
9	22-1248	350MMF 2 1/2% COMP. RESISTOR
10	22-182	250MMF 500 20% MICA
11	22-250	.05 MFD. 50-10% 200V
12	22-906	.004 MFD. 20-10% 200V
13	22-182	250MMF 500 20% MICA
14	22-1170	.01 MFD. 20% 600V
15	22-1170	.01 MFD. 20% 600V
16		.25 MFD. 25WV
17	22-1233	10 MFD. 200WV
18		.20 MFD. 150 WV
19	22-1247	.008 MFD. 20-10% 1500V
20	22-1238	5 MFD. 50-10% 120V
21	22-908	5 MFD. 50-10% 120V
22	22-250	.05 MFD. 50-10% 200V
23	22-1076	LOW REACTOR DUAL 250MMFD

DIAG. NO.	PART NO.	RESISTORS
R1	63-736	330000 OHMS 1 4W 20%
2	63-265	220 OHMS 1 4W 10%
3	63-645	27000 OHMS 1 4W 10%
4	63-645	33000 OHMS 1 4W 10%
5	63-584	68000 OHMS 1 4W 20%
6	63-1180	15000 OHMS 1 2W 20%
7	63-937	33000 OHMS 1W 10%
8	63-234	100 OHMS 1 4W 10%
9	63-271	1 MEG. 1 4W 20%
10	63-1254	250000 VC TAP AT 75000
11	63-976	15 MEG. 1 4W 20%
12	63-596	330000 OHMS 1 4W 20%
13	63-596	330000 OHMS 1 4W 20%
14	63-941	330 OHMS 1W 10%
15	63-968	3300 OHMS 2W 10%
16	63-1197	82 OHMS 1 2W 20%
17	63-1197	82 OHMS 1 2W 20%
18	63-712	33000 OHMS 1 4W 20%

NO.	PART NO.	MISCELLANEOUS
1	S-10064	ANTENNA COIL
2	S-10064	R.F. GRID COIL
3	S-9763	ANTUNED R.F. TRANSFORMER
4	S-10095	OSC. SHUNT COIL
5	20-242	OSC. SERIES COIL
6	S-10063	OSC. TUNING COIL
7	95-819	1ST I.F. TRANSFORMER
8	95-820	DIODE TRANSFORMER
9	95-837	OUTPUT TRANSFORMER
10	52-246	SPEAKER CABLE & SOCKET
11	49-477	SPEAKER & PLUG
12	95-832	VIBRATOR POWER TRANSFORMER
13	190-19	VIBRATOR
14	20-213	HASH CHOKE
15	S-5844	MOTOR NOISE CHOKE
16	100-32	DIAL LIGHT (1)
17	78-406	FOOT SWITCH SOCKET
18	S-10115	SILENCING & SELECTOR SWITCH
19	S-10115	SAFETY SWITCH-BOTTOM SET UP
20	S-10127	SOLENOID
21	136-12	FUSE-20 AMPS.
22	63-1254	ON-OFF SWITCH ON VOL. CONTROL
23	S-9841	HEATER LINE CHOKE
24	S-8819	ANT. MOTOR NOISE CHOKE

SCHEMATIC DIAGRAM AND PARTS LIST FOR 1942 WILLYS AMERICAR RECEIVER

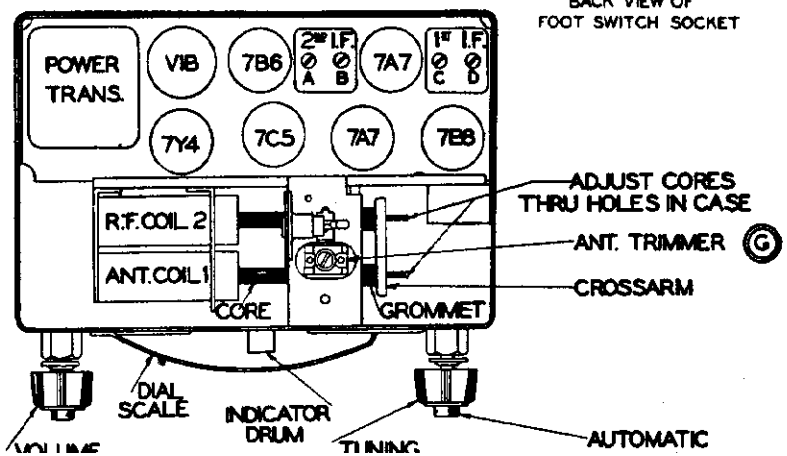
SENSITIVITY..3 microvolts at 1 watt output

POWER OUTPUT....4.5 watts measured at the voice coil

SPEAKER.....7" Firewall mounting

CURRENT CONSUMPTION...7.3 amp

INSTANTANEOUS CURRENT CONSUMPTION DURING AUTOMATIC CHANGE CYCLE.....16.0 amp



ZENITH RADIO CORP.

I.F. Alignment Procedure

1—Remove the top and bottom covers from the receiver.

2—Place the receiver in the Manual tuning position and set the pointer at the low frequency end of the dial (540 Kc.).

3—Set the signal generator at 265 Kc.

4—Apply the signal from the generator through a .1 mfd. dummy to the 7B8 converter grid.

5—Adjust trimmers A-B-C and D (Fig. 8) for maximum output. Repeat the operation to assure accurate alignment.

R.F. and Oscillator

1—Set the signal generator at 1640 Kc.

2—Connect the signal generator leads, through the dummy as illustrated in Figure 10, to the antenna receptacle on the receiver.

3—Set the receiver dial at 1640 Kc. (Maximum high frequency end of dial).

4—Screw the cores completely out of the antenna, R.F. and oscillator coils.

5—Set the oscillator trimmer (F—Fig. 9) at 1640 Kc.

6—Peak the R.F. and antenna trimmers (G and H—Fig. 8-9) for maximum output reading.

7—Replace the cores to their approximate original positions in the antenna, R.F. and oscillator coils.

8—Set the generator and the receiver dial at 1200 Kc.

9—Adjust the oscillator core (6—Fig. 9) to scale at 1200 Kc.

10—Adjust the antenna and R.F. cores (1 and 2—Fig. 8) for maximum output reading.

11—Set the signal generator at 600 Kc.

12—"Rock in" the Shunt oscillator core (4—Fig. 9) for maximum output reading. (Same as rocking in the padder condenser on a ganged condenser receiver.)

13—Check receiver at 1200 Kc. for calibration and gain. If the receiver is off scale or weak, repeat operations 9 and 10.

IMPORTANT: When reinstalling the receiver in the car, allow it to operate for approximately 15 minutes to reach normal operating temperature before checking the antenna trimmer alignment on a **weak station** at approximately 1200 Kc.

Figure 9 shows the approximate voltages as measured with a 1000 ohm per volt meter measured between the socket terminals and the chassis. Volume control set at maximum with no signal.

Battery Voltage — 6.3.

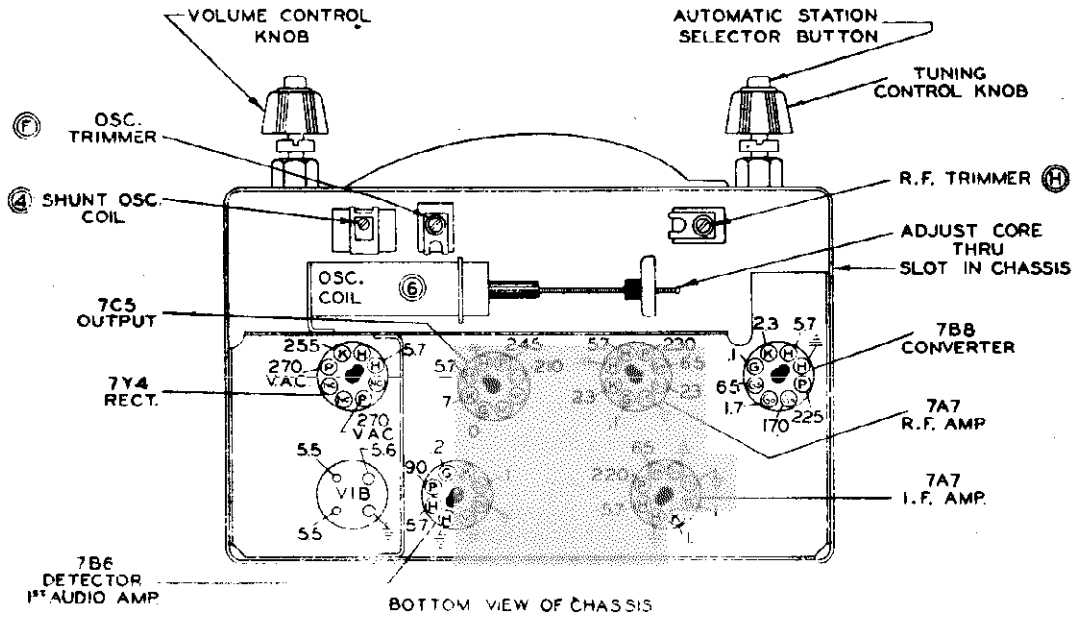
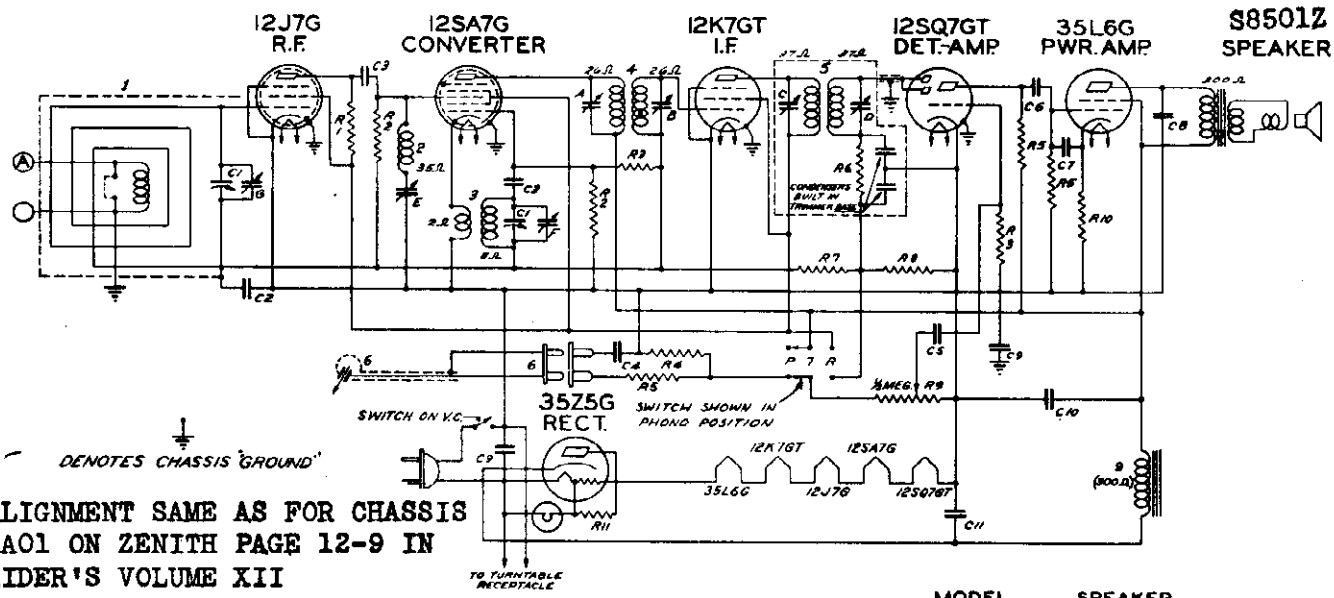


FIG. 9

ZENITH RADIO CORP.

MODELS 6R583, 6R592,
Chassis 6A08
MODELS S8500, S8501,
S8501Z



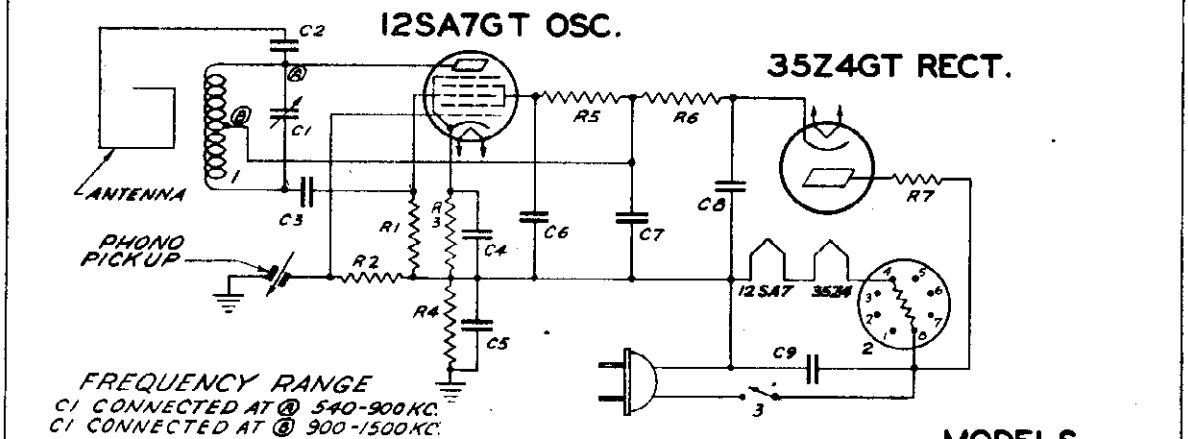
ALIGNMENT SAME AS FOR CHASSIS 6A01 ON ZENITH PAGE 12-9 IN RIDER'S VOLUME XII

DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION
C1	22-1006	TWO-GANG VARIABLE		R3	63-1093	15 MEGOHM	½ W.	5	95-697	2ND I.F. TRANS.
C2	22-829	.05 MFD.	200V.	R4	63-715	100 M OHM	½ W.	6	142-31	PICKUP & R.Line
C3	22-162	.0001 MFD.	600V.	R5	63-719	470 M OHM	½ W.	7	85-280	PHONO-RADIO SWITCH
C4	22-327	.02 MFD.	200V.	R6	63-713	47 M OHM	½ W.	8	100-67	PILOT LIGHT 6.3V. .15 A.
C5	22-493	.002 MFD.	600V.	R7	63-782	2.2 MEGOHM	½ W.	9	95-713	FILTER CHOKE
C6	22-243	.01 MFD.	400V.	R8	63-726	10 MEGOHM	½ W.			
C7	22-854	.0005 MFD.	600V.	R9	63-1112	VOLUME CONTROL				
C8	22-849	.03 MFD.	400V.	R10	63-684	150 OHM WIREWOUND	½ W.			
C9	22-1017	.05 MFD.	200V.	R11	63-1023	22 OHM WIREWOUND	½ W.	A		1ST I.F. TRANS. PRI.
C10	22-1014	20 MFD. ELECTROLYTIC	150V.					B		1ST I.F. TRANS. SEC.
C11		20 MFD. ELECTROLYTIC	150V.					C		2ND I.F. TRANS. PRI.
								D		2ND I.F. TRANS. SEC.
				1		WAVE MAGNET ASSEMBLY		E	22-1015	WAVE TRAP
				2	S8326	WAVE TRAP COIL ASSEMBLY		F		BROADCAST OSC. (ON GANG)
				3	S8336	OSC. COIL ASSEMBLY		G		BROADCAST ANT. (ON GANG)
R1	63-709	10 M OHM	½ W.	4	95-696	1ST I.F. TRANS.				
R2	63-711	22 M OHM	½ W.							

MODEL 6R583 — **SPEAKER** 49-403 4"

6R542

I.F. FREQUENCY 455 KC.
6 TUBE SUPERHETERODYNE
CHASSIS Nº 6A08 – A.C. PHONO



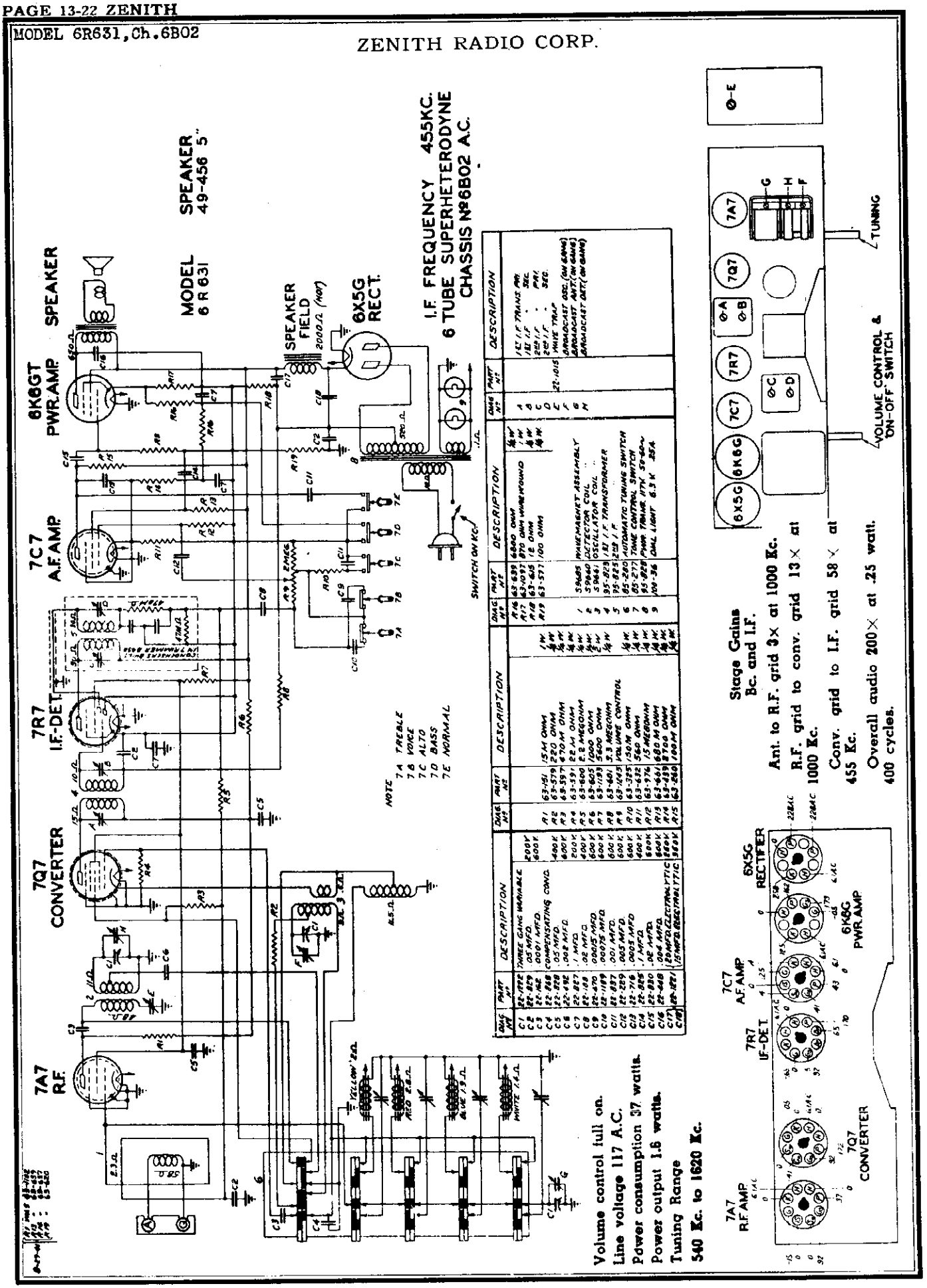
DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-690	TUNING CONDENSER		R3	63-701	470 OHM	¼ W.
C2	22-162	.0001 MFD.	600V.	R4	63-296	220 M OHM	¼ W.
C3	22-182	.00025 MFD.	600V.	R5	63-964	4700 OHM	½ W.
C4	22-829	.05 MFD.	200V.	R6	63-803	2200 OHM	½ W.
C5	22-827	.1 MFD.	200V.	R7	63-575	47 OHM	¼ W.
C6	22-243	.01 MFD.	400V.				
C7	22-876	8 MFD. ELECTROLYTIC	150V.				
C8		40 MFD. "	150V.	1	S8611	OSC. COIL ASSEM.	
C9	22-828	.05 MFD.	400V.	2	100-76	BALLAST TUBE	
				3	85-170	A.C. SWITCH	
R1	63-591	22 M OHM	¼ W.				
R2	63-271	1 MEGOHM	¼ W.				

MODELS
S 8500
S 8501
S 8501 Z

PHONOGRAPH OSCILLATOR
ZENITH RADIO CORPORATION
CHICAGO, ILL.

MODEL 6R631, Ch.6B02

ZENITH RADIO CORP.



DIAG. NO.	PART NO.	DESCRIPTION
C1	22-1172	THREE GANG VARIABLE
C2	22-829	.05 MFD.
C3	22-162	.0001 MFD.
C4	22-868	COMPENSATING COND.
C5	22-828	.05 MFD.
C6	22-892	.008 MFD.
C7	22-827	.1 MFD.
C8	22-168	.02 MFD.
C9	22-870	.0005 MFD.
C10	22-1189	.00075 MFD.
C11	22-827	.001 MFD.
C12	22-829	.005 MFD.
C13	22-716	.0025 MFD.
C14	22-825	.1 MFD.
C15	22-830	.02 MFD.
C16	22-648	.004 MFD.
C17	22-1211	15MFD ELECTROLYTIC
C18		15MFD ELECTROLYTIC

DIAG. NO.	PART NO.	DESCRIPTION	
R1	63-151	15M OHM	1W
R2	63-579	220 M OHM	½W
R3	63-597	470 M OHM	½W
R4	63-591	2.2 M OHM	½W
R5	63-600	2.2 MEGOHM	½W
R6	63-605	1500 OHM	½W
R7	63-1051	560 OHM	½W
R8	63-601	3.3 MEGOHM	½W
R9	63-1045	VOLUME CONTROL	½W
R10	63-325	150M OHM	½W
R11	63-632	560 OHM	½W
R12	63-776	1.5 MEGOHM	½W
R13	63-661	680 M OHM	½W
R14	63-439	2700 OHM	½W
R15	63-280	100M OHM	½W

DIAG. NO.	PART NO.	DESCRIPTION	
R16	63-639	6800 OHM	½W
R17	63-1097	870 OHM WIREWOUND	1W
R18	63-645	18 OHM	½W
R19	63-577	100 OHM	½W
1	39645	PANEMAGNET ASSEMBLY	
2	39640	DETECTOR COIL	
3	39641	OSCILLATOR COIL	
4	95-823	1ST I.F. TRANSFORMER	
5	95-825	2ND I.F.	
6	85-260	AUTOMATIC TUNING SWITCH	
7	85-277	TONE CONTROL SWITCH	
8	95-828	PWR. TRANS. HTV 5V-6.3V	
9	100-36	DIAL LIGHT 6.3 V .25A	

DIAG. NO.	PART NO.	DESCRIPTION
A		1ST I.F. TRANS. PRI.
B		1ST I.F. " SEC.
C		2ND I.F. " PRI.
D	22-1015	2ND I.F. " SEC.
E		WAVE TRAP
F		BROADCAST OSC. (SW GANG)
G		BROADCAST ANT. (SW GANG)
H		BROADCAST DET. (SW GANG)

ZENITH RADIO CORP.

Model 6R631 ALIGNMENT PROCEDURE

Chassis No. 6B02

Operation	Conn. Test Osc. to	Dummy Ant.	Input Sig. Freq.	Band	Set Dial At	Trimmers	Purpose
1	Converter Grid	.5 Mfd.	455 Kc.	Manual	600 Kc.	A B C D	Align I.F.
2	R.F. Grid	.5 Mfd.	455 Kc.	Automatic	600 Kc.	E	Adjust Wavetrap for Minimum
3	One Turn Loop Coupled Loosely to Wave Magnet	.5 Mfd.	1600 Kc.	Manual	1600 Kc.	F	Set to Scale
4		.5 Mfd.	1400 Kc.	Manual	1400 Kc.	H. G	Align det. and ant. stage

Models 6S632–6S646–6S656

Chassis No. 6B08

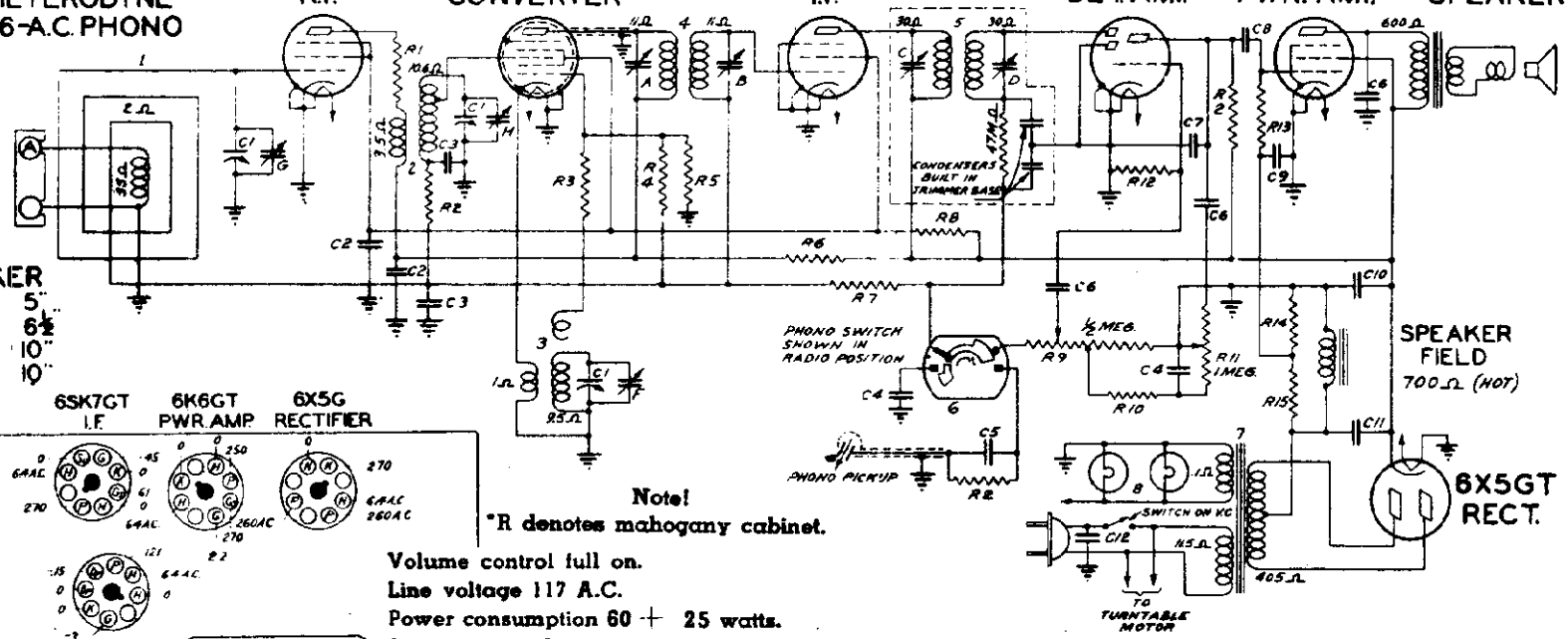
Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Adjust Trimmers	Purpose
1	Converter Grid	.5 Mfd.	455 Kc.	Broadcast	600 Kc.	A, B, C, D	I. F. Alignment
2	" "	.5 Mfd.	455 Kc.	Automatic	—	E	Adjust for Minimum
3	Antenna-Gnd.	400 Ohms	18 Mc.	S. W.	18 Mc.	K	Set to Scale
4	" " "	400 Ohms	16 Mc.	S. W.	16 Mc.	M	Align ant.
5	Single Turn Loop Coupled Loosely to Wave Magnet	—	1600 Kc.	Broadcast	1600 Kc.	F	Set to Scale
6		—	1400 Kc.	Broadcast	1400 Kc.	G—H	Align R.F. & Ant.
7	" " "	—	600 Kc.	Broadcast	600 Kc.	J	Rock gang & Adj. padder
8	Recheck 5 and 6						

Models 7S681–7S682–7S685

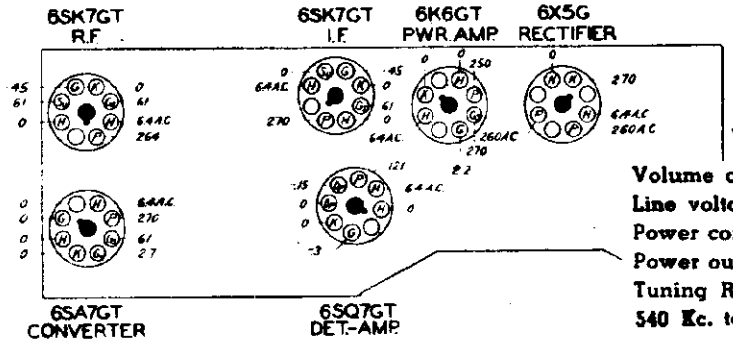
Chassis No. 7B02 Phono.

Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Adjust Trimmers	Purpose
1	Converter Grid	½ Mfd.	455 Kc.	Broadcast	600 Kc.	A, B, C, D	I. F. Alignment
2	Ant.-Gnd.	400 Ohms	455 Kc.	S.W.	6.5 Mc.	E	Adjust Wavetrap for Minimum
3	"	"	18 Mc.	S. W.	18 Mc.	F	Set to Scale
4	"	"	16 Mc.	S. W.	16 Mc.	M	Align ant.
5	Single Turn Loop Loosely Coupled to Wave Magnet	—	1600 Kc.	Broadcast	1600 Kc.	K	Set to Scale
6		—	1400 Kc.	Broadcast	1400 Kc.	H, G	Align det. and ant. stage
7	"	—	600 Kc.	Broadcast	600 Kc.	J	Rock Gang and Adjust for Max.

I.F. FREQUENCY 455 KC.
6 TUBE SUPERHETERODYNE
CHASSIS №6B06-A.C. PHONO



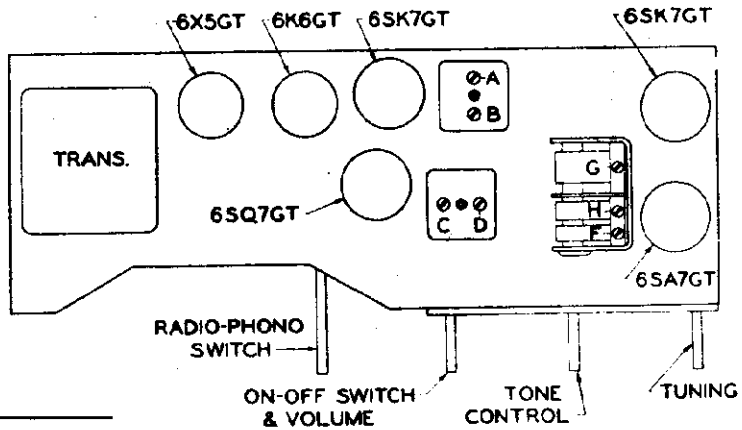
MODEL	SPEAKER	
6 R 683	49-467	5"
6 R 684	49-469	6½"
6 R 687	49-465	10"
6 R 688	49-465	10"



Note!
*R denotes mahogany cabinet.

Volume control full on.
Line voltage 117 A.C.
Power consumption 60 + 25 watts.
Power output 6. watts.
Tuning Range
540 Kc. to 1620 Kc.

DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION
C1	22-1241	THREE GANG VARIABLE		R3	63-579	220 OHM	½ W.	2	59834	DETECTOR COIL ASSEM.
C2	22-888	.05 MFD.	400V.	R4	63-673	8.2 MEGOHM	½ W.	3	59835	OSCILLATOR " "
C3	22-829	.05 MFD.	200V.	R5	63-589	10 M OHM	½ W.	4	95-841	1ST I.F. TRANSFORMER
C4	22-327	.02 MFD.	200V.	R6	63-605	1000 OHM	½ W.	5	95-842	2ND I.F. "
C5	22-887	.001 MFD.	600V.	R7	63-600	2.2 MEGOHM	½ W.	6	85-297	PHONO-RADIO SWITCH
C6	22-448	.004 MFD.	600V.	R8	63-1058	22 M OHM	2 W.	7	95-840	PWR. TRANS. 117 V. 50-60~
C7	22-854	.0005 MFD.	600V.	R9	63-1246	VOLUME CONTROL		8	100-36	DIAL LIGHT 6.3 V. .25 A.
C8	22-830	.02 MFD.	600V.	R10	63-591	22 M OHM	½ W.			
C9	22-138	.2 MFD.	200V.	R11	63-1247	TONE CONTROL				
C10	22-719	16 MFD. ELECTROLYTIC	350V.	R12	63-976	15 MEGOHM	½ W.	A		1ST I.F. TRANS. PRI.
C11	22-1036	14 MFD. "	450V.	R13	63-597	470 M OHM	½ W.	B		1ST I.F. " SEC.
C12	22-1041	.005 MFD.	600V.	R14	63-655	220 M OHM	½ W.	C		2ND I.F. " PRI.
				R15	63-656	270 M OHM	½ W.	D		2ND I.F. " SEC.
								E		BROADCAST OSC. (ON GANG)
R1	63-1071	10 M OHM	1 W.					F		BROADCAST ANT (ON GANG)
R2	63-896	220 M OHM	½ W.	1		WAVEMAGNET		G		BROADCAST DET (ON GANG)
								H		



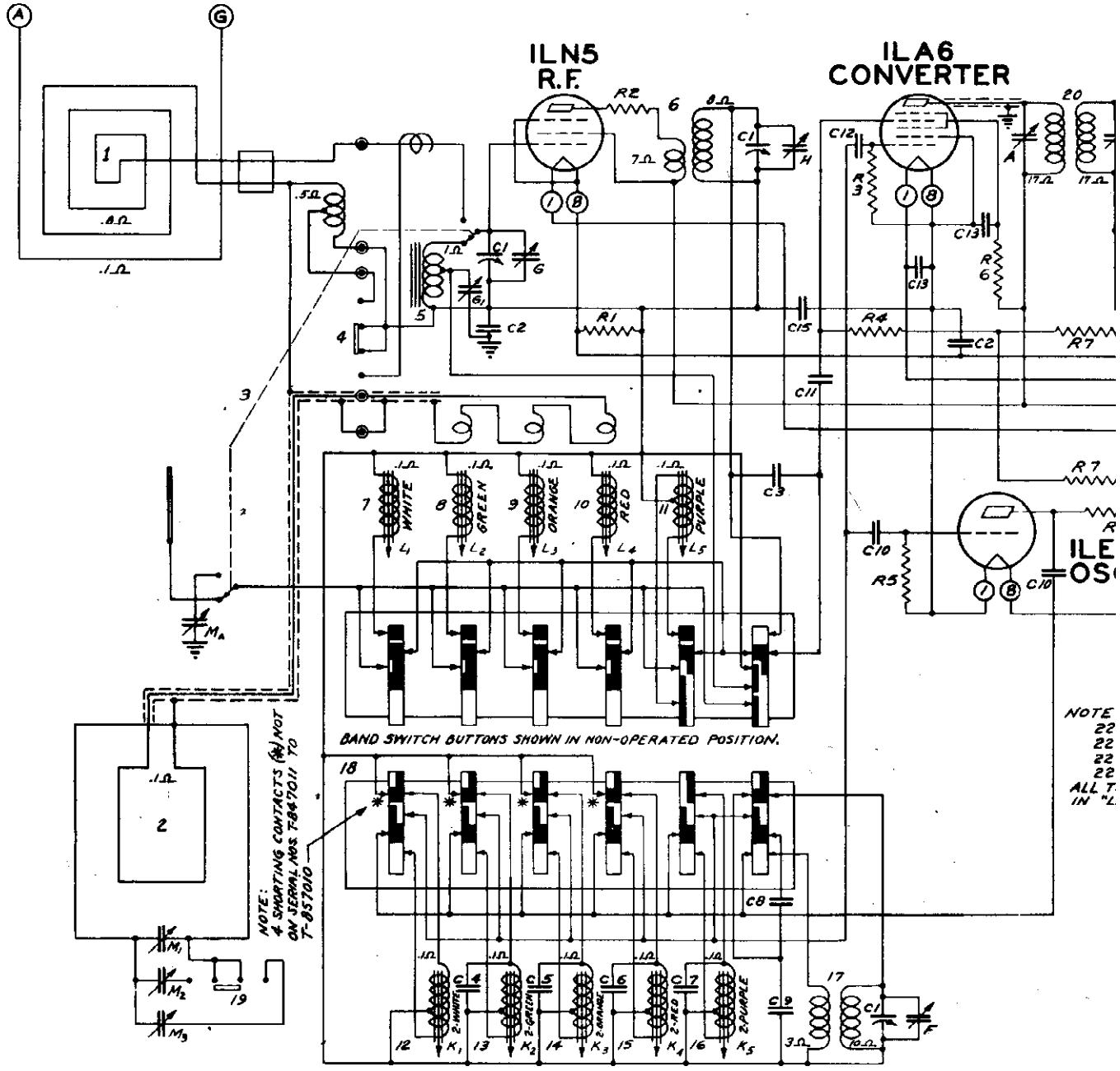
Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Trimmers	Purpose
1	Converter Grid	.5 mfd.	455 Kc.	BC	600 Kc.	A, B, C, D	Align I.F.
2	Single Turn Loop Coupled Loosely Wave Magnet	.5 mfd.	1600 Kc.	"	1600 Kc	F	Set Oscillator to Scale
3		.5 mfd.	1400 Kc.	"	1400 Kc.	H, G	Align det. and antenna stage

Ant. to R.F. grid 7 × at 1000 Kc.

R.F. grid to conv. grid 9 × at 1000 Kc.

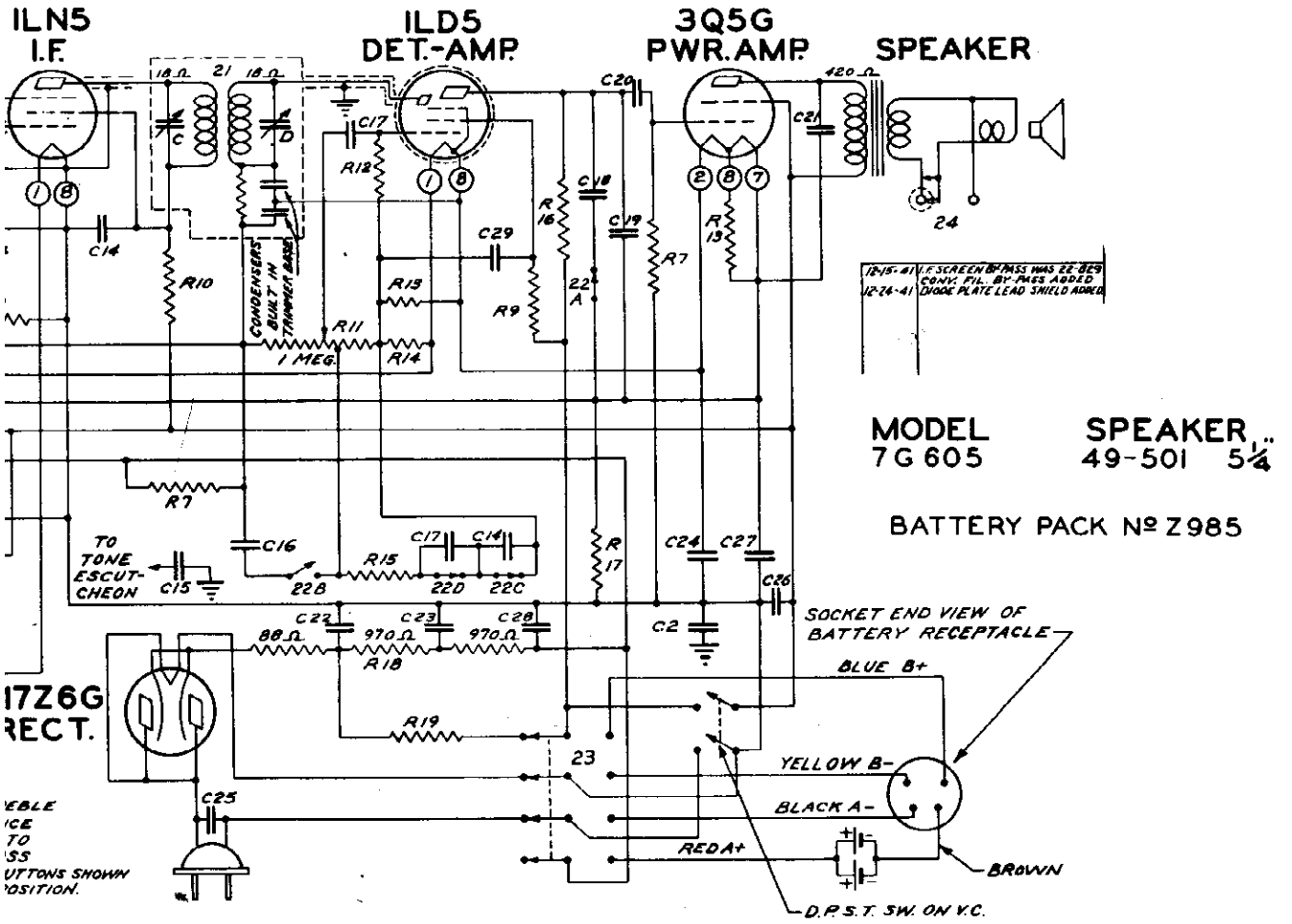
Conv. grid to I.F. grid 52 × at 455 Kc.

Overall audio—630 × at 1 watt, 400 cycles.



DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION	DIAG. Nº	PA
C1	22-1308	THREE GANG VARIABLE		C26	22-1282	40MFD. ELECTROLYTIC	150 V.				24	44
C2	22-827	.1 MFD.	200 V.	C27	OR	40MFD. "	25 V.					
C3	22-1130	15 MMFD.	600 V.	C28	22-1159	20MFD. "	25 V.	1	S10680	BROADCAST WAVEMAGNET	A	
C4	22-1312	100 MMFD. COMP.		C29	22-326	.003 MFD.	400 V.	2	S10682	SHORTWAVE WAVEMAGNET	B	
C5	22-1332	200 MMFD. COMP.						3	85-314	ANTENNA POLE SWITCH	C	
C6	22-705	150 MMFD. COMP.						4	85-225	WAVEMAGNET SWITCH	D	
C7	22-702	250 MMFD. COMP.		R1	63-596	330M OHM	1/4 W.	5	S10670	ANTENNA COIL ASSEM.	F	
C8	22-1311	75 MMFD. COMP.		R2	63-641	10M OHM	1/4 W.	6	S10298	DETECTOR COIL ASSEM.	G	
C9	22-1310	50 MMFD. COMP.		R3	63-773	180M OHM	1/4 W.	7	S10284	6MC. ANTENNA COIL ASSEM	H	
C10	22-162	.0001 MFD.	600 V.	R4	63-325	150M OHM	1/4 W.	8	S10289	9 MC. " " "	K1	
C11	22-327	.02 MFD.	200 V.	R5	63-648	47M OHM	1/4 W.	9	S10288	12 MC. " " "	K2	
C12	22-289	50 MMFD	600 V.	R6	63-592	33M OHM	1/4 W.	10	S10296	15MC. " " "	K3	
C13	22-829	.05 MFD	200 V.	R7	63-600	2.2 MEGOHM	1/4 W.	11	S10297	18MC. " " "	K4	
C14	22-826	.01 MFD.	200 V.	R8	63-761	10 M OHM	1/4 W.	12	S10281	6MC. OSCILLATOR COIL ASSEM.	K5	
C15	22-1207	.07 MFD.	200 V.	R9	63-602	4.7 MEGOHM	1/4 W.	13	S10290	9 MC. " " "	L1	
C16	22-887	.001 MFD.	600 V.	R10	63-583	1000 OHM	1/4 W.	14	S10285	12 MC. " " "	L2	
C17	22-492	.002 MFD.	600 V.	R11	63-1265	VOLUME CONTROL		15	S10293	15MC. " " "	L3	
C18	22-953	.0002 MFD.	600 V.	R12	63-976	15 MEGOHM	1/4 W.	16	S10294	18MC. " " "	L4	
C19	22-470	.00015MFD.	600 V.	R13	63-580	330 OHM	1/4 W.	17	S10295	BC. " " "	L5	
C20	22-196	.01 MFD.	600 V.	R14	63-577	100 OHM	1/4 W.	18	85-312	AUTOMATIC BAND SWITCH	G1	
C21	22-148	.004 MFD.	600 V.	R15	63-594	68M OHM	1/4 W.	19	85-322	SHORTWAVE LOOP SWITCH	MA	
C22	22-1307	40MFD. ELECTROLYTIC	150 V.	R16	63-271	1 MEGOHM	1/4 W.	20	95-862	1ST I.F. TRANSFORMER	M1	
C23	OR	20MFD. "	150 V.	R17	63-941	390 OHM WIREWOUND	1 W.	21	95-863	2ND I.F. TRANSFORMER	M2	
C24	22-1330	40 MFD. -	25 V.	R18	63-1264	THREE SECTION CANDOHM		22	85-313	TONE CONTROL SWITCH	M3	
C25	22-869	.05 MFD.	400 V.	R19	63-1156	1800 OHM	1/2 W.	23	85-311	POWER CHANGE-OVER SWITCH	NOTE: TRI	

DIO CORP.



CHANGEOVER SWITCH SHOWN IN POSITION FOR A.C. OPERATION

DENOTES CHASSIS "GROUND"

FOR OTHER DATA SEE INDEX

DESCRIPTION
HEADPHONE JACK
1ST I.F. TRANS. PRI.
1ST I.F. " SEC.
2ND I.F. TRANS. PRI.
2ND I.F. " SEC.
BROADCAST OSC. (ON GANG)
BROADCAST ANT. (ON GANG)
BROADCAST DET. (ON GANG)
SHORTWAVE OSC. 6 MC.
SHORTWAVE OSC. 9 MC.
SHORTWAVE OSC. 12 MC.
SHORTWAVE OSC. 15 MC.
SHORTWAVE OSC. 18 MC.
SHORTWAVE DET. 6 MC.
SHORTWAVE DET. 9 MC.
SHORTWAVE DET. 12 MC.
SHORTWAVE DET. 15 MC.
SHORTWAVE DET. 18 MC.
WAVEROD TRIMMER (SEE NOTE)
WAVEROD COMPENSATOR (SEE NOTE)
SHORTWAVE ANT. 19 M.
SHORTWAVE ANT. 25 M.
SHORTWAVE ANT. 31 M.
M & M. ARE MOUNTED ON STRIP 22-1230

110 V. A.C.-D.C.- BATTERY PACK UNIVERSAL PORTABLE I.F. FREQUENCY 455KC. 7 TUBE SUPERHETERODYNE CHASSIS Nº 7B04 6 BAND

Tuning ranges:

540 to 1620 Kc.

6.0 to 6.5 Mc.

9.4 to 9.8 Mc.

11.7 to 11.9 Mc.

15.1 to 15.3 Mc.

17.6 to 18.0 Mc.

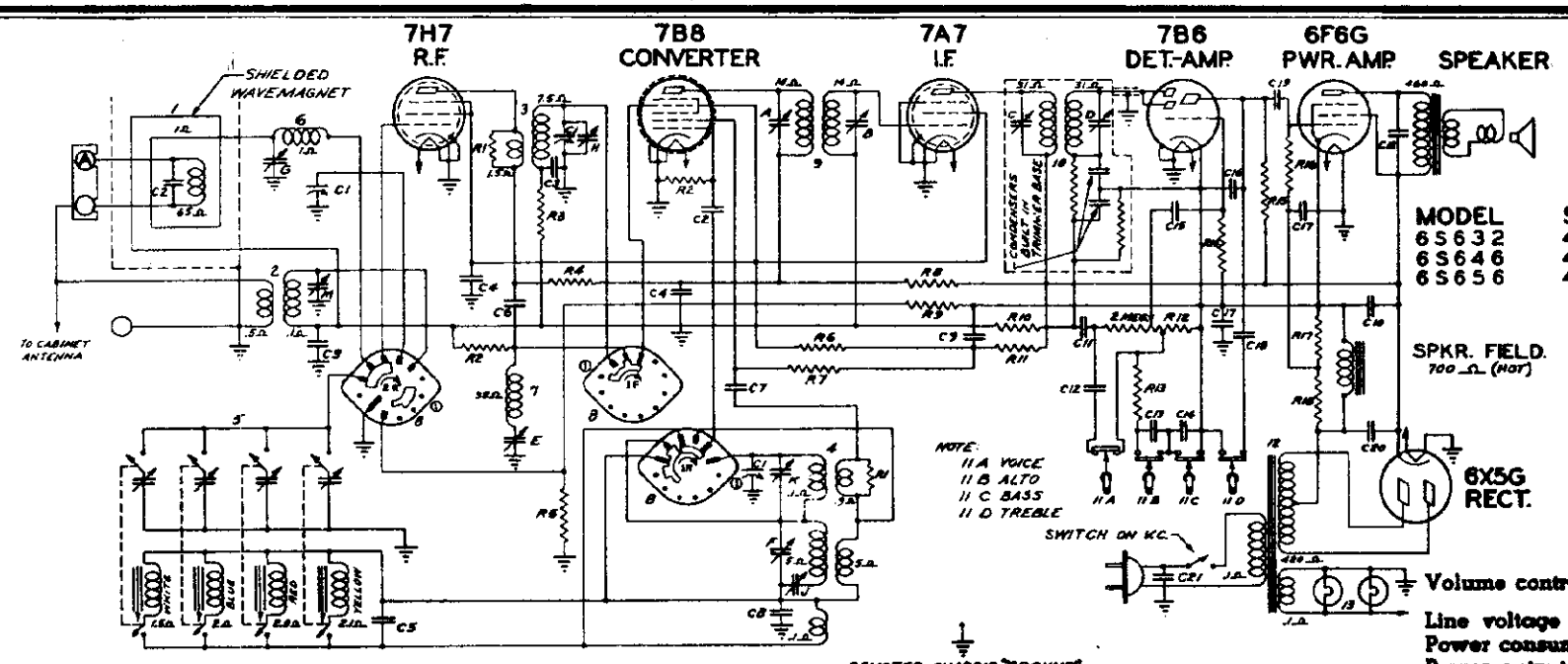
Stage Gains
Bc. and I.F.

Ant. to R.F. grid 5× at 1000 Kc.

R.F. grid to conv. grid 9× at 1000 Kc.

Conv. grid to I.F. grid 66× at 455 Kc.

Overall audio 900× at .05 watt, 400 cycles.



MODEL	SPEAKER
6S632	49-460 .6"
6S646	49-459 8"
6S656	49-465 10"

Volume control full on.

Line voltage 117 A.C.
Power consumption 60 watts
Power output 6 watts.

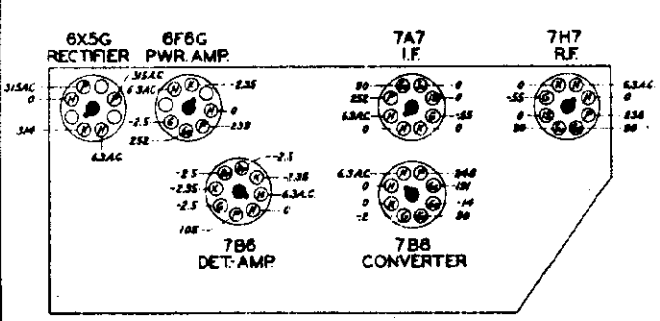
Tuning Range

540 Kc. to 1620 Kc.
5400 Kc. —18300 Kc.

I. F. FREQUENCY 455KC.
6 TUBE SUPERHETERODYNE
CHASSIS No. 6B08 2 BAND A.C.

8-29-41 R17 WAS 63-654 & R18 WAS 63-656
5-16-41 C21 ADDED

DIAG. No.	PART No.	DESCRIPTION		DIAG. No.	PART No.	DESCRIPTION		DIAG. No.	PART No.	DESCRIPTION		DIAG. No.	PART No.	DESCRIPTION
C1	22-1205	TUNE GANG VARIABLE		C20	22-1036	14 MFD ELECTROLYTIC	450V	R16	63-597	470M OHM	½ W			
C2	22-269	50 MMFD	600V	C21	22-1041	.005 MFD.	600V	R17	63-658	390M OHM	½ W	A		1ST I.F. TRANS. PRI.
C3	22-829	.05 MFD	200V					R18	63-660	560M OHM	½ W	B		1ST I.F. - SEC.
C4	22-828	.05 MFD	600V									C		2ND I.F. - PRI.
C5	22-668	COMPENSATING COND.		R1	63-590	15M OHM	½ W					D		2ND I.F. - SEC.
C6	22-162	.0001 MFD.	600V	R2	63-593	47M OHM	½ W	1		WAVEMAGNET ASSEMBLY		E	22-1045	WAVE TRAP
C7	22-182	.00025 MFD.	600V	R3	63-595	100M OHM	½ W	2	59587	ANTENNA COIL ASSEMBLY		F		BROADCAST OSC. (NOTE 1)
C8	22-1026	.005 MFD.	600V	R4	63-637	4700 OHM	½ W	3	59585	DETECTOR - "		G		BROADCAST ANT. (NOTE 2)
C9	22-1030	5 MFD ELECTROLYTIC	450V	R5	63-626	68 OHM	½ W	4	59586	OSCILLATOR "		H		BROADCAST DET. (ON BAND)
C10		(5 MFD. "	350V	R6	63-957	33M OHM	1 W	5	59735	AUTOMATIC TUNING "		J		BROADCAST PHASER (NOTE 2)
C11	22-188	.02 MFD.	400V	R7	63-750	10M OHM	½ W	6	59589	LOOP LOADING COIL "		K		SHORT WAVE OSC. (NOTE 1)
C12	22-470	.00015 MFD.	600V	R8	63-583	1000 OHM	½ W	7	58326	WAVETRAP COIL ASSEMBLY		M		SHORT WAVE ANT. (NOTE 2)
C13	22-826	.01 MFD.	200V	R9	63-1098	82 OHM WIREWOUND	2 W	8	65-218	BAND SELECTOR SWITCH				
C14	22-229	.005 MFD.	600V	R10	63-599	1.5 MEGOHM	½ W	9	35-768	1ST I.F. TRANSFORMER				
C15	22-498	.002 MFD.	600V	R11	63-1191	8200 OHM	2 W	10	35-769	2ND I.F. "		NOTES		(1) TRIMMERS A F & K ARE MOUNTED ON STRIP 22-1045
C16	22-854	.0005 MFD.	600V	R12	63-1129	VOLUME CONTROL		11	59743	TONE CONTROL SW. ASSEM.				(2) TRIMMERS G, J & M ARE MOUNTED ON STRIP 22-1011
C17	22-827	.1 MFD.	200V	R13	63-592	33M OHM	½ W	12	35-716	PWR. TRANS. 115 V. 50-60 ~				
C18	22-448	.004 MFD.	600V	R14	63-976	15 MEGOHM	½ W	13	100-36	DIAL LIGHT 6.3 V. .25 A.				
C19	22-850	.02 MFD.	600V	R15	63-296	220 M OHM	½ W							



FOR ALIGNMENT SEE INDEX

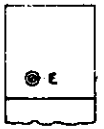
Stage Gains
Bc. and I.F.

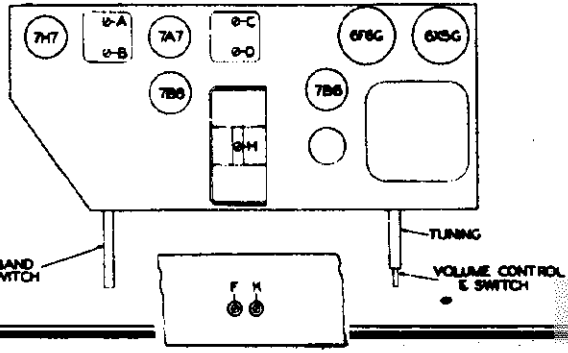
Ant. to R.F. grid 4.6× at 1000 Kc.

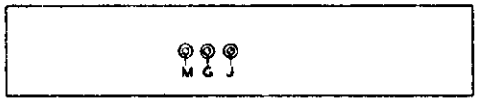
R.F. grid to conv. grid 9.3× at 1000 Kc.

Conv. grid to I.F. grid 75× at 455 Kc.

Overall audio 724× at 1 watt 400 cycles.





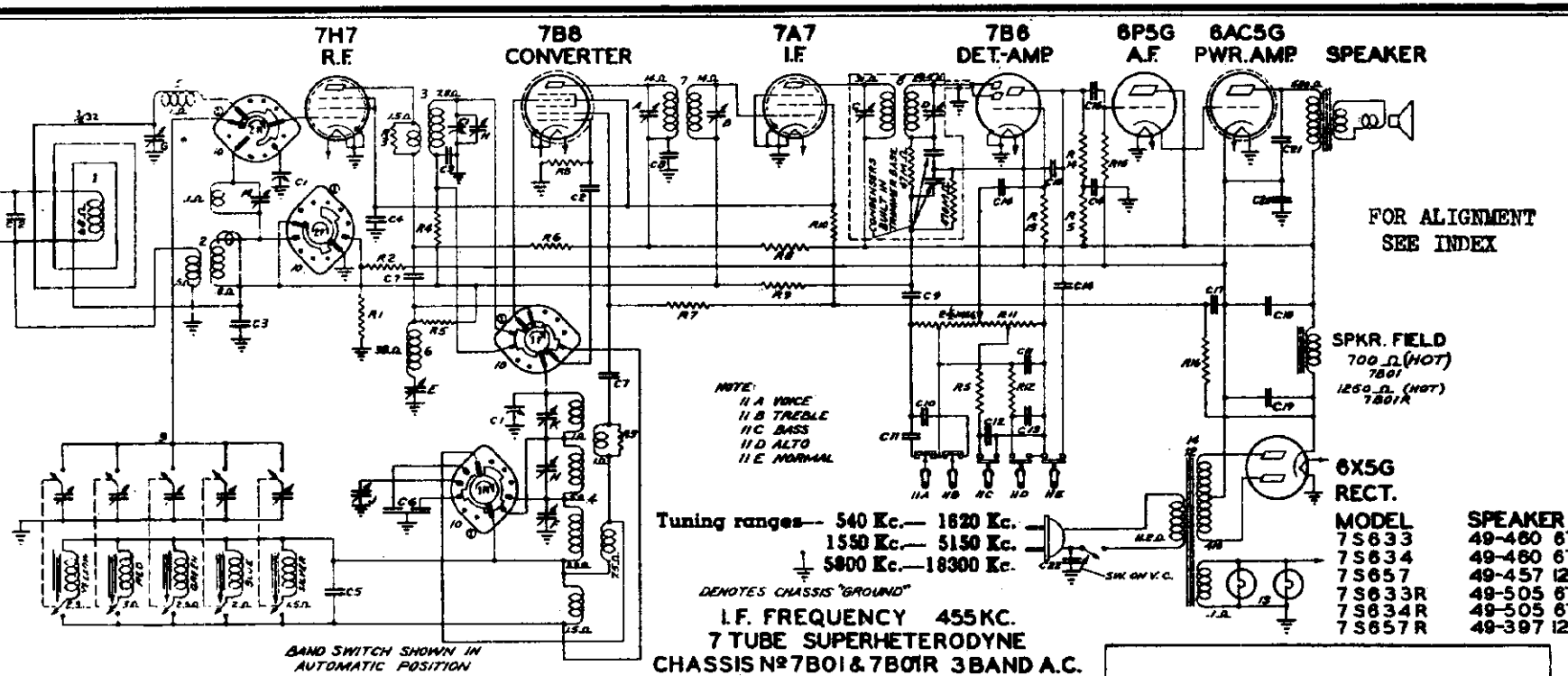


ZENITH RADIO CORP.

ZENITH PAGE
MODELS 6S632, 6S646
6S656, Chas. 6B08

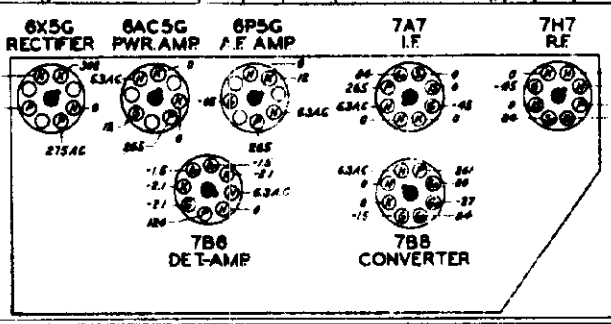
MODELS 7S633, 7S634, 7S657,
Chassis 7B01; 7S633R, 7S634R,
7S657R, Chassis 7B01R

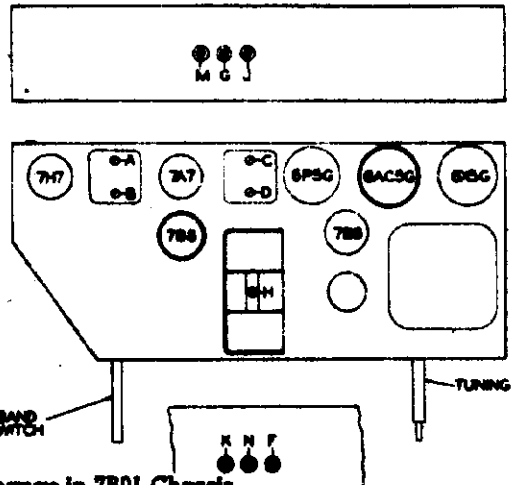
ZENITH RADIO CORP.



MODEL	SPEAKER
7S633	49-460 6"
7S634	49-460 6"
7S657	49-457 12"
7S633R	49-505 6"
7S634R	49-505 6"
7S657R	49-397 12"

DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION
C1	22-[illegible]	TRIPLE GANG VARIABLE		C20	22-867	.1 MFD.	200 V.	R15	63-271	1 MEGOHM	½ W.	M	95-882	PWR. TRANS. (7B01 R)
C2	22-289	50 MMFD.	600 V.	C21	22-1119	.005 MFD.	1000 V.	R16	63-1191	8200 OHM	2 W.	A		1ST I.F. TRANS. PRI.
C3	22-829	.05 MFD.	200 V.	C22	22-1041	.005 MFD.	600 V.					B		1ST I.F. - SEC.
C4	22-828	.05 MFD.	400 V.									C		2ND I.F. - PRI.
C5	22-868	COMPENSATING COND.										D		2ND I.F. - SEC.
C6	22-1031	DUAL PADDER		R1	63-1100	52 OHM WIREWOUND	½ W.	1		WAVE MAGNET ASSEMBLY		E	22-1015	WAVE TRAP
C7	22-182	.00025 MFD.	600 V.	R2	63-793	33 OHM	½ W.	2	S9657	ANTENNA COIL	-	F		BROADCAST OSC. (NOTE 1)
C8	22-865	.1 MFD.	400 V.	R3	63-590	1.5 M OHM	½ W.	3	S9585	DETECTOR COIL	-	G		BROADCAST ANT. (INTER)
C9	22-971	.02 MFD.	200 V.	R4	63 715	100M OHM	½ W.	4	S9658	OSCILLATOR COIL	-	H		BROADCAST DET. (ON BAND)
C10	22-954	.00035 MFD.	600 V.	R5	63-593	47M OHM	½ W.	5	S9589	LOOP LOADING COIL		J		BROADCAST PRIMER (NOTE 2)
C11	22-430	.00015 MFD.	600 V.	R6	63-587	4700 OHM	½ W.	6	S8926	WAVE TRAP COIL ASSEMBLY		K		SHORT WAVE OSC. (NOTE 1)
C12	22-229	.005 MFD.	600 V.	R7	63 150	10M OHM	½ W.	7	35-708	1ST I.F. TRANSFORMER		M		SHORT WAVE ANT. (NOTE 2)
C13	22-887	.01 MFD.	600 V.	R8	63-605	1000 OHM	½ W.	8	95-709	2ND I.F.	-	N		POLICE BAND OSC. (NOTE 1)
C14	22-448	.004 MFD.	600 V.	R9	63-599	1.5 MEGOHM	½ W.	9	S9808	AUTOMATIC TUNING		NOTES		(1) TRIMMERS F, K, N, M ARE MOUNTED ON STRIP 22-1014
C15	22-834	.0005 MFD.	600 V.	R10	63 1192	27 M OHM	1 W.	10	89-290	BAND SELECTOR SWITCH				(2) TRIMMERS G, J, B, M ARE MOUNTED ON STRIP 22-1016
C16	22-830	.1 MFD.	600 V.	R11	63-1122	VOLUME CONTROL		11	S9805	TONE CONTROL SWITCH ASSEM.				
C17		15 MFD. ELECTROLYTIC	450 V.	R12	63-594	68M OHM	½ W.	12	95-710	PWR. TRANS. (7B01 R)	50-60 ~			
C18	22-[illegible]	MFD.	350 V.	R13	63-976	.5 MEGOHM	½ W.				(7B01)			
C19		MFD.	450 V.	R14	63-296	220 M OHM	½ W.	13	199-36	DIAL LIGHT 6.3 V. .25 A.				





Stage Gains Rc. and I.F.

Ant. to R.F. grid 6.3× at 1000 Kc.

R.F. grid to conv. grid 6.1× at 1000 Kc.

Conv. grid to I.F. grid 80× at 455 Kc.

Overall audio 846× at 1 watt, 400 cycles.

***R denotes change in 7B01 Chassis of loading coil, speaker and power transformer.**

S9589 L.C. to S-8474.
49-460 Speaker to 49-505.
49-457 Speaker to 49-397.
95-710 Power Trans. to 95-882.

Line voltage 117 A.C.
Power consumption 85 watts.
Power output—5 watts.

ZENITH RADIO CORP.

CHASSIS 7B01,7B01R
CHASSIS 8B01
CHASSIS 10B1,10B2

CHASSIS 7B01. 7B01R ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Adjust Trimmers	Purpose
1	Converter Grid	½ Mfd.	455 Kc.	Broadcast	600 Kc.	A, B, C, D	I. F. Alignment
2	R.F. Grid	½ Mfd.	455 Kc.	Automatic	600 Kc.	E	Adj. for Minimum
3	Ant.-Gnd.	400 Ohms	18 Mc.	S. W.	18 Mc.	K	Set Oscillator to Scale
4	"	"	18 Mc.	S.W.	18 Mc.	M	Alignment of Antenna
5	"	"	4.5 Mc.	Police	4.5 Mc.	N	Rock Gang and Adjust for Max.
6	Single Turn Loop Coupled Loosely to Wave Magnet	—	1600 Kc.	Broadcast	1600 Kc.	F	Set Oscillator to Scale
7		—	1400 Kc.	Broadcast	1400 Kc.	H. G	Align R.F. & Ant.
8	"	—	600 Kc.	Broadcast	600 Kc.	J	Rock Gang and Adjust for Max.

CHASSIS 8B01 ALIGNMENT PROCEDURE

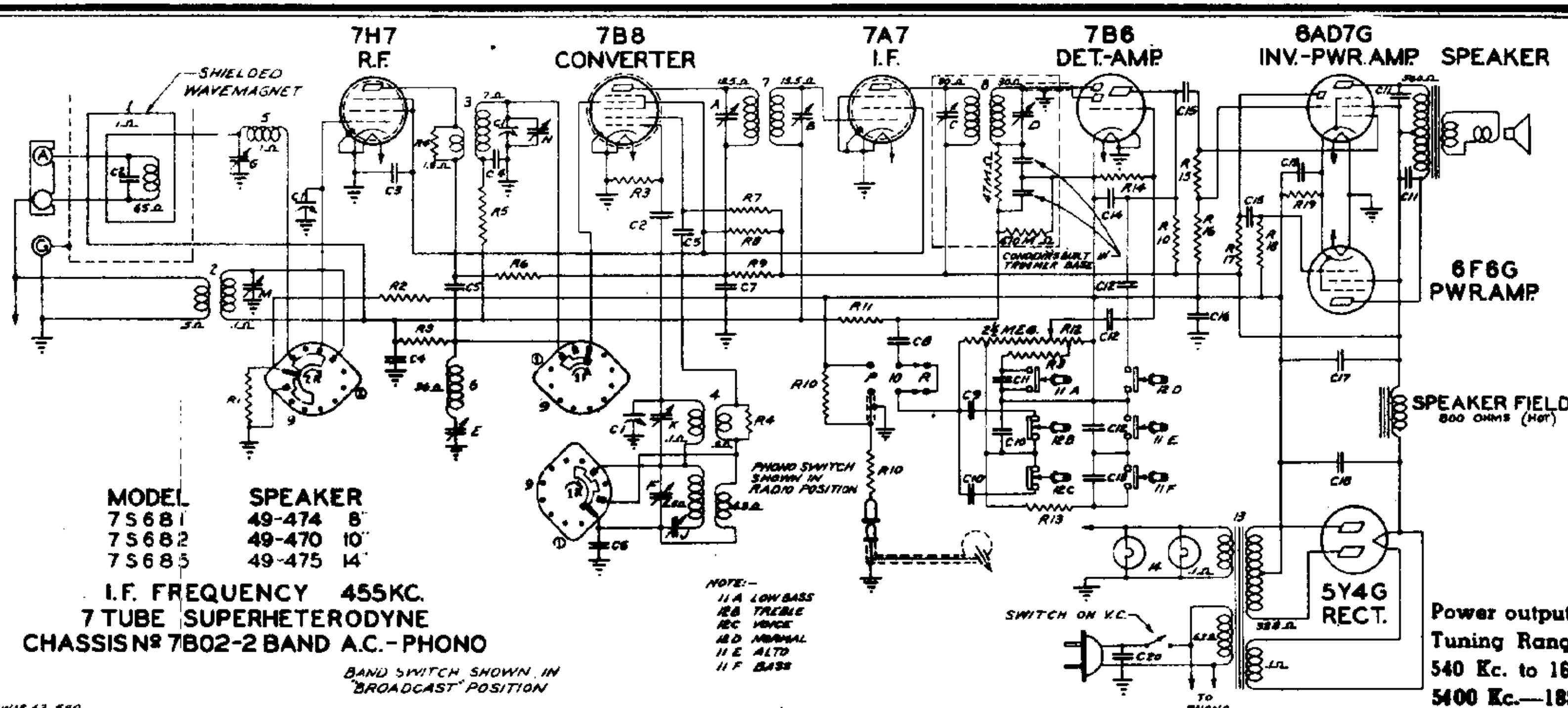
Operation	Conn. Test Osc. to	Dummy Ant.	Input Sig. Freq.	Band	Set Dial At	Trimmers	Purpose
1	Converter Grid	.5 Mfd.	455 Kc.	B.C.	1600 Kc.	A B C D	Align I.F.
2	Ant.-Gnd. with 10 ohm shunt	400 Ohms	455 Kc.	Police	1700 Kc.	E	Adjust for Minimum
3	"	"	18 Mc.	S.W.	18 Mc.	K	Set to Scale
4	"	"	16 Mc.	S.W.	16 Mc.	M	Align ant.
5	"	"	4.5 Mc.	Police	4.5 Mc.	N	Set to Scale
6	"	"	4.5 Mc.	Police	4.5 Mc.	Q	Align ant.
7	Single Turn Loop Loosely Coupled to Wave Magnet	—	1500 Kc.	B.C.	1500 Kc.	F	Set to Scale
8		—	1400 Kc.	B.C.	1400 Kc.	G-H	Align R.F. Align ant.
9	"	—	600 Kc.	B.C.	600 Kc.	J	Rock Gang and Adj. Padder
10	Rpt. 7 & 8						

CHASSIS 10B1,10B2 ALIGNMENT PROCEDURE

Operation	Conn. Test Osc. to	Dummy Ant	Input Sig. Freq	Set Dial At	Band	Trimmers	Purpose
1	Converter Grid	.5 Mfd.	455 Kc.	B.C.	600 Kc.	A B C D	Align I.F.
2	Ant.-Gnd. with 10 ohm shunt	400 ohms	455 Kc.	POL.	1700 Kc.	E	Adjust for Minimum
3	"	"	18 Mc.	S.W.	18 Mc.	K	Set to Scale
4	"	"	16 Mc.	S.W	16 Mc.	M	Align ant.
5	"	"	4.5 Mc.	POL.	4 5 Mc.		Set to Scale
6	"	"	4.5 Mc.	POL.	4.5 Mc.	Q	Align ant.
7	Single Turn Loop Loosely	—	1500 Kc.	B.C.	1500 Kc.	F	Set to Scale
8	Coupled to Wave Magnet	—	1400 Kc.	B.C.	1400 Kc.	G—H	Align R.F. Det.
9	"	—	600 Kc.	B.C.	600 Kc.	J	Rock Gang and Adj. Padder
10	"	—	1500 Kc.	B.C.	1500 Kc.	F—G—H	Rpt. 7 & 8

MODELS 7S681, 7S682, 7S685, Chassis 7B02 Phono

ZENITH RADIO CORP.



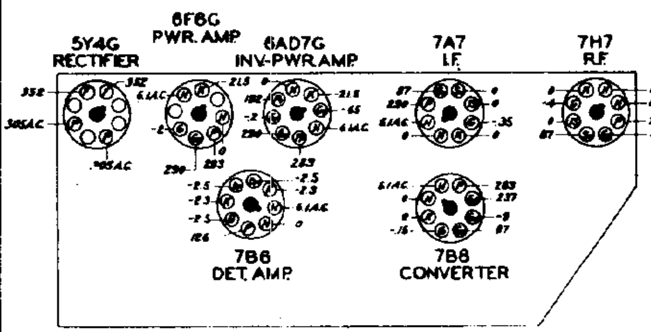
MODEL	SPEAKER	
7S681	49-474	8"
7S682	49-470	10"
7S685	49-475	14"

I.F. FREQUENCY 455KC.
7 TUBE SUPERHETERODYNE
CHASSIS Nº 7B02-2 BAND A.C.-PHONO

Power output 8.4 watts.
Tuning Range
540 Kc. to 1620 Kc.
5400 Kc.—18300 Kc.

8-19-41 R7 WAS 63-589

DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION
C1	22-1205	THREE GANG VARIABLE		C20	22-1041	.005 MFD.	600 V.	R17	63-772	150M OHM	¼ W.	14	100-36	DIAL LIGHT 6.3V .25 A.
C2	22-289	50 MMFD.	600 V.					R18	63-659	470M OHM	¼ W.			
C3	22-828	.05 MFD	400 V.					R19	63-1174	420 OHM WIREWOUND	1½ W.			
C4	22-829	.05 MFD	200 V.	R1	63-1020	68 OHM WIREWOUND	½ W.					A		1ST I.F. TRANS. PRI.
C5	22-182	.00025 MFD.	600 V.	R2	63-1098	42 OHM WIREWOUND	½ W.					B		1ST I.F. " SEC.
C6	22-1022	.005 MFD.	600 V.	R3	63-593	47M OHM	¼ W.					C		2ND I.F. " PRI.
C7	22-825	.1 MFD	400 V.	R4	63-590	15M OHM	¼ W.	1		WAVEMAGNET ASSEMBLY		D		2ND I.F. " SEC.
C8	22-327	.02 MFD	200 V.	R5	63-595	100M OHM	¼ W.	2	59587	ANTENNA COIL		E	22-1015	WAVE TRAP
C9	22-954	.00035 MFD	600 V.	R6	63-587	4700 OHM	¼ W.	3	59595	DETECTOR "		F		BROADCAST OSC. (NOTE 1)
C10	22-470	.00015 MFD	600 V.	R7	63-609	22M OHM	½ W.	4	59659	OSCILLATOR "		G		BROADCAST ANT. (NOTE 2)
C11	22-229	.005 MFD	600 V.	R8	63-1194	47M OHM	1 W.	5	59589	LOOP LOADING COIL		H		BROADCAST DET. (ON BAND)
C12	22-448	.006 MFD	600 V.	R9	63-605	1000 OHM	½ W.	6	58326	WAVE TRAP COIL ASSEMBLY		J		BROADCAST PADDER (NOTE 2)
C13	22-492	.002 MFD	600 V.	R10	63-296	220M OHM	¼ W.	7	95-708	1ST I.F. TRANSFORMER		K		SHORTWAVE OSC. (NOTE 1)
C14	22-854	.0005 MFD	600 V.	R11	63-599	1.5 MEGOHM	¼ W.	8	95-824	2ND I.F. "		M		SHORTWAVE ANT. (NOTE 2)
C15	22-196	.01 MFD	600 V.	R12	63-1127	VOLUME CONTROL		9	85-291	BAND SELECTOR SWITCH				
C16	22-827	.1 MFD.	200 V.	R13	63-596	68M OHM	¼ W.	10	85-171	PHONO-RADIO SWITCH			NOTES	(1) TRIMMERS F & K ARE
C17		20 MFD. ELECTROLYTIC	450 V.	R14	63-976	15 MEGOHM	¼ W.	11	59803	T.C. SWITCH ASSEM. (LEFT)				MOUNTED ON STRIP 22-1165
C18	22-1187	20 MFD "	450 V.	R15	63-657	330M OHM	¼ W.	12	59802	T.C. SWITCH ASSEM. (RIGHT)				(2) TRIMMERS G, J & M ARE
C19		40 MFD "	35 V.	R16	63-652	120M OHM	¼ W.	13	95-756	PWR. TRANS 117V. 50-60~				MOUNTED ON STRIP 22-1211



Volume control full on.
Line voltage 117 A.C.
Power consumption 80+30 watts.

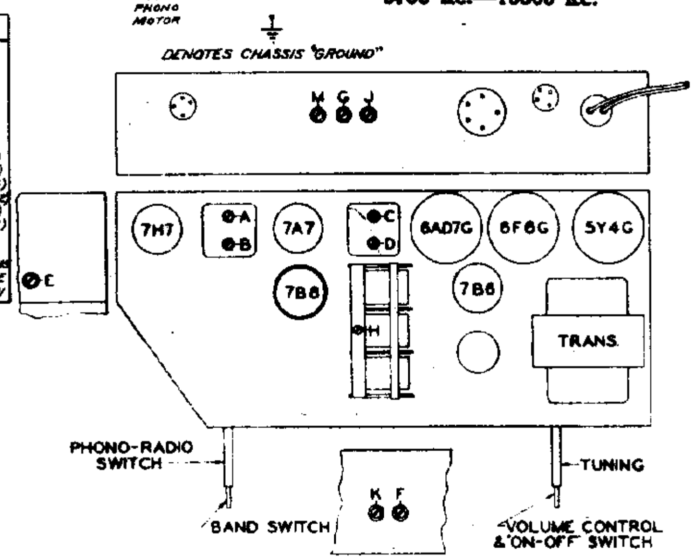
Stage Gains
Bc. and I.F.

Ant. to R.F. grid 7.1× at 1000 Kc.

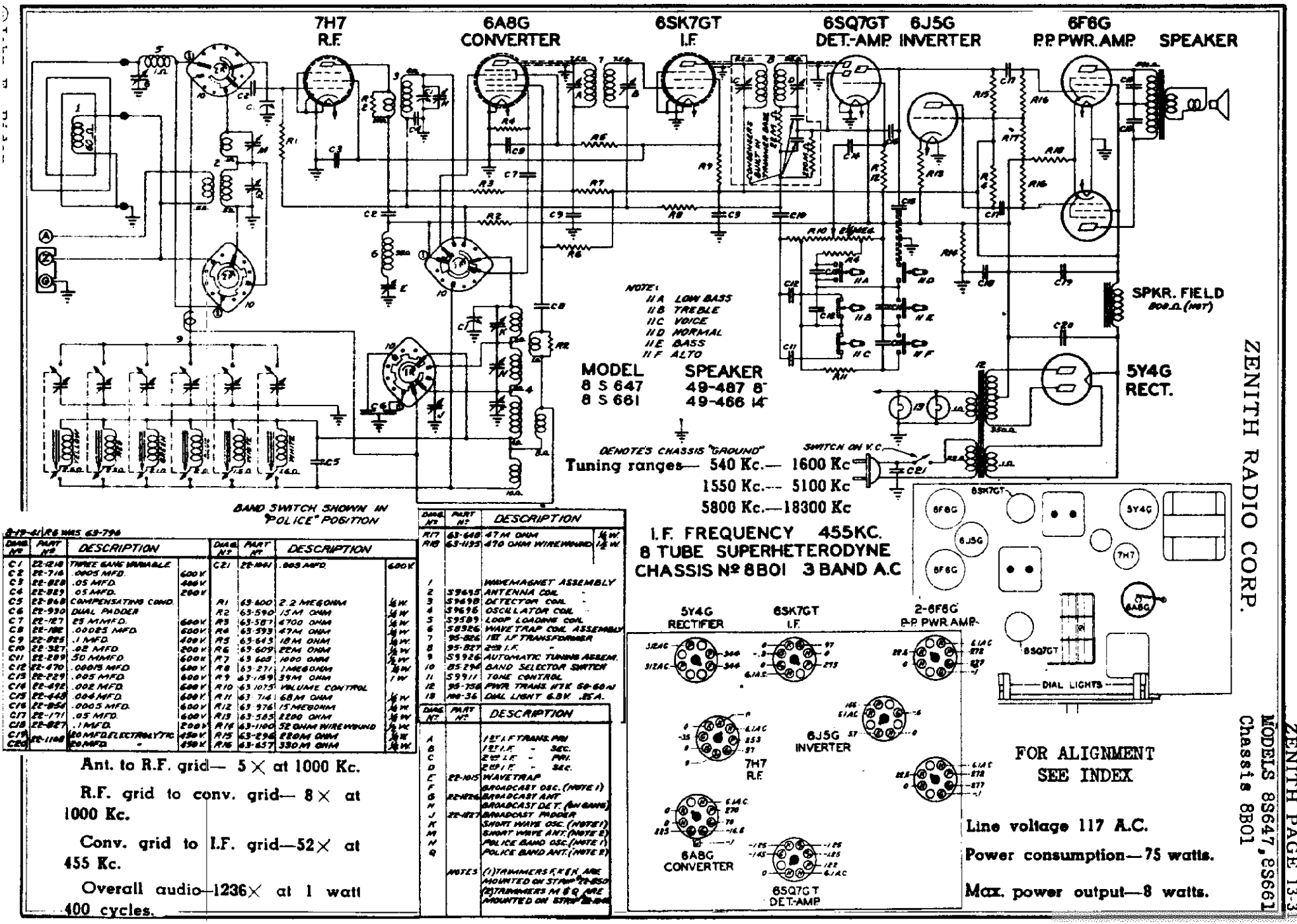
R.F. grid to conv. grid 5.6× at 1000 Kc.

Conv. grid to I.F. grid 73× at 455 Kc.

Overall audio 1600× at 1 watt 400 cycles.



FOR ALIGNMENT SEE INDEX



8-19-41 | F6 WAS 63-796

DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-1218	THREE GANG VARIABLE		C21	22-1041	.005 MFD.	600V
C2	22-716	.0005 MFD.	600V				
C3	22-828	.05 MFD.	400V				
C4	22-823	.05 MFD.	200V				
C5	22-868	COMPENSATING COND.		R1	63-600	2.2 MEGOHM	½W
C6	22-930	DUAL PADDER		R2	63-590	15M OHM	½W
C7	22-127	25 MMFD.	600V	R3	63-587	4700 OHM	½W
C8	22-182	.00025 MFD.	600V	R4	63-593	47M OHM	½W
C9	22-825	.1 MFD.	400V	R5	63-643	10M OHM	½W
C10	22-327	.02 MFD.	200V	R6	63-609	22M OHM	½W
C11	22-289	50 MMFD.	600V	R7	63-605	1000 OHM	½W
C12	22-470	.00015 MFD.	600V	R8	63-271	1 MEGOHM	½W
C13	22-229	.005 MFD.	600V	R9	63-1159	39M OHM	1W
C14	22-498	.002 MFD.	600V	R10	63-1075	VOLUME CONTROL	
C15	22-448	.006 MFD.	600V	R11	63-716	68M OHM	½W
C16	22-856	.0005 MFD.	600V	R12	63-976	15 MEGOHM	½W
C17	22-171	.05 MFD.	600V	R13	63-585	2200 OHM	½W
C18	22-827	.1 MFD.	200V	R14	63-1190	52 OHM WIREWOUND	½W
C19	22-1108	40 MFD. ELECTROLYTIC	450V	R15	63-598	820M OHM	½W
C20		20 MFD. -	450V	R16	63-657	330M OHM	½W

DIAG. Nº	PART Nº	DESCRIPTION	
R17	63-648	47M OHM	½W
R18	63-1195	470 OHM WIREWOUND	1½W
1		WAVEMAGNET ASSEMBLY	
2	39695	ANTENNA COIL	
3	39698	DETECTOR COIL	
4	39696	OSCILLATOR COIL	
5	39589	LOOP LOADING COIL	
6	58926	WAVE TRAP COIL ASSEMBLY	
7	95-826	1ST I.F. TRANSFORMER	
8	95-827	2ND I.F. -	
9	59926	AUTOMATIC TUNING ASSEM.	
10	85-294	BAND SELECTOR SWITCH	
11	5991/	TONE CONTROL	
12	95-356	PWR. TRANS. #7K 50-60 ~	
13	96-36	DIAL LIGHT 6.3V .15 A.	

DIAG. Nº	PART Nº	DESCRIPTION
A		1ST I.F. TRANS. PRI.
B		1ST I.F. - SEC.
C		2ND I.F. - PRI.
D		2ND I.F. - SEC.
E	22-105	WAVE TRAP
F		BROADCAST OSC. (NOTE 1)
G	22-476	BROADCAST ANT.
H		BROADCAST DET. (SW GANG)
J	22-827	BROADCAST PADDER
K		SHORT WAVE OSC. (NOTE 1)
M		SHORT WAVE ANT. (NOTE 2)
N		POLICE BAND OSC. (NOTE 1)
Q		POLICE BAND ANT. (NOTE 2)

NOTES (1) TRIMMERS K, R & N ARE MOUNTED ON STATOR OF GANG
(2) TRIMMERS M & Q ARE MOUNTED ON STATOR OF GANG

Ant. to R.F. grid— 5× at 1000 Kc.

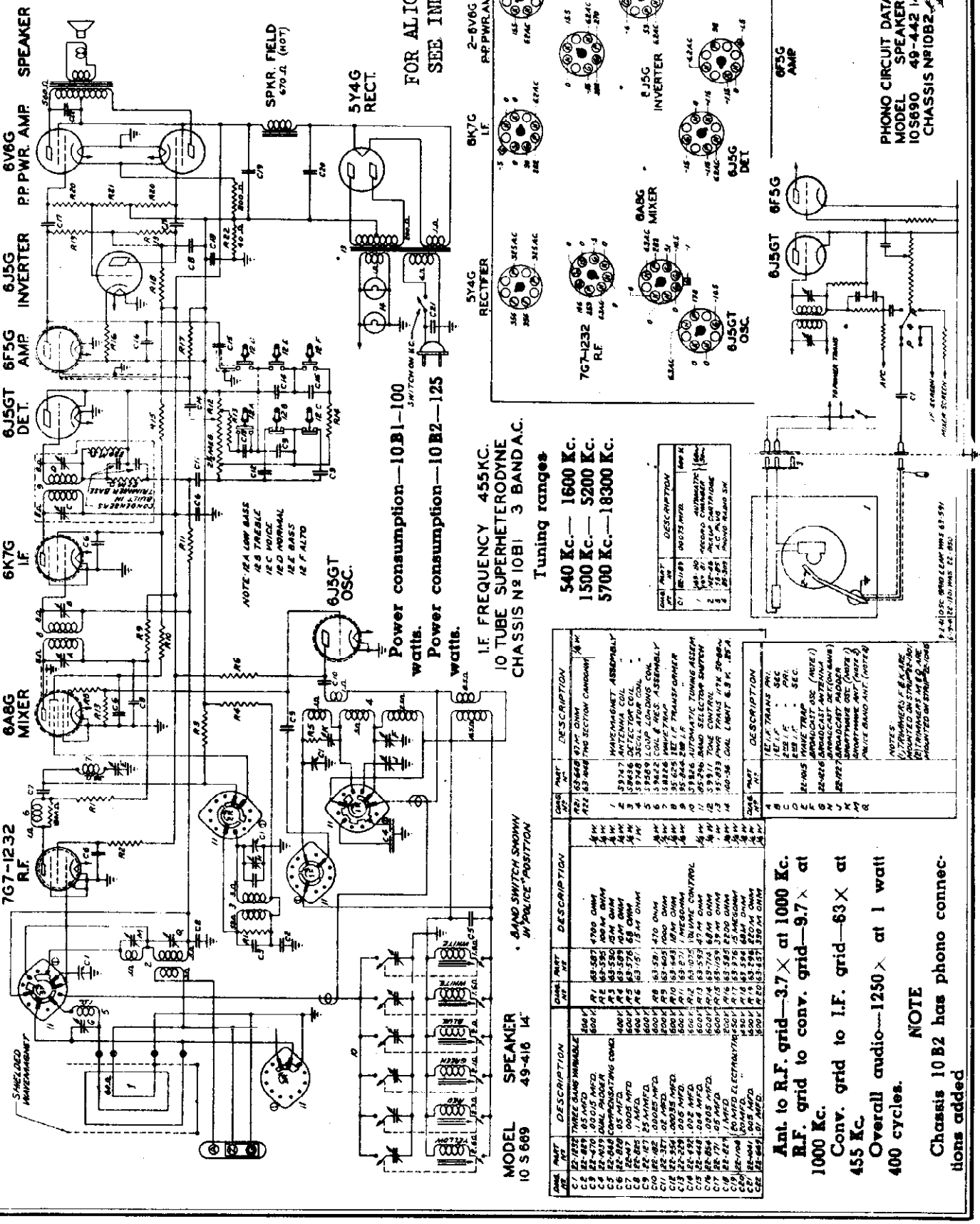
R.F. grid to conv. grid— 8× at 1000 Kc.

Conv. grid to I.F. grid—52× at 455 Kc.

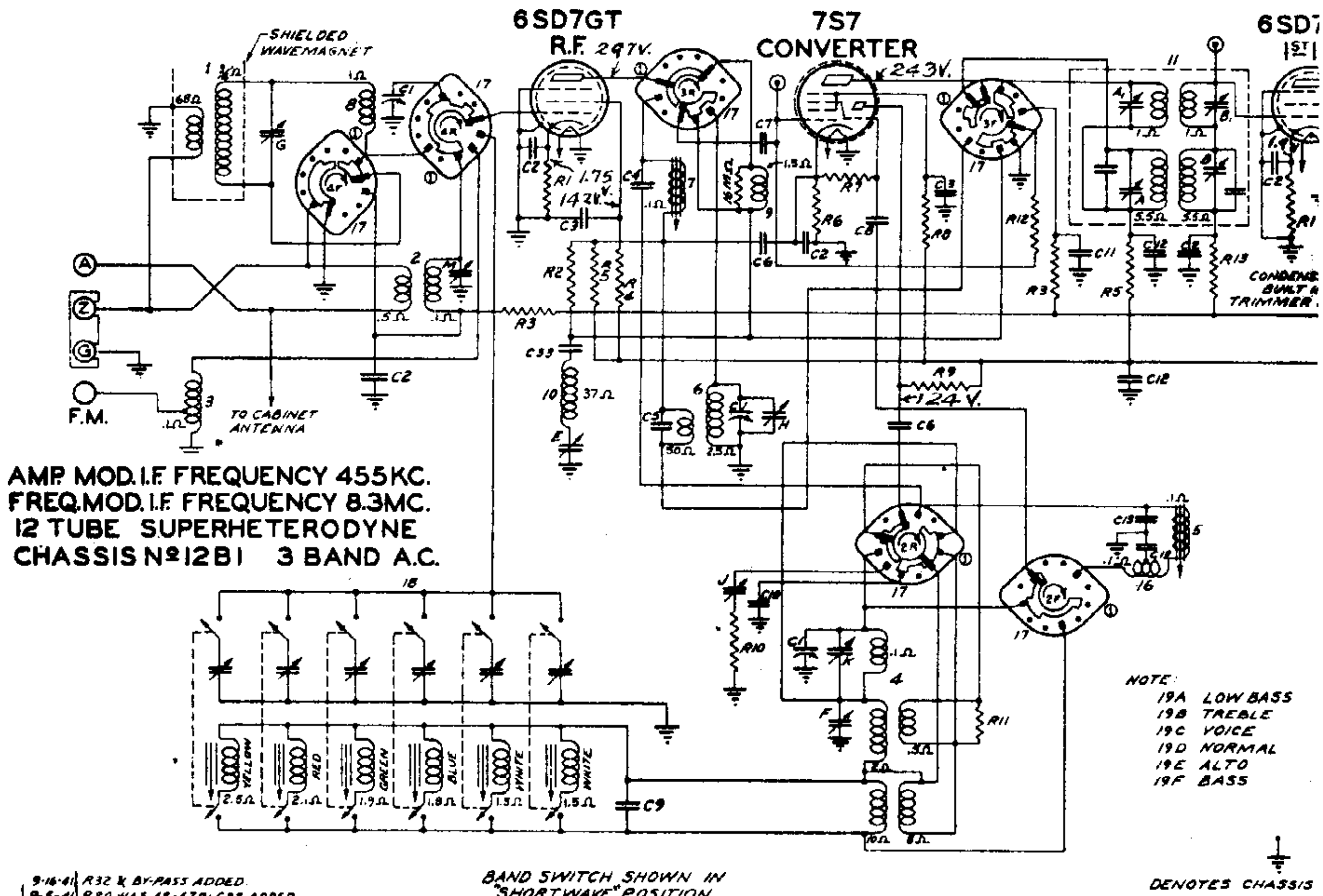
Overall audio—1236× at 1 watt 400 cycles.

MODELS 10S669,Ch.10B1;
10S690,Ch.10B2

ZENITH RADIO CORP.



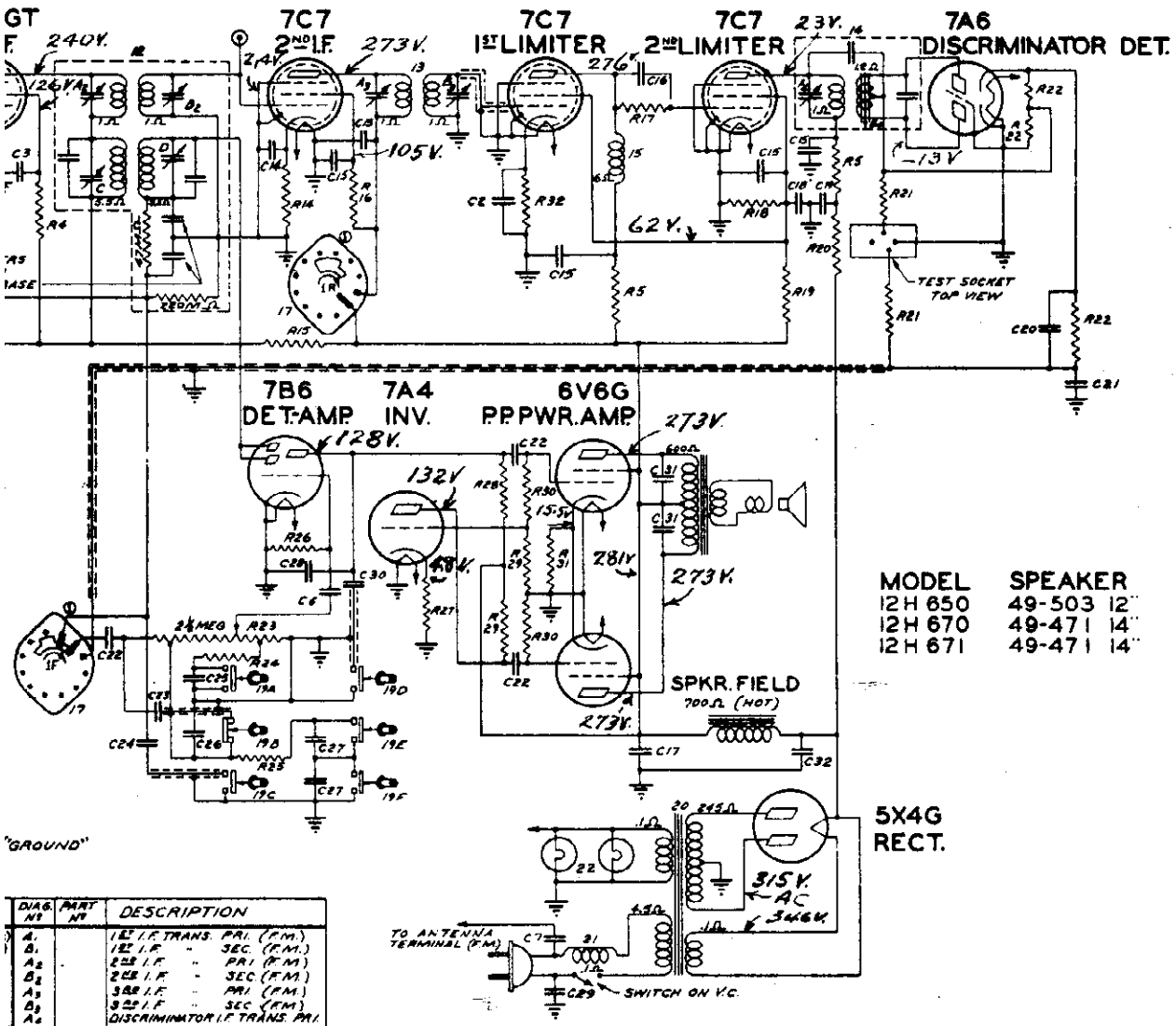
AMP. MOD. I.F. FREQUENCY 455KC.
FREQ. MOD. I.F. FREQUENCY 8.3MC.
12 TUBE SUPERHETERODYNE
CHASSIS Nº 12B1 3 BAND A.C.



9-16-41 R32 & BY-PASS ADDED.
9-5-41 R20 WAS 63-679; C33 ADDED.
8-29-41 C5 WAS 22-470; OUTPUT BY-PASSES RETURNED TO B+
6-5-41 7B6 GRID COND WAS 22-188

DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION
C1	22-1251	THREE GANG VARIABLE		C26	22-1137	.00015 MFD.	600V.	R15	63-606	1000 OHM	1 W.	6	S9847	DETECTOR COIL ASSEM. (A.M
C2	22-829	.05 MFD	200V.	C27	22-1126	.01 MFD	400V.	R16	63-656	270M OHM	¼ W.	7	S9849	DETECTOR " (F.M
C3	22-243	.01 MFD.	400V.	C28	22-1136	.00025 MFD.	600V.	R17	63-599	1.5 MEGOHM	¼ W.	8	S9589	LOOP LOADING COIL
C4	22-1259	COMPENSATING COND.		C29	22-1041	.005 MFD.	600V.	R18	63-607	15M OHM	½ W.	9	S9850	COIL & RES. ASSEMBLY
C5	22-182	.00025 MFD.	600V.	C30	22-448	.004 MFD.	600V.	R19	63-957	33M OHM	1 W.	10	S8926	WAVETRAP
C6	22-492	.002 MFD.	600V.	C31	22-1134	.002 MFD.	1000V.	R20	63-1211	82M OHM	2 W.	11	95-849	1ST I.F. TRANSFORMER
C7	22-162	.0001 MFD.	600V.	C32	22-1124	30 MFD. ELECTROLYTIC	450V.	R21	63-597	470M OHM	¼ W.	12	95-850	2ND I.F. "
C8	22-289	50 MMFD	600V.	C33	22-887	.001 MFD.	600V.	R22	63-260	100M OHM	¼ W.	13	95-787	3RD I.F. " (F.M
C9	22-868	COMPENSATING COND.						R23	63-1074	VOLUME CONTROL		14	95-788	DISCRIMINATOR I.F. TRANS. (F.M
C10	22-1257	.005 MFD.	1000V.					R24	63-593	47M OHM	¼ W.	15	S10075	PLATE CHOKE
C11	22-826	.01 MFD.	200V.					R25	63-711	22M OHM	¼ W.	16	S9882	PEAKING COIL
C12	22-828	.05 MFD.	400V.	R1	63-246	150 OHM	¼ W.	R26	63-976	15 MEGOHM	¼ W.	17	85-302	BAND SELECTOR SWITCH
C13	22-1267	COMPENSATING COND.		R2	63-680	10M OHM	1 W.	R27	63-585	2200 OHM	¼ W.	18	S10817	AUTOMATIC TUNING UNIT
C14	22-319	.005 MFD.	200V.	R3	63-600	2.2 MEGOHM	¼ W.	R28	63-296	220M OHM	¼ W.	19	S9606	TONE CONTROL SW. ASSEM.
C15	22-229	.005 MFD.	600V.	R4	63-1159	39M OHM	1 W.	R29	63-648	47M OHM	¼ W.	20	95-849	POWER TRANS 117V {50-60.
C16	22-127	25 MMFD.	600V.	R5	63-583	1000 OHM	¼ W.	R30	63-657	330M OHM	¼ W.		95-864	25 ~
C17	22-1178	30 MFD. ELECTROLYTIC	450V.	R6	63-742	180 OHM	¼ W.	R31	63-1189	200 OHM WIREWOUND	2 W.	21	S9504	LINE CHOKE
C18	22-1178	5 MFD. "	300V.	R7	63-713	47M OHM	¼ W.	R32	63-418	1500 OHM	½ W.	22	100-96	DIAL LIGHT 6.3V. .25A.
C19	22-1178	15 MFD. "	250V.	R8	63-773	180M OHM	¼ W.							
C20	22-1138	.0005 MFD.	600V.	R9	63-1065	15M OHM	1 W.							
C21	22-1203	.001 MFD.	600V.	R10	63-572	15 OHM	¼ W.	1		WAVEMAGNET				
C22	22-830	.02 MFD.	600V.	R11	63-587	4700 OHM	¼ W.	2	S9972	ANTENNA COIL ASSEM.		A		1ST I.F. TRANS. PRI. (A.M
C23	22-1256	75 MMFD.	600V.	R12	63-719	470M OHM	¼ W.	3	S9972	ANTENNA COIL ASSEM.		B		1ST I.F. " SEC (A.M
C24	22-1135	.005 MFD.	600V.	R13	63-271	1 MEGOHM	¼ W.	4	S9823	OSCILLATOR " "	(A.M.)	C		2ND I.F. " PRI. (A.M
C25	22-1127	.02 MFD.	400V.	R14	63-483	680 OHM	¼ W.	5	S9848	OSCILLATOR " "	(F.M.)	D		2ND I.F. " SEC (A.M

MODELS 12H650,12H671,12H691
Chassis 12B1



DIAG. N°	PART N°	DESCRIPTION
A		1ST I.F. TRANS. PRI. (FM)
B_1		1ST I.F. " SEC. (FM)
A_2		2ND I.F. " PRI (FM)
B_2		2ND I.F. " SEC (FM)
A_3		3RD I.F. " PRI (FM)
B_3		3RD I.F. " SEC (FM)
A_4		DISCRIMINATOR I.F TRANS. PRI.
B_4		DISCRIMINATOR I.F " SEC
E	22-1015	WAVE TRAP
F		BROADCAST OSC (NOTE 1)
G		BROADCAST ANTENNA (NOTE 2)
H		BROADCAST DET (ON GANG)
J	22-1227	BROADCAST PADDER
K		SHORT WAVE OSC (NOTE 1)
M		SHORT WAVE ANT. (NOTE 2)

NOTE:
(1) TRIMMERS F & K ARE MOUNTED ON STRIP #22-1045
(2) TRIMMERS G & M ARE MOUNTED ON STRIP #22-1038

FOR OTHER DATA SEE INDEX

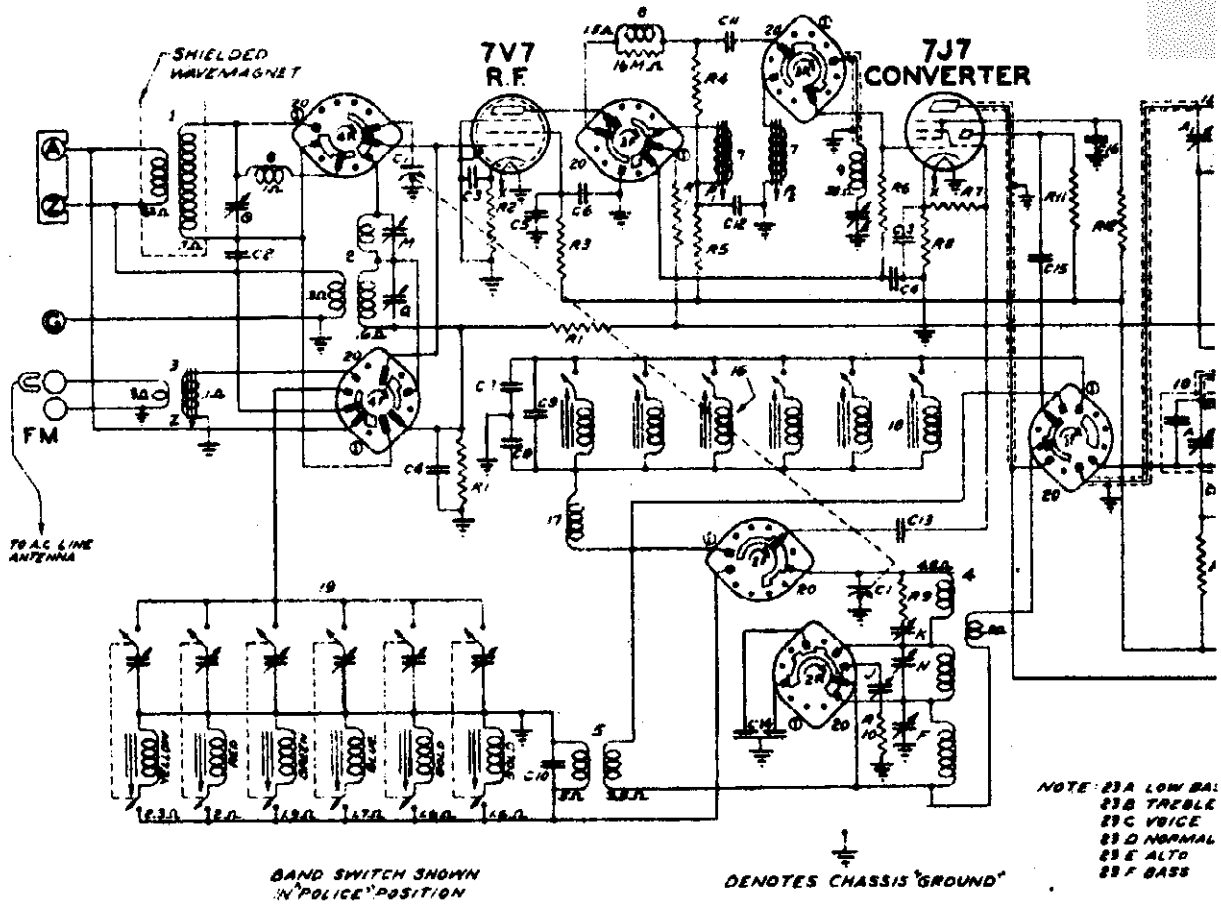
Line voltage 117 A.C.
Power consumption 110 watts.
Power output 15 watts.
Tuning Ranges
540 Kc. to 1620 Kc.
5.6 Mc. to 18.5 Mc.
42 Mc to 50 Mc—(FM)

Stage Gains
Bc. and I.F.

Ant. to R.F. grid 8× at 1000 Kc.c.
R.F. grid to conv. grid 7.25× at 1000 Kc.
Conv. grid to I.F. grid 41.5× at 455 Kc.
Overall audio 1850× at 1 watt 400 cycles.

MODELS 12H678,12H679
Chassis 12A6

ZENITH



DIAG NO	PART NO	DESCRIPTION		DIAG NO	PART NO	DESCRIPTION		DIAG NO	PART NO	DESCRIPTION		DIAG NO	PART NO	DESCRIPTIO
C1	22-1121	TWO GANG VARIABLE		C29	22-1135	.005 MFD.	600V	R16	63-968	33M OHM	1 W.	5	66666	OSCILLATOR COI
C2	22-319	.005 MFD.	200V.	C30	22-1127	.02 MFD.	400V	R17	63-599	1.5 MEGOHM	½ W.	6	59066	LOOP LOADING C
C3	22-827	.1 MFD.	200V.	C31	22-1139	.00015 MFD	600V	R18	63-667	15 M OHM	½ W.	7	59066	DETECTOR COIL
C4	22-829	.05 MFD.	200V.	C32	22-1126	.01 MFD.	400V	R19	63-597	470 M OHM	½ W.	8	58359	COIL & RES. ASS
C5	22-1123	5 MFD ELECTROLYTIC	300V	C33	22-448	.004 MFD.	600V	R20	63-160	100 M OHM	½ W.	9	58326	WAVE TRAP
C6	22-293	.01 MFD.	400V	C34	22-953	.0082 MFD.	600V	R21	63-596	330 M OHM	½ W.	10	95-769	1ST I.F TRANSFOR
C7	22-1166	50 MMFD. COMP.		C35	22-1136	.002 MFD.	600V	R22	63-598	680 M OHM	½ W.	11	95-766	2ND I.F
C8	22-1139	50 MMFD. COMP.		C36	22-1184	30MFD ELECTROLYTIC	450V	R23	63-1179	1000 OHM	1 W.	12	95-765	1ST I.F
C9	22-1193	15 MMFD. CERAMIC		C37	22-196	.01 MFD.	600V	R24	63-1074	VOLUME CONTROL		13	95-786	2ND I.F
C10	22-868	COMPENSATING COND.		C38	22-1041	.005 MFD.	600V	R25	63-701	470 OHM	½ W.	14	95-787	3RD I.F
C11	22-162	.0001 MFD.	600V					R26	63-593	47M OHM	½ W.	15	95-788	DISCRIMINATOR I.F
C12	22-825	.1 MFD.	400V					R27	63-594	68 M OHM	½ W.	16	59566	MANUAL F.M. C
C13	22-1140	50MMFD.	600V					R28	63-648	1000 OHM	½ W.	17	59594	GRID PEAKING
C14	22-1039	DIAL PADDER		R1	63-600	2.8 MEGOHM	½ W.	R29	63-695	330 M OHM	½ W.	18	59531	AUTOMATIC TUNI
C15	22-358	.002 MFD.	600V	R2	63-741	15Ω OHM	½ W.	R30	63-717	220 M OHM	½ W.	19	58695	AUTOMATIC TUNI
C16	22-828	.05 MFD.	400V	R3	63-1188	39M OHM	1 W.	R31	63-657	330 M OHM	½ W.	20	95-784	BAND SELECTOR
C17	22-182	.00025 MFD.	600V	R4	63-1071	10 M OHM	1 W.	R32	63-311	15 M OHM	½ W.	21	59485	PLATE CHOKE
C18	22-692	.002 MFD.	600V	R5	63-605	1000 OHM	½ W.	R33	63-1189	560 OHM	½ W.	22	59503	RM. I.F WAVET
C19	22-127	25 MMFD.	600V	R6	63-715	100 M OHM	½ W.	R34	63-1130	0.8 OHM	½ W.	23	58490	TONE CONTROL
C20		30MFD ELECTROLYTIC	450V	R7	63-713	47M OHM	½ W.	R35	63-1158	100 OHM	1 W.	24	95-783	PHONO RADIO
C21	22-1178	5 MFD.	300V	R8	63-1104	300 OHM	½ W.	R36	63-679	82 M OHM	1 W.	25	20-220	FILAMENT CH
C22		15 MFD.	25V	R9	63-576	68 OHM	½ W.					26	59506	LINE CHOKE
C23	22-283	.50 MMFD.	600V	R10	63-572	15 OHM	½ W.					27	95-840	POWER TRANS.
C24	22-1138	.0005 MFD.	600V	R11	63-1065	15 M OHM	1 W.					28	95-961	PILOT LIGHT
C25	22-368	.001 MFD.	600V	R12	63-1068	36 M OHM	1 W.	1		WAVEMAGNET ASSEMBLY			100-36	
C26	22-1203	.001 MFD.	600V	R13	63-271	1 MEGOHM	½ W.	2	63075	ANTENNA COIL	(S.W.)	A		1ST I.F TRANS
C27	22-830	.02 MFD.	600V	R14	63-588	1000 OHM	½ W.	3	59068	ANTENNA COIL	(F.M.)	B		2ND I.F
C28	22-1220	.008 MFD.	600V	R15	63-1180	15M OHM	½ W.	4	59074	OSCILLATOR COIL				

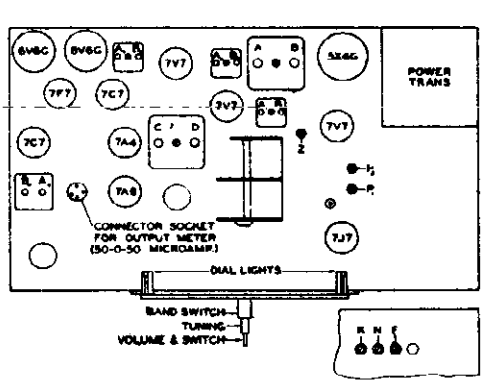
Stage Gains
Bc. and I.F.

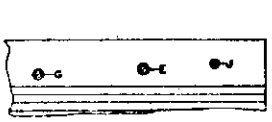
Ant. to R.F. grid 6.5× at 1000 Kc.

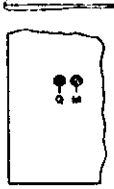
R.F. grid to conv. grid 28.1× at 1000 Kc.

Conv. grid to I.F. grid 265× at 455 Kc.

Overall audio 807× at 1 watt. 400 cycles.

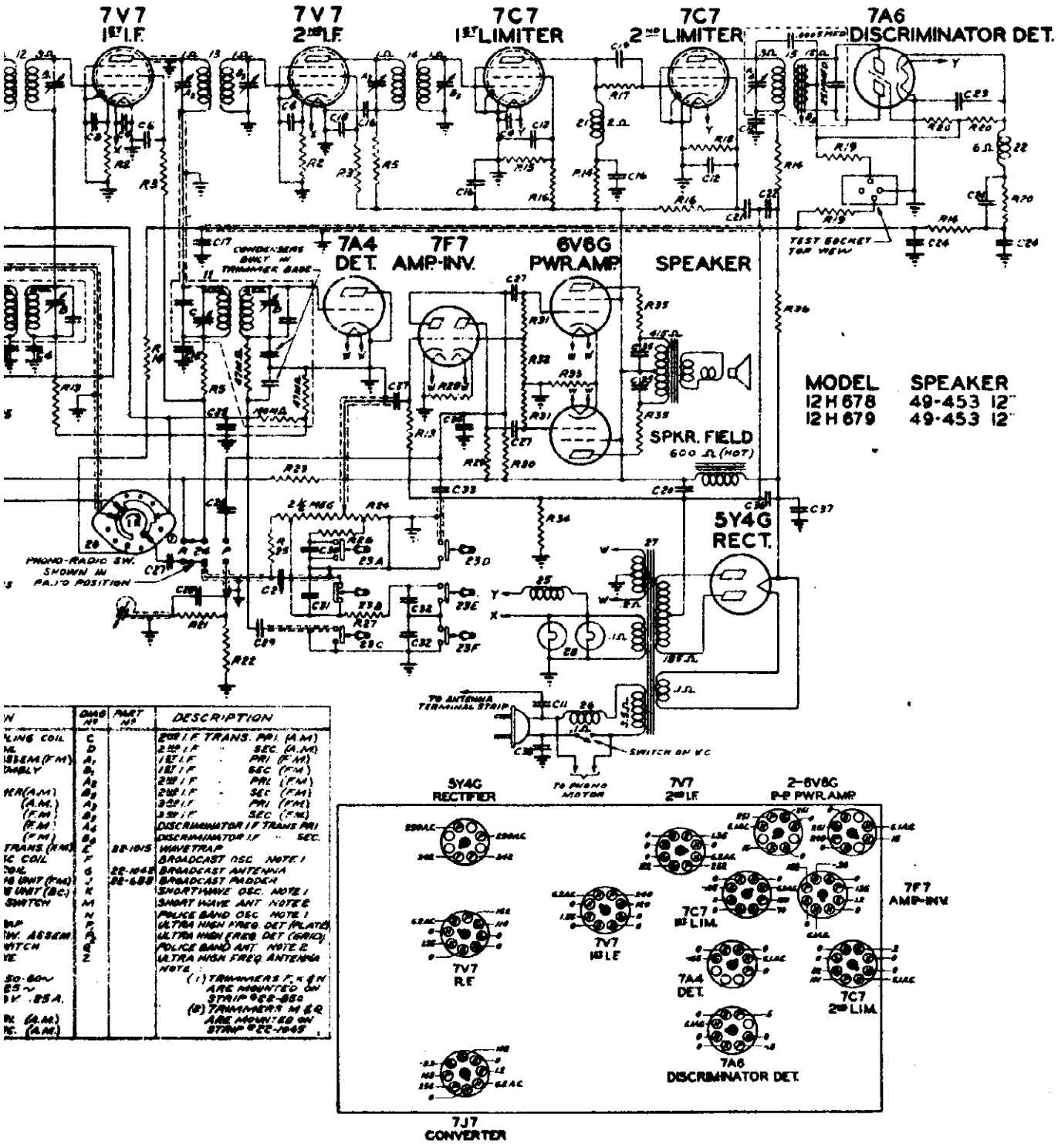






AMP. MOD.
FREQ. MOD
12 TUBE
CHASSIS

FOR ALIGN



	CHG NO	PART NO	DESCRIPTION
	C		2ND I.F. TRANS. PRI. (A.M.)
	D		2ND I.F. " SEC. (A.M.)
	A_1		1ST I.F. " PRI. (F.M.)
	B_1		1ST I.F. " SEC. (F.M.)
	A_2		2ND I.F. " PRI. (F.M.)
	B_2		2ND I.F. " SEC. (F.M.)
	A_3		3RD I.F. " PRI. (F.M.)
	B_3		3RD I.F. " SEC. (F.M.)
	A_4		DISCRIMINATOR I.F. TRANS. PRI.
	B_4		DISCRIMINATOR I.F. " SEC.
	E	88-1015	WAVE TRAP
	F		BROADCAST OSC. NOTE 1
	G	88-1045	BROADCAST ANTENNA
	J	88-688	BROADCAST PADDER
	K		SHORT WAVE OSC. NOTE 1
	M		SHORT WAVE ANT. NOTE 2
	N		POLICE BAND OSC. NOTE 1
	P		ULTRA HIGH FREQ. DET. (PLATE)
	A_5		ULTRA HIGH FREQ. DET. (GRID)
	B_5		POLICE BAND ANT. NOTE 2
	Z		ULTRA HIGH FREQ. ANTENNA

NOTE (1) TRIMMERS F, K & N ARE MOUNTED ON STRIP 88-1015
(2) TRIMMERS M & Q ARE MOUNTED ON STRIP 88-1045

I.F. FREQUENCY 455 KC.
I.F. FREQUENCY 8.3 MC.
SUPERHETERODYNE
№ 12A6 - A.C. - 4 BAND

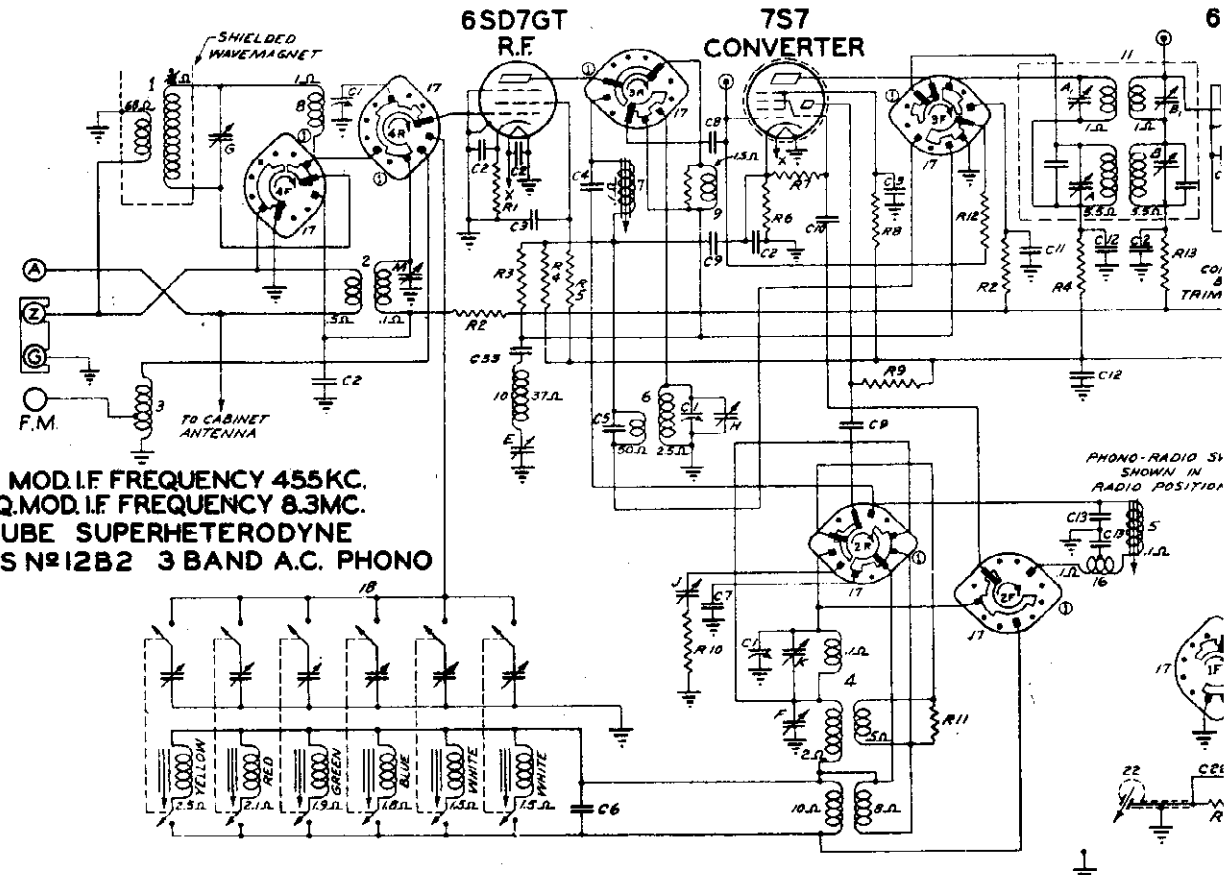
MENT SEE INDEX

Line voltage 117 A.C.
Power consumption 150 watts.
Power output 14. watts.
Tuning Ranges
540 Kc. to 1600 Kc.
1.5 Mc. to 5.2 Mc.
5.2 Mc. to 18.5 Mc.
41.5 Mc to 50.5 Mc—(FM)

All voltages measured with a 20,000 ohm per volt meter from chassis to socket contact indicated.

All voltages are positive D.C. unless marked otherwise.

Volume control full on.



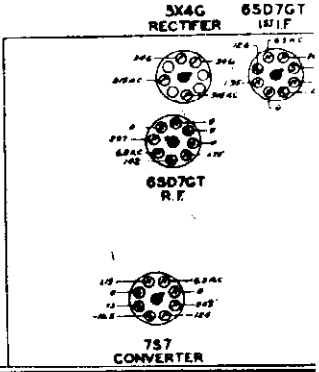
AMP. MOD. I.F. FREQUENCY 455 KC.
FREQ. MOD. I.F. FREQUENCY 8.3 MC.
12 TUBE SUPERHETERODYNE
CHASSIS Nº 12B2 3 BAND A.C. PHONO

BAND SWITCH SHOWN IN SHORTWAVE POSITION

DENOTES CHASSIS "GROUND"

9-22-41 R36 ½ BY-PASS ADDED.
9-5-41 C33 ADDED; R25 WAS 63-1204; R26 WAS 63-1205.
9-29-41 R.F. FILAMENT BYPASS & B+ BYPASS ADDED.

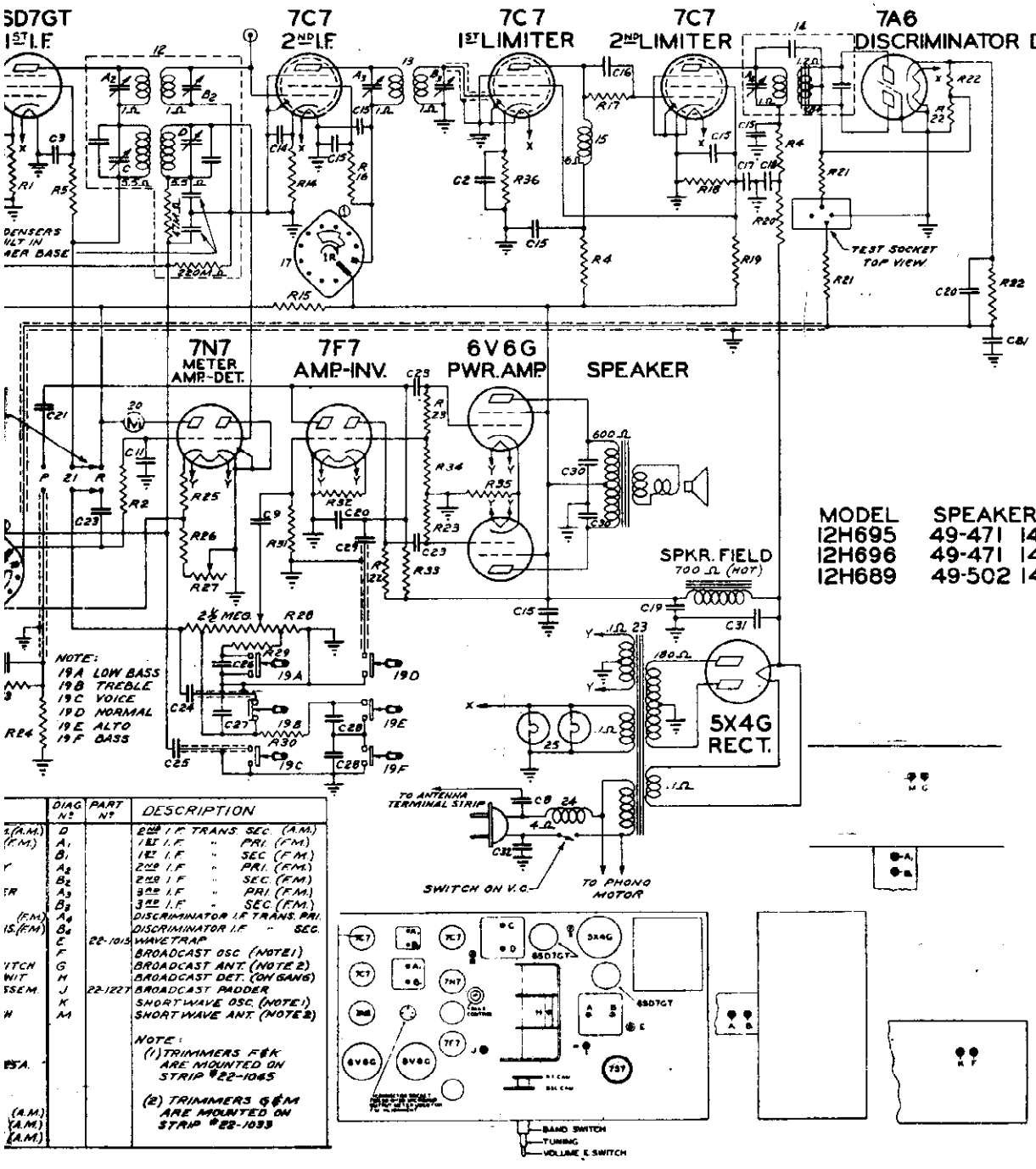
DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION
C1	22-1224	THREE GANG VARIABLE		C27	22-1137	.00015 MFD.	600V	R18	63-1102	15 M OHM	½ W.	6	S9847	DETECTOR COIL ASSE
C2	22-829	.05 MFD.	200V.	C28	22-1126	.01 MFD.	400V.	R19	63-957	33 M OHM	1 W.	7	S9849	DETECTOR "
C3	22-243	.01 MFD.	400V.	C29	22-448	.004 MFD.	600V.	R20	63-1211	82 M OHM	2 W.	8	S9589	LOOP LOADING COIL
C4	22-1259	5 MMFD. COMP.		C30	22-1134	.002 MFD.	1000V	R21	63-597	470 M OHM	½ W.	9	S9850	COIL & RES. ASSEMB.
C5	22-470	.00015 MFD.	600V.	C31	22-1124	30 MFD. ELECTROLYTIC	450V	R22	63-260	100 M OHM	½ W.	10	S8326	WAVETRAP
C6	22-868	COMPENSATING COND.		C32	22-1041	.005 MFD.	600V	R23	63-657	330 M OHM	½ W.	11	95-849	1ST I.F. TRANSFORM.
C7	22-1257	.005 MFD.	1000V	C33	22-887	.001 MFD.	600V.	R24	63-661	680 M OHM	½ W.	12	95-850	2ND I.F. "
C8	22-162	.0001 MFD.	600V.					R25	63-1212	1800 OHM	½ W.	13	95-787	3RD I.F. "
C9	22-492	.002 MFD.	600V.					R26	63-395	600 OHM	½ W.	14	95-788	DISCRIMINATOR I.F. TRA
C10	22-289	50 MMFD.	600V.	R1	63-246	150 OHM	½ W.	R27	63-1251	VARIABLE RESISTOR		15	S10073	PLATE CHOKE
C11	22-826	.01 MFD.	200V.	R2	63-600	2.2 MEGOHM	½ W.	R28	63-1074	VOLUME CONTROL		16	S9882	PEAKING COIL
C12	22-828	.05 MFD.	400V.	R3	63-680	10 M OHM	1 W.	R29	63-593	47 M OHM	½ W.	17	85-301	BAND SELECTOR SW.
C13	22-1267	COMPENSATING COND.		R4	63-583	1000 OHM	½ W.	R30	63-711	22 M OHM	½ W.	18	S10325	AUTOMATIC TUNING
C14	22-319	.005 MFD.	200V.	R5	63-1159	39 M OHM	1 W.	R31	63-976	15 MEGOHM	½ W.	19	S9606	TONE CONTROL SW.
C15	22-229	.005 MFD.	600V.	R6	63-742	180 OHM	½ W.	R32	63-585	2200 OHM	½ W.	20	122-16	TUNING METER
C16	22-127	.25 MMFD.	600V.	R7	63-713	47M OHM	½ W.	R33	63-296	220M OHM	½ W.	21	85-303	PHONO-RADIO SWIT
C17		5 MFD. ELECTROLYTIC	300V.	R8	63-773	180M OHM	½ W.	R34	63-311	15M OHM	½ W.	22	189-89	PHONO PICKUP
C18	22-1178	15 MFD. "	250V.	R9	63-1065	15M OHM	1 W.	R35	63-1189	200 OHM WIREWOUND	2 W.	23	95-854	POWER TRANS.
C19		30 MFD. "	450V.	R10	63-572	15 OHM	½ W.	R36	63-418	1500 OHM	½ W.	24	S9504	LINE CHOKE
C20	22-1138	.0005 MFD.	600V.	R11	63-587	4700 OHM	½ W.					25	100-36	DIAL LIGHT 6.3 V.
C21	22-1203	.001 MFD.	600V.	R12	63-719	470M OHM	½ W.							
C22	22-1220	.002 MFD.	600V.	R13	63-271	1 MEGOHM	½ W.	1		WAVEMAGNET				
C23	22-830	.02 MFD.	600V.	R14	63-633	680 OHM	½ W.	2	S9972	ANTENNA COIL ASSEMBLY		A		1ST I.F. TRANS. PR
C24	22-1256	75 MMFD.	600V.	R15	63-606	1000 OHM	1 W.	3				B		1ST I.F. " SE
C25	22-1135	.005 MFD.	600V.	R16	63-656	270M OHM	½ W.	4	S9823	OSCILLATOR - - (A.M.)		C		2ND I.F. " PR
C26	22-1127	.02 MFD.	400V.	R17	63-599	1.5 MEGOHM	½ W.	5	S9848	OSCILLATOR " " (F.M.)				



FOR ALIGNMENT SEE INDEX

RADIO CORP.

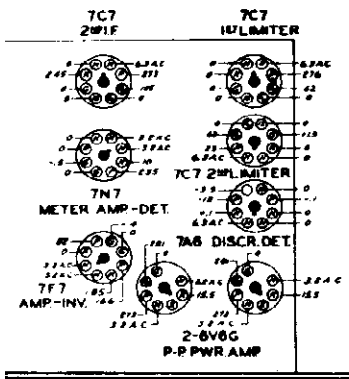
MODELS 12H689, 12H695
Chassis 12B2 **Phono**



MODEL	SPEAKER
12H695	49-471 14"
12H696	49-471 14"
12H689	49-502 14"

	DIAG. Nº	PART Nº	DESCRIPTION
	D		2ND I.F. TRANS. SEC. (A.M.)
	A_1		1ST I.F. " PRI. (F.M.)
	B_1		1ST I.F. " SEC. (F.M.)
	A_2		2ND I.F. " PRI. (F.M.)
	B_2		2ND I.F. " SEC. (F.M.)
	A_3		3RD I.F. " PRI. (F.M.)
	B_3		3RD I.F. " SEC. (F.M.)
	A_4		DISCRIMINATOR I.F. TRANS. PRI.
	B_4		DISCRIMINATOR I.F. " SEC.
	C	22-1015	WAVE TRAP
	F		BROADCAST OSC. (NOTE 1)
	G		BROADCAST ANT. (NOTE 2)
	H		BROADCAST DET. (ON GANG)
	J	22-1227	BROADCAST PADDER
	K		SHORT WAVE OSC. (NOTE 1)
	M		SHORT WAVE ANT. (NOTE 2)

NOTE:
(1) TRIMMERS F & K ARE MOUNTED ON STRIP #22-1065
(2) TRIMMERS G & M ARE MOUNTED ON STRIP #22-1033



Line voltage 117 A.C.

Power consumption 150 watts, including Phono motor.

Power output 15 watts.

Tuning Ranges

540 Kc. to 1620 Kc.

5.6 Mc. to 18.5 Mc.

42 Mc to 50 Mc—(FM)

Stage Gains
Bc. and I.F.

Ant. to R.F. grid 8× at 1000 Kc.c.

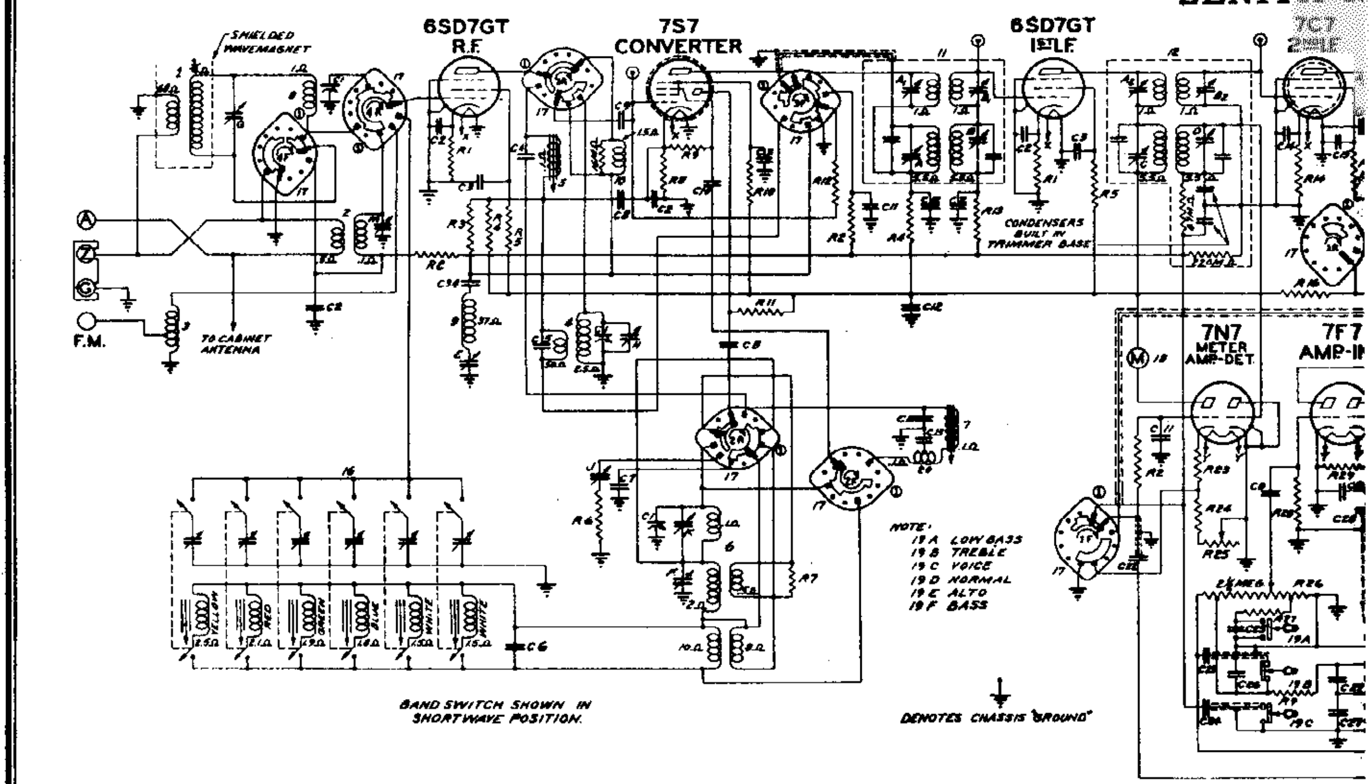
R.F. grid to conv. grid 7.25× at 1000 Kc.

Conv. grid to I.F. grid 41.5× at 455 Kc.

Overall audio 1850× at 1 watt 400 cycles.

MODEL 14H697, Chassis 14B1

ZENITH R



DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-1224	THREE GANG VARIABLE	
C2	22-829	.05 MFD.	200 V.
C3	22-243	.01 MFD	400 V
C4	22-1259	5 MMFD. COMP	
C5	22-182	.00025 MFD.	600 V.
C6	22-868	COMPENSATING COND	
C7	22-1257	.005 MFD.	1000 V.
C8	22-492	.002 MFD.	600 V.
C9	22-162	.0001 MFD	600 V
C10	22-289	50 MMFD	600 V.
C11	22-826	.01 MFD	200 V.
C12	22-828	.05 MFD	400 V.
C13	22-1267	100 MMFD. COMP	
C14	22-319	.005 MFD.	200 V.
C15	22-229	.005 MFD.	600 V.
C16	22-127	25 MMFD.	600 V.
C17	22-1170	5 MFD. ELECTROLYTIC	300 V.
C18	or	15 MFD.	250 V.
C19	22-1295	30 MFD.	450 V.
C20	22-1138	.0005 MFD.	600 V.
C21	22-1220	.002 MFD.	600 V.
C22	22-138	.2 MFD.	200 V.
C23	22-1256	75 MMFD.	600 V.
C24	22-1135	.005 MFD.	600 V.
C25	22-1127	.02 MFD.	400 V.
C26	22-1137	.00015 MFD.	600 V.

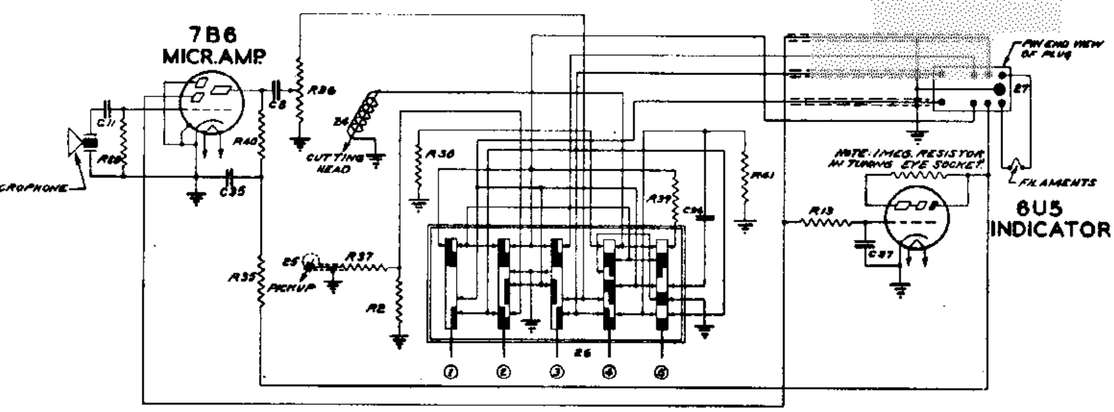
DIAG. Nº	PART Nº	DESCRIPTION	
C27	22-1126	.01 MFD.	[illegible]
C28	22-448	.004 MFD.	600 V.
C29	22-830	.02 MFD.	600 V.
C30	22-1134	.002 MFD.	1000 V.
C31	22-1124	30 MFD. ELECT. [illegible]	450 V.
C32	22-854	.0005 MFD.	600 V.
C33	22-1041	.005 MFD.	600 V.
C34	22-887	.001 MFD.	600 V.
R1	63-246	150 OHM	[illegible]
R2	63-600	2.2 MEGOHM	[illegible]
R3	63-680	10 M OHM	[illegible]
R4	63-583	1000 OHM	¼ W.
R5	63-1159	39 M OHM	1 W.
R6	63-572	15 OHM	¼ W.
R7	63-587	4700 OHM	¼ W.
R8	63-742	180 OHM	¼ W.
R9	63-713	47 M OHM	¼ W.
R10	63-773	180 M OHM	¼ W.
R11	63-1063	15 M OHM	1 W.
R12	63-719	470 M OHM	¼ W.
R13	63-271	1 MEGOHM	½ W.
R14	63-633	680 OHM	¼ W.
R15	63-656	270 M OHM	¼ W.
R16	63-606	1000 OHM	1 W.

DIAG. Nº	PART Nº	DESCRIPTION	
[illegible]	63-590	1.5 MEGOHM	¼ W.
[illegible]	63-1102	15 M OHM	¼ W.
[illegible]	63-957	33 M OHM	1 W.
R20	63-1211	82 M OHM	2 W.
R21	63-597	470 M OHM	¼ W.
R22	63-260	100 M OHM	¼ W.
R23	63-1212	1500 OHM	¼ W.
R24	63-395	600 OHM	¼ W.
[illegible]	[illegible]	BIAS CONTROL	
[illegible]	[illegible]	VOLUME CONTROL	
[illegible]	[illegible]	47 M OHM	¼ W.
[illegible]	[illegible]	15 MEGOHM	¼ W.
[illegible]	[illegible]	2200 OHM	¼ W.
R30	[illegible]	220 M OHM	¼ W.
R31	[illegible]	330 M OHM	¼ W.
R32	[illegible]	15 M OHM	¼ W.
R33	[illegible]	200 OHM	2 W.
R34	[illegible]	330 M OHM	¼ W.
R42	[illegible]	1500 OHM	¼ W.
1		WAVE MAGNET [illegible]	
2, 3	S9972	ANTENNA [illegible]	
4	S9847	DETECTOR [illegible]	
5	S9849	DETECTOR - -	(F.M.)

DIAG. Nº	PART Nº	DESCRIPTION
6	S9823	OSCILLATOR COIL ASSEM.(A.M.)
7	S9848	OSCILLATOR - - (F.M.)
8	S9589	LOOP LOADING COIL
9	S8326	WAVE TRAP
10	S9850	COIL & RES. ASSEMBLY
11	95-849	1st I.F. TRANSFORMER
12	95-850	2nd I.F. "
13	95-888	3rd I.F.
14	95-788	DISCRIMINATOR I.F. TRANS.(F.M.)
15	S10073	PLATE CHOKE
16	S10325	AUTOMATIC TUNING UNIT
17	95-301	BAND SELECTOR SWITCH
18	122-16	TUNING METER
19	S10507	TONE CONTROL SW. ASSEM.
20	S9882	PEAKING COIL
21	95-858	PWR TRANS. 117 V. 50-60~
22	100-36	DIAL LIGHT 6.3 V. .25 A.
23	S9604	LINE CHOKE
24	38-471	CONNECTOR SOCKET
[illegible]		[illegible]
A1		1st I.F. [illegible]

DIAG. Nº	PART Nº	DESCRIPTION
B1		1st I.F. TRANS. SEC. (F.M.)
A2		2nd I.F. " PRI. (F.M.)
B2		2nd I.F. " SEC (F.M.)
A3		3rd I.F. " PRI. (F.M.)
B3		3rd I.F. " SEC. (F.M.)
A4		DISCRIMINATOR I.F. TRANS. PRI.
B4		DISCRIMINATOR I.F. " SEC.
E	22-1115	WAVE TRAP
F		BROADCAST OSC. (NOTE 1)
G		BROADCAST ANT. (NOTE 2)
H		BROADCAST DET (ON GANG)
J	22-1227	BROADCAST PADDER
K		SHORTWAVE OSC. (NOTE 1)
M		SHORTWAVE ANT. (NOTE 2)

NOTE:
(1) TRIMMERS F & K ARE MOUNTED ON STRIP #22-1065
(2) TRIMMERS G & M ARE MOUNTED ON STRIP #22-1038



DENOTES CHASSIS "GROUND"

NOTE:
ALL BUTTONS SHOWN IN NON-OPERATED POSITION.

① RADIO
② PHONO
③ P.A.
④ RECORD MICR.
⑤ RECORD RADIO

DIAG. Nº	PART Nº	DESCRIPTION	
C8	22-492	.02 MFD.	600 V.
C11	22-826	.01 MFD.	200 V.
C35	22-1123	5 MFD. ELECTROLYTIC	300 V.
C36	22-1205	.001 MFD.	600 V.
C37	22-887	.1 MFD.	200 V.
R2	63-600	2.2 MEGOHM	¼ W.
R13	63-271	1 MEGOHM	½ W.
R28	63-976	15 MEGOHM	¼ W.
R35	63-595	100 M OHM	¼ W.
R36	63-1250	VOLUME CONTROL	
R37	63-774	220 M OHM	¼ W.
R38	63-1209	20 OHM	1 W.

DIAG. Nº	PART Nº	DESCRIPTION	
R39	63-1210	38 OHM	1 W.
R40	63-717	220 M OHM	¼ W.
R41	63-445	100 M OHM	¼ W.
24	162-58	CUTTING HEAD	
25	142-49	PICKUP CARTRIDGE	
26	85-300	RECORDER CONTROL SW.	
27	58-102	CONNECTOR PLUG	

MODEL	SPEAKER
14H697	49-504 14"

Microphone Amplifier

AMP. MOD. I.F. FREQUENCY 455KC.
FREQ. MOD. I.F. FREQUENCY 8.3MC.
14 TUBE SUPERHETERODYNE
CHASSIS Nº 14B1 3 BAND A.C. PHONO
ZENITH RADIO CORPORATION
CHICAGO, ILL.

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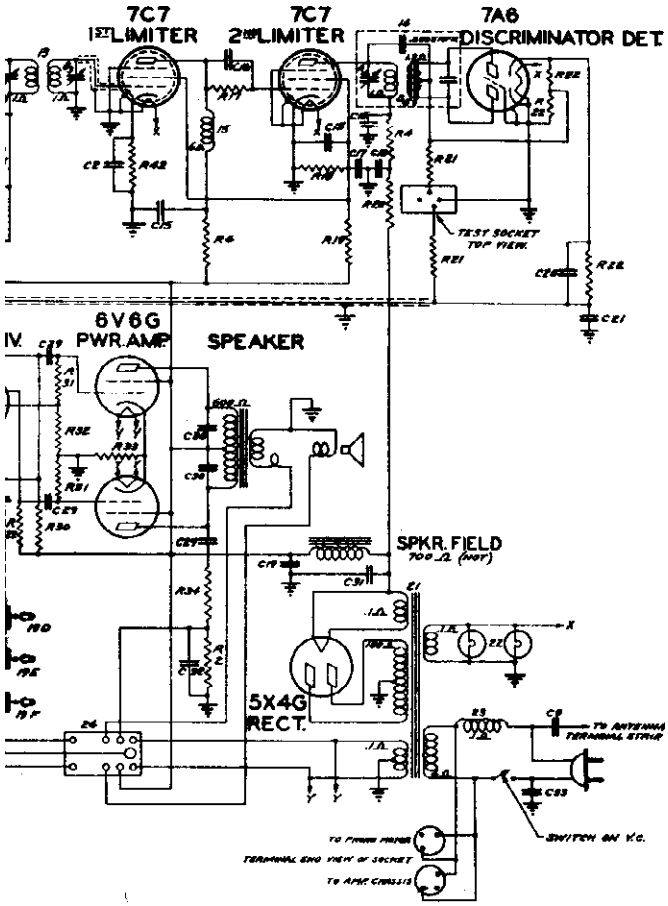
ADIO CORP



AMP. MOD. I.F. FREQUENCY 455KC.
FREQ. MOD. I.F. FREQUENCY 8.3MC.
14 TUBE SUPERHETERODYNE
CHASSIS Nº 14B1 3 BAND A.C. PHONO
ZENITH RADIO CORPORATION
CHICAGO, ILL.

ll voltages measured with a
00 ohm per volt meter from
sis to socket contact indicated.

ll voltages are positive D.C. un-
marked otherwise.

olume control full on.

ne voltage 117 A.C. 60 cycle.

wer consumption 115 watts.

ono motor 35 watts additional.

aximum audio power output 15
s.

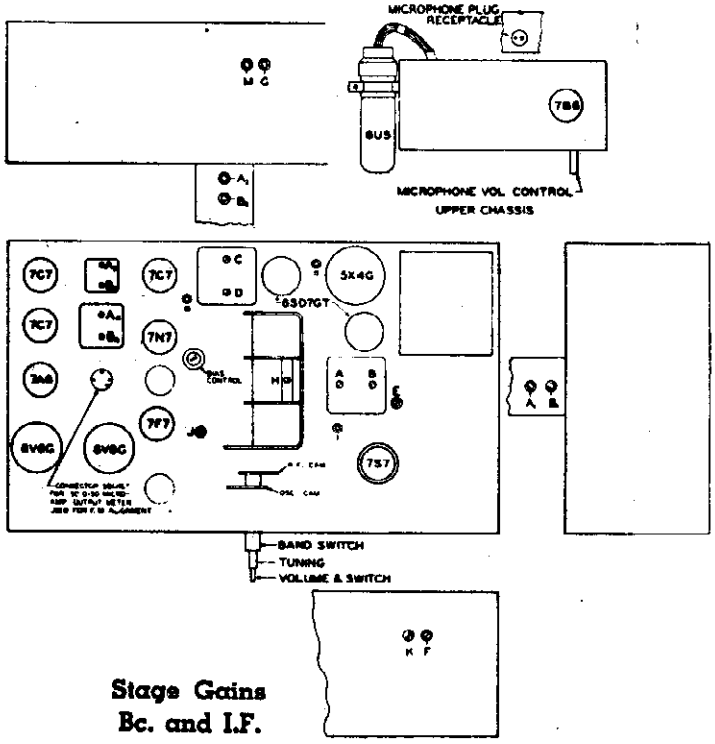
ning ranges:

0 to 1620 Kc.

to 18.4 Mc.

to 50 Mc. (F.M.).

FOR ALIGNMENT
SEE INDEX



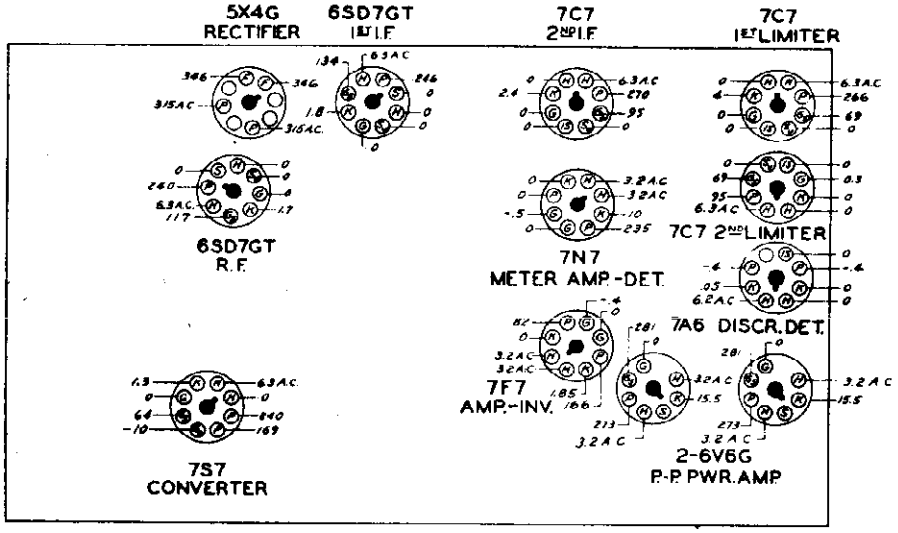
Stage Gains
Bc. and I.F.

Ant. to R.F. grid 8× at 1000 Kc.

R.F. grid to conv. grid 7× at 1000 Kc.

Conv. grid to I.F. grid 40× at 455 Kc.

Overall audio 1850× at 1 watt, 400 cycles.



SOCKET VOLTAGES—BOTTOM SIDE UP

ZENITH RADIO CORP.

CHASSIS 12A6
CHASSIS 12B1,12B2 Phono

ALIGNMENT PROCEDURE CHASSIS 12A6

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Trimmers	Purpose
1	Con. Grid	0.5 mfd.	455 Kc.	BC	600 Kc.	A, B, C, D	Align I.F.
2	R.F. Grid	0.5 mfd.	455 Kc.	BC	600 Kc.	E	Adjust for minimum 455 Kc. signal
3	Ant. Z and G	400 ohm	18 Mc.	SW	18 Mc.	K	Scale SW Osc. at 18 meg.
4	"	"	16 Mc.	SW	16 Mc.	M	Align SW antenna
5	"	"	5 Mc.	Med.	5.0 Mc.	N	Scale med. band osc. at 5. meg.
6	"	"	4.5 Mc.	Med.	4.5 Mc.	Q	Align med. band antenna
7	One turn loop made with generator lead or Radex loop	——	1600 Kc.	BC	1600 Kc.	F	Set BC Osc. to scale at 1600 Kc.
8		——	1400 Kc.	BC	1400 Kc.	G	Align broadcast loop
9		——	600 Kc.	BC	600 Kc.	J	Rock gang to track BC padder
10	7V7 2nd I.F. Grid	0.5 mfd.	8.3 Mc.	Man. F.M.	42.5 Mc.	A_4	Align for max. deflection across ½ discrim. load
11	"	"	"	"	"	B_4	Align for zero deflection across full discrim. load
12	"	"	"	"	"	A_3 - B_3	Align for max. deflection across ½ discrim. load
13	7V7 1st I.F. Grid	"	"	"	"	A_2 - B_2	"
14	Converter Grid	"	"	"	"	A_1 - B_1	"
15	F.M. Ant. Terminal	100 ohm	46 Mc.	"	46 Mc.	Adj. cam on gang to scale osc.	Align for zero deflection across full discrim. load
16	"	"	42.5 Mc.	"	42.5 Mc.	P_1	Align for max. deflection across ½ discrim. load
17	"	"	49 Mc.	"	49 Mc.	P_2	"
18	"	"	46 Mc.	"	46 Mc.	Z	"

FOR TRIMMER LOCATIONS SEE INDEX

ALIGNMENT PROCEDURE CHASSIS 12B1 and 12B2 Phono

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Trimmers	Purpose
1	Con. Grid	0.5 mfd.	455 Kc.	BC	600 Kc.	A, B, C, D	Align I.F.
2	R.F. Grid	0.5 mfd.	455 Kc.	BC	600 Kc.	E	I.F. Trap. Adjust for Minimum. I.F. Signal
3	Ant. A and G	400 ohm	18 Mc.	SW	18 Mc.	K	Scale SW Osc. at 18 meg.
4	"	"	15 M.C.	SW	15 M.C.	M	Align SW antenna
5	One turn loop made with generator lead or Radex loop	——	1600 Kc.	BC	1600 Kc.	F	Set BC Osc. to scale. at 1600 Kc.
6		——	1400 Kc.	BC	1400 Kc.	H	Align BC R.F. Stage
7		——	1400 Kc.	BC	1400 Kc.	G	Align broadcast loop
8	"	——	600 Kc.	BC	600 Kc.	J	Rock gang to track BC padder
9	7C7 2nd I.F. Grid Pin Jack III	0.5 mfd.	8.3 Mc.	F.M.	42.5 Mc.	A_4	Align for max. deflection across ½ discrim. load
10	"	"	"	"	"	B_4	Align for zero Deflection across Full Disc. Load. Repeat Operation No. 9
11	"	"	"	"	"	A_3 - B_3	Align for max. deflection across ½ discrim. load
12	6SD7GT 1st I.F. Grid Pin Jack II	"	"	"	"	A_2 - B_2	Align for max. deflection across ½ discrim. load
13	Con. Grid Pin Jack I	"	"	"	"	A_1 - B_1	"
14	F.M. Ant. Terminal	100 ohm	46 Mc.	"	46 Mc.	Adjust Osc. Cam GangShaft to Scale Osc	Align for zero deflection across full discrim. load
15	"	100 ohm	46 Mc.	"	46 Mc.	Adjust R.F. Cam for FM Tracking	Align for max. deflection across ½ discrim. load
16	Adjust Tuning Meter.			F.M.	Clear of signals	Bias Control	Adjust bias for tuning meter

Remove 2nd I.F. tube (7C7) from socket. Adjust bias control until meter reads exactly center. Replace I.F. tube and check meter behavior on F.M. and A.M. signals.

NOTE: THE ALIGNMENT FOR CHASSIS 12B1 IS THE SAME AS THE ABOVE WITH THE EXCEPTION THAT OPERATION NO. 16 IS NOT USED FOR 12B1 NOR IS THE LAST OPERATION.

MODEL 7G605
MODEL 14H697
MODELS 22H698, 22H699

ZENITH RADIO CORP.

Model 7G605

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Trimmers	Purpose
1	Conv. grid	.1 mfd.	455 Kc.	BC	600 Kc.	A. B. C. D	Align I.F.
2	One Turn Loop Coupled		1600 Kc.	BC	1600 Kc.	F	Set oscillator to scale
3	Loosely to Broadcast		1400 Kc.	BC	1400 Kc.	H	Alignment of detector section
4	Wavemagnet		1400 Kc.	BC	1400 Kc.	G	Alignment of B.C. Wavemagnet
5	3 Feet of Wire		1400 Kc.	BC	1400 Kc.	G_1	B.C. waverod alignment
6	Approximately		6.2 Mc.	49 Met.	6.2 Mc.	K_1-L_1	Alignment of S.W. Oscillators and Antenna Trimmers
7	1 Foot from		9.6 Mc.	31 Met.	9.6 Mc.	K_2-L_2	
8	Extended		11.8 Mc.	25 Met.	11.8 Mc.	K_3-L_3	
9	Waverod		15.2 Mc.	19 Met.	15.2 Mc.	K_4-L_4	
10			17.8 Mc.	16 Met.	17.8 Mc.	K_5-L_5	
11	One Turn Loop Coupled Loosely to Shortwave Magnet, Waverod Collapsed		15.2 Mc.	19 Met.	15.2 Mc.	M_1-M_2	Alignment of shortwave magnet
12			11.8 Mc.	25 Met.	11.8 Mc.	M_2	
13			9.6 Mc.	31 Met.	9.6 Mc.	M_1	

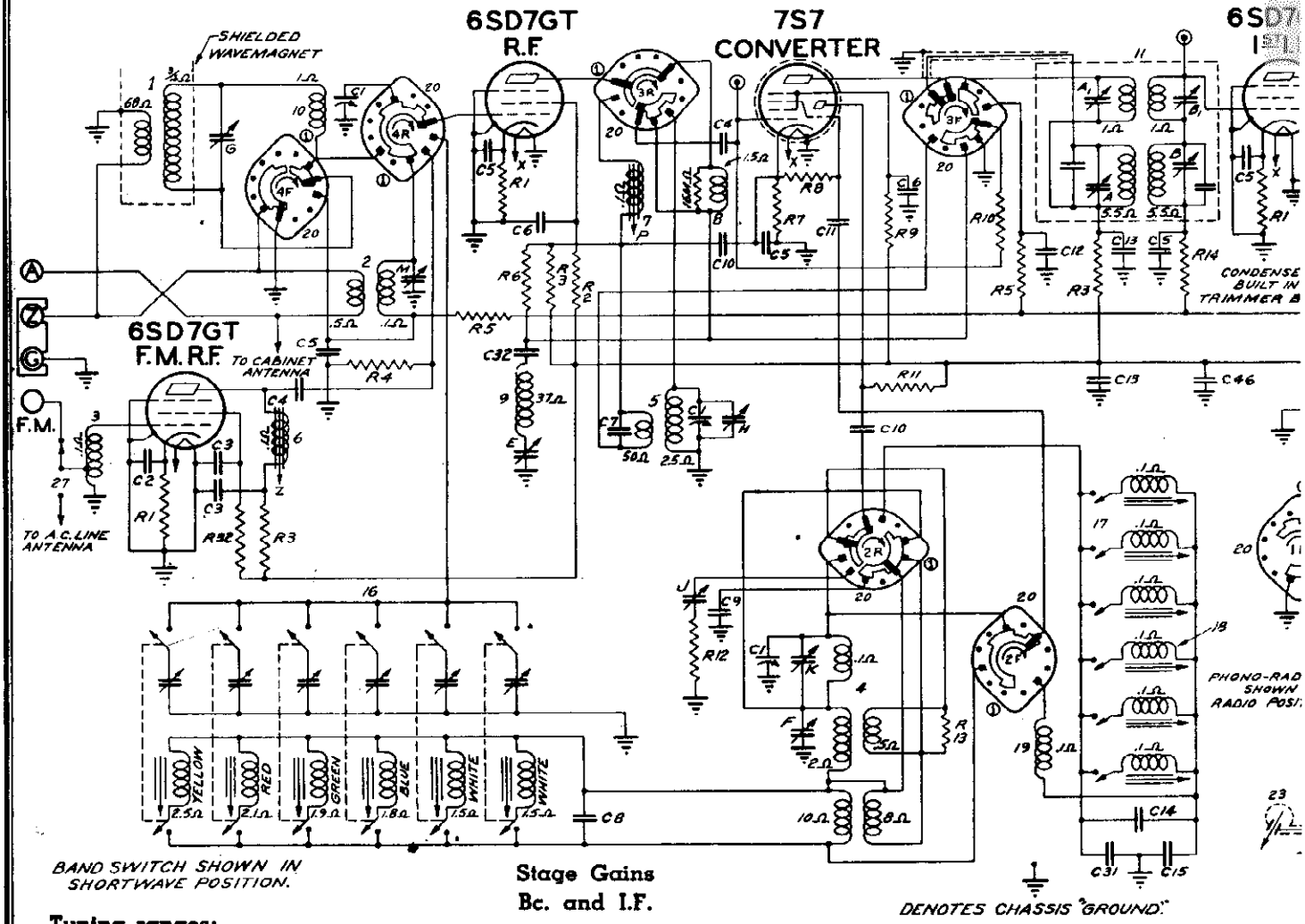
ALIGNMENT PROCEDURE Model 14H697

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Trimmers	Purpose
1	Conv. grid	.5 mfd.	455 Kc.	BC	600 Kc.	A, B, C, D	Align BC I. F.
2	R.F. grid	"	"	"	"	E	I.F. trap adjustment for minimum I.F. signal
3	Ant. Gnd.	400 ohm	18 Mc.	SW	18 Mc.	K	Scale osc. at 18 Mc.
4	"	"	15 Mc.	"	15 Mc.	M	Align SW antenna
5	ONE TURN		1600 Kc.	BC	1600 Kc.	F	Set BC osc. to scale at 1600 Kc.
6	LOOP WITH		1400 Kc.	"	1400 Kc.	H	Align BC R.F. stage
7	GENERATOR		1400 Kc.	"	1400 Kc.	G	Align BC loop
8	LEADS		600 Kc.	"	600 Kc.	J	Rock gang to track BC padder
9	7C7 2nd I.F. Grid Pin Jack III	.5 mfd.	8.3 Mc.	FM	42.5 Mc.	A_1	Align for maximum deflection across ½ discrim. load
10		"	"	"	"	B_1	Align for zero deflection across full discrim. load. Repeat operation No. 9
11		"	"	"	"	A_2-B_2	Align for maximum deflection across ½ discrim. load
12	6SD7 1st I.F. grid Pin Jack III	"	"	"	"	A_3-B_3	Align for maximum deflection across ½ discrim. load
13	Conv. grid Pin Jack I	"	"	"	"	A_4-B_4	Align for maximum deflection across ½ discrim. load
14	F.M. Ant. Ter.	100 ohms	46 Mc.	"	46 Mc.	Adjust osc. cam gang shaft to scale osc.	Align for zero deflection across full discrim. load
15	"	"	"	"	"	Adjust R.F. cam for F.M. tracking	Align for max. deflec. across ½ discrim. load
16	Adjust Tuning Meter			"	Clear of Signals	Bias control	Adjust bias for tuning meter

Remove 2nd I.F. tube (7C7) from socket. Adjust bias control until meter reads exactly center.
Replace I.F. tube and check meter behavior on F.M. and A.M. signals.

ALIGNMENT PROCEDURE Models 22H698 and 22H699

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Trimmers	Purpose
1	Conv. grid	.5 mfd.	455 Kc.	BC	600 Kc.	A. B. C. D	Align B.C. I.F.
2	R.F. grid	"	"	"	"	E	I.F. trap adjustment for minimum I.F. signal
3	Ant. Gnd.	400 ohm	18 Mc.	SW	18 Mc.	K	Scale osc. at 18 Mc.
4	"	"	15 Mc.	"	15 Mc.	M	Align SW antenna
5	ONE TURN		1600 Kc.	BC	1600 Kc.	F	Set BC osc. to scale at 1600 Kc.
6	LOOP MADE WITH		1400 Kc.	"	1400 Kc.	H	Align BC R.F. stage
7	GENERATOR		1400 Kc.	"	1400 Kc.	G	Align BC loop
8	LEADS		600 Kc.	"	600 Kc.	J	Rock gang to track BC padder
9	7C7 2nd I.F. grid Pin Jack III	.5 mfd.	8.3 Mc.	F.M.	42.5 Mc.	A_1	Align for maximum deflection across ½ discrim. load
10	"	"	"	"	"	B_1	Align for zero deflection across full discriminator load. Repeat operation No. 9
11	"	"	"	"	"	A_2-B_2	Align for maximum deflection across ½ discrim. load
12	6SD7 1st I. F. grid Pin Jack III	"	"	"	"	A_3-B_3	Align for maximum deflection across ½ discrim. load
13	Conv. grid Pin Jack I	"	"	"	"	A_4-B_4	Align for maximum deflection across ½ discrim. load
14	F.M. Ant. Ter.	100 ohm	46 Mc.	"	46 Mc.	Adjust osc. cam gang shaft to scale osc.	Align for zero deflection across full discriminator load
15A	"	"	49 Mc.	"	49 Mc.	Z	Align for maximum deflection across ½ discriminator load
15B	"	"	43 Mc.	"	43 Mc.	P	Align for maximum deflection across ½ discriminator load
16	Adjust Tuning Meter			"	Clear of Sigs	Bias control	Adjust bias for tuning meter
	Remove 2nd I.F. tube (7C7) from socket. Adjust bias control until meter reads exactly center. Replace I.F. tube and check meter behavior on F.M. and A.M. signals.						
17	Set hum adjustment for minimum hum level. (Page 317)						



Tuning ranges:

540 to 1620 Kc.
5.6 to 18.5 Mc.
42 to 50 Mc. (F.M.)

Stage Gains
Bc. and I.F.

Ant. to R.F. grid 5× at 1000 Kc.

R.F. grid to conv. grid 5× at 1000 Kc.

Conv. grid to I.F. grid 41× at 455 Kc.

Overall audio 1286× at 1 watt.

AMP. MOD. I.F. FREQUENC
FREQ. MOD. I.F. FREQUEN
22 TUBE SUPERHETE
CHASSIS Nº 22BI 3 BAN

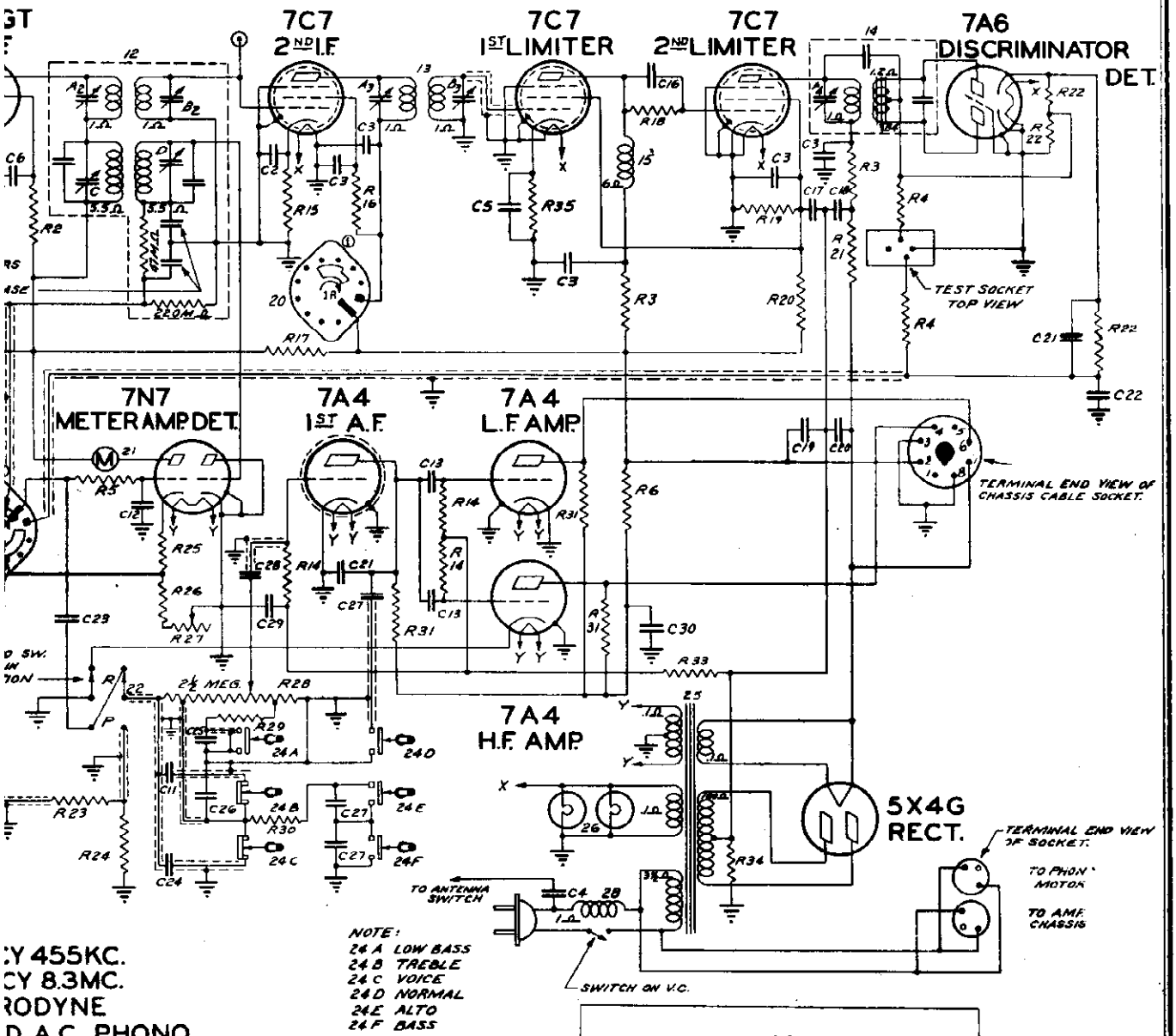
R. F. Chassis 22

12-10-41 C46 ADDED.
11-13-41 R17 WAS 63-606.
11-5-41 C14 WAS 22-1193; 19 WAS S9594
9-22-41 R35 & BY-PASS ADDED
9-8-41 C32 ADDED; R25 WAS 63-1204; R26 WAS 63-1205; #21 WAS 122-15.

DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION
C1	22-1224	THREE GANG VARIABLE		C27	22-1126	.01 MFD.	400V.	R20	63-957	33M OHM	1 W.	9	S8326	WAVE TRAP
C2	22-319	.005 MFD.	200V.	C28	22-188	.02 MFD.	400V.	R21	63-1211	82M OHM	2 W.	10	S9589	LOOP LOADING COIL
C3	22-229	.005 MFD.	600V.	C29	22-825	.1 MFD.	400V.	R22	63-260	100M OHM	½ W.	11	95-869	1ST I.F. TRANSFORMER
C4	22-162	.0001 MFD.	600V.	C30	22-719	16 MFD. ELECTROLYTIC	350V.	R23	63-652	120M OHM	½ W.	12	95-850	2ND I.F. "
C5	22-829	.05 MFD.	200V.	C31	22-1146	50 MMFD. COMP.	500V.	R24	63-661	680M OHM	½ W.	13	95-888	3RD I.F. "
C6	22-243	.01 MFD.	400V.	C32	22-887	.001 MFD.	600V.	R25	63-1212	1800 OHM	½ W.	14	95-788	DISCRIMINATOR
C7	22-182	.00025 MFD.	600V.	C46	22-852	30 MFD.	250V.	R26	63-395	600 OHM	½ W.	15	S10073	PLATE CHOKE
C8	22-868	COMPENSATING COND	300V.	R1	63-246	150 OHM	½ W.	R27	63-1251	VAR. RES.		16	S10325	AUTOMATIC TUNING
C9	22-1257	.005 MFD.	1000V.	R2	63-1159	39M OHM	1 W.	R28	63-1076	VOLUME CONTROL		17	S10334	AUTOMATIC TUNING
C10	22-492	.002 MFD.	600V.	R3	63-583	1000 OHM	½ W.	R29	63-648	47M OHM	½ W.	18	S9562	MANUAL F.M. OSC
C11	22-289	50 MMFD.	600V.	R4	63-597	470M OHM	½ W.	R30	63-767	47M OHM	½ W.	19	S10681	GRID PEAKING COIL
C12	22-826	.01 MFD.	200V.	R5	63-600	2.2 MEGOHM	½ W.	R31	63-595	100M OHM	½ W.	20	85-301	BAND SELECTOR
C13	22-828	.05 MFD.	400V.	R6	63-680	10M OHM	1 W.	R32	63-1188	39 M OHM	1 W.	21	122-16	TUNING METER
C14	22-1331	10 MMFD. COMP.	500V.	R7	63-742	180 OHM	½ W.	R33	63-604	10 MEGOHM	½ W.	22	85-283	PHONO-RADIO
C15	22-1139	50 MMFD. COMP.	500V.	R8	63-713	47M OHM	½ W.	R34	63-1094	33 OHM WIREWOUND	1 W.	23	169-92	PHONO PICKUP
C16	22-127	25 MMFD.	600V.	R9	63-773	180M OHM	½ W.	R35	63-418	1500 OHM	½ W.	24	S9606	TONE CONTROL
C17		5 MFD. ELECTROLYTIC	300V.	R10	63-719	470M OHM	½ W.					25	95-879	POWER TRANS.
C18	22-1178	15 MFD. "	250V.	R11	63-1065	15M OHM	1 W.					26	100-36	DIAL LIGHT 6.3 V.
C19		30 MFD. "	450V.	R12	63-572	15 OHM	½ W.	1		WAVEMAGNET ASSEMBLY		27	85-238	ANTENNA CHANGEOVER
C20	22-1124	30 MFD.	450V.	R13	63-587	4700 OHM	½ W.	2	S10267	S.W. ANTENNA COIL ASSEMBLY		28	S10313	LINE CHOKE
C21	22-1138	.0005 MFD.	600V.	R14	63-271	1 MEGOHM	½ W.	3		F.M. ANTENNA " "				
C22	22-1203	.001 MFD.	600V.	R15	63-633	680 OHM	½ W.	4	S9823	OSCILLATOR " " (A.M.)				
C23	22-199	.5 MFD.	200V.	R16	63-656	270M OHM	½ W.	5	S9847	DETECTOR COIL ASSEM. (A.M.)		A		1ST I.F. TRANS. PRI
C24	22-365	.0001 MFD.	600V.	R17	63-1105	1000 OHM	2 W.	6	S9066	R.F. " " (F.M.)		B		1ST I.F. " SEC
C25	22-1127	.02 MFD.	400V.	R18	63-599	1.5 MEGOHM	½ W.	7		DETECTOR " " (F.M.)		C		2ND I.F. " PRI
C26	22-1137	.00015 MFD.	600V.	R19	63-1102	15M OHM	½ W.	8	S-9850	COIL & RES. ASSEMBLY		D		2ND I.F. " SEC

DIO CORP.

MODELS 22H698, 22H699
Chassis 22B1

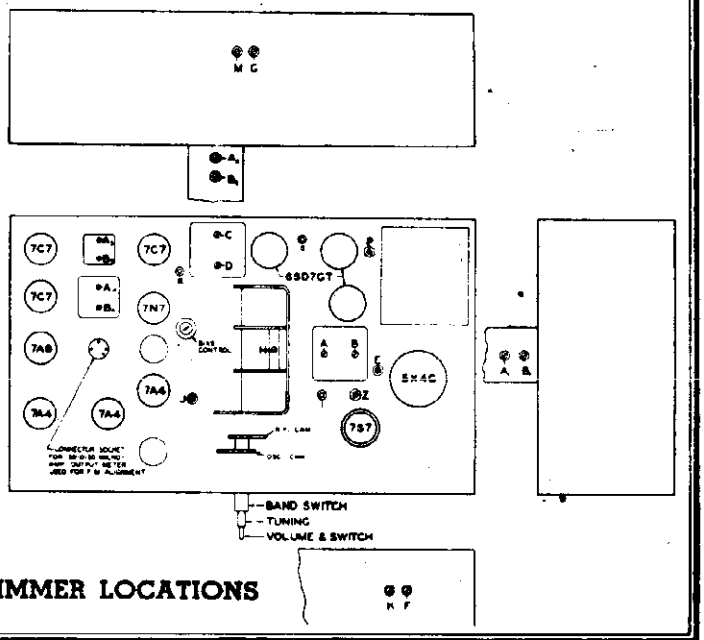


NOTE:
24 A LOW BASS
24 B TREBLE
24 C VOICE
24 D NORMAL
24 E ALTO
24 F BASS

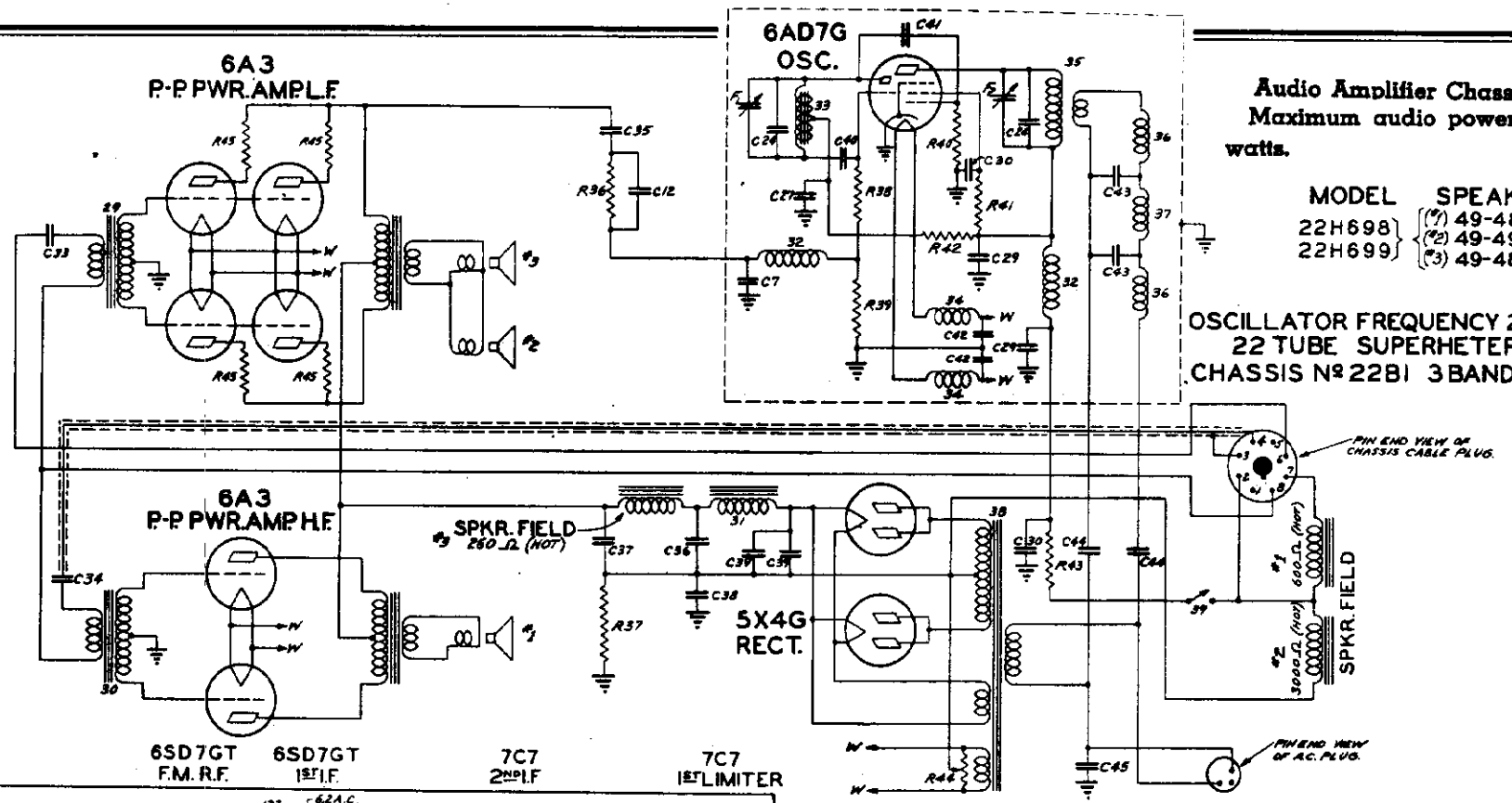
:Y 455KC.
:Y 8.3MC.
RODYNE
D A.C. PHONO

1 FOR A-F AMPLIFIER AND OTHER DATA SEE INDEX

	DIAG. Nº	PART Nº	DESCRIPTION
	A_1		1ST I.F. TRANS. PRI. (F.M.)
	B_1		1ST I.F. " SEC. (F.M.)
	A_2		2ND I.F. " PRI. (F.M.)
	B_2		2ND I.F. " SEC. (F.M.)
	A_3		3RD I.F. " PRI. (F.M.)
(F.M.)	B_3		3RD I.F. " SEC. (F.M.)
ITER)	A_4		DISCRIMINATOR I.F. TRANS. PRI.
WIT(BC)	B_4		DISCRIMINATOR I.F. " SEC.
IT(F.M.)	E	22-1015	WAVE TRAP
L	F		BROADCAST OSC. (NOTE 1)
	G		BROADCAST ANT. (NOTE 2)
H	H		BROADCAST DET. (ON GANG)
	J	22-1227	BROADCAST PADDER
	K		SHORTWAVE OSC. (NOTE 1)
	M		SHORTWAVE ANT. (NOTE 2)
ISEM.	P		U.H.F. DET.
	Z		U.H.F. ANT.
P5 A. SW.		NOTE	(1) TRIMMERS F & K ARE MOUNTED ON STRIP #22-1045 (2) TRIMMERS G & M ARE MOUNTED ON STRIP #22-1033



TUBE AND TRIMMER LOCATIONS



Audio Amplifier Chassis 22B1
Maximum audio power output 50 watts.

MODEL	SPEAKER
22H698	(#1) 49-488 6"
22H699	(#2) 49-490 12"
	(#3) 49-489 12"

OSCILLATOR FREQUENCY 240-260 KC.
22 TUBE SUPERHETERODYNE
CHASSIS Nº 22B1 3 BAND A.C. PHONO

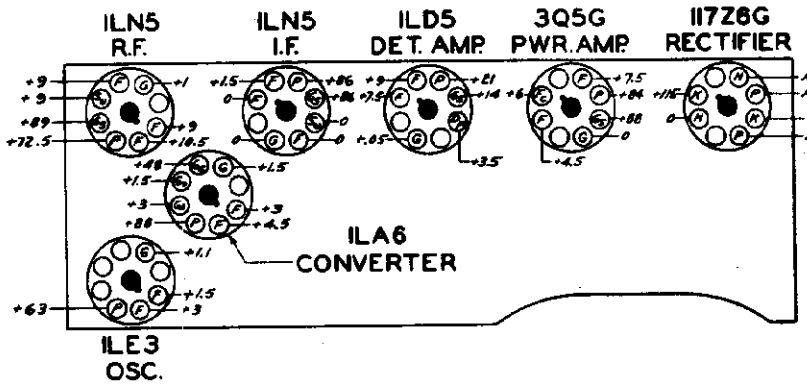
DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION	
C7	22-182	.00025 MFD.	600 V.	C43	22-1207	.07 MFD.	200 V.
C12	22-526	.01 MFD.	200 V.				
C24	22-365	.0001 MFD.	600 V.				
C27	22-1126	.01 MFD.	400 V.				
C29	22-825	.1 MFD.	400 V.	R36	63-647	39 M OHM	½ W.
C30	22-719	16 MFD. ELECTROLYTIC	350 V.	R37	63-1263	1000 OHM CANDOHM	5 W.
C33	22-966	.04 MFD.	600 V.	R38	63-646	33 M OHM	½ W.
C34	22-1135	.005 MFD.	600 V.	R39	63-311	15 M OHM	½ W.
C35	22-417	.1 MFD.	600 V.	R40	63-718	330 M OHM	½ W.
C36	22-1304	(25 MFD. ELECTROLYTIC	450 V.	R41	63-1059	39 M OHM	½ W.
C37		30 MFD. "	450 V.	R42	63-150	10 M OHM	½ W.
C38	22-893	20 MFD. ELECTROLYTIC	200 V.	R43	63-1193	5600 OHM	2 W.
C39	22-1303	15 MFD. "	450 V.	R44	63-1270	HUM CONTROL	
C40	22-716	.0005 MFD.	600 V.	R45	63-577	100 OHM	½ W.
C41	22-954	.00035 MFD.	600 V.				
C42	22-827	.1 MFD.	200 V.				
C43	22-1302	.01 MFD.	600 V.	29	95-866	AUDIO TRANS. (BASS)	
C44	22-670	.1 MFD.	400 V.	30	95-865	AUDIO " (TREBLE)	
				31	95-254	FILTER CHOKE	
				32	S10277	R.F. CHOKE	
				33	S10633	OSCILLATOR COIL	
				34	S10278	FILAMENT CHOKE	
				35	S10271	LINE COUPLING COIL	
				36	S10280	LINE FILTER COIL	
				37	S10275	LINE FILTER COIL	
				38	95-867	POWER TRANS. 50-60~ 117 V.	
				39	85-134	OSCILLATOR ON-OFF SWITCH	
				F_1 F_2	22-1089	OSCILLATOR FREQ. AMPLIFIER TUNING	

Volume control full on.

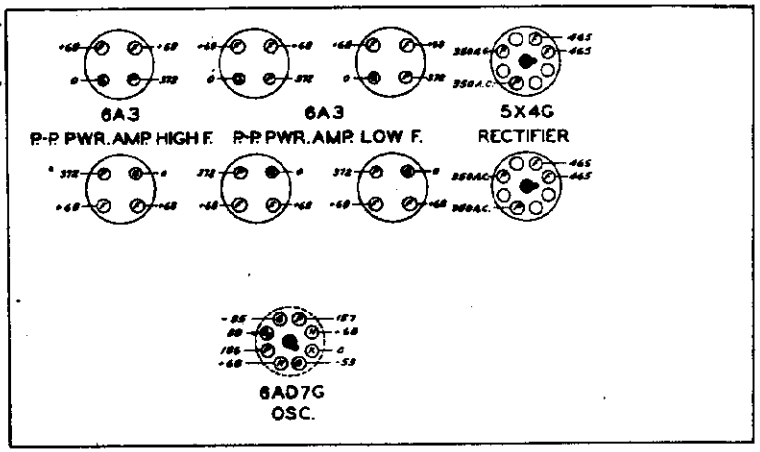
Line voltage 117 A.C. 60 cycle

Power consumption 325 watts.

Phono motor 25 watts additional.

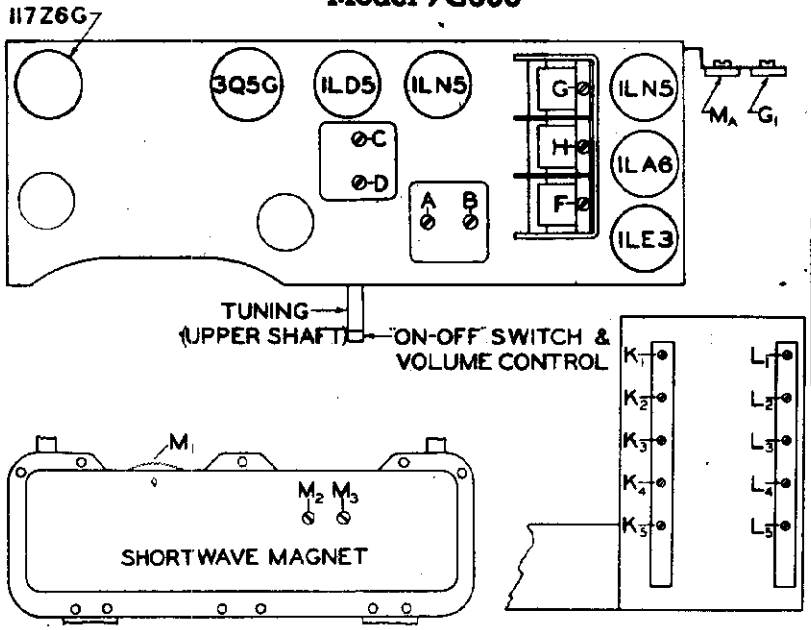


SOCKET VOLTAGES—BOTTOM SIDE UP



SOCKET VOLTAGES—BOTTOM SIDE UP

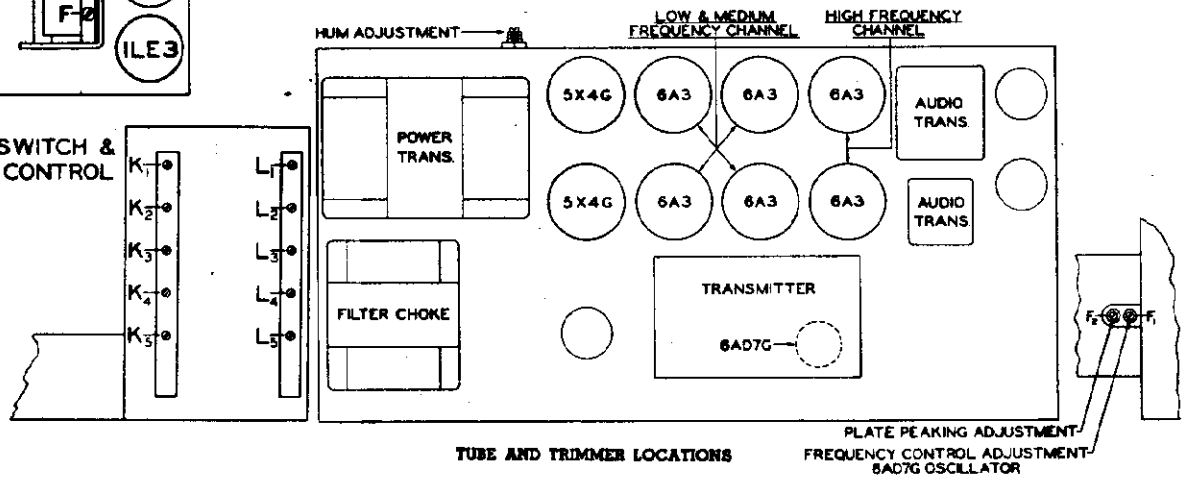
Model 7G605



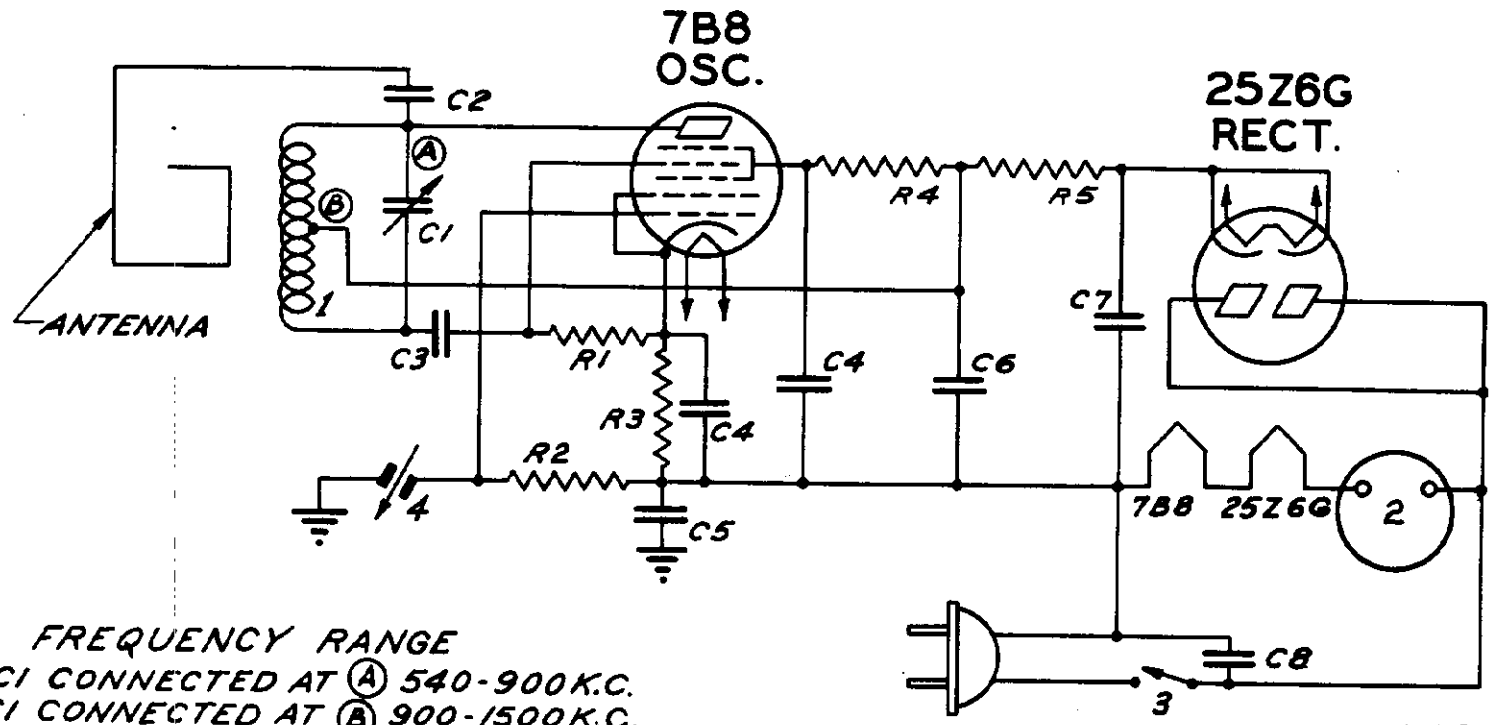
TUBE AND TRIMMER LOCATIONS

Models 22H698 and 22H699

Chassis 22B1—Phono
Audio Amplifier Section



TUBE AND TRIMMER LOCATIONS



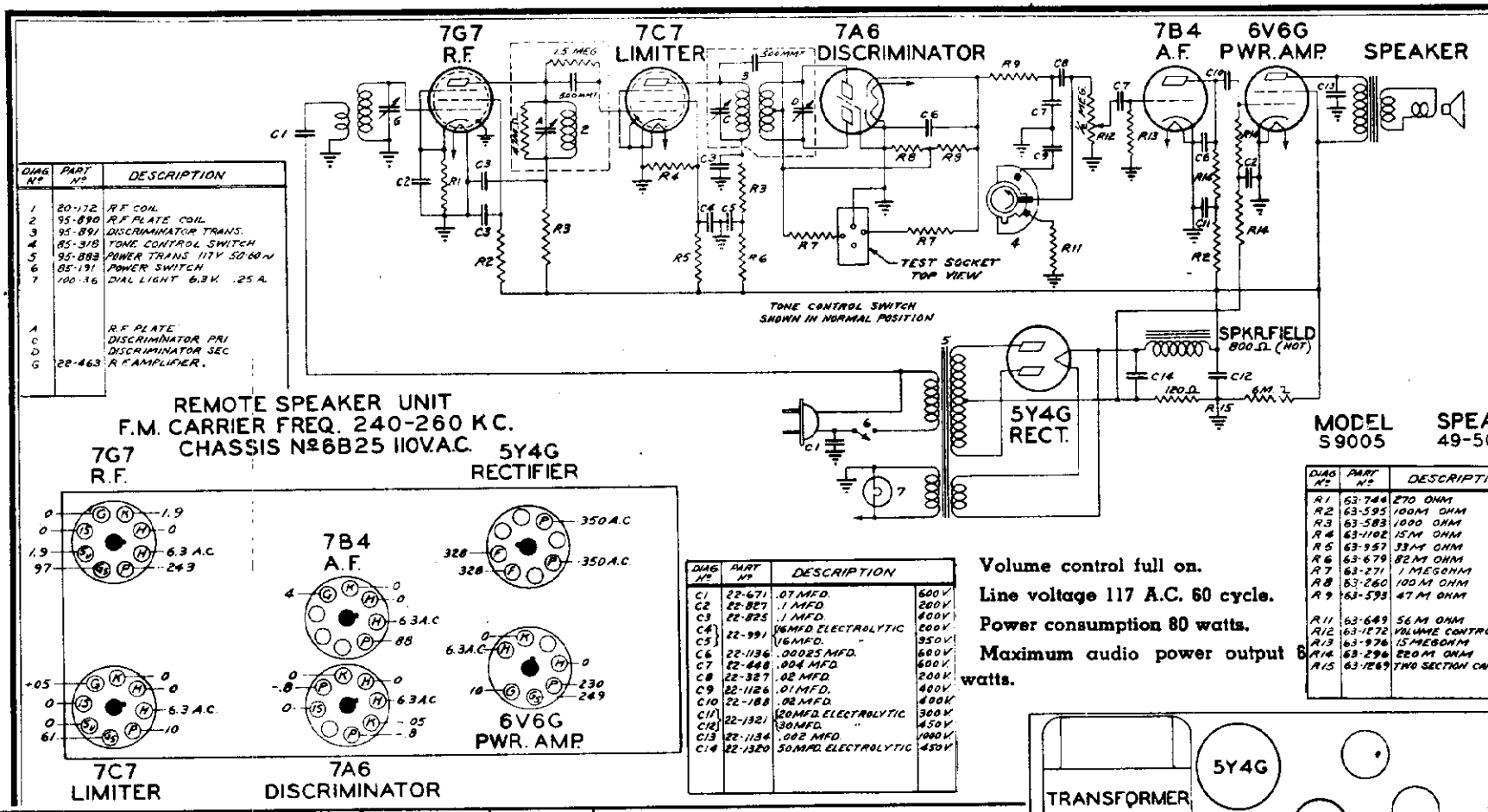
FREQUENCY RANGE
C1 CONNECTED AT (A) 540-900K.C.
C1 CONNECTED AT (B) 900-1500K.C.

DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-690	TUNING CONDENSER		R2	63-464	1 MEGOHM	1/4 W.
C2	22-127	25 MMFD.	600 V.	R3	63-581	470 OHM	1/4 W.
C3	22-182	.00025 MFD.	600 V.	R4	63-707	4700 OHM	1/4 W.
C4	22-829	.05 MFD.	200 V.	R5	63-964	4700 OHM	1/2 W.
C5	22-827	.1 MFD.	200 V.				
C6	22-1061	8 MFD. ELECTROLYTIC	150 V.				
C7		16 MFD. "	150 V.	1	S8611	OSC. COIL ASSEM.	
C8	22-1017	.05 MFD.	400 V.	2	141-85	MOTOR (60~)	
				3	85-191	A.C. SWITCH	
				4	142-50	PICKUP-MODEL-S9001	
R1	63-593	47M OHM	1/4 W.		142-51	PICKUP-MODEL-S9002	

PHONOGRAPH OSCILLATOR
ZENITH RADIO CORPORATION
CHICAGO, ILL.

ZENITH RADIO CORP.

MODELS
S9001
S9002



DIAG Nº	PART Nº	DESCRIPTION
1	20-172	R.F. COIL
2	95-890	R.F. PLATE COIL
3	95-891	DISCRIMINATOR TRANS.
4	85-318	TONE CONTROL SWITCH
5	95-883	POWER TRANS 117V 50-60~
6	85-191	POWER SWITCH
7	100-16	DIAL LIGHT 6.3V. .25 A.
A		R.F. PLATE
C		DISCRIMINATOR PRI
D		DISCRIMINATOR SEC
G	22-463	R.F. AMPLIFIER.

REMOTE SPEAKER UNIT
F.M. CARRIER FREQ. 240-260 KC.
CHASSIS Nº6B25 110V.A.C.

DIAG Nº	PART Nº	DESCRIPTION	
C1	22-671	.07 MFD.	600 V.
C2	22-827	.1 MFD.	200 V.
C3	22-825	.1 MFD.	400 V.
C4	22-991	16 MFD. ELECTROLYTIC	200 V.
C5		16 MFD. "	350 V.
C6	22-1136	.00025 MFD.	600 V.
C7	22-448	.004 MFD.	600 V.
C8	22-327	.02 MFD.	200 V.
C9	22-1126	.01 MFD.	400 V.
C10	22-188	.02 MFD.	400 V.
C11	22-1321	20 MFD. ELECTROLYTIC	300 V.
C12		30 MFD. "	450 V.
C13	22-1134	.002 MFD.	1000 V.
C14	22-1320	50 MFD. ELECTROLYTIC	450 V.

Volume control full on.

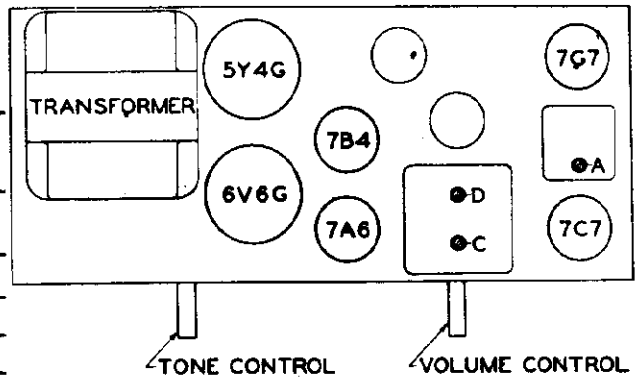
Line voltage 117 A.C. 60 cycle.

Power consumption 80 watts.

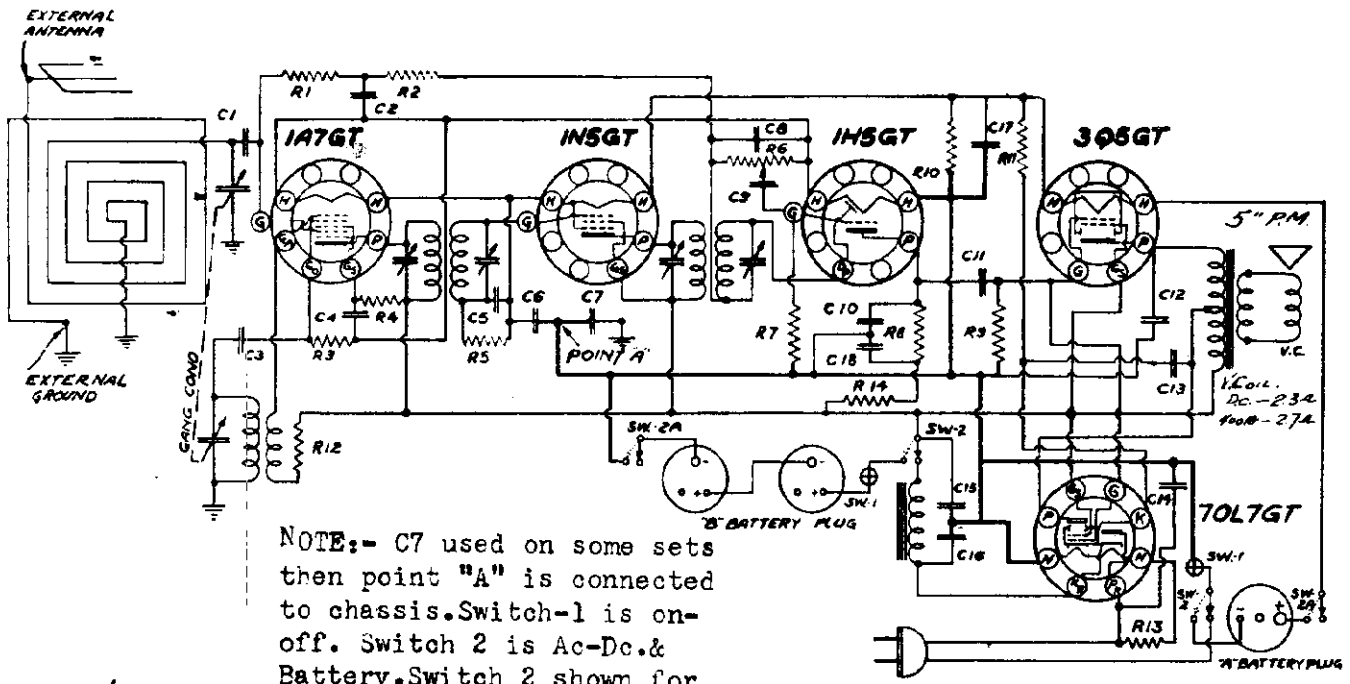
Maximum audio power output 6 watts.

MODEL S9005 SPEAKER 49-506 10"

DIAG Nº	PART Nº	DESCRIPTION	
R1	63-744	270 OHM	½ W.
R2	63-595	100M OHM	½ W.
R3	63-583	1000 OHM	½ W.
R4	63-1102	15M OHM	½ W.
R5	63-957	33M OHM	1 W.
R6	63-679	82M OHM	1 W.
R7	63-271	1 MEGOHM	½ W.
R8	63-260	100M OHM	½ W.
R9	63-593	47M OHM	½ W.
R11	63-649	56M OHM	½ W.
R12	63-1272	VOLUME CONTROL	
R13	63-976	1.5 MEGOHM	½ W.
R14	63-296	220M OHM	½ W.
R15	63-1269	TWO SECTION CANDOHM	



Operation	Connect oscillator to	Dummy Antenna	Input Sig. Frequency	Trimmers	Purpose
1	Coil side of C1. See Schematic	.5 mfd.	250 Kc.	C	Align for max. deflec. across ½ discrim. load
2	"	"	"	D	Align for zero deflec. across full discrim. load
3	"	"	"	A	Align for max. deflec. across ½ discrim. load
4	"	"	"	G	Align for max. deflec. across ½ discrim. load
5	Repeat step No. 2 and then remove oscillator leads.				
6	If the tone quality of the remote speaker is impaired, the frequency of the 6AD7G transmitter will have to be reset in the following manner: Align F. (see 22B1 trimmer locations) for zero deflection across the full discriminator load of the remote receiver and then align F. for maximum deflection across ½ of the discriminator load. If F. tunes broad it is an indication that the remote speaker is located too close to the transmitter and the action of the limiter is masking the correct peak adjustment.				



NOTE:- C7 used on some sets then point "A" is connected to chassis. Switch-1 is on-off. Switch 2 is Ac-Dc.& Battery. Switch 2 shown for Ac.-Dc. I.F. 455 KC.

9/39

I.F. 455 KC

Switch 2A not used in some Models

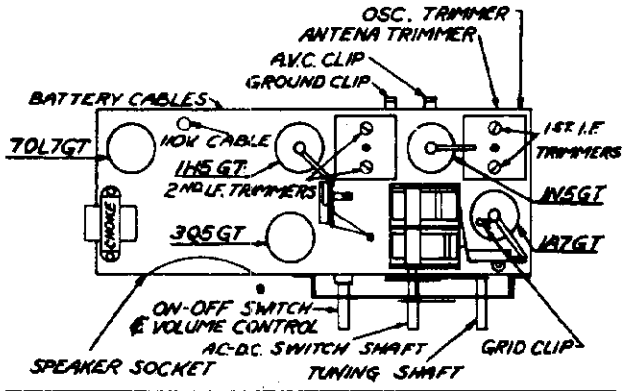


Fig. 1—Top View

TUBE FUNCTIONS
1A7GT- MIXER-OSCILLATOR
1N5GT- I.F. AMPLIFIER
1H5GT- 2ND DET-AVC-1ST A.F.
3Q5GT- OUTPUT
70L7GT-RECTIFIER

FOR CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII.
TRIM OSC- 1550 KC, TRIM ANT- 1400 KC
PAD- 600 KC

CONDENSERS

C1 -	.002	mfd. 600 volt
C2 -	.05	mfd. 400 volt
C3 -	.00005	mfd. mica
C4 -	.05	mfd. 400 volt
C5 -	.002	mfd. 600 volt
C6 & C17-	40-40	mfd. 25 volt elect.
C7 -	.25	mfd. 200 volt (used in 5NL only)
C8 -	.00025	mfd. mica
C9 -	.01	mfd. 400 volt
C10-	.00025	mica
C11-	.01	mfd. 400 volt
C12-	.002	mfd. 600 volt
C13-	.01	mfd. 400 volt
C14-	.05	mfd. 400 volt
C15 C16-	20-30	mfd. 150 volt elect.
C18-	.1	mfd. 200 volt
		Gang Condenser
		Trimmer Condenser

RESISTORS

R1 -	2,000,000	ohm ½ watt
R2 -	2,000,000	ohm ½ watt
R3 -	200,000	ohm ½ watt
R4 -	25,000	ohm ½ watt
R5 -	5,000,000	ohm ½ watt
R6 -	1,000,000	ohm Volume Control & Switch
R7 -	5,000,000	ohm ½ watt
R8 -	250,000	ohm ½ watt
R9 -	500,000	ohm ½ watt
R10-	1,000	ohm ½ watt 10%
R11-	30	ohm ½ watt 10%
R12-	750	ohm ½ watt
R13-	335	ohm 10 watt
R14-	100,000	ohm ½ watt

MODEL L-65

LAUREHK MFG. CO.

ALIGNMENT PROCEDURE

GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 456, 600, 1400 and 1720 KC and an output meter 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. Remove the chassis from the cabinet and set on a bench taking care that no iron or other metal is near the loop. Do not make this setup on a metal bench. The intermediate frequency (I.F.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the broadcast band should be adjusted.

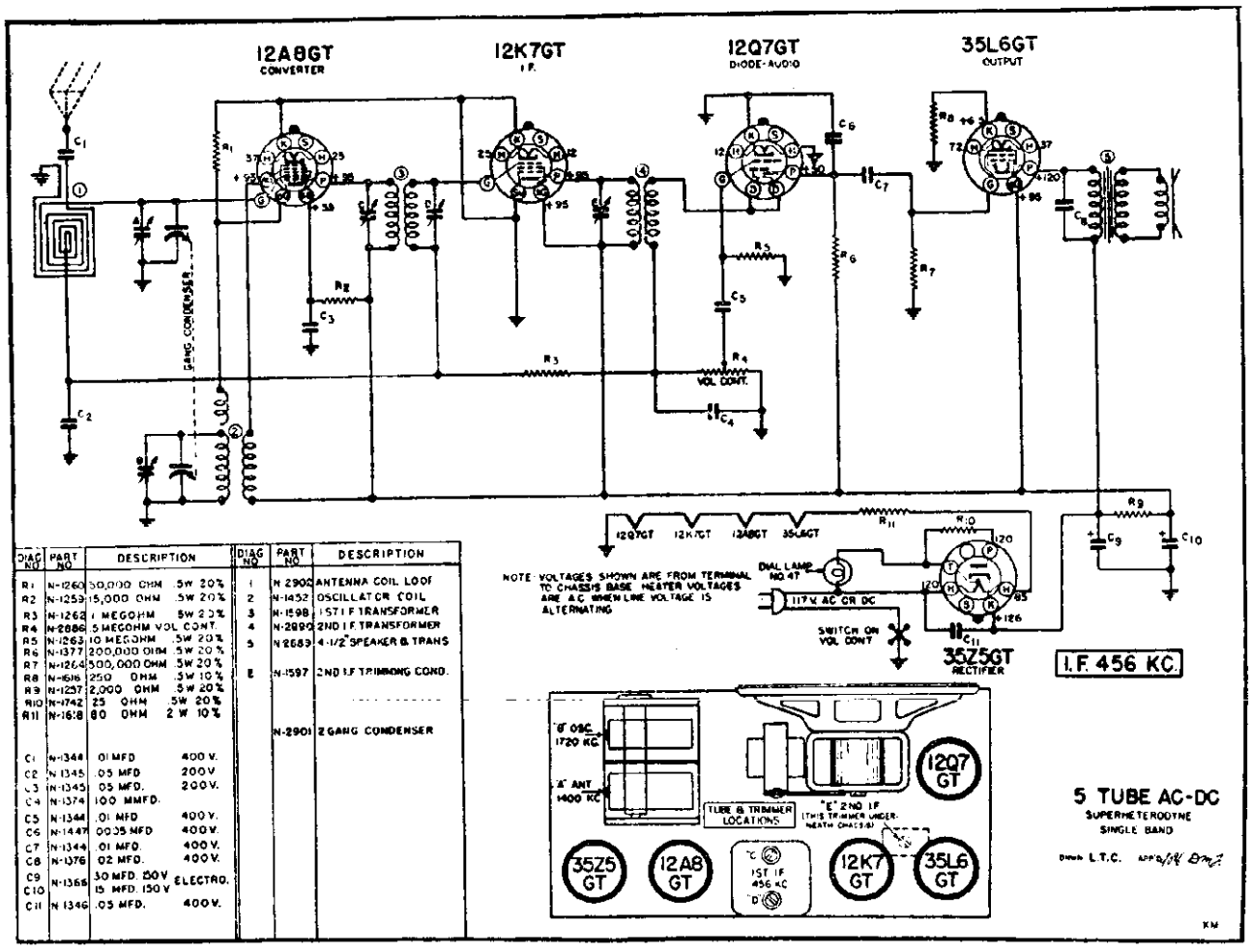
I. F. ALIGNMENT. With the gang condenser set at minimum, adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tube (12A8GT) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the chassis ground. Align all three I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT. Connect the test oscillator to the antenna of the set through a 200 mmfd. (.0002) condenser. With the gang condenser set at minimum capacity, set the test oscillator at 1720 K.C. and adjust the oscillator (or 1720 KC trimmer) on gang condenser. Next—set the test oscillator at 1400 KC, and tune in the signal on the gang condenser. Adjust the antenna trimmer (or 1400 KC trimmer) for maximum signal. Next set the test oscillator at 600 KC, and tune in signal on condenser to check alignment of coils.

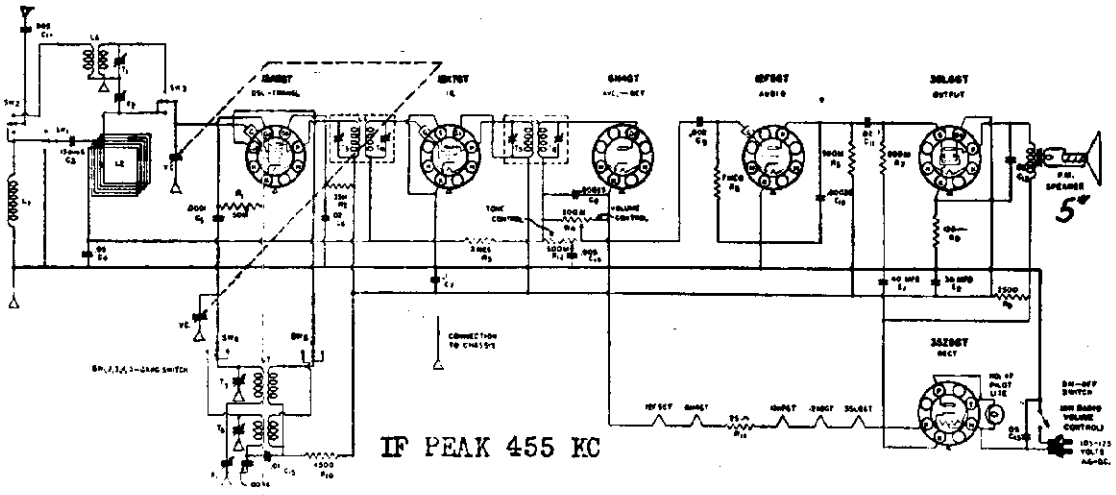
Voltages shown on the circuit diagram are from socket terminals to chassis base. In measuring voltages use a voltmeter having a resistance of at least 1000 ohms per volt. Allowances should be made for variations in line voltage.

Lack of sensitivity and poor tone quality may be due to any one or a combination of causes such as weak or defective tubes or speaker, open or grounded bias resistor, bypass condenser, etc. Never attempt to realign set until all other possible sources of trouble have been first thoroughly investigated and definitely proved not to be the cause.

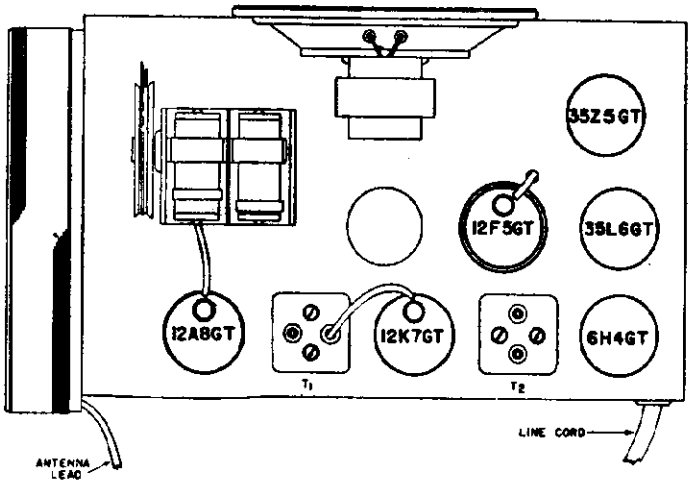
NOTE: IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OUTPUT MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER AND THAT THE PROCEDURE BE CAREFULLY FOLLOWED, OTHERWISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT. THE TRIMMERS WILL BE REFERRED TO BY THEIR FUNCTION AS INDICATED ON THE PARTS DIAGRAM.



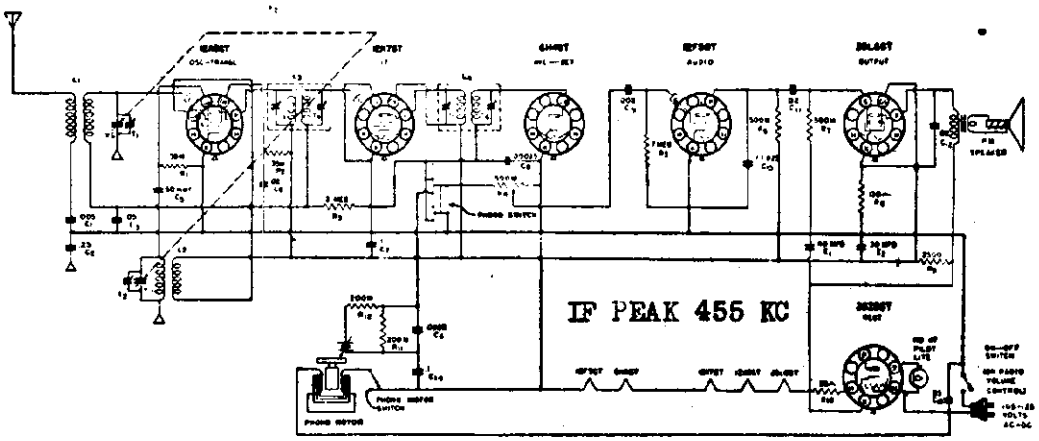
DIAG NO	PART NO	DESCRIPTION	DIAG NO	PART NO	DESCRIPTION
R1	N-1260	50,000 OHM .5W 20%	1	N-2900	ANTENNA COIL LOOP
R2	N-1253	15,000 OHM .5W 20%	2	N-1452	OSCILLATOR COIL
R3	N-1262	1 MEGOHM .5W 20%	3	N-1598	1ST I.F. TRANSFORMER
R4	N-2886	.5 MEGOHM VOL CONT.	4	N-2899	2ND I.F. TRANSFORMER
R5	N-1263	10 MEGOHM .5W 20%	5	N-2689	4-1/2" SPEAKER & TRANS
R6	N-1377	200,000 OHM .5W 20%			
R7	N-1264	500,000 OHM .5W 20%			
R8	N-1616	250 OHM .5W 10%	E	N-1597	2ND I.F. TRIMMING COND.
R9	N-1257	2,000 OHM .5W 20%			
R10	N-1742	25 OHM .5W 20%			
R11	N-1618	80 OHM 2 W 10%			
				N-2901	2 GANG CONDENSER
C1	N-1344	.01 MFD 400 V.			
C2	N-1345	.05 MFD 200 V			
C3	N-1345	.05 MFD. 200 V.			
C4	N-1374	100 MMFD.			
C5	N-1344	.01 MFD 400 V.			
C6	N-1441	.0035 MFD 400 V.			
C7	N-1344	.01 MFD. 400 V.			
C8	N-1376	.02 MFD. 400 V.			
C9	N-1368	30 MFD. 150 V ELECTRO.			
C10		15 MFD. 150 V			
C11	N-1346	.05 MFD. 400 V.			



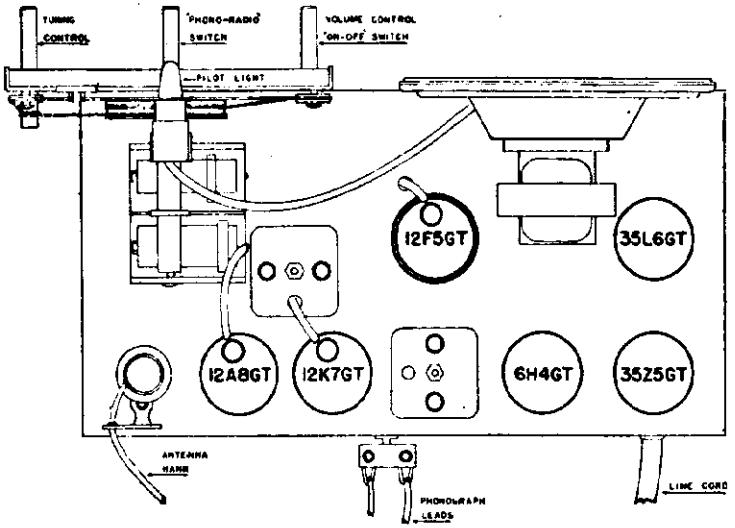
MODEL 440



MODEL 440



MODEL 740



MODEL 740

MODELS 463,464,465, 468,469,470,471

REMLER CO., LTD.

MODELS 463, 464, 465
469, 469, 470, 471

DESCRIPTION

These are six tube superheterodyne receivers designed for use on 110-120 volts, 50 or 60 cycles, alternating current. The basic circuit of these models is the same and the following general instructions apply to all above listed models.

INSTALLATION

This receiver may be used with the Built-In antenna where receiving conditions are favorable. Where greater distance is required, or where receiving conditions are not satisfactory with the Built-In antenna, an outside antenna may be used. This outside antenna should be from 50 to 100 feet in length and should be connected to the blue wire accessible at the back of the cabinet. This antenna should be run in as straight a line as possible and be kept clear of wires or other metal objects. A good ground connection to a water pipe is essential for clearest reception. The ground lead should be connected to the black wire extending from the rear of the chassis.

CONTROLS

The control on the left side of the cabinet is the volume control and ON and OFF switch when in the extreme left position. Next to the volume control is the tone control which controls the high frequency response. When turned to the left the full tone range of the program is reproduced. Turning the control to the right diminishes the higher frequency response. A position approximately one quarter turn from the left is satisfactory for most programs. On the right of the receiver is located the station selector, or tuning control. On receiver models 465, and 471 a small switch knob below the middle of the dial controls the bass and treble response. When turned to the left the lower frequency response is reduced. In this position reproduction of the voice frequencies is generally improved. When the switch is turned to the right the bass response is emphasized. This condition is usually more acceptable for musical programs. An operation switch is provided on models 465 and 471 for changing the functions of the receiver as noted on the control escutcheon. On the back of the chassis an antenna switch is provided for changing the connections of the receiver to the Built-In antenna or to the Outside Antenna when one is connected.

OPERATION

With the line cord connected turn the volume control about one half turn to the right and allow about one half minute for the tubes to properly heat. Select the desired station with the tuning control, varying the control until the tuning indicator produces the narrowest shadow. Adjust the volume control to the desired level and the tone control for the most pleasing response. For best quality be certain the station is properly tuned in as indicated by the tuning indicator.

AUTOMATIC PUSH BUTTON TUNING - MODELS 464, 469 and 470

The push buttons are adjusted for selecting five stations as indicated by the call letters over the buttons. To receive any one of these stations, turn on the receiver as described above and depress the button corresponding to the desired station. Adjust the volume to the intensity required. To use the tuning control for selecting the stations, depress the DIAL button. Directions for changing the push button station set up are attached to the bottom of the cabinet.

PHONOGRAPH COMBINATION MODEL 465

This model is provided with a record player which reproduces up to 12 inch recordings with the cabinet top closed. To change to phonograph operation turn the operation switch to the Phono position and after turning up the volume - ON and OFF switch, start the motor with the motor switch located in the top of the cabinet. Volume and tone may be adjusted as with the radio operation.

SERVICE DATA

The antenna switch on the back of the receiver changes the input circuit to either the enclosed loop antenna or to an outside aerial. The trimmer for this circuit is on the rear section of the variable condenser, while the oscillator trimmer is on the front section of the variable condenser. Trimmers for the I.F. circuits are adjustable through holes on the tops of the I.F. transformer shields. The intermediate frequency is 455 K.C.

Trimmers for the push button circuits are accessible through an opening in the bottom of the cabinet. The lowest frequency range sections are on the left.

The following tubes are used in this receiver:

6SA7 - Mixer Oscillator
6SK7 - I.F. Amplifier
6SQ7 - Detector - A.F. Amplifier
6V6GT - Power Amplifier
6X5G - Rectifier
6U5 - Tuning Indicator
6J7 - Microphone Amplifier (Model 471)
Type 46 dial lamps

Voltage Readings

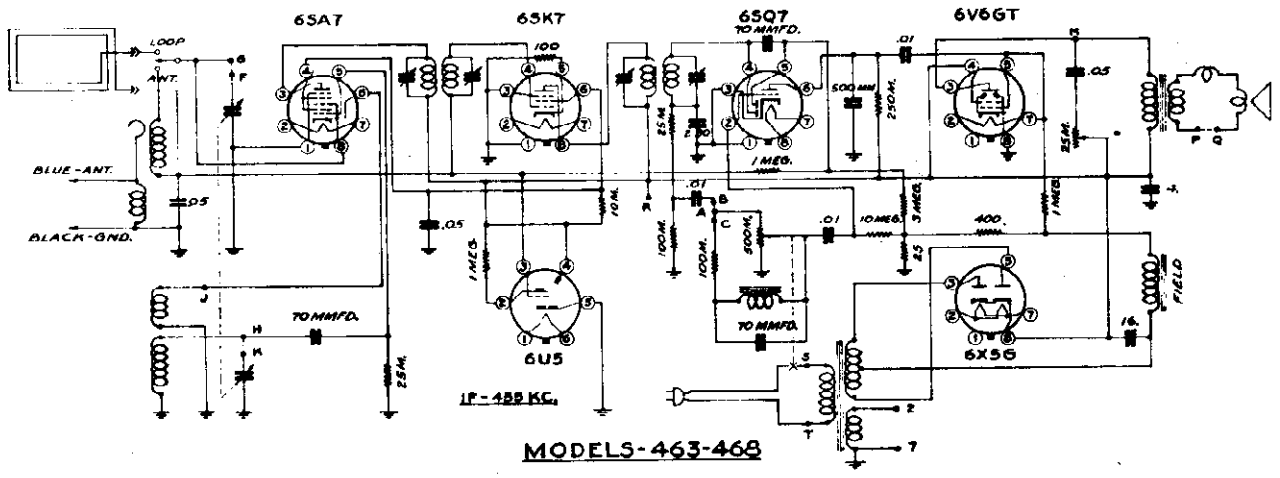
A.C. Voltages

Line	120 volts
Heater	6 volts

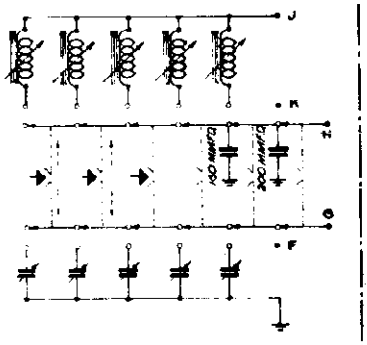
D.C. Voltages

From Ground to-		
6X5G	Cathode	235 volts
6V6GT	Plate	225 "
6V6GT	Screen	235 "
6V6GT	Grid Bias Supply	18 "
6SQ7	Plate	110 "
6SQ7	Grid Bias Supply	1.1 "
6SK7	Plate	235 "
6SK7	Screen	105 "
6SK7	Cathode	1.3 "
6SA7	Plate	235 "
6SA7	Screen	105 "
6J7	Plate	20 "
6J7	Screen	20 "
6J7	Cathode	0 "

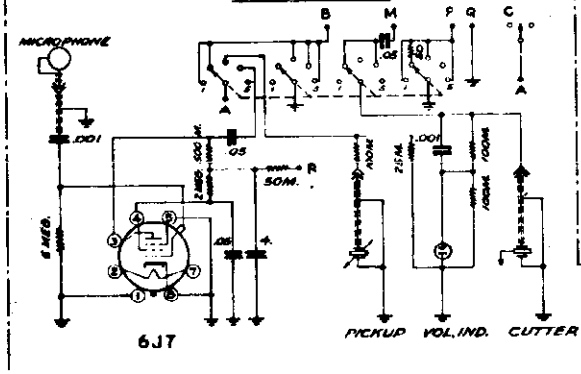
Readings with 1000 ohm per volt meter.



MODELS-463-468

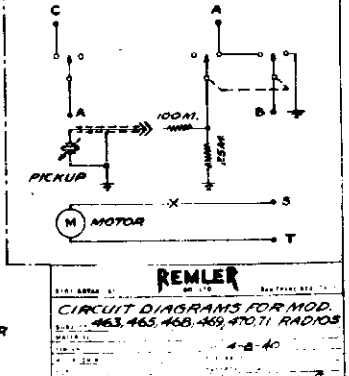


MODELS-469-70



MODEL-471

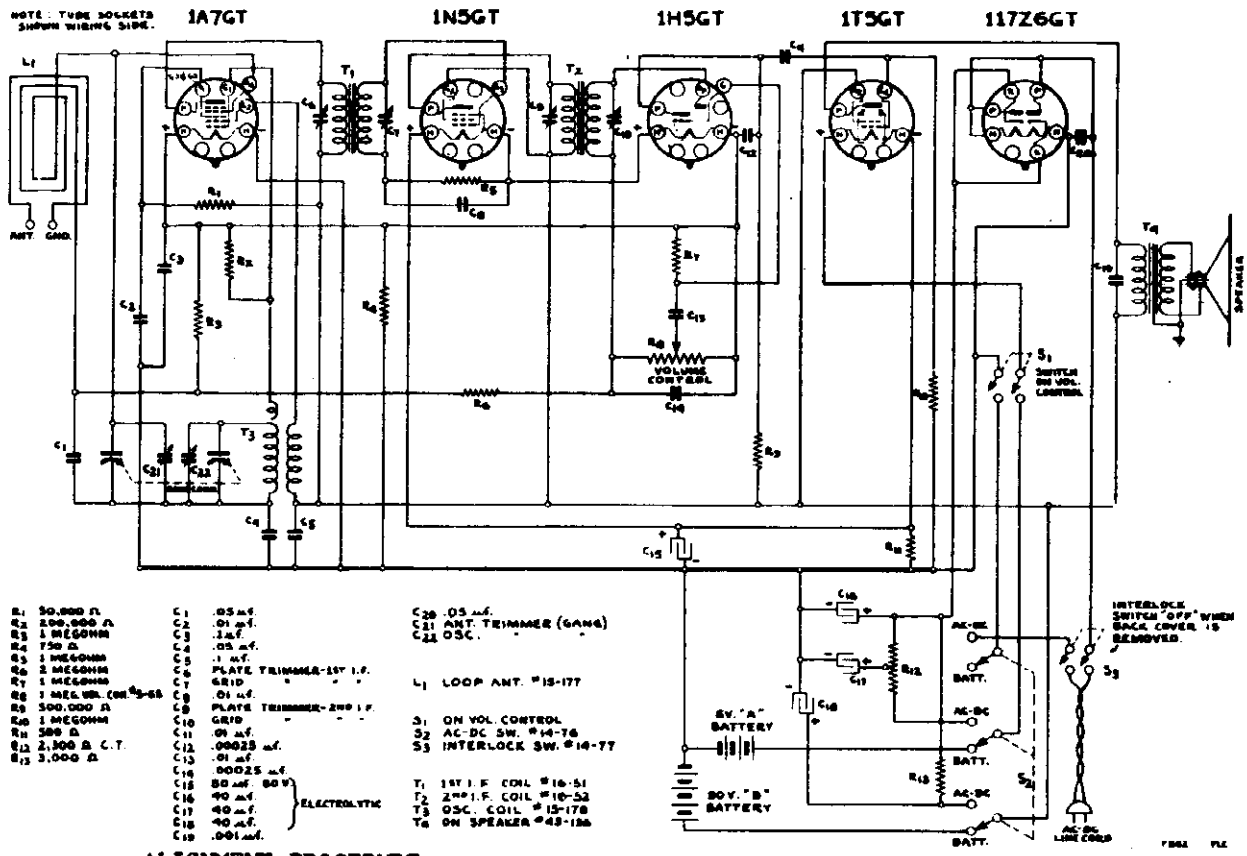
Beginning Sr 122447



MODEL-465

REMLER
CIRCUIT DIAGRAMS FOR MOD. 463, 465, 468, 469, 470, 71 RADIOS
4-8-40
Dwg No

TRAV-LER RADIO & TELEV. CORP.

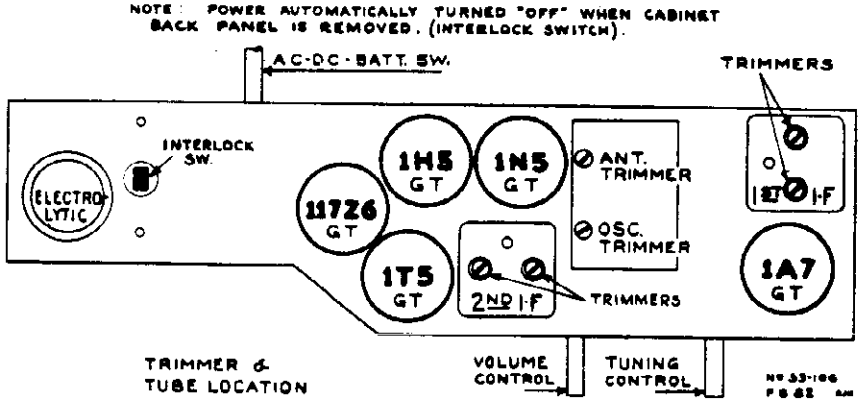


ALIGNMENT PROCEDURE:

Set the pointer to 1500 K. C. Connect the generator leads to the 1A7G grid and to the chassis thru a .1 Mfd. condenser. Adjust the I.F. trimmers for maximum output indication.

Connect the generator leads to the 1A7G grid and to the chassis thru a .1 Mfd. condenser. Set the signal generator at 1400 KC., and set the receiver pointer at 1400 KC. Adjust the BC. oscillator shunt trimmer for resonance.

Couple the generator loosely to the set and adjust the BC. loop antenna trimmer at 1400 KC. for maximum output.

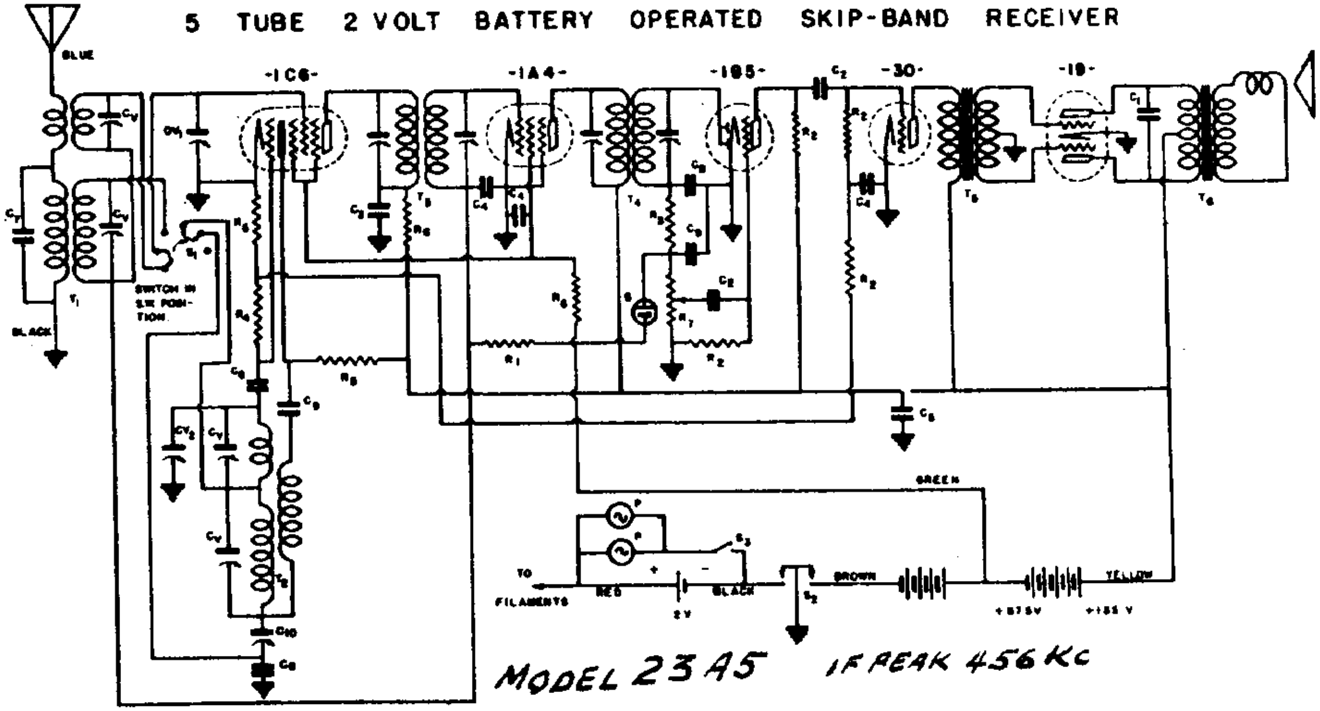


TECHNICAL INSTRUCTIONS:

A good output meter should be used in all alignment adjustments. This meter should be of the high resistance A. C. type, and is connected across the voice coil of the speaker, using the low voltage range of the meter. (0 to 1.5 or 2 volts). Use the lowest possible readings in order to minimize the A. V. C. effect.

ZEPHYR RADIO CO.

5 TUBE 2 VOLT BATTERY OPERATED SKIP-BAND RECEIVER



MODEL 23A5 IF PEAK 456 KC

LEGEND	OUR PART NO	DESCRIPTION
C_1	210	.006 MFD. 600 V. TUBULAR CONDENSER
C_2	211	.01 MFD. 400 V. TUBULAR CONDENSER
C_3	212	.05 MFD. 200 V. TUBULAR CONDENSER
C_4	203	.1 MFD. 200 V. TUBULAR CONDENSER
C_5	214	.25 MFD. 200 V. TUBULAR CONDENSER
C_6	410	.0015 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

CV_{1-2}	612	2 GANG VARIABLE CONDENSER
CV	600	5-30 MMFD. TRIMMER CONDENSER
R_1	118	1 MEGOHM ½ WATT CARBON RESISTOR
R_2	117	½ MEGOHM ½ WATT CARBON RESISTOR
R_3	113	50,000 OHM ½ WATT CARBON RESISTOR
R_4	111	25,000 OHM ½ WATT CARBON RESISTOR
R_5	109	10,000 OHM ½ WATT CARBON RESISTOR
R_6	134	2,000 OHM ½ WATT CARBON RESISTOR
R_7	[illegible]	500,000 VOLUME CONTROL
P	2901	MAZDA #46 PILOT LIGHTS

T_1	3225	SKIP-BAND ANTENNA COIL
T_2	1412	SKIP-BAND OSCILLATOR COIL
T_3	1503	INPUT I.F. TRANSFORMER
T_4	1507	DIODE I.F. TRANSFORMER
T_5	[illegible]	INTERSTAGE TRANSFORMER
T_6	[illegible]	P.M. DYNAMIC SPEAKER TRANSFORMER
S_1	1020	BAND SELECTOR SWITCH
S_2	—	LINE SWITCH ON VOLUME CONTROL
S_3	—	PILOT LIGHT ECONOMIZER SWITCH
B	[illegible]	BIAS BUTTON