SERVICE MANUAL

ZENITH
LONG DISTANCE RADIO

1937 RECEIVERS

MODELS

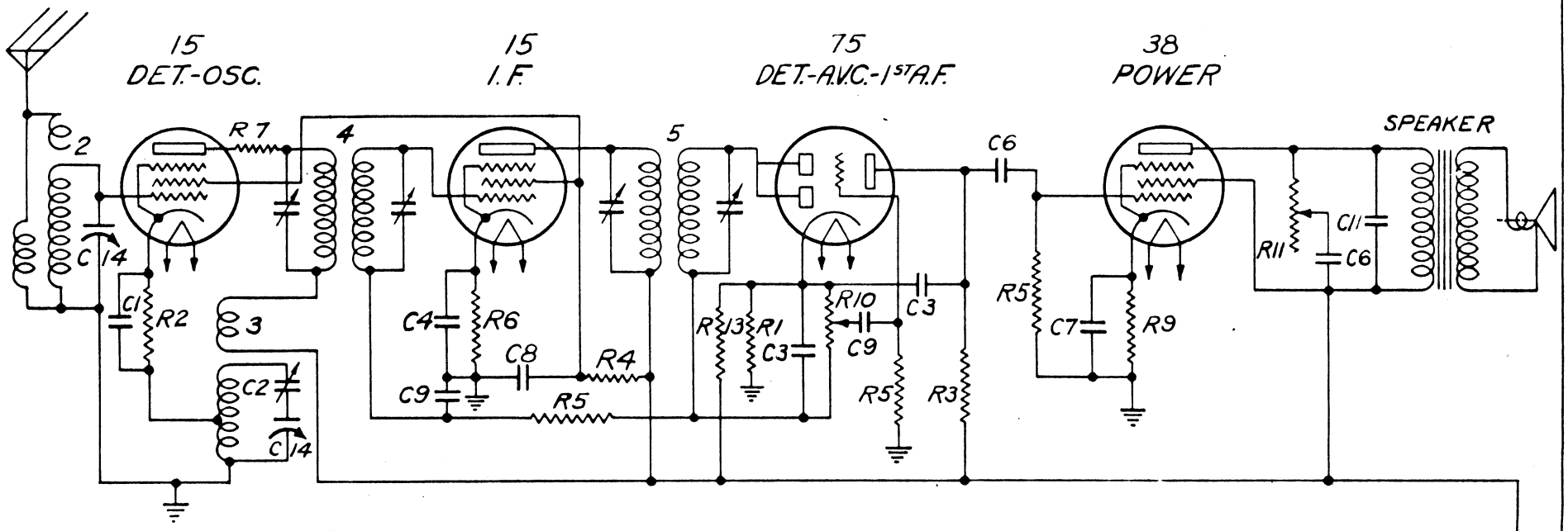
4-B-106	6-D-117	7-D-162
4-B-131	6-D-118	7-D-168
4-B-132	6-S-128	8-S-129
5-S-119	6-S-137	8-S-154
5-S-126	6-S-147	10-S-130
5-S-127	6-S-152	10-S-147
5-S-150	6-S-157	10-S-153
5-S-151	7-D-119	10-S-155
5-S-161	7-D-126	10-S-156
6-B-107	7-D-127	10-S-157
6-B-129	7-D-138	10-S-160
6-B-164	7-D-148	12-U-158
6-D-116	7-D-151	12-U-159

ZENITH RADIO CORPORATION
CHICAGO, U. S. A.

Form H-1

[PRINTED IN U.S.A.]

8-37



DIAG Nº	PART Nº	DESCRIPTION
C1	22-82	.001 MFD 600V
C2	22-205	200-550 MMFD. PADDER
C3	22-182	.00025 MFD 600V
C4	22-185	.01 MFD 200V
C5	22-199	.5 " 200V
C6	22-212	.05 " 400V
C7	22-225	5 MFD ELTLYTIC 25V
C8	22-243	.01 " 400V
C9	22-250	.05 " 200V
C10	22-455	.01 " 1200V
C11	22-358	.002 " 600V
C12	22-419	2 MFD 250V
C13	22-419	8 " 250V
C14	22-426	VARIABLE

DIAG Nº	PART Nº	DESCRIPTION
R13	63-260	100M OHMS 1/4W
1	5-2778	VIB. R.F. CHOKE
2	5-4456	ANT. COIL ASSEM.
3	5-3756	OSC. COIL ASSEM.
4	95-352	1ST I.F. TRANS.
5	95-359	2ND I.F. TRANS.
6	95-300	RECT. TRANS.
7	190-6	VIBRATOR
8	95-298	POWER CHOKE

R1	63-238	1M OHMS	1/4W
R2	63-499	9M "	1/4W
R3	63-258	490M "	1/4W
R4	63-281	29M "	1/4W
R5	63-293	990M "	1/4W
R6	63-303	700 "	1/4W
R7	63-357	300 "	1/4W
R8	63-394	200 "	1/2W
R9	63-418	1500 "	1/2W
R10	63-534	400M " VOL. CONTROL	
R11	63-469	100M " TONE "	
R12	63-536	30 " WIRE WOUND	

SPEAKER		MODELS
49-153	6" P.M.	4-B-131, 4-B-132
49-159	6" P.M.	4-B-106

4 TUBE BATTERY SUPERHETERODYNE
I.F. FREQUENCY 456 K.C.
CHASSIS Nº 5406

TUNING RANGE 550-1700 K.C.

ZENITH RADIO CORP.
CHICAGO, ILL.

4-30-36 - W.A

MODELS
4-B-106, 4-B-131, 4-B-132
CHASSIS No. 5406

SOCKET VOLTAGES

Tube	Position	Ef	Ek	Eg^1	Eg^2	Eg^3	Ep
15	1st Det. Osc.	2	8	0	115	—	155
15	I. F.	2	3.5	0	115	—	155
75	2nd Det. A.V.C.	6	1.5	0	—	—	30
38	PWR	6	14	0	155	—	148

f—filament; k—cathode; g^1—control grid; g^2—screen grid; g^3—suppressor grid; p—plate.

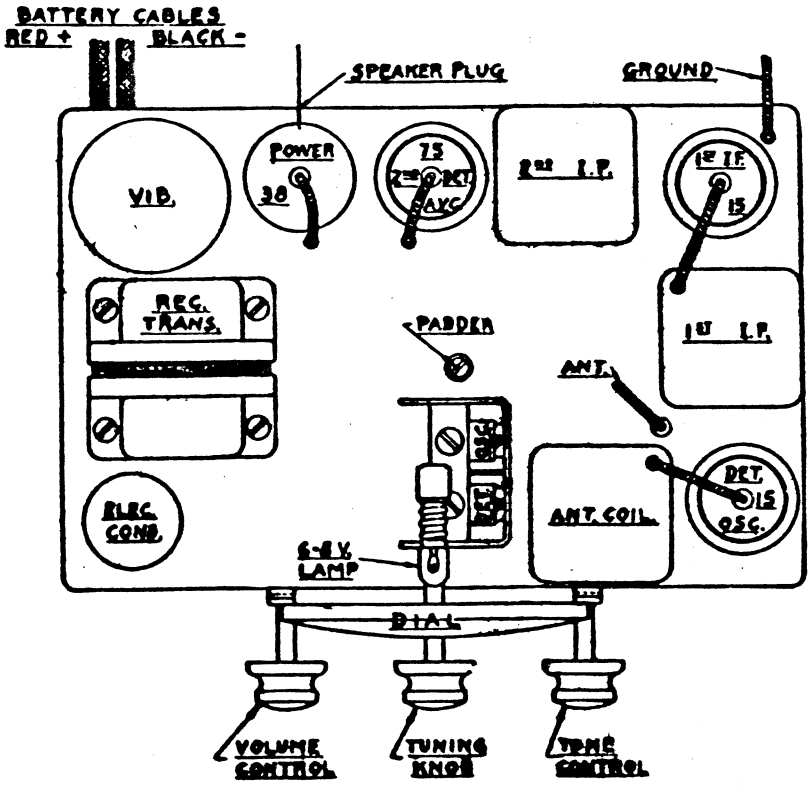
All measurements taken from point indicated to ground using a 1000 ohm per volt D. C. meter with antenna and ground disconnected.

Battery Voltage 6V.

Battery Drain 1.7 amperes.

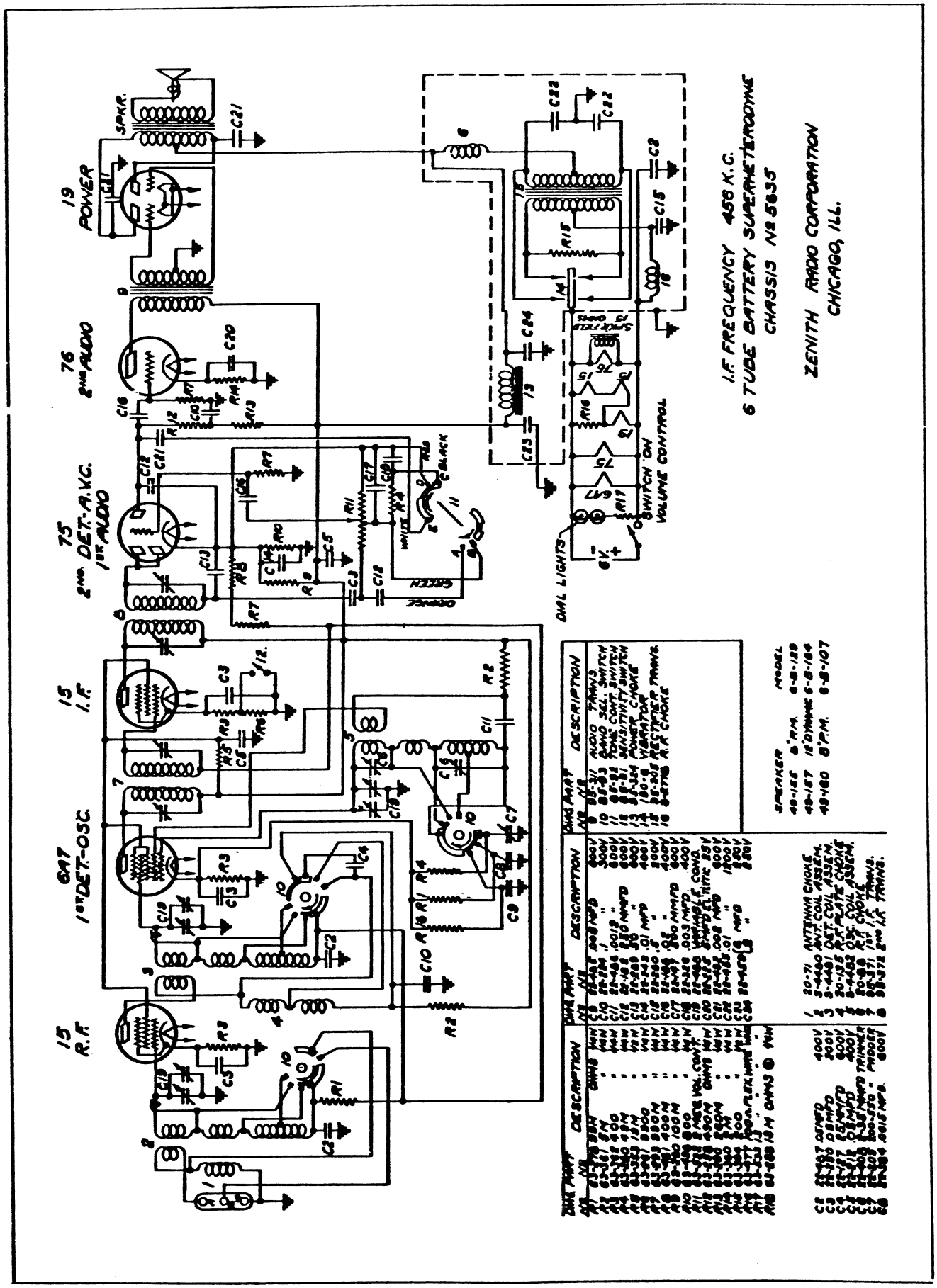
Power Output 1 watt.

Alignment procedure on page 24.



TUBE POSITION

CAUTION: Reversal of the battery polarity will damage the filter condensers. The storage battery must be connected as shown above.



CIRCUIT DIAGRAM—Models 6-B-107, 6-B-129, 6-B-164. (Chassis No. 5635)

MODELS
6-B-107, 6-B-129, 6-B-164
CHASSIS No. 5635

SOCKET VOLTAGES

Tube	Position	Ef	Eg	Eg^1	Eg^2	Eg^3	Ep
15	R. F.	2	1.5	0	65	—	115
6A7	Det. Osc.	6	2.5	0 −5	75 —	— —	115 135
15	I. F.	2	3.5	0	75	—	130
75	2nd Det. A.V.C.	6	1.2	0	—	—	35
76	1st Audio	6	6		—	—	125

f—filament; k—cathode; g^1—control grid; g^2—screen grid; g^3—suppressor grid; p—plate.

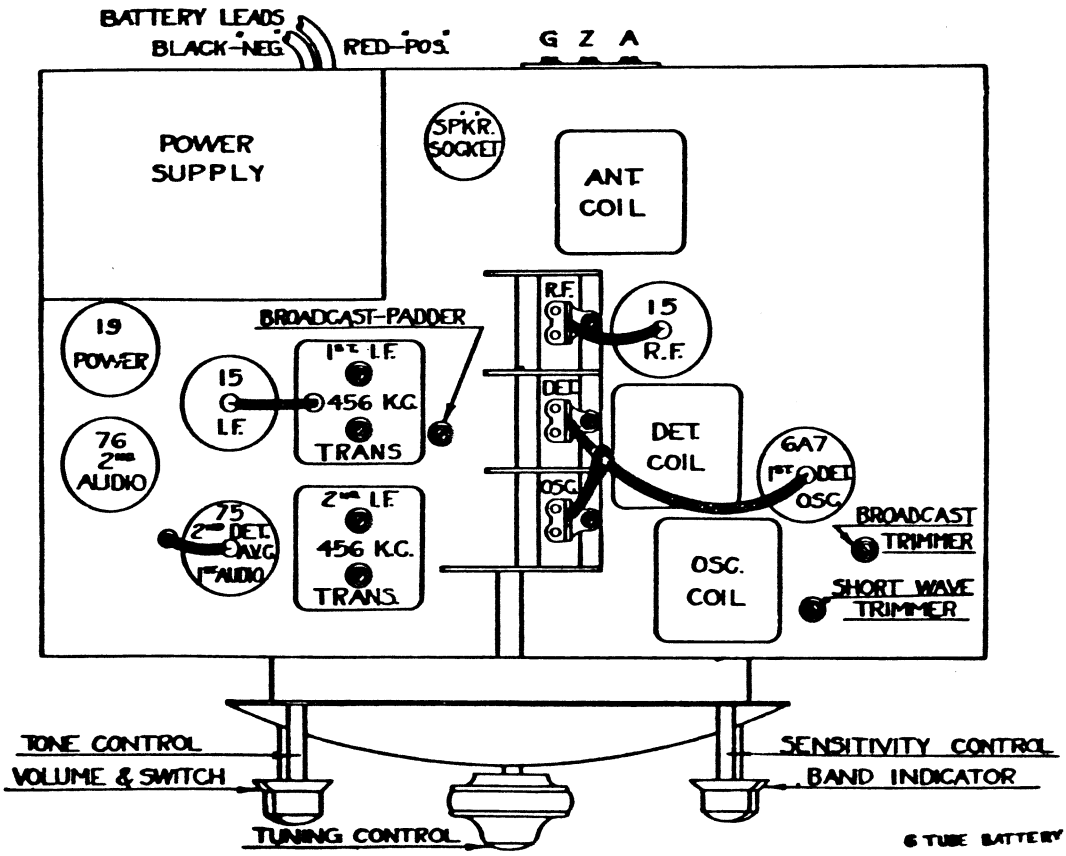
All voltages measured from socket contacts to ground with 1000 ohm per volt D. C. meter. Antenna and ground disconnected.

Battery Voltage 6V.

Battery Drain 2.2 amperes.

Power Output 2 watts.

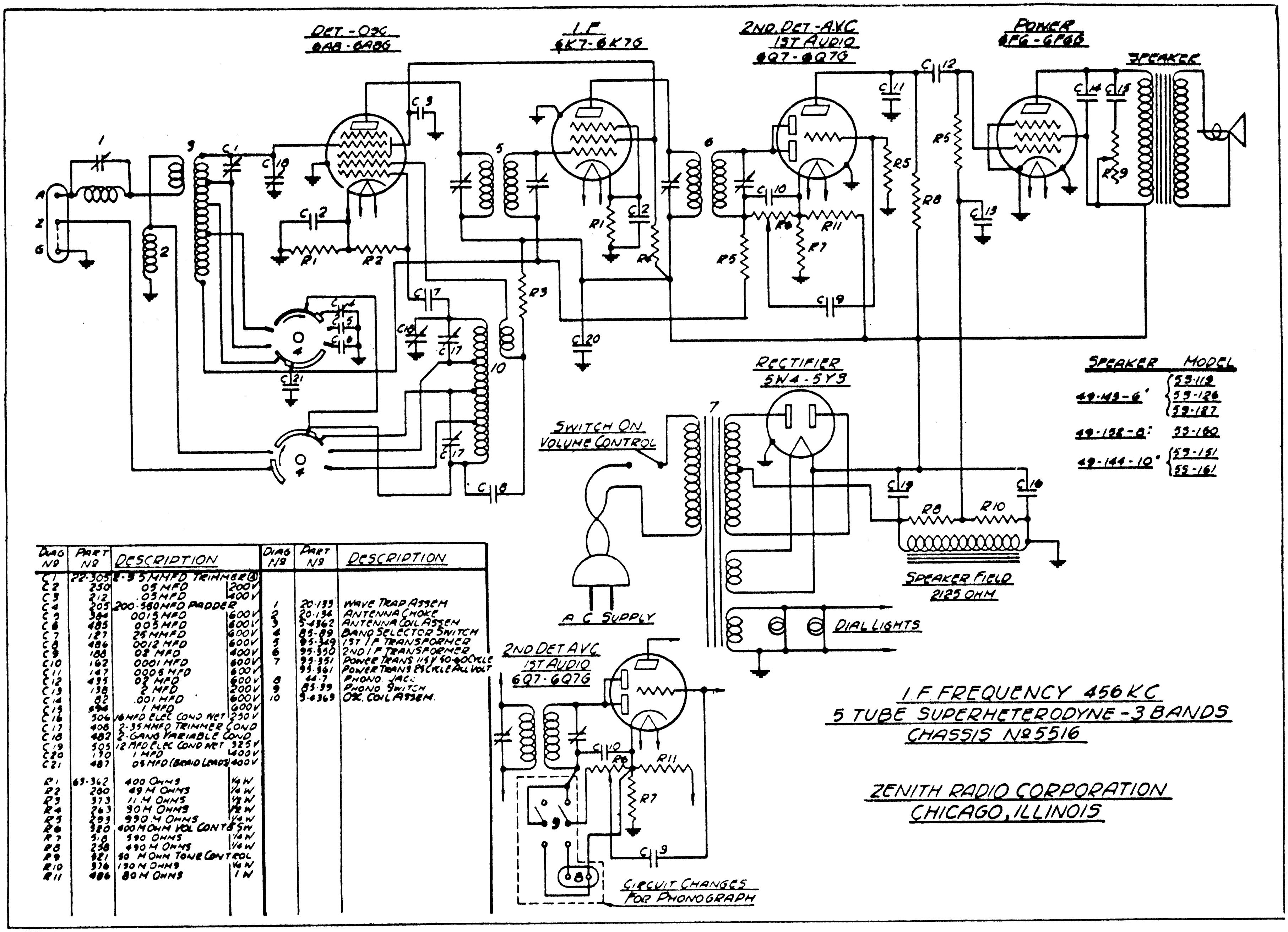
Alignment procedure on page 27.



TUBE POSITION

CAUTION: Reversal of the battery polarity will damage the filter condensers. The storage battery must be connected as shown above.

NOTE: See bottom page 18 for details of antenna connector strip.



Diag No	Part No	Description	
C1	22-305	8-35 MMFD TRIMMER (4)	
C2	250	.05 MFD	200V
C3	212	.05 MFD	400V
C4	205	200-580 MFD PADDER	
C5	384	.0015 MFD	600V
C6	485	.005 MFD	600V
C7	127	25 MMFD	600V
C8	486	.0012 MFD	600V
C9	188	.02 MFD	400V
C10	162	.0001 MFD	600V
C11	147	.0005 MFD	600V
C12	435	.02 MFD	600V
C13	138	2 MFD	200V
C14	82	.001 MFD	600V
C15	[illegible]	1 MFD	600V
C16	506	16 MFD ELEC COND NET	250V
C17	408	2-35 MMFD TRIMMER COND	
C18	482	2-GANG VARIABLE COND	
C19	505	12 MFD ELEC COND NET	325V
C20	170	1 MFD	400V
C21	487	.05 MFD (BAND LEADS)	400V
R1	63-362	400 OHMS	1/4 W
R2	200	49 M OHMS	1/4 W
R3	373	11 M OHMS	1/2 W
R4	263	30 M OHMS	1/2 W
R5	293	990 M OHMS	1/4 W
R6	380	400 M OHM VOL CONT & SW	
R7	518	590 OHMS	1/4 W
R8	258	490 M OHMS	1/4 W
R9	321	50 M OHM TONE CONTROL	
R10	376	190 M OHMS	1/4 W
R11	486	80 M OHMS	1 W

Diag No	Part No	Description
1	20-133	WAVE TRAP ASSEM
2	20-134	ANTENNA CHOKE
3	S-4362	ANTENNA COIL ASSEM
4	85-89	BAND SELECTOR SWITCH
5	95-349	1ST I F TRANSFORMER
6	95-350	2ND I F TRANSFORMER
7	95-351	POWER TRANS 115V 50-60 CYCLE
	95-361	POWER TRANS 25 CYCLE ALL VOLT
8	44-7	PHONO JACK
9	85-39	PHONO SWITCH
10	S-4363	OSC. COIL ASSEM.

CIRCUIT DIAGRAM—Models 5-S-119, 5-S-126, 5-S-127, 5-S-150, 5-S-151, 5-S-161. (Chassis No. 5516)

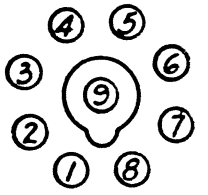
MODELS

5-S-119, 5-S-126, 5-S-127, 5-S-150, 5-S-151, 5-S-161

CHASSIS No. 5516

SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9
6A8	1st Det. Osc.	0	0	240	85	-1	166	6ac	4	0
6K7	I. F.	0	0	240	85	3	—	6ac	3	0
6Q7	2nd Det. A.V.C.	0	0	75	1	1	—	6ac	1.5	0
6F6	Power	0	0	230	240	-5	—	6ac	0	—
5Y3 5W4	Rectifier	0	240	—	AC	—	AC	—	240	—



BOTTOM VIEW OF SOCKET

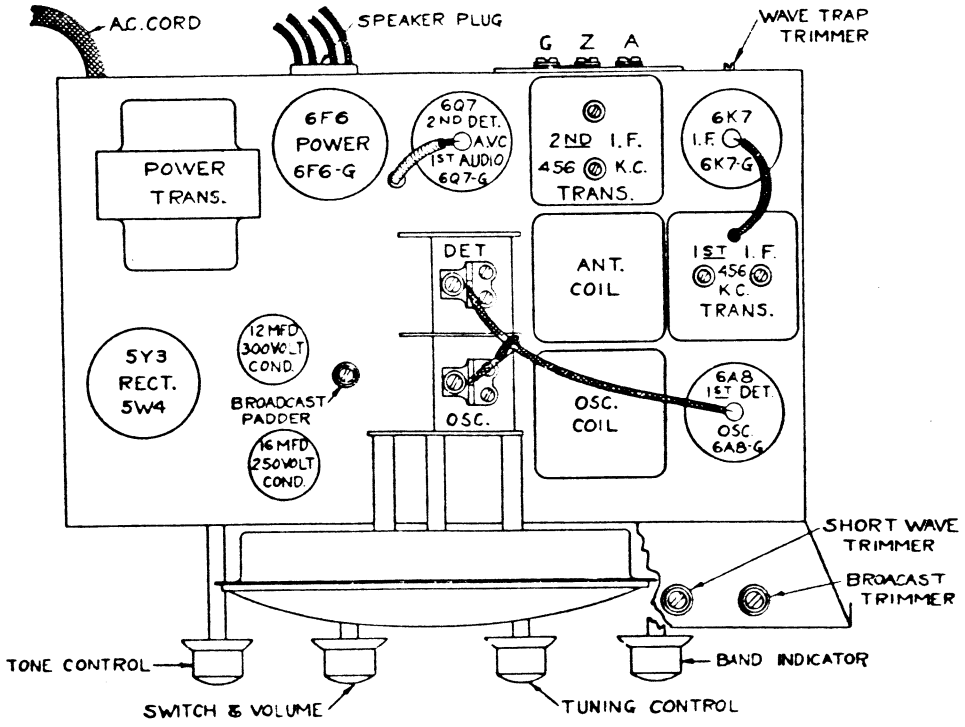
All voltages measured from point indicated to ground, using a 1000 ohm per volt meter with antenna and ground disconnected.

Line Voltage 112V.

Current Consumption 55 watts.

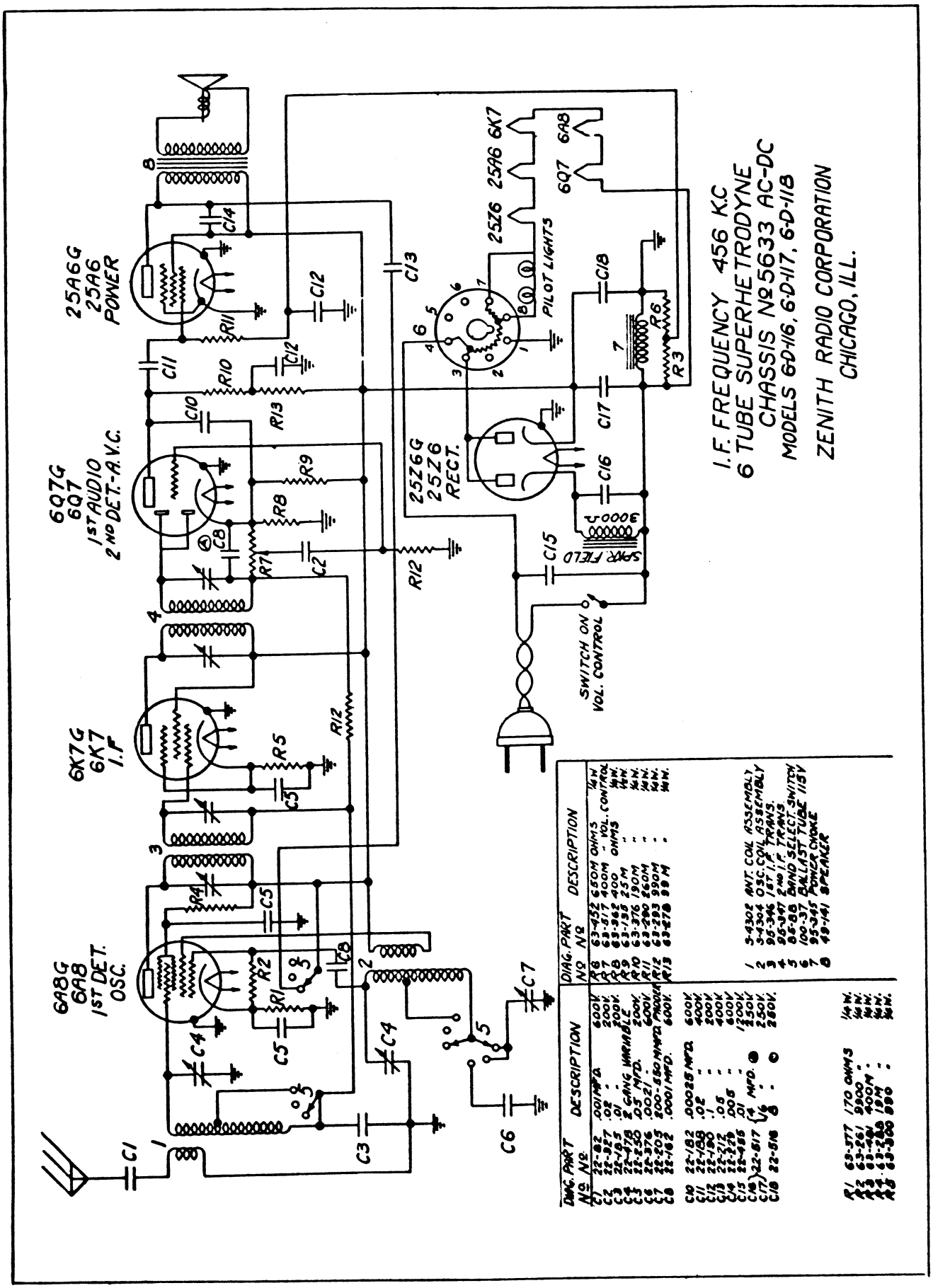
Power Output 3 watts.

Alignment Procedure on page 26.



TUBE POSITION

NOTE: See bottom page 18 for details of antenna connector strip



DWG. PART №	№	DESCRIPTION		DIAG. PART №	№	DESCRIPTION	
C1	22-82	.001 MFD.	600V.	R1	63-452	680M OHMS	½W.
C2	22-327	.02 "	200V.	R2	63-317	400M "	VOL. CONTROL
C3	22-105	.01 "	200V.	R3	63-362	470 OHMS	½W.
C4	22-178	2 GANG VARIABLE		R4	63-135	25M "	½W.
C5	22-230	.05 MFD.	200V.	R5	63-376	150M "	½W.
C6	22-376	.0021 "	600V.	R6	63-290	260M "	½W.
C7	22-205	200-450 MMFD. PADDER		R7	63-293	330M "	½W.
C8	22-182	.0001 MFD.	600V.	R8	63-278	99M "	½W.
C9	22-182	.0025 MFD.	600V.	R9	63-317	400M "	½W.
C10	22-88	.02 "	400V.	R10	63-362	470 "	½W.
C11	22-180	.1 "	200V.	R11	63-290	260M "	½W.
C12	22-212	.05 "	400V.	R12	63-293	330M "	½W.
C13	22-324	.005 "	400V.	R13	63-278	99M "	½W.
C14	22-325	.01 "	1200V.				
C15	22-327	.02 "	250V.	1	3-4302	ANT. COIL ASSEMBLY	
C16	22-817	½ MFD.	250V.	2	3-4304	OSC. COIL ASSEMBLY	
C17		½ "	250V.	3	95-346	1ST I.F. TRANS.	
C18	22-516	8 "	250V.	4	95-347	2ND I.F. TRANS.	
				5	95-85	BAND SELECT. SWITCH	
				6	100-37	BALLAST TUBE 115V.	
				7	95-345	POWER CHOKE	
				8	49-141	SPEAKER	
R1	63-577	170 OHMS	¼W.				
R2	63-261	9900 "	½W.				
R3	63-401	4000 "	½W.				
R4	63-286	1M "	½W.				
R5	63-300	880 "	½W.				

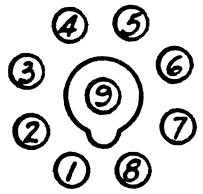
CIRCUIT DIAGRAM—Models 6-D-116, 6-D-117, 6-D-118. (Chassis No. 5633)

MODELS
6-D-116, 6-D-117, 6-D-118

CHASSIS No. 5633

SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9
6A8	1st Det. Osc.	0	AC	100	50	-5	100	AC	1	-1
6K7	I. F.	0	AC	100	100	.5	—	AC	5	0
6Q7	2nd Det. A.V.C.	0	AC	50	0	0	—	AC	1	0
25A6	Power	0	AC	90	100	1	—	AC	0	—
25Z6	Rectifier	0	AC	AC	AC	100	—	AC	125	—
100-37	115 Volt Ballast	—	—	—	—	—	—	—	—	—



BOTTOM VIEW OF SOCKET

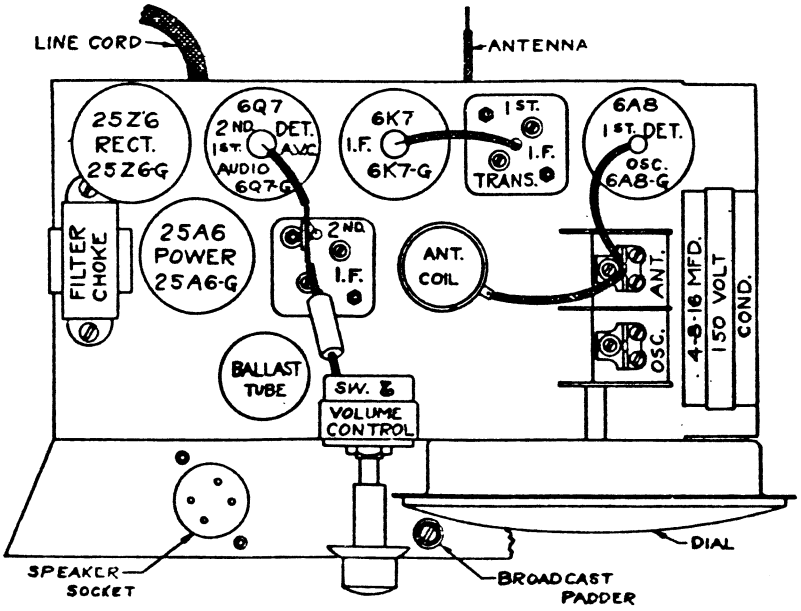
All voltages measured from point indicated to ground, using a 1000 ohm per volt meter. Antenna and ground disconnected.

Line Voltage 112V. (A.C.)

Current Consumption 44 watts.

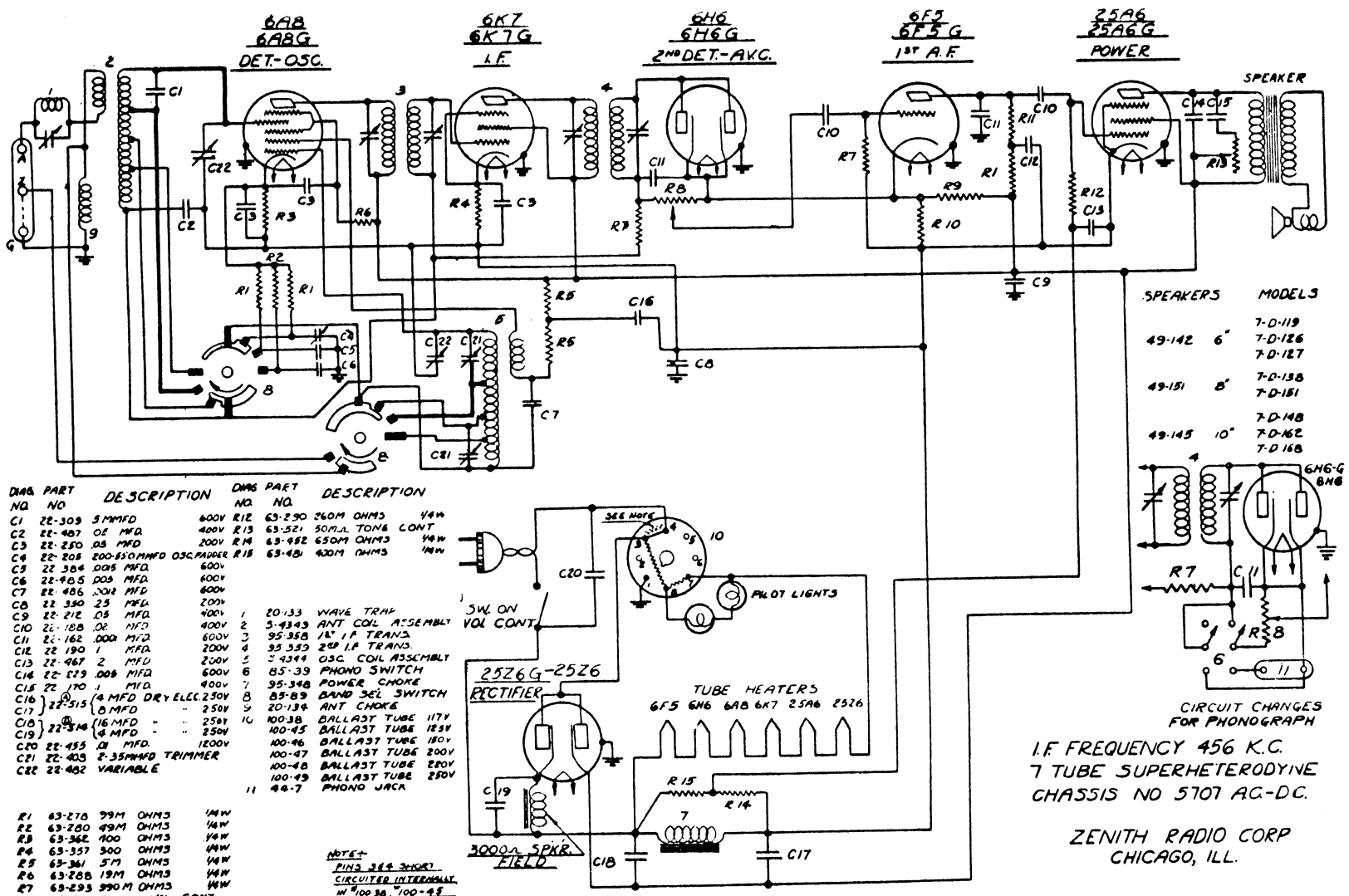
Power Output 1.5 watts.

Alignment procedure on page 25.



TUBE POSITION

CAUTION: Do not ground chassis while testing or during operation, otherwise filter choke will be short circuited.



DIAG NO.	PART NO.	DESCRIPTION	
C1	22-309	5 MMFD	600V
C2	22-487	.05 MFD.	400V
C3	22-250	.05 MFD	200V
C4	22-208	200-650 MMFD OSC. PADDER	
C5	22-384	.0015 MFD.	600V
C6	22-485	.005 MFD.	600V
C7	22-486	.002 MFD	600V
C8	22-350	.25 MFD.	200V
C9	22-212	.05 MFD.	400V
C10	22-188	.02 MFD	400V
C11	22-162	.0001 MFD	600V
C12	22-190	.1 MFD.	200V
C13	22-467	.2 MFD.	200V
C14	22-229	.005 MFD.	600V
C15	22-170	.1 MFD.	400V
C16	22-515	(4 MFD DRY ELEC.	250V
C17		8 MFD "	250V
C18	22-516	(16 MFD "	250V
C19		(4 MFD "	250V
C20	22-455	.01 MFD.	1200V
C21	22-409	2-35 MMFD TRIMMER	
C22	22-462	VARIABLE	

DIAG NO.	PART NO.	DESCRIPTION	
R1	63-278	99M OHMS	1/4W
R2	63-280	49M OHMS	1/4W
R3	63-362	100 OHMS	1/4W
R4	63-357	300 OHMS	1/4W
R5	63-361	5M OHMS	1/4W
R6	63-288	19M OHMS	1/4W
R7	63-293	990M OHMS	1/4W
R8	63-520	400M Ω VOL. CONT.	
R9	63-442	50M OHMS	1/4W
R10	63-518	590 OHMS	1/4W
R11	63-376	190M OHMS	1/4W
R12	63-290	260M OHMS	1/4W
R13	63-521	50M Ω TONE CONT.	
R14	63-482	650M OHMS	1/4W
R15	63-481	400M OHMS	1/4W

DIAG NO.	PART NO.	DESCRIPTION
1	20-133	WAVE TRAP
2	5-4343	ANT COIL ASSEMBLY
3	95-358	1ST I.F. TRANS.
4	95-359	2ND I.F. TRANS.
5	5-4344	OSC. COIL ASSEMBLY
6	85-39	PHONO SWITCH
7	95-348	POWER CHOKE
8	85-89	BAND SEL. SWITCH
9	20-134	ANT CHOKE
10	100-38	BALLAST TUBE 117V
	100-45	BALLAST TUBE 125V
	100-46	BALLAST TUBE 150V
	100-47	BALLAST TUBE 200V
	100-48	BALLAST TUBE 220V
	100-49	BALLAST TUBE 250V
11	44-7	PHONO JACK

NOTE: PINS 3 & 9 SHORT CIRCUITED INTERNALLY IN #100-38, #100-45 AND #100-48 ONLY

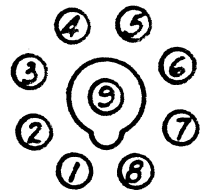
CIRCUIT DIAGRAM—Models 7-D-119, 7-D-126, 7-D-127, 7-D-138, 7-D-151, 7-D-148, 7-D-162, 7-D-168. (Chassis No. 5707)

MODELS
7-D-119, 7-D-126, 7-D-127, 7-D-138, 7-D-151, 7-D-148, 7-D-162, 7-D-168

CHASSIS No. 5707

SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9
6A8	1st Det. Osc.	0	AC	125	80	20	100	AC	25	15
6K7	I. F.	0	AC	125	125	25	—	AC	.25	10
6H6	2nd Det. A.V.C.	0	AC	10	25	10	—	AC	25	—
6F5	1st Audio	0	AC	—	60	—	—	AC	25	5
25A6	Power	0	AC	110	125	1	—	AC	25	—
25Z6	Rectifier	0	0	AC	AC	105	—	AC	125	—
	Ballast	—	—	—	—	—	—	—	—	—



BOTTOM VIEW OF SOCKET

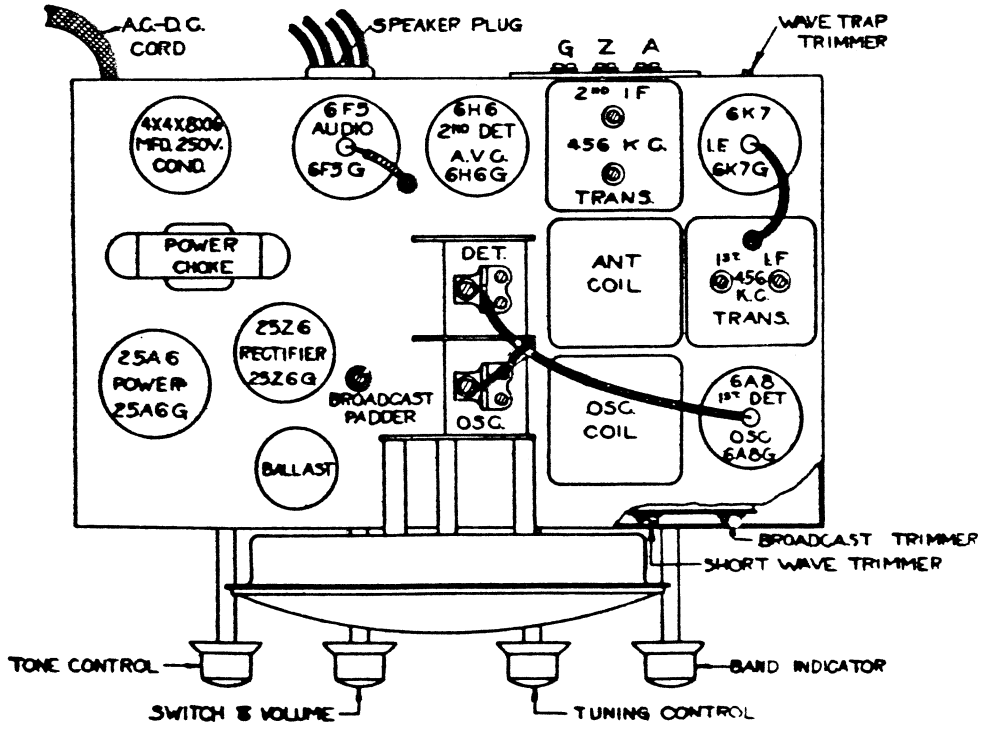
Measured from point indicated to junction of filter choke and speaker field using a 1000 ohm per volt meter.

Line Voltage 112 (A.C.)

Current Consumption 44 watts.

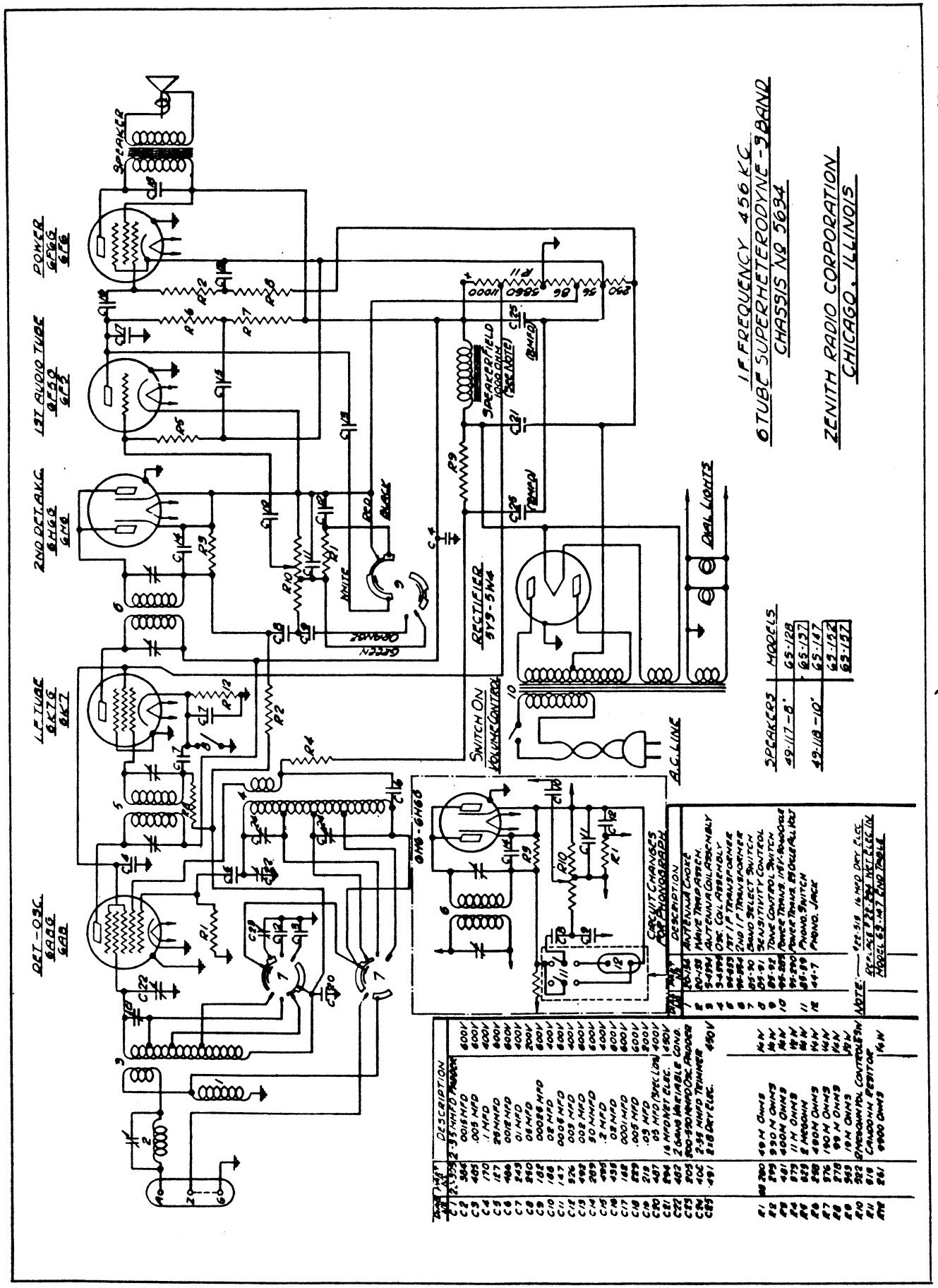
Power Output 1.5 watts.

Alignment procedure on page 26.



TUBE POSITION

NOTE: See bottom page 18 for details of antenna connector strip.



CIRCUIT DIAGRAM—Models 6-S-128, 6-S-137, 6-S-147, 6-S-152, 6-S-157. (Chassis No. 5634)

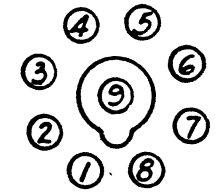
MODELS

6-S-128, 6-S-137, 6-S-147, 6-S-152, 6-S-157

CHASSIS No. 5634

SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9
6A8	1st Det Osc.	0	6AC	280	80	–4	175	0	0	0
6K7	I F	0	6AC	280	80	0	—	0	Local 7	0
6H6	2nd Det A.V.C.	0	6AC	—2	—2	–2	—	0	—2	—
6F5	1st Audio	0	6AC	—	75	—	—	0	—2	—2
6F6	Power	0	6AC	260	280	–2	—	0	—2	—
5Y3 5W4	Rectifier	0	320	—	AC	—	AC	—	320	—



BOTTOM VIEW OF SOCKET

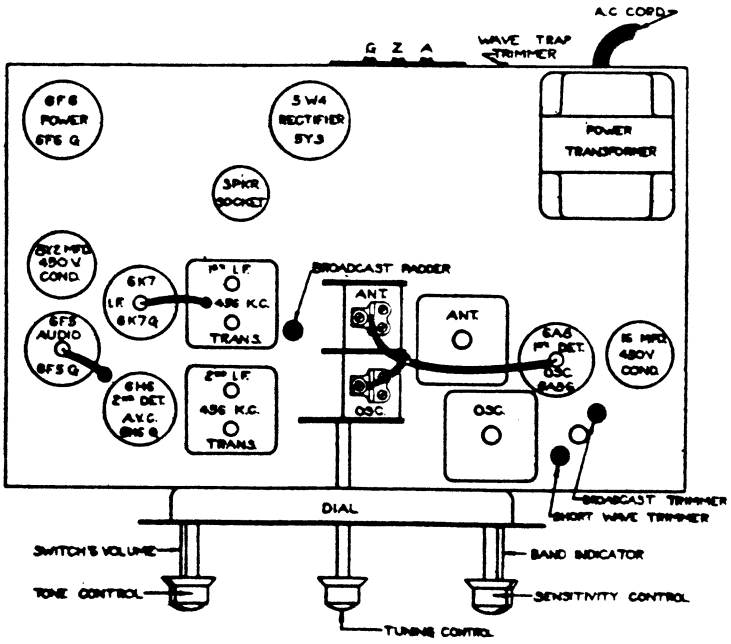
All voltages measured from point indicated to ground, using a 1000 ohm per volt meter. Antenna and ground disconnected.

Line Voltage 112V.

Current Consumption 75 watts.

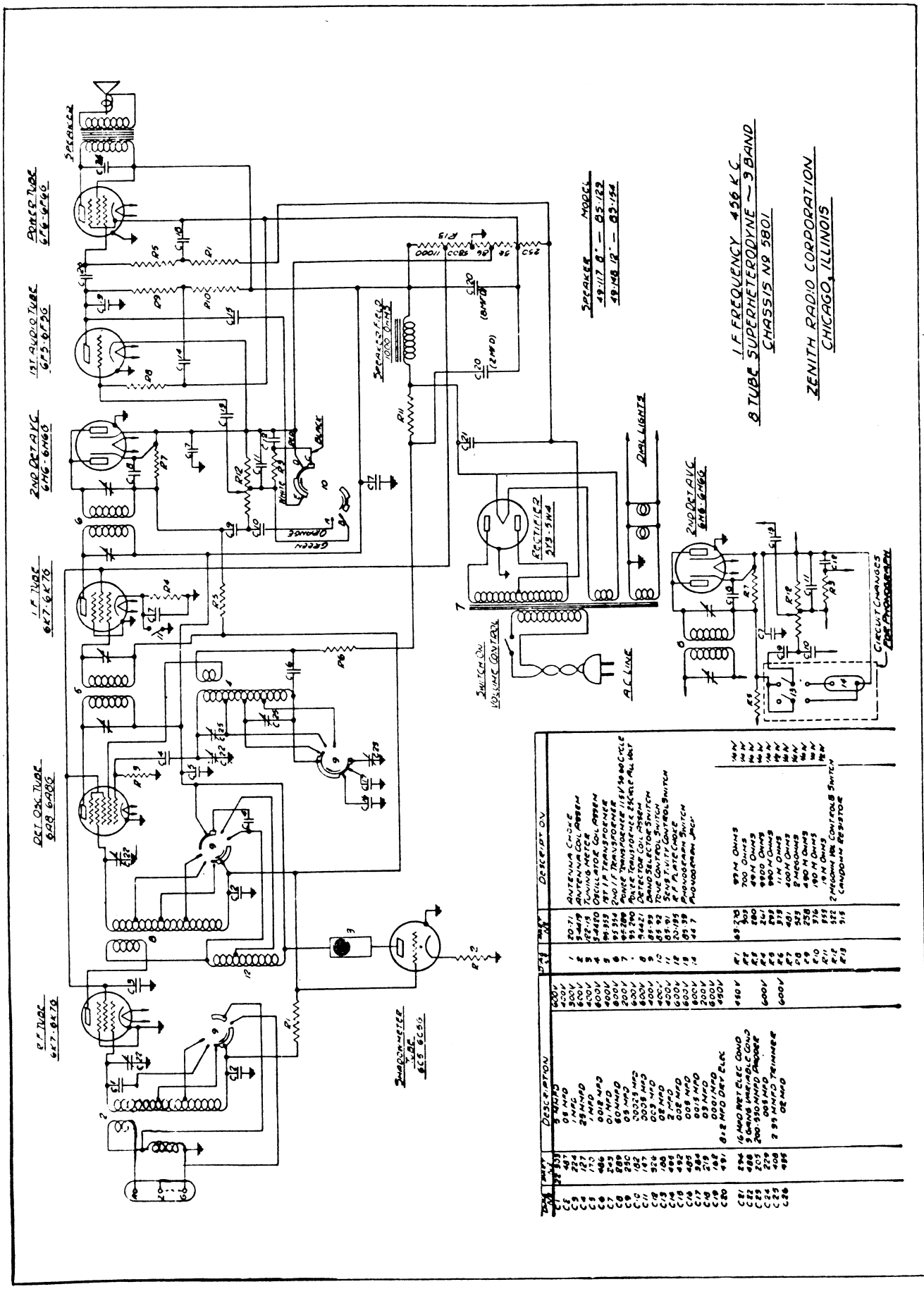
Power Output 4 watts.

Alignment procedure on page 26.



TUBE POSITION

NOTE: See bottom page 18 for details of antenna connector strip.

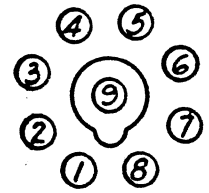


CIRCUIT DIAGRAM—Models 8-S-129, 8-S-154. (Chassis No. 5801)

MODELS
8-S-129, 8-S-154
CHASSIS No. 5801

SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9
6K7	R. F.	0	6AC	250	68	0	—	0	0	0
6A8	1st Det. Osc.	0	6AC	250	68	–4	150	0	0	0
6K7	I. F.	0	6AC	250	68	0	—	0	Local 5	0
6H6	2nd Det. A.V.C.	0	6AC	–3	–3	–3	—	0	–3	—
6F5	1st Audio	0	6AC	—	70	0	0	0	–3	–3
6F6	Power	0	6AC	235	250	–4	—	0	–4	—
6C5	Target Tuning Amp.	0	6AC	250	—	– 5	—	0	4	—
5Y3 5W4	Rectifier	0	310	—	AC	—	AC	—	310	—



BOTTOM VIEW OF SOCKET

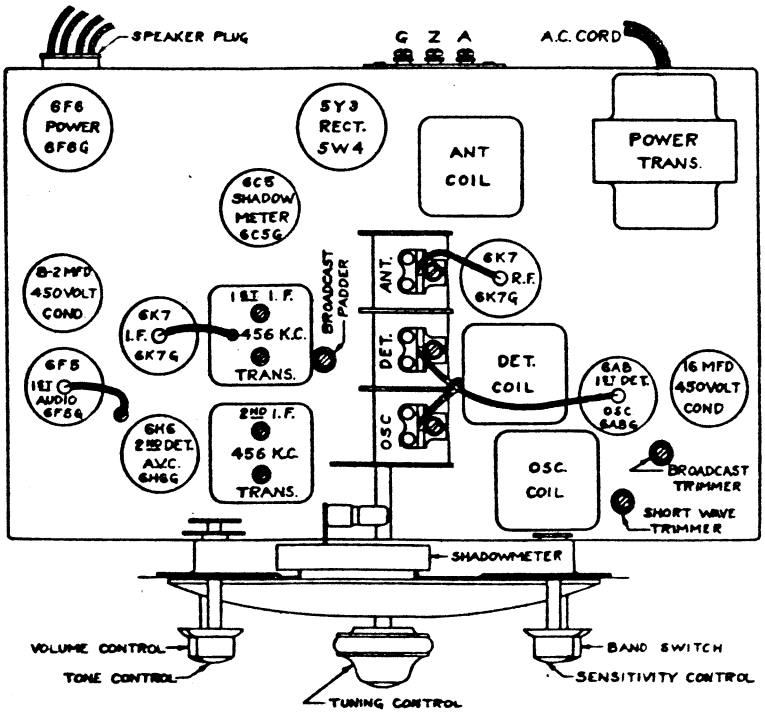
All voltages measured from point indicated to ground, using a 1000 ohm per volt meter. Antenna and ground disconnected.

Line Voltage 112V.

Current Consumption 85 watts.

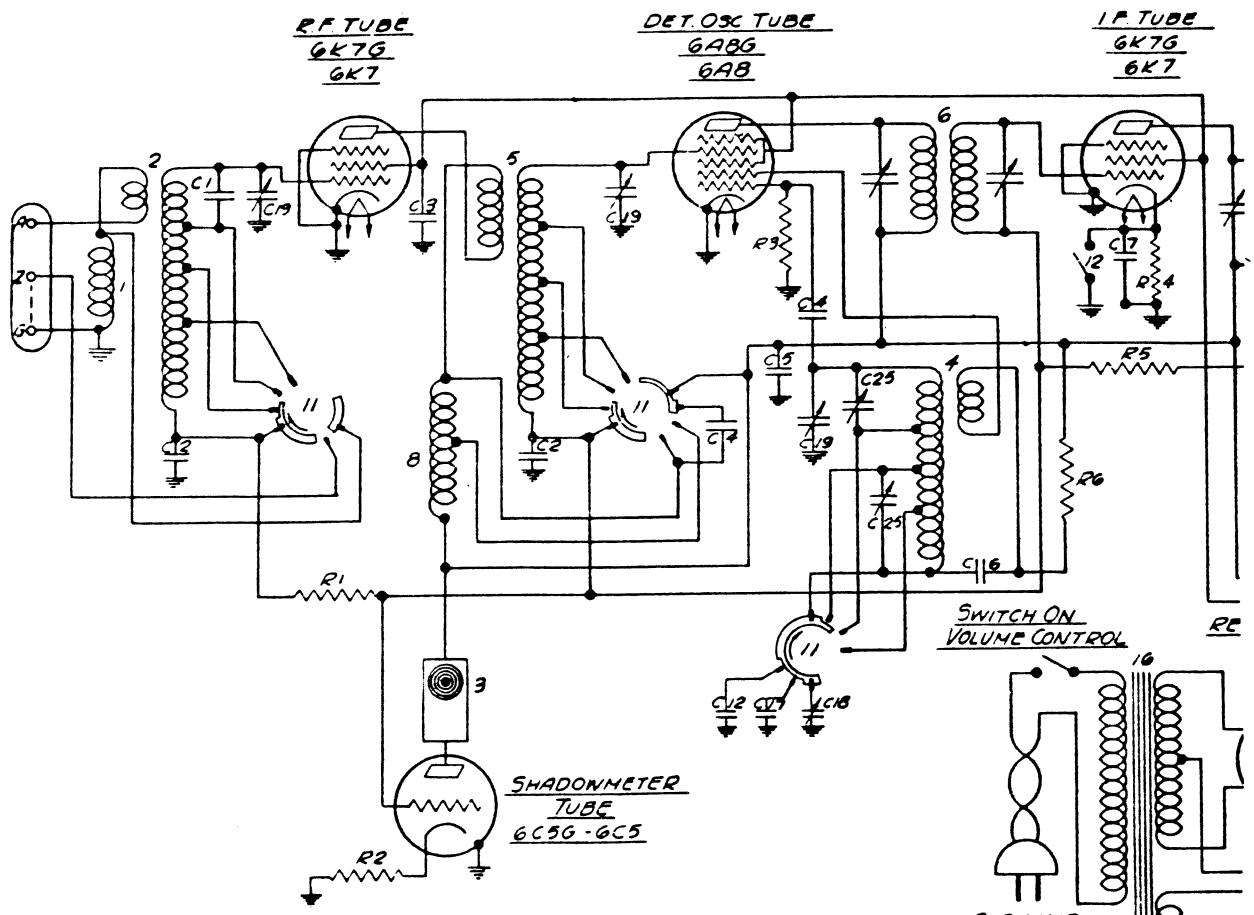
Power Output 5 watts.

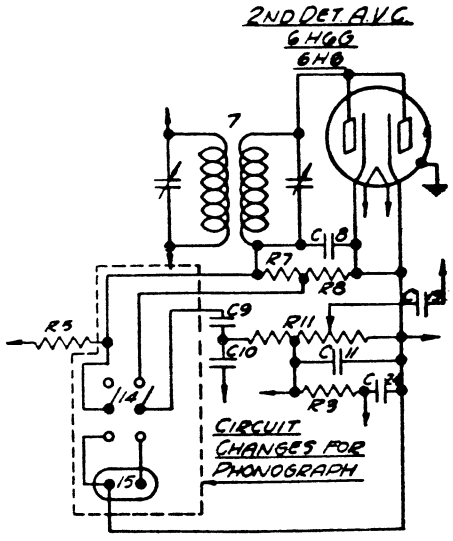
Alignment procedure on page 27



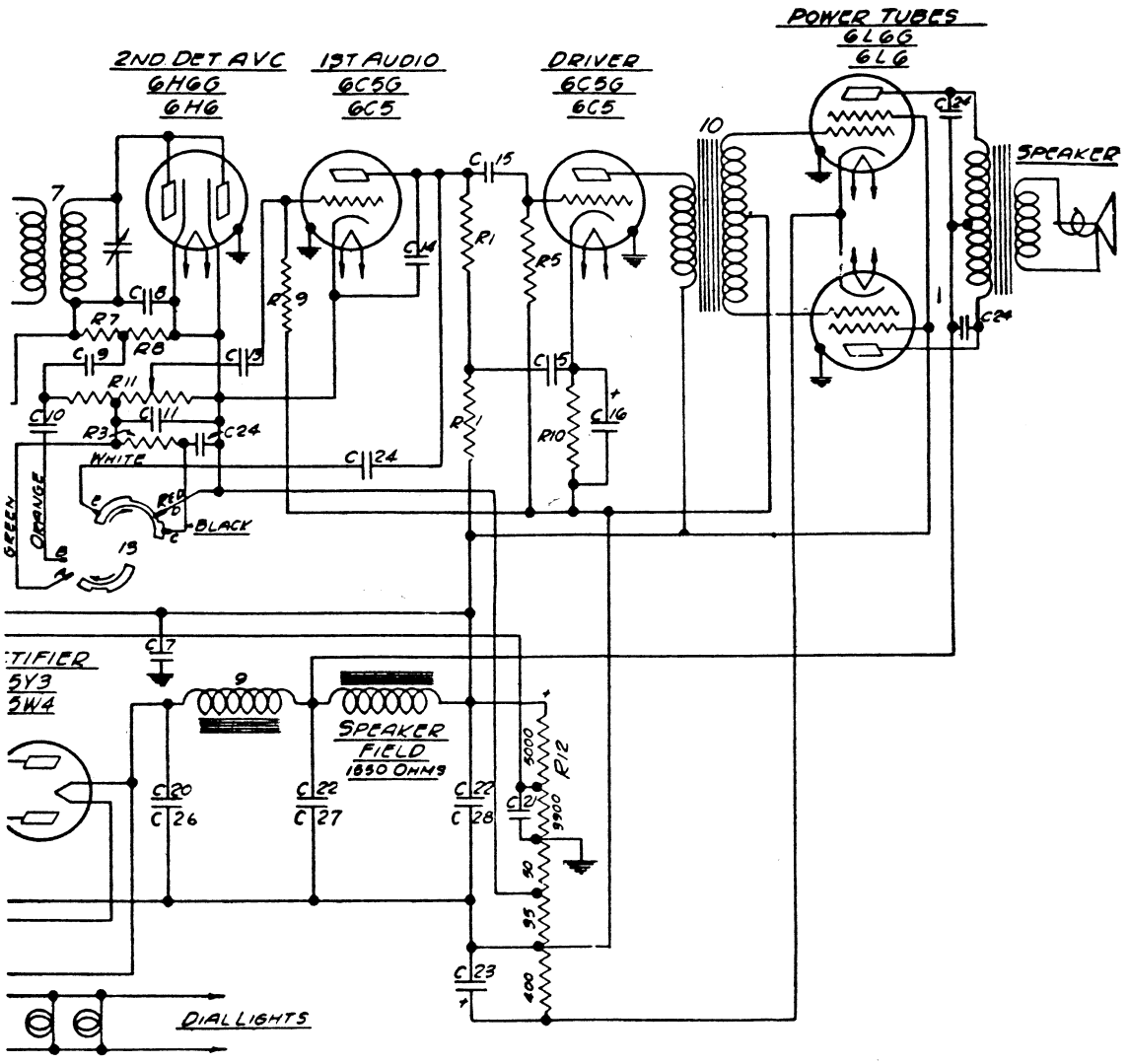
TUBE POSITION

NOTE: See bottom page 18 for details of antenna connector strip.





DIAG NO	PART NO	DESCRIPTION		DIAG NO	PART NO	DESCRIPTION	
C1	22-303	5 MMFD	600V	1	20-71	ANTENNA CHOKE	
C2	487	.05 MFD	400V	2	54419	ANTENNA COIL ASSEM	
C3	224	.1 MFD	300V	3	22-13	TUNING METER	
C4	127	25 MMFD	600V	4	54421	OSCILLATING COIL ASSEM	
C5	170	.1 MFD	400V	5	54420	DETECTOR COIL ASSEM	
C6	496	.0012 MFD	600V	6	95-353	1ST I.F. TRANSFORMER	
C7	249	.01 MFD	400V	7	95-354	2ND I.F. TRANSFORMER	
C8	289	50 MMFD	600V	8	20-135	R.F. PLATE CHOKE	
C9	250	.05 MFD	200V	9	95-356	POWER CHOKE	
C10	182	.00025 MFD	600V	10	95-360	AUDIO TRANSFORMER	
C11	147	.0005 MFD	600V	11	85-93	BAND SELECTOR SWITCH	
C12	485	.005 MFD	600V	12	85-91	SENSITIVITY CONT. SWITCH	
C13	188	.02 MFD	400V	19	85-92	TONE CONTROL SWITCH	
C14	182	.0001 MFD	600V	14	85-39	PHONOGRAPH SWITCH	
C15	435	.02 MFD	600V	15	44-7	PHONOGRAPH JACK	
C16	507	10 MFD DRY ELEC COND	25V		95-355	POWER TRANS 115V 50-60 CYCLE	
C17	384	.0015 MFD	600V	16	95-363	POWER TRANS 25 CYCLE - ALL VOLTAGE	
C18	205	200-550 MMFD OSC PADDER					
C19	488	3 GANG VARIABLE COND					
C20	504	8 MFD WET ELEC. COND. 60 CYCLE	450V				
C21	506	16 MFD WET ELEC COND	250V				
C22	493	8-8 MFD DRY ELEC. COND 60~	450V				
C23	405	10 MFD DRY ELEC COND	50V				
C24	229	.005 MFD	600V				
C25	408	2-55 MMFD TRIMMER					
R1	69-278	99 M OHMS	1/4 W			NOTE —	
R2	309	700 OHMS	1/6 W			#22-510 8-8-8 MFD DRY	
R3	280	49 M OHMS	1/4 W			ELECTROLYTIC REPLACES	
R4	261	9900 OHMS	1/4 W			#22-497 & #22-506. #22-512-	
R5	293	990 M OHMS	1/2 W			8 MFD DRY ELECTROLYTIC	
R6	373	11 M OHMS	1/2 W			REPLACES #22-504 8 MFD WET	
R7	260	100 M OHMS	1/4 W			ELECTROLYTIC IN MODEL	
R8	385	900 M OHMS	1/4 W			#10 S-147 END TABLE.	
R9	529	2 MEGOHMS	1/4 W				
R10	300	990 OHMS	1/4 W				
R11	522	2 MEGOHM VOLUME CONT & SW					
R12	516	CANOHM RESISTOR					
				C26	22-294	16 MFD WET ELEC COND 25 CYCLE	450V
				C27	22-502	16 MFD DRY ELEC COND 25 CYCLE	450V
				C28		8 MFD DRY ELEC. COND 25 CYCLE	450V



SPEAKER		MODEL
49-146	8"	105130
49-147	12"	105135
		105156
		105160
49-156	12"	105147
		105159
		109157

I.F. FREQUENCY 456 KC.
10 TUBE SUPERHETERODYNE — 3 BAND
CHASSIS NO 1004

ZENITH RADIO CORPORATION
CHICAGO, ILLINOIS

SERVICE NOTES 1004 CHASSIS

OFF SCALE AT LOW FREQUENCY END OF DIAL, UNABLE TO ADJUST BY REGULAR ALIGNMENT—Check 600 padder, broken lug, wire, etc. Also check .0012 condenser in oscillator plate circuit C-6 22-486.

LACK OF SENSITIVITY ON ALL BANDS—Check tubes, antenna and ground—all coils. Poor contact on sensitivity switch—rebalance.

LACK OF SENSITIVITY ON BROADCAST BAND—Open radio frequency plate choke.

NOISY—Tubes, check condenser bond wires to clear chassis; dirty gang condenser or wipers; loose lugs on candohm resister; shorted bus bar wires in coil circuits; aerial and ground. Also loose connecting wire between G and Z on aerial strip.

NOISY ON "C" BAND ONLY IN SPOTS—Check dial pulley—move pulley away from dial pan; condenser bonds do not clear chassis hold. Poor contacts on any of the band, tone or sensitivity switches; defective volume control; defective 16 mmfd condenser—22-506.

HUM—Tubes, oscillator tube shorted or output tubes not matched; open filter, electrostatic shield open in power transformer. This will give carrier hum and can be corrected by by-passing the A.C. line with .001 mica-condenser. Reverse A.C. plug.

STATIONS RIDE IN—Check balance; check .0012 condenser in oscillator plate circuit.

WEAK OR LACK VOLUME—Open 2nd detector cathode resistor or candohm; will also affect tone quality if open; .00025 condenser grounded in tone circuit, noticeable on high fidelity position of switch, with distortion. Repeak I.F.'s to 456 K.C. Defective tubes, in particular 1st and 2nd detector. Switch on normal and with lack volume—check tone switch for short circuit to foreign lug.

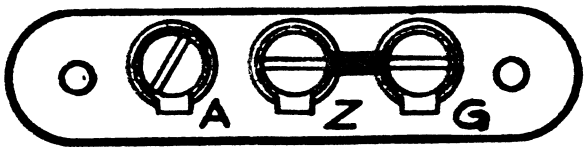
FLUTTERING AT LOW FREQUENCY—Tubes, particularly oscillator tube, rebalance I.F.'s to 456.

INTERMITTENT RECEPTION—Tubes, I.F. trimmers short; dirty variable condenser, poor ground at candohm; loose link wire across Z and G on aerial strip. Poor contact on band switch; defective aerial; defective by-pass condenser.

POOR ACTION OF TARGET TUNER—Note: Do not expect target to center exactly in the center of bull's eye except on very strong input signal. Check 6C5 tube or replace target unit.

DIAL SLIPS—Loose dial clutch.

IMPORTANT!



Connect ordinary single wire antenna to A with jumper wire placed between Z and G (shipped from factory in this manner.)

When using a ZENITH DOUBLET ANTENNA, remove jumper wire between Z and G and attach doublet lead-in to A and Z.

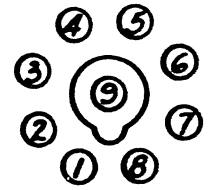
Although it is not usually necessary to ground the receiver, there may be occasional instances where a ground connection removes noise or may aid reception of signals. It should be tried and left connected if any improvement is noted. Where it does not help, or if it introduces hum, try reversing the wall plug or leave the ground lead off entirely.

MODELS
10-S-130, 10-S-155, 10-S-156, 10-S-160, 10-S-147, 10-S-153, 10-S-157

CHASSIS No. 1004

SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9
6K7	R. F.	0	3AC	250	100	0	—	3AC	0	0
6A8	1st Det. Osc.	0	3AC	250	100	–6.5	175	3AC	0	0
6K7	I. F.	0	3AC	250	100	0	—	3AC	Local 9	0
6H6	2nd Det. A.V.C.	0	3AC	–2.5	.25	–2.5	—	3AC	–2.5	—
6C5	1st Audio	0	3AC	45	—	–2	—	3AC	–2.5	—
6C5	Driver	0	3AC	235	—	–2	—	3AC	2	—
6L6	Power	0	3AC	320	120	–4	—	3AC	13	—
6C5	Target Tuning Amp.	0	3AC	·250	—	–.5	—	3AC	4	—
5Y3 5W4	Rectifier	0	340	—	AC	—	AC	—	340	—



BOTTOM VIEW OF SOCKET

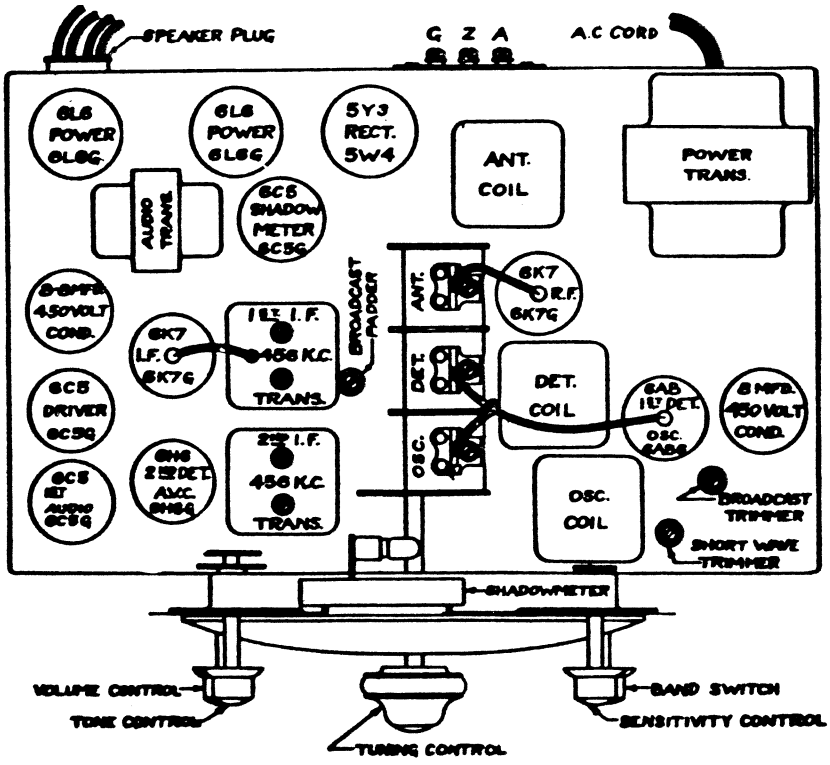
All voltages measured from point indicated to ground, using a 1000 ohm per volt meter. Antenna and ground disconnected.

Line Voltage 112V.

Current Consumption 110 watts.

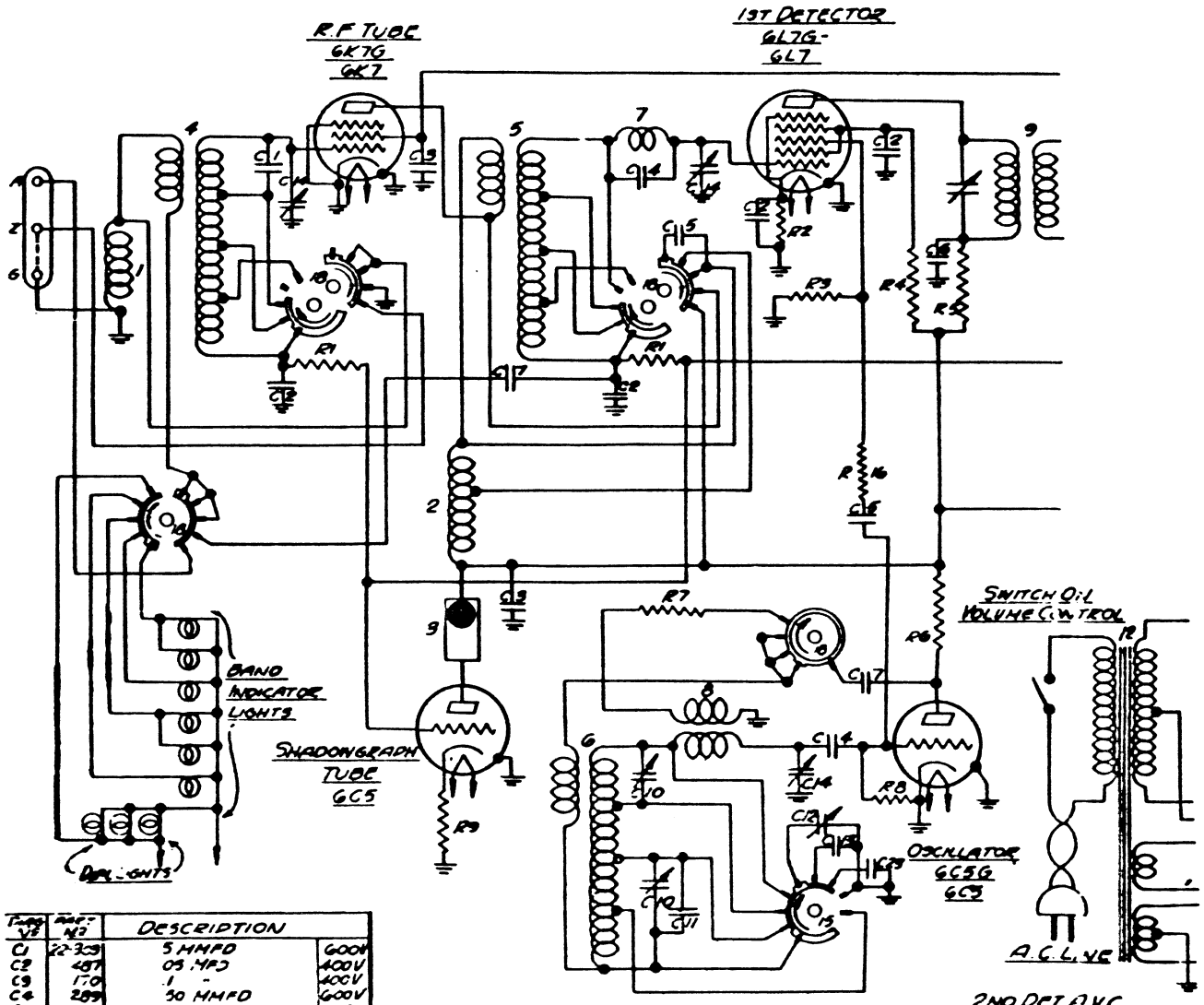
Power Output 12 watts.

Alignment procedure on page 27.



TUBE POSITION

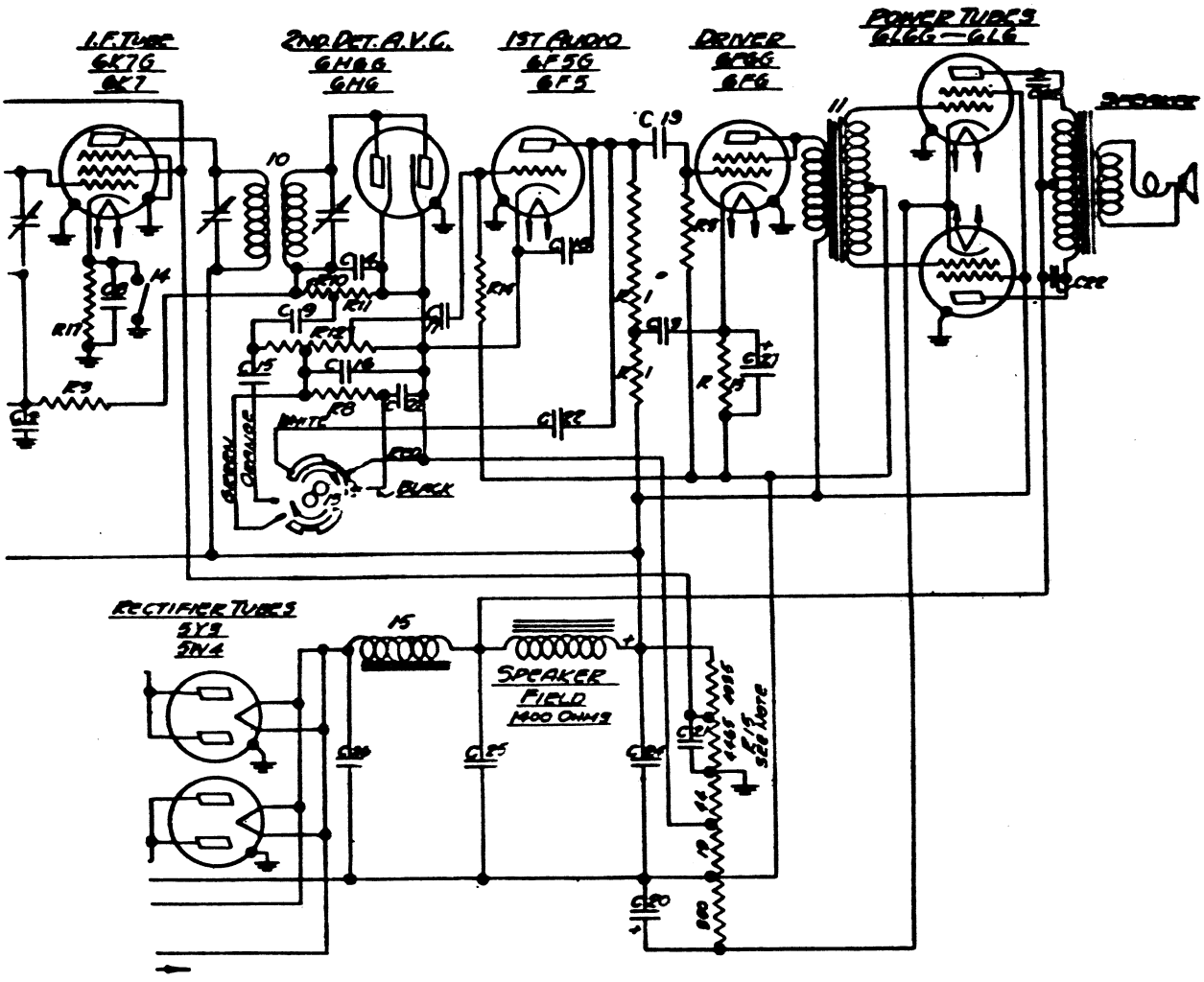
NOTE: See bottom page 18 for details of antenna connector strip.



Diag. No.	Part No.	Description	
C1	22-359	5 MMFD	600V
C2	487	05 MFD	400V
C3	170	.1 "	400V
C4	289	50 MMFD	600V
C5	187	25 MMFD	600V
C6	218	05 MFD	400V
C7	486	0012 "	600V
C8	249	01 "	400V
C9	250	05 "	200V
C10	508	TRIMMER COND	
C11	285	10 MMFD	600V
C12	205	200-550 MFD PADDER	
C13	304	0015 MFD	600V
C14	489	3 GANG VARIABLE	
C15	182	.00025 MFD	600V
C16	147	0005 "	600V
C17	188	02 "	400V
C18	162	.0001 "	600V
C19	495	02	600V
C20	509	10 MFD DRY ELEC COND	50V
C21	506	16 " WET " "	250V
C22	229	.005 MFD (TUBULAR)	600V
C23	495	.006 "	600V
C24	185	8 MFD WET ELEC. COND	450V
C25	294	16 " " " "	450V
C26	304	8 " " " (CHROM)	450V
C27	405	10 " DRY " COND.	50V
R1	22-278	99 M OHM	1/4W
R2	367	500 "	1/4W
R3	288	990 M "	1/4W
R4	208	12 M "	1/W
R5	466	990 "	1/2W
R6	398	5100 "	1/W
R7	390	5 "	1/4W
R8	280	40 M "	1/4W
R9	303	700 "	1/4W

Diag. No.	Part No.	Description	
R10	63-260	100 M OHMS	1/4W
R11	385	900 M "	1/4W
R12	522	2 MEGOHM VOL CONT & SW.	
R13	531	650 OHM	1W
R14	529	2 MEGOHM	1/4W
R15	528	CANOHM	
R16	411	80 OHM	1/2W
R17	281	9900 OHM	1/2W
1	80-71	ANTENNA CHOKE	
2	20-195	R.F. PLATE "	
3	172-14	TUNING METER	
4	S-4545	ANTENNA COIL ASSEM	
5	S-4546	DETECTOR " "	
6	S-4547	OSCILLATOR " "	
7	S-4387	H.F. DETECTOR " "	
8	S-4388	H.F. OSCILLATOR " "	
9	95-368	1ST I.F. TRANS.	
10	95-369	2ND I.F. "	
11	95-367	AUDIO "	
12	95-370	POWER " 115V 50-60 CYCLE	
	95-373	" " 25 CYCLE ALL VOLT	
13	85-98	TONE CONT SWITCH	
14	85-91	SENSITIVITY CONT SW.	
15	95-366	POWER CHOKE	
16	85-99	PHONO SWITCH	
17	44-7	" JACK	
18	85-94	BAND SELECTOR SWITCH	

CIRCUIT DIAGRAM—Models 12-U-158,



SPEAKER	MODEL
No1 49-149 12"	12-U-158
No1 49-150 12"	12-U-159
No2 49-150 6"	

NOTE.— #2 SPEAKER FIELD IS AUTOMATICALLY SUBSTITUTED FOR 4995 OHM SECTION OF CANDOHM RESISTOR WHEN SPEAKER PLUG IS INSERTED IN SET.

I.F. FREQUENCY 456 KC
12 TUBE SUPERHETERODYNE — 4 BAND
CHASSIS No 1203

ZENITH RADIO CORP.
CHICAGO, ILL.

SERVICE NOTES ON 1203 CHASSIS

OFF SCALE—Unable to line up and gain drops off—check 20 ohm. resistor in screen of 1st detector for open R-16 63-411.—check 50 mmfd condenser in oscillator circuit C4—22-289.

NOISY—Tubes, antenna and ground. Poor contact on band switch; volume control; coil wires short to band switch; poor contact on sensitivity switch. Noisy air trimmers, 16 mfd. screen condenser noisy, C-21—22-506.

NOISY ON "D" BAND—Clear gang bonds away from chassis, center in chassis holes, wire of "D" band tuned circuit shorting, loose solder lugs or terminals.

LACK SENSITIVITY ON "D" BAND—Open coil winding, defective 6H6, 6L7 tubes, poor contact of tube prongs, poor contact on band switch, check antenna, check I.F. peak, 456 K.C. Shorted 25 mmfd condenser in oscillator circuit; if shorted sensitivity will fall off on all bands, but more noticeable on "D" band. Check coupling of wires in "D" band circuit.

NOISY AND OFF SCALE ON "D" BAND—Replace 50 mmfd. in oscillator circuit, will vary scale reading considerably if defective.

STATIONS RIDE IN—Check balance. Check .0012 in oscillator plate circuit.

LACK SENSITIVITY ON ULTRA SHORT WAVE—Note: Do not expect extreme pick-up on this band. However, the following will affect operation of the band—open oscillator coil, open or shorted .0012 condenser, shorted 50 mmfd across H.F. coil, grounded trimmer on detector section of gang. Do not alter or change length of wires or position of coils, etc., as this will affect entire short wave band operation—leave or replace all units in position shipped from factory. Open 5 ohm resistor at H.F. coil, will give spotty sensitivity; tubes, in particular 1st detector has a great effect on ultra short wave reception; also aerial installation.

DISTORTION—Tubes, open 16 mfd condenser, output tubes mismatched, 10 mfd. dry electrolytic in cathode circuit shorted; open cathode circuits, defective by-pass condenser; grounded or shorted tone circuit, defective speaker. Distortion only on normal, tone switch lugs are shorted. Also shorted .005 on one of the output tubes, open P.P. transformer.

CARRIER HUM—Open electrostatic shield in power transformer, by-pass A.C. line with approx. .001 micamold. Reverse A.C. plug. Open candohm ground — shorted .005 plate of output tube, grounded tap on volume control, tubes 6C5, 6H6 and output.

LACKS HIGHS—Poor contact on tone switch .00025 open; if tap on volume control is open, tone control will have no effect.

DEAD—Audio but no R.F. signals. 5 meter coil broken loose from gang terminal. Shorted air trimmer, gang trimmer shorted, open resistor in plate 1st audio. Tubes, filters shorted or by-pass condenser. Open coils.

B. C. OFF SCALE—Check pointer—line up across dial scale parallel to line with gang closed. Note: Air trimmer for "B" band as shown in earlier receivers and listed in technical book not used on later models. B.C. and D trimmers in same position as shown—follow usual line up procedure.

LACKS SENSITIVITY—Open coils, tubes, 2nd detector in particular; open R.F. choke in plate circuit, rebalance I.F.'s; broken grid wires; defective antenna and ground.

SPECIAL ACCESSORIES

For the convenience of those wishing to use headphones, and those hard of hearing, Zenith has made available an adapter, and several headphone combinations such as single, double and Bone Conductor head sets. They may be used with or without operation of the set speaker, and with external independent volume control.

There is also available an adapter and special cabineted permanent magnet dynamic speaker for extension use, and a Volume Limiting Knob for controlling maximum speaker level in hospitals or other installations where subdued response is desirable.

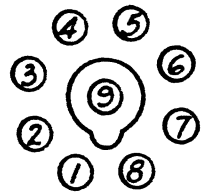
Write the factory for literature and prices on this special equipment.

MODELS
12-U-158, 12-U-159

CHASSIS No. 1203

SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9
6K7	R. F.	0	3AC	235	100	0	—	3AC	0	0
6L7	1st Det.	0	3AC	230	120	–.5	—	3AC	0	0
6C5	Osc.	0	3AC	185	—	–8	—	3AC	0	—
6K7	I. F.	0	3AC	235	100	0	—	3AC	Local 9	0
6H6	2nd Det. A.V.C.	0	3AC	–2.5	–2.5	–2.5	—	3AC	–2.5	—
6F5	1st Audio	0	3AC	—	90	—	—	3AC	–2.5	—
6F6	Driver	0	3AC	215	215	–.5	—	3AC	11	—
6L6	Power	0	3AC	330	210	–3	—	3AC	14	—
6C5	Target Tuning Amp.	0	3AC	230	—	0	—	3AC	0	—
5Y3 5W4	Rectifier	0	340	—	AC	—	AC	—	340	—



BOTTOM VIEW OF SOCKET

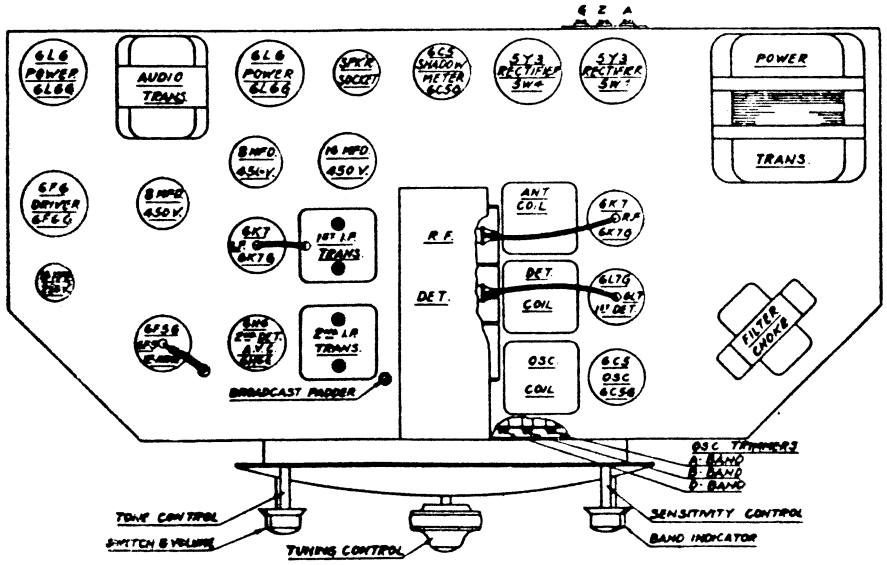
All voltages measured from point indicated to ground, using a 1000 ohm per volt meter. Antenna and ground disconnected

Line Voltage 112V.

Current Consumption 120 watts.

Power Output 17 watts.

Alignment procedure on page 28.



TUBE POSITION

NOTE See bottom page 18 for details of antenna connector strip.

ALIGNMENT PROCEDURE

CHASSIS No. 5406

(1) Connect the output leads of the signal generator to the grid of the first detector and receiver ground lead. Also connect an output meter across the speaker leads.

(2) Set the signal generator at 456 K.C. and carefully adjust the four I.F. trimmers to the point giving the greatest output reading. These I.F. transformers are of a very high gain, selective type, and the adjustments should be repeated several times for greatest accuracy.

(3) Change the signal generator leads to the antenna and ground leads of the receiver.

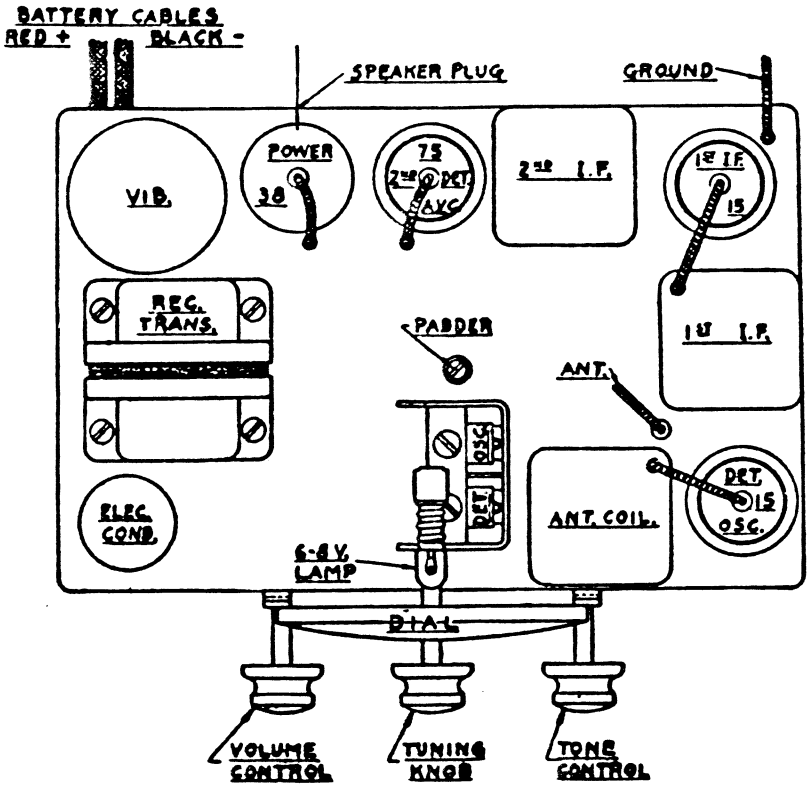
(4) Set the signal generator at 1400 K.C. Set the pointer on the receiver dial at the same frequency.

First adjust the oscillator and then the detector trimmers on the gang condenser to the point giving the maximum reading on the output meter, using as small a signal from the generator as possible so as to prevent the A.V.C. action from affecting the output readings.

(5) Reset the signal generator to 600 K.C.

(6) Slowly rock the pointer past 600 K.C. on dial meanwhile adjusting the osc. padder (located in rear of gang condenser) to the combination giving the greatest output reading.

(7) Repeat operation No. 4.



LOCATION OF TRIMMERS

ALIGNMENT PROCEDURE

CHASSIS No. 5633

(1) Connect the output leads of the signal generator to the grid of the first detector and receiver chassis through an .01 mfd. condenser. Also connect an output meter across the speaker transformer leads.

(2) Set the signal generator at 456 K.C. and carefully adjust the four I.F. trimmers to the point giving the greatest output reading. These I.F. transformers are of a very high gain selective type, and the adjustments should be repeated several times for greatest accuracy.

(3) Change the signal generator leads to the antenna and ground leads of the receiver.

(4) Set the signal generator at 1400 K.C. Set the pointer on the receiver dial at the same frequency.

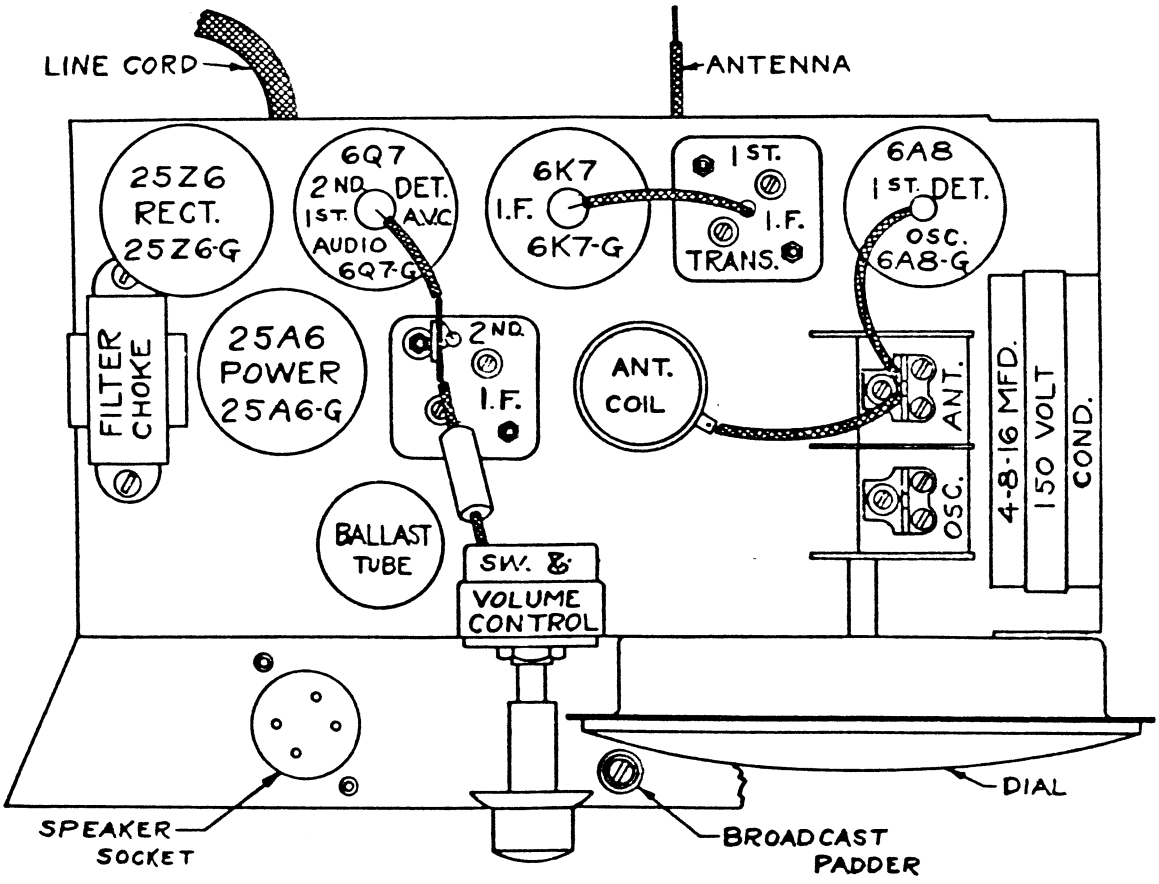
First adjust the oscillator and then the detector trimmers on the gang condenser to the point giving the maximum reading on the output meter, using as weak a signal from the generator as possible so as to prevent the A.V.C. action from affecting the output readings.

(5) Reset the signal generator to 600 K.C.

(6) Slowly rock the pointer past 600 K.C. on dial meanwhile adjusting the osc. padder (located on front of chassis) to the combination giving the greatest output reading.

(7) Repeat operation No. 4.

(8) There are no adjustments on the short wave band.



LOCATION OF TRIMMERS

ALIGNMENT PROCEDURE

CHASSIS Nos. 5516-5634-5707

(1) Connect the output leads of the signal generator to the grid of the first detector and receiver chassis. Also connect an output meter across the speaker transformer leads.

(2) Set the signal generator at 456 K.C. and carefully adjust the four I.F. trimmers to the point giving the highest reading on the output meter. The output transformers are of a very high grain, selective type and these adjustments should be repeated several times in order to secure maximum accuracy.

All adjustments should be made using as weak an output from the signal generator as possible in order to prevent the A.V.C. action from affecting the output readings.

(3) Change the signal generator leads to the antenna and ground terminals of the receiver.

(4) Adjust the wave trap (located on rear of chassis) for **minimum** output reading.

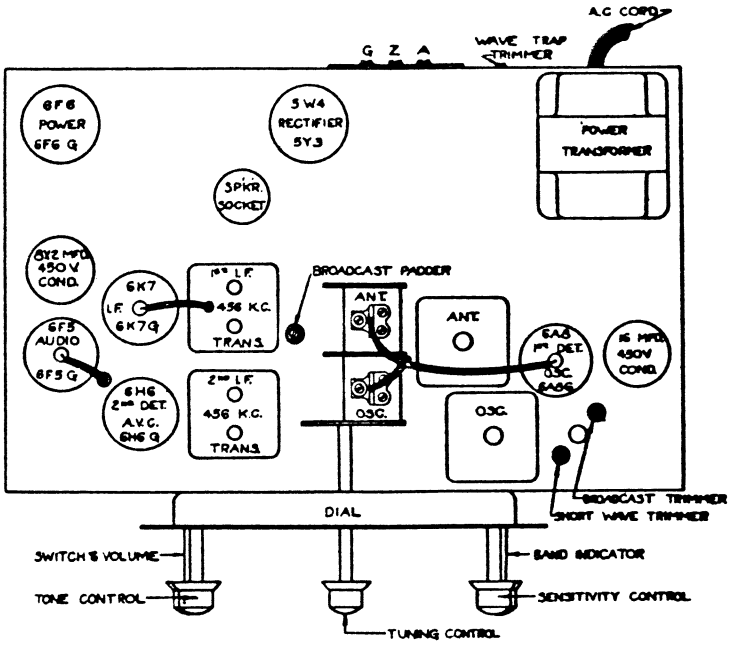
(5) Set signal generator at 6 M.C. Switch receiver to band B, and adjust osc. trimmer on gang for correct dial reading.

(6) Set signal generator at 1400 K.C. Switch receiver to band A and adjust broadcast trimmer (located in front of 6A8 tube—see diagram below) for correct dial reading. Also adjust antenna trimmer on gang to resonance.

(7) Set signal generator at 18 M.C.—Switch receiver to band C, and adjust the short wave trimmer while rocking the pointer past 18 M.C. on the dial to the combination giving the greatest output.

(8) Set signal generator at 600 K.C.—Switch receiver to band A, and rock pointer past 600 on dial while adjusting the broadcast padder (located adjacent to gang condenser) to combination giving the greatest output reading.

(9) Readjust broadcast and ant. trimmers at 1400 K.C. (as in operation 6).



LOCATION OF TRIMMERS

(Trimmer positions are the same on all chassis)

ALIGNMENT PROCEDURE

CHASSIS Nos. 5635-5801-1004

(1) Connect the output leads of the signal generator to the grid of the first detector and receiver chassis. Also connect an output meter across the speaker transformer leads.

(2) Set the signal generator at 456 K.C. and carefully adjust the four I.F. trimmers to the point giving the highest reading on the output meter. The output transformers are of a very high gain, selective type and these adjustments should be repeated several times in order to secure maximum accuracy. All adjustments should be made using as weak an output from the signal generator as possible in order to prevent the A.V.C. action from affecting the output readings.

(3) Change the signal generator leads to the antenna and ground terminals of the receiver.

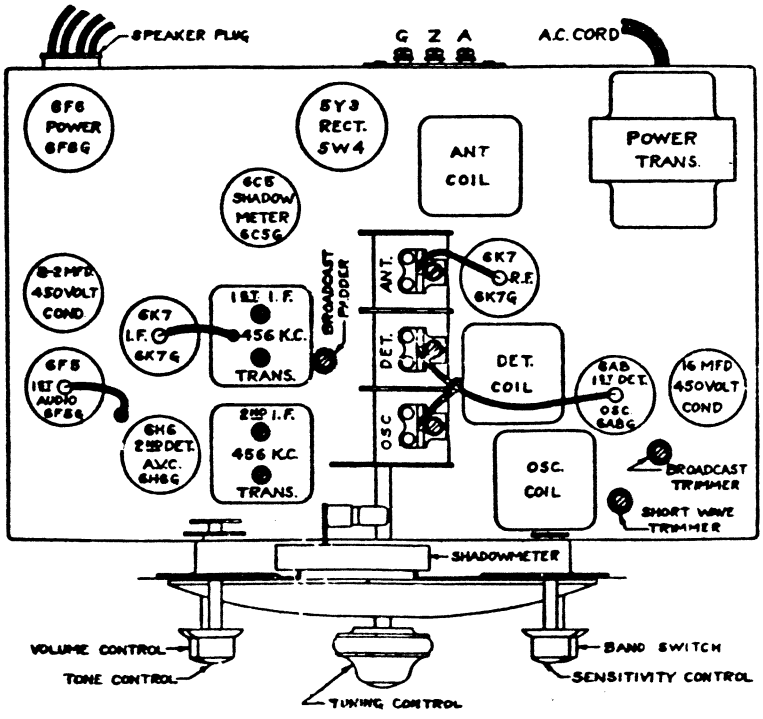
(4) Set signal generator at 6 M.C.—Switch receiver to band B, and adjust osc. trimmer on gang for correct dial reading.

(5) Set signal generator at 1400 K.C.—Switch receiver to band A and adjust broadcast trimmer (located in front of 6A8 tube—see diagram below) for correct dial reading. Also adjust ant. and det. trimmers on gang to resonance, adjust only the det. trimmer on two gang sets.

(6) Set signal generator at 18 M.C.—Switch receiver to band C and adjust the short wave trimmer while rocking the pointer past 18 M.C. on the dial to the combination giving the greatest output.

(7) Set signal generator at 600 K.C.—Switch receiver to band A, and rock pointer past 600 on dial while adjusting the broadcast padder (located adjacent to gang condenser) to combination giving the greatest output reading.

(8) Re-align broadcast trimmers at 1400 K.C. as outlined in operation 5.



(Trimmer positions are the same on all chassis)

ALIGNMENT PROCEDURE

CHASSIS No. 1203

(1) Connect the output leads of the signal generator to the control grid of the first detector and receiver ground. Also connect an output meter across the speaker transformer leads.

(2) Set the signal generator at 456 K.C. and carefully adjust the four I.F. trimmers to the point giving the highest reading on the output meter. The output transformers are of a very high gain, selective type, and these adjustments should be repeated several times in order to secure maximum accuracy. All adjustments should be made using as weak an output from the signal generator as possible in order to prevent the A.V.C. action from affecting the output readings.

(3) Change the signal generator leads to the antenna and ground terminals of the receiver.

(4) Set signal generator at 1400 K.C.—Switch receiver to Band A and adjust broadcast oscillator trimmer "A" (located on front of chassis) for correct dial reading. Also adjust the R.F. and det. trimmers on gang condenser for greatest output.

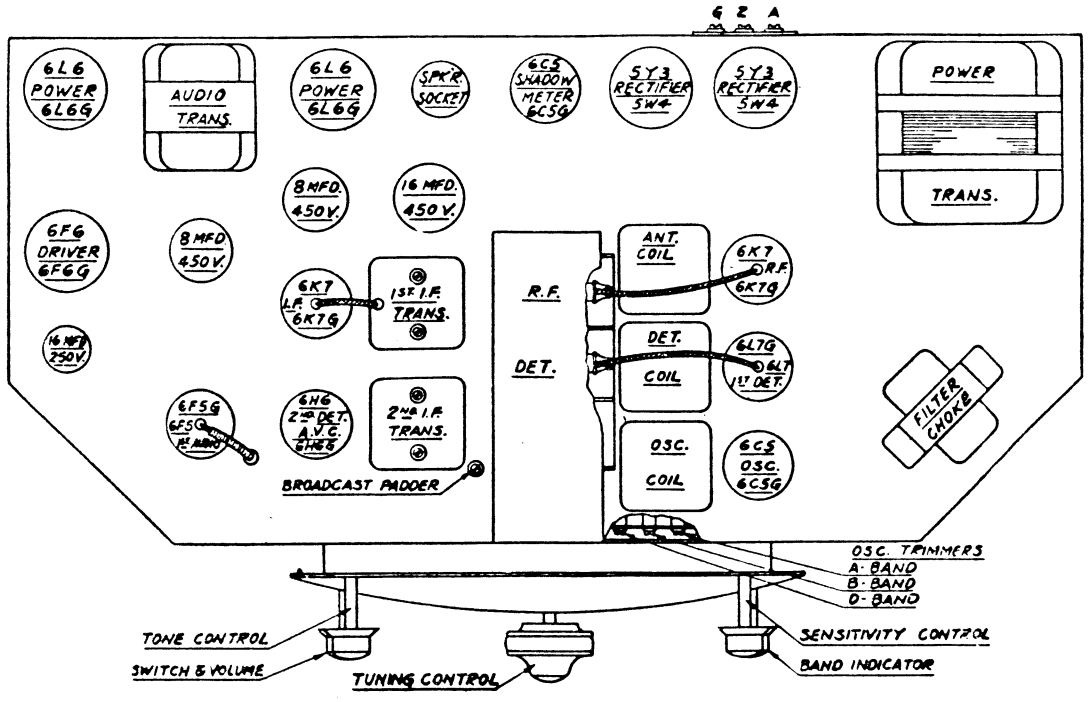
(5) Set signal generator at 600 K.C., and rock pointer past 600 K.C. on dial scale, meanwhile adjusting the broadcast padder until combination is reached which gives the greatest output reading.

(6) Readjust broadcast trimmers as outlined in operation No. 4.

(7) Set signal generator at 5.5 M.C.—Switch receiver to Band B, and adjust trimmer "B" (located on front of chassis) while rocking pointer past 5.5 on dial scale for combination giving the highest output reading.

(8) Set signal generator at 18 M.C.—Switch receiver to Band D and adjust the short wave trimmer "D" (located on front of chassis) while rocking the pointer past 18 M.C. on dial scale to combination giving the highest output reading.

(9) There are no adjustments on the (C) ultra short wave band. Caution! The length and position of the leads on both coil trimmers and band switch greatly affect the tuning on the short wave bands. These leads should not be altered in any way.



LOCATION OF TRIMMERS

PARTS LIST

Dial & Drive Assembly Parts

PART NO.	DESCRIPTION	CHASSIS NO. 1203	1004	5801	5707	5634	5695	5633	5516	5406	PRICE
11-3	Dial cord (per foot)							•		•	$ .10
26-98	Dial scale									•	.50
26-116	Dial Scale							•			.50
26-117	Dial Scale					•	•		•	•	1.25
26-122	Dial Scale				•				•		.75
26-123	Dial Scale		•	•							1.50
26-130	Dial Scale	•									2.00
27-16	Flywheel Disc	•	•	•	•		•				1.00
32-10	Drive belt				•				•		.20
32-11	Drive belt		•	•		•	•				.25
32-12	Drive belt	•									.25
34-49	Condenser shaft gear	•	•	•	•	•	•		•		.25
34-51	Lower pinion and gear	•	•	•	•	•	•		•		.15
59-32	Split second pointer			•							.15
59-40	Z pointer				•				•		.15
59-41	Split second pointer				•			•	•		.10
59-45	Dial pointer and bushing							•		•	.15
59-52	Split second pointer		•			•	•				.15
59-53	Z pointer		•	•		•	•				.20
59-54	Pointer	•									.25
59-55	Split second pointer	•									.15
61-34	Drive pulley	•									.10
61-40	Drive pulley		•	•		•	•				.10
76-215	Drive shaft		•	•		•	•				.10
76-216	Dial shaft	•									.35
76-219	Band selector shaft	•									.20
80-53	Tension pulley spring	•	•	•		•	•				.05
80-60	Tension pulley spring				•				•		.05
80-69	Tension pulley spring							•		•	.01
80-118	Dial drive spring	•	•	•	•	•	•		•		.15
80-127	Dial glass retainer spring	•	•	•	•	•	•	•	•		.03
80-128	Shaft pulley spring	•	•	•	•	•	•				.01
83-407	Dial light diffusion strip		•	•	•	•	•	•			.05
93-273A	.031 x 9/32 x 3/4 bake. wash.	•	•	•	•	•	•	•			.01
97-91	Lower gear stud		•		•	•	•		•		.01
100-36	Dial lights 6.3V bayonet	•	•	•	•	•		•	•		.15
100-39	Dial lights 2.9V bayonet						•			•	.15
118-11	Band switch link	•									.05
122-13	Target tuning meter		•	•							2.00
122-14	Target tuning meter	•									2.00
126-221	Dial light shield	•									.01
132-15	Dial glass retainer ring									•	.05
148-13	Switch lever arm	•									.05
159-12	Snap buttons	•									.02
188-2	Retainer rings	•	•	•	•	•	•	•	•	•	.01
192-11	Dial glass									•	.15
192-15	Dial glass							•		•	.15
192-16	Dial glass				•				•		.25
192-17	Dial glass		•	•		•	•				.50
192-19	Dial glass	•									1.50
196-5	Dial glass gasket									•	.03
196-9	Dial glass gasket							•			.05
196-10	Dial glass gasket				•				•		.10
196-11	Dial glass gasket		•	•		•	•				.10
196-12	Dial glass gasket	•									.10
MS-308	Dial drive pulley assm.							•			.25
MS-310	Dial refl. & strip assm.								•		.75
MS-312	Dial drive pulley assm.	•	•	•		•	•				.25
MS-313	Dial refl. & strip assm.					•					1.00
MS-321	Dial drive pulley assm.									•	.20

PART NO.	DESCRIPTION	CHASSIS NO. 1203	1004	5801	5707	5634	5635	5633	5516	5406	PRICE
S-3780	Shft. pul., slv. & pin. assm.				•				•		.35
S-3888	Drive shaft assembly									•	.10
S-4301	Dial light sock. & clip assm.	•	•	•	•	•	•	•	•	•	.10
S-4323	Dial drive shft. & wash. assm.							•			.10
S-4340	Tension pulley & arm assm.	•	•	•	•	•	•		•		.15
S-4342	Drive shaft & pulley assm.						•				.35
S-4380	Lever arm and shaft assm.	•	•								.25
S-4412	Vol. con. indic. scale & bush.		•	•		•	•				.35
S-4413	Band Ind. scale & bush.		•	•		•	•				.35
S-4414	Tone Cont. Ind. scale & bush.		•	•		•	•				.35
S-4415	Sensitiv. Con. Ind. scale & bush		•	•		•	•				.35
S-4416	Pin. gear & pntr. shft. bush. as.	•	•	•		•	•				.25
S-4541	Vol. Con. ind. scale & bush. as.	•									.35
S-4542	Band Ind. scale & bush. as.	•									.35
S-4543	Tone cont. ind. scale & bush. as.	•									.35
S-4544	Sensitivity control indicator scale and bushing assembly	•									.35

R. F. Coils, Chokes & I. F. Transformers

20-71	Antenna Choke	•	•	•			•				.20
20-88	R. F. Choke						•				.25
20-133	Wave Trap Assembly				•	•					.60
20-134	Antenna Choke				•	•			•		.25
20-135	R. F. Plate Choke	•	•	•			•				.50
95-346	1st I.F. Transformer							•			1.25
95-347	2nd I.F. Transformer							•			1.25
95-349	1st I.F. Transformer								•		1.25
95-350	2nd I.F. Transformer								•		1.25
95-352	1st I.F. Transformer									•	1.25
95-353	1st I.F. Transformer			•	•		•				1.25
95-354	2nd I.F. Transformer			•	•		•				1.25
95-358	1st I.F. Transformer				•						1.25
95-359	2nd I.F. Transformer				•					•	1.25
95-368	1st I.F. Transformer	•									1.25
95-369	2nd I.F. Transformer	•									1.25
95-371	1st I.F. Transformer						•				1.25
95-372	2nd I.F. Transformer						•				1.25
S-2778	R.F. Choke						•			•	.15
S-3756	Osc. Coil Assembly									•	1.50
S-4302	Antenna Coil Assembly							•			1.00
S-4304	Oscillator Coil Assembly							•			.50
S-4343	Antenna Coil Assembly				•						1.25
S-4344	Oscillator Coil Assembly				•						1.25
S-4362	Antenna Coil Assembly								•		1.00
S-4363	Oscillator Coil Assembly								•		1.00
S-4387	H.F. Det. Coil Assembly	•									.35
S-4388	H.F. Osc. Coil Assembly	•									.35
S-4394	Antenna Coil Assembly					•					1.00
S-4395	Oscillator Coil Assembly					•					1.00
S-4419	Detector Coil Assembly			•	•						1.25
S-4420	Oscillator Coil Assembly			•	•						1.25
S-4421	Detector Coil Assembly			•	•						1.25
S-4452	Wave Trap Assembly								•		.75
S-4456	Antenna Coil Assembly									•	1.25
S-4480	Antenna Coil Assembly						•				1.25
S-4481	Detector Coil Assembly						•				1.25
S-4482	Oscillator Coil Assembly						•				1.25
S-4545	Antenna Coil Assembly	•									1.00
S-4546	Detector Coil Assembly	•									1.00
S-4547	Oscillator Coil Assembly	•									1.50

PRICE LIST (Continued)

Condensers—By-Pass, Fixed, Variable & Electrolytic

PART NO.	DESCRIPTION	CHASSIS NO. 1203	1004	5801	5707	5634	5635	5633	5516	5406	PRICE
22-82	.001 mfd. 600 Volt							•	•	•	.25
22-125	8 mfd. 450 Volt Wet Elec.	•									1.00
22-127	25 mmfd. 600 Volt	•	•	•		•	•		•		.15
22-138	.2 mfd. 200 Volt								•		.25
22-147	.005 mfd. 600 Volt	•	•	•		•	•		•		.15
22-162	.0001 mfd. 600 Volt	•	•	•	•	•		•	•		.20
22-170	.1 mfd. 400 Volt	•	•	•	•	•			•		.25
22-182	.00025 600 Volt	•	•	•		•	•	•		•	.12
22-185	.01 200 Volt							•		•	.20
22-188	.002 400 Volt	•	•	•	•	•	•	•	•		.15
22-190	.1 200 Volt				•			•			.20
22-199	.5 200 Volt									•	.35
22-205	200-550 mmfd. Padder	•	•	•	•	•	•	•	•	•	.35
22-212	.05 mfd. 400 Volt	•			•		•	•	•	•	.20
22-219	.03 mfd. 200 Volt			•		•					.15
22-224	.1 mfd. 300 Volt		•	•			•				.15
22-225	5 mfd. Elect. 25 Volt						•			•	.65
22-229	.0005 600 Volt	•	•	•	•	•		•			.15
22-243	.01 400 Volt	•	•	•		•	•			•	.15
22-250	.5 mfd. 200 Volt	•	•	•	•	•	•	•	•	•	.15
22-280	.5 mfd. 200 Volt						•				.25
22-285	.10 mmfd. 600 Volt	•									.15
22-289	50 mmfd. 600 Volt	•	•	•		•	•				.12
22-294	16 mfd. 450 Volt	•	•	•		•					1.00
22-303	5 mmfd. 600 Volt	•	•	•	•						.15
22-305	2-35 mmfd. Padder					•			•		.15
22-326	.003 mfd. 400 Volt			•		•	•				.15
22-327	.02 mfd. 200 Volt							•			.20
22-350	.25 mfd. 200 Volt										.20
22-358	.002 600 Volt										.20
22-376	.0021 600 Volt										.20
22-384	.0015 mfd. 600 Volt	•	•	•	•	•	•		•		.20
22-405	10 mfd. Dry Elect. 50 Volts										.75
22-408	2-35 mfd. Trimmer Cond.		•	•	•	•	•		•		.25
22-419	2-8 mfd. 250 Volt									•	1.75
22-435	.02 mfd. 600 Volt	•	•	•		•			•		.15
22-455	.01 mfd. 1200 Volt				•			•		•	.15
22-459	2-8 mfd. 250 Volt Dry Elect.						•				1.25
22-467	.2 mfd. 200 Volt				•						.20
22-478	2 gang Variable							•			2.50
22-481	4-16-8 mfd. 150V							•			2.50
22-482	2 gang Variable				•	•			•		2.50
22-484	4-8-16-4 mfd. 250 Volt				•						3.00
22-485	.005 mfd. 600 Volt	•	•	•	•	•	•		•		.35
22-486	.0012 mfd. 600 Volt	•	•	•	•	•	•		•		.15
22-487	.05 mfd. 400 Volt	•	•	•	•	•	•		•		.15
22-488	3 gang Variable		•	•			•				3.50
22-489	3 gang Variable	•									3.50
22-491	8-2 mfd. Dry Elect. 450 V. (Rep. 22-496)			•		•					1.50
22-492	.002 mfd. 600 Volt			•		•	•				.20
22-493	8-8 mfd. Dry Elect. 450 Volt		•								2.00
22-494	.1 mfd. 600 Volt								•		.25
22-495	.2 mfd. 400 Volt			•		•					.20
22-502	8-16 mfd. Dry Elect. 450 V. 25 Cy.		•								1.00
22-504	8 mfd. Wet Elect. Cond. 450 V.	•	•								1.00
22-505	12 mfd. Wet Elect. Cond. 325 V								•		1.00
22-506	16 mfd. Wet Elect. Cond. 250 V.	•	•						•		1.00
22-507	10 mfd. Dry Elect. 25 Volts		•								.65
22-508	Trimmer Cond.	•									.20
22-509	10 mfd. Dry Elect. Cond. 50 V.	•									.75
22-510	8-8-8 mfd. Dry Elect. Cond. 450 V.		•								2.75
22-512	8 mfd. Dry Elect. 450 Volt		•								1.00
22-513	16 mfd. Dry Elect. 450 V.					•					1.50
22-514	4-16 mfd. Dry Elect. 250 V.				•						1.50
22-515	4-8 mfd. Dry Elect. 250 V.				•						1.25
22-516	8 mfd. Elect. 150 Volt								•		.75
22-517	4-16 mfd. Elect. 150 V.								•		1.15

Resistors, Voltage Dividers and Variable Controls

63-135	25M ohm ½ watt								•		.20
63-208	12 M ohm 1 watt	•									.25
63-238	1 M ohm ¼ watt									•	.20
63-258	490 M ohm ¼ watt			•		•	•		•	•	.20
63-260	100 M ohm ¼ watt	•	•				•			•	.20
63-261	9900 M ohm ¼ watt	•	•	•		•	•	•			.20
63-263	30 M ohm ½ watt								•		.20
63-278	99 M ohm ¼ watt	•	•	•	•	•	•	•			.20
63-280	49 M ohm ¼ watt		•	•	•	•	•		•		.20
63-281	29 M ohm ¼ watt									•	.20
63-288	9 M ohm ¼ watt				•		•	•			.20
63-290	260 M ohm ¼ watt				•		•	•			.20
63-293	990 M ohm ¼ watt	•	•	•	•	•	•	•	•	•	.20
63-300	990 ohm ¼ watt										.20
63-303	700 ohm ¼ watt	•	•	•				•		•	.20
63-353	19 M ohm ½ watt			•		•	•				.20
63-357	300 ohm ¼ watt	•	•			•				•	.20
63-360	2 M ohm ¼ watt						•				20
63-361	5 M ohm ¼ watt				•		•				.20
63-362	400 ohm ¼ watt				•		•	•	•		.20
63-373	11 M ohm ½ watt		•	•		•					.20
63-376	190 M ohm ¼ watt			•	•	•		•	•		.20
63-377	170 ohm ¼ watt							•			.20
63-385	300 M ohm ¼ watt	•	•								.20
63-394	200 ohm ¼ watt						•			•	.20
63-411	20 ohm ¼ watt	•									.20
63-418	1500 ohm ½ watt									•	.20
63-442	50 M ohm ¼ watt				•						.20
63-452	650 M ohm ¼ watt				•			•			.20
63-466	990 ohm ½ watt	•									.20
63-469	100 M ohm Tone Control									•	.60
63-477	100 ohm Flex Wire Wound						•				.20
63-481	400 M ohm ¼ watt			•	•	•	•	•			.20
63-486	80 M ohm 1 watt										.20
63-498	800 ohm ¼ watt						•				.20
63-499	9 M ohm ¼ watt									•	.20
63-515	Candohm Resistor			•		•					.65
63-516	Candohm Resistor		•								.65
63-517	400 M ohm Volume Control								•		1.00
63-518	590 ohm ¼ watt				•					•	.20
63-520	400 M ohm Vol. Con. & Switch									•	1.00
63-521	50 M ohm Tone Control				•					•	.70
63-522	2 megohm Vol. Con. & Switch	•	•	•		•	•				1.00
63-523	2 megohm ¼ watt	•	•	•		•	•				.20
63-528	Candohm Resistor	•									.65
63-530	5 ohm ¼ watt	•									.20
63-531	650 ohm 1 watt	•									.20
63-532	5100 ohm 1 watt	•									.20

PRICE LIST (Continued)

PART NO.	DESCRIPTION	CHASSIS NO. 1203	1004	5801	5707	5634	5635	5633	5516	5406	PRICE
63-534	400 M vol. Con. & Switch									•	1.00
63-536	30 ohm Flex Wire Wound									•	.15

Transformers—Audio and Power

95-289	Power Trans. 115 V. 50-60 Cy.			•		•					3.50
95-290	Power Trans. All Voltage 25 Cy.			•		•					6.50
95-298	Power Choke									•	.75
95-300	Rectifier Trans.									•	2.00
95-305	Rectifier Trans.						•				1.75
95-311	Audio Trans.						•				1.25
95-324	Power Choke						•				1.00
95-345	Power Choke							•			.75
95-348	Power Choke				•						.75
95-351	Power Trans. 115 V. 50-60 Cy.								•		3.00
95-355	Power Trans. 115 V. 50-60 Cy.		•								5.00
95-356	Power Choke		•								1.25
95-360	Audio Trans.		•								2.00
95-361	Power Trans. All Voltage 25 Cy.								•		5.00
95-365	Power Trans. All Voltage 25 Cy.		•								9.00
95-366	Power Choke	•									1.50
95-367	Audio Trans.	•									2.50
95-370	Power Trans. 115 V. 50-60 Cy.	•									6.00
95-373	Power Trans. All Voltage 25 Cy.	•									10.00

Speakers and Speaker Parts

49-117	8" Dynamic Speaker			•		•					8.00
	Cone and Voice Coil for 49-117			•		•					2.50
	Output Transformer for 49-117			•		•					2.00
	Field Coil for 49-117			•		•					2.00
49-118	10" Dynamic Speaker					•					9.00
	Cone and Voice Coil for 49-118					•					3.25
	Output Transformer for 49-118					•					2.00
	Field Coil for 49-118					•					2.00
49-141	5" Dynamic Speaker							•			4.00
	Cone and Voice Coil for 49-141							•			1.50
	Output Transformer for 49-141							•			1.50
	Field Coil for 49-141							•			1.50
49-142	6" Dynamic Speaker					•					5.00
	Cone and Voice Coil for 49-142					•					2.00
	Output Transformer for 49-142					•					1.50
	Field Coil for 49-142					•					2.00
49-143	6" Dynamic Speaker									•	5.00
	Cone and Voice Coil for 49-143									•	2.00
	Output Transformer for 49-143									•	1.50
	Field Coil for 49-143									•	2.00
49-144	10" Dynamic Speaker									•	8.00
	Cone and Voice Coil for 49-144									•	2.50
	Output Transformer for 49-144									•	2.00
	Field Coil for 49-144									•	2.00
49-145	10" Dynamic Speaker					•					8.00
	Cone and Voice Coil for 49-145					•					2.50
	Output Transformer for 49-145					•					2.00
	Field Coil for 49-145					•					2.00
49-146	8" Dynamic Speaker			•							7.00
	Cone and Voice Coil for 49-146			•							2.00
	Output Transformer for 49-146			•							2.00
	Field Coil for 49-146			•							2.00

PART NO.	DESCRIPTION	CHASSIS NO. 1203	1004	5801	5707	5634	5635	5633	5516	5406	PRICE
49-147	12" Dynamic Speaker		•								10.00
	Cone and Voice Coil for 49-147		•								3.25
	Output Transformer for 49-147		•								2.50
	Field Coil for 49-147		•								3.00
49-148	12" Dynamic Speaker			•							10.00
	Cone and Voice Coil for 49-148			•							3.25
	Output Transformer for 49-148			•							2.50
	Field Coil for 49-148			•							3.00
49-149	12" Dynamic Speaker 12U158	•									10.00
	Cone and Voice Coil for 49-149	•									3.25
	Output Transformer for 49-149	•									2.00
	Field Coil for 49-149	•									2.00
49-150	12" Dynamic Speaker 12U159	•									12.00
	Cone and Voice Coil for 49-150	•									3.25
	Output Transformer for 49-150	•									2.00
	Field Coil for 49-150	•									2.00
49-151	8" Dynamic Speaker				•						6.50
	Cone and Voice Coil for 49-151				•						2.00
	Output Transformer for 49-151				•						2.00
	Field Coil for 49-151				•						2.00
49-152	8" Dynamic Speaker									•	6.50
	Cone and Voice Coil for 49-152									•	2.00
	Output Transformer for 49-152									•	2.00
	Field Coil for 49-152									•	2.00
49-153	6" P. M. Dynamic Speaker									•	6.00
	Cone and Voice Coil for 49-153									•	2.00
	Output Transformer for 49-153									•	2.00
49-155	8" P .M. Dynamic Speaker						•				8.00
	Cone and Voice Coil for 49-155						•				2.50
	Output Transformer for 49-155						•				2.50
49-156	12" Dynamic Speaker		•								10.00
	Cone and Voice Coil for 49-156		•								3.25
	Output Transformer for 49-156		•								2.50
	Field Coil for 49-156		•								3.00
49-157	12" P. M. Dynamic Speaker						•				10.00
	Cone and Voice Coil						•				3.25
	Output Transformer						•				2.50
49-158	6" Dynamic Speaker	•									5.00
	Cone and Voice Coil for 49-158	•									2.00
	Output transformer for 49-158	•									2.00
	Field Coil for 49-158	•									2.00
49-159	6" P. M. Dyn. Speaker for S4465									•	6.50
	Cone and Voice Coil for 49-159									•	2.00
	Output Transformer for 49-159									•	2.00
S-4465	Comp. Speaker and Case Assm.									•	10.00
49-160	8" P. M. Dynamic Speaker						•				8.00
	Cone and Voice Coil for 49-160						•				2.50
	Output Transformer for 49-160						•				2.50
S-4466	Comp. Speaker and Case Assm.						•				10.00

Miscellaneous

78-101	Wafer Socket for 75 Tube						•			•	.10
78-106	Wafer Socket for 6A7 Tube						•				.10
78-109	Wafer Socket for 76 Tube						•				.10
78-124	Wafer Socket for 19 Tube						•				.10
78-128	Wafer Sock. for Speak. (5 con.)		•	•	•	•	•		•	•	.10
78-129	Voltage Indicator Socket	•	•	•		•			•		.10
78-133	Wafer Socket for 6H6 Tube	•	•	•	•	•					.15
78-136	Wafer Socket for 5Y3-5W4 Tube	•	•	•		•			•		.15
78-137	Wafer Socket for 6F6-6L6 Tube	•	•	•		•			•		.15

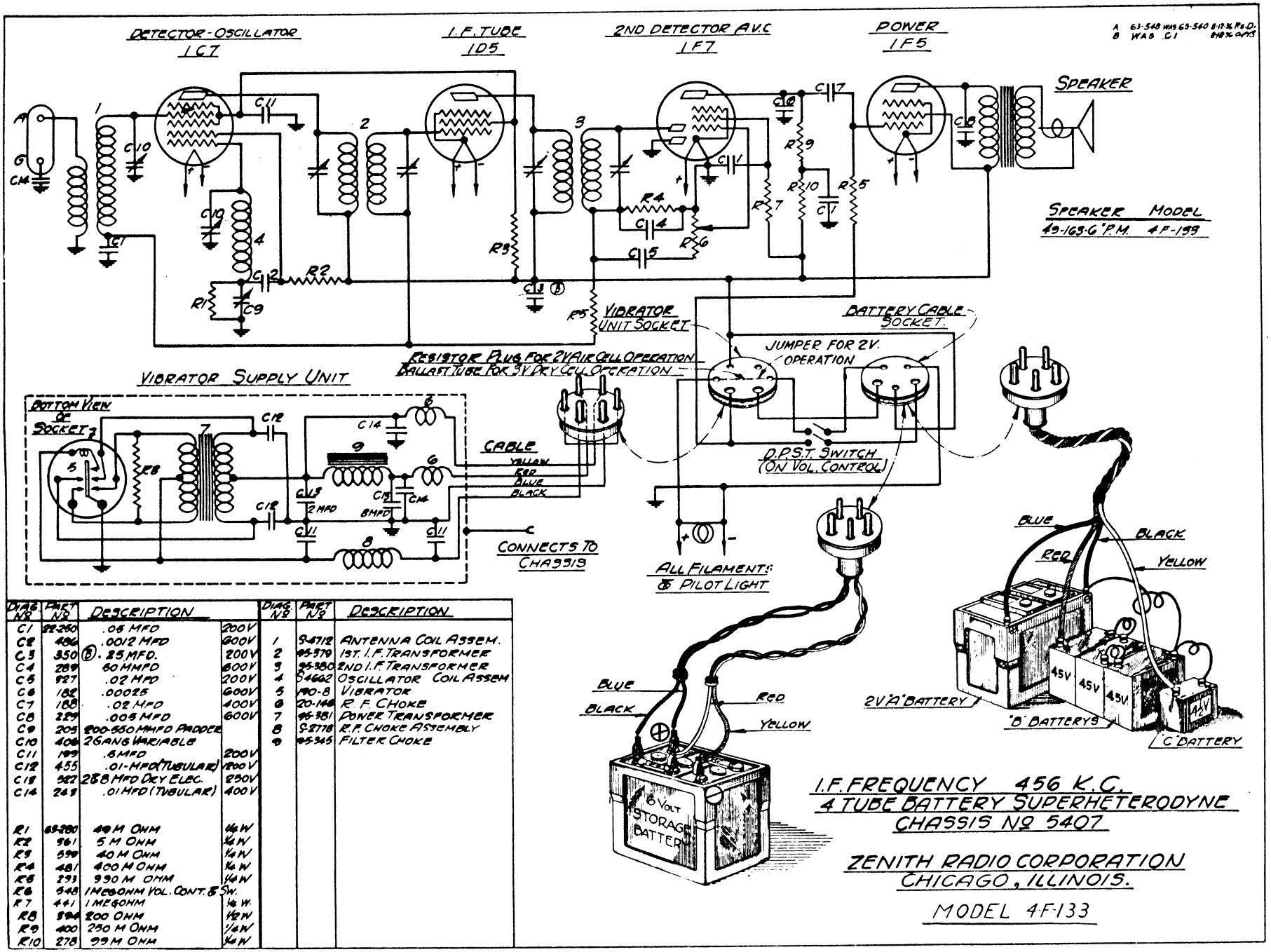
PRICE LIST (Continued)

PART NO.	DESCRIPTION	CHASSIS NO. 1203	1004	5801	5707	5634	5635	5633	5516	5406	PRICE
78-139	Wafer Socket for 15 Tube						•			•	.10
78-140	Wafer Socket for 38 Tube									•	.10
78-141	Vibrator Socket						•			•	.10
78-144	Wafer Socket for Speaker	•									.15
78-145	Wafer Socket for 6F5 Tube	•		•	•	•					.15
78-148	Wafer Socket for 6Q7 Tube							•	•		.15
78-150	Wafer Socket for 6K7 Tube	•	•	•	•	•		•	•		.15
78-151	Wafer Socket for 6A8 Tube		•	•	•	•		•	•		.15
78-156	Wafer Socket for 6C5 Tube	•	•	•							.15
78-158	Wafer Socket for 25A6 Tube				•			•			.15
78-159	Wafer Socket for 25Z6 Tube				•			•			.15
78-160	Wafer Socket for Speaker							•			.15
78-161	Wafer Socket for Ballast Tube				•			•			.15
78-162	Wafer Socket for 6L7 Tube	•									.15
19-59	Battery clip (positive)						•			•	.15
19-60	Battery clip (negative)						•			•	.15
44-7	Phono jack	•	•	•	•	•			•		.15
46-122	Tuning knob									•	.10
*46-123	Band selector and vol. con. knob	•	•	•	•	•	•		•		.20
46-127	Tuning and vol. con. knob				•				•		.20
*46-166	Tuning knob	•	•	•		•	•				.35
*46-167	Tone and sensitiv. con. knob	•	•	•		•	•				.20
46-168	Control knob							•			.20
46-169	Band switch knob				•				•		.20
51-21	Fuse mounting						•			•	.25
57-551	Escutcheon plate					•	•				1.00
57-556	Escutcheon plate			•	•						1.00
57-562	Escutcheon plate	•									2.00
83-433	Antenna and gr. terminal strip	•	•	•	•	•	•		•		.15
85-39	Phono switch	•	•	•	•	•			•		1.00
85-88	Band selector switch							•			.60
85-89	Band selector switch				•				•		1.00
85-90	Band selector switch					•					1.00
85-91	Sensitivity switch	•	•	•		•	•				.35
85-92	Tone control switch	•	•	•		•	•				.50
85-93	Band selector switch		•	•		•					1.50
85-94	Band selector switch	•									2.75
91-190	Battery cable (black) per ft						•			•	.05
91-191	Battery cable (red) per ft						•			•	.05
97-91	Lower gear stud			•							.01
100-37	115 V ballast tube							•			.75
100-38	117 V ballast tube				•						.75
100-45	125 V ballast tube				•						.75
100-46	150 V ballast tube				•						.75
100-47	200 V ballast tube				•						.75
100-48	220 V ballast tube				•						.75
100-49	250 V ballast tube				•						.75
126-109	Tube shields (small)	•	•	•	•	•					.15
126-127	Tube shields (large)	•	•	•	•	•	•	•	•		.10
136-10	5 ampere fuse						•			•	.06
190-6	Vibrator						•			•	5.00
S-4567	Acoustic adapter assembly	•	•	•							3.50

*When ordering colored knobs place the code letter H—Honey maple, Y—Ebony, W—Bone White, after the part number and add $0.10 to list price.

Zenith Radio Corporation

CHICAGO, ILL.



DIAG. NO	PART NO	DESCRIPTION	
C1	88-260	.06 MFD	200V
C2	486	.0012 MFD	600V
C3	350	Ⓑ .25 MFD.	200V
C4	289	60 MMFD	600V
C5	927	.02 MFD	200V
C6	182	.00025	600V
C7	188	.02 MFD	400V
C8	229	.005 MFD	600V
C9	209	800-550 MMFD PADDER	
C10	408	26 GANG VARIABLE	
C11	199	.6 MFD	200V
C12	455	.01-MFD (TUBULAR)	1200V
C13	327	2-8 MFD DRY ELEC.	250V
C14	249	.01 MFD (TUBULAR)	400V
R1	68-280	40 M OHM	1/4 W
R2	961	5 M OHM	1/4 W
R3	599	40 M OHM	1/4 W
R4	481	400 M OHM	1/4 W
R5	293	990 M OHM	1/4 W
R6	548	1 MEGOHM VOL. CONT. & SW.	
R7	441	1 MEGOHM	1/4 W.
R8	594	800 OHM	1/2 W
R9	400	250 M OHM	1/4 W
R10	278	99 M OHM	1/4 W

DIAG. NO	PART NO	DESCRIPTION
1	9-4712	ANTENNA COIL ASSEM.
2	95-579	1ST. I.F. TRANSFORMER
3	95-380	2ND I.F. TRANSFORMER
4	5-4662	OSCILLATOR COIL ASSEM
5	190-8	VIBRATOR
6	20-146	R.F. CHOKE
7	95-381	POWER TRANSFORMER
8	5-2778	R.F. CHOKE ASSEMBLY
9	95-345	FILTER CHOKE

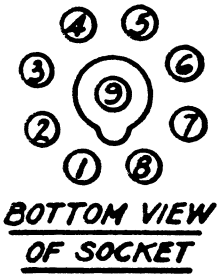
SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9	
1C7	1st Det.Osc.	0	2	128	48	-2	112	0	0	0	-
1D5	I.F.	0	2	126	48	-	-	0	0	0	
1F7	2nd Det.A.V.C.	0	2	27	0	0	9	0	0	0	
1F5	Power	0	2	122	126	0	-	0	0	-	

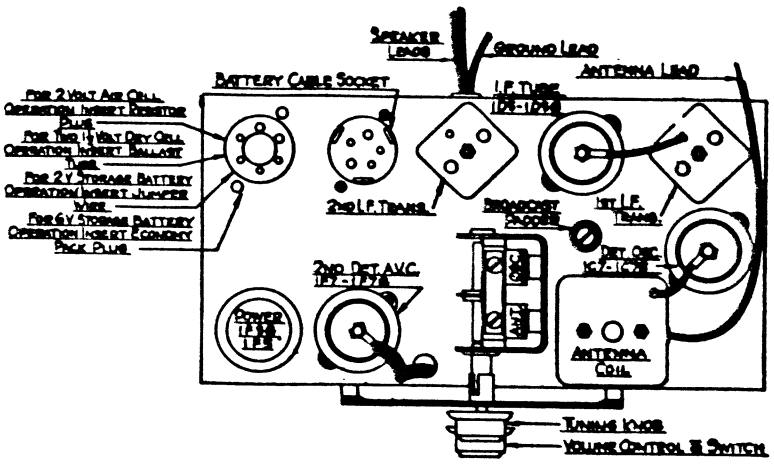
All voltages measured with a 1000 ohm per volt D.C. meter and using the Zenith 6 V Economy Pack - Antenna and ground disconnected.
Battery Voltage - 6.3 V.
Battery Drain - .98 amp.

ALIGNMENT

(1) Connect the output leads of the signal generator to the grid of the first detector and receiver ground lead. Also connect an output meter across the speaker leads.
(2) Set the signal generator at 456 K.C. and carefully adjust the four I.F. trimmers to the point giving the greatest output reading. These I.F. transformers are of a very high gain, selective type, and the adjustments should be repeated several times for greatest accuracy.
(3) Change the signal generator leads to the antenna and ground leads of the receiver.
(4) Set the signal generator at 1400 K.C. Set the pointer on the receiver dial at the same frequency.
First adjust the oscillator and then the detector trimmers on the gang condenser to the point giving the maximum reading on the output meter, using as small a signal from the generator as possible so as to prevent the A.V.C. action from affecting the output readings.
(5) Reset the signal generator to 600 K.C.
(6) Slowly rock the pointer past 600 K.C. on dial meanwhile adjusting the osc. padder (located in rear of gang condenser) to the combination giving the greatest output reading.
(7) Repeat operation No. 4.



BOTTOM VIEW OF SOCKET



Tube Position

ZENITH **PARTS LIST** Model 4F-133

	Condensers	
22-182	.00025 mfd. 600 Volt	.12
22-188	.02 mfd. 400 Volt	.15
22-199	.5 mfd. 200 Volt	.35
22-205	200-550 mmfd. Padder Condenser	.35
22-229	.005 mmfd. 600 Volt	.15
22-243	.01 mmfd. 400 Volt	.15
22-250	.05 mmfd. 200 Volt	.15
22-289	50 mmfd. 600 Volt	.12
22-327	.02 mfd. 200 Volt	.15
22-350	.25 mfd. 200 Volt	.20
22-406	Two Gang Variable Condenser	2.50
22-455	.01 mfd. 1200 Volt	.15
22-486	.0012 mfd. 600 Volt	.15
22-522	2 x 8 mfd. Dry Electrolytic (S-4680)	1.00
	Resistors	
63-278	99 M Ohm 1/4 Watt	.20
63-280	49 M Ohm 1/4 Watt	.20
63-293	990 M Ohm 1/4 Watt	.20
63-361	5 M Ohm 1/4 Watt	.20
63-394	200 Ohm 1/2 Watt	.20
63-400	250 M Ohm 1/4 Watt	.20
63-441	1 Megohm 1/4 Watt	.20
63-481	400 M Ohm 1/4 Watt	.20
63-539	40 M Ohm 1/4 Watt	.20
63-548	1 Megohm Volume Control and Switch	1.00
	Coils, Chokes, Etc.	
20-146	R. F. Choke	.20
95-379	1st I. F. Transformer	1.25
95-380	2nd I. F. Transformer	1.25
S-2778	R. F. Choke Assembly	.15
S-4662	Oscillator Coil Assembly	.30
S-4712	Antenna Coil Assembly	1.25
	Parts For S-4680	
	Economy Pack (Used with 6 V. Storage Battery)	
S-4680	Economy Pack Complete	10.00
20-146	R. F. Choke	.20
22-199	.5 mfd. 200 Volt Condenser	.35
22-243	.01 mfd. 400 Volt Condenser	.15
22-455	.01 mfd. 1200 Volt Condenser	.15
22-522	2-8 mfd. 250 Volt Elect. Condenser	1.25
63-394	200 Ohm 1/2 Watt Resistor	.20
78-141	Vibrator Wafer Type Socket	.15
95-345	Filter Choke	.75
95-381	Power Transformer	2.00
100-51	Dial Lights 2.5 Volt .65 Amp.	.15
166-4	Channeled Rubber Bumpers 2 7/8" Long	.05
166-5	Channeled Rubber Bumpers 3/8" Long	.02
190-8	Vibrator	5.00

Parts for S-4680 Economy Pack (Cont'd)

S-4659	Battery Cable-Plug and Clip Assembly	1.25
S-4663	Power Unit Cable and Plug Assembly	.50

Special Parts

23-12	Tube Socket Contact Jumper	.02
63-544	Resistor Plug (Used With Air Cell Battery)	.50
100-52	Ballast Tube (Used with 3 Volt Dry Cell)	1.25

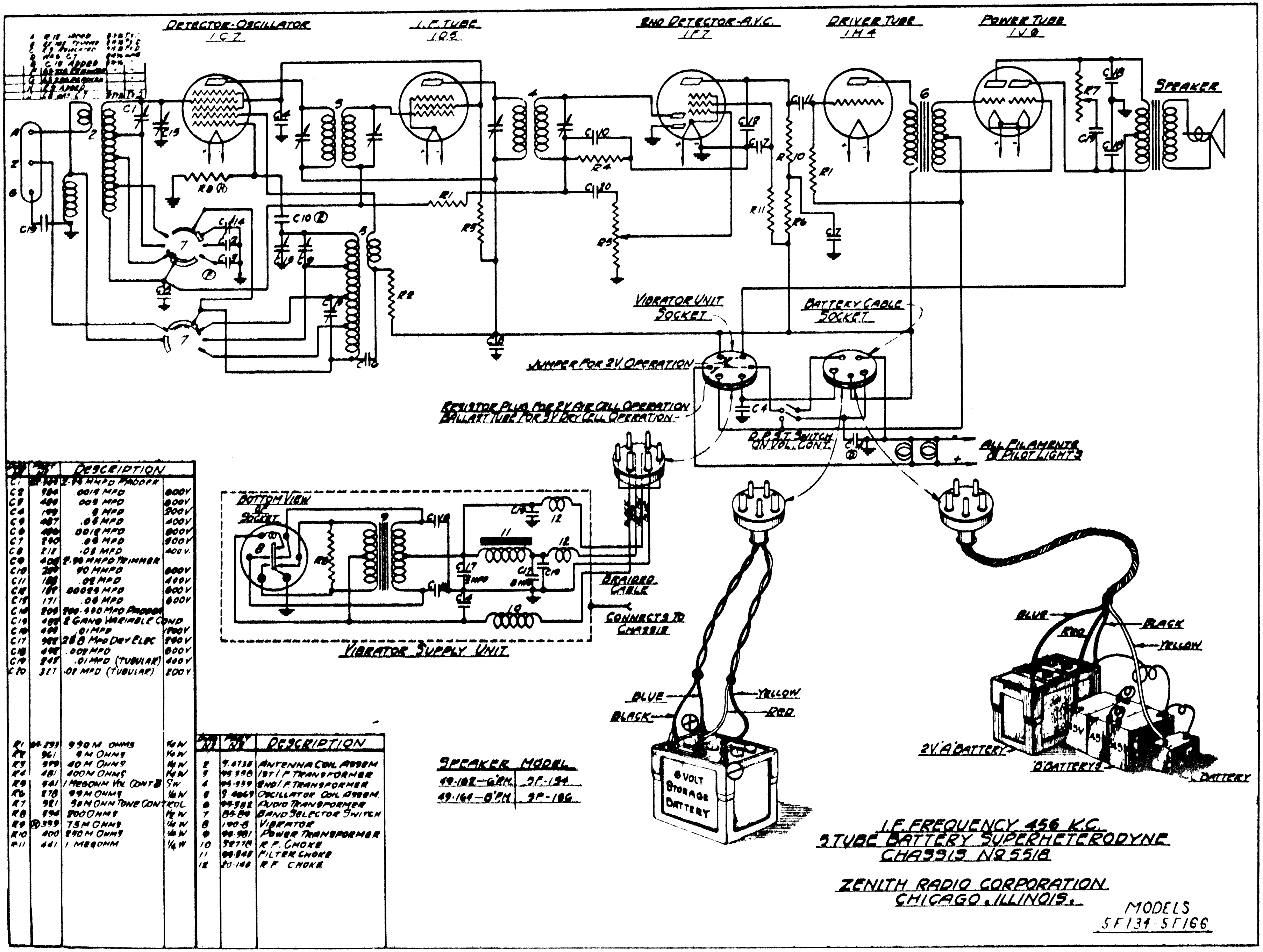
Miscellaneous

46-122	Tuning Knobs	.10
49-163	6" P. M. Speaker	6.00
	Cone and Voice Coil for 49-163	2.00
	Output Transformer for 49-163	2.00
52-85	Battery Cable and Plug	.90
78-163	Battery Cable Plug Socket	.15
78-164	Power S upply Cable Plug Socket	.15
78-165	1C7 Wafer Type Socket	.15
78-166	1D5 Wafer Type Socket	.15
78-167	1F5 Wafer Type Socket	.15
78-168	1F7 Wafer Type Socket	.15
100-50	Dial Light 2 Volt .06 Amp.	.30
171-4	Dial Scale Lens	.25
S-3717	Dial Pointer and Bushing Assembly	.25
S-4301	Dial Light Socket and Clip Assembly	.10
S-4709	Dial Scale and Frame Assembly	.75

THESE PRICES SUPERSEDE ALL PREVIOUS QUOTATIONS AND ARE SUBJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE

ZENITH RADIO CORPORATION
CHICAGO, ILLINOIS, U. S.A.
September 25, 1936

C.J.P.



		Description	
C1	[illegible]	2-15 MMFD PADDER	
C2	904	.0019 MFD	600V
C3	486	.005 MFD	600V
C4	179	.5 MFD	200V
C5	487	.05 MFD	400V
C6	486	.0012 MFD	600V
C7	240	.05 MFD	200V
C8	218	.02 MFD	400V.
C9	405	2-30 MMFD TRIMMER	
C10	239	50 MMFD	600V
C11	188	.02 MFD	400V
C12	188	.00025 MFD	600V
C13	171	.06 MFD	600V
C14	205	700-990 MFD PADDER	
C15	488	2 GANG VARIABLE COND	
C16	484	.01 MFD	1500V
C17	982	2&8 MFD DRY ELEC	250V
C18	498	.005 MFD	600V
C19	845	.01 MFD (TUBULAR)	400V
C20	317	.02 MFD (TUBULAR)	200V
R1	63-293	250M OHMS	1/4 W
R2	961	5M OHMS	1/4 W
R3	359	40M OHMS	1/4 W
R4	481	400M OHMS	1/4 W
R5	541	1 MEGOHM VOL CONT. & SW	
R6	278	25M OHMS	1/2 W
R7	921	50M OHM TONE CONTROL	
R8	594	2000 OHMS	1/2 W
R9	(R) 399	75M OHMS	1/4 W
R10	400	250M OHMS	1/4 W
R11	441	1 MEGOHM	1/4 W

		Description
2	9-4735	ANTENNA COIL ASSEM.
3	95-550	1ST I.F. TRANSFORMER
4	95-559	2ND I.F. TRANSFORMER
5	9-4069	OSCILLATOR COIL ASSEM.
6	95-382	AUDIO TRANSFORMER
7	85-84	BAND SELECTOR SWITCH
8	190-8	VIBRATOR
9	95-581	POWER TRANSFORMER
10	98770	R.F. CHOKE
11	95-545	FILTER CHOKE
12	20-140	R.F. CHOKE

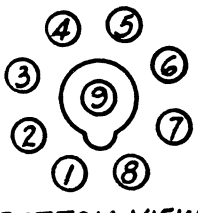
SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9
1C7	1st Det. Osc.	0	2	130	53	0	115	0	0	0
1D5	I.F.	0	2	130	53	-	-	0	0	0
1F7	2nd Det.A.V.C.	0	2	24	0	0	15	0	0	0
1H4	Driver	0	2	120	-	0	-	0	0	-
1J6	Power	0	2	143	-1	-1	143	0	0	-

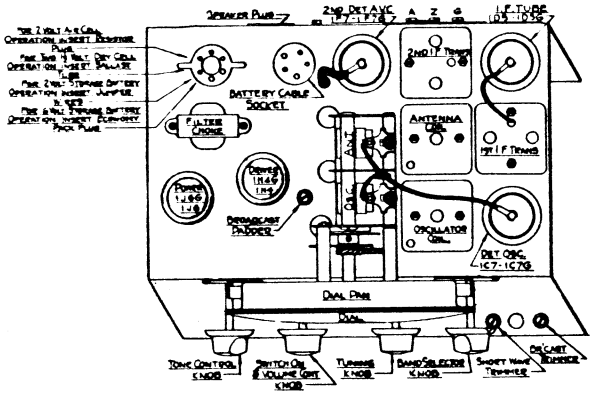
All voltages measured with a 1000 ohm per volt D.C. meter and using the Zenith 6 V. Economy Pack. Antenna and ground disconnected.
Battery Voltage 6.3 V. - Battery Drain 1.1 ampere

ALIGNMENT PROCEDURE

(1) Connect the output leads of the signal generator to the grid of the first detector and receiver chassis. Also connect an output meter across the speaker transformer leads.
(2) Set the signal generator at 456 K.C. and carefully adjust the four I.F. trimmers to the point giving the highest reading on the output meter. The output transformers are of a very high gain, selective type, and these adjustments should be repeated several times in order to secure maximum accuracy.
All adjustments should be made using as weak an output from the signal generator as possible in order to prevent the A.V.C. action from affecting the output readings.
(3) Change the signal generator leads to the antenna and ground terminals of the receiver.
(4) Set signal generator at 5 M.C. Switch receiver to band B and adjust osc. trimmer on gang for correct dial reading.
(5) Set signal generator at 1400 K.C. Switch receiver to band A and adjust broadcast trimmer (located at front of chassis - see diagram below) for correct dial reading. Also adjust antenna trimmer on gang to resonance.
(6) Set signal generator at 18 M.C. - Switch receiver to band C and adjust the short wave trimmer while rocking the pointer past 18 M.C. on the dial to the combination giving the greatest output.
(7) Set signal generator at 600 K.C. - Switch receiver to band A and rock pointer past 600 on dial while adjusting the broadcast padder (located adjacent to gang condenser) to combination giving the greatest output reading.
(8) Readjust broadcast and ant. trimmers at 1400 K.C. (Same as No.5)



BOTTOM VIEW OF SOCKET



Tube Position

ZENITH

PARTS LIST

Models 5F134
5F166

Dial and Drive Assembly

26-122	Airplane Dial Scale	$.75
32-10	Drive Belt	.20
34-49	Condenser Shaft Gear	.25
34-51	Lower Pinion and Gear	.15
59-40	Special Z Pointer	.15
59-41	Split Second Pointer	.10
80-60	Tension Pulley Spring	.05
80-118	Dial Spring	.15
80-127	Dial Glass Retainer Spring	.05
83-407	Dial Light Diffusion Strip	.05
93-273	Black Bakelite Pointer Washer	.01
97-91	Lower Gear Stud	.01
100-50	2 Volt .06 Amp. Dial Light Lamp (Bayonet)	.30
192-16	Dial Glass	.25
192-10	Dial Glass Gasket	.10
S-3780	Shaft Pulley and Sleeve and Pinion Assembly	.35
S-4301	Dial Light Socket and Clip Assem. (Bayonet)	.10
S-4340	Tension Pulley and Arm Assem.	.15
S-4342	Drive Shaft and Pulley Assembly	.35

Coils and Chokes

95-358	1st I.F. Transformer	1.25
95-359	2nd I.F. Transformer	1.25
S-2778	R.F. Choke	.15
S-4669	Oscillator Coil Assembly	1.25
S4735	Antenna Coil Assembly	1.25

Condensers

22-171	.05 Mfd. 600 Volt	.20
22-182	.00025 Mfd. 600 Volt	.12
22-188	.02 Mfd. 400 Volt	.15
22-199	.5 Mfd. 200 Volt	.35
22-205	200-550 Mmfd. Osc. Padder	.35
22-250	.05 Mfd. 200 Volt	.15
22-289	50 Mmfd. 600 Volt	.12
22-305	2-35 Mmfd. Trimmer	.15
22-327	.02 Mfd. 200 Volt	.15
22-384	.0015 Mfd. 600 Volt	.20
22-408	2-35 Mmfd. Trimmer	.25
22-482	Two Gang Variable	2.50
22-485	.005 Mfd. 600 Volt	.35
22-486	.0012 Mfd. 600 Volt	.15
22-487	.05 Mfd. 400 Volt	.15
22-492	.002 Mfd. 600 Volt	.20

Resistors

63-278	99 M Ohm 1/4 Watt	.20
63-293	990 M Ohm 1/4 Watt	.20
63-361	5 M Ohm 1/4 Watt	.20
63-399	75 M Ohm 1/4 Watt	.20
63-400	250 M Ohm 1/4 Watt	.20
63-441	1 Megohm 1/4 Watt	.20
63-481	400 M Ohm 1/4 Watt	.20

Resistors (Cont'd)

63-521	50 M Ohm Tone Control	$ .70
63-539	40 M Ohm 1/4 Watt	.20
63-541	1 Megohm Volume Control and Switch	1.00

Parts for S -4680 Economy Pack
(Used with 6 Volt Storage Battery)

S -4680	Economy Pack Complete	10.00
20-146	R.F.Choke	.20
22-199	.5 Mfd. 200 V. Condenser	.35
22-243	.01 Mfd. 400 V. Condenser	.15
22-455	.01 Mfd. 1200 V. Condenser	.15
22-522	2-8 Mfd. Electrolytic Cond. 250 V.	1.25
63-394	200 Ohm Resistor 1/2 Watt	.20
78-141	Vibrator Wafer Type Socket	.15
95-345	Filter Choke	.75
95-381	Power Transformer	2.00
100-39	Dial Lights 2.9 V. .17 Amp. (Bayonet Type)	.15
190-8	Vibrator	5.00
S-4659	Battery Cable Plug and Clip Assem.	1.25
S-4863	Power Unit Cable and Plug Assem.	.50

Special Parts

23-12	Tube Socket Contact Jumper (Large)	.02
23-13	Tube Socket Contact Jumper (Small)	.02
63-543	Resistor Plug (For Air Cell Operation)	.50
100-53	Ballast Tube (For Dry Cell Operation)	1.25

Miscellaneous

46-123	Tone Control Knob	.20
46-127	Tuning and Volume Control Knob	.20
46-169	Band Selector Switch Knob	.20
49-162	6" P.M. Speaker (5F134)	6.50
	Cone and Voice Coil for 49-162	2.00
	Output Transformer for 49-162	2.00
49-164	8" P.M. Speaker (5F166)	8.00
	Cone and Voice Coil for 49-164	2.50
	Output Transformer for 49-164	2.50
52-85	Battery Cable and Plug	.90
78-128	Speaker Plug Socket	.10
78-163	Battery Cable Plug Socket	.15
78-164	Power Supply Cable Plug Socket	.15
78-165	#1C7 Wafer Type Socket	.15
78-166	#1D5 Wafer Type Socket	.15
78-168	#1F7 Wafer Type Socket	.15
78-169	#1H6 Wafer Type Socket	.15
78-170	#1J6 Wafer Type Socket	.15
83-433	Ant. & Grnd. Term Strip	.15
85-89	Band Selector Switch	1.00
95-382	Audio Transformer	1.50
126-127	Tube Shields	.10
159-13	Plug Button	.05
188-2	Shaft Retaining Ring	.01

THESE PRICES SUPERSEDE ALL PREVIOUS QUOTATIONS AND ARE SUBJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE

ZENITH RADIO CORPORATION,
CHICAGO, ILLINOIS, U.S.A.
September 25, 1936

ZENITH RADIO TUBES

TRADE MARK REG.

TYPE	CLASS	OPERATION	EMITTER	ELECTRODE POTENTIALS (VOLTS)						ELECTRODE CURRENTS				AVERAGE COEFFICIENTS					INTERELECTRODE CAPACITANCE MMFD.		
				FILAMENT OR HEATER	PLATE	G_1 (NEGATIVE)	G_2	G_3	G_4	FILAMENT OR HEATER AMPS	PLATE MA.	G_2 MA.	G_3 MA.	PLATE RESISTANCE OHMS	TRANSCONDUCTANCE MICROMHOS	AMPLIFICATION FACTOR	RATED PLATE LOAD OHMS	RATED POWER OUTPUT MILLIWATTS	GRID PLATE	INPUT	OUTPUT
5Y3 (5Z4)	RECTIFIER	FULL-WAVE HIGH VACUUM	F	5.0	400[a]					2.0	110										
5Z4-G (5Z4)	RECTIFIER	FULL-WAVE HIGH VACUUM	F	5.0	350[a]					1.5	110										
6A8-G (6A8)	PENTAGRID CONVERTER	OSCILLATOR MODULATOR	K	6.3	250	-h	250[d]	100[g]	-3	0.3	3.3	4.0	2.2			800[m]			0.03	12.5	12.5
6B6 (A)	DUPLEX DIODE TRIODE	DETECTOR AMPLIFIER	K	6.3	250	-2				0.3	0.8			91000	1100	100			1.70	1.70	3.80
6C8-G (6C8)	TRIODE	AMPLIFIER	K	6.3	250	-8				0.3	8.0			10000	2000	20			1.80	4.00	13.0
6F8-G (6F8)	TRIODE	AMPLIFIER	K	6.3	250	-2				0.3	0.9			66000	1500	100			2.00	6.00	12.0
6F6-G (6F6)	PENTODE	POWER AMPLIFIER	K	6.3	250	-16.5	250			0.7	34.0	6.3		80000	2500	200	7000	4000			
6H6-G (6H6)	TWIN DIODE	DETECTOR	K	6.3	100[d]					0.3	8.0								0.02[s]		
6J7-G (6J7)	PENTODE	AMPLIFIER	K	6.3	250	-3	100	6		0.3	2.0	0.5		2.8x10[6]	1225	3400			.005	7.00	12.0
6K7-G (6K7)	PENTODE	VARIABLE-MU AMPLIFIER	K	6.3	250	-3[l]	100	6		0.3	7.0	1.7		800000	1450	1160			.005	7.00	12.0
6L6-G (6L6)	BEAM POWER AMPLIFIER		K	6.3	375	-17.5	250			0.9	87.0	2.5		40,000	5000	200	4500	11500			
6L7-G (6L7)	PENTAGRID MIXER		K	6.3	250	-6	150[l]	10[o] -15[p]		0.3	3.3	8.5[c]		1.0x10[6][l]	350[m]				.060	8.5	12.5
6L7-G (6L7)	PENTAGRID VARIABLE MU AMPLIFIER		K	6.3	250	-3[k]	100[c]	-3[l]		0.3	3.3	8.5		800000	1100	880					
6N6-G (6N6)	DOUBLE TRIODE	POWER AMPLIFIER	K	6.3	500[e]	0				0.9[f]	45[t]			24,100	2400	58	7000	6000			
6N7-G (6N7)	DUPLEX TRIODE	AMPLIFIER CLASS B	A	6.3	300	0				0.8	125[t]						10000[j]	10300			
6J7-G (6J7)	DUPLEX TRIODE	AMPLIFIER CLASS A	K	6.3	294	-8				0.8	7.0			11000	3200	7	40000	400			
6F7	TRIODE PENTODE	TRIODE AMPLIFIER	K	6.3	100	-3				0.3	3.5			16000	500	8			2.00	2.50	3.00
6P7	TRIODE PENTODE	PENTODE AMPLIFIER	K	6.3	250	-3	100			0.3	6.5	1.5		650000	1100	900			.008	3.20	12.5
6Q7-G (6Q7)	DUPLEX DIODE TRIODE	DETECTOR AMPLIFIER		6.3	250	-3				0.3	1.1			58000	1200	70					
6R7-G (6R7)	DUPLEX DIODE TRIODE	DETECTOR AMPLIFIER	K	6.3	250	-9				0.3	9.5			8500	1900	16					
6X5-G (6X5)	RECTIFIER	FULL-WAVE HIGH VACUUM	K	6.3	350[a]					0.6	75										
25A6-G (25A6)	PENTODE	AMPLIFIER CLASS A	K	25.0	95 135	-15 -20	95 135			0.3	20.0 39.0	4.0 8.5		45000 42000	2000 2350	90 100	4800 4000	900 2000			
25Z6-G (25Z6)	RECTIFIER	HIGH VACUUM DOUBLER	K	25.0	125[d]					0.3	85										

A - Also contains two diodes
B - Class B
C - Class A - Driver, both grids connected together at socket, likewise both plates.
D - Mixer Operation
E - Amplifier Operation

(a) R.M.S. per plate
(b) Grid Nos. 3&5
(c) Grid Nos. 2&4
(d) With 20,000 ohm dropping resistor
(e) R.M.S. volts with 50,000 ohm dropping resistor
(f) Peak volts applied to Grid #3 from Separate Oscillator
(g) Tied to cathode at socket
(h) 50,000 Automatic Biasing Resistor
(j) At -42.5 volts Gm 2 umhos
(j) Plate to Plate
(k) Minimum
(l) Peak. Zero signal plate current per plate 17.5 m.a.
(m) Conversion Conductance
(n) Plate to Plate
(o) Min. applied peak oscillator volts.
(p) Developed D.C. bias on 50,000 grid resistor
(r) Signal applied to No.1 grid only
(s) Both Input and Output Sections
(t) Output Section
(u) Input Section Plate Current

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TYPE	CLASS	OPERATION	EMITTER	ELECTRODE POTENTIALS (VOLTS)						ELECTRODE CURRENTS				AVERAGE COEFFICIENTS					INTERELECTRODE CAPACITANCE MMFD		
				FILAMENT OR HEATER	PLATE	G_1 (NEGATIVE)	G_2	G_3	G_4	FILAMENT OR HEATER AMPS.	PLATE MA.	G_2 MA.	G_3 MA.	PLATE RESISTANCE OHMS	TRANSCONDUCTANCE MICROMHOS	AMPLIFICATION FACTOR	RATED PLATE LOAD OHMS	RATED POWER OUTPUT MILLIWATTS	GRID PLATE	INPUT	OUTPUT
01-A	TRIODE	DETECTOR	F	5.0	22.5					0.25									8.1	3.1	2.2
		AMPLIFIER			45.0																
					90.0	4.5					2.5			11,000	725	8.0					
					135.0	9.0					3.0			10,000	800	8.0					
10	TRIODE	AMPLIFIER CLASS A	F	7.5	250.0	22.0				1.25	10.0			6,000	1330	8.0	13,000	400	7.0	4.0	3.0
					350.0	31.0					16.0			5,150	1550	8.0	11,000	900			
					425.0	39.0					18.0			5,000	1600	8.0	10,200	1600			
12-A	TRIODE	DETECTOR OR AMPLIFIER	F	5.0	90.0	4.5				0.25	5.2			5,400	1575	8.5	5,300	35	8.1	4.0	2.0
		AMPLIFIER			135.0	9.0					6.2			5,100	1650	8.5	9,000	130			
					180.0	13.5					7.6			4,700	1800	8.5	10,650	285			
15	PENTODE	AMPLIFIER	H	2.0	67.5	1.5	67.5			0.220	1.85	0.5		620,000	710	440			0.01	8.35	7.8
					135	1.5	67.5				1.85	0.4		800,000	750	600					
19	DUPLEX TRIODE	AMPLIFIER CLASS B	F	2.0	135.0	0.0				0.26	10.0						10,000[34]	2100			
					135.0	3.0					4.0						15,000	1900			
					135.0	6.0					1.0						15,000	1600			
22	TETRODE	AMPLIFIER	D	3.3	135.0	1.5	45.0			0.13	1.7	0.6		725,000	375	270.0			.01	3.0	10.0
					135.0	1.5	67.5				3.7	1.3		325,000	600	160.0					
24	TETRODE	DETECTOR BIASED (1)	H	2.5	250.0	5.0[3]	20.0[3]			1.75	0.1								.007	5.3	10.5
		AMPLIFIER			180.0	1.5	75.0				4.0	1.0		400,000	1050	420.0					
					180.0	3.0	90.0				4.0	1.5		400,000	1000	400.0					
					250.0	3.0	90.0				4.0	1.7		600,000	1050	630.0					
26	TRIODE	AMPLIFIER	F	1.5	90.0	7.0				1.05	2.9			8,900	935	8.3			8.1	3.5	2.8
					135.0	10.0					5.5			7,600	1100	8.3					
					180.0	14.5					6.2			7,300	1150	8.3					
27	TRIODE	DETECTOR BIASED (2)	H	2.5	250.0	30.0[4]				1.75	0.2								3.3	3.5	3.0
		AMPLIFIER			275.0	33.0[4]					0.2										
					90.0	6.0					2.7			11,000	820	9.0	14,000	30			
					135.0	9.0					4.5			9,000	1000	9.0	13,000	80			
					180.0	13.5					5.0			9,000	1000	9.0	18,700	165			
					250.0	21.0					5.2			9,250	975	9.0	34,000	300			
30	TRIODE	DETECTOR OR AMPLIFIER	F	2.0	90.0	4.5				0.06	2.5			11,000	850	9.3	15,000	16	6.0	3.7	2.1
		AMPLIFIER			135.0	9.0					3.0			10,300	900	9.3					
					180.0	13.5					3.1			10,300	900	9.3					
31	TRIODE	POWER AMPLIFIER	F	2.0	135.0	22.5				0.13	8.0			4,100	925	3.8	7,000	185	5.7	3.5	2.2
					180.0	30.0					12.3			3,600	1050	3.8	5,700	375			
32	TETRODE	DETECTOR BIASED[5]	F	2.0	135.0	4.5[4]	45.0			0.06	0.2			950,000			100,000		.015	6.0	11.7
		AMPLIFIER			180.0	5.0[4]	67.5				0.2						100,000				
					135.0	3.0	67.5				1.7	0.4		950,000	640	610.0					
					180.0	3.0	67.5				1.7	0.4		1,200,000	650	780.0					
33	PENTODE	AMPLIFIER CLASS A	F	2.0	135.0	13.5	135.0			0.26	14.5	3.0		50,000	1450	70.0	7,000	700	.9	8.9	11.1
34	PENTODE	SUPER-CONTROL R.F. AMPLIFIER	F	2.0	67.5	3.0	67.5			0.06	2.7	1.1		400,000	560[6]	224.0			.02	5.8	11.6
					135.0	3.0	67.5				2.8	1.0		600,000	600[6]	360.0					
					180.0	3.0	67.5				2.8	1.0		1,000,000	620[6]	620.0					
35	USE TYPE 51																				
36	TETRODE	DETECTOR BIASED	H	6.3	100.0	5.0[7]	55.0			0.30	0.2						250,000		.007	3.7	9.2
		AMPLIFIER			180.0	6.0[7]	67.5				0.2						250,000				
					250.0	8.0[7]	90.0				0.2						250,000				
					100.0	1.5	55.0				1.8			550,000	850	470.0					
					135.0	1.5	67.5				2.8			475,000	1000	475.0					
					180.0	3.0	90.0				3.1			500,000	1050	525.0					
					250.0	3.0	90.0				3.2	1.7		550,000	1080	595.0					
37	TRIODE	DETECTOR BIASED	H	6.3	90.0	10.0[4]				0.30	0.2								2.0	3.5	2.2
					135.0	15.0[4]					0.2										
					180.0	20.0[4]					0.2										
					250.0	28.0[4]					0.2										
		AMPLIFIER			90.0	6.0					2.5			11,500	800	9.2					
					135.0	9.0					4.1			10,000	925	9.2					
					180.0	13.5					4.3			10,200	900	9.2					
					250.0	18.0					7.5			8,400	1100	9.2					
38	PENTODE	AMPLIFIER CLASS A	H	6.3	100.0	9.0	100.0			0.30	7.0	1.2		140,000	875	120.0	15,000	270	0.3	3.5	7.5
					135.0	13.5	135.0				9.0	1.5		130,000	925	120.0	13,500	550			
					180.0	18.0	180.0				14.0	2.4		110,000	1050	120.0	11,600	1000			
					250.0	26.0	250.0				22.0	3.8		100,000	1200	120.0	10,000	2500			

39-44	PENTODE	SUPER-CONTROL R.F. AMPLIFIER MODULATOR	H	6.3	90.0 180.0 250.0 90.0 180.0 250.0	3.0 3.0 3.0 7.0(8) 7.0(8) 7.0(8)	90.0 90.0 90.0 90.0 90.0 90.0			0.30	5.6 5.6 5.6	1.6 1.4 1.4		375,000 750,000 1,000,000	960(17) 1000(17) 1050(17)	360.0 750.0 1050.0			.007	3.5	10.0
41	PENTODE	AMPLIFIER CLASS A	H	6.3	100.0 135.0 180.0 250.0	7.0 10.0 13.5 18.0	100.0 135.0 180.0 250.0			0.40	9.0 12.5 18.5 32.0	1.6 2.2 3.0 5.5		103,500 94,000 81,000 68,000	1450 1600 1850 2200	150.0 150.0 150.0 150.0	12,000 10,400 9,000 7,600	330 750 1500 3400			
42	PENTODE	AMPLIFIER CLASS A	H	6.3	250.0	16.5	250.0			0.70	34.0	6.5		100,000	2200	222.0	7,000	5000			
43	PENTODE	AMPLIFIER CLASS A	H	25.0(11)	95.0 135.0	15.0 20.0	95.0 135.0			0.30	20.0 34.0	4.0 7.0		45,000 35,000	2000 2300	90.0 80.0	4,500 4,000	900(9) 2000(10)			
44	USE TYPE 39-44																				
45	TRIODE	AMPLIFIER CLASS A	F	2.5	180.0 250.0 275.0	31.5 50.0 56.0				1.50	31.0 34.0 36.0			1,900 1,750 1,670	1850 2000 2100	3.5 3.5 3.5	3,500 3,900 4,600	780 1500 2000	7.2	4.5	3.0
46	TETRODE	AMPLIFIER CLASS A AMPLIFIER CLASS B	F	2.5	250.0(13) 300.0 400.0	33.0 ± .0(14) ± .0(15)	250.0(12) ± .0(13) ± .0(13)			1.75	22.0 4.0(16) 6.0(16)			2,380	2350	5.5	6,400 1,300 1,450	1250 16000(16) 20000(16)			
47	USE TYPE PZ																				
50	TRIODE	AMPLIFIER CLASS A	F	7.5	350.0 400.0 450.0	63.0 70.0 84.0				1.25	45.0 55.0 55.0			1,900 1,800 1,800	2000 2100 2100	3.8 3.8 3.8	4,100 3,670 4,350	2400 3400 4600	9.0	5.0	3.0
51	TETRODE	VARIABLE-MU AMPLIFIER MODULATOR	H	2.5	180.0 250.0 250.0	3.0 3.0 7.0	90.0 90.0 90.0(11)			1.75	6.2 6.5	2.5 2.5		300,000 400,000	1160(18) 1110(18)	350.0 445.0			.007	5.0	10.0
53	DUPLEX TRIODE	AMPLIFIER CLASS B AMPLIFIER CLASS A DRIVER(20)	H	2.5	250.0 300.0 250.0 300.0	±.0 ±.0 -5.0 -6.0				2.0	14.0(21) 17.5 6.0 7.0			11,300 11,000	3100 3200	35.0 35.0	8,000 10,000(22) (22)	8000 10000 400 400			
55	DUPLEX DIODE TRIODE	AMPLIFIER CLASS A (20)	H	2.5	135.0 180.0 250.0	10.5 13.5 20.0				1.00	3.7 6.0 8.0			11,000 8,500 7,500	750 975 1100	8.3 8.3 8.3	25,000 20,000 20,000	75 150 350	1.5	1.5	4.3
56	TRIODE	DETECTOR BIASED(2) AMPLIFIER	H	2.5	250.0 250.0	20.0(4) 13.5				1.00	0.2 5.0			9,500	1450	13.5			3.2	3.2	2.2
57	PENTODE	DETECTOR BIASED(1) AMPLIFIER CLASS A	H	2.5	250.0 250.0 250.0 250.0 250.0	1.95(17) 1.70(17) 3.86(17) 4.30(17) 3.0	50.0 33.0 100.0 100.0 100.0	(23)		1.00	0.2 0.2 0.2 0.2 2.0	0.5		1,500,000	1225(17)	1500.0	250,000 500,000 250,000 500,000		.007	5.2	6.5
58	PENTODE	VARIABLE-MU AMPLIFIER MODULATOR	H	2.5	250.0 250.0	3.0 10.0(24)	100.0 100.0	(23)		1.00	8.2	3.0		800,000	1600(18)	1260.0			.007	5.2	6.5
59	PENTODE	AMPL. CLASS A TRIODE AMPL. CLASS A PENTODE AMPL CLASS B TRIODE PER TUBE TWO TUBES	H	2.5	250.0 250.0 400.0	28.0 18.0 ± .0(25)	250.0(26) 250.0(26) ± .0(25)	250(26) (27) 400(28)		2.00	26.0 36.0 13.0(29)	9.0		2,400 40,000	2600 2500	6.0 100.0	5,000 6,000 6,000(30)	1250 3000 20000			

1. For use as a grid leak detector 250-volts plate; screen up to 70-volts; capacity .00025-mfd; resistance 1-5 megohms; grid return to cathode.
2. For use as a grid leak detector 90-volts plate; capacity .00025-mfd; resistance 1-5 megohms; grid return to cathode.
3. Screen g_2, +50 to +45-volts; adjust g_1 to give 0.1 ma. with no a.c. input signal.
4. Adjust g_1 bias for plate current of 0.2 ma. with no a.c. input signal.
5. For use as a grid leak detector 135-volts plate; .00025-mfd; resistance 1-5 megohms; screen up to+45 volts; plate load 100,000 ohms; grid return to cathode.
6. Mutual conductance at g_1 -22.5 volts is approximately 15 μ-mhos.
7. Mutual conductance at g_1 -42.5 volts is approximately 2 μ-mhos.
8. This grid bias is minimum for oscillator peak potential of 6.0 volts.
9. Total harmonic distortion 11%.
10. Total harmonic distortion 9%.
11. Heater to cathode potential should not exceed 90 volts d.c. as measured between negative heater terminal and cathode.
12. Grid g_2 adjacent to plate is connected to plate.
13. g_1 and g_3 are connected together to serve as control grid.
14. Peak plate current (per tube) 150 ma. and maximum plate dissipation (per tube) 10 watts.
15. Peak plate current (per tube) 200 ma. and maximum plate dissipation (per tube) 10 watts.
16. Maximum continuous power output for two tubes 20-watts.
17. Maximum signal potential (rms per tube) 40 volts.
18. Maximum signal potential (rms per tube) 41 volts.
19. Mutual conductance at g_1 -40 volts is approximately 15.0 μ-mhos, and at -80 is 0.
20. Diode units used for half-wave and full-wave detection, and avc arrangement.
21. Screen g_2, +40 to+60-volts, adjust g_1 to give 0.2 ma. with input signal.
22. Cut-off of cathode current occurs at -7 volts (g_1).
23. Suppressor (g_3) connected to cathode at socket.
24. Mutual conductance at g_1 -40 volts is approximately 10 μ-mhos and at -80 is 2.
25. This grid bias is minimum for oscillator peak voltage of 9.0-volts.
26. Grids (g_2) and (g_3) are connected to plate when operated as class "A" amplifier.
27. Grid (g_3) tied to cathode.
28. Grid (g_2) is screen only.
29. Grids (g_1) and (g_3) tied together and average dissipation is 1.5-watts (max.).
30. Grid (g_2) tied to plate.
31. Dynamic peak plate current 200 ma. and average plate dissipation 10-watt (max.).
32. Plate to Plate.

TYPE	CLASS	OPERATION	EMITTER	ELECTRODE POTENTIALS (VOLTS)						ELECTRODE CURRENTS				AVERAGE COEFFICIENTS					INTERELECTRODE CAPACITANCE MMFD.		
				FILAMENT OR HEATER	PLATE	G_1 (NEGATIVE)	G_2	G_3	G_4	FILAMENT OR HEATER AMPS.	PLATE MA.	G_2 MA.	G_3 MA.	PLATE RESISTANCE OHMS	TRANSCONDUCTANCE MICROMHOS	AMPLIFICATION FACTOR	RATED PLATE LOAD OHMS	RATED POWER OUTPUT MILLIWATTS	GRID PLATE	INPUT	OUTPUT
71-A	TRIODE	AMPLIFIER CLASS A	F	5.0	90.0 135.0 180.0	16.5 27.0 40.5				0.25	10.0 17.3 20.0			2,170 1,820 1,750	1400 1650 1700	3.0 3.0 3.0	3,000 3,000 4,800	135 400 790	7.6	3.7	8.1
75	DUPLEX DIODE TRIODE	AMPLIFIER CLASS A (33)	H	6.3	250.0	2.0				0.30	0.8			91,000	1100	100.0			1.7	1.7	3.8
76	TRIODE	DETECTOR BIASED (2)	H	6.3	250.0	20.0 (4)				0.30	0.2								3.8	3.8	8.8
		AMPLIFIER			250.0	13.5					5.0			9,500	1450	13.8					
77	PENTODE	DETECTOR BIASED (1)	H	6.3	100.0 250.0 250.0	1.95 (31) 1.95 (31) 4.30 (31)	36.0 80.0 100.0	(34)		0.20	0.2 0.2 0.2			250,000 250,000 500,000					.007	4.4	10.6
		AMPLIFIER CLASS A			100.0 250.0	1.50 3.0	60.0 100.0				1.7 2.3	0.4 0.6		650,000 1,500,000	1100 1250	715.0 1500.0					
78	PENTODE	AMPLIFIER CLASS A	H	6.3	90.0 180.0 250.0 250.0	3.0 (min) 3.0 (min) 3.0 (min) 3.0 (min)	90.0 75.0 100.0 125.0	(34)		0.30	5.4 4.0 7.0 10.5	1.5 1.0 2.0 3.0		315,000 1,000,000 800,000 600,000	1275 1100 1450 1650	400.0 1100.0 1160.0 990.0			.007	4.4	10.6
79	DUPLEX TRIODE	AMPLIFIER CLASS B	H	6.3	180.0 (41)	±.0				0.60	7.5 (42)						7,000 (42)	5800 (42)			
80	DUPLEX DIODE	RECTIFIER FULL-WAVE	F	5.0	350.0 (44) 400.0 (44) 550.0 (45)					2.00	125.0 110.0 135.0										
		HALF-WAVE			350.0 (52) 400.0 (52) 550.0 (53)						250.0 220.0 270.0										
81	DIODE	RECTIFIER HALF-WAVE	F	7.5	700.0					1.25	85.0 (46)										
82 (AF)	DUPLEX DIODE (MERCURY VAPOR)	RECTIFIER FULL WAVE	F	2.5	500.0 (47)					3.00	125.0 (46)						(48)				
83 (AG)	DUPLEX DIODE (MERCURY VAPOR)	RECTIFIER FULL-WAVE	F	5.0	500.0 (47)					3.00	250.0 (46)						(48)				
84	DUPLEX DIODE	RECTIFIER FULL-WAVE	H	6.3	350.0 (51)					0.60	50.0										
85	DUPLEX DIODE TRIODE	AMPLIFIER CLASS A (20)	H	6.3	135.0 180.0 250.0	10.5 13.5 20.0				0.30	3.7 6.0 8.0			11,000 8,500 7,500	750 975 1100	8.3 8.3 8.3	25,000 20,000 20,000	75 160 350	1.5	1.5	4.3
89	PENTODE	AMPLIFIER CLASS A TRIODE	H	6.3	160.0 180.0 250.0	20.0 22.5 31.0	160.0 (24) 180.0 (24) 250.0 (24)	160.0 (24) 180.0 (24) 250.0 (24)		0.40	17.0 20.0 32.0			3,300 3,000 2,600	1425 1650 1800	4.7 4.7 4.7	7,000 6,500 5,500	300 400 900			
		AMPLIFIER CLASS A PENTODE			100.0 135.0 180.0 250.0	10.0 13.5 18.0 25.0	100.0 (24) 135.0 (24) 180.0 (24) 250.0 (24)	(27) (27) (27) (27)			9.5 14.0 20.0 32.0	1.6 2.2 3.0 5.5		104,000 92,500 80,000 70,000	1200 1350 1550 1800	125.0 125.0 125.0 125.0	10,700 9,200 8,000 6,750	350 750 1500 3400			
		AMPLIFIER CLASS B TRIODE-PER TUBE TWO TUBES			250.0	±.0 (52)	±.0 (52)	250.0 (34)			3.0 (53)						13,600 (34)	2500 (54)			
99 UV	TRIODE	DETECTOR OR AMPLIFIER	F	3.3	90.0	4.5				.06	2.5			15,500	425	6.6			3.3	2.8	2.8
99 UX	TRIODE	DETECTOR OR AMPLIFIER	F	3.3	90.0	4.5				.06	2.5			15,500	425	6.6			3.3	2.8	2.8
GA	PENTODE	AMPLIFIER CLASS A	F	5.0	180.0	10.0	180.0	(55)		.25	25.0	7.5		30,000	2000	60.0	7,000	800			
PZ	PENTODE	AMPLIFIER CLASS A	F	2.5	250.0	16.5	250.0	(55)		1.75	31.0	6.0		60,000	2500	150.0	7,000	2700	1.5	3.7	13.2
PZH	PENTODE	AMPLIFIER CLASS A	H	2.5	250.0	16.5	250.0	(34)		2.00	36.0	8.2		38,000	3160	98.0	6,600	3300			
WUNDERLICH WUNDERLICH AUTO	DUAL-GRID DETECTOR, AMPLIFIER		H H	2.5 6.3	250.0 250.0	16.5 16.5				1.00 0.30	7.5 7.5			10,500 10,500	900 900	9.5 9.5			4.7, 4.7	7.1 7.1	3.0 3.0
1A6	HEPTODE	OSCILLATOR MODULATOR	F	2.0	135.0	(56)	135.0	67.5 (57)	-3.0 (58)	.06	1.2	2.3	2.5	400,000	275 (59)						
1C6	HEPTODE	OSCILLATOR MODULATOR	F	2.0	135.0 180.0	(56)	135.0 (76) 180.0	67.5 (57)	-3.0 (58)	.120	1.3 1.5	2.6 3.3	2.0 2.0	550,000 750,000	300 (71) 325						

2A3	TRIODE	AMPLIFIER CLASS A	F	2.5	250.0	45.0				2.5	60.0			800	5250	4.2	2,500	3500	13.	9.	4.
		PUSH PULL SELF BIAS			300.0	62.0					40.0						5,000	10000			
		PUSH PULL FIXED BIAS			300.0	62.0					40.0						3,000	15000			
2A5	PENTODE	AMPLIFIER CLASS A	H	2.5	250.0	16.5	250.0	(34)		1.75	34.0	6.5		100,000	2200	220.0	7,000	3000			
2A6	DUPLEX DIODE TRIODE	AMPLIFIER CLASS A (33)	H	2.5	250.0	2.0				0.8	0.8			91,000	1100	100.0			2.7	1.7	3.8
2A7	HEPTODE	OSCILLATOR MODULATOR	H	2.5	250.0	(56)	250.0	100(57)	-3.0 (58)	0.80	4.0	3.5	2.0	300,000	475(59)						
2B7	DUPLEX DIODE PENTODE	AMPLIFIER R.F. OR I.F. (13)	H	2.5	100.0	3.0	100.0	(34)		0.80	5.8	1.7		300,000	950(44)	285.0					
					180.0	3.0	75.0	(34)			3.4	0.9		1,000,000	840(60)	840.0					
					250.0	3.0	100.0	(34)			6.0	1.5		800,000	1000(61)	800.0					
					250.0	3.0	125.0	(34)			9.0	2.3		650,000	1125(62)	730.0					
		AMPLIFIER A.F.			250.0	4.5	50.0	(34)			0.6						200,000				
5Z3	DUPLEX DIODE	RECTIFIER FULL-WAVE	F	5.0	500.0					3.00	250.0										
6A6	DUPLEX TRIODE	AMPLIFIER CLASS B	H	6.3	250.0	1.0				.8	14.0 (67)						8,000	8000			
					300.0	1.0					17.5						10,000 (68)	10000			
		AMPLIFIER CLASS A DRIVER (69)			250.0	-5.0					6.0			11,300	3100	35.0	(69)	400			
					300.0	-6.0					7.0			11,000	3200	35.0		400			
6A7	HEPTODE	IDENTICAL TO 2A7 EXCEPT HEATER	H	6.3						0.30											
6B7	DUPLEX DIODE PENTODE	IDENTICAL TO 2B7 EXCEPT HEATER	H	6.3						0.30											
6C6	PENTODE	DETECTOR BIASED (1)	H	6.3	250.0 (21)	1.95	50.0	(23)		0.30	0.2						250,000		.007	5.2	6.8
					250.0 (21)	1.70	33.0				0.2						500,000				
					250.0 (21)	3.86	100.0				0.2						250,000				
					250.0 (21)	4.30	100.0				0.2						500,000				
		AMPLIFIER CLASS A			250.0	3.0	100.0				2.0	0.5		1,500,000	1225 (27)	1500.0					
6D6	PENTODE	VARIABLE MU AMPLIFIER	H	6.3	250.0	3.0	100.0			0.30	8.2	3.0		800,000	1600 (64)	1280.0			.007	5.2	6.8
		MODULATOR			250.0	10.0 (25)	100.0	(23)													
6F7	TRIODE PENTODE	OSCILLATOR MODULATOR	H	6.3	100.0	-3.0					3.5	1.0		17,800	450	8.0					
					250.0	-3.0	100.0			0.3	6.5	1.5		850,000	1100 (38)	90.0			.008	3.2	12.5
12A5	PENTODE	AMPLIFIER CLASS A	H	12.6	180.0	27.0	180.0	(23)		0.36	36.0	9.0		32,000	2500	80.0	3800	3.5			
				6.3	180.0	27.0	180.0			0.60	36.0	9.0		35,000	2500	80.0	3800	3.5			
12A7	PENTODE DIODE	OUTPUT PENTODE	H	12.6	100.0	9.0	100.0			0.30	7.0	1.2		140,000	875	120.0	15,000	270	0.3	3.5	7.5
					135.0	13.5	135.0				9.0	1.5		130,000	925	120.0	13,500	550			
					180.0	18.0	180.0				14.0	2.4		110,000	1050	120.0	11,600	1000			
					250.0	25.0	250.0				22.0	3.8		100,000	1200	120.0	10,000	2500			
		RECTIFIER HALF WAVE			125.0						30.0										
12Z3	DIODE	RECTIFIER HALF-WAVE	H	12.6 (64)	225.0					0.30	60.0										
12Z5	DUPLEX DIODE	RECTIFIER FULL-WAVE VOLTAGE DOUBLER	H	12.6	225.0					0.30	60.0										
				6.3	225.0					0.60	60.0										
25Z5	DUPLEX DIODE	RECTIFIER FULLWAVE VOLTAGE DOUBLER	H	25.0	125.0					0.30	100.0										

1. For use as a grid leak detector 250-volts plate; screen up to 70-volts; capacity .00025-mfd; resistance 1-5 megohms; grid return to cathode.
20. Diode units used for half-wave and full-wave detection, and avc arrangement.
21. Screen (g_2) +20 to+60-volts, adjust g_1 to give 0.2 ma. with input signal.
22. Cut-off of cathode current occurs at -7 volts (g_1).
23. Suppressor (g_3) connected to cathode at socket.
24. Mutual conductance at g_1 -40 volts is approximately 10 m-mhos and at -80 is 2.
25. This grid bias is minimum for oscillator peak voltage of 9.0-volts.
26. Grids (g_2) and (g_3) are connected to plate when operated as class "A" amplifier.
27. Grid (g_3) tied to cathode.
28. Grid (g_2) is screen only.
29. Grids (g_1) and (g_2) tied together and average dissipation is 1.5-watts (max.).
30. Grid (g_3) tied to plate.
31. Dynamic peak plate current 200 ma. and average plate dissipation 10-watt (max.).
32. Plate to Plate.
33. The triode unit is hi-mu and the diode units are used in various detector arrangements.
34. Grid (g_3) connected to cathode at socket as suppressor.
35. Both the internal shield surrounding plate and grid (g_2) tied internally to pin 3.
36. Mutual conductance approximately 0 (cathode current cut-off) at g_1, -7.5 volts.
37. Mutual conductance at g_1 -25 volts is approximately 10, and at -32.5 is 2.
38. Mutual conductance at g_1 -35 volts is approximately 10, and at -42.5 is 2.
39. Mutual conductance at g_1 -45 volts is approximately 10, and at -52.5 is 2.
40. Both internal shield surrounding plate and cathode connected internally to pin 5.
41. Average plate dissipation 7-watts (max.).
42. Static plate current 7.5 ma, and dynamic peak plate current (per plate) 90 ma. (max.).
43. With average power in-put of 380 milli-watts applied between grids g_1 and g_3.
44. Operating with condenser in-put filter.
45. Operating with choke in-put filter of 20-henry (min.).
46. Two tubes operated as full-wave rectifier delivers 170 ma. (max.) at 700 plate volts rms.(max.
47. Maximum peak inverse potential 1400-volts.
48. Maximum peak plate current 400 ma.
49. Approximate internal drop 15 volts.
50. Maximum peak plate current should not exceed 800 ma.
51. Operating with either condenser or choke in-put to filter.
52. Grids (g_1) and (g_2) tied together and average dissipation 0.35 watts (max.).
53. Dynamic peak plate current 75 ma. (max.).
54. With a plate load of 9400-ohms nominal power output is 3500 milli-watts.
55. Grid (g_2) tied to center of filament.
56. Grid (g_1) operating in oscillator circuit feeding 50,000 ohms.
57. Grids (g_3) and (g_5) connected together.
58. Grid (g_4) operating as control grid for modulator.
59. Conversion conductance 475 at -3 volts grid (g_4), and 2 at -50 volts.
60. Cathode current cut-off at -17 volts g_1.
61. Cathode current cut-off at -13 volts g_1.
62. Cathode current cut-off at -21 volts g_1.
63. Heater-cathode potential should not exceed 100-volts.
64. Center tap on heater to permit dual operation.
65. Conversion conductance 875 at -3 volts grid (g_4), and 4 at -22.5 volts.
66. With average power of 350 milliwatts applied between grids.
67. Static plate current, dynamic peak plate current 125 max. ma,
68. Connect the two grids together at socket; likewise the two plates.
69. Depends on design factors of class B amplifier. In general between 30,000 and 40,000 ohms.
70. Applied through 20,000 ohm dropping resistor
71. Conversion Conductance at - 14 volts on 0 = 4.0

TYPE	TYPE BULB	TYPE BASE	PHYSICAL CHARACTERISTICS — TERMINAL ARRANGEMENT PIN NO. 1	2	3	4	5	6	7	TOP CAP	OVERALL HEIGHT (MAX.) INCHES	DIAMETER (MAX.) INCHES
01-A	ST-14	M-4	F	P	G_1	F					4.688	1.813
10	S-17	M-4	F	P	G_1	F					5.688	2.188
18 A	ST-14	M-4	F	P	G_1	F					4.688	1.813
18	ST-18C	S-8	H	P	G_2	K	M			G_1	4.531	1.563
19	ST-18	S-8	H	P_a	G_a	G_b	P_b	H			4.250	1.563
83	S-16C	M-4	F	P	G_2	F				G_1	5.081	1.813
84	ST-14C	M-8	H	P	G_2	K	H			G_1	5.081	1.813
86	ST-14	M-4	F	P	G_1	F					4.688	1.813
87	ST-12	S-8	H	P	G_1	K	H				4.250	1.563
80	ST-18	S-8	F	P	G_1	F					4.250	1.563
81	ST-12	S-8	F	P	G_1	F					4.250	1.563
82	ST-14C	M-4	F	P	G_2	F				G_1	5.081	1.813
85	ST-14	M-8	F	P	G_1	G_2	F				4.688	1.813
84	ST-14C	M-4	F	P	G_2					G_1	5.081	1.813
86	ST-12C	S-8	H	P	G_2	K	H			G_1	4.531	1.563
87	ST-12	S-8	H	P	G_1	K	H				4.250	1.563
88	ST-12C	S-8	H	P	G_2	K	H			G_1	4.531	1.563
89-64	ST-12C	S-8	H	P	G_2	K	H			G_1	4.531	1.563
41	ST-12	S-8	H	P	G_2	G_1	K	H			4.250	1.563
42	ST-14	M-8	H	P	G_2	G_1	K	H			4.688	1.813
43	ST-14	M-8	H	P	G_2	G_1	K	H			4.688	1.813
45	ST-14	M-4	F	P	G_1	F					4.688	1.813
46	S-17	M-8	F	P	G_1	G_2	F				5.688	2.188
80	S-21	M-4	F	P	G_1	F					6.250	2.563
81	ST-14C	M-8	H	P	G_2	K	H			G_1	5.081	1.831
83	ST-14	M-7	H	P_a	G_1a	K	G_1b	P_b	H		4.688	1.813
85	ST-12C	S-8	H	P	P_1	P_2	K	H		G_1	4.531	1.563
86	ST-12	S-8	H	P	G_1	K	H				4.250	1.563
87	ST-12C	S-8	H	P	G_2	G_3	K	H		G_1	4.937	1.563
88	ST-12C	S-8	H	P	G_2	G_3	K	H		G_1	4.937	1.563
89	ST-16	M-7	H	P	G_2	G_1	G_3	K	H		5.375	2.063
71-A	ST-14	M-4	F	P	G_1	F					4.688	1.813
75	ST-12C	S-8	H	P	P_1	P_2	K	H		G_1	4.531	1.563
76	ST-12	S-8	H	P	G_1	K	H				4.250	1.563
77	ST-12C	S-8	H	P	G_2	G_3	K	H		G_1	4.531	1.563

TYPE	TYPE BULB	TYPE BASE	PHYSICAL CHARACTERISTICS — TERMINAL ARRANGEMENT PIN NO. 1	2	3	4	5	6	7	TOP CAP	OVERALL HEIGHT (MAX.) INCHES	DIAMETER (MAX.) INCHES
78	ST-12C	S-8	H	P	G_2	G_3	K	H		G_1	4.531	1.563
79	ST-12C	S-8	H	P_a	G_{1a}	K	P_b	H		G_{1b}	4.531	1.563
80	ST-14	M-4	F	P_1	P_2	F					4.688	1.813
81	S-18	M-4	F	P	–	F					5.250	2.438
82	ST-14	M-4	F	P_1	P_2	F					4.688	1.813
83	ST-16	M-4	F	P_1	P_2	F					5.375	2.063
84	ST-12	S-8	H	P_1	P_2	K	H				4.250	1.563
85	ST-12C	S-8	H	P	P_1	P_2	K	H		G_1	4.531	1.563
89	ST-12C	S-8	H	P	G_2	G_3	K	J		G_1	4.531	1.563
99 UV	T-8	S-8M	F	P	F	G_1					3.500	1.063
99 UX	T-8	S-4	F	P	G_1	F					4.125	1.188
9A	S-14	M-8	F	P	G_1	G_2	F				4.688	1.813
P2	ST-14	M-8	F	P	G_1	G_2	P				4.688	1.813
P2H	ST-14	M-7	H	P	G_2	G_1	G_3	K	H		4.688	1.813
WUNDERLICH A WUNDERLICH A-AUTO	S-18C S-1M	M-8 M-8	M M	O P	P J	O O	M K	M		K	4.688 4.125	1.563 1.563
2A3	ST-16	M-4	F	P	G_1	F					5.375	2.063
2A5	ST-14	M-8	H	P	G_2	G_1	K	H			4.688	1.813
1A6	ST-12C	S-8	F	P	G_2	G_1	G_3G_5	F		G_4	4.531	1.563
1C6	ST-12C	S-8	F	P	G_2	G_1	G_3G_5	F		G_4	4.531	1.563
2A6	ST-12C	S-8	M	P	P_1	P_2	K	M		G_1	4.531	1.563
2A7	ST-12C	S-7	H	P	G_3 [1]	G_2	G_1	K	H	G_4	4.531	1.563
2B7	ST-12C	S-7	H	P	G_2	P_1	P_2	K	H	G_1	4.531	1.563
2C5	ST-16	M-4	F	P_1	P_2	F					5.375	2.063
6A6	ST-14	M-7	H	P_a	G_1a	K	G_1b	P_b	M		4.688	1.813
6A7	IDENTICAL TO 2A7 EXCEPT HEATER											
6B7	IDENTICAL TO 2B7 EXCEPT HEATER											
6C6	ST-12C	S-8	H	P	G_2	G_3	K	H		G_1	4.531	1.563
6D6	ST-12C	S-8	H	P	G_2	G_3	K	H		G_1	4.531	1.563
6F7	ST-12C	S-7	H	P_b	G_2b	P_a	G_1a	K	H	G_1b	4.531	1.563
12A8	ST-12	S-7	H	P	G_2	G_1	K	H [2]	H		4.250	1.563
12A7	ST-12C	S-7	H	P_P	G_{PP}	K_P	P_H	K_P	H	G_{1P}	4.531	1.563
12Z3	ST-12	S-4	H	P	K	H					4.250	1.563
12Z5	ST-12	S-7	H	P_1	K_1	H [2]	K_2	P_2	H		4.250	1.563
25Z5	ST-12	S-6	H	P_1	K_1	K_2	P_2	H			4.250	1.563

EXPLANATION OF SYMBOLS

CLASS OF TUBE

Tubes are assigned names according to the number of active elements, progressing outward from the cathode; a tube with a cathode, a control grid and a plate is classified as a triode.

NUMBER ELEMENTS	CLASSIFICATION	NUMBER ELEMENTS	CLASSIFICATION
2	Diode	6	Hexode
3	Triode	7	Heptode
4	Tetrode	8	Octode
5	Pentode		

Where two separate units are contained in a single bulb, a compound name is assigned -- i.e., double diode, diode triode, etc.

TUBE TYPE NUMBERS (New Tubes)

The first digit or digits indicates the filament voltage in steps of one volt. The figure 1 is used for voltages below 2.0; the figure 2, for voltages between 2.0 and 2.9; 3, voltages between 3.0 and 3.9; etc.

Next is a letter for serial designation. Rectifiers start at "Z" and work backwards; all other types start at "A".

The next number indicates the number of useful elements brought out to terminals.

ELECTRODE SYMBOLS

In a tube embodying a single set of elements, the electrodes are designated:

H = Heater	G = Grid
K = Cathode	P = Plate

PLATE NOMENCLATURE

In tubes with one plate the letter "P" is employed; tubes possessing two sets of elements, as the type 75 (duplex diode triode), the plate of the triode unit is identified by the letter "P"; the two diode plates as P_1 and P_2.

NOTE: P_1 and P_2 always designate the plates of a diode or rectifier.

Where duplex elements are contained in a bulb each set are uniformly correlated and designated by small letters, a, b, etc. For instance, the type 79 class "B" twin amplifier; the plate and grid of one unit should be designated as P_a and G_{1a}; the other unit P_b and G_{2b}.

GRID NOMENCLATURE

In tubes possessing more than one grid the notations G_1, G_2, etc. are used. G_1 is the grid nearest the cathode and the numbering runs consecutively toward the plate.

Where grids are not coaxially arranged but interlaced as in the co-planar or twin-grid construction, the grids are designated as No. A-1 grid and No. A-2 grid, etc.

PIN IDENTIFICATION

Point the pins toward observer so that the two heater pins (the heater pins are larger than the others) are at the top. With 5-prong tubes, rotate the base until the isolated pin is at the bottom; the two pins opposite at the top are the heater pins. Separate these two by a vertical line and the heater pin to the right is No. 1. The numbers assigned to the remaining pins progress consecutively in a clock-wise direction.

TUBE DIMENSIONS

When capital letters designate the various dimensions of a radio tube, generally the letter "A" represents the over-all height of the tube as measured from the extreme bottom of the pins to the extreme top of the tube. When a top cap is employed "A" represents the over-all height of the tube including the top cap.

B, the largest diameter of the tube,
C, the diameter of the dome,
D, the height of the top-cap,
E, the height from the bottom of the base to the top of the dome,
F, the height of the base,
G, the length of the pins,
H, the diameter of the base.

When a single dimension is listed it represents the average dimension; when two are entered they are maximum and minimum.

BULB SHAPE AND DIMENSIONS

A letter indicates the shape of the bulb and a figure represents the number of eights of inches as the maximum diameter of the bulb.

When the bulb is referred to as a S-16, it describes a "straight-sloped sided" bulb similar to that of the 01-A, the maximum diameter being 16/8" or 2".

An ST-12 bulb has a tee section at the top, commonly called a dome bulb, similar to the glass of the 25-Z-5 rectifier. "C" appended to the bulb designation indicates a top cap.

BASING CONNECTIONS FOR ZENITH TUBES WITH OCTAL BASES

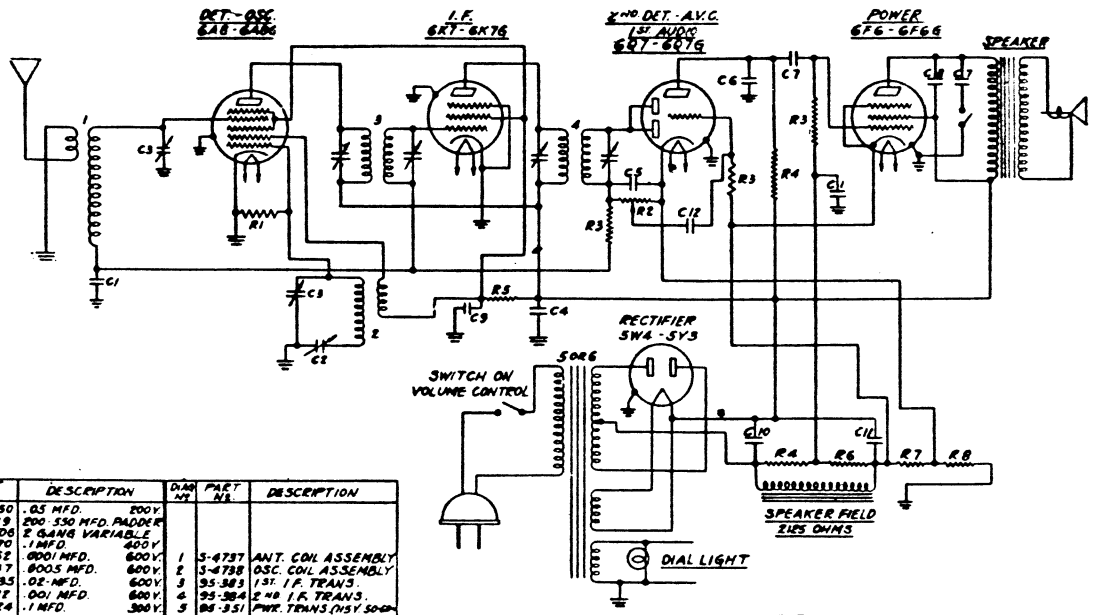
TYPE	NO. OF PRONGS	POSITIONS 1	2	3	4	5	6	7	8	TOP CAP	OVERALL HEIGHT	MAXIMUM DIAMETER
5Y3	5	Xa	H	X	P1	X	P2	X	H	X	4-3/32"	1-13/16"
5W4	5	S	F	X	P1	X	P2	X	F	X		
5W4-G	5	Xa	F	X	P1	X	P2	X	F	X	4-3/32"	1-13/16"
6A8	8	S	H	P	G3-G5	G1	G2	H	K	G4		
6A8-G	8	Xa	H	P	G3-G5	G1	G2	H	K	G4	3-15/16"	1-9/16"
6B6	7	Xa	H	P	D	D	X	H	K	G1	3-15/16"	1-9/16"
6C5	6	S	H	P	X	G1	X	H	K	X		
6C5-G	6	S	H	P	X	G1	X	H	K	X	3-17/32"	1-9/16"
6F5	5	S	H	X	P	X	X	H	K	G1		
6F5-G	5	Xa	H	X	P	X	X	H	K	G1	3-15/16"	1-9/16"
6F6	7	S	H	P	G2	G1	X	H	K	X		
6F6-G	7	Xa	H	P	G2	G1	X	H	K	X	4-3/32"	1-13/16"
6H6	7	S	H	P1	K1	P2	X	H	K2	X		
6H6-G	7	Xa	H	P1	K1	P2	X	H	K2	X	3-17/32"	1-9/16"
6J7	7	S	H	P	G2	G3	X	H	K	G1		
6J7-G	7	S	H	P	G2	G3	X	H	K	G1	3-15/16"	1-9/16"
6K7	7	S	H	P	G2	G3	X	H	K	G1		
6K7-G	7	S	H	P	G2	G3	X	H	K	G1	3-15/16"	1-9/16"
6L6	7	S	H	P	G2	G1	X	H	K	X		
6L6-G	7	Xa	H	P	G2	G1	X	H	K	X	4-3/4"	2-1/16"
6L7	7	S	H	P	G2-G4	G3	X	H	K-G5	G1		
6L7-G	7	Xa	H	P	G2-G4	G5	X	H	K-G5	G1	3-15/16"	1-9/16"
6N6	7	S	H	$B_{(2)}$	$B_{(1)}$	$C_{(1)}$	X	H	K	X		
6N6-G	7	Xa	H	$B_{(2)}$	$B_{(1)}$	$C_{(1)}$	X	H	K	X	4-3/4"	2-1/16"
6N7-G	8	Xa	H	P1	G1	G2	P2	H	K	X	4-3/32"	1-13/16"
6P7	8	Xa	H	H	P_p	G2	P_t	G_t	K	$G1_p$	3-15/16"	1-9/16"
6Q7-G	7	Xa	H	P	D	D	X	H	K	G1	3-15/16"	1-9/16"
6R7	7	S	H	P	D	D	X	H	K	G1		
6R7-G	7	Xa	H	P	D	D	X	H	K	G1	3-15/16"	1-9/16"
6X5-G	6	Xa	H	P	X	5	X	H	K	X	3-17/32"	1-9/16"
25A6	7	S	H	P	G2	G1	X	H	K-G3	X		
25A6-G	7	Xa	H	P	G2	G1	X	H	K-G3	X	4-3/32"	1-13/16"
25Z6	7	S	H	P2	K2	P1	X	H	K1	X		
25Z6-G	7	Xa	H	P2	K2	P1	X	F	K1	X	3-17/32"	1-9/16"

X - Indicates omission of terminal.
Xa - Pin provided but no internal connection. Corresponding contact in socket should be grounded to accommodate metal tube replacements.

S - Shield(external in metal tubes; internal in G tubes). Should be grounded.
NOTE - Base is viewed from bottom, with key pointing upward - 1st pin in clockwise direction is #1; 2nd is #2; etc.

Zenith Radio Corporation
CHICAGO, ILL.

CHASSIS No. 5519



DIAG NO	PART NO	DESCRIPTION	
C1	22-250	.05 MFD.	200V.
C2	22-319	200-550 MFD. PADDER	
C3	22-406	2 GANG VARIABLE	
C4	22-170	.1 MFD.	400V.
C5	22-162	600 MFD.	600V.
C6	22-167	600S MFD.	600V.
C7	22-435	.02 MFD.	600V.
C8	22-87	.001 MFD.	600V.
C9	22-224	.1 MFD.	300V.
C10	22-505	12 MFD.	325V.
C11	22-306	16 MFD.	250V.
C12	22-227	.02 MFD.	200V.
R1	63-289	4.9 M OHMS	½ W.
R2	63-547	400 M VOL. CONTROL	
R3	63-293	390 M OHMS	¼ W.
R4	63-258	490 M OHMS	½ W.
R5	63-545	12.5 M OHMS	1 W.
R6	63-376	190 M OHMS	½ W.
R7	63-546	80 OHMS	½ W.
R8	63-266	190 OHMS	½ W.

DIAG NO	PART NO	DESCRIPTION
1	53-4737	ANT. COIL ASSEMBLY
2	53-4738	OSC. COIL ASSEMBLY
3	95-382	1ST. I.F. TRANS.
4	95-384	2 ND I.F. TRANS.
5	95-351	PWR. TRANS (115V 50-60)
6	95-387	PWR. TRANS. 25-W (ALL VOLTAGES)
7		

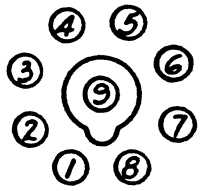
MODEL NO	SPEAKER NO	SIZE
5R123	49-115	5"
5R135	49-131	8"
5R165	49-144	10"

I.F. FREQUENCY 456 K.C.
5 TUBE SUPERHETERODYNE
CHASSIS NO. 5519

ZENITH RADIO CORPORATION
CHICAGO, ILLINOIS

SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9
6A8G	1st Det. Osc.	0	0	220	102	—5	97	6.1AC	0	0
6K7G	I. F.	0	0	220	102	0	—	6.1AC	0	0
6Q7G	2nd Det. A. V. C.	0	0	54	—3	—3	—	6.1AC	—.3	0
6F6G	Power	0	0	210	225	—4	—	6.1AC	—5	—
5Y3	Rect.	0	225	—	305AC	—	305AC	—	225	—



BOTTOM VIEW OF SOCKET

Line voltage 115 V. Antenna and ground disconnected. All voltages measured from point indicated to ground, using a 1000 ohm per volt meter.

ALIGNMENT PROCEDURE

(1) Connect the output leads of the signal generator to the grid of the first detector and receiver ground lead. Also connect an output meter across the speaker leads.

(2) Set the signal generator at 456 K.C. and carefully adjust the four I.F. trimmers to the point giving the greatest output reading. These I.F. transformers are of a very high gain, selectivity type, and the adjustments should be repeated several times for greatest accuracy.

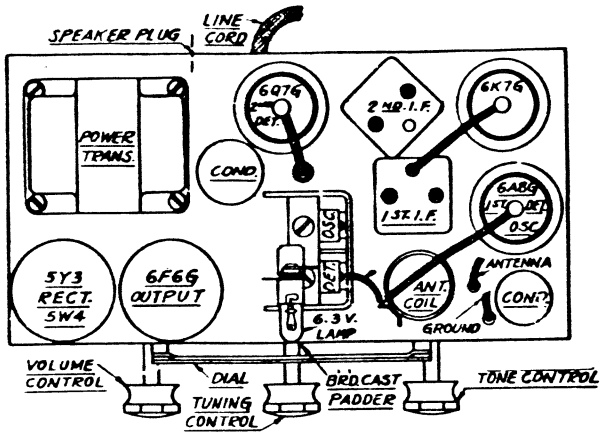
(3) Change the signal generator leads to the antenna and ground leads of the receiver.

(4) Set the signal generator at 1400 K.C. Set the pointer on the receiver dial at the same frequency. First adjust the oscillator and then the detector trimmers on the gang condenser to the point giving the maximum reading on the output meter, using as small a signal from the generator as possible so as to prevent the A.V.C. action from affecting the output readings.

(5) Reset the signal generator to 600 K.C.

(6) Slowly rock the pointer past 600 K.C. on dial meanwhile adjusting the osc. padder (located beneath dial on front of chassis) to the combination giving the greatest output reading.

(7) Repeat operation No. 4.



TUBE POSITION

●

PARTS PRICE LIST

		Models 5R135 5R123 5R165
	CONDENSERS	
22-82	.001 Mfd. 600 Volts	$ .25
22-147	.0005 Mfd. 600 Volts	.15
22-162	.0001 Mfd. 600 Volts	.20
22-170	.1 Mfd. 400 Volts	.25
22-224	.1 Mfd. 400 Volts	.15
22-250	.05 Mfd. 200 Volts	.15
22-327	.02 Mfd. 200 Volts	.15
22-406	Two Gang Variable	2.50
22-435	.02 Mfd. 600 Volts	.15
22-505	12 Mfd. Wet Elect. 325 Volts	1.00
22-506	16 Mfd. Wet Elect. 250 Volts	1.00
22-519	200-550 Mmfd. Padder	.35
	RESISTORS	
63-246	150 Ohm ¼ Watt	.20
63-258	490 M Ohm ¼ Watt	.20
63-280	49 M Ohm ¼ Watt	.20
63-293	990 M Ohm ¼ Watt	.20
63-376	190 M Ohm ¼ Watt	.20
63-545	12.5 M Ohm 1 Watt	.20
63-546	80 Ohm 1/42 Watt	.20
63-547	400 M Ohm Vol. Cont. and Switch	.90
	COILS AND CHOKES	
95-383	1st I.F. Transformer	1.25
95-384	2nd I.F. Transformer	1.25
S-4737	Ant. Coil Assem.	.60
S-4738	Osc. Coil Assem.	.60

	MISCELLANEOUS	
46-122	Tuning Control Knobs	.10
49-115	5" Dynamic Speaker (Model 123)	4.50
	Cone & Voice Coil for 49-115 Spkr.	2.00
	Output Trans. for 49-115 Spkr.	1.75
	Field Coil for 49-115 Speaker	1.50
49-144	10" Dynamic Speaker (Model 165)	8.00
	Cone & Voice Coil for 49-144 Spkr.	2.50
	Output Transformer for 49-144	2.00
	Field Coil for 49-144	2.00
49-152	8" Dynamic Speaker (Model 135)	6.50
	Cone & Voice Coil for 49-152 Spkr.	2.00
	Output Trans. for 49-152 Spkr.	2.00
	Field Coil for 49-152 Speaker	2.00
78-128	Speaker Plug Socket	.10
78-136	No. 5Y3 Wafer Socket	.15
78-137	No. 6F6 Wafer Socket	.15
78-148	No. 6Q7 Wafer Socket	.10
78-150	No. 6K7 Wafer Socket	.15
78-151	No. 6A8 Wafer Socket	.15
85-84	Tone Control Switch	.45
95-351	Power Trans. 115 V. 50-60 Cy.	3.00
95-387	Power Trans. 25 Cy. All Voltage	5.50
100-36	Dial Light Lamp 6.3 V. .25 Amp.	.15
126-127	Tube Shields	.10
S-3717	Dial Pointer & Bushing Assem.	.25
S-4301	Dial Light Socket & Clip Assem.	.10
S-4722	Dial Scale & Frame Assem.	.75

THESE PRICES SUPERSEDE ALL PREVIOUS QUOTATIONS AND ARE SUBJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE.

ZENITH RADIO CORPORATION
CHICAGO, ILLINOIS, U.S.A.
OCTOBER 26, 1936

●

Made by

ZENITH RADIO CORPORATION

3620 IRON ST. **CHICAGO. ILL., U. S. A.**

SERVICE MANUAL

ZENITH
TRADE MARK REG.
LONG DISTANCE RADIO

1937

AUTOMOBILE RECEIVERS

MODELS

5-M-191

6-M-192

6-M-193

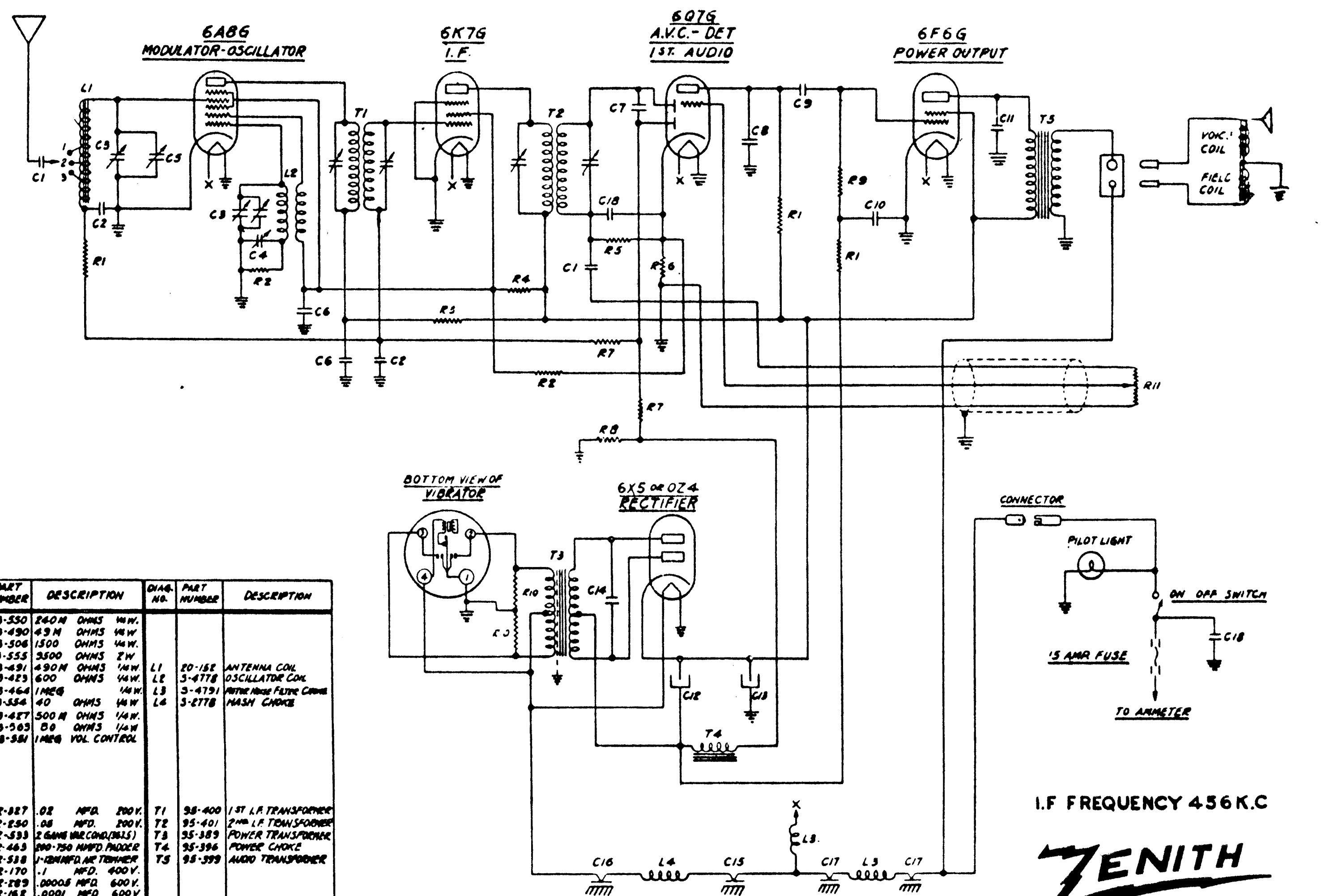
6-M-194

8-M-195

ZENITH RADIO CORPORATION
CHICAGO, U. S. A.

Form A7

Printed in U. S. A.



DIAG. NO.	PART NUMBER	DESCRIPTION	DIAG. NO.	PART NUMBER	DESCRIPTION
R1	63-550	240M OHMS 1/4W.			
R2	63-490	49M OHMS 1/4W			
R3	63-506	1500 OHMS 1/4W.			
R4	63-555	3500 OHMS 2W			
R5	63-491	490M OHMS 1/4W.	L1	20-152	ANTENNA COIL
R6	63-423	600 OHMS 1/4W.	L2	3-4778	OSCILLATOR COIL
R7	63-464	1MEG 1/4W.	L3	3-4791	MOTOR NOISE FILTER CHOKE
R8	63-554	40 OHMS 1/4W	L4	3-2778	HASH CHOKE
R9	63-427	500M OHMS 1/4W.			
R10	63-503	50 OHMS 1/4W			
R11	63-551	1MEG VOL. CONTROL			
C1	22-327	.02 MFD. 200V.	T1	95-400	1ST I.F. TRANSFORMER
C2	22-250	.05 MFD. 200V.	T2	95-401	2ND I.F. TRANSFORMER
C3	22-533	2 GANG VAR.COND.(3625)	T3	95-389	POWER TRANSFORMER
C4	22-463	200-750 MMFD. PADDER	T4	95-396	POWER CHOKE
C5	22-538	1-[illegible] MMFD. AIR TRIMMER	T5	95-399	AUDIO TRANSFORMER
C6	22-170	.1 MFD. 400V.			
C7	22-289	.00005 MFD. 600V.			
C8	22-162	.0001 MFD 600V			
C9	22-212	.05 MFD. 400V.		49-170	DYNAMIC SPEAKER
C10	22-540	.25 MFD. 200V.		190-9	VIBRATOR
C11	22-229	.005 MFD. 600V.			
C12	22-528	4 MFD 350V.			
C13	22-528	8 MFD. 350V.			
C14	22-535	.008 MFD. 1400V.			
C15	22-468	.5 MFD. 200V.			
C16	22-530	.5 MFD. 200V.			
C17		250 MMFD. LO-REACT.			
C18	22-182	.00025 MFD. 600V.			

I.F FREQUENCY 456 K.C

ZENITH AUTO RADIO

MODEL 5M191 CHASSIS 5520

ZENITH RADIO CORPORATION CHICAGO, ILL.

FIG. 1. CIRCUIT DIAGRAM. MODEL 5-M-191 (CHASSIS No. 5520)

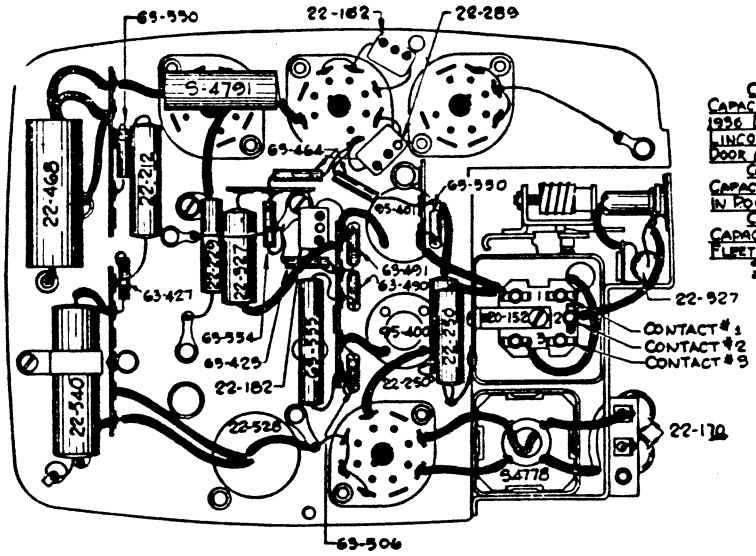
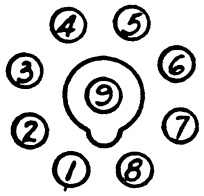


Fig. 2

SOCKET VOLTAGES MODEL 5-M-191

Tube	Position	1	2	3	4	5	6	7	8	9
6A8	Mixer Osc.	0	0	190	90	—4	90	5.9	0	0
6K7	I. F.	0	0	195	90	0	—	5.9	0	0
6Q7	Det. A. V. C. Audio	0	0	80	0	—.1	—	5.9	.8	0
6F6	Power	0	0	185	195	—3.5	—	5.9	0	—
OZ4	Rectifier			Inacessible						



BOTTOM VIEW OF SOCKET

Voltage at Battery 6V.

Voltage at Receiver 5.9 V.

Antenna disconnected

All voltages measured with 1000 ohms per volt D. C. meter

Total current consumption 5.5 amperes

Sensitivity at 1 watt out put 5 M. V.

Maximum power output 3.2 watts.

IMPORTANT ANTENNA INFORMATION
(All Models)

Some cars are factory equipped with an antenna. If this is the case, the lead should be checked to make certain that it is not grounded, and after being shielded by a large diameter loom, ground this loom to the instrument panel, and attach the Delco-Remy male connector to the end of the antenna wire. This should be done carefully so as to insure a good solder joint, and prevent any grounding at this point to the braided shielding. Insert the antenna lead-in connector into the female Delco-Remy receptacle directly below the tuning cable shoulder on the receiver case.

Where a car is not equipped with an antenna, such as convertible models, or those with all steel turret top, any one of the following Zenith antennas may be used:

Undercar antenna—part No. S-4800 and S-4801.
Over the Top Antenna (Sedan) S-4802.
Over the Top Antenna (Coupe) S-4803.
Zenith Fleet Wing Antenna S-4821.
Zenith Bumper Pole Antenna S-4822.

Complete instructions covering the installation of each of the above antennas is furnished with the various kits.

IMPORTANT: BALANCING SET TO ANTENNA. There is such an extremely wide variation in antenna capacities that it is difficult to match this condition without some means of variable antenna alignment. To accomplish this, an antenna compensating adjustment is provided through the small hole directly above the antenna cable connector on the receiver case. In addition to this, a tapped antenna transformer is also incorporated (see Figure No. 2). The proper method of alignment is as follows: After completely connecting receiver, tune in a signal between 1400 and 1450 K.C. and adjust the antenna compensator shown in Figure 3, for either the roof antenna, or single or double under-car antenna. The receiver is shipped from the factory with the antenna tap shown in Figure 2 set to the No. 2 position, and, therefore, need not be changed for either of the two types of antennas mentioned.

For Zenith Fleet Wing, and Over the Top Antennas, unsolder the antenna lead from the No. 2 lug, and resolder it to the No. 3 lug. After this is done, tune in a station between 1450 and 1400 K.C., and adjust the antenna compensator shown in Figure 3 to resonance.

For high capacity antennas such as the 1936 Dodge solid steel roof, or the Lincoln Zephyr luggage compartment, drawer antenna, etc., remove the antenna lead from the No. 2 lug, as it comes from the factory, and resolder it to the No. 1 connector. After this is done, the same procedure of tuning in a signal from 1450 to 1400 K.C., and balancing to resonance with the antenna compensator, as described above, should be followed.

This system of tapped transformer, and variable compensating adjustment gives an extremely flexible means of resonating the receiver to any type of antenna, and it should be noted that the tap need only be changed in two cases. Of course, it is necessary to remove the bottom cover in order to shift the antenna tap where necessary.

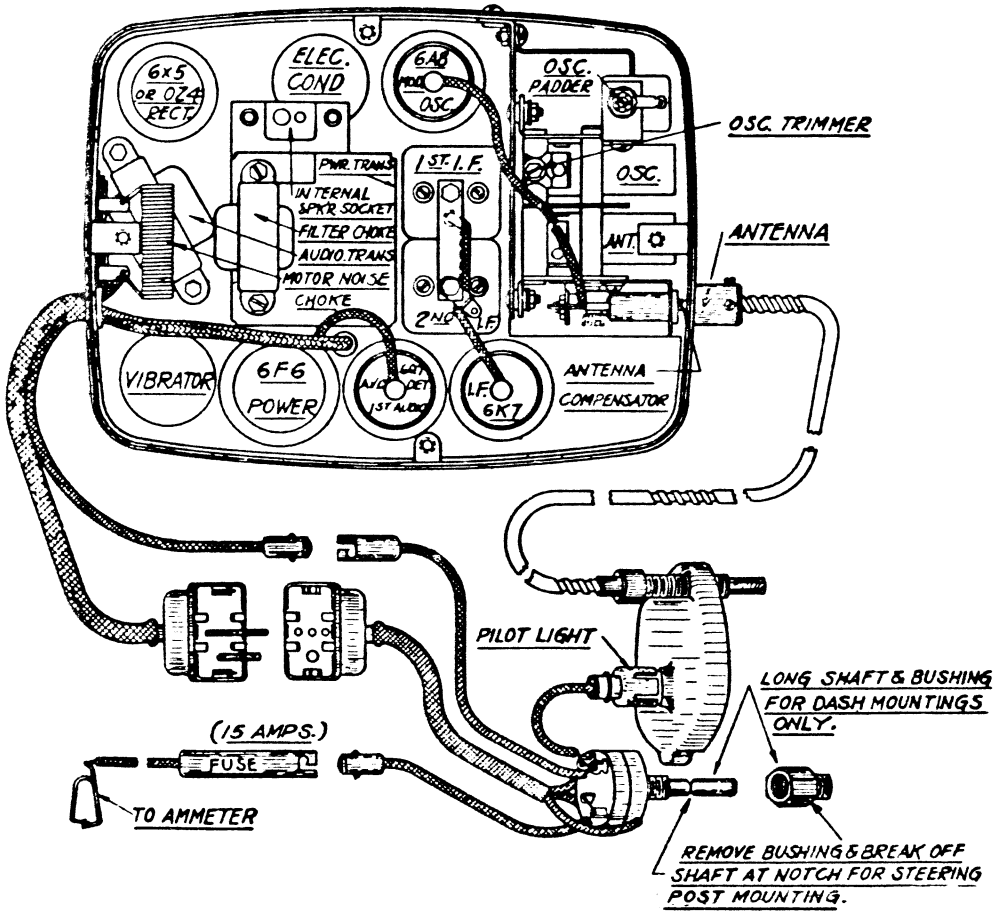


Fig. 3.—Tube Position 5-M-191

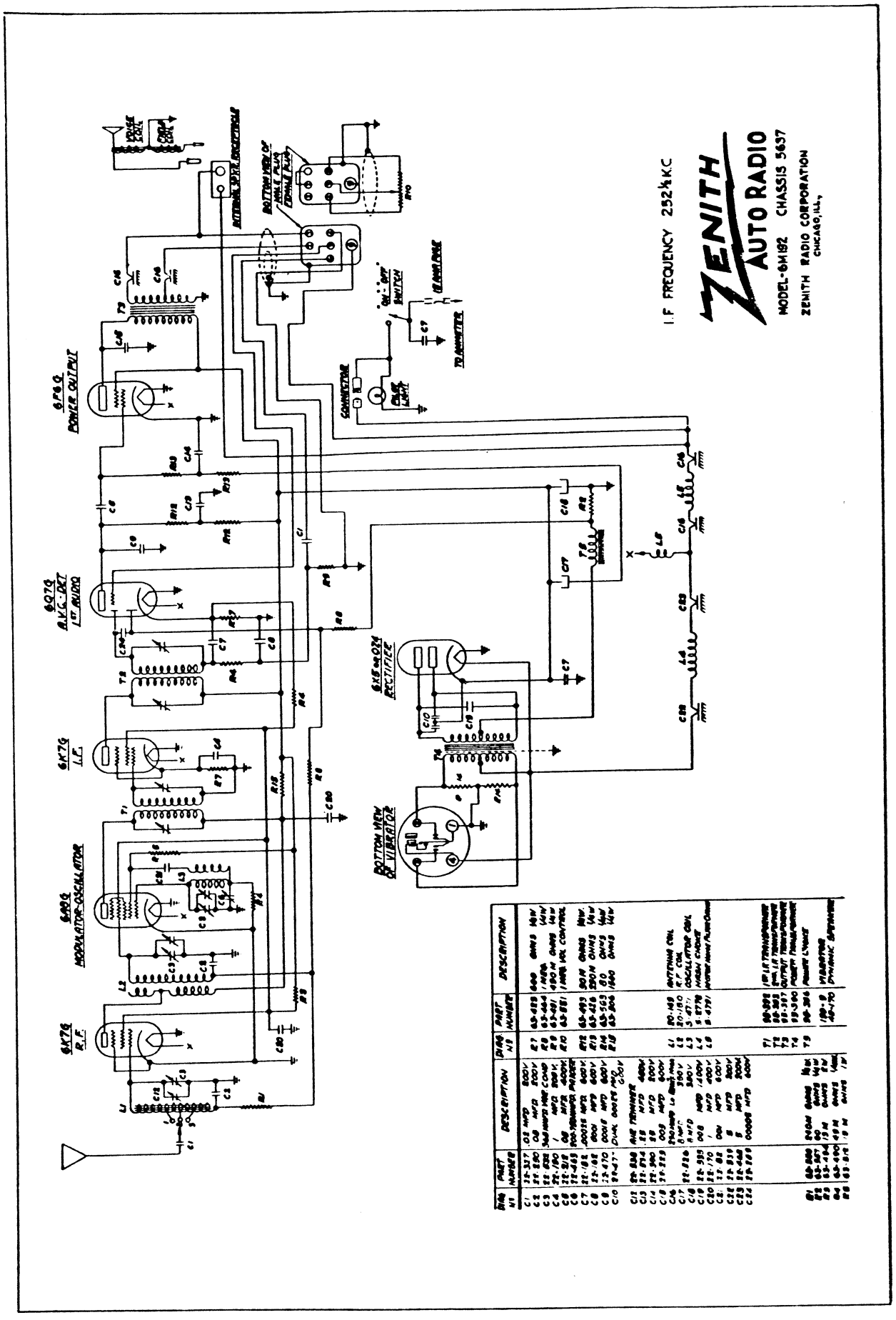
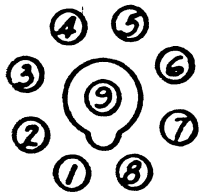


FIG. 4. WIRING DIAGRAM R.M.192 (CHASSIS No. 5637)

SOCKET VOLTAGES 6-M-192

Tube	Position	1	2	3	4	5	6	7	8	9
6K7	R. F.	0	0	225	95	0	—	5.9	0	0
6A8	Mixer Osc.	0	0	225	95	—32	140	5.9	0	0
6K7	I. F.	0	0	235	95	4	—	5.9	4	0
6Q7	Det. A. V. C. Audio	0	0	140	0	—.5	—	5.9	—2	0
6F6	Power	0	0	215	233	—14	—	5.9	0	—
OZ4	Rectifier			Inaccessible						



BOTTOM VIEW OF SOCKET

Voltage at Battery 6V.

Voltage at Receiver 5.9 V.

Antenna disconnected

All voltages measured with 1000 ohms per volt D. C. meter

Total current consumption 6-M-192—7.5 amperes

Sensitivity at 1 watt output — .9 M. V.

Maximum power output 4.5 watts.

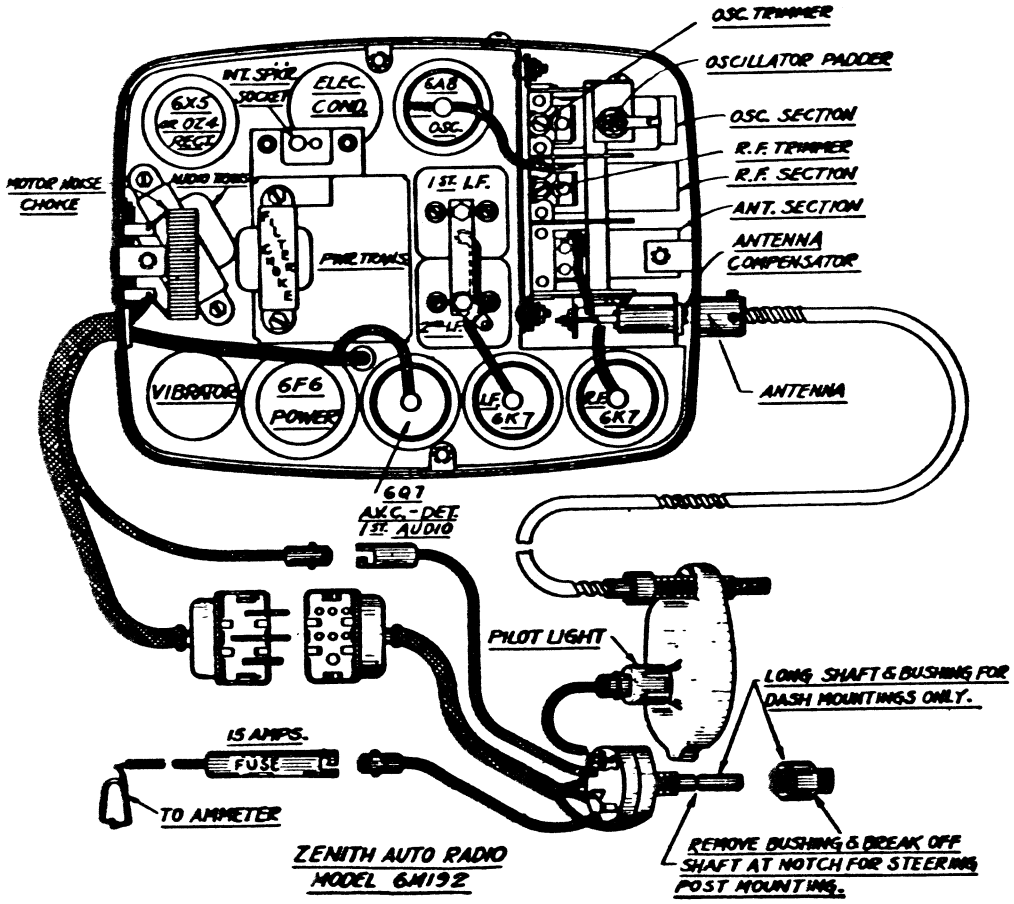


Fig. 5.—Tube Position 6-M-192

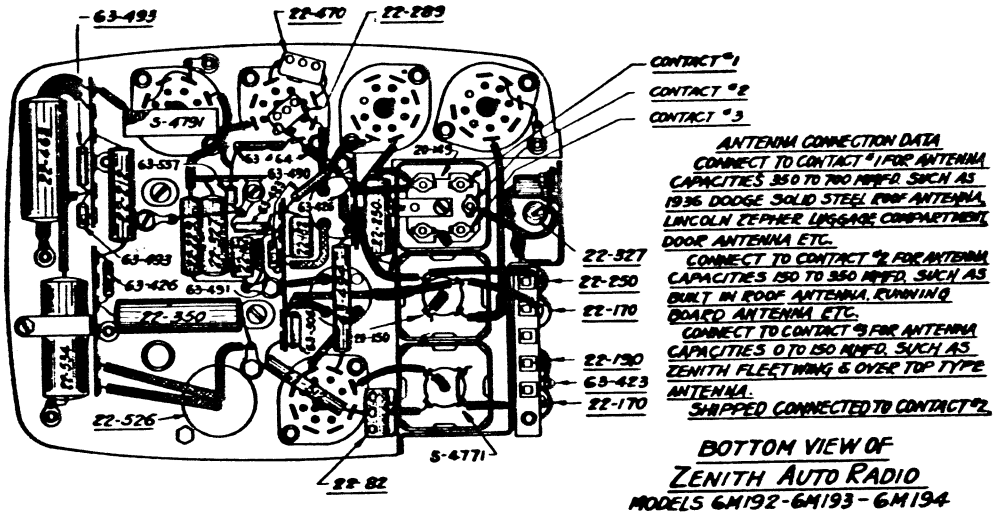


Fig. 6.—Bottom View—6-M-192, 6-M-193, 6-M-194

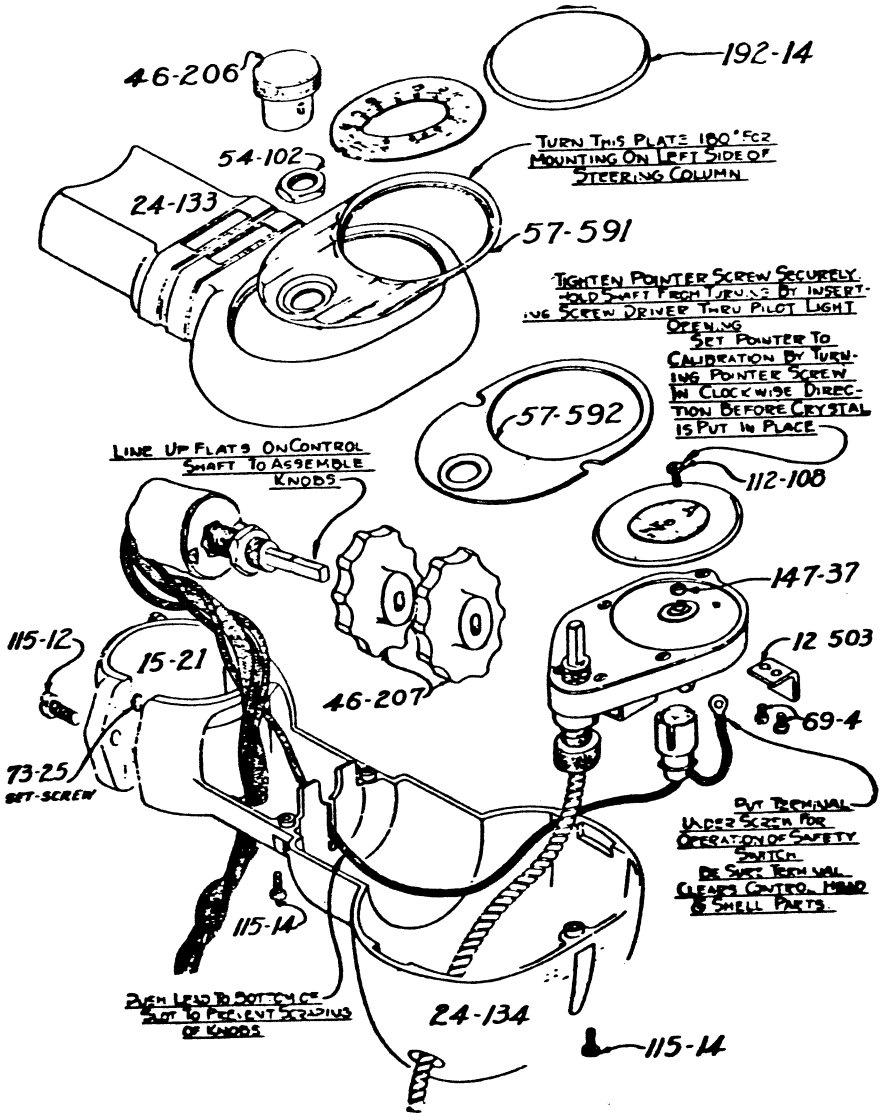
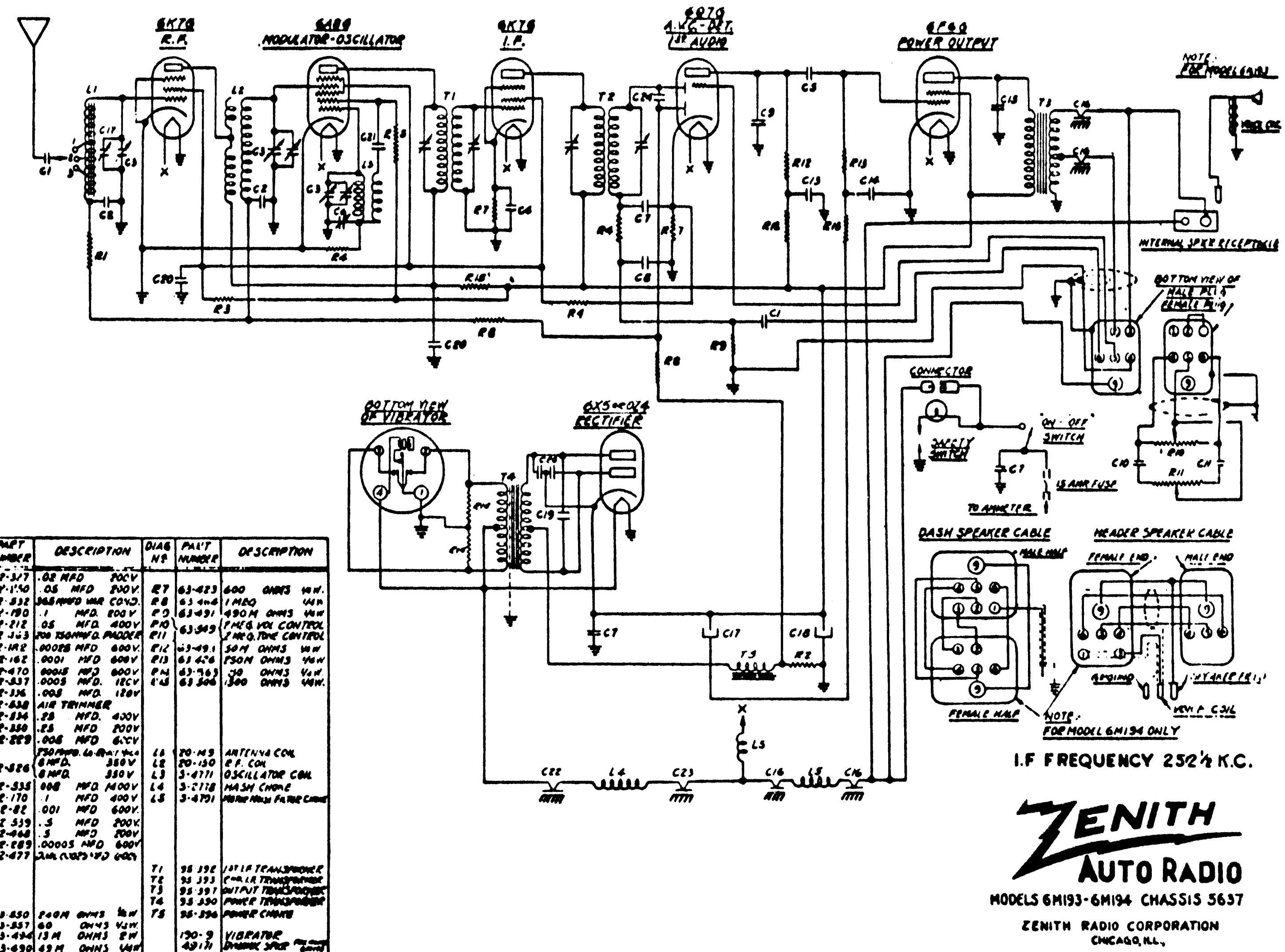


Fig. 7.—Steering Control Assembly

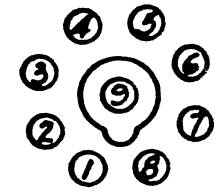


DIAG. NO	PART NUMBER	DESCRIPTION	DIAG NO	PART NUMBER	DESCRIPTION
C1	22-317	.02 MFD 200V			
C2	22-150	.05 MFD 200V.	R7	63-423	600 OHMS 1/4 W.
C3	22-532	365 MMFD VAR COND.	R8	63-446	1 MEG 1/4 W
C4	22-190	.1 MFD. 200V	R9	63-491	490 M OHMS 1/4 W
C5	22-212	.05 MFD. 400V	R10	63-549	2 MEG VOL CONTROL
C6	22-363	200 750 MMFD. PADDER	R11		2 MEG. TONE CONTROL
C7	22-182	.00025 MFD 600V.	R12	63-491	50 M OHMS 1/4 W
C8	22-162	.0001 MFD 600V	R13	63-426	250 M OHMS 1/4 W
C9	22-470	.00015 MFD 600V	R14	63-363	30 OHMS 1/4 W.
C10	22-337	.0005 MFD. 120V	R15	63-506	1300 OHMS 1/4 W.
C11	22-336	.005 MFD. 120V			
C12	22-538	AIR TRIMMER			
C13	22-534	.25 MFD. 400V			
C14	22-350	.25 MFD 200V			
C15	22-229	.006 MFD 600V			
C16		750 MMFD. [illegible] MICA	L1	20-149	ANTENNA COIL
C17	22-526	8 MFD. 350V	L2	20-150	R.F. COIL
C18		8 MFD. 350V	L3	S-4771	OSCILLATOR COIL
C19	22-535	.008 MFD. 1400V	L4	S-2778	HASH CHOKE
C20	22-170	.1 MFD 400V	L5	S-4791	[illegible] FILTER CHOKE
C21	22-82	.001 MFD 600V.			
C22	22-539	.5 MFD 200V.			
C23	22-468	.5 MFD 200V			
C24	22-229	.00005 MFD 600V			
C25	22-477	[illegible] 600V			
			T1	95-392	1ST I.F. TRANSFORMER
			T2	95-393	2ND I.F. TRANSFORMER
			T3	95-391	OUTPUT TRANSFORMER
			T4	95-390	POWER TRANSFORMER
R1	63-550	240 M OHMS 1/2 W	T5	95-396	POWER CHOKE
R2	63-557	60 OHMS 1/2 W.			
R3	63-496	13 M OHMS 2 W		190-9	VIBRATOR
R4	63-490	49 M OHMS 1/4 W		49171	DYNAMIC SPKR [illegible]
R5	63-512	10 M OHMS 1 W.			

FIG. 8. WIRING DIAGRAM 6-M-193, 6-M-194 (CHASSIS No. 5637)

SOCKET VOLTAGES 6-M-193, 6-M-194

Tube	Position	1	2	3	4	5	6	7	8	9
6K7	R. F.	0	0	225	95	0	—	5.9	0	0
6A8	Mixer Osc.	0	0	225	95	—32	140	5.9	0	0
6K7	I. F.	0	0	235	95	4	—	5.9	4	0
6Q7	Det. A. V. C. Audio	0	0	140	0	—.5	—	5.9	—2	0
6F6	Power	0	0	215	233	—14	—	5.9	0	—
OZ4	Rectifier			Inaccessible						



Voltage at Battery 6V.

Voltage at Receiver 5.9 V.

Antenna disconnected

All voltages measured with 1000 ohms per volt D. C. meter

Total current consumption 6-M-193—6-M-194 5.9 amperes

Sensitivity at 1 watt output — .9 M. V.

Maximum power output 4.5 watts.

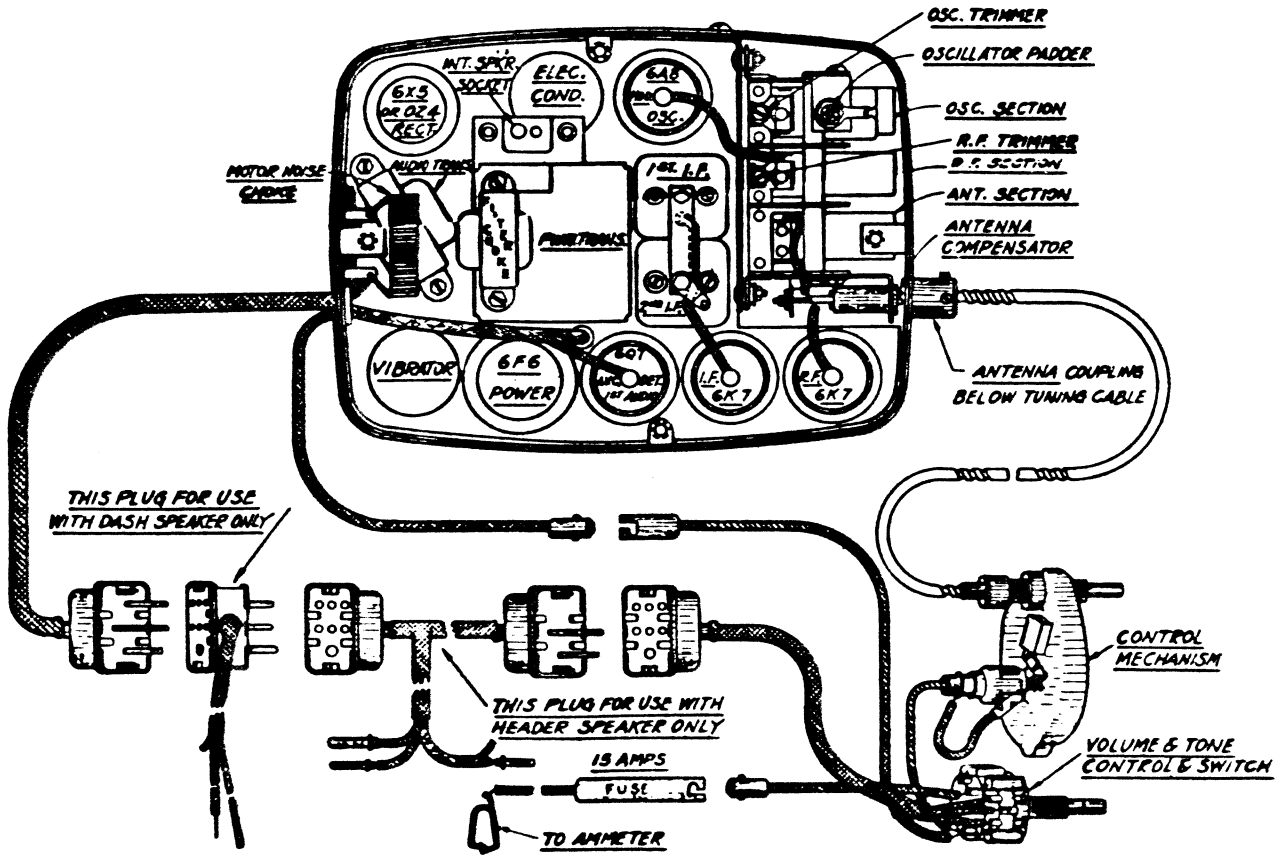
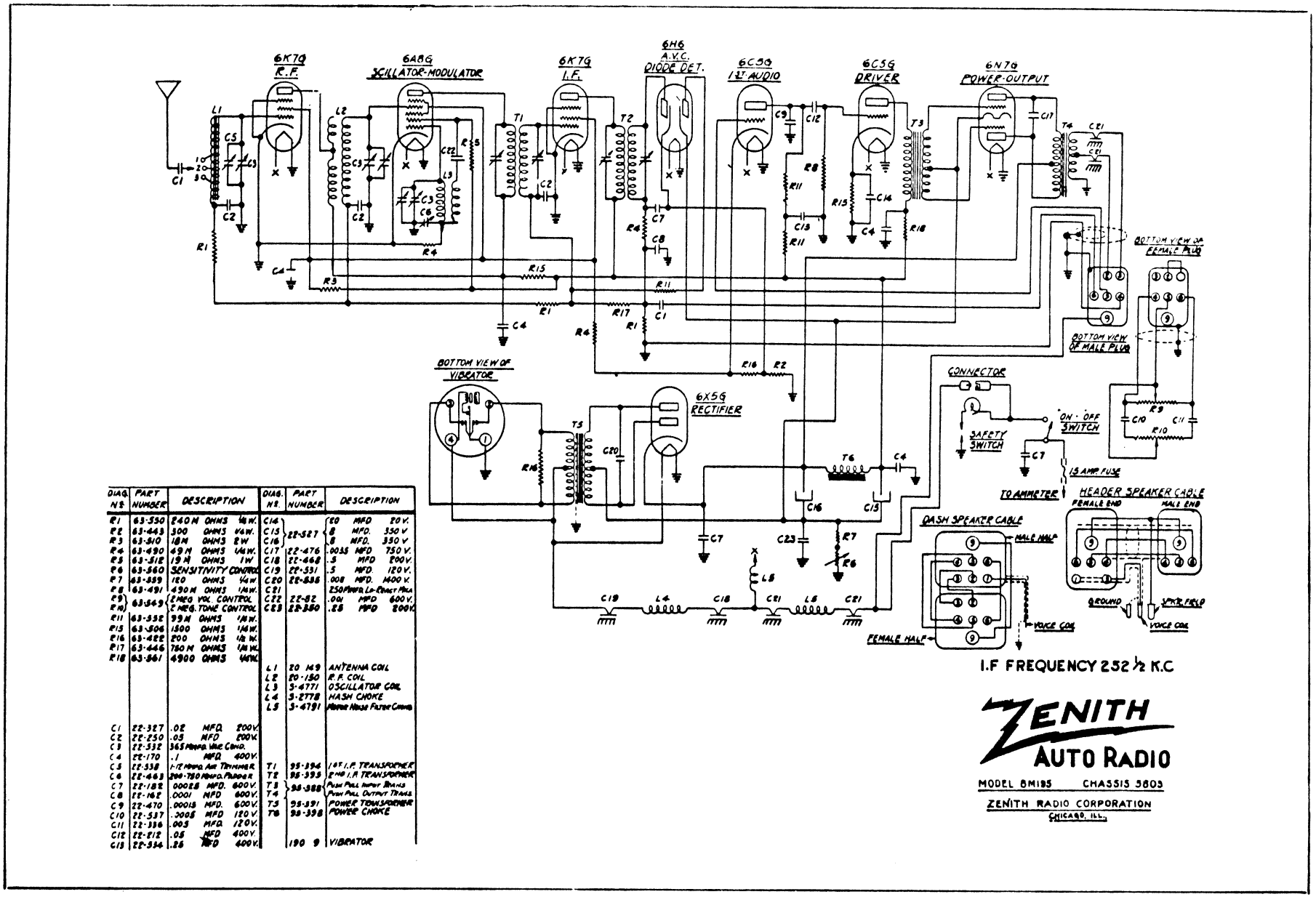


Fig. 9.—Tube Position 6-M-193, 6-M-194

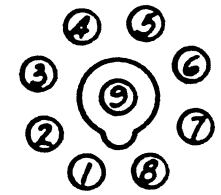


DIAG. NO.	PART NUMBER	DESCRIPTION
R1	63-550	240 M OHMS ½ W.
R2	63-443	300 OHMS ½ W.
R3	63-510	18 M OHMS 2 W
R4	63-490	49 M OHMS ½ W.
R5	63-518	1.9 M OHMS 1 W
R6	63-560	SENSITIVITY CONTROL
R7	63-559	150 OHMS ½ W
R8	63-491	490 M OHMS 1 W.
R9	63-569	2 MEG VOL CONTROL
R10		2 MEG. TONE CONTROL
R11	63-532	99 M OHMS 1 W.
R15	63-506	1500 OHMS ½ W.
R16	63-422	200 OHMS ½ W.
R17	63-446	750 M OHMS 1 W.
R18	63-561	4900 OHMS ½ W.
C1	22-327	.02 MFD. 200 V.
C2	22-250	.05 MFD 200 V.
C3	22-532	365 Mmfd. Var. Cond.
C4	22-170	.1 MFD. 400 V.
C5	22-538	I.F. Mmfd. Air Trimmer
C6	22-463	200-730 Mmfd. Padder
C7	22-182	.00028 MFD. 600 V.
C8	22-162	.0001 MFD 600 V.
C9	22-470	.00018 MFD. 600 V.
C10	22-537	.0098 MFD 120 V.
C11	22-336	.005 MFD. 120 V.
C12	22-512	.05 MFD 400 V.
C13	22-534	.25 MFD 400 V.
C14	22-527	.20 MFD. 20 V.
C15		.8 MFD. 350 V
C16		.8 MFD. 350 V
C17	22-476	.0035 MFD 750 V.
C18	22-468	.5 MFD 200 V.
C19	22-531	.5 MFD. 120 V.
C20	22-838	.008 MFD. 1400 V.
C21		250 Mmfd. Lo-Effect Mica
C22	22-82	.001 MFD 600 V.
C23	22-350	.25 MFD 800 V.
L1	20 149	ANTENNA COIL
L2	20-150	R.F. COIL
L3	3-4771	OSCILLATOR COIL
L4	3-2778	HASH CHOKE
L5	3-4791	Marine Noise Filter Choke
T1	95-356	1ST I.F. TRANSFORMER
T2	95-393	2ND I.F. TRANSFORMER
T3	95-388	Push Pull Input Trans.
T4		Push Pull Output Trans.
T5	95-391	POWER TRANSFORMER
T6	95-398	POWER CHOKE
	190 9	VIBRATOR

FIG. 10. WIRING DIAGRAM MODEL 8-M-195 (CHASSIS No. 5803)

SOCKET VOLTAGES 8-M-195

Tube	Position	1	2	3	4	5	6	7	8	9
6K7	R. F.	0	0	220	75	0	—	5.9	0	0
6A8	Mixer Osc.	0	0	220	75	—11	115	5.9	0	0
6K7	I. F.	0	0	230	75	0	—	5.9	0	0
6H6	Det. A. V. C.			Inacessible						
6C5	Audio	0	5.9	44	—	0	—	0	1.1	—
6C5	Driver	0	5.9	200	—	0	—	0	6.8	—
6N7	Power	0	0	235	—3.5	—3.5	235	5.9	—3.5	—
6X5	Rectifier			Inaccessible						



BOTTOM VIEW OF SOCKET

Voltage at Battery 6V.

Voltage at Receiver 5.9 V.

Antenna disconnected

All voltages measured with 1000 ohms per volt D. C. meter

Total current consumption 9.2 amperes

Maximum sensitivity at 1 watt output .9 M. V.

Maximum power output 9 watts

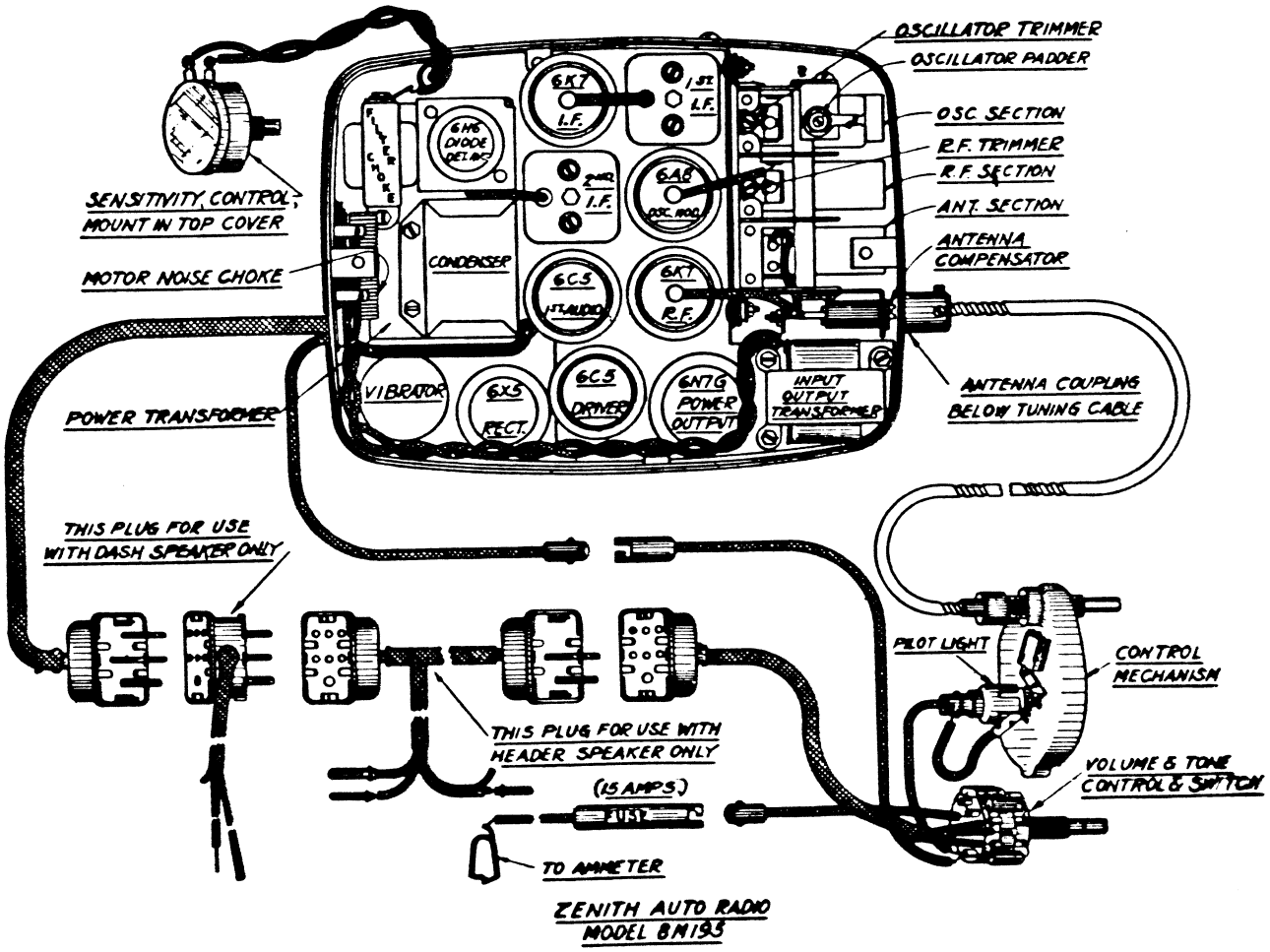
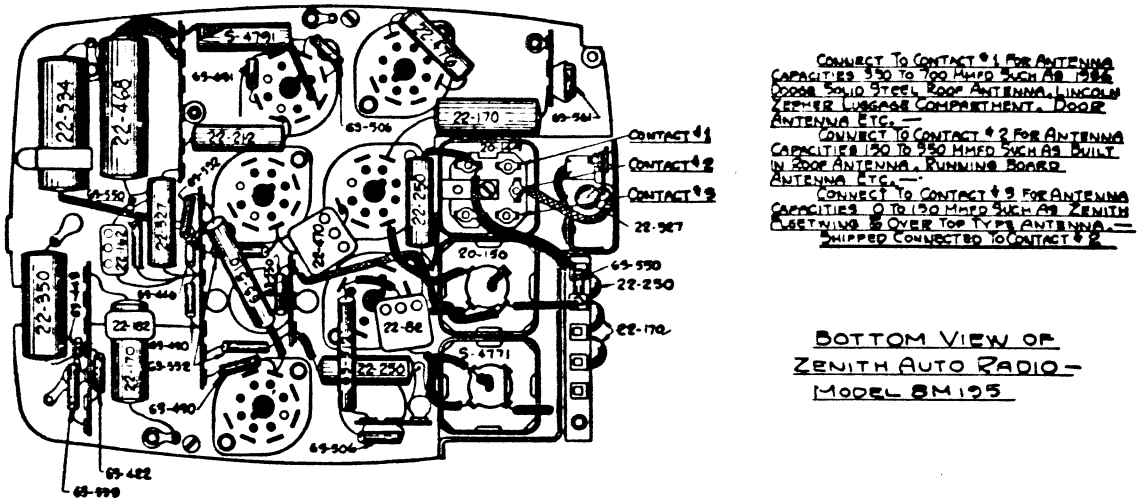


Fig. 11.—Tube Position 8-M-195



BOTTOM VIEW OF ZENITH AUTO RADIO — MODEL 8M195

Fig. 12.—Bottom View 8-M-195

IGNITION INTERFERENCE

Remove the center high tension lead of the distributor and insert the suppressor into the distributor at that point. The wire is then placed in the open end of the suppressor. The generator condenser is fastened under the cut-out housing and the wire connected to the generator connection on the cut-out. The coil condenser is attached to the battery connection of the coil and the other end to the coil case. Make absolutely certain that this condenser is not accidentally connected to the distributor side of the coil since this will increase motor noise terrifically and make operation of the receiver highly unsatisfactory when the motor is running. Where two distributors or two coils are employed a corresponding number of condensers and suppressors must be applied. In some instances it might be of benefit to attach a by-pass condenser from one side of the ammeter to a grounded part of the instrument panel. If the dome light is feeding interference to the antenna the lead should be cut where it comes from the post and a switch inserted on the instrument panel at that point, to turn it off and on. In some cases, a by-pass condenser connected to the dome-light lead and grounded at the post is as effective as a separate switch. Try this first.

If additional attention is necessary to reduce motor interference, the motor block must be securely bonded, both at the rear and front supports with ½ inch copper braid. Also bond or ground all metal control cables or pipes feeding from the motor side into the car. These bonds should be made to the control wire or pipe and soldered to the fire wall immediately adjacent on the motor side. As a further precaution the rotor should be lengthened to reduce the gap between it and the distributor head contacts by either peening the end or applying a small quantity of solder at this point.

ALIGNMENT

Every Zenith receiver is carefully balanced, and the sensitivity measured on accurate crystal controlled signal generators before leaving the factory, and unless a part is changed, or the receiver otherwise altered, the adjustment should not be tampered with.

When realignment is required, an accurately calibrated service oscillator and output meter are essential.

The proper procedure is as follows:

5-M-91

"A" Connect the service oscillator output leads to the control grid of the 6A8 tube, and to the chassis. If the oscillator output is a single shielded lead the shield should connect to the chassis.

Connect an output meter across the primary of the speaker transformer.

Set the service oscillator at 456 K.C. and adjust the trimmers on the I.F. transformers to the point giving the greatest reading on the output meter. These, as well as the following adjustments should be made using as small an output from the signal generator as possible so that the A.V.C. action will be least effective.

"B" Change the service oscillator lead from the grid of the 6A8 to the antenna connection. A male Delco Remy connector may be used in making a connection to the antenna lead.

Set the service oscillator at 1600 K.C. and rotate the gang condenser until the plates are entirely out of mesh. Adjust the oscillator section trimmer until the 1600 K.C. signal is tuned in.

"C" Set the service oscillator to 600 K.C. and rock the gang condenser slowly to and fro past the point where this signal is received, meanwhile adjusting the padder condenser for a setting which gives the greatest output reading.

"D" Repeat operation "B". See antenna instruction page 379 for correct alignment of antenna stage.

6-M-192 — 6-M-193 — 6-M-194 — 8-M-195

"A" Connect the service oscillator to the control grid of the 6A8 tube and the chassis.

Connect the output meter across the primary of the speaker transformer.

Set the service oscillator to 252.5 K C. and adjust the trimmers on the I.F. transformers for the greatest output reading. These adjustments should be repeated several times using as weak an input signal as possible so as to obtain greater accuracy.

"B" Change the service oscillator lead from the grid of the 6A8 to the antenna connection. A male Delco Remy connector may be used in making a connection to the antenna lead.

Set the service oscillator at 1600 K.C. and rotate the gang condenser until the plates are entirely out of mesh. Adjust the oscillator section trimmer until the 1600 K.C. signal is tuned in.

Change the service oscillator to 1400 K.C. Rotate the gang condenser until this signal is tuned in, and then adjust the R.F. trimmer on the gang condenser to the point giving the greatest output reading.

"C" Set the service oscillator to 600 K.C. and rock the gang condenser slowly to and fro past the point where this signal is received, meanwhile adjusting the padder condenser for a setting which gives the greatest output reading.

"D" Repeat operation "B".

The sensitivity control should be in the extreme clockwise position when making all adjustments.

NOTE — Due to the high gain type of I.F. transformers used in these receivers it is essential that a non metallic screw driver be used in making all adjustments. See antenna instructions page 379 for correct alignment of antenna stage.

SERVICE NOTE

The 0Z4 rectifier tube used in the 5 and 6 tube models may be replaced with a 6X5 rectifier, providing the 6X5 tube is inclosed in a grounded tube shield.

The Goat shield with a ground clip which connects to the shield contact pin of the tube is the most convenient type to use.

PARTS LIST

Coils and Chokes

		8T.	6T.	5T.	PRICE
20-149	Antenna Coil	8	6		$ 1.25
20-150	R.F. Coil	8	6		.60
20-152	Antenna Coil			5	1.25
95-392	1st I.F. Transformer		6		1.25
93-393	2nd I.F. Transformer		6		1.25
95-394	1st I.F. Transformer	8			1.25
95-395	2nd I.F. Transformer	8			1.25
95-400	1st I.F. Transformer			5	1.25
95-401	2nd I.F. Transformer			5	1.25
S-2778	Hash Choke	8	6	5	.15
S-4771	Oscillator Coil	8	6		.45
S-4778	Oscillator Coil			5	.45
S-4791	Motor Noise Filter Choke	8	6	5	.20

Condensers

22-82	.001 mfd. 600 Volt	8	6		.25
22-162	.0001 mfd. 600 Volt	8	6	5	.20
22-170	.1 mfd. 400 Volt	8	6	5	.25
22-182	.00025 mfd. 600 Volt	8	6	5	.12
22-190	.1 mfd. 200 Volt		6		.20
22-212	.05 mfd. 400 Volt	8	6	5	.20
22-229	.005 mfd. 600 Volt		6	5	.15
22-250	.05 mfd. 200 Volt	8	6	5	.15
22-289	.00005 mfd. 600 Volt		6	5	.12
22-327	.02 mfd. 200 Volt	8	6	5	.15
22-336	.005 mfd. 120 Volt (Models 193-194 only)	8	6		.15
22-350	.25 mfd. 200 Volt	8	6		.20
22-463	200-750 mmfd. Osc. Padder	8	6	5	.35
22-468	.5 mfd. 200 Volt	8	6	5	.30
22-470	.00015 mfd. 600 Volt	8	6		.20
22-476	.0035 mfd. 750 Volt	8			.15
22-526	8-8 mfd. Dry Elect. 350 Volt		6		1.25
22-527	8-8 mfd. 350 Volt-20 mfd. 20 Volt	8			2.25
22-528	4-8 mfd. 350 Volt			5	1.25
22-531	.5 mfd. 120 Volt	8			.30
22-532	3 Gang Variable Cond. 365 mmfd.	8	6		4.50
22-533	2 Gang Variable Cond. 362.5 mmfd.			5	3.00
22-534	.25 mfd. 400 Volt	8	6		.25
22-535	.008 mfd. 1400 Volt	8	6	5	.20
22-537	.0005 mfd. 120 Volt	8	6		.15
22-538	1-12 mmfd. Air Trimmer	8	6	5	.20
22-539	.5 mfd. 200 Volt		6	5	.30
22-540	.25 mfd. 200 Volt			5	.25

Resistors

63-422	200 Ohm 1/2 Watt	8	6	5	.20
63-423	600 Ohm 1/4 Watt		6	5	.20
63-426	250 M ohm 1/4 Watt		6		.20
63-427	500 M ohm 1/4 Watt			5	.20
63-443	300 Ohm 1/4 Watt	8			.20
63-446	750 M ohm 1/4 Watt	8			.20
63-464	1 megohm 1/4 Watt		6	5	.20
63-490	49 M ohm 1/4 Watt	8	6	5	.20
63-491	490 M ohm 1/4 Watt	8	6	5	.20
63-493	50 M ohm 1/4 Watt		6		.20
63-494	13 M ohm 2 Watt		6		.25
63-506	1500 ohm 1/4 Watt	8	6	5	.20
63-511	18 M ohm 2 Watt	8			.25
63-512	19 M ohm 1 Watt	8	6		.20
63-549	2 megohm vol. and tone control (dual)	8	6		2.00
63-550	240 M ohm 1/4 Watt	8	6	5	.20
63-551	1 megohm vol. control (6M192 only)		6	5	1.00
63-552	99 M ohm 1/4 Watt	8			.20
63-554	40 ohm 1/4 Watt			5	.20
63-555	9,500 ohm 2 Watt			5	.25
63-557	60 ohm 1/4 Watt		6		.20
63-559	120 ohm wire wound 1/4 Watt	8			.20
63-560	Sensitivity Control	8			.70
63-561	4900 ohm 1/4 Watt	8			.20

		PRICE
	Control Head Assem. Part for Model 5M191	
S-4789	Volume Control and Cable Assembly Above Assembly consists of	$ 3.50
	1 22-182 .00025 mfd. condenser 600 v.	.12
	1 52-93 Control Head Cable and Plug	1.00
	1 52-95 On-Off Switch Cable	.20
	1 52-96 Battery Cable	.20
	1 52-99 Pilot Light Cable and Socket	.20
	1 63-551 Volume Control and Switch	1.00
	1 94-239 Extension Bushing	.15
	1 183-6 Rubber Band	.01
26-140	Calibrated Dial Scale	.10
27-17	Dial Pointer Disc	.10
54-101	Cable Sheath Clamping Nut	.05
76-208	Tuning Control Flexible Shaft 18"	1.00
100-32	Pilot Light Bulb	.15
170-18	Remote Control Drive Mechanism	2.75
	Control Head Assem. Part for Model 6M192	
S-4844	Volume Control and Cable Assembly Above Assembly consists of	$ 4.00
	1 22-182 .00025 mfd. Condenser 600 v.	.12
	1 52-95 On-Off Switch Cable	.20
	1 52-96 Battery Cable	.20
	1 52-98 Control Head Cable and Plug Assem.	1.00
	1 52-99 Pilot Light Cable & Socket	.20
	1 63-551 Volume Control and Switch	1.00
	1 94-239 Extension Bushing	.15
	1 183-6 Rubber Band	.01
26-141	Calibrated Dial Scale	.10
27-17	Dial Pointer Disc	.10
54-101	Cable Sheath Clamping Nut	.05
76-209	Tuning Control Flexible Shaft 24"	1.25
100-32	Pilot Light Bulb	.15
170-19	Remote Control Drive Mechanism	2.75
	Control Head Assembly Parts for Models 6M193 - 6M194 - 8M195	
S-4846	Volume Control and Cable Assembly Above Assembly consists of	$ 5.00
	1 22-182 .00025 mfd. Condenser 600 v.	.12
	1 22-336 .005 mfd. Condenser 120 v.	.15
	1 22-537 .005 mfd. Condenser 120 v.	.15
	1 52-95 On-Off Switch Cable	.20
	1 52-96 Battery Cable	.20
	1 52-98 Control Head Cable and Plug	1.00
	1 52-100 Pilot Light Cable and Socket	.30
	1 63-549 Volume & Tone Control & Switch Assem.	2.00
	1 183-7 Rubber Band	.01
26-141	Calibrated Dial Scale	.10
27-17	Dial Pointer Disc	.10
46-150	Tone Control Knob	.15
54-101	Cable Sheath Clamping Nut	.05
76-223	Tuning Control Flexible Shaft 24" long	1.25
100-32	Pilot Light Bulb Mazda	.15
147-28	Tuning Control Knob Spacer	.15
170-20	Remote Control Drive Mechanism	4.00

PARTS LIST (Cont'd.)

Additional Optional Control Cables

		PRICE
	Models 6M192—5M191 Only	
76-209	Tuning Control Flexible Shaft 24"	1.25
76-214	Tuning Control Flexible Shaft 30"	1.50
76-218	Tuning Control Flexible Shaft 36"	1.75
	Models 6M193—6M194—8M195 Only	
76-223	Tuning Control Flexible Shaft 24"	1.25
76-224	Tuning Control Flexible Shaft 30"	1.50
76-225	Tuning Control Flexible Shaft 36"	1.75

S-4700 **Z-188**

Steering Column Control Head Accessory Kit
(Used on Models 6M193—6M194—8M195 Only)

12-503	Mechanism Retaining Bracket	.05
15-21	Steering Column Mtg. Cap	.30
24-133	Steering Column Mtg. Cover Upper Half	1.50
24-134	Steering Column Mtg. Cover Lower Half	2.00
46-206	Tuning Control Knob	.20
46-207	Volume & Tone Control Knobs	.15
57-591	Bezel Plate	.45
57-592	Mounting Plate	.30
69-4	No. 6/32 x 3/16" R.H.M.S. N.P.	.01
73-25	No. 10/32 x 5/16" Headless Set Screw	.01
94-238	Paper Bushings	.01
112-108	Dial Pointer Mtg. Screw 3/48" x 7/32	.01
115-12	No. 10/32 x 1/2 F.H.M.S. N.P.	.01
115-14	No. 4/36 x 3/8" F.H.M.S.	.01
147-37	Pointer Screw Spacer	.01
192-14	Unbreakable Dial Glass	.20

S-4810 **R-188**

Steering Column Mounting Shell
(Used with Models 5M191 — 6M192 Only)

12-459	Control Mechanism Retaining Bracket	.05
12-469	Control Housing Mtg. Bracket	.05
17-38	Control Housing Retaining Clamp	.05
43-11	Control Mechanism Housing	.50
46-160	Tuning & Volume Control Knobs	.25
54-106	No. 10/32 x 3/8" Hex Nuts	.01
57-594	Spacer Plate	.05
69-4	No. 6/32 x 3/16 R.H.M.S. N.P.	.01
69-124	No. 8/32 x 7/8" R.H.M.S. Parkerized	.01
69-125	No. 10/32 x 5/16" R.H.M.S.	.01
93-126	No. 8 Internal Shakeproof Lockwashers	.01
93-127	No. 10 Internal Shakeproof Lockwashers	.01
93-312	Shim Washers	.01
93-322	1/16" x 13/32" x 13/16 Steel Washer	.01
112-108	No. 3/48 x 7/32" B.I.M.S. Black Nickel Finish	.01
192-14	Unbreakable Dial Glass	.20

Special Cables to Adapt 1936 External Speakers to 1937 Auto Radios

52-102	Firewall Cable (Used for BH-177 BH-177S Also)	1.50
52-103	Header Cable	2.25
	I.E. Additional of either of the above transforms 1936 speaker to X type (GM77+52-103=GM77X)	

Set Mounting Parts

22-193	.5 mfd. Ignition Coil Condenser 200 volts	.45
22-194	.5 mfd. Generator Condenser	.50

		ST.	ST.	ST.	PRICE
52-90	Antenna Cable				.50
52-97	Battery Cable - Ammeter End				.25
54-102	3/8-32 x 1/2" Hex Nuts Cadmium				.01
57-478	Set Mounting Plate				.25
58-26	Delco Remy Fuse Bushing				.01
63-336	15 M ohm Distributor Suppressor				.35
69-84	No. 10/32 x 1/4" R.H.M.S. for Mounting Plate				.30
93-127	No. 10 Internal Shakeproof Lockwasher				.35
93-143	3/8" Internal Shakeproof Lockwasher				.01
93-222	7/16" Internal Shakeproof Lockwasher				.01
93-233	Set Mounting Bolt Washer 2 1/4" Dia.				.02
136-6	15 Amp. Fuse				.06
144-14	7/16" x 3" Carriage Bolt & Nut				.05
193-2	Installation Template				.01
196-1	Mounting Plate Gasket				.03

Miscellaneous

12-502	Spkr. Mtg. Brackets (5M191 - 6M192 Only)		6	5	.03
19-65	Chassis Box Top Cover Grd. Clip Terminal	8	6	5	.01
44-14	Speaker Plug Jack		6	5	.10
46-205	Sensitivity Control Knob	8			.20
49-170	5" Dynamic Speaker (5M191 - 6M192 Only)*				3.50
	Cone & Voice Coil for 49-170				1.50
	Field Coil for 49-170				1.50
49-171	6" P.M. Dynamic Speaker (6M193 Only)				5.00
	Cone & Voice Coil for 49-171				2.00
49-172	8" P.M. Dynamic Speaker (BH-177 Only)				6.00
	Cone & Voice Coil for 49-172				2.00
49-173	6" P. M. Dynamic Speaker (BH-177S Only)				5.00
	Cone & Voice Coil for 49-173				2.00

***IMPORTANT! When ordering speaker parts always give the entire part and code number i.e., 49-138AB or 49-138U.**

52-91	Chassis & Speaker Supply Cable		6		1.75
52-94	Chassis Control Cable & Plug Assem.			5	1.50
52-101	Chassis Control Cable & Plug Assem.	8			1.70
69-129	10/32 x 1" R.H.M.S. Statuary Bronze for Mounting Top Cover	8	6	5	.01
69-130	10/32 x 3/8" R.H.M.S. Statuary Bronze for Mtg. Top Cover		6		.01
73-17	No. 8/32 x 1/4" Headless Set Screw Cuppoint				.01
78-115	Vibrator Wafer Type Socket	8	6	5	.10
78-133	No. 6H6 Wafer Type Socket	8			.15
78-148	No. 6Q7 Wafer Type Socket		6	5	.10
78-149	No. 6 x 5-No. OZ4 Wafer Type Socket	8	6	5	.10
78-150	No. 6K7 Wafer Type Socket	8	6	5	.15
78-151	No. 6A8 Wafer Type Socket	8	6	5	.15
78-152	No. 6F6 Wafer Type Socket		6	5	.10
78-156	No. 6C5 Wafer Type Socket	8			.10
78-157	No. 6N7 Wafer Type Socket	8			.10
95-388	Audio Transformer Assembly	8			4.00
95-389	Power Transformer			5	2.75
95-390	Power Transformer		6		2.75
95-391	Power Transformer	8			3.25
95-396	Power Choke				.75
95-397	Output Transformer		6		1.25
95-398	Power Choke	8			.90
95-399	Audio Transforme.			5	1.00
112-130	No. 8 x 1/4" H.H. Slotted Self Tapping Screw Acorn Head	8	6	5	.01
126-131	Tube Shield Complete With Rings	8	6	5	.10
143-31	Insulated Coupling	8			.10
190-9	Vibrator	8	6	5	5.00

PARTS LIST (Cont'd.)

Instrument Panel Plate Kits 1936 and Previous

NUMBER	CAR AND YEARS
A88	Auburn 34-35-36
B88	Buick 36
CA87	Cadillac-LaSalle 35
CA88	Cadillac-LaSalle 36
C88	Chevrolet 35-36
CH87	Chrysler 6 - DeLuxe 8 34-35 All Hupmobile; DeSoto 34
CH88	Chrysler 36
CH88A	Chrysler Del. 8 - 36
CH88B	Chrysler Airflow and Imp. 36
DE88F	DeSoto Airstr. Cust. & Airfl. 36
DE87D	All DeSoto 35
DE88S	DeSoto DeLuxe 36
DO88	Dodge 36
DO87	Dodge 35
DO-86	Dodge-Plymouth DeLuxe 34
FS88 Gray	Ford Standard 36
FS88L Mah.	Ford Standard 36
F88L Wal.	Ford DeLuxe 36
F87	Ford Standard 35
F87D	Ford DeLuxe 35
F86	Ford DeLuxe 34
F88	Lincoln Zephyr 36 Ford DeLuxe 36
G87	Graham 35
H86	Hudson Terraplane 34
H87	Hudson-Terraplane 35
H88	Hudson 36
LA88	LaFayette 35-36
N88	Nash 400-Ambass. 35-36
OL87	Oldsmobile 35
OL88	Oldsmobile 36
PC188S	Packard 6 37
PC188	Packard 120 37
PC88	Packard 120B 36
PC87	Packard 120 35
PC88S	Packard 8 Sup. 8-12 35-36
PL87	Plymouth DeLuxe 35
PL87W	Plymouth DeLuxe 35
PL88S	Chrysler Airfl. and Imp. 34-35; Plym. Std. 35-36; All Studebaker 35
PL88	Gray Plymouth DeLuxe 36
PO88	Pontiac Standard 35-36 Pontiac DeLuxe 35
PO88D	Pontiac DeLuxe 36
PO88DL	Pontiac DeLuxe After June 36
RE88	Reo Flying Cloud 36
SD-188	Studebaker Dict. "37"
SD188C	Stu. Dict. Bus. C. "37"
SP188	Stude. Pres. "37"
SD88	Studebaker Dictator 36
SP88	Studebaker President 36
T88	Terraplane 36

Instrument Panel Plate Kits 1937 Models

NUMBER	MAKE OF CAR
	Steering post and under panel (Polished Chrome)
R-188	Steering post and under panel (Dull Black)
A-188	Auburn
B-188	Buick — 40-60 Series
B-188-A	Buick — 80-90 Series
CA-188	Cadillac and LaSalle
C-188	Chevrolet
CH-188R	Chrysler Royal
CH-188B	Chrysler Imperial
CH-188A	Chrysler Airflow
DE-188	DeSoto
DO-188	Dodge
FS-188	Ford Standard
F-188	Ford De Luxe
G-188	Graham
H-188	Hudson
L-188	Lincoln Zephyr
N-188	Nash Lafayette 400
NA-188	Nash Ambassador
OL-188	Oldsmobile
PC-188	Packard 120-C
PC-188S	Packard 6
PC-188D	Packard Super 8 and 12
PL-188S	Plymouth Standard
PL-188	Plymouth DeLuxe
PO-188	Pontiac
SD-188C	Studebaker Dictator Business Coupe
SD-188	Studebaker Dictator
SP-188	Studebaker President
T-188	Terraplane

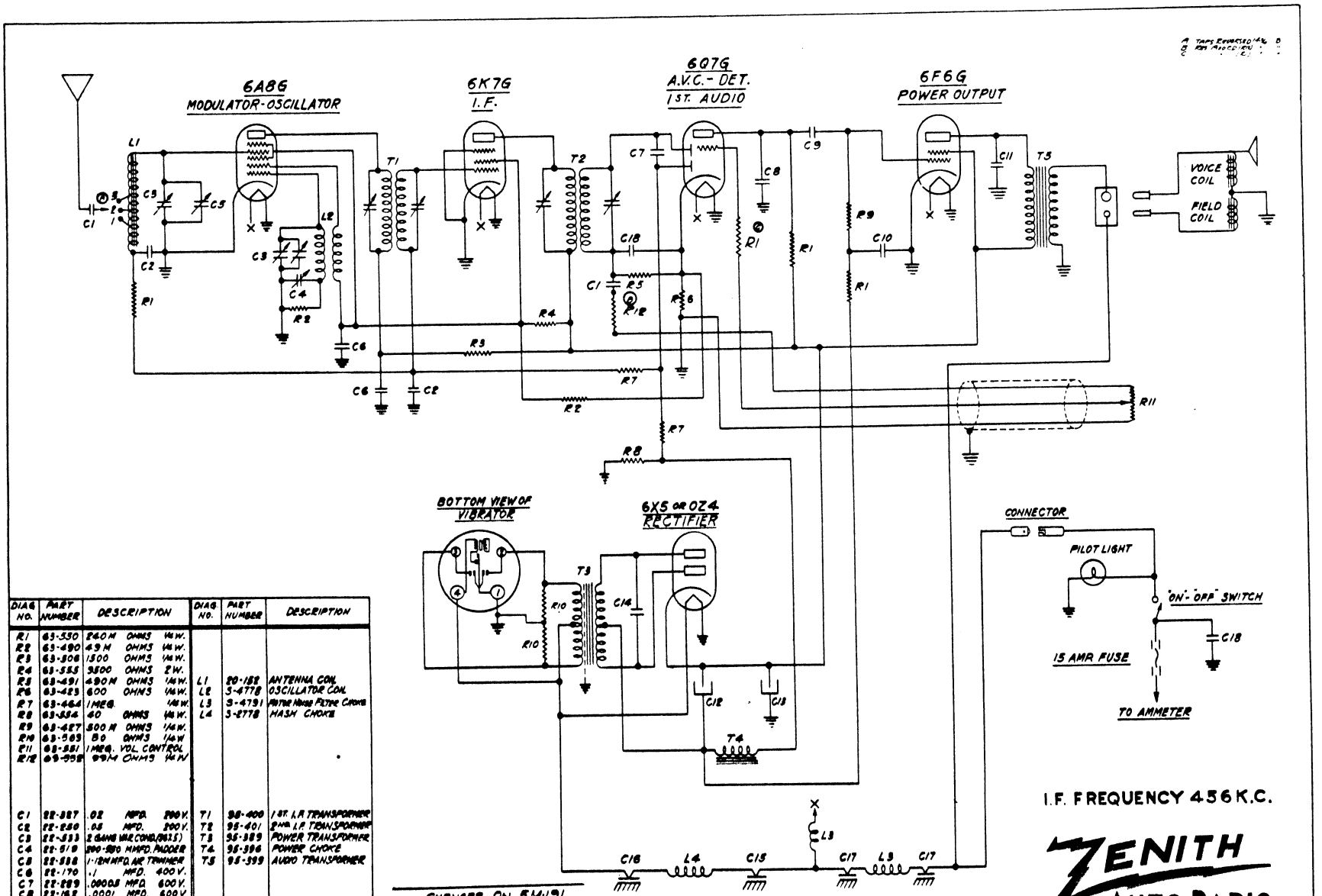
All panel and steering assemblies available @ .65 each net.

Housing Kits For Steering Column Installation — Description

TYPE	
R188	Standard Steering Column Housing for Models 5M191 and 6M192 only
Z188	Safety Steering Column Housing for Models 6M193, 6M194 and 8M195 only.

These Prices Supersede All Previous Quotations and Are Subject to Regular Discounts and Change Without Notice.

ZENITH RADIO CORPORATION
CHICAGO, ILL.
1-1-37



DIAG NO.	PART NUMBER	DESCRIPTION	DIAG NO.	PART NUMBER	DESCRIPTION
R1	63-330	240 M OHMS 1/4 W.			
R2	63-490	4.3 M OHMS 1/4 W.			
R3	63-308	1500 OHMS 1/4 W.			
R4	63-353	3800 OHMS 2 W.			
R5	63-491	490 M OHMS 1/4 W.	L1	20-182	ANTENNA COIL
R6	63-423	600 OHMS 1/4 W.	L2	3-4778	OSCILLATOR COIL
R7	63-464	1 MEG. 1/4 W.	L3	3-4791	NOISE FILTER CHOKE
R8	63-354	40 OHMS 1/4 W.	L4	3-2778	HASH CHOKE
R9	63-427	800 M OHMS 1/4 W.			
R10	63-369	80 OHMS 1/4 W.			
R11	63-351	1 MEG. VOL. CONTROL			
R12	63-398	99 M OHMS 1/4 W.			
C1	22-387	.02 MFD. 200 V.	T1	98-400	1ST. I.F. TRANSFORMER
C2	22-250	.05 MFD. 200 V.	T2	98-401	2ND. I.F. TRANSFORMER
C3	22-333	3 GANG VAR. COND. (365 S.)	T3	95-389	POWER TRANSFORMER
C4	22-319	200-320 MMFD. PADDER	T4	96-396	POWER CHOKE
C5	22-338	1-12 MMFD. AIR TRIMMER	T5	98-399	AUDIO TRANSFORMER
C6	22-170	.1 MFD. 400 V.			
C7	22-289	.00005 MFD. 600 V.			
C8	22-162	.0001 MFD. 600 V.			
C9	22-212	.05 MFD. 400 V.		49-170	DYNAMIC SPEAKER
C10	22-340	.25 MFD. 200 V.		190-9	VIBRATOR
C11	22-229	.005 MFD. 600 V.			
C12	22-328	4 MFD 350 V.			
C13		8 MFD. 350 V.			
C14	22-383	.008 MFD. 1400 V.			
C15	22-468	.5 MFD. 500 V.			
C16	22-339	.8 MFD. 200 V.			
C17		250 MMFD. LO-REACT.			
C18	22-182	.0005 MFD. 600 V.			

CHANGES ON 5M191

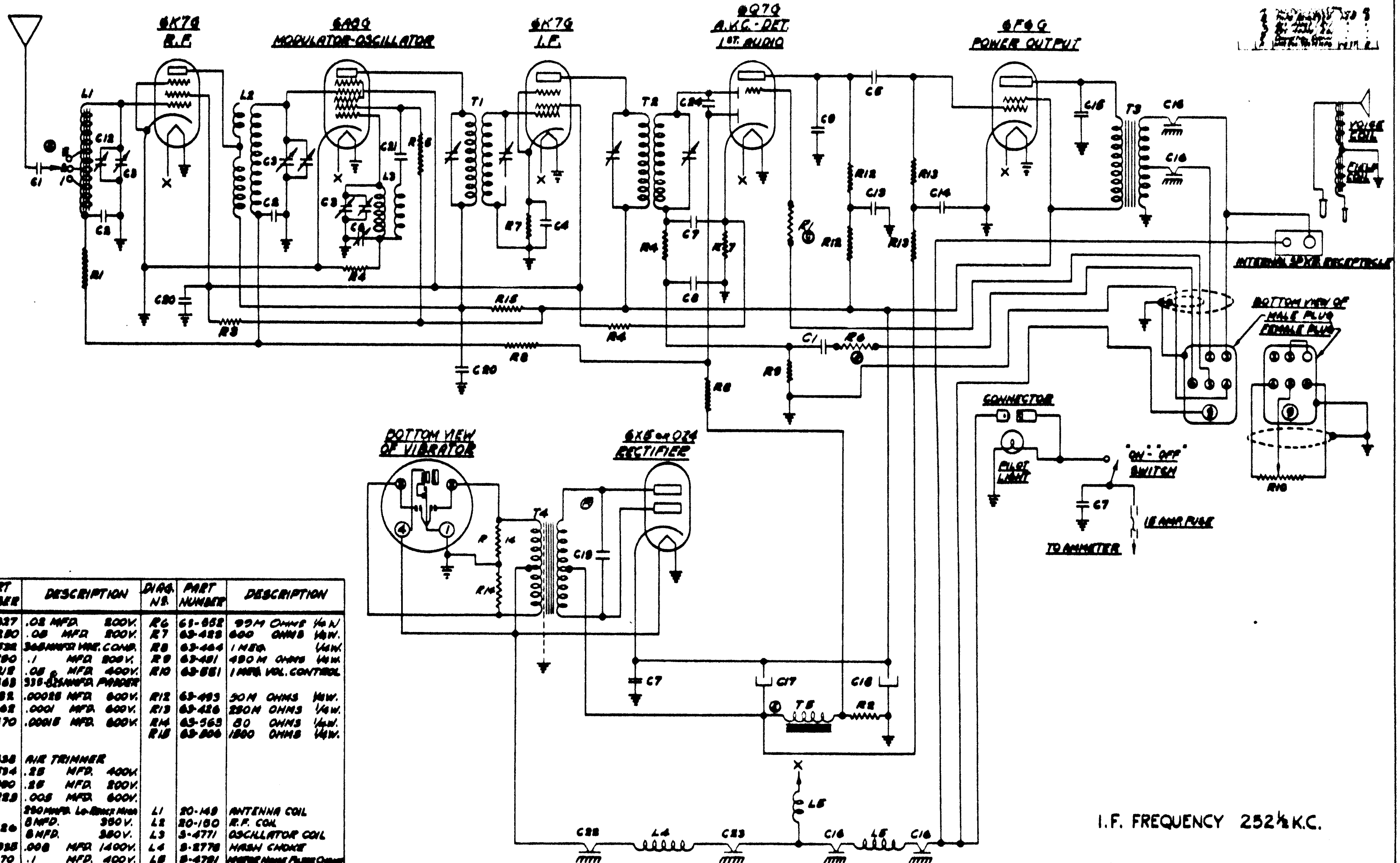
LETTER	DESCRIPTION	DATE
A	TAPS REVISED	1-4-37
B	RESISTOR ADDED (R12)	1-4-37
C	RESISTOR ADDED (R1)	1-4-37

I.F. FREQUENCY 456 K.C.

ZENITH AUTO RADIO

MODEL 5M191 CHASSIS 5520

ZENITH RADIO CORPORATION
CHICAGO, ILL.,



DIAG. NO.	PART NUMBER	DESCRIPTION	DIAG. NO.	PART NUMBER	DESCRIPTION
C1	22-327	.02 MFD. 200V.	R6	63-552	99M OHMS 1/4W.
C2	22-280	.05 MFD. 200V.	R7	63-423	600 OHMS 1/4W.
C3	22-532	365MMFD. VAR. COND.	R8	63-464	1 MEG. 1/4W.
C4	22-190	.1 MFD. 200V.	R9	63-481	490M OHMS 1/4W.
C5	22-218	.05 MFD. 400V.	R10	63-551	1 MEG. VOL. CONTROL
C6	22-463	335-825MMFD. PADDER			
C7	22-182	.00025 MFD. 600V.	R12	63-493	50M OHMS 1/4W.
C8	22-102	.0001 MFD. 600V.	R13	63-426	250M OHMS 1/4W.
C9	22-470	.00015 MFD. 600V.	R14	63-563	80 OHMS 1/4W.
			R15	63-306	1500 OHMS 1/4W.
C12	22-538	AIR TRIMMER			
C13	22-534	.25 MFD. 400V.			
C14	22-390	.25 MFD. 200V.			
C15	22-223	.005 MFD. 600V.			
C16		250MMFD. Lo-Break Mica	L1	20-149	ANTENNA COIL
C17	22-526	8MFD. 350V.	L2	20-150	R.F. COIL
C18		8MFD. 350V.	L3	S-4771	OSCILLATOR COIL
C19	22-335	.008 MFD. 1400V.	L4	S-2778	HASH CHOKE
C20	22-170	.1 MFD. 400V.	L5	S-4781	MOTOR NOISE FILTER CHOKE
C21	22-82	.001 MFD. 600V.			
C22	22-539	.5 MFD. 200V.			
C23	22-468	.5 MFD. 200V.			
C24	22-289	.00005 MFD. 600V.			
			T1	95-392	1ST. I.F. TRANSFORMER
			T2	95-393	2ND. I.F. TRANSFORMER
			T3	95-387	OUTPUT TRANSFORMER
			T4	95-380	POWER TRANSFORMER
R1	63-550	240M OHMS 1/4W.	T5	95-386	POWER CHOKE
R2	63-357	60 OHMS 1/4W.			
R3	63-494	13M OHMS 2W.		190-9	VIBRATOR
R4	63-490	49M OHMS 1/4W.		49-170	DYNAMIC SPEAKER
R5	63-512	19M OHMS 1W.			

CHANGES ON 6M-192

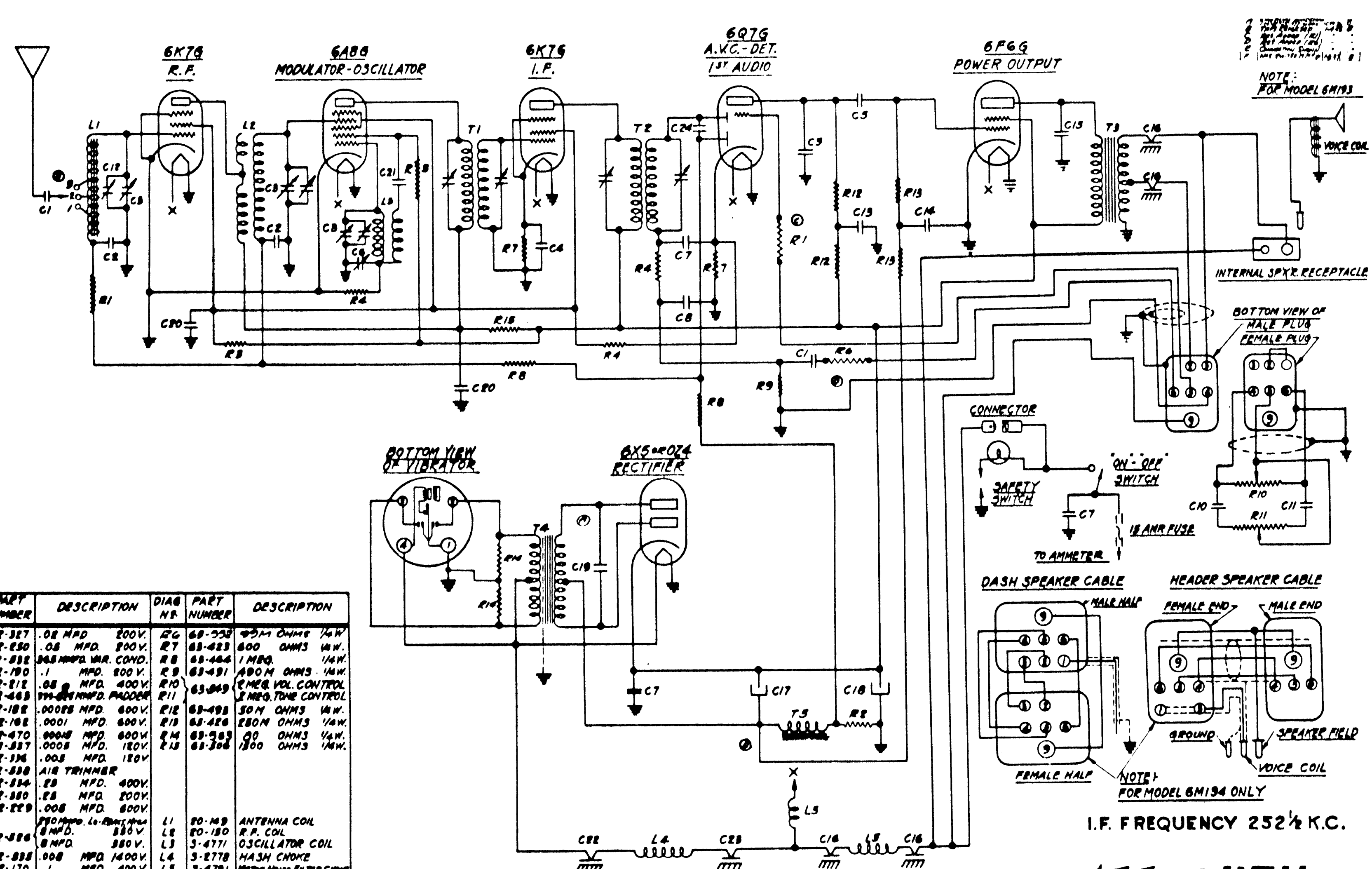
LETTER	DESCRIPTION	DATE
A	Was Dual .0002 600V (22-477)	12-29-36
B	Taps Revised	1-4-37
C	Resistor Added (R1)	1-4-37
D	Resistor Added (R6)	1-4-37
E	Connection Shown	1-4-37
F	Cond. 22-468 Was 200-750 MMFD.	1-8-37

I.F. FREQUENCY 252½ K.C.

ZENITH AUTO RADIO

MODEL-6M192 CHASSIS 5637

ZENITH RADIO CORPORATION
CHICAGO, ILL.



DIAG. NO.	PART NUMBER	DESCRIPTION	DIAG NO.	PART NUMBER	DESCRIPTION
C1	22-327	.02 MFD 200V.	R6	63-332	45M OHMS 1/4W
C2	22-250	.05 MFD. 200V.	R7	63-423	600 OHMS 1/4W.
C3	22-232	.365 MMFD. VAR. COND.	R8	63-464	1 MEG. 1/4W.
C4	22-190	.1 MFD. 200V.	R9	63-491	400M OHMS 1/4W.
C5	22-212	.05 MFD. 400V.	R10	63-349	2 MEG. VOL. CONTROL
C6	22-463	[illegible] MMFD. PADDER	R11		2 MEG. TONE CONTROL
C7	22-182	.00025 MFD. 600V.	R12	63-493	50M OHMS 1/4W.
C8	22-162	.0001 MFD. 600V.	R13	63-426	250M OHMS 1/4W.
C9	22-470	.00015 MFD. 600V.	R14	63-363	80 OHMS 1/4W.
C10	22-337	.0005 MFD. 120V.	R15	63-306	1500 OHMS 1/4W.
C11	22-336	.005 MFD. 120V.			
C12	22-338	AIR TRIMMER			
C13	22-234	.25 MFD. 400V.			
C14	22-250	.25 MFD. 200V.			
C15	22-229	.005 MFD. 600V.			
C16		250 MMFD. Lo-React. Mica	L1	20-149	ANTENNA COIL
C17	22-326	8 MFD. 350V.	L2	20-150	R.F. COIL
C18		8 MFD. 350V.	L3	3-4771	OSCILLATOR COIL
C19	22-235	.005 MFD. 1400V.	L4	3-2778	HASH CHOKE
C20	22-170	.1 MFD. 400V.	L5	3-4791	MOTOR NOISE FILTER CHOKE
C21	22-82	.001 MFD. 600V.			
C22	22-339	.5 MFD 200V.			
C23	22-468	.5 MFD 200V.			
C24	22-229	.00005 MFD. 600V.			
			T1	95-392	1ST I.F. TRANSFORMER
			T2	95-393	2ND I.F. TRANSFORMER
			T3	95-397	OUTPUT TRANSFORMER
			T4	95-390	POWER TRANSFORMER
R1	63-250	240M OHMS 1/4W.	T5	95-396	POWER CHOKE
R2	63-357	60 OHMS 1/4W.			
R3	63-494	15M OHMS 2W.		190-9	VIBRATOR
R4	63-490	49M OHMS 1/4W.		49-171	DYNAMIC SPKR. [illegible]
R5	63-318	15M OHMS 1W.			

CHANGES ON 6M-193-4

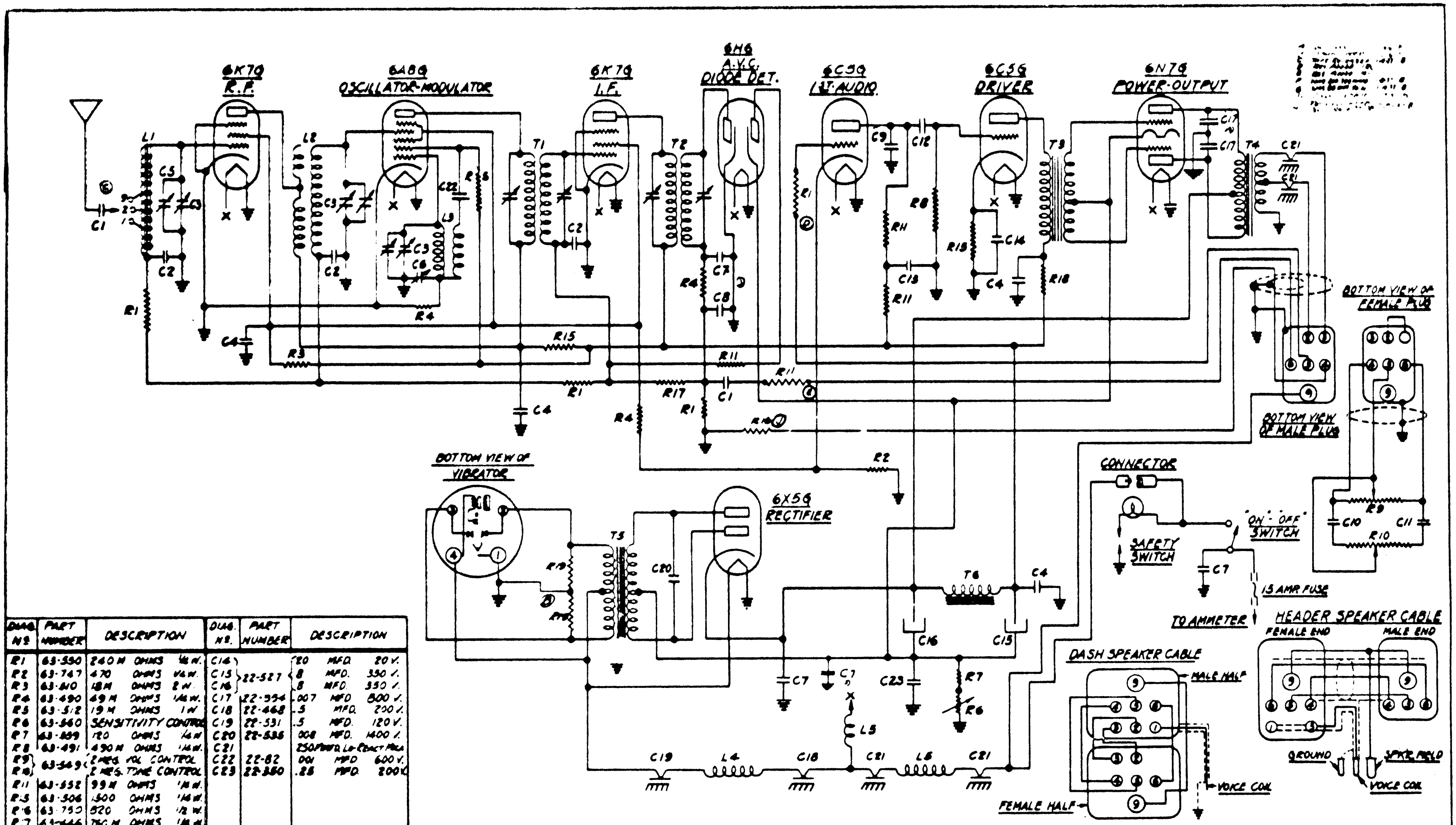
LETTER	DESCRIPTION	DATE
A	Was Dual .00025 MFD 600V (22-477)	12-29-36
B	Tubes Revised	1-4-37
C	Resistor Added (R1)	1-4-37
D	Resistor Added (R6)	1-4-37
E	Connection Shown	1-4-37
F	Cond. 22-464 Was 200-750 MMFD	1-8-37

I.F. FREQUENCY 252½ K.C.

ZENITH AUTO RADIO

MODELS 6M193-6M194 CHASSIS 5657

ZENITH RADIO CORPORATION
CHICAGO, ILL.



DIAG. NO.	PART NUMBER	DESCRIPTION	DIAG. NO.	PART NUMBER	DESCRIPTION
R1	63-550	240 M OHMS 1/4 W.	C14	22-527	20 MFD. 20 V.
R2	63-747	470 OHMS 1/4 W.	C15	22-527	8 MFD. 350 V.
R3	63-610	18 M OHMS 2 W.	C16	22-527	8 MFD. 350 V.
R4	63-490	49 M OHMS 1/4 W.	C17	22-554	.007 MFD 800 V.
R5	63-512	19 M OHMS 1 W	C18	22-468	.5 MFD. 200 V.
R6	63-560	SENSITIVITY CONTROL	C19	22-531	.5 MFD. 120 V.
R7	63-559	120 OHMS 1/4 W	C20	22-536	.008 MFD. 1400 V.
R8	63-491	490 M OHMS 1/4 W.	C21		250 MMFD. Lo-React Mica
R9	63-549	2 MEG. VOL. CONTROL	C22	22-82	.001 MFD 600 V.
R10	63-549	2 MEG. TONE CONTROL	C23	22-350	.25 MFD. 200 V.
R11	63-552	99 M OHMS 1/4 W.			
R15	63-506	1500 OHMS 1/4 W.			
R16	63-750	520 OHMS 1/2 W.			
R17	63-646	750 M OHMS 1/4 W.			
R18	63-56	4930 OHMS 1/4 W.			
R19	63-564	850 OHMS 1 W.	L1	20-149	ANTENNA COIL
			L2	20-150	R.F. COIL
			L3	S-4771	OSCILLATOR COIL
			L4	S-2778	HASH CHOKE
			L5	S-4791	Motor Noise Filter Choke
C1	22-327	.02 MFD. 200 V.			
C2	22-250	.05 MFD 200 V.			
C3	22-532	365 MMFD. Air Cond.			
C4	22-170	.1 MFD. 400 V.			
C5	22-538	1-12 MMFD. Air Trimmer	T1	95-394	1ST I.F. TRANSFORMER
C6	22-465	355-525 MMFD. Padder	T2	95-395	2ND I.F. TRANSFORMER
C7	22-182	.00025 MFD 600 V.	T3	95-388	Push Pull Input Trans
C8	22-162	.0001 MFD 600 V.	T4	95-388	Push Pull Output Trans
C9	22-470	.00015 MFD. 600 V.	T5	95-391	POWER TRANSFORMER
C10	22-537	.0005 MFD 120 V.	T6	95-398	POWER CHOKE
C11	22-336	.005 MFD. 120 V.			
C12	22-212	.05 MFD 400 V.			
C13	22-534	.25 MFD. 400 V.		190-9	VIBRATOR

CHANGES ON 8M-195

LTR.	DESCRIPTION	DATE
A	CONDENSER ADDED (C17)	12-29-36
B	RESISTOR ADDED (R19)	12-29-36
C	TAPS REVISED	1-4-37
D	RESISTOR ADDED (R1)	1-4-37
E	RESISTOR ADDED (R11)	1-4-37
F	COND. #22-465 WAS 800-750 MMFD	1-8-37
G	RESISTOR #63-564 WAS 800 OHM 1/2 W	1-19-37
H	CONDENSER ADDED (C7)	2-3-37
J	RESISTOR RELOCATED — CONNECTION MADE C7 TO C8	2-21-37

ZENITH AUTO RADIO

MODEL 8M195 CHASSIS 5805

ZENITH RADIO CORPORATION
CHICAGO, ILL.