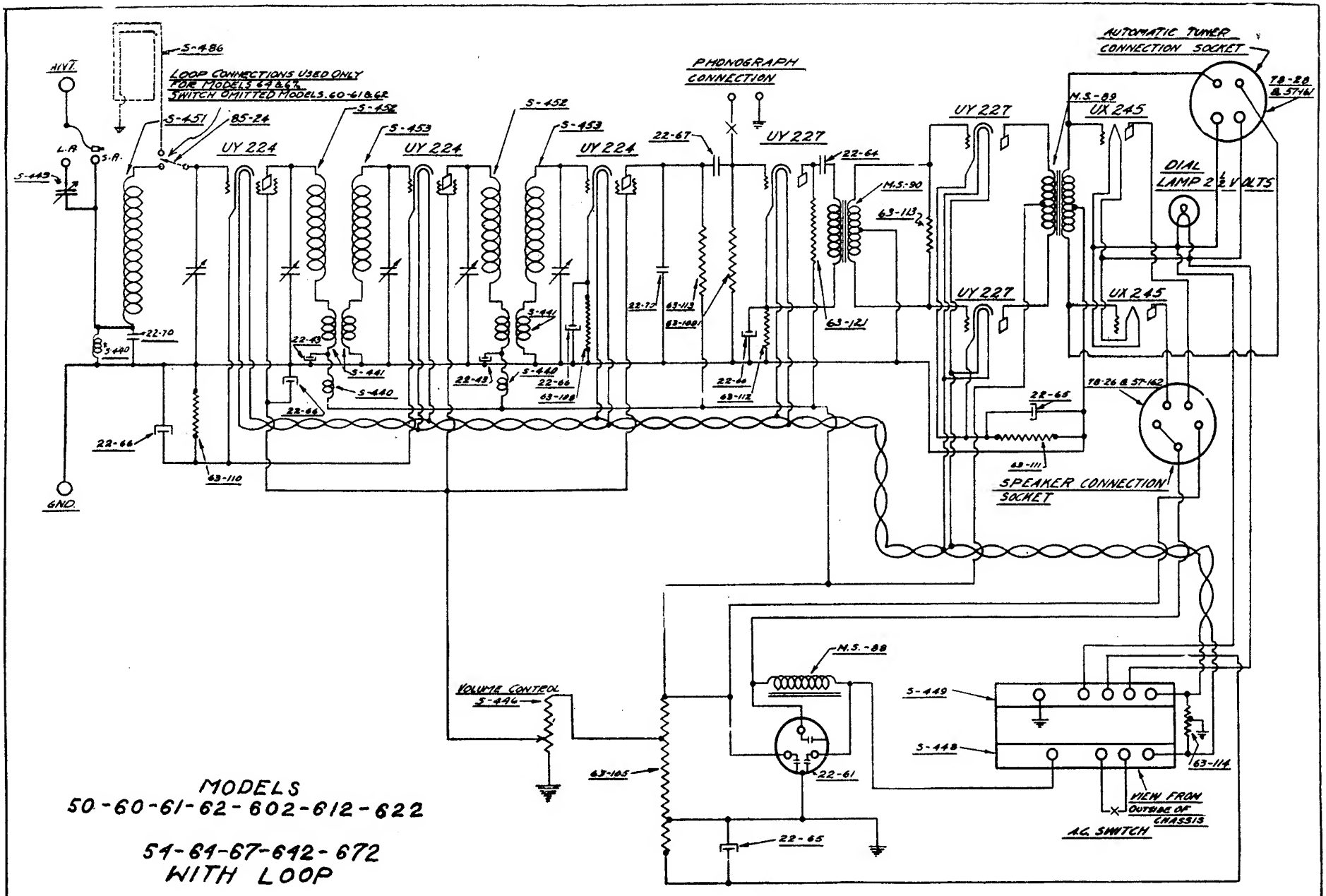


MODELS
50-60-61-62-602-612-622

54-64-67-642-672
WITH LOOP

SINGLE VOLUME CONTROL

ZENITH RADIO CORPORATION
CHICAGO, ILLINOIS.

TUBE	POSITION	Ef	Ek	Eg1	Eg2	Ep
224	1st R. F.	2.4	2	0	54	175
224	2nd R.F.	2.4	2	0	54	175
224	Det.	2.4	5	0	36	90
227	1st Aud.	2.4	2	0	-	55
227	2nd Aud.	2.4	13.5	0	-	143
227	2nd Aud.	2.4	13.5	0	-	143
245	PWR.	2.2	45	0	-	248
245	PWR	2.2	45	0	-	248

Line voltage 115 Fuse in 120 volt clips

Volume control in maximum position

Alignment

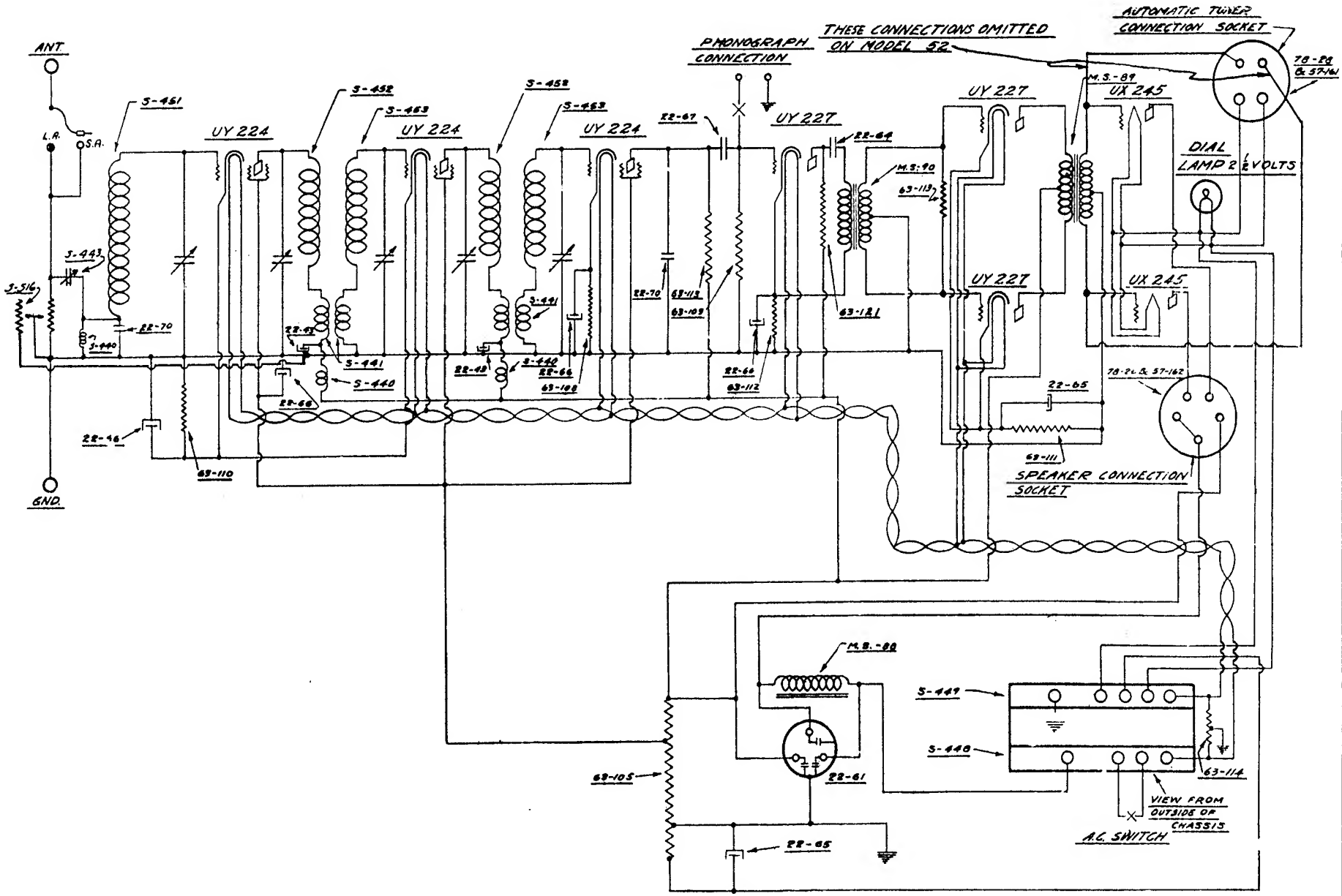
Through holes in the rear of the condenser shield four hexagonal nuts can be seen. By turning these nuts to the right or left, increases or decreases the capacity of the vernier condensers. The adjusting may be done with a socket wrench of the Spintite type, size No.5.

Balancing at the factory is done with an oscillator tuned to 203 meters. Since an oscillator is not at all times available, rebalancing may be accomplished with the carrier wave of a station, preferably a distant one between 200 and 250 meters. The set should be tuned to the station and without further turning the dial, the balancing nuts, starting with the one to the left, turned until the peak of the signal is reached. A tolerance of 5 meters is allowed between the dial setting and the given wave-length of the station. That is, it may be necessary to rebalance a set so that it is off scale 5 meters each way from the wave-length of the station, in order to bring the set to the best operating point. The difference in the dial reading may afterwards be corrected by adjusting the dial strip.

Adjusting Dial Strip

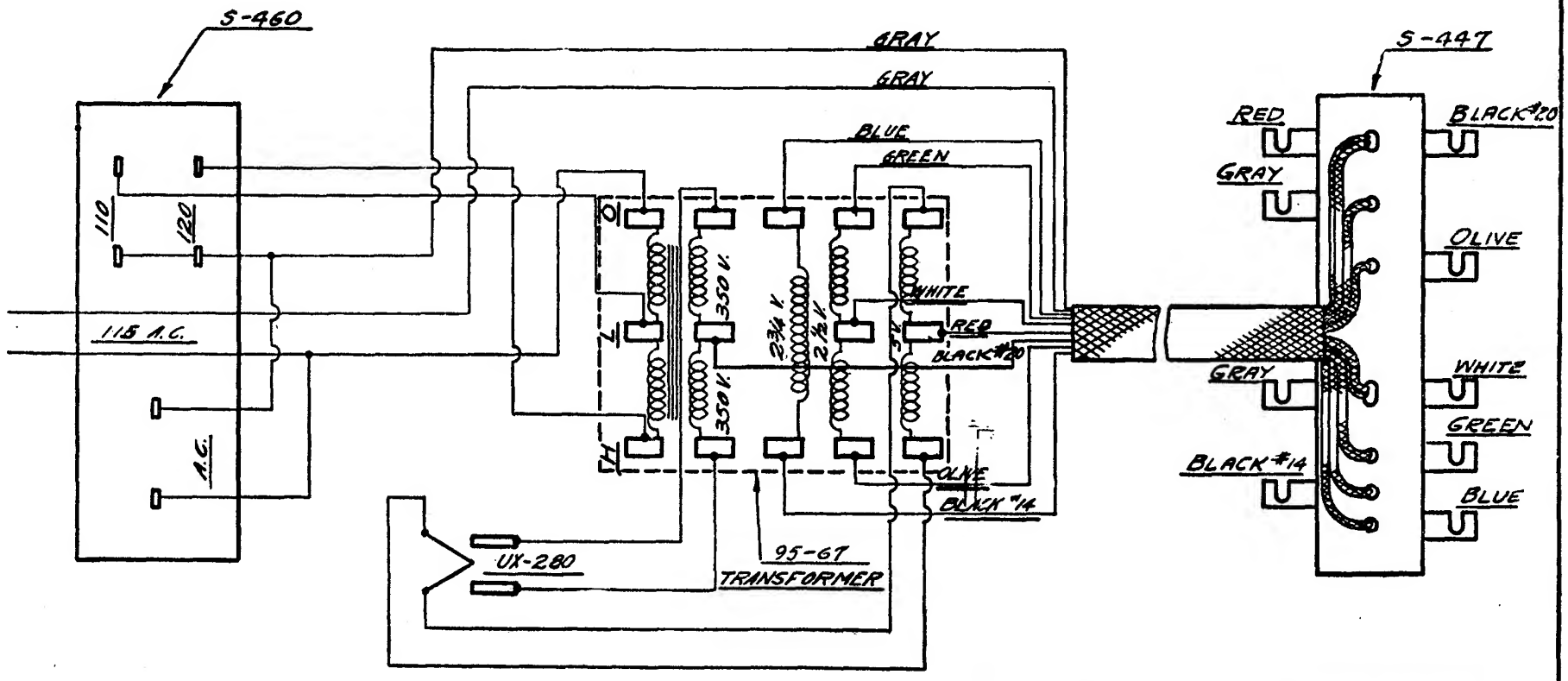
The dial strip is held in place by the knurled dial segment, which in turn is secured at each end to the drum with two flat head machine screws. There are also three small screws running through the dial strip into the dial segment on the inside of the drum.

The five screws (2 large and 3 small) should be loosened just enough to allow the dial strip to be slipped around the drum under the dial segment. After the dial strip is adjusted to the proper position the screws should be tightened.



DOUBLE VOLUME CONTROL
MODELS 60, 61, 62, 608, 612 AND 629

ZENITH RADIO CORPORATION.
CHICAGO, ILLINOIS.



ZENITH RADIO CORPORATION

3620 IRON ST., CHICAGO, ILL. A.W.M. 7-25-29

"FADING" OR "CUTTING-OUT"

"50" AND "60" SERIES

The most common cause of complaint in the "50" or "60" series is of Fading or Cutting-out. Outside of the usual possibility of a poorly soldered connection, it may be attributed to two major conditions, as follows:

The original audio tuning condenser, (Part #22-64, on diagram) had a tendency to open internally as a result of poor connection between the leads and the tinfoil. At the time this occurs, the volume will drop about sixty (60%) percent and the reproduction becomes distorted. In this case the condenser should be replaced with one of similar capacity, namely .03 mfd.

In many cases of "fading" or "cutting-out" of the "50" and "60" series, we have found the fault traceable to a certain condition of the volume control unit.

The graphite lubricating material seems to dry between the roller and roller arm, causing a high resistance or semi-contact surface which causes the circuit to open or close at this point. A simple remedy is to disassemble the volume control and clean all movable parts thoroughly in alcohol.

The resistance strip should also be wiped with a clean dry cloth, in order to remove grease and loose carbon particles. Be careful not to use alcohol on the resistance strip, since it may dissolve and remove the carbon. When reassembling, the pressure washer must be set tightly between the inner face and the roller arm.

Complaint of noisy volume control operation may be attributed to loose carbon particles between the rollers and resistance strip. This may also be corrected in the above manner.

Where the case is very obstinate and can not be corrected with the data given, the Service man should direct his attention to the by-pass condensers. An intermittently open or shorted unit will also cause "fading" or "cutting-out"; however, the possibility of trouble at this point is very small in comparison to the audio coupling condenser or volume control.

A. C. HUM IN 50 and 60 SERIES

Abnormal hum in any 50 or 60 model may be traced to either one of two definite sources. First, the screen grid detector tube. Due to the use of three audio stages a slight hum, originating in the detector, is greatly amplified by the time it reaches the speaker. To actually determine whether this is the cause, remove this tube from the set. If the hum level decreases, a new tube will remedy it immediately.

The second cause may be due to lack of proper filtering resulting from a defective electrolytic condenser. This unit is housed in the round metal container near the dial drum. The condenser is removed by simply loosening, with two or three full turns, the screws at the base and sides of the container. Three leads will be found at the top of the condenser which should be carefully unsoldered. The terminal which bears a paint or crayon mark is the 18 mfd. section. (Be careful to note color of the wire which attaches to it in order that it can be soldered to the corresponding lug of the replacement unit.) The condenser can then be easily removed by prying from the bottom and sides and lifting from the top. Be sure to place the new condenser in the same relative position in order that the leads (cut to a specific length) can be soldered back in place properly. A new, improved condenser of the dry type, Zenith part number 22-61D, is available at $4.00 list. Its use will afford a permanent hum cure.

If a slight residual hum is present after following instructions given above, connect a 250,000 ohm, 1 watt carbon resistor from grid to grid of the '27 first push-pull audio stage. This will make the set practically humless.

PARTS AND PRICES
MODELS 52, 53, 54, 57
60, 61, 62, 64,67

Condensers

22-43	.25 Mfd. (R. F. Plate By-Pass)	$ .75
22-61D	9 x 9-18 Mfd. (Filter)	4.00
22-64	.03 " (Audio Tuning Condenser)	.55
22-65	1. x 1. " (1st Audio Cathode By-Pass)	2.00
22-66	1. x 1.x 1.x 1. Mfd.(R.F.Cathode,R.F.Screen, Detector Cathode, and 2nd Audio Cathode)	1.75
22-67	.15 Mfd. (Audio Coupling)	.75
22-69	.1 x .1 Mfd. By-Pass Condenser	1.60
22-70	.001 Mfd. (Detector Plate)	.25

Resistors

63-105	6 M Ohm (Voltage Divider)	1.00
63-108	50 M Ohm (Detector Cathode)	.25
63-109	100 M Ohm (1st Audio Grid)	.25
63-110	400 " (R. F. Cathode)	.25
63-111	2 M " (2nd Audio Cathode)	.25
63-112	4 M " (1st Audio Cathode)	.25
63-113	250 M " (Det. Plate, 2nd Audio Grid)	.25
63-114	10 Ohm (C.T.)(Filament Circuit)	.25
63-121	100 M Ohm (1st Audio Plate)	.25
63-226	Dual Volume Control and Switch Assembly (D.V. Chassis)	2.50
63-227	Single " " " " "	1.25

Coils

S-440	R. F. Choke	.60
S-441	R. F. Coupling (6-turn)	.60
S-441	R. F. Coupling (9-turn) D.V. Chassis	.60
S-451	Antenna Coil	1.00
S-452	1st and 2nd R. F. Plate coil	1.00
S-453	2nd R. F. Grid and Detector Grid Coil	1.00

Miscellaneous

26-13	Calibrated Dial Strip	.35
46-36	Control Knobs	.30
95-70	25 Cycle 110 V. Power Transformer	12.00
95-120	60 Cycle 110 V. " "	7.00
100-18	2½ V. Pilot Lamp	.12
136-2	2 Ampere Fuse	.06
145-1	Vernier Gear Arm	.15
146-1	Bakelite Dial Segment	.60
MS-88	Filter Choke	3.00
MS-89	Second Stage Audio Transformer (6-lead)	4.50
MS-90	First " " " (5-lead)	5.25
S-517	Vernier Shaft and Gear Assembly	1.00
49-27	Dynamic Speaker Complete	12.30
	Replacement Cones - Slate Color for Magnavox	3.25
	Silver " " Oxford	3.25
	Purple " " Symington	3.25
	Transformer coils only for Symington	1.25

Miscellaneous Cont'd

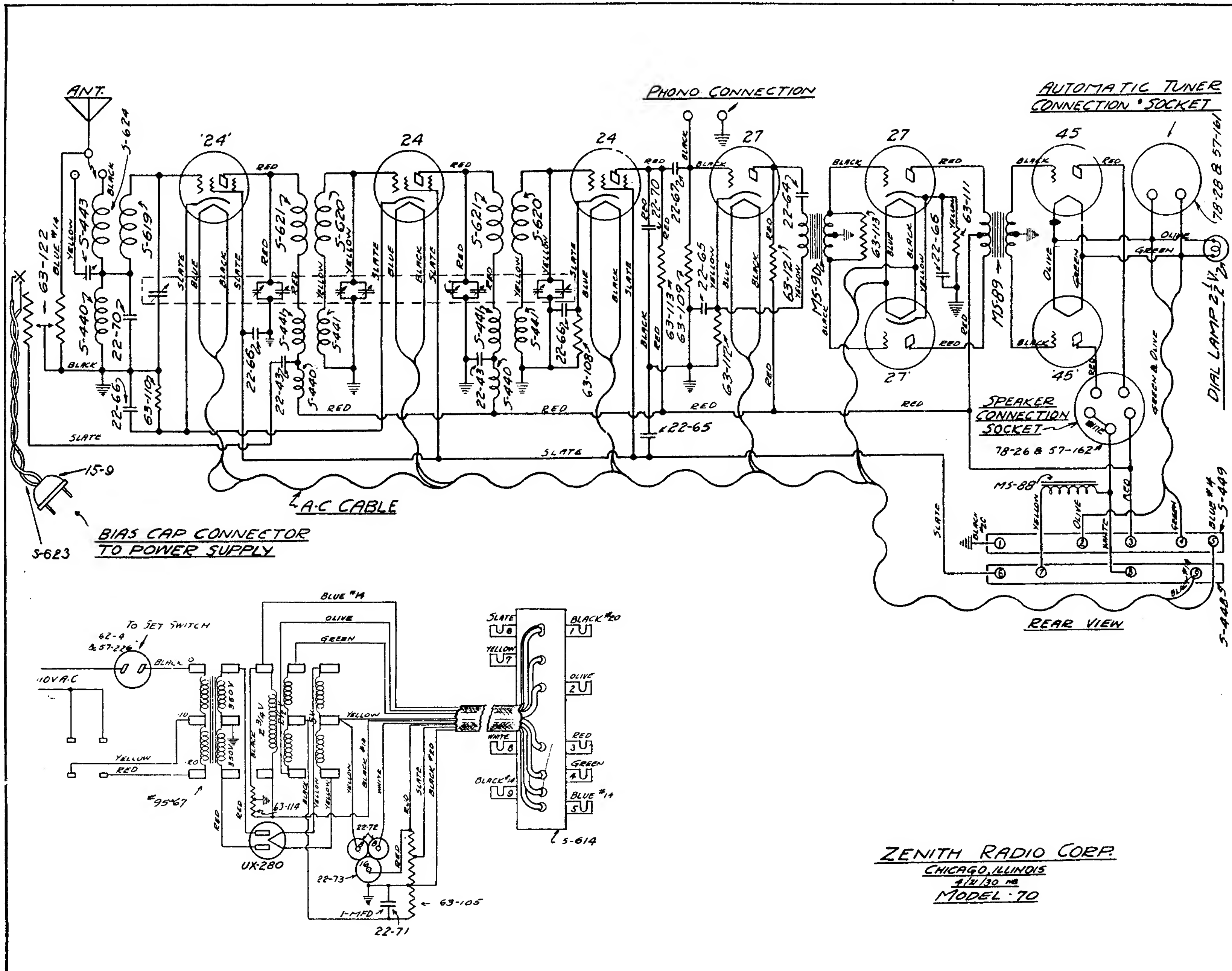
Complete output transformer for Oxford	$2.00
" " " " Magnavox	$2.00
Field Coils for Magnavox, Symington and Oxford.....	$5.00

Note: Farrand Speakers (Tan Color) also used in these models. Parts no longer available.

Parts not listed are no longer available.

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

ZENITH RADIO CORPORATION
May 13, 1935



ANT.
PHONO CONNECTION
AUTOMATIC TUNER CONNECTION SOCKET
DIAL LAMP 2½ V.
SPEAKER CONNECTION SOCKET
78-26 & 57-162
78-28 & 57-161
A-C CABLE
BIAS CAP CONNECTOR TO POWER SUPPLY
REAR VIEW
To SET SWITCH
110V A-C
UX-280
ZENITH RADIO CORP.
CHICAGO, ILLINOIS
MODEL 70

SOCKET VOLTAGES — MODEL 70

TYPE	POSITION	Ef	Ek	Eg1	Eg2	Ep
24	1st. R.F.	2.5	2.	0	60	180
24	2nd. R.F.	2.5	2.5	0	60	180
24	Det.	2.5	2.5	0	60	90
27	1st. A.F.	2.5	5.	0	-	65
27	2nd. A.F.	2.5	13	0	-	160
27	2nd. A.F.	2.5	13	0	-	160
45	PWR.	2.4	55	0	-	260
45	PWR	2.4	55	0	-	260

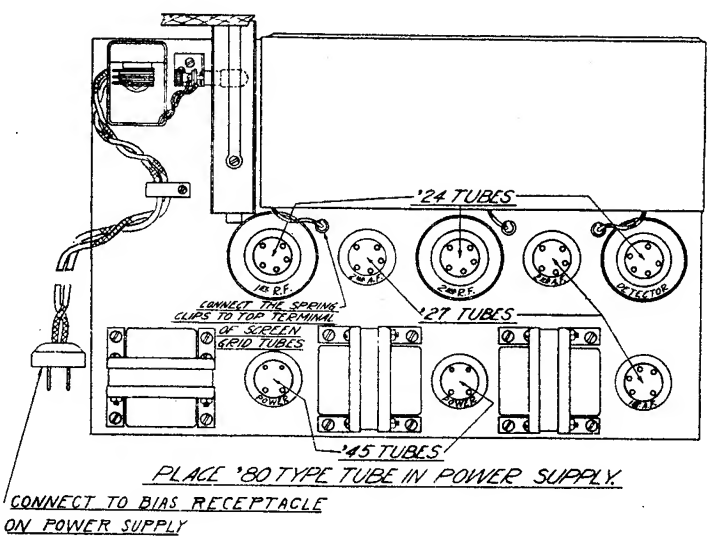
Line Voltage 110 V. Aerial and Ground disconnected.

F - Filament K - Cathode G1 - Control Grid

G2 - Screen Grid P - Plate

All voltages taken from points indicated to ground, using 1000 ohms per volt D.C. meter (except filaments), volume control full on.

To realign chassis turn dial to maximum reading. The pointer on escutcheon should read exactly 500. Now tune in a weak station, about 1400, on dial. Adjust the four trimmers on rear of gang(these may be reached through holes in rear of condenser shield) to maximum volume. The dial may be shifted to correct reading by the adjustment of all four of these trimmers in the same direction.



PARTS AND PRICES
MODELS 71, 72, 73 & 77
712, 722, 732, 772

Condensers

22-43	.25 Mfd. (R.F. Plate By-pass)	$ .75
22-64	.03 " (Audio Tuning Condenser)	.55
22-65	Dual 1. Mfd. (1st Audio Cathode B-Pass)	2.00
22-66	Quad.1 " (R.F.Cathode, R. F.Screen Grid,Detector Cathode, 2nd Audio Cathode)	1.75
22-67	.15 Mfd. (Audio Coupling)	.75
22-70	.001 " (Detector Plate)	.25
22-71	1. " (Output Filament By-Pass)	1.10
22-72	8. " (Electrolytic Filter)	1.25
22-73	16. " (" ")	2.50
S-442	Variable Gang ....No Longer Available	-
S-443	Antenna Compensator	.50

Resistors

63-105	6000 Ohm Porcelain Voltage Divider	1.00
63-108	50 M Ohm 1 Watt (Detector Cathode)	.25
63-109	100 M " 1 " (1st Audio Grid)	.25
63-110	400 Ohm 1 " (R.F.Cathodes)	.25
63-111	2000 " 1 " (2nd Audio Cathode)	.25
63-112	4000 " 1 " (1st Audio Cathode)	.25
63-113	250 M " 1 " (Detector Plate, 2nd Audio Grid)	.25
63-114	10 " (Center Tap - Filament Circuit)	.25
63-121	100 M " 1 " (1st Audio Plate)	.25
63-226	Volume Control and Switch(Replaces S-617)	2.50

Coils

S-619	Antanna or 1st R.F.Grid Coil	.75
S-620	2nd R.F. and Detector Grid Coil	.75
S-621	1st and 2nd R.F. Plate Coil	.75
S-624	Antenna or 1st R.F. Primary	.50
S-440	R.F. Choke	.50
S-441	R.F. Coupling Coil (Specify whether 6 or 9 turns)	.50

Miscellaneous

26-13	Calibrated Dial Strip	.35
46-36	Control Knob	.30
95-70	25 Cycle 110 Volt Power Transformer	12.00
95-120	60 Cycle 110 " " "	7.00
100-18	2½ Volt Dial Lamp	.12
136-2	2 Ampere Fuse	.06
145-1	Vernier Gear Arm	.15
146-1	Bakelite Dial Segment	.60
S-517	Vernier Shaft and Gear Assembly	1.00
MS-88	Filter Choke	3.00
MS-89	Second Stage Audio Transformer (6-lead)	4.50
MS-90	First " " " (5-Lead)	5.25
49-27	Replacement Speaker Complete	12.30

MODELS 71, 72, 73, 77
712, 722, 732, 772

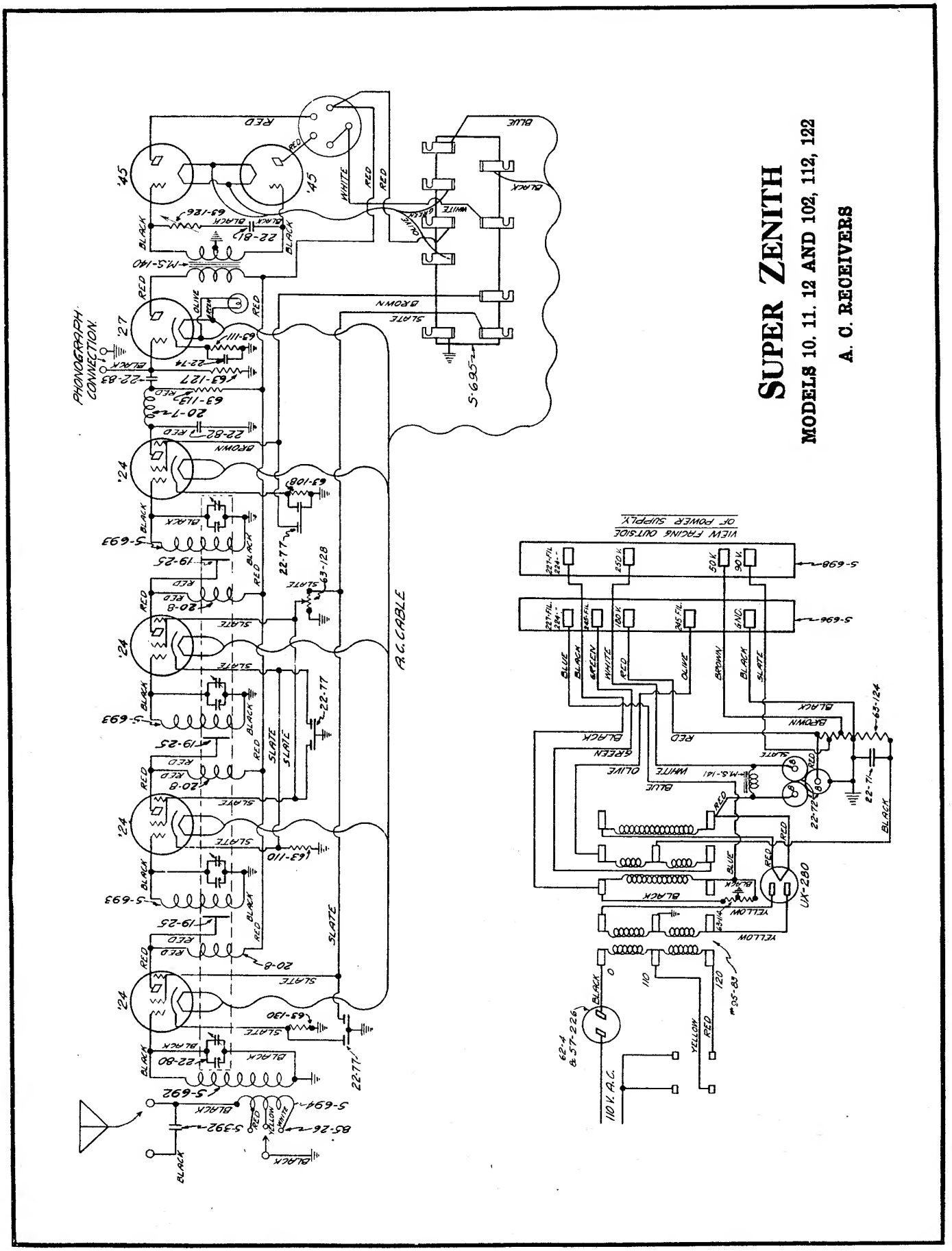
Miscellaneous Cont'd

49-27	Replacement Cones - Slate Color for Magnavox	$3.25
	" " Silver " " Oxford	3.25
	" " Purple " " Symington	3.25
	Transformer Coils only (LL-18) " Symington Speaker	1.25
	Complete Output Transformer for Oxford Speaker.....	2.00
	" " " " Magnavox Speaker.....	2.00
	Field Coils for Magnavox, Oxford and Symington Speakers.....	5.00

NOTE: Parts not listed are no longer available.

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

ZENITH RADIO CORPORATION
May 13, 1935

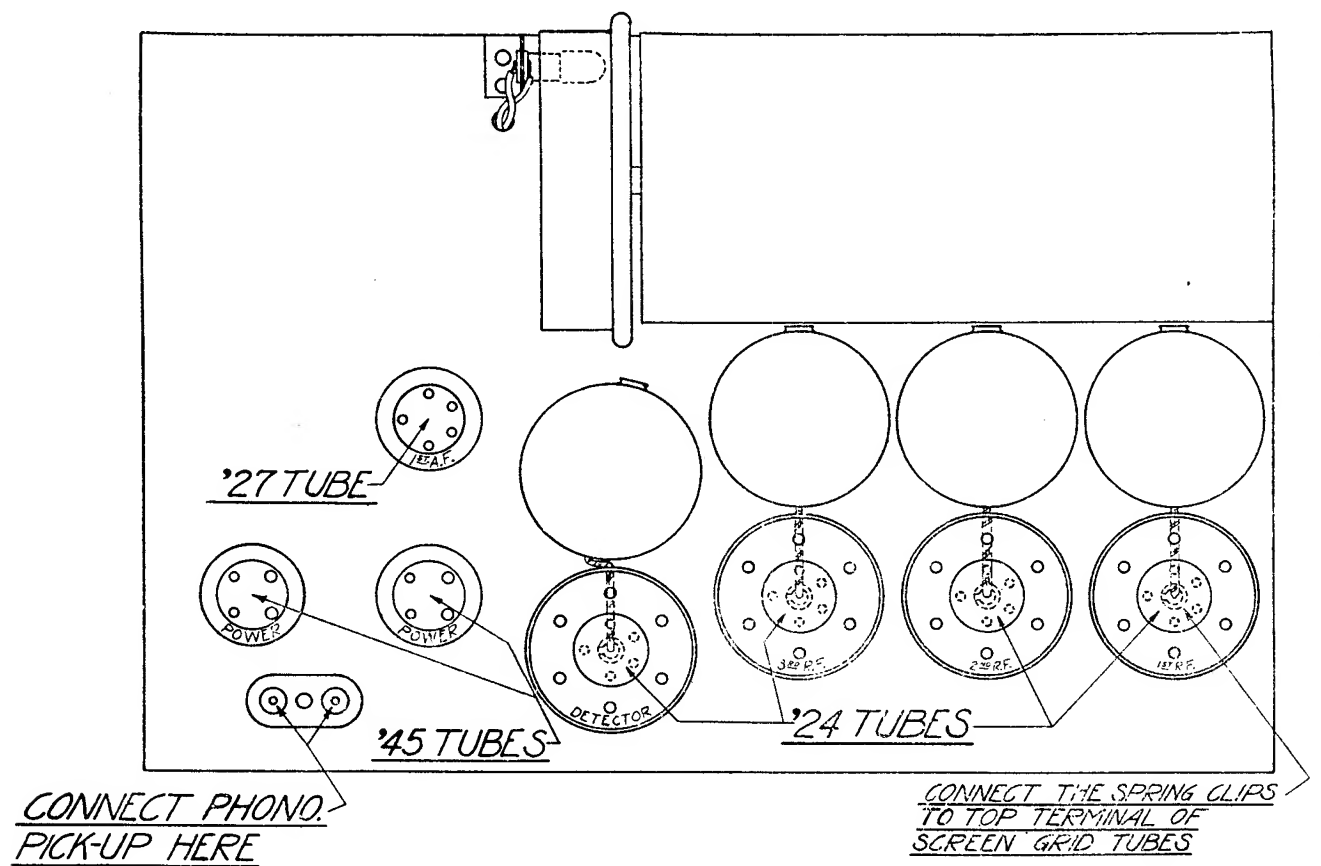

SUPER ZENITH
MODELS 10, 11, 12 AND 102, 112, 122
A. C. RECEIVERS
PHONOGRAPH CONNECTION
A.C. CABLE
'45
'27
'24
S-692
S-693
S-694
S-695
S-696
S-698
M.S.-140
M.S.-141
UX-280
110 V. A.C.
VIEW FACING OUT-SIDE OF POWER SUPPLY

VOLTAGE READINGS AT SOCKETS USING WESTON 547 ANALYZER

Line Voltage 115. Fuse in 120 Volt Clips.

TYPE	POS. ITION	FIL. VOLTS	PLATE VOLTS	GRID VOLTS	SCREEN VOLTS	NORMAL PLATE M.A.	GRID TEST M. A.
224	1st R.F.	2.3	185	3.25	90	4	7
224	2nd R.F.	2.3	185	3.4	90	4	7.5
224	3rd R.F.	2.3	185	3.3	90	4	7.5
224	Det.	2.3	90	3	30	.25	.75
227	1st A.F.	2.3	170	12	—	6	7
245	P.P.	2.3	245	50	—	28	37
245	P.P.	2.3	245	50	—	28	37

Balance condenser gang at 1500 K.C. Use #6 Spintite wrench and small screw driver.



PARTS AND PRICES
FOR SUPER ZENITH RECEIVER MODELS 10, 11, 12 AND 102, 112, 122

20-7	Detector Choke	$ .50
20-8	R.F. Choke	.50
22-74	Single .1 mfd Condenser	.60
22-77	Dual .1 " "	.85
22-80	Variable Condenser	8.00
22-81	.01 mfd Condenser	.75
22-82	.001 " "	.25
22-83	.03 " "	.60
26-17	Celluloid Dial Strip	.40
46-42	Control Knobs	.25
52-23	Multicord	.90
57-255	Escutcheon Plate for Tone Control	.20
57-261	Escutcheon Plate for Dial	.35
57-262	Escutcheon Plate for On & Off Switch	.20
57-264	Escutcheon Plate for Volume Control	.20
57-265	Escutcheon Plate for Distance Control	.20
63-108	50M Ohm Resistor (Green)	.25
63-110	400 " " (Yellow)	.25
63-111	2M " " (Black)	.25
63-113	250M " " (White)	.25
63-126	600M " Tone Control	.75
63-127	1 megohm Resistor (Brown)	.25
63-128	50M Ohm Volume Control	1.00
63-130	800 " Resistor (Black, Yellow Spot)	.25
73-2	Set Screw for Control Knobs	.01
78-31	Five Prong Socket	.15
78-32	Four Prong Socket	.15
57-242	Socket Guide Plate for 78-31 & 78-32)	.03
85-26	Three Point Antenna Switch	.50
85-27	A.C. On & Off Switch	.75
126-61	Tube Shield Can	.20
S-392	Antenna Series Condenser	.10
S-692	1st R.F. or Antenna Coil(Secondary)	1.00
S-694	" " " " " (Primary)	.50
S-695	Multicord Plate & Terminal Assembly	1.50
S-710	2nd and 3rd R.F. and Detector Coils	1.00
S-715	Multicord Terminal Plate Only	1.25
S-704	Dial Drum Assembly	2.00
MS-140	Push Pull Input Transformer	3.50

Power Pack Z E -70 Jr.

22-71	1. mfd Condenser	1.00
22-72	8. " " (Electrolytic)	1.25
63-114	10 Ohm C.T. Resistor	.25
63-124	10,450 Ohm Voltage Divider	1.25
78-32	Four Prong Socket	.15
57-242	" " " Location Plate	.03
95-83	117 V. 60 Cycle Power Transformer	8.00
95-84	117 V. 25 " " "	15.00

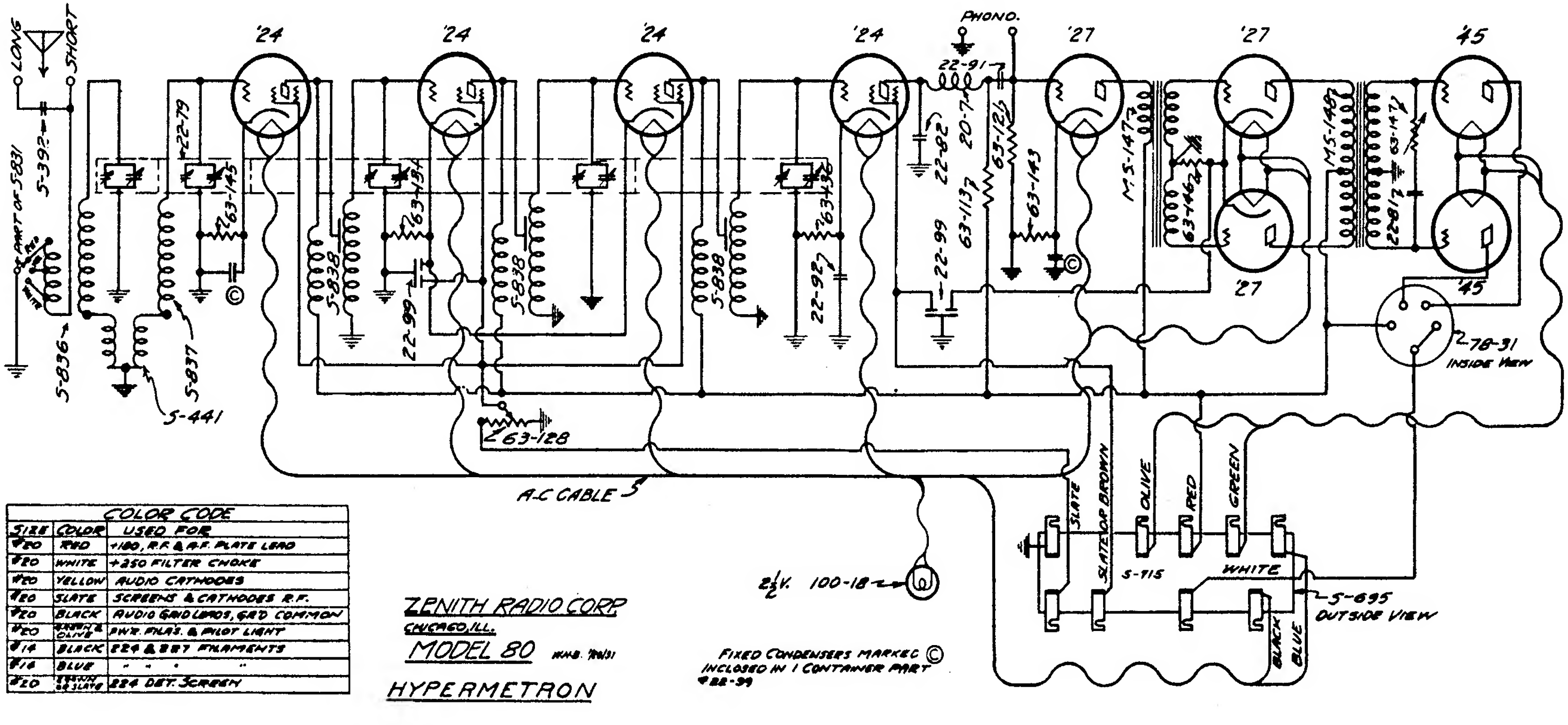
Power Pack ZE-70 Jr. Cont'd.

136-2	2 Amp. Fuse.....	$ .06
MS-84	Power Receptacle & Fuse Plate.....	.50
MS-141	Filter Choke	3.00
S-696	Top Terminal Strips.....(Five).....	.50
S-698	Bottom Terminal Strips...(Four).....	.50

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

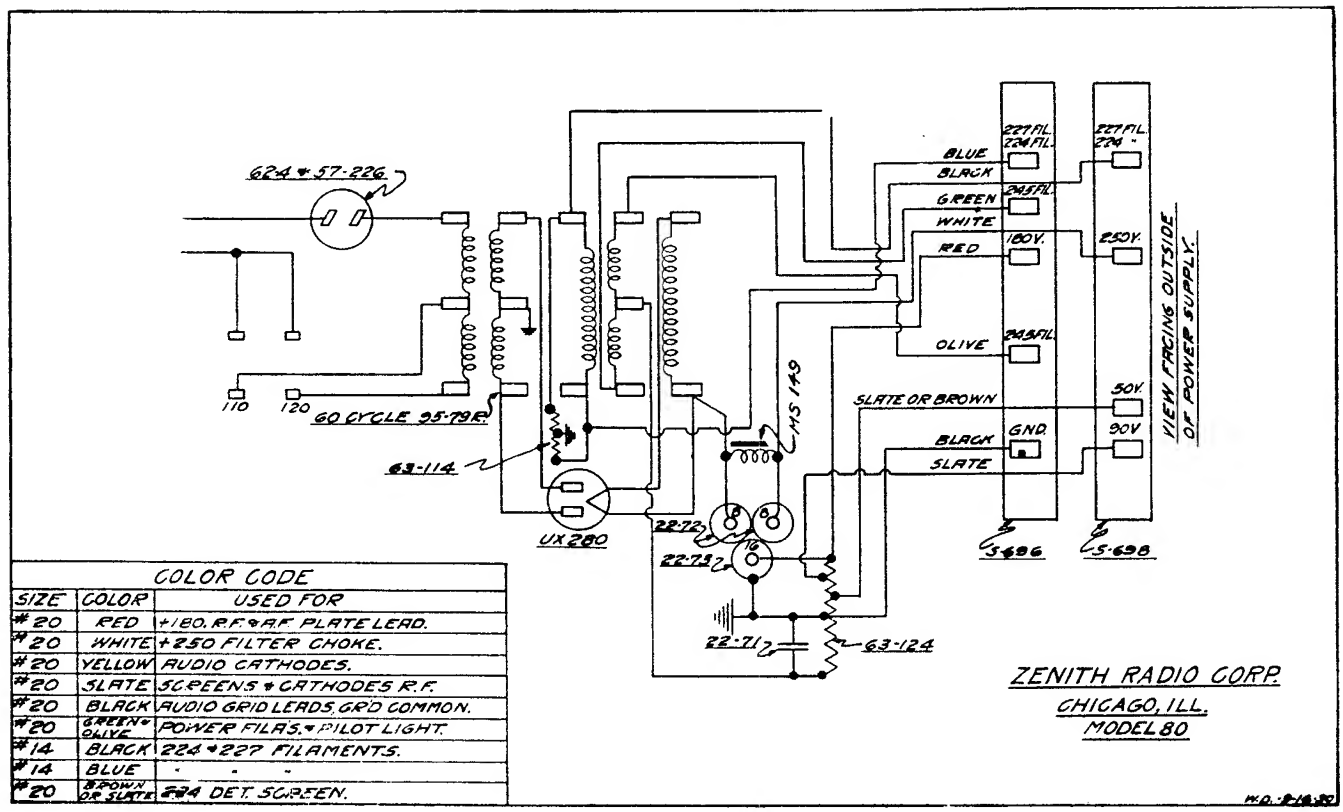
ZENITH RADIO CORPORATION

December 18, 1933.



COLOR CODE		
SIZE	COLOR	USED FOR
#20	RED	+180, R.F. & A.F. PLATE LEAD
#20	WHITE	+250 FILTER CHOKE
#20	YELLOW	AUDIO CATHODES
#20	SLATE	SCREENS & CATHODES R.F.
#20	BLACK	AUDIO GRID LEADS, GRD COMMON
#20	BROWN & OLIVE	PWR. FILS. & PILOT LIGHT
#14	BLACK	224 & 227 FILAMENTS
#14	BLUE	" " " "
#20	BROWN OR SLATE	224 DET. SCREEN

ZENITH RADIO CORP.
CHICAGO, ILL.
MODEL 80 W.H.B. 7/20/31
HYPERMETRON



COLOR CODE		
SIZE	COLOR	USED FOR
#20	RED	+180. R.F. & A.F. PLATE LEAD.
#20	WHITE	+250 FILTER CHOKE.
#20	YELLOW	AUDIO CATHODES.
#20	SLATE	SCREENS & CATHODES R.F.
#20	BLACK	AUDIO GRID LEADS. GRD COMMON.
#20	GREEN & OLIVE	POWER FILAS. & PILOT LIGHT.
#14	BLACK	224 & 227 FILAMENTS.
#14	BLUE	- - -
#20	BROWN OR SLATE	224 DET. SCREEN.

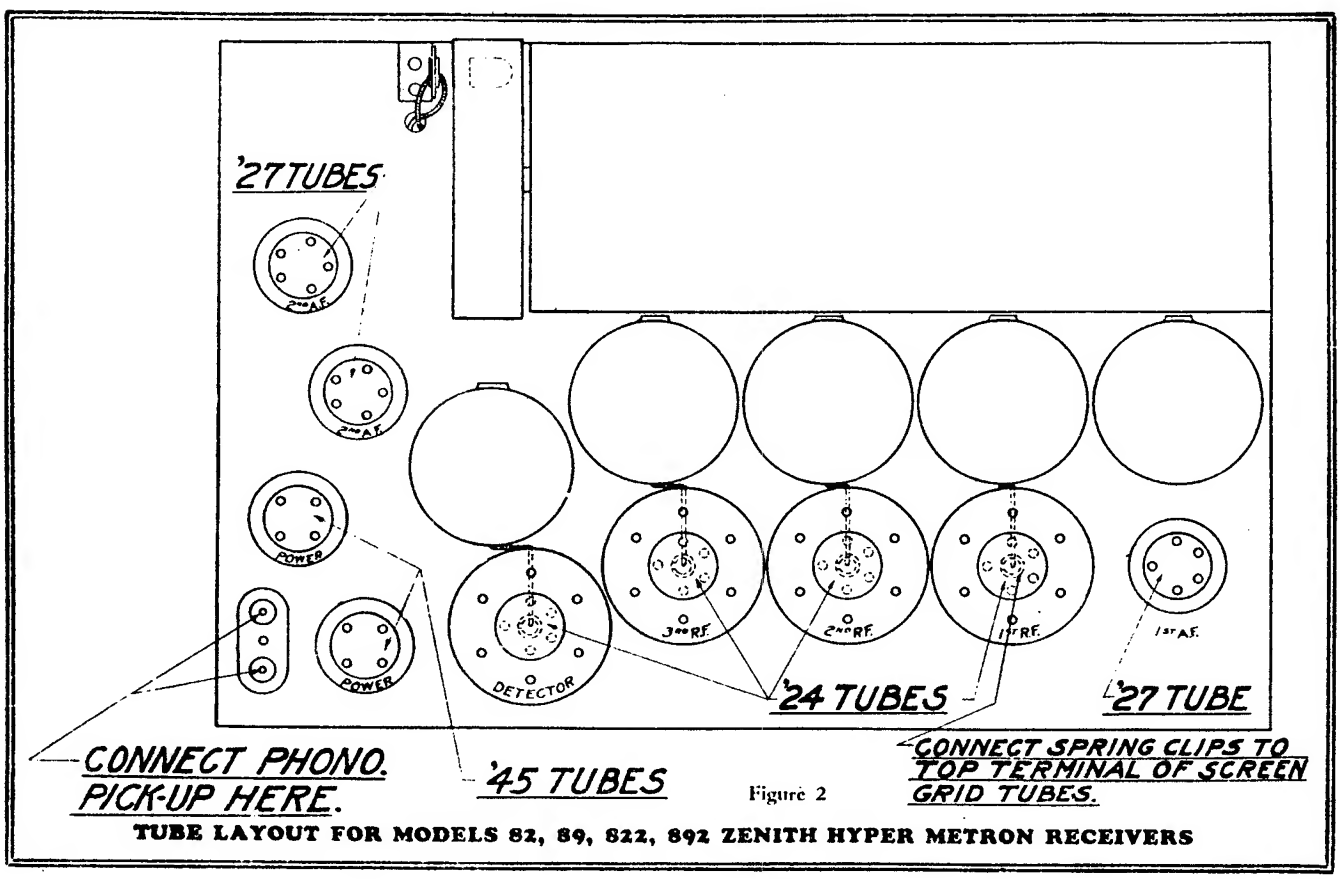


Figure 2

TUBE LAYOUT FOR MODELS 82, 89, 822, 892 ZENITH HYPER METRON RECEIVERS

PARTS AND PRICES

HYPERMETRON

Variable Condenser Assembly

22-79	Five Gang Variable Condenser	$16.00
S-829	Dial Drum Assembly	1.50
26-21	Calibrated Dial Strip	.20
S-703	Dial Lamp Bracket	.45
100-18	2½ Volt Dial Lamp	.12
11-2	Dial Control Cable ... per ft	.10
80-70	Dial Control Cable Tension Spring	.01

Fixed Condensers

22-81	Single .01 Mfd. Condenser (Tone Control Condenser)	.75
22-82	Single .001 " " (Detector Plate)	.25
22-91	Single .03 " " (Audio Coupling)	.45
22-92	Single .5 " " (Det. Cathode Bypass)	.60
22-99	Dual .1 " " (2nd RF & Det.Bypass)	.65
S-392	Antenna Series Condenser	.10

Resistors

63-113	250M Ohm Resistor...(Red, Green End, Yellow Dot)	.25
63-121	100M " " ...(Pink)	.25
63-131	400 " " ...(Yellow, Black End, Brown Dot)	.25
63-136	50M " " ...(Green, Black End, Orange Dot)	.25
63-143	4M " " ...(Yellow, Black End, Red Dot)	.25
63-145	800 " " ...(Gray, Black End, Brown Dot)	.25
63-146	2000 " " ...(Red, Black End, Red Cot)	.25

R.F.Coils

S-441	R.F. Coupling Coil	1.00
S-836	Preselector Coil...(Coil Only)	1.40
S-837	1st R. F. Coil...(" ")	1.00
S-838	2nd, 3rd R. F. & Det. Coils...(" ")	1.00
20-7	Detector Choke	.50
20-8	R.F.Choke	.50

Shields & Bases

4-87	Tube Shield Can Base	.05
126-62	Coil " " "	.05
126-59	R. F. Coil Shield Can	.25
126-61	Tube Shield Can	.20
MS-153	Variable Condenser Shield	.75

Miscellaneous

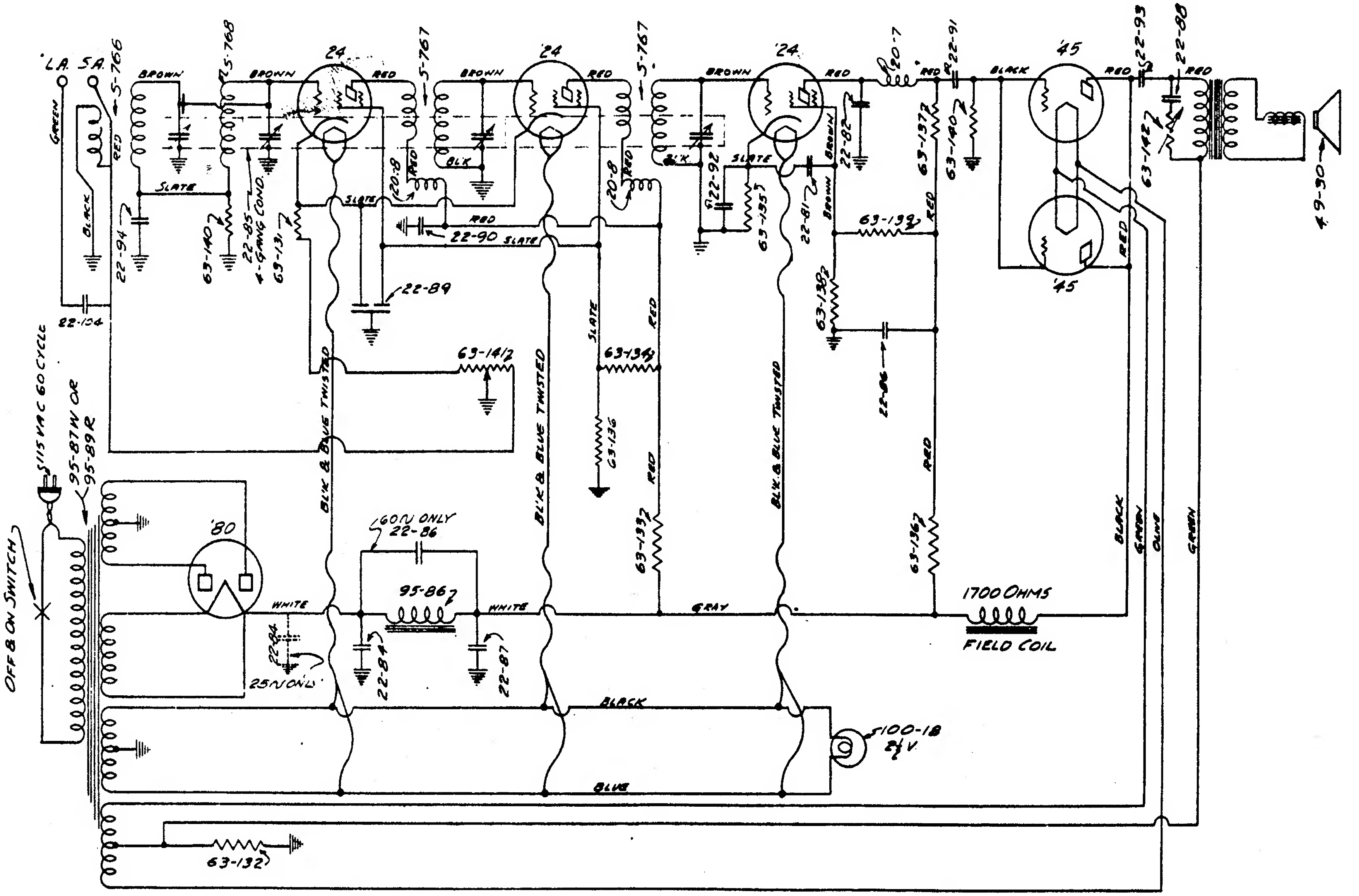
44-4	Phono Connector Base	.15
78-30	Five Prong Floating Socket	.20
78-31	Five Prong Stationary Socket	.20
78-32	Four Prong Stationary Socket	.20
57-161	UY Socket Guide Plate	.01
57-242	Four & Five Prong Socket Guide Plates	.03

	Miscellaneous Cont'd	
63-128	Volume Control	$ 1.00
63-147	Tone Control	1.00
85-26	Three Point Switch Base Less Shaft	.45
143-9	Three Point Switch Bushing with Contact Arm	.35
117-31	Three Point Switch Lever Arm	.01
S-695	Multicord & Terminal Plate Assembly	1.50
S-715	Multicord Terminal Plate Only	.50
52-23	Multicord only	1.25
MS-147	1st Stage Push Pull Transformer...(5 Lead)	4.00
MS-148	2nd Stage Push Pull Transformer...(6 Lead)	4.25
	Power Supply - ZE 80	
22-71	1. Mf. Condenser.....(Power Bias)	1.10
22-72	8. " " .....(Electrolytic)	1.50
22-73	16. " " .....(Electrolytic)	3.00
Note:	16 Mf.Condenser can be identified by Blue marking on anode	
63-114	10 Ohm Center Tap Resistor	.25
63-124	10,450 Ohm Voltage Divider	1.35
57-226	Bias Plate	.04
57-242	Bias Socket & Guide Plate	.01
78-32	Four Prong Socket for Rectifier	.15
95-79	Power Transformer.....(60 Cycle)	7.50
95-93	Power Transformer.....(25 Cycle)	12.00
136-2	2 Amp Fuse	.06
S-696	Terminal Strip Assembly.....(Five)	.50
S-698	Terminal Strip Assembly.....(Four)	.50
S-700	Fuse Receptacle & A.C. Outlet Plate	.20
MS-149	Power Choke	3.50
	Cabinet Parts	
46-49	Volume & Tone Control Knobs	.30
46-48	Tuning Knob	.30
57-262	A. C. Switch Escutcheon Plate	.20
57-281	Dial Escutcheon Plate	.40
85-27	On & Off Switch	.75
93-138	Felt Washer for Knobs	.01

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

ZENITH RADIO CORPORATION
April 9, 1934

0

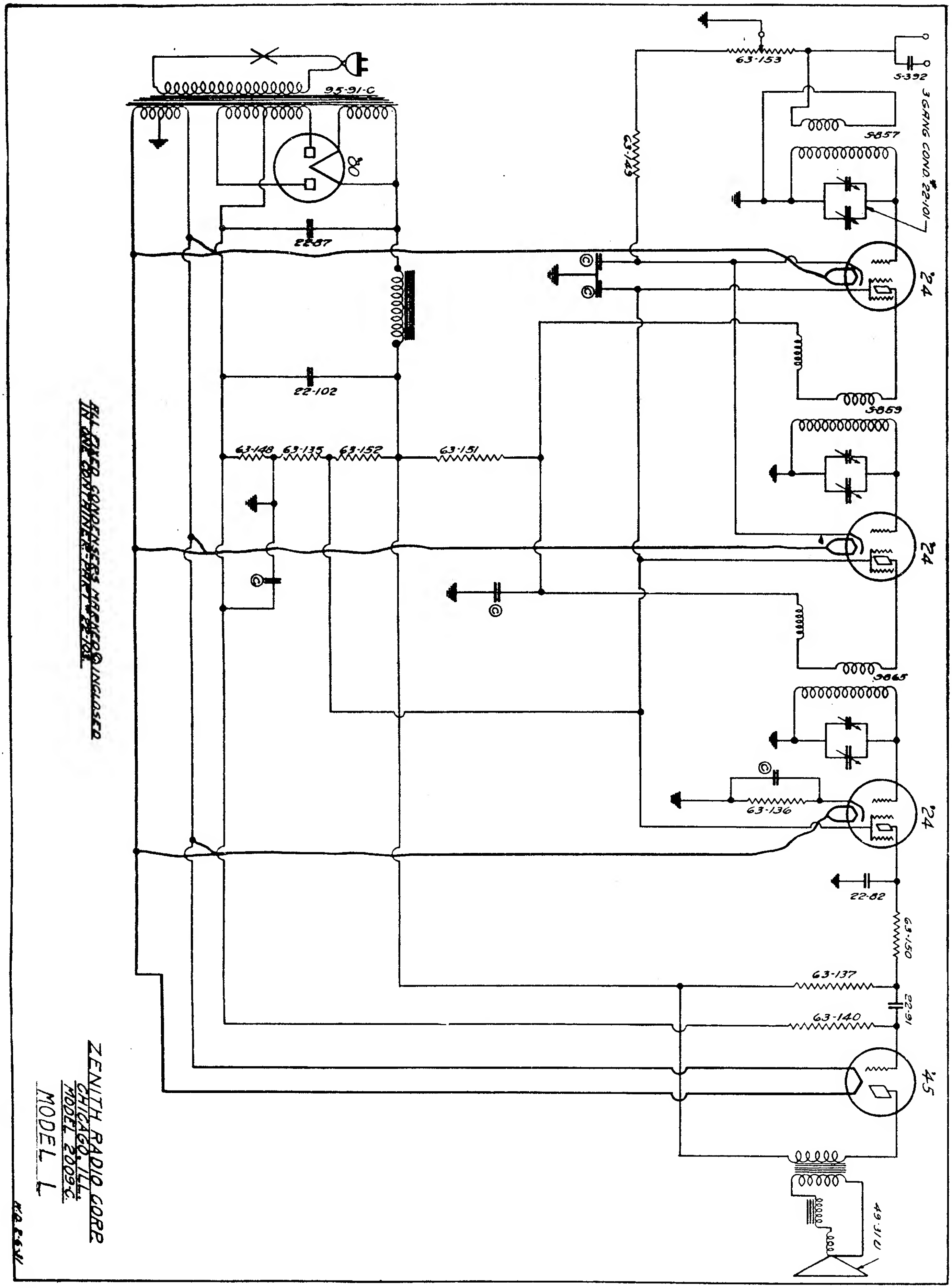


ZENITH RADIO CORP.
CHICAGO, ILL.
MODELS A-B-C-D
(IMPROVED)
2-21-31

PARTS & PRICES — MODELS A B C & D CHASSIS

	CONDENSERS		
22-85	Four Gang Variable	7.00	
S-759	Dial Drum Assembly	.80	
12-210	Dial Lamp Bracket	.15	
S-769	Dial Lamp Socket	.15	
100-18	Dial Lamp	.25	
11-2	Pulley String	.05	net
80-69	Dial String Tension Spring	.01	
22-81	.01 mf Bypass (Detector Screen)	.85	
82	.001 " " (Detector Plage)	.30	
84	2. " Filter	3.00	
86	.1 " Bypass (Single)	.60	
87	8. " Electrolytic	2.50	
88	.25 " Bypass (Tone Control)	.75	
89	.1 " Bypass (Double) (Screen Grid & Cathode)	.85	
90	.1 " Bypass (Single) (1st R.F. Plate)	.55	
91	.03 " Audio Coupling	.50	
92	.5 " Bypass (Detector & Cathode)	.75	
93	.5 " Output	1.00	
94	.03 " Bypass (1st R.F.)	.30	
	RESISTORS		
63-131	400 ohm 1st R F Bias (Yellow Brown Dot)	.35	
132	900 " Power Bias (White " ")	.35	
133	25M " 1st,2nd R.F. (Red Orange ") Large	.35	
134	35M " Screen Grid (Orange)	.35	
135	25M " Detector Bias (Red Orange Dot) Small	.35	
136	50M " Detector Plate (Green)	.35	
137	250M " Detector Plate (Red Yellow Dot)	.35	
138	350M " Detector Screen (Orange Yellow ")	.35	
139	500M " Detector Screen (Green Yellow ")	.35	
140	1 Meg " Power & 1st R.F. Grid (Brown)	.35	
141	50M " Volume Control	1.25	
142	50M " Tone Control & On & Off Switch	2.10	
	R F COILS		
S-766	#1 Pre-Selector Coil (Less Mtg.Base & Can)	1.40	
S-767	#3 & 4 Coils (Less Choke Mtg.Base & Can)	1.40	
S-768	#2 Coil (Less Mtg.Base & Can)	1.40	
	SHIELDS		
MS-144	Tube Shield Assembly	.30	
S-771	Coil Shield Base	.20	
126-59	Coil Shield Top	.25	
126-66	Variable Condenser Shield	.15	
	MISCELLANEOUS		
20-7	Detector Plate Choke	.50	
20-6	R.F. Plate Choke	.50	
46-46	Control Knobs	.25	
49-30	Electro Dynamic Speaker	11.50	
57-269	Escutcheon Plate	.40	
78-34	Four Prong Socket	.15	
78-35	Five Prong Socket	.15	
83-221	Speaker Terminal Strip	.15	
95-87	Power Transformer (60 Cycle)	5.00	
95-88	Filter Choke	1.75	
95-90	Power Transformer (25 Cycle)	9.50	

ALL PRICES SUEJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE.

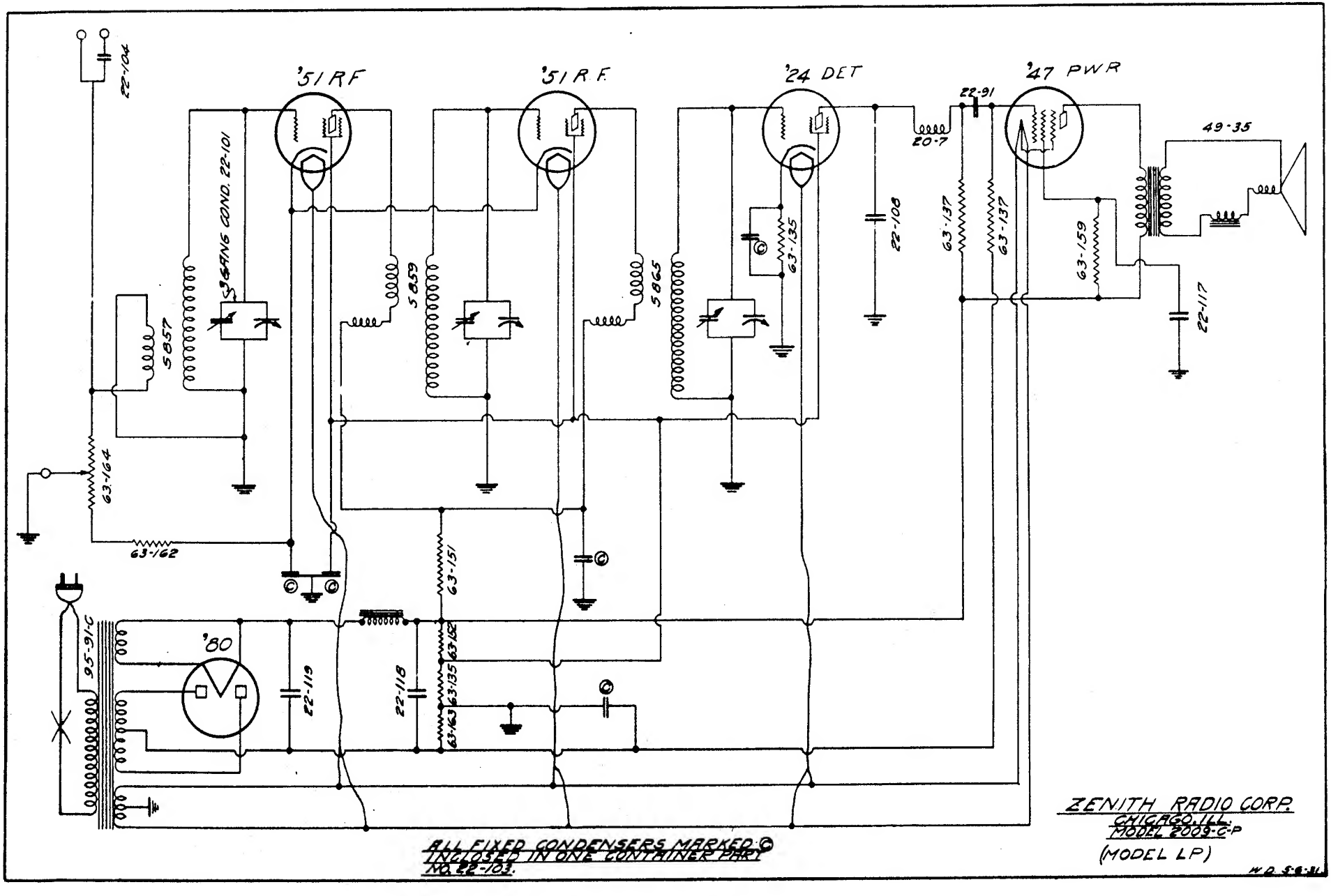


ZENITH RADIO CORP
CHICAGO, ILL.
MODEL 2009-C
MODEL L
ALL FIXED CONDENSERS MARKED © ENCLOSED
95-91-C
80
22-87
22-102
63-148
63-135
63-152
63-151
63-153
5-392
3 GANG COND # 22-101
5857
63-143
24
5859
5865
63-136
22-82
63-150
63-137
22-91
63-140
45
49-31U

PARTS & PRICES
MODEL "L" CHASSIS

	Variable Condenser Assembly	
22-101	Three Gang Condenser	$4.00
S-861	Dial Drum Assembly	1.00
S-769	Pilot Lamp Bracket & Socket	.15
100-18	2½ volt Lamp	.12
11-2	Pulley String ..... per.ft.	.10
80-69	Dial String Tension Spring	.01
	Fixed Condensers	
22-82	.001 mf. Condenser .....(Detector Plate)	.25
22-87	8. " " .....(Electrolytic High Voltage)	1.50
22-102	8. " " .....(Electrolytic Low Voltage)	1.25
	Note: High Voltage Condenser Identified by Red Dot On Anode	
22-91	.03 mf. Condenser .....(Audio Coupling)	.45
22-100	.08 " " .....(Filter Condenser)	.50
22-103	Five Section By-pass Condenser	1.75
S-392	Antenna Series Condenser	.25
	Resistors	
63-135	25M Ohm Resistor 1 Watt(Red,Green End,Orange Dot)	.25
63-136	50M Ohm Resistor ½ Watt(Green,Black " " ")	.25
63-137	250M " " ½ " (Red,Green " Yellow ")	.25
63-140	1 Meg " " ½ " (Brown,Black " Green ")	.25
63-148	1000 " " .....(Metal Mounting-Large)	.25
63-149	400 " " .....(" " -Small)	.20
63-150	10M " " ½ Watt(Brown,Black End,Orange Dot)	.25
63-151	15M " " 1 " (Brown,Green End " ")	.25
63-152	43M " " ½ " (Yellow,Orange End " ")	.25
63-153	10M " Volume Control	1.10
	R. F. Coils	
S-857	1st R.F.Coil (Antenna).....(Coil only)	1.30
S-859	2nd " " " (Intermediate)...(" ")	1.30
S-865	3rd " " " (Detector).....(" ")	1.30
20-8	R. F. Choke	.50
	Shields	
126-59	R. F. Coil Shield Can	.25
126-68	Condenser Shield	.15
MS-163	Tube Shield	.25
S-771	Coil Mounting Base	.20
	Miscellaneous	
26-20	Calibrated Dial Strip	.25
46-50	Knobs for Switch & Volume Control	.20
46-51	Knob for Dial	.20
49-31	Electro Dynamic Speaker	8.00
57-269	Escutcheon Plate	.40
78-34	Four Prong Socket	.15
78-35	Five " "	.15
83-226	Speaker Terminal Strip	.15
85-29	On & Off Switch	.55
95-91	Power Transformer.....(60 cycle)	5.00
95-92	Power Transformer.....(25 cycle)	5.00

ALL PRICES ARE SUBJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE. ALSO THESE PRICES SUPERSEDE ALL PREVIOUS QUOTATIONS FOR LIKE PARTS 2/9/34.


'51 RF
'51 R.F.
'24 DET
'47 PWR
22-104
3 GANG COND. 22-101
5857
5859
5865
63-164
63-162
63-151
63-135
22-108
20-7
22-91
63-137
63-137
63-159
49-35
22-117
'80
95-91-C
22-119
22-118
63-63
63-135
63-182
ALL FIXED CONDENSERS MARKED © INCLOSED IN ONE CONTAINER PART NO. 22-103.
ZENITH RADIO CORP.
CHICAGO, ILL.
MODEL 2005-C-P
(MODEL LP)

PARTS & PRICES
MODEL "LP" CHASSIS

Variable Condenser Assembly

22-101	Three gang condenser	5.00
S-861	Dial drum assembly	.80
S-769	Pilot lamp bracket and socket	.15
00-18	2½ volt lamp	.25
11-2	Pulley string	Net .05
80-69	Dial string tension spring	.01

Fixed Condensers

22-91	.03 mfd. condenser	(audio coupling)	.50
S-392	Antenna series condenser		.25
22-103	Five section bypass condenser		2.00
22-108	.002 mfd. condenser	(bypass)	.35
22-117	.5 " "	"	.50
22-118	6. " "	(electrolytic low voltage)	2.25
22-119	6. " "	(" high ")	2.50

Resistors

63-135	25M ohm resistor	(Red, Green end, Orange Dot)	.30
63-137	250M " "	(" " " Yellow ")	.30
63-151	15M " "	(Brown " " Orange ")	.30
63-152	43M " "	(Yellow Orange " ")	.30
63-159	4M " "	(" Black end Red ")	.30
63-162	100 " "	(Flat wire wound black ")	.15
63-163	320 " "	" " " Red ")	.25
63-164	Volume control		1.10

Coils

S-857	1st R.F.coil (antenna)	(Coil Only)	1.30
S-859	2nd " " " (intermediate)	(" ")	1.30
S-865	3rd " " " (detector)	(" ")	1.30
20-8	R.F.choke		.50

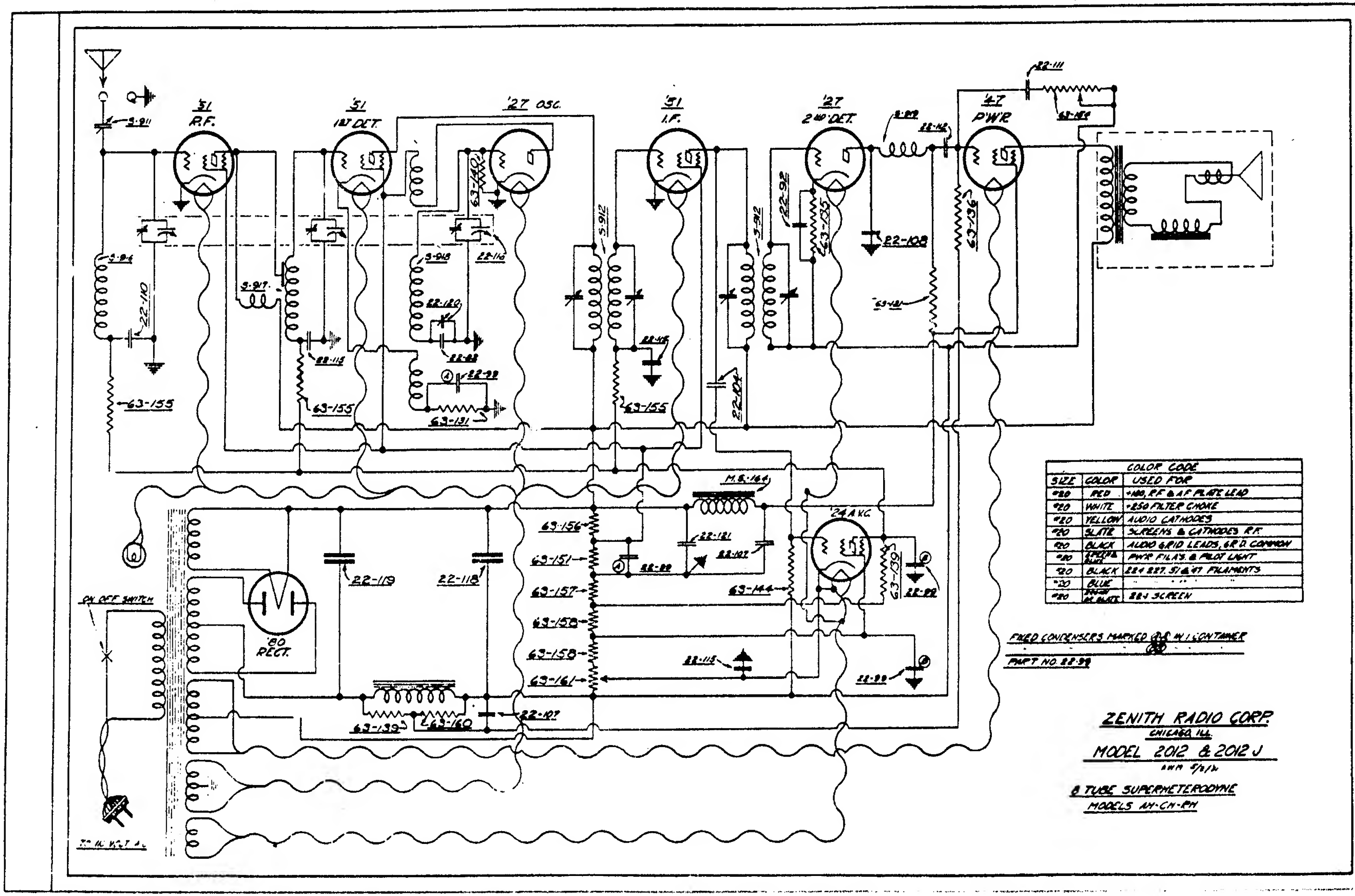
Shields

26-59	R.F. coil shield can	.25
26-68	Condenser shield	.15
MS-163	Tube shield	.25
S-771	Coil mounting base	.20

Miscellaneous

26-20	Calibrated dial strip		.10
46-50	Knobs for switch & volume control		.20
46-51	Knob for dial		.20
49-34	Dynamic speaker		10.50
57-269	Escutcheon plate		.40
78-34	Four prong socket		.15
78-35	Five " "		.15
78-39	" " Pentode socket		.15
83-226	Speaker terminal strip		.15
85-29	Off & On switch		.55
95-91	Power transformer	(60 cycle)	4.50
95-92	" "	(25 ")	8.50

ALL PRICES ARE SUBJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE


'51 R.F.
'51 1st DET.
'27 OSC.
'51 I.F.
'27 2nd DET.
'47 PWR.
'24 A.V.C.
'80 RECT.
ON OFF SWITCH
COLOR CODE
SIZE | COLOR | USED FOR
#20 | RED | +180, R.F. & A.F. PLATE LEAD
#20 | WHITE | +250 FILTER CHOKE
#20 | YELLOW | AUDIO CATHODES
#20 | SLATE | SCREENS & CATHODES R.F.
#20 | BLACK | AUDIO GRID LEADS, GR'D COMMON
#20 | | PWR FILA'S. & PILOT LIGHT
#20 | BLACK | 224 227. 51 & 47 FILAMENTS
#20 | BLUE |
#20 | | 224 SCREEN
FIXED CONDENSERS MARKED IN 1 CONTAINER
PART NO. 22-99
ZENITH RADIO CORP.
CHICAGO ILL.
MODEL 2012 & 2012 J
TUBE SUPERHETERODYNE
MODELS AH-CH-RH

Socket Voltages

Type	Position	Fil. Volts	Plate Volts	Control Grid Volts	Cathode Volts	Plate M.A.	S.G. Volts
Z51	R.F.	2.25	170	---.4	0	4.5	64
Z51	1st Det.	2.25	165	--1.5	1.5	3.	62
Z27	Osc.	2.1	55	0	0	4.5	0
Z51	I.F.	2.3	180	--5.6	0	.75	80
Z27	2nd Det.	2.15	160	--14.5	8.5	.80	0
Z47	Power	2.3	250	---15	0	28.	250
Z24	A. V. C.	2.1	8	---.5	0	0	40
Z80	Rect.	4.7	0	0	0	34. ea	0

Balancing Chassis

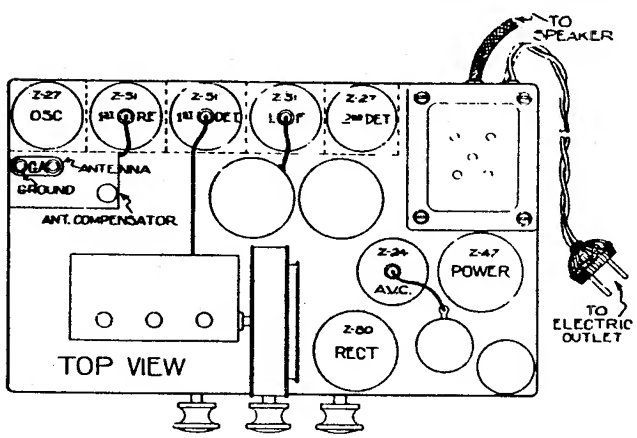
(1) Remove oscillator tube and balance intermediate transformers (through openings underneath chassis) at 175 kilocycles with service oscillator connected to grid of first detector and ground.

(2) Connect service oscillator to antenna and ground and set at 1500 kilocycles. Insert oscillator tube and set receiver dial at 1500. Adjust oscillator trimmer on gang for greatest output. Adjust first detector trimmer on gang to resonance.

(3) Set service oscillator at 550 kilocycles. Adjust oscillator padder (through opening in side of chassis) meanwhile moving dial to and fro past 550 K.C. to combination giving greatest output.

(4) Repeat operation #2.

Tube Layout



TUBE LAYOUT
showing type number, position and circuit function of each.

ZENITH RADIO CORPORATION

PARTS AND PRICES
Chassis 2012 - 2012J
and 2012-4J

Models AH, RH CH
090, 90, V-8

Resistors

63-121	100 M ohm	Detector Plate	(Brown,black end,yellow dot).. $ .25
63-131	400 "	1st Det.Cathode	(Yellow,black end,brown dot)... .25
63-135	25 M "		(Red,green end,orange dot)..... .25
63-136	50 M "	Power Tube Grid	(Green,black end,orange dot)... .25
63-139	500 M "	A.V.C.Plate	(Green,black end,yellow dot)... .25
63-140	1 megohm	Osc. Grid	(Brown,black end,green dot).... .25
63-144	3 "	A.V.C. Grid	(Orange,black end,green dot)... .25
63-151	15 M ohm	Voltage Divider	(Brown,green end,orange dot)... .25
63-155	1 M "	R.F.1st Det.I.F.	(Brown, black end,red dot)..... .25
63-156	10 M "	Voltage Divider	(Brown,black end,orange dot)... .25
63-157	100 "	Voltage Divider	(Brown,black end,brown dot).... .25
63-158	1700 "	" "	(Brown,purple end,red dot)..... .25
63-160	100 M "	Power Tube Bias	(Brown,black end, yellow dot).. .25
63-154	Tone Control		1.00
63-161	Volume Control and Switch Assembly		1.25

Condansers

22-82	.001 Mfd.	Detector Plate	.25
22-92	.5 "	2nd Det. Cathode	.60
22-99	.1 "	(Dual) See Footnote	.65
22-104	.0001 "	A.V.C.Coupling	.20
22-107	.5 "	See Footnote	.80
22-108	.001 "	Padder Fixed	.30
22-110	.1 "	R.F.Grid Return	.45
22-111	.03 "	Tone Control	.20
22-112	.1 "	Audio Coupling	.25
22-115	.1 "	1st Det.Grid	.20
22-116	3-gang Condenser		4.75
22-118	6. Mfd.	Electrolytic - Low Voltage	1.25
22-119	6. "	" High "	1.25
22-120	Trimmer used with Part No.22-108		.25
22-121	8. Mfd.	Plate Filter	1.50

Miscellaneous

S-905	Dial Drum Assembly	1.10
S-911	Antenna Series Condenser Assembly	.85
S-912	I.F. Coil - Complete with base mounting and shield	2.50
S-916	Antenna Coil Assembly	.75
S-917	1st Det. Coil - Complete with choke and coupling band	1.25
S-918	Oscillator Coil - Complete with plate and pick up winding ...	1.25
S-919	2nd Det. Plate Choke and Bracket Assembly	.60

Note - #22-99 - (2 used) - Bypassing osc.cathode,screen grids, and A.V.C. Plate.
Note - #22-107-(2 used)-Bypassing power tube,bias resistor & power filter choke.
Note - #22-115-(3 used)-Bypassing 1st det.grid return,I.F.grid return and A.V.C.cathode.

Miscellaneous Cont'd

S-933	Multicord and Terminal Strip for 2012 Chassis	$ .65
S-934	Multicord and Terminal Strip for 2012J Chassis	.75
S-963	Dial Pointer Mask Bracket and Mask Assembly	.25
S-964	Magnavision Escutcheon Plate with Lens	1.50
MS-164	Choke (Filter)	1.50
11-3	Pulley String Cable (27 in.)	Net .05
12-219	Dial Lamp Bracket	.05
26-23-	Celluloid Dial Strip	.15
46-52	Knobs for Volume Control, Tone Control, and Tuning	.25
49-34	Dynamic Speaker for Model AH	9.75
49-36	Dynamic Speaker for Model CH	11.50
73-11	Knob Set Screws	.03
78-36	5-prong Socket marked "Z-51"	.20
78-37	5-prong Socket " "Z-27"	.20
78-38	5-prong Socket " "Z-24"	.20
78-39	5-prong Socket " "Z-47"	.20
78-40	4-prong Socket " "Z-80"	.20
95-95	Power Transformer (60 cycle, 110 volt)	4.75
95-98	Power Transformer (25 cycle, 110 volt)	7.75
95-99	Power Transformer (60 cycle, 220 volt)	5.50
100-18	2½-volt Dial Lamp	.12

Note - The intermediate coils are peaked at the factory on an elaborate temperature control crystal oscillator, therefore, the vernier adjustments should not be changed or tampered with.

Superheterodyne 8-Tube Chassis 2012-4J
090 - 90 - V-8

Note - The above chassis are practically the same as the AH, RH and CH, excepting for the following changes in parts:

Four-gang condenser instead of three-gang. The fourth section tunes the preselector stage employing an additional coil (S-916). The original 8 Mfd. filter condenser mounted at the side of the condenser gang is removed and installed below the chassis. No mounting base is used, therefore, it bears a new part number, namely 22-136. The variable and fixed padder assembly is replaced by variable unit in the 90 and 090, part #22-129. A 4½ megohm resistor is added for provision of the local-distance switch.

85-33	Local Distance Switch	$ .65
S-916	Preselector Coil	.75
S-2000	Escutcheon Plate (Deduct S-964)	1.50
46-56	Control Knob (Deduct 46-52)	.20
49-36	Dynamic Speaker (Deduct 49-34)	11.50
63-188	4½ megohm Resistor (Deduct 63-144)	.25
22-108	Bypass Condenser	.30
22-134	Four-Gang Condenser (Deduct 22-116)	5.50
22-129	Padder Condenser (Deduct 22-108 & 22-112)	.40
22-136	8 mfd. Electrolytic Condenser (Deduct 22-121)	1.50

ALL PRICES ARE SUBJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE.

ZENITH RADIO CORPORATION
August 13, 1935

SERVICE DATA

for

ZENITH AUTOMATIC →LONG DISTANCE← RADIO

A. C.

SUPERHETERODYNE

RECEIVERS

MODELS 91 and 92

No. 4A

Made by

ZENITH RADIO CORPORATION

3620 IRON ST. JULY, 1931 CHICAGO, ILL., U. S. A.

GENERAL

Before an analysis is made of the receiver, in locating trouble, the serviceman should first carefully inspect the antenna and ground system which is being employed. The antenna connection may be broken or corroded, or may be found to be grounding at some point along its length. This is the cause of many complaints where intermittent or fading of signals is experienced. If the antenna has been in use for a considerable length of time the lead-in may have broken from the aerial wire or become parted inside the insulation. This is especially true on apartment buildings where a multitude of aerials are employed, any of which may have broken and fallen upon another. If a lightning arrester is used it should also be inspected.

A poor ground connection is also a frequent cause for complaint. It should be carefully inspected and repaired if necessary. When there is a condition of noisy reception the serviceman should first disconnect the antenna and ground in order to make certain that it is not arising from an outside source.

Our experience has taught us that ninety percent of service complaints can be traced to defective tubes. The fact that they light gives no indication whatsoever of their operating condition. After the antenna and ground have been gone over, each tube should be carefully tested and those found defective should be replaced.

In making replacements we warn against the use of any other than Zenith Quality Tubes. Those of other manufacture, in some cases, vary from our tube characteristics and will, consequently, impair proper operation of the receiver.

The Service Division of the Zenith Radio Corporation will be pleased to be of further assistance should any problem arise not covered by this manual.

INDEX

ZENITH RADIO CORPORATION

ZENITH AUTOMATIC RADIO

Function of the Superheterodyne

Operation of the present day Superheterodyne, as in the case of all previous Superheterodynes, depends entirely on the principle of beat frequencies. A beat frequency is the result of two signals of different frequencies mixing to form a third frequency. To explain this more clearly let us suppose we hear a vibration of one definite frequency and at the same time a second and slightly different vibration is set in motion. In addition to the two separate vibrations we would hear the beat frequency of these or a third vibration equal to the difference in their frequency or pitch. This is essentially what happens in a Superheterodyne except that the frequencies involved are not audible. The beat frequency, is produced by action of an oscillator frequency mixing with the incoming signal to form an intermediate frequency which then undergoes further amplification.

It is well known that R. F. Circuits become unstable and have a greater tendency to oscillate as the frequency is increased. In fact, a point may be reached in the usual T. R. F. circuit where even a screen grid tube will prove extremely inefficient. In the Superheterodyne these undesirable conditions are overcome by amplifying the signal at a low but constant frequency.

The sketch in figure 1 at A indicates the action which takes place in the usual T. R. F. set. While figure 1 at B shows that of a Superheterodyne.

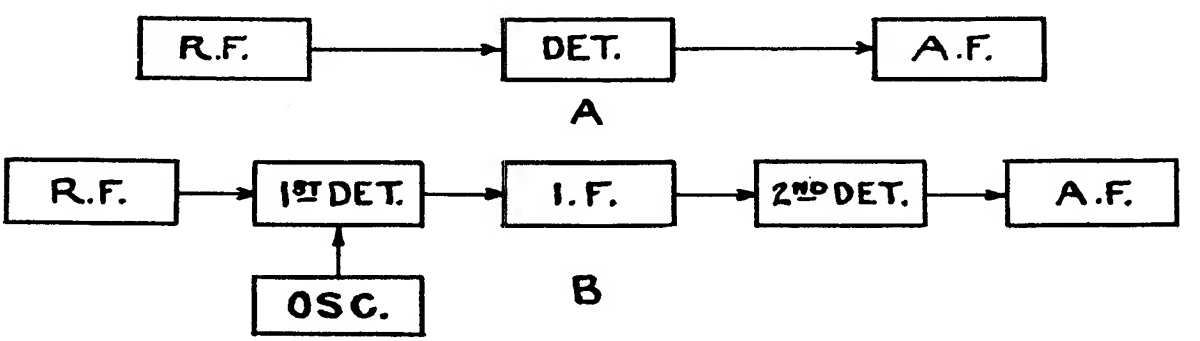


Fig. 1

In the design of a modern Superheterodyne a definite frequency is first chosen to serve in the intermediate amplifier. It is always one which will give the least reaction to the other essentials of the circuit in the form of double-spot tuning, harmonics, etc. Now in order to generate the frequency which has been decided upon the oscillator circuit must have that separation from the frequency of the incoming signal. Supposing we have taken 175 K.C. for the frequency at which we wish our intermediates to operate. Now we have an incoming signal say at 600 kilocycles. The oscillator must be tuned to either 775 K.C. or 425 K.C. to beat with it and create the third or intermediate frequency of 175 K.C. In order to simplify oscillator design, the higher frequency is most usually employed.

The oscillator tuning is made to follow the 1st detector always maintaining a difference of 175 K.C. and for this reason the intermediate frequency remains constant and we have equal amplification for any signal impressed upon the antenna, regardless of its position in the broadcast band. This, however, does not mean that all stations will be received with equal volume since the intensity generated is governed by the initial strength of the signal to which the set is tuned.

In modern Superheterodynes we use an ordinary tuned radio frequency stage before the 1st detector in order to improve selectivity and sensitivity before the intermediate frequency is formed.

In a summary of the foregoing we have a signal entering the antenna amplified at its broadcast frequency by the R. F. tube followed by the 1st detector, which due to the action of the oscillator tube, converts it to a lower frequency, namely, 175 K. C. for further amplification in the intermediate stages following. The result of this action is a third R. F. signal of a frequency equal to that of the separation. This signal is amplified by the intermediate frequency tube. It is then rectified by a second detector tube and followed by the usual audio amplifier.

ZENITH AUTOMATIC RADIO

OPERATION

MODELS 91 and 92

The Zenith Models 91 and 92 uses ten tubes in a modern Superheterodyne circuit, employing many refinements. Among these being an antenna resonator, pre-selector stage, four tuned circuits, automatic volume control, and push-pull audio amplification. The following is a list of the various types of tubes used and the circuit duty of each.

R. F.—1 Z-51 Multi-Mu
1st Detector—1 Z-51 Multi-Mu
Oscillator—1 Z-27
I. F.—1 Z-51
2nd Detector—1 Z-27
1st A. F.—1 Z-27
2nd A. F.—2 Z-45
A. V. C.—1 Z-24
Rectifier—1 Z-80

In order to obtain a thorough understanding of how the ten tube Superheterodyne operates, the circuit should be followed from the antenna. A tuned coil and condenser forms the pre-selector stage which is coupled at one end to the antenna through the variable antenna compensating condenser, and from the other end direct to ground. The pre-selector coil is placed in inductive relation to the 1st R. F. tuning coil and condenser so that a transfer of energy occurs from one to the other. The 1st R. F. tuned grid circuit returns its R. F. energy through the path of least resistance, namely a fixed condenser between the coil and ground. The plate circuit of the R. F. stage is capacity coupled to the 1st detector tuned grid circuit. A section of the variable condenser and a coil is also employed here which returns to ground through a fixed condenser in the same manner as the R. F. grid circuit. It should be noted that a pick-up coil is placed in series with the 1st detector cathode by which energy is absorbed and mixed with the signal generated in the oscillator circuit. An oscillator, operates at 175 kilocycles higher in frequency than the R. F. or 1st detector, and employs a grid coil and tuning condenser and also a tickler winding. A small series or padding condenser is connected between the variable condenser section and the oscillator coil return which enables the oscillator circuit to track accurately with that of the other tuned circuits over the entire broadcast scale. (See balancing.)

After the oscillator frequency has mixed with the incoming signal in the 1st detector it is tuned to an intermediate frequency of 175 kilocycles in the 1st detector plate circuit. The 1st detector tuned plate coil is inductively coupled to a tuned grid coil of the intermediate frequency amplifier. This coil is also tuned to a frequency of 175 kilocycles. Remaining at this same frequency the signal is transferred from the intermediate frequency amplifier to the 2nd detector by means of a tuned plate coil inductively coupled to a tuned grid coil in the 2nd detector grid circuit. The 2nd detector is resistance coupled to a Z-27 1st A. F. stage which is, in turn, transformer coupled to a pair of push-pull Z-45's. The tone control, consisting essentially of a variable resistance and fixed condenser, is connected from grid to grid of the Z-45 tubes.

Automatic Volume Control

A Z-24 automatic volume control tube keeps the volume of the incoming signal constant by varying the grid bias voltage on the 1st R. F., 1st detector, and I. F. stages, in relation to the change of R. F. energy amplified before the 2nd detector. The three grid returns mentioned are coupled to the plate of the automatic volume control tube through three limiting resistors, while the 2nd detector grid couples to the volume control tube grid through a small fixed condenser. Any variation in signal strength on the 2nd detector grid is transferred to the automatic volume control tube which, proportionately varies the voltage drop across the volume control tube plate resistor which changes the bias of the three tubes mentioned.

The local distance switch simply shunts a resistor from plate to cathode of the automatic volume control tube when in the local position, thereby placing a constant bias on the three R. F. stages. This has the effect of minimizing the automatic volume control action and, consequently, subdues noise between stations. When the local distance switch is in the distance position it opens the external resistor circuit, thereby, allowing the volume control tube to operate normally.

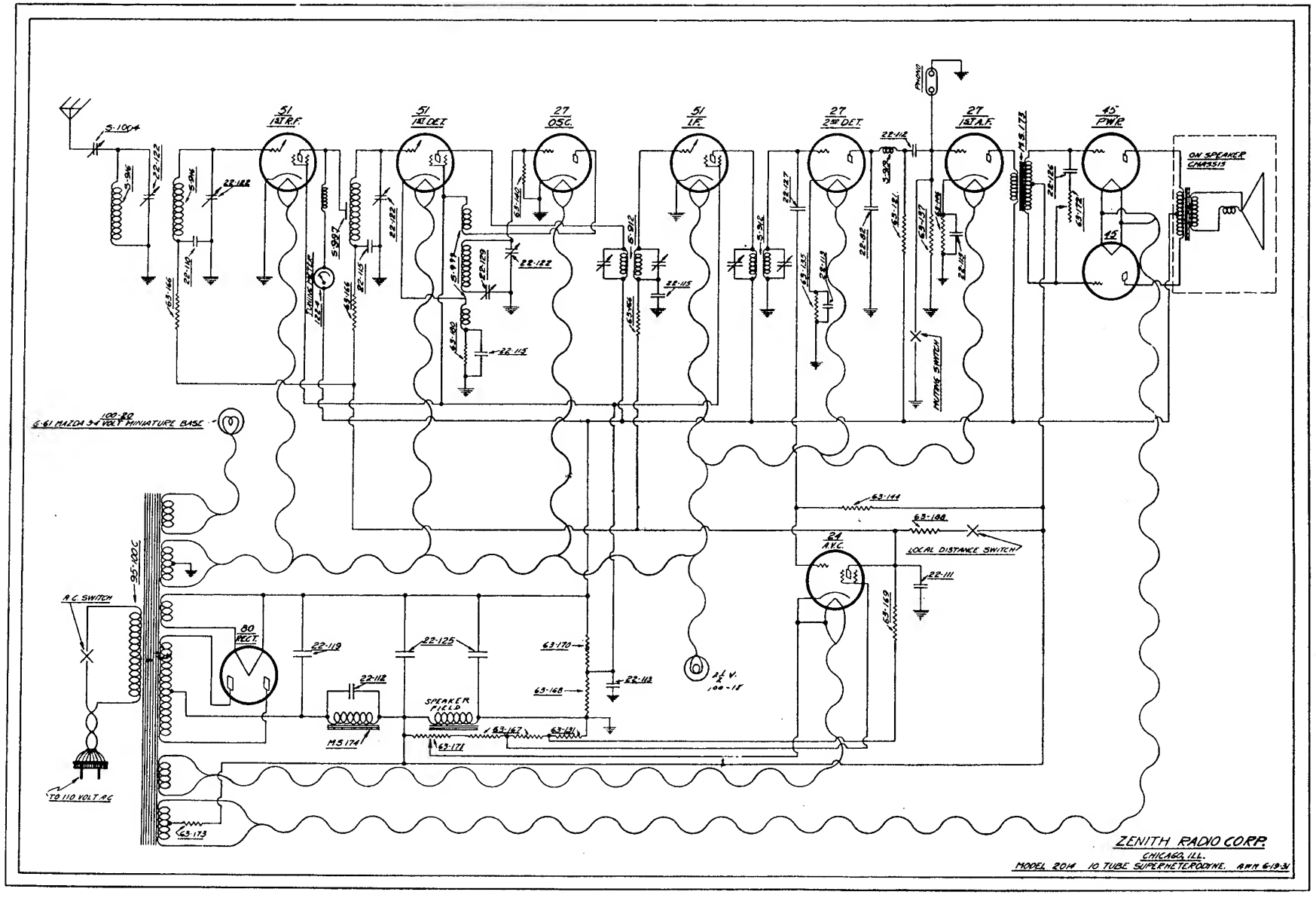


FIG. 2—CIRCUIT DIAGRAM—MODELS 91-92

ZENITH AUTOMATIC RADIO

Balancing Chassis

Every Zenith Superheterodyne Receiver is carefully balanced on laboratory equipment before leaving the factory and should not require further attention in this respect. However, in the event that some part of the R. F. circuit has been changed, or the adjustments shifted by mishandling, the chassis may be rebalanced as follows:

If an oscillator is available more accurate results will be obtained. It should be accurately calibrated from 1500 to 550 kilocycles and should also have provision for generating a 175 kilocycle signal. In cases where an oscillator is not available a fairly good result may be had by listening to stations which operate as nearly as possible to the extreme ends of the dial. Although an output meter will give most accurate results, satisfactory adjustments can be made simply by listening to the speaker.

The chassis should be removed from the cabinet so that all adjustments are easily accessible. Next place the test oscillator in operation and connect it direct to the antenna and ground posts of the receiver. It should then be set to 1500 kilocycles and the receiver tuned to the same reading on the dial. If the oscillator is not accurate the stations will not be received on their proper calibration. If a station is used for this purpose, the dial pointer should first be set to the exact frequency of the station being received. Beginning with the variable condenser tuning section at the extreme left, which tunes the oscillator circuit, the trimmer should be regulated for maximum response, in either the loud speaker or output meter. It will be noticed that the second section does not employ a vernier adjustment. This stage is resonated by adjusting the antenna compensator knob as explained in the instruction card. The third, or 1st R. F. trimmer, is adjusted in the same manner as the oscillator. If at any time the volume reaches a very high level, so that it is not possible to determine slight changes, it should be reduced by means of the volume control knob so as to be barely audible. The fourth, or 1st detector section, is next in order and its trimmer should also be adjusted for resonance.

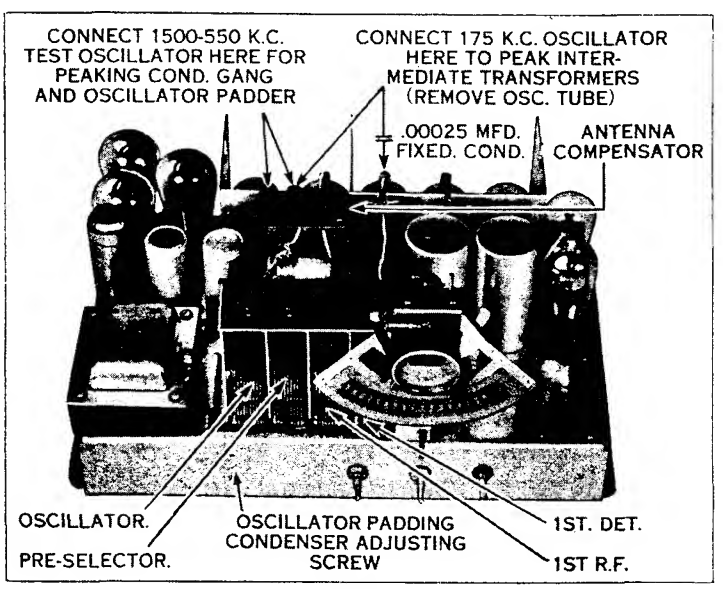


FIG. 3

After the vernier adjustments have been completed the test oscillator should be set at 550 kilocycles and the dial of the receiver turned until the oscillator signal is tuned in. Now the oscillator padding condenser (see fig. 3) should be very carefully adjusted with a screw driver for maximum output of the receiver, while rocking the tuning condenser back and forth over the signal. This padding adjustment brings the oscillating circuit of the receiver in resonance with the remaining tuned circuits and, thereby, enables it to tract accurately over the entire scale. The receiver will now operate at full efficiency and all stations will be received at their proper calibration. If this is not found to be entirely so, the entire balancing operation should be repeated.

The intermediate transformers used in the ten tube Superheterodyne have been accurately peaked at 175 kilocycles on a temperature controlled crystal oscillator before leaving the factory. It is not recommended that their adjustments be tampered with unless an oscillator is available which is very accurately calibrated at 175 kilocycles, or unless the serviceman is absolutely certain the trouble lies in their adjustment. However, if it is necessary to check the adjustments, the 175 K. C. test oscillator may be connected to the grid terminal of the 1st detector through a .00025 fixed condenser. The ground lead of the test oscillator is connected to the ground post of the receiver. The oscillator tube must be removed from the chassis while this operation is being performed. Four adjusting screws are provided under the chassis directly beneath the intermediate transformers, which tune the plate circuit of the 1st detector, grid and plate circuits of the I. F. stage, and grid circuit of the second detector. (See wiring diagram.) Beginning with the 2nd detector grid vernier, each adjusting screw should, in turn, be set for maximum signal output from the speaker or output meter. For best results the verniers should be gone over twice in the same rotation always keeping the output from the test oscillator at the weakest possible strength in order to determine slight variations in volume.

ZENITH AUTOMATIC RADIO

Socket Voltages

Type	Position	Fil. Volts	Plate Volts	Control Grid Volts	Cathode Volts	Plate M. A.	S. G. Volts
Z-51	1st. R. F.	2.25	175	.2	0	7.	100
Z-51	1st. Det.	2.25	175	3.5	.4	3.5	90
Z-27	Osc.	2.2	70	0	0	8.5	0
Z-51	I. F.	2.2	200	4.	0	2.5	115
Z-27	2nd. Det.	2.2	115	0	9.	.5	0
Z-27	1st. Aud.	2.2	145	0	13.	6.5	0
Z-45	P. P.	2.2	275	54.	0	30.	0
Z-45	P. P.	2.2	275	54	0	30.	0
Z-24	A. V. C.	2.2	35	.4	0	0	54
Z-80	Rect.	4.8	355	0	0	76.	0

Voltage readings taken with a Weston type 566 tester. Manual volume control in maximum position and antenna and ground disconnected. Line voltage 112.

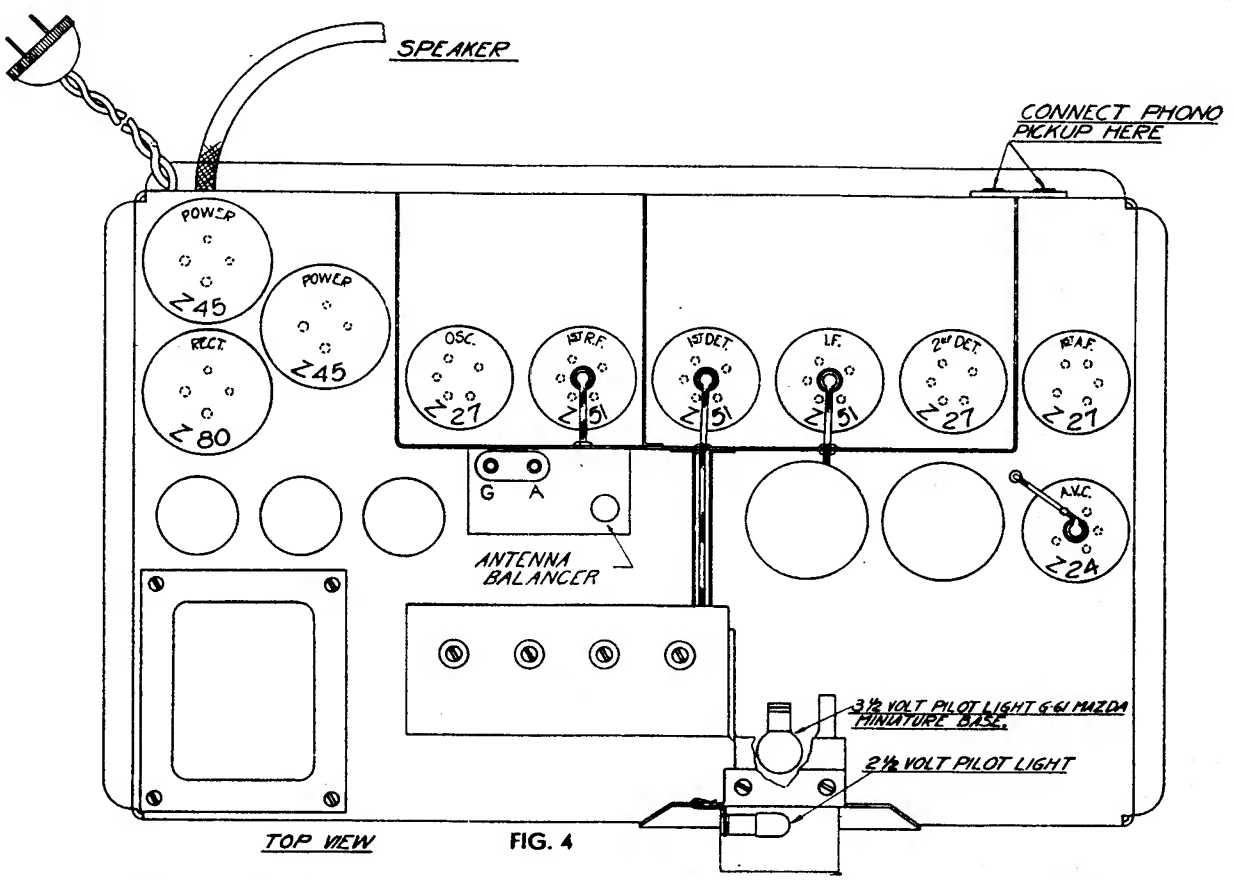


FIG. 4

TUBE LAYOUT - Showing Position and Circuit Function of each.

ZENITH AUTOMATIC RADIO

SERVICE DATA CHART

Before using the service data chart, the service man should make certain that the tubes and antenna and ground system are not at fault.

Nature of Trouble	*Possible Cause*	*Remedy*
No Signals	Defective A. C. Switch.	Replace.
	No power at socket outlet.	Check line fuses and socket voltage.
	One or more defective tubes.	Test and replace.
	Shorted antenna series condenser.	Adjust to relieve short.
	Shorted oscillator padding condenser.	Inspect and adjust or replace if necessary.
	Open windings or broken connections on oscillator or R. F. coils.	Inspect and resolder or replace.
	Shorted section of variable condenser gang.	Clean all sections with a pipe cleaner to remove metal slivers.
	Shorted trimmer on variable condenser gang.	Adjust to relieve short.
	Open tuning meter.	Repair connections or replace.
	Grounded volume control.	Inspect all volume control leads and respace control from chassis.
	2nd detector choke grounded or open.	Remove choke shield and adjust or replace.
Oscillation (Over entire scale)	Open by-pass condenser.	Replace.
	Grounded resistor.	Space from chassis.
	Poor ground returns.	Resolder and tighten.
	Open oscillator plate coil.	Replace oscillator coil.
	Broken connection in oscillator circuit.	Trace and repair or resolder.
	Defective oscillator tube.	Replace.
Oscillation (Low frequency end)	Variable condenser cradle not grounding properly.	Solder three pigtail wires from each end and from center of cradle direct to chassis on the under side.
Hum	Open or shorted power bias resistor.	Replace.
	Loose transformer laminations.	Tighten lamination bolts.
	Grounded pilot light socket (2.5 volt).	Turn socket contacts away from dial bracket.
	Grounded filament lead.	Trace filament wiring and remove ground.
	Shorted filter choke.	Check leads or replace choke.
	Defective electrolytic condenser.	Replace.
	Defective tube.	Locate and replace.
Tuning meter does not read	Open meter.	Replace.
	Grounded meter.	Replace.
	Open R. F. coil.	Resolder or replace.
	Grounded volume control.	Respace from chassis and check connections.
Manual volume control does not operate	Defective A.V.C. tube.	Replace.
	Shorted or grounded volume control.	Respace from chassis and check connections or replace.
	Rosin or broken joint in A.V.C. circuit.	Repair or resolder.
	Shorted I.F. transformer.	Replace I.F. unit.

ZENITH AUTOMATIC RADIO

SERVICE DATA CHART

Nature of Trouble—Cont.	*Possible Cause—Cont.*	*Remedy—Cont.*
Weak reception	Resistors touching each other on resistor strip.	Respace.
	Grounded resistor.	Space from chassis.
	High resistance joint on R. F. coils.	Resolder where necessary.
	Defective padding condenser.	Replace.
	Padding condenser not set properly.	See "Balancing."
	Chassis out of balance.	See "Balancing."
	Antenna Compensator not adjusted properly.	See "Balancing."
	Open cathode winding on oscillator coil.	Repair or replace.
	Defective tubes.	Replace.
Flutter or motor-boating	Filament lead cutting into grid terminal of 2nd detector.	Respace from grid terminal.
	Oscillation.	See paragraph on "Oscillation."
	Grounded resistor.	Respace from chassis.
	Poor ground connections.	Tighten resistor brackets to chassis and resolder ground return connections.
	Open by-pass condenser in audio circuit.	Replace.
	Open grid circuit in audio circuit.	Defective push-pull transformer or rosin joint.
	Defective local-distance switch.	Repair or replace.
Fading	Defective A.V.C. tube.	Replace.
	Other tubes defective.	Test and replace.
	Resistor mounting loose on chassis.	Tighten securely.
	Poor ground return.	Tighten and resolder all grounds in chassis.
	Defective local-distance switch.	Repair or replace.
	Defective by-pass condenser.	Locate and replace.
	Rosin joint on R. F. coils or variable condenser.	Resolder.
Intermittent reception	Loose resistor mounting.	Tighten mounting screws securely.
	Defective by-pass condenser.	Locate and replace.
	Broken strands on R. F. coils.	Resolder.
	Rosin or broken connection.	Check all connections and resolder where necessary.
	Defective A. C. switch.	Replace.
	Defective local-distance switch.	Repair or replace.
	Grounded resistor.	Space resistor from chassis.
	Defective tubes.	Replace.
Dial off calibration	Chassis out of balance.	See "Balancing."
	Dial strip bracket pressed against front of cabinet.	Space chassis from front of cabinet.
	Dial cam and drum assembly loose on condenser shaft.	Tighten securely.

REPLACEMENT PARTS

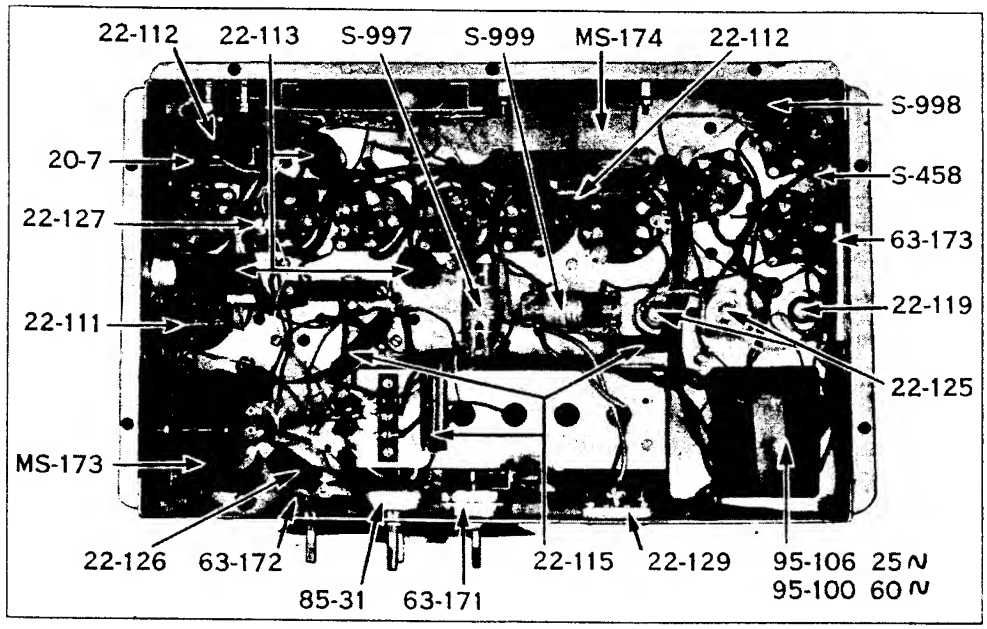


FIG. 5

CONDENSERS

22- 82	.001 Mfd.	(2nd Det. Plate)	$ .30
22-110	.1 Mfd.	(R. F.)	.50
22-111	.03 Mfd.	(A.V.C. Plate)	.30
22-112	.1 Mfd.	(2 Used. See Footnote)	.35
22-113	.5 Mfd.	(3 Used. See Footnote)	.50
22-115	.1 Mfd.	(3 Used. See Footnote)	.30
22-119	6. Mfd.	(High Voltage Electrolytic)	1.50
22-122	Four Gang Variable		7.00
22-125	8. Mfd.	(Low Voltage Electrolytic. 2 Used)	1.50
22-126	.006 Mfd.	(Tone Control)	.55
22-127	.000025 Mfd.	(A.V.C. Coupling)	.35
22-129	Oscillator, Padding		.75

RESISTORS

63-111	2M	Ohm	1	Watt (1st A. F. Cathode)	$ .30
63-121	100M	Ohm	1	Watt (2nd Det. Plate)	.30
63-131	400	Ohm	½	Watt (A.V.C. Voltage Divider)	.30
63-135	25M	Ohm	½	Watt (2nd Detector Cathode)	.30
63-137	250M	Ohm	½	Watt (1st A. F. Grid)	.30
63-140	1 Meg.	Ohm	½	Watt (Oscillator Grid)	.30
63-144	3 Meg.	Ohm	½	Watt (A.V.C. Grid)	.30
63-146	2M	Ohm	½	Watt (1st A. F. Cathode)	.30
63-166	1400	Ohm	¼	Watt (3 Used. See Footnote)	.30
63-167	8M	Ohm	1	Watt (A.V.C. Divider)	.30
63-168	3600	Ohm	2	Watt (Plate Voltage Divider)	.50
63-169	400M	Ohm	½	Watt (A.V.C. Plate)	.30
63-170	2800	Ohm	2	Watt (Plate Voltage Divider)	.50
63-171	Manual Volume Control and Switch Assembly				1.65
63-172	Tone Control				1.00
63-173	750	Ohm		Metal Mounting (Power Tube Bias)	.40
63-180	1M	Ohm	½	Watt (1st Detector Cathode)	.30
63-188	4½ Meg.	Ohm	½	Watt (A.V.C. Plate)	.30

Note: All resistors employed in this receiver are marked in accordance with R. M. A. standards. Color code charts may be obtained by writing direct to the Erie Resistor Corp., Erie, Pa.

S-912	Intermediate Transformer Complete (2 Used) (Specify with or without grid lead)	$2.50
S-916	Antenna and 1st R. F. Coils	.75
S-997	1st Detector Complete	1.25
S-999	Oscillator Coil Complete	1.25

Note: 22-112 Filter Choke By-pass and 1st Audio Coupling Condensers.
22-113 1st R. F., 1st Det. and I. F. Screen. 2nd Det. and A. F. Cathode.
22-115 2nd Det. and I. F. Grid Return. 1st Det. Cathode.
63-166 1st R. F., 1st Det. and I. F. Grid Return Resistor.

ALL PRICES ARE SUBJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE.

REPLACEMENT PARTS

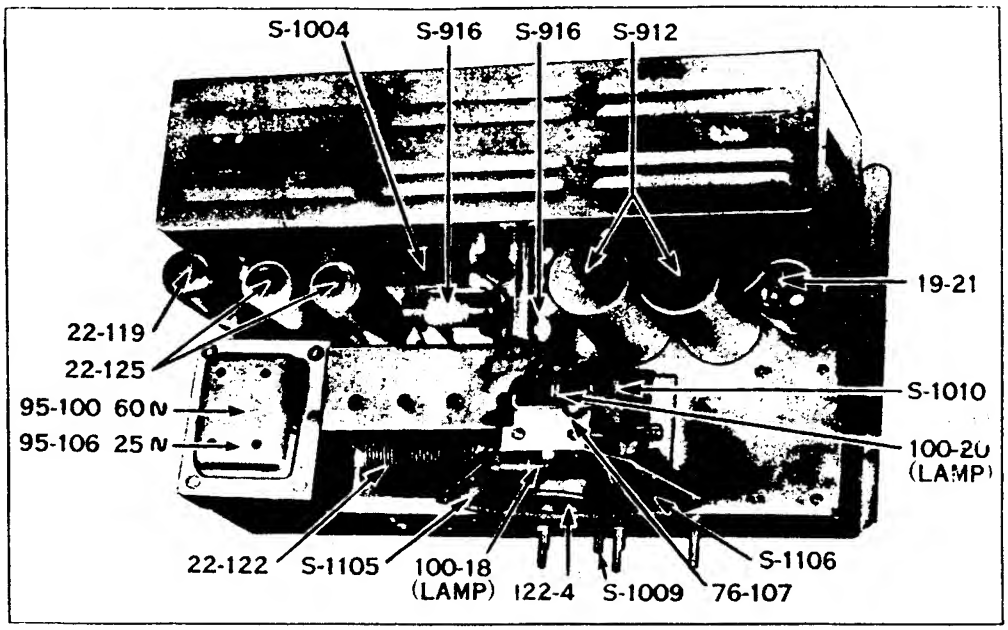


FIG. 6

DIAL ASSEMBLY

6-14	Pointer Arm Bearing	$ .20
15-12	Dial Light Cap	.35
76-107	Dial Elevator Shaft	.10
80-72	Pointer Arm Tension Spring	.08
94-119	Roller Bushings	.08
100-18	2½V Meter Lamp	.25
100-20	3¼V Dial Lamp	.70
122-4	Tuning Meter and Cord	2.25
148-3	Dial Elevator Arm	.35
S-1003	Dial Lamp Socket and Clip (less Lamps)	.60
S-1009	Tuning Shaft and Bracket Assembly	1.50
S-1010	Drum Gear and Cam	.85
S-1105	Dial Strip and Bracket Assembly	.60
S-1106	Dial Pointer and Reflector Plate	1.50

MISCELLANEOUS

19-21	Grid Lead Clips	$ .02
20-7	2nd Detector Plate Choke	.50
24-24	Electrolytic Condenser Cover	.02
46-53	Knobs (3 Used)	.25
46-54	Knobs	.20
49-37J	Dynamic Speaker	15.00
57-308	Escutcheon Plate for Dial	.80
57-309	Escutcheon Plate for Meter	.35
73-8	Dial Drum Bushing Set Screw	.02
73-11	Knob Set Screws	.03
78-28	Stationary Automatic Pilot Lamp Socket	.35
78-36	Z-51 Socket	.20
78-37	Z-27 Socket	.20
78-38	Z-24 Socket	.20
78-40	Z-80 Socket	.20
78-41	Z-45 Socket	.20
85-31	Local Distance Switch	.85
93-152	Volume Control Washer (Large Insulating)	.05
93-153	Volume Control Washer (Small Insulating)	.01
93-154	Cup Washer for Electrolytic Condenser	.05
93-155	Insulating Washer	.05
95-100	60 Cycle Power Transformer	7.00
95-106	25 Cycle Power Transformer	11.50
112-10	Tube Shield Thumb Screw	.05
S-458	A. C. Line Cord and Plug	.40
S-998	Speaker Cord and Connector Strip	.75
S-1004	Antenna Series Condenser and Binding Post Assembly	1.15
MS-173	Five Lead Push Pull Transformer	4.50
MS-174	Power Choke	3.50

ALL PRICES ARE SUBJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE.

ZENITH AUTOMATIC RADIO

(SUPPLEMENT TO SERVICE MANUAL 4A)

GENERAL

This supplement covers an improvement in the 10-tube Superheterodyne. It is confined entirely to the Manual volume control circuit as may be seen by comparing the diagram on page three with the schematic shown on page 5 of the 4A service manual. In all receivers produced, bearing serial number 373,334 on Model 91 and 301,394 on Model 92 or higher, this change is incorporated.

The manual control has been removed from the A. V. C. cathode and placed in the grid circuit of the 1st A. F. stage. A tapped resistor takes the place of the original control. By use of this new system, the automatic volume control operates independently and at full efficiency, manual volume being controlled by varying the audio output.

It should be noted that since the A. V. C. or R. F. circuit remains constant, the tuning meter will show maximum swing on the station at any manual control setting. Originally the meter action decreased as the volume was lowered.

All voltages, tube locations and parts listed in the 4A Manual apply directly and are to be used when servicing either type set. The balancing process remains unchanged. The parts list show previously, except for the substitutions given below, should be used when ordering replacement components.

PARTS CHANGE

(Receivers bearing No. 373,334 on Model 91 and No. 301,394 on Model 92, or higher.)

1 Audio Volume control, part No. 63-212, List **$1.65**

1 Center tapped resistor, part No. 63-210, List **$0.50**

Deduct the 63-171 volume control.

ZENITH RADIO CORPORATION

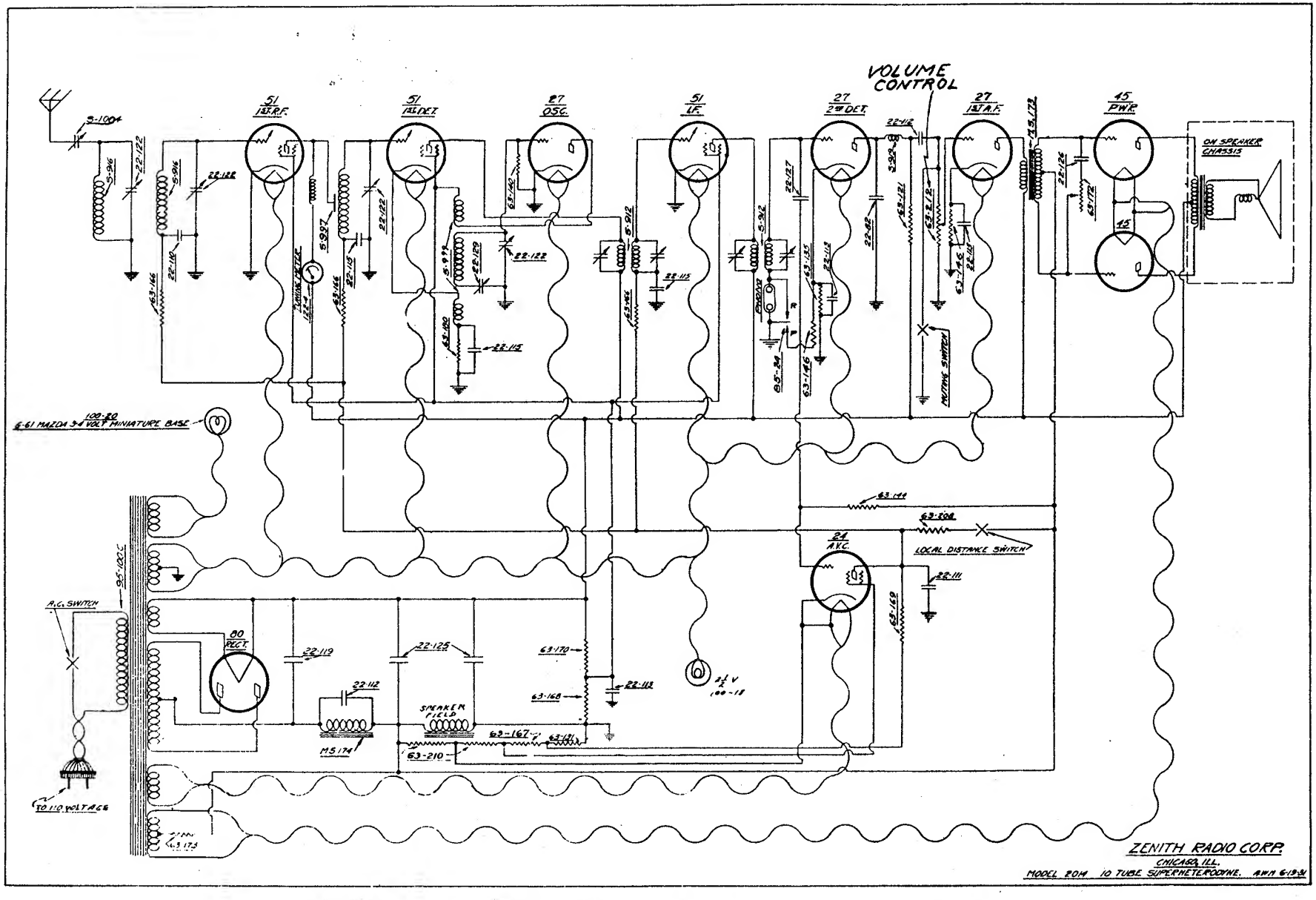


Fig. 1—CIRCUIT DIAGRAM—MODELS 91-92 (Serial Nos. after 373,334 and 301,394 respectively)

ZENITH AUTOMATIC RADIO

Supplement to Service Manuals No. 4A & 4B

for

MODELS 91 - 92

All ten-tube Zenith Superheterodynes produced after the following serial numbers will incorporate a variable Sensitivity Control in place of the original Local-Distance switch.

Model 91 No. 375,532

Model 92 No. 302,007

The diagram on the reverse side indicates its position as being connected into the I. F. cathode. In addition to the control unit the first detector coil has been replaced by one having slightly different construction to provide equal sensitivity over the entire tuning range. It is not advisable to make this change in receivers subsequent to the numbers given for the reason that each complete set of chassis coils must be inductively matched, otherwise the efficiency of the receiver will be seriously affected.

With exception of the above all data given in the 4A manual, such as method of balancing, tube layout, etc., should be followed closely when repairs or adjustments are necessary.

The followings alteration makes the 4A parts list directly applicable to the improved models:

DEDUCT

	No.	Description	List
1	85-31	Local-Distance switch	.85
1	S-997	First detector coil	1.25
1	63-224	8 meg. resistor	.30
1	63-135	25,000 ohm resistor	.30

ADD

1	63-228	Sensitivity Control	1.00
1	S-2104	Detector Coil Assembly	1.25
1	22-115	Bypass condenser	.30
1	63-136	50,000 ohm resistor	.30

ZENITH RADIO CORPORATION

3620 IRON ST. DECEMBER, 1931 CHICAGO, ILL., U. S. A.

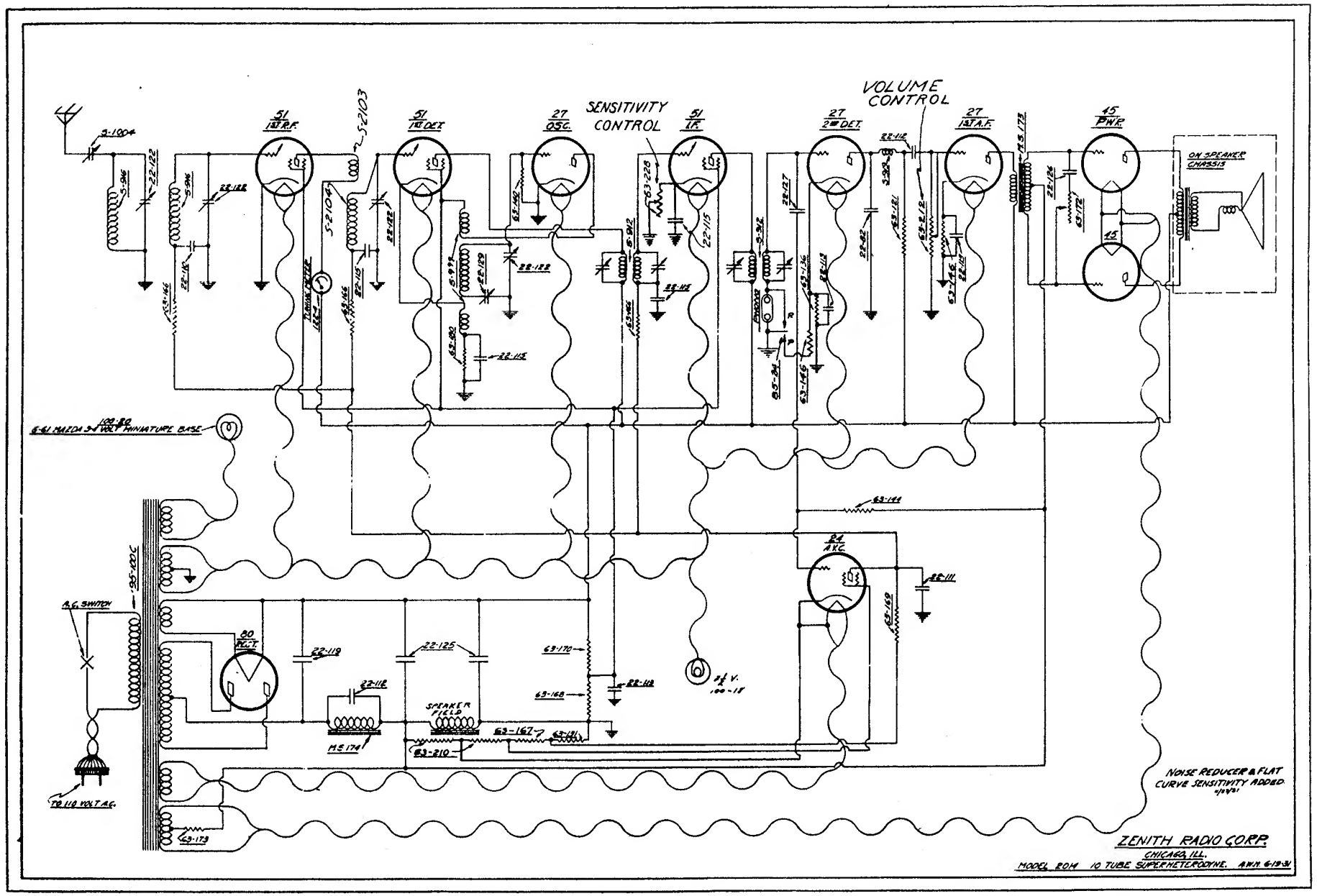
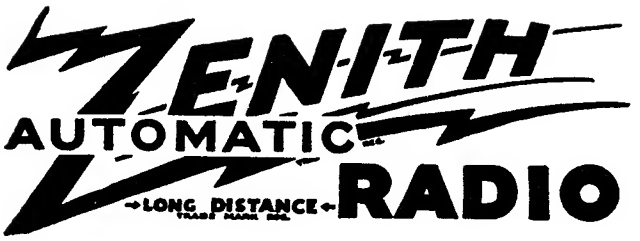


Fig. 1–CIRCUIT DIAGRAM–MODELS 91 After No. 375,532, 92 After No. 302,007


ZENITH
AUTOMATIC
LONG DISTANCE
RADIO

SERVICE DATA

for

ZENITH AUTOMATIC LONG DISTANCE RADIO

14 TUBE A. C.

SUPERHETERODYNE

RECEIVERS

MODEL 103

No. 5A

Made by

ZENITH RADIO CORPORATION

3620 IRON ST. SEPTEMBER, 1931 CHICAGO, ILL., U. S. A.

ZENITH AUTOMATIC RADIO

GENERAL

This No. 5A Service Manual is published as a supplement to No. 4A, which covers in detail the Zenith ten-tube Superheterodyne models. Since circuit action of the fourteen tube receiver is fundamentally the same as the ten, function of the Superheterodyne is not repeated in the following pages. Many refinements over the Models 91 and 92 are to be found in the Model 103. However, since they take the form of additional R. F. and audio stages, they need not be considered as independent subjects.

The "Service Data Chart" outlined in manual 4A should be consulted in determining the reason for complaint, since it applies directly to the fourteen tube set. Of course, the usual service procedure with respect to antenna, ground and tubes should always come first in order.

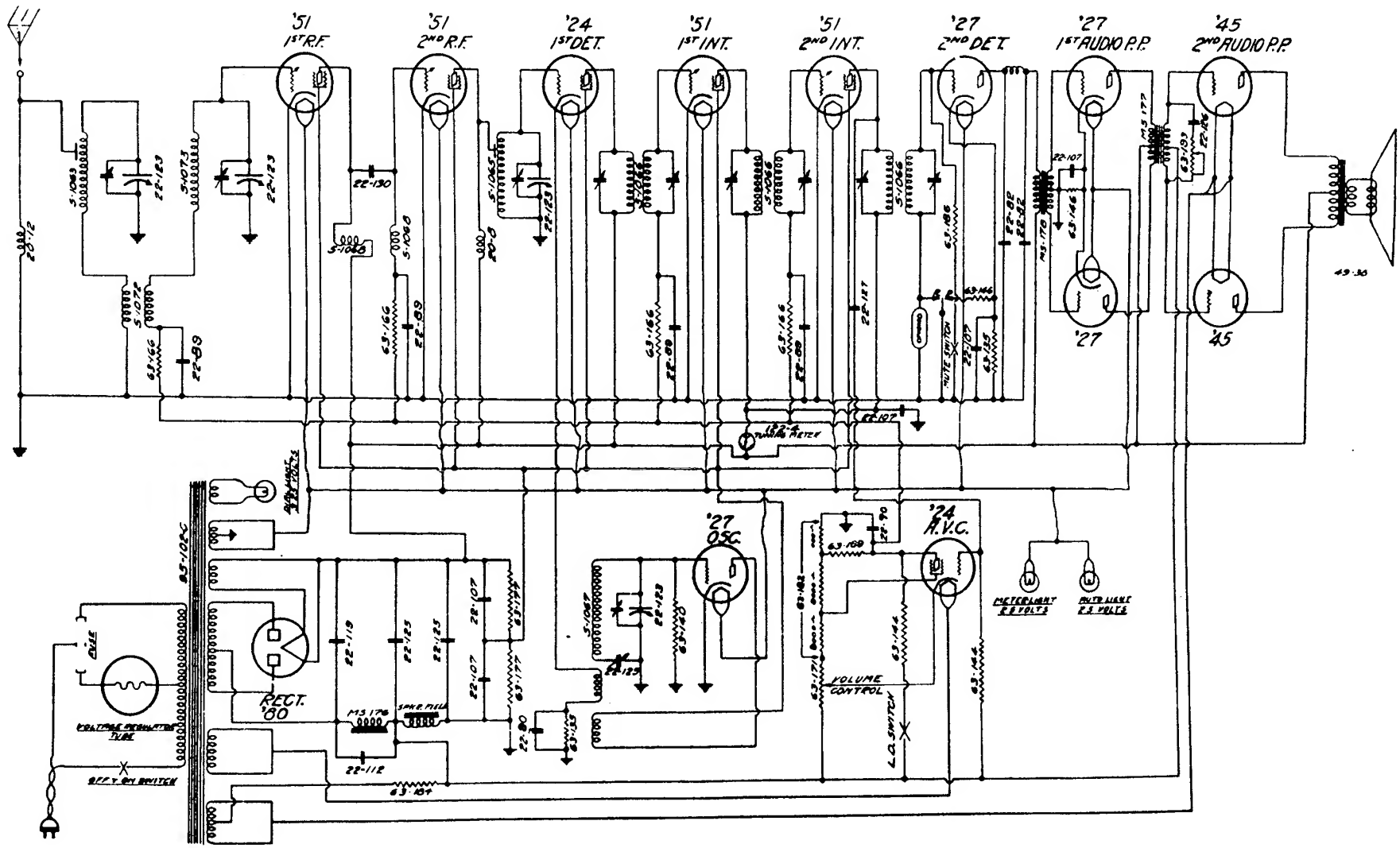
It should be noted that the line fuse provided in the rear of the chassis has two positions. The fuse should normally be used in the "Regulator Tube In" position. If the regulator tube becomes defective and a replacement is not immediately available, the fuse may be placed in the "Regulator Tube Out" clips. Do not leave the voltage regulator tube out permanently since line fluctuation or high voltage may cause damage to the tubes or power transformer.

OPERATION

The Model 103 employs a preselector and two R. F. amplifiers before the 1st detector. The first Multi-mu R. F. stage is tuned while the 2nd stage is impedance coupled or untuned. The first detector is coupled through its cathode to the oscillator and the plate circuit tuned to the intermediate frequency of 175 K. C. Two Multi-mu intermediate stages follow and supply energy to the Z-27 second detector. Its grid is also tuned to the intermediate frequency. The second detector is transformer coupled to a pair of push-pull Z-27's which in turn feed the Z-45 push-pull output stage.

It should be noted that the phonograph pick-up switch and jacks are connected in the grid return circuit of the second detector, consequently a howl will be heard if the phono switch is thrown to the phono position without a phono pick-up having been attached. Be sure this action is taken into consideration when servicing the receiver or if there is a complaint of very weak reception accompanied by a very peculiar howl.

ZENITH RADIO CORPORATION



CIRCUIT DIAGRAM

(SERIAL NOS. 450,001 TO 450,450 ONLY)

ZENITH RADIO CORP.
CHICAGO, ILL.
14 TUBE SUPERHETERODYNE
MODEL 8017

Fig. 1

Balancing Chassis

Each Zenith Superheterodyne receiver is carefully balanced on a temperature controlled Crystal Oscillator before leaving the factory and should require no further attention in this respect. However, in the event that a part of the R. F. circuit has been changed or the phasing adjustments shifted by mishandling, the chassis may be re-balanced as follows:

A test oscillator will give more accurate results and is, therefore, recommended in preference to use of a broadcast signal. It should be calibrated from 1500 to 550 K. C. and also provide a 175 K. C. signal. An output meter is not required since the tuning meter on the set is connected to the intermediate stages in such a way that it shows a variation during adjustment of any R. F. or intermediate circuit of the set. It is only necessary to watch the tuning meter for greatest swing to the right when adjusting the R. F. and I. F. trimmer condensers.

The chassis should be removed from the cabinet for this operation so that all adjustments are easily accessible. The test oscillator should be set to 1500 K. C. and attached to the antenna and ground posts. If a broadcast signal is used, tune to a station as near to 1500 K. C. as it is possible to hear. In this case the dial must point to the exact frequency on which the station operates.

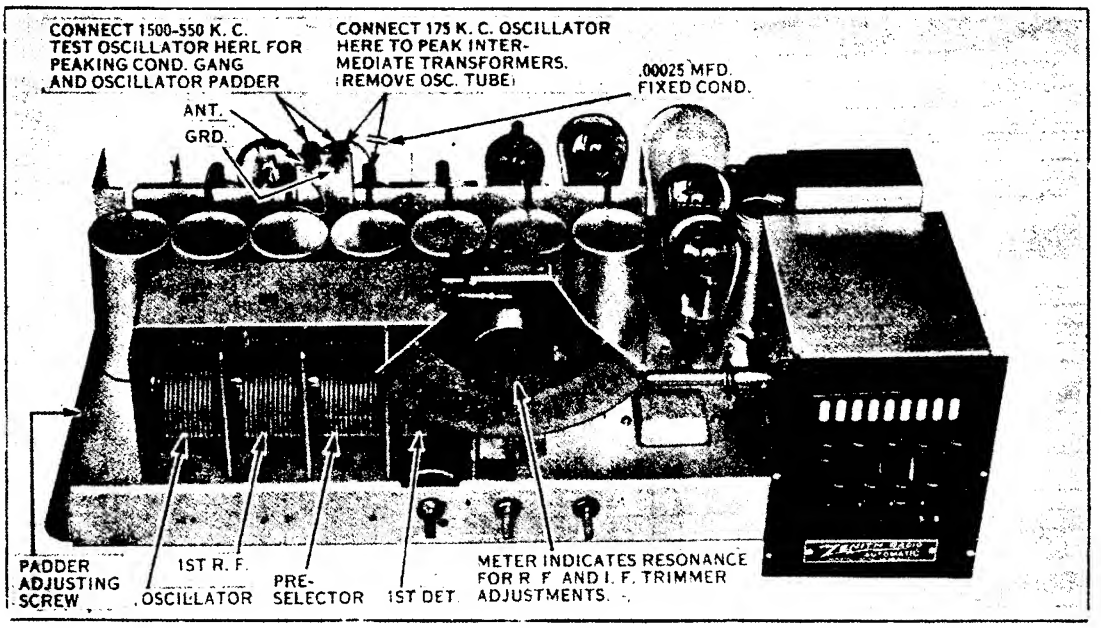


Fig. 2

First turn the trimmer provided on the oscillator section of the condenser gang (See fig. 2) and peak for greatest deflection, to the right, of the tuning meter. The second section from the left tunes the 1st R. F. stage and is next in order. Also peak for the greatest swing of the meter. The preselector or third, and the 1st detector or fourth sections follow in turn and are adjusted in the same manner. The second R. F. stage is of the fixed impedance type, and therefore requires no adjustment. The untuned coils are concealed beneath the chassis in a small round shield.

When the trimmers have been resonated, set the dial to 550 K. C. and tune the test oscillator until it is heard clearly in the speaker. This may also be done by tuning to a station at or near 550 K. C. Turn the oscillator padding condenser screw for greatest swing to the right on the tuning meter, while rocking the dial back and forth over the signal. The padder adjusting screw will be found on the left side of the chassis base when looking from the front. (See Figure 2.)

The six intermediate adjusting screws provided beneath the chassis, directly under the intermediate transformers (See fig. 5) are to be used only when it is absolutely certain that trouble lies at that point. If it is necessary to change the setting connect an accurate 175 K. C. test oscillator to the ground post and to the 1st detector grid cap through a .00025 mfd. fixed condenser. The oscillator tube must be removed for this operation. Beginning with the first detector plate screw (the one farthest to the left when viewing the chassis from underneath with the control shafts at the top) each one is tuned for maximum swing of the tuning meter. The procedure applies to all but the last or second detector grid vernier. The meter is not effected by this circuit, therefore, it will be necessary to turn it to a point which gives greatest volume from the speaker.

ZENITH AUTOMATIC RADIO

Socket Voltages

Type	Position	Fil. Volts	Plate Volts	Control Grid Volts	Cathode Volts	Plate M. A.	S. G. Volts
Z-51	1st. R. F.	2.2	185	— 9.	0.	2.5	80
Z-51	2nd. R. F.	2.2	200	— 3.9	0.	3.	84
Z-24	1st Det.	2.2	185	0.	+ 7.	.25	70
Z-27	Osc.	2.2	80	0.	0.	7.	0
Z-51	I. F.	2.2	185	— 4.	0.	3.	90
Z-51	I. F.	2.2	185	— 4.	0.	2.	90
Z-27	2nd. Det.	2.2	185	0.	+17.5	.5	0
Z-27	1st. P. P.	2.2	165	0.	+12.5	3.	0
Z-27	1st. P. P.	2.2	165	0.	+12.5	3.	0
Z-45	2nd. P. P.	2.3	240	—48.	0.	36.	0
Z-45	2nd. P. P.	2.3	240	—48.	0.	36.	0
Z-24	A. V. C.	2.3	30	— .4	0.	0.	45
Z-80	Rect.	5	350	0.	0.	70.	0
	Vol. Reg.	Con-	tin-	uity	test	only.	

Voltage readings taken with a Weston model 566 type 3 tester. Manual volume control in maximum position and antenna and ground disconnected. Line voltage 112

Fig. 3

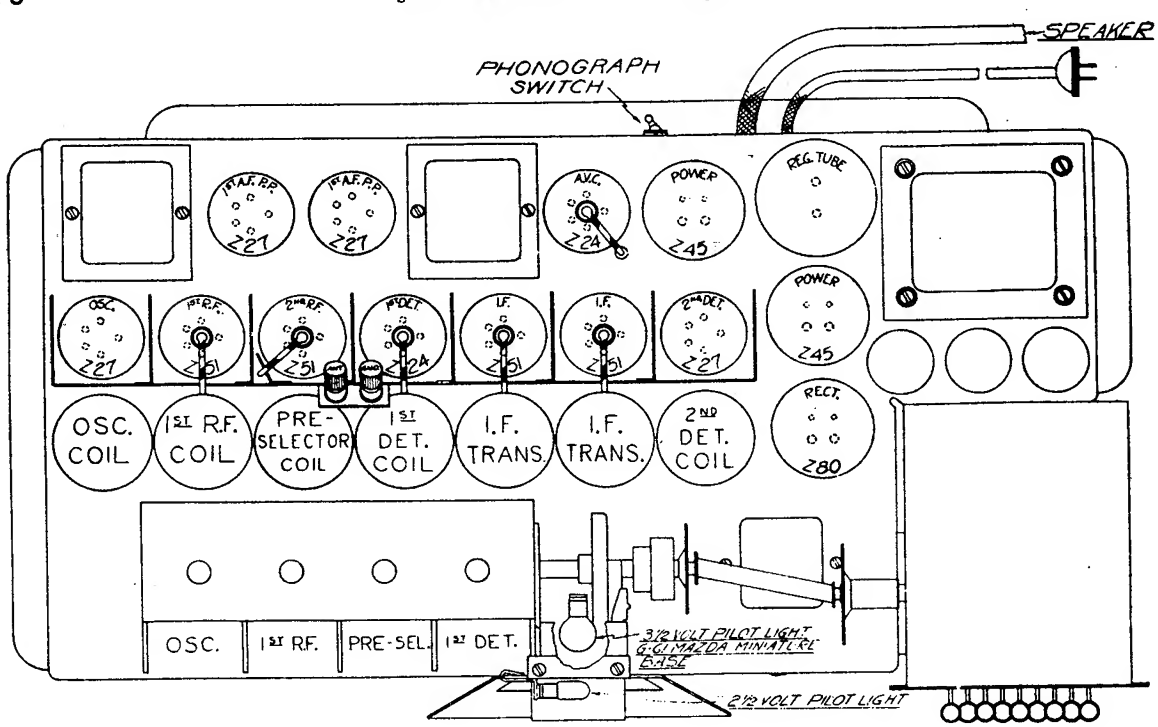


Fig. 4 TUBE LAYOUT - Showing Position and Circuit Function of each.

Replacement Parts

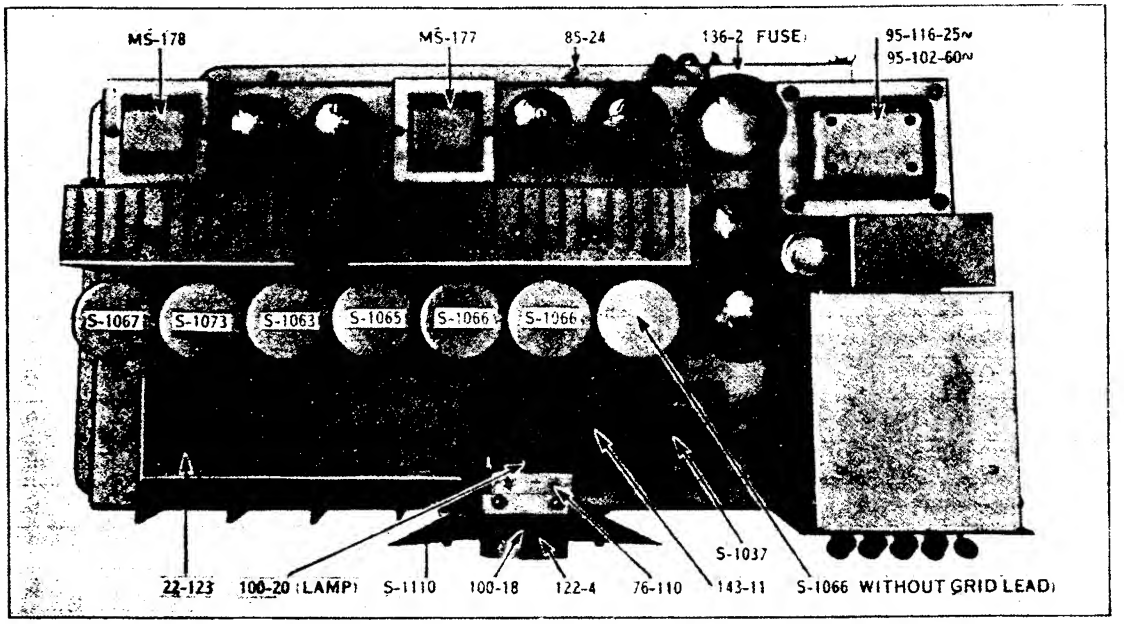


Fig. 5

CONDENSERS

22-82	.001	Mfd.	(2nd Detector Plate)	$ .30
22-89	.1	Mfd.	(2 used, see footnote)	.85
22-90	.1	Mfd.	(2 used, see footnote)	.55
22-107	.1	Mfd.	(5 used, see footnote)	.85
22-112	.1	Mfd.	(Choke Bypass)	.35
22-119	6.	Mfd.	(Electrolytic)	2.50
22-123	Four Gang Variable			10.00
22-125	8.	Mfd.	(Electrolytic)	1.50
22-126	.006	Mfd.	(Tone Control)	.55
22-127	.000025	Mfd.	(A. V. C. Coupling)	.35
22-129	Padder			.75
22-130	.0001	Mfd.	(R. F. Coupling)	.20

RESISTORS

63-135	25M	Ohm	(1st, 2nd Detector Cathode)	.30
63-140	1 Meg	Ohm	(Oscillator Grid)	.30
63-146	2M	Ohm	(2nd Detector and A. F.)	.30
63-166	1400	Ohm	(R. F. and I. F. Grid Return)	.30
63-169	400M	Ohm	(A. V. C. Plate)	.30
63-182	16400	Ohm	(A. V. C. Divider, Metal Mtg.)	.75
63-183	6M	Ohm	(Voltage Divider, see footnote)	.65
63-184	750	Ohm	(Power Bias)	.30
63-186	5M	Ohm	(2nd Detector Grid)	.30
63-192	Volume Control and Switch Assembly			1.75
63-193	Tone Control			1.00
63-144	3 Meg	Ohm	(A. V. C. Grid)	.30

COILS

20-8	2nd R. F. Plate Choke	.50
20-12	Antenna Choke	.50
S-919	2nd Detector Plate Choke and Bracket	.60
S-1063	Pre-Selector (Coil Only)	2.00
S-1073	1st R. F. (Coil Only)	.90
S-1065	1st Detector (Coil Only)	1.80
S-1066	I. F. Transformer (Specify with or without Grid Lead)	2.85
S-1067	Oscillator (Coil Only)	1.65
S-1068	2nd R. F. Untuned Transformer	2.00
S-1072	Coupling Coil	.90

Note: 22-89 1st, 2nd, R. F. and 1st, 2nd, I. F. Grids.
22-90 1st Detector Cathode and A. V. C. Plate.
22-107 2nd Detector Cathode, 1st A. F. Bias, I. F. Plate and Voltage Divider.
63-183 Specify—Porcelain or Metal Mounted Type.

IMPORTANT: GIVE SERIAL NUMBER OF RECEIVER ON ALL PARTS ORDERS.
ALL PRICES ARE SUBJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE.

Replacement Parts

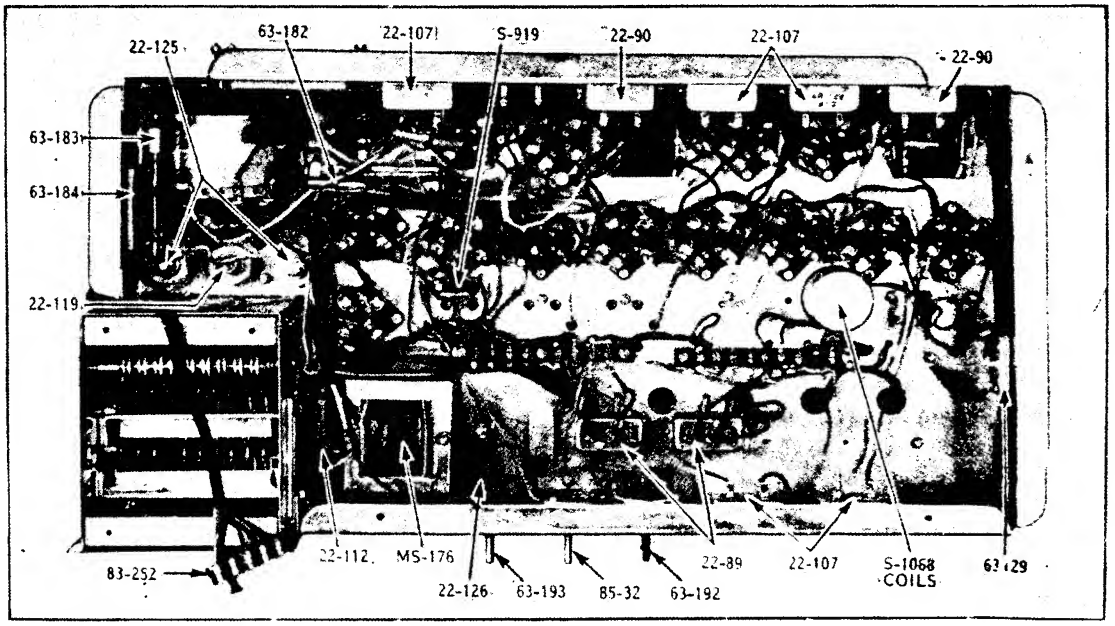


Fig. 6

DIAL ASSEMBLY

S-1003	Dial Light Socket and Clip (less lamp)	$ .60
S-1009	Tuning Shaft and Bracket Assembly	1.50
S-1010	Drum Gear and Cam	.85
S-1106	Dial Pointer and Reflector Plate	1.50
S-1110	Dial Strip and Bracket	.85
6-14	Pointer Arm Bearing	.20
15-12	Dial Light Clip	.35
76-110	Dial Elevator Shaft	.10
80-72	Pointer Arm Tension Spring	.08
94-119	Roller Bearings	.08
100-18	2½ volt Meter Lamp	.25
100-20	3¼ volt Dial Lamp	.60
122-4	Tuning Meter and Cord	2.25
148-3	Dial Elevator Arm	.35

MISCELLANEOUS

19-21	Grid Clip	.02
44-4	Phono Jack Base Assembly	.30
46-49	Tuning Knob	.25
46-55	Control Knob (3 used)	.20
49-38	Dynamic Speaker	25.00
52-25	Speaker Multicord	.45
57-308	Dial Escutcheon Plate	.80
57-309	Meter Escutcheon Plate	.35
73-8	Small Set Screw for Auto Coupling	.01
78-36	Z-51 Socket	.20
78-37	Z-27 Socket	.20
78-38	Z-24 Socket	.20
78-40	Z-80 Socket	.20
78-41	Z-45 Socket	.20
78-42	Amperite Socket	.15
83-252	Speaker Multicord Terminal Strip	.20
85-24	Phono Switch	.75
85-32	Local Distance and Mute Switch	1.00
93-147	Electrolytic Condenser Insulating Washer	.02
95-102	110 volt 60 cycle Power Transformer	8.00
95-116	110 volt 25 cycle Power Transformer	13.50
114-6	Large Set Screw for Auto Coupling	.05
136-2	2 amp Fuse	.10
143-11	Auto Coupling Collar	.85
S-1037	Auto Control Shaft Assembly	.90
MS-176	Power Choke	4.00
MS-177	Audio Transformer (Six Lead)	5.50
MS-178	Audio Transformer (Five Lead)	5.50

IMPORTANT: GIVE SERIAL NUMBER OF RECEIVER ON ALL PARTS ORDERS.
ALL PRICES ARE SUBJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE.

ZENITH AUTOMATIC RADIO

GENERAL

This supplement covers an improvement in the Model 103, fourteen tube Superheterodyne. It is confined entirely to the Manual volume control circuit as may be seen by comparing the diagram on page three with the schematic shown on the same page of the 5A Service Manual. In all receivers produced bearing serial number 450,451 or higher this change is incorporated.

The manual control has been removed from the A. V. C. cathode and placed in the grid circuit of the 1st A. F. stage. A tapped resistor takes the place of the original control. By use of this new system, the automatic volume control operates independently and at full efficiency, manual volume being controlled by varying the audio output.

It should be noted that since the A. V. C. or R. F. circuit remains constant, the tuning meter will show maximum swing on the station at any manual control setting. Originally the meter action decreased as the volume was lowered.

All voltages, tube locations, and parts listed in the 5A Manual apply directly and are to be used when servicing either type set. The balancing process remains unchanged. The parts list shown previously, except for the substitutions given below, should be used when ordering replacement components.

PARTS CHANGE

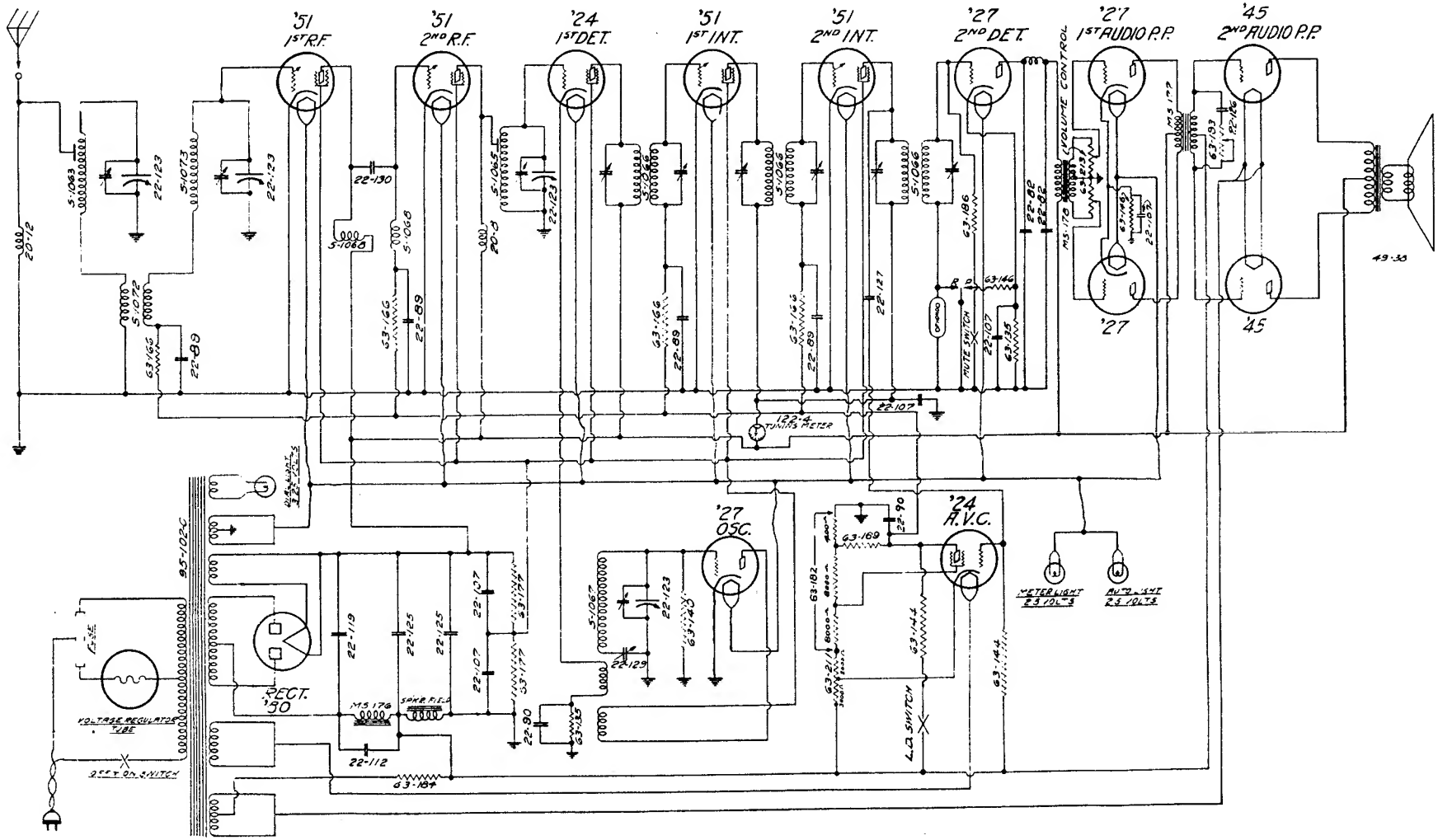
(Receivers bearing No. 450, 451 or higher, only)

1 Double section Audio Volume Control, part No. 63-213
List **$3.00**

1 Center tapped resistor, part No. 63-211
List **$0.50**

Deduct the 63-171 volume control.

ZENITH RADIO CORPORATION



CIRCUIT DIAGRAM

(SERIAL NOS. AFTER 450,451 ONLY)

ZENITH RADIO CORP.
CHICAGO, ILL.
4 TUBE SUPERHETERODYNE
MODEL 2017

W.D. 6-5-N

Fig. 1

SERVICE BULLETIN

No. 5C

Supplement to Service Manuals No. 5A & 5B

for

MODEL 103

All Zenith fourteen-tube Superheterodynes after serial number 451,260, incorporate a variable Sensitivity Control in place of the original Local-Distance switch. This improvement gives more flexible adjustment of the sensitivity thereby reducing the noise between stations for the type of reception desired. Since it constitutes only a few minor parts changes the 5A and 5B service manuals may be followed in making repairs or adjustments.

The change consists essentially of inserting a variable bias resistor into the I. F. cathode returns and transfer of the tuning meter from the I. F. to the R. F. circuit. It is absolutely essential that the meter be changed in the event that this improvement is added in the field, otherwise practically no reading will be obtained when the sensitivity control is used in a lower position.

It should be also noted that the 22-107 bypass condenser, employed in receivers subsequent to number 451,260, has been omitted from the plate to screen circuit and is now used to bypass the I. F. cathodes. A 2,000 ohm limiting resistor is connected in series from this point to the sensitivity control.

In addition to the improvements listed the A. V. C. coupling condenser No. 22-127 has been transferred from the plate of the second I. F. stage to the grid of the second detector. The 400 ohm resistor 63-131 in series with the 63-182 divider lowers the overall sensitivity to a more controllable level.

With the following changes, the parts list given in the 5A and 5B manuals will apply directly.

DEDUCT

	No.	Description	List
1	85-32	Local-Distance switch	.85
1	63-144	3 megohm ½ watt resistor	.30

ADD

1	63-228	Sensitivity Control	1.00
1	63-131	400 ohm ½ watt resistor	.30
1	63-146	2,000 ohm ½ watt resistor	.30

ZENITH RADIO CORPORATION

3620 IRON ST. DECEMBER, 1931 CHICAGO, ILL., U. S. A.

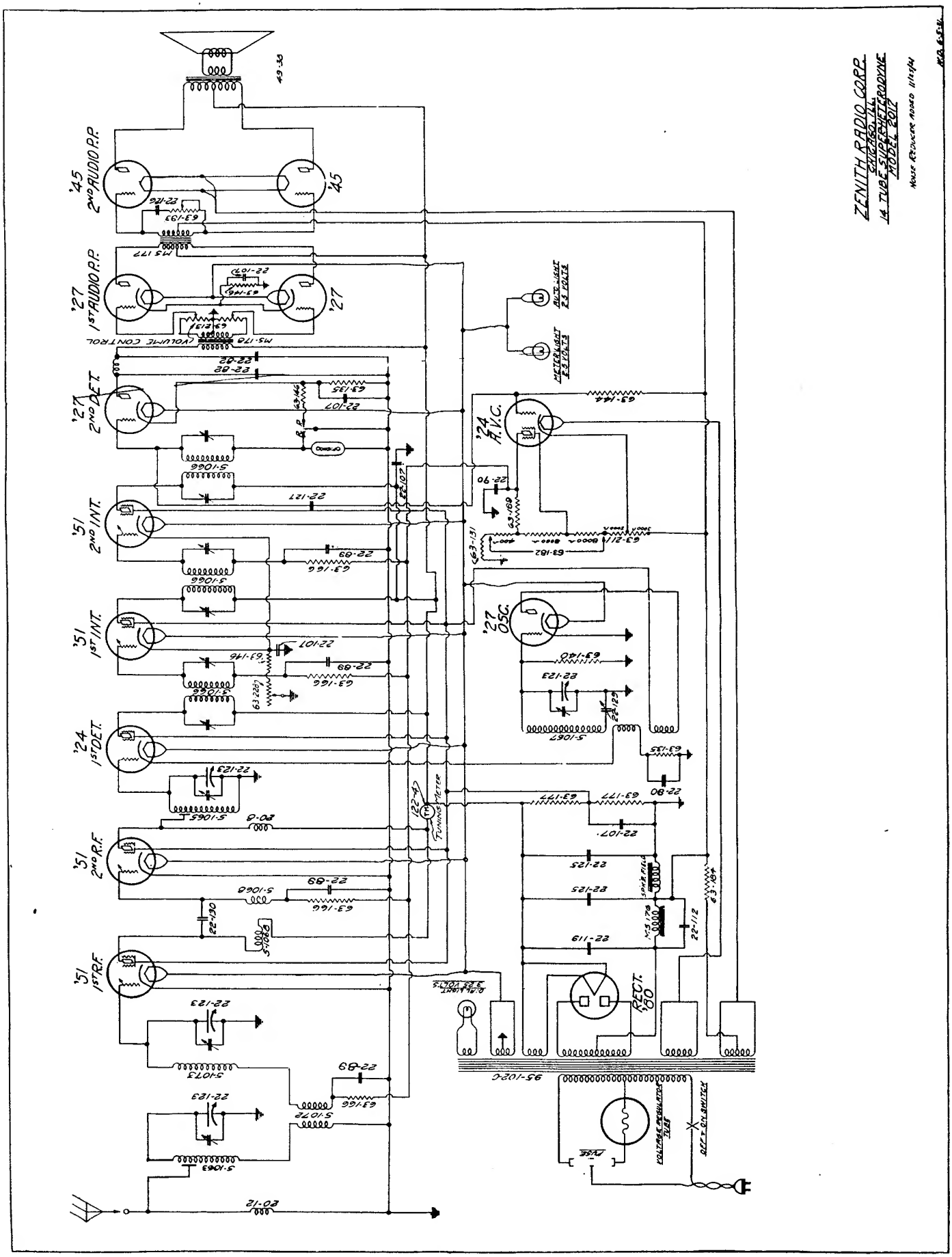
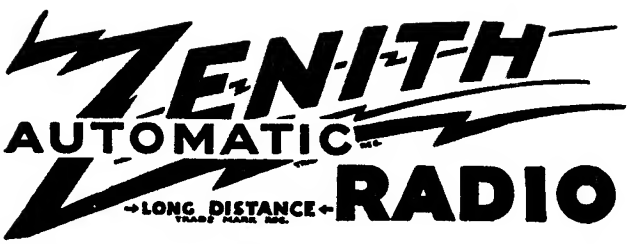
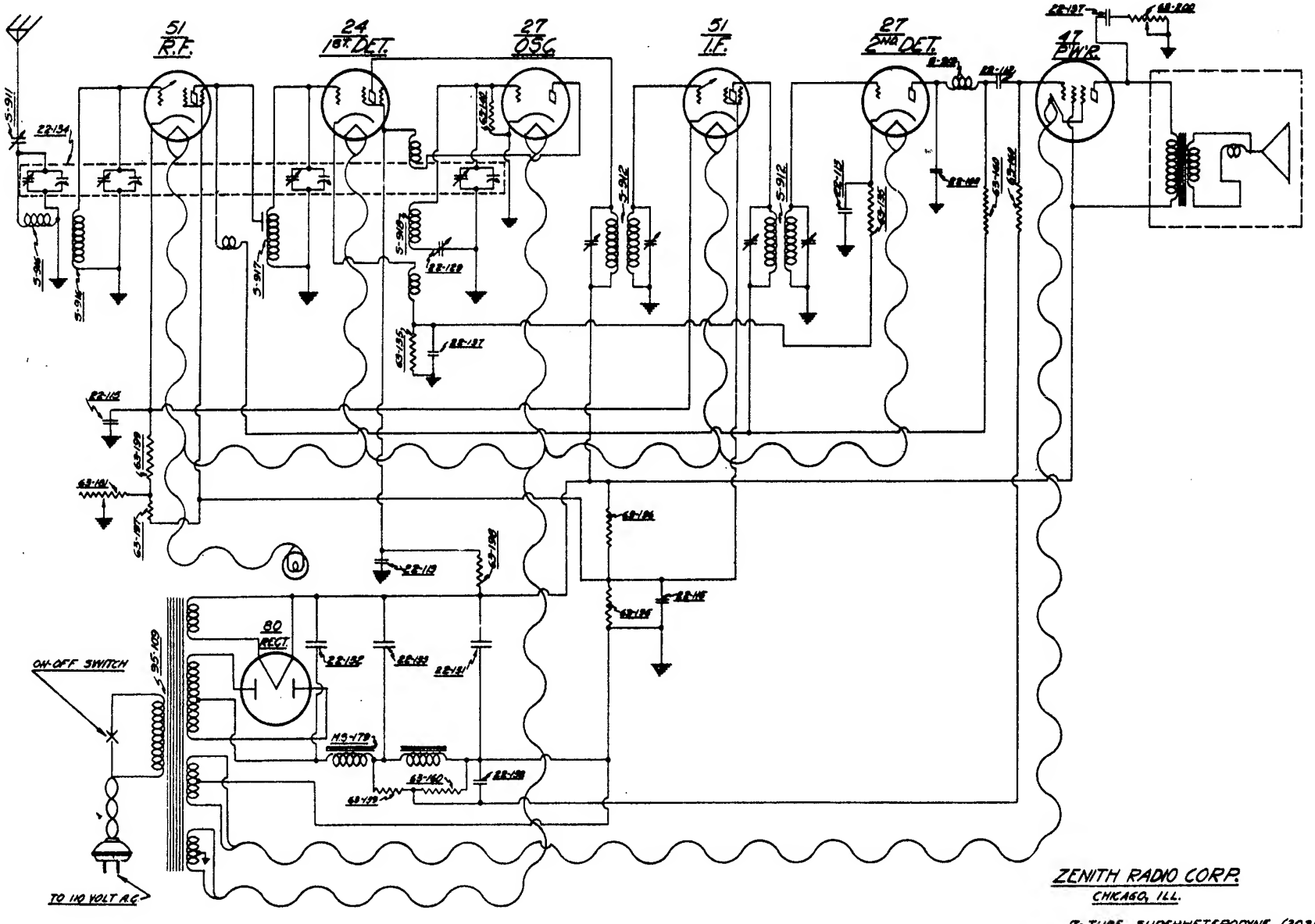


Fig. 1—CIRCUIT DIAGRAM—MODEL 103 After Serial No. 451.260


ZENITH
AUTOMATIC
LONG DISTANCE
RADIO



ZENITH RADIO CORP.
CHICAGO, ILL.

7-TUBE SUPERHETERODYNE (2021)
MODEL BH

A.W.M. 7-14-31

PARTS LIST MODEL BH

	Variable Condenser Assembly	
22-134	Four Gang Condenser	$ 6.00
S-905	Dial Drum Assembly	1.10
S-769	Pilot Lamp Bracket and Socket	.15
00-18	2½ Volt Pilot Lamp	.25
11-3	Pulley String (27") net	.10
30-69	Dial String Tension Spring	.01
S-963	Dial Pointer Mask and Bracket	.25
	Fixed Condensers	
22-108	.002 mfd. (2nd Detector Plate)	.35
22-112	.1 " (Audio Coupling)	.35
22-113	.5 " (See Footnote)	.50
22-115	.1 " (See Footnote)	.35
22-129	Padder Condenser (Variable)	.75
22-132	4. mfd. 450 Volt (Filter)	.85
22-133	2. " 450 Volt (Filter)	.80
22-137	.05 " (See Footnote)	.25
22-138	.2 " (Pentode Grid)	.25
	Resistors	
63-135	25M ohm (See Footnote)	.30
63-139	500M " (Pentode Bias)	.30
63-140	1meg" (Oscillator Grid)	.30
63-160	100M " (See Footnote)	.30
63-181	Volume Control and Switch	1.50
63-195	12M ohm (Voltage Divider)	.50
63-196	6M " (Voltage Divider)	.50
63-197	17M " (R.F. & I.F. Screen)	.30
63-198	30M " (1st Detector Screen)	.30
63-199	150 " Wire Wound (R.F. & I.F.Cathode)	.30
63-200	Tone Control	1.00
	Coils	
S-916	Pre-Selector or 1st R. F.	.75
S-917	1st Detector Coil Complete with Choke and Band	1.25
S-918	Oscillator Coil Complete	1.25
S-912	Intermediate Transformer(Specify with or without Grid Lead)	2.50
S-919	2nd Detector Plate Choke	.60
	Miscellaneous	
49-39	Dynamic Speaker	9.50
MS-179	Filter Choke	1.00
95-108	60 Cycle Power Transformer	4.50
95-111	25 Cycle Power Transformer	6.75
95-112	220 Volt Power Transformer	6.75
S-911	Antenna Series Condenser Assembly	.85
26-23	Calibrated Dial Strip	.20
46-56	Control Knobs	.25
83-228	Speaker Terminal Strip	.15
52-27	Speaker Cord	.25
78-36	Z-51 Tube Socket	.20
78-37	Z-27 Tube Socket	.20
78-38	Z-24 Tube Socket	.20
78-39	Z-47 Tube Socket	.20
78-40	Z-80 Tube Socket	.20

Note: 22-113 - Two used - Bypass 1st Detector Screen and 2nd Detector Cathode.
Note: 22-115 - Two used - Bypass R. F. - I. F. Screens and 1st R. F. Cathode.
Note: 22-137 - Two used - Tone Control and 1st Detector Cathode.
Note: 63-160 - Three used - 2nd Detector Plate, Pentode Grid and Pentode Bias.
Note: 63-135 - Two used - 1st and 2nd Detector Cathodes.

ALL PRICES ARE SUBJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE.

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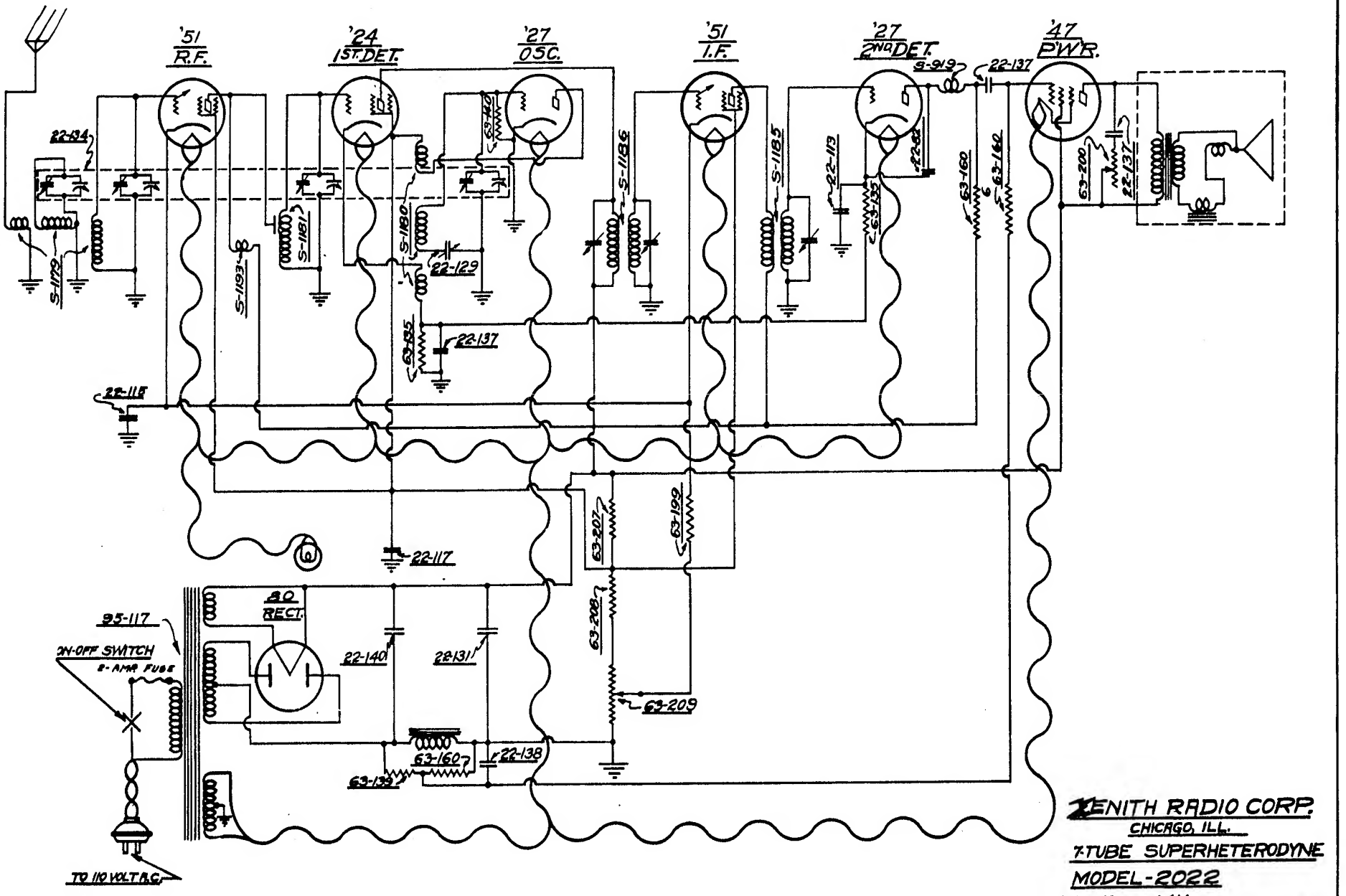
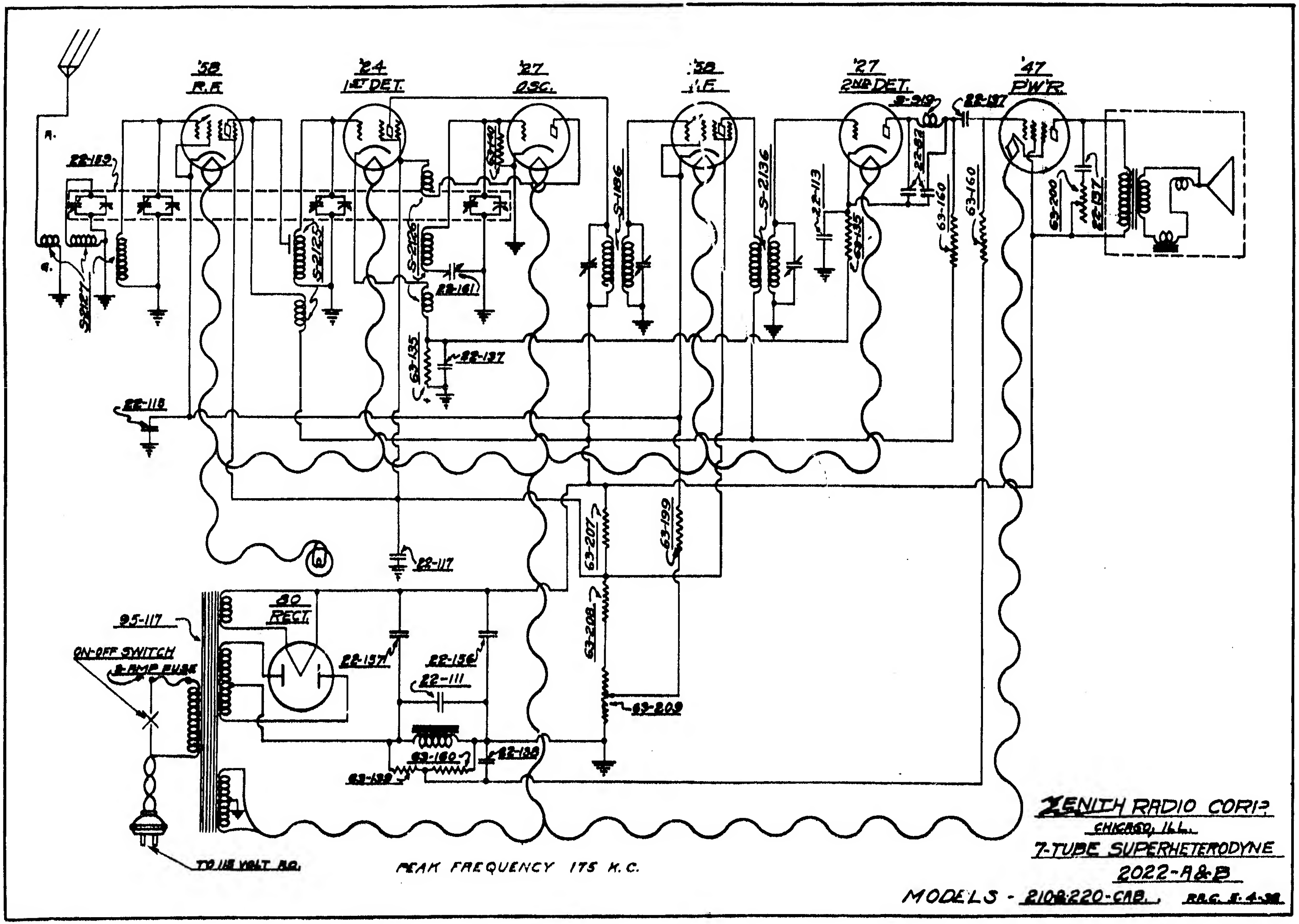

'51 R.F.
'24 1ST. DET.
'27 OSC.
'51 I.F.
'27 2ND DET.
'47 PWR.
22-134
S-1179
S-1193
S-1191
S-1180
22-129
63-135
22-137
22-118
S-1186
S-1185
22-113
22-62
63-135
63-160
63-162
S-919
22-137
63-200
22-137
22-117
63-207
63-199
63-208
63-209
80 RECT.
22-140
22-131
95-117
ON-OFF SWITCH
8-AMP FUSE
63-160
63-139
22-138
TO 110 VOLT A.C.
ZENITH RADIO CORP.
CHICAGO, ILL.
7-TUBE SUPERHETERODYNE
MODEL-2022
LH-WH-MH
FTA.C-8-26-31

	Variable Condenser Assembly	
22-134	Four Gang Condenser	$ 6.00
S-1191	Dial Drum Assembly	.80
11-8	Pulley String per ft	.10
26-28	Dial Strip	.10
80-69	Dial String Cable Tension Spring	.01
100-18	2½ volt Pilot Lamp	.25
S-769	Dial Lamp Socket Assembly (Less Lamp)	.15
	Fixed Condensers	
22-82	.001 mfd. (2nd Detector Plate)	.30
22-113	.5 " (2nd Detector Cathode)	.50
22-115	.1 " (R.F. & I.F. Cathode)	.35
22-117	.5 " (R.F. & 1st Detector Screen)	.50
22-129	Padder	.75
22-131	6. mfd. (Power Filter)	1.25
* 22-137	.05 " (3 used, see footnote)	.25
22-138	.2 " (Power Grid)	.25
22-140	8. " (Power Filter)	1.50
	Resistors	
63-135	25M ohm (1st, 2nd Detector Cathode)	.30
63-139	500M " (Power Grid)	.30
63-140	1meg" (Oscillator Grid)	.30
63-160	100M " (2nd Det. Plate & Power Grid)	.30
63-199	250 " (R.F.& I.F.Cathode, Flexible)	.30
63-200	Tone Control	1.00
63-207	10M ohm (Voltage Divider, Wire Wound)	.35
63-208	12M " (Voltage Divider)	.30
63-209	Volume Control and Switch Assembly	1.25
	Coils	
S-919	2nd Detector Plate Coil	.60
S-1179	R. F. Pre-Selector	1.50
S-1180	Oscillator Coil	.90
S-1181	Detector Coil	.90
S-1185	2nd I. F. Transformer (175 K. C.)	1.50
S-1186	1st I. F. Transformer (175 K. C.)	1.40
S-1193	R. F. Plate Choke and Bracket	.50
	Miscellaneous	
49-40	Dynamic Speaker for LH and WH	8.00
49-41	Dynamic Speaker for MH	8.50
46-58	Control Knobs, all sets, three used	.10
52-27	Speaker Cable	.25
57-326	Escutcheon Plate, all sets	.30
78-36	Z-51 Tube Socket	.20
78-37	Z-27 " "	.20
78-38	Z-24 " "	.20
78-39	Z-47 " "	.20
78-40	Z-80 " "	.20
83-228	Speaker Cable Terminal Strip	.15
95-138	Felt Washer for Control Knob	.01
95-117	60 cycle 110 volt Power Transformer (Specify with or	4.50
95-118	25 cycle 110 volt Power Transformer) without fuse	6.75
95-121	60 cycle 220 volt Power Transformer) clip assembly).	6.75
136-2	2 amp Fuses	.10
S-1151	Heat Insulating Shield	.30
S-1183	Antenna and Ground Mounting Plate Complete	.25
S-1184	Variable Condenser Shield	.85
MS-180	Tube Shield Assembly	.60

IMPORTANT: GIVE SERIAL NUMBER OF RECEIVER ON ALL PARTS ORDERS.

* A. F. COUPLING, TONE CONTROL, AND 1ST DETECTOR CATHODE.

ALL PRICES ARE SUBJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE.


'58
R.F.
'24
1ST DET.
'27
OSC.
'58
I.F.
'27
2ND DET.
'47
PWR.
22-159
S-2127
S-2125
S-2126
22-161
63-135
22-137
22-118
S-186
S-2136
22-113
9-919
22-82
63-160
63-200
22-117
63-207
63-199
63-208
63-209
80
RECT.
95-117
ON-OFF SWITCH
2-AMP FUSE
22-157
22-156
22-111
22-138
63-139
TO 115 VOLT AC.
PEAK FREQUENCY 175 K.C.
ZENITH RADIO CORP.
CHICAGO, ILL.
7-TUBE SUPERHETERODYNE
2022-A&B
MODELS - 2106-220-CAB.

ZENITH AUTOMATIC RADIO

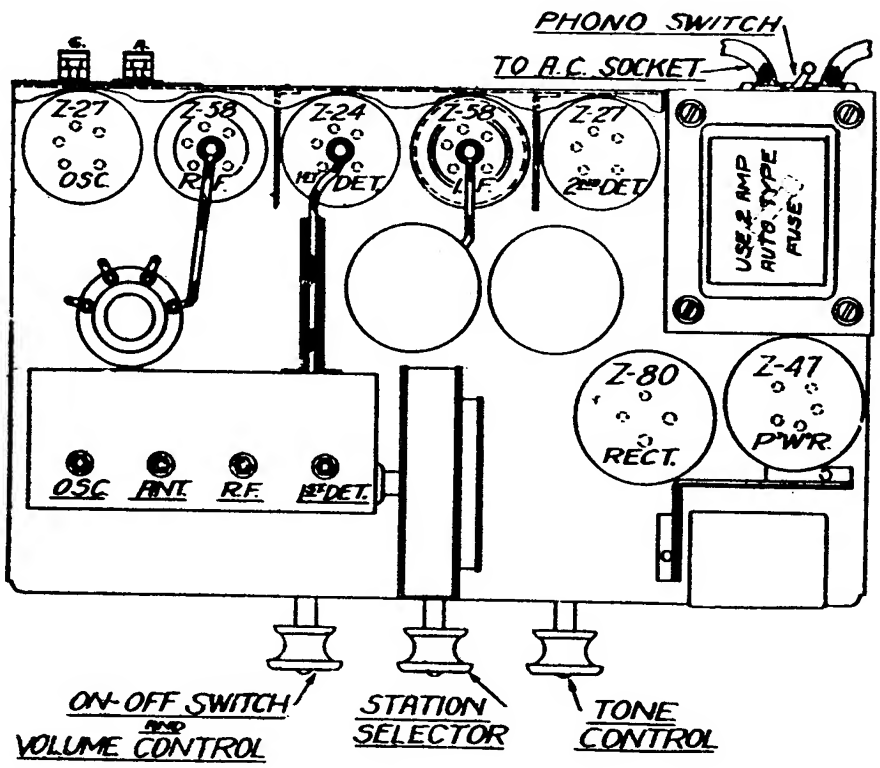
Socket Voltages — Models 210-220-221

Tube Type	Position	Fil. Volt.	Plate Volt.	Cath. Volt.	Screen Volt.	Supp. Volt.	Plate Current
Z-58	R.F.	2.35	248	3	115	3	9.5
Z-24	1st Det.	2.35	248	22	115	-	.4
Z-27	Osc.	2.35	118	-	-	-	3.
Z-58	I.F.	2.35	248	3	115	3	8.
Z-27	2nd Det.	2.35	110	50	-	-	.4
Z-47	Power	2.35	226	-	245	-	38.
Z-80	Rect.	4.8	360	-	-	-	32.

Line 115 Volts — All Controls Maximum

(All readings, with exception of heaters, taken from socket connections to ground. Use 1,000 ohm per volt D. C. meter.)

BALANCE I.F. frequency at 175 K.C. Condenser gang at 1500 K.C. and oscillator padder at 600 K.C.



TUBE LAYOUT MODELS 210-220-221

PARTS AND PRICES
MODELS 210 220

Variable Condenser Assembly

22-159	Four Gang Condenser	$6.00
S-2121	Dial Drum Assembly	.80
11-3	Pulley String.....per ft.	.10
26-34	Dial Strip	.25
100-18	2½ volt Pilot Lamp	.12
S-769	Dial Lamp Socket Assembly (Less Lamp)	.15

Fixed Condensers

22-82	.001 mfd.....(2nd Detector Plate)	.25
22-111	.03 " .....(Filter Choke Bypass)	.20
22-113	.5 " .....(2nd Detector Cathode)	.30
22-115	.1 " .....(R.F. & I. F. Cathode)	.20
22-117	.5 " .....(R.F. & I. F. Detector Screen)	.30
22-161	Padder	.45
22-156	6. mfd.....(Power Filter)	1.25
* 22-137	.5 " .....(3 used, see footnote)	.15
22-138	.2 " .....(Power Grid)	.25
22-157	8. " .....(Power Filter)	1.50

Resistors

63-135	25M ohm.....(1st, 2nd Detector Cathode)	.25
63-139	500M " .....(Power Grid)	.25
63-140	1Meg ".....(Oscillator Grid)	.25
63-160	100M ".....(2nd Det.Plate & Power Grid)	.25
63-199	150 ".....(R.F. & I.F.Cathode, Flexible)	.25
63-200	Tone Control	.80
63-207	10M ohm.....(Voltage Divider, Wire Wound)	.30
63-208	12M " .....(Voltage Divider)	.25
63-209	Volume control and switch assembly	1.25

Coils

S-919	2nd Detector Choke	.60
S-2125	Detector Coil	.90
S-2126	Oscillator Coil	.90
S-2127	R.F. Pre-selector	1.50
S-1186	1st I.F. Transformer.....(175 K.C.)	1.40
S-2136	2nd I.F. Transformer.....(175 K.C.)	1.30

Miscellaneous

49-44	Dynamic Speaker	8.00

* A.F.COUPLING, TONE CONTROL, AND FIRST DETECTOR CATHODE.

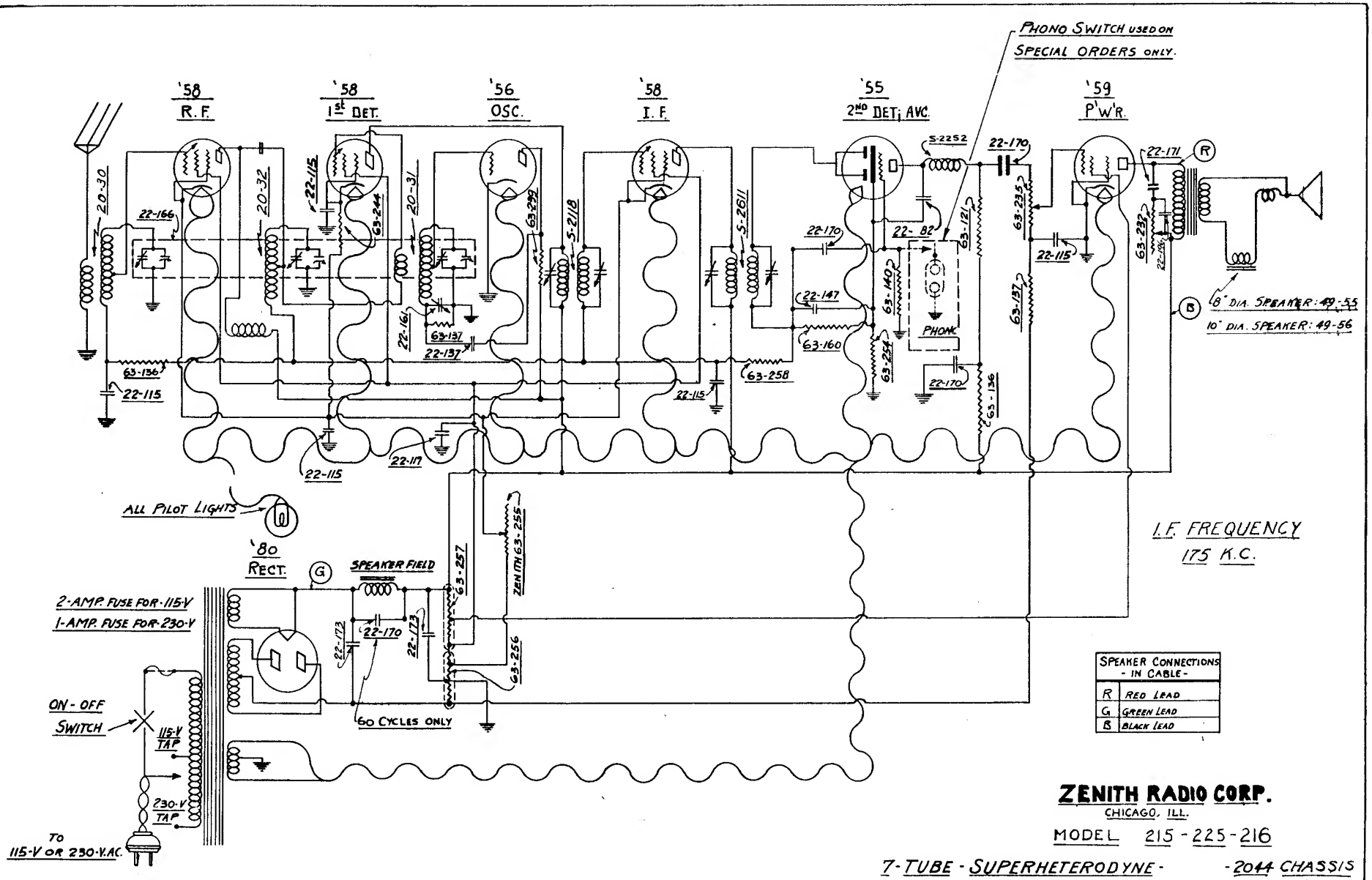
Miscellaneous (Cont'd)

46-58	Control Knobs, all sets, three used	$ .15
52-27	Speaker Cable	.25
57-326	Escutcheon Plate, all sets	.30
78-37	Z-27 Tube Socket	.20
78-38	Z-24 Tube Socket	.20
78-39	Z-27 Tube Socket	.20
78-40	Z-80 Tube Socket	.20
78-54	Z-58 Tube Socket	.20
83-228	Speaker Cable Terminal Strip	.15
93-138	Felt Washer for Control Knob	.01
95-127	60 cycle 110 volt Power Transformer	4.75
95-172	25 cycle all voltage Power Transformer	7.75
136-2	2 amp Fuse	.06
136-4	1 amp Fuse	.06
S-1183	Antenna and Ground Mounting Plate Complete	.25
S-2120	Variable Condenser Shield	.85
S-2124	Heat Insulating Shield	.30
MS-187	Tube Shield Assembly	.60

IMPORTANT: GIVE SERIAL NUMBER OF RECEIVER ON ALL PART ORDERS

ALL PRICES SUBJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE. ALSO ALL PRICES QUOTED HERE SUPERSEDE PREVIOUS QUOTATIONS IN OTHER PARTS LISTS FOR LIKE PARTS.

ZENITH RADIO CORPORATION
May 21, 1934


PHONO SWITCH USED ON SPECIAL ORDERS ONLY.
'58 R.F.
'58 1ST DET.
'56 OSC.
'58 I.F.
'55 2ND DET; AVC.
'59 P'W'R.
20-30
20-32
20-31
22-115
22-166
63-244
63-299
S-2118
S-2611
S-2252
22-170
22-171
63-235
63-232
22-82
63-121
63-140
63-137
63-160
63-254
63-258
63-136
22-147
22-161
63-137
22-137
22-117
PHONE
8" DIA. SPEAKER: 49-55
10" DIA. SPEAKER: 49-56
ALL PILOT LIGHTS
'80 RECT.
SPEAKER FIELD
63-257
63-255
ZENITH
63-256
22-173
2-AMP. FUSE FOR 115-V
1-AMP. FUSE FOR 230-V
ON-OFF SWITCH
115-V TAP
230-V TAP
TO 115-V OR 230-V. AC.
60 CYCLES ONLY
I.F. FREQUENCY 175 K.C.
SPEAKER CONNECTIONS - IN CABLE -
R RED LEAD
G GREEN LEAD
B BLACK LEAD
ZENITH RADIO CORP.
CHICAGO, ILL.
MODEL 215-225-216
7-TUBE - SUPERHETERODYNE - -2044 CHASSIS
R.E. 9-26-32.

Socket Voltages

Models 215-216-225

Tube Type	Position	Fil. Volt.	Plate Volt.	Cath. Volt.	Screen Volt.	Supp. Volt.	Plate Current
Z-58	R.F.	2.5	270	8	107	8	5.8
Z-58	1st Det.	2.5	270	10	107	10	4.7
Z-56	Osc.	2.5	140	0	-	-	4.8
Z-58	I.F.	2.5	170	8	107	8	5.5
Z-55	2nd Det. AVC	2.5	70	7	-	-	1.4
Z-59	Power	2.5	250	0	250	0	26.
Z-80	Rect.	5.	360ea	-	-	-	34.ea.

Line 115 Volts

All Controls Maximum

(All readings, with exception of heaters and rectifier plates taken from socket connections to ground. Use 1,000 ohm per volt D.C. meter. Antenna disconnected).

BALANCE I.F. frequency at 175 K.C. Condenser gang at 1500 K.C. and oscillator padder at 600 K.C.

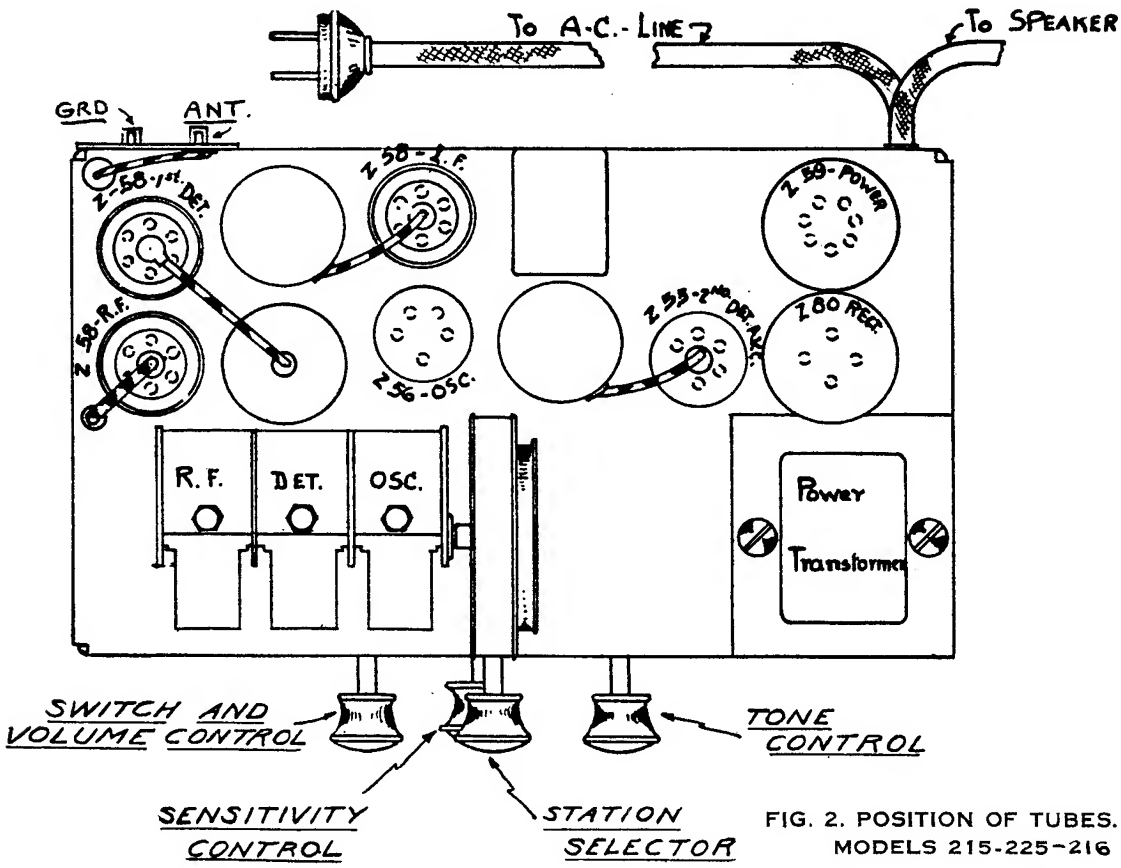


FIG. 2. POSITION OF TUBES. MODELS 215-225-216

Variable Condenser Assembly

11-3	Dial Cord.....per ft.	$ .10
22-166	Three Gang Variable Condenser.....	3.50
26-38	Celluloid Dial Strip.....	.25
80-69	Dial Cord Tension Spring.....	.01
80-89	Dial Cord Guide Spring.....	.01
100-18	2½ Volt Dial Lamp.....	.12
S-2238	Dial Drum Assembly.....	.80

Fixed Condensers

22-82	.001 mfd. 500 volt	.....(2nd Det. Plate).....	.25
* 22-115	.1 " 200 "	.....(5 Used. See Footnote).....	.20
22-117	.5 " 300 "	.....(Screen Bypass).....	.30
22-137	.05 " 400 "	.....(Oscillator Plate).....	.15
22-147	.0005 " 600 "	.....(2nd Det. Cathode).....	.15
22-161	Padder.....		.45
* 22-170	.1 mfd. 400 volt	.....(Four Used. See Footnote).....	.25
22-171	.05 " 600 "	.....(Tone Control).....	.20
22-173	8. " 500 "	.....(Filter).....	1.50
22-196	.01 " 600 "	.....(Tone Control).....	.15

Resistors

63-121	100M ohm	.....(2nd Det. Plate).....	.25
63-136	50M "	.....(RF Grid, 2nd Det.Plate).....	.25
63-137	250M "	.....(Osc.Bias, Power Grid).....	.25
63-140	1Meg "	.....(Grid).....	.25
63-160	100M "	.....(2nd Det.).....	.25
63-232	Tone Control.....		.75
63-235	Volume Control.....		1.25
63-239	24M ohm	.....(Oscillator Plate).....	.25
63-244	500 "	.....(1st Det. Cathode).....	.20
63-254	5M "	.....(2nd Det.Grid).....	.25
63-255	Sensitivity Control.....		.60
63-256	6950 ohm	.....(Voltage Divider).....	.45
63-257	8350 "	.....(Voltage Divider).....	.40
63-258	490 "	.....(1st Det. & I.F.Grid Return).....	.20

Coils - Chokes

20-30	Antenna Coil.....	.75
20-31	Oscillator Coil.....	.85
20-32	Detector Coil.....	1.00

* 22-115 R.F. Grid; R.F.1st Det. and I.F. Cathode; 1st Det.Suppressor; 1st Det. I.F.Grid Return and Power Choke.

* 22-170 2nd Det. Plate; 2nd Det. Grid Filter & Audio Coupling.

Coils - Chokes Cont'd

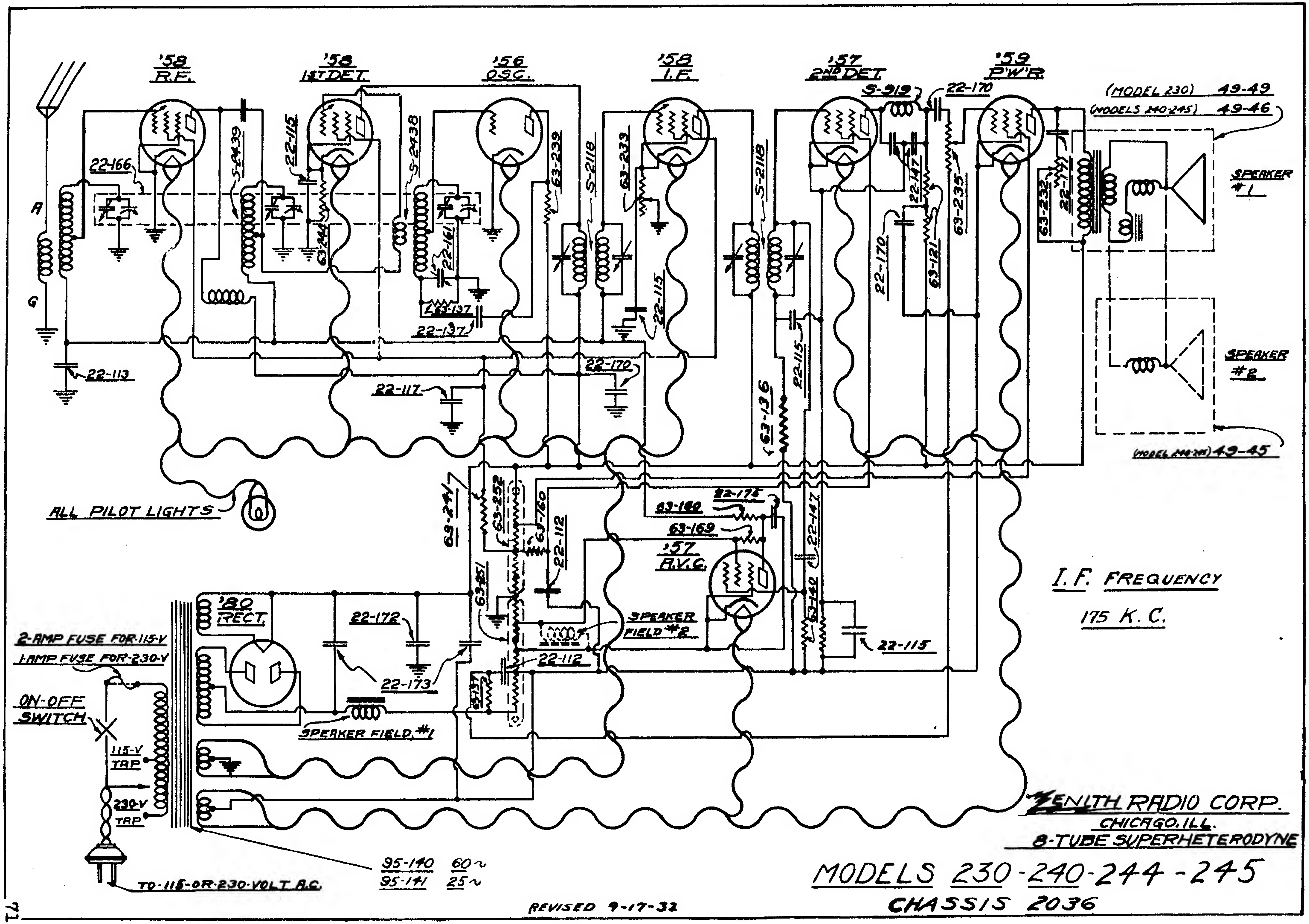
S-2118	1st I.F. Coil Assembly..(Without Grid Lead).....	$1.75
S-2611	2nd I.F. Coil Assembly..(With Grid Lead).....	1.75
S-2252	Detector Plate Choke.....	.60

Miscellaneous

46-61	Large Tuning Knob.....	.25
46-62	Small Control Knob.....	.25
49-55	Dynamic Speaker for Model 215 and 216.....	7.00
49-56	Dynamic Speaker for Model 225.....	8.00
52-37	Speaker Multicable.....	.25
57-370	Escutcheon Plate.....	.30
78-56	Type 59 Tube Socket.....	.15
78-57	Type 56 Tube Socket.....	.15
78-58	Type 58 Tube Socket.....	.15
78-60	Type 80 Tube Socket.....	.15
78-61	Type 55 Tube Socket.....	.15
93-167	Upper Cushion Washer for Chassis Mounting.....	.01
95-153	Regular 117 volt 60 cycle Power Transformer.....	5.25
95-173	25 cycle all voltage Power Transformer.....	7.75
126-109	Tube Shields.....	.10
15-16	Tube Shield Cap in AVC Tube.....	.05
136-2	2 Amp Fuse.....	.06
136-4	1 Amp Fuse.....	.06

ALL PRICES SUBJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE. ALSO ALL PRICES QUOTED HERE SUPERSEDE PREVIOUS QUOTATIONS IN OTHER PARTS LISTS FOR LIKE PARTS.

ZENITH RADIO CORPORATION
May 21, 1934



'58 R.F.
'58 1ST DET.
'56 OSC.
'58 I.F.
'57 2ND DET.
'59 PW'R
(MODEL 230) 49-49
(MODELS 240-245) 49-46
SPEAKER #1
SPEAKER #2
(MODEL 240-245) 49-45
A
G
22-166
22-113
S-2439
22-115
63-244
S-2438
22-161
63-137
22-137
63-239
S-2118
63-233
22-115
22-117
22-170
S-919
22-170
22-147
63-121
63-235
63-232
22-171
63-136
22-115
ALL PILOT LIGHTS
63-241
63-252
63-160
22-112
63-180
22-175
63-169
'57 A.V.C.
22-147
63-140
22-115
63-251
SPEAKER FIELD #2
22-112
'80 RECT.
22-172
22-173
SPEAKER FIELD #1
2-AMP FUSE FOR 115-V
1-AMP FUSE FOR 230-V
ON-OFF SWITCH
115-V TAP
230-V TAP
TO 115 OR 230 VOLT A.C.
95-140 60~
95-141 25~
I.F. FREQUENCY
175 K.C.
ZENITH RADIO CORP.
CHICAGO, ILL.
8-TUBE SUPERHETERODYNE
MODELS 230-240-244-245
CHASSIS 2036
REVISED 9-17-32

Socket Voltages

Models 230-240-245

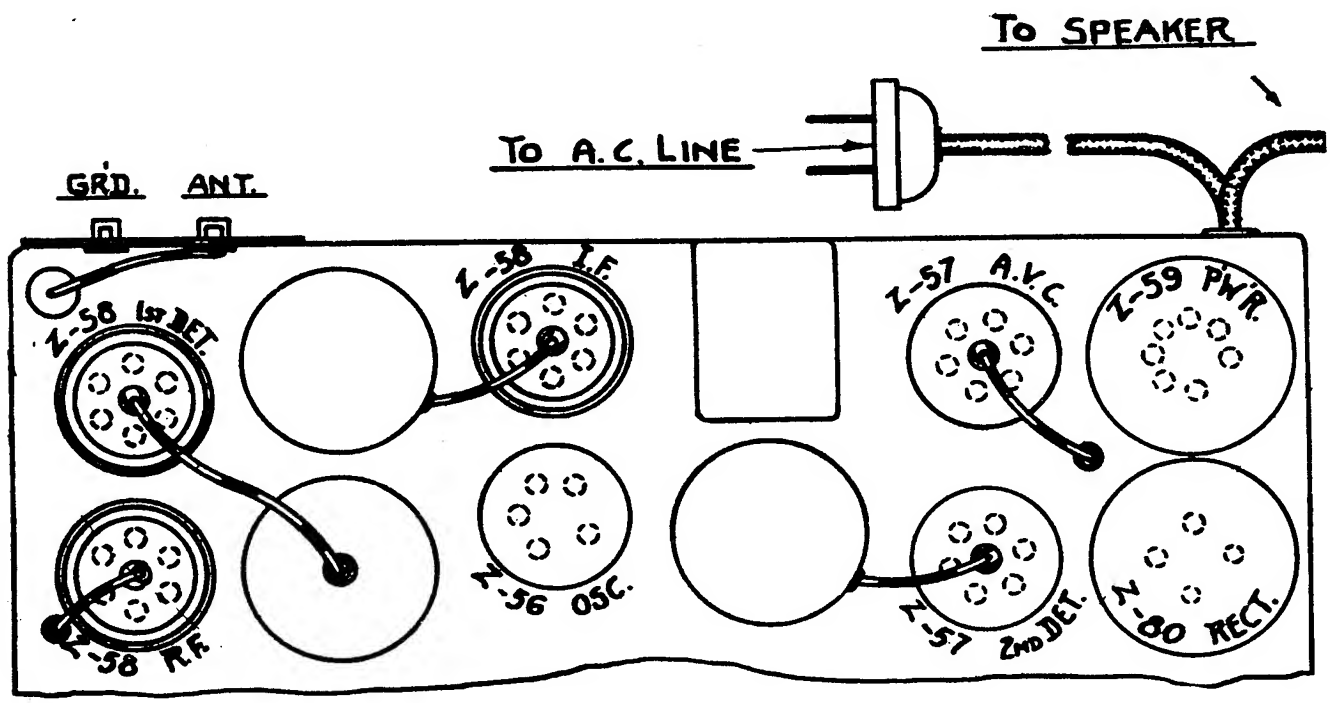
Tube Type	Position	Fil. Volt.	Plate Volt.	Cath. Volt.	Screen Volt.	Supp. Volt.	Plate Current
Z-58	R.F.	2.4	190	0	95	0	7.
Z-58	1st Det.	2.4	190	2.3	95	2.3	4.
Z-56	Osc.	2.4	100	0	-	-	4.
Z-58	I.F.	2.4	190	0	90	0	2.
Z-57	2nd Det.	2.4	90	-60	70	-60	.2
Z-57	A.V.C.	2.4	-10	-65	-2	-65	0
Z-59	Power	2.4	175	-70	165	-70	25
Z-80	Rect.	5.	*350	-	-	-	*36

Line 115 Volts

All Controls Maximum

(All readings, with exception of heaters, taken from socket connections to ground. Use 1,000 ohm per volt D. C. meter.)

BALANCE I.F. frequency at 175 K.C. Condenser gang at 1500 K.C. and oscillator padder at 600 K.C.



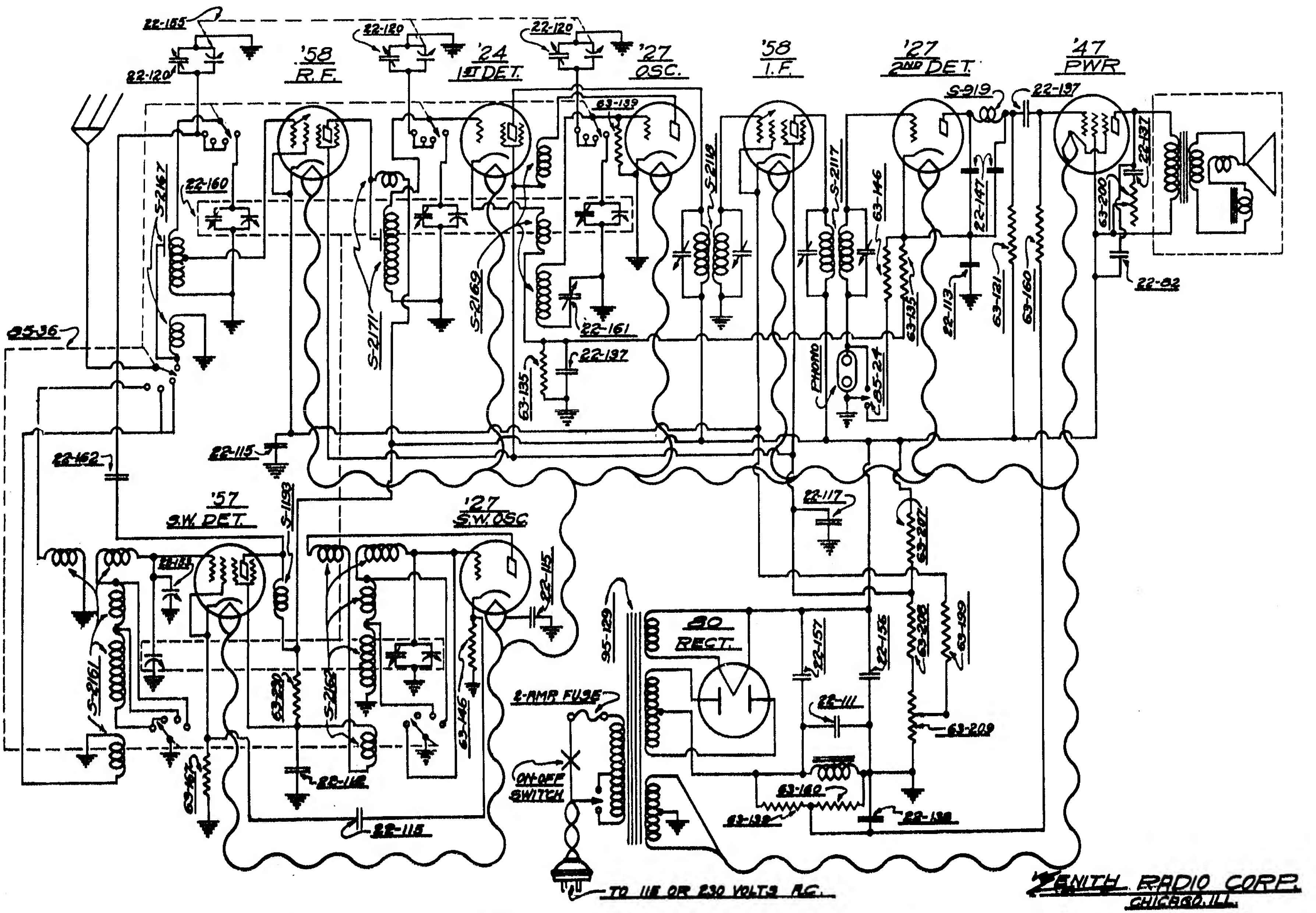
	Dial Assembly	
S-769	Dial Lamp Socket and Bracket (less lamp).....	$ .15
S-2238	Dial Drum Assembly.....	.80
S-2248	Small Hypoid Gear Complete with Drive Shaft.....	1.25
11-3	Pulley String.....per ft.	.10
26-36	Celluloid Dial Strip.....	.30
34-23	Hypoid Drum Gear (large).....	1.00
34-24	Hypoid Drum Gear (small).....	1.00
80-69	Dial String Tension Spring.....	.01
	Condensers	
22-112	.1 mfd 300 V.(2nd Detector Screen & Power Grid).....	.25
22-113	.5 " .....(R.F.1st Detector & I.F. Grid Return)....	.30
* 22-115	.1 " 200 V.(Four used, see below).....	.20
22-117	.5 " .....(R.F.1st Detector & I.F. Screen).....	.30
22-137	.05 " 400 V.(Oscillator Plate).....	.15
22-147	.0005 " 600 V.(2nd Detector Plate & AVC Screen).....	.20
22-161	Padder.....	.45
22-166	Three Gang Variable.....	3.50
22-170	.1 mfd 400 V.(R.F.& 1st Detector Plate, 2nd Det. Plate).	.25
22-171	.05 " 600 V.(Tone Control).....	.20
22-172	2. " 450 V.(Filter).....	.80
22-173	8. " 500 V.(Filter).....	1.50
22-175	.002 " 600 V.(A.V.C.Plate).....	.25
	Resistors	
63-121	100M ohm 1 Watt.....(2nd detector plate).....	.25
63-135	25M " ½ " .....(2nd detector cathode).....	.25
63-136	50M " ½ " .....(2nd detector grid return).....	.25
63-137	250M " ½ " .....(Oscillator & Power Grid).....	.25
63-140	1 meg " ½ " .....(A.V.C. Screen).....	.25
63-160	100M " ½ " .....(A.V.C.Plate, 2nd Detector Screen)	.25
63-169	400M " ½ " .....(A.V.C.Grid).....	.25
63-232	Manual Tone Control.....	.75
63-233	Manual Sensitivity Control.....	.75
63-235	Manual Volume Control.....	1.25
63-239	24M ohm 1 Watt.....(Oscillator Plate).....	.25
63-241	5M " 1 " .....(R. F. 1st Detector,I.F.Screen).....	.25
63-244	500 " ¼ " .....(1st Detector Cathode).....	.20
63-251	Voltage Divider.....(six tap).....	.65
63-252	Voltage Divider.....(five tap).....	.60
	Chokes and Coils	
S-2118	I.F. Coil Assembly.....	1.75
S-2437	Antenna Coil Assembly.....	.75
S-2438	Oscillator Coil Assembly.....	.85
S-2439	Detector Coil Assembly.....	1.00
S-2252	Plate Choke.....	.50
S-919	2nd Detector Choke.....	.50
* 22-115	I.F. Cathode,2nd Det.Grid Ret.1st and 2nd Det. Cathodes..	

Miscellaneous

46-49	Large Knob for Model 240 - 245	$ .20
46-55	Small Knob for Model 240 - 245	.15
46-61	Large Knob for Model 230	.25
46-62	Small Knob for Model 230	.25
49-45	Dynamic Speaker for Model 240 -245 (without transformer)	6.00
49-46	Dynamic Speaker for Model 240 -245(with transformer)	8.00
49-49	Dynamic Speaker for Model 230	7.00
52-32	Speaker Multicord	.35
57-326	Escutcheon Plate for Model 230	.30
57-353	Escutcheon Plate for Model 240 -245	.30
78-56	59, 7 Prong Tube Socket	.15
78-57	56, 5 Prong Tube Socket	.15
78-58	58, 6 Prong Tube Socket	.15
78-59	57, 6 Prong Tube Socket	.15
78-60	80, 4 Prong Tube Socket	.15
95-140	110 Volt 50 - 60 Cycle Power Transformer	5.00
95-170	All Voltage 25-30 Cycle Power Transformer	8.50
100-18	2½ Volt Dial Lamp	.12
136-2	2 amp Fuse.....(For 110 Volt Transformer)	.06
136-4	1 amp Fuse.....(For 220 Volt Transformer)	.06
126-109	Tube Shield.....(Small)	.10
MS-196	Tube Shield.....(Large for Model 240-245 only)	1.25
S-1183	Antenna and Ground Mounting Plate Assembly	.25

ALL PRICES SUBJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE. ALSO ALL PRICES QUOTED HERE SUPERSEDE PREVIOUS QUOTATIONS IN OTHER PARTS LISTS FOR LIKE PARTS.

January 15, 1934



ZENITH RADIO CORP.
CHICAGO, ILL.

STANDARD AND SHORT WAVE MODELS 250-260-272 CHASSIS MODEL 2031

Socket Voltages — Models 250-260-272

Tube Type	Position	Fil. Volts	Plate Volts	Cath. Volts	Screen Volt.	Supp. Volt.	Plate Current
Z-58	R.F.	2.4	240	4	110	4	6.2
Z-24	1st Det.	2.4	235	8	110	-	.5
Z-57	S.W.1st Det.	2.4	235	6	150	6	.5
Z-27	S.W.Osc.	2.4	150	10	-	-	5.
Z-27	Osc.	2.4	110	0	-	-	9.
Z-58	I.F.	2.4	235	3	110	3	8.
Z-27	2nd Det.	2.4	35	4	-	-	1.8
Z-47	PWR.	2.4	215	-	230	-	28.
Z-80	Rect.	5.	110ea. to grd.				34. ea

Line 115 Volts — All Controls Maximum

(All readings, with exception of heaters, taken from socket connections to ground. Use 1,000 ohm per volt D.C. meter.)

BALANCE - Standard Wave. I.F. 175 K.C. Tuning condenser (three rear sections) 1500 K.C. Oscillator padder 600 K.C.

Short Wave. Set 1,000 K.C. adjustment shaft to the center of its tuning range and balance Short Wave I.F. trimmers (1, 2, and 3) to 1,000 K.C. with S.W. oscillator tube removed. Insert tube and place S.W. tuning on scale by adjusting S.W. oscillator trimmer on condenser gang until a station on the 1.5 to 3.75 megacycle band is resonated at its corresponding frequency on the dial.

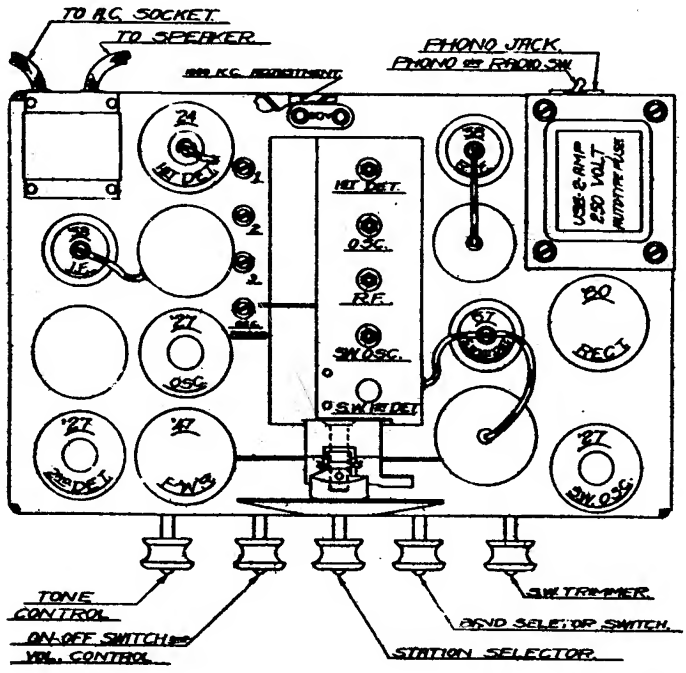


Fig. 2. Tube Position.

PARTS AND PRICES
STANDARD AND SHORT WAVE RECEIVERS
MODELS 250 - 260 - 272

Dial Assembly

11-3	Dial Cord.....per ft.	$ .10
12-251	Dial Slide Support Bracket.....	1.25
61-23	Dial Cord Pulley.....	.15
73-8	Dial Collar Set Screw.....	.01
80-77	Dial Cord Tension Spring.....	.01
84-41	Dial Lamp Support Slide.....	.60
S-2137	Dial Pointer Mask Assembly.....	1.70
S-2164	Dial Vernier Tuning Shaft and Bracket.....	1.50
S-2165	Dial Gear and Bushing Assembly.....	1.50
S-2166	Dial Strip Support and Strip Assembly.....	2.00

Condensers

22-82	.001 Mfd 500 volt.....(Power Plate).....	.20
22-111	.03 " 600 " .....(Filter).....	.20
22-112	.1 " 300 " .....(S.W. Det. Screen).....	.25
22-113	.5 " 200 " .....(2nd Det. Plate).....	.35
* 22-115	.1 " 200 " .....(3 Used, See Below).....	.35
22-117	.5 " 300 " .....(R.F.Det. & I.F.Screen).....	.50
* 22-137	.05 " 400 " .....(3 Used, See Below).....	.25
22-138	.2 " 200 " .....(Power Grid).....	.25
* 22-147	.0005 " 600 " .....(2 Used, See Below).....	.25
22-153	Short Wave Variable Trimmer.....	1.00
22-155	Three Gang Variable Trimmer.....	2.40
22-156	6. Mfd Electrolytic.....(Filter).....	1.25
22-157	8. " Electrolytic.....(Filter).....	1.50
22-158	Three Section Padder.....	.75
22-160	Five Gang Variable Tuning Condenser.....	7.00
22-161	Single Padder.....	.45
22-162	.0001Mfd 600 volt.....	.20

Resistors

63-121	100M ohm 1 watt.....(Det. Plate).....	.25
63-135	25M " ½ " .....(2 Used, 1st & 2nd Det. Cathode).....	.25
63-139	500M " ½ " .....(2 Used, Power Grid, Osc. Grid).....	.25
63-146	2M " ½ " .....(S.W.OSc. Grid, 2nd Det. Cathode)....	.25
63-160	100M " ½ " .....(Power Grid).....	.25
63-167	8M " 1 " .....(S. W. Det. Cathode).....	.25
63-199	150 " .....(R.F., I.F. Cathode).....	.25
63-200	Tone Control.....	.80
63-207	10M ohm ½ watt.....(Voltage Divider).....	.30
63-208	12M " .....(Voltage Divider).....	.25
63-209	Volume Control and Switch Assembly.....	1.25
63-230	15M ohm .....(S. W. Det. Screen).....	.35

* 22-115 S.W.Coupling,S.W.Oscillating Filter, and R.F.Cathode
* 22-137 1st Detector Cathode, Audio Coupling, and Tone Control
* 22-147 2nd Detector Plate

PARTS AND PRICES
MODELS 250 - 260 - 272

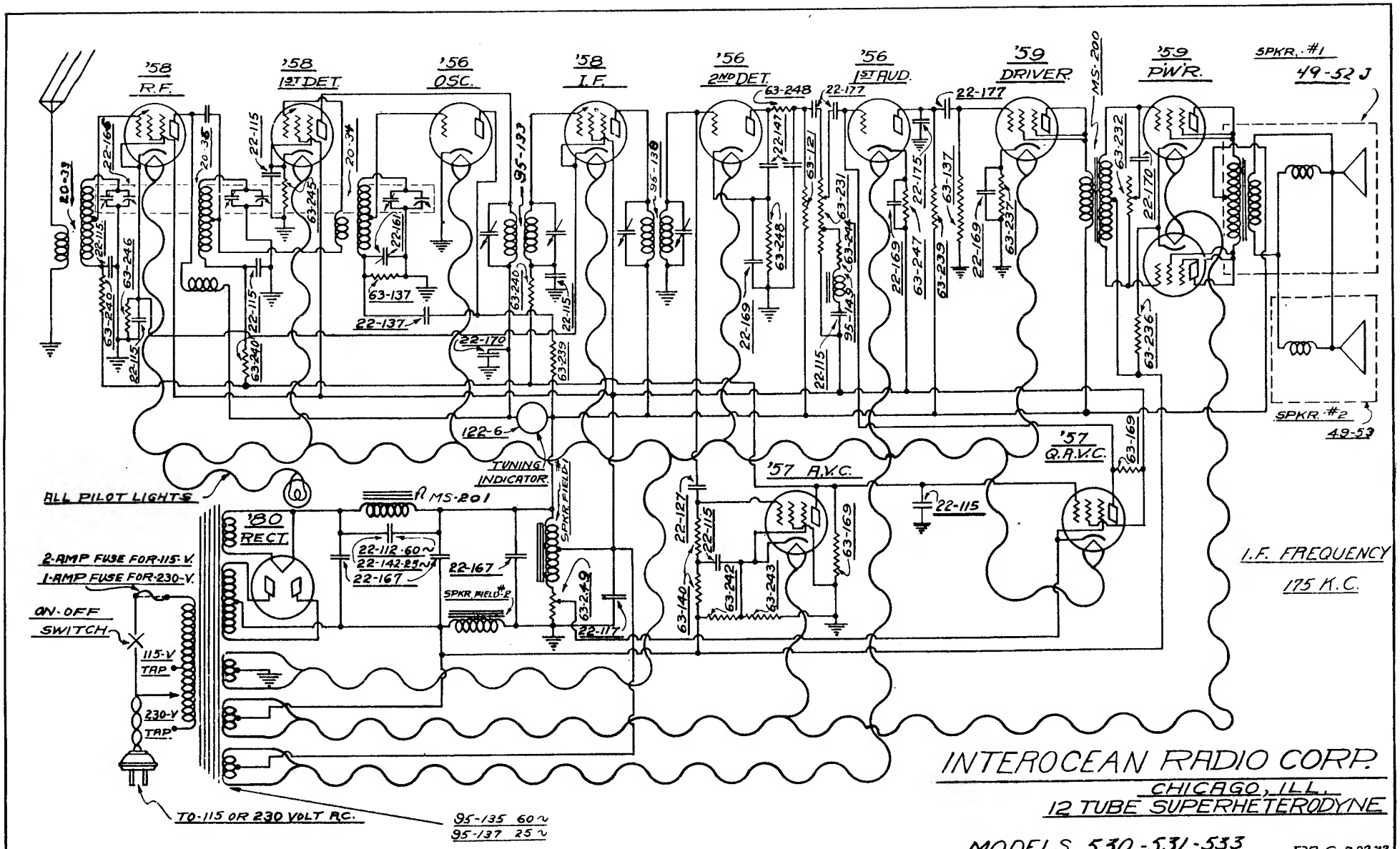
Coils - Chokes

S-919	2nd Detector Plate Choke	$ .60
S-1193	S.W.Detector Plate Choke	.50
S-2117	2nd I.F. Coil Assembly.....(No Grid Lead)	1.75
S-2118	1st I.F. Coil Assembly.....(With Grid Lead)	1.75
S-2161	Detector S. W. Coil.....(Mounted above Chassis)	1.25
S-2162	Oscillator S. W. Coil.....(Mounted under Chassis)	1.25
S-2167	1st R.F. Coil Assembly	1.25
S-2169	Oscillator Coil L.W	.80
S-2171	1st Detector Coil L.W	1.25

Miscellaneous

8-25	Antenna and Ground Binding Post Assembly	.20
44-4	Phono Jack Receptacle Assembly	.15
46-59	Large Knob	.15
46-60	Small Knob	.15
49-44	Dynamic Speaker	8.00
57-342	Escutcheon Plate	.60
78-39	Z-47 Tube Socket	.15
78-40	Z-80 Tube Socket	.15
78-54	Z-58 Tube Socket	.15
78-55	Z-57 Tube Socket	.15
83-218	Single Terminal Soldering Brackets	.05
83-228	Speaker Cable Terminal Strip	.15
83-260	Double Terminal Mounting Brackets	.07
85-24	Radio Phono Switch	.60
85-36	S.W. Selector Band Switch	2.00
93-167	Rubber Cushion for Chassis Mounting (Upper)	.01
93-168	Rubber Cushion for Chassis Mounting (Lower)	.01
93-170	Metal Washer for Chassis Mounting	.02
95-129	Combination 110-220 volt, 60 cycle Power Transformer	6.00
95-131	Regular 110 volt, 25 cycle Power Transformer	8.00
100-18	$2\frac{1}{2}$ volt Pilot Lamp	.12
112-6	Speaker Mounting Screw 8/32 x $1\frac{1}{4}$"	.01
136-2	2 amp Fuse	.06
136-4	1 amp Fuse	.06

ALL PRICES ARE SUBJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE.


'58 R.F.
'58 1ST DET.
'56 OSC.
'58 I.F.
'56 2ND DET.
'56 1ST AUD.
'59 DRIVER
'59 PW'R.
SPKR. #1 49-52 J
SPKR. #2 49-53
'57 A.V.C.
'57 Q.A.V.C.
'80 RECT.
MS-201
MS-200
TUNING INDICATOR
ALL PILOT LIGHTS
2-AMP FUSE FOR 115 V.
1-AMP FUSE FOR 230-V.
ON-OFF SWITCH
115-V TAP
230-V TAP
TO 115 OR 230 VOLT A.C.
95-135 60~
95-137 25~
I.F. FREQUENCY 175 K.C.
INTEROCEAN RADIO CORP.
CHICAGO, ILL.
12 TUBE SUPERHETERODYNE
MODELS 530-531-533
P.R.C. 7-2232

VOLTAGE READINGS - MODELS 530 531 533

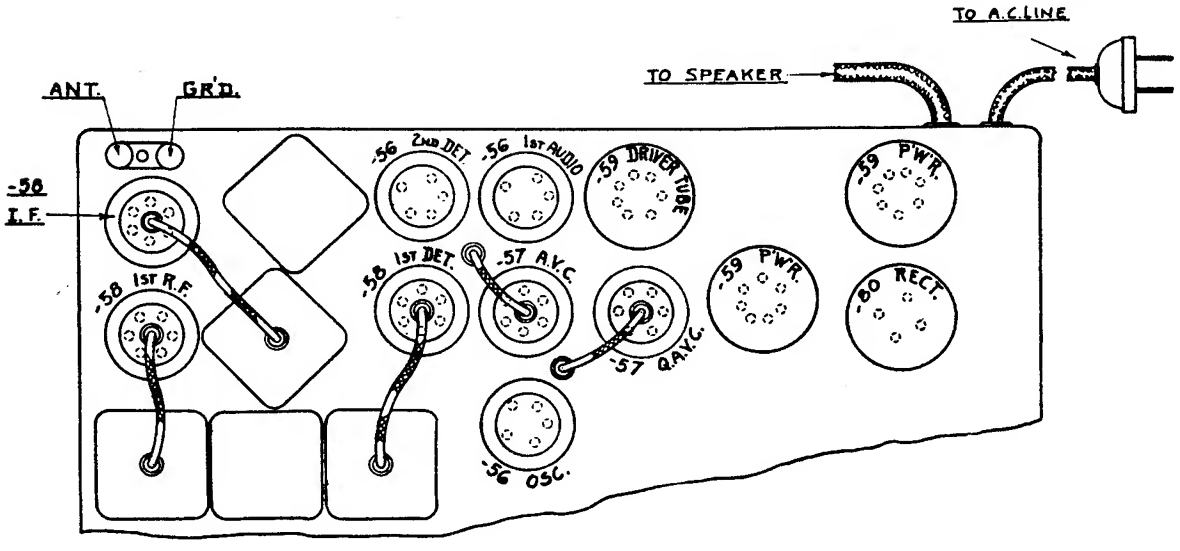
Antenna Disconnected — Meter 1000 Ohms Per Volt

Tube Type	Position	Fil. Volt.	Plate Volt.	Cath. Volt.	Screen Volt.	Supp. Volt.	Plate Current
Z-58	1st R.F.	2.5	175	2.2	75	2.2	5.7
Z-58	1st Det.	2.5	190	4.5	75	4.5	2.3
Z-56	Osc.	2.5	100	0	-	-	3.5
Z-58	1st I.F.	2.5	200	2.2	75	2.2	5.5
Z-56	2nd Det.	2.5	110	10	-	-	.3
Z-56	1st Audio	2.5	170	80	-	-	.8
Z-57	A.V.C.	2.5	-	-85	-	-85	-
Z-57	Q.A.V.C.	2.5	30	13	75	13	-
Z-59	Driver	2.5	190	20	190	190	13
Z-59	Power	2.5	195	-70	195	195	22
Z-59	Power	2.5	195	-70	195	195	22
Z-80	Rect.	5.0	360	-	-	-	65

Line Voltage 115 (Reading to Ground) Volume control maximum

(All readings, with exception of heaters, taken from socket connections to ground. Use 1,000 ohm per volt D. C. meter.)

BALANCE I.F. frequency at 175 K.C. Condenser gang at 1500 K.C. and oscillator padder at 600 K.C.



Tube Position

Dial and Meter Assembly

11-3	Dial Pulley String.....per ft.	$ .10
26-38	Calibrated Dial Strip.....	.15
80-69	Dial Cord Tension Spring.....	.01
80-85	Volume and Tone Control Dial Tension Spring.....	.01
83-274	Volume Control Dial Strip.....	.10
83-275	Tone Control Dial Strip.....	.10
100-18	2½ Volt Pilot Lamp.....	.12
122-5	Shadowgraph Meter.....	2.00

Condensers

22-112	.1 mfd 300 volt...(Filter).....	.25
*22-115	.1 " 200 " ...(Eight Used, See Below).....	.35
22-117	.5 " 300 " ...(Filter).....	.50
22-127	.000025 600 " ...(A.V.C. Grid).....	.35
22-137	.05 mfd 400 " ...(Oscillator Plate).....	.25
22-142	.4 " 300 " ...(Filter 25 Cycle Only).....	.40
22-147	.0005" 600 " ...(2nd Detector Plate).....	.20
22-161	Padder.....	.45
22-165	Three Gang Variable.....	3.50
22-167	8. mfd 500 volt...(Filter).....	1.50
22-169	8. " 50 " ...(2nd Det. Cathode, Driver Cathode & 1st Audio Cathode).....	.55
22-170	.1 " 400 " ...(1st Det. Plate, Tone Control).....	.25
22-175	.002 " 600 " ...(1st Audio Plate).....	.25
22-177	.2 " 400 " ...(2nd Det. Plate, 1st Audio Grid, 1st Audio Plate).....	.25

Resistors

63-121	100M ohm 1 watt...(2nd Detector Plate).....	.25
63-137	250M " ½ " ...(Driver Grid).....	.25
63-140	1 meg" ½ " ...(A.V.C. Grid & Cathode).....	.25
63-169	400 " ½ " ...(A.V.C. & Q.A.V.C. Plate).....	.25
63-231	Volume Control & Switch Assembly.....	1.40
63-232	Tone Control.....	.75
63-236	500 ohm ...(Wide Metal) (Power Tube Bias).....	.25
63-237	1500 " ...(Narrow Metal) (Driver Tube Bias).....	.25
63-239	24M " 1 watt...(Osc. & 1st Audio Plate).....	.25
63-240	1900 " ¼ " ...(R.F. 1st Det. & I.F. Grids).....	.25
63-242	2500 " ½ " ...(A.V.C. Cathode).....	.25
63-243	18M " 1 " ...(A.V.C. Cathode).....	.25
63-244	500 " ¼ " ...(Acoustic Filter).....	.25
63-245	1500 " ¼ " ...(1st Detector Cathode).....	.25
63-246	150 " ¼ " ...(R.F. Cathode).....	.25
63-247	8M " ¼ " ...(1st Audio Cathode).....	.25
63-248	50M " 1 " ...(2nd Det. Plate & Cathode).....	.25
63-249	Sensitivity & Quiet Control.....	.75

*22-115 R.F. 1st Detector, I.F. Grid Returns, A.V.C. Plate, A.V.C. Cathode, 1st Detector Cathode, R.F. Cathode, and Acoustic Filter.

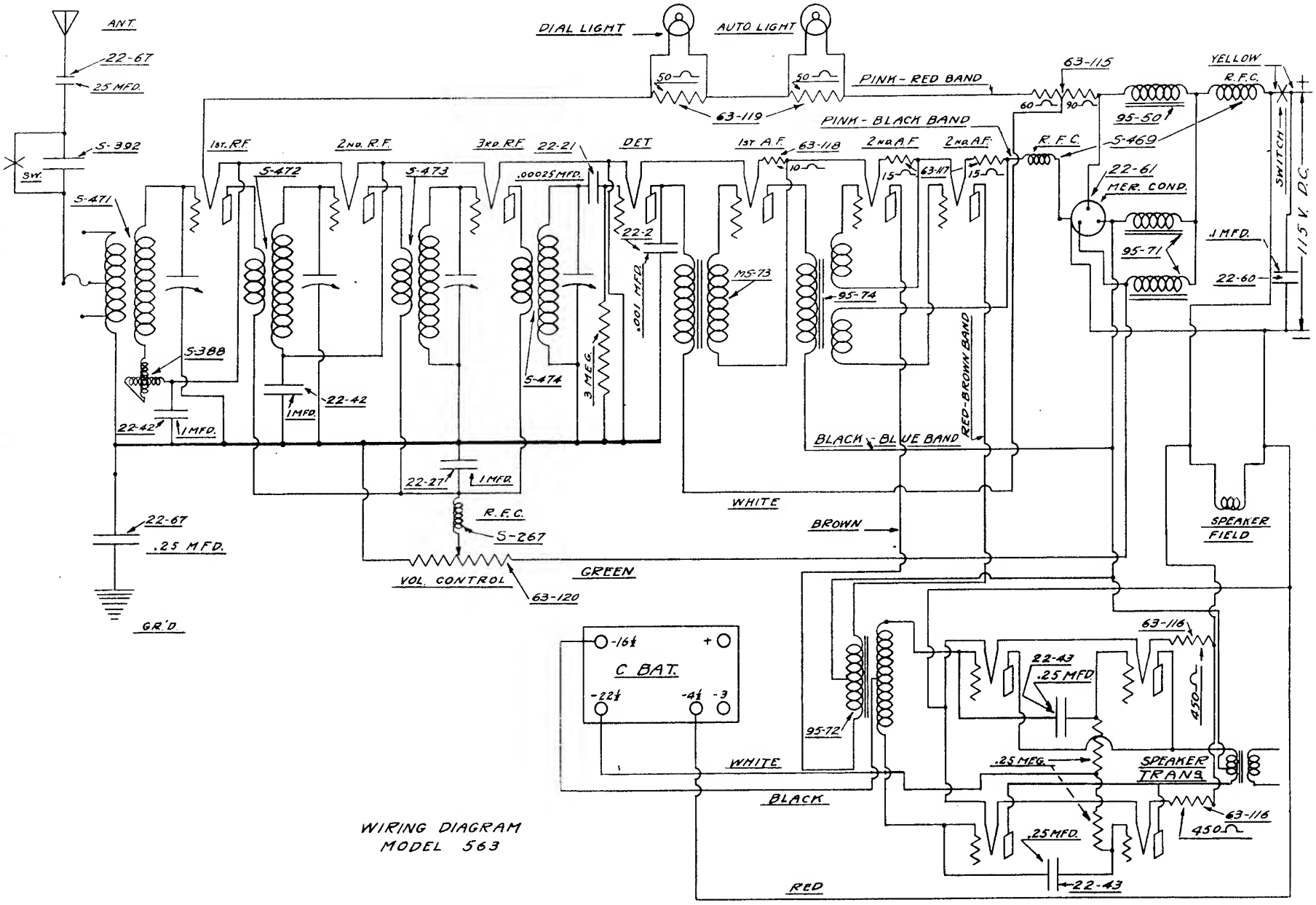
Coils

20-33	Antenna Coil	$ .75
20-34	Oscillator Coil	.85
20-35	Detector Coil	1.00
95-133	1st I.F. Transformer with Grid Lead	1.25
95-139	2nd I.F. Transformer without Grid Lead	1.25

Miscellaneous

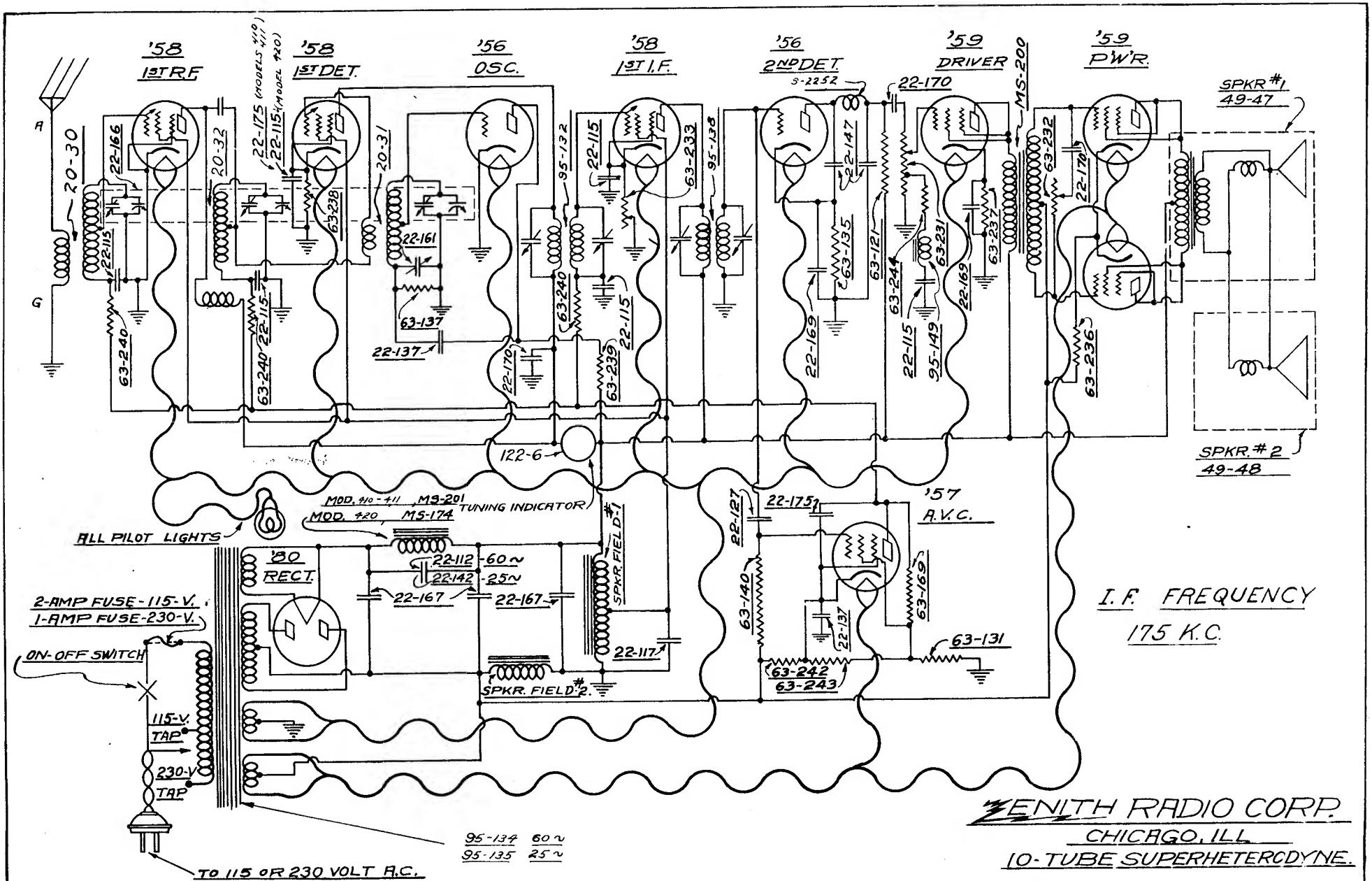
46-61	Large Knobs	.20
46-62	Small Knobs	.10
49-52	Dynamic Speaker (With Transformer)	8.25
49-53	Dynamic Speaker (Without Transformer)	7.00
52-34	Speaker Multicord	.45
57-343	Escutcheon Plate	.50
78-56	Type 59 Socket	.15
78-57	Type 56 Socket	.15
78-58	Type 58 Socket	.15
78-59	Type 57 Socket	.15
78-60	Type 80 Socket	.15
93-167	Upper Cushion Washer for Chassis Mounting	.01
93-168	Lower Cushion Washer for Chassis Mounting	.01
95-142	115 volt 25 cycle Power Transformer	7.25
95-143	115 volt 60 cycle Power Transformer	5.25
95-149	Acoustic Filter Choke	.30
106-129	Small Tube Shield	.10
MS-200	Push Pull Input Transformer	3.50
MS-201	Power Filter Choke	3.25

ALL PRICES ARE SUBJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE.



WIRING DIAGRAM
MODEL 563

ZENITH RADIO CORPORATION
CHICAGO, ILLINOIS
DATE 7-24-29 V.C.T.


'58 1ST R.F.
'58 1ST DET.
'56 OSC.
'58 1ST I.F.
'56 2ND DET.
'59 DRIVER
'59 P'W'R.
SPKR #1 49-47
SPKR. #2 49-48
'57 A.V.C.
'50 RECT.
ALL PILOT LIGHTS
MOD. 410-411, M3-201 TUNING INDICATOR
MOD. 420, M5-174
2-AMP FUSE-115-V.
1-AMP FUSE-230-V.
ON-OFF SWITCH
115-V. TAP
230-V. TAP
TO 115 OR 230 VOLT A.C.
SPKR. FIELD #1
SPKR. FIELD #2
95-134 60~
95-135 25~
I.F. FREQUENCY
175 K.C.
ZENITH RADIO CORP.
CHICAGO, ILL.
10-TUBE SUPERHETERODYNE.
MODELS 410-411-420
P.A.C. 7-22-32.

Socket Voltages

Models 410-411-420

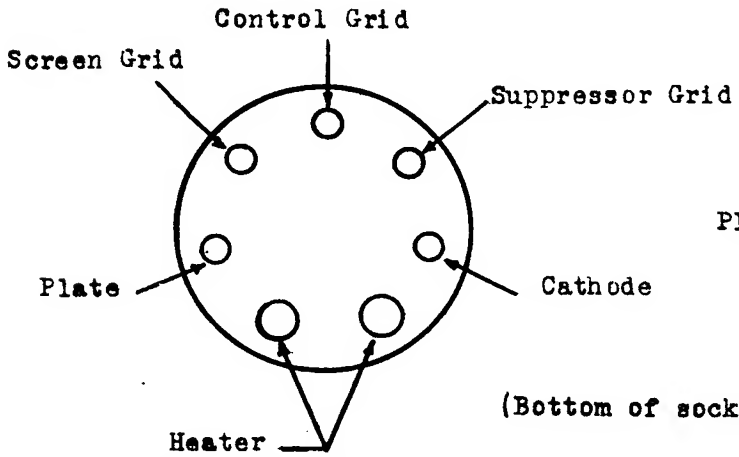
Tube Type	Position	Fil. Volt.	Plate Volt.	Cath. Volt.	Screen Volt.	Supp. Volt.	Plate Current
Z-58	R.F.	2.5	220	0	100	0	5.2
Z-58	1st Det.	2.5	220	+2	100	+2	3.
Z-56	Osc.	2.5	120	0	0	*	4.
Z-58	I.F.	2.5	220	0	100	0	6.
Z-56	2nd Det.	2.5	120	20	0	*	.75
Z-57	A.V.C.	2.5	-40	-75	-2	-75	0
Z-59	Driver	2.5	220	+25	220	+220	8.2
Z-59	Power	2.5	230	-65	230	+230	25.
Z-59	Power	2.5	230	-65	230	+230	25.
Z-80	Rect.	5.0	400*				62.5*

Line 115 Volts

All Controls Maximum

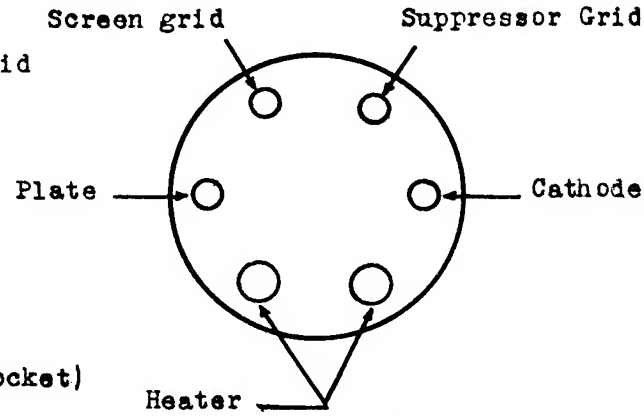
(All readings, with exception of heaters, taken from socket connections to ground. Use 1,000 ohm per volt D. C. meter).

BALANCE I.F. frequency at 175 K.C. Condenser gang at 1500 K.C. and oscillator padder at 600 K.C.



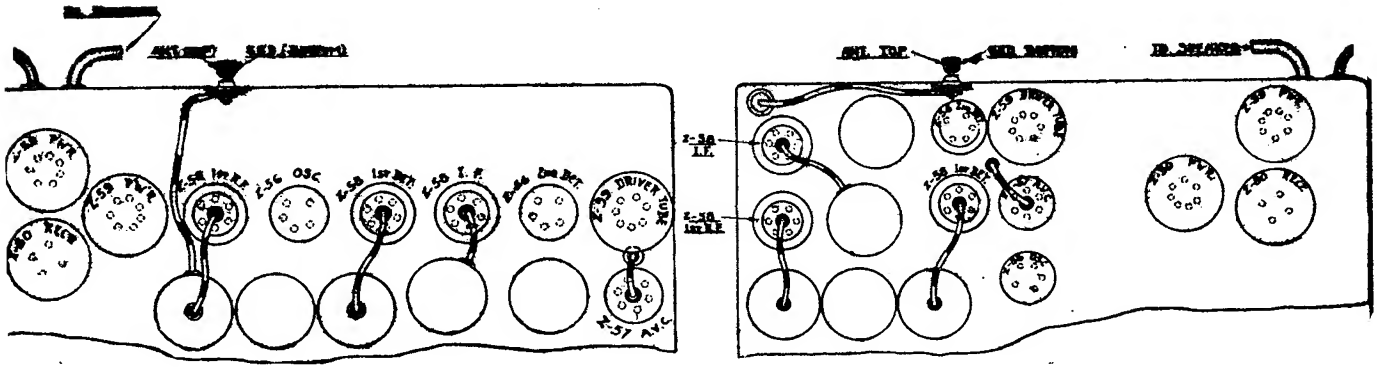
7 Prong Type '59

(Bottom of socket)



6 Prong Type '57-'58

SOCKET CONNECTIONS



Model 420 SOCKET LAYOUT Models 410-411

PARTS AND PRICES
MODELS 410 411 420
CHASSIS #2030 - 2043

Dial and Meter Assembly

11-3	Dial Pulley String.....per ft.	$ .10
26-37	Dial Strip.....	.15
34-23	Large Hypoid Gear (Model 420 Only).....	.30
34-24	Small Hypoid Gear (Model 420 Only).....	.15
59-16	Volume Control Pointer.....	1.00
59-17	Tone Control Pointer.....	1.00
80-69	Dial String Tension Spring.....	.01
80-84	Volume and Tone Control Pointer Spring.....	.01
80-86	Volume and Tone Control Friction Spring.....	.01
83-272	Volume Control Dial Strip.....	.10
83-273	Tone Control Dial Strip.....	.10
83-277	Pointer Guide Strip.....	.01
100-18	Pilot Lamp.....	.12
122-6	Shadowgraph Meter.....	2.00
S-2255	Tone Control Pointer Cam.....	.25
S-2256	Volume Control Pointer Cam.....	.25
S-2265	Dial Drum Assembly.....	1.00

Condensers

22-112	.1 mfd 300 volt (Filter).....	.25
22-115	.1 " 200 " (Six used, see footnote).....	.35
22-117	.5 " 200 " (Filter).....	.50
22-127	.000025 600 " (A. V. C. Grid).....	.35
22-137	.05mfd 400 " (Oscillator Plate).....	.25
22-142	.4 " 300 " (Filter 25 Cycle Only).....	.40
22-147	.0005 600 " (2nd Detector Plate).....	.20
22-161	Padder.....	.45
22-166	Three Gang Variable.....	3.50
22-167	8. mfd 500 volt (Filter).....	1.50
22-169	8. " 50 " (2nd Det. and Driver Cathodes).....	.55
22-170	.1 " 400 " (1st Det. plate, Audio Coup., Tone Control)..	.25
22-175	.002" 600 " (1st Det. cathode - Models 410-411 only).....	.20

Resistors

63-121	100M ohm 1 watt (2nd Detector Plate).....	.25
63-135	50M " 1 " (2nd Detector Cathode).....	.25
63-137	250M " ½ " (Oscillator Grid).....	.25
63-140	1 meg" ½ " (A. V. C. Grid).....	.25
63-169	400 " ½ " (A. V. C. Plate).....	.25
63-231	Volume Control Assembly.....	1.25
63-232	Tone Control Assembly.....	.75
63-233	Sensitivity Control.....	.75
63-236	500 ohm.....(Power Bias) (Wide Metal).....	.25
63-237	1500 " .....(Driver Bias) (Narrow Metal).....	.25
63-238	1M " ¼ watt (1st Detector Cathode).....	.25
63-239	24M " 1 " (Oscillator Plate).....	.25
63-240	1900 " ¼ " (R.F., 1st Detector and I.F. Grids).....	.25
63-242	2500 " ½ " (A. V. C. Cathode).....	.25
63-243	18M " 1 " (A. V. C. Cathode).....	.25
63-244	500 " ¼ " (Acoustic Filter).....	.25

*22-115 R. F., 1st Detector, I. F. Grid Return, I. F. Cathode, Acoustic Filter, (1st Detector Cathode Model 420 Only).

Coils

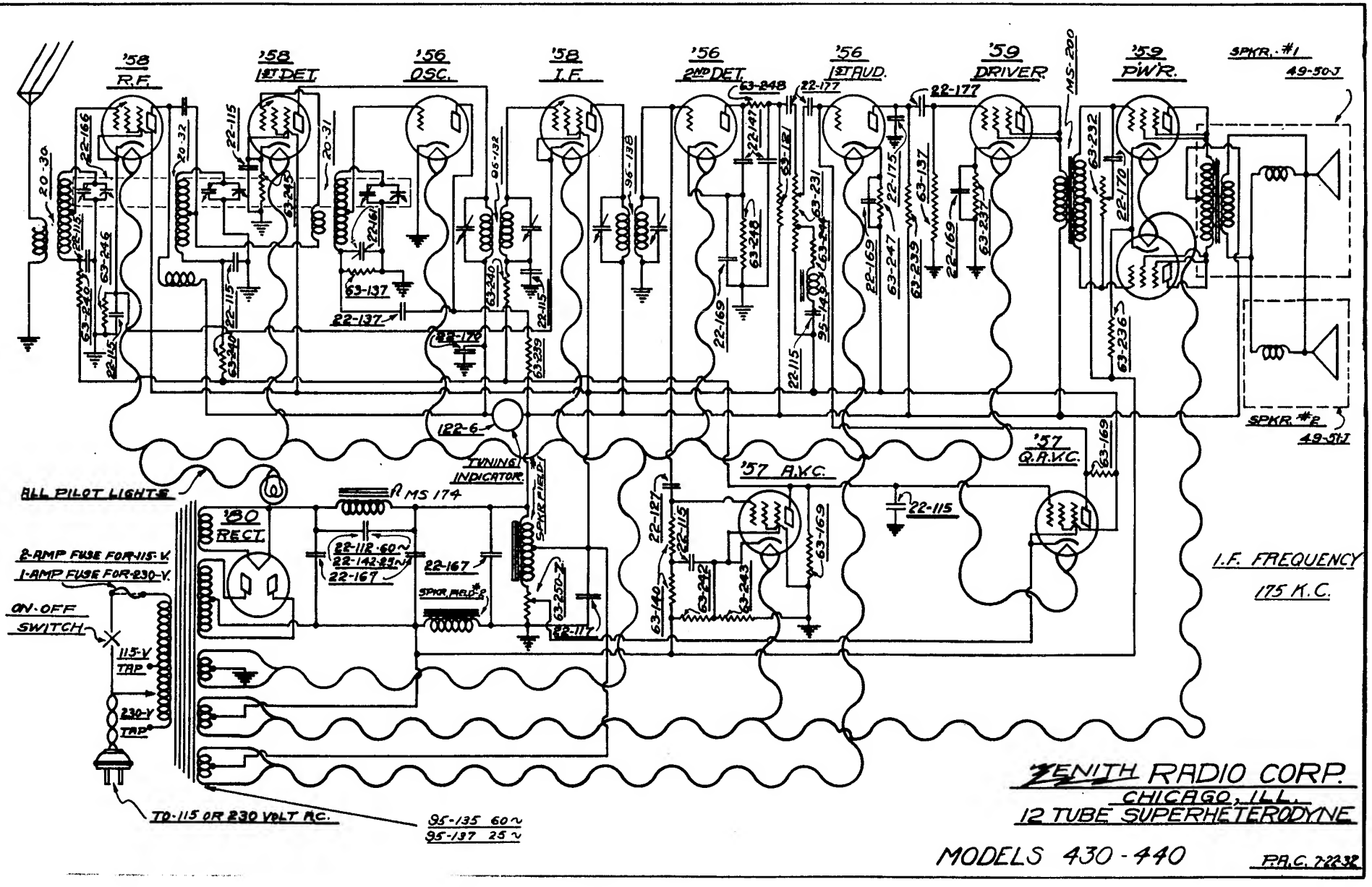
20-30	Antenna Coil	$ .75
20-31	Oscillator Coil	.85
20-32	Detector Coil	1.00
S-2252	Plate Choke and Bracket	.50
95-132	1st I. F. Transformer (With Grid Lead)	1.25
95-138	2nd I. F. Transformer (Without Grid Lead)	1.25

Miscellaneous

46-49	Large Control Knob	.20
46-55	Small Control Knob	.15
49-47	Dynamic Speaker with Transformer	7.00
49-48	Dynamic Speaker without Transformer	8.25
52-35	Speaker Multicord	.35
57-341	Escutcheon Plate	.35
78-56	Type 59 Socket	.15
78-57	Type 56 Socket	.15
78-58	Type 58 Socket	.15
78-59	Type 57 Socket	.15
78-60	Type 80 Socket	.15
93-167	Upper Cushion Washer for Chassis Mounting	.01
93-168	Lower Cushion Washer for Chassis Mounting	.01
95-134	115 Volt 50-60 Cycle Power Transformer	5.50
95-136	115 Volt 25-30 Cycle Power Transformer	7.75
95-149	Accoustic Filter Choke	.30
126-109	Small Tube Shield	.10
136-2	2 amp Fuse	.06
MS-174	Power Choke (Model 420 Only)	3.25
MS-200	Push Pull Input Transformer	3.50
MS-201	Power Choke (Models 410-411 Only)	3.25

ALL PRICES ARE SUBJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE.

ZENITH RADIO CORPORATION
September 10th, 1932.


'58 R.F.
'58 1ST DET.
'56 OSC.
'58 I.F.
'56 2ND DET.
'56 1ST AUD.
'59 DRIVER
'59 PWR.
SPKR. #1 49-30-J
SPKR. #2 49-31-J
'57 A.V.C.
'57 Q.A.V.C.
'50 RECT.
TUNING INDICATOR
SPKR. FIELD
ALL PILOT LIGHTS
2-AMP FUSE FOR 115-V.
1-AMP FUSE FOR 230-V.
ON-OFF SWITCH
115-V TAP
230-V TAP
TO 115 OR 230 VOLT A.C.
95-135 60~
95-137 25~
I.F. FREQUENCY
175 K.C.
ZENITH RADIO CORP.
CHICAGO, ILL.
12 TUBE SUPERHETERODYNE
MODELS 430-440
P.R.C. 7-22-38

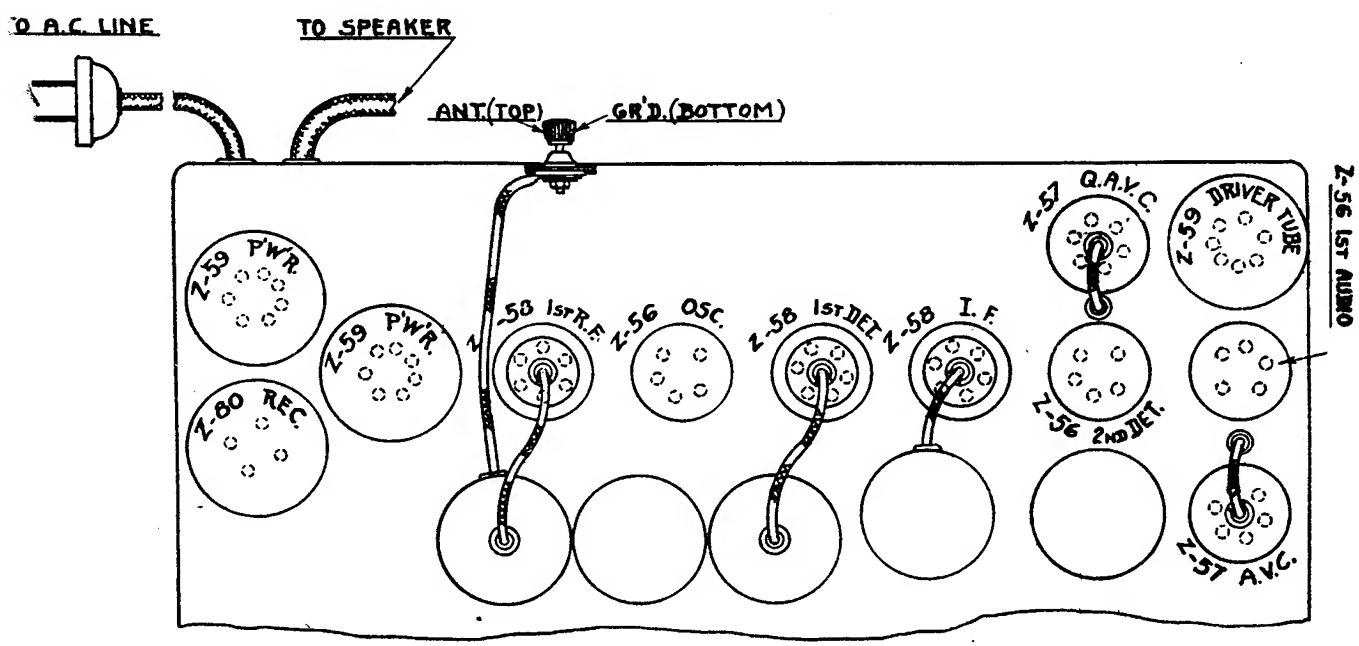
Socket Voltages — Models 430-440

Tube Type	Position	Fil. Volt.	Plate Volt.	Cath. Volt.	Screen Volt.	Supp. Volt.	Plate Current
Z-58	1st R.F.	2.5	175	2.2	75	2.2	5.7
Z-58	1st Det.	2.5	190	4.5	75	4.5	2.3
Z-56	Osc.	2.5	100	0	-	-	3.5
Z-58	1st I.F.	2.5	200	2.2	75	2.2	5.5
Z-56	2nd Det.	2.5	110	10	-	-	.3
Z-56	1st Audio	2.5	170	80	-	-	.8
Z-57	A.V.C.	2.5	-	-85	-	-85	-
Z-57	Q.A.V.C.	2.5	30	13	75	13	-
Z-59	Driver	2.5	190	20	190	190	13
Z-59	Power	2.5	195	-70	195	195	22
Z-59	Power	2.5	195	-70	195	195	22
Z-80	Rect.	5.0	360	-	-	-	65

Line 115 Volts — All Controls Maximum

(All readings, with exception of heaters, taken from socket connections to ground. Use 1,000 ohm per volt D. C. meter.)

BALANCE I.F. frequency at 175 K.C. Condenser gang at 1500 K.C. and oscillator padder at 600 K.C.



TUBE LAYOUT MODELS 430-440

PARTS AND PRICES
MODELS 430 440
CHASSIS 2033

Dial and Meter Assembly

11-3	Dial String.....per ft....	$ .10
26-37	Dial Strip.....	.25
34-23	Large Hypoid Gear.....	.30
34-24	Small Hypoid Gear.....	.15
59-16	Volume Control Pointer.....	1.00
59-17	Tone Control Pointer.....	1.00
80-69	Dial String Tension Spring.....	.01
80-84	Volume and Tone Control Pointer Spring.....	.01
80-86	Volume and Tone Control Friction Spring.....	.01
83-272	Volume Control Dial Strip.....	.10
83-273	Tone Control Dial Strip.....	.10
83-277	Pointer Guide Strip.....	.01
100-18	Pilot Lamp.....	.12
122-6	Shadowgraph Meter.....	2.00
S-2255	Tone Control Pointer Cam.....	.25
S-2256	Volume Control Pointer Cam.....	.25
S-2265	Dial Drum Assembly.....	1.00

Condensers

22-112	.1 mfd 300 volt (Filter).....	.25
*22-115	.1 " 200 " (Eight used, see footnote).....	.20
22-117	.5 " 300 " (Filter).....	.30
22-127	.000025 600 " (A.V.C. Grid).....	.35
22-137	.05 " 400 " (Oscillator Plate).....	.15
22-142	.4 " 300 " (Filter-25 cycle only).....	.40
22-147	.0005 " 600 " (2nd Detector Plate).....	.20
22-161	Padder.....	.45
22-166	Three Gang Variable.....	3.50
22-167	8. mfd 500 volt (Filter).....	1.50
22-169	8. " 50 " (2nd Detector Cathode, Driver Cathode & 1st Audio Cathode).....	.85
22-170	.1 " 400 " (1st Detector Plate, Tone Control)....	.25
22-175	.002 " 600 " (1st Audio Plate).....	.25
22-177	.2 " 400 " (2nd Detector Plate, 1st Audio Grid, 1st Audio Plate).....	.25

Resistors

63-121	100M Ohm, 1 Watt (2nd Detector Plate).....	.25
63-169	400 " ½ " (A.V.C. & Q.A.V.C. Plates).....	.25
63-231	Volume Control and Switch Assembly.....	1.25
63-232	Tone Control Assembly.....	.75
63-236	500 Ohm (wide metal) (Power Tube Bias).....	.25
63-237	1500 " (narrow metal) (Driver Tube Bias).....	.25
63-137	250M " (½ Watt) (Driver Grid).....	.25
63-239	24M " 1 Watt (Oscillator & 1st Audio Plate).....	.25
63-240	1900 " ¼ " (R.F., 1st Detector & I.F. Grid).....	.20

* See note on next page.

Resistors Cont'd

63-242	2500 Ohm ½ Watt(A.V.C. Cathode).....	$ .25
63-243	18M " 1 " (A.V.C. Cathode).....	.25
63-244	500 " ¼ " (Acoustic Filter).....	.20
63-245	1500 " ¼ " (1st Detector Cathode).....	.20
63-246	150 " ¼ " (R.F. Cathode).....	.20
63-247	8M " ¼ " (1st Audio Cathode).....	.20
63-248	50M " 1 " (2nd Detector Plate & Cathode).....	.25
63-250	Sensitivity and Quiet Control.....	.75
63-140	1 megohm ½ Watt(A.V.C. Grid & Cathode).....	.20

Coils

20-30	Antenna Coil.....	.75
20-31	Oscillator Coil.....	.85
20-32	Detector Coil.....	1.00
95-132	1st I.F. Transformer with Grid Lead.....	1.25
95-138	2nd I.F. Transformer without Grid Lead.....	1.25

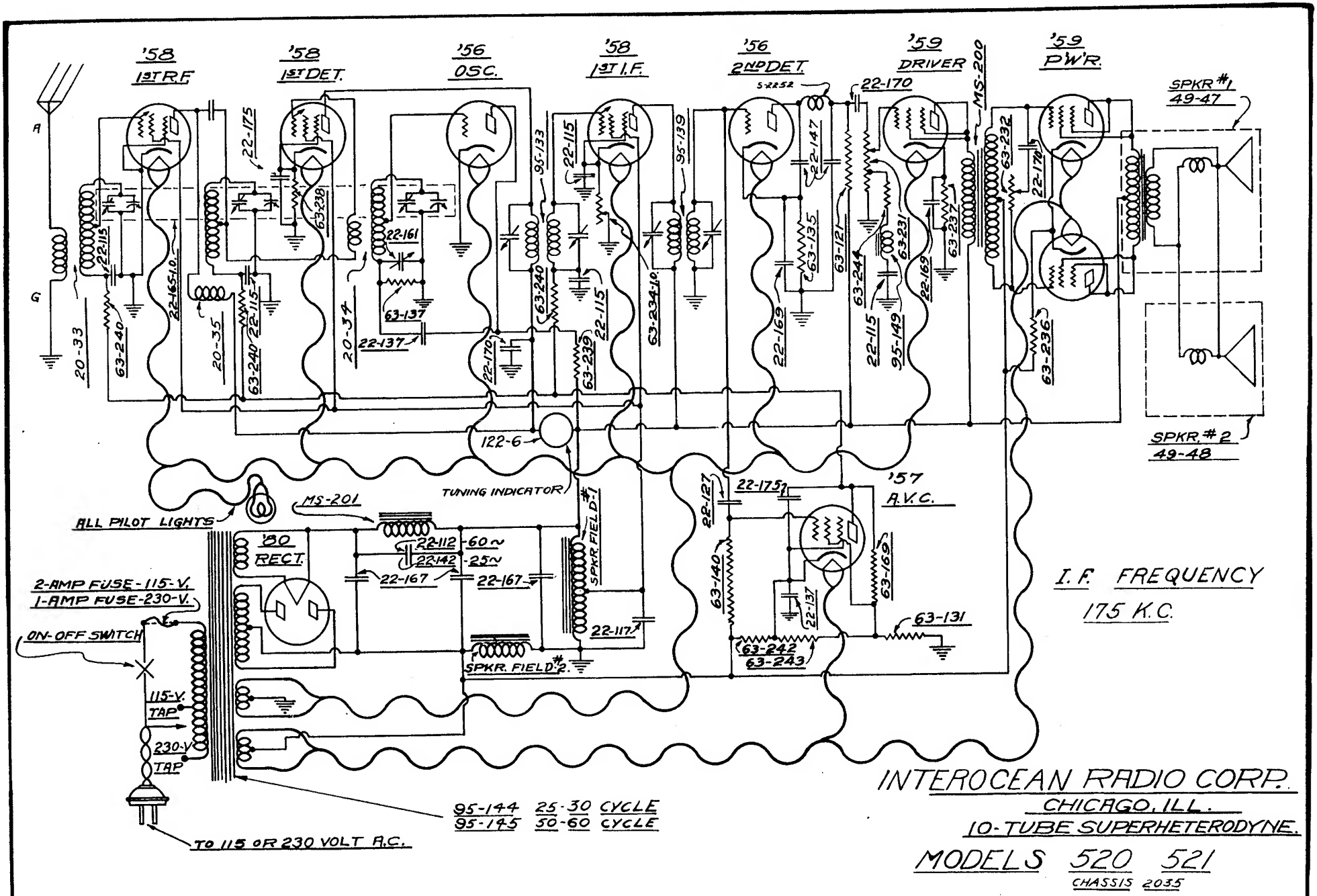
Miscellaneous

46-49	Large Control Knob.....	.20
46-55	Small Control Knob.....	.15
49-50	Dynamic Speaker (without transformer).....	8.00
49-51	Dynamic Speaker (with transformer).....	10.00
52-33	Speaker Multicord.....	.50
57-341	Escutcheon Plate.....	.50
78-56	Seven Prong Socket type 59.....	.15
78-57	Five Prong Socket type 56.....	.15
78-58	Six Prong Socket type 58.....	.15
78-59	Six Prong Socket type 57.....	.15
78-60	Four Prong Socket type 80.....	.15
93-167	Upper Cushion Washer for Chassis Mounting.....	.01
93-168	Lower Cushion Washer for Chassis Mounting.....	.01
95-135	115 volt 50-60 cycle Power Transformer.....	7.00
95-137	115 volt 25-30 cycle Power Transformer.....	9.00
126-109	Small Tube Shield.....	.10
136-2	2 amp Fuse for 115 volt sets.....	.06
136-4	1 amp Fuse for 230 volt sets.....	.06
MS-174	Power Choke.....	3.25
Ms-195	Large Tube Shield Assembly.....	1.25
MS-200	Audio Transformer.....	3.50

* 22-115 R.F.,1st Detector,I.F. Grid Return, A.V.C. Plate, A.V.C. Cathode,1st Detector Cathode, R.F.Cathode, & Acoustic Filter.

ALL PRICES ARE SUBJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE.

ZENITH RADIO CORPORATION
December 18, 1933.



INTEROCEAN RADIO CORP.
CHICAGO, ILL.
10-TUBE SUPERHETERODYNE.

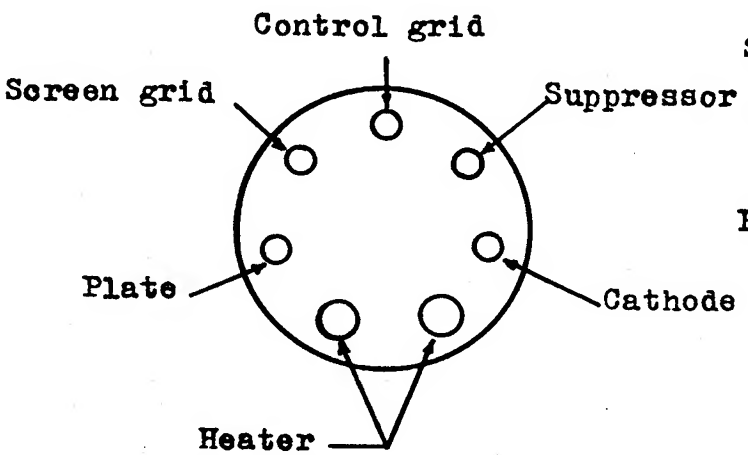
MODELS 520 521
CHASSIS 2035

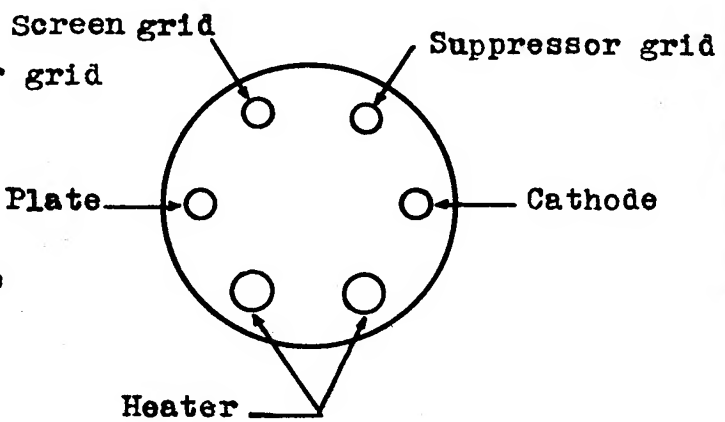
VOLTAGE READINGS - MODELS 520 521

Antenna Disconnected — Meter 1000 Ohms Per Volt

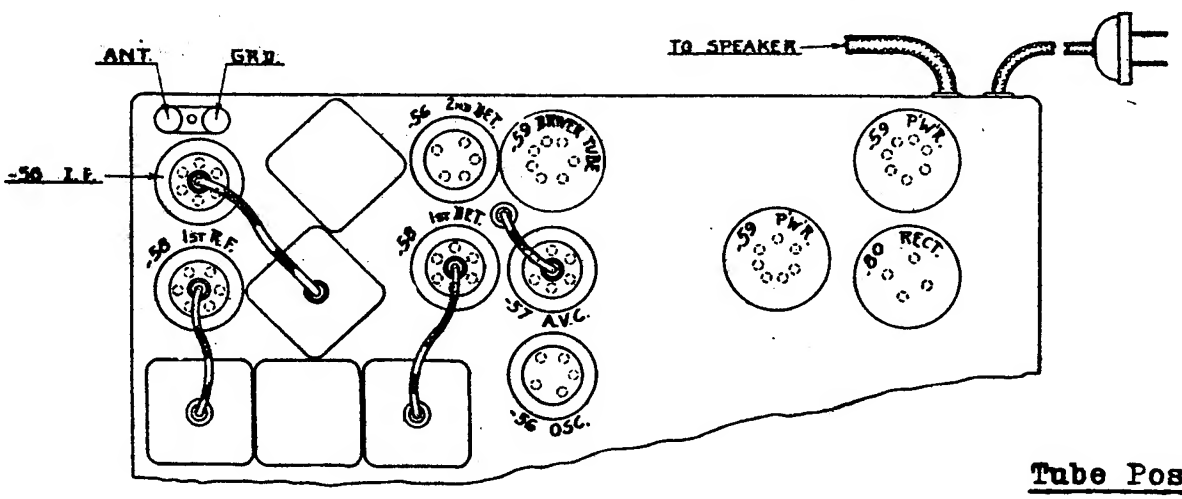
Tube Type	Position	Fil. Volt.	Plate Volt.	Cath. Volt.	Screen Volt.	Plate Current
Z-58	R.F.	2.5	220	0	100	5.2
Z-58	1st Det.	2.5	220	+2	100	3.
Z-56	Osc.	2.5	120	0	0	4.
Z-58	I.F.	2.5	220	0	100	6.
Z-56	2nd Det.	2.5	120	20	0	.75
Z-57	A.V.C.	2.5	-40	-75	-2	0
Z-59	Driver	2.5	220	+25	220	8.2
Z-59	Power	2.5	230	-65	230	25.
Z-59	Power	2.5	230	-65	230	25.
Z-80	Rect.	5.0	400*			62.5*

Line voltage 115 (Reading to Ground) Volume control maximum





Six and seven prong socket connections (Bottom of socket)



Tube Position

PARTS AND PRICES
MODELS 520 521
CHASSIS NO. 2035

	Dial and Meter Assembly	
11-3	Dial Pulley String.....per ft.	$ .25
26-38	Calibrated Dial Strip.....	.15
80-69	Dial Cord Tension Spring.....	.01
80-85	Volume and Tone Control Dial Tension Spring.....	.01
83-274	Volume Control Dial Strip.....	.10
83-275	Tone Control Dial Strip.....	.10
100-18	2.5 Volt Pilot Lamp.....	.12
122-5	Shadowgraph Meter.....	2.00
	Condensers	
22-112	.1 mfd 300 Volt (Filter).....	.25
22-115	.1 " 200 " (5 used, see footnote).....	.35
22-117	.5 " 300 " (Filter).....	.50
22-137	.05 " 400 " (Oscillator Plate).....	.25
22-142	.4 " 300 " (Filter, 25 Cycle Only).....	.40
22-147	.0005 600 " (2nd Detector Plate).....	.20
22-161	Padder.....	.45
22-165	Three Gang Variable.....	3.50
22-167	8. mfd 500 Volt (Filter).....	1.50
22-169	8. " 50 " (2nd Detector Cathode, Driver Cathode, and 1st Audio Cathode).....	.55
22-170	.1 " 400 " (1st Detector Plate, Audio Coupling and Tone Control).....	.25
	Resistors	
63-121	100M Ohm 1 Watt (2nd Detector Plate).....	.25
63-135	50M " 1 " (2nd Detector Cathode).....	.25
63-137	250M " ½ " (Oscillator Grid).....	.25
63-140	1 Meg" ½ " (A. V. C. Grid).....	.25
63-169	400 " ½ " (A. V. C. Plate).....	.25
63-231	Volume Control Assembly.....	1.25
63-232	Tone Control Assembly.....	.75
63-234	Sensitivity Control.....	.75
63-236	500 Ohm.....(Power Bias) (Wide Metal).....	.25
63-237	1500 " .....(Driver Bias)(Narrow Metal).....	.25
63-238	1000 " ¼ Watt (1st Detector Cathode).....	.25
63-239	24M " 1 " (Oscillator Plate).....	.25
63-240	1900 " ¼ " (R.F.,1st Detector & I.F. Grids).....	.25
63-242	2500 " ½ " (A. V. C. Cathode).....	.25
63-243	18M " 1 " (A. V. C. Cathode).....	.25
63-244	500 " ¼ " (Acoustic Filter).....	.25
	Coils	
20-33	Antenna Coil.....	.75
20-34	Oscillator Coil.....	.85
20-35	Detector Coil.....	1.00
S-2252	2nd Detector Plate Choke and Bracket.....	.50
95-133	1st I. F. Transformer (with Grid Lead).....	1.25
95-139	2nd I. F. Transformer (without Grid Lead).....	1.25

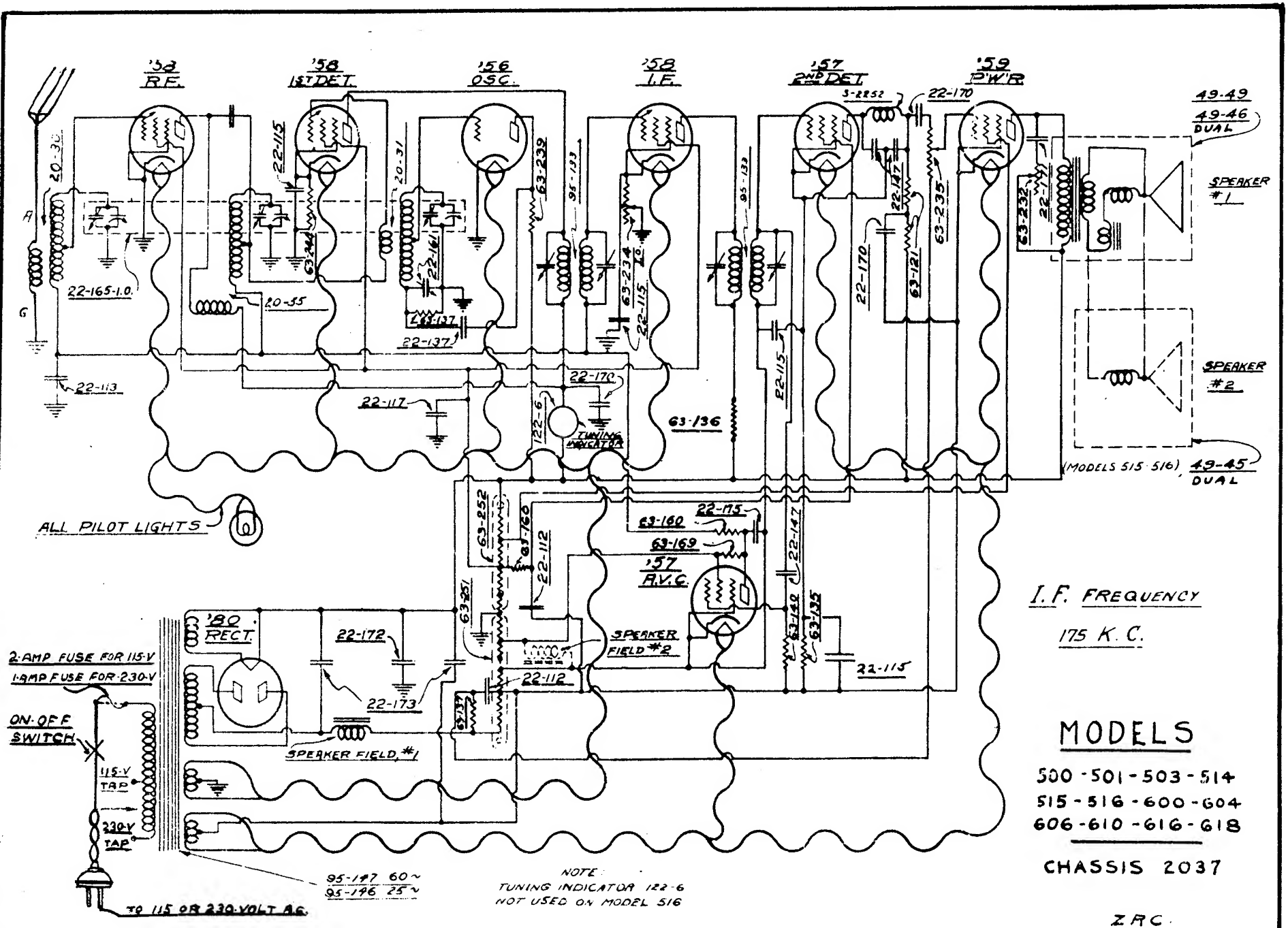
*22-115 R. F., 1st Detector, I. F. Grid Returns, I. F. Cathode, and Acoustic Filter.

Miscellaneous

46-61	Large Control Knob	$ .25
46-62	Small Control Knob	.15
49-47	Dynamic Speaker with Transformer	7.00
49-48	Dynamic Speaker without Transformer	8.25
52-31	Speaker Multicord	.35
57-343	Escutcheon Plate	.50
78-56	Type 59 Socket	.15
78-57	Type 56 Socket	.15
78-58	Type 58 Socket	.15
78-59	Type 57 Socket	.15
78-60	Type 80 Socket	.15
93-167	Upper Cushion Washer for Chassis Mounting	.01
93-168	Lower Cushion Washer for Chassis Mounting	.01
95-144	115 Volt 25-50 Cycle Power Transformer	7.25
95-145	115 Volt 50-60 Cycle Power Transformer	5.00
95-149	Acoustic Filter Choke	.30
106-129	Small Tube Shield	.10
136-2	2 amp Fuse	.06
MS-200	Push Pull Input Transformer	3.50
MS-201	Power Filter Choke	3.25

ALL PRICES ARE SUBJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE.

INTEROCEAN RADIO CORPORATION


'53 R.F.
'58 1ST DET.
'56 OSC.
'58 I.F.
'57 2ND DET.
'59 PWR
49-49
49-46 DUAL
SPEAKER #1
SPEAKER #2
(MODELS 515 516) 49-45 DUAL
ALL PILOT LIGHTS
'80 RECT.
'57 A.V.C.
2-AMP FUSE FOR 115-V
1-AMP FUSE FOR 230-V
ON-OFF SWITCH
115-V TAP
230-V TAP
TO 115 OR 230-VOLT A.C.
SPEAKER FIELD #1
SPEAKER FIELD #2
95-147 60~
95-196 25~
NOTE
TUNING INDICATOR 122-6
NOT USED ON MODEL 516
I.F. FREQUENCY
175 K.C.
MODELS
500-501-503-514
515-516-600-604
606-610-616-618
CHASSIS 2037
ZRC

SOCKET VOLTAGES

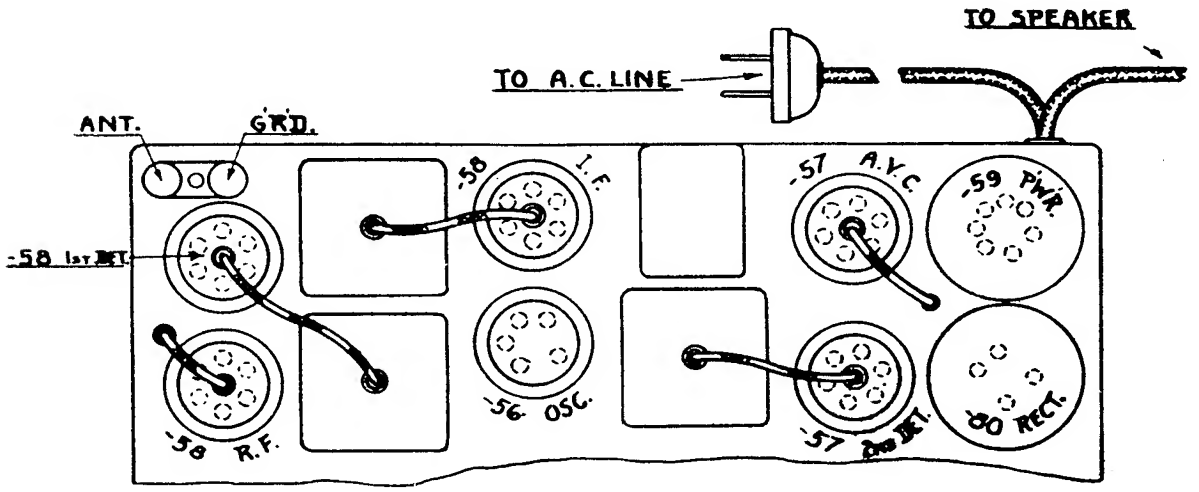
Tube Type	Position	Fil. Volt.	Plate Volt.	Cath. Volt.	Screen Volt.	Supp. Volt.	Plate Current
Z-58	R.F.	2.4	190	0	95	0	7.
Z-58	1st Det.	2.4	190	2.3	95	2.3	4.
Z-56	Osc.	2.4	100	0	-	-	4.
Z-58	I.F.	2.4	190	0	90	0	2.
Z-57	2nd Det.	2.4	90	-60	70	-60	.2
Z-57	A.V.C.	2.4	-10	-65	-2	-65	0
Z-59	Power	2.4	175	-70	165	-70	25
Z-80	Rect.	5.	*350	-	-	-	*36

Line 115 Volts

All Controls Maximum

(All readings, with exception of heaters, taken from socket connections to ground. Use 1,000 ohm per volt D. C. meter.)

BALANCE I.F. frequency at 175 K.C. Condenser gang at 1500 K.C. and oscillator padder at 600 K.C.



TUBE POSITION

PARTS AND PRICES

CHASSIS 2037

Dial and Meter Assembly

11-3	Pulley String.....per ft.....	$ .10
26-38	Dial Drum Strip.....	.10
61-19	Tuning Shaft Pulley (small idler).....	.05
61-22	Tuning Shaft Pulley (large idler).....	.10
80-65	Dial Drum Pulley Tension Spring.....	.01
80-69	Volume and Tone Control Tension Spring.....	.01
100-18	2½ volt Pilot Lamp.....	.12
122-5	Shadow Meter.....(Not Used On Model 516)	2.00
S-2242	Volume Control Dial Assembly.....(" " " " ")	.35
S-2243	Tone Control Dial Assembly.....(" " " " ")	.35

Condensers

22-112	.1 mfd 300 volt(2nd Detector Screen & Power Grid).....	.25
22-113	.5 " .....(R.F.1st Detector & I.F.Grid Return).....	.30
* 22-115	.1 " 200 volt(Four used, see below).....	.20
22-117	.5 " .....(R.F.1st Detector, & I.F.Screen).....	.30
22-137	.05 " 400 volt(Oscillator Plate).....	.15
22-147	.0005 600 volt(2nd Detector Plate & A.V.C.Screen).....	.15
22-161	Padder.....	.45
22-165	Three-Gang Variable.....	3.50
22-170	.1 mfd 400 volt(R.F.& 1st Det. Plate, 2nd Det. Plate)....	.25
22-171	.05 " 600 volt(Tone Control).....	.20
22-172	2. " 450 volt(Filter).....	.80
22-173	8. " 500 volt(Filter).....	1.50

Resistors

63-121	100M ohm,1 Watt (2nd Detector Plate).....	.25
63-135	25M " ½ " (2nd Detector Cathode).....	.25
63-137	250M " ½ " (Oscillator & Power Grid).....	.25
63-140	1 meg " ½ " (A.V.C.Screen).....	.25
63-160	100M " ½ " (A.V.C.Plate).....	.25
63-169	400M " ½ " (A.V.C.Grid).....	.25
63-232	Manual Tone Control.....	.70
63-234	Manual Sensitivity Control.....	.70
63-235	Manual Volume Control.....	1.25
63-239	24M ohm 1 Watt (Oscillator Plate).....	.25
63-244	500M " ¼ " (1st Detector Cathode).....	.20
63-251	Voltage Divider (six tap).....	.65
63-252	Voltage Divider (five tap).....	.60

Coils and Chokes

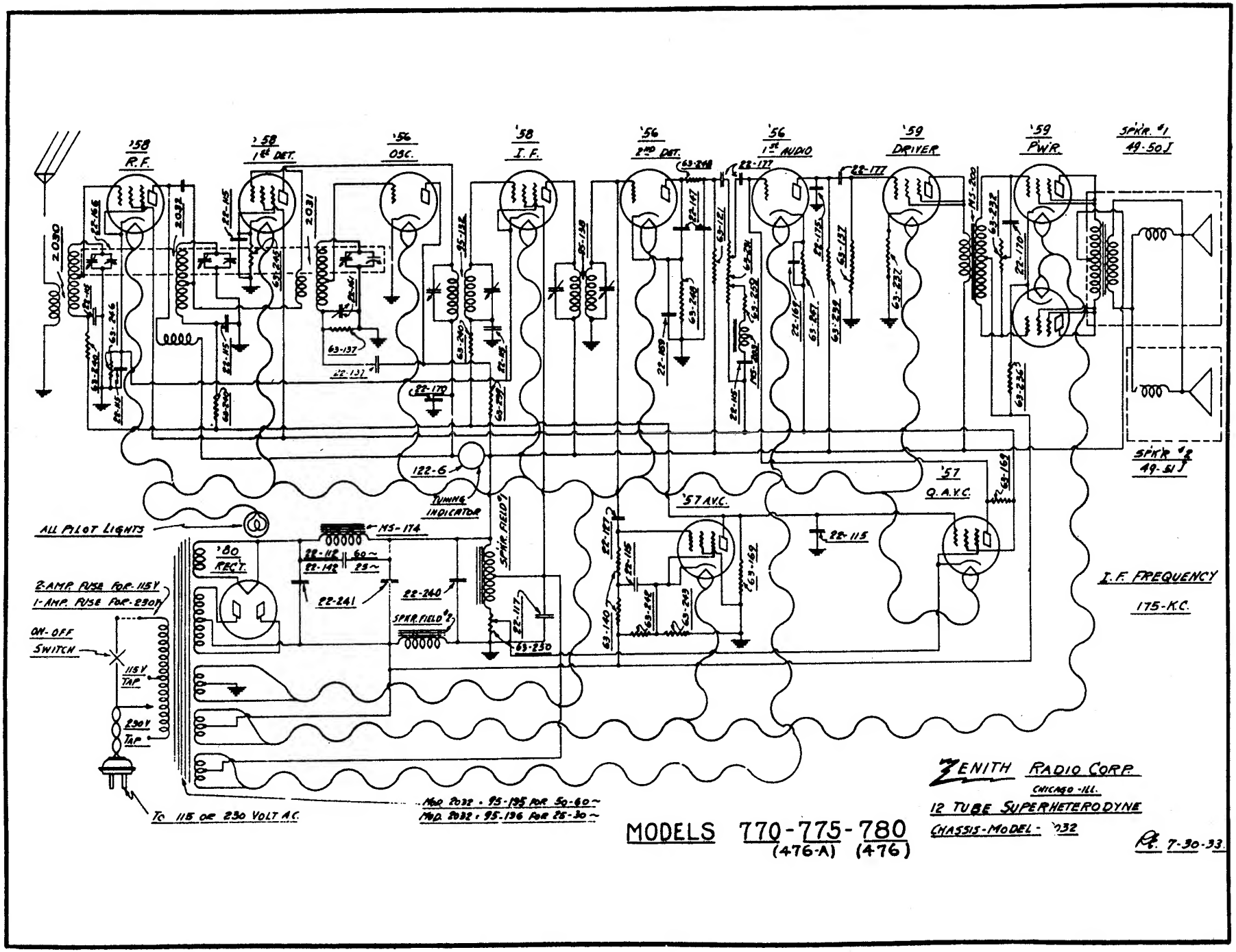
20-30	Antenna Coil.....	.75
20-31	Oscillator Coil.....	.85
20-35	Detector Coil.....	1.00
95-133	1st & 2nd I. F. Transformer.....	1.25
S-2252	Plate Choke and Bracket.....	.5[illegible]

* 22-115 I.F.Cathode,2d.Det.Grid Ret.1st & 2d.Det.Cathodes.....

Miscellaneous

46-46	Large Knob	$ .20
46-62	Small Knob	.20
49-45	Dynamic Speaker for Models 500,516 without transformer	6.00
49-46	Dynamic Speaker for Models 500, 516 with transformer	8.00
49-49	Dynamic Speaker for Model 517	7.00
52-32	Speaker Multicord	.35
57-343	Escutcheon Plate	.50
78-56	59 Seven-Prong Socket	.15
78-57	56 Five-Prong Socket	.15
78-58	58 Six-Prong Socket	.15
78-59	57 Six-Prong Socket	.15
78-60	80 Four-Prong Socket	.15
95-146	115 volt 25 cycle Power Transformer	8.50
95-147	115 volt 60 cycle Power Transformer	5.00
136-109	Tube Shield	.10
136-2	2 amp Fuse	.06

ZENITH RADIO CORPORATION
April 2, 1934


'58 R.F.
'58 1st DET.
'56 OSC.
'58 I.F.
'56 2nd DET.
'56 1st AUDIO
'59 DRIVER
'59 PWR.
SPKR. #1 49-501
SPKR. #2 49-511
'57 A.V.C.
'57 Q.A.V.C.
'80 RECT.
122-6
TUNING INDICATOR
ALL PILOT LIGHTS
MS-174
SPKR. FIELD #1
SPKR. FIELD #2
2-AMP. FUSE FOR 115V
1-AMP. FUSE FOR 230V
ON-OFF SWITCH
115V TAP
230V TAP
TO 115 OR 230 VOLT A.C.
MOD. 2032 - 95-195 FOR 50-60~
MOD. 2032 - 95-196 FOR 25-30~
I.F. FREQUENCY
175-K.C.
ZENITH RADIO CORP.
CHICAGO-ILL.
12 TUBE SUPERHETERODYNE
CHASSIS-MODEL-2032
MODELS 770-775-780
(476-A) (476)
7-30-33.

ZENITH AUTOMATIC RADIO

Socket Voltages

770 - 775 - 780 -476-476A

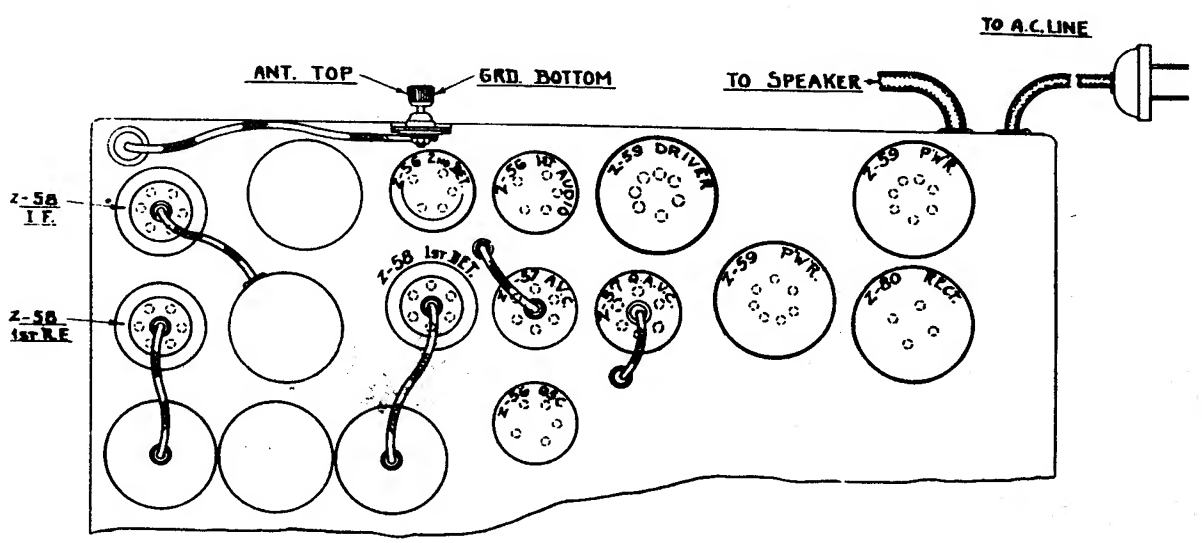
Tube Type	Position	Fil. Volt.	Plate Volt.	Cath. Volt.	Screen Volt.	Supp. Volt.	Plate Current
Z-58	1st R.F.	2.5	175	2.2	75	2.2	5.7
Z-58	1st Det.	2.5	190	4.5	75	4.5	2.3
Z-56	Osc.	2.5	100	0	-	-	3.5
Z-58	1st I.F.	2.5	200	2.2	75	2.2	5.5
Z-56	2nd Det.	2.5	110	10	-	-	.3
Z-56	1st Audio	2.5	170	80	-	-	.8
Z-57	A.V.C.	2.5	-	-85	-	-85	-
Z-57	Q.A.V.C.	2.5	30	13	75	13	-
Z-59	Driver	2.5	190	20	190	190	13
Z-59	Power	2.5	195	-70	195	195	22
Z-59	Power	2.5	195	-70	195	195	22
Z-80	Rect.	5.0	360	-	-	-	65

Line 115 Volts

All Controls Maximum

(All readings, with exception of heaters, taken from socket connections to ground. Use 1,000 ohm per volt D. C. meter.)

BALANCE I.F. frequency at 175 K.C. Condenser gang at 1500 K.C. and oscillator pad der at 600 K.C.



TUBE LAYOUT

PARTS AND PRICES
MODELS 770 775 780 476 476 A
CHASSIS NO. 2032

Dial and Meter Assembly

11-3	Dial String.....per ft...	$ .10
26-39	Dial Strip.....	.25
59-16	Volume Control Pointer.....	1.00
59-17	Tone Control Pointer.....	1.00
80-69	Dial String Tension Spring.....	.01
80-84	Volume and Tone Control Pointer Spring.....	.01
80-86	Volume and Tone Control Friction Spring.....	.01
80-89	Dial Cord Guide Spring.....	.01
83-272	Volume Control Dial Strip.....	.10
83-273	Tone Control Dial Strip.....	.10
83-277	Pointer Guide Strip.....	.01
100-18	Pilot Lamp.....	.12
122-5	Shadowgraph Meter.....	2.00
S-2254	Dial Drum Assembly.....	1.00
S-2255	Tone Control Pointer Cam.....	.25
S-2256	Volume Control Pointer Cam.....	.25

Condensers

22-112	.1	mfd	300	volt	(filter).....	.25
* 22-115	.1	"	200	"	(eight used, see footnote).....	.20
22-117	.5	"	300	"	(filter).....	.30
22-127	.000025		600	"	(A.V.C.Grid).....	.35
22-137	.05	mfd	400	"	(oscillator plate).....	.15
22-142	.4	"	300	"	(filter - 25 cycle only).....	.40
22-147	.0005	"	600	"	(2d detector plate -2 used).....	.15
22-161	Padder.....					.45
22-166	Three Gang Variable.....					3.50
22-169	8.	mfd	50	volt	(2d detector cathode & 1st audio cathode.	.85
22-170	.1	"	400	"	(1st detector plate, tone control).....	.25
22-175	.002	"	600	"	(1st audio plate).....	.30
22-177	.2	"	400	"	(2d det.plate, 1st audio grid, 1st audio plate).....	.25
22-240	8.	"	500	"	(filter).....	1.50
22-241	Dual 8 mfd 500 volt (filter).....					3.00

Resistors

63-121	100M	ohm	1	watt	(2d detector plate).....	.25
63-137	250M	"	½	"	(driver grid).....	.25
63-169	400	"	½	"	(A.V.C. & Q.A.V.C. plates).....	.25
63-231	Volume Control and Switch Assembly.....					1.25
63-232	Tone Control Assembly.....					.75
63-236	500	ohm (wide metal)..(power tube bias).....				.25
63-237	1500	" (narrow metal)(driver tube bias).....				.25
63-239	24M	"	1	watt	(oscillator & 1st audio plate).....	.25
63-240	1900	"	¼	"	(R. F.,1st detector & I.F. grid).....	.20

* 22-115 R.F.,1st detector, I.F. grid return, A.V.C. plate, A.V.C. cathode, 1st detector cathode, R.F.cathode, & acoustic filter.

Resistors Cont'd

63-242	2500 ohm ½ watt (A.V.C. cathode)	$ .25
63-243	18 M " 1 " (A.V.C.cathode)	.25
63-245	1500 " ¼ " (1st detector cathode)	.20
63-246	150 " ¼ " (R.F.cathode)	.20
63-247	8M " ¼ " (1st audio cathode)	.20
63-248	50M " 1 " (2d detector plate & cathode)	.25
63-250	Sensitivity and Quiet Control	.75
63-259	2600 ohm ¼ watt (acoustic filter)	.20
63-140	1 meg ohm ½ " (A.V.C. grid and cathode)	.20

Coils

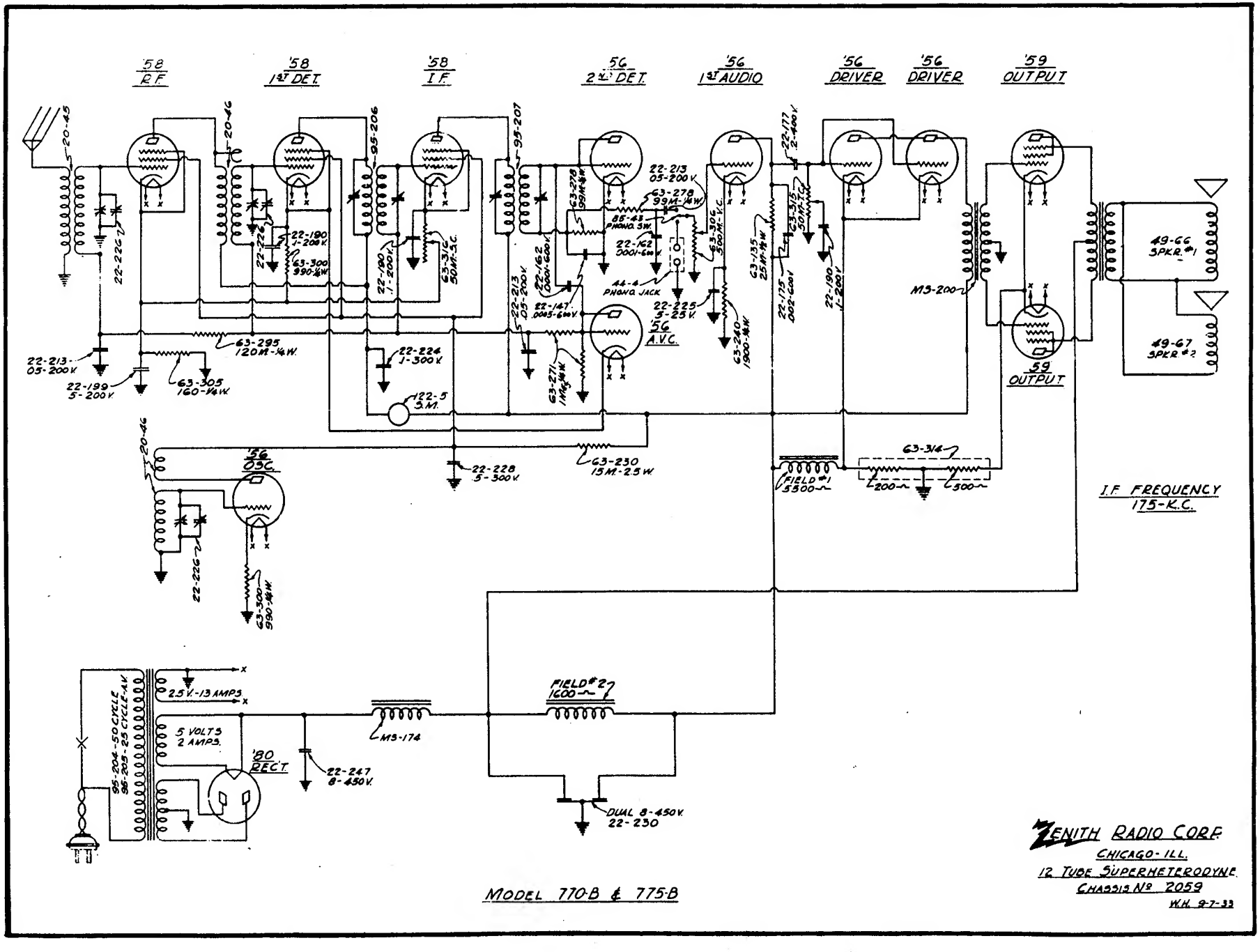
20-30	Antenna Coil	.75
20-31	Oscillator Coil	.85
20-32	Detector Coil	1.00
95-132	1st I.F. Transformer with grid lead	1.25
95-138	2d I.F. Transformer without grid lead	1.25

Miscellaneous

46-49	Large Control Knob	.20
46-55	Small Control Knob	.15
49-52	Dynamic Speaker (with transformer)	10.00
49-53	Dynamic Speaker (without transformer)	6.50
52-33	Speaker Multicord	.50
57-341	Escutcheon Plate	.50
78-56	Seven prong Socket type 59	.15
78-57	Five " " " 56	.15
78-58	Six " " " 58	.15
78-59	Six " " " 57	.15
78-60	Four " " " 80	.15
93-167	Upper Cushion Washer for Chassis Mounting	.01
93-168	Lower Cushion Washer for Chassis Mounting	.01
95-195	115 volt 50-60 cycle Power Transformer	7.00
95-196	115 volt 25-30 cycle Power Transformer	9.00
126-109	Small Tube Shield	.10
136-2	2 amp Fuse for 115 volt sets	.06
136-4	1 amp Fuse for 230 volt sets	.06
MS-174	Power Choke	3.25
MS-195	Large Tube Shield Assembly	1.25
MS-200	Audio Transformer	3.50

ALL PRICES SUBJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE. ALSO ALL PRICES QUOTED HERE SUPERSEDE PREVIOUS QUOTATIONS IN OTHER PRICE LISTS FOR LIKE PARTS.

November 21, 1933


'58 R.F.
'58 1ST DET.
'58 I.F.
'56 2ND DET.
'56 1ST AUDIO
'56 DRIVER
'56 DRIVER
'59 OUTPUT
'56 OSC.
'56 A.V.C.
'59 OUTPUT
'80 RECT.
95-204-50 CYCLE
95-205-25 CYCLE-AV
2.5 V.-13 AMPS.
5 VOLTS 2 AMPS.
M3-174
FIELD #2 1600~
DUAL 8-450 V. 22-230
22-247 8-450 V.
FIELD #1 5500~
63-314
200~
300~
M3-200
49-66 SPKR. #1
49-67 SPKR. #2
I.F. FREQUENCY 175-K.C.
MODEL 770-B & 775-B
ZENITH RADIO CORP.
CHICAGO-ILL.
12 TUBE SUPERHETERODYNE
CHASSIS Nº 2059
W.H. 9-7-33

Socket Voltages

ZENITH AUTOMATIC RADIO

770B - 775B - 476B

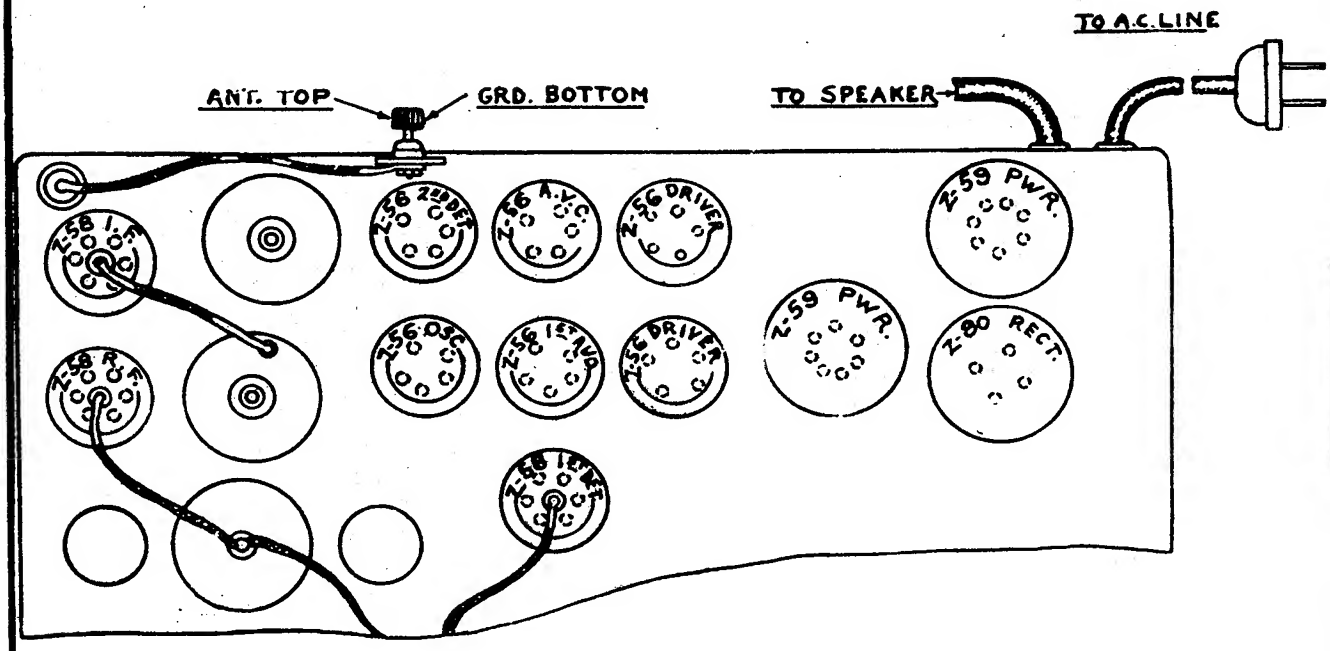
Tube Type	Position	Fil. Volt.	Plate Volt.	Cath. Volt.	Screen Volt.	Supp. Volt.	Plate Current
Z-58	1st R.F.	2.5	200	2.2	82	2.2	4.6
Z-58	1st Det.	2.5	200	5.0	82	5.0	2.4
Z-56	Osc.	2.5	80	6.0	—	---	5.4
Z-58	1st I.F.	2.5	210	2.2	82	2.2	5.2
Z-56	2nd Det.	2.5	0	0	—	---	0
Z-56	A.V.C.	2.5	0	5.0	—	---	0
Z-56	1st A.F.	2.5	120	5.0	—	---	3.0
Z-56	Driver	2.5	200	9.0	—	---	3.0
Z-56	Driver	2.5	200	9.0	—	---	3.0
Z-59	Power	2.5	310	30.0	310	310	24.0
Z-59	Power	2.5	310	30.0	310	310	24.0
Z-80	Rect.	5.0	360	----	---	---	62.5

Line 115 Volts

All Controls Maximum

(All readings, with exception of heaters, taken from socket connections to ground. Use 1,000 ohm per volt D.C. meter.)

BALANCE I.F. frequency at 175 K.C. Condenser gang at 1500 K.C. No padder adjustment required.



TUBE LAYOUT

PARTS AND PRICES
MODELS 770B 775B 476B
CHASSIS NO.2059

Dial and Meter Assembly

11-3	Dial String .....per ft..	$ .10
59-16	Volume Control Pointer	1.00
59-17	Tone Control Pointer	1.00
61-22	Dial Vernier Pulley	.05
80-69	Pulley String Tension Spring	.01
80-84	Volume and Tone Control Pointer Spring	.01
80-86	" " " " Friction "	.01
83-272	Tone Control Dial Strip.....	.10
83-273	" " " "	.10
83-277	Pointer Guide Strip	.01
83-315	Calibrated Dial Strip	.25
100-18	2½ V Pilot Lamp	.12
122-5	Shadowgraph Meter.....	2.00
S-769	Dial Lamp Socket Assembly (Less Lamp).....	.15
S-2255	Tone Control Cam Bushing Assembly	.25
S-2256	Volume " " " "	.25

Condensers

22-147	.0005 mfd	600 volt	(2nd Detector Grid).....	.20
22-162	.0001 "	600 "	(A.V.C.Plate & 2nd Detector Grid).....	.20
22-175	.002 "	600 "	(1st Audio Plate).....	.25
22-177	.2 "	400 "	(Audio Coupling).....	.25
22-190	.1 "	200 "	(1st Detector, I F, Cathodes & Driver Grid.	.20
22-199	.5 "	200 "	(R F Cathode).....	.35
22-213	.05 "	200 "	(R F,2nd Detector & A.V.C. Grids).....	.20
22-224	.1 "	300 "	(R F & 1st Detector Plates).....	.15
22-225	5. "	25 "	(1st Audio Cathode).....	.65
22-226	Three Gang Variable			3.00
22-228	.5 mfd	300 volt	(R F, 1st Detector & I F Screens).....	.35
22-230	Dual 8 "	500 "	(Filter).....	2.50
22-247	Single 8 mfd	450 "	(").....	1.50

Resistors

63-135	25 M ohm ½ Watt	(1st Audio Plate).....	.25
63-230	15 M " 2½ "	(R F,1st Detector & I F Screens).....	.35
63-240	1900 " ¼ "	(1st Audio Cathode).....	.20
63-271	1 meg " ¼ "	(A.V.C. Grid)	.20
63-278	99 M " ¼ "	(2nd Detector	.20
63-295	120 M " ¼ "	(R F Grid).....	.20
63-300	990 " ¼ "	(1st Detector Cathode).....	.20
63-305	160 " ¼ "	(R F Cathode).....	.20
63-306	Volume Control Assembly (500 M ohm).....		1.25
63-314	700 ohm Tapped Metal (Voltage Divider).....		.35
63-315	Tone Control (50 M ohms)		.70
63-316	Sensitivity Control (50 M ohms).....		.65

CHASSIS NO.2059

Coils

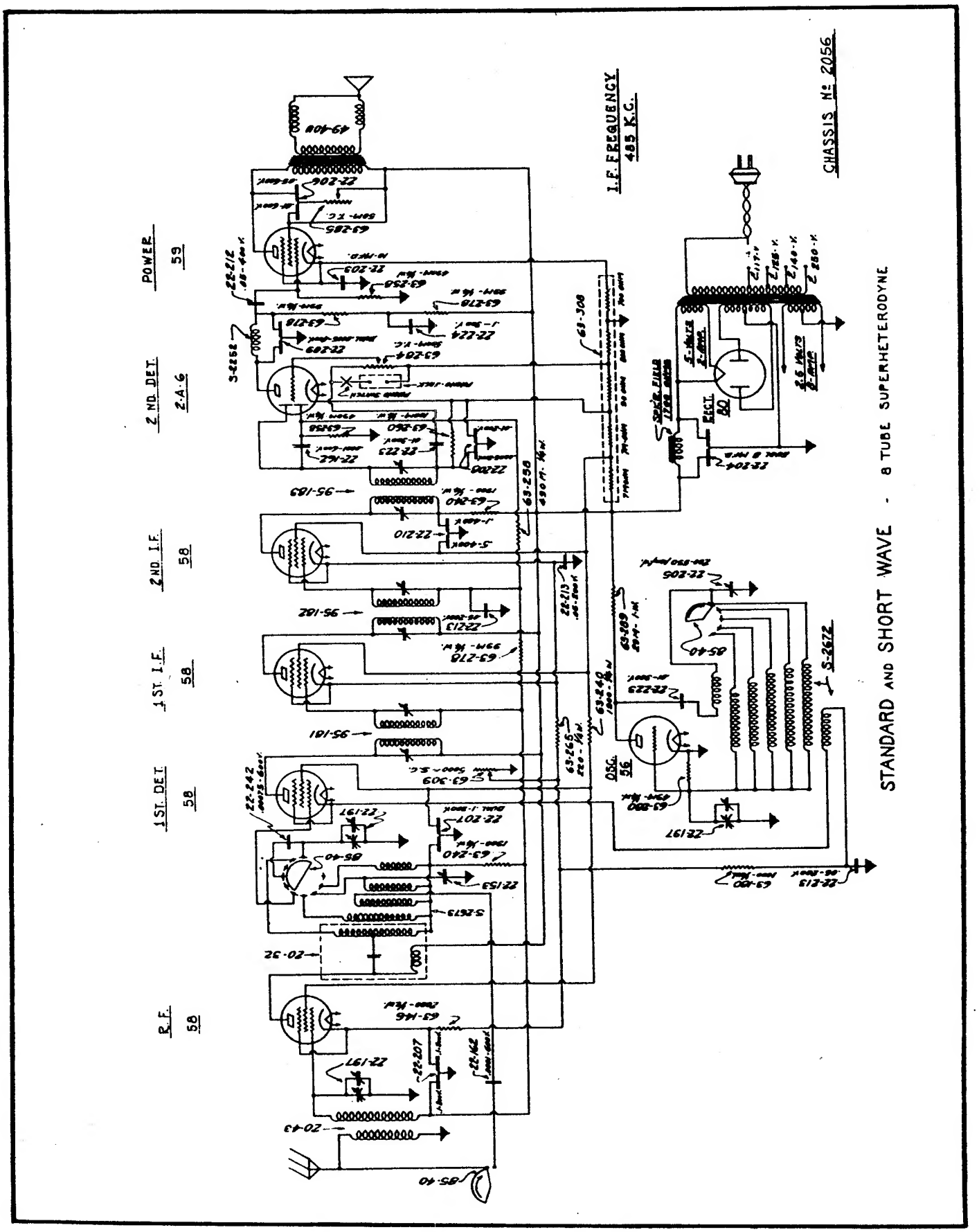
20-45	R F Coil Assembly	$ .75
20-46	Detector Oscillator Coil Assembly	1.25
95-206	1st I F Transformer	1.50
95-207	2nd " " "	1.50

Miscellaneous

44-4	Phono Receptacle Assembly	.15
46-49	Large Wooden Knob (One Used)	.20
46-55	Small " " (Three ")	.15
49-66	#1 Dynamic Speaker (With Transformer)	12.00
49-67	#2 " " (Without ")	8.00
57-341	Escutcheon Plate	.50
78-84	#56 Tube Socket	.10
78-85	#58 " "	.10
78-86	#59 " "	.10
78-87	#80 " "	.10
85-43	Phono Radio Switch	.60
93-167	Chassis Mounting Cushion Washers	.01
95-204	117 volt 50-60 Cycle Power Transformer	6.00
95-205	All Voltage 25 Cycle " "	8.75
126-109	Tube Shield	.10
126-127	" "	.10
MS-174	Filter Choke Assembly	3.25
MS-200	Audio Transformer	3.50
S-2736	Binding Post Assembly	.60

ALL PRICES SUBJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE. ALSO ALL PRICES QUOTED HERE SUPERSEDE PREVIOUS QUOTATIONS IN OTHER PARTS LISTS FOR LIKE PARTS.

November 14, 1935.


STANDARD AND SHORT WAVE - 8 TUBE SUPERHETERODYNE
CHASSIS Nº 2056
I.F. FREQUENCY 485 K.C.
POWER 59
2 ND. DET. 2-A-6
2 ND. I.F. 58
1 ST. I.F. 58
1 ST. DET. 58
R.F. 58
S-2672
S-2673

SOCKET VOLTAGES (2056)

TYPE	POSITION	E_f	E_k	E_g^1	E_g^2	E_g^3	E_p
58	R.F.	2.5	5	0	100	5	255
58	1st Det.	2.5	3.5	0	100	3.5	249
56	Osc.	2.5	0	24	—	—	90
58	1st I.F.	2.5	3	0	104	3	255
58	2nd I.F.	2.5	3	0	104	3	249
2A6	2nd. Det.	2.5	8.5	7	—	—	70
59	Pwr.	2.5	18	0	234	18	234
80	Rect.	5.	—	—	—	—	360

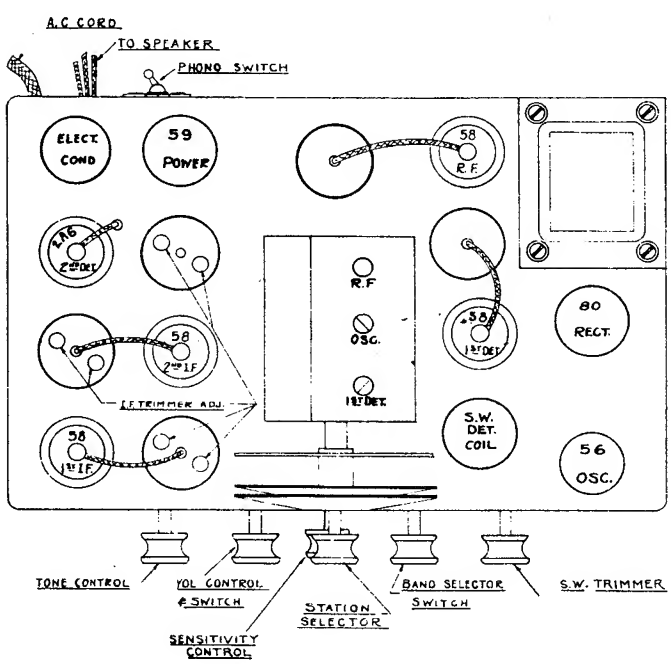
E_f - filament E_k - cathode E_g^1 - control grid E_g^2 - screen grid

E_g^3 - suppressor grid E_p - plate

All voltage readings taken from indicated points to ground with 1000 ohms per volt D.C. meter.

Aligning Procedure

First set I.F. trimmers with an accurate 485 K.C. test oscillator connected to the grid of the 1st detector and ground. Remove oscillator tube and turn I.F. adjusting screws indicated on the diagram below. Insert oscillator tube and connect the test oscillator to the aerial and ground posts. Set the test oscillator and dial to 1500 K.C. and turn the three trimmers on the tuning condenser to resonance, then set the test oscillator and dial to 600 K.C. and adjust the padder condenser for maximum output. Repeat the entire procedure for greater accuracy.



Tube Layout

Showing position and circuit function of each. Note location of padder and trimmer adjusting screws.

PARTS AND PRICES
STANDARD AND SHORT WAVE RECEIVER
CHASSIS NOS. 2056 - 2056I

Dial Assembly

11-3	Dial Cord.....per ft...	$ .10
12-297	Dial Lamp Bracket.....	.05
34-21	Hypoid Tuning Gear.....	.45
73-8	Dial Hub Set Screw.....	.02
80-93	Dial Mask Special Spring.....	.25
100-18	2½ volt Dial Lamp.....	.12
S-2677	Pointer Dial Lamp and Clip Assembly.....	.45
S-2678	Tuning Shaft and Bracket Assembly.....	.80
S-2679	Dial Strip and Support Assembly (for 2056 Chassis).....	1.00
S-2697	Dial Strip and Support Assembly (for 2056I Chassis).....	1.00

Condensers

22-162	.001 mfd 600 volt (band switch and 2A6 diode).....	.20
22-197	Three Gang Variable Condenser.....	3.25
22-203	10. mfd 25 volt(power cathode).....	.75
22-204	8. x 8.mfd 500 volt(filter).....	3.00
22-205	Padder.....	.35
22-206	.01 x .05 mfd 600 volt(tone control).....	.25
22-207	.1 x .1 mfd 200 volt(R.F.cathode & 1st det.cathode).....	.25
22-208	.01 x .0005 mfd 200 volt(2d detector cathode).....	.20
22-209	.0005 x.0005 mfd 400 volt(2d detector plate).....	.20
22-210	.1 x .5 mfd 400 volt(2d I.F. plate and screen).....	.40
22-212	.05 mfd 400 volt(audio coupling).....	.20
22-213	.05 mfd 200 volt(R.F.cathode,I.F.cathode & 2d IF grid	.20
22-223	.01 mfd 300 volt(2d det.grid and oscillator plate)...	.15
22-224	.1 mfd 300 volt(2d detector plate).....	.15
22-242	.00075 mfd 600 volt(band switch).....	.20

Resistors

63-146	2M ohm ½ watt.....(R.F.cathode)	.20
63-180	1M ohm ½ watt.....(1st detector cathode).....	.20
63-240	1900 ohm ½ watt.....(1st detector grid & I.F. plate)....	.20
63-258	490M ohm ¼ watt.....(2d detector diode).....	.20
63-265	220 ohm ¼ watt.....(R.F.cathode).....	.20
63-278	99M ohm ¼ watt.....(A.V.C & 2d detector plate).....	.20
63-280	49M ohm ¼ watt.....(oscillator grid).....	.20
63-284	Volume Control and Switch (500M ohm).....	1.25
63-285	Tone Control (50M ohm).....	.75
63-289	29M ohm 1 watt.....(oscillator plate).....	.20
63-308	15,290 ohm Voltage Divider.....	.85
63-309	Sensitivity Control....(5M ohm).....	.75

Coils - Chokes

22-32	Standard Wave Detector Coil Assembly.....	1.00
20-43	Antenna Coil Assembly.....	.75

Coils - Chokes Cont'd

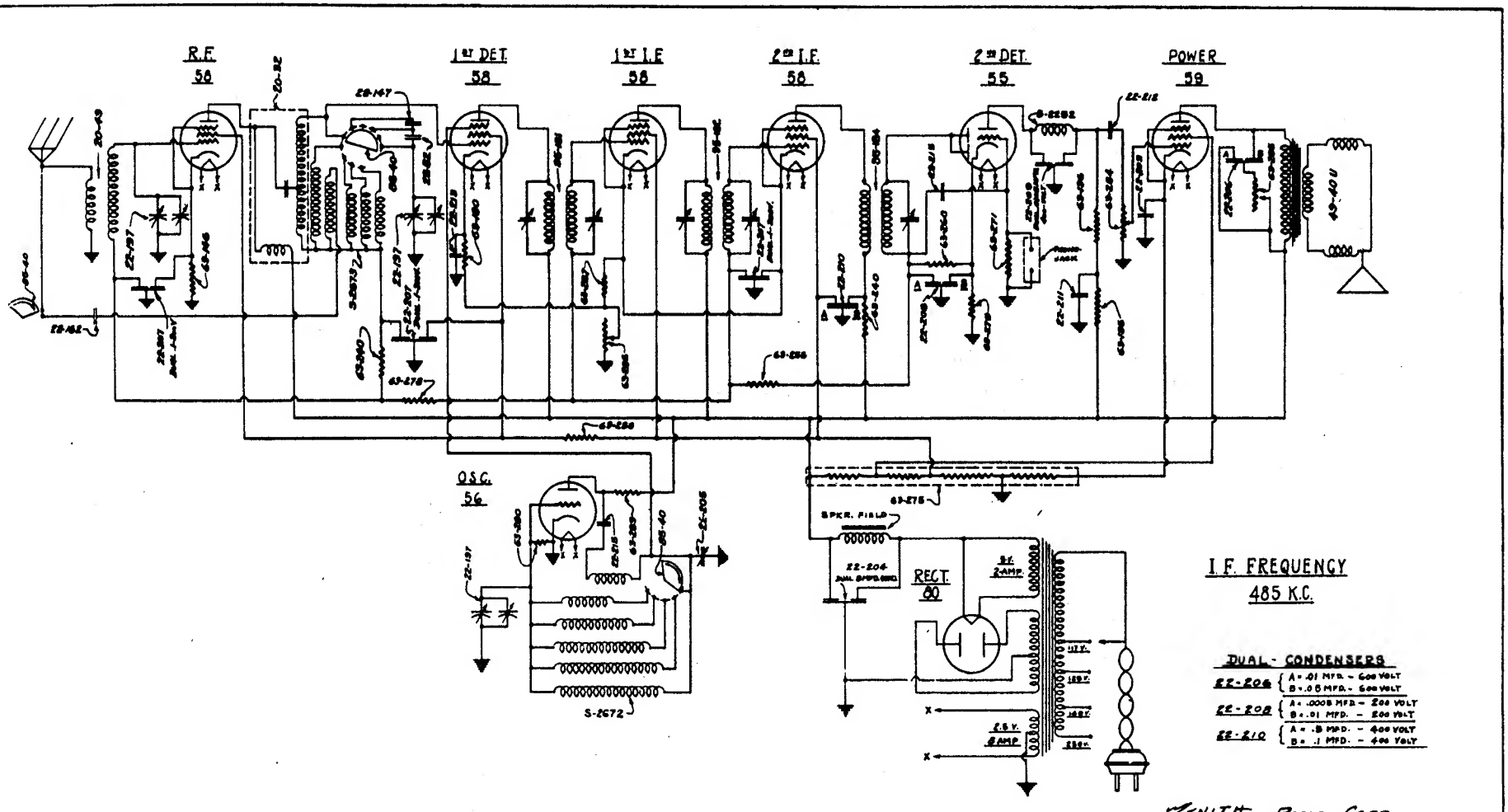
95-181	1st I. F. Transformer	$1.50
95-182	2nd I. F. Transformer	1.50
95-183	3rd I. F. Transformer	1.50
S-2252	Plate Choke Assembly	.50
S-2672	Short Wave Oscillator Coil	1.50
S-2673	Short Wave Detector Coil	1.50

Miscellaneous

4-118	Tube Shield Base	.05
8-25	Antenna Ground Binding Post Assembly	.20
19-4	Grid Cap	.03
44-4	Phono Receptacle Base	.15
46-59	Large Control Knob	.15
46-60	Small Control Knob	.15
49-44	Dynamic Speaker	8.00
	Cone and Voice Coil for above (#8304-3 hole mounting)	3.00
	Output Transformer for 49 44 Speaker	2.50
57-342	Escutcheon Plate for 2056 Chassis	.60
78-56	7 prong tube Socket type 59	.15
78-57	6 prong tube Socket type 56	.15
78-85	6 prong tube Socket type 58	.15
78-87	4 prong tube Socket type 80	.15
78-88	6 prong tube Socket type 2A6	.15
83-288	Speaker Cable Terminal Strip	.15
85-24	Radio Phono Switch	.60
85-40	Two Gang Selector Switch	1.75
93-167	Rubber Cushion for Chassis Mounting (lower)	.01
93-168	Rubber Cushion for Chassis Mounting (upper)	.01
95-168	All Voltage 25-60 Cycle Power Transformer	8.00
126-109	Small Tube Shield	.10

ALL PRICES SUBJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE. ALSO ALL PRICES QUOTED HERE SUPERSEDE PREVIOUS QUOTATIONS IN OTHER PRICE LISTS FOR LIKE PARTS.

November 21, 1933


R.F. 58
1ST DET. 58
1ST I.F. 58
2ND I.F. 58
2ND DET. 55
POWER 59
OSC. 56
RECT. 80
SPKR. FIELD
I.F. FREQUENCY
485 K.C.
DUAL - CONDENSERS
22-206 { A - .01 MFD. - 600 VOLT B - .05 MFD. - 600 VOLT
22-208 { A - .0005 MFD. - 200 VOLT B - .01 MFD. - 200 VOLT
22-210 { A - .1 MFD. - 400 VOLT B - .1 MFD. - 400 VOLT
ZENITH RADIO CORP.
CHICAGO ILL. U.S.A.
8 TUBE SUPERHETERODYNE
CHASSIS # 2051

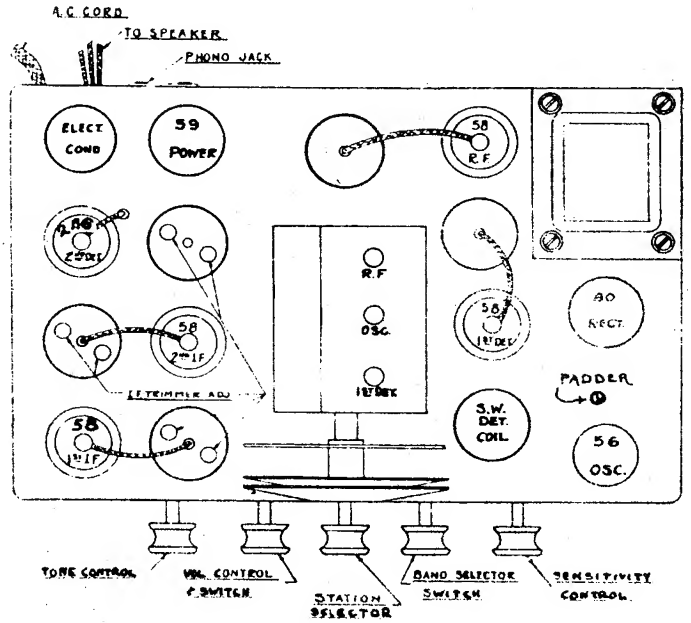
SOCKET VOLTAGES 2051 CHASSIS

TYPE	POSITION	E_f	E_K	E_{g^1}	E_{g^2}	E_{g^3}	E_p
58	R.F.	2.5	5	-2	5	75	255
58	1 - Det.	2.5	3.5	0	-16	75	249
56	Osc.	2.5	0	-24	--	--	90
58	1st I.F.	2.5	7.5	-2	7.5	104	249
58	2nd I.F.	2.5	7.5	-2	7.5	104	255
2A6	2nd Det.	2.5	1.5	0	--	--	170
59	Power	2.5	18	0	18	234	234
80	Rect.	5	--	--	--	--	360

E_f - filament E_K - cathode E_{g1} - control grid E_{g2} - suppressor grid
E_{g3} - screen grid E_p - plate
All voltage readings taken from indicated points to ground with 1000 ohms per volt D.C. meter.

Aligning Procedure

First adjust I.F. trimmers by attaching an accurate 485 K.C. test oscillator to the grid of the 1st detector and ground. Remove oscillator tube and turn I.F. adjusting screws indicated on the diagram below. Insert oscillator tube and connect the test oscillator to the aerial and ground posts. Set the test oscillator and dial to 1500 and turn the three trimmers on the tuning condenser to resonance, then turn the test oscillator and dial to 600 K.C. and set the padder condenser to a position which gives greatest output. Repeat the entire procedure for greater advantage.



Tube Layout

Showing position and circuit function of each. Note location of padder and trimmer adjusting screws.

STANDARD AND SHORT WAVE RECEIVER

Dial Assembly

11-2	Dial Cord.....per ft.	$ .10
12-297	Dial Lamp Bracket.....	.05
73-19	Dial Bushing Set Screw.....	.01
S-2677	Dial Socket, Clip and Indicator Assembly (less lamp).....	.45
S-2678	Dial Tuning Shaft and Bracket Assembly.....	.80
S-2679	Dial Strip and Support Assembly.....(plain).....	1.00
S-2680	Dial Mask and Support Assembly.....	1.25
S-2697	Dial Strip and Support Assembly.....(colored).....	1.00

Condensers

22-82	.001 mfd 500 volt (band switch).....	.25
22-113	.05 " 200 " (1st detector cathode).....	.35
22-115	.01 " 400 " (oscillator plate & 2nd detector grid)	.35
22-147	.0005 " 600 " (band switch).....	.25
22-162	.0001 " 500 " (band switch).....	.20
22-197	Variable Condenser.....	2.75
22-203	10. mfd 25 volt (power cathode).....	.60
22-204	Dual 8 " 500 " (filter).....	2.00
22-205	Oscillator Padder.....	.35
22-206	Dual .01 mfd 600 volt(tone control).....	.25
22-207	Dual .1 " 200 " (R.F.,1st det. I. F. grid & cathode)..	.25
22-208	Dual .01 & .0005 mfd 400 volt(2nd det. grid & cathode)....	.20
22-209	Dual .01 mfd 400 volt(2nd det. plate).....	.20
22-210	Dual .1 & .5 mfd 400 volt(2nd I. F. screens & plate).....	.35
22-211	.1 mfd 300 volt (2nd detector plate).....	.20
22-212	.05 " 400 " (audio coupling).....	.20

Resistors

63-136	50M ohm ½ watt...(2nd detector plate).....	.20
63-146	2M " ½ " ...(R. F. cathode).....	.20
63-180	1M " ½ " ...(1st detector cathode).....	.20
63-240	1900 " ¼ " ...(1st detector grid & 2nd I.F. plate)..	.20
63-258	490M " ¼ " ...(2nd detector anode).....	.20
63-260	100M " ¼ " ...(power grid).....	.20
63-265	220 " ½ " ...(I. F. Cathodes).....	.20
63-271	1 meg" ¼ " ...(2nd detector grid).....	.20
63-275	15500 " ...(voltage divider).....	.70
63-278	99M " ¼ " ...(R.F. & 1st detector grid return).....	.20
63-280	49M " ¼ " ...(oscillator bias).....	.20
63-284	500M " Volume Control.....	1.00
63-285	50M " Tone Control.....	.75
63-286	50M " Sensitivity Control.....	.75
63-288	19M " ¼ watt...(R. F. & 1st detector screens).....	.20
63-289	29M " 1 " ...(oscillator plate).....	.20
63-307	40 " 1 " ...(2nd detector cathode)..metal.....	.15

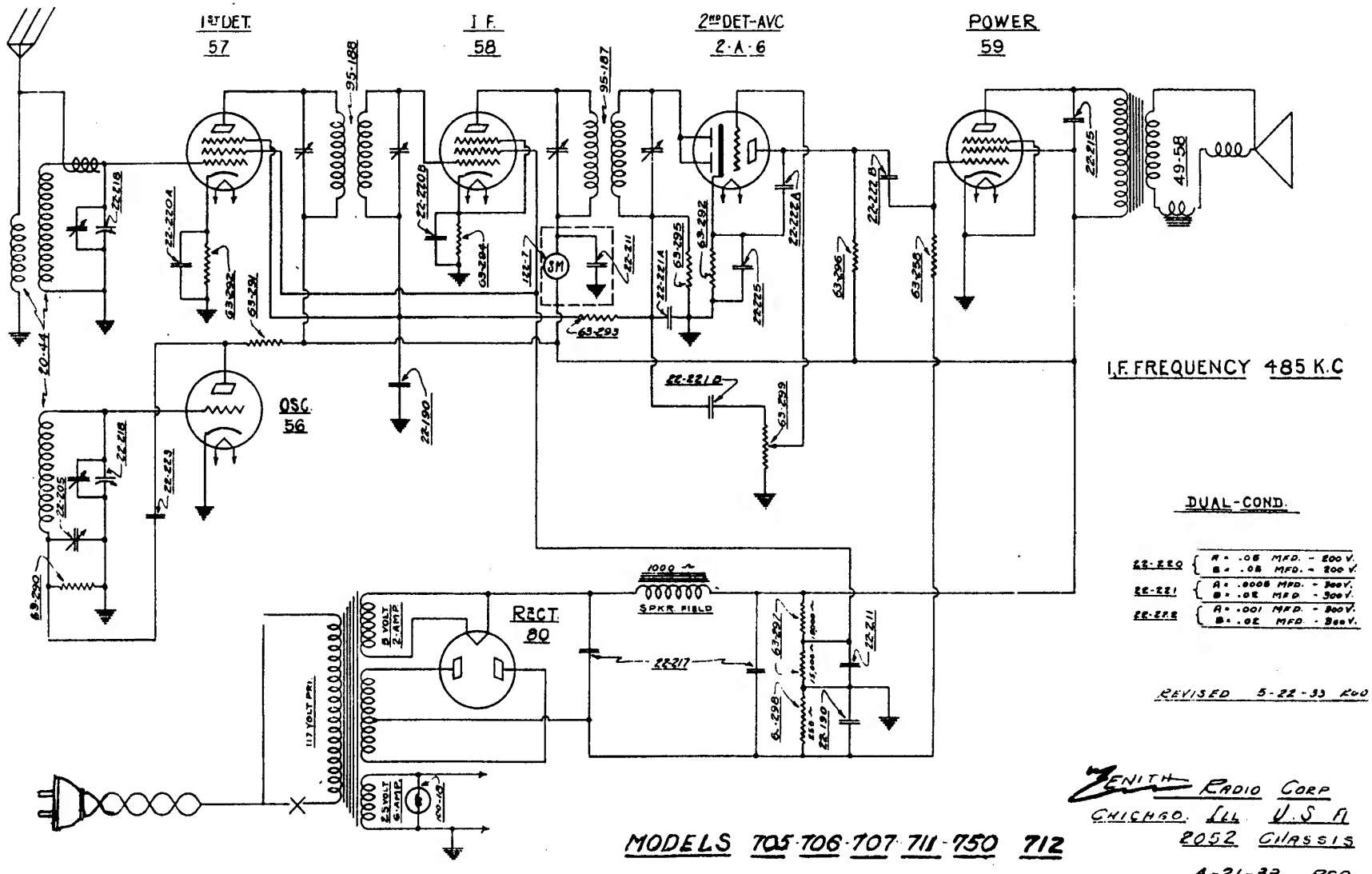
Coils - Chokes

20-32	Standard Wave Detector Coil	$ 1.00
20-43	Antenna Coil	.75
95-181	1st I. F. Transformer.....(485 kilocycle).....	1.25
95-182	2nd I. F. Transformer.....(485 kilocycle).....	1.25
95-184	3rd I. F. Transformer.....(485 kilocycle).....	1.25
S-2252	Plate Choke and Bracket Assembly	.50
S-2672	Short Wave Oscillator Coil	1.25
S-2673	Short Wave Detector Coil	1.25

Miscellaneous

4-118	Tube Shield Base	.05
8-25	Antenna and Ground Binding Post Assembly	.20
44-4	Phono Connector Jack	.15
46-59	Large Control Knob	.15
46-60	Small Control Knob	.15
49-44	Dynamic Speaker	8.00
	Cone and Voice Coil for above #8304 (3 hole mounting spider)	3.00
	Output Transformer for 49-44 Speaker	2.00
57-342	Escutcheon Plate	.60
78-56	7 prong Socket #59	.15
78-57	5 " " #56	.15
78-58	6 " " #58	.15
78-60	4 " " #80	.15
78-61	6 " " #55	.15
83-228	Connector Strip for Speaker Cord	.15
85-40	Two Gang Selector Switch	1.50
93-167	Rubber Cushion for Chassis Mounting (lower)	.01
93-168	Rubber Cushion for Chassis Mounting (upper)	.01
95-168	All Voltage, All Cycle Power Transformer	6.00
100-18	2½ volt Dial Lamp	.12
126-109	Tube Shield	.10

ALL PRICES SUBJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE.


1ST DET.
57
I. F.
58
2ND DET-AVC
2-A-6
POWER
59
OSC.
56
RECT.
80
SPKR. FIELD
I.F. FREQUENCY 485 K.C
DUAL-COND.
22-222 A = .05 MFD. - 200 V. B = .05 MFD. - 200 V.
22-221 A = .0005 MFD. - 300 V. B = .05 MFD. - 300 V.
22-223 A = .001 MFD. - 300 V. B = .05 MFD. - 300 V.
REVISED 5-22-33 RCO
ZENITH RADIO CORP
CHICAGO. ILL. U.S.A.
2052 CHASSIS
4-21-33 RCO
MODELS 705-706-707-711-750 712

Socket Voltages

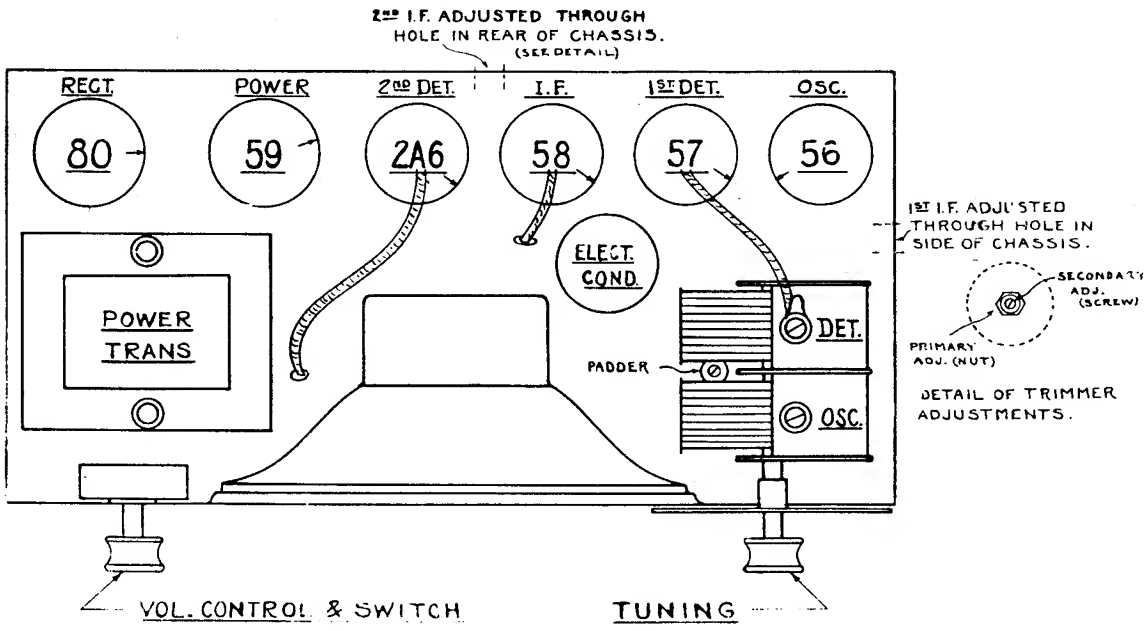
2052 Chassis

TYPE	POSITION	E_f	E_k	E_{g1}	E_{g2}	E_{g3}	E_p
57	1st Det.	2.5	⊀5	0	0	95	220
56	Osc.	2.5	0	-22	—	—	120
58	I.F.	2.5	⊀1	0	⊀1	95	220
2A6	2nd Det.	2.5	⊀1.5	0	—	—	150
59	PWR	2.5	0	-11	0	220	210
80	Rect.	5.	—	—	—	—	280

E - filament E_k - cathode E_{g1} - control grid E_{g2} - suppressor grid E_{g3} - screen grid P - plate

All measurements taken from points indicated to ground with 1000 ohm per volt D.C. meter. (except filaments)

Balance I.F. frequency at 485 K.C., condenser gang at 1500 K.C. and oscillator padder at 600 K.C.



Tube Position

MODELS 705 706 707 711 750 712
CHASSIS NOS. 2052 A B & C

MODELS 705 706 707 CHASSIS 2052A

Condensers

22-190	Dual .1 mfd 200 volt (1st det.suppressor & power grid).....	$ .15
22-205	Padder.....	.35
22-217	Dual 8 mfd. 500 volt (filters).....	3.00
22-218	Two Gang Variable.....	2.00
** 22-220	Dual .05 mfd & .05 mfd 200 volt(1st det.& I.F.cathodes)....	.20
22-221	Dual .02 mfd & .001 mfd 300 " (2nd det.plate).....	.20
22-223	.01 mfd 300 volt.....(oscillator & power plates).	.15
22-224	.1 mfd 300 volt.....(1st det.& I.F.screens).....	.15
22-225	5. mfd 25 volt.....(2nd det.cathode).....	.65
22-222	Dual .02 Mfd. x .001 Mfd.	.25

Resistors

63-258	490M ohm ¼ watt.....(power grid).....	.20
63-290	260M ohm ½ watt.....(oscillator grid).....	.20
63-291	29M ohm ½ watt.....(oscillator plate).....	.20
63-292	5400 ohm ¼ watt.....(1st & 2d det.cathode).	.20
63-293	990M ohm ¼ watt.....(1st det.suppressor)...	.20
63-294	100 ohm ½ watt.....(I.F.cathode).....	.20
63-295	120M ohm ¼ watt.....(2nd det.grid).....	.20
63-296	220M ohm ¼ watt.....(2nd det.plate).....	.20
63-297	30M ohm 3 watt.....(voltage divider).....	.40
63-298	250 ohm 1½ watt.....(voltage divider).....	.25
63-299	Volume Control and Switch.....(Also 63-312).....	1.10

Coils

20-44	R.F. and Oscillator Assembly.....	.85
95-187	2nd I.F.Transformer .....(leads at top).....	1.35
95-188	1st I.F.Transformer .....(leads at bottom).....	1.35

Miscellaneous

4-133	Tube Shield Base.....	.05
12-302	Speaker Mounting Bracket.....	.01
26-42	Dial and Friction Gear Assembly.....	.50
46-67	Control Knob.....	.15
*49-58	6" Dynamic Speaker.....(Also 49-70).....	6.00
	Cone and Voice Coil for Above.....	2.50
	Output Transformer for 49-58.....	1.50
57-403	Zenith Name Plate.....	.10
57-404	Escutcheon Plate for Dial.....	.10
57-406	Chassis Base Plate.....	.50
78-77	59 tube socket.....	.10
78-78	2A6 " "	.10
79-79	58 " "	.10
78-80	57 " "	.10
** Replaced by two #22-250 .05 Mfd. condensers		.15

Miscellaneous cont'd

78-81	56 tube socket	$ .10
78-82	80 tube socket	.10
78-76	Dial Lamp Socket and Clip	.10
91-138	30' Antenna Wire	.30
95-185	117 volt 50-60 cycle Power Transformer	3.00
95-189	All Voltage 25-60 cycle Power Transformer	6.00
100-18	2½ volt Dial Lamp	.12
126-127	Tube Shield	.10
S-458	8' Cord and Plug Assembly	.30

Model 711 Chassis No. 2052B
Same as Chassis No. 2052A with additional parts as follows:

22-224	.1 mfd 300 volt Condenser	.15
57-405	Shadowmeter Escutcheon Plate	.10
100-18	Shadowmeter Pilot Lamp	.12
122-5	Shadowmeter	2.00

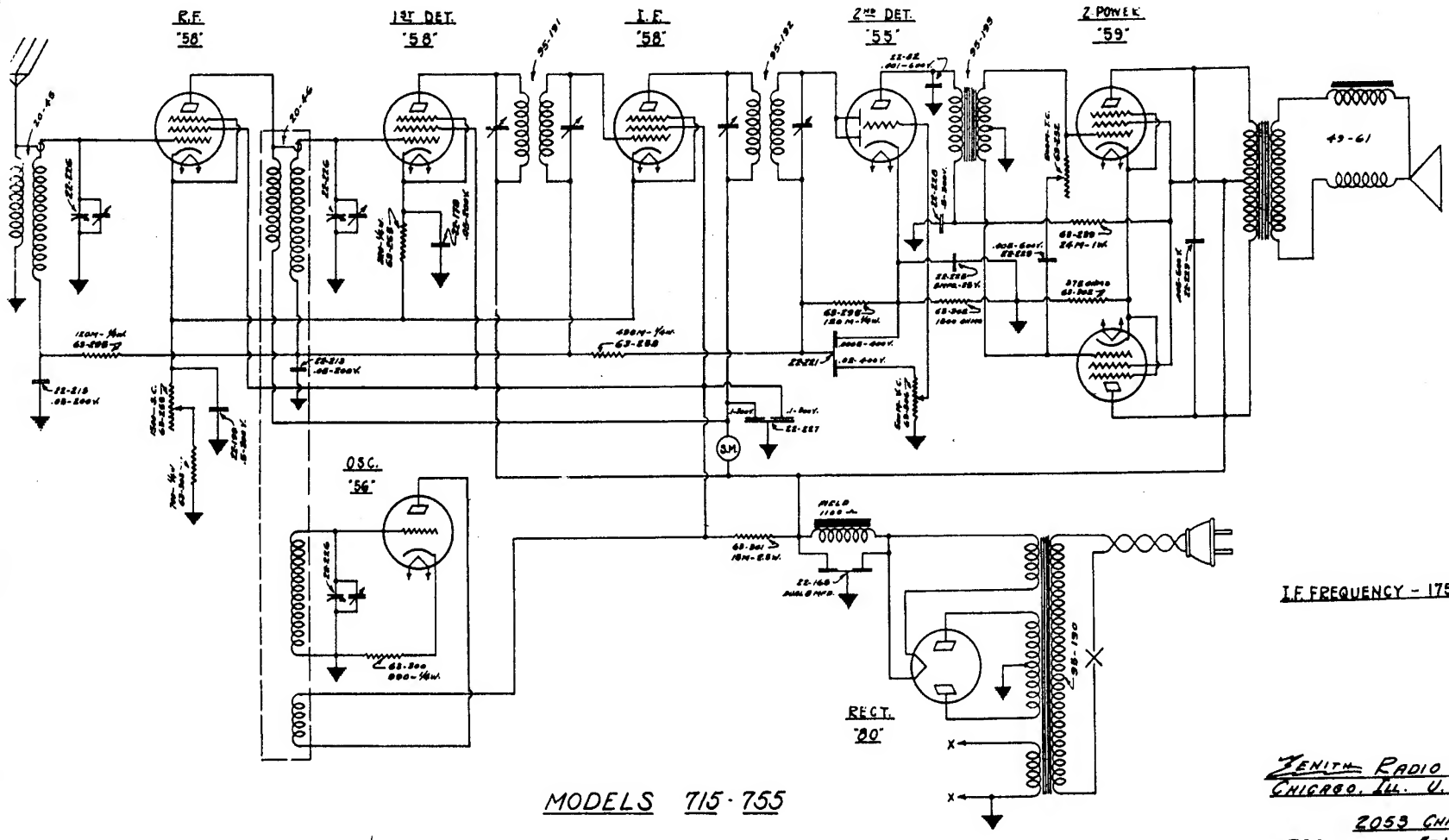
Model 750 Chassis No. 2052C
Same as Chassis No. 2052B, excepting speaker 49-58 (6") is deducted and speaker 49-59 (8") is added.

49-59	8" Dynamic Speaker	7.50
	Cone and Voice Coil for Above	3.00
	Output Transformer for 49-59	2.00

ALL PRICES SUBJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE. ALSO ALL PRICES QUOTED HERE SUPERSEDE PREVIOUS QUOTATIONS IN OTHER PRICE LISTS FOR LIKE PARTS.

* NOTE: When Ordering Speaker Parts Specify Whether They Are Required For Jensen or Utah Speakers.

November 21, 1933


R.F.
'58'
1ST DET.
'58'
I.F.
'58'
2ND DET.
'55'
2 POWER
'59'
OSC.
'56'
RECT.
'20'
49-61
I.F. FREQUENCY - 175 K.C.
MODELS 715 · 755
ZENITH RADIO CORP.
CHICAGO, ILL. U.S.A.
2053 CHASSIS
5-18-33
R.G.O.

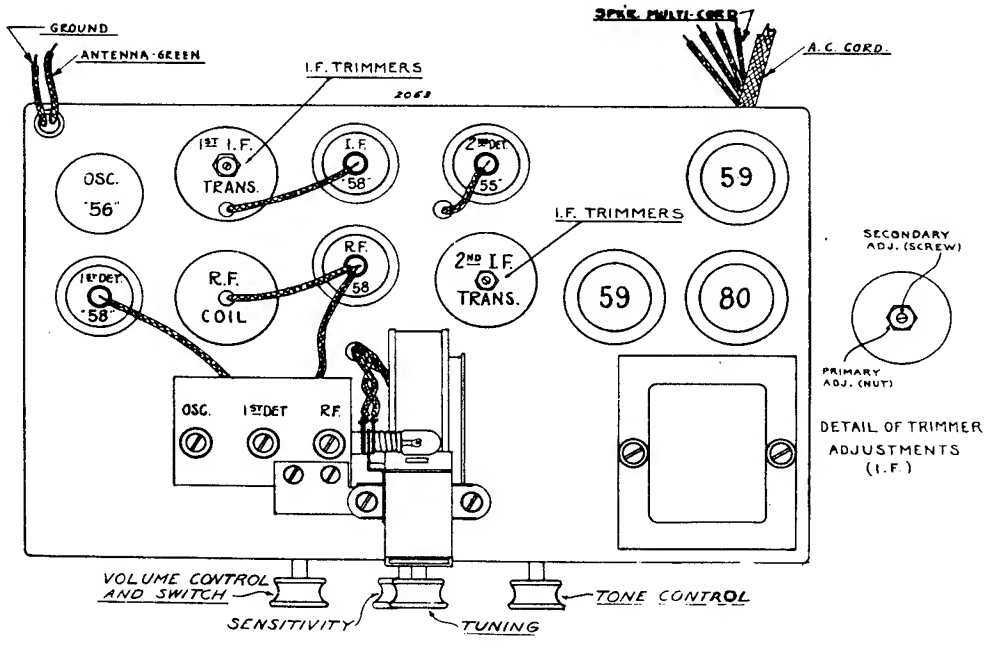
SOCKET VOLTAGES

MODELS 715 - 755

TYPE	POSITION	FIL.	CATH.	GRID	SCREEN	SUPP.	PLATE
58	R.F.	2.5	10	0	83	10	258
58	1st Det.	2.5	12	5	83	12	260
56	Osc.	2.5	8	0	--	--	80
58	I.F.	2.5	11	2	83	11	258
55	2nd Det.	2.5	8	0	--	--	126
59	Power	2.5	21	0	255	21	249
59	Power	2.5	21	0	255	21	249
80	Rect.	5.	--	-	--	--	372

Measurements taken from points indicated to ground. Line voltage - 117. All controls in maximum position and with Antenna and Ground disconnected.

Adjust I.F. frequency at 175 K.C. and condenser gang at 1500 K.C. No padder adjustment necessary.



TUBE POSITION

PARTS AND PRICES
MODELS 755 756 474
CHASSIS NO. 2053 B

Condensers

22-82	.001 mfd. 600 volt	$ .25
22-168	Dual 8 mfd. 500 volt	3.00
22-169	8 mfd. 50 volt	.55
22-199	.5 mfd.200 volt	.25
22-213	.05 mfd. 200 volt	.30
22-221	Dual .0005 mfd and .02 mfd. 400 volt	.20
22-226	Three Gang Variable	2.50
22-227	Dual .1 mfd. 300 volt	.25
22-228	.5 mfd. 300 volt	.30
22-229	.005 mfd. 600 volt	.10

Resistors

63-232	50M ohm Tone Control	.75
63-239	24M ohm 1 watt carbon	.25
63-255	1500 ohm Sensitivity Control	.60
63-258	490 ohm ¼ watt carbon	.20
63-295	120M ohm ¼ watt carbon	.20
63-300	990 ohm ¼ watt carbon	.20
63-301	15M ohm 2¼ watt metal	.25
63-302	1500 and 375 ohm 5 watt metal	.25
63-303	700 ohm ¼ watt carbon	.20
63-306	500M ohm Volume Control and Switch Assembly	1.25

Coils

20-45	R. F. Coil Assembly	.50
20-46	Detector and Oscillator Coil Assembly	.80
95-191	1st I. F. Coil Assembly	1.10
95-192	2nd I. F. Coil Assembly	1.10

Miscellaneous

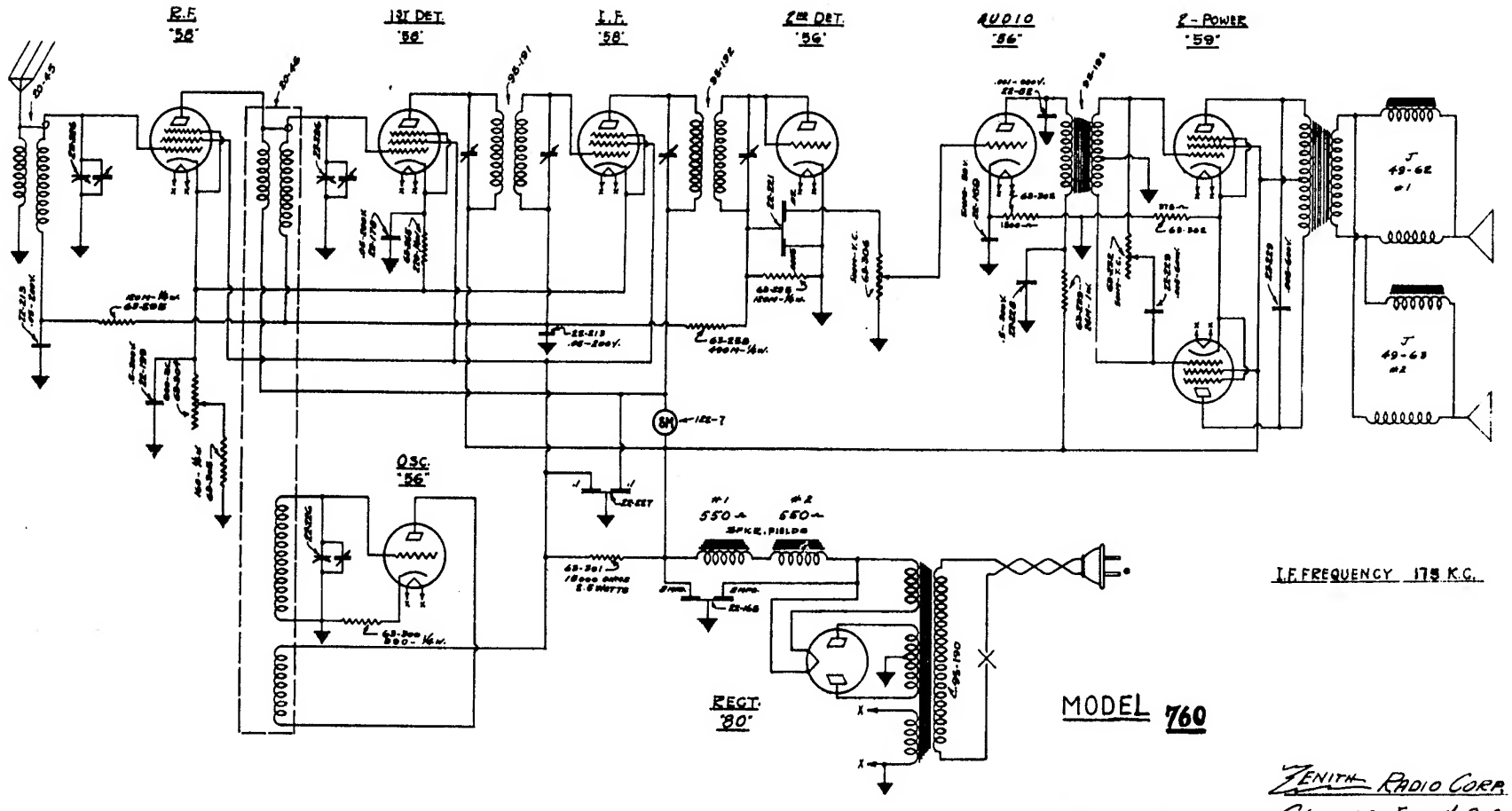
4-134	Tube Shield Base	.05
11-3	Pulley String per ft	.10
46-49	Large Knob	.20
46-55	Small Knob	.15
49-61	8" Dynamic Speaker	6.50
	Output Transformer for 49-61 Speaker	2.00
	Cone and Voice Coil for 49-61 Speaker	2.00
	Field Coil for 49-61 Speaker	2.00
57-408	Escutcheon Plate	.30
78-83	55 Tube Socket	.10
78-84	56 Tube Socket	.10
78-85	58 Tube Socket	.10
78-86	59 Tube Socket	.10
78-87	80 Tube Socket	.10
80-69	Dial String Tension Spring	.01
83-315	Celluloid Dial Strip	.20

Miscellaneous Con'd

95-190	117 volt 50-60 cycle Power Transformer.....	$ 4.00
95-193	Audio Transformer.....	1.10
95-194	117, 125, 140, 250 volt, 25 cycle Power Transformer...	6.00
100-18	2½ volt Dial Lamp.....	.12
122-7	Shadowgraph Meter.....	1.75
126-127	Tube Shield.....	.10
S-769	Dial Lamp Socket Assembly (less lamp).....	.15
S-2710	Dial Drum Assembly.....	.80

ALL PRICES ARE SUBJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE.

ZENITH RADIO CORPORATION
JUNE 10TH, 1933.


R.F.
'58'
1ST DET.
'56'
I.F.
'58'
2ND DET.
'56'
AUDIO
'56'
2-POWER
'59'
OSC.
'56'
RECT.
'80'
I.F. FREQUENCY 175 K.C.
MODEL 760
2054 CHASSIS
ZENITH RADIO CORP.
CHICAGO, ILL. U.S.A.
R.G.O. 5-15-39

ZENITH AUTOMATIC RADIO

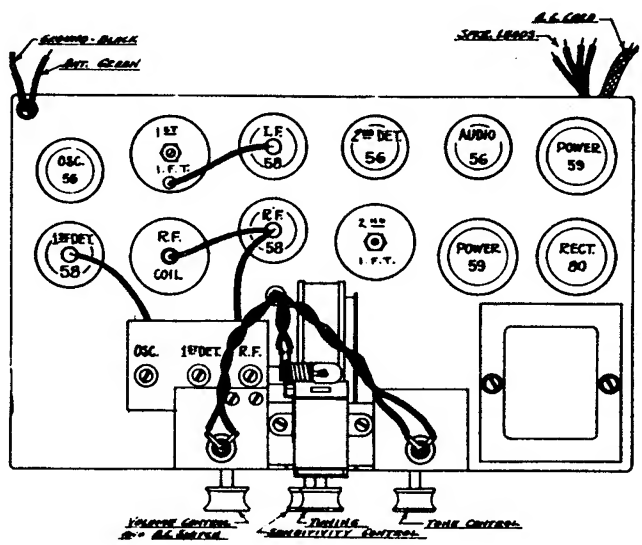
SOCKET VOLTAGES

MODEL 760

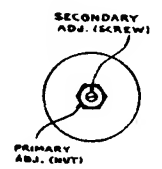
TYPE	POSITION	FIL.	CATH.	GRID	SCREEN	SUPP.	PLATE
58	R.F.	2.5	3	0	100	3	260
58	1st Det.	2.5	4	5	100	4	275
56	Osc.	2.5	7	0	-	-	100
58	I.F.	2.5	3	2	100	3	255
56	2nd Det.	2.5	0	0	-	-	0
56	1st Audio	2.5	7	0	-	-	150
59	Power	2.5	20	0	270	20	260
59	Power	2.5	20	0	270	20	260
80	Rect.	5.	-	-	-	-	364

Measurements taken from points indicated to ground. Line voltage - 117. All controls in maximum position and with Antenna and Ground disconnected.

Adjust I.F. frequency at 175 K.C. and condenser gang at 1500 K.C. No padder adjustment necessary.



TUBE POSITION



DETAIL OF TRIMMER ADJUSTMENTS (I.F.)

PARTS AND PRICES
MODELS 475 760
CHASSIS NO. 2054 B

Dial and Meter Assembly

11-3	Pulley String.....per ft.	$ .10
59-16	Volume Control Pointer Arm.....	1.00
59-17	Tone Control Pointer Arm.....	1.00
80-69	Dial Cable Tension Spring.....	.01
80-86	Tension Springs for Volume and Tone Control Arms.....	.01
83-272	Volume Control Dial Strip.....	.10
83-273	Tone Control Dial Strip.....	.10
83-277	Pointer Guide Strips.....	.01
83-315	Dial Strip for Dial Drum.....	.20
100-18	2½ volt Pilot Lamp.....	.12
122-7	Shadowgraph Meter.....	1.75
S-2710	Complete Dial Drum Assembly.....	1.00

Condensers

22-82	.001 mfd 500 volt.....(audio plate).....	.20
* 22-168	Dual 8 mfd 500 volt.....(filter).....	3.00
22-169	8. mfd 50 volt.....(audio cathode).....	.55
22-196	.01 mfd 600 volt.....(tone control).....	.15
22-199	.5 mfd 200 volt.....(R.F. cathode).....	.25
22-213	.05 mfd 200 volt.....(R.F. & I.F. grid).....	.30
22-221	.0005 & .02 mfd 400 volt..(2nd detector grid).....	.20
22-226	3 Gang Variable.....	2.50
22-228	.5 mfd 500 volt.....(1st audio plate).....	.30
22-229	.005 mfd 600 volt.....(power plates).....	.10

Resistors

63-232	500M ohm Tone Control.....	.75
63-239	24M ohm 1 watt.....(audio plate).....	.25
63-258	490M ohm ¼ watt.....(A.V.C. bias).....	.20
63-265	220 ohm ¼ watt.....(I. F. cathode).....	.20
63-295	120M ohm ¼ watt.....(R.F. & 2nd detector grids)	.20
63-300	990M ohm ¼ watt.....(oscillator bias).....	.20
63-301	15M ohm 2½ watt.....(voltage divider).....	.25
63-302	1875 ohm (tapped at 375 ohm)(voltage divider).....	.25
63-304	800 ohm Sensitivity Control.....	.60
63-305	160 ohm ¼ watt.....(R. F. bias).....	.20
63-306	500M ohm Volume Control and Switch Assembly.....	1.25

Coils

20-45	R. F. Coil Assembly.....	.50
20-46	Detector Oscillator Coil Assembly.....	.80
95-191	1st I. F. Coil Assembly.....	1.10
95-192	2nd I. F. Coil Assembly.....	1.10

* Part No. 22-168 condenser is in cardboard container. Later production sets incorporated condenser No. 22-230 which is in metal can. 2.00

Miscellaneous

46-49	Large Control Knob	$ .20
46-55	Small Control Knob	.15
49-62	Dynamic Speaker with Transformer	7.00
49-63	Dynamic Speaker without Transformer	5.00
	Output Transformer for 49-62 Speaker	2.00
	Cone and Voice Coil Assemblies for 49-62 and 49-63	2.00
	Field Coils for 49-62 and 49-63 Speakers	2.00
57-341	Escutcheon Plate	.35
78-84	Type 56 Tube Socket	.10
78-85	Type 58 Tube Socket	.10
78-86	Type 59 Tube Socket	.10
78-87	Type 80 Tube Socket	.10
95-190	117 volt, 50-60 cycle Power Transformer	4.00
95-193	P. P. Audio Transformer	1.10
95-194	117, 125, 140, 250 volt, 25 cycle Power Transformer	6.00
126-127	Tube Shield	.10
136-2	2 amp Fuse	.06

ALL PRICES ARE SUBJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE.

ZENITH RADIO CORPORATION
JULY 5TH, 1933.

SERVICE MANUAL MODEL 701

OPERATING INSTRUCTIONS

1. Carefully remove antenna wire from its compartment and stretch out full length. A properly erected well insulated outdoor antenna about 75 feet in length, including lead-in is recommended for permanent installations. A GROUND IS NOT REQUIRED.
2. After making certain that power supply is 110 volts, insert plug in receptacle.
3. Rotating VOLUME control clockwise (right) from off position turns power switch on, continued rotation increases volume. IF SET DOES NOT OPERATE IN ONE MINUTE ON DIRECT CURRENT REVERSE PLUG IN RECEPTACLE.
4. Advance volume control three-quarter turn, then select the desired station. Tune this station to the loudest point on the scale, then raise or lower volume with VOLUME control. Never regulate volume by detuning station selector, always adjust VOLUME control.

FIVE TUBES, 2—6D6, 1—75, 1—43, 1—25Z5.

SERVICE SUGGESTIONS

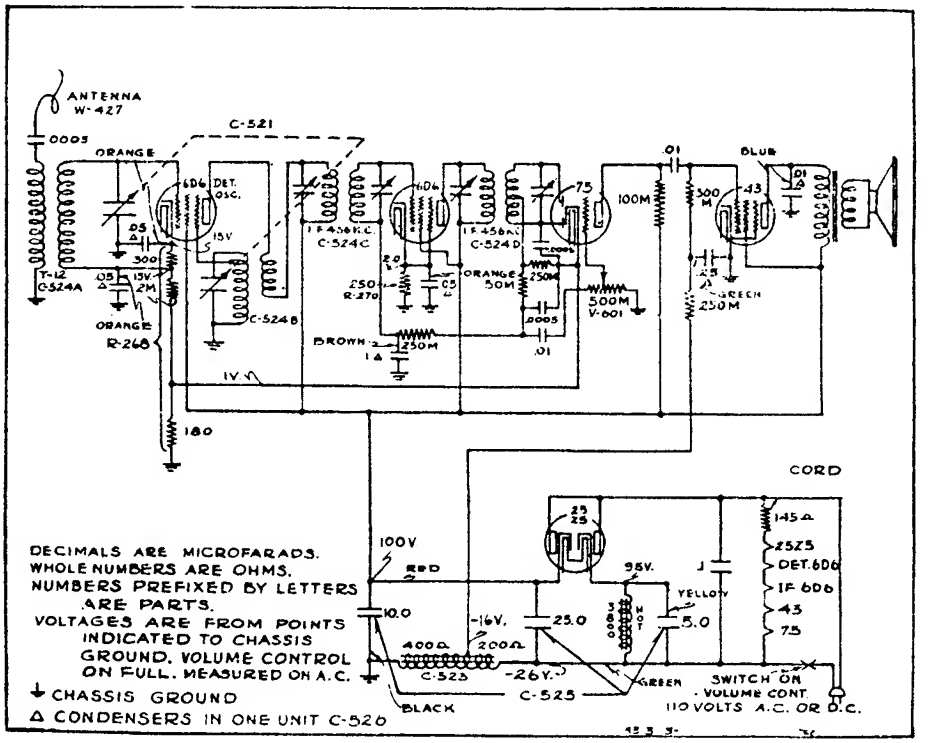
NOTE—CONNECTING CORD OF SET GETS WARM IN NORMAL OPERATION. DO NOT BECOME ALARMED.

Make sure that all tubes are pushed firmly in their proper sockets and that the clips are securely fastenened to the caps on the tops of the tubes.

That the aerial is stretched out and that the connections to an outdoor antenna (if used) are good.

If necessary to change tubes or service chassis, UNDER NO CIRCUMSTANCES REMOVE BACK OR CHASSIS WITHOUT FIRST REMOVING PLUG FROM LIGHT SOCKET.

To remove chassis from cabinet, pull off knobs from front, remove back (held with screws to case). Remove four mounting screws, then chassis can be slipped out of case.



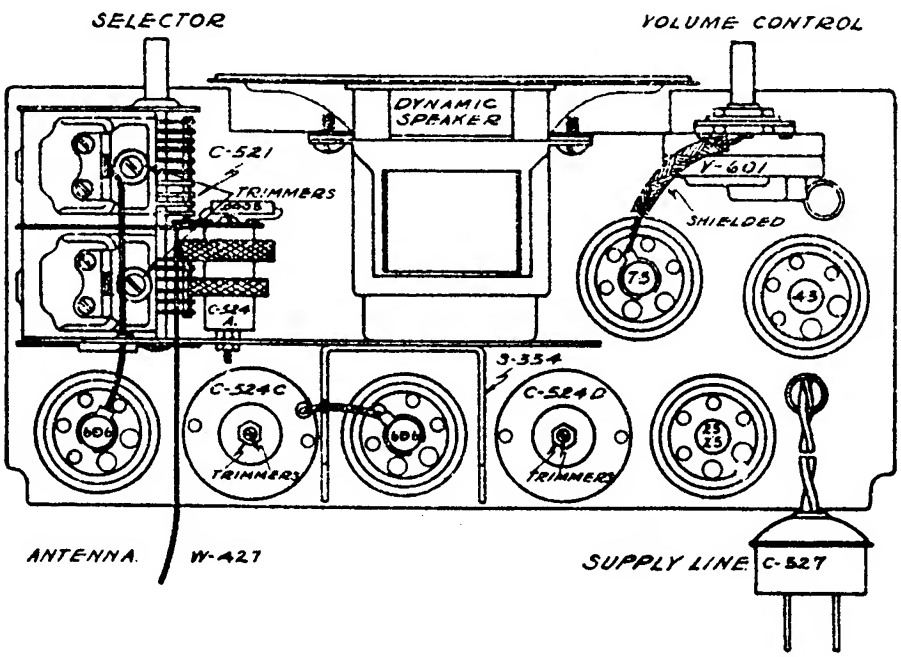
Schematic circuit diagram Model 701 AC-DC Superheterodyne, with automatic volume control

Should it be necessary, at any time, to rebalance this set the procedure is as follows: Attach a 456 kilocycle oscillator to the grid of the 6D6 tube in back of the variable condenser and adjust the trimming condensers of the I. F. transformers to maximum deflection on an output meter connected across the primary of the speaker input transformer. While adjusting these trimmers, the variable condenser should be at the maximum capacity position—at the extreme right of its rotation.

Next disconnect the antenna wire and connect an oscillator in series with a 75 mmf. condenser to the antenna coil. Rotate the condenser plates to the minimum capacity position—extreme left turn, and adjust the trimmer condenser of the rear section of the variable condenser to resonance with an oscillator set at 1725 kilocycles, then adjust the condenser of the front section of the variable condenser to resonance. Align at 1400—1200—1000—800—600—530 kilocycles, bend slotted plates of variable condenser if necessary.

PARTS LIST

Part No.	Description	List Price
A 103	Same	
C 145	.1—300 Volt Condenser	$0.25 ea.
C 155	.0005 Mica Condenser	.20 ea.
C 521	Two Gang Condenser	2.50 ea.
C 522	.01—400 Volt Condenser	.25 ea.
C 523	600 Ohm Choke Coil	1.25 ea.
C 524A	Antenna Coil	.80 ea.
C 524B	Oscillator Coil	.70 ea.
C 524C	I. F. Transformer	1.25 ea.
C 524D	I. F. Transformer	1.25 ea.
C 525	5-25-10 Electrolytic Condenser	2.00 ea.
C 526	By-Pass Condenser Block	1.50 ea.
C 527	Special Cord and Plug	1.25 ea.
K 214	Knobs	.40 ea.
R 268	2480 Ohm Resistor	.50 ea.
R 270	250 Ohm—Wire Wound Resistor	.25 ea.
V 601	Volume Control	1.35 ea.
W427	Antenna Wire	.30 ea.
	All carbon resistors	.20 ea.
	All sockets	.20 ea.
	Dynamic speakers	5.00 ea.
	Cabinets	2.50 ea.
	Carrying cases	2.00 ea.
	Adapters for 220 volt operation	2.25 ea.



ZENITH RADIO CORPORATION

3620 Iron Street — Chicago, Illinois

SERVICE MANUAL MODEL 702

OPERATING INSTRUCTIONS

1. Carefully remove antenna wire from its compartment. A properly erected well insulated outdoor antenna about 75 feet in length, including lead-in is recommended. A GROUND IS NOT REQUIRED.
2. After making certain that power supply is 110 volts, insert plug in receptacle.
3. Rotating VOLUME control clockwise (right) from off position turns power switch on, continued rotation increases volume. IF SET DOES NOT OPERATE IN ONE MINUTE ON DIRECT CURRENT REVERSE PLUG IN RECEPTACLE.
4. Advance volume control three-quarters turn, then select the desired station. Tune this station to the loudest point on the scale, then raise or lower volume with VOLUME control. Never regulate volume by detuning station selector, always adjust VOLUME control.

FIVE TUBES. 1—6A7, 1—6D6, 1—75, 1—43, 1—25Z5.

SERVICE SUGGESTIONS

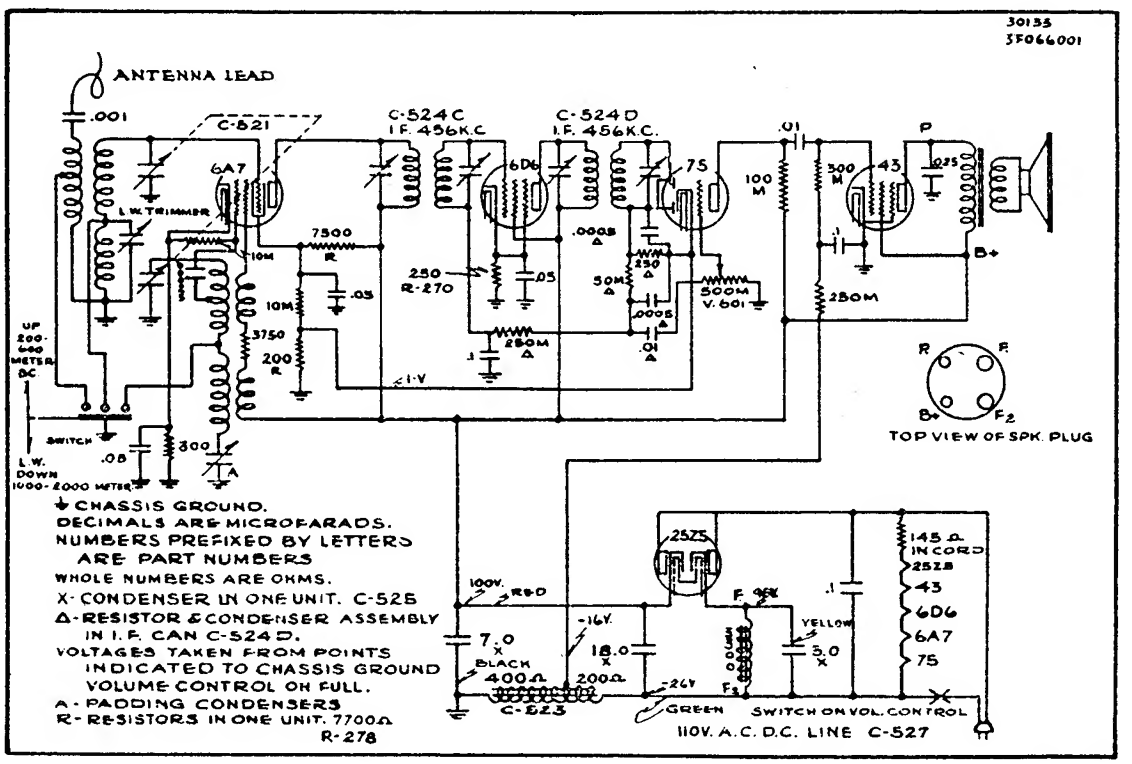
NOTE—CONNECTING CORD OF SET GETS WARM IN NORMAL OPERATION. DO NOT BECOME ALARMED.

Make sure that all tubes are pushed firmly in their proper sockets and that the clips are securely fastened to the caps on the tops of the tubes.

That the aerial is stretched out and that the connections to an outdoor antenna (if used) are good.

If necessary to change tubes or service chassis, UNDER NO CIRCUMSTANCES REMOVE BACK OR CHASSIS WITHOUT FIRST REMOVING PLUG FROM LIGHT SOCKET.

To remove chassis from cabinet, pull off knobs from front, remove back (held with screws to case). Remove four mounting screws, then chassis can be slipped out of case.



Schematic Circuit Diagram and Aligning Instructions Model 702 AC-DC Superheteredyne
200-600 Meters: 1000-2000 Meters

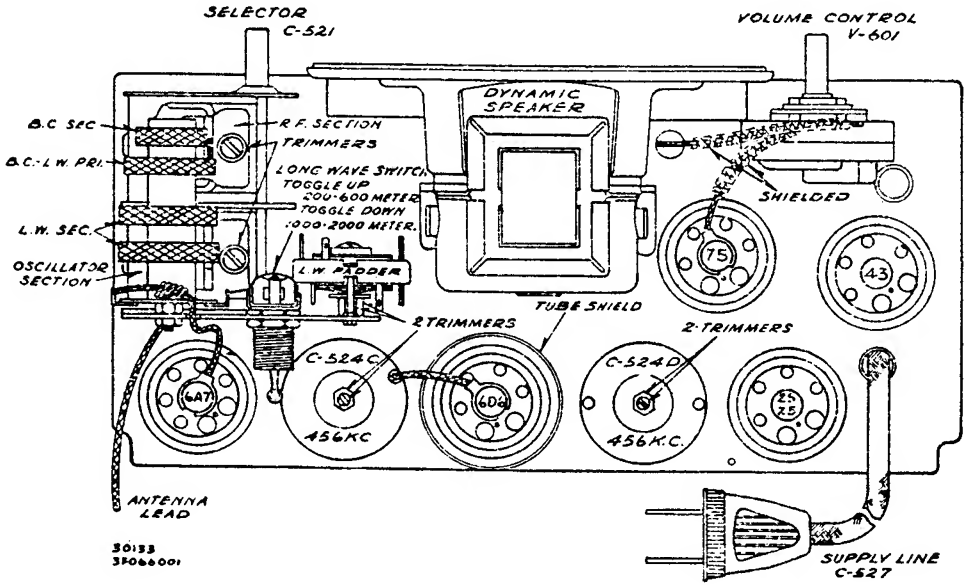
Should it be necessary, at any time, to rebalance this set the procedure is as follows: Attach a 456 kilocycle oscillator to the grid of the 6A7 tube in back of the variable condenser and adjust the trimming condensers of the I. F. transformers to maximum deflection on an output meter connected across the primary of the speaker input transformer. While adjusting these trimmers, the variable condenser should be at the maximum capacity position—at the extreme right of its rotation.

With switch lever up in 200-600 meter position, disconnect the antenna wire and connect an oscillator in series with a 250 mfd. condenser to the antenna coil, rotate the condenser plates to the minimum capacity position, extreme left turn, and adjust trimmer condenser of the oscillator and rear section of the va iable to resonance with the oscillator set at 200 meters, adjust the front section to resonance at 215 meters, align at 250—300—400—500 meters and bend

slotted plates of variable condenser if necessary. To adjust long wave, 1000-2000 meters, with switch lever down, set variable at maximum capacity, extreme right turn, and tune generator to maximum output, then peak long wave padder (hexagon nut of L. W. Padder), at the same time tuning oscillator until maximum output is attained. Attach oscillator leads to grid of 6A7 ground, set variable condenser at minimum capacity, extreme left turn, and adjust oscillator to resonance with set. Remove oscillator lead from grid of 6A7 and attach to antenna lead, then adjust long wave R.F. trimmer to maximum output (set screw adjustment of L. W. Padder). Do not disturb either oscillator or variable condenser while making this adjustment.

PARTS LIST

Part No.	Description	List Price
C 145	.1—300 Volt Condenser	$0.25 ea.
C 155	.0005 Mica Condenser	.20 ea.
C 521	Two Gang Condenser	2.50 ea.
C 522	.01—400 Volt Condenser	.25 ea.
C 523	600 Ohm Choke Coil	1.25 ea.
C 538	5-25-5 Electrolytic Condenser	2.00 ea.
C 548	Padding Condenser	.75 ea.
C 525B	5-25-10 Electrolytic Condenser	2.00 ea.
C 524C	I. F. Transformer	1.25 ea.
C 524D	I. F. Transformer	1.25 ea.
C 524E	Combination Antenna Coil	1.25 ea.
C 524F	Combination Oscillator Coil	1.10 ea.
C 527	Special Cord and Plug	1.25 ea.
C 531	Dual .05 Condenser	.30 ea.
C 534	Dual .1-.025 Condenser	.30 ea.
K 214	Knobs	.40 ea.
R 270	250 Ohm—Wire Wound Resistor	.25 ea.
R 278	7700 Ohm Resistor	.50 ea.
S 336	Wave Change Switch	.60 ea.
V 601	Volume Control	1.35 ea.
	All carbon resistors	.20 ea.
	All sockets	.20 ea.
	Dynamic speakers	5.00 ea.
	Cabinets	2.50 ea.
	Carrying cases	2.00 ea.
	Adapters for 220 volt operation	2.25 ea.



ZENITH RADIO CORPORATION

3620 Iron Street — Chicago, Illinois

SERVICE BULLETIN

ZENITH

Automobile Receiver — Model 460

NOV., 1933

1. Installation

There are certain problems, in connection with every Auto Radio Installation, which are not common to the average home receiver. They may be classed as follows:

1. Antenna
2. Installation
3. Motor Noise Suppression

In order to insure complete satisfaction to the car owner, each subject must be given very careful consideration. The information contained in this bulletin should serve to simplify the work and at the same time stimulate confidence in the service man. A thorough study of the following pages is essential.

Antenna

Automobile manufacturers are realizing the general trend by the public in the use of a radio receiver in the car. As a consequence, practically all late models are equipped with a roof antenna which is suitable for broadcast reception. If there is any question as to whether the particular car in which the installation will be made is equipped with an antenna, the local sales agency will furnish this information. Where it is already incorporated, the lead-in will be found most generally under the instrument panel, beneath the right hand windshield post, and if not shielded, this should be done, at least between the point where it comes through the post over to where it attaches to the antenna cable on the control head. This shielding should be grounded to the instrument panel. Factory built antennas should first be checked with a continuity meter, in order to make certain that they are not grounded. It is possible that when the aerial was installed at the factory, it might have shorted to the body at some point inside the roof.

If the car is not equipped with an aerial, there are several means whereby suitable pickup may be provided. Among these are the plate antenna, the running board type, or the roof antenna. After repeated tests we have found that the last mentioned gives best results and is less likely to pick up motor interference.

A piece of copper screening approximately two and one-half feet square, placed between the headlining and the top covering, is very satisfactory. This is installed by first removing the upholstered moulding around the headlining and then dropping the headlining about half way from the front in sedans, or completely in a coupe. If it is found that chicken wire is used in the top construction, a piece should be cut out large enough to allow at least six inches spacing around the copper mesh, or if preferred, the chicken wire can simply be left in place and segregated around a portion two to two and a half feet square. A cut out around the edges of about six inches is satisfactory. The copper screen, or remaining portion of the chicken wire, should be securely tacked to the ribs and the lead-in wire soldered to the left front corner. The headlining should then be very carefully tacked back into position and the lead-in brought down the left hand corner post and behind the instrument panel.

In roadsters, or convertible models, where the antenna efficiency will become poor if installed in the top, the plate or running board system is advisable. It is important, however, that the lead-in be shielded and grounded in several places from the plate to the receiver, inasmuch as they are more apt to pick up motor noises.

Never bring the lead-in through the motor compartment, since it will always result in motor noise which it will be impossible to eliminate. Also, when making the installation, be sure that the battery lead from the receiver does not go out to the motor compartment and that it is attached directly to the battery and not at the ammeter or starter.

Receiver

Although installation of the receiver itself is covered in the instruction manual, there are several suggestions which will prove helpful to the serviceman.

In some cases it might be found that the control head cannot be mounted parallel to the steering column because of insufficient space between the wheel and the instrument panel and, if mounted horizontally, it blocks essential instruments from the driver's vision. Where this is true it may be placed in the glove compartment. This is done by removing the glove compartment from the instrument panel and screwing the control head direct to the bottom without using the mounting clamps. If the control head does not go back far enough to allow room for the door to close, the rear end of the box can be cut off and the head allowed to protrude from the rear.

The best place for the speaker chassis unit is, of course, on the steering column, beneath the instrument panel. However, if space is not available or some of the control rods are in the way, it should be fastened to the bulkhead. The speaker chassis may be set either in the normal position or upside down, without interfering with its performance. The three carriage bolts and carriage bolt brackets, in connection with the wooden mounting blocks, give a very satisfactory and firm method of support.

Inasmuch as the battery cable has a grounded shield, it should not be placed behind the instrument panel in such a way that it might accidentally touch the ammeter or any other hot battery terminal so as to cause a short circuit. The cable should be placed as close as possible to the dashboard and taped to some solid member, to hold it securely.

The shielded lead on the control head cable must be attached to the instrument panel, or other grounded part of the car. This may be done underneath, so as to keep it out of sight.

2. Motor Noise Suppression

Every automobile generates high frequency electrical interference by virtue of the ignition coil, distributor and spark plugs. In order to receive any degree of satisfaction from an automobile receiver, the interference so generated must be eliminated by means of suppression. Each car, however, presents an individual problem where the serviceman must use his own ingenuity in addition to certain definite instructions. We offer the following as a result of actual experience, and believe that if followed carefully, motor noise in any car can be overcome.

The first essential procedure is to apply the standard suppression parts furnished in each kit. This consists of placing a resistor on each spark plug and on the center high tension lead at the distributor. Since all high tension wires act as small antennas or radiators, they should be kept down as close to the motor as possible. Do not attach the suppressors in an upright position. Always try to keep them horizontal, or as near to the block as conditions will permit. Next in importance is the generator condenser. This filters a high pitched whining noise, which would otherwise be heard without it, as the motor is accelerated. Next in order is the ignition coil condenser. It is very essential that it be placed on the proper low tension coil connection. This can be determined by testing each side of the primary with a screw driver held in the hand by the metal part. One will give off a slight high frequency spark, while the other side will appear to be cold. This test is made with the motor running. The condenser is attached from the cold (battery side) side to ground. Placing the condenser on the wrong side of the coil will seriously affect the car's operation and tend to make the motor noise more pronounced. THIS IS IMPORTANT. Reversing the primary leads will sometimes reduce motor noise, especially if they were incorrectly wired at the factory.

After standard suppression has been applied and the hood clamped down to prevent radiation, the receiver should be turned on and the dial tuned off a station, with the volume control at maximum. If the motor noise is still objectionable, the next step is to determine whether the interference is originating through chassis pickup or from the antenna.

To check for chassis pickup, the antenna should be disconnected and the leads on the control head cable shorted. The motor is then started and if any noise is heard, it is originating through the battery circuit and will require isolation of certain of the car wires. Chassis pickup can be reduced effectively also by shortening the gap in the distributor head. To do this, solder is applied to the end of the rotor arm, after which it is placed back in position and the distributor cap reset. With the crank, the motor should be turned over slowly, in order to clean the excess solder. As an additional precaution, the breaker points should be thoroughly cleaned, or new points installed if they are burned or badly worn.

Where the low tension leads are all bunched together with the high tension wires in a sleeve under the instrument panel, they should be separated and the high tension leads brought out through another hole. Sometimes a .1 mfd. condenser on the distributor low tension side of the coil is also effective.

Cars with floating power must have the motor bonded to the bulkhead and again to the frame at the radiator, to provide a direct path for the high tension interference developed in the ignition system. 5/8" copper braid will be found satisfactory.

If the coil is mounted inside the driving compartment, it might be necessary to shield the high tension lead. This cannot be done effectively, however, if the wire has rubber insulation. Where the car is so equipped, this wire should be removed and Packard cable of the same length substituted. This allows shielding without corona effects and consequent interruption of car performance. When applying the shield over this wire be sure that it terminates at least an inch and a half from both the coil and the distributor; otherwise, it might have a tendency to break down. The shield must be grounded to the instrument panel, dashboard or motor block. The other high tension leads to the spark plugs are not to be shielded. So far there has never been a case where this procedure was required. It would therefore only involve considerable work to no advantage.

Be sure to keep the battery cable from the receiver out of the motor compartment. It should run under the floor mat, on the driver side, and attach directly to the battery. Running this cable through the motor side has been found to be the cause of ignition interference.

This procedure should eliminate all possibility of chassis pickup, after which the antenna lead can be connected to the control head cable. Any motor noise picked up from this point on is being absorbed entirely by the antenna. The first precaution, if it exists, is to check the dome light wiring. It is known that these leads pick up motor noise and carry it to the aerial from around the dash compartment. Removing the dome light wire from the ammeter, or connecting a low resistance RF choke at this point will overcome the difficulty.

If the car has a wooden bulkhead, it will be found necessary to line it on the motor side with thin sheet lead, or other conductor. This will prevent interference from entering the inside of the car and from there being picked up by the antenna. Occasionally it will be found that the copper tubing which runs from the motor to the windshield wiper carries the interference to the antenna. This can be eliminated by bonding the windshield pipe at the dashboard with a short piece of copper braid. The same procedure might also be necessary with respect to the oil line, brake rod, spark and gas controls, or other metal conductors which pick up high frequency interference from the motor compartment.

No absolute rule for complete motor interference elimination can be specified inasmuch as sometimes two cars of the same make are likely to require bonding or shielding at different points. However, the foregoing suggestions, in addition to some ingenuity on the part of the radio man, will in every case prove effective.

3. Service

Circuit

Model 460 employs a seven tube Superheterodyn automatic volume control circuit with the following tubes:

1—6C6	Combination 1st detector and oscillator
2—6D6	1st and 2nd I.F. amplifiers
1—85	A.V.C. 2nd detector
2—89	Push pull power output
1—6Z4	Rectifier

The table on page 4 specifies the socket voltage and figure 1, page 5, the relative tube position.

The antenna circuit is inductively coupled to the type 6C6 through coil 20-40. This tube acts as the first detector and, through plate feed-back and inductance 2039, as an oscillator. An I.F. frequency of 485 K.C. is developed and transferred from the control head to the speaker chassis through the connecting cable. Part of the first I.F. transformer 95-160 is in the head, while the secondary 95-159 is contained in the chassis. A 6D6 in the first I.F. stage feeds another 6D6 in the second I.F. stage through another I.F. transformer. The third I.F. transformer, 95-162, couples to a half wave dual diode triode type 85. A.V.C. action and 2nd detection takes place at this point and the audio signal is transformer coupled to a pair of type 89's in the push-pull output stage.

The power supply is of the built-in vibrator type, using a tube 6Z4, step-up transformer and buzzer in a full wave rectifier circuit. Choke 95-164 and condensers 22-183 are the essential filter components. The volume control, although in the control head, is wired in the cathode circuit of the 2nd detector.

The following is a list of performance factors which information may be of assistance where accurate measurements are essential.

Intermediate Frequency	485 K.C.
Sensitivity in Microvolts	1.5
Power in Milliwatts	2200
Power Consumption in Watts	36

Test Procedure

In the event that trouble develops it is advisable to first inspect the battery and antenna. A battery with a defective cell or in a run down condition will supply insufficient voltage to the receiver with a serious drop in efficiency. Check it for voltage and specific gravity.

Next inspect the antenna. The metal windshield moulding may have cut the insulation and shorted the wire. A continuity test will quickly determine its condition. In the case of under car systems inspect the insulators closely, since corrosion or road dirt is likely to create high leakage to the car frame.

If the receiver is entirely inoperative the fuse should be examined. It is contained in an insulated holder at the "Hot" battery terminal. Be sure to replace the spaghetti insulator over the fuse if necessary to change it. The next important step is to very carefully check the tubes both in the control head and speaker chassis. This has been found to be the most common cause of service in an auto receiver. The extreme vibration to which the tubes are subjected will occasionally develop a short in the elements in spite of the precautions that have been taken in their construction. A loud hum and lack of sensitivity can usually be attributed to a defective 6C6. Microphonic howl can be traced to the 89's. Replacement is recommended for such complaints, since the average tube checker will not show up this condition. An intermittent cutting out accompanied with rasping and other noises will usually be found in either of the 6D6's. The chassis may be taken out for inspection by simply removing the cable plug and three round-head hexagon nuts on the front of the case.

If further inspection indicates that the difficulty lies in the parts or wiring, a voltage reading at all sockets should be taken. They should coincide closely with the values given in the table. It is also advisable to check for continuity in the I.F. transformers both at the control head and in the speaker chassis.

Where the set lacks volume or sensitivity check the power output tubes and the overall alignment of the I.F., R.F. and padder adjustments as specified under "Alignment." Always make certain that the volume and sensitivity controls are in maximum position when making a service inspection.

TUBE OPERATING VOLTAGES

Position	Tube	Ef	Ek	Eg^1	Eg^2	Eg^3	Ep
1st Detector	6C6	4.8	6.5	0	6.5	120	150
1st I.F. Amp.	6D6	5.3	10.5	*	10.5	103.5	165
2nd I.F. Amp.	6D6	5.3	10.5	*	10.5	103.5	165
2nd Detector	85	5.3	8.	0	--	—	156
P. P. Audio	89	5.3	17.	0	17	165	165
	89	5.3	17	0	17	165	165

f—Filament. k—Cathode. g^1—Control grid. g^2—Suppressor grid. g^3—Screen grid. p—Plate.
*Depends on applied signal strength. All voltages measured from indicated points to ground.

Alignment

Every Zenith Automobile receiver is balanced on an accurate, temperature controlled crystal oscillator before leaving the factory and unless a part is changed or the calibration has shifted, the adjustments should not be tampered with. Where it is absolutely necessary, however, a good test oscillator capable of delivering a modulated signal at 1500, 600 and 485 K.C. will be required.

To balance the I.F. circuit remove the cap and lead from the grid of the 6C6 tube in the control head and attach the test oscillator to the grid and to ground. Set to 485 K.C. and first adjust the primary I.F. trimmer shown (A) in Figure 1. Next trim the secondary (B). Now turn the plate trimmer (C) on the side of the chassis base to resonance, with a No. 4 Spintite wrench. Its (2nd I.F.) transformer is directly above the adjustment. Set the screw (D) in the top of the transformer shield to resonance also. The third I.F. transformer is adjusted through a hole in the rear of the chassis and also on top of the transformer indicated at E and F. This completes the I.F. circuit. Replace the grid lead on the 6C6 and screw the metal cap back in position.

Next attach the test oscillator to the antenna and ground lead of the control head and set it to 1500 K.C. Remove the control head cover and set the variable condenser trimmers (G and H) to a point where the 1500 K.C. signal is loudest at that frequency on the dial. Then set the test oscillator to 600 K.C. and rock the dial slowly at that frequency; at the same time turn the padder condenser adjusting screw. This trimmer is reached by removing the button plug on the bottom of the control head. The adjustments should be gone over twice to insure greater precision. Provided the test equipment is dependable, the entire receiver will now be in proper alignment and the calibration very accurate.

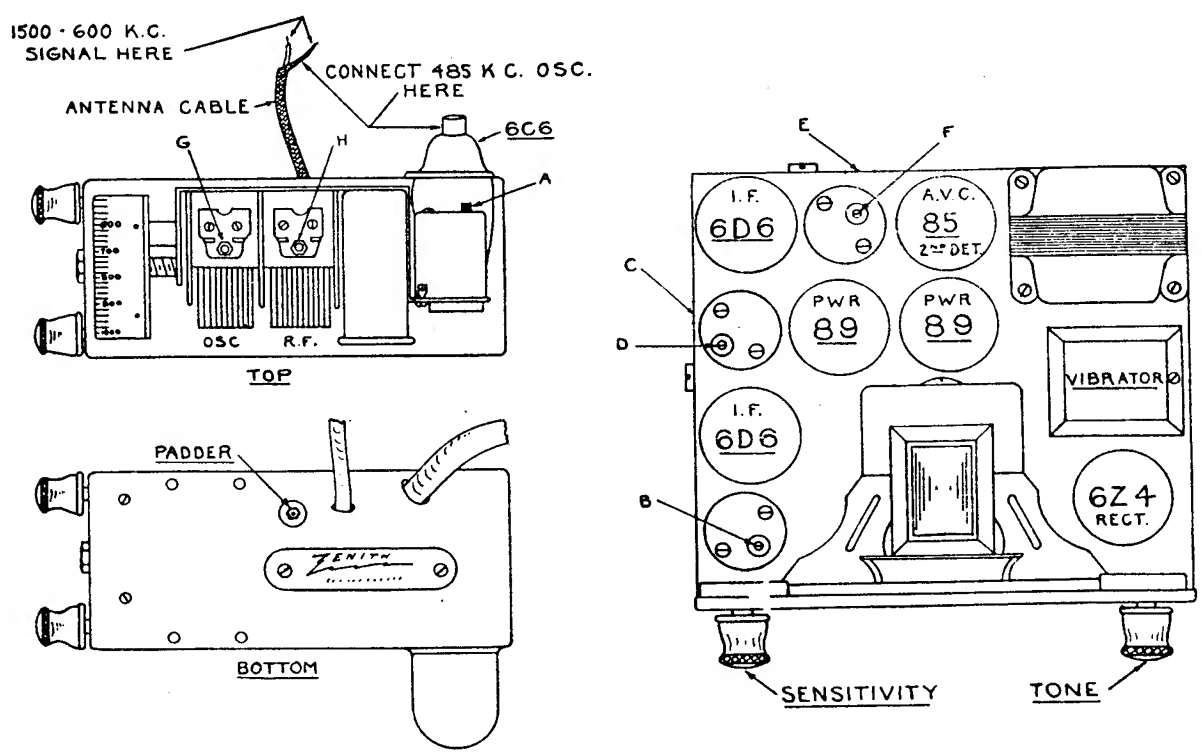
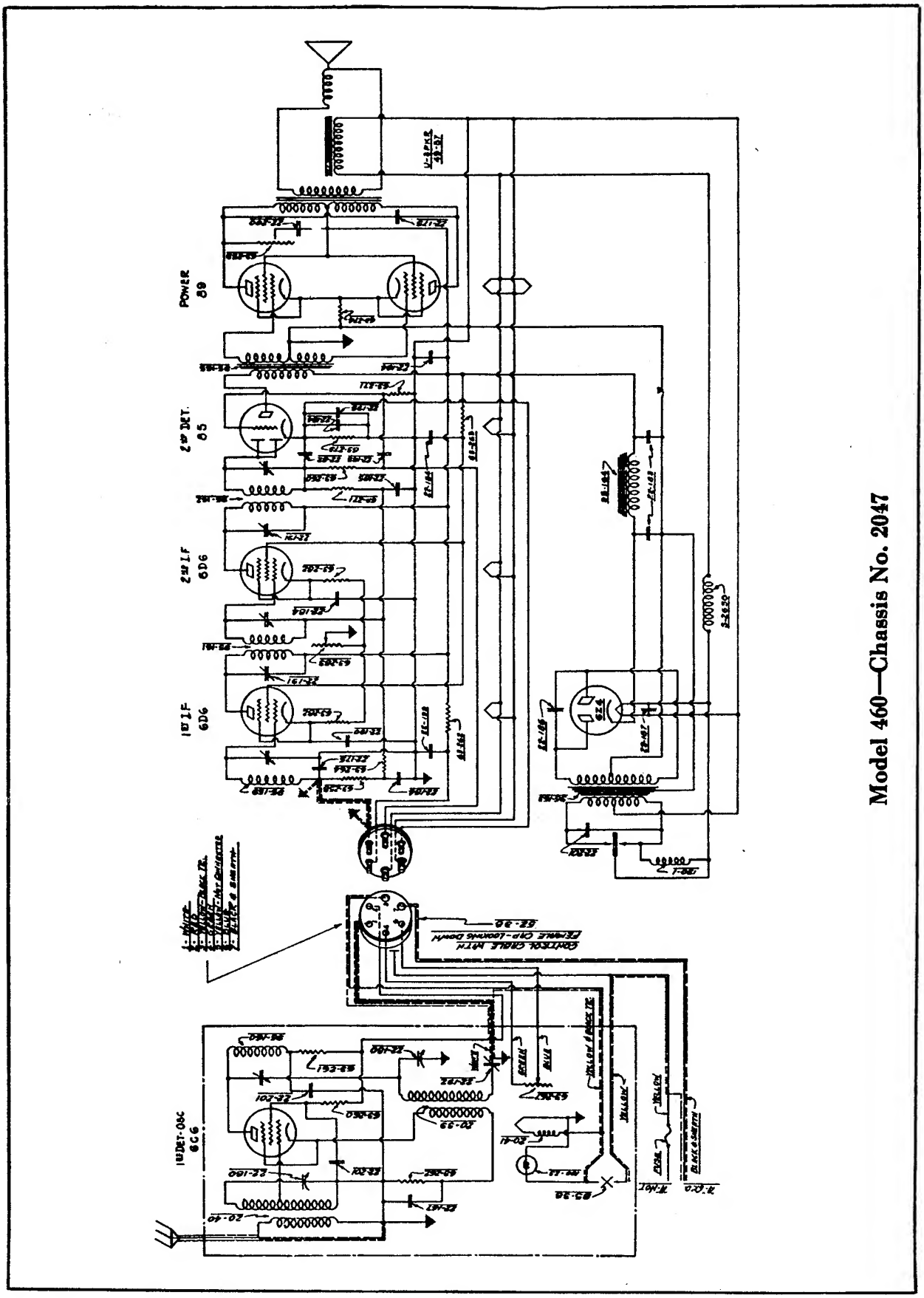


Fig. 1



Model 460—Chassis No. 2047

Parts and Prices

Zenith Automobile Set
Model 460

CONTROL HEAD ASSEMBLY

15-15	Control Box Tube Cap	$0.25
20-39	Oscillator Coil	.75
20-40	Antenna Coil	1.00
20-41	Filament Choke	.20
22-147	.0005 mfd. Condenser (Cathode Bypass)	.15
22-180	Variable Condenser	2.00
22-192	7 Plate Series Trimmer Condenser (R. F. Coupling)	.45
22-201	.1 mfd. 200 volt Condenser (Screen Bypass)	.15
34-26	Hypoid Pinion Gear	.10
46-66	Control Knob	.15
52-38	Multicord Cable and Female Plug Assembly	4.00
52-39	Antenna Cable	.30
57-373	Escutcheon Plate	.40
63-260	100M ohm 1/4 watt Resistor (Screen)	.20
63-261	9900 ohm 1/4 watt Resistor (Plate)	.20
63-262	7M ohm 1/4 watt Resistor (Cathode)	.20
63-276	500M ohm Volume Control	.65
78-68	6-C-6 Tube Socket	.10
80-90	Tuning Shaft Spring	.01
85-38	On and Off Switch	1.00
100-23	6.3 volt Dial Lamp	.20
126-121	Dial Lamp Shield	.10
126-122	Detector and Oscillator Coil Shields	.15
136-5	10 amp. Auto Fuse	.12
S-2638	Dial Light Socket Assembly (Less Lamp)	.15
S-2640	Dial and Hypoid Gear Assembly	1.00
6-C-6	1st Detector Oscillator Tube	1.80

SPEAKER CHASSIS ASSEMBLY

15-16	Tube Shield Cap	.10
22-82	.001 mfd. Condenser (2nd Det. Cathode)	.25
22-175	.002 mfd. Condenser (1st I.F. Grids and Power Plates)	.25
22-183	2-8 mfd. Condenser (Filter Block)	2.00
22-184	Condenser Block (Three .1 and two .25 mfd.)	1.50
22-185	.01 mfd. 200 volt Condenser (2nd Det. Anode and Grid)	.15
22-186	.02 mfd. 800 volt Condenser (Rectifier Plates)	.25
22-187	.5 mfd. 200 volt Condenser (Rectifier Filaments)	.50
22-190	.1 mfd. 200 volt Condenser (1st I.F. Cathodes)	.15
22-191	3 Plate I.F. Trimmer 25-125 M M F (1st and 2nd I.F. Plate)	.30
22-195	10 mfd. 25 volt Condenser (2nd Detector Cathode)	.55
22-199	.5 mfd. 200 volt Condenser (1st I.F. Grid)	.30
22-200	.06 mfd. 200 volt Condenser (Tone Control)	.15
22-201	.1 mfd. 200 volt Condenser (Vibrator Filter)	.15
46-66	Control Knob	.15
49-57	Dynamic Speaker	6.50
58-16	Female Battery Plug	.12
63-253	50M ohm Tone Control	.75
63-258	490M ohm 1/4 watt Resistor (1st I.F. Grid)	.20
63-260	100M ohm 1/4 watt Resistor (2nd Det. Anode)	.20
63-262	7M ohm 1/4 watt Resistor (Det. Osc. Plate)	.20
63-263	30M ohm 1/2 watt Resistor (I.F. Screens)	.20
63-264	240M ohm 1/4 watt Resistor (1st I.F. Grid)	.20
63-271	1 megohm 1/4 watt Resistor (2nd Det. Anode)	.20
63-273	1800 ohm 1/4 watt Resistor (2nd Det. Cathode)	.20
63-274	800 ohm 1/4 watt Resistor (Power Bias)	.20
63-282	2200 ohm 1/4 watt Resistor (I.F. Cathode)	.20
63-283	20M ohm Sensitivity Control	.75

Parts and Prices (cont'd)

78-64	85 Tube Socket	.10
78-65	89 Tube Socket	.20
78-67	6-Z-4 Tube Socket	.10
78-69	6-D-6 Tube Socket	.10
93-177	Cushion Washer for Vibrator Mounting	.10
95-159	1st I.F. Grid Coil Assembly	.90
95-161	2nd I.F. Transformer	1.25
95-162	3rd I.F. Transformer	1.25
95-163	Rectifier Transformer	2.25
95-164	Power Choke	1.50
95-165	Push Pull Input Transformer	2.00
110-21	Grill Cloth	.05
126-123	Tube Shield	.10
190-1	Vibrator Assembly	8.00
S-2650	Vibrator Choke Assembly	.25
6-Z-4	Rectifier Tube (1 used)	1.75
6-D-6	I. F. Tube (2 used)	1.80
85	A. V. C. 2nd Detector Tube (1 used)	1.60
89	Power Output Tube (2 used)	1.80

STANDARD SUPPRESSOR EQUIPMENT

12-193	.5 mfd. 200 volt Ignition Coil Condenser	.45
22-194	.5 mfd. 200 volt Generator Coil Condenser	.50
63-268	Spark Plug Suppressor	.45
63-269	Distributor Suppressor	.45

STANDARD MOUNTING PARTS

17-20	Mounting Clamp for Control Head	.25
15-14	Mounting Clamp Cap for above	.25
69-17	8/32x5/16" R H Machine Screws, C	.20
69-40	8/32x1" R H Machine Screws, C	.20
69-93	8/32x7/16" R H Machine Screws, C	.20
73-17	Headless Set Screws	.01
93-126	No. 8 Shakeproof Washers, C	.20
93-143	3/8" Internal Shakeproof Washers, C	.30
94-143	Fibre Clamp Bushing	.10
144-11	5/16x3" Carriage Bolts and Nuts, C	.20
147-12	Wooden Spacer Blocks	.01

SPECIAL MOUNTING PARTS

S-2704	Parallel Steering Column (consists of following)	1.00
	15-14 Clamp Caps (2 used)	.20
	17-20 Mounting Clamps (2 used)	.20
	69-40 8/32x1" R H Machine Screws (8 used), C	.35
	69-93 8/32x7/16" R H Machine Screws (8 used), C	.35
	73-17 Headless Set Screws (2 used)	.01
	93-126 No. 8 Shakeproof Lockwasher (8 used), C	.35
	94-143 Fibre Clamp Bushing (4 used)	.10
S-2705	Swivel Steering Column (consists of following)	1.00
	12-293 Swivel Mounting Brackets (2 used)	.20
	17-21 Swivel Mounting Clamps (2 used)	.20
	54-65 Forged Winged Nuts (6 used)	.02
	93-127 No. 10 Shakeproof Washers (6 used), C	.35
	118-8 Connecting Links (2 used)	.10
	144-12 3/16x3/4" Carriage Bolts (6 used), C	.20

All prices are subject to regular discount and change without notice.
These prices supersede all previous quotations on like parts.

Nov., 1933

Supplement to Model 460 Service Bulletin

JULY, 1933

All Zenith Auto Radio receivers after serial number 502101 on the control head and number 202101 on the speaker chassis incorporate the following changes:

1. Power transformer
2. I. F. transformers
3. Diode circuit
4. A. V. C. circuit
5. I. F. Bias resistors

The circuit diagram on the reverse side of this sheet shows the improvements alphabetically as listed below.

A — Was part #22-184. Replaced by part #22-198 (Same electrical specifications with slightly smaller container)
B — Was part #95-163. Replaced by part #95-197.
C — I. F. transformers #95-159, #95-161, and #95-162 replaced by numbers 95-198, 95-199 and 95-200 respectively.
D — Bias resistors #63-282 (2200 ohms) replaced by #63-265 (220 ohms each)
E — Diode split and A. V. C. return wiring altered (See diagram)

(Since electrical specifications are identical, it is not necessary to replace part number 224-184 when converting earlier sets)

PARTS REMOVED

1	95-163 Power transformer	1	95-162 I. F. transformer
1	95-159 I F. transformer	2	63-282 2200 ohm resistors
1	95-161 I. F. transformer	1	22-184 condenser block

PARTS ADDED

1	95-197 Power transformer	1	22-162 .0001 mfd. condenser
1	95-198 I. F. transformer	1	63-258 490,000 ohm resistor
1	95-199 I. F. transformer	2	63-265 220 ohm resistors
1	95-200 I. F. transformer		

TUBE OPERATING VOLTAGES

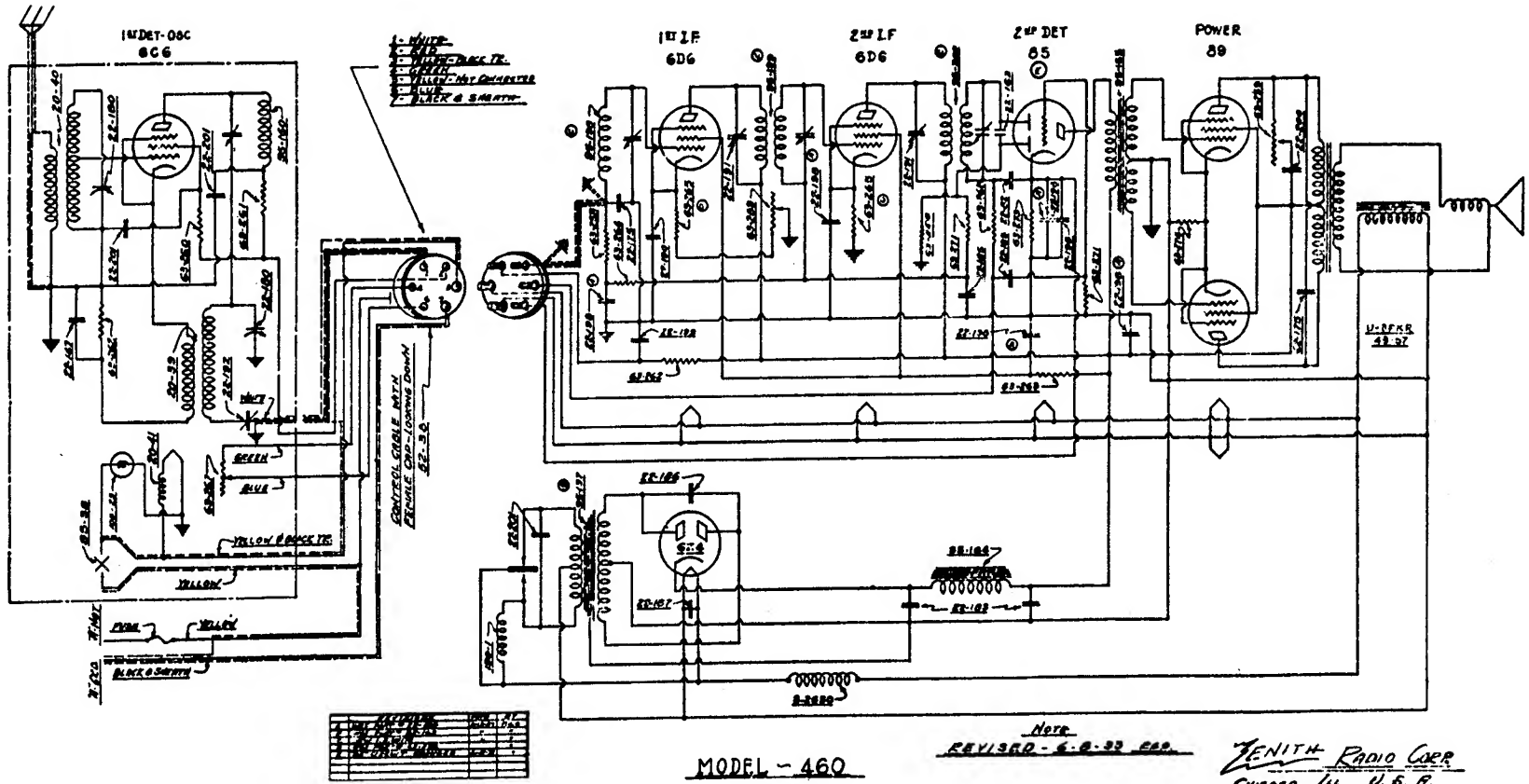
Position	Tube	Ef	Ek	Eg^1	Eg^2	Eg^3	Ep
1st Detector	6C6	5.6	7	0	7	125	180
1st I.F. Amp.	6D6	5.3	1.8	*	1.8	110	200
2nd I.F. Amp.	6D6	5.3	1.8	*	1.8	110	200
2nd Detector	85	5.3	8.	0	--	—	185
P. P. Audio	89	5.3	20	0	20	200	200
	89	5.3	20	0	20	200	200

f—Filament. k—Cathode. g^1—Control grid. g^2—Suppressor grid. g^3—Screen grid. p—Plate.
*Depends on applied signal strength. All voltages measured from indicated points to ground.

Tube equipment and all other components remain unchanged.

ZENITH RADIO CORPORATION CHICAGO, ILL.

(over)


1st DET-OSC
6C6
1st I.F.
6D6
2nd I.F.
6D6
2nd DET
85
POWER
89
MODEL - 460
ZENITH RADIO CORP.
CHICAGO, ILL. U.S.A.

Zenith Radio Corporation

Service Bulletin

MODELS 835 - 880 CHASSIS 1001 - 1001A

SERVICE NOTES

Dial Slips or Binds. Tighten lugs on planetary drive. See that both pointers are free. Make sure gang is squarely lined up with dial.

Off Calibration. Check for loose set screws on dial assembly to condenser shaft. Black pointer may be loose on shaft. Check alignment as outlined in Alignment Proceedure.

Poor Tone. Defective tubes in audio. One side of push-pull circuit faulty. Check audio and output transformers. See A.V.C. blocking.

Insensitive. Out of alignment, weak tubes or defective by-pass condenser.

Shadowgraph Inoperative. Weak 76 tube, burnt out shadowgraph, open resistor in 76 plate circuit.

Distortion at Medium Volume. Defective 75 tube, defective volume control. Separate green volume control-lead and speaker-lead close to grid of 42 tube.

Insensitive on Any Short Wave Band. Check alignment, make sure R.F.circuit is not aligned to image frequency. Change 6A7 tube. Change position of fixed condensers adjacent to rear section of wave change switch. Location of these condensers in relation to each other and their distance from the chassis will effect dial calibration and sensitivity, especially on the Blue Band.

Stops Oscillating Around 9 M.C. Change 6A7 tube, leakage in 50 mmfd. or .0029 mfd. condenser.

A.V.C. Blocks. Shorted resistor on antenna choke. C-14 padder shorted. Grounded R.F. grid circuit.

Oscillates on Broadcast. Check alignment. Push brown wire away from 6A7 socket. Grounded cathode on 1st I.F. or grounded to 600 K.C. padder. Check for open by-pass condenser.

Noisy. Shorting plates in gang condenser. Poor contact in band switch. Loose shields or shield bases. Static shields may be touching leads under gang condenser.

Overheats. Check pilot light and heater circuits for partial short or ground.

Flutters. Rearrange leads under chassis especially around 6A7.

Oscillates on Short Wave Bands. Make sure brown R.F. grid return lead is pushed away from 6A7 socket. Check for ground on any A.V.C.lead. Open by-pass condenser.

Tone Control Inoperative. Resin joint or poor contact on tone control switch. Defective condensers in tone control circuits.

Continuous Audio Whistle. Rearrange leads in audio circuit.

Alignment

The diagram on page 2 shows position of major components and aligning adjustments. It should be studied carefully before any attempt is made to adjust the various circuits. The Clough-Brengle type is the only commercial service oscillator found practical for this work.

Separate coils are used for each band. Mounted on the coils are individual trimmers that align each band, independent of the other bands.

Connect 485 K.C. service oscillator to grid of 6A7 and chassis ground. Adjust I.F. trimmers on rear of I.F. transformers for strongest signal.

Connect 485 K.C. service oscillator to antenna and ground. Turn dial to 540 K.C. on broadcast band and adjust wave trap trimmer on right rear side of chassis for weakest signal.

Broadcast - Black Band

Set service oscillator at 1400 K.C., remaining attached to antenna ground posts. Turn dial to same point and adjust #1 trimmer (top one on oscillator coil) to resonance. Adjust #1 R.F. trimmer (top one on R.F. coil); #1 detector trimmer (through hole in chassis base) and band pass trimmer (top front section of gang) all to resonance.

Set service oscillator at 600 K.C. Adjust padder (located in center rear of chassis) for correct dial reading.

Recheck 1400 K.C. alignment.

Orange Band

Set service oscillator at 4 M.C.(still attached to antenna and ground) and adjust trimmer #2 (2nd from top) on oscillator coil for correct dial reading. Adjust #2 R.F. trimmer (2nd from top on R.F. coil) and #2 detector trimmer (center hole through chassis) to resonance.

Brown Band

Loosen #3 detector trimmer (top one on detector coil). Set service oscillator at 10.5 M.C. Adjust #3 oscillator trimmer (third from top on oscillator coil) for correct dial reading. Adjust #3 R.F. trimmer (third from top of R.F.coil) and #3 detector trimmer (rear one through hole in top of chassis). Adjust #3 detector trimmer on coil to resonance.

Blue Band

Tighten #4 detector trimmer (bottom one on detector coil). Set service oscillator at 21 M.C. Adjust #4 oscillator trimmer (bottom one on oscillator coil) for correct dial reading. Adjust #4 R.F. trimmer (lower one on R.F. coil) and #4 detector trimmer (lower one on detector coil) to resonance.

It is very easy to mistake the image frequency for the fundamental on this band. Rotate dial and if shadowmeter narrows at any point, especially at 15 M.C., the band should be rebalanced.

Green Band

There are no adjustments to be made on this band.

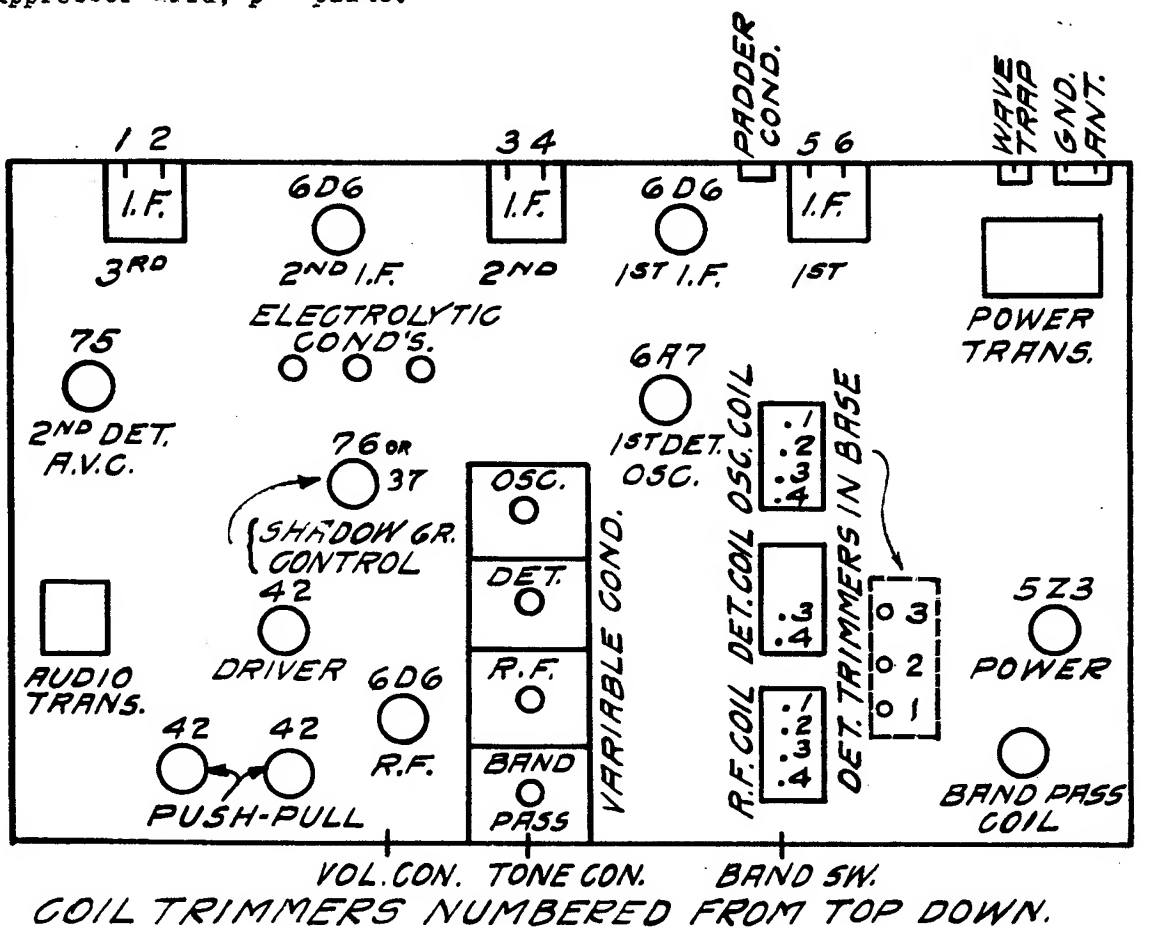
ZENITH AUTOMATIC RADIO

Socket Voltage

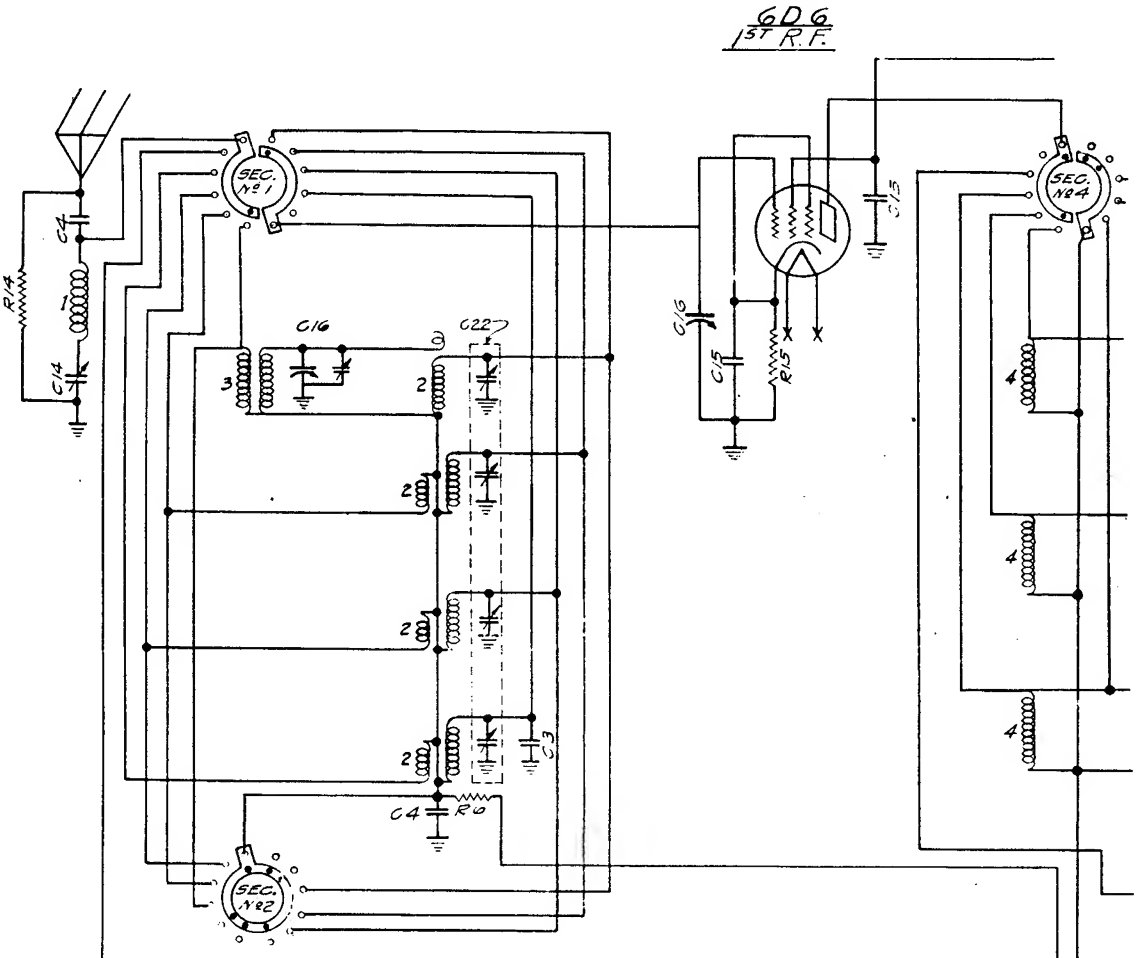
TUBE	POSITION	Ef	Ek	Eg1	Eg2	Eg3	Ep
6D6	R. F.	5.9	1.7	0	85	1.7	235
6A7	1st. Det.	5.9	2.5	0	95	-	235
	OSC.			-1	-	-	165
6D6	1st. I. F.	5.9	8	0	95	8	235
6D6	2nd. I. F.	5.9	8	0	95	8	230
75	2nd. Det. 1st. Aud.	5.9	1.5	0	-	-	155
37 or 76	Shadow-Met. Amp.	5.9	0	-1	-	-	98
42	2nd. Aud.	5.9	21	0	-	-	230
42	PWR.	5.9	33	0	-	-	340
42	PWR.	5.9	33	0	-	-	340
5Z3	Rect.	4.5	-	-	-	-	-

Line Voltage 112 Volts Antenna and Ground Disconnected.

f - filament; k - cathode; g1 - control grid; g 2 - screen grid; g3 - suppressor grid; p - plate.



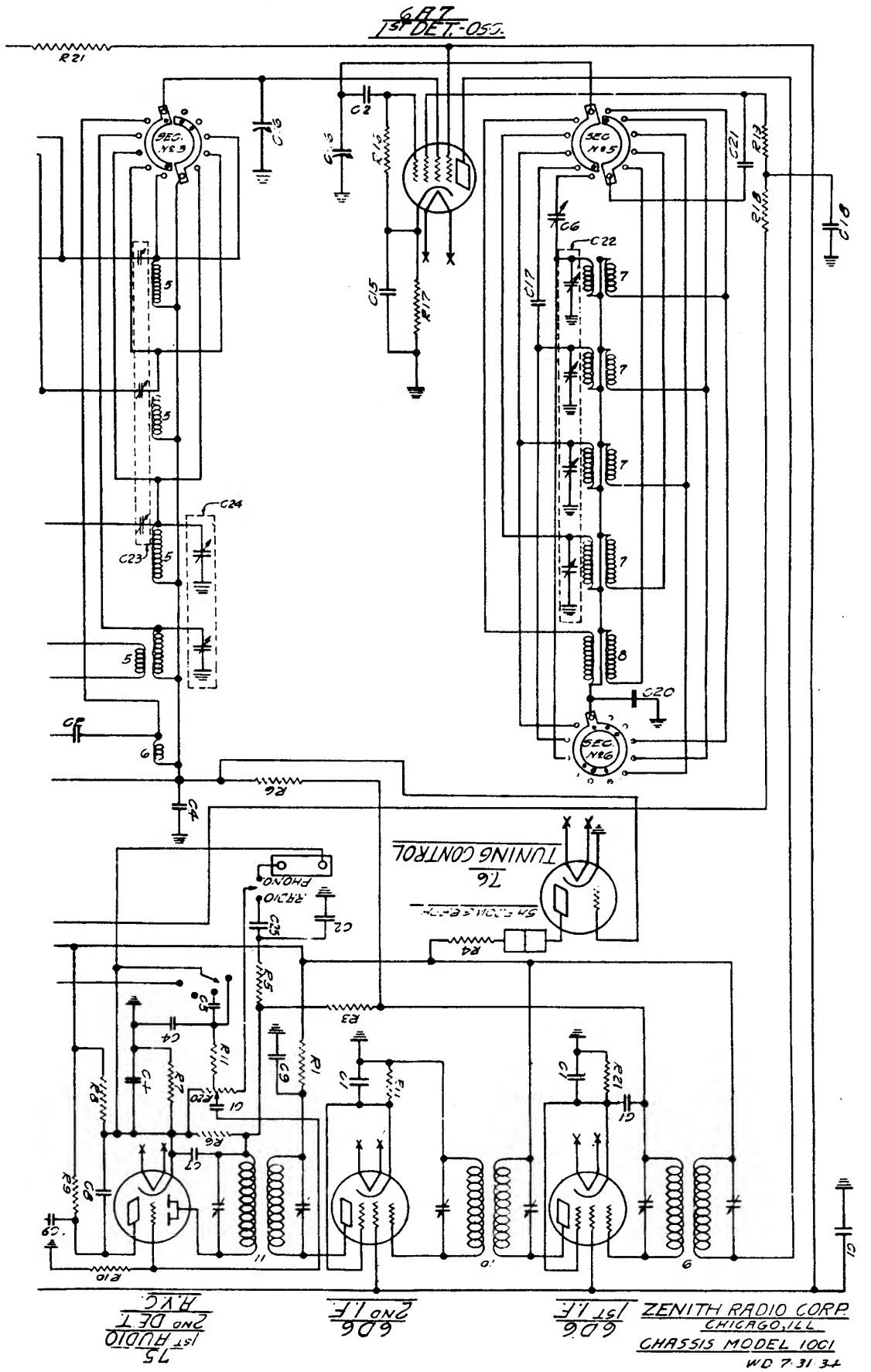
COIL TRIMMERS NUMBERED FROM TOP DOWN.



DIAG. No.	PART No.	DESCRIPTION
C1	22-250	.05 - 200V
C2	22-289	.00005 - 600V.
C3	22-285	.00001 - 600V.
C4	22-185	.01 - 200V
C5	22-327	.02 - 200V.
C6	22-292	500-1000 MMF.
C7	22-182	.00025 - 600V.
C8	22-82	.001 - 600V
C9	22-212	.05 - 400V.
C10	22-326	.003 - 400V.
C11	22-225	5. - 25V.
C12	22-331	8. 500V.
C13	22-125	8 440V.
C14	22-284	.75 - 225 MMF.
C15	22-190	.1 - 200V.
C16	22-333	4 GANG VAR.
C17	22-329	.00097 - 600V.
C18	22-228	.5 - 300V.
C20	22-328	.0029 - 600V.
C21	22-147	.0005 - 600V.
C22	22-325	2-35 MMFD.
C23	22-324	2-35 "
C24	22-323	2-35 "
C25	22-188	.02 - 400V.
R1	63-238	1000 - ½ W.
R3	63-258	490M - ½ W.
R4	63-386	12 M - 2 W.
R5	63-281	29M - ½ W.
R6	63-278	99M - ½ W.
R7	63-379	670 - ½ W.
R8	63-380	100M - 1W.
R9	63-381	100M - ½ W.
R10	63-290	260M - ½ W.
R11	63-261	9900 - ½ W.
R12	63-382	2400 - 4M
R13	63-383	500-730
R14	63-288	19M - ½ W.
R15	63-265	220 - ½ W.
R16	63-372	50M - ½ W.
R17	63-378	250 - ½ W.
R18	63-388	19M - 1W.
R19	63-291	29M - ½ W.
R20	63-384	500M V. CONTROL
R21	63-361	5M - ½ W.

3	20-85	BAND PASS COIL
1	20-64	WAVE TRAP
4	20-81	R.F. P. CHOKES
5	5-3079	DET. COIL
7	5-3080	OSC. COIL
2	5-3078	R.F. COIL
9	95-242	1ST I.F. TRANS.
10	95-242	2ND I.F. TRANS
11	95-243	3RD I.F. TRANS.
12	95-241	POWER TRANS.
13	95-239	AUDIO TRANS.
14	95-240	FILTER CHOKE
8	5-3115	7 METER OSC COIL
6	20-84	7 " DET. "

SWITCHES SHOWN IN BROADCAST POSITION.
I. F. FREQUENCY - 485 KC.


6A7
1ST DET.-OSC.
SEC. NO. 3
SEC. NO. 5
SEC. NO. 6
TUNING CONTROL
PHONO
606
1ST I.F.
606
2ND I.F.
75
1ST AUDIO
2ND DET
A.V.C.
ZENITH RADIO CORP.
CHICAGO, ILL.
CHASSIS MODEL 1001
WD 7-31 34

Parts and Prices

Chassis 1001

MODELS 835, 880, 881 and 1101

Dial Assembly

26-66	Complete Dial and Drive Assembly	$7.50
26-67	Dial Scale only	.75
33-57	Dial Retaining Frame	.35
59-28	Large Z Pointer	.10
59-29	Split Second Pointer	.10
192-4	Dial Glass	.20
93-217	Dial Glass Cushion Washer	.10
76-151	Planetary Drive Assembly	2.00
32-3	Pulley Drive Belt	.15

Resistors

63-238	1 M ohm ¼ watt	.20
63-258	49M " ¼ "	.20
63-261	9900 " ¼ "	.20
63-265	220 " ¼ "	.20
63-278	99M " ¼ "	.20
63-281	29M " ¼ "	.20
63-288	19M " ¼ "	.20
63-290	260M " ½ "	.20
63-291	29M " ½ "	.20
63-361	5 M " ½ "	.20
63-372	50M " ½ "	.20
63-378	250 " ¼ "	.20
63-379	670 " ¼ "	.20
63-380	100M " 1 "	.25
63-381	100M " ½ "	.20
63-382	2400 - 4000 ohm Candohm	.75
63-383	500 - 730 " "	.30
63-384	500 ohm Volume Control and Switch Assembly	1.00
63-386	12M " 2 Watt	.30
63-388	19M " 1 "	.25

Condensers

22-82	.001 Mfd. 600 V.	.25
22-125	8. " 440 V.	1.00
22-147	.0005 " 600 V.	.15
22-182	.00025 " 600 V.	.12
22-185	.01 " 200 V.	.15
22-188	.02 " 400 V.	.15
22-190	.1 " 200 V.	.20
22-212	.05 " 400 V.	.20
22-225	5. " 25 V.	.65
22-228	.5 " 300 V.	.35
22-250	.05 " 200 V.	.15
22-284	75 - 275 Mmfd.	.30
22-285	10 Mmfd. 600 V.	.15
22-289	50 Mmfd. 600 V.	.12

	Condensers Cont'd	
22-292	500 - 1000 Mmfd.	$ .45
22-324	3-gang Adj. Condenser	.40
22-326	.003 Mfd. 400 V.	.15
22-327	.02 " 200 V.	.15
22-328	2900 Mmfd. 600 V.	.30
22-329	970 Mmfd. 600 V.	.20
22-331	8. Mmfd. 500 V.	1.25
22-333	4- gang Variable	5.00
	Coils & Chokes	
20-64	Wave Trap	.35
20-81	R. F. Plate Choke	.65
20-84	7-Meter Detector Coil Assembly	.10
20-85	Band Pass Coil Assembly	.60
95-242	1st and 2nd I. F. Coil Assembly	1.50
95-243	3rd I. F. Coil Assembly	1.50
S-3078	R. F. Coil Assembly	2.75
S-3079	Detector Coil Assembly	2.50
S-3080	Oscillator Coil Assembly	2.75
S-3115	7-Meter Oscillator Coil Assembly	.40
	Miscellaneous	
44-7	Phono Connector Jack (Export Models Only)	.15
46-94	Band Selector Switch Knob	.25
46-95	Tone and Volume Knobs	.25
46-96	Tuning Knob - Large	.25
46-97	Tuning Knob - Small	.20
49-91	10" Dynamic Speaker (Model 835)	10.00
	Cone and Voice Coil for 49-91	3.00
	Output Transformer for 49-91	2.00
	Field Coil for 49-91	2.00
49-92	12" Dynamic Speaker (Models 880, 881)	14.50
	Cone and Voice Coil for 49-92	3.25
	Output Transformer for 49-92	2.50
	Field Coil for 49-92	2.50
57-455	Dial Escutcheon Plate for Models 880, 881	.75
78-100	Tube Socket - 6D6	.10
78-101	" " 75	.10
78-102	" " 42	.10
78-106	" " 6A7	.10
78-109	" " 76	.10
78-110	" " 5Z3	.10
85-56	Phono Switch	.35
85-58	Band Selector Switch	4.00
85-60	4-position Tone Switch	.60
95-239	Push Pull Input Transformer	2.00
95-240	Power Filter Choke	2.00

Miscellaneous Cont'd

95-241	117 V. 50/60 Cycle Power Transformer	$5.75
95-246	All Voltage 25 Cycle " "	$10.00
100-23	6.3 Volt Pilot Lamp	.15
122-9	Shadowgraph Meter	2.00
126-127	Tube Shields	.15

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

WARRANTY

The Zenith Radio Corporation guarantees each new ZENITH receiver and each new ZENITH QUALITY TUBE to be free from defects in workmanship and material.

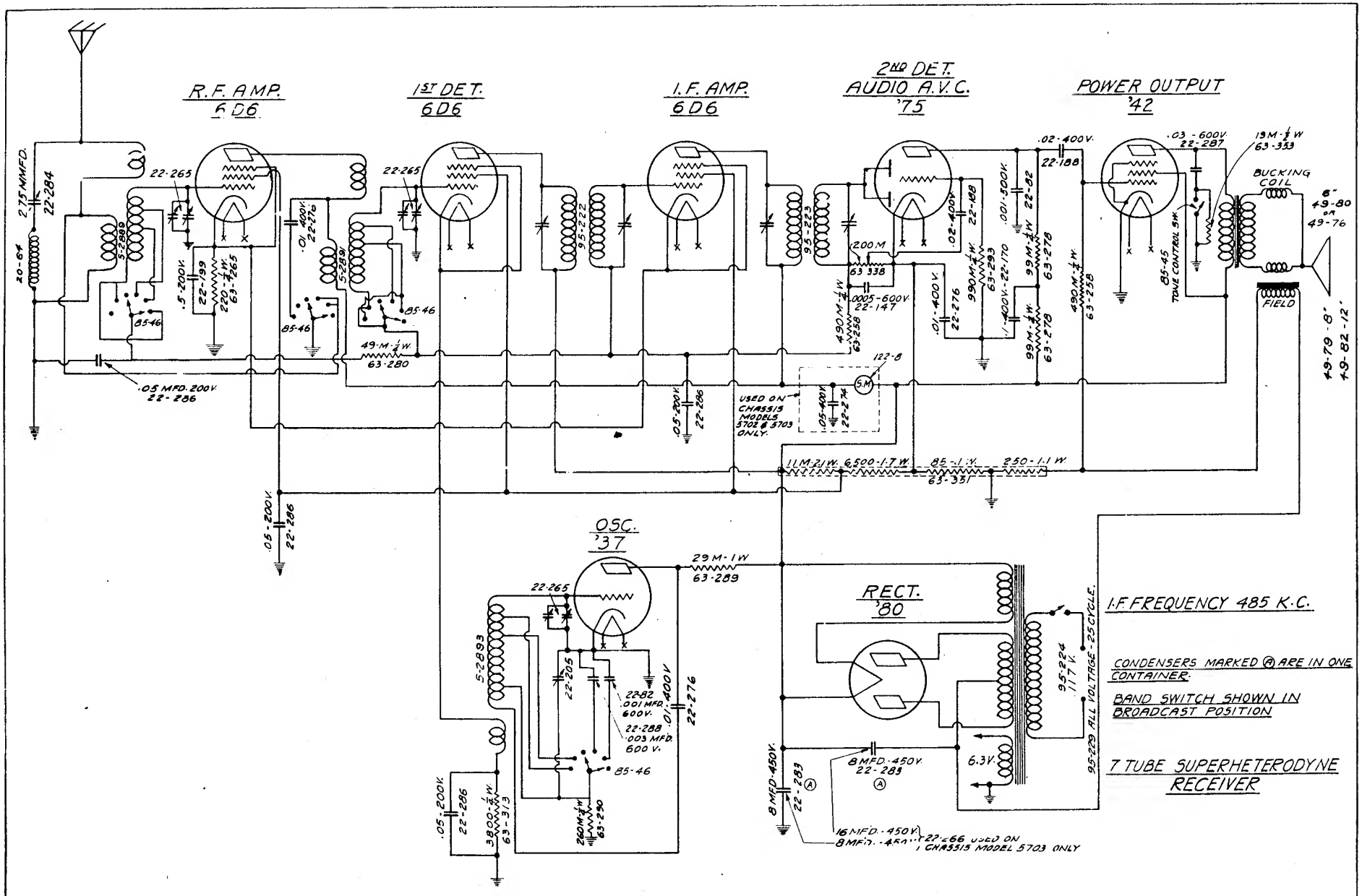
Our obligation under this warranty is limited to making good at our factory any part or parts of the receiver which within ninety days from date of purchase shall be returned to us with transportation charges prepaid and which on examination shall be found to our satisfaction to have been thus defective. The ZENITH QUALITY TUBES used in this receiver are guaranteed against mechanical and electrical defects under the same warranty as the receiver. This warranty is expressly in lieu of all other warranties expressed or implied, and we neither assume nor authorize any representative or other person to assume for us any other liability in connection with the sale of ZENITH receivers or ZENITH QUALITY TUBES.

This warranty shall not apply to any receiver or tube which shall have been repaired or altered outside of our factory in any way so as, in our judgment, to affect its stability or reliability, nor which has been subject to misuse, negligence or accident, nor which has had the serial number or name altered, defaced or removed. Neither shall this warranty apply to any receiver in which other than ZENITH QUALITY TUBES have been used.

ZENITH RADIO CORPORATION.

ZENITH — LONG DISTANCE — RADIO

ZENITH RADIO CORPORATION
3620 Iron Street
CHICAGO, ILL., U. S. A.



MODELS 825-827-829-870

CHASSIS 5701-2-3

ZENITH RADIO CORPORATION
CHICAGO, ILL. U.S.A.

P.S.D. - DATE 3-27-34

SOCKET VOLTAGES — 5701 - 2 - 3 CHASSIS

TYPE	POSITION	Ef	Ek	Eg1	Eg2	Eg3	Ep
6D6	R.F.	5.4	2.8	0	2.8	74	230
6D6	1st. Det.	5.4	7.8	0	7.8	74	230
37	Osc.	5.4	0	38	-	-	130
6D6	I.F.	5.4	2.8	0	2.8	74	230
74	2nd. Det.	5.4	1	0	-	-	125
42	PWR.	5.4	0	4	0	230	215
80	Rect.	4.2	-	-	-	-	235

Line Voltage 112 V. Aerial and Ground disconnected.

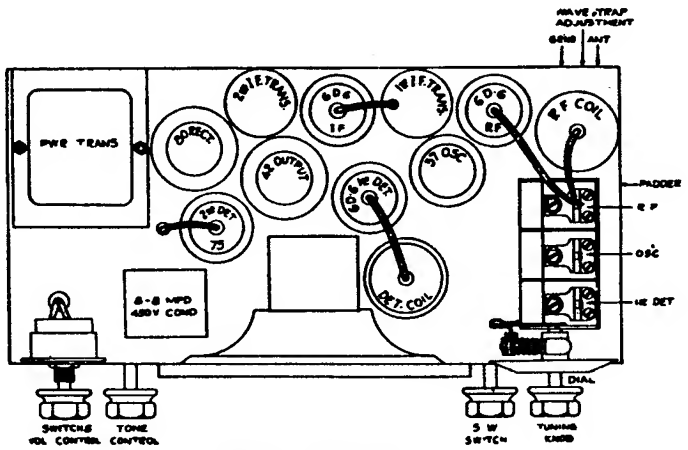
F - Filament K - Cathode G1 - Control Grid

G2 Suppressor Grid G3 - Screen Grid P - Plate

All measurements taken from points indicated to ground with 1000 ohms per volt D.C. meter (except filaments).

Balance I.F. transformers at 485 K.C., trimmers on condenser gang at 1500 K.C. and oscillator padder at 600 K.C.

The screw adjustment at the right hand rear of chassis is a wave trap for the elimination of code interference at the I.F. frequency. Connect 485 K.C. oscillator on antenna and adjust for weakest signal.



Tube Layout

MODEL 825
CHASSIS 5701

Condensers

22-82	.001 mfd. 600 volt (1st Audio Plate, Oscillator).....	$ .25
22-147	.0005 " 600 " (Volume Control Bypass).....	.15
22-170	.1 " 400 " (1st Audio Plate).....	.25
22-188	.02 " 400 " (Audio Coupling - 2 used).....	.15
22-199	.5 " 200 " (R.F. Cathode).....	.30
22-205	200 - 500 mmfd. Padder.....	.35
22-265	3-Gang Variable.....	3.00
22-276	.01 mfd. 400 volt (R.F.Plate -Det.Cathode - Osc. Plate)..	.15
22-283	Dual 8 mfd. 450 volt (for 5701 and 2 only) Filter.....	2.50
22-284	75-275 mmfd. Trimmer (Wave Trap).....	.30
22-286	.05 mfd. 200 volt (R.F.Grid Return - Screen Bypass - I.F.Grid Return - 1st Det. Cathode).....	.15
22-287	.03 mfd. 600 volt (Tone Control).....	.15
22-288	.003 mfd. 600 volt (Oscillator Cathode).....	.15

Resistors

63-258	490M ohms ¼ watt (A.V.C.Filter - Power Grid).....	.20
63-265	220 " ¼ watt (R.F.Cathode).....	.20
63-278	99M " ¼ watt (1st Audio Plate - 2 used).....	.20
63-280	49M " ¼ watt (1st Det. A.V.C.).....	.20
63-289	29M " 1 watt (Oscillator Plate).....	.25
63-290	260M " ¼ watt (Oscillator Grid).....	.20
63-293	990M " ¼ watt (1st Audio Grid).....	.20
63-305	160 " ¼ watt (Oscillator Plate).....	.20
63-313	3800 " ¼ watt (1st Det. Cathode).....	.20
63-338	Volume Control & Switch Assembly(200M Ohms).....	1.00
63-351	Candohm Voltage Divider.....	.65
63-353	19M ohms ½ watt (Tone Control).....	.20

Coils

20-64	Wave Trap Coil.....	.35
S-2889	R.F.Coil and Shield Assembly.....	.85
S-2891	Detector Coil and Shield Assembly.....	1.50
S-2893	Oscillator Coil and Shield Assembly.....	1.20
95-222	1st I.F. Transformer,485 K.C.....	1.75
95-223	2nd I.F. Transformer, 485 K.C.....	1.75

Miscellaneous

19-44	Coat Tube Shield Clips.....	.03
46-77	Knob - Band Selector.....	.25
46-78	Knob - Tuning & Volume Control.....	.20
46-79	Knob - Tone Control.....	.20
49-76 J	Dynamic Speaker 6" (Also 49-80 Utah).....	5.50
49-76 C	Output Transformer (" " " ").....	1.50
49-76 A	Cone & Voice Coil (" " " ").....	2.00
49-76 B	Field Coil.....(" " " ").....	2.00
57-439	Escutcheon Plate for Dial.....	.20
57-440	Zenith Nameplate (5701 only).....	.10
78-69	6D6 Socket.....	.10

Miscellaneous Cont'd

78-70	80 Socket	$ .10
78-91	75 Socket	.10
78-92	42 Socket	.10
78-95	37 Socket	.10
78-76	Pilot Lamp Clip and Socket Assembly	.10
83-334	Antenna and Ground Terminal Strip	.12
85-45	2-Position Tone Control Switch	.35
85-46	2-Section Wave Change Switch	1.50
95-224	117 V.- 50/60 cycle Power Transformer	3.75
95-229	All Voltage - 25 Cycle Power Transformer	7.25
100-29	6 - 8 Volt Pilot Lamp (also Shadowmeter Lamp)	.15
126-131	Goat Tube Shield with Rings	.10
26-51	Tuning Dial Complete	1.50

MODEL 827, CHASSIS #5702

Same as Chassis #5701 with additional parts as follows:

22-274	.05 mfd. 400 volt Condenser (Shadowgraph Filter)	.15
57-407	Zenith Nameplate	.10
57-441	Shadowmeter Escutcheon Plate	.15
100-29	6-8 volt Pilot Lamp	.15
122-8	Shadowmeter	2.00

MODEL 870, CHASSIS #5703

Same as Chassis #5701 less 49-76 Speaker, 22-283 Condenser and S-2897 Tuning Dial and with additional parts as follows:

22-266	8-16 mfd. 500 volt Condenser	3.50
26-52	Aeroplane Dial Complete	2.75
57-442	Escutcheon Plate for Dial	.40
49-82	12" Dynamic Speaker	10.00
49-82 A	Cone and Voice Coil for 49-82	3.25
49-82 B	Output Transformer for 49-82	2.00
49-82 C	Field Coil for 49-82	2.00

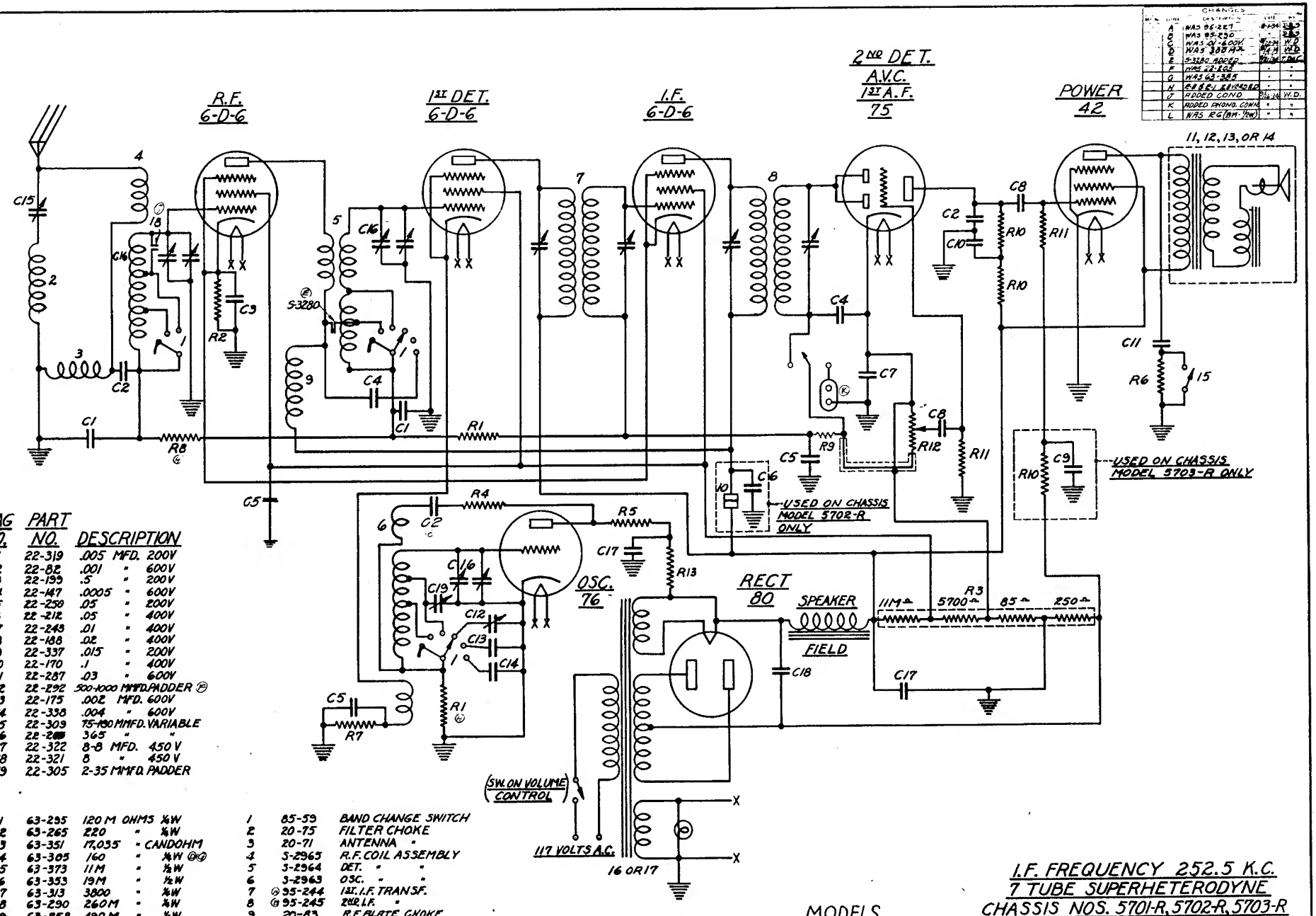
MODEL 829, CHASSIS #5704

Same as Chassis #5703 less 49-82 Speaker and with additional parts as follows:

46-84	Knob - Band Switch	.25
46-85	Knob - Tuning and Volume	.20
46-86	Knob - Tone	.20
49-79	8" Dynamic Speaker	8.00
49-79 A	Cone and Voice Coil for 49-79	2.50
49-79 B	Output Transformer for 49-79	2.00
49-79 C	Field Coil for 49-79	2.00

ALL PRICES SUBJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE. ALSO ALL PRICES QUOTED HERE SUPERSEDE PREVIOUS QUOTATIONS ON OTHER PARTS LISTS FOR LIKE PARTS.

ZENITH RADIO CORPORATION
November 15, 1934



DIAG NO.	PART NO.	DESCRIPTION
C1	22-319	.005 MFD. 200V
C2	22-82	.001 " 600V
C3	22-199	.5 " 200V
C4	22-147	.0005 " 600V
C5	22-259	.05 " 200V
C6	22-212	.05 " 400V
C7	22-249	.01 " 400V
C8	22-188	.02 " 400V
C9	22-337	.015 " 200V
C10	22-170	.1 " 400V
C11	22-287	.03 " 600V
C12	22-292	500-1000 MMFD. PADDER (F)
C13	22-175	.002 MFD. 600V
C14	22-338	.004 " 600V
C15	22-309	75-180 MMFD. VARIABLE
C16	22-[illegible]	365 " "
C17	22-322	8-8 MFD. 450 V
C18	22-321	8 " 450 V
C19	22-305	2-35 MMFD. PADDER

R1	63-295	120 M OHMS	½W
R2	63-265	220 "	½W
R3	63-351	17,035 "	CANDOHM
R4	63-305	160 "	½W (D)(G)
R5	63-373	11M "	½W
R6	63-353	19M "	½W
R7	63-313	3800 "	½W
R8	63-290	260M "	½W
R9	63-258	490M "	½W
R10	63-278	99M "	½W
R11	63-293	990M "	½W
R12	63-338	200M OHMS	VOL. CON.
R13	63-388	19M "	1W.

(B)-S-3280 APPROX. 10 MMFD. COUP. COND.

1	85-59	BAND CHANGE SWITCH
2	20-75	FILTER CHOKE
3	20-71	ANTENNA "
4	S-2965	R.F. COIL ASSEMBLY
5	S-2964	DET. " "
6	S-2963	OSC. " "
7	(A) 95-244	1ST I.F. TRANSF.
8	(G) 95-245	2ND I.F. "
9	20-83	R.F. PLATE CHOKE
10	122-8	SHADOW METER
11	49-76	6" SPEAKER
12	49-86	8" "
13	49-97	12" "
14	49-98	12" AUDITORIUM SPEAKER
15	85-56	TONE CONTROL SWITCH
16	95-234	POWER TRANSF. 50-60 CYCLE
17	95-229	" " 25 CYCLE

MODELS
S-829 - S-870
S-871 - 1170

I.F. FREQUENCY 252.5 K.C.
7 TUBE SUPERHETERODYNE
CHASSIS NOS. 5701-R, 5702-R, 5703-R

ZENITH RADIO CORP.
CHICAGO ILL.

DBS. 7-20-34

TUBE	POSITION	Ef	Ek	Eg1	Eg2	Eg3	Ep
6D6	R.F.	5.4	3	0	76	3	250
6D6	1st.Det.	5.4	6.2	0	76	6.2	250
75	Osc.	5.4	0	0	-	-	165
6D6	I.F.	5.4	6.2	0	76	6.2	250
75	2nd.Det. A.V.C. 1st.Aud.	5.4	1	0	-	-	125
42	PWR	5.4	0	-.5	-	250	240
80	Rect.	4.6	-	-	-	-	-

Line voltage 112 Antenna and Ground Disconnected

F - heaters; K - cathode; G1 - control grid; G2 - screen grid; G3 suppressor grid; P - plate.

Alignment

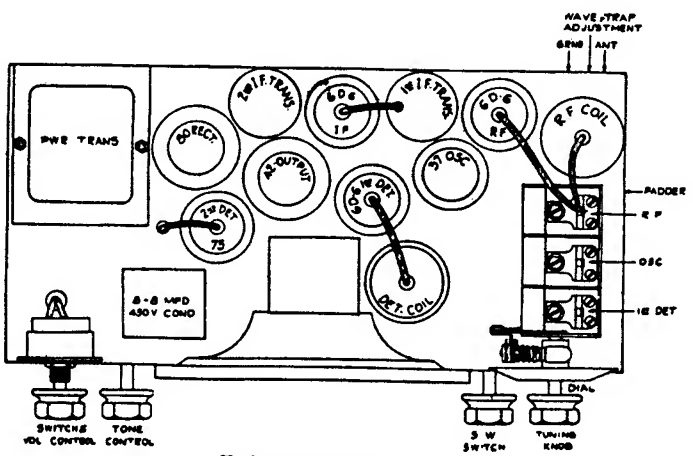
(1) Balance intermediate transformers at 252.5 K.C. with service oscillator connected to grid of first detector and ground.

(2) Adjust wave trap padder (located on rear of chassis at right side) at 252.5 K.C. for weakest signal with service oscillator connected to aerial and ground.

(3) Turn wave band switch clockwise to the highest frequency band. Set service oscillator at 15 megacycle (still connected to aerial and ground). Adjust trimmer on oscillator section of 3-gang condenser for correct dial reading at this frequency.

(4) Turn wave band switch counter-clockwise to standard broadcast. Adjust oscillator trimmer (located underneath chassis next to band switch) for correct dial reading at 1400 K.C. and balance R.F. and 1st detector trimmers on gang condenser for loudest signal at this frequency.

(5) Adjust broadcast oscillator padder (through hole in right side of chassis) at 600 K.C. meanwhile rocking dial pointer past this point on dial, to position giving loudest signal.



Tube Layout

Condensers

22-82	.001 Mfd. 200 V.	$ .25
22-147	.0005 Mfd. 600 V.	.15
22-170	.1 " 400 V.	.25
22-175	.002 " 600 V.	.25
22-188	.02 " 400 V.	.15
22-199	.5 " 200 V.	.30
22-212	.05 " 400 V.	.20
22-243	.01 " 400 V.	.15
22-250	.05 " 200 V.	.15
22-265	Variable Condenser Assembly	3.00
22-287	.03 Mfd. 600 V.	.15
22-292	Padder	.45
22-305	"	.15
22-309	"	.25
22-319	.0005 Mfd. 200 V.	.20
22-321	8. " 450 V.	1.25
22-322	8. x 8. Mfd. 450 V.	2.50
22-337	.015 Mfd. 200 V.	.15
22-338	.004 " 600 V.	.35

Resistors

63-258	490 M Ohm $\frac{1}{4}$ Watt	.20
63-265	220 " $\frac{1}{4}$ "	.20
63-278	99M " $\frac{1}{4}$ "	.20
63-290	260M " $\frac{1}{4}$ "	.20
63-293	990M " $\frac{1}{4}$ "	.20
63-295	120M " $\frac{1}{4}$ "	.20
63-305	160 " $\frac{1}{4}$ "	.20
63-313	3800 " $\frac{1}{4}$ "	.20
63-338	200M " Volume Control Assembly	1.00
63-351	17,035 " Candohm	.65
63-353	19M " $\frac{1}{2}$ Watt	.20
63-373	11M " $\frac{1}{2}$ "	.25

Coils and Chokes

20-71	Antenna Choke	.20
20-75	Filter Choke	.25
20-83	R.F.Plate Choke	.30
95-244	1st I.F. Transformer	1.50
95-245	2nd I.F. Transformer	1.50
S-2963	Oscillator Coil Assembly	1.00
S-2964	Detector Coil Assembly	1.25
S-2965	R.F.Coil Assembly	1.25

Miscellaneous

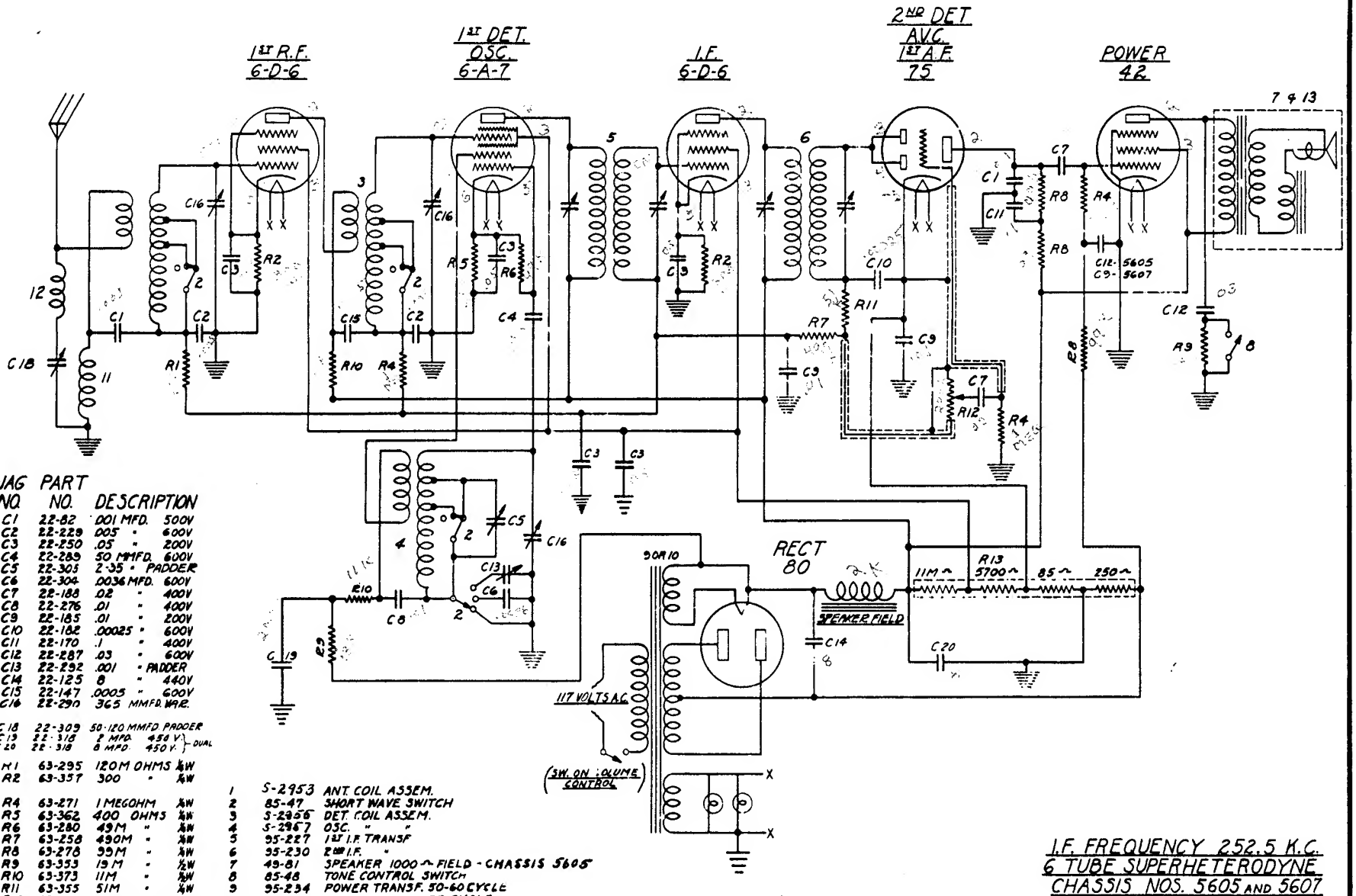
26-61	Complete Airplane Dial and Drive Assembly	2.75
46-85	Knobs for Volume and Tuning (Model S-829 only)	.20
46-88	" " " " " (" S-870 and S-871 only)...	.10
46-91	Band Selector Switch Knob (Model S-870 and S-871 only)...	.15

Miscellaneous Contd.

46-92	Band Selector Switch Knob (Model S-829 only)	$ .20
49-79	8" Dynamic Speaker for Model S-829 only	8.00
49-79A	Cone and Voice Coil for 49-79	2.00
49-79B	Output Transformer for 49-79	2.00
49-79C	Field Coil for 49-79	2.00
49-97	12" Dynamic Speaker for S-870 and 1170	10.00
49-97A	Cone and Voice Coil for 49-97	3.25
49-97B	Output Transformer for 49-97	2.00
49-97C	Field Coil for 49-97	2.00
49-98	12" Auditorium Dynamic Speaker for Model S-871	12.00
49-98A	Cone and Voice Coil for 49-98	3.25
49-98B	Output Transformer for 49-98	2.50
49-98C	Field Coil for 49-98	2.00
57-442	Dial Escutcheon Plate	.40
78-69	6D6 Socket	.10
78-70	80 "	.10
78-91	75 "	.10
78-92	42 "	.10
78-111	76 "	.10
83-334	Antenna and Ground Terminal Strip	.12
85-45	Two-Position Tone Control Switch	.35
85-59	Wave Change Switch	1.50
95-234	117 V. 50-60 Cycle Power Transformer	3.75
95-229	25 Cycle All Voltage Power Transformer	7.25
100-23	6.3 Volt Pilot Lamp	.15
126-131	Goat Tube Shield	.10

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

ZENITH RADIO CORPORATION
October 23, 1934



DIAG NO.	PART NO.	DESCRIPTION	
C1	22-82	.001 MFD.	500V
C2	22-229	.005 "	600V
C3	22-250	.05 "	200V
C4	22-289	50 MMFD.	600V
C5	22-305	2-35 "	PADDER
C6	22-304	.0036 MFD.	600V
C7	22-188	.02 "	400V
C8	22-276	.01 "	400V
C9	22-185	.01 "	200V
C10	22-182	.00025 "	600V
C11	22-170	.1 "	400V
C12	22-287	.03 "	600V
C13	22-292	.001 "	PADDER
C14	22-125	8 "	440V
C15	22-147	.0005 "	600V
C16	22-290	365 MMFD. VAR.	
C18	22-309	50-120 MMFD.	PADDER
C19	22-318	8 MFD. 450 V.	DUAL
C20	22-318	8 MFD. 450 V.	DUAL
R1	63-295	120M OHMS	½W
R2	63-357	300 "	½W
R4	63-271	1 MEGOHM	½W
R5	63-362	400 OHMS	½W
R6	63-280	49M "	½W
R7	63-258	490M "	½W
R8	63-278	99M "	½W
R9	63-353	19M "	1W
R10	63-373	11M "	½W
R11	63-355	51M "	½W
R12	63-366	200M	VOL. CON.
R13	63-351	17,035	CANDOHM

1	S-2953	ANT. COIL ASSEM.
2	85-47	SHORT WAVE SWITCH
3	S-2956	DET. COIL ASSEM.
4	S-2957	OSC. " "
5	95-227	1ST I.F. TRANSF.
6	95-230	2ND I.F. "
7	49-81	SPEAKER 1000 ~ FIELD - CHASSIS 5605
8	85-48	TONE CONTROL SWITCH
9	95-234	POWER TRANSF. 50-60 CYCLE
10	95-229	" " 25 CYCLE
11	20-71	ANT. CHOKE
12	20-75	WAVE TRAP CHOKE
13	49-85	SPEAKER - CHASSIS 5607

I.F. FREQUENCY 252.5 K.C.
6 TUBE SUPERHETERODYNE
CHASSIS NOS. 5605 AND 5607

ZENITH RADIO CORP.
CHICAGO ILL.

5605

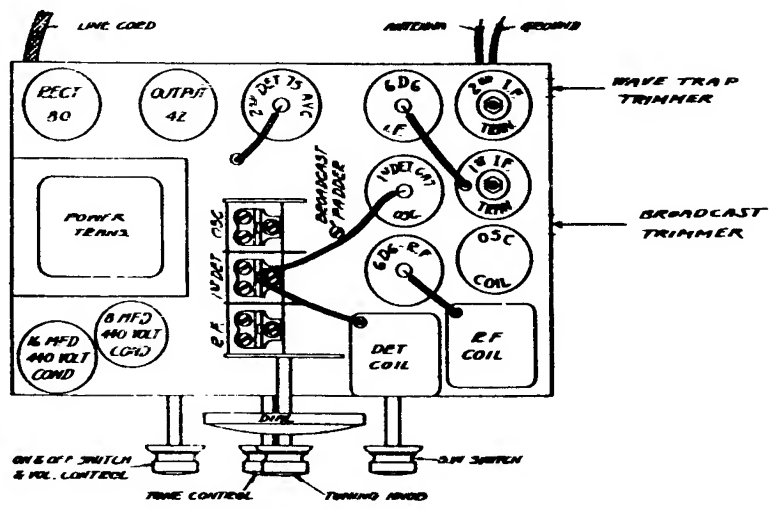
TUBE	POSITION	Ef	Ek	Eg1	Eg2	Eg3	Ep
6D6	R.F.	5.6	2.4	0	70	2.4	200
6A7	1St. Det.	5.6	3	0	70	-	250
	Osc.			3.6	-	-	230
6D6	I.F.	5.6	2.6	0	70	2.6	250
75	2nd.Det. 1st Audio	5.6	1.4	0	-	-	148
42	PWR.	5.6	0	-.6	250	-	250
80	RECT.	4.6	-	-	-	-	300

Line Voltage 112 Antenna and Ground Disconnected

All measurements taken from point indicated to ground, using a 1000 ohm per volt D.C. meter (except heaters).
F - Filament; K - Cathode; g1 - Control Grid; g2 - Screen Grid; g3 - Suppressor Grid; p - Plate.

Alignment

1. Balance intermediate transformers at 252.5 K.C. with oscillator connected to grid of first detector and ground.
2. Adjust wave trap padder (located underneath chassis at rear right side) for weakest signal with 252.5 K.C. oscillator connected to aerial and ground.
3. Turn wave band switch clockwise to the highest frequency band. Connect 15,000 K.C. oscillator to aerial and ground. Balance oscillator trimmer on three-gang condenser for correct dial reading at this frequency.
4. Turn wave band switch counter-clockwise to standard broadcast position. Adjust broadcast oscillator trimmer (located underneath chassis at right center) for correct dial reading at 1400 K.C. and balance R. F. and 1st detector trimmers on three-gang condenser for loudest signal.
5. Adjust oscillator standard broadcast padder through hole in top center of chassis for correct dial reading at 600 K.C.



TUBE-POSITION

PARTS AND PRICES
MODELS 808 and 809
Chassis 5605

Dial Assembly

12-372	Bracket Shaft and Frame Assembly	$ .65
26-50	Dial Scale	.40
27-5	Celluloid Disc and Hub Assembly	.25
73-22	Set Screw	.03
59-27	Pointer	.15
93-207	Glass Cushion Washer	.05
192-3	Glass	.20

Condensers

22-82	.001 Mfd. 500 Volt (1st Audio Plate)	.25
22-125	8. " 440 " (Power Filter)	1.00
22-147	.0005 " 600 " (R.F.Plate Coupling)	.15
22-170	.1 " 400 " (1st Audio Plate)	.25
22-182	.00025 " 600 " (A.V.C. By-Pass)	.12
22-185	.01 " 200 " (2nd Detector Cathode)	.15
22-188	.02 " 400 " (1st and 2nd Audio Coupling)	.15
22-229	.005 " 600 " (R.F. and 1st Det.A.V.C. By-Pass)	.15
22-250	.05 " 200 " (Screens)	.15
22-276	.01 " 400 " (Oscillator)	.15
22-287	.03 " 600 " (Tone Control & Pwr. Grid)	.15
22-289	50 Mmfd. 600 " (Oscillator Grid)	.12
22-290	Three-Gang Variable	3.25
22-292	500-1000 Mmfd. Padder (Oscillator)	.45
22-304	.0036 Mfd. 600 Volt (Oscillator)	.30
22-305	2 - 35 Mmfd. Padder (Oscillator)	.15
22-306	2. Mfd. (Dry Electrolytic) (Oscillator B Filter)	.80
22-309	50 - 120 Mmfd. Padder (Wave Trap)	.25
22-318	8 - 2 Mfd. 450 Volt Filter	1.60

Resistors

63-258	490 M. Ohms 1/4 Watt (A.V.C. Filter)	.20
63-271	1 Megohm 1/4 " (1st and 2nd Audio Grids)	.20
63-278	99 M Ohms 1/4 " (1st Audio Plates and Pwr.Grid)	.20
63-280	49 M Ohms 1/4 " (Oscillator Grid)	.20
63-295	120 M Ohms 1/4 " (R.F.Grid Return)	.20
63-351	Candohm Voltage Divider	.65
63-353	19 M Ohms 1/2 Watt (Tone Control and Osc.Filter)	.20
63-355	51 M Ohms 1/4 " (A.V.C. Load)	.20
63-357	300 Ohms 1/4 " (R.F. and I.F. Cathodes)	.20
63-362	400 Ohms 1/4 " (1st Detector Cathode)	.20
63-366	Volume Control and Switch	.80
63-373	11 M Ohms 1/2 Watt (R.F. and Osc. Plates)	.25

Coils

20-71	Antenna Choke	.20
20-75	Wave Trap Choke	.25
95-227	1st I. F. Transformer (252.5 K.C.)	1.50

Coils (Continued)

95-230	2nd I. F. Transformer (252.5 K.C.).....	$ 1.50
S-2953	Oscillator Coil and Shield Assembly.....	1.00
S-2955	Antenna Coil and Shield Assembly.....	1.25
S-2957	Detector Coil and Shield Assembly.....	1.60

Miscellaneous

19-44	Goat Tube Shield Clips (For Moulded Socket).....	.03
19-50	" " " " " Wafer "	.03
46-87	Small Knob.....	.10
46-88	Large Knob (2 used).....	.10
46-90	Knob (with Color Indicator for Wave Change).....	.15
49-81	6" Dynamic Speaker.....	5.50
	Cone and Voice Coil for 49-81 Speaker.....	2.00
	Output Transformer for 49-81 Speaker.....	1.50
	Field Coil for 49-81 Speaker.....	2.00
57-435	Escutcheon Plate for Dial.....	.40
78-70	Moulded Socket for #80 Tube (Wafer Type #78-82).....	.10
78-91	" " " #75 " (" " #78-101).....	.10
78-92	" " " #42 " (" " #78-102).....	.10
78-96	" " " #6D6 " (" " #78-100).....	.10
78-105	" " " #6A7 " (" " #78-106).....	.10
85-47	Short Wave Selector Switch.....	1.10
85-48	Two-Position Tone Control Switch.....	.35
95-229	25 Cycle - All Voltage Power Transformer.....	6.50
100-23	6.3 Volt Pilot Lamps.....	.15
126-131	Goat Tube Shields.....	.10
S-3021	Power Transformer and Mtg. Plate Assemb. 117 V. 50/60 Cycle	4.00

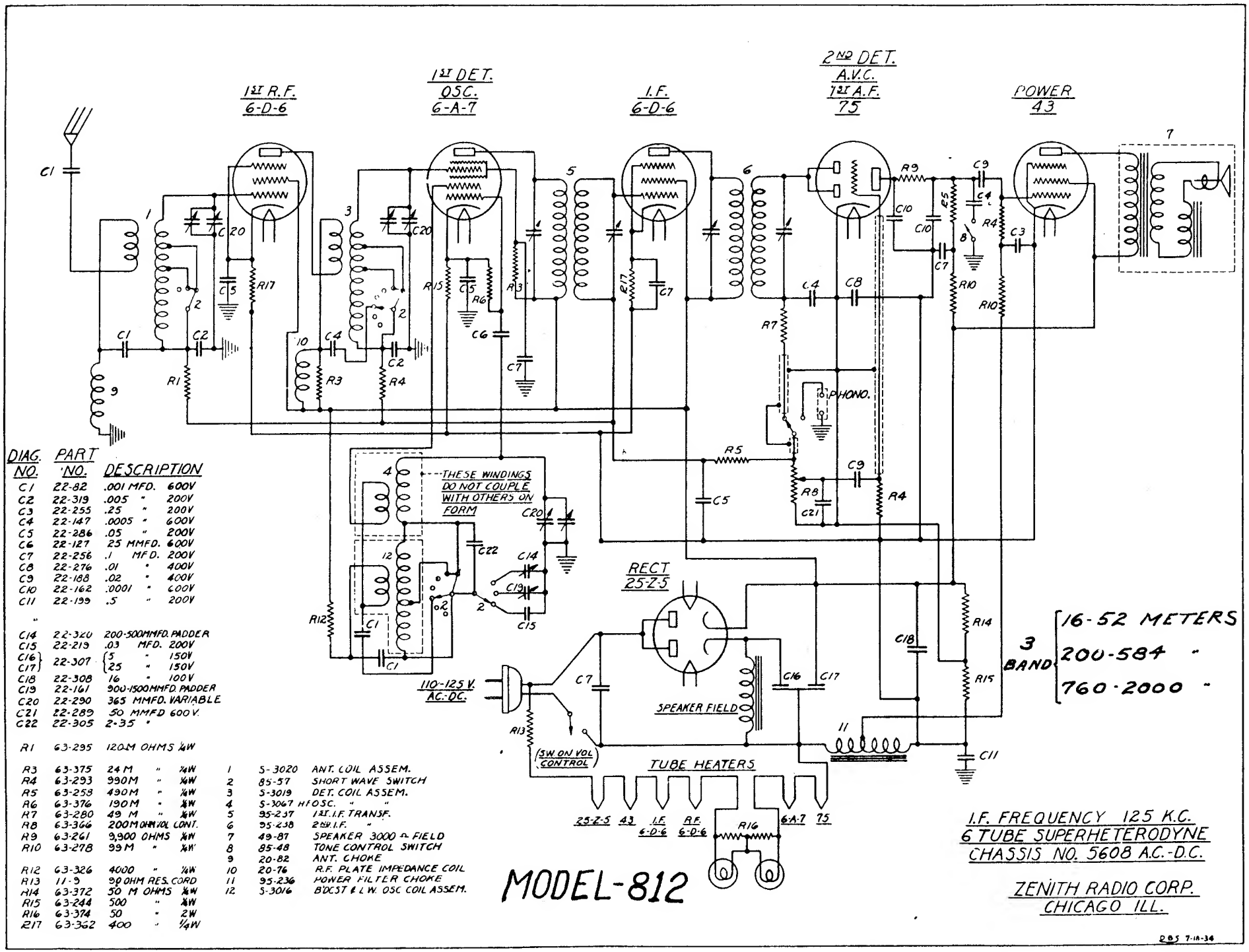
MODELS 860 and 861
Chassis 5607

Same as Chassis 5605 excepting the following is added:

1	22-185	.01 Mfd. 200 Volt Condenser (Deduct 22-182 from 5605).....	.15
1	49-85	10" Dynamic Speaker (Deduct 49-81 6" Speaker).....	8.50
		Cone and Voice Coil for 49-85 Speaker.....	3.00
		Output Transformer for 49-85 Speaker.....	2.00
		Field Coil for 49-85 Speaker.....	2.00

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

ZENITH RADIO CORPORATION
July 13, 1934



DIAG. NO.	PART NO.	DESCRIPTION
C1	22-82	.001 MFD. 600V
C2	22-319	.005 " 200V
C3	22-255	.25 " 200V
C4	22-147	.0005 " 600V
C5	22-286	.05 " 200V
C6	22-127	25 MMFD. 600V
C7	22-256	.1 MFD. 200V
C8	22-276	.01 " 400V
C9	22-188	.02 " 400V
C10	22-162	.0001 " 600V
C11	22-199	.5 " 200V
C14	22-320	200-500MMFD. PADDER
C15	22-219	.03 MFD. 200V
C16	22-307	5 " 150V
C17		25 " 150V
C18	22-308	16 " 100V
C19	22-161	900-1500MMFD. PADDER
C20	22-290	365 MMFD. VARIABLE
C21	22-289	50 MMFD 600V.
C22	22-305	2-35 "
R1	63-295	120M OHMS ½W
R3	63-375	24 M " ½W
R4	63-293	990M " ½W
R5	63-258	490M " ½W
R6	63-376	190M " ½W
R7	63-280	49 M " ½W
R8	63-366	200M OHM VOL CONT.
R9	63-261	9,900 OHMS ½W
R10	63-278	99M " ½W
R12	63-326	4000 " ½W
R13	11-9	90 OHM RES. CORD
R14	63-372	50 M OHMS ½W
R15	63-244	500 " ½W
R16	63-374	50 " 2W
R17	63-362	400 " ¼W

1	S-3020	ANT. COIL ASSEM.
2	85-57	SHORT WAVE SWITCH
3	S-3019	DET. COIL ASSEM.
4	S-3067	H.F. OSC. " "
5	95-237	1ST I.F. TRANSF.
6	95-238	2ND I.F. "
7	49-87	SPEAKER 3000 Ω FIELD
8	85-48	TONE CONTROL SWITCH
9	20-82	ANT. CHOKE
10	20-76	R.F. PLATE IMPEDANCE COIL
11	95-236	POWER FILTER CHOKE
12	S-3016	B'DCST & L.W. OSC COIL ASSEM.

TUBE	POSITION	Ef	Ek	Eg1	Eg2	Eg3	Ep
6D6	R.F.	5.7	4.2	5	96	5	98
6A7	1st Det.	5.7	2.3	2	50	-	96
	Osc.			0	-	-	96
6D6	I. F.	5.7	4.1	5	96	5	96
75	2nd Det.	5.7	1.1	5	-	-	25
43	PWR.	24	0	-5	96	-	90
25Z5	RECT.	24	Spkr. Fld. 80	-	-	-	-

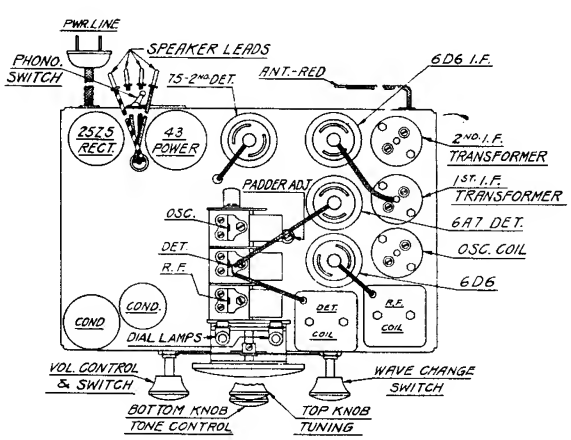
Line Voltage 112 Antenna and Ground Disconnected

All voltages measured from B-(negative side of C18) using a 1000 ohm per volt D.C. meter (except heaters).
F - Filament; K - Cathode; g1 - Control Grid; g2 - Screen Grid; g3 - Suppressor Grid; p - Plate.

Alignment

1. Balance intermediate transformers at 125 K.C. with service oscillator connected to grid of first detector and chassis.
2. Rotate wave-band switch clockwise to the short-wave position. Connect service oscillator to antenna and ground leads and set for 18750 K.C. Balance oscillator trimmer on gang for correct dial reading at 16 meters.
3. Turn wave-band switch to center or standard broadcast position. Adjust padder condenser (located on top center of chassis next to gang) for correct dial reading at 500 meters (600 K.C.).
4. Balance oscillator trimmer (located underneath chassis at right center) for correct dial reading at 210 meters (1440 K.C.). Balance R.F. and 1st detector trimmers on gang to resonance
5. Turn switch counter-clockwise to long-wave position. Adjust oscillator padder (located underneath chassis at rear right side) for correct dial reading at 2000 meters (150 K.C.).

NOTE: If howls are encountered on short-wave band the oscillator trimmer on gang is too tight.



Tube Position

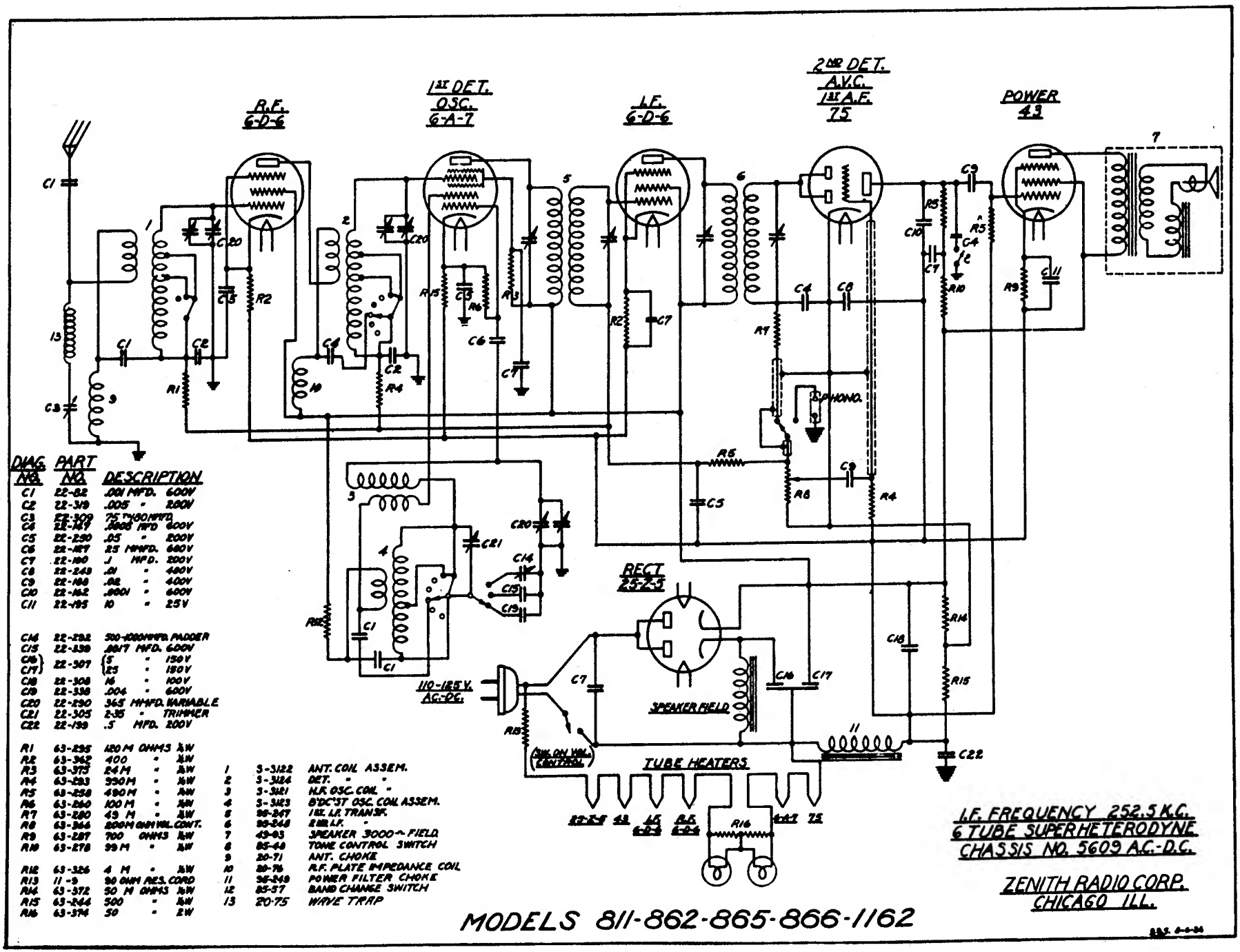
PARTS AND PRICES
MODEL 812
Chassis 5608

	Dial Assembly	
12-372	Mtg. Bracket Dial Holder and Drive Shaft Assembly	$ .65
26-56	Airplane Dial Scale	.35
27-5	Celluloid Drive Disc and Hub Assembly	.25
59-27	Pointer	.15
73-22	Hex Hd. Set Screw for 27-5	.03
93-207	Cork Cushion Washer for Glass	.05
93-210	Small Celluloid Washer	.01
192-3	Glass	.20
	Condensers	
22-82	.001 Mfd. 600 Volt	.25
22-127	25 Mmfd. 600 "	.20
22-147	.0005 Mfd. 600 "	.15
22-161	900 - 1500 Mmfd. Padder	.45
22-162	.0001 Mfd. 600 Volt	.20
22-188	.02 " 400 "	.15
22-199	.5 " 200 "	.30
22-219	.03 " 200 "	.12
22-255	.25 " 200 "	.20
22-256	.1 " 200 "	.12
22-276	.01 " 400 "	.15
22-286	.05 " 200 "	.15
22-289	50 Mmfd. 600 "	.12
22-290	Three-gang Variable	3.25
22-305	2 - 35 Mmfd.	.15
22-307	5 -25 Mfd. 150 Volts Electrolytic	2.00
22-308	16 " 100 " "	.85
22-319	.005 " 200 "	.20
22-320	200 - 500 Mmfd.	.35
	Resistors	
63-244	500 Ohms ¼ Watt	.20
63-258	490M " ¼ "	.20
63-261	9900 " ¼ "	.20
63-278	99M " ¼ "	.20
63-280	49M " ¼ "	.20
63-293	990M " ¼ "	.20
63-295	120M " ¼ "	.20
63-326	4M " ¼ "	.20
63-362	400 " ¼ "	.20
63-366	200M " Volume Control and Switch Assembly	.80
63-372	50M " ¼ Watt	.20
63-374	50 " 2 "	.25
63-375	24M " ¼ "	.20
63-376	190M " ¼ "	.20
	Coils	
S-3016	Long Wave Oscillator Coil Assembly Complete	.85
S-3019	Detector Coil Assembly Complete	1.35

	Coils (Contd.)	
S-3020	R. F. Coil Assembly Complete	$1.35
S-3067	Short Wave Oscillator Coil Assembly Complete	.40
20-76	R. F. Plate Impedance Coil	.25
20-82	Antenna Choke	.25
95-237	1st I. F. Transformer 125 K.C.	1.50
95-238	2nd I. F. " " " "	1.50
	Miscellaneous	
11-9	Line Cord and Plug Assembly 115 Volt AC-DC (For Operation on Other Than 115 Volt see additional)	.75
19-51	Goat Tube Shield Clips	.03
44-7	Phono Receptacle	.15
46-87	Small Knob (1 used)	.10
46-88	Large Knob (2 used)	.10
46-90	Band Selector Switch Knob	.15
49-87	6" Dynamic Speaker	6.00
	Cone and Voice Coil for 49-87 Speaker	2.00
	Field Coil for 49-87 Speaker	2.00
	Output Transformer for 49-87 Speaker	2.00
57-435	Escutcheon Plate for Dial	.40
78-100	Wafer Type Socket for 6D6 Tube	.10
78-101	" " " " 75 "	.10
78-106	" " " " 6A7 "	.10
78-107	" " " " 43 "	.10
78-108	" " " " 25Z5 "	.10
85-48	Two-position Tone Control Switch	.35
85-56	Phono Switch	.35
85-57	Band Selector Switch	1.25
95-236	Power Filter Choke	.75
126-131	Goat Tube Shield with Ring	.10
	Additional	
11-6	Stepdown Resistor Cord for 150 Volt Operation	1.25
11-7	" " " " 220 " "	1.25
11-8	" " " " 250 " "	1.25

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

ZENITH RADIO CORPORATION
September 14, 1934



DIAG. NO.	PART NO.	DESCRIPTION
C1	22-82	.001 MFD. 600V
C2	22-319	.005 " 200V
C3	22-309	75 TWIN MFD.
C4	22-247	.0005 MFD 600V
C5	22-290	.05 " 200V
C6	22-187	25 MMFD. 600V
C7	22-190	1 MFD. 200V
C8	22-248	.01 " 400V
C9	22-188	.02 " 400V
C10	22-162	.0001 " 600V
C11	22-195	10 " 25V
C12	22-282	500-1000 MMFD. PADDER
C13	22-339	.0017 MFD. 600V
C16	22-307	5 " 150V
C17		25 " 150V
C18	22-308	16 " 100V
C19	22-338	.006 " 600V
C20	22-290	365 MMFD. VARIABLE
C21	22-305	2-35 " TRIMMER
C22	22-199	.5 MFD. 200V
R1	63-235	150 M OHMS ½W
R2	63-362	100 " ½W
R3	63-373	2.4 M " 1W
R4	63-283	990 M " ½W
R5	63-238	490 M " ½W
R6	63-260	100 M " ½W
R7	63-280	49 M " ½W
R8	63-344	500 M OHMS VOL. CONT.
R9	63-287	700 OHMS ½W
R10	63-278	99 M " ½W
R12	63-326	4 M " ½W
R13	11-9	90 OHM RES. CORD
R14	63-372	50 M OHMS ½W
R15	63-244	500 " ½W
R16	63-374	50 " 2W

1	5-3122	ANT. COIL ASSEM.
2	5-3124	DET. " "
3	5-3121	H.F. OSC. COIL "
4	5-3123	B'DC'ST OSC. COIL ASSEM.
5	98-247	1ST I.F. TRANSF.
6	98-248	2ND I.F. "
7	49-83	SPEAKER 3000 ~ FIELD
8	85-48	TONE CONTROL SWITCH
9	20-71	ANT. CHOKE
10	88-76	R.F. PLATE IMPEDANCE COIL
11	98-249	POWER FILTER CHOKE
12	85-57	BAND CHANGE SWITCH
13	20-75	WAVE TRAP

I.F. FREQUENCY 252.5 K.C.
6 TUBE SUPERHETERODYNE
CHASSIS NO. 5609 A.C.-D.C.

ZENITH RADIO CORP.
CHICAGO ILL.

MODELS 811-862-865-866-1162

885. 4-6-36

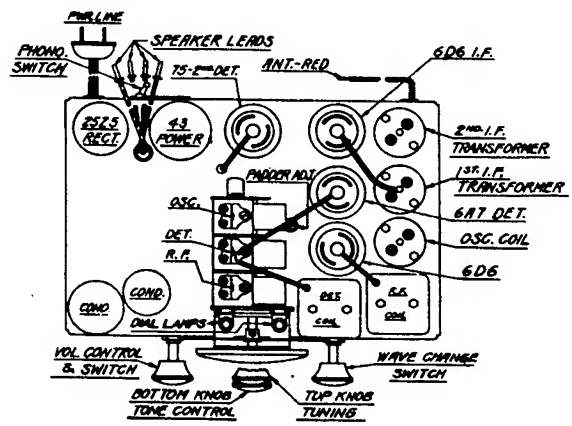
TUBE	POSITION	Ef	Ek	Eg1	Eg2	Eg3	Ep
6D6	R.F.	5.8	3		98	3	98
6A7	1st Det.	5.8	2.5		60	-	98
	Osc.			-1	-	-	90
6D6	I.F.	5.8	3		98	3	98
75	2nd Det. A.V.C 1st Aud.	5.8	.5		-	-	30
43	PWR.	26	13.5	0	98	-	90
25Z5	Rect.	26	-30 -28	-	-	-	-

Line Voltage 112 Antenna and Ground Disconnected

F - Filament; K - Cathode; g1 - Control Grid; g2 - Screen Grid; g3 - Suppressor Grid; p - Plate

Alignment

1. Balance intermediate transformers at 252.5 K.C. with service oscillator connected to grid of 6A7 and chassis ground.
2. Adjust wave trap padder (located underneath chassis at rear right side) for weakest signal with 252.5 K.C. service oscillator connected to antenna and ground.
3. Turn wave-band switch clockwise to the highest frequency band. Set service oscillator at 15 M.C. - still connected to aerial and ground. Balance oscillator trimmer on gang condenser for correct dial reading at this frequency.
4. Turn wave-band switch counter clockwise to standard broadcast position. Adjust broadcast oscillator trimmer (located underneath chassis at right - center) for correct dial reading at 1400 K.C. and adjust R.F. and first detector trimmers on gang condenser for loudest signal.
5. Set service oscillator at 600 K.C. Adjust oscillator broadcast padder through hole in top of chassis, simultaneously rocking the dial back and forth for loudest signal.



Tube Position

PARTS AND PRICES
MODEL 811 - Chassis #5609
" 862 - Chassis #5610
" 1162 - " "

Dial Assembly

12-372	Mtg. Bracket, Dial Holder and Drive Assembly	$ .65
26-64	Airplane Dial Scale	.35
27-5	Celluloid Drive Disc and Hub Assembly	.25
59-27	Special Z pointer	.15
93-207	Cork Cushion Washer for Glass	.05
93-210	Small Celluloid Washer	.01
192-3	Glass	.20

Condensers

22-82	.001 Mfd. 600 V.	.25
22-127	25 Mmfd. 600 V.	.20
22-147	.0005 Mfd. 600 V.	.15
22-162	.0001 " 600 V.	.20
22-188	.02 " 400 V.	.15
22-190	.1 " 200 V.	.20
22-195	10. " 25 V.	.55
22-199	.5 " 200 V.	.30
22-243	.01 " 400 V.	.15
22-250	.05 " 200 V.	.15
22-290	Three-Gang Variable	3.25
22-292	500-1000 Mmfd.	.45
22-305	2-35 "	.15
22-307	5. x 25. Mfd. 150 V.	2.00
22-308	16. Mfd. 100 V.	.85
22-309	75 - 180 Mmfd. Padder	.25
22-319	.005 Mfd. 200 V.	.20
22-338	.004 " 600 V.	.35
22-339	.0017 " 600 V.	.25

Resistors

63-244	500 Ohm 1/4 Watt	.20
63-258	490M " 1/4 "	.20
63-260	100M " 1/4 "	.20
63-278	99 M " 1/4 "	.20
63-280	49 M " 1/4 "	.20
63-287	700 " 1/4 "	.20
63-293	990M " 1/4 "	.20
63-295	120M " 1/4 "	.20
63-326	4 M " 1/4 "	.20
63-362	400 " 1/4 "	.20
63-366	200M " Volume Control and Switch Assembly	.90
63-372	50M " 1/4 Watt	.20
63-374	50 " 2 " ....(Wire Wound)	.25
63-375	24M " 1/4 "	.20

Coils - Chokes

20-71	Antenna Choke	.20
20-75	Antenna Filter Choke	.25

Coils - Chokes Contd.

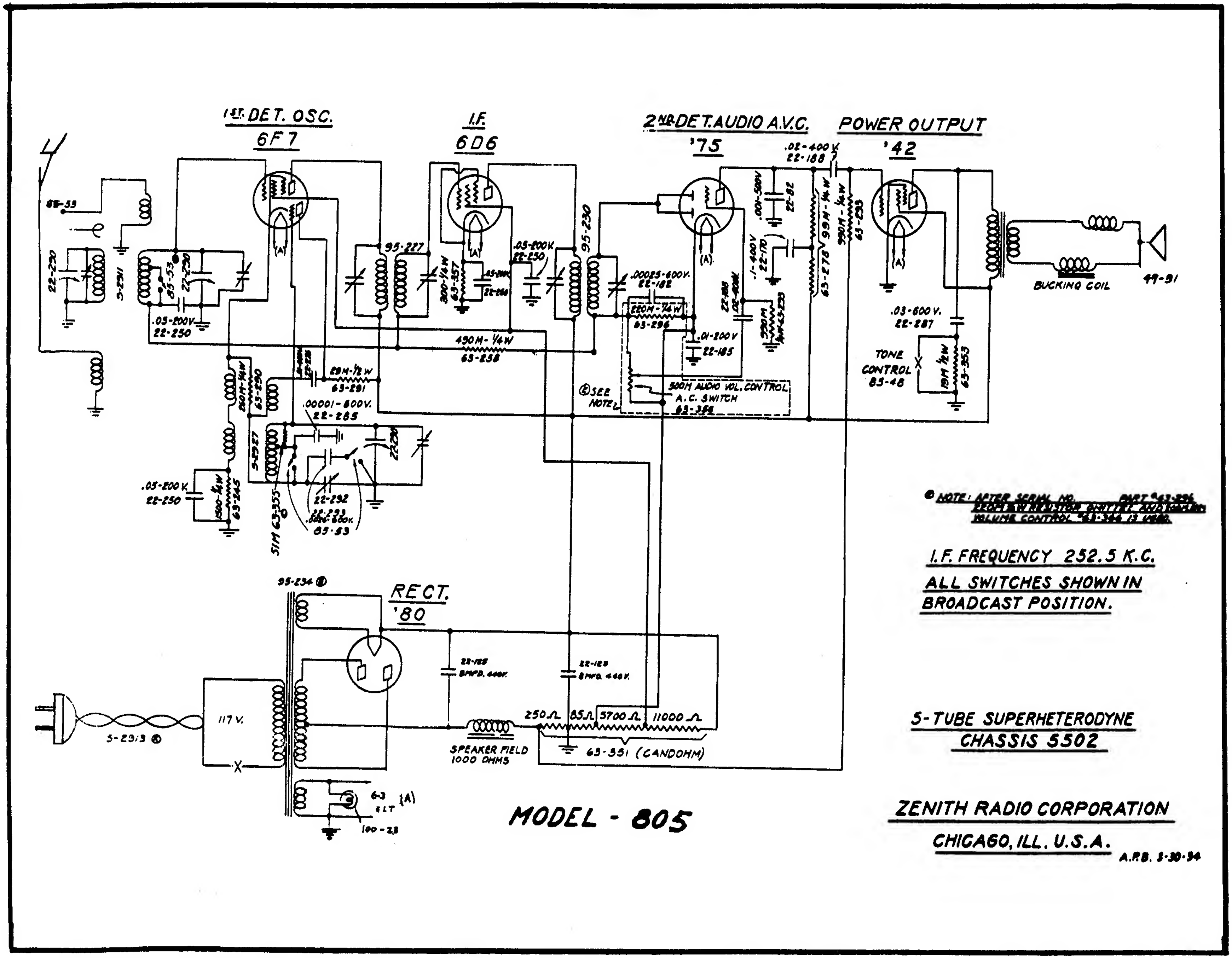
20-76	R.F. Plate Impedance Coil	$ .25
95-247	1st I.F. Transformer (252 K.C.)	1.50
95-248	2nd I.F. " (" " ")	1.50
S-3121	H.F. Oscillator Coil Assembly	.60
S-3122	R.F. Coil Assembly	1.50
S-3123	Police and Broadcast Coil Assembly	1.00
S-3124	Detector Coil Assembly	1.35

Miscellaneous

11-6	Step-down Resistance Cord Assembly 150 V. - 110 V.	1.25
11-7	" " " " " 220 V. - 110 V.	1.25
11-8	" " " " " 250 V. - 110 V.	1.25
11-9	Regular 110 V. AC-DC Line Cord and Plug	.75
44-7	Phono Jack (European Models Only)	.15
46-87	Small Knob	.10
46-88	Large Knob	.10
46-90	Band Selector Knob	.15
49-93	6" Dynamic Speaker (Model 811 only)	6.50
	Cone and Voice Coil for 49-93 Speaker	2.00
	Output Transformer for 49-93 speaker	2.00
	Field Coil for 49-93 speaker	2.00
49-94	12" Dynamic Speaker (Models 862, 1162)	10.00
	Cone and Voice Coil for 49-94 Speaker	3.25
	Output Transformer for 49-94 Speaker	2.00
	Field Coil for 49-94 Speaker	2.00
57-435	Escutcheon Plate	.40
78-100	Tube Socket 6D6	.10
78-101	" " 75	.10
78-106	" " 6A7	.10
78-107	" " 43	.10
78-108	" " 25Z5	.10
85-48	Two-Position Tone Control Switch	.35
85-56	Phono Switch (European Models Only)	.35
85-57	Band Selector Switch	1.25
95-249	Power Filter Choke	1.00
100-23	6.3 V. Pilot Lamps	.15
126-131	Goat Tube Shield	.10

ALL PRICES SUBJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE. ALSO ALL PRICES QUOTED HERE SUPERSEDE PREVIOUS QUOTATIONS IN OTHER PARTS LISTS FOR LIKE PARTS.

ZENITH RADIO CORPORATION
October 19, 1934



1ST. DET. OSC.
6F7
I.F.
6D6
2ND DET. AUDIO A.V.C.
'75
POWER OUTPUT
'42
RECT.
'80
BUCKING COIL
SPEAKER FIELD
1000 OHMS
63-351 (CANDOHM)
500M AUDIO VOL. CONTROL
A.C. SWITCH
TONE
CONTROL
85-48
117 V.
MODEL - 805
I.F. FREQUENCY 252.5 K.C.
ALL SWITCHES SHOWN IN
BROADCAST POSITION.
5-TUBE SUPERHETERODYNE
CHASSIS 5502
ZENITH RADIO CORPORATION
CHICAGO, ILL. U.S.A.
A.P.B. 5-30-34

SOCKET VOLTAGES

Chassis 5502

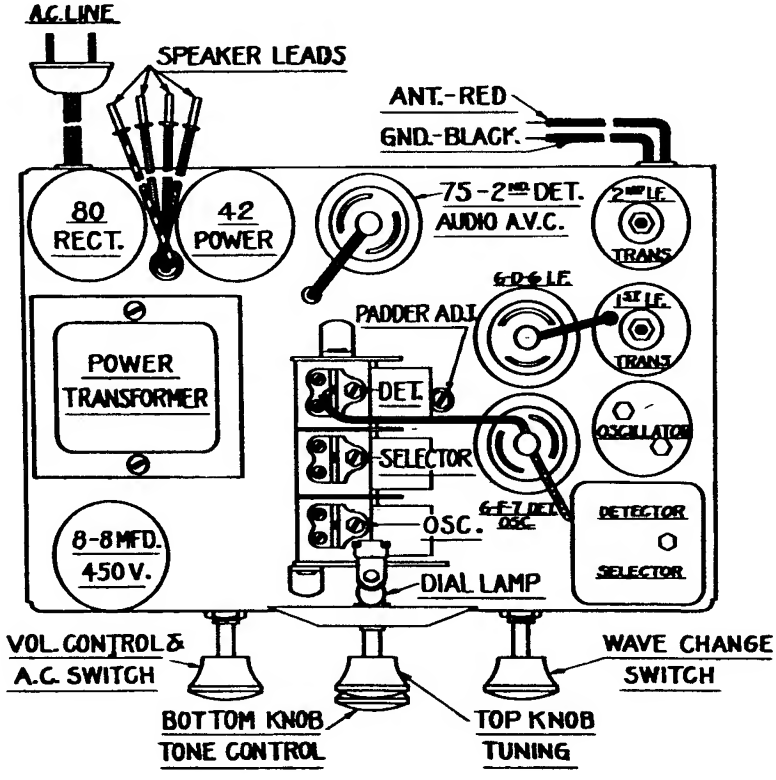
TUBE	POSITION	Ef	Ek	Eg1	Eg2	Eg3	Ep
6F7	Mixer	5.8	8	0	76	--	240
	Osc.			1		-	125
6D6	I.F.	5.8	2.3	0	76	2.3	240
75	Det.	5.8	1.2	0	--	--	130
42	Pwr.	5.8	0	-10	240	--	220
80	Rect.	4.6	--	--	--	--	--

Line Voltage 112 V. Ant. and Gnd. Disconnected.

f - filament; k - cathode; g1 - control grid; g2 - screen grid; g3 - suppressor grid; p - plate.

All measurements taken from points indicated to ground with a 1,000 ohms per volt D.C.meter (except filaments).

Balance I. F. transformers at 252.5 K.C.; trimmers on gang at 1500 K.C.; and oscillator padder at 600 K.C., with wave switch on broadcast position. No adjustments necessary on short wave bands.



PARTS AND PRICES
MODEL 805 - 845
Chassis 5502

Condensers

22-82	.001 Mfd. 500 Volt (1st Audio Plate)	$ .25
22-125	8. " 440 " (Filter)	1.00
22-170	.1 " 400 " (1st Audio Plate)	.25
22-182	.000025 " 600 " (A.V.C. By-Pass)	.12
22-185	.01 " 200 " (2nd Detector Cathode)	.15
22-188	.02 " 400 " (1st & 2nd Audio Coupling)	.15
22-250	.05 " 200 " (1st Det.,I.F.Cathode, & A.V.C.)	.15
22-276	.01 " 400 " (Oscillator Plate)	.15
22-285	10 Mmfd. 600 " (Oscillator Tuned Circuit)	.15
22-287	.03 Mfd. 600 " (Tone Control)	.15
22-290	Three-Gang Variable	3.25
22-292	Padder	.45
22-293	2600 Mmfd. 600 Volt (Oscillator Padder)	.30

Resistors

63-245	1500 Ohm ¼ Watt (1st Det. Cathode)	.20
63-258	490M " ¼ " (A.V.C.Filter)	.20
63-278	99M " ¼ " (1st Audio Plate)	.20
63-290	260M " ¼ " (Oscillator Grid)	.20
63-291	29M " ¼ " (Oscillator Plate)	.20
63-293	990M " ¼ " (Power & 1st Audio Grids)	.20
* 63-296	220M " ¼ " (Diode - See Footnote)	.20
63-351	Candohm Voltage Divider	.65
63-353	19M Ohm ¼ Watt (Tone Control)	.20
63-355	51M " ¼ " (Oscillator Grid)	.20
* 63-356	Volume Control & Switch Assembly (Terminal Type)	.80
63-357	300 Ohm ¼ Watt (I.F.Cathode)	.20
63-366	Volume Control & Switch Assembly (Wire-Lead Type)	.90

Coils

S-2931	Oscillator Coil Assembly Complete with Can	1.00
S-2933	Selector " " " " "	1.75
95-227	1st I F. Transformer " " " "	1.50
95-230	2nd I.F.Transformer " " " "	1.50

Miscellaneous

19-44	Goat Tube Shield Clip (for Moulded Sockets)	.03
19-50	" " " " (for Wafer Sockets)	.03
46-82	Control Knobs	.10
26-49	Dial Assembly Complete	.75

* 63-296 Used only in sets incorporating 63-356 Volume Controls
63-356 " " " " " 63-296 Resistors

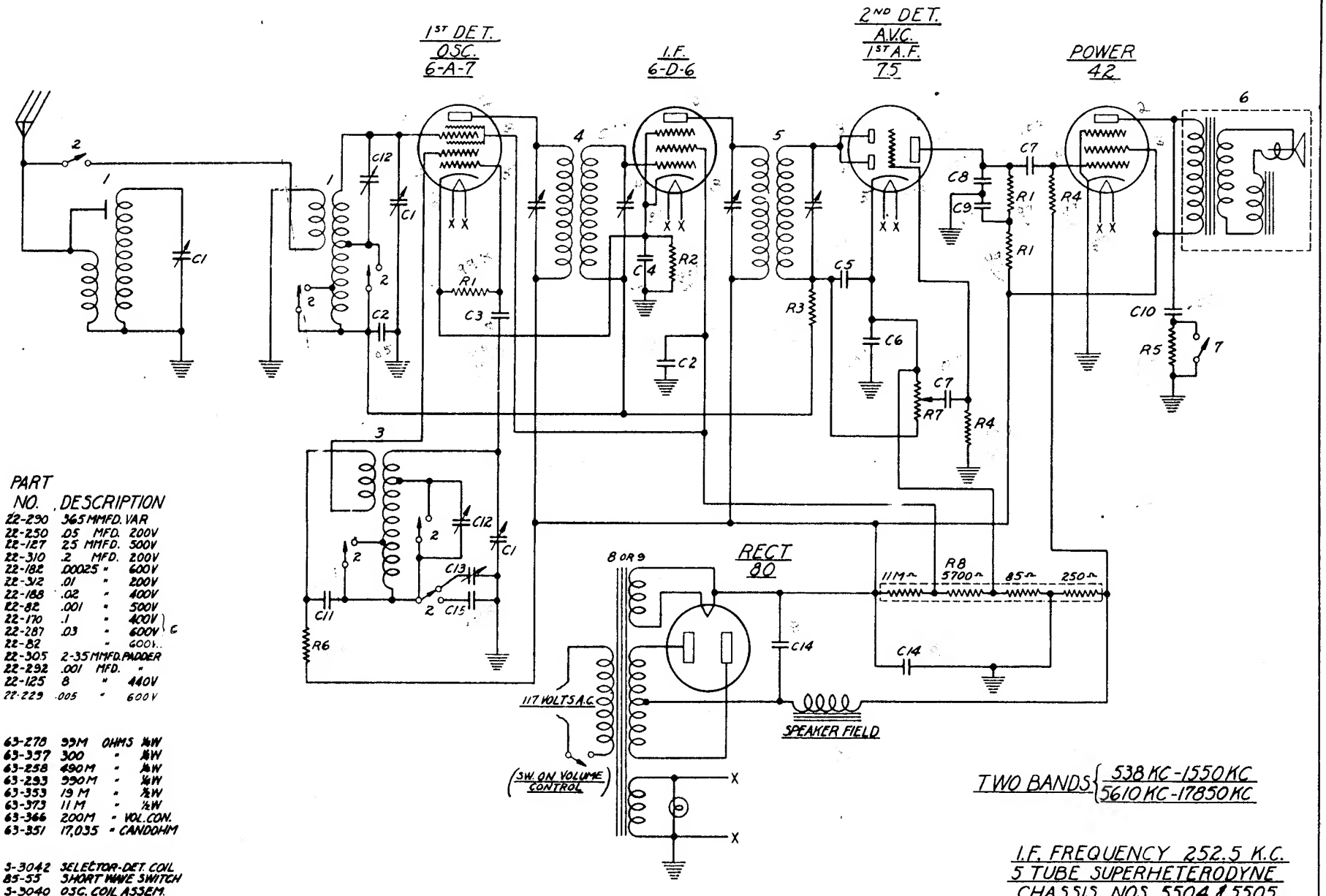
Miscellaneous Cont'd

49-81	6" Dynamic Speaker	$5.50
	Cone and Voice Coil for 49-81 Speaker	2.00
	Output Transformer " " " "	1.50
	Field Coil " " " "	2.00
57-436	Escutcheon Plate for Dial	.25
78-70	Modlded Socket for #80 Tube (Wafer Type 78-82)	.10
78-91	" " " #75 " (" " 78-101)	.10
78-92	" " " #42 " (" " 78-102)	.10
78-96	" " " #6D6 " (" " 78-100)	.10
78-97	" " " #6F7 " (" " 78-103)	.10
85-48	Two Position Tone Control Switch	.35
85-53	Wave-Change Switch	.60
100-23	6 V.- 8 V. Pilot Lamp	.15
126-123	Goat Tube Shields with Rings	.10
* S-302	117 V. 50-60 Cycle Power Transformer (Upright Type)	4.00
95-229	25 Cycle, All Voltage, Power Transformer	6.50

* First production models used inverted type. Replace with upright type transformer with mounting plate.

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

ZENITH RADIO CORPORATION
June 28, 1934.



DIAG NO.	PART NO.	DESCRIPTION
C1	22-290	365 MMFD. VAR
C2	22-250	.05 MFD. 200V
C3	22-127	25 MMFD. 500V
C4	22-310	.2 MFD. 200V
C5	22-182	.00025 " 600V
C6	22-312	.01 " 200V
C7	22-188	.02 " 400V
C8	22-82	.001 " 500V
C9	22-170	.1 " 400V
C10	22-287	.03 " 600V
C11	22-82	" 600V
C12	22-305	2-35 MMFD. PADDER
C13	22-292	.001 MFD. "
C14	22-125	8 " 440V
C15	22-229	.005 " 600V
R1	63-278	99M OHMS ½W
R2	63-357	300 " ½W
R3	63-258	490M " ½W
R4	63-293	990M " ½W
R5	63-353	19 M " ½W
R6	63-373	11 M " ½W
R7	63-366	200M " VOL. CON.
R8	63-351	17,035 " CANDOHM
1	3-3042	SELECTOR-DET. COIL
2	85-55	SHORT WAVE SWITCH
3	3-3040	OSC. COIL ASSEM.
4	95-244	1ST I.F. TRANSF.
5	95-245	2ND I.F. "
6	49-81	SPEAKER 1000 Ω FIELD
7	85-48	TONE CONTROL SWITCH
8	95-234	POWER TRANSF. 50-60 CYCLE
9	95-229	" " 25 CYCLE

MODELS 806-807-S847-850

TWO BANDS { 538 KC - 1550 KC / 5610 KC - 17850 KC

I.F. FREQUENCY 252.5 K.C.
5 TUBE SUPERHETERODYNE
CHASSIS NOS. 5504 & 5505

ZENITH RADIO CORP.
CHICAGO ILL.

S&T

BBJ 6-19-34

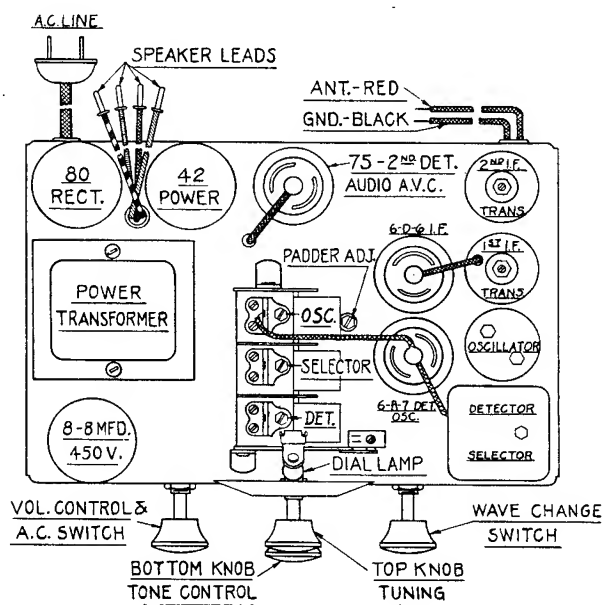
TUBE	POSITION	Ef	Ek	Eg1	Eg2	Eg3	Ep
6A7	1st Det.	5.8	5.2	0	80	-	260
	Osc.			.6	-	-	210
6D6	I.F.	5.8	5.2	0	80	5.2	260
75	2nd Det.	5.8	1.5	0	-	-	135
42	PWR.	5.8	0	-.7	260	-	245
80	RECT.	4.8	-	-	-	-	-

Line Voltage 112 Antenna and Ground Disconnected

All measurements taken from point indicated to ground, using a 1000 ohm per volt D.C. meter (except filaments).
F - Filament; K - Cathode; g1 - Control Grid; g2 - Screen Grid; g3 - Suppressor Grid; p - Plate.

Alignment

1. Balance I.F. transformers at 252.5 K.C. with test oscillator connected to control grid of 6A7 and ground.
2. Connect test oscillator to antenna and ground leads.
3. Adjust broadcast padder (located nest to gang on top of chassis) for correct dial reading at 600 K.C.
4. Adjust trimmer on oscillator section of gang for correct dial reading at 15 M.C. Adjust detector trimmers (located between gang and coil shield on top of chassis) for maximum signal.
5. Adjust oscillator trimmer (located on right side underneath chassis) for correct dial reading at 1400 K.C. - also adjust preselector and detector trimmers on gang for maximum signal.
6. Readjust broadcast padder for correct dial setting.



Tube Position

PARTS AND PRICES
MODEL 806
Chassis 5504

MODELS 806, S-847, 807, 850

Condensers

22-82	.001 Mfd. 500 Volt (1st Audio Plate, Osc. Plate).....	$ .25
22-125	8. " 440 Volt (Filter).....	1.00
22-127	25 Mmfd. 500 Volt (Osc. Grid.).....	.15
22-170	.1 Mfd. 400 Volt (1st Audio bypass).....	.25
22-182	.000025 " 600 Volt (A.V.C. Bypass).....	.12
22-188	.02 " 400 Volt (1st & 2nd Audio Coupling).....	.15
22-229	.005 " 600 Volt (Osc. Grid).....	.15
22-250	.05 " 200 Volt (1st Det. I. F. Screen, A.V.C.).....	.15
22-287	.03 " 600 Volt (Tone Control).....	.15
22-290	Three-gang variable	3.25
22-292	Padder	.45
22-305	.35 Mmfd. Padder (Osc. Grid).....	.15
22-310	.2 Mfd. 200 Volt (1st I.F. Cathode).....	.15
22-312	.01 " 200 Volt (2nd Detector Cathode).....	.10

Resistors

63-258	490 M Ohms ¼ Watt (A.V.C. Filter).....	.20
63-278	99 M " ¼ Watt (1st Aduio Plate, Osc. Grid).....	.20
63-293	990 M " ¼ Watt (Power & 1st Audio Grid).....	.20
63-351	Candohm Voltage Divider	.65
63-353	19 M Ohms ¼ Watt (Tone Control).....	.20
63-357	300 " ¼ Watt (I.F.Cathode & 1st Detector Cathode).....	.20
63-366	Volume Control and Switch	.90
63-373	11 M Ohms ½ Watt (Osc. Plate).....	.25

Coils

S-3048	Oscillator Coil and Shield Assembly	1.00
S-3049	Selector Coil and Shield Assembly	1.75
95-227	1st I. F. Transformer Complete with Shield	1.50
95-230	2nd I. F. Transformer " " "	1.50

Miscellaneous

19-51	Goat Tube Shield Clips.....	.03
46-82	Control Knobs (4 used).....	.10
49-81	6" Dynamic Speaker	5.50
	Cone and Voice Coil for 49-81 Speaker	2.00
	Output Transformer for 49-81 Speaker	1.50
	Field Coil for 49-81 Speaker	2.00
57-436	Escutcheon Plate for Dial	.25
78-82	Wafer Socket for Type 80 Tube	.10
78-100	" " " " 6D6 "	.10
78-101	" " " " 75 "	.10
78-102	" " " " 42 "	.10
78-106	" " " " 6A7 "	.10
85-48	Two-position Tone Control Switch	.35
85-55	Wave Change Switch	.35
95-229	25 Cycle all-voltage Power Transformer	6.50

Miscellaneous Contd.

100-23	6.3 Volt Pilot Lamp	$ .15
126-131	Goat Tube Shield with Rings	.10
S-2940	Speaker Cord Assembly	.20
S-3021	#95-234 Power Transformer and Mtg. Plate - 117 V. - 60 Cycle.	4.00
S-3061	Dial Strip and Drive Assembly	.85

MODEL S-847
Chassis 5507

Same as Chassis 5504 less #49-81 Speaker and with #49-79 Speaker Added

49-79	8" Dynamic Speaker	8.00
	Cone and Voice Coil for #49-79 Speaker	2.50
	Output Transformer " " " "	2.00
	Field Coil " " " "	2.00

MODEL 807
Chassis 5506

Same as Chassis 5504 less S-3061 Dial, 46-82 Knobs and 57-436 Escutcheon and addition of the following:

12-372	Tuning Shaft, Bracket and Frame Assembly	.65
26-54	Dial Scale	.25
27-5	Celluloid Drive Disc and Hub Assembly	.25
46-87	Small Knob (1 used)	.10
46-88	Large Knob (3 used)	.10
57-435	Escutcheon Plate for Airplane Dial	.40
59-27	Pointer for Dial	.15
73-22	Set Screw for 27-5	.03
93-207	Cork Cushion Washer for Glass	.05
192-3	Glass for Dial	.20

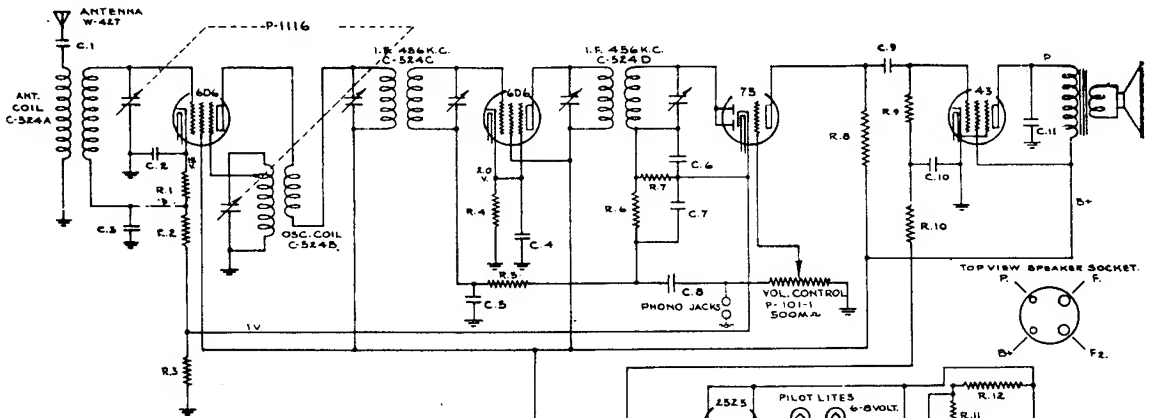
MODEL 850
Chassis 5505

Same as Chassis 5506 less 49-81 Speaker and addition of 49-79 Speaker

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

ZENITH RADIO CORPORATION
September 12, 1934

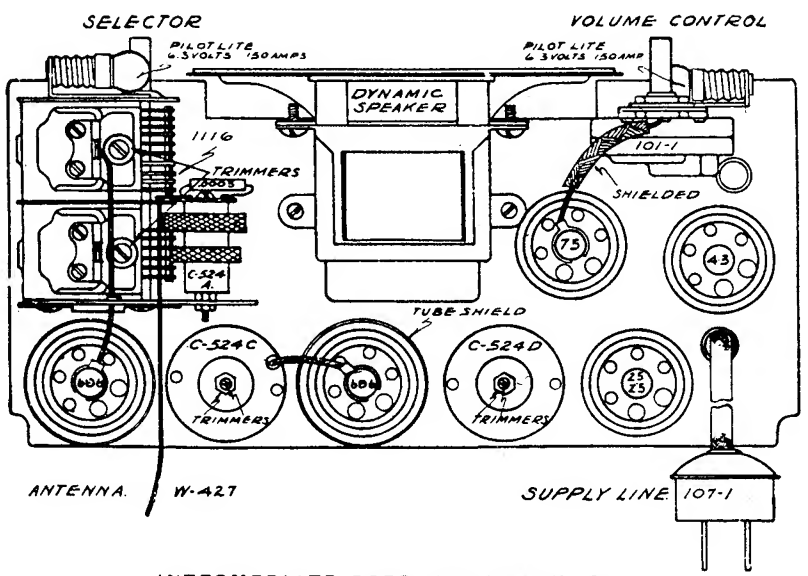
SERVICE MANUAL MODEL 801



LEGEND

RESISTORS			CONDENSERS		
Nº	VALUE		Nº	VALUE	
R.1 :-	300	*	C.1 :-	.0005	MICA
R.2 :-	2M	*	C.2 :-	.05	200V
R. 3 :-	180	*	C 3 :-	.05	200V.
R.4 :-	250 R-270		C.4 :-	.05	200V
R.5 :-	250M		C.5 :-	.1	200V.
R.6 :-	50M		C. 6 :-	.0005	MICA
R 7 :-	250M		C. 7 :-	.0005	MICA
R 8. -	100M		C 8 :-	.01	400V
R 9 :-	300M		C 9 -	.01	400V.
R 10 :-	250M		C. 10 -	.1	200V.
R. 11 :-	40-300M.A. 0.36W.P-106-1		C 11 :-	.025	300
R.12 :-	126 IN CORD P107-1		C 12 :-	5.0MFD.	C-525D
			C.13 :-	25.0MFD.	*
			C 14 -	.1	400V.
			C.15 :-	5.0MFD	*

:-NOTE:-
* R.1, R.2 & R.3 IN ONE UNIT PART NUMBER R-268.
* C. 13 AND C. 15 IN ONE UNIT PART NUMBER C-525-C
NUMBERS PREFIXED BY LETTERS ARE PARTS.
VOLTAGES TAKEN FROM POINTS INDICATED TO CHASSIS GROUND. VOLUME CONTROL ON FULL MEASURED ON A. C. CURRENT.



INTERMEDIATE FREQUENCY 456 K. C.

SERVICE SUGGESTIONS:

NOTE—CONNECTING CORD OF SET GETS WARM IN NORMAL OPERATION. DO NOT BECOME ALARMED.

Make sure that all tubes are pushed firmly in their proper sockets and that the clips are securely fastened to the caps on the tops of the tubes.

That the aerial is stretched out and that the connections to an outdoor antenna (if used) are good.

If necessary to change tubes or service chassis, **UNDER NO CIRCUMSTANCES REMOVE BACK OR CHASSIS WITHOUT FIRST REMOVING PLUG FROM LIGHT SOCKET.**

To remove chassis from cabinet, pull off knobs from front, remove back (held with screws to case). Remove four mounting screws, then chassis can be slipped out of case.

ZENITH RADIO CORPORATION

3620 Iron Street Chicago, Illinois

ZENITH

SERVICE NOTES

Should it be at any time necessary to rebalance this set, the correct procedure is as follows:

1. Volume control on full during all alignment.
2. Variable condenser in minimum capacity position, plates open, at start of all aligning.

I.F. ALIGNMENT

1. To peak I.F. transformers, connect oscillator set at 456 kilocycles to the grid of the 6D6 tube directly in back of the variable condenser and adjust the trimming condensers of the I.F. transformers to resonance (Maximum deflection on an output meter connected across the primary of the speaker input transformer).

   Each I.F. trimmer has two adjustments, one nut and one screw, both of which are adjustable from the top.

BROADCAST BAND ALIGNMENT

1. Disconnect antenna wire and connect oscillator in series with a 75 mmfd. condenser to the antenna coil. With the variable condenser set at its minimum capacity position, at the extreme right of its rotation, and with an oscillator output adjusted to 1720 kilocycles, adjust trimmer of oscillator section of variable condenser (rear section) to resonance (maximum deflection on an output meter connected across the primary of the speaker input transformer). Next adjust the trimmer condenser of the front section of the variable condenser to resonance.
2. Check alignment at 1400-1200-1000-800-600-530 kilocycles, bending the slotted plates of the front section of the variable condenser only if absolutely necessary.

PARTS LIST

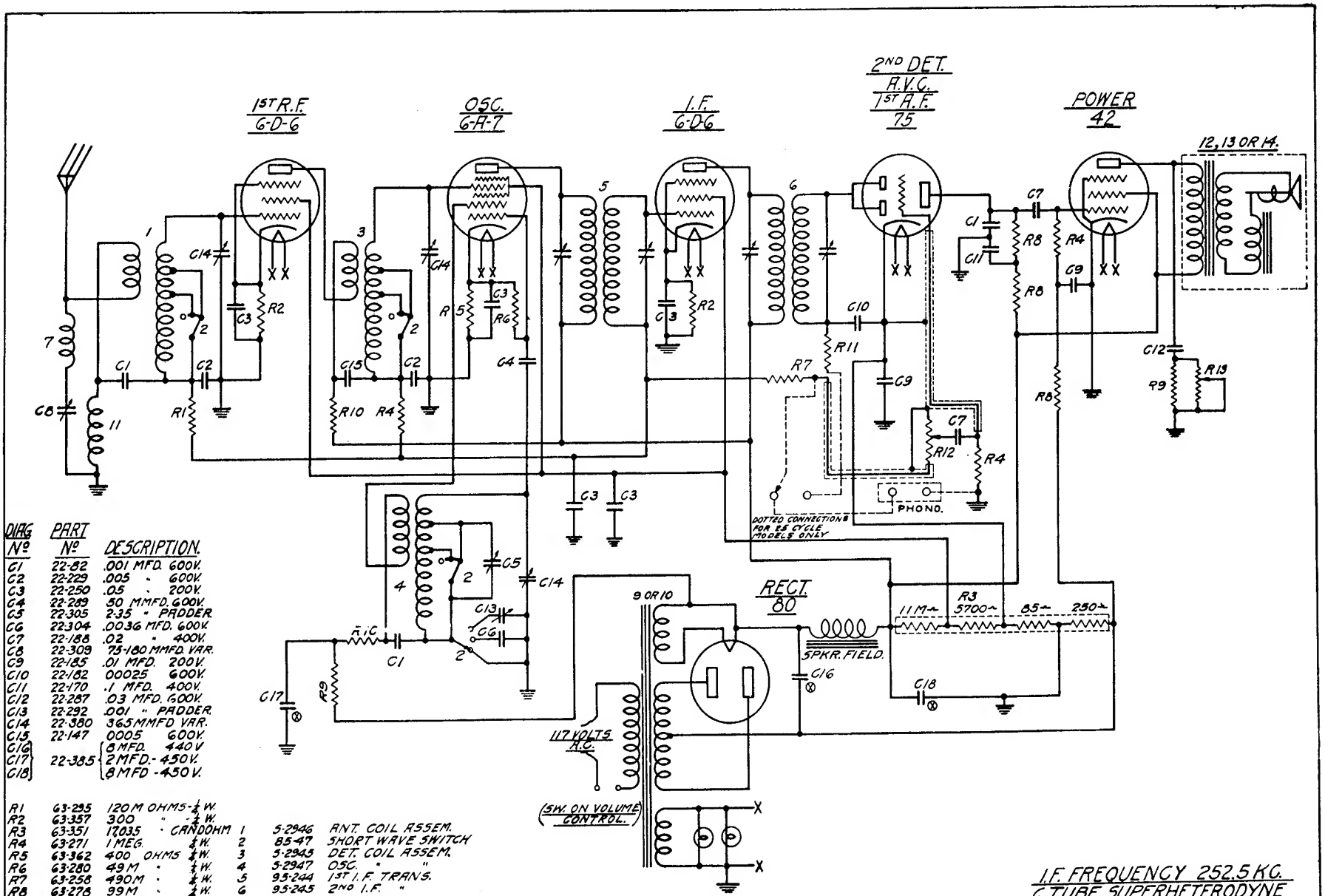
When ordering parts, always specify part and model number as well as serial number of chassis.

Part No.	Description	List Price
101-1	Volume Control with Switch	1.35 ea.
106-1	40 Ohm Resistor-10%	.30 ea.
107-1	126 Ohm Special Cord and Plug	1.25 ea.
C-523	600 Ohm Choke	1.25 ea.
C-524A	Antenna Coil	.80 ea.
C-524B	Oscillator Coil	.70 ea.
C-524C	Input I.F. Transformer	1.25 ea.
C-524D	Output I.F. Transformer	1.25 ea.
C-525C	5-25 Mfd. Electrolytic Condenser	1.50 ea.
C-525D	5 Mfd. Electrolytic Condenser	.50 ea.
R-268	2480 Ohm Resistor	.50 ea.
R-270	250 Ohm Wire Wound Resistor	.25 ea.
W-427	Aerial Wire (20 Ft.)	.30 ea.
1101	Pilot Light Socket	.10 ea.
1116	Two Gang Variable Condenser	2.50 ea.
	All Carbon Resistors	.20 ea.
	All Single Section Tubular Paper By-Pass Cond.	.25 ea.
	All Dual Section Tubular Paper By-Pass Condensers	.50 ea.
	All Molded Mica Condensers.	.25 ea.
	All Sockets	.20 ea.
	Dynamic Speaker	5.00 ea.
	Cabinet	6.00 ea.
	Carrying Case	2.50 ea.
	Adapters for 220 Volt Operation	2.25 ea.

Prices subject to change without notice.

All resistors are RMA color coded - specify value and/or resistor number (per schematic diagram) and model number.

When ordering condensers, specify part number, model number and/or capacitor (per schematic diagram) and model number.



DIAG Nº	PART Nº	DESCRIPTION.
C1	22-82	.001 MFD. 600V.
C2	22-229	.005 " 600V.
C3	22-250	.05 " 200V.
C4	22-289	50 MMFD. 600V.
C5	22-305	2-35 " PADDER
C6	22-304	.0036 MFD. 600V.
C7	22-188	.02 " 400V.
C8	22-309	75-180 MMFD. VAR.
C9	22-185	.01 MFD. 200V.
C10	22-182	.00025 600V.
C11	22-170	.1 MFD. 400V.
C12	22-287	.03 MFD. 600V.
C13	22-292	.001 " PADDER.
C14	22-380	365 MMFD VAR.
C15	22-147	0005 600V.
C16	22-385	8 MFD. 440V
C17		2 MFD.-450V.
C18		8 MFD -450V.

R1	63-295	120M OHMS-½W.
R2	63-357	300 " -½W.
R3	63-351	17035 " CARDOHM
R4	63-271	1 MEG. ½W.
R5	63-362	400 OHMS ½W.
R6	63-280	49M " ½W.
R7	63-258	490M " ½W.
R8	63-278	99M " ½W.
R9	63-353	19M " ½W.
R10	63-373	11M " ½W.
R11	63-335	51M " ½W.
R12	63-366	200M " V. CON.
R13	63-316	50M " T. " .

1	5-2946	ANT. COIL ASSEM.
2	85-47	SHORT WAVE SWITCH
3	5-2945	DET. COIL ASSEM.
4	5-2947	OSC. " "
5	95-244	1ST I.F. TRANS.
6	95-245	2ND I.F. "
7	20-75	WAVE TRAP CHOKE
8	85-48	TONE CONTROL SWITCH
9	95-234	POWER TRANS.-50-60 CYCLE
10	93-229	" " 25 CYCLE
11	20-71	ANT. CHOKE
12	49-79	8" SPEAKER-FIELD 1000~ (908-909)
13	49-85	10" " " " (960)
14	49-97	12" " " " (961)

CONDENSERS MARKED THUS ⊗ ARE IN SINGLE CONTAINER.

MODELS-908-909-960-961

I.F. FREQUENCY 252.5 KC.
6 TUBE SUPERHETERODYNE.
CHASSIS NO. 5614

ZENITH RADIO CORP.
CHICAGO, ILL.

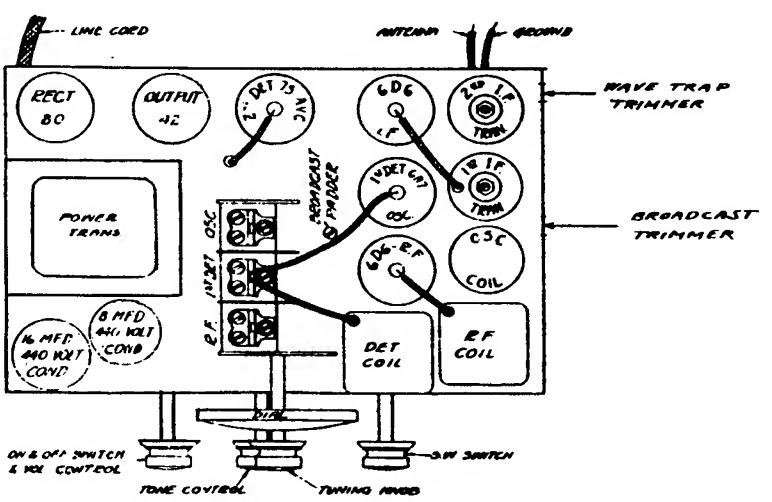
TUBE	POSITION	Ef	Ek	Eg1	Eg2	Eg3	Ep
6D6	R.F.	5.6	2.4	0	70	2.4	200
6A7	1St. Det.	5.6	3	0	70	-	250
	Osc.			3.6	-	-	230
6D6	I.F.	5.6	2.6	0	70	2.6	250
75	2nd.Det. 1st Audio	5.6	1.4	0	-	-	148
42	PWR.	5.6	0	-.6	250	-	250
80	RECT.	4.6	-	-	-	-	300

Line Voltage 112 Antenna and Ground Disconnected

All measurements taken from point indicated to ground, using a 1000 ohm per volt D.C. meter (except heaters).
F - Filament; K - Cathode; g1 - Control Grid; g2 - Screen Grid; g3 - Suppressor Grid; p - Plate.

Alignment

1. Balance intermediate transformers at 252.5 K.C. with oscillator connected to grid of first detector and ground.
2. Adjust wave trap padder (located underneath chassis at rear right side) for weakest signal with 252.5 K.C. oscillator connected to aerial and ground.
3. Turn wave band switch clockwise to the highest frequency band. Connect 15,000 K.C. oscillator to aerial and ground. Balance oscillator trimmer on three-gang condenser for correct dial reading at this frequency.
4. Turn wave band switch counter-clockwise to standard broadcast position. Adjust broadcast oscillator trimmer (located underneath chassis at right center) for correct dial reading at 1400 K.C. and balance R.F. and 1st detector trimmers on three-gang condenser for loudest signal.
5. Adjust oscillator padder(located next to oscillator section of gang on top of chassis) while rocking pointer back and forth past 600 K. C. for combination giving maximum output.
6. Recheck 1400 K.C.



TUBE POSITION

ZENITH

PARTS AND PRICES
Chassis #5614

MODELS 908
960
961
1117

	Dial Assembly	
S-3421	Complete Split Second Dial Assembly	$3.75
26-79	Dial Scale Only	.40
59-32	Split Second Pointer	.10
59-33	Special "Z" Pointer	.20
93-231	Glass Cushion Washer	.05
192-6	Dial Glass	.20
	Resistors	
63-258	490 M Ohm ¼ Watt	.20
63-271	1 Megohm ¼ Watt	.20
63-278	99 M Ohm ¼ Watt	.20
63-280	49 M Ohm ¼ Watt	.20
63-295	120 M Ohm ¼ Watt	.20
63-316	50 M Tone Control	.65
63-351	17,035 Ohm Candohm	.65
63-353	19 M Ohm ½ Watt	.20
63-355	51 M Ohm ¼ "	.20
63-357	300 Ohm ¼ "	.20
63-362	400 " ¼ "	.20
63-366	200 M Volume Control Assembly	.90
63-373	11 M Ohm ½ Watt	.25
	Condensers	
22-82	.001 Mfd. 600 Volt	.25
22-147	.0005 " " "	.15
22-170	.1 " 400 "	.25
22-182	.00025 " 600 "	.12
22-185	.01 " 200 "	.15
22-188	.02 " 400 "	.15
22-229	.005 " 600 "	.15
22-250	.05 " 200 "	.15
22-287	.03 " 600 "	.15
22-289	50 Mmfd 600 "	.12
22-292	.001 Mfd. Padder	.45
22-304	.0036 " 600 Volt	.30
22-305	2 - 35 " Padder	.15
22-309	75 - 180 Mmfd. Variable Padder	.25
22-380	Variable Condenser Assembly	3.50
22-385	8 x 8 x 2 Mfd. Filter Condenser	2.00
	Coils and Chokes	
20-71	Antenna Choke	.20
20-75	Wave Trap Choke	.25
95-244	1st I.F. Transformer	1.50
95-245	2nd I.F. Transformer	1.50
S-2957	Detector Coil Assembly	1.60

PARTS AND PRICES
PAGE No.2

MODELS 908
960
961
1117

Coils and Chokes Cont'd

S-2955	Antenna Coil Assembly	$1.25
S-2953	Oscillator Coil Assembly	1.00

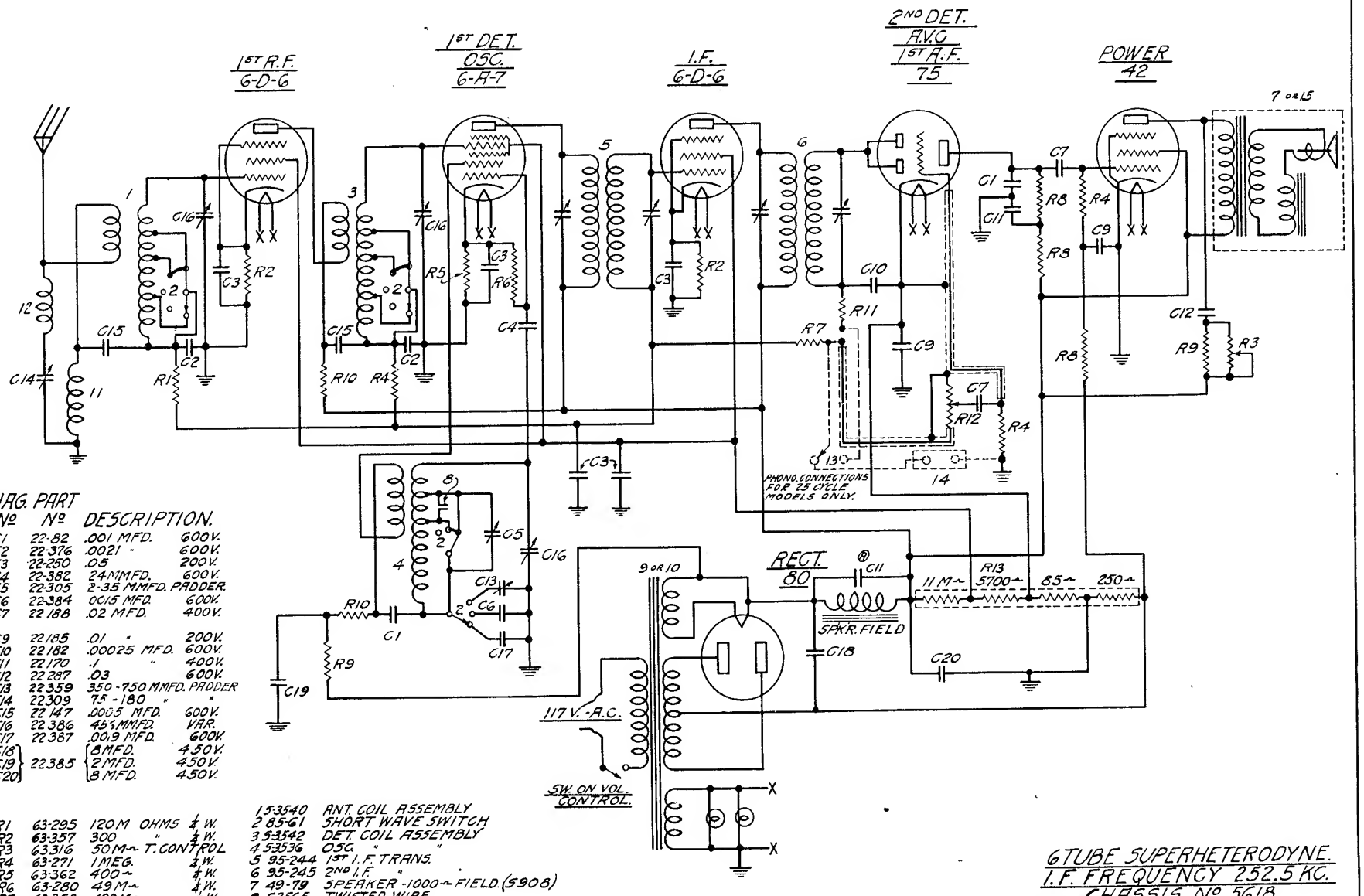
Miscellaneous

46-108	Band Selector Switch Knob (960-961)	.15
46-109	Tuning Control Knob	.10
46-110	Tone Control Knob	.10
46-111	Volume Control Knob	.10
46-112	Band Selector Switch Knob (908)	.15
49-79	8" Dynamic Speaker for Model 908	8.00
	Cone and Voice Coil for 49-79	2.50
	Output Transformer for 49-79	2.00
	Field Coil for 49-79	2.00
49-85	10" Dynamic Speaker	8.50
	Cone and Voice Coil for 49-85	3.00
	Output Transformer for 49-85	2.00
	Field Coil for 49-85	2.00
57-483	Dial Escutcheon Plate	.45
78-82	Type 80 Tube Socket	.10
78-100	Type 6D6 " "	.10
78-101	Type 75 " "	.10
78-102	Type 42 " "	.10
78-103	Type 6A7 " "	.10
85-47	Wave Change Switch	1.10
85-56	Phono Switch (25 Cycle only)	.35
95-229	All Voltage 25 Cycle Power Transformer	6.50
95-234	117 Volt 50/60 Cycle Power Transformer	3.75
100-23	Pilot Lamp	.15
126-131	Goat Tube Shield	.10

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

ZENITH RADIO CORPORATION
January 31, 1935

A C-11 ADDED 4/23/35 T.DEC



DIAG. NO.	PART NO.	DESCRIPTION.	
C1	22-82	.001 MFD.	600V.
C2	22-376	.0021 "	600V.
C3	22-250	.05	200V.
C4	22-382	24 MMFD.	600V.
C5	22-305	2-35 MMFD. PADDER.	
C6	22-384	0015 MFD.	600V.
C7	22 188	.02 MFD.	400V.
C9	22 185	.01 "	200V.
C10	22 182	.00025 MFD.	600V.
C11	22 170	.1 "	400V.
C12	22 287	.03	600V.
C13	22 359	350-750 MMFD. PADDER	
C14	22309	7.5-180 " "	
C15	22 147	.0005 MFD.	600V.
C16	22 386	45½ MMFD.	VAR.
C17	22 387	.0019 MFD.	600V.
C18	22385	8 MFD.	450V.
C19		2 MFD.	450V.
C20		8 MFD.	450V.

R1	63-295	120 M OHMS	¼ W.
R2	63-357	300 "	¼ W.
R3	63-316	50 M~ T. CONTROL	
R4	63-271	1 MEG.	½ W.
R5	63-362	400~	¼ W.
R6	63-280	49 M~	¼ W.
R7	63-258	490 M~	½ W.
R8	63-278	99 M~	½ W.
R9	63-353	19 M~	½ W.
R10	63-373	11 M~	½ W.
R11	63-355	5 M~	½ W.
R12	63-366	200 M~ VOL CONTROL	
R13	63-351	17,035~ CANDOHM.	

1	5-3540	ANT. COIL ASSEMBLY
2	85-61	SHORT WAVE SWITCH
3	5-3542	DET. COIL ASSEMBLY
4	5-3536	OSC. " "
5	95-244	1ST I.F. TRANS.
6	95-245	2ND I.F. "
7	49-79	SPEAKER - 1000~ FIELD (5908)
8	5-3565	TWISTED WIRE
9	95-234	POWER TRANS.
10	95-229	" " 25 CYCLE.
11	20-71	ANT. CHOKE
12	20-75	WAVE TRAP CHOKE.
13	85-56	PHONO.-RADIO SWITCH
14	44-7	PHONO. JACK
15	49-97	12" SPEAKER 1000~ FIELD (5961)

MODELS 5908 - 5961

6 TUBE SUPERHETERODYNE.
I.F. FREQUENCY 252.5 KC.
CHASSIS Nº 5618

ZENITH RADIO CORP.
CHICAGO, ILL.

1-18-35-W.D.

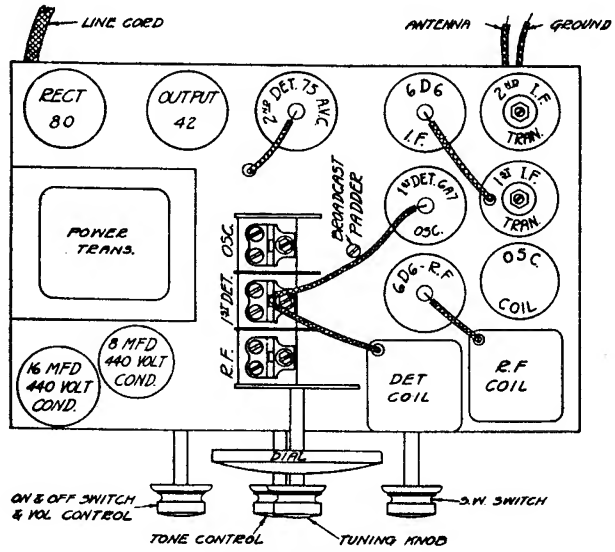
TUBE	POSITION	Ef	Ek	Eg1	Eg2	Eg3	Ep
6D6	R.F.	5.6	2.4	0	70	2.4	200
6A7	1st.Det.	5.6	3	0	70	-	250
	Osc.			3.6	-	-	230
6D6	I.F.	5.6	2.6	0	70	2.6	250
75	2nd.Det. 1st Audio	5.6	1.4	0	-	-	148
42	PWR.	5.6	0	-.6	250	-	250
80	RECT.	4.6	-	-	-	-	-

Line Voltage 112 Antenna and Ground Disconnected

All measurements taken from point indicated to ground, using a 1000 ohm per volt D.C. meter (except heaters). F - filament; K - cathode; g1 - control grid; g2 - screen grid; g3 - suppressor grid; p - plate.

Alignment

1. Balance intermediate transformers at 252.5 K.C. with oscillator connected to grid of first detector and ground.
2. Adjust wave trap padder (located underneath chassis at rear right side) for weakest signal with 252.5 K.C. oscillator connected to aerial and ground.
3. Turn wave band switch clockwise to the highest frequency band. Connect 17,500 K.C. oscillator to aerial and ground. Balance oscillator trimmer on three-gang condenser for correct dial reading at this frequency.
4. Turn wave band switch counter-clockwise to standard broadcast position. Adjust broadcast oscillator trimmer (located underneath chassis at right center) for correct dial reading at 1400 K.C. and balance R.F. and 1st detector trimmers on three-gang condenser for loudest signal.
5. Adjust oscillator padder (located next to oscillator section of gang on top of chassis) while rocking pointer back and forth past 600 K.C. for combination giving maximum output.
6. Recheck 1400 K.C.



TUBE-POSITION

Tube Position

PARTS AND PRICES

Models S-908
909
S-961
1167

Chassis 5618

Dial Assembly

S-3552	Complete split second dial assembly	$3.75
26-84	Dial scale only	.40
59-32	Split second pointer	.10
59-33	Special Z pointer	.20
93-231	Glass cushion washer	.05
192-6	Dial glass	.20

Resistors

63-258	490 M ohms ¼ Watt	.20
63-271	1 Megohm ¼ "	.20
63-278	99 M ohm ¼ "	.20
63-280	49 M " ¼ "	.20
63-295	120 M " ¼ "	.20
63-316	Tone control (50 M ohms)	.65
63-351	17,035 ohm candohm	.65
63-353	19 M " ½ Watt	.20
63-355	51 M " ¼ "	.20
63-357	300 " ¼ "	.20
63-362	400 " ¼ "	.20
63-366	Volume control assembly (200 M ohm)	.90
63-373	11 M ohm ½ Watt	.25

Condensers

22-82	.001 Mfd. 600 V.	.25
22-147	.0005 " 600 V.	.15
22-170	.1 " 400 V.	.25
22-182	.00025 " 600 V.	.12
22-185	.01 " 200 V.	.15
22-188	.02 " 400 V.	.15
22-250	.05 " 200 V.	.15
22-287	.03 " 600 V.	.15
22-305	2-35 Mmfd. Padder	.15
22-309	75-180 " "	.25
22-359	350-750 " "	.45
22-376	.0021 Mfd. 600 V.	.20
22-382	24 Mmfd. 600 V.	.15
22-384	.0015 Mfd. 600 V.	.20
22-385	8-2-8 Mfd. 450 V. filter	2.00
22-386	Variable gang assembly	3.50
22-387	.0019 Mfd. 600 V.	.20

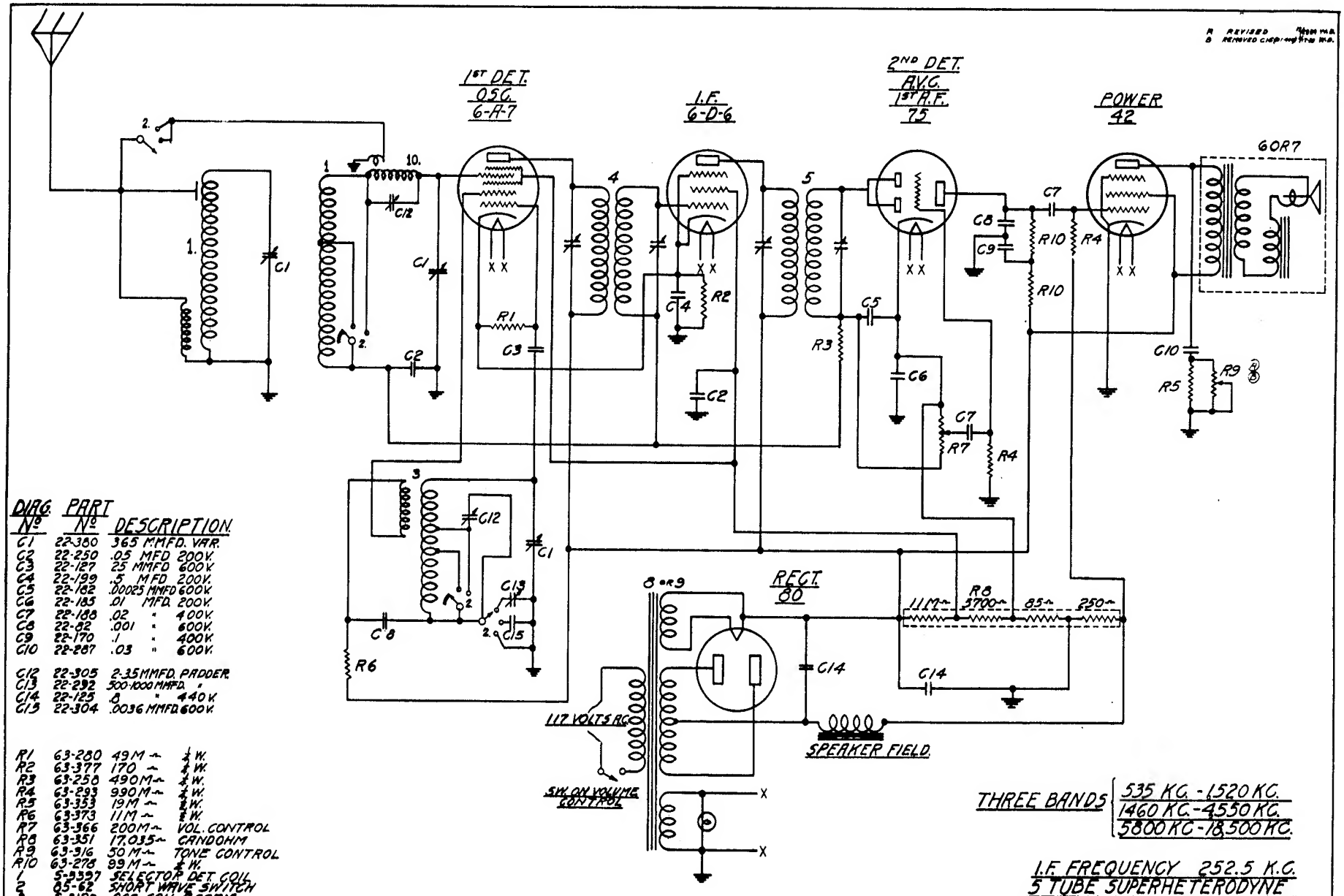
Coils and Chokes

20-71	Antenna Choke	.20
20-75	Wave trap choke	.25
95-244	1st I.F. transformer	1.50
95-245	2nd I.F. transformer	1.50
S-3536	Oscillator coil assembly	1.25

	Coils and Chokes (Cont'd)	
S-3540	Antenna coil assembly	$1.75
S-3542	Detector " "	2.00
	Miscellaneous	
46-108	Band selector switch knob (Models 909, S-961, 1167)	.15
46-109	Tuning control knob	.10
46-110	Tone control knob	.10
46-111	Volume control knob	.10
46-112	Band selector switch knob (Model S-908)	.15
49-79	8" Dynamic speaker for S-908, 909	8.00
	Cone and voice coil for 49-79	2.50
	Output transformer for 49-79	2.00
	Field coil for 49-79	2.00
49-97	12" Dynamic speaker for S-961, 1167	10.00
	Cone and voice coil for 49-97	3.25
	Output transformer for 49-97	2.00
	Field coil for 49-97	2.00
57-483	Dial escutcheon plate	.45
78-82	Type 80 tube socket	.10
78-100	" 6D6 " "	.10
78-101	" 75 " "	.10
78-102	" 42 " "	.10
78-106	" 6A7 " "	.10
85-56	Phono switch (25 cycle)	.35
85-61	Band selector switch	1.10
95-229	All voltage, 25 cycle power transformer	6.50
100-23	Pilot lamp	.15
126-131	Goat tube shield	.10
S-3021	#95-234 power transformer and mounting plate, 117 V.,60 C.	4.00

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

ZENITH RADIO CORPORATION
MARCH 13, 1935



DIAG. Nº	PART Nº	DESCRIPTION
C1	22-380	365 M.MFD. VAR.
C2	22-250	.05 MFD 200V.
C3	22-127	25 MMFD 600V.
C4	22-199	.5 MFD 200V.
C5	22-182	.00025 MMFD 600V.
C6	22-185	.01 MFD. 200V.
C7	22-188	.02 " 400V.
C8	22-82	.001 " 600V.
C9	22-170	.1 " 400V.
C10	22-287	.03 " 600V.
C12	22-305	2-35 MMFD. PADDER
C13	22-292	500-1000 MMFD. "
C14	22-125	.8 " 440 V.
C15	22-304	.0036 MMFD 600V.
R1	63-280	49 M ~ ½ W.
R2	63-377	170 ~ ½ W.
R3	63-258	490 M ~ ½ W.
R4	63-293	990 M ~ ½ W.
R5	63-353	19 M ~ ½ W.
R6	63-373	11 M ~ ½ W.
R7	63-366	200 M ~ VOL. CONTROL
R8	63-351	17,035 ~ CANDOHM
R9	63-316	50 M ~ TONE CONTROL
R10	63-276	99 M ~ ½ W.
1	5-9327	SELECTOR DET. COIL
2	85-62	SHORT WAVE SWITCH
3	5-9129	OSC. COIL ASSEM.
4	95-244	1ST I.F. TRANS.
5	95-245	2ND I.F. "
6	49-79	8" SPEAKER - 1000 ~ FIELD (MOD. 945)
7	49-85	10" SPEAKER - 1000 ~ " (MOD. 950)
8	95-234	POWER TRANS. 50-60 CYCLE
9	95-229	" 25 CYCLE
10	5-9377	16 METER DET. COIL ASSEMBLY.

THREE BANDS { 535 KC. - 1520 KC. / 1460 KC. - 4550 KC. / 5800 KC. - 18,500 KC.

I.F. FREQUENCY 252.5 K.C.
5 TUBE SUPERHETERODYNE
CHASSIS NOS. 5308 & 5309

MODELS 945-950

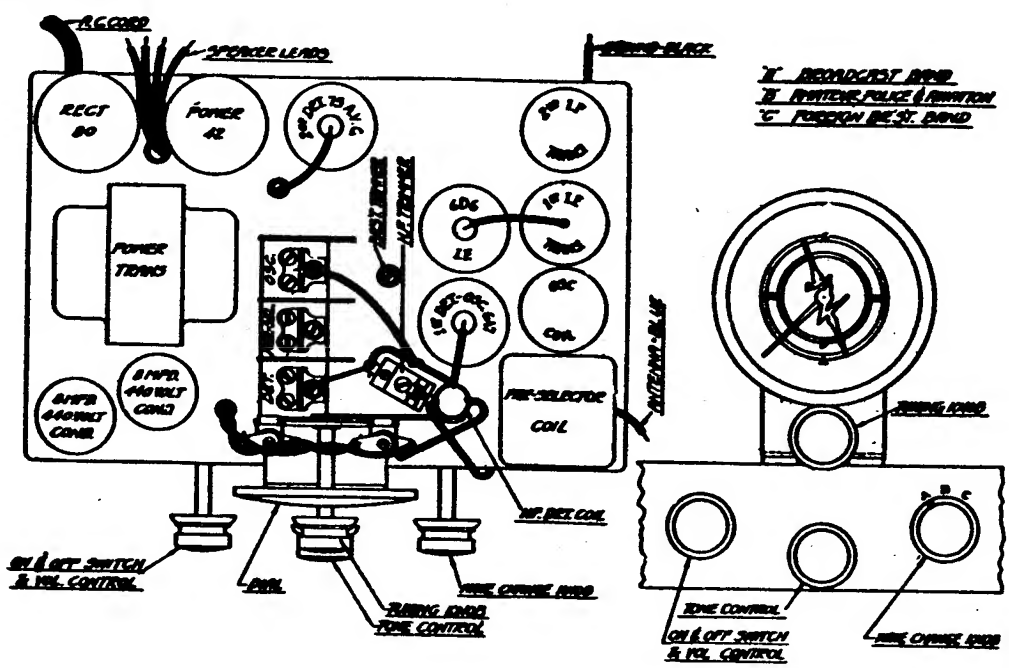
ZENITH RADIO CORP.
CHICAGO, ILL.

TUBE	POSITION	Ef	Ek	Eg1	Eg2	Eg3	Ep
6A7	1st Det.	5.8	4	0	80	-	260
	Osc.			.6	-	-	210
6D6	I.F.	5.8	5.2	0	80	5.2	260
75	2nd Det.	5.8	1.5	0	-	-	135
42	PWR.	5.8	0	-.7	260	-	245
80	RECT.	4.8	-	-	-	-	-

Line Voltage 112 Antenna and Ground Disconnected.
All measurements taken from point indicated to ground, using a 1000 ohm per volt D.C. meter (except filaments).
F- Filament; K - Cathode; G1 - Control Grid; G2 - Screen Grid; G3 - Suppressor Grid; P - Plate

Alignment

1. Balance I.F.transformers at 252.5 K.C. with test oscillator connected to control grid of 6A7 and ground.
2. Turn band switch to C band. Connect test oscillator to antenna and ground leads. Set test oscillator at 15 Megacycles. Adjust oscillator trimmer on gang condenser for correct dial reading.
3. Adjust detector trimmer (located on top of chassis between front section of gang condenser and coil) for maximum output.
4. Turn band switch to A band. Adjust oscillator trimmer (located on right side underneath chassis) for correct dial reading at 1400 K.C. also adjust preselector and detector trimmers on gang for maximum output.
5. Adjust oscillator padder (next to oscillator section of gang on top of chassis) while rocking pointer back and forth past 600 K.C. to the combination giving greatest output.
6. Recheck 1400 K.C.



TUBE POSITION

ZENITH RADIO

PARTS AND PRICES
Chassis #5508 & #5509

MODELS 945, 950

	Dial Assembly	
S-3403	Complete Split Second Dial Assembly	$3.75
26-78	Dial Scale Only	.40
59-27	Special "Z" Pointer	.15
59-32	Split Second Pointer	.10
93-231	Dial Glass Cushion Washer	.05
192-6	Dial Glass	.20
	Resistors	
63-258	490 M Ohm 1/4 Watt	.20
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
63-316	50 M Ohm Tone Control	.65
63-351	17,035 Ohm Candohm	.65
63-353	19 M Ohm 1/2 Watt	.20
63-366	200 M Volume Control Assembly	.90
63-373	11 M Ohm 1/2 Watt	.25
63-377	170 Ohm 1/4 Watt	.20
	Condensers	
22-82	.001 Mfd. 600 Volt	.25
22-125	8 " 440 "	1.00
22-127	25 Mmfd. 600 "	.20
22-170	.1 Mfd. 400 "	.25
22-182	.00025 Mmfd. 600 Volt	.12
22-185	.01 Mfd. 200 Volt	.15
22-188	.02 " 400 "	.15
22-199	.5 " 200 "	.35
22-243	.01 " 400 "	.15
22-250	.05 " 200 "	.15
22-292	500-1000 Mmfd. Padder	.45
22-304	.0036 Mmfd. 600 Volt	.30
22-305	2 - 35 Mmfd. Padder	.15
	Coils, Etc.	
95-244	1st I.F. Transformer	1.50
95-245	2nd I.F. Transformer	1.50
S-3129	Oscillator Coil Assembly	1.00
S-3397	Selector Detector Coil Assembly	2.00
S-3377	16 Meter Detector Coil Assembly	.65
	Miscellaneous	
46-108	Band Selector Knob	.15
46-109	Tuning Control Knob	.10
46-110	Tone Control Knob	.10
46-111	Volume Control Knob	.10

	Miscellaneous Cont'd	
49-79	8" Dynamic Speaker for Model 945	$8.00
	Cone and Voice Coil for Model 945	2.50
	Output Transformer for Model 945	2.00
	Field Coil for Model 945	2.00
49-85	10" Dynamic Speaker for Model 950	8.50
	Cone and Voice Coil for Model 950	3.00
	Output Transformer for Model 950	2.00
	Field Coils for Model 950	2.00
57-483	Dial Escutcheon Plate	.45
78-82	Type 80 Tube Socket	.10
78-100	" 6D6 " "	.10
78-101	" 75 " "	.10
78-102	" 42 " "	.10
78-106	" 6A7 " "	.10
85-62	Wave Change Switch	.80
95-229	Power Transformer 25 Cycle	6.50
95-234	Power Transformer 50/60 Cycle	3.75
100-23	6.3 Volt Pilot Lamp	.15
126-131	Goat Tube Shield	.10

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

January 31, 1935

ZENITH RADIO CORPORATION

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

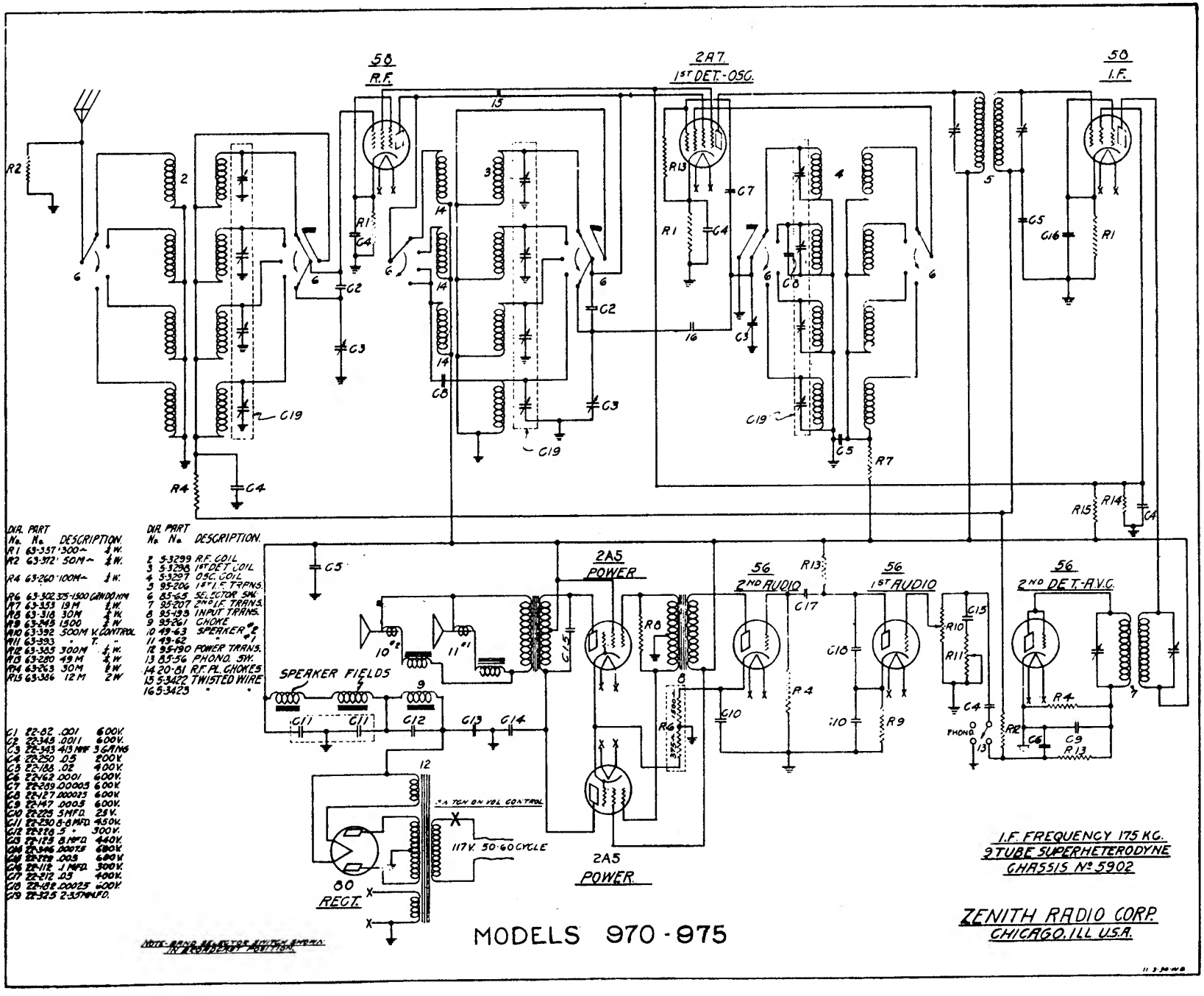
WARRANTY

The Zenith Radio Corporation guarantees each new ZENITH receiver and each new ZENITH QUALITY TUBE to be free from defects in workmanship and material.

Our obligation under this warranty is limited to making good at our factory any part or parts of the receiver which within ninety days from date of purchase shall be returned to us with transportation charges prepaid and which on examination shall be found to our satisfaction to have been thus defective. The ZENITH QUALITY TUBES used in this receiver are guaranteed against mechanical and electrical defects under the same warranty as the receiver. This warranty is expressly in lieu of all other warranties expressed or implied, and we neither assume nor authorize any representative or other person to assume for us any other liability in connection with the sale of ZENITH receivers or ZENITH QUALITY TUBES.

This warranty shall not apply to any receiver or tube which shall have been repaired or altered outside of our factory in any way so as, in our judgment, to affect its stability or reliability, nor which has been subject to misuse, negligence or accident, nor which has had the serial number or name altered, defaced or removed. Neither shall this warranty apply to any receiver in which other than ZENITH QUALITY TUBES have been used.

ZENITH RADIO CORPORATION.



DIA. No.	PART No.	DESCRIPTION.
R1	63-337	300Ω ½ W.
R2	63-372	50M Ω ½ W.
R4	63-260	100M Ω ½ W.
R6	63-302	375-1500 OHMS
R7	63-353	1.9 M ½ W.
R8	63-318	30M ½ W.
R9	63-348	1.200 ½ W.
R10	63-392	.500M V. CONTROL
R11	63-393	" T. "
R12	63-385	.300M ½ W.
R13	63-280	49 M ½ W.
R14	63-263	30M ½ W.
R15	63-386	12 M 2 W

DIA. No.	PART No.	DESCRIPTION.
2	5-3299	R.F. COIL
3	5-3296	1ST DET. COIL
4	5-3297	OSC. COIL
5	95-206	1ST I.F. TRANS.
6	85-65	SELECTOR SW.
7	95-207	2ND I.F. TRANS.
8	85-193	INPUT TRANS.
9	95-261	CHOKE
10	49-63	SPEAKER #2
11	49-62	" #1
12	95-190	POWER TRANS.
13	85-56	PHONO. SW.
14	20-81	R.F. PL. CHOKES
15	5-3422	TWISTED WIRE
16	5-3423	"

DIA. No.	PART No.	DESCRIPTION.
C1	82-82	.001 600V.
C2	22-348	.0011 600V.
C3	22-343	413 MM 3 GANG
C4	20-250	.05 200V.
C5	22-183	.02 400V.
C6	22-162	.0001 600V.
C7	22-239	.00003 600V.
C8	22-127	.000025 600V.
C9	22-147	.0005 600V.
C10	20-225	.5 MFD. 25V.
C11	82-230	8-8 MFD 450V.
C12	22-226	.5 " 300V.
C13	22-179	8 MFD. 450V.
C14	22-346	.00015 600V.
C15	22-229	.005 600V.
C16	22-112	.1 MFD. 300V.
C17	22-212	.05 400V.
C18	22-188	.00025 600V.
C19	22-325	2-357 MMFD.

TUBE	POSITION	Ef.	Ek	Eg1	Eg2	Eg3	Ep
58	R.F.	2.6	A 14 B 9.5 C 3 D 3	0	110	A 14 B 9.5 C 3 D 3	250
2A7	1st Det.	2.6	3	0	110	-	250
	Osc.			-1	-	-	180
58	I.F.	2.6	2.8	0	110	2.8	250
56	2nd Det.	2.6	0	0	-	-	0
56	1st Aud.	2.6	6	0	-	-	120
56	2nd Aud.	2.6	13.5	0	-	-	250
2A5	PWR.	2.6	18	0	250	-	250
2A5	PWR.	2.6	18	0	250	-	250
80	Rect.	4.6	-	-	-	-	-

Line 116 V. Antenna and Ground Disconnected

F - filament; K - cathode; G1 - control grid; G2 - screen grid; G3 - suppressor grid; P - plate.

Alignment

The diagram on page 3 shows position of major components and aligning adjustments. It should be studied carefully before any attempt is made to adjust the various circuits. A suitable high frequency service oscillator capable of excellent atenuation is required and no adjustments should be made without one. Separate coils are used for each band. Mounted on the coils are individual trimmers that align each band, independent of the other bands.

(I.F.) - Connect 175 K.C. service oscillator to grid of 6A7 and chassis ground. Adjust I.F. trimmers to point of maximum output.

(A) - Set service oscillator at 1400 K.C. and connect to antenna and ground leads. Place pointer at 1400 K.C. on dial and first adjust top trimmer on oscillator coil, then top trimmer on detector coil and top trimmer on R.F. coil to resonance. There is no 600 K.C. adjustment necessary.

(B) - Set service oscillator at 3 megacycle. Adjust second from top trimmer on oscillator coil to secure correct dial reading. Adjust second from top trimmers on detector and R.F. coils to resonance.

(C) - Set service oscillator at 6 megacycle. Adjust third from top trimmer on oscillator coil to secure correct dial reading. Adjust third from top trimmers on detector and R.F. coils to resonance.

(D) - Set service oscillator at 18 megacycle. Adjust bottom trimmer on oscillator coil to secure correct dial reading. Adjust bottom trimmers on detector and R.F. coils to resonance. Check for scale at 9 megacycle, if off, either twist or untwist blue wire loop on rear section of gang-switch and rebalance.

NOTE: It may be possible to obtain two settings on the oscillator and detector trimmers, particularly on bands C and D. If this occurs the oscillator should always be left on the loosest setting and the detector on the tightest one. Otherwise, reception over the band will be very erratic.

SERVICE HINTS ON CHASSIS 5902

Hums - Defective 56, 2A5 of 58 tube. Open condenser or defective filter. Yellow and white resistor shorted to brown, white tip, orange, at band switch.

Cuts out - No plate click on 2A5 when tube is removed from socket. Check bias candohm resistor R6 for open.

Audio howl or tendency to oscillate at center of volume control, particularly on end of one of the S.W. bands caused by coupling of #2 I.F. red plate wire. Remove the wire from aeroplane lug at .02 condensers. Lengthen I.F. wire about 2 inches and re-route this wire on other side of 8 mfd. condenser, connecting to plate choke. This places I.F. in the same circuit but reduces coupling tendency. May be necessary to repeak I.F.

Weak on C band - Open one 22-224.

Dead on B.C. - 58 Grid cap - 1st R.F. will read approximately 10,000 ohms to ground. Signal will come through if aerial is placed on grid of 58 R.F. tube. This is very difficult to locate, band switch has high resistance short across red R.F. coil lug to 9900 ohm resistor lug, may be necessary to replace band switch.

Set smokes - Grounded filament or 300 ohm across .1 is shorted to 22-188 - .02 condenser in I.F. plate circuit.

Distorted - Check tubes and speaker, balance, resistors and by-pass condensers. If voltage across red black speaker wires read approximately 160 instead of 120 volts, and 1 - 2A5 excessively hot, check bias candohm for ground on both ends. Also check push-pull transformer for open or short.

Weak 9 Megacycles - D band - Check for open or leaky .0011 micamold on band switch.

Noisy on S.W. - Check static shields making contact with gang, poor contact on Band Switch.

Mushy on full volume. Tendency to oscillate on edge of carrier. Check C9 .0005 micamold condenser for open.

Dead, or very distorted on strong signal only. Check for open R 4 100,000 ohm resistor on 56 tube - 2nd detector and A.V.C.

Weak and distorted - Check R 13 49,000 ohms for open.

Too much audio hiss and flutter on broadcast, .005 - C15 across 2A5 open. Weak audio if condenser is shorted or leaky.

Too much highs. Check C 14 .00075 from 2A5 to ground for open. Set dead if shorted.

Weak - Audio lacks bass. Poor quality. Check 1500 ohm resistor and 22-225 in 56 circuits for open or shorts.

Dead - 280 plates red - Check filter and plate circuits for shorts or grounds.

Carrier hum, on stations. Usually caused by static shield in power transformer not being grounded. Check tubes and by-passes first. If carrier hum still present, replace power transformer.

Weak and Distorted - A.V.C. seems to block. C5 near 2nd I.F. shorted.

Weak and Oscillates on B.C. - Open antenna coil or open .001 - C1 grounded. Also set will be weak on R.F.

Weak on D and dead at 3 Meg. Stops oscillating around 10-11. Check C8 micamold .000025 for open or high leakage. Check tubes and coils for opens.

Weak on all S.W. bands. Check C2 .0011 micamold for open or high leakage.

Microphonic - Try tubes, put cotton in oscillator coil to suppress grid wire vibrations. Check by-passes.

Dead on B.C. - Shorted coil trimmer condenser, usually oscillator coil.

Balance proceedure must be done very carefully on this model, and tubes checked carefully in particular for satisfactory S.W. operation. In addition to above, an occasional open coil or shorted trimmer will cause either weak or no reception on one or more bands. Check for poor contacts on band switch, rosin or loose connections.

Oscillates on S.W. - Ground 56 detector cathode directly at socket prong. Remove black ground wire to #2 I.F. ground at C5 condenser

MODELS 970, 975
Chassis #5902

Dial Assembly

26-71	Complete Split Second Dial Assembly	$6.50
26-72	Dial Scale Only	.75
32-4	Dial Drive Belt	.20
33-60	Dial Glass Frame	.35
59-28	Large Z Pointer (black)	.10
59-29	Split Second Pointer (red)	.10
93-232	Dial Glass Cushion Washer	.10
192-4	Dial Glass	.20
132-9	Dial Glass Retaining Ring	.03

Resistors

63-242	2500 Ohm 1/4 Watt	.20
63-245	1500 " 1/4 "	.20
63-258	490M " 1/4 "	.20
63-260	100M " 1/4 "	.20
63-263	30M " 1/4 "	.20
63-280	49M " 1/4 "	.20
63-302	375 - 1500 Candohm	.40
63-318	30M Ohm 1/4 Watt	.20
63-353	19M " 1/2 "	.20
63-357	300 " 1/4 "	.20
63-372	50M " 1/4 "	.20
63-385	300M " 1/4 "	.20
63-386	12M " 2 "	.30
63-392	Volume Control Assembly	1.25
63-393	Tone Control Assembly	.75

Condensers

22-82	.001 Mfd. 600 V.	.25
22-112	.1 " 300 V.	.25
22-125	8. " 440 V.	1.00
22-127	.000025 " 600 V.	.20
22-147	.0005 " 600 V.	.15
22-162	.0001 " 600 V.	.20
22-182	.00025 " 600 V.	.12
22-188	.02 " 400 V.	.15
22-212	.05 " 400 V.	.20
22-225	5. " 25 V.	.65
22-228	.5 " 300 V.	.35
22-229	.005 " 600 V.	.15
22-230	8. x 8. " 450 V.	2.50
22-250	.05 " 200 V.	.15
22-289	.00005 " 600 V.	.12
22-325	2 - 35 Mmfd.	.45
22-343	3-Gang Variable	3.00
22-345	.0011 Mfd. 600 V.	.15
22-346	.00075 Mfd. 600 V.	.15

Coils & Chokes

20-81	R.F.Plate Choke	.65

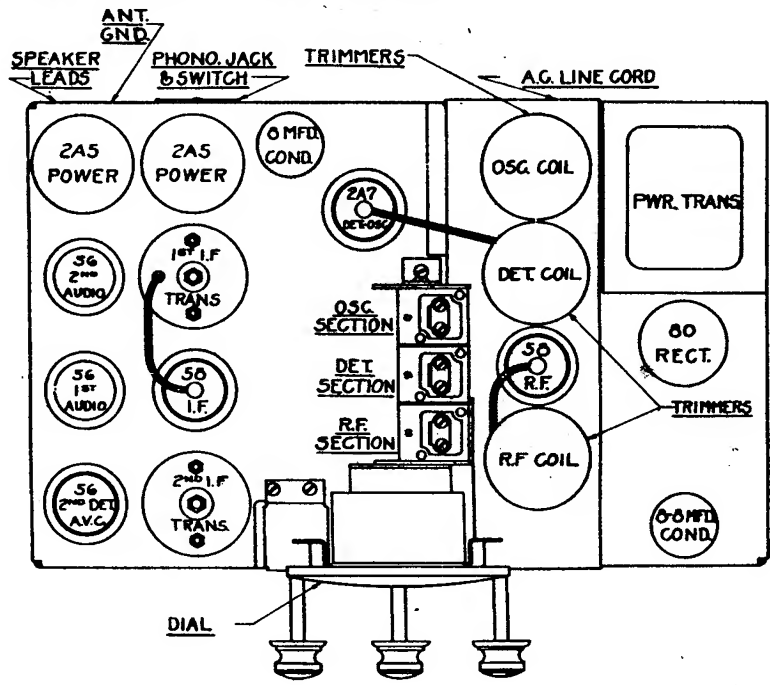
Coils & Chokes (Contd.)

95-206	1st I.F. Transformer	$1.50
95-207	2nd I.F. "	1.50
S-3297	Oscillator Coil Assembly	2.75
S-3298	1st Detector Coil Assembly	2.60
S-3299	R.F. Coil Assembly	3.00

Miscellaneous

44-7	Phono Connector Jack (Export Models Only)	.15
46-49	Knob, large control	.20
46-55	Knob, small control	.15
46-102	Knob for Band Selector	.20
49-62	Dynamic Speaker With Transformer	8.50
49-63	" " Without "	6.25
	Output Transformer for 49-62	2.50
	Cone & Voice Coil for 49-62 or 49-63	2.50
	Field Coil for 49-62 or 49-63	2.00
57-475	Dial Escutcheon Plate	.70
78-84	Tube Socket 56	.10
78-85	" " 58	.10
78-86	" " 59	.10
78-87	" " 80	.10
78-112	" " 2A7	.10
85-56	Phono Switch (Export Models Only)	.35
85-65	Band Selector Switch	2.50
95-190	117 V. 50/60 Cycle Power Transformer	5.00
95-193	Push Pull Audio Transformer	1.50
95-194	All Voltage 25 Cycle Power Transformer	7.00
95-261	Power Choke	1.00
100-18	2.5 V. Pilot Lamp	.12
126-127	Tube Shields	.10

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



ZENITH RADIO CORPORATION - December 17, 1934.

Service Bulletin

ZENITH RADIO

MODELS
980-985-990

Chassis
1201 - 1201A

SERVICE NOTES

Dial Slips or Binds. Tighten lugs on planetary drive. See that both pointers are free. Make sure gang is squarely lined up with dial.
Off Calibration. Check for loose set screws on dial assembly to condenser shaft. Black pointer may be loose on shaft. Check alignment as outlined in Alignment Procedure.
Poor Tone. Defective tubes in audio. One side of push-pull circuit faulty. Check audio and output transformers. See A.V.C. blocking.
Insensitive. Out of alignment, weak tubes or defective by-pass condenser.
Shadowgraph Inoperative. Weak 76 tube, burnt out shadowgraph, open resistor in 76 plate circuit.
Distortion at Medium Volume. Defective 75 tube, defective volume control. Separate green volume control-lead and speaker-lead close to grid of 42 tube.
Insensitive on Any Short Wave Band. Check alignment, make sure R.F. circuit is not aligned to image frequency. Change 6A7 tube. Change position of fixed condensers adjacent to rear section of wave change switch. Location of these condensers in relation to each other and their distance from the chassis will affect dial calibration and sensitivity.
Stops Oscillating Around 9 M.C. Change 6A7 tube, leakage in 50 Mmfd. or .0029 Mfd. condenser.
A.V.C.Blocks. Shorted resistor on antenna choke. C-14 padder shorted. Grounded R.F. grid circuit.
Oscillates on Broadcast. Check alignment. Push brown wire away from 6A7 socket. Grounded cathode on 1st I.F. or grounded to 600 K.C. padder. Check for open by-pass condenser.
Noisy. Shorting plates in gang condenser. Poor contact in band switch. Loose shields or shield bases. Static shields may be touching leads under gang condenser.
Overheats. Check pilot light and heater circuits for partial short or ground.
Hum on D and E Bands. Antenna lead too close to AC line or 5Z3 socket short in 6D6 in R.F. socket.
Flutters. Rearrange leads adjacent to 6A7 socket. Open antenna coil. Push yellow band pass lead away from detector trimmer assembly and yellow choke leads. Replace 6D6 in R.F. socket.
Oscillates on Short Wave Bands. Make sure brown R.F. grid return lead is pushed away from 6A7 socket. Check for ground or any A.V.C. lead. Open by-pass condenser.
Tone Control Inoperative. Loose ground lug or 63-430 cardohm. Defective condensers in tone control circuit.
Whistles. Rearrange leads in audio circuits. Speaker wires couple with 1st I.F.
Warning. The wiring to the switch is a part of the tuned circuit on the "E" band. Do not change the position of any leads.

Alignment

The diagram on page 2 shows position of major components and aligning adjustments. It should be studied carefully before any attempt is made to adjust the various circuits. The Clough-Brengle type is the only commercial service oscillator found practical for this work.

Separate coils are used for each band. Mounted on the coils are individual trimmers that align each band, independent of the other bands.

Connect 485 K.C. service oscillator to grid of 6A7 and chassis ground. Adjust I.F. trimmers on rear of I.F. transformers for strongest signal.

Connect 485 K.C. service oscillator to antenna and ground. Turn dial to 540 K.C. on broadcast band and adjust wave trap trimmer on right rear side of chassis for weakest signal.

Broadcast - "A" Band

Set service oscillator at 1400 K.C., remaining attached to antenna ground posts. Turn dial to same point and adjust #1 trimmer (top one on oscillator coil) to resonance. Adjust #1 R.F. trimmer (top one on R.F. coil); #1 detector trimmer (through hole in chassis base) and band pass trimmer (top front section of gang) all to resonance.

Set service oscillator at 600 K.C. Adjust padder (located in center rear of chassis) for correct dial reading.

Recheck 1400 K.C. alignment.

"B" Band

Set service oscillator at 4 M.C.(still attached to antenna and ground) and adjust trimmer #2 (2nd from top) on oscillator coil for correct dial reading. Adjust #2 R.F. trimmer (2nd from top on R.F. coil) and #2 detector trimmer (center hole through chassis) to resonance.

"C" Band

Loosen #3 detector trimmer (top one on detector coil). Set service oscillator at 10.5 M.C. Adjust #3 oscillator trimmer (third from top on oscillator coil) for correct dial reading. Adjust #3 R.F. trimmer (third from top of R.F.coil) and #3 detector trimmer (rear one through hole in top of chassis). Adjust #3 detector trimmer on coil to resonance.

"D" Band

Tighten #4 detector trimmer (bottom one on detector coil). Set service oscillator at 21 M.C. Adjust #4 oscillator trimmer (bottom one on oscillator coil) for correct dial reading. Adjust #4 R.F. trimmer (lower one on R.F. coil) and #4 detector trimmer (lower one on detector coil) to resonance.

It is very easy to mistake the image frequency for the fundamental on this band. Rotate dial and if shadowmeter narrows at any point, especially at 15 M.C., the band should be rebalanced.

"E" Band

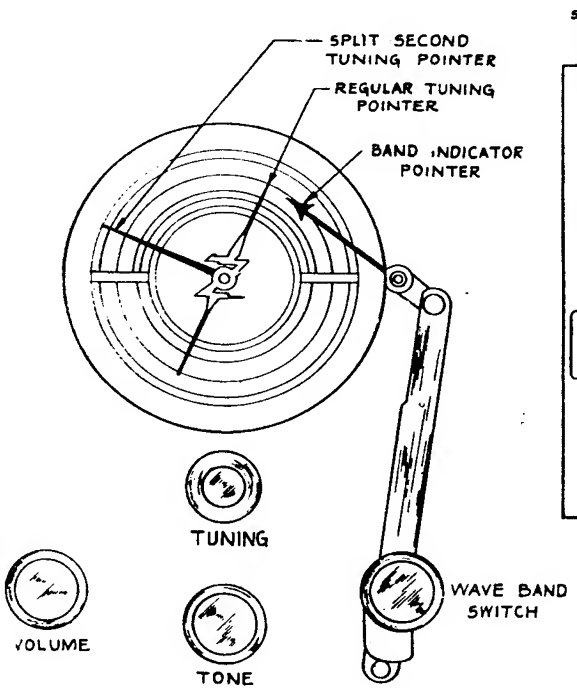
There are no adjustments to be made on this band.

Socket Voltages

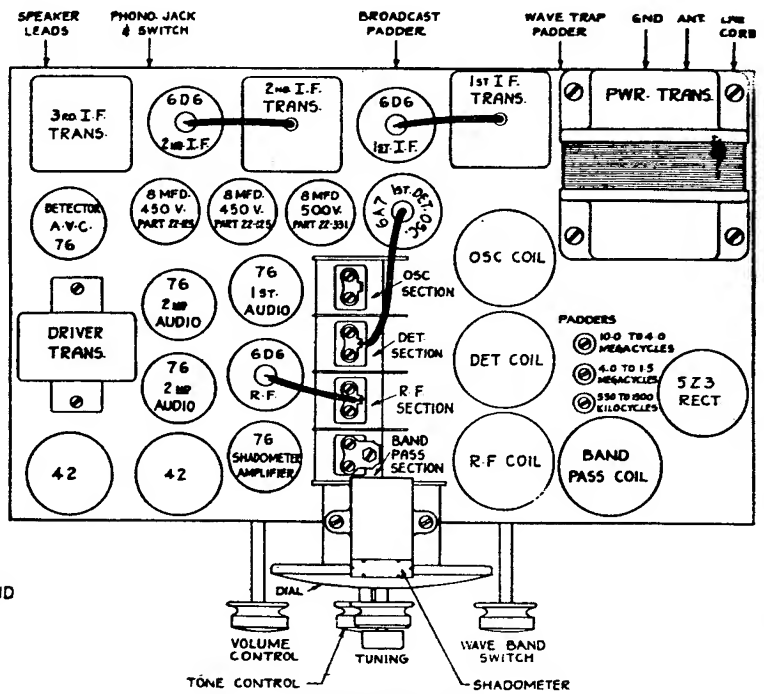
TUBE	POSITION	Ef	Ek	Eg1	Eg2	Eg3	Ep
6D6	R.F.	5.8	1	0	78	1	220
6A7	1st Det.	5.8	1.5	0	86	-	220
	Osc.			-10	-	-	220
6D6	1st I.F.	5.8	7	0	86	7	220
6D6	2nd I.F.	5.8	7	0	86	7	220
76	2nd Det.	5.8	0	0	-	-	0
76	Shadow-meter AMP.	5.8	10	0	-	-	210
76	1st Aud.	5.8	11	0	-	-	210
76	P.P. Driver	5.8	11	0	-	-	220
76	P.P. Driver	5.8	11	0	-	-	220
42	PWR.	5.8	26	0	260	-	260
42	PWR.	5.8	26	0	260	-	260
5Z3	RECT.	4.8	-	-	-	-	-

Line Voltage 110 Volts Antenna and Ground Disconnected.

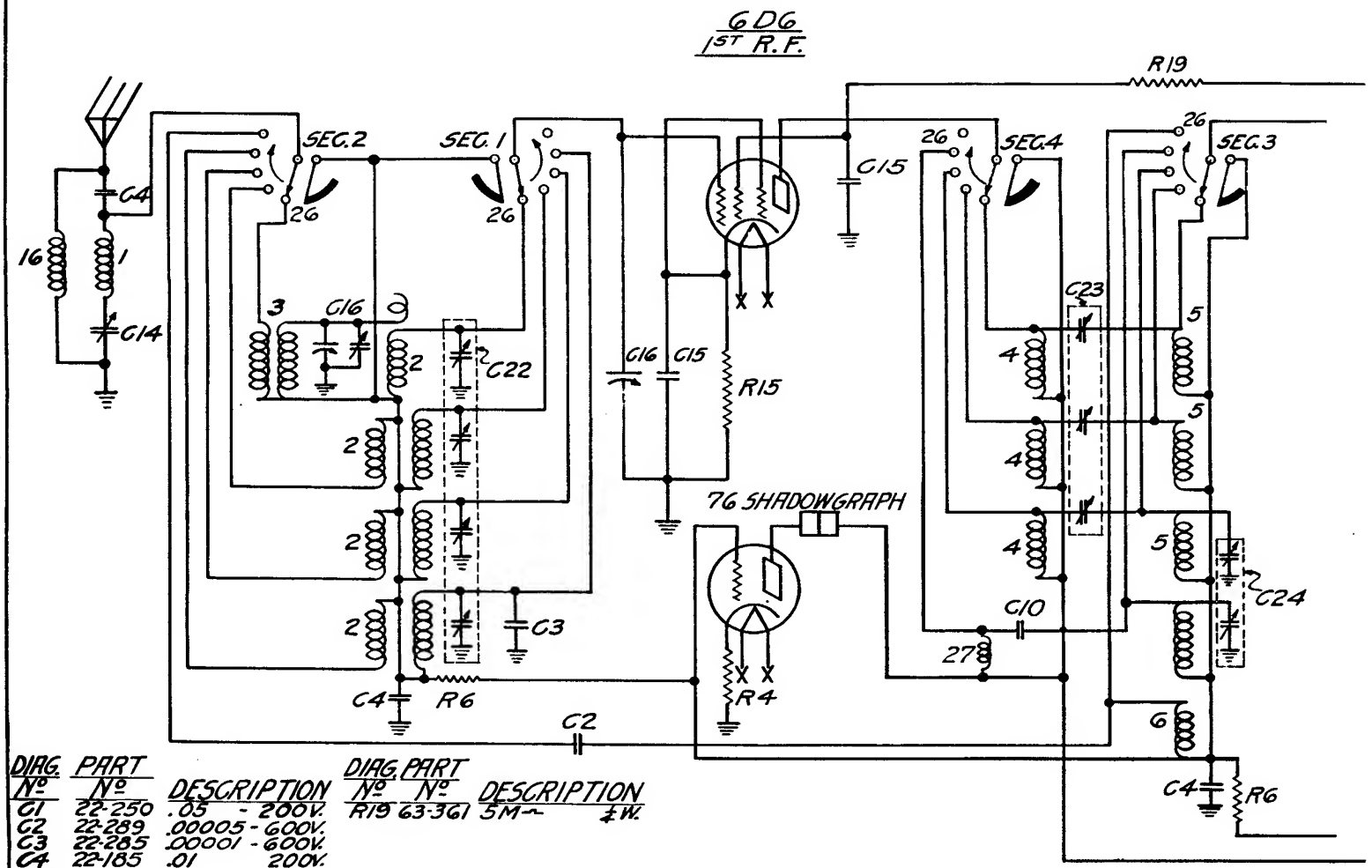
f - filament; k - cathode; g1 - control grid; g2 - screen grid; g3 - suppresso grid; p - plate.



Control Panel

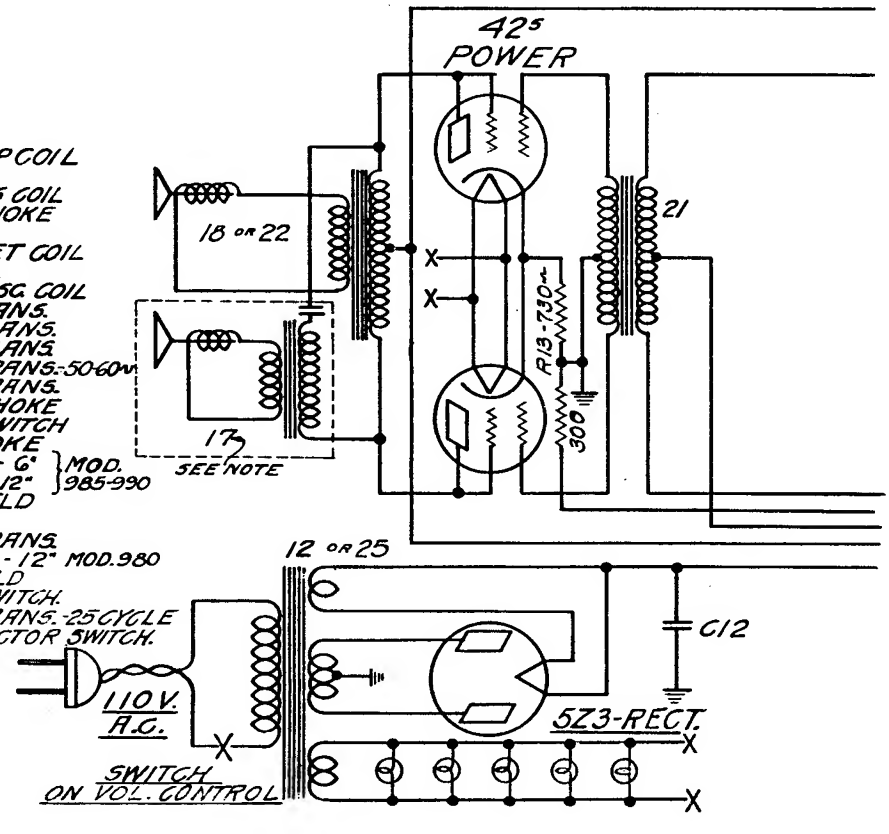


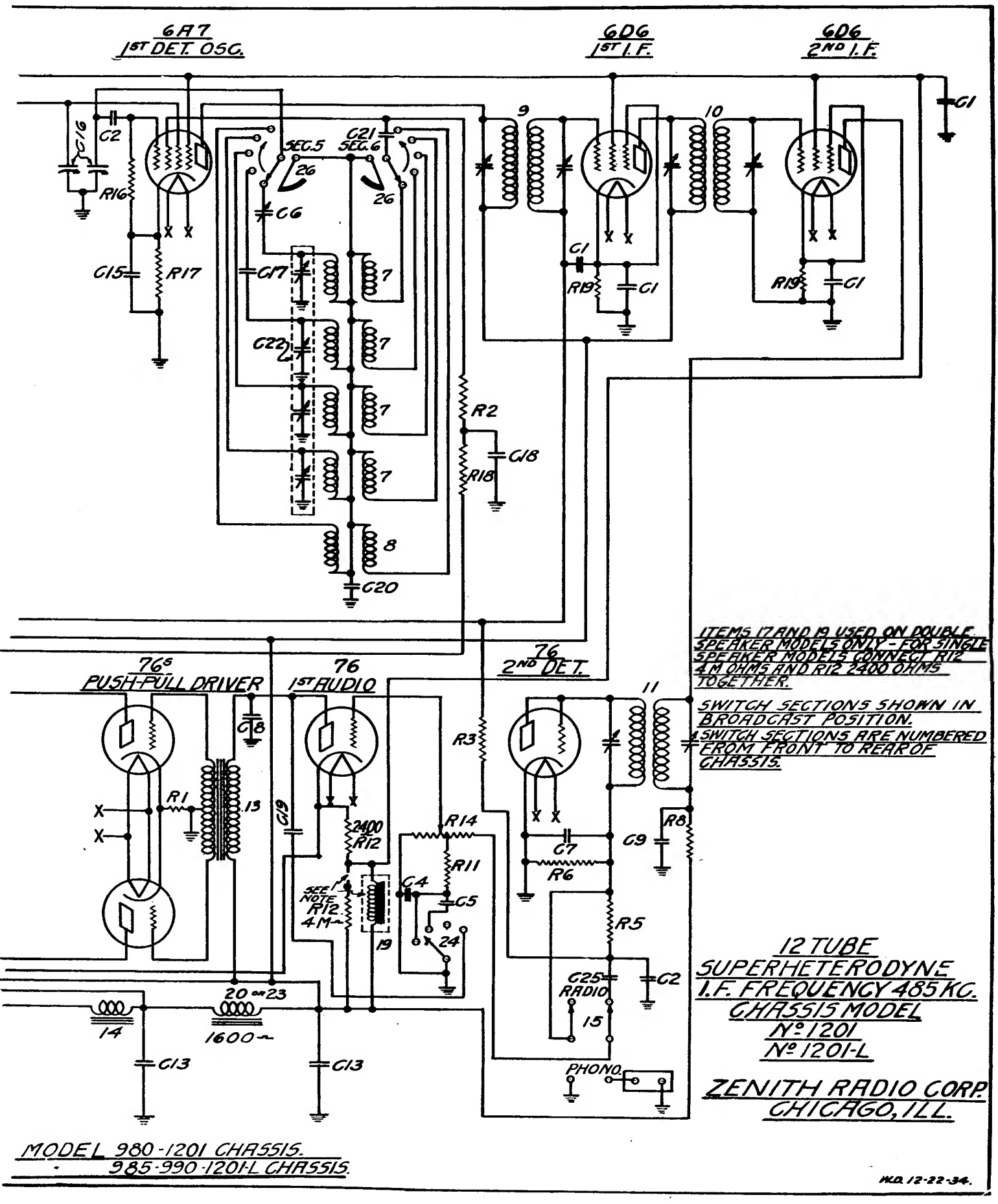
TUBE POSITION



DIAG. Nº	PART Nº	DESCRIPTION
C1	22-250	.05 - 200V.
C2	22-289	.00005 - 600V.
C3	22-285	.00001 - 600V.
C4	22-185	.01 200V.
C5	22-219	.03 200V.
C6	22-292	500-1000 MMFD.
C7	22-182	.00025 600V.
C8	22-82	.001 600V.
C9	22-212	.05 400V.
C10	22-127	.000025 600V.
C12	22-331	8 500V.
C13	22-125	8 440V.
C14	22-284	75-275 MMFD.
C15	22-190	.1 200V.
C16	22-333	4 GANG VAR.
C17	22-341	.00092 - 600V.
C18	22-228	.5 300V.
C19	22-243	.01 400V.
C20	22-342	.0029 600V.
C21	22-147	.0005 600V.
C22	22-325	2-35 MMFD.
C23	22-324	2-35 "
C24	22-323	2-35 "
C25	22-188	.02 400V.
R1	63-238	1000 ~ 1/4 W.
R2	63-291	29M ~ 1/4 W.
R3	63-258	490M ~ 1/4 W.
R4	63-410	1200 ~ 1/4 W.
R5	63-281	29M ~ 1/4 W.
R6	63-278	99M ~ 1/4 W.
R8	63-245	1500 ~ 1/4 W
R11	63-261	9900 ~ 1/4 W.
R12	63-431	2400-4000 ~ CANDOHM
R13	63-430	300-730 ~ "
R14	63-384	500M-VOL. CON.
R15	63-377	170 ~ 1/4 W.
R16	63-372	50M ~ 1/4 W.
R17	63-305	160 ~ 1/4 W.
R18	63-388	19M ~ 1 W.
R19	63-361	5M ~ 1/4 W.

1	20-64	WAVE TRAP COIL
2	5-3078	R.F. COIL
3	20-85	BAND PASS COIL
4	20-81	R.F. PL. CHOKE
5	5-3537	DET. COIL
6	20-84	7 METER DET COIL
7	5-3080	OSC. COIL
8	5-3115	7 METER OSC. COIL
9	95-242	1ST I.F. TRANS.
10	95-242	2ND I.F. TRANS.
11	95-243	3RD I.F. TRANS.
12	95-241	POWER TRANS.-50-60~
13	95-269	AUDIO TRANS.
14	95 240	FILTER CHOKE
15	85-39	PHONO. SWITCH
16	20-88	ANT. CHOKE
17	49-107	SPEAKER - 6" } MOD. 985-990
18	49-108	" 12" }
19	49-107	SPKR. FIELD
20	49-108	" "
21	95-268	DRIVER TRANS.
22	49-92	SPEAKER. - 12" MOD. 980
23	49-92	SPKR FIELD
24	85-60	TONE C. SWITCH.
25	95-246	POWER TRANS.-25 CYCLE
26	85-58	BAND SELECTOR SWITCH.
27	5-3538	PL. CHOKE.




6A7
1ST DET. OSC.
6D6
1ST I.F.
6D6
2ND I.F.
C16
C2
R16
C15
R17
SEC.5
SEC.6
26
26
C6
C17
C22
C21
7
7
7
7
8
C20
9
10
C1
R19
C1
C1
R19
C1
R2
C18
R18
76S
PUSH-PULL DRIVER
76
1ST AUDIO
76
2ND DET.
C8
R1
13
X
X
C19
2400
R12
R14
R11
C4
C5
SEE NOTE
R12. 4M~
19
24
R3
11
C7
R6
C9
R8
R5
C25
RADIO
C2
15
PHONO.
20 or 23
14
1600~
C13
C13
ITEMS 17 AND 19 USED ON DOUBLE SPEAKER MODELS ONLY - FOR SINGLE SPEAKER MODELS CONNECT R12 4M OHMS AND R12 2400 OHMS TOGETHER.
SWITCH SECTIONS SHOWN IN BROADCAST POSITION.
SWITCH SECTIONS ARE NUMBERED FROM FRONT TO REAR OF CHASSIS.
12 TUBE
SUPERHETERODYNE
I.F. FREQUENCY 485 KC.
CHASSIS MODEL
Nº 1201
Nº 1201-L
ZENITH RADIO CORP.
CHICAGO, ILL.
MODEL 980-1201 CHASSIS.
985-990-1201-L CHASSIS.
H.D. 12-22-34.

Parts and Prices

Models 980, 985, 990

Chassis 1201

Dial Assembly

S-3424	Complete Split Second Dial Assembly	$7.50
26-80	Dial Scale Only	.75
32-3	Drive Belt	.20
33-62	Dial Glass Frame	.40
59-28	Large "Z" Pointer	.10
59-29	Split Second Pointer	.10
76-151	Planetary Drive Assembly	2.00
93-217	Dial Glass Cushion Washer	.10
100-23	6.3 Volt Pilot Lamp	.15
122-9	Shadowgraph Meter	2.00
192-4	Dial Glass	.20

Resistors

63-238	1 M Ohm ¼ Watt	.20
63-245	1500 " ¼ "	.20
63-258	490 M " ¼ "	.20
63-261	9900 " ¼ "	.20
63-278	99 M " ¼ "	.20
63-281	29 M " ¼ "	.20
63-291	29 M " ½ "	.20
63-305	160 " ¼ "	.20
63-361	5 M " ¼ "	.20
63-372	50 M " ¼ "	.20
63-377	170 M " ¼ "	.20
63-384	500 M " Volume Control Assembly	1.00
63-388	19 M " 1 Watt Resistor	.25
63-410	1200 " ¼ " "	.20
63-430	300-730 Ohm Candohm	.30
63-431	2400-4000 Ohm Candohm	.80

Condensers

22-82	.001 Mfd. 600 V.	.25
22-125	8. " 440 V.	1.00
22-127	.000025 Mfd. 600 V.	.15
22-147	.0005 Mfd. 600 V.	.15
22-182	.00025 Mfd. 600 V.	.12
22-185	.01 Mfd. 200 V.	.20
22-188	.02 " 400 V.	.15
22-190	.1 Mfd. 200 V.	.20
22-212	.05 " 400 V.	.20
22-219	.03 " 200 V.	.15
22-228	.5 " 300 V.	.35
22-243	.01 " 400 V.	.15
22-250	.05 " 200 V.	.15
22-284	75 - 275 Mmfd. Padder	.30

PARTS AND PRICES — MODELS 980, 985, 990
PAGE NO. 2

	Condensers Cont'd	
22-285	.00001 Mfd. 600 V.	$ .15
22-289	.00005 Mfd. 600 V.	.12
22-292	500-1000 Mmfd. Padder	.45
22-323	2 - 35 Mmfd. Padder	.25
22-324	2 - 35 Mmfd. Padder	.40
22-325	2 - 35 Mmfd. Padder	.40
22-331	8. Mfd. 500 V.	1.25
22-333	Four Gang Variable Condenser	5.00
22-341	920 Mmfd. 600 V.	.15
22-342	.0029 Mfd. 600 V.	.25
	Coils, Chokes, Etc.	
20-64	Wave Trap Coil	.35
20-81	R.F. Plate Choke	.65
20-84	7-Meter Detector Coil	.10
20-85	Band Pass Coil	.60
20-88	Antenna Choke	.25
95-242	1st and 2nd I.F. Transformer	1.50
95-243	3rd I.F. Transformer	1.50
S-3538	Plate Choke	.40
	Miscellaneous	
44-7	Phono Connector Jack(Export Models Only)	.15
46-97	Tuning Knob (Small)	.20
46-111	Volume Control Knob	.10
46-113	Wave Change Switch Knob	.25
46-114	Tuning Knob (Large)	.25
49-92	12" Auditorium Speaker (Model 980)	14.50
	Cone and Voice Coil Assembly for 49-92	3.25
	Output Transformer for 49-92	2.50
	Field Coil for 49-92	2.50
49-107	6" Dynamic Speaker for (Models 985, 990)	5.50
	Cone and Voice Coil Assembly for 49-107	2.00
	Output Transformer for 49-107	2.00
	Field Coil for 49-107	2.00
49-108	12" Auditorium Speaker for (Models 985, 990)	25.00
	Cone and Voice Coil Assembly for 49-108	5.00
	Output Transformer for 49-108	3.50
	Field Coil for 49-108	7.00
57-486	Dial Escutcheon Plate	.40
78-100	6D6 Tube Socket	.10
78-102	42 Tube Socket	.10
78-106	6A7 Tube Socket	.10
78-109	76 Tube Socket	.10

PARTS AND PRICES — MODELS 980, 985, 990
PAGE NO.3

Miscellaneous Cont'd

78-110	5Z3 Tube Socket	$ .10
83-334	Antenna and Ground Terminal Strip	.10
85-39	D.P.D.T. Phono Switch (Export Models Only)	.75
85-58	Wave Change Switch	4.00
85-60	4-Position Tone Control Switch	.60
95-240	Power Filter Choke	2.00
95-241	117 V 50/60 Cycle Power Transformer	5.75
95-246	All Voltage 25 Cycle Power Transformer	10.00
95-268	Driver Transformer	2.00
95-269	1st Audio Transformer	2.00
126-109	Tube Shield (small)	.10
126-127	Tube Shield (large)	.15

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

January 29, 1935

ZENITH RADIO CORPORATION

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

WARRANTY

The Zenith Radio Corporation guarantees each new ZENITH receiver and each new ZENITH QUALITY TUBE to be free from defects in workmanship and material.

Our obligation under this warranty is limited to making good at our factory any part or parts of the receiver which within ninety days from date of purchase shall be returned to us with transportation charges prepaid and which on examination shall be found to our satisfaction to have been thus defective. The ZENITH QUALITY TUBES used in this receiver are guaranteed against mechanical and electrical defects under the same warranty as the receiver. This warranty is expressly in lieu of all other warranties expressed or implied, and we neither assume nor authorize any representative or other person to assume for us any other liability in connection with the sale of ZENITH receivers or ZENITH QUALITY TUBES.

This warranty shall not apply to any receiver or tube which shall have been repaired or altered outside of our factory in any way so as, in our judgment, to affect its stability or reliability, nor which has been subject to misuse, negligence or accident, nor which has had the serial number or name altered, defaced or removed. Neither shall this warranty apply to any receiver in which other than ZENITH QUALITY TUBES have been used.

ZENITH RADIO CORPORATION.

INSTALLATION AND SERVICE INSTRUCTIONS

AUTO RADIO — MODEL 7

INSTALLATION: Determine most satisfactory or desirable mounting position. In most cases it will be found that the receiver can be mounted on the car bulk head, above and to the right of the steering post. Use the paper template which is the same size as set and mark location for the mounting bolt. Then drill two one-half inch (½") holes, making certain that the paint around the hole on the engine side of fire wall or bulk head is scraped clean to insure a good ground connection between the receiver and the frame of the car. Insert bolts through dash, with lockwasher and nut on engine side, then hang receiver over bolt heads and tighten nuts securely.

Mount the remote control unit on steering column by means of mounting bracket. Two flexible shafts are furnished, one with a slotted fitting on one end, which is the volume control shaft. The other is the selector shaft, with key fitting at one end. Make certain that the outer casings of flexible shafts go into remote control bushings for approximately five-sixteenths of an inch and tighten set screws to secure cables. If cables are pushed too far into remote control head, shafts will not turn freely. Always try to install drive shafts in as straight a line as possible from remote control to set. AVOID SHARP BENDS IN CABLES. 18" cables are supplied with receiver. 24", 30" or 36" cables may be obtained from the factory.

After the control unit and cables have been connected to the set, the dial pointer must be adjusted. To do this, slowly rotate the tuning control knob to either right or left until a definite stop is reached, do not force the knob after the stop, as this will damage the control mechanism. Now rotate the knob slowly in the opposite direction until the other stop is reached. The pointer will usually come to the end of the dial strip before the stop is reached. In the later type control heads the pointer is adjusted to the correct frequency by means of a screw on the rear of the head.

The battery cable, (red wire with fuse receptacle at one end and terminal lug at other end)—must be connected to battery terminal of the ammeter. At the same time connect ammeter condenser to battery terminal of ammeter, and to any convenient grounded screw on back of instrument panel. Make certain that insulating sleeve is slipped over fuse when fuse is placed in receptacle, before inserting in receiver. When connected properly, the discharge due to current drawn by the receiver should not indicate on the ammeter. This is important, since if improperly connected, as shown by the deflection of ammeter, motor interference may be encountered. The pilot light assembly, a shielded cable, plugs in to set and to the rear of the remote control unit. The antenna is connected to the receiver by means of the antenna cable. The antenna wire is the single black wire projecting from the end of the cable. Splice this wire to the roof antenna lead and ground the pig-tail shielding as close to the corner post of the car as possible.

ANTENNA: For very best results an antenna in the top of the car must be used. Practically all 1933 and 1934 cars are so equipped with the lead-in brought down one of the corner posts. Running board or other undercar antennas are not recommended since they are subject to all weather conditions and require constant attention. If the car in which the receiver is to be installed does not have a top antenna the first consideration is to have one built in. This should be done by the nearest authorized Zenith service station or someone capable of removing and replacing the top upholstering with previous training in this type of work.

In order to reduce electrical interference it is highly advisable to shield the antenna lead-in from as high as possible in the corner post to the antenna cable of the receiver with the shield grounded to the instrument panel. After all connections have been made and the set placed in operation it may be found necessary to balance the set to the antenna. This is accomplished as follows: With the receiver tuned to a very weak station, at between 130 to 140 on the dial, adjust the antenna trimmer with a screwdriver until maximum volume is attained. To reach the antenna trimmer remove the plug button from the top of the case.

The antenna is connected to the receiver by means of the antenna cable. The antenna wire is the single black lead projecting from the end of the cable. The white pigtail must be attached to the lead-in shield or otherwise grounded as near to the corner post as possible.

OPERATION: Place key (knob) in lock on left side of remote tuning unit. After waiting approximately forty-five seconds for tubes to heat, rotate station selector (right hand knob) until a desirable program is heard. Always adjust volume with the volume control, never by de-tuning the selector control. De-tuning will very seriously affect the tone quality of the receiver. Do not leave the receiver turned on over night or while not in the car as the battery might become discharged and cause difficulty in starting. In any event the charging rate of the generator should be advanced to about sixteen amperes to offset the current drain of the receiver. This receiver is equipped with automatic volume control which counteracts fading, blasting of locals while tuning and maintain the same volume level without repeated adjustment of the manual volume control knob. However, regardless of the automatic volume control efficiency there are certain "dead spots" such as under a totally shielded viaduct or bridge where reception is practically impossible. Some fading is to be expected under such conditions.

MOTOR NOISE: Disconnect the high tension leads to spark plugs and connect a plug resistor to the top of each spark plug. Next remove the high tension lead from coil to distributor and insert distributor suppressor. For cap type distributor, exchange the standard distributor suppressor from your dealer for special screw type. In some few cases, such as Buicks

it is necessary to use screw type suppressors. Cut lead about two inches from distributor and screw one end of suppressor into the wire attached to distributor, screw wire from coil into other end of suppressor.
Generator condenser is connected to generator side of the cutout. The ground side can be fastened to the generator housing under the same screw that holds the relay housing to the generator. In some cases, an additional condenser (obtainable from your dealer) must be installed between the battery side of ignition coil and the car frame. If after connecting suppressors and condensers as outlined above there is still motor noise, proceed as follows:

Shield and ground the center high tension lead.

Bond flexible shaft leads, such as free wheeling, which run close to distributor, radiating ignition interference which is picked up by the antenna inside of car.

In cars using wooden floor boards, place a grounded copper screen under toe board.

If there is an excessive gap between the distributor rotor and the high tension contacts, replace it with a special radio rotor arm or build up the end with solder and dress with a file so that its original shape is retained. The rotor should not brush or wipe the contacts, but should just clear them.

In some cases, such as the V-8 Ford, it is necessary to pull the battery and primary leads out of metal tube which houses the high tension leads. Shield and ground these leads. Also on V-8 Fords it is necessary to install a condenser at the primary terminal of the coil housing.

Additional suppressors can be obtained from your dealer if required for larger motors.

The ignition system of car must be kept in good condition. Fouled plugs or plugs with improperly adjusted gaps will affect the operation of receiver as well as of the automobile. Burned or poorly adjusted braker points will also impair the performance. It is advisable to advance the generator charging rate in order to compensate for the additional drain of the receiver on car storage battery. A charging rate of approximately 18 amperes should be sufficient.

It is sometimes necessary to also connect a condenser between the hot side of the dome light lead and ground, keeping it as near to the corner post as possible.

SERVICE: The Model 7 Auto Radio is a modern five-tube superheterodyne with the following tube complement. 1-6D6 R.F. amplifier; 1-6C6 1st detector-oscillator; 1-75 2nd detector-A.V.C.; 1-42 power amplifier and 1-84 rectifier. Use only Zenith Quality tubes for replacement as the stability might be affected otherwise. Both the top and bottom covers may be removed thereby making the chassis easily accessible for service.

Should it ever be necessary or desirable to re-align this receiver, the proper method is as follows:
Adjustments can be made with the receiver mounted in the case, being necessary only to remove the top cover.

I. F. ALIGNMENT:

1. With variable condenser at its maximum capacity position and with volume control full on, connect in series with a .1 mfd. condenser, an oscillator set at 175 kilocycles to the grid cap of the 6C6 tube.
2. Adjust trimming condensers I. F. transformer, part number 7108-19 (see top view of chassis) to resonance with oscillator, as indicated on an output meter connected across the primary terminals of the speaker input transformer. Maximum deflection on the meter indicates resonance.

Note: The I. F. transformer has two trimmers, both of which are adjustable through the rear of the case.

FREQUENCY ALIGNMENT:

1. Attach oscillator connected in series with a 200 mmfd. condenser to the antenna lead and with the variable condenser at its minimum capacity position (extreme right of its rotation) and with an oscillator set at 1550 kilocycles, adjust concondenser trimmer of oscillator section (shaft end) to resonance.
2. Re-set oscillator to 1400 kilocycles, rotate variable condenser to pick up signal, adjust antenna and R. F. trimmers to resonance.
3. Check alignment at 1200-1000-800-600-530 kilocycles by setting oscillator to these frequencies and picking up signal by rotating condenser.
4. Bend slotted plates of antenna and R. F. sections only if necessary. UNDER NO CIRCUMSTANCES BEND PLATES OF OSCILLATOR SECTION.

NOTE: Voltages from chassis to different points are indicated on the socket voltage table, and should be measured with a volt meter having a resistance of 1000 ohms per volt.

Failure to operate, noisy or weak reception, may be due to defective tubes or poor contact between cap on top of tube and grid clip.

Tubes may be checked by replacing with another tube which is known to be good.

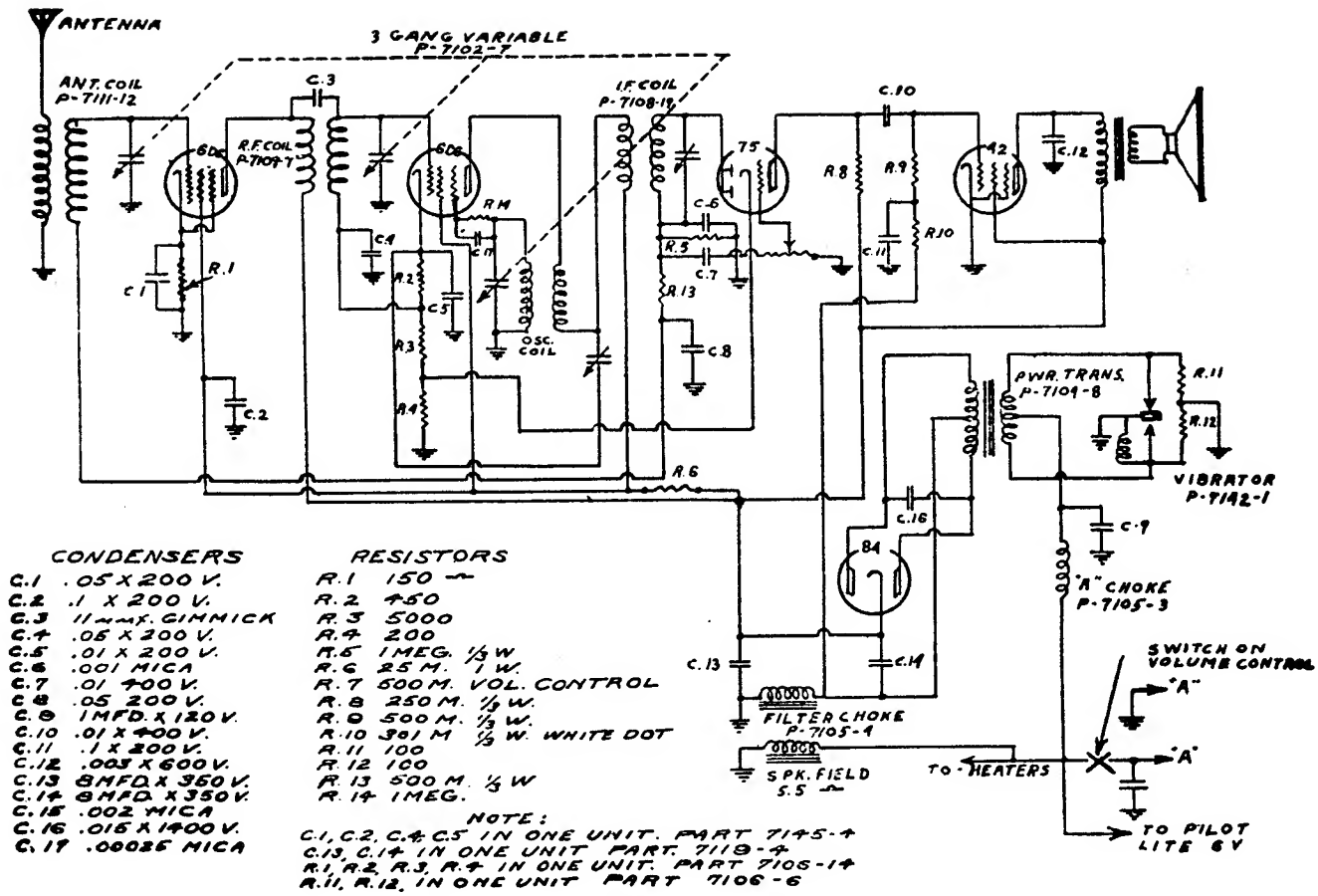
If fuse blows out frequently, and insulating sleeve has been properly placed over fuse, the trouble probably is in the vibrator and vibrator should be replaced.

NEVER ATTEMPT TO ADJUST VIBRATOR POINTS.

SOCKET VOLTAGES

TUBE	POSITION	Ef	Ek	Eg^1	Eg^2	Eg^3	Ep
6D6	R.F.	5.9	1.5	0.	98	1.5	240
6C6	DET.-OSC.	5.9	17.	15.	98	—.5	98
75	1st AUD.	5.9	.5	0	—	—	80
42	PWR.	5.9	0	—5	240	0	220
84	RECT.	5.9	240	—	—	—	—

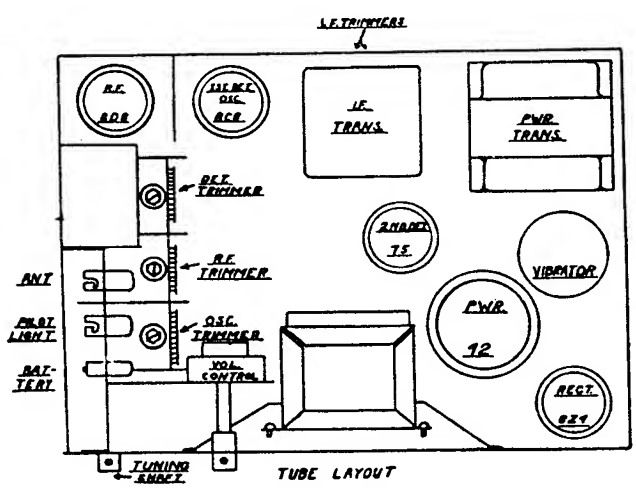
Ef—Filament. Ek—Cathode. Eg^1—Control Grid. Eg^2—Screen Grid. Eg^3—Suppressor Grid. Ep—Plate.
ALL VOLTAGES MEASURED FROM INDICATED POINTS TO GROUND.



CONDENSERS		RESISTORS	
C.1	.05 X 200 V.	R.1	150 Ω
C.2	.1 X 200 V.	R.2	450
C.3	11 mmf. GIMMICK	R.3	5000
C.4	.05 X 200 V.	R.4	200
C.5	.01 X 200 V.	R.5	1 MEG. ½ W
C.6	.001 MICA	R.6	25 M. 1 W.
C.7	.01 400 V.	R.7	500 M. VOL. CONTROL
C.8	.05 200 V.	R.8	250 M. ½ W.
C.9	1 MFD. X 120 V.	R.9	500 M. ½ W.
C.10	.01 X 400 V.	R.10	301 M ½ W. WHITE DOT
C.11	.1 X 200 V.	R.11	100
C.12	.003 X 600 V.	R.12	100
C.13	8 MFD X 350 V.	R.13	500 M. ½ W
C.14	8 MFD X 350 V.	R.14	1 MEG.
C.15	.002 MICA		
C.16	.015 X 1400 V.		
C.17	.00025 MICA		

NOTE:
C.1, C.2, C.4, C.5 IN ONE UNIT. PART 7145-4
C.13, C.14 IN ONE UNIT PART 7119-4
R.1, R.2, R.3, R.4 IN ONE UNIT. PART 7105-14
R.11, R.12, IN ONE UNIT PART 7106-6

CIRCUIT DIAGRAM - MODEL 7



TUBE POSITION

Warranty

The Zenith Radio Corporation guarantees each new ZENITH receiver and each new ZENITH QUALITY TUBE to be free from defects in workmanship and material.

Our obligation under this warranty is limited to making good at our factory any part or parts of the receiver which within thirty days shall be returned to us with transportation charges prepaid and which on examination shall be found to our satisfaction to have been thus defective. This warranty is expressly in lieu of all other warranties expressed or implied, and we neither assume nor authorize any representative or other person to assume for us any other liability in connection with the sale of ZENITH receivers or ZENITH QUALITY TUBES.

This warranty shall not apply to any receiver or tube which shall have been repaired or altered outside of our factory in any way so as, in our judgment, to affect its stability or reliability, nor which has been subject to misuse, negligence or accident, nor which has had the serial number or name altered, defaced or removed. Neither shall this warranty apply to any receiver in which other than ZENITH QUALITY TUBES have been used.

ZENITH RADIO CORPORATION.

PARTS LIST

ZENITH JR. MODEL 7

Condensers

Part No.	Description	List Price
7100-4	.1 Mfd. 200 V	$ .15
7100-8	.015 Mfd. 1400 V	.25
7100-9	.05 Mfd. 200 V	.15
7100-11	.01 Mfd. 400 V	.15
7100-12	.003 Mfd. 600 V	.25
7129-1	.001 Mfd. 600 V	.20
7129-6	.002 Mfd. 600 V	.20
7129-12	.00025 Mfd. 600 V	.20
7145-4	.21 Mfd. Block	.65
7148-2	1. Mfd. 120 V	.60
7119-4	8. x 8. Mfd. 350 V	2.25
7102-7	2-Gang Variable	3.25

Resistors

7101-9	Volume Control Assembly	1.00
7106-6	200 Ohm C.T. Wire Wound	.20
7106-14	5800 Ohm C.T. Wire Wound	.45
7130-3	500M Ohm 1/3 Watt Carbon	.20
7130-11	250M Ohm 1/3 Watt Carbon	.20
7130-15	301M Ohm 1/3 Watt Carbon	.20
7130-19	1 Megohm 1/3 Watt Carbon	.20
7130-30	25M Ohm 1 Watt Carbon	.25

Coils—Chokes

7105-3	A. Choke	.75
7108-19	I. F. Coil Complete	1.50
7109-7	R. F. Coil Complete	.65
7110-7	Oscillator Coil and Bracket Assembly	.65
7111-12	Antenna Coil	1.20

Miscellaneous

7146-1	Steering Column Mounting Bracket Assembly	.30
7152-2	Zenith Jr. Control Head Assembly (Less Cables)	4.00
7116-6	Pilot Lamp Cable & Bracket Assembly	.50
7116-5	6 V. - 8 V. Pilot Lamp	.15
7149-18	18″ Volume Control Cable Assembly	.67
7150-18	18″ Tuning Control Cable Assembly	.67
7104-6	Power Transformer	2.50
7105-4	Filter Choke	.80
	All Sockets	.10
7142-1	Vibrator	5.00
7146-2	Cable Clamp Bushing & Bracket Assembly	.20
7167-1	5″ Dynamic Speaker	4.75
7152-1	Antenna Cable	.30
7152-2	A Battery Cable	.25
7148-1	.5 Mfd. 200 V. Generator Condenser	.50
7148-3	.5 Mfd. 200 V. Ammeter Condenser	.45
7168-1	15M Ohm Spark Plug Suppressor	.30
7168-2	15M Ohm Distributor Plug Suppressor	.30
7135-5	3″ Carriage Bolt and Nut	.05
7169-1	15 Ampere Fuse	.06

ALL PRICES ARE LIST, SUBJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE. USE ONLY GENUINE ZENITH PARTS FOR REPLACEMENT.

ZENITH RADIO CORPORATION
3620 Iron Street
Chicago, U. S. A.

SERVICE MANUAL

AUTOMOBILE RECEIVER | FEB., 1934 | Model 462

Installation

There are certain problems in connection with every automobile radio installation not common to the average home receiver. They may be classed as follows:

a. Antenna
b. Receiver
c. Motor Noise Suppression

In order to insure complete satisfaction to the car owner, each subject must be given careful consideration. The following information should serve to simplify the job and at the same time give the service man more confidence in his work.

Antenna

Practically all late model automobiles are equipped with a top antenna suitable for broadcast reception. If there is any question as to whether the particular car in which the installation is being made is equipped with an antenna, the local sales agency will furnish this information. Where it is incorporated, the lead-in will be found most generally under the instrument panel, beneath the right or left windshield post. The lead-in must be shielded at least from where it comes out of the post to the receiver. This shielding should then be grounded to the instrument panel or bulkhead. Car antennas should always be checked with a continuity meter for high resistance leakage or short circuit. Either of these conditions will seriously affect the efficiency of the receiver.

If the car does not have an antenna, a standard plate or strap may be used. However by far the best results will be obtained if the antenna is constructed in the top. A piece of copper screen approximately two and one half feet square, tacked to the top ribs between the head-lining and the top covering, will prove satisfactory. Remove the upholstered moulding from the front and sides and drop the head-lining about half way back in sedans or the total length in coupes. The lead-in is soldered to a front corner and brought down the corresponding post. Shield this wire over its entire length but be careful that the shield does not touch the copper screen. If the top is re-enforced with chicken wire, it can be used as an antenna by cutting about three inches away around four sides of a portion two feet square. The lead-in is of course attached in the same manner as in the case of the copper screen.

In roadsters or convertible models a plate or strap type antenna is advisable since the efficiency of a top system is poor especially when folded back against the body. It is important, however, to shield the lead-in since more motor noise is apt to be intercepted. Never bring the lead-in through the motor compartment as it will inevitably feed a great deal of motor interference to the receiver.

Receiver

The first step in the installation of the receiver is to select a suitable spot on the bulkhead, inside the driver's compartment, where it will not interfere with the operating controls of the car.

Provisions have been made for rear mounting with the speaker facing the occupants of the car, or for side mounting with the speaker facing directly across the car. The preferred position is high up on the left hand side of the bulkhead, with the speaker facing to the right. This will leave the right hand side of the bulkhead free for heaters, etc.

The remote tuning unit must be clamped to the lower edge of the instrument board in such position that the control cables are not cramped or bent sharply, as it would otherwise interfere with the free operation of the control knobs.

After a suitable location has been selected for both the receiver and the remote control unit, three ½" holes should be drilled through the bulkhead, spotting them by means of the drilling template supplied with each set. (Be sure the proper side of the template is used, depending upon the mounting position of the set.)

The carriage bolts are next placed through the carriage bolt brackets and fastened to the receiver by two 10/32x¼" round head machine screws each, in the tapped holes provided on the side or rear of the chassis case for this purpose. Wooden spacers are supplied with each kit to compensate for different thicknesses of the bulkhead, or variations in its surface. Usually it is advisable to employ one block for each bolt on the inside of the car and another on the outside.

The battery cable can be identified as the larger of the two wires that come out through the speaker panel. It is in two sections, being divided so a fuse can be connected in series with it. Connect the hot lead of this battery cable to the battery side of the ammeter (the side that does not register current drain), or to the battery terminal of the ignition coil. The cold lead is to be grounded under any convenient screw on the instrument panel. THESE INSTRUCTIONS APPLY REGARDLESS OF THE POLARITY OF THE BATTERY.

The antenna connection will be found at the rear of the receiver.

Insert the free end of the remote tuning cable (right hand knob) in the upper hole on the speaker panel, making sure the wedge shaped tip falls into the slotted connector before tightening the cable clamp screw. Insert the free end of the volume control cable in the lower hole, taking the same precautions.

When installing cables, it is essential that the cable armour be inserted in the clamp far enough that the tightening process does not crimp the end of the armour, causing the control shaft to bind. This precaution should also be taken when fastening the other end of the cable in the control head. The end of the cable armour must extend beyond the set screw. To prevent creeping or backlash of the controls, the control cables should be securely fastened at several points throughout their lengths to any stationary object under the instrument panel.

If the operating controls turn too hard, it may be necessary to loosen the two screws that hold each cable clamp to the speaker panel and shift the clamp slightly to align it properly with the hole in the panel, retightening the screws when the correct alignment is determined.

Clamp the remote control head to the lower edge of the instrument panel, using the two thumb nuts to fasten it securely. Be sure it is mounted in such a position that the cables do not make sharp bends.

Connect the dial light cable from the control head to the smaller of the two cables which come out of the speaker panel.

To place the dial on scale proceed as follows:

1. Tune in a station of known frequency on the high frequency end of the scale. (Between 1300 K.C. and 1500 K.C.)
2. Loosen the set screw and remove the tuning knob.
3. Loosen 2 set screws in the tuning shaft bushing. This permits the bushing and pointer to be turned without changing the variable condenser setting.
4. Turn the bushing until the pointer registers the exact frequency of the station that is being received.
5. Tighten the set screws and put the tuning knob back in place.

The dial should now track accurately throughout the scale.

Motor Noise Suppression

Every automobile generates high frequency electrical interference by virtue of the ignition coil, distributor and spark plugs. In order to receive any degree of satisfaction from an automobile receiver, the interference so generated must be eliminated by means of suppression. Each car, however, presents an individual problem where the serviceman must use his own ingenuity in addition to certain definite instructions. We offer the following as a result of actual experience, and believe that if followed carefully, motor noise in any car can be overcome.

The first essential procedure is to apply the standard suppression parts furnished in each kit. This consists of placing a resistor on each spark plug and on the center high tension lead at the distributor. Since all high tension wires act as small antennas or radiators, they should be kept down as close to the motor as possible. Do not attach the suppressors in an upright position. Always try to keep them horizontal, or as near to the block as conditions will permit. Next in importance is the generator condenser. This filters a high pitched whining noise, which would otherwise be heard without it, as the motor is accelerated. Next in order is the ignition coil condenser. It is very essential that it be placed on the proper low tension coil connection. This can be determined by testing each side of the primary with a screw driver held in the hand by the metal part. One will give off a slight high frequency spark, while the other side will appear to be cold. This test is made with the motor running. The condenser is attached from the cold (battery side) side to ground. Placing the condenser on the wrong side of the coil will seriously affect the car's operation and tend to make the motor noise more pronounced. THIS IS IMPORTANT. Reversing the primary leads will somtimes reduce motor noise.

After standard suppression has been applied and the hood clamped down to prevent radiation, the receiver should be turned on and the dial tuned off a station, with the volume control at maximum. If the motor noise is still objectionable, the next step is to determine whether the interference is originating through chassis pickup or from the antenna.

To check for chassis pickup, the antenna should be disconnected and the lead grounded. The motor is then started and if any noise is heard, it is originating through the battery circuit and will require isolation of certain of the car wires. Chassis pickup can be reduced effectively also by shortening the gap in the distributor head. To do this, solder is applied to the end of the rotor arm, after which it is placed back

in position and the distributor cap reset. With the crank, the motor should be turned over slowly, in order to clean the excess solder. As an additional precaution, the breaker points should be thoroughly cleaned, or new points installed if they are burned or badly worn.

Where the low tension leads are all bunched together with the high tension wires in a sleeve under the instrument panel, they should be separated and the high tension leads brought out through another hole. Sometimes a .1 mfd. condenser on the distributor low tension side of the coil is also effective. A condenser should be used at the electrical connection of all gauges such as oil, water, gas, etc.

Cars with rubber mounted motors must have the motor bonded to the bulkhead and again to the frame at the radiator, to provide a direct path for the high tension interference developed in the ignition system. ⅜" copper braid will be found satisfactory.

If the coil is mounted inside the driving compartment, it might be necessary to shield the high tension lead. This cannot be done effectively, however, if the wire has rubber insulation. Where the car is so equipped, this wire should be removed and Packard cable of the same length substituted. This allows shielding without corona effects and consequent interruption of car performance. When applying the shield over this wire be sure that it terminates at least an inch and a half from both the coil and the distributor; otherwise, it might have a tendency to break down. The shield must be grounded to the instrument panel, dashboard or motor block. The other high tension leads to the spark plugs are not to be shielded. So far there has never been a case where this procedure was required. It would therefore only involve considerable work to no advantage.

Be sure to keep the battery cable from the receiver out of the motor compartment. Running this cable through the motor side has been found to be the cause of ignition interference.

This procedure should eliminate all possibility of chassis pickup, after which the antenna lead can be connected. Any motor noise picked up from this point on is being absorbed entirely by the antenna. The first precaution, if it exists, is to check the dome light wiring. It is known that these leads pick up motor noise and carry it to the aerial from around the dash compartment. Removing the dome light wire from the ammeter, or connecting a low resistance RF choke at this point will overcome the difficulty.

If the car has a wooden bulkhead, it will be found necessary to line it on the motor side with thin sheet lead, or other conductor. This will prevent interference from entering the inside of the car and from there being picked up by the antenna. Occasionally it will be found that the copper tubing which runs from the motor to the windshield wiper carries the interference to the antenna. This can be eliminated by bonding the windshield pipe at the dashboard with a short piece of copper braid. The same procedure might also be necessary with respect to the oil line, brake rod, spark and gas controls, or other metal conductors which pick up high frequency interference from the motor compartment.

No absolute rule for complete motor interference elimination can be specified inasmuch as sometimes two cars of the same make are likely to require bonding or shielding at different points. However, the foregoing suggestions, in addition to some ingenuity on the part of the radio man, will in every case prove effective.

Service

This receiver employs a six tube superheterodyne circuit of the following tube complement:

1—6C6 Radio Frequency Amplifier
1—6F7 1st Detector and Oscillator
1—6D6 Intermediate Amplifier
1—75 2nd Detector
1—42 Power Amplifier
1—6Z4 Rectifier

The following subjects cover in an elementary manner the possible complaints encountered in ordinary service and the corresponding corrections. It is suggested that they be considered in the order listed when making a preliminary examination.

1. Inoperative
2. Weak
3. Distortion
4. Rattles
5. Dial off Calibration
6. Intermittent Operation
7. Motor Noise
8. Noisy Reception

After the trouble has been isolated, the following procedure will prove effective. (Consult illustrations)

1. INOPERATIVE
   (a) Examine fuse and replace if open.
   If fuses continue to blow, a probable short circuit exists in the power supply unit or chassis wiring.
   (b) Defective tube—replace those that do not check normal.
   (c) Loose or corroded radio supply connection.
   (d) Broken wire in chassis.
   (e) Tube out of socket.
2. WEAK
   (a) Defective tube.
   (b) Shorted antenna.
   (c) Weak storage battery.

(d) Defective speaker.
(e) Defective vibrator assembly.
(f) Broken connection.

3. DISTORTION
(a) Defective speaker.
(b) Defective tube (42, 75 or 6Z4).
(c) Defective vibrator.

4. RATTLES
(a) Loose tube shields.
(b) Loose speaker or case screws.
(c) Defective speaker.
(d) Loose instruments, wires, rods, etc. on dash.

5. DIAL OFF CALIBRATION
(a) See paragraph on resetting indicator in "Alignment."

6. INTERMITTENT
(a) Loose radio supply connection.
(b) Defective tubes.
(c) Loose connection in receiver chassis.
(d) Broken tube socket.
(e) Short in antenna or lead-in.

7. MOTOR NOISE
(a) Defective suppressor.
(b) Broken lead or defective by-pass condenser at generator, coil or gauge.
(c) Open ground to lead-in shielding.

8. NOISY RECEPTION
(a) See "motor noise."
(b) Defective vibrator.
(c) Loose antenna connection at receiver.
(d) Loose fuse holder.
(e) Defective tubes.
(f) Loose tube shields.
(g) Antenna shorting to frame of car.
(h) Natural atmospheric or electrical disturbances.
(i) Loose or defective wiring in high or low tension car wiring.

To Replace Power Supply Unit:

1. Unsolder two red leads from rectifier (6Z4) socket; blue lead from terminal strip near tone control and black lead from green terminal on electrolytic condenser. (Leads mentioned feed through the chassis base beneath power supply unit).
2. Remove the 4-8/32 screws which hold power supply unit in place beneath chassis base.

To Replace Speaker:

1. Remove 4-6/32 screws at lower left and right hand corners of front panel.
2. Unsolder speaker leads from terminal strip and 42 socket on under side of chassis.
3. Remove 4-6/32 speaker screws from around grill on panel.

Tubes:

Tubes should be checked on a standard test panel and conform to the corresponding tolerances.

To Remove Receiver from Car:

1. Loosen cable clamp screws at receiver and remove cables.
2. Disconnect battery, dial light and antenna cables.
3. Remove 3 5/16" nuts from carriage bolts, which hold chassis to bulkhead.

To Replace Dial Light:

1. Lower control head below bottom edge of instrument panel.
2. Remove one screw from dial light bracket (on rear of control head).
3. Remove bracket and install new dial light.

The following is a list of performance factors that will be of value where it is desired to make accurate measurements:

Intermediate Frequency—252½ K.C.
Sensitivity in Microvolts—1
Power Output in Milliwatts—2500
Power consumption—40 watts at 6 volts.

Tube Operating Voltages:

Position	Tube	Ef	Ek	Eg^1	Eg^2	Eg^3	Ep
R. F. Amplifier	6C6	5.6	1.5	*	1.5	72	174
1st Det.-Osc.	6F7	5.6	3.5	0	3.5	72	Det. 174 Osc. 130
1. F. Amplifier	6D6	5.6	1.5	*	1.5	72	174
2nd Det. A. V. C.	75	5.6	1.2	0	0	—	156
Power Amp.	42	5.6	0	—11.5	0	174.6	165
Rectifier	6Z4	5.6	174.6	—	—	—	—

f—Filament; k—Cathode; g^1—Control Grid; g^2—Suppressor Grid; g^3—Screen Grid; p—Plate; *—Depends on applied signal strength. All voltages measured from indicated points to ground. Battery voltage 6 volts.

Alignment

Every Zenith automobile receiver is balanced on an accurate crystal controlled oscillator before leaving the factory; and, unless a part is changed or the calibration has shifted, the adjustments should never be tampered with. Where it is absolutely necessary, however, a good test oscillator capable of delivering a modulated signal at 1500, 600 and 252½ K. C. will be essential.

Before attempting to make any adjustments, the dial indicator must be set to 540 K. C. with the tuning condenser plates in full mesh. This is done as follows:

1. Turn control knob toward the left until the stop is reached.
2. Remove tuning knob.
3. Loosen two set screws in tuning shaft bushing (under knob).
4. Turn bushing until dial reads 540 K. C.
5. Tighten set screws and replace tuning knob.

The receiver may now be aligned and will dial accurately when the operation is completed.

To balance the I.F. circuit, remove the grid lead from the 6F7 and connect the 252½ K.C. test oscillator signal to the grid of the tube and to ground. Adjust the 1st I.F. primary trimmer to maximum output from either the speaker or an output meter. Follow in the same manner with the secondary, and the primary and secondary of the 2nd I.F. transformer. This completes the I.F. circuit. Place the grid lead back on the 6F7 tube.

Next attach the test oscillator to the antenna and ground leads and set it to 1500 K.C. Turn the dial indicator to 1500 and adjust the oscillator, detector and R.F. trimmers, on the condenser gang, for maximum output. Set the test oscillator to 600 K.C. and rock the pointer slowly over the same frequency on the dial at the same time adjust the padder condenser for greatest signal strength. All adjustments should be gone over twice—at least twice—to insure greatest accuracy.

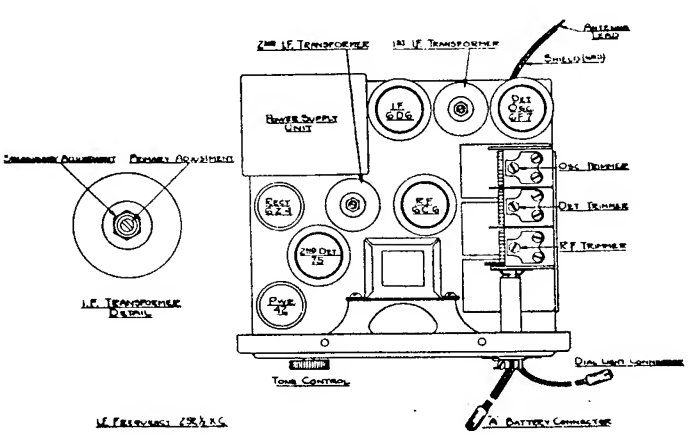


Fig. 1

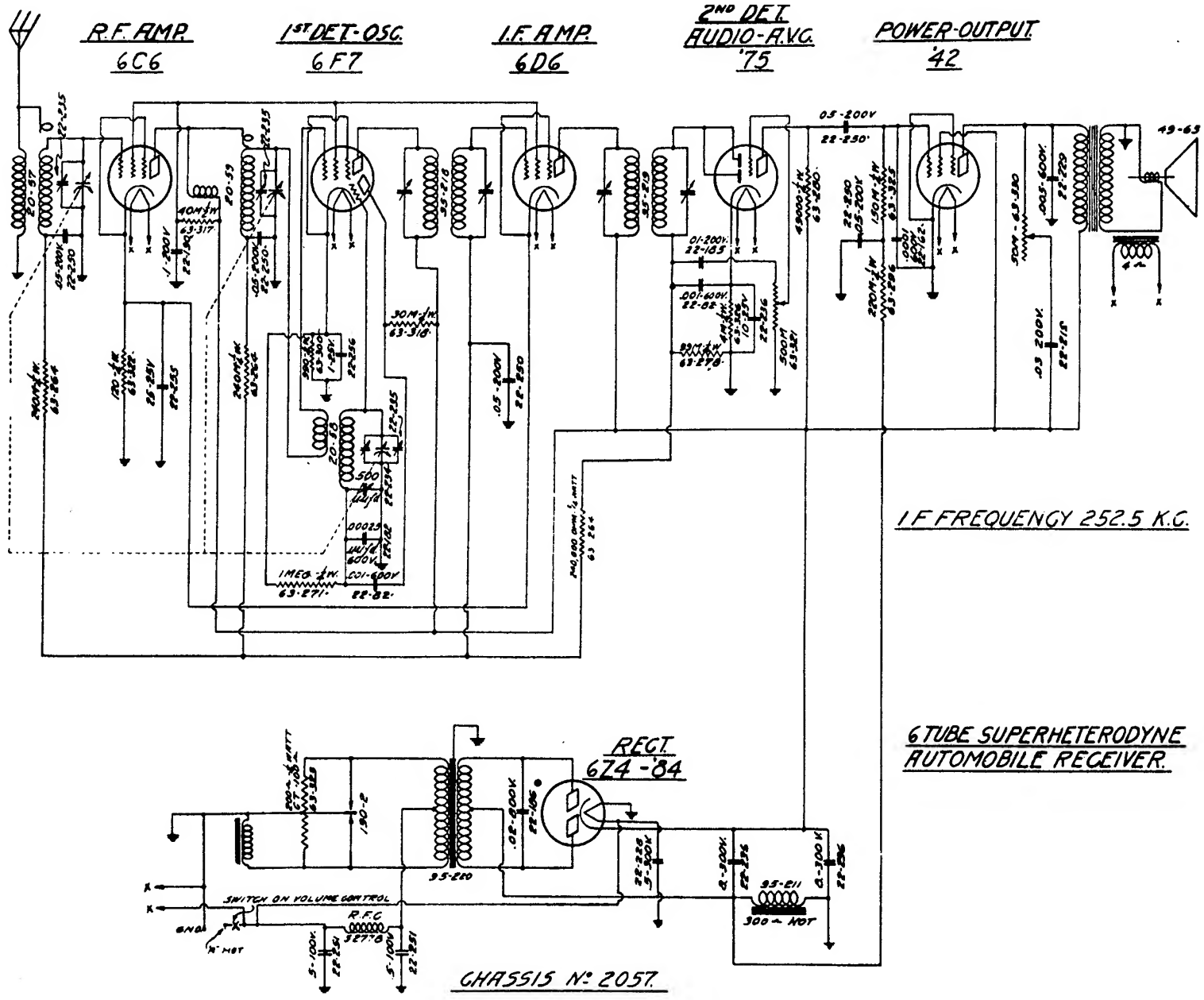
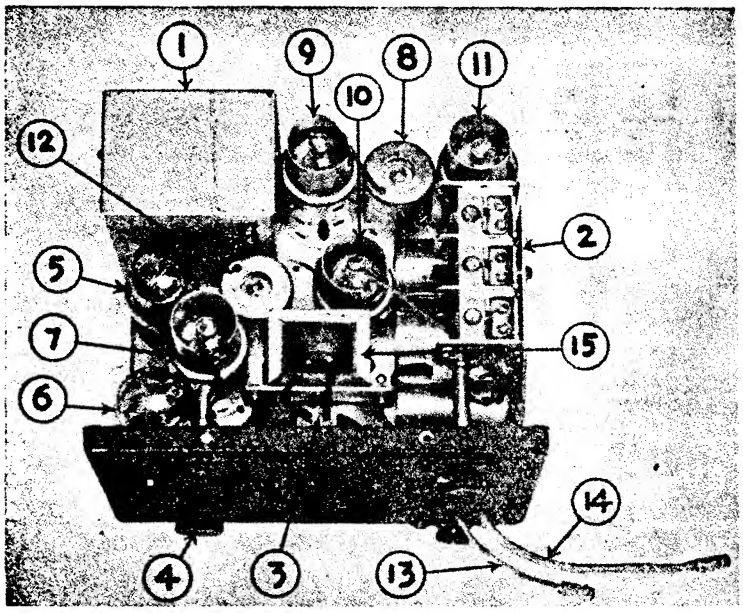

R.F. AMP.
6C6
1ST DET-OSC.
6F7
I.F. AMP.
6D6
2ND DET.
AUDIO-A.V.C.
'75
POWER-OUTPUT
'42
I.F. FREQUENCY 252.5 K.C.
6 TUBE SUPERHETERODYNE
AUTOMOBILE RECEIVER.
RECT.
6Z4-84
SWITCH ON VOLUME CONTROL
CHASSIS No. 2057.

Fig. 2



1. Power Supply Unit
2. Variable Condenser
3. Speaker
4. Tone Control
5. 6Z4 Rectifier Tube
6. 42 Power Tube
7. 75 2nd Detector Tube
8. 1st I.F. Transformer
9. 6D6 I.F. Amplifier Tube
10. 6C6 R.F. Amplifier Tube
11. 6F7 1st Detector-Oscillator Tube
12. 2nd I.F. Transformer
13. Pilot Light Supply Lead
14. Battery Cable
15. Speaker Transformer

FIGURE 3

Parts and Prices

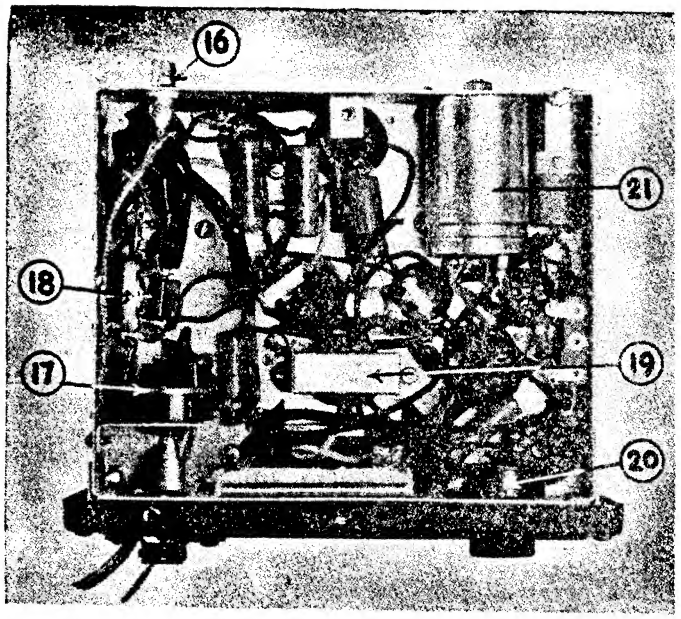
S-2814	Chassis Case Assembly		$ 2.30
MS-217	Front Panel & Grill Assembly		.55
S-2803	Control Cable Sleeve Clamp		2.52C
54-67	No. 8-32 x 11/32" Square Stud Nuts	(Used with S-2803)	.20C
69-102	No. 8-32 x ⅜" Rd. Hd. Mach. Screws	(Used with S-2803)	.28C
49-65	Dynamic Speaker Complete		5.50
49-65A	Cone & Voice Coil for 49-65		2.30
49-65B	Field Coil for 49-65		1.00
49-65C	Output Transformer for 49-65		1.50
110-23	Speaker Grill Cloth for Front Panel		.10
83-329	Sponge Rubber Baffle Strips for Speaker Mtg.		.12
112-44	No. 6-32 x ¾" Black Speaker Mtg. Screws		.20C
93-125	No. 6 Lock Washers		.18C
54-34	No. 6-32 x ¼" Hex Nuts		.18C
22-235	Three Gang Variable Condenser		3.25
20-57	R. F. Coil Assembly Complete with Can & Connector		1.30
20-58	Oscillator Coil Complete with Can		1.20
20-59	Detector Coil Complete with Can		1.30
95-218	1st I.F. Transformer Complete with Can		1.50
95-219	2nd I.F. Transformer Complete with Can		1.50
95-211	Filter Choke		.75
S-2779	Complete Power Unit Assembly		10.50
S-2778	Vibrator Isolation Choke	(Part of Power Unit Assembly)	.15
22-251	.5 Mfd. 100 volt Condenser	(Part of Power Unit Assembly)	.35
22-186	.02 Mfd. 800 volt Condenser	(Part of Power Unit Assembly)	.25
63-323	200 Ohm ¼ Watt C.T. Resistor	(Part of Power Unit Assembly)	.20
95-220	Rectifier Transformer	(Part of Power Unit Assembly)	2.00
190-2	Rectifier Vibrator	(Part of Power Unit Assembly)	3.75
24-50	Power Unit Cover	(Part of Power Unit Assembly)	.10

MISCELLANEOUS CONDENSERS

22-82	.001 Mfd. 600 Volt	(Osc. Plate & 2nd Detector Diode)	.25
22-162	.0001 Mfd. 600 Volt	(Power Grid)	.12
22-182	.00025 Mfd. 600 Volt	(Fixed Padder)	.12
22-185	.01 Mfd. 200 Volt	(2nd Detector Diode)	.15
22-190	.1 Mfd. 200 Volt	(R.F. Screen)	.15
22-219	.03 Mfd. 200 Volt	(Tone Control)	.15
22-228	.5 Mfd. 300 Volt	(Rectifier Filament)	.30
22-229	.005 Mfd. 600 Volt	(Power Plate)	.15
22-234	Padder Condenser Assembly		.45
22-236	Three Section Filter	(See Diagram)	2.75
22-250	.05 Mfd. 200 Volt	(R.F. 1st Detector, I.F. Grid Return)	
		(Audio Coupling and Power Grid)	.15
22-255	.25 Mfd. 25 Volt	(R.F. Cathode)	.20
22-256	.1 Mfd. 25 Volt	(Oscillator Cathode)	.15

MISCELLANEOUS RESISTORS

63-264	240M Ohms ¼ Watts	(R.F. 1st Det. Grid Return & 2nd Det. Diode)	$ .20
63-271	1 Megohm ¼ Watts	(Oscillator Grid)	.20
63-278	99 M Ohms ¼ Watts	(Diode)	.20
63-280	49M Ohms ¼ Watts	(2nd Detector Plate)	.20
63-296	220M Ohms ¼ Watts	(Power Grid)	.20
63-300	990 Ohms ¼ Watts	(1st Detector Cathode)	.20
63-317	40M Ohms ½ Watts	(R.F. Screen)	.25
63-318	30M Ohms ¼ Watts	(Oscillator Plate)	.20
63-321	500M Ohms (Volume Control & Bushing Assembly)		1.00
63-322	120 Ohms ¼ Watts	(R.F. Cathode)	.20
63-325	150M Ohms ¼ Watts	(Power Grid)	.20



GURE
4

16. Antenna Connector (Female)
17. Volume Control and Switch
18. Padder Condenser
19. Filter Choke
20. Tone Control
21. Filter Condenser

MISCELLANEOUS RESISTORS (Cont.)

3-326	4M Ohms ¼ Watts (2nd Detector Cathode)	.20
3-330	50M Ohms (Tone Control Unit)	.75

CONTROL HEAD ASSEMBLY

0-5	Complete Head with Knobs, Panel Mtg. Bracket and 24" Cables	6.00
0-8	Complete Head with Knobs, Column Mtg. Bracket and 30" Cables	6.78
2-322	Panel Mtg. Bracket only (Standard)	.22
2-46	2" x 10/24 Thumb Screws for Above	.03
6-74	Volume Control Key Knob	.30
6-75	Tuning Control Knob	.20
S-2818	Pilot Lamp Cable & Bracket Assembly	.80
0-27	6-8 Volt Pilot Lamps	.15
6-6	15 Ampere Fuse	.04
8-26	Fuse Insulating Sleeve	.01
S-2819	Bushing & Gear Assembly	.80
S-2820	Pointer Gear & Shaft Assembly	.80
S-2821	Dial Scale, Mask & Frame Assembly	.80
1-2	Glass	.12
7-427	Cover Plate	.50
7-20	Pointer	.10

MISCELLANEOUS PARTS

6-71	Rubber Tone Control Knob	.05
2-42	"A" Battery Cable on Chassis	.20
2-44	A Battery Cable and Fuse Receptacle	.55
8-21	D.-R. Antenna Connector Cap	.01
8-22	D.-R. Spring	.005
8-23	D.-R. Body (Outside Connector)	.01
8-24	D.-R. Bushing and Ferrule	.01
8-25	D.-R. Washer	.005
8-67	6Z4 Tube Socket	.10
8-68	6C6 Tube Socket	.10
8-69	6D6 Tube Socket	.10
8-89	6F7 Tube Socket	.10
8-91	75 Tube Socket	.10
8-92	42 Tube Socket	.10
6-123	Shielded Antenna Loom	.25
6-127	Tube Shield, Plain	.10
S-2787	Tube Shield, with Flexible Lead	.15
8-2	Rubber Band for Tubes	.02
S-2810	Pilot Lamp Cable on Chassis	.10

SUPPRESSOR AND MOUNTING EQUIPMENT

2-193	.5 Mfd. 200 Volt Ignition Coil Condenser	.45
2-194	.5 Mfd. 200 Volt Generator Coil Condenser	.50
3-334	15M Ohm Spark Plug Suppressor	.35
3-335	15M Ohm Distributor Suppressor	.35
2-323	Special Control Head Steering Column Mtg. Assembly	.67
5-125	Volume Control Cable Assembly 20" length	$ 1.30
5-126	Volume Control Cable Assembly 24" length	1.30
5-127	Volume Control Cable Assembly 30" length	1.60
5-128	Volume Control Cable Assembly 36" length	1.90
5-129	Tuning Control Cable Assembly 20" length	1.20
5-130	Tuning Control Cable Assembly 24" length	1.20
5-131	Tuning Control Cable Assembly 30" length	1.50
5-132	Tuning Control Cable Assembly 36" length	1.80
2-321	Chassis Box Mtg. Bracket	.02
0-104	10/32 x ¼ Black Machine Screws	.35C
3-127	No. 10 Shakeproof Lock Washer	.35C
3-143	⅜" Shakeproof Lock Washer	.30C
4-11	3" Carriage Bolt & Nut	.20C
7-12	Wooden Spacer Block	.01

All prices subject to regular discount and change without notice. February 8, 1934

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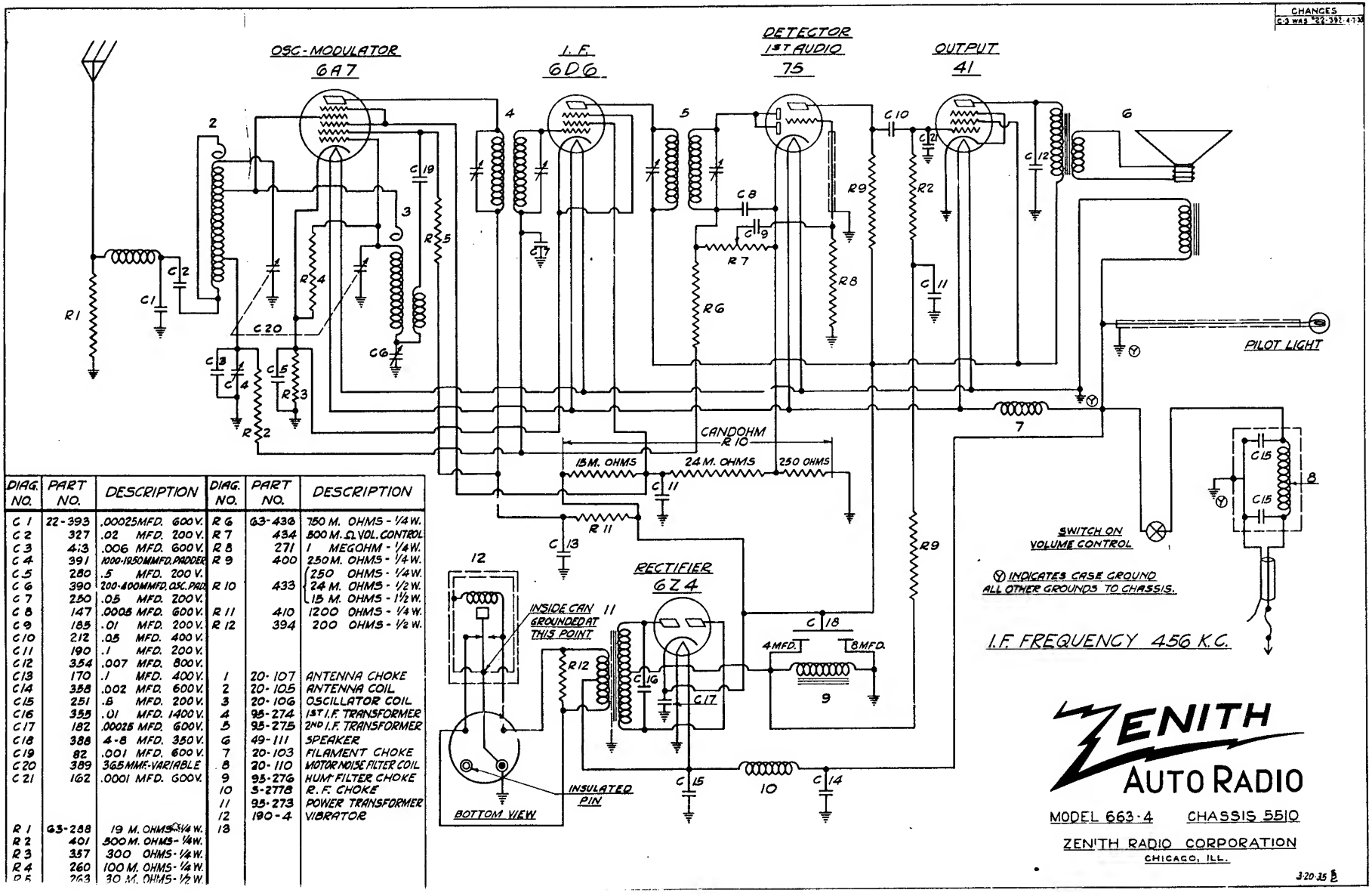


DIAG. NO.	PART NO.	DESCRIPTION
C 1	22-393	.00025MFD. 600V.
C 2	327	.02 MFD. 200V.
C 3	413	.006 MFD. 600V.
C 4	391	100-1950MMFD. PADDER
C 5	280	.5 MFD. 200V.
C 6	390	200-400MMFD. OSC. PAD.
C 7	250	.05 MFD. 200V.
C 8	147	.0008 MFD. 600V.
C 9	185	.01 MFD. 200V.
C 10	212	.05 MFD. 400V.
C 11	190	.1 MFD. 200V.
C 12	354	.007 MFD. 800V.
C 13	170	.1 MFD. 400V.
C 14	358	.002 MFD. 600V.
C 15	251	.8 MFD. 200V.
C 16	355	.01 MFD. 1400V.
C 17	182	.00025 MFD. 600V.
C 18	388	4-8 MFD. 350V.
C 19	82	.001 MFD. 600V.
C 20	389	365 MMF. VARIABLE
C 21	162	.0001 MFD. 600V.
R 1	63-288	19 M. OHMS - 1/4 W.
R 2	401	500 M. OHMS - 1/4 W.
R 3	357	300 OHMS - 1/4 W.
R 4	260	100 M. OHMS - 1/4 W.
R 5	263	30 M. OHMS - 1/2 W.

DIAG. NO.	PART NO.	DESCRIPTION
R 6	63-436	750 M. OHMS - 1/4 W.
R 7	434	500 M. Ω VOL. CONTROL
R 8	271	1 MEGOHM - 1/4 W.
R 9	400	250 M. OHMS - 1/4 W.
R 10	433	250 OHMS - 1/4 W. 24 M. OHMS - 1/2 W. 15 M. OHMS - 1 1/2 W.
R 11	410	1200 OHMS - 1/4 W.
R 12	394	200 OHMS - 1/2 W.
1	20-107	ANTENNA CHOKE
2	20-105	ANTENNA COIL
3	20-106	OSCILLATOR COIL
4	95-274	1ST I.F. TRANSFORMER
5	95-275	2ND I.F. TRANSFORMER
6	49-111	SPEAKER
7	20-103	FILAMENT CHOKE
8	20-110	MOTOR NOISE FILTER COIL
9	95-276	HUM FILTER CHOKE
10	5-2778	R. F. CHOKE
11	95-273	POWER TRANSFORMER
12	190-4	VIBRATOR
13		

TUBE	POSITION	Ef	Ek	Eg1	Eg2	Eg3	Ep
6A7	1st Det.	5.8	4	0	97	-	205
	Osc.			0	-	-	175
6D6	I. F.	5.8	4	0	97	4	217
75	2nd Det. A. V. C. 1st Audio	5.8	1.1	0	-	-	160
41	PWR.	5.8	0	-15	225	-	215
6Z4	RECT.	5.8		225	-	-	-

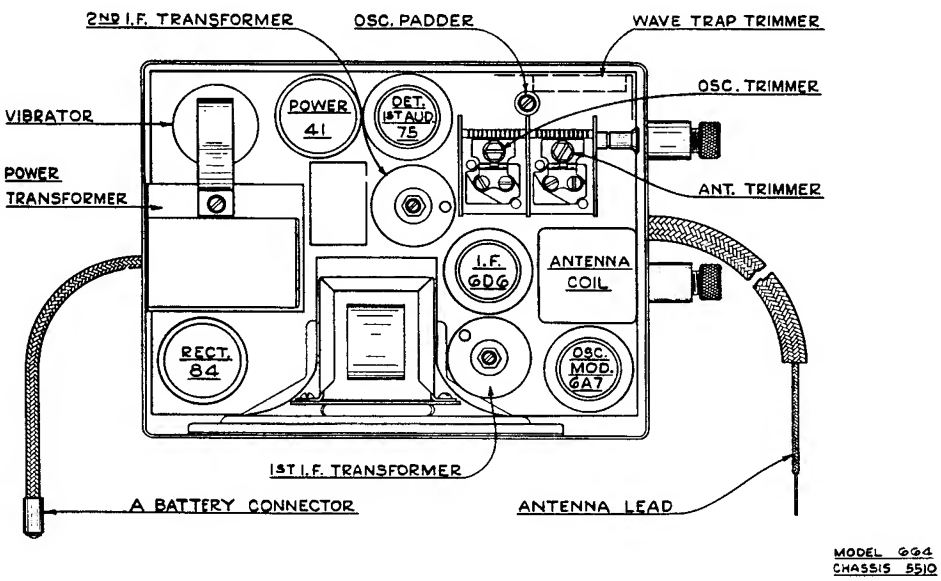
Line Voltage - 6 V.

Ef - heaters; Ek - cathode; Eg1 - control grid; Eg2 - screen grid; Eg3 suppressor grid; Ep - plate.

All measurements taken from point indicated to ground, using a 1000 ohm per volt D.C. meter.

Alignment

(1) Balance I. F. transformers at 456 K. C. with signal generator connected to grid of 6A7 and ground.
(2) Connect signal generator to antenna and ground. Adjust oscillator trimmer on gang for correct dial reading at 1400 K.C. Adjust detector trimmer for greatest output.
(3) Adjust oscillator padder while rocking pointer forward and backward past 600 K.C. to combination giving greatest output.
(4) Realign 1400 K.C. trimmers on gang.
(5) Set signal generator at 456 K.C. and gang at 600 K.C. Adjust wave trap trimmer for minimum signal.



Tube Position

PARTS AND PRICES
MODEL 664
Chassis #5510

Resistors (Chassis Only)

63-260	100 M Ohm ¼ Watt	$ .20
63-263	30 M " ½ "	.20
63-271	1 Megohm 1 "	.20
63-288	19 M Ohm 1½ "	.20
63-357	300 " 2 "	.20
63-394	200 " 2½ "	.20
63-400	250 M " 3 "	.20
63-401	500 M " 4 "	.20
63-410	1200 " 5 "	.20
63-433	250 " 10 " , 24 M Ohm ½ Watt, 15M Ohm 1½ Watt	.65
63-434	500 M " Volume Control	1.00
63-436	750 M " ¼ Watt	.20

Condensers (Chassis Only)

22-82	.001 Mfd. 600 V.	.25
22-147	.0005 " 600 V.	.15
22-162	.0001 " 600 V.	.20
22-170	.1 " 400 V.	.15
22-182	.00025 " 600 V.	.12
22-185	.01 " 200 V.	.15
22-190	.1 " 200 V.	.20
22-212	.05 " 400 V.	.20
22-250	.05 " 200 V.	.15
22-251	.5 " 200 V.	.40
22-280	.5 " 200 V.	.25
22-327	.02 " 200 V.	.15
22-354	.007 " 800 V.	.20
22-355	.01 " 1400 V.	.20
22-358	.002 " 600 V.	.20
22-388	4. x 8. Mfd. 350 V.	1.50
22-389	Variable Gang Assembly	4.00
22-390	200-400 Mmfd.	.40
22-391	1000-1950 Mmfd.	.75
22-393	.00025 Mfd. - 600 V.	.12
22-413	.006 " 600 V.	.15

Coils, Chokes and Miscellaneous Chassis Parts

20-103	Filament Choke	.15
20-106	Oscillator Coil	.50
20-107	Antenna Choke	.25
20-110	Motor Noise Filter Coil only	.25
52-44	"A" Battery Cable with Fuse Receptacle	.60
52-59	Antenna Shielded Loom	.50
52-66	"A" Battery Cable Lead on Chassis	.25
54-76	1/4" x 20 Knurled Coupling Shaft Nuts	.08
78-100	Socket for 6D6 Tube	.10
78-101	" " 75 "	.10
78-106	" " 6A7 "	.10

PARTS AND PRICES — MODEL 664, Chassis #5510

	Coils, Chokes and Miscellaneous Chassis Parts Cont'd	
78-114	Socket for 6Z4	$ .10
78-115	" " Vibrator	.10
78-126	" " 41 Tube	.10
95-273	Power Transformer	2.00
95-275	2nd I. F. Transformer	1.25
95-276	Hum Filter Choke	.60
190-4	Vibrator	5.00
S-2778	R. F. Choke	.15
S-3603	Motor Noise Filter Assemb. complete with Case & "A" Bat. lead.	1.50
S-3609	1st I. F. Transformer Assembly	1.35
S-3622	Antenna Coil Assembly	2.00
	Case Assembly	
93-220	Bakelite Washer for Chassis Mounting Screws	.02
94-185	Rubber Bushing " " " "	.02
97-75	#10-32 x $\frac{1}{4}$" Wing Screws for Top Cover	.02
97-76	Wing Screw for Ground Connection	.02
112-69	Chassis Mounting Screws	.02
114-27	#8 x 1/4" Black Screws for Bottom Cover	.01
MS-261	Chassis Box Body less Covers	1.50
S-3601	Chassis Box Top Cover	1.00
24-93	Chassis Box Bottom Cover	.85
	Speaker Parts	
49-111	"6 Dynamic Speaker with Output Transformer	5.00
	Cone and Voice Coil for 49-111	2.30
	Output Transformer for 49-111	2.00
	Field Coil for 49-111	2.00
	Remote Control Unit	
170-15	Zenith Remote Control Unit with Knobs, Mounting Bracket and Pilot Lamp Cable less Shafts	4.50
12-423	Complete Steering Mounting Bracket Assembly	.60
17-29	Mounting Clamp only	.35
83-395	Mounting Strip only	.20
93-183	1/4" Shakeproof Washer only	.01
112-85	Mounting Clamp Screws (small)	.03
112-86	" " " (large)	.05
26-90	Dial Scale and Cup Assembly	.30
46-121	Volume and Tuning Knobs	.20
73-21	Headless Set Screw for 46-121	.02
80-110	Tension Springs for 46-121	.01
52-72	Dial Lamp Cable Assembly	.30
59-37	Dial Pointer	.10
80-110	Tuning Knob Spring	.01
100-29	6-8 V. Dial Lamp	.15
112-83	Set Screw for Volume Control Coupling Housing	.01
112-84	" " " Tuning " " "	.01
192-9	Dial Glass	.12

PARTS AND PRICES — MODEL 664, Chassis #5510

Remote Control Unit Cont'd

196-3	Dial Glass Gasket	$ .03
76-171	18" Tuning Cable and Shaft Assembly	1.00
76-174	18" Volume Cable and Shaft Assembly	1.00
76-172	24" Tuning Cable and Shaft Assembly	1.25
76-175	24" Volume Cable and Shaft Assembly	1.25
76-173	30" Tuning " " " "	1.50
76-176	30" Volume " " " "	1.50

Mounting Parts

22-193	.5 Mfd. Ignition Coil Condenser	.45
22-194	.5 " Generator " "	.50
52-44	"A" Battery Cable	.60
57-478	Set Mounting Plate	.25
58-26	Fuse Bushing	.01
63-336	Distributor Suppressior	.35
63-429	Spark Plug Suppressor (optional)	.30
69-84	10/32 x 1/4 R.H.M. Screws for 57-478	.30
93-127	#10 Shakeproof Lockwasher	.35
93-222	7/16 " "	.01
93-233	Mounting Bolt Washer	.02
136-6	15 Ampere Fuse	.06
144-14	7/16 x 3" Carriage Bolt and Nut	.05
196-1	Mounting Plate Gasket	.03

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

ZENITH RADIO CORPORATION
Chicago, Illinois, U.S.A.
May 13, 1935

SERVICE MANUAL

ZENITH AUTO RADIO

ZENITH RADIO CORPORATION

CHICAGO, U S.A.

MODEL 666 **FEB. 1935**

General

The 1935 Model 666 Zenith Auto Radio is a six tube Superheterodyne of extreme sensitivity yet requiring no spark plug suppressors for quiet operation in an automobile. This is accomplished by an exclusive method of floating the entire chassis independently of the case and incorporating a unique "A" filter within the receiver. It is especially adapted to undercar aerials as required on many of the 1935 cars with "turret" tops. Note the autodyne type of detector-oscillator circuit. This arrangement is not only highly efficient but also minimizes tube trouble in that portion of the circuit. The following service instruction should be followed carefully especially as regards "motor noise" and "antenna."

The circuit employed is a 6 tube Superheterodyne with the following tube compliment:

1—6D6 R. F. Amplifier
1—6C6 1st Detector and Oscillator
1—6D6 I. F. Amplifier
1—75 A. V. C. and 2nd Detector
1—42 Power Amplifier
1—84 Rectifier

Installation

MOUNTING RECEIVER. The receiver must be mounted on the inside of the driving compartment on the fire wall in either a horizontal or vertical position. First, use the template on the inside of the instruction folder as a means of size and determine best position of receiver on the fire wall. Next, fasten the mounting plate to the rear of the receiver case in such a manner as to allow the mounting slot to extend downward. This is important inasmuch as the receiver must rest its weight on the mounting bolt. If the plate is not put on in this manner the receiver might slide out through vibration of the automobile. Again using the template, punch the center for hole A, B, C, or D, as the case might require. Only one hole is used, depending upon the position in which the mounting plate is fastened to the receiver case. All bolt holes in the mounting plate are so arranged that it may be fastened in any one of the four positions. After the center punch mark is made, drill a 9/16 inch hole in the bulkhead, insert the square head of the mounting bolt in the slot and push the entire assembly tight against the bulkhead, pulling it up securely by tightening the large hex nut on the motor side of the bulkhead. The large metal washer furnished should be used under the nut.

MOUNTING CONTROL HEAD. Fasten the control head to the mounting clamp and mount the complete control unit on the steering column, using the bronze strap and screw provided for this purpose. If there is not enough friction between the steering column clamp and the steering column to prevent the control from shifting, a single layer of tape under the band will be effective.

Loosen the two knurled chuck nuts on the cable connectors at the receiver and insert the tuning cable (controlled by the right-hand knob) in the center chuck. Revolve the knob as this is being done in order to match the cable insert with the tuning condenser. Next, securely tighten the chuck nut. Fasten the volume control cable in the outer chuck, also revolving the control knob until the connector slips into the volume control receptacle. Screw down the chuck nut. The dial is set on calibration by tuning in a station of known frequency after the set is completely installed and then simply turning the indicator independently by adjustment of the screw in the rear of the control head to a point where the station is heard at its proper location on the dial.

Connect the dial light cable from the control head to the pin jack on the control cable side of the receiver. The shield over this lead must be securely fastened under the wing nut next to the pilot light jack.

Insert the fuse and insulating sleeve into the fuse receptacle of the "A" cable and connect this to the "A" lead of the receiver. Attach this lead to the ammeter, grounding the shield securely at some point under the instrument panel. The polarity of the battery need not be considered when making these connections, however, when making a ground contact scrape away any corrosion or paint in order to insure a good electrical contact.

Antenna

ANTENNA. Some automobiles are factory equipped with a roof antenna. If this is the case the lead should be checked to make certain that it is not grounded, and after being shielded by large loom from the post connect it to the antenna lead of the receiver. Be sure the shield over this lead is fastened to the shield on the antenna lead of the set and carefully grounded either to the instrument panel or to some portion of the frame in that immediate location. Where the car is not furnished with an antenna, such as convertible models or some of the 1935 series with an all metal top, an under-car antenna must be used. Your dealer can give you his recommendations on this subject but it is well to remember that the lead from an under-car antenna must be very thoroughly shielded from the aerial to the antenna connection in the receiver and grounded in several places. Only large size loom allowing separation between the shield and the antenna lead of at least ¼ of an inch will prove satisfactory. In no case should the lead be simply shielded without space between it and the wire as it will increase the antenna capacity to a point where its efficiency drops very noticeably.

Ignition Interference

All automobiles develop high frequency disturbance through radiation from the coil, distributor and plugs and it is necessary to minimize this interference by means of suppression. A suppressor is placed in the center distributor lead and, if necessary, on each spark plug. By-pass condensers must be used on the generator, coil and at all electrical gauges and the leads kept as short as possible. Each car, however, presents an individual problem where the technician must use some ingenuity, carefully following instructions.

Apply the standard suppression parts furnished with the receiver. This consists of a resistor for the distributor in addition to a coil condenser and a generator condenser. Lay all high tension leads close to the motor to lessen the possibility of radiation. Be sure the coil condenser is connected from the BATTERY side to ground. The points will become burned and pitted if placed on the coil side. Apply additional condensers to oil, water, gas or other electrical gauges. Carefully shield the aerial lead-in to the receiver, from the running board or the wind-shield post, with large loom and copper shielding. The capacity here MUST be as low as possible. The lead-in shield is grounded at the outer edge of the running board or at a point on the frame as close as possible to the lead-in post if a top antenna is used. Bond the instrument panel thoroughly to the car frame and body on each side.

After the hood is clamped in place to prevent radiation, the receiver should be turned on and dial tuned off a station with the volume control at maximum.

If motor noise is prevalent determine whether it is being conducted through the chassis or from the antenna. This test is made by disconnecting the antenna and grounding it to the shield. If ignition noise is heard upon again starting the motor it indicates chassis pickup which may be removed as follows:

Check distributor points and clean. Set to between .013" minimum and .015" maximum clearance. Next build-up the distributor rotor arm to a clearance of between .002" to .004" clearance to the distributor cap contacts. Solder may be used for this purpose, but it will eventually burn off and the noise will return. In the event low tension leads are bunched or in the same pipe housing with high tension leads, they should be separated as far as possible or removed from the same pipe. Removal and segregation is very effective. In some cases it might be necessary to shield and bond the low tension coil or distributor leads.

Motors mounted on rubber must be bonded with heavy braid to produce a short path to ground in order to break any radiating oscillatory circuit. Such bonds should be placed between the front motor support and frame and between the radiator top hose pipe and to the cylinder head where the water jacket is bolted. Move control cables slightly so that inner shaft contacts outer armour and tape in position under instrument panel.

When chassis pickup has been reduced to a minimum the antenna is then re-connected. Be sure the lead-in shield is grounded as previously mentioned.

Where a running board antenna is used it must be installed under the board farthest from the distributor and high tension system. If a top antenna is used it is usually necessary to by-pass the dome light lead. This should be done as close as possible to the windshield post through which it is wired. It will NOT help remove noise from this source if connected at any distance from the post. Another method is to break the dome lead and install an auxiliary switch at this point. In that case the condenser is not necessary. In many cases a condenser from one side of the ammeter to ground is very effective. Be sure to keep the radio battery cable out of the motor compartment. Running this cable through the motor side may cause severe interference.

The suggestions given need not all be necessary for a satisfactory installation. Therefore, they should be followed in order until the most effective remedy has been found. In any event, these rules should prove helpful in all cases. Spark plug suppressors are not required or furnished due to the added filtering incorporated in the 1935 Receiver. They should be applied only in extremely stubborn cases as a last resort after all bonding and filtering instructions have been followed.

Service

The Model 666 Autoradio receiver employs the following tubes in position shown on "Tube Layout," 6D6 R. F. Amplifier, 6C6 1st Detector and Oscillator, 6D6 I. F. Amplifier, 75 A. V. C. and 2nd Detector, 42 Power Amplifier and 84 Rectifier. The following subjects cover in an elementary manner the ordinary complaints encountered in service and in the corresponding corrections. It is suggested they be considered in the order listed when making a preliminary examination.

1. Inoperative
2. Weak
3. Distortion
4. Rattles
5. Dial off calibration
6. Intermittent operation
7. Ignition noise
8. Noisy reception

After the trouble has been isolated the following procedure will prove effective. (Consult illustrations.)

1. Inoperative
   - (a) Examine fuse and replace if blown. Make certain fuse insulating sleeve is over fuse. If fuse continues to blow, look for short in chassis wiring, defective tube or defective vibrator.
   - (b) Defective tube—check all tubes on a tube tester and replace any that are shorted or below normal reading.
   - (c) Loose or broken receiver battery cable.
   - (d) Broken lead in chassis.
   - (e) Tube or vibrator out of socket.
   - (f) Broken antenna wire or antenna grounded.
   - (g) Speaker plugs loose or out of receiver.

2. Weak
   - (a) Grounded or partially grounded antenna.
   - (b) Defective tube.
   - (c) Weak storage battery.
   - (d) Broken connection.
   - (e) Defective vibrator.
   - (f) Defective speaker.

3. Distortion
   - (a) Defective tube.
   - (b) Defective speaker.
   - (c) Defective vibrator.

4. Rattles
   - (a) Loose wires, rods, instruments, screws, washers, etc., on instrument panel or dash.
   - (b) Loose speaker or speaker bolts.
   - (c) Dirt in speaker.
   - (d) Speaker voice coil warped.

5. Dial off calibration
   - (a) See paragraph on resetting indicator under "Alignment".

6. Intermittent operation
   - (a) Loose radio supply connection.
   - (b) Short in antenna or lead-in.
   - (c) Defective tubes.
   - (d) Loose speaker connector.
   - (e) Loose or defective vibrator.
   - (f) Loose connection in receiver chassis.

7. Ignition interference

(a) Suppressor defective or missing entirely.
(b) Defective condenser at coil, ammeter or electrical gauges.
(c) Lead-in shield not grounded.
(d) Motor bonds broken or not tight electrically.
(e) Chassis to case grounds broken.
(f) Motor noise filter in set defective.
(g) Pilot lamp shielding disconnected or broken.

8. Noisy reception

(a) See "Ignition Interference"
(b) Defective vibrator.
(c) Loose antenna connection.
(d) Loose fuse holder.
(e) Defective tubes.
(f) Loose tube shields.
(g) Antenna shorting to frame of car.
(h) Natural atmospheric or electrical disturbances.
(i) Loose or defective high or low tension wiring.

To Remove Receiver from Car

1. Disconnect antenna lead from receiver.
2. Disconnect "A" lead at fuse receptacle.
3. Remove tuning cables by loosening knurled cable clamps at receiver.
4. Take out pilot light lead and shield connection.
5. Loosen mounting bolt on motor side and lift receiver out.

To Remove Chassis from Case

(Chassis does NOT have to be removed from case for ordinary repairs or service as removal of top lid permits easy access to tubes and vibrator.)

1. Remove top and bottom covers.
2. Remove ground lug from "A" filter.
3. Remove hot lead from "A" filter.
4. Disconnect "A" filter bond from case.
5. Remove leads from speaker jacks and ground lead to outer case.
6. Disconnect three bonds from chassis to case on bottom side.
7. Remove four rubber mounting screws from sides of case.

Following is a list of performance factors that will be of value in making accurate measurements.

Intermediate Frequency 252.5 K. C.
Sensitivity in Microvolts 1 to 1½
Power output in Milliwatts 3000
Power consumption—40 watts at 6 volts

Tube Operating Voltages:

Position	Tube	EF	EK	EG1	EG2	EG3	EP
R. F. Amplifier	6D6	5.6	4.1	*	4.1	76	200
1st Det.-Osc.	6C6	5.6	4.5	0	4.5	76	200
I. F. Amplifier	6D6	5.6	4.1	*	4.1	76	200
2nd Det. A. V. C.	75	5.6	1.3	0	0	—	165
Power Amp.	42	5.6	0	3	0	200	192
Rectifier	6Z4	5.6	200	—	—	—	—

f—Filament; k—Cathode; g1—Control Grid; g2—Suppressor Grid; g3—Screen Grid; p—Plate; *—Depends on applied signal strength. All voltages measured from indicated points to ground. Battery voltage 6 volts. (Check voltages with condenser gang in full mesh.)

Alignment

Every Zenith automobile receiver is balanced on an accurate crystal controlled oscillator before leaving the factory and, unless a part is changed or the calibration has shifted, the adjustments should never be tampered with. Where it is absolutely necessary, however, a good test oscillator capable of delivering a modulated signal at 1600, 1400, 600 and 252½ K. C. will be essential. Proceed as follows:

I. F. Alignment:

To balance the I. F. Circuit, connect the 252½ K. C. test oscillator signal to the grid of the 6C6 tube through a 0.5 mfd. condenser and to ground. Adjust the 1st I. F. primary trimmer to maximum output from either the speaker or an output meter. Follow in the same manner with the secondary, and the primary and secondary of the 2nd I. F. transformer. This completes the I. F. circuit adjustment.

R. F. Alignment:

1. Next attach the test oscillator thru a 150 mmf. condenser to the antenna and ground leads.
2. Turn condenser plates completely out of mesh.
3. Set test oscillator to 1600 K. C.
4. Adjust the oscillator condenser trimmer (see fig. 1) to approximate resonance at 1600. Disregard dial setting for this operation.
5. Set test oscillator to 1400 K. C. and turn gang condenser to resonance and peak the three trimmers accurately. Now set pointer on dial to 1400 K. C. by turning indicator screw in rear center of head.
6. Set test oscillator to 600 K. C. and tune set to pick up the signal. Rock the dial over this point while adjusting the padder condenser (see fig. 1) for greatest output.

If the dial is off calibration at the low frequency end after this is done the indicator may be moved slightly in either direction to give a uniform accuracy over the entire scale.

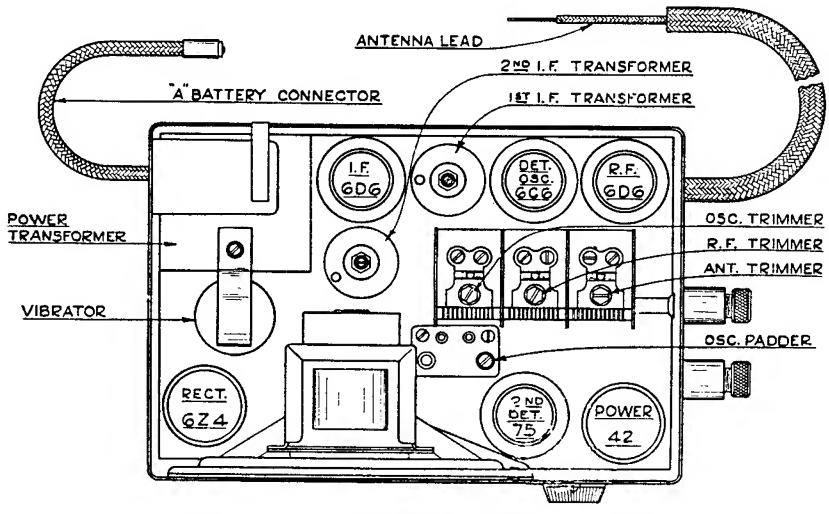
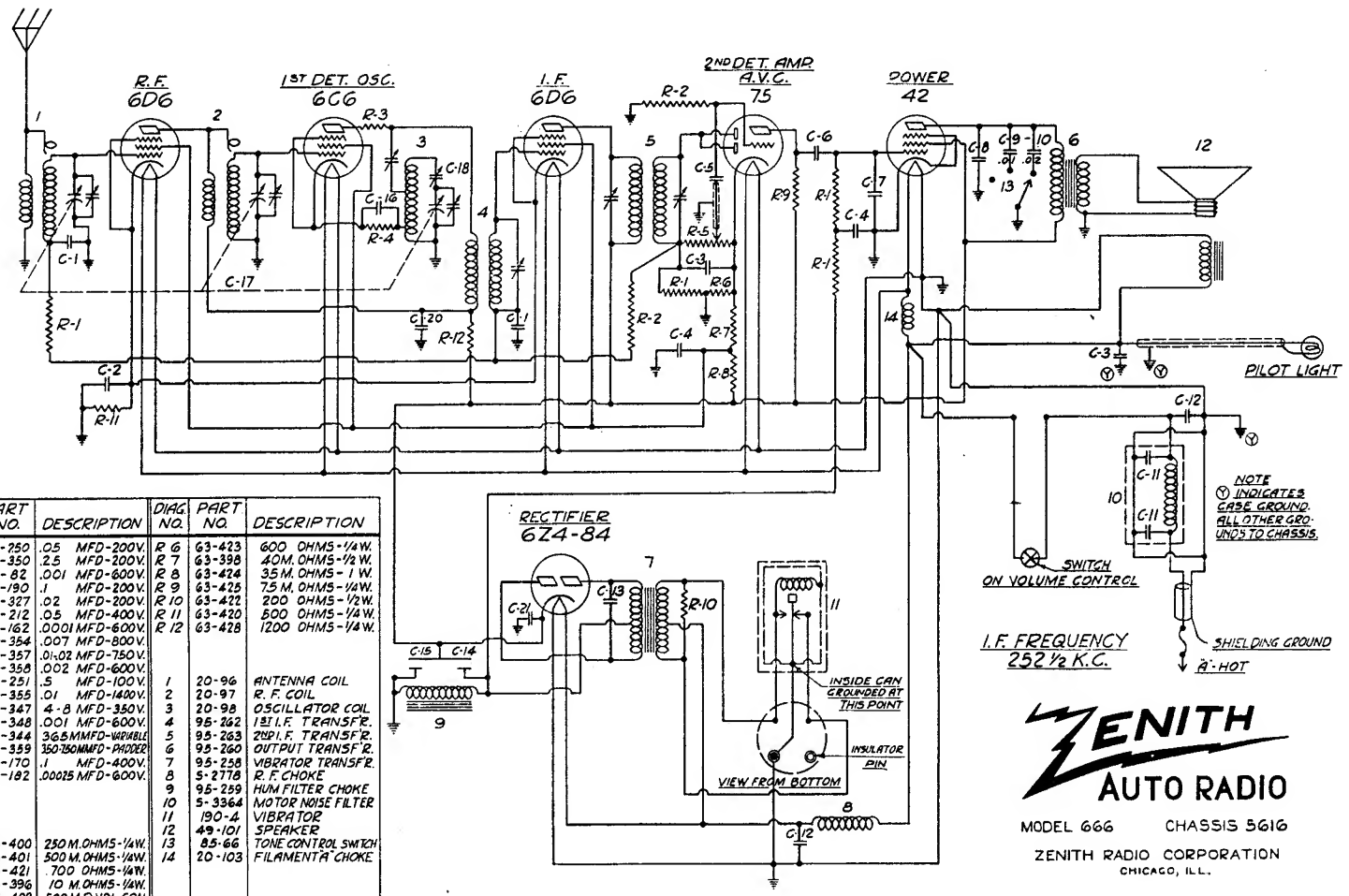
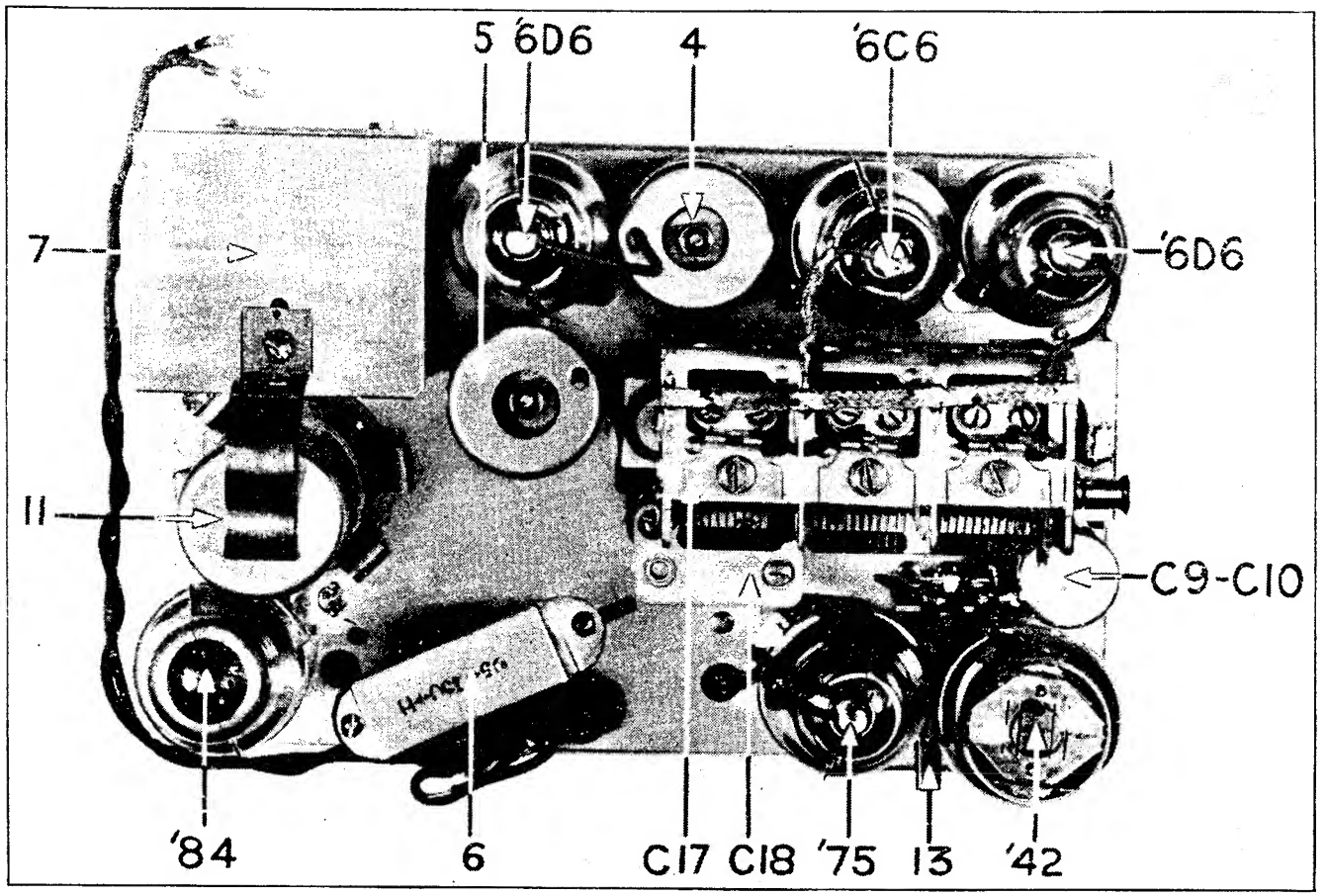


Fig. 1—TUBE POSITION



DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
C 1	22-750	.05 MFD-200V.	R 6	63-423	600 OHMS-1/4W.
C 2	22-350	.25 MFD-200V.	R 7	63-398	40M. OHMS-1/2 W.
C 3	22-82	.001 MFD-600V.	R 8	63-424	35 M. OHMS - 1 W.
C 4	22-190	.1 MFD-200V.	R 9	63-425	7.5 M. OHMS-1/4W.
C 5	22-327	.02 MFD-200V.	R 10	63-422	200 OHMS-1/2W.
C 6	22-212	.05 MFD-400V.	R 11	63-420	500 OHMS-1/4 W.
C 7	22-162	.0001 MFD-600V.	R 12	63-428	1200 OHMS-1/4 W.
C 8	22-354	.007 MFD-800V.			
C 9-10	22-357	.01-.02 MFD-750V.			
C 11	22-358	.002 MFD-600V.			
C 12	22-251	.5 MFD-100V.	1	20-96	ANTENNA COIL
C 13	22-355	.01 MFD-1400V.	2	20-97	R. F. COIL
C 14-15	22-347	.4-.8 MFD-350V.	3	20-98	OSCILLATOR COIL
C 16	22-348	.001 MFD-600V.	4	95-262	1ST I.F. TRANSF'R.
C 17	22-344	365 MMFD-VARIABLE	5	95-263	2ND I.F. TRANSF'R.
C 18	22-359	350-150MMFD-PADDER	6	95-260	OUTPUT TRANSF'R.
C 20	22-170	.1 MFD-400V.	7	95-258	VIBRATOR TRANSF'R.
C 21	22-182	.00025 MFD-600V.	8	5-2778	R. F. CHOKE
			9	95-259	HUM FILTER CHOKE
			10	5-3364	MOTOR NOISE FILTER
			11	190-A	VIBRATOR
			12	49-101	SPEAKER
R 1	63-400	250 M.OHMS-1/4W.	13	85-66	TONE CONTROL SWITCH
R 2	63-401	500 M. OHMS-1/4W.	14	20-103	FILAMENT "A" CHOKE
R 3	63-421	.700 OHMS-1/4W.			
R 4	63-396	.10 M. OHMS-1/4W.			
R 5	63-402	500 M.Ω VOL. CON.			

Fig. 2



TOP OF CHASSIS WITH SPEAKER REMOVED

Parts and Prices

Chassis No. 5616

RESISTORS (CHASSIS ONLY)

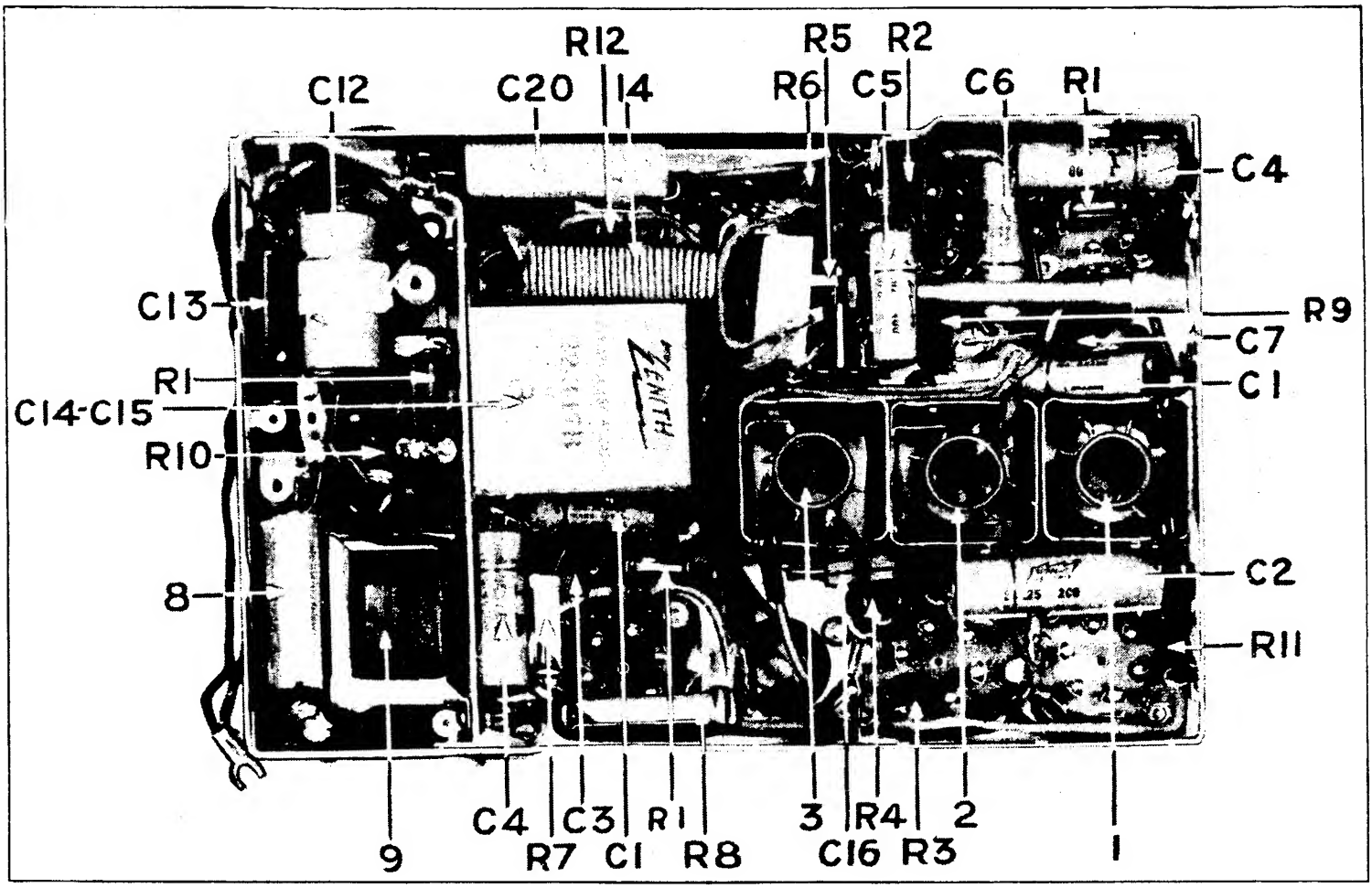
Part Number	Description	Price
63-396	10M Ohm ¼ Watt	$ .20
63-398	40M Ohm ½ Watt	.20
63-400	250M Ohm ¼ Watt	.20
63-401	500M Ohm ¼ Watt	.20
63-402	500M Ohm Vol. Control & Switch Ass'mbly	1.00
63-420	500 Ohm ¼ Watt	.20
63-421	700 Ohm ¼ Watt	.20
63-422	200 Ohm ½ Watt	.20
63-423	600 Ohm ¼ Watt	.20
63-424	35M Ohm 1 Watt	.20
63-425	75M Ohm ¼ Watt	.20
63-428	1200 Ohm ¼ Watt	.20

CONDENSERS (CHASSIS ONLY)

22-82	.001 Mfd. 600 V	.25
22-162	.0001 Mfd. 600 V	.20
22-170	.1 Mfd. 400 V	.15
22-190	.1 Mfd. 200 V	.20
22-182	.00025 Mfd. 600 V	.12
22-212	.05 Mfd. 400 V	.20
22-250	.05 Mfd. 200 V	.15
22-251	.5 Mfd. 100 V	.40
22-327	.02 Mfd. 200 V	.15
22-344	Three-Gang Variable	4.00
22-347	4. x S. Mfd. 350 V	1.75
22-348	.001 Mfd. 600 V	.20
22-350	.25 Mfd. 120 V	$ .20
22-354	.007 Mfd. 750 V	.20
22-355	.01 Mfd. 1400 V	.20
22-357	.01 x .02 Mfd. 750 V	.50
22-358	.002 Mfd. 600 V	.20
22-359	Padder	.45

MISCELLANEOUS CHASSIS PARTS
COILS AND CHOKES

20-96	Antenna Coil Assembly	.60
20-97	R. F. Coil Assembly	.75
20-98	Oscillator Coil Assembly	.60
20-103	Filament "A" Choke	.15
95-262	1st I. F. Transformer	1.25
95-263	2nd I. F. Transformer	1.25
S-2778	R. F. Choke	.15
S-3364	Motor Noise Filter	1.00
46-101	Tone Control Knob (Knob Spring only, see 80-107)	.10
52-44	"A" Battery Cable	.65
52-59	Antenna Cable	.50
54-76	¼ x 20 Knurled Coupling Shaft Nuts	.08
78-100	Socket 6D6	.10
78-101	Socket 75	.10
78-102	Socket 42	.10
78-113	Socket 6D6	.10
78-114	Socket 6Z4	.10
78-115	Socket Vibrator	.10
80-107	Tone Control Knob Spring	.01
85-66	Tone Control Switch	.40



BOTTOM OF CHASSIS

Parts and Prices, Cont.

MISCELLANEOUS CHASSIS PARTS (Contd.)

Part Number	Description	Price
93-125	No. 6 Lock Washers	$ .15C
93-220	Bakelite Washer for Chassis Mtg. Screws	.02
94-185	Rubber Bushing for Chassis Mtg. Screws	.02
95-258	Power Transformer	2.00
95-259	Hum Filter Choke	.75
97-75	10/32 x ¼ Wing Screw for Box Cover	.02
114-27	No. 8 x ¼ Chassis Box Screws	.01
190-4	Vibrator	5.00
MS-330	Chassis Box Top Cover and Clip Assem.	1.00
24-88	Chassis Box Bottom	.85
MS-256	Chassis Box Body Less Cover and Top	1.50

SPEAKER

*49-100	6" Dynamic Speaker (with output transformer	5.00
	Cone & Voice Coil Assemb.	2.30
	Field Coil	2.00

REMOTE CONTROL UNIT

170-12	Zenith Control Unit (with knobs and mounting brackets—less cable)	$ 5.00
7-5	Control Unit Bezel	.10
26-83	Zenith Dial Scale Assembly	.30
46-117	Volume and Tuning Knobs	.20
52-63	Pilot Lamp Cable and Socket Assemb.	.30
76-156	24" Tuning Control Cables	1.25
26-157	24" Volume Control Cables	1.25
80-110	Knob Springs	.01
100-27	6-8 V. Pilot Lamp	.15
192-7	Unbreakable Dial Glass	.15

SUPPRESSOR AND MOUNTING PARTS

22-193	.5 Mfd. Ignition Coil Condenser	.45
22-194	.5 Mfd. Generator Coil Condenser	.50
52-44	"A" Battery Cable	.60
57-478	Set Mounting Plate	.25
63-336	15 M Ohm Dist. Suppressor	.35
67-107	10/32 x ¾ RHM Screws (8 used) C	.35
93-127	No. 10 Lock Washer (8 used) C	.35
93-222	7/16 Lock Washer	.01
93-223	Mounting Bolt Washer	.02
136-6	15 Ampere Fuse	.06
144-14	Mounting Bolt and Nut	.05
196-1	Mounting plate Gasket	.03

*Speakers are numbered 49-100U, 49-100-R, 49-100-M designating three different types. Therefore, when ordering speaker or speaker parts refer to the number on speaker at all times and order by that part number accordingly.

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

Service Bulletin

ZENITH RADIO

MODEL 668 Chassis 5626

Model 668 incorporates the same chassis as Model 666 except for the following mechanical parts changes. Use Model 666 service bulletin and diagram.

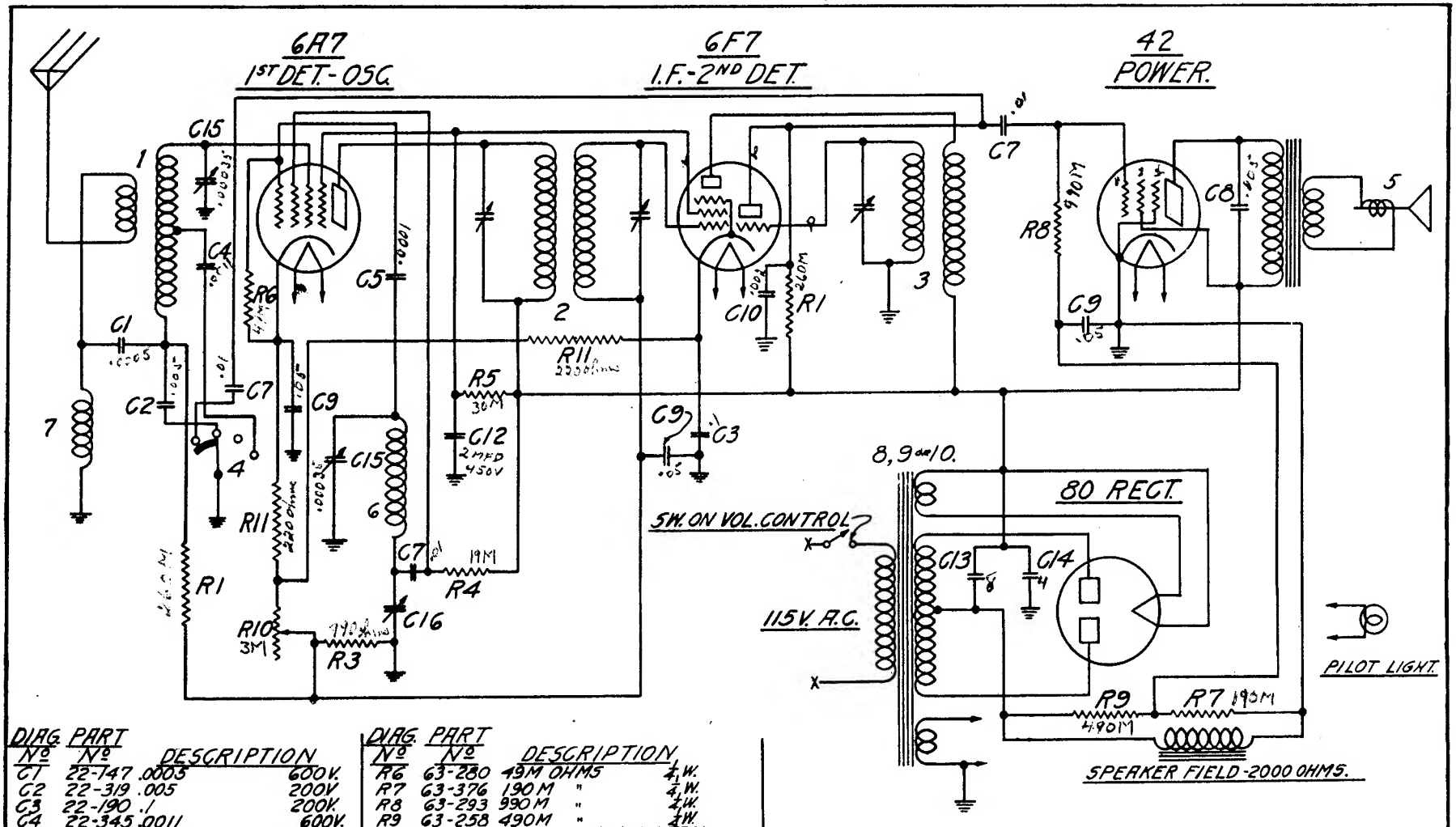
Model 668 parts added		Price	Model 666 parts omitted	
24-87	Chassis box cover.....	$1.00	MS-350	same .....
24-88	" " bottom.....	.85	24-88	" .....
10-42	" " body.....	1.50	MS-256	" .....
10-43	Speaker assem. shell only..	1.50	None used	.....
49-114	8" dynamic speaker less transformer.....	7.00	49-100 6" dynamic speaker with transformer.....	
	Cone & voice coil for 49-114	2.50	Cone & voice coil for 49-100.....	
95-285	Output transformer for 49-114(mtg.in chassis).....	2.00	Output transformer for 49-100.....	
	Field coil for 49-114.....	2.00	.....	
52-69	Speaker cable	.75	Field coil for 49-100	
97-92	Speaker mounting stud.....	.05	None used	
S-3665	Complete speaker assembly with case and cable.....	9.00	" "	
			External speaker not used	

Note - All Model 668s use Zenith control head, part #170-16.

ALL PRICES SUBJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE.

ZENITH RADIO CORPORATION

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



DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-147	.0003	600V.
C2	22-319	.005	200V.
C3	22-190	.1	200V.
C4	22-345	.0011	600V.
C5	22-162	.0001	600V.
C7	22-243	.01	400V.
C8	22-229	.005	600V.
C9	22-250	.05	200V.
C10	22-358	.002	600V.
C12	22-407	2 MFD. ELECT.	450V.
C13	22-407	8 " "	"
C14	22-407	4 " "	"
C15	22-406	.00036 VARIABLE.	
C16	22-205	200-350 MMFD. PADDER.	
R1	63-290	260M OHMS	½W.
R3	63-300	990 "	½W.
R4	63-353	19M "	½W.
R5	63-263	30M "	½W.

DIAG. Nº	PART Nº	DESCRIPTION	
R6	63-280	49M OHMS	½W.
R7	63-376	190M "	½W.
R8	63-293	990M "	½W.
R9	63-258	490M "	½W.
R10	63-455	3M "	VOL. CONTROL.
R11	63-265	220 "	½W.
1	5-3673	ANT. COIL ASSEMBLY.	
2	95-287	1ST I.F. TRANS.	
3	95-284	2ND I.F. TRANS.	
4	85-76	BAND SELECT. & T.C. SWITCH.	
5	49-115	SPEAKER-COMPLETE.	
6	5-3674	OSC. COIL ASSEMBLY.	
7	20-82	ANT. CHOKE.	
8	95-297	115-V-60 CYCLE TRANS.	
9	95-288	115-V-50 CYCLE VAR. VOLT. TRANS.	
10	95-296	115 V.-25 " " "	

2 BANDS { 550 KC. - 1600 KC. / 1550 KC. - 3650 KC.

I.F. FREQUENCY 456 K.C.

4 TUBE SUPERHETERODYNE

CHASSIS NO 5401

ZENITH RADIO CORP.

CHICAGO, ILL.

4-10-35-W.D.

TUBE	POSITION	Ef	Ek	Eg1	Eg2	Eg3	Ep
6A7	1st. Det.	6.1	27	0	111	-	231
	Osc.			12	-	-	150
6F7	I.F.	6.1	25	0	111	-	231
	2nd. Det.			0	-	-	195
42	PWR.	6.1	0	-15	231	-	219
80	RECT.	5	-	-	-	-	231

Line 115 V.

f - heaters; k - cathode; g1 - control grid; g2 - screen grid; g3 - suppressor grid; p - plate.

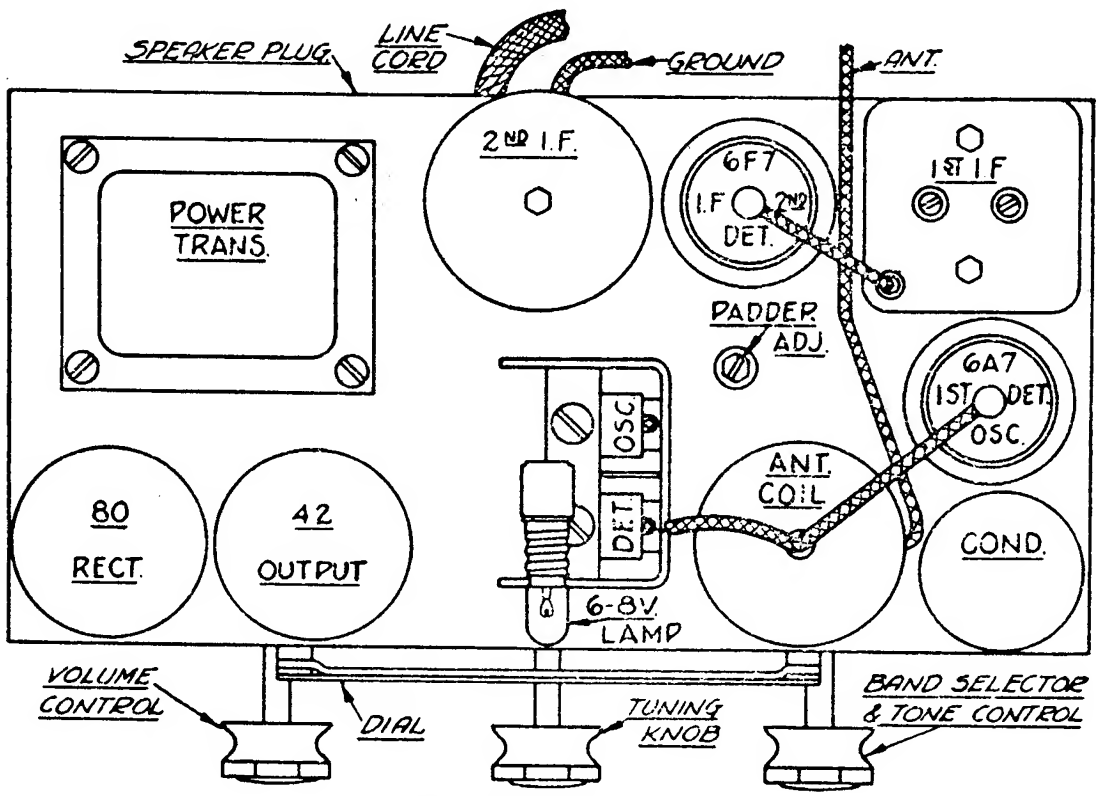
All measurements taken from point indicated to ground, using a 1,000 ohm per volt D.C. meter (except heater).

Alignment

(1) Balance I. F. transformer at 456 K.C.

(2) Place switch in left or broadcast position. Set dial pointer at 1500 K.C. and align trimmers on gang to resonance. Align broadcast padder at 540 K.C. slowly rocking pointer past 540 on dial to position giving strongest signal.

There are no adjustments for the short wave band.



Tube Position

PARTS AND PRICES
MODELS 4-P-26
4-T-26
4-P-51
4-T-51
Chassis #5401

Resistors

63-258	490 M Ohm 1/2 Watt Resistor	$ .20
63-263	30M " 1/2 "	.20
63-265	220 " 1/2 "	.20
63-280	49M " 1/2 "	.20
63-290	260M " 1/2 "	.20
63-293	990M " 1/2 "	.20
63-300	990 " 1/2 "	.20
63-376	190M " 1/2 "	.20
63-455	Volume Control Assembly	1.00

Condensers

22-147	.0005 Mfd. 600 V.	.15
22-162	.0001 " 600 V.	.20
22-205	200-500M Mfd. Padder	.35
22-229	.005 Mfd. 600 V.	.15
22-243	.01 " 400 V.	.15
22-250	.05 " 200 V.	.20
22-319	.005 " 200 V.	.20
22-345	.0011 " 600 V.	.15
22-358	.002 " 600 V.	.20
22-406	2-Gang Variable	2.50
22-407	2 x 4 x 8 Mfd. 450 V.	1.75

Coils, Chokes, Etc.

S-3673	Antenna Coil Assembly	1.00
S-3674	Oscillator Coil Assembly	.65
S-3720	1st I.F. Transformer Assembly	1.25
95-284	2nd I.F. Transformer Assembly	1.00
20-82	Antenna Choke	.25

Miscellaneous

S-3717	Dial Pointer and Bushing Assembly	.25
S-3718	Dial Scale and Frame Assembly	.50
46-122	Tuning Knobs	.10
49-115	5" Dynamic Speaker (Model 26)	4.50
	Cone and Voice Coil for 49-115	2.00
	Output Transformer for 49-115	1.75
	Field Coil for 49-115	1.50
49-116	8" Dynamic Speaker for Model 51	6.00
	Cone and Voice Coil for Model 51	2.50
	Output Transformer for Model 51	1.75
	Field Coil for Model 51	1.50
78-82	Type 80 Socket (Wafer Type)	.10
78-102	" 42 " " "	.10

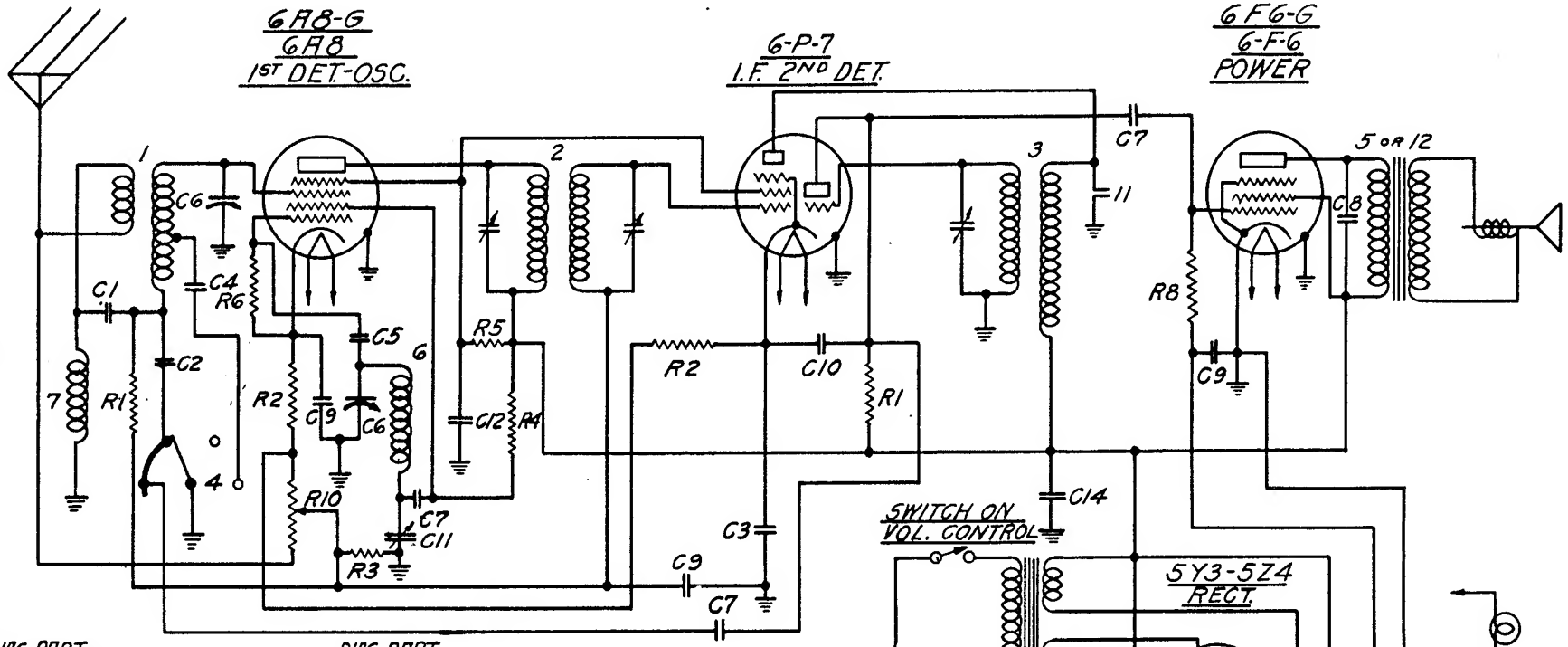
MODELS 4-P-26, 4-P-51
4-T-26, 4-T-51
Chassis #5401

Miscellaneous Cont'd

78-103	Type 6F7 Socket (Wafer Type)	$ .10
78-106	" 6A7 " " "	.10
78-128	Speaker Plug Socket	.10
78-129	Voltage Indicator Socket (25 Cycle only)	.10
85-76	Band Selector and Tone Control Switch	.35
95-297	115 V., 60 Cycle Power Transformer	2.50
95-296	All Voltage 25 Cycle Power Transformer	4.75
100-23	6.3 V. Pilot Lamp	.15
126-191	Tube Shield	.15

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

ZENITH RADIO CORPORATION
Chicago, Illinois, U.S.A.
May 13, 1935



DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-147	.0005	600V.
C2	22-319	.005	200V.
C3	22-190	.1	200V.
C4	22-345	.0011	600V.
C5	22-162	.0001	600V.
C6	22-406	.00036	VARIABLE
C7	22-243	.01	400V.
C8	22-229	.005	600V.
C9	22-250	.05	200V.
C10	22-358	.002	600V.
C11	22-205	.200-550 MMFD.	PADDER
C12	22-407	2 MFD.	450V.
C13	22-407	8 "	450V.
C14	22-407	4 "	450V.

DIAG. Nº	PART Nº	DESCRIPTION	
R1	63-290	250 M OHMS	½ W.
R2	63-265	220	½ W.
R3	63-300	990	½ W.
R4	63-353	1 M	½ W.
R5	63-263	30 M	½ W.
R6	63-280	49 M	½ W.
R7	63-376	190 M	½ W.
R8	63-293	990	½ W.
R9	63-258	490 M	
R10	63-455	3 M	VOL. CONTROL.

DIAG. Nº	PART Nº	DESCRIPTION
1	5-3673	ANT. COIL ASSEM.
2	95-287	1ST I.F. TRANS.
3	95-284	2ND I.F. TRANS.
4	85-76	BAND SELECT. & T.C. SW.
5	49-115	5" SPKR - MOD. 4-T-26
6	5-3674	OSC. COIL ASSEM.
7	20-82	ANT. CHOKE
8	95-297	115 V. 60 CYCLE TRANS.
9	95-288	" 50 " " VAR. VOLTAGE
10	95-296	" 25 " "
11	5-3865	COUPLING CAPACITY.
12	49-116	8" SPKR - MOD. 4-T-51

2 BANDS { 550 KC. - 1600 KC. / 1550 KC. - 3650 KC.

I.F. FREQUENCY 456 KC.
4 TUBE SUPERHETERODYNE
CHASSIS Nº 5403

MODELS - 4-T-26, 4-T-51
AFTER SERIAL NO.
54439

ZENITH RADIO CORP.
CHICAGO, ILL.

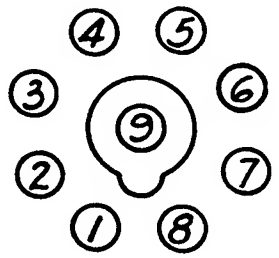
M.O. - 6-18-35

Zenith Radio Corporation

Socket Voltages

TUBE	POSITION	1	2	3	4	5	6	7	8	9
6A8	1st Det. Osc.	0	6 AC	220	90	6	125	6 AC	14	0
6P7	I.F. 2nd Det.	0	6 AC	0	220	100	100	0	13	0
6F6	PWR	0	0	200	220	-1	-	6 AC	0	-
5Y3	Rect.	0	220	-	230 AC	-	230 AC	-	220	-

Line Voltage 110 Antenna and Ground Disconnected.

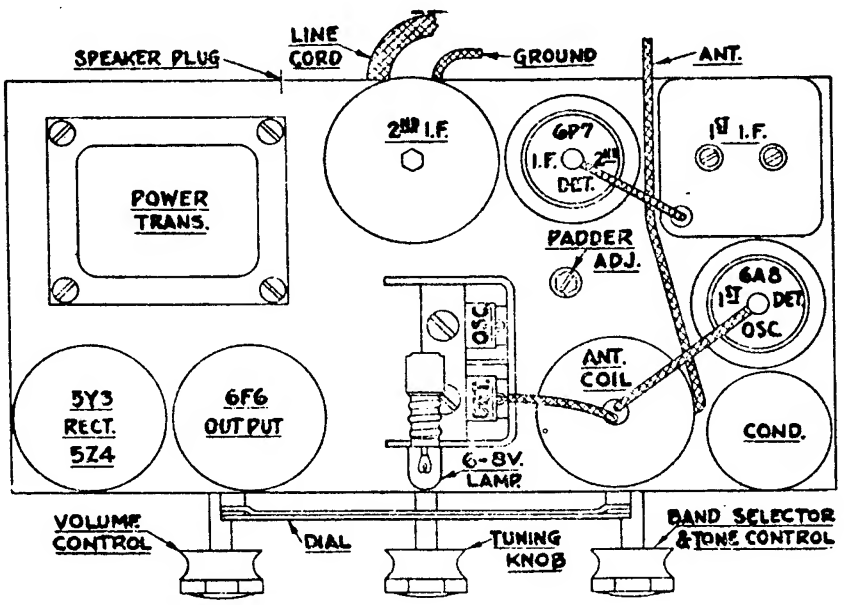


BOTTOM VIEW OF SOCKET

All voltages measured from point indicated to ground, using a 1000 ohm per volt D.C. meter (unless marked otherwise.)

Alignment

(1) Balance I.F. transformer at 456 K.C.
(2) Place switch in left or broadcast position. Set dial pointer at 1500 K.C., and align trimmers on gang to resonance. Align broadcast padder at 540 K.C. slowly rocking pointer past 540 on dial to position giving strongest signal.
There are no adjustments for the short wave band.



ZENITH

PARTS AND PRICES
Chassis #5403
(after serial #54439)

Models 4-T-26
4-T-51

		Resistors	
63-258	490 M Ohm	1/4 Watt	$ .20
63-263	30 M "	1/4 "	.20
63-265	220 "	1/4 "	.20
63-280	49 M "	1/4 "	.20
63-290	260 M "	1/4 "	.20
63-293	990 M "	1/4 "	.20
63-300	990 "	1/4 "	.20
63-353	19 M "	1/4 "	.20
63-376	190 M "	1/4 "	.20
63-455	3 M "	Volume Control and Switch Assembly	1.00
		Condensers	
22-147	.0005 Mfd.	600 V.	.15
22-162	.0001 "	600 V.	.20
22-190	.1 "	200 V.	.20
22-205	200-550 Mmfd.	Padder	.35
22-229	.005 Mfd.	600 V.	.15
22-243	.01 "	400 V.	.15
22-250	.05 "	200 V.	.15
22-319	.005 "	200 V.	.20
22-358	.002 "	600 V.	.20
22-406	2-gang Variable Condenser		2.50
22-407	8 x 4. x 2. Mfd.	450V.	1.75
22-448	.004 Mfd.	600 V.	.15
		Coils, Chokes, Etc.	
20-82	Antenna Choke		.25
95-284	2nd I.F. Transformer		1.00
95-287	1st I.F. "		1.25
S-4015	Antenna Coil Assembly		1.00
S-4017	Oscillator Coil Assembly		.75
		Miscellaneous	
S-3717	Dial Pointer and Bushing Assembly		.25
S-3718	" Scale and Frame Assembly		.50
19-58	New Type Grid Clips		.01
46-122	Tuning Knobs (3 used)		.10
49-115	5" Dynamic Speaker (Model 26)		4.50
	Cone and Voice Coil for 49-115 Speaker		2.00
	Output Transformer for 49-115 Speaker		1.75
	Field Coil for 49-115 Speaker		1.50
49-116	8" Dynamic Speaker (Model 51)		6.00
	Cone and Voice Coil for 49-116 Speaker		2.50
	Output Transformer for 49-116 Speaker		1.75
	Field Coil for 49-116 Speaker		1.50
58-30	4-prong Speaker Plug		.25
78-128	5-prong " "	Socket	.10
78-132	Type 6A8 Socket		.15

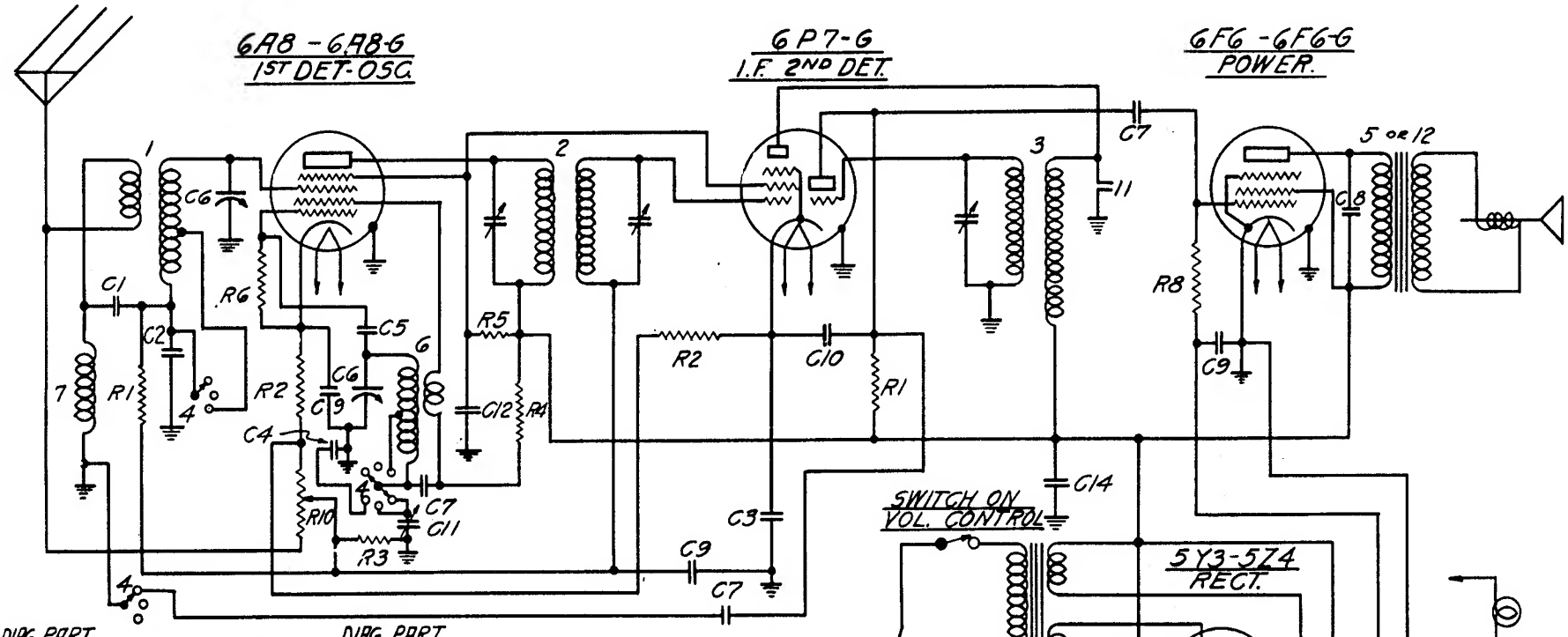
PARTS AND PRICES

Miscellaneous Cont'd

78-136	Type 5Y3 Socket	$ .15
78-137	" 6F6 "	.15
78-138	" 6P7 "	.15
85-76	Band Selector and Tone Control Switch	.35
95-288	Variable Voltage 50 Cycle Power Transformer	4.00
95-296	115 Volt, 25 Cycle Power Transformer	4.75
95-297	115 " 60 " " "	2.50
100-23	6.3 Volt Pilot Lamp	.15
126-191	Tube Shields	.15

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

ZENITH RADIO CORPORATION
Chicago, Illinois, U.S.A.
August 22, 1935



DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-147	.0005 MFD.	600V.
C2	22-319	.005 "	200V.
C3	22-190	.1 "	200V.
C4	22-448	.004 "	600V.
C5	22-162	.0001 "	600V.
C6	22-406	2 GANG	VARIABLE
C7	22-243	.01 "	400V.
C8	22-229	.005 "	600V.
C9	22-250	.05 "	200V.
C10	22-358	.002 "	600V.
C11	22-205	200-550 MMFD.	
C12	22-407	2 MFD.	450V.
C13	22-407	8 MFD.	450V.
C14	22-407	4 MFD.	450V.

DIAG. Nº	PART Nº	DESCRIPTION
1	54015	ANT. COIL ASSEM.
2	95-287	1ST I.F. TRANS.
3	95-284	2ND I.F. TRANS.
4	85-83	BAND SELECT & T.C. SW.
5	49-115	5" SPKR. - MOD. 4T26
6	54017	OSC. COIL ASSEM.
7	20-82	ANT. CHOKE
8	95-297	115V. 60~ TRANS.
9	95-288	" 50~ " VAR. VOLTAGE
10	95-296	" 25~ "
11	53865	COUPLING CAPACITY
12	49-116	8" SPKR. MOD. 4T51.

R1	63-290	260 M OHMS ½ W.
R2	63-265	220 " ½ W.
R3	63-300	990 " ½ W.
R4	63-353	19M " ½ W.
R5	63-263	30M " ½ W.
R6	63-280	49M " ½ W.
R7	63-376	190M " ½ W.
R8	63-293	990M " ½ W.
R9	63-258	490M " ½ W.
R10	63-455	3M " V. CONTROL

2 BANDS

545 KC. - 1600 KC.
1520 KC. 4850 KC.

I.F. FREQUENCY 456 KC.
4 TUBE SUPERHETERODYNE.
CHASSIS Nº 5403
SERIAL Nº 54439 & ABOVE.

MODELS 4T26-4T51

(IMPROVED SHORT WAVE)

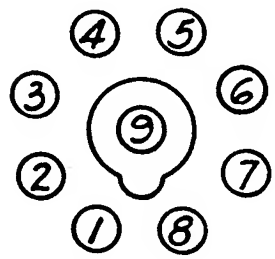
ZENITH RADIO CORP.
CHICAGO, ILL.

W.D. 7-25-35

Socket Voltages

TUBE	POSITION	1	2	3	4	5	6	7	8	9
6A8	1st Det. Osc.	0	6 AC	220	90	6	125	6 AC	14	0
6P7	I.F. 2nd Det.	0	6 AC	0	220	100	100	0	13	0
6F6	PWR	0	0	200	220	-1	-	6 AC	0	-
5Y3	Rect.	0	220	-	230 AC	-	230 AC	-	220	-

Line Voltage 110 Antenna and Ground Disconnected.

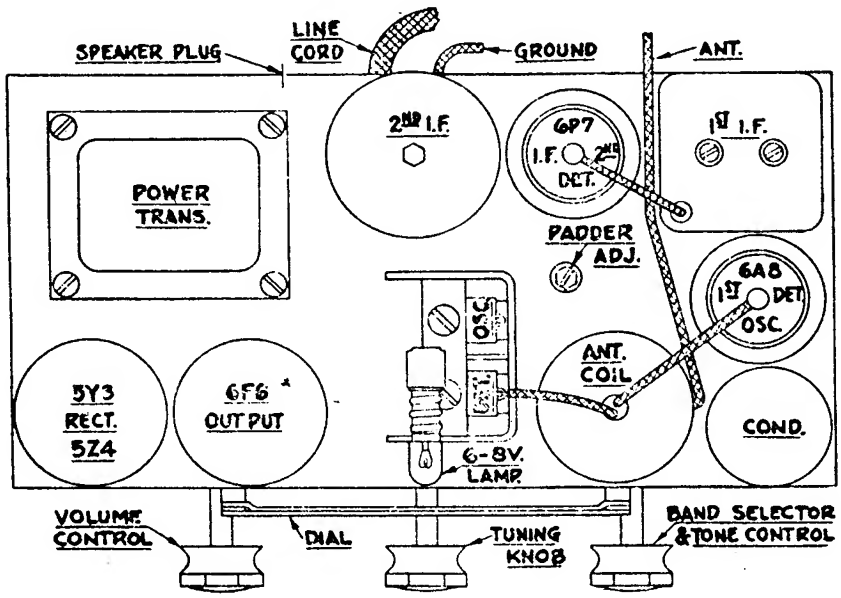


BOTTOM VIEW OF SOCKET

All voltages measured from point indicated to ground, using a 1000 ohm per volt D.C. meter (unless marked otherwise.)

Alignment

(1) Balance I.F. transformer at 456 K.C.
(2) Place switch in left or broadcast position. Set dial pointer at 1500 K.C., and align trimmers on gang to resonance. Align broadcast padder at 540 K.C. slowly rocking pointer past 540 on dial to position giving strongest signal.
There are no adjustments for the short wave band.



PARTS AND PRICES
Chassis #5403
After Serial No. 54439

Model 4-T-26
Model 4-T-51

Condensers

22-147	.0005 Mfd. 600 Volt	$ .15
22-162	.0001 " 600 Volt	.20
22-190	.1 " 200 Volt	.20
22-205	200-550 Mmfd. Padder	.35
22-229	.005 Mfd. 600 Volt	.15
22-243	.01 " 400 Volt	.15
22-250	.05 " 200 Volt	.15
22-319	.005 " 200 Volt	.20
22-358	.002 " 600 Volt	.20
22-406	Two Gang Variable Condenser	2.50
22-407	8.x4.x2. Mfd. 450 Volt	1.75
22-448	.004 Mfd. 600 Volt	.15

Resistors

63-258	490 M Ohm $\frac{1}{4}$ Watt	.20
63-263	30 M Ohm $\frac{1}{2}$ Watt	.20
63-265	220 Ohm $\frac{1}{4}$ Watt	.20
63-280	49 M Ohm $\frac{1}{4}$ Watt	.20
63-290	260 M Ohm $\frac{1}{4}$ Watt	.20
63-293	990 M Ohm $\frac{1}{4}$ Watt	.20
63-300	990 Ohm $\frac{1}{4}$ Watt	.20
63-353	19 M Ohm $\frac{1}{2}$ Watt	.20
63-376	190 M Ohm $\frac{1}{4}$ Watt	.20
63-455	3 M Volume Control Assembly	1.00

Coils, Chokes, Etc.

20-82	Antenna Choke	.25
95-284	2nd I.F. Transformer	1.00
95-287	1st I.F. Transformer	1.00
S-4015	Antenna Coil Assembly	1.00
S-4017	Oscillator Coil Assembly	.75

Miscellaneous

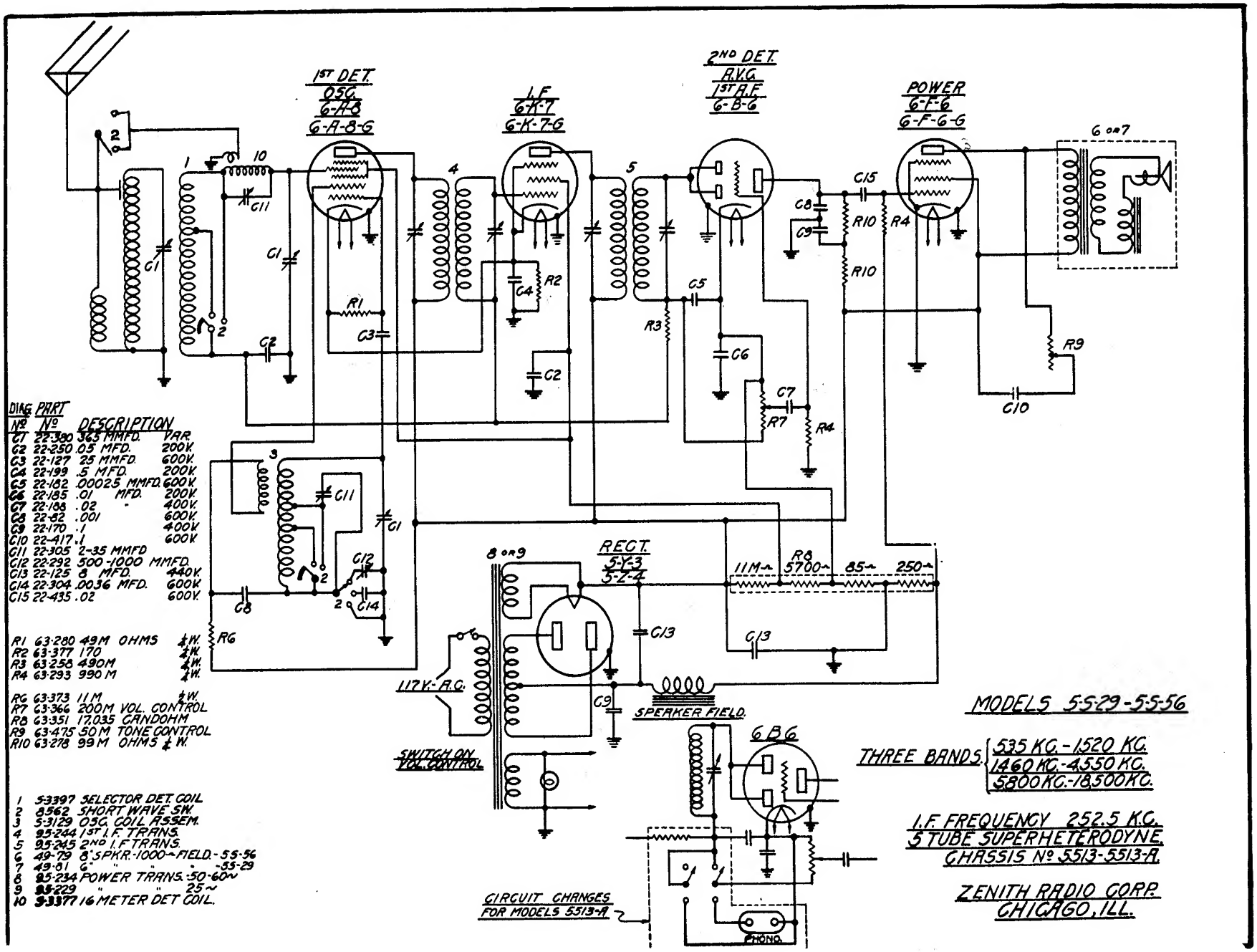
26-92	Dial Scale only (Less Frame)	.35
S-3718	" " and Frame Complete	.50
S-3717	" Pointer and Bushing	.25
46-122	Tuning Knobs (3 used)	.10
49-115	5" Dynamic Speaker	4.50
	Cone and Voice Coil for 49-115	2.00
	Output Transformer for 49-115	1.75
	Field Coil for 49-115	1.50
49-116	8" Dynamic Speaker	6.00
	Cone and Voice Coil for Model 51	2.50
	Output Transformer for Model 51	1.75
	Field Coil for Model 51	1.50
58-30	Four Prong Speaker Plug	.25
78-132	6-A-8 Wafer Type Socket	.15
78-136	5-Y-3 " " "	.15

Miscellaneous (Cont'd.)

78-137	6-F-6 Wafer Type Socket	$.15
78-138	6-F-7 " " "	.15
78-128	Four Contact Speaker Plug Socket	.10
85-83	Band Selector and Tone Control Switch	.75
95-288	All Voltage 50 Cycle Power Transformer	4.00
95-296	" " 25 " " "	4.75
95-297	115 Voltage 60 Cycle Power Transformer	2.50
100-23	6.3 Volt Pilot Lamp	.15
126-191	Tube Shield	.15

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

ZENITH RADIO CORPORATION
Chicago, Illinois, U.S.A.
January 2, 1936.



DIAG.	PART Nº	DESCRIPTION	
CT	22-380	365 MMFD.	VAR.
C2	22-250	.05 MFD.	200V.
C3	22-127	25 MMFD.	600V.
C4	22-199	.5 MFD.	200V.
C5	22-182	.00025 MMFD.	600V.
C6	22-185	.01 MFD.	200V.
C7	22-188	.02 "	400V.
C8	22-82	.001	600V.
C9	22-170	.1	400V.
C10	22-417	.1	600V.
C11	22-305	2-35 MMFD	
C12	22-292	500-1000 MMFD.	
C13	22-125	8 MFD.	440V.
C14	22-304	.0036 MFD.	600V.
C15	22-435	.02	600V.

R1	63-280	49M OHMS	½W.
R2	63-377	170	½W.
R3	63-258	490M	½W.
R4	63-293	990 M	½W.
RG	63-373	11 M	½W.
R7	63-366	200M VOL. CONTROL	
R8	63-351	17,035 CANDOHM	
R9	63-475	50 M TONE CONTROL	
R10	63-278	99 M OHMS	½ W.

1	5-3397	SELECTOR DET. COIL
2	8562	SHORT WAVE SW.
3	5-3129	OSC. COIL ASSEM.
4	95-244	1ST I.F. TRANS.
5	95-245	2ND I.F. TRANS.
6	49-79	8" SPKR.-1000~ FIELD.-5-5-56
7	49-81	6" " " " -5-5-29
8	95-234	POWER TRANS.-50-60~
9	95-229	" " 25~
10	5-3377	16 METER DET. COIL.

MODELS 5-5-29 - 5-5-56

THREE BANDS { 535 KC. - 1520 KC. / 1460 KC. - 4550 KC. / 5800 KC. - 18,500 KC.

I.F. FREQUENCY 252.5 K.C.
5 TUBE SUPERHETERODYNE.
CHASSIS Nº 5513-5513-A.

ZENITH RADIO CORP.
CHICAGO, ILL.

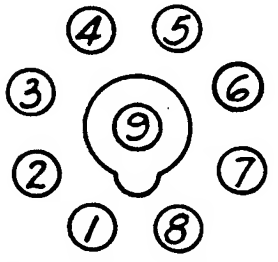
Zenith Radio Corporation

Socket Voltages

TUBE	POSITION	1	2	3	4	5	6	7	8	9
6A8	1st Det. Osc.	0	5.8_{ac}	260	80	-.1	210	0	4	0
6K7	I. F.	0	5.8_{ac}	260	80	0	-	0	5.2	0
6B6	2nd Det. A.V.C.	0	5.8_{ac}	135	0	0	-	0	1.5	0
6F6	PWR	0	5.8_{ac}	240	260	-.7	-	0	0	-
5Y3	Rect.	0	260	-	270_{ac}	-	270_{ac}	-	260	-

Line Voltage 110 Antenna and Ground Disconnected

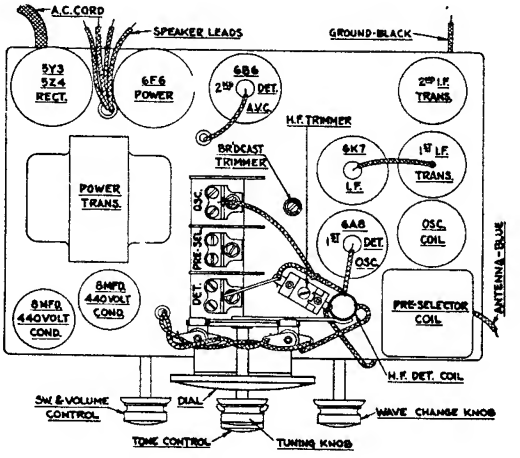
All voltages measured from point indicated to ground, using a 1000 ohm per volt D.C. meter (unless marked otherwise).



BOTTOM VIEW OF SOCKET

Alignment

1. Balance I.F. transformers at 252.5 K.C. with test oscillator connected to control grid of 6A8 and ground.
2. Turn band switch to C band. Connect test oscillator to antenna and ground leads. Set test oscillator at 15 Megacycles. Adjust oscillator trimmer on gang condenser for correct dial reading.
3. Adjust detector trimmer (located on top of chassis between front section of gang condenser and coil) for maximum output.
4. Turn band switch to A band. Adjust oscillator trimmer (located on right side underneath chassis) for correct dial reading at 1400 K.C. also adjust preselector and detector trimmers on gang for maximum output.
5. Adjust oscillator padder (next to oscillator section of gang on top of chassis) while rocking pointer back and forth past 600 K.C. to the combination giving greatest output.
6. Recheck 1400 K.C.
7. Repeat entire procedure.



TUBE POSITION

Dial Assembly

S-3867	Complete Split Second Dial Assembly	$3.75
26-105	Dial Scale	.40
32-6	Drive Belt	.15
59-48	Split Second Pointer	.10
59-49	Special Z Pointer	.15
93-231	Glass Cushion Washer	.05
100-23	6.3 Volt Pilot Lamp	.15
132-14	Dial Glass Retainer Ring	.05
192-6	Dial Glass	.20

Condensers

22-82	.001 Mfd. 600 V.	.25
22-125	8. " 440 V.	1.00
22-127	25 Mmfd. 600 V.	.20
22-170	.1 Mfd. 400 V.	.25
22-182	.00025 Mmfd. 600 V.	.12
22-185	.01 Mfd. 200 V.	.20
22-188	.02 " 400 V.	.15
22-199	.5 " 200 V.	.35
22-250	.05 " 200 V.	.15
22-292	500 - 1000 Mmfd. Padder	.45
22-304	.0036 Mfd. 600 V.	.30
22-305	2-35 Mmfd. Padder	.15
22-380	Gang Variable	3.50
22-417	.1 Mfd. 600 V.	.25
22-435	.02 Mfd. 600 V.	.15

Resistors

63-258	490 M Ohm $\frac{1}{4}$ Watt	.20
63-277	170 " $\frac{1}{4}$ "	.20
63-278	99 M " $\frac{1}{4}$ "	.20
63-280	49 M " $\frac{1}{4}$ "	.20
63-293	990 M " $\frac{1}{4}$ "	.20
63-351	17.035 Candohm.	.65
63-366	Volume Control & Switch Assembly	.90
63-373	11 M Ohm $\frac{1}{4}$ Watt	.20
63-409	Volume Control & Switch Assembly (Export Only)	1.00
63-475	Tone Control Assembly	.65

Coils and Chokes

95-244	1st I. F. Transformer Assembly	1.50
95-245	2nd I. F. Transformer Assembly	1.50
S-3129	Oscillator Coil Assembly	1.00
S-3377	16-Meter Detector Coil Assembly	.75
S-3397	Selector-Detector Coil Assembly	2.00

Miscellaneous

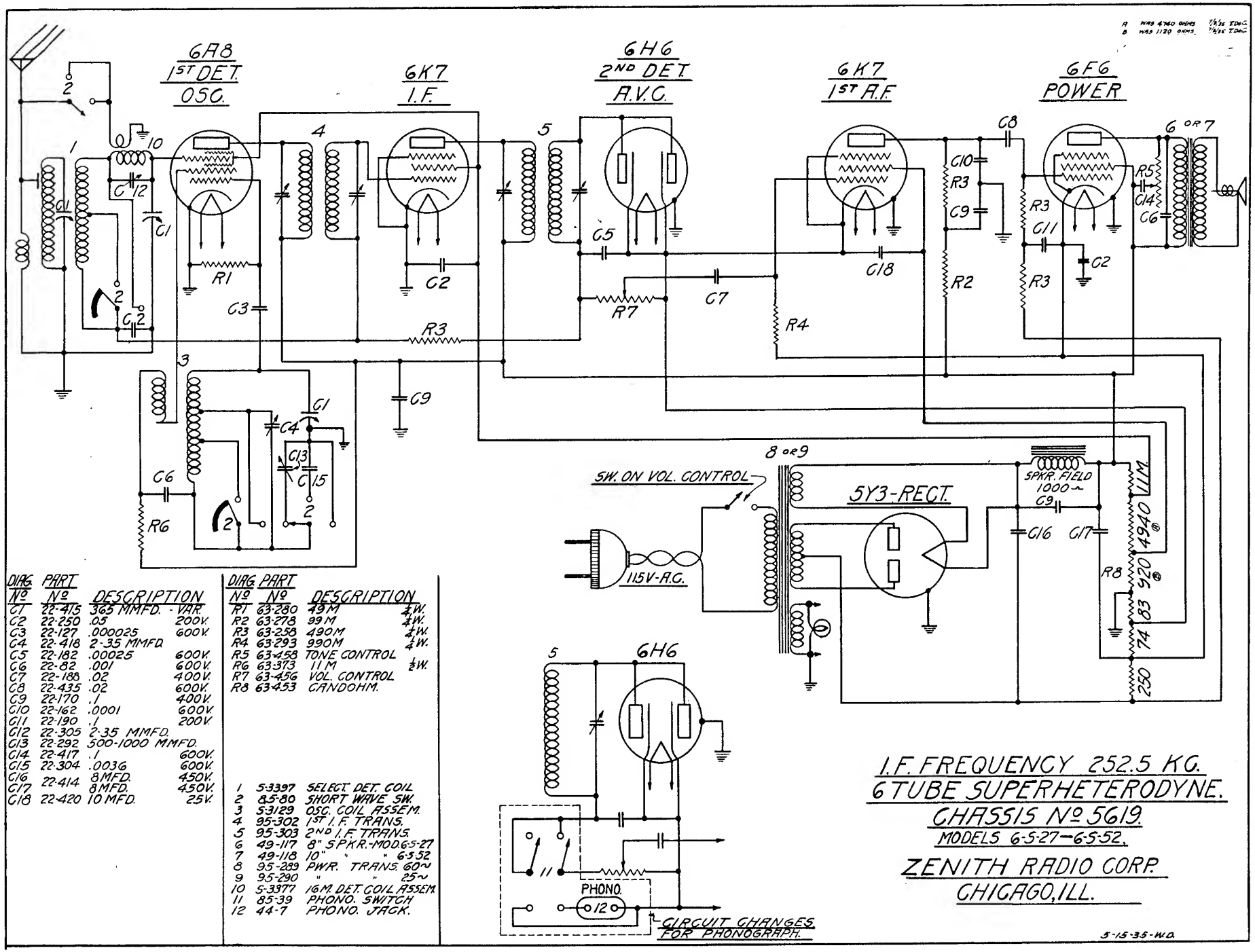
44-7	Phonograph Jack (Export Only)	.15
46-124	Volume and Tone Control Knobs	.20

Miscellaneous (Cont'd)

46-127	Tone Control Knob	.15
46-130	Band Selector Knob	.20
46-131	Tuning Knob	.15
49-79	8" Dynamic Speaker (Model 56)	8.00
	Cone and Voice Coil for 49-79	2.50
	Field Coil for 49-79	2.00
	Output Transformer for 49-79	2.00
49-81	6" Dynamic Speaker (Model 29)	5.50
	Cone and Voice Coil for 49-81	2.00
	Field Coil for 49-81	2.00
	Output Transformer for 49-81	1.50
57-483	Dial Escutcheon Plate	.50
78-131	6K7 Wafer Type Tube Socket	.15
78-132	6A8 Wafer Type Tube Socket	.15
78-136	5Y3 " " " "	.15
78-137	6F6 " " " "	.15
78-143	6B6 " " " "	.15
85-39	Phono Switch - D. P. D. T. ...(Export only)	1.00
85-62	Band Selector Switch	.80
95-229	All Voltage 25 cycle Power Transformer	6.50
95-234	117 Volt, 50-60 cycle Power Transformer	3.75
126-127	Tube Shield	.10

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

ZENITH RADIO CORPORATION
CHICAGO, ILLINOIS, U. S. A.
July 5, 1935



DIAG. No.	PART No.	DESCRIPTION	
C1	22-415	365 MMFD. - VAR.	
C2	22-250	.05	200V.
C3	22-127	.000025	600V.
C4	22-418	2-35 MMFD.	
C5	22-182	.00025	600V.
C6	22-82	.001	600V.
C7	22-188	.02	400V.
C8	22-435	.02	600V.
C9	22-170	.1	400V.
C10	22-162	.0001	600V.
C11	22-190	.1	200V.
C12	22-305	2-35 MMFD.	
C13	22-292	500-1000 MMFD.	
C14	22-417	.1	600V.
C15	22-304	.0036	600V.
C16	22-414	8 MFD.	450V.
C17		8 MFD.	450V.
C18	22-420	10 MFD.	25V.

DIAG. No.	PART No.	DESCRIPTION	
R1	63-280	49 M	½W.
R2	63-278	99 M	½W.
R3	63-258	490 M	½W.
R4	63-293	990 M	½W.
R5	63-458	TONE CONTROL	
R6	63-373	11 M	½W.
R7	63-456	VOL. CONTROL	
R8	63-453	CANDOHM.	

1	5-3397	SELECT. DET. COIL
2	85-80	SHORT WAVE SW.
3	5-3129	OSC. COIL ASSEM.
4	95-302	1ST I.F. TRANS.
5	95-303	2ND I.F. TRANS.
6	49-117	8" SPKR.-MOD. 6-5-27
7	49-118	10" " " 6-5-52
8	95-289	PWR. TRANS. 60~
9	95-290	" " 25~
10	5-3377	16 M. DET. COIL ASSEM.
11	85-39	PHONO. SWITCH
12	44-7	PHONO. JACK.

I.F. FREQUENCY 252.5 KC.
6 TUBE SUPERHETERODYNE.
CHASSIS No. 5619.
MODELS 6-5-27—6-5-52.

ZENITH RADIO CORP.
CHICAGO, ILL.

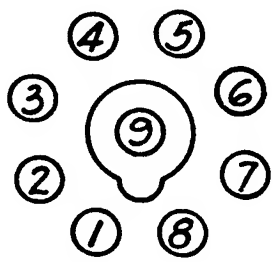
5-15-35-W.D.

Zenith Radio Corporation

Socket Voltages

TUBE	POSITION	1	2	3	4	5	6	7	8	9
6A8	1st.Det. Osc.	0	5_{ac}	225	70	-.1	190	0	0	0
6K7	I.F.	0	5_{ac}	225	70	0	-	0	0	0
6H6	2nd Det.	0	5_{ac}	-1	-2.5	-1	-	0	-2.5	-
6K7	1st.Aud.	0	5_{ac}	60	14	-2.5	-	0	-2.5	0
6F6	PWR	0	5_{ac}	220	225	-2.5	-	0	-2.5	-
5Y3	Rect.	0	300	-	305_{ac}	-	305_{ac}	-	300	-

Line voltage 110. Antenna and Ground disconnected.

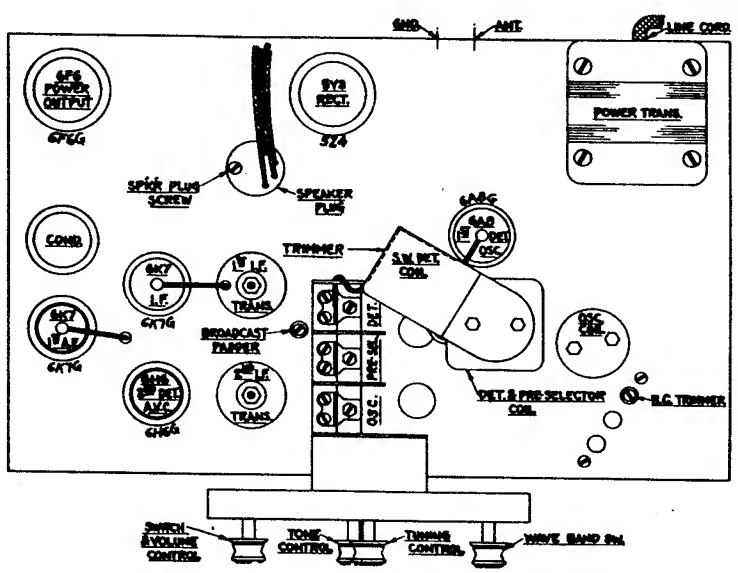


BOTTOM VIEW OF SOCKET

All voltages measured from point indicated to ground, using a 1000 ohm per volt D.C. meter (unless marked otherwise).

Alignment

(1) Balance I.F. transformers at 252½K.C. with test oscillator connected to control grid of 6A8 and ground.
(2) Turn band switch to "C" Band. Connect test oscillator to antenna and ground leads and set for 15 megacycles. Adjust oscillator trimmer on gang condenser to secure correct dial reading.
(3) Adjust detector trimmer (located on bracket on top of detector coil) for maximum output.
(4) Turn band switch to "A" Band. Adjust oscillator trimmer (through hole in top of chassis next to oscillator) for correct dial reading at 1400 K.C. Also adjust preselector and detector trimmers on gang for maximum output.
(5) Adjust oscillator padder (next to oscillator section of gang through hole in top of chassis) while rocking pointer back and forth past 600 K.C. to the combination giving greatest output.
(6) Recheck at 1400 K.C.
(7) Repeat entire procedure.



ZENITH

PARTS AND PRICES
Chassis #5619 - Domestic
#5619 A - Export

Models 6-S-27, 6-S-27 A,
6-S-52, 6-S-52 A

Dial Assembly

7-6	Dial Glass Bezel .....(part of 57-511).....	-
26-97	Aeroplane Dial Scale	$1.00
32-7	Dial Drive Belt	.20
34-49	Condenser Shaft Gear	.25
34-50	Pinion Gear	.05
34-51	Lower Pinion and Gear	.15
59-40	Special Z Pointer	.15
59-41	Split Second Pointer and Bushing	.10
61-34	Drive Pulley	.10
61-35	Shaft Pulley and Sleeve	.25
61-36	Tension Pulley	.05
76-178	Drive Shaft	.10
76-180	Tension Pulley Shaft	.05
80-111	Dial Spring	.25
80-112	Tension Pulley Spring	.10
83-407	Dial Light Diffusion Strip	.05
100-23	6.3 V. Pilot Lamp	.15
159-11	Snap Buttons	.02
188-2	Retaining Ring	.10
192-10	Dial Glass .....(part of 57-511)....	-
196-4	Dial Glass Gasket..... " " " "	-
198-1	Dial Reflector	.40
S-3777	Tension Pulley and Spring Assembly	.30

Condensers

22-82	.001 Mfd. 600 Volt	.25
22-127	.000025 " 600 "	.20
22-162	.0001 " 600 "	.20
22-170	.1 " 400 "	.25
22-182	.00025 " 600 "	.12
22-188	.02 " 400 "	.15
22-190	.1 " 200 "	.20
22-250	.05 " 200 "	.15
22-292	500-1000 Mmfd Padder	.45
22-304	.0036 Mfd. 600 Volt	.30
22-305	2-35 Mmfd. Padder	.15
22-414	8 z 8 Mfd. 450 Volt	2.00
22-415	3-Gang Variable Condenser Gang	3.50
22-417	.1 Mfd. 600 Volt	.25
22-418	2-35 Mmfd. Padder	.15
22-420	10. Mfd. 25 Volt	.65
22-423	8 x 8 " 450 "	2.25
22-435	.02 " 600 "	.15

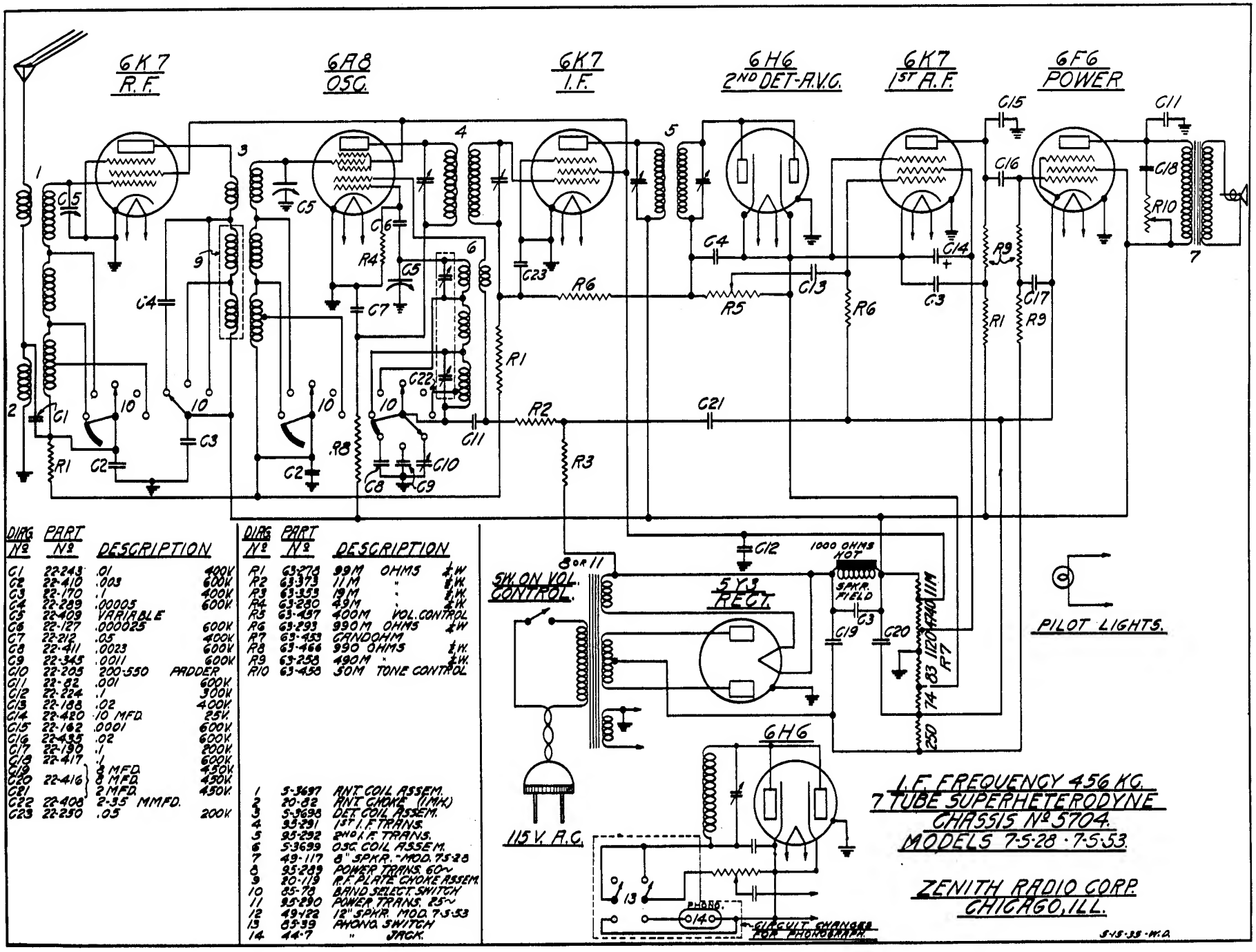
Resistors

63-258	490 M Ohm $\frac{1}{4}$ Watt	.20
63-278	99 M " $\frac{1}{4}$ "	.20
63-280	49 M " $\frac{1}{4}$ "	.20
63-293	990 M " $\frac{1}{4}$ "	.20
63-373	11 M " $\frac{1}{4}$ "	.20
63-453	Candohm	.85
63-456	Volume Control and Switch Assembly	1.00

	Resistors (contd.)	
63-458	Tone Control Assembly	$ .80
63-473	Volume Control and Switch Assembly	1.00
	Coils and Chokes	
95-302	1st I.F. Transformer Assembly	1.25
95-303	2nd I.F. " "	1.25
S-3129	Oscillator Coil Assembly	1.00
S-3377	16-meter Detector Coil Assembly	1.00
S-3397	Selector and Detector Coil Assembly	2.00
	Miscellaneous	
44-7	Phono Jack (export only)	.15
46-127	Volume, Tone and Tuning Knobs	.15
46-128	Band Selector Switch Knob	.20
49-117	8" Dynamic Speaker (Model 27)	7.00
	Cone and Voice Coil for 49-117	2.50
	Field Coil for 49-117	2.00
	Output Transformer for 49-117	2.00
49-118	10" Dynamic Speaker	9.00
	Cone and Voice Coil for 49-118 (Model 52)	3.25
	Field Coil for 49-118	2.00
	Output Transformer for 49-118	2.00
57-511	Dial Glass and Escutcheon Plate	1.50
58-30	4-Prong Speaker Plug	.25
78-129	Voltage Indicator Socket (export only)	.10
78-131	6K7 Wafer Type Tube Socket	.15
78-132	6A8 " " " "	.15
78-133	6H6 " " " "	.15
78-136	5Y3 " " " "	.15
78-137	6F6 " " " "	.15
83-334	Antenna and Ground Terminal Strip	.10
83-398	Voltage Indicator Socket Strip (export only)	.03
85-39	Phono Switch D.P.D. T. (" ")	1.00
85-80	Band Selector Switch	1.00
95-289	117-Volt, 50-60 cycle Power Transformer	3.50
95-290	25 cycle All Voltage Transformer	6.50
126-127	Tube Shields	.10

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

ZENITH RADIO CORPORATION
Chicago, Illinois, U.S.A.
June 21, 1935



DIAG Nº	PART Nº	DESCRIPTION	
C1	22-243	.01	400V
C2	22-410	.003	600V
C3	22-170	.1	400V
C4	22-289	.00005	600V
C5	22-409	VARIABLE	
C6	22-127	.000025	600V
C7	22-212	.05	400V
C8	22-411	.0023	600V
C9	22-345	.0011	600V
C10	22-205	200-550	PADDER
C11	22-82	.001	600V
C12	22-224	.1	300V
C13	22-188	.02	400V
C14	22-420	10 MFD.	25V.
C15	22-162	.0001	600V
C16	22-435	.02	600V
C17	22-190	.1	200V
C18	22-417	.1	600V
C19	22-416	8 MFD.	450V
C20		8 MFD.	450V
C21		2 MFD.	450V
C22	22-408	2-95 MMFD.	
C23	22-250	.05	200V

DIAG Nº	PART Nº	DESCRIPTION	
R1	63-274	99M OHMS	½W
R2	63-373	11M "	½W.
R3	63-353	1M "	½W.
R4	63-290	49M "	½W.
R5	63-457	400M VOL. CONTROL	
R6	63-293	990M OHMS	½W
R7	63-453	CANDOHM	
R8	63-466	990 OHMS	½W.
R9	63-258	490M "	½W.
R10	63-450	50M TONE CONTROL	

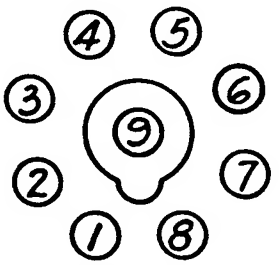
1	5-3697	ANT. COIL ASSEM.
2	20-82	ANT. CHOKE (1M/K)
3	5-3698	DET. COIL ASSEM.
4	93-291	1ST I.F. TRANS.
5	95-292	2ND I.F. TRANS.
6	5-3699	OSC. COIL ASSEM.
7	49-117	8" SPKR. - MOD. 7S-28
8	95-289	POWER TRANS. 60~
9	20-119	R.F. PLATE CHOKE ASSEM.
10	85-70	BAND SELECT. SWITCH
11	95-290	POWER TRANS. 25~
12	49-122	12" SPKR. MOD. 7S-53
13	85-39	PHONO. SWITCH
14	44-7	" JACK.

Zenith Radio Corporation

Socket Voltages

TUBE	POSITION	1	2	3	4	5	6	7	8	9
6K7	R.F.	0	6_{ac}	250	75	0	-	0	0	-.1
6A8	1st.Det. Osc.	0	6_{ac}	250	75	-1	195	0	0	-.1
6K7	I. F.	0	6_{ac}	250	75	0	-	0	0	-.1
6H6	2nd Det. A.V.C.	0	6_{ac}	-2	-2.5	-2	-	0	-2.5	-
6K7	1st Audio	0	6_{ac}	65	14	-1	-	0	- 1	-.1
6F6	PWR.	0	6_{ac}	235	250	-10	-	0	-5	-
5Y3	Rect.	0	310	-	250_{ac}	-	250_{ac}	-	310	-

Line Voltage 115 Antenna and Ground Disconnected



BOTTOM VIEW OF SOCKET

All voltages measured from point indicated to ground, using a 1000 ohm per volt D.C.meter (unless marked otherwise).

Alignment

The use of an accurately calibrated service oscillator is imperative in the alignment of modern superheterodynes. The alignment procedure is as follows:

(1) Connect service oscillator to grid of 6A8 and ground. Balance I.F. trimmers at 456 K.C.

(2) Connect service oscillator to antenna and ground binding posts and set at 6 megacycles. Adjust trimmer on gang for correct dial reading, (6 megacycles on Band B).

(3) Set service oscillator and pointer to 21 megacycles and adjust S.W. trimmer (through hole in top of chassis) for correct dial reading.

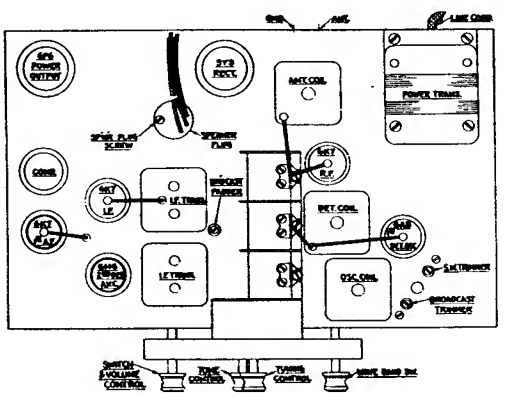
(4) Recheck 6 megacycle adjustment.

(5) Set service oscillator and pointer to 1700 K. C. (Band A) and adjust broadcast trimmer (through hole in top of chassis) for correct dial reading.

(6) Set service oscillator at 600 K.C. Adjust broadcast padder (through hole in top of chassis next to I.F. transformer), meanwhile rocking pointer to and fro past 600 K.C. on dial to combination giving greatest output.

(7) Readjust at 1700 K.C.

Note: These adjustments affect each other slightly and the entire procedure should be repeated to secure maximum results.



TUBE POSITION

Dial Assembly

7-6	Dial Glass Bezel (part of 57-511)	-
26-94	Aeroplane Dial Scale	$1.00
32-8	Drive Belt	.20
34-49	Condenser Shaft Gear	.25
34-50	Pinion Gear	.05
34-51	Lower Pinion and Gear	.15
56-44	Planetary Guide Pin (furnished with 76-181)	-
59-40	Special Z Pointer	.15
59-41	Split Second Pointer	.10
61-35	Shaft Pulley and Sleeve	.25
61-36	Tension Pulley	.05
61-37	Dial Pulley	.05
76-180	Tension Pulley Shaft	.05
76-181	Planetary Drive Assembly	1.00
80-111	Dial Spring	.25
80-112	Tension Pulley Spring	.10
83-407	Dial Light **Diffusion Strip**	.05
100-23	6.3 Volt Pilot Lamp	.15
118-10	Band Switch Indicator Link	.05
159-11	Snap Buttons	.02
188-2	Retainer Ring	.10
196-4	Dial Glass Gasket (part of 57-511)	-
S-3777	Tension Pulley and Spring Assembly	.30
S-3782	Band Indicator Lever Arm and Bushing Assembly	.30
S-3783	" " Scale and Arm Assembly	1.00
S-2918	Dial Lamp Socket and Clip Assembly	.15

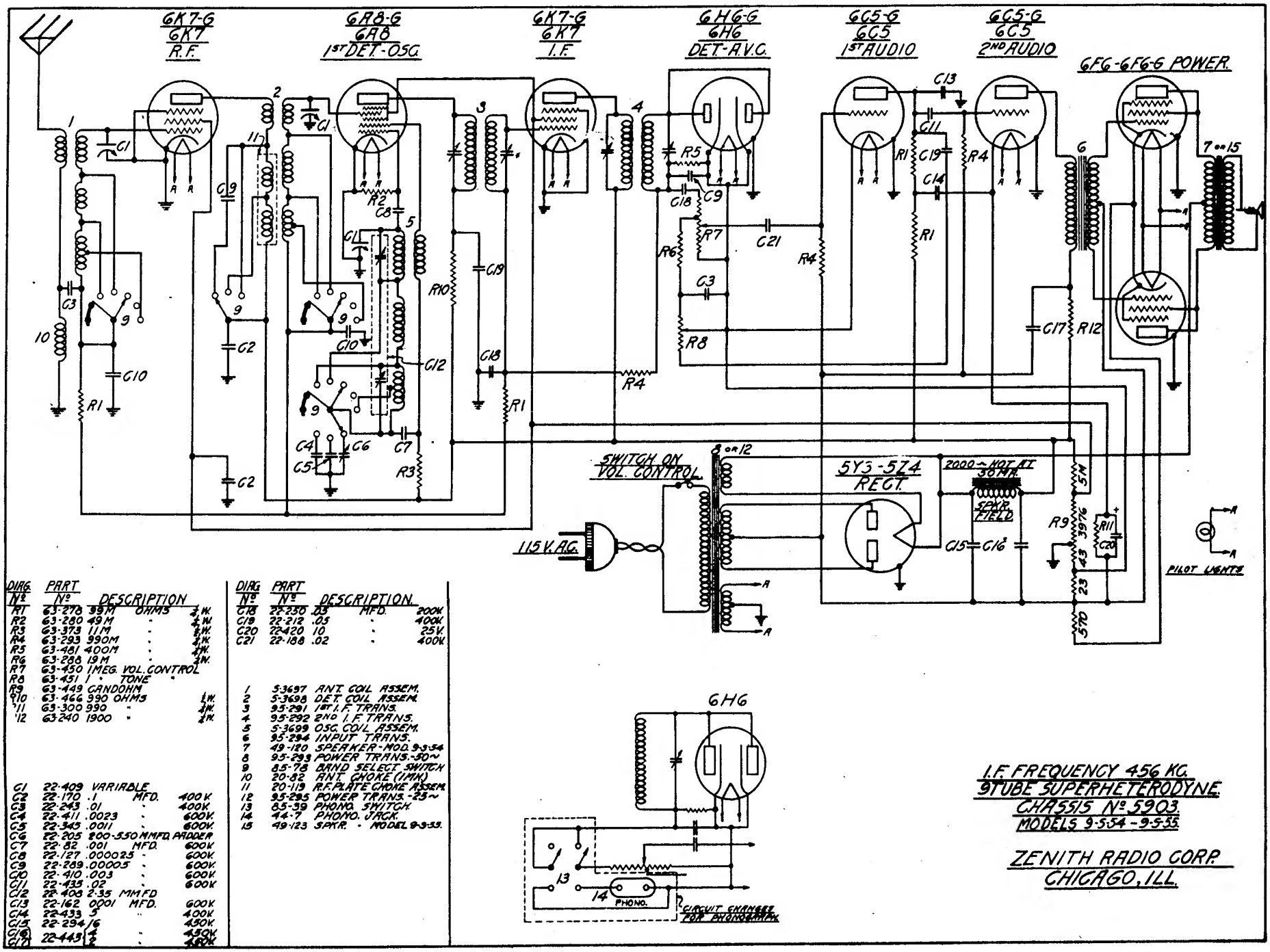
Condensers

22-82	.001 Mfd. 600 Volts	.25
22-127	.000025 " 600 "	.20
22-162	.0001 " 600 "	.20
22-170	.1 " 400 "	.25
22-188	.02 " 400 "	.15
22-190	.1 " 200 "	.20
22-205	200-550 Mmfd. Padder	.35
22-212	.05 Mfd. 400 Volts	.20
22-224	.1 " 300 "	.15
22-243	.01 " 400 "	.15
22-250	.05 " 200 "	.15
22-289	.0005 " 600 "	.12
22-345	.0011 " 600 "	.15
22-408	2-35 Mmfd. Padder	.25
22-409	3-Gang Variable	3.50
22-410	.003 Mfd. 600 Volts	.40
22-411	.0023 " 600 "	.25
22-416	8.x 8.x 2. Mfd. 450 Volts (domestic only)	2.50
22-417	.1 Mfd. 600 Volts	.25
22-420	10. " 25 "	.65
22-422	8. x 8.x 2. Mfd. 450 Volts (export only)	2.75
22-435	.02 Mfd. 600 Volts	.15

	Resistors	
63-258	490 M Ohm 1/4 Watt	$ .20
63-278	99 M " 1/4 "	.20
63-280	49 M " 1/4 "	.20
63-293	990 M " 1/4 "	.20
63-353	19 M " 1/2 "	.20
63-373	11 M " 1/2 "	.20
63-453	Candohm	.75
63-457	400 M Ohm Volume Control.....(domestic only).....	1.00
63-458	50 M " Tone Control	.80
63-466	990 " 1/2 Watt	.20
63-474	400 M " Volume Control .....(export only).....	1.00
	Coils and Chokes	
20-82	Antenna Choke	.25
20-119	R.F.Plate Choke	.50
95-291	1st I.F. Transformer	1.25
95-292	2nd I. F. "	1.25
S-3697	Antenna Coil Assembly	1.00
S-3698	Detector Coil Assembly	.85
S-3699	Oscillator Coil Assembly	.85
	Miscellaneous	
44-7	Phonograph Jack.....(export only).....	.15
46-123	Band Selector Knob	.20
46-124	Volume and Tone Control Knobs	.20
46-125	Tuning Knob - (small)	.15
46-126	" " (large)	.15
49-117	8" Dynamic Speaker (Models 28 and 30)	8.00
	Cone and Voice Coil for 49-117	2.50
	Field Coil " " "	2.00
	Output Transformer " " "	2.00
49-122	12" Dynamic Speaker (Model 53)	10.00
	Cone and Voice Coils for 49-122	3.25
	Field Coil " " "	2.00
	Output Transformer " " "	2.00
57-511	Dial Glass and Escutcheon Plate	1.50
58-30	4-Prong Speaker Plug	.25
78-128	5-Prong Speaker Plug Socket	.10
78-129	Voltage Indicator Socket .....(export only).....	.10
78-131	6K7 Wafer Type Tube Socket	.15
78-132	6A8 " " " "	.15
78-133	6H6 " " " "	.15
78-136	5Y3 " " " "	.15
78-137	6F6 " " " "	.15
85-39	Phono Switch - D.P.D.T.	1.00
85-78	Band Selector Switch	1.50
95-289	115 Volt, 50-60 cycle Power Transformer	3.50
95-290	All Voltage, 25 " " " ..(export only).....	6.50
126-127	Tube Shields	.10

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

ZENITH RADIO CORPORATION
CHICAGO, ILLINOIS, U.S.A.
June 19, 1935



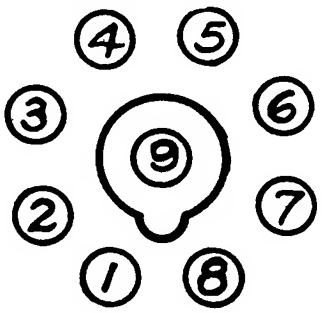
DIAG Nº	PART Nº	DESCRIPTION	
R1	63-278	39M OHMS	½W.
R2	63-280	49M "	½W.
R3	63-373	11M "	½W.
R4	63-293	990M "	½W.
R5	63-481	400M "	½W.
R6	63-288	19M "	½W.
R7	63-450	1MEG. VOL. CONTROL	
R8	63-451	1 " TONE "	
R9	63-449	CANDOHM	
R10	63-466	990 OHMS	1W.
R11	63-300	990 "	½W.
R12	63-240	1900 "	½W.

DIAG Nº	PART Nº	DESCRIPTION	
C1	22-409	VARIABLE	
C2	22-170	.1 MFD.	400V.
C3	22-243	.01 "	400V.
C4	22-411	.0023 "	600V.
C5	22-345	.0011 "	600V.
C6	22-205	800-550 MMFD. PADDER	
C7	22-82	.001 MFD.	600V.
C8	22-127	.000025 "	600V.
C9	22-289	.00005 "	600V.
C10	22-410	.003 "	600V.
C11	22-435	.02 "	600V.
C12	22-403	2-35 MMFD.	
C13	22-162	.0001 MFD.	600V.
C14	22-433	.5 "	400V.
C15	22-294	16 "	450V.
C16	22-443	8 "	450V.
C17		2 "	450V.

DIAG Nº	PART Nº	DESCRIPTION	
C18	22-230	.03 MFD.	200V.
C19	22-212	.05 "	400V.
C20	22-420	10 "	25V.
C21	22-188	.02 "	400V.

1	5-3697	ANT. COIL ASSEM.
2	5-3698	DET. COIL ASSEM.
3	95-291	1ST I.F. TRANS.
4	95-292	2ND I.F. TRANS.
5	5-3699	OSC. COIL ASSEM.
6	95-294	INPUT TRANS.
7	49-120	SPEAKER-MOD. 9-S-54
8	95-293	POWER TRANS.-50~
9	85-78	BAND SELECT SWITCH
10	20-82	ANT. CHOKE (1MH)
11	20-119	R.F. PLATE CHOKE ASSEM.
12	95-295	POWER TRANS.-25~
13	85-39	PHONO. SWITCH
14	44-7	PHONO. JACK
15	49-123	SPKR. - MODEL 9-S-55

TUBE	POSITION	1	2	3	4	5	6	7	8	9
6K7	R.F.	0	3_{ac}	230	95	0	-	3_{ac}	0	-.1
6A8	1st.Det. Osc.	0	3_{ac}	230	95	0	140	3_{ac}	0	-.1
6K7	I.F.	0	3_{ac}	230	95	0	-	3_{ac}	0	-.1
6H6	2nd Det. A.V.C.	0	3_{ac}	-1	-1	0	-	3_{ac}	-1	-
6C5	1st.Aud.	0	3_{ac}	22	-	-2	-	3_{ac}	-2	-
6C5	2nd Aud.	0	3_{ac}	210	-	-2	-	3_{ac}	0	-
6F6	PWR.	0	3_{ac}	350	350	-3	-	3_{ac}	27	-
5Y3	Rect.	0	360	-	350_{Ac}	-	350_{Ac}	-	360	-



BOTTOM VIEW OF SOCKET

Line Voltage 115 Antenna and Ground Disconnected

Voltages measured from point indicated to ground, using a 1000 ohm per volt meter, except heaters. (2 - 7)

Alignment

The use of an accurately calibrated service oscillator is imperative in the alignment of modern superheterodynes. The alignment procedure is as follows:

(1) Connect service oscillator to grid of 6A8 and ground. Balance I. F. trimmers at 456 K.C.

(2) Connect service oscillator to antenna and ground binding posts and set at 6 megacycles. Adjust oscillator trimmer on gang for correct dial reading, (6 megacycles on Band B).

(3) Set service oscillator and pointer to 21 megacycles and adjust S.W. trimmer (through hole in top of chassis) for correct dial reading.

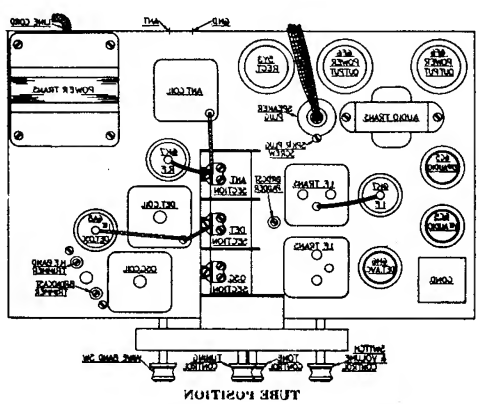
(4) Recheck 6 megacycle adjustment.

(5) Set service oscillator and pointer to 1700 K.C.(Band A) and adjust broadcast trimmer (through hole in top of chassis) for correct dial reading.

(6) Set service oscillator at 600 K.C. Adjust broadcast padder (through hole in top of chassis next to I.F. transformer), meanwhile rocking pointer to and fro past 600 K.C. on dial to combination giving greatest output.

(7) Readjust at 1700 K.C.

Note: These adjustments affect each other slightly and the entire procedure should be repeated to secure maximum results.



ZENITH RADIO — LONG DISTANCE

PARTS AND PRICES
Chassis #5903 - Domestic
#5903 A - Export
Models 9-S-30, 9-S-54 and 9-S-55

	Dial Assembly	
7-6	Dial Glass Bezel (part of 57-511)	-
26-94	Aeroplane Dial Scale	$1.00
32-8	Drive Belt	.20
34-49	Condenser Shaft Gear	.25
34-50	Pinion Gear	.05
34-51	Lower Pinion and Gear	.15
56-44	Planetary Guide Pin (furnished with 76-181)	-
59-40	Special Z Pointer	.15
59-41	Split Second Pointer	.10
61-35	Shaft Pulley and Sleeve	.25
61-36	Tension Pulley	.05
61-37	Dial Pulley	.05
76-180	Tension Pulley Shaft	.05
76-181	Planetary Drive Assembly	1.00
80-111	Dial Spring	.25
80-112	Tension Pulley Spring	.10
83-407	Dial Light Diffusion Strip	.05
100-23	6.3 Volt Pilot Lamp	.15
118-10	Band Switch Indicator Link	.05
159-11	Snap Buttons	.02
188-2	Retainer Ring	.10
196-4	Dial Glass Gasket (part of 57-511)	-
S-3777	Tension Pulley and Spring Assembly	.30
S-3782	Band Indicator Lever Arm and Bushing Assembly	.30
S-3783	" " Scale and Arm Assembly	1.00
S-2918	Dial Lamp Socket and Clip Assembly	.15
	Condensers	
22-82	.001 Mfd. 600 Volt	.25
22-127	.000025 " 600 "	.20
22-162	.001 " 600 "	.20
22-170	.5 " 400 "	.25
22-188	.02 " 400 "	.15
22-205	200-500 Mmfd. Padder	.35
22-212	.05 Mfd. 400 Volt	.20
22-243	.01 " 400 "	.15
22-250	.05 " 200 "	.15
22-289	.00005 " 600 "	.12
22-345	.0011 " 600 "	.15
22-408	2-35 Mmfd. Padder	.25
22-409	3-Gang Variable Condenser	3.50
22-410	.003 Mfd. 600 Volt	.40
22-411	.0023 " 600 "	.25
22-412	16 x 4 x 2 Mfd. 450 Volt (domestic only)	3.00
22-420	10. Mfd. 25 Volt	.65
22-433	.5 " 400 "	.30
22-435	.02 " 600 "	.15
22-421	16 x 4 x 2 Mfd. 450 Volt (export only)	3.25
	Resistors	
63-240	1900 Ohm ½ Watt	.20

	Resistors (Cont'd)	
63-278	99 M Ohm 1/4 Watt	$ .20
63-280	49 M " 1/4 "	.20
63-288	19 M " 1/4 "	.20
63-293	990 M " 1/4 "	.20
63-300	990 " 1/4 "	.20
63-373	11 M " 1/2 "	.20
63-449	Candohm Resistor	1.00
63-450	Volume Control and Switch Assembly.....(domestic only).....	1.00
63-451	Tone Control Assembly	.80
63-452	650 M Ohm 1/4 Watt	.20
63-466	990 " 1/2 "	.20
63-472	Volume Control and Switch Assembly .....(export only).....	1.00
	Coils and Chokes	
20-82	Antenna Choke	.25
20-119	R. F.Plate Choke Assembly	.50
95-291	1st I.F. Transformer Assembly	1.25
95-292	2nd " " " "	1.25
S-3697	Antenna Coil Assembly	1.00
S-3698	Detector Coil Assembly	.85
S-3699	Oscillator Coil Assembly	.85
	Miscellaneous	
44-7	Phonograph Jack.....(export only).....	.15
46-123	Band Selector Switch Knob.....	.20
46-124	Volume and Tone Control Knobs	.20
46-125	Tuning Knob .....(small).....	.15
46-126	" " .....(large).....	.15
49-120	12" Dynamic Speaker (Models 54 and 55)	10.00
	Cone and Voice Coil for 49-120	3.25
	Field Coil for 49-120	2.00
	Output Transformer for 49-120	2.00
49-126	8" Dynamic Speaker (Model 30)	8.00
	Cone and Voice Coil for 49-126	2.50
	Field Coil for 49-126	2.00
	Output Transformer for 49-126	2.00
57-511	Dial Glass Escutcheon Plate	1.50
58-30	4-Prong Speaker Plug	.25
78-128	5-Prong " " Socket	.10
78-120	Voltage Indicator Socket .....(export only)....	.10
78-131	6K7 Wafer Type Tube Socket	.15
78-132	6A8 " " " "	.15
78-133	6H6 " " " "	.15
78-134	6C5 " " " "	.15
78-136	5Y3 " " " "	15
78-137	6F6 " " " "	.15
85-39	Phono Switch D.P. D.T.	1.00
85-78	Band Selector Switch	1.50
95-293	115 V., 50-60 cycle, Power Transformer	4.50
95-294	Audio Transformer	2.00
95-295	All Voltage, 25 cycle, Power Transformer ....(export only)...	7.50
126-127	Tube Shields.....	.10

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

ZENITH RADIO CORPORATION
Chicago, Illinois, U.S.A. 6/19/35

Service Bulletin

MODELS
12-L-57
12-L-58

ZENITH RADIO

Chassis
No. 1202-1202A

SERVICE NOTES

On actual service hints, check all tubes, aerial and ground installation first.

Lack sensitivity -- Re-Balance.

A.V.C. blocks -- Open A.V.C. resistor or grounded circuit, noticeable by distortion. Usually clears up when aerial is removed.

Weak - S.W. -- Open #22-242 .05 condenser.

Weak - all over -- Open #22-190 .1 in A.V.C. circuit.

Dead -- Open #22-435 .02 coupling condenser. If shorted, set will be weak and distorted.

Dead or very weak -- Open #22-188 .02 condenser. If shorted, set will be distorted with no apparent change in volume control.

Dead -- #22-433 .5 shorted.

Hums -- #22-433 .5 open, also mismatched 6K6 tubes. In rare cases defective choke or filter.

Weak -- Open #22-250 .05 condensers.

Weak -- L.W. band, open .000025 - red - green - black. Condenser in L.W. circuit.

Weak -- I.F. or R.F. coil open or shorted. Flutters all bands - Open .1 #22-170 screen condenser Set dead if shorted with no screen voltage.

Distorted & Weak -- Shorted I.F. grid circuit.

Signals tune sharp -- noise level low off the signal --- check 6H6 tube.

Pointers will not turn -- Belt off pulley. Split second hand will not turn - binds on cabinet or loose planetary lugs - adjust carefully.

Lack sensitivity with oscillation on "D" band around 12 megacycles -- check for open antenna choke or antenna coil.

Carrier Hum -- Open Antenna choke coil.

Oscillates -- Dress all I.F. wires. Check for open condensers, tubes, balance, etc. - check aerial installation and ground.

Off scale -- Large "Z" pointer loose on gang hub.

Alignment

The bands are as follows:

Band	Color	Kilocycles	Megacycles	Meters
A	Green	550 - 1,740	.55 - 1.74	545 - 172
B	Green	2,000 - 7,000	2 - 7	150 - 42.8
C	Red	150 - 370	.15 - .37	2,000 - 800
D	Red	7,000 - 22,500	7 - 22.5	42.8 - 13.3

The diagram on Page 3 shows position of major components and aligning adjustments. It should be studied carefully before any attempt is made to adjust the various circuits. The Clough-Brengle Model OC is a commercial service oscillator highly recommended for this work.

Separate coils are used for each band. Mounted on the coils are individual trimmers that align each band, independent of the other bands.

1. Connect service oscillator to grid of 6A8 detector oscillator tube and peak I.F. trimmers (see diagram Page 3) at 456 K.C.

2. Connect service oscillator to antenna post and set to 1400 K.C. Adjust trimmers A, B and C to resonance with dial indicator to 1400 K.C.

3. Set service oscillator to 600 K.C. and adjust broadcast padder D for maximum gain while rocking dial slowly over 600 K.C.

4. Place band switch on band "B" (2 - 7 megacycles) and set service oscillator and dial indicator to 6 megacycles. Adjust gang condenser trimmer E for maximum output while slowly rocking dial over 6 megacycles.

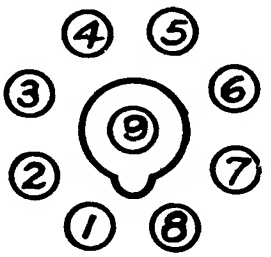
5. Align "D" band (7-22.5 megacycles) next by setting service oscillator and dial indicator to 18 megacycles and rocking indicator slowly over that point while adjusting rimmer F to maximum output.

6. Set band switch to "C" band (long wave) and peak at 350 K.C.with trimmers G, I and J. Turn dial indicator and service oscillator to 150 K.C.and adjust long wave padder H while slowly rocking dial indicator.

7. Re-balance again at 6 megacycles and 1400 K.C. as in 2 and 4.

Socket Voltages

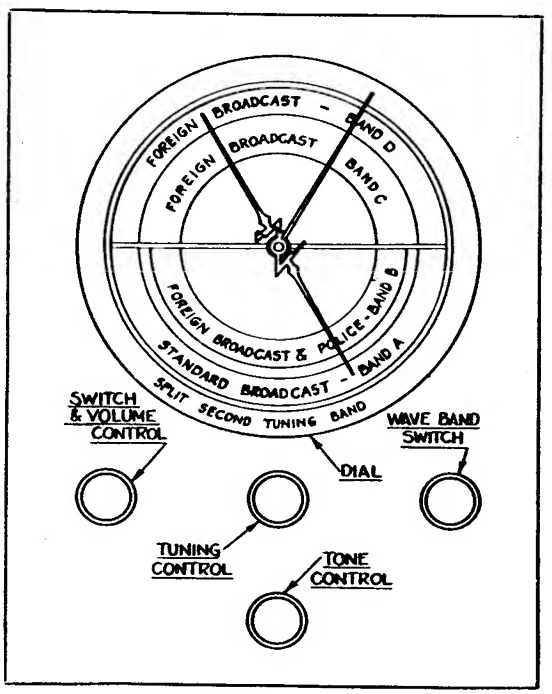
TUBE	POSITION	1	2	3	4	5	6	7	8	9
6K7	R.F.	0	2.9ac	225	97	0	-	2.9ac	0	- .1
6A8	1st. Det. Osc.	0	2.9ac	225	97	-5	200	2.9ac	0	- .1
6K7	I.F.	0	2.9ac	225	97	0	-	2.9ac	0	- .1
6H6	2nd Det. A. V. C.	0	2.9ac	-2.1	-2.5	-2.5	-	2.9ac	-2.5	-
6C5	Shadow Meter	0	2.9ac	215	-	0	-	2.9ac	8.5	-
6C5	1st. Audio	0	2.9ac	42	-	0	-	2.9ac	0	-
6C5	Driver	0	2.9ac	215	-	0	-	2.9ac	8.5	-
6F6	Power	0	2.9ac	340	340	-4.5	-	2.9ac	25	-
5Y3 5Z4	RECT.	0	350	-	300 a.c.	-	300 a.c.	-	350	-



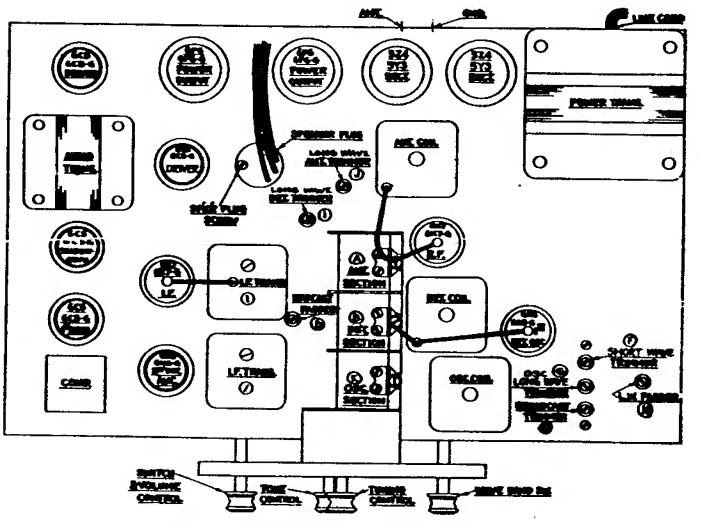
BOTTOM VIEW OF SOCKET

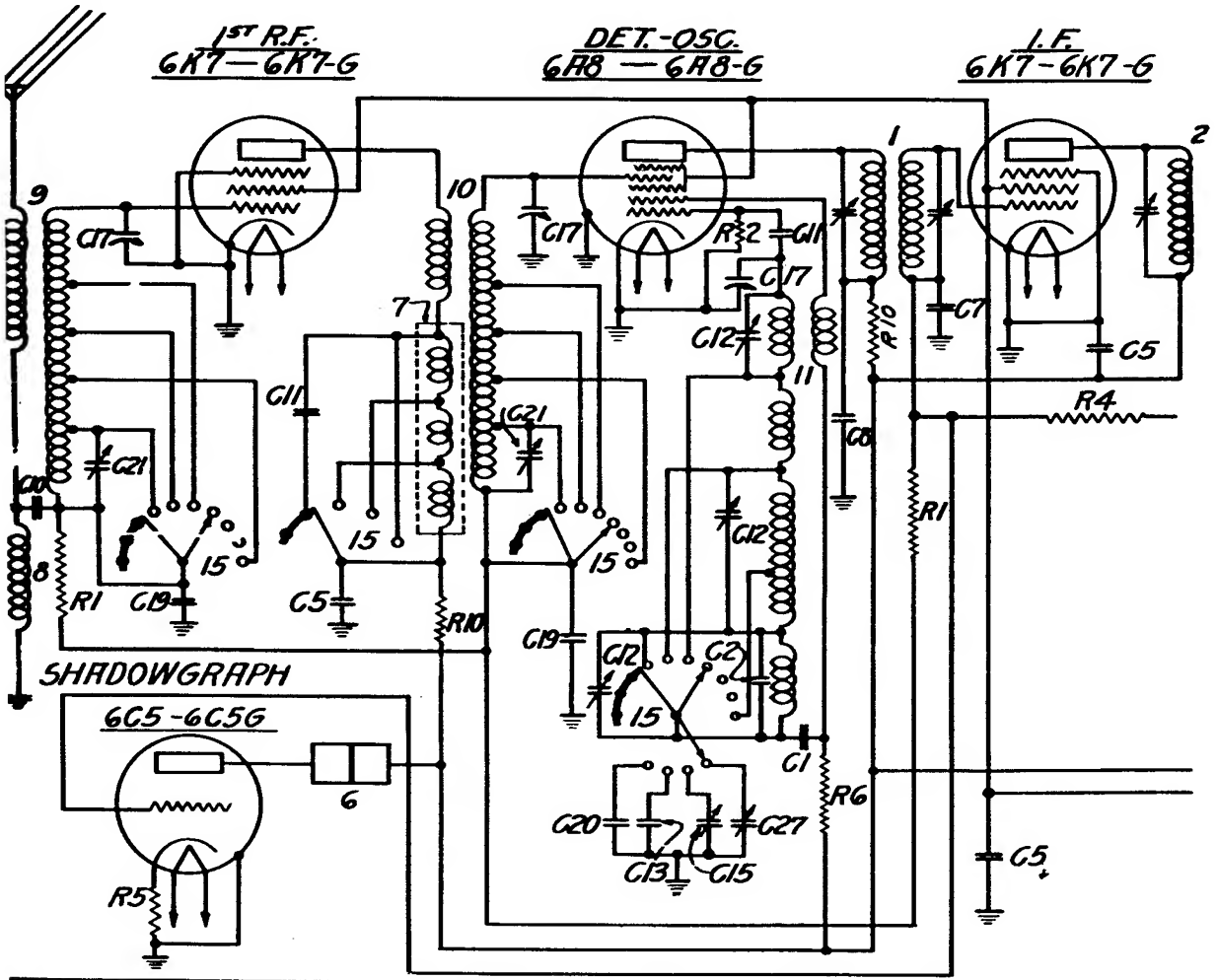
Line Voltage 115 Antenna and Ground Disconnected

Voltages measured from point indicated to ground, using a 1000 ohm per volt meter, except heaters. (2 - 7)



Control Panel



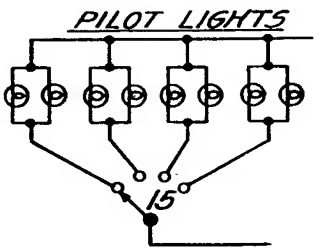


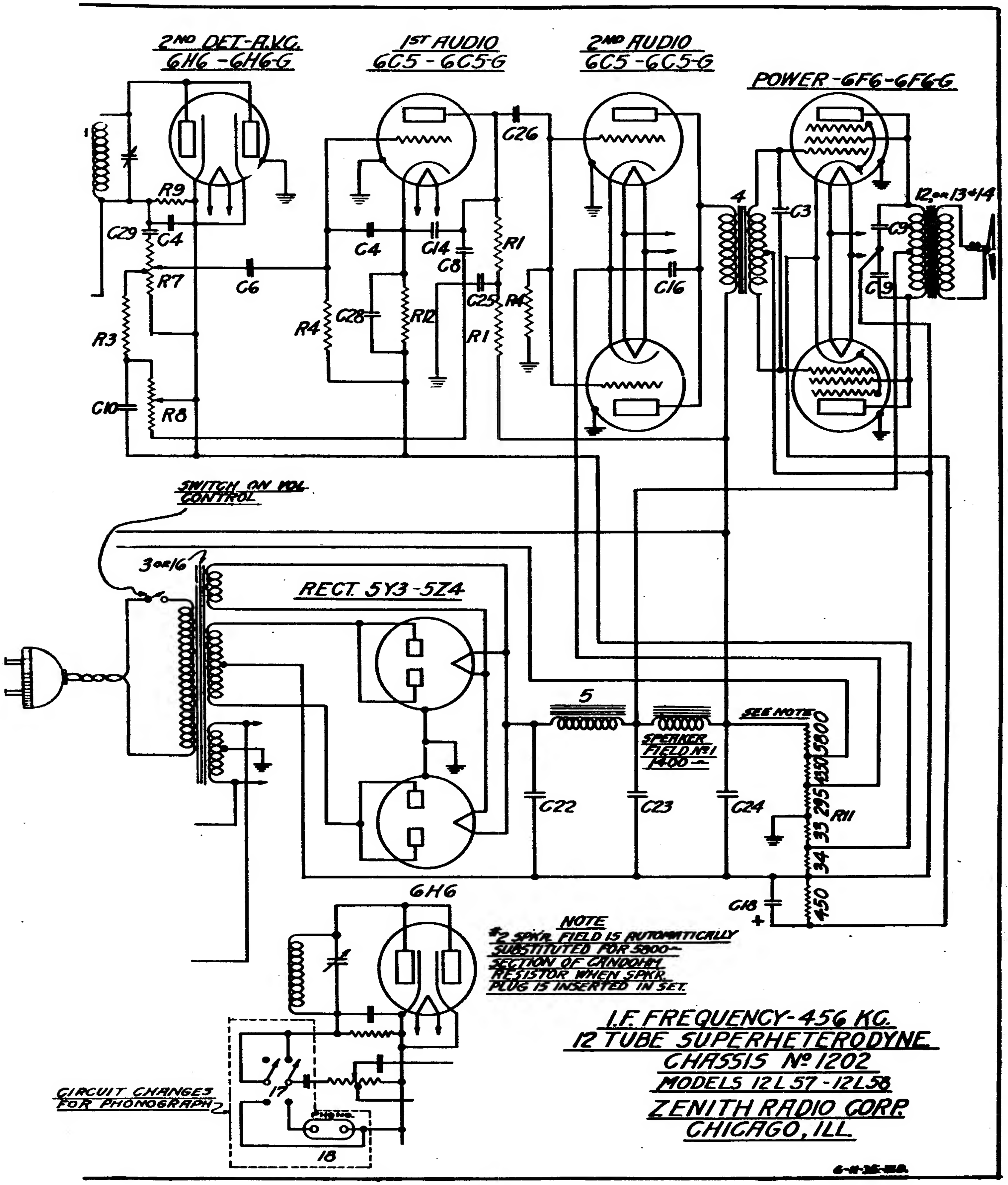
DIAG. No	PART No	DESCRIPTION	
R1	63-278	99M OHMS	½ W.
R2	63-280	49M "	½ W.
R3	63-288	19M "	½ W.
R4	63-293	990M "	½ W.
R5	63-303	700 "	½ W.
R6	63-373	11M "	½ W.
R7	63-450	1MEG. VOL. CONTROL	
R8	63-451	1MEG. TONE CONTROL	
R9	63-481	400M. OHMS	½ W.
R10	63-466	990 "	½ W.
R11	63-471	CANDOHM	
R12	63-242	2500 OHMS	½ W.

DIAG. No	PART No	DESCRIPTION	
C1	22-82	.001 MFD.	600V.
C2	22-127	.0000025	600V.
C3	22-147	.0005	600V.
C4	22-162	.0001	600V.
C5	22-170	.1	400V.
C6	22-188	.02	400V.
C7	22-190	.1	200V.
C8	22-212	.05	400V.
C9	22-229	.005	600V.
C10	22-243	.01	400V.
C11	22-289	.00005	600V.
C12	22-324	2-35 MMFD. - 3 SECTION.	
C13	22-345	.0011 MFD.	600V.
C14	22-358	.002 "	600V.
C15	22-205	200-550 MMFD. PADDER	
C16	22-368	.003 MFD.	600V.
C17	22-409	3 GANG VARIABLE	
C18	22-405	10 MFD.	50V.
C19	22-410	.003 MFD.	600V.
C20	22-411	.0023 "	600V.
C21	22-418	2-35 MMFD.	

DIAG. No	PART No	DESCRIPTION	
C22	22-294	16 MFD.	450V.
C23 C24	22445	8 MFD. / 4 MFD.	"
C25	22-433	.5 MFD.	400V.
C26	22-435	.02 "	600V.
C27	22-424	50-180 MMFD. PADDER	
C28	22-420	10 MFD.	25V.
C29	22-250	.05 MFD.	200V.
1	95-291	1ST I.F. TRANS. - 456 KC.	
2	95-292	2ND I.F. " "	
3	95-306	117V.-50-60 CYCLE TRANS.	
4	95-307	AUDIO TRANS.	
5	95-320	POWER CHOKE	
6	122-10	SHADOW METER	
7	20-120	R.F. PLATE CHOKE	
8	20-124	ANT. CHOKE - 2MH.	
9	5-3747	ANT. COIL ASSEM.	
10	5-3746	DET. COIL ASSEM.	
11	5-3745	OSC. COIL ASSEM.	
12	49-121	12" SPKR. - MODEL 12 L 57	
13	49-124	12" "	MODEL
14	49-125	6 " - 5800~FIELD	12L58
15	85-82	BAND SELECTOR SW.	
16	95-310	25~ALL VOLT. PWR. TRANS.	
17	85-39	PHONO. SWITCH.	
18	44-7	PHONO. JACK	

PILOT LIGHTS




2ND DET-A.V.C.
6H6 - 6H6-G
1ST AUDIO
6C5 - 6C5-G
2ND AUDIO
6C5 - 6C5-G
POWER - 6F6 - 6F6-G
R9
C29
C4
R7
C6
R3
C10
R8
C14
C8
R1
C28
R12
R4
C25
R6
C26
C16
4
C3
C9
12 or 13 & 14
SWITCH ON VOL. CONTROL
3 or 16
RECT. 5Y3 - 5Z4
5
SPEAKER FIELD No 1 1400 ~
SEE NOTE
5800
4350
295
35
34
450
R11
C22
C23
C24
C18
6H6
NOTE
#2 SPKR. FIELD IS AUTOMATICALLY SUBSTITUTED FOR 5800~ SECTION OF CANDOHM RESISTOR WHEN SPKR. PLUG IS INSERTED IN SET.
I.F. FREQUENCY - 456 KC.
12 TUBE SUPERHETERODYNE
CHASSIS No 1202
MODELS 12L57 - 12L58
ZENITH RADIO CORP.
CHICAGO, ILL.
CIRCUIT CHANGES FOR PHONOGRAPH
17
PHONO.
18

Parts and Prices

Chassis #1202 - Domestic
#1202 A - Export
Dial and Drive assembly

Models 12-A-57 and 12-A-58

7-8	Escutcheon Glass Bezel (part of 57-516)	-
26-99	Glass Dial Scale (Split Second Calibration)	$ 1.25
26-100	Glass Dial Scale (Police and Long Wave Band)	1.25
26-101	Glass Dial Scale (Broadcast and Short Wave Band)	1.25
27-7	Backing Disc	.05
32-9	Drive Belt	.25
34-49	Condenser Shaft Gear	.25
34-50	Pinion Gear	.05
34-51	Lower Pinion and Gear	.15
56-44	Planetary Guide Pin. (Part of 76-181)	-
59-46	Special Z Pointer and Bushing	.25
59-47	Split Second Pointer	.15
61-35	Shaft Pulley and Sleeve	.25
61-36	Tension Pulley	.05
61-37	Dial Pulley	.05
76-179	Drive Shaft	.05
76-180	Tension Pulley Shaft	.05
76-181	Planetary Drive Assembly	1.00
80-111	Dial Spring	.25
80-112	Tension Pulley Spring	.10
93-268	Brass U Washer	.01
93-269	Spring Washer	.01
93-270	Black Bakelite Washer	.01
97-91	Lower Gear Stud	.01
100-23	6.3 Volt Dial Lamps	.15
147-23	Dial Glass Spacer (4 used)	.01
188-2	Retaining Rings	.10
196-6	Escutcheon Glass Gasket (Part of 57-516)	-
196-7	Dial Glass Gasket	.02
S-3777	Tension Pulley and Spring Assembly	.30

Condensers

22-82	.001	Mfd.	600	Volts	.25
22-127	.000025	"	600	"	.20
22-147	.0005	"	600	"	.15
22-162	.0001	"	600	"	.20
22-170	.1	"	400	"	.25
22-188	.02	"	400	"	.15
22-190	.1	"	200	"	.20
22-205	200-550	Mmfd.	Padder		.35
22-212	.05	Mfd.	400	Volts	.20
22-229	.005	"	600	"	.15
22-243	.01	"	400	"	.15
22-289	.00005	"	600	"	.12
22-294	16.	"	450	"	1.00
22-324	2-35	Mmfd.	Padder		.40
22-345	.0011	Mfd.	600	Volts	.15
22-358	.002	"	600	"	.20
22-368	.003	"	600	"	.20
22-405	10.	"	50	"	.75

PARTS AND PRICES — ZENITH RADIO — Models 12-A-57 and 12-A-58

	Condensers (Cont'd)	
22-409	3-Gang Variable Condenser	$ 3.50
22-410	.003 Mfd. 600 Volt	.40
22-411	.0023 " 600 "	.25
22-418	2-35 Mmfd. Padder	.25
22-420	10. Mfd. 25 Volt	.65
22-424	50-180 Mmfd. Padder	.35
22-433	.5 Mfd. 400 Volt	.30
22-435	.02 " 600 "	.15
22-445	8. x 4. Mfd. 450 " .....(Domestic Only)	1.75
22-446	8. x 4. " 450 " .....(Export Only)	1.75
	Resistors	
63-242	2500 Ohm ½ Watt	.20
63-278	99 M " ¼ "	.20
63-280	49 M " ¼ "	.20
63-288	19 M " ¼ "	.20
63-293	990 M " ¼ "	.20
63-303	700 " ¼ "	.20
63-373	11 M " ½ "	.20
63-450	1 Megohm Volume Control Assembly (Domestic Only)	1.00
63-451	1 " Tone " "	.80
63-452	650 M Ohm ¼ Watt	.20
63-466	990 " ½ "	.20
63-471	Candohm Resistor	1.00
63-472	1 Megohm Volume Control Assembly (Export only)	1.00
	Coils and Chokes	
20-120	R. F. Plate Choke	.75
20-124	Antenna Choke	.25
95-291	1st I. F. Transformer Assembly	1.25
95-292	2nd I. F. Transformer Assembly	1.25
S-3745	Oscillator Coil Assembly	1.25
S-3746	Detector Coil Assembly	1.50
S-3747	Antenna Coil Assembly	1.50
	Miscellaneous	
44-7	Phonograph Jack ...(Export only)	.15
46-123	Band Selector Knob	.20
46-124	Volume Control Knob	.20
46-125	Tuning Knob (Small)	.15
46-126	" " (Large)	.15
46-127	Tone Control Knob	.20
49-121	12" Dynamic Speaker (Model 57)	10.00
	Cone and Voice Coil Assembly for 49-121	3.25
	Output Transformer for 49-121	2.00
	Field Coil for 49-121	2.00
49-124	12" Dynamic Speaker (Model 58)	10.00
	Cone and Voice Coil Assembly for 49-124	3.25
	Output Transformer for 49-124	2.00
	Field Coil for 49-124	2.00
49-125	6" Dynamic Speaker (Model 58)	5.00
	Cone and Voice Coil for 49-125	2.00
	Field Coil for 49-125	2.00
57-516	Dial Glass and Escutcheon Plate	3.00
58-31	Seven Prong Speaker Plug	.30

Miscellaneous (Cont'd)

78-129	Voltage Indicator Socket (Export only)	$ .15
78-131	6K7 Wafer Type Socket	.15
78-132	6A8 " " "	.15
78-133	6H6 " " "	.15
78-134	6C5 " " "	.15
78-136	5Y3 " " "	.15
78-137	6F6 " " "	.15
78-144	Seven Contact Speaker Plug Socket	.15
85-39	Phono Switch D.P.D.T. (Export only)	1.00
85-82	Band Selector Switch	2.00
95-306	117 Volt, 50-60 cycle Power Transformer	6.00
95-307	Audio Transformer	2.50
95-310	25 Cycle, All Voltage Power Transformer (Export only)	10.00
95-312	Power Choke	.75
122-10	Shadowgraph Meter	2.00
126-92	Tube Shields (Black)	.15
126-109	Tube Shields (Small)	.15
126-127	Tube Shields (Large)	.10

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

ZENITH RADIO CORPORATION
CHICAGO, ILLINOIS, U.S.A.
July 16, 1935

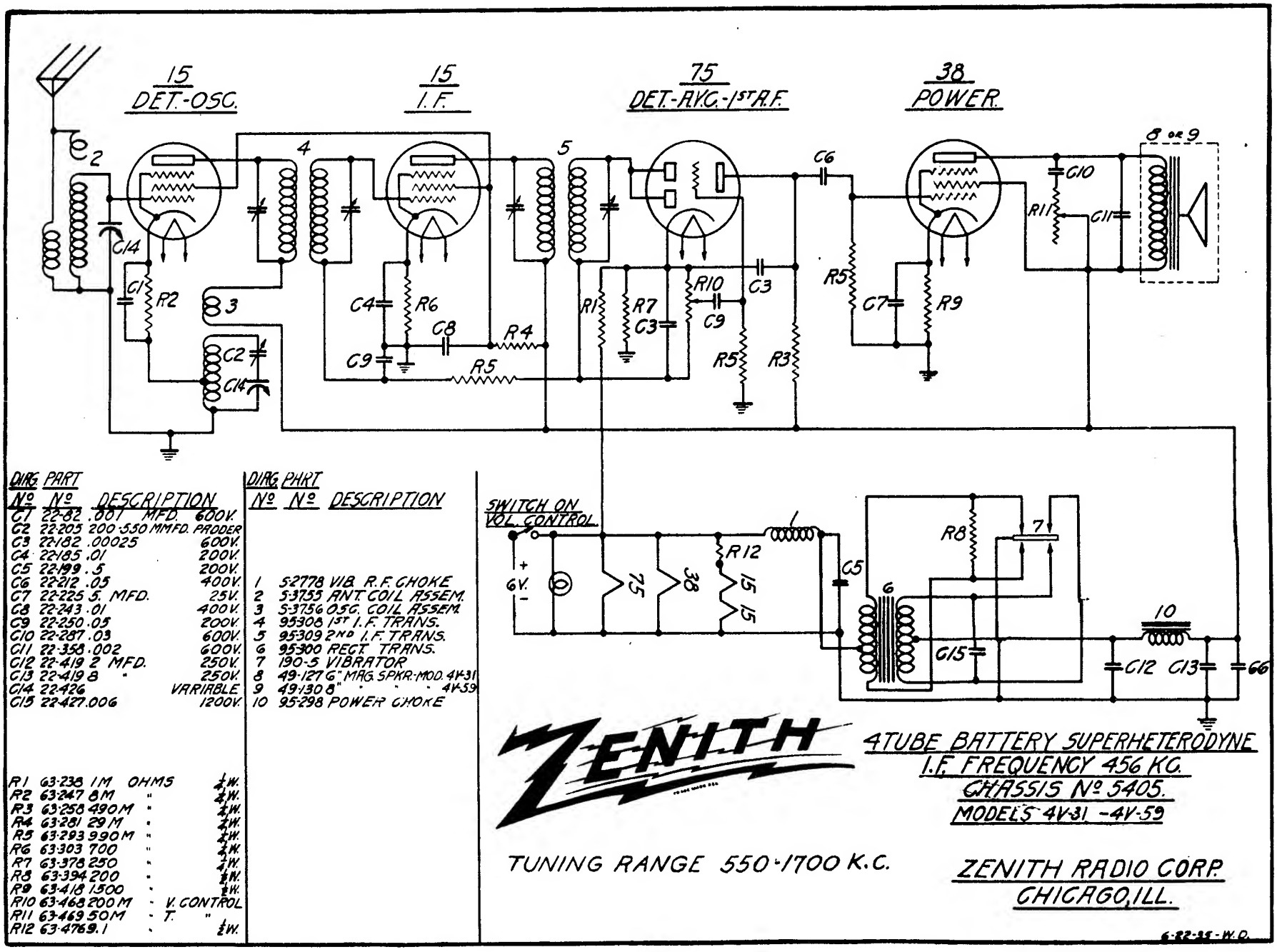
WARRANTY

The Zenith Radio Corporation guarantees each new ZENITH receiver and each new ZENITH QUALITY TUBE to be free from defects in workmanship and material.

Our obligation under this warranty is limited to making good at our factory any part or parts of the receiver which within ninety days from date of purchase shall be returned to us with transportation charges prepaid and which on examination shall be found to our satisfaction to have been thus defective. The ZENITH QUALITY TUBES used in this receiver are guaranteed against mechanical and electrical defects under the same warranty as the receiver. This warranty is expressly in lieu of all other warranties expressed or implied, and we neither assume nor authorize any representative or other person to assume for us any other liability in connection with the sale of ZENITH receivers or ZENITH QUALITY TUBES.

This warranty shall not apply to any receiver or tube which shall have been repaired or altered outside of our factory in any way so as, in our judgment, to affect its stability or reliability, nor which has been subject to misuse, negligence or accident, nor which has had the serial number or name altered, defaced or removed. Neither shall this warranty apply to any receiver in which other than ZENITH QUALITY TUBES have been used.

ZENITH RADIO CORPORATION.



DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-82	.001 MFD.	600V.
C2	22-205	200-550 MMFD.	PRODER
C3	22-182	.00025	600V.
C4	22-185	.01	200V.
C5	22-199	.5	200V.
C6	22-212	.05	400V.
C7	22-225	5. MFD.	25V.
C8	22-243	.01	400V.
C9	22-250	.05	200V.
C10	22-287	.03	600V.
C11	22-358	.002	600V.
C12	22-419	2 MFD.	250V.
C13	22-419	8 "	250V.
C14	22-426		VARIABLE
C15	22-427	.006	1200V.

DIAG. Nº	PART Nº	DESCRIPTION
1	5-2778	VIB. R.F. CHOKE
2	5-3755	ANT. COIL ASSEM.
3	5-3756	OSC. COIL ASSEM.
4	95-308	1ST I.F. TRANS.
5	95-309	2ND I.F. TRANS.
6	95-300	RECT. TRANS.
7	190-5	VIBRATOR
8	49-127	6" MAG. SPKR: MOD. 4V-31
9	49-130	8" " " 4V-59
10	95-298	POWER CHOKE

R1	63-238	1M OHMS	½W.
R2	63-247	8M "	½W.
R3	63-258	490M "	½W.
R4	63-281	29M "	½W.
R5	63-293	990M "	½W.
R6	63-303	700 "	½W.
R7	63-378	250 "	½W.
R8	63-394	200 "	½W.
R9	63-418	1500 "	½W.
R10	63-468	200M "	V. CONTROL
R11	63-469	50M "	T. "
R12	63-476	9.1 "	½W.

Socket Voltages

TUBE	POSITION	Ef	Ek	Eg1	Eg2	Eg3	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

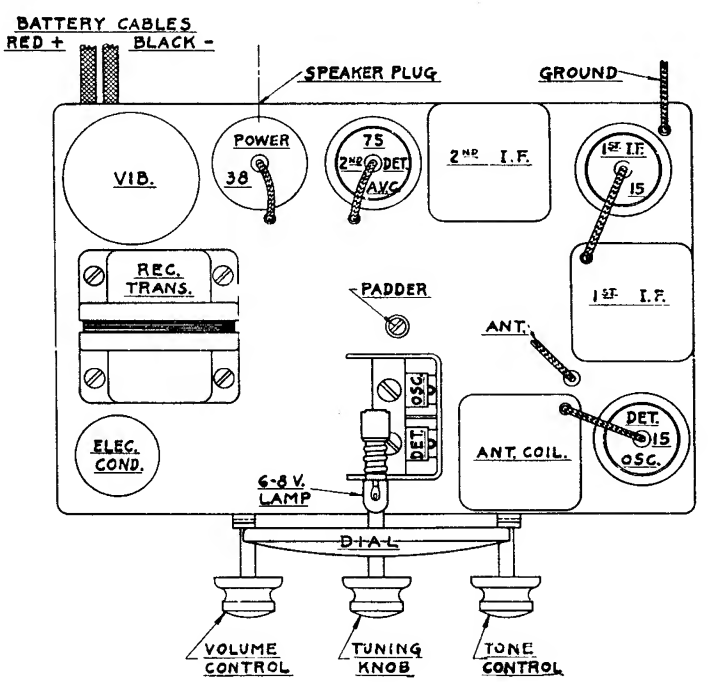
Battery - 6 volts Antenna and ground disconnected.

f - filament; k - cathode; g1 - control grid; g2 - screen grid; g3 - suppressor grid; p - plate.

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

Alignment

(1) Balance intermediate transformers at 456 K.C. with service oscillator connected to grid of 15 first detector and ground.
(2) Connect service oscillator to antenna and ground.
(3) Adjust oscillator trimmer on gang condenser for correct dial reading at 1400 K.C.
(4) Adjust detector trimmer on gang condenser to resonance.
(5) Adjust oscillator padder (located in rear of gang) meanwhile rocking pointer past 600 K.C. to combination giving greatest output.
(6) Repeat operations 3 and 4.



Tube Layout

	Dial Assembly	
7-7	Dial Glass and Scale Bezel and Mounting Bracket	$ .40
26-98	Dial Scale	.50
59-45	Dial Pointer and Busing Assembly	.15
61-38	Dial Pulley	.40
76-182	Dial Drive Shaft	.10
80-69	Dial Tension Spring	.02
94-200	Dial Shaft Bushing	.10
100-23	6.3 Volt Dial Lamp	.15
132-13	Dial Glass Retaining Ring	.05
188-2	Retaining Rings	.10
192-11	Dial Glass	.15
196-5	Dial Glass Gasket	.03
	Condensers	
22-82	.001 Mfd. 600 Volts	.25
22-182	.00025 " 600 "	.12
22-185	.01 " 200 "	.20
22-199	.5 " 200 "	.35
22-205	200-550 Mmfd. Padder	.35
22-212	.05 Mfd. 400 Volts	.20
22-225	5. " 25 "	.65
22-243	.01 " 400 "	.15
22-250	.05 " 200 "	.15
22-287	.03 " 600 "	.15
22-358	.002 " 600 "	.20
22-419	2 x 8 " 250 "	1.75
22-426	2-Gang Variable Condenser	2.00
22-427	.006 Mfd. 1200 Volts	.15
	Resistors	
63-238	1 M Ohm $\frac{1}{4}$ Watt	.20
63-247	8 M " $\frac{1}{4}$ "	.20
63-258	490 M " $\frac{1}{4}$ "	.20
63-281	29 M " $\frac{1}{4}$ "	.20
63-293	990 M " $\frac{1}{4}$ "	.20
63-303	700 " $\frac{1}{4}$ "	.20
63-378	250 " $\frac{1}{4}$ "	.20
63-394	200 " $\frac{1}{2}$ "	.20
63-418	1500 " $\frac{1}{2}$ "	.20
63-468	200 M Volume Control and Switch Assembly	1.00
63-469	50 M Tone Control Assembly	.60
63-476	9.1 Ohm $\frac{1}{2}$ Watt	.20
	Coils and Chokes	
95-308	1st I.F. Transformer Assembly	1.25
95-309	2nd I.F. Transformer Assembly	1.25
S-3755	Antenna Coil Assembly	1.25
S-3756	Oscillator Coil Assembly	1.50
S-2778	Vibrator R. F. Choke Assembly	.15
	Miscellaneous	
19-59	Battery Lead Clip (positive)	.15

Miscellaneous (Cont'd.)

19-60	Battery Lead Clip (Negative)	$ .15
46-122	Tuning Knobs	.10
49-127	6" Magnetic Speaker (Model 31)	5.00
	Cone Assembly for 49-127	.50
	Paper Ring for " "	.05
	Coil " " "	1.25
	Motor Drive Assembly for 49-127	4.75
	Terminal Strip Cord and Plug Assembly for above	.50
49-130	8" Dynamic Speaker (Model 59)	6.00
	Cone Assembly for 49-130	.60
	Paper Ring " " "	.10
	Coil " " "	1.25
	Motor Drive Assembly for 49-130	4.75
	Terminal Strip Cord and Plug Assembly for 49-130	.60
78-101	Type 75 Wafer Tube Socket	.10
78-128	Five Contact Speaker Plug Socket	.10
78-139	Type 15 Wafer Tube Socket	.10
78-140	Type 38 " " "	.10
78-141	Vibrator Socket	.10
95-298	Power Choke	.75
95-300	Rectifier Transformer	2.00
126-127	Tube Shields	.10
126-201	Vibrator Shield	.15
190-5	Vibrator	5.00

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

ZENITH RADIO CORPORATION
CHICAGO, ILLINOIS, U. S. A.
July 15, 1935

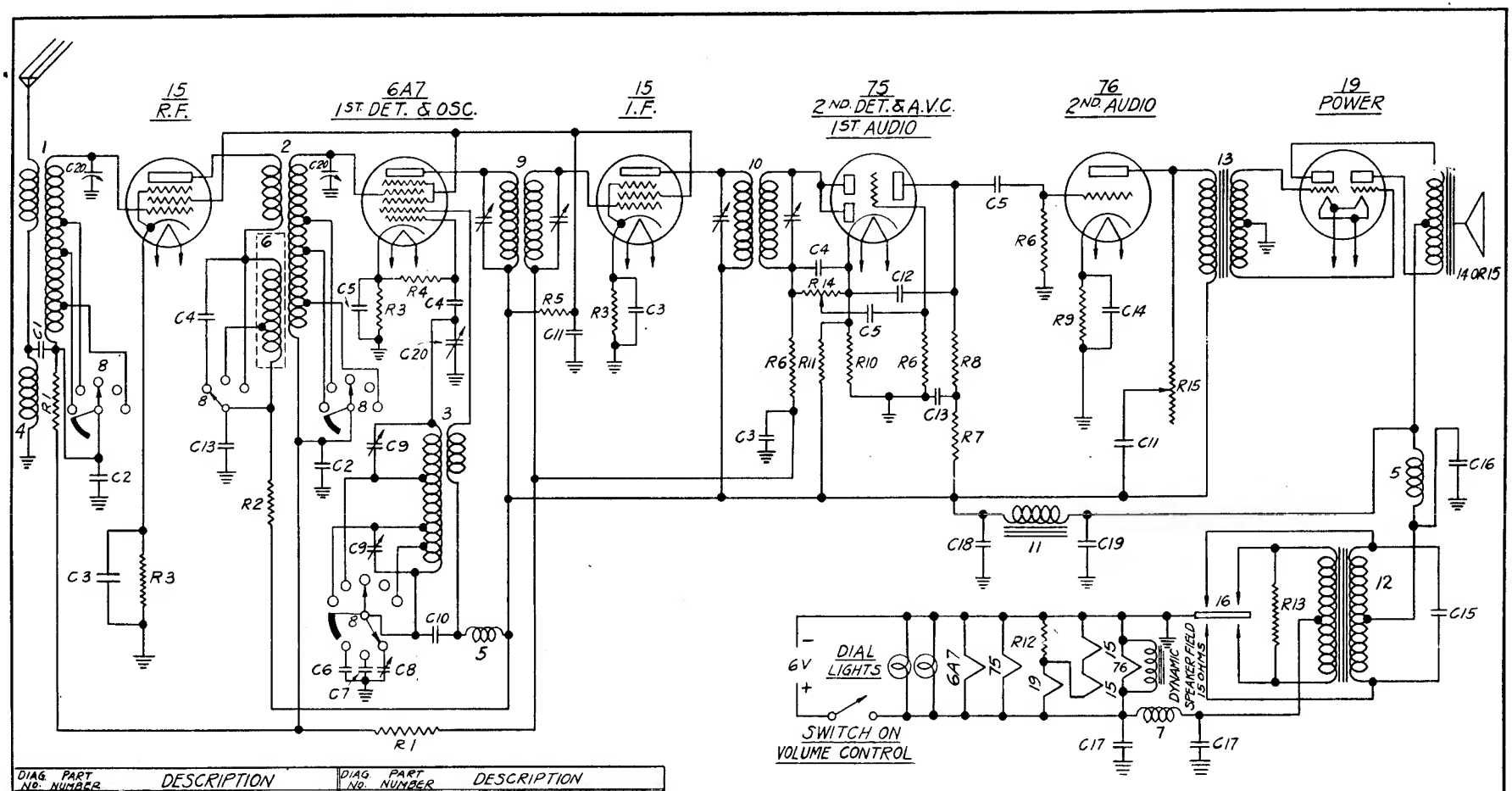
4-TUBE 6-VOLT
FARM RECEIVER

(5405)

Made by

ZENITH RADIO CORPORATION

3620 IRON ST. JUNE, 1931 CHICAGO, ILL., U. S. A.



DIAG. NO.	PART NUMBER	DESCRIPTION	
R1	63-278	99 M	OHMS 1/4 W.
R2	63-361	5 M	" 1/4 W.
R3	63-362	400	" 1/4 W.
R4	63-280	49 M	" 1/4 W.
R5	63-353	19 M	" 1/2 W.
R6	63-293	990 M	" 1/4 W.
R7	63-290	260 M	" 1/4 W.
R8	63-258	490 M	" 1/4 W.
R9	63-272	4 M	" 1/4 W.
R10	63-238	1 M	" 1/4 W.
R11	63-260	100 M	" 1/4 W.
R12	63-477	100	FLEXIBLE WIRE WOUND 1/4
R13	63-394	200	OHMS 1/2 W.
R14	63-456	200 M	VOL. CONTROL & SWITCH
R15	63-458	50 M	TONE CONTROL
C1	22-243	.01	MFD. 400 V.
C2	22-410	.003	" 600 V.
C3	22-250	.05	" 200 V.
C4	22-289	50	MMFD. 600 V.
C5	22-188	.02	MFD. 400 V.
C6	22-411	.0023	" 600 V.
C7	22-345	.0011	" 600 V.
C8	22-205	200-350	MMFD. PADDER

DIAG. NO.	PART NUMBER	DESCRIPTION	
C9	22-408	2-35	MMFD. PADDER
C10	22-82	.001	MFD. 600 V.
C11	22-212	.05	" 400 V.
C12	22-182	.00025	" 600 V.
C13	22-224	.1	" 300 V.
C14	22-225	.5	" 25 V.
C15	22-437	.01	" 1400 V.
C16	22-228	.5	" 300 V.
C17	22-251	.5	" 200 V.
C18	22-432	8	" 250 V.
C19		2	"
C20	22-409	456	MMF. VAR. COND.
1	5-3697		ANT. COIL ASSEM.
2	5-3698		DET. COIL ASSEM.
3	5-3699		OSC. COIL ASSEM.
4	20-82		ANT. CHOKE
5	20-88		R.F. CHOKE
6	20-119		R.F. PLATE CHOKE
7	5-2778		R.F. CHOKE
8	85-78		BAND SELECTOR SWITCH
9	95-291		1ST. I.F. TRANS.
10	95-292		2ND. I.F. TRANS.
11	95-298		POWER CHOKE
12	95-305		RECTIFIER TRANS.
13	95-311		AUDIO TRANS.
14	49-132	8"	MAG. SPEAKER MOD. 6V27
15	49-134	12"	DYN. " " MOD. 6V62
16	190-5		VIBRATOR

ZENITH

3 BAND { 550 KC. - 1780 KC. / 2100 KC. - 6800 KC. / 7000 KC. - 23000 KC.

I.F. FREQUENCY 456 KC.
6 TUBE BATTERY SUPERHETERODYNE
CHASSIS Nº 5621

MODELS - 6V27, 6V62

ZENITH RADIO CORP.
CHICAGO, ILL.

SOCKET VOLTAGES

TUBE	POSITION	Ef	Ek	Eg1	Eg2	Eg3	Ep
15	R. F.	2	1.5	0	70	-	125
6A7	Det.-Osc.	6	2	0	150	-	150
				-1	-	-	150
15	I. F.	2	2	0	70	-	150
75	2nd Det. A.V.C.	6	1.5	0	-	-	40
76	1st Audio	6	8	0	-	-	140
19	PWR.	2	-	0	-	-	160
				0			160

Battery Voltage 6 Volts Antenna and Ground Disconnected

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

F - Filament; K - Cathode; g1 - Control grid; g2 - Screen grid; g3 - Suppressor grid; p - plate.

Alignment

1. Attach service oscillator to grid cap of 6A7 tube and adjust I.F. trimmers at 456 K.C.
2. Place band switch in "A" (Standard broadcast) position and attach 1400 K.C. service oscillator to antenna and ground posts. Set dial indicator to 1400 K.C. and adjust trimmers "A" (Osc.); "B" (R.F.); "C" (Det.) to maximum output.
3. Set service oscillator to 600 K.C. and rock indicator over 600 K.C. on dial of receiver while adjusting standard broadcast padder "D".
4. Repeat operations 2 and 3.
5. Place band switch in "B" or 1st short wave position (2100 - 6800 K.C.) and set white dial pointer on 6 megacycles. Set service oscillator to 6 megacycles and adjust trimmer "E" for maximum output while rocking dial pointer slowly over 6 megacycle division.
6. Place band switch on "C" position (7000- 23000 K.C.) and set service oscillator and white dial pointer to 18 megacycles. Adjust trimmer "F" to resonance while rocking dial indicator slowly over 18 megacycle division.
7. Set dial and service oscillator at 9 megacycles and twist or untwist tinned bare wire tuning "loop" (on front section of band switch under chassis) for maximum output.
8. Align standard broadcast band again at 1400 K.C. by adjusting trimmer "A" only. Repeat all eight operations for final accuracy.

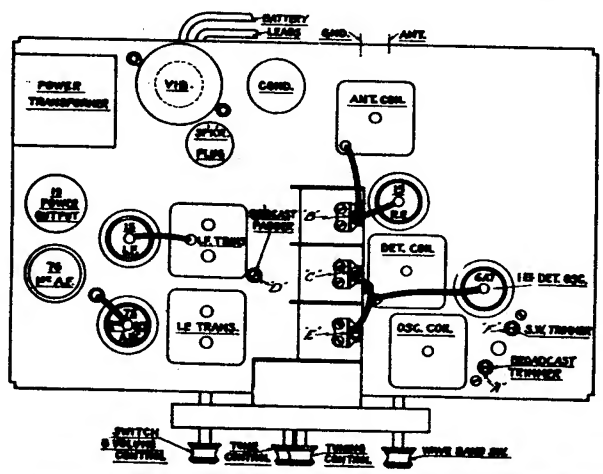


Figure at left shows tube position and location of balancing adjustments.

ZENITH RADIO

PARTS AND PRICES
Chassis #5621

Models 6-V-27,
6-V-62

Dial Assembly

7-6	Dial Glass Bezel	-
26-104	Aeroplane Dial Scale	$ 1.00
32-7	Dial Drive Belt	.20
34-49	Condenser Shaft Gear	.25
34-50	Pinion Gear	.05
34-51	Lower Pinion and Gear	.15
59-40	Special Z Pointer	.15
59-41	Split Second Pointer and Bushing	.10
61-34	Drive Pulley	.10
61-35	Shaft Pulley and Sleeve	.25
61-36	Tension Pulley	.05
76-178	Drive Shaft	.10
76-180	Tension Pulley Shaft	.05
80-111	Dial Spring	.25
80-112	Tension Pulley Spring	.10
83-407	Dial Light Diffusion Strip	.05
100-23	6.3 V. Pilot Lamp	.15
159-11	Snap Buttons	.02
188-2	Retaining Ring	.10
192-10	Dial Glass (part of 57-511)	-
196-4	Dial Glass Gasket " " " "	-
198-1	Dial Reflector	.40
S-3777	Tension Pulley and Spring Assembly	.30

Condensers

22-82	.001 Mfd. 600 Volt	.25
22-182	.00025 " 600 "	.12
22-188	.02 " 400 "	.15
22-205	200-350 Mmfd. Padder	.35
22-212	.05 Mfd. 600 Volt	.20
22-224	.1 " 300 "	.15
22-225	5. " 25 "	.65
22-228	.5 " 300 "	.35
22-243	.01 " 400 "	.15
22-250	.05 " 200 "	.15
22-251	.5 " 200 "	.40
22-289	50 Mmfd. 600 "	.12
22-345	.0011 Mfd. 600 "	.15
22-408	2-35 Mmfd. Padder	.25
22-409	3-Gang Variable Assembly	3.50
22-410	.003 Mfd. 600 Volt	.40
22-411	.0023 " 600 "	.25
22-432	8. x 2. Mfd. 250 "	1.75
22-437	.01 " 200 "	.15

Resistors

63-238	1 M Ohm 1/4 Watt	.20
63-258	490 M " 1/4 "	.20
63-260	100 M " 1/4 "	.20
63-272	4 M " 1/4 "	.20
63-278	99 M " 1/4 "	.20

		Resistors (Cont'd)	
63-280	49 M Ohm	1/4 Watt	$ .20
63-290	260 M "	1/4 "	.20
63-293	990 M "	1/4 "	.20
63-361	5 M "	1/4 "	.20
63-362	400 "	1/4 "	.20
63-353	19 M "	1/4 "	.20
63-394	200 "	1/4 "	.20
63-456	200 M "	Volume Control and Switch Assembly	1.00
63-458	50 M "	Tone Control Assembly	.80
63-477	100 "	Flexible 1/4 Watt	.15
		Coils and Chokes	
20-82	Antenna Choke		.25
20-88	R. F. Choke		.25
20-119	R. F. Plate Choke Assembly		.50
95-291	1st I. F. Transformer Assembly		1.25
95-292	2nd I. F. " "		1.25
S-3697	Antenna Coil Assembly		1.00
S-3698	Detector " "		.85
S-3699	Oscillator " "		.85
		Miscellaneous	
19-59	Battery Lead Clip (Positive)		.15
19-60	" " " (Negative)		.15
46-124	Volume Control Knob		.20
46-127	Tone and Tuning Knobs		.20
46-132	Band Selector Switch Knob		.20
49-131	12" Magnetic Speaker Assembly (Model 62)		8.00
	Cone Assembly for 49-131		1.00
	Felt Ring " " "		.15
	Coil for 49-131		1.25
	Motor Drive Assembly for 49-131		6.50
	Cord and Plug Assembly for 49-131		.75
49-132	8" Magnetic Speaker Assembly (Model 27)		6.00
	Cone Assembly for 49-132		.60
	Paper Ring " " "		.10
	Coil for 49-132		1.25
	Motor Drive Assembly for 49-132		4.75
	Terminal Strip Cord and Plug Assembly for 49-132		.60
57-511	Dial Glass and Escutcheon Plate Assembly		1.50
58-30	Four Prong Speaker Plug		.25
78-101	Type 75 Wafer Tube Socket		.10
78-106	" 6A7 " " "		.10
78-109	" 76 " " "		.10
78-124	" 19 " " "		.10
78-128	Five Prong Speaker Plug Socket		.10
78-139	Type 15 Wafer Tube Socket		.10
78-141	Vibrator " " "		.10
83-334	Antenna and Ground Terminal Strip		.10
85-78	Band Selector Switch		1.50
95-298	Power Choke		.75
95-305	Rectifier Transformer		1.75
95-311	Audio Transformer		1.25
126-127	Tube Shield		.10
126-201	Vibrator Shield		.15
190-5	Special Zenith Vibrator		5.00

SERVICE BULLETIN

ZENITH

TRADE MARK REG.

MODELS

16-A-61 16-A-63

Stratosphere

SERVICE DATA

A.V.C. blocks -- Open A.V.C. resistor or grounded circuit, noticeable by distortion. Usually clears up when aerial is removed.

Distorted & Weak -- Shorted I.F. grid circuit.

Signals tune sharp -- Noise level low off the signal --- check 6H6 tube.

Pointers will not turn -- Belt off pulley. Split second hand will not turn - binds on cabinet or loose planetary lugs - adjust carefully.

Lack sensitivity with oscillation on "D" band around 12 megacycles -- check for open antenna choke or antenna coil.

Distorted -- Tubes - 22-438 - 20 mfd. shorted. A.V.C. grounded or open. Open - 63-478 resistor. One-half of push-pull transformer open.

Distorts at full volume -- (Do not confuse with overloading which is a natural characteristic on a strong input signal) - Check 22-171 .05 condensers for short. Set will be weak if open.

Dead as tone control is turned on bass only - Check 22-196 .01 for short. Set will lack bass response if this condenser is open.

No minimum volume control and also lacks bass response - Check 95-321 for open. If shorted a lack of high response.

Lacks bass - Check 22-287 .03 for open.

Volume control noisy - Check 22-240 for short; also check volume control

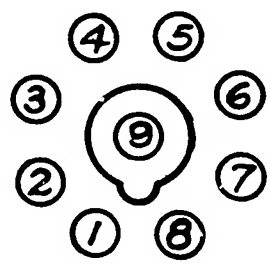
Graph will not operate - Defective 6C5 tube or open graph - burned out pilot bulb.

ZENITH RADIO CORPORATION

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

Socket Voltages

TUBE	POSITION	1	2	3	4	5	6	7	8	9
6K7	R.F.	0	3AC	280	100	3.5	-	3AC	3.5	0
6A8	1st Det.& Osc.	0	3AC	280	100	.4	125	3AC	3.5	0
6K7	1st I.F.	0	3AC	280	100	6.5	-	3AC	6.5	0
6K7	2nd I.F.	0	3AC	280	100	6.5	-	3AC	6.5	0
6H6	2nd Det.	0	3AC	-.2	0	-.2	-	3AC	0	-
6F5	1st Audio	0	3AC	-	3	-	-	3AC	1	0
6F6	2nd Audio Driver	0	3AC	280	280	0	-	3AC	25	-
6C5	Shadowgraph Amp.	0	3AC	280	-	0	-	3AC	11	-
6F6	(4 tubes) Power	0		370	370	0	-		35	-
5Y3	Rectifier Top Chassis	0	390	-	320AC	-	320AC	-	390	-
5Y3	Rectifier Lower Chassis	0	360	-	300AC	-	300AC	-	360	-



BOTTOM VIEW OF SOCKET

Line Voltage 115 Antenna and Ground Disconnected

Voltages measured from point indicated to ground, using a 1000 ohm per volt meter, except heaters(2 - 7)

Alignment

1. The diagram on page shows position of major components and aligning adjustments. It should be studied carefully before any attempt is made to adjust the various circuits.

2. Set service oscillator to 456 KC, and connect to the grid of the 6A8 tube. The grid cap should not be removed from the tube as this will remove bias. Tune the I.F. transformers for maximum output. Alignment should always be made with the service oscillator set to as low an output as will give a satisfactory indication on the output meter.

3. Connect the service oscillator to the antenna and ground post. With the band switch in the broadcast position, set the dial pointer to 1700 kilocycles, and adjust the oscillator trimmer on the gang condenser for a maximum output. Align the R.F. and detector condenser trimmers, also located on the gang condenser, for a maximum output.

4. Set the dial pointer to 600 kilocycles, and adjust the B.C. padder meanwhile rocking the gang condenser back and forth across 600 kilocycles until the padder setting for maximum output is obtained.. It may be necessary to go back and make a slight correction of the trimmer at 1700 kilocycles after the padder adjustment is completed.

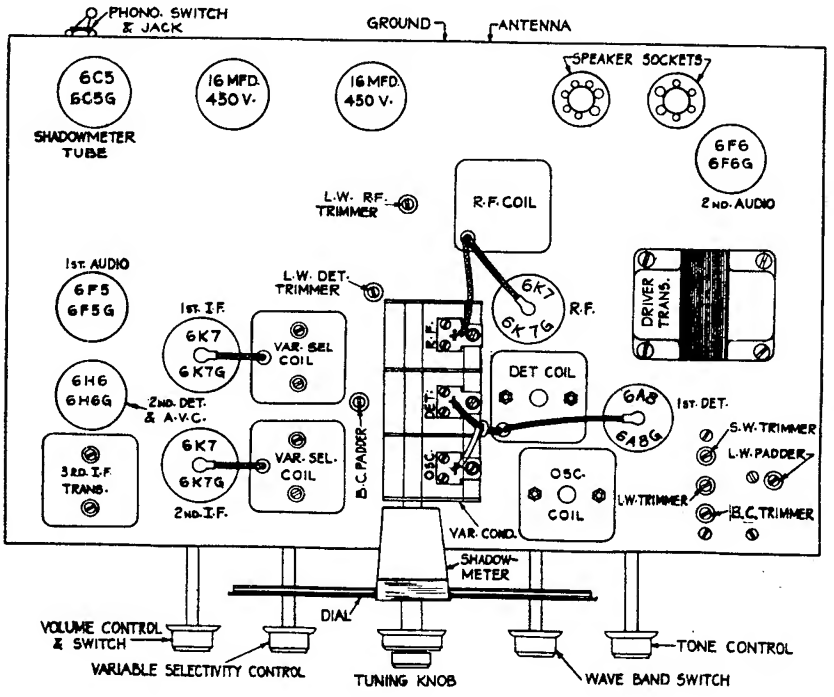
5. Turn the band switch for the "B" band. Rock the gang back and forth across the 6 megacycle readings, meanwhile adjusting the oscillator trimmer on the gang condenser until maximum output is obtained. It will always be found that the dial reading for 6 megacycles is very close to this point. The service oscillator, of course, should be set at 6 megacycles.

6. Align "D" band (7-22.5 megacycles) next by setting service oscillator and dial indicator to 18 megacycles, and rocking indicator slowly over that point while adjusting the S.W. Trimmer to maximum output.

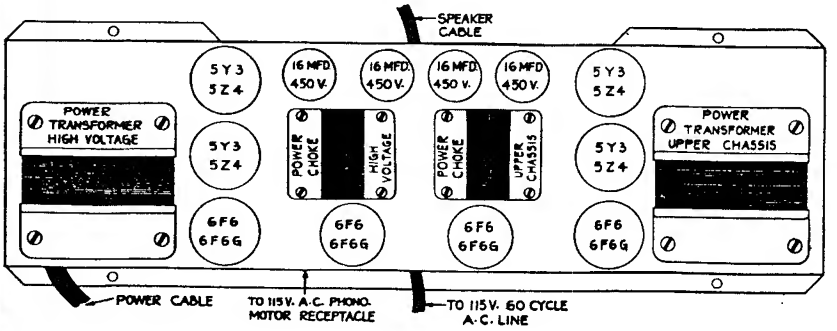
7. Set back to 1700 K.C. Readjust oscillator circuit this time using broadcast trimmer on chassis base.

8. Set band switch to "C" band (long wave) and peak at 350 K.C. with L.W.,R.F.-Det. and Oscillator trimmers. Turn dial indicator and service oscillator to 180 K.C., and adjust long wave padder while slowly rocking dial indicator.

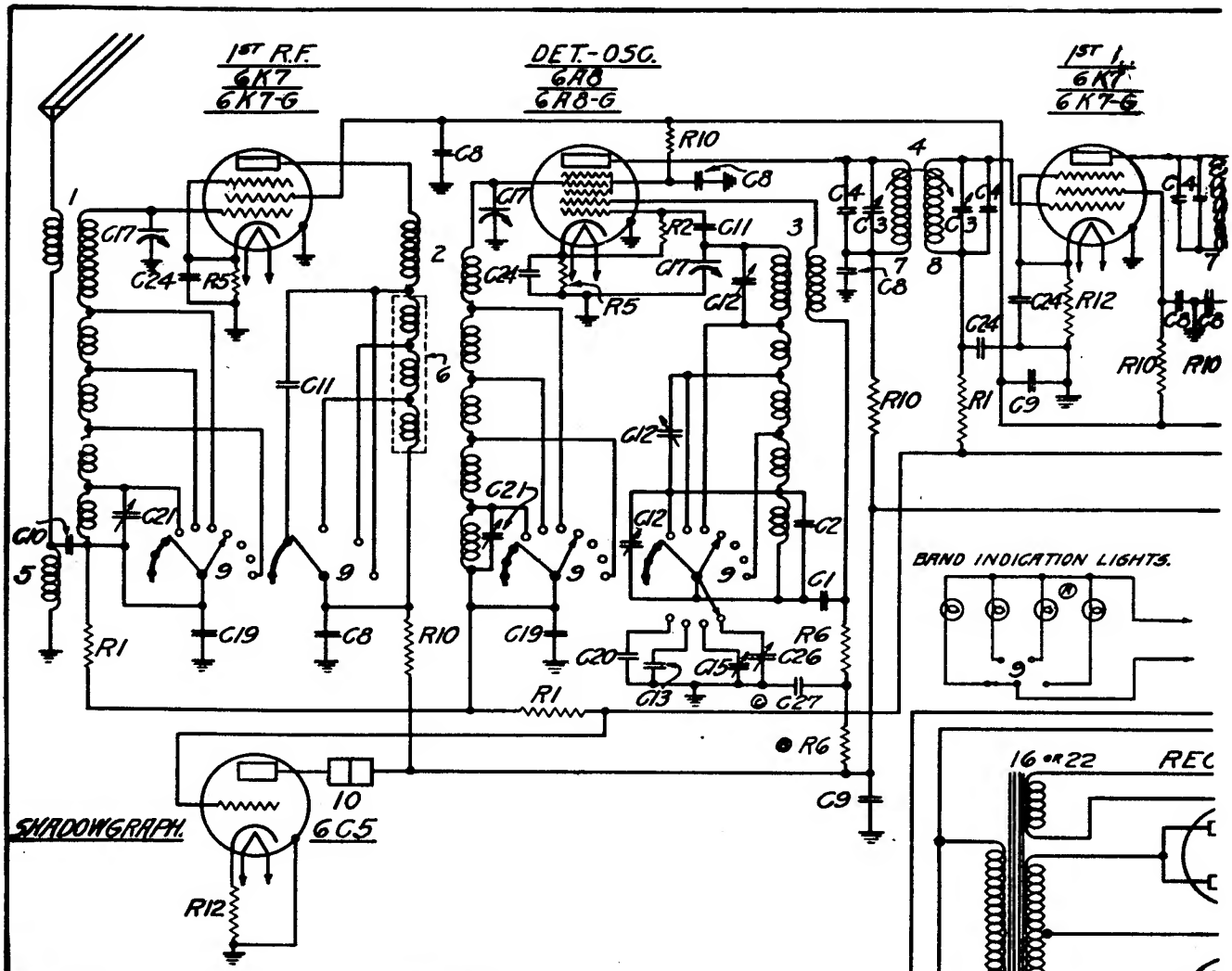
9. Repeat operation #2.



Receiver Chassis Drawing



Power Pack Chassis Drawing

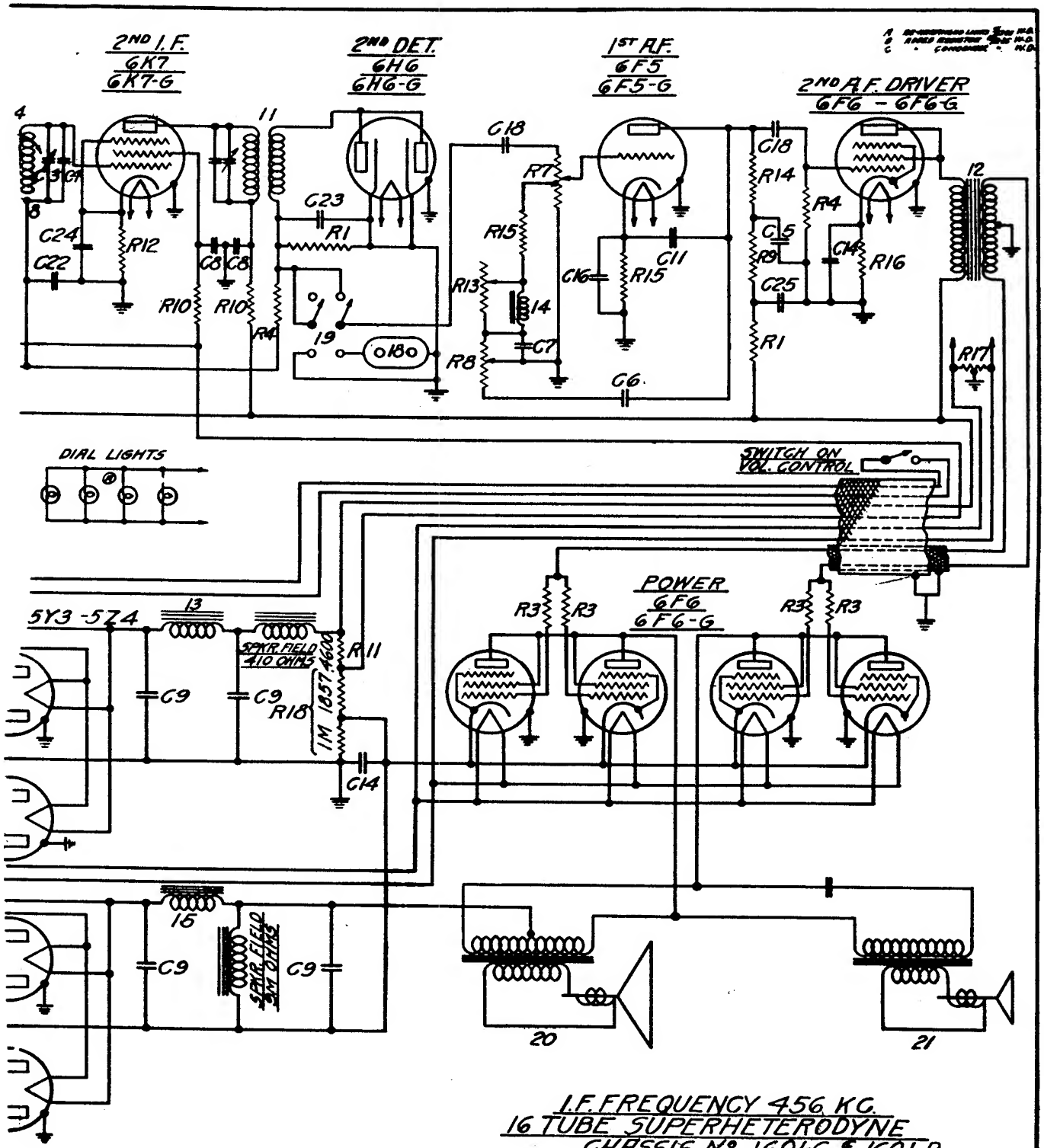


DWG. Nº	PART Nº	DESCRIPTION	
R1	63-278	98 M OHMS	½W.
R2	63-280	49 M "	½W.
R3	63-417	99 "	½W.
R4	63-293	990 M "	½W.
R5	63-367	300 "	½W.
R6	63-373	1 M. "	½W.
R7	63-450	1 MEG. VOL. CONTROL	
R8	63-451	1 MEG. TONE CONTROL	
R9	63-400	250 M OHMS	½W.
R10	63-466	990 "	½W.
R11	63-479	CANDOHM	
R12	63-416	1400 OHMS	½W.
R13	63-480	HIGH FIDELITY CONTROL	
R14	63-325	150 M OHMS	½W.
R15	63-279	3 M "	½W.
R16	63-478	1000 " CANDOHM	
R17	63-404	60 OHMS-CT. CANDOHM	
R18	63-989	CANDOHM	

DWG. Nº	PART Nº	DESCRIPTION	
C1	22-82	.001 MFD.	600V.
C2	22-127	.000025	600V.
C3	22-496	25-250 MMFD. DUAL I.F.	
C4	22-447	.0005 MFD.	600V.
C5	22-368	.003 "	600V.
C6	22-196	.01	600V.
C7	22-287	.03	600V.
C8	22-212	.05	400V.
C9	22-361	1 "	450V.
C10	22-243	.01	400V.
C11	22-289	.00005	600V.
C12	22-324	2-35 3 SECTION.	
C13	22-345	.0011 MFD.	600V.
C14	22-498	20 "	50V.
C15	22-205	200-350 MMFD. PADDER.	
C16	22-420	10 MFD.	25V.
C17	22-409	3 GANG VARIABLE	
C18	22-171	.05 MFD.	600V.
C19	22-410	.003 "	600V.

DWG. Nº	PART Nº	DESCRIPTION	
C20	22-411	.0023 MFD.	600V.
C21	22-418	2-35 MMFD.	
C22	22-138	.2 MFD.	200V.
C23	22-182	.00025	600V.
C24	22-250	.05	200V.
C25	22-433	.5	400V.
C26	22-424	50-180 MMFD. PADDER.	
C27	22-321	8 MFD.	450V.

1	3-3747	ANT. COIL ASSEM.
2	3-3746	DET. " "
3	3-3745	OSC. " "
4	3-4014	VAR. I.F. TRANS. ASSEM.
5	20-124	ANT. CHOKE
6	20-120	R.F. PLATE CHOKE
7	20-125	VAR. I.F. PRIMARY COIL
8	20-126	VAR. I.F. SECONDARY COIL
9	85-82	BAND SELECT. SWITCH.
10	122-10	SHADOWGRAPH.
11	95-317	3RD I.F. TRANS.
12	95-318	DRIVER TRANS.
13	95-313	FILTER CHOKE
14	95-321	HIGH FIDELITY CHOKE
15	95-319	FILTER CHOKE
16	95-314	117V. 50-60~ PWR. TRANS.
17	95-315	PWR. OUTPUT PLATE VOLT. TRANS. 117V-50-60~
18	44-7	PHONO. JACK
19	85-39	" SWITCH
20	49-128	12" SPKR 9M OHM FIELD
21	49-129	6" " 410 OHM "
22	95-322	25~ ALL VOLT PWR. TRANS.
23	95-323	25~ " " " OUTPUT PL.V. TRANS.



I.F. FREQUENCY 456 KC.
16 TUBE SUPERHETERODYNE
CHASSIS Nº 1601-C & 1601-P
MODELS 16-A-61 - 16-A-63

ZENITH RADIO CORP.
CHICAGO, ILL.

7-18-38 W.D.

Parts and Prices

Models 16-A-61
and 16-A-63

Chassis #1601 C
#1601 P

	Dial and Drive Assembly	
26-109	Calibrated Dial Scale (Glass)	$2.00
26-110	Band Indicator Scale	.35
32-9	Dial Drive Belt	.25
34-49	Condenser Shaft Gear	.25
34-50	Pinion Gear	.05
34-51	Lower Pinion and Gear	.15
59-46	Large Z Pointer	.25
59-47	Split Second Pointer	.15
61-35	Shaft Pulley and Sleeve	.25
61-36	Tension Pulley	.05
61-37	Driver Pulley	.05
80-111	Dial Spring	.25
80-113	Tension Pulley Spring	.10
100-23	6.3 Volt Dial Lamps	.15
122-10	Shadowgraph Meter	2.00
126-202	Dial Lamp Shield	.05
147-23	Dial Glass Spacers	.01
159-7	Snap Buttons	.05
188-2	Retaining Ring	.10
192-12	Escutcheon Plate Glass	.20
196-6	Escutcheon Plate Glass Gasket	.10
196-7	Dial Glass Gasket	.15
S-2918	Dial Light Socket and Clip Assembly (Less Lamp)	.15
S-3777	Tension Pulley and Spring Assembly	.30
S-4089	Planetary Drive Assembly	1.00
	Condensers	
22-82	.001 Mfd. 600 Volts	.25
22-127	.000025 " 600 "	.20
22-138	.2 " 200 "	.25
22-171	.05 " 600 "	.20
22-182	.00025 " 600 "	.12
22-196	.01 " 600 "	.15
22-205	200-550 Mmfd. Padder	.35
22-212	.05 Mfd. 400 Volts	.20
22-243	.01 " 400 "	.15
22-250	.05 " 200 "	.15
22-287	.03 " 600 "	.15
22-289	.00005 " 600 "	.12
22-321	8. " 450 "	1.25
22-324	2-35 3 Section Padder	.40
22-345	.0011 Mfd. 600 Volts	.15
22-361	16. " 450 "	1.50
22-368	.003 " 600 "	.20
22-409	3-Gang Variable Condenser	3.50
22-410	.003 Mfd. 600 Volts	.40
22-411	.0023 " 600 "	.25

PARTS AND PRICES — Models 16-A-61 and 16-A-63

	Condensers (Cont'd)	
22-418	2-35 Mmfd. Padder	.25
22-420	10. Mfd. 25 Volts	.65
22-424	80-180 Mmfd. Padder	.35
22-433	.5 Mfd. 400 Volts	.30
22-436	25-250 Mmfd. Dual I.F. Padder	.40
22-438	20. Mfd. 50 Volts	1.00
22-447	.0005 " 600 "	.20
	Resistors	
63-278	99 M Ohm 1/4 Watt	.20
63-279	3 M " 1/4 "	.20
63-280	49 M " 1/4 "	.20
63-293	990 M " 1/4 "	.20
63-325	150 M " 1/4 "	.20
63-357	300 " 1/4 "	.20
63-373	11 M " 1/2 "	.20
63-389	Candohm 1 M-1857 Ohms	.45
63-400	250 M Ohm 1/4 Watt	.20
63-404	Candohm 60 Ohm C.T.	.25
63-416	1400 Ohm 1/4 Watt	.30
63-417	99 " 1/4 "	.30
63-450	Volume Control Assembly	1.00
63-451	Tone Control Assembly	.80
63-466	990 Ohm 1/2 Watt	.20
63-478	Candohm 1 M Ohms	.30
63-479	Candohm 4600 Ohms	.50
63-480	High Fidelity Control Assembly	1.25
	R.F. Coils and Chokes	
20-120	R.F. Plate Choke	.75
20-124	Antenna Choke	.25
20-125	Var.I.F. Primary Coil only	.30
20-126	" " Secondary " "	.20
95-317	3rd " Transformer Assembly	1.25
S-3745	Oscillator Coil Assembly	1.25
S-3746	Detector " "	1.50
S-3747	Antenna " "	1.50
S-4014	Variable I.F. Transformer Assembly (2 used)	3.00
	Miscellaneous	
44-7	Phonograph Jack	.15
46-123	Band Selector and Variable Selectivity Knobs	.20
46-125	Tuning Control Knob (Small)	.15
46-127	Tone and Volume Control Knobs	.20
46-134	Tuning Control Knob (Large)	.15
49-128	12" Dynamic Speaker (Concert Type)	17.50
	Cone and Voice Coil Assembly for 49-128	3.25
	Output Transformer for 49-128	3.00
	Field Coil for 49-128	3.00
49-129	6" Dynamic Speaker (Tweeter Type)	7.00
	Cone and Voice Coil Assembly for 49-129	2.00
	Output Transformer for 49-129	2.00
	Field Coil for 49-129	1.50
52-74	Power Cable	2.00

PARTS AND PRICES — Models 16-A-61 and 16-A-63

Miscellaneous (Cont'd)

52-75	Speaker Cable	.50
57-516	Escutcheon Plate and Glass Assembly	3.00
58-32	5 Prong Power Cable Plug	.35
58-33	6 " " and Speaker Cable Plug	.35
62-7	A.C. Plug Receptacle	.75
78-129	Voltage Indicator Socket	.15
78-131	6-K-7 Wafer Type Socket	.15
78-132	6-A-8 " " "	.15
78-133	6-H-6 " " "	.15
78-134	6-C-5 " " "	.15
78-136	5-Y-3 " " "	.15
78-137	6-F-6 " " "	.15
78-145	6-F-5 " " "	.15
78-146	Six Contact Power Cable Socket	.15
78-147	Seven " " " "	.15
85-39	Phono Switch D.P.D.T	1.00
85-82	Band Selector Switch	2.00
95-313	Power Cable	2.50
95-314	117 Volt,50-60 Cycle Power Transformer	8.00
95-315	117 Volt 50-60 Cycle Power Output Plate Transformer	6.50
95-318	Driver Transformer	3.00
95-319	Power Choke	2.50
95-321	High Fidelity Choke	1.00
95-322	All Voltage 25 Cycle Power Transformer	12.00
95-323	All Voltage 25 Cycle Power Output Plate Transformer	10.00
126-171	Tube Shields (Large)	.20
126-182	Tube Shields (Small)	.20

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

ZENITH RADIO CORPORATION
CHICAGO, ILLINOIS,U.S.A.
November 5, 1935

WARRANTY

The Zenith Radio Corporation guarantees each new ZENITH receiver and each new ZENITH QUALITY TUBE to be free from defects in workmanship and material.

Our obligation under this warranty is limited to making good at our factory any part or parts of the receiver which within ninety days from date of purchase shall be returned to us with transportation charges prepaid and which on examination shall be found to our satisfaction to have been thus defective. The ZENITH QUALITY TUBES used in this receiver are guaranteed against mechanical and electrical defects under the same warranty as the receiver. This warranty is expressly in lieu of all other warranties expressed or implied, and we neither assume nor authorize any representative or other person to assume for us any other liability in connection with the sale of ZENITH receivers or ZENITH QUALITY TUBES.

This warranty shall not apply to any receiver or tube which shall have been repaired or altered outside of our factory in any way so as, in our judgment, to affect its stability or reliability, nor which has been subject to misuse, negligence or accident, nor which has had the serial number or name altered, defaced or removed. Neither shall this warranty apply to any receiver in which other than ZENITH QUALITY TUBES have been used.

ZENITH RADIO CORPORATION.

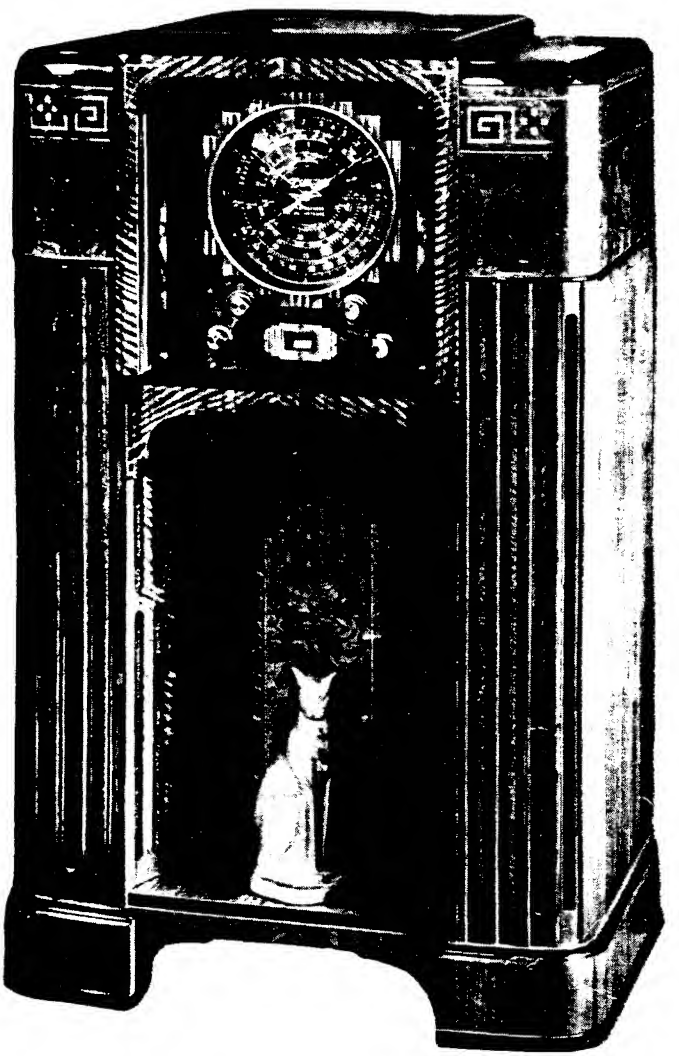
SERVICE BULLETIN

ZENITH

25 Tube

Stratosphere

(SERIAL NOS. 174001 TO 174100



ZENITH RADIO CORPORATION

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

GENERAL INFORMATION

Tubes used are as follows:

	6D6	First Radio Frequency Amplifier
	6D6	Second Radio Frequency Amplifier
	6A7	First Detector and Oscillator
	6D6	First Intermediate Amplifier
	6D6	Second Intermediate Amplifier
	76	Second Detector
2 -	76	First Audio Amplifier
2 -	42	Push-Pull Second Audio Amplifier
8 -	45	Parallel Push-Pull Power Amplifier
	79	Electron Relay for Q Circuit
	6D6	Shadowgraph Amplifier
	85	Automatic Volume Control
	6D6	A.V. C. Amplifier
2 -	5Z3	Rectifier for Power Amplifier
	5Z3	Rectifier for remainder for receiver.

CIRCUIT

Radio Frequency Amplifier. This receiver employs two stages of radio frequency amplification using pentode tubes in conjunction with tuned plate circuits resulting in high R. F. gain at all frequencies. The bias voltage on both stages is varied through the band switch to secure stability and preserve maximum gain on all bands. Both stages are used on all bands except the fifth or ultra-high frequency band. Double shielding is employed on the entire R. F. section to prevent signal pick-up by the wiring.

First Detector and Oscillator. A 6A7 tube is used as first detector and oscillator. The input circuit of the first detector is an R.F.choke and a 50,000 ohm resistor in parallel. The input grid of a 6A7 type of tube has a tendency to become positive whenever a strong signal is impressed on it, if there is any appreciable resistance in the grid circuit. The grid return connection of the choke is connected to one diode plate of the 85 A.V.C. tube so that if at any time the input grid of the 6A7 should become positive, due to overload, the diode plate will provide a low D.C. path to ground preventing detector overload distortion.

Intermediate Amplifier. The circuit employed in the two stages of intermediate amplification is conventional. The unusual feature of this portion of the receiver is in the transformers which are so designed that the mechanical coupling, and, in turn, the band width or selectivity may be varied continuously without changing the natural period of either primary or secondary coils. This variation of selectivity has no effect on the sensitivity of the receiver.

Delayed Automatic Volume Control. A pick-up winding is incorporated in the third I.F. transformer which feeds I.F. to the control grid of a 6D6 A.V.C. amplifier. The output of this stage is coupled through an untuned transformer to the diode plate of an 85 tube. The plate of the 85 is connected directly to B plus and the control grid to a tap in the diode load resistor. This tube is biased at approximately 10 volts which places a negative bias on the diode plate and no A.V.C. voltage is developed until a signal is tuned in of a strong enough value to swing the diode plate positive. At this point A.V.C. voltage is developed, which in turn makes the grid of the 85 negative and reduces the plate current which reduces the bias and allows still more A.V.C. voltage to be developed. This accumulative action allows excellent automatic control of the stronger signals and eliminates the detrimental effects of A.V.C. on weak signals.

Q.A.V.C. A portion of the resistance load of the 85 diode is incorporated in a potentiometer on the rear of the upper chassis. The arm of this potentiometer is connected to the grids of a 79 tube. The two plates of the 79 are connected in parallel and operate a magnetic relay which short-circuits the grids of the push-pull 42 audio driver stage. When a signal is tuned in the grids of the 79 tube become negative stopping the plate current and the relay opens, allowing the audio system of the receiver to operate. The signal level at which this occurs is determined by the setting of the potentiometer arm. A switch, operated by a lever under the band switch knob on the front panel is in series with the 79 plate circuit and when opened makes the Q.A.V.C. circuit inoperative. The shadowmeter is connected in the plate circuit of a separate 6D6 whose control grid is controlled by the A.V.C. voltage. The amplifying action of this tube allows the shadowmeter to operate on very weak stations.

First Audio and Driver. In order to eliminate any possibility of overloading, two 76 tubes are used in parallel in the first audio stage. Two audio transformers of special design couple the first audio stage to a push-pull driver stage using two 42 tubes. The smaller transformer only handles frequencies above 400 cycles and has a rising high characteristic. The large transformer handles frequencies below 400 cycles and is resonated at 30 cycles. The voltage output of each of these transformers is controlled by the tone control.

The Power Output Stage. This consists of eight 45 tubes connected in parallel push-pull. A much better balance is preserved in this stage by using several medium size power tubes rather than a pair of high-power tubes. Also, the voltage requirements are greatly reduced. A 99 ohm resistor is incorporated in the grid circuit of each tube to prevent parasitic oscillation.

Power Supply. There are two rectifying and filtering systems incorporated in the lower power amplifier chassis. One uses a single 5Z3 full wave rectifier and supplies plate current for the upper chassis and bias voltage for the output stage. The second uses two 5Z3 tubes and supplies plate current for the output stage only. Special electrolytic condensers are used in both power supplies. These condensers will make a slight frying sound while the tubes are heating, unlike the more common type of electrolytic condensers. This is not an indication of deterioration.

Reproducers. There are three dynamic reproducers used. The small one in the center reproduces the higher register above 4000 cycles. A filtering system is used in conjunction with this speaker which prevents the lower frequencies from being reproduced. The two large concert dynamics handle all frequencies lower than 4000 cycles. Two are necessary to handle the 500 watts output of the power stage without distortion. The leads and connections on all three speakers are color coded so as to insure correct connections and proper phasing. These connections must not be reversed.

Tuning Ranges.

Color	Kilocycles	Megacycles	Meters
Green	535 - 1,550	.53 - 1.55	560 - 190
Orange	1,530 - 4,575	1.53 - 4.57	196 - 65.7
Yellow	3,725 -11,150	3.72 -11.15	80.5 - 27
Red	9,500 -31,600	9.5 - 31.6	31.5 - 9.4
Blue	19,500 -63,600	19.5 - 63.6	15.3 - 4.7

The high efficiency and unexcelled performance of this receiver has been achieved by the careful selection and high quality of all components. It is therefore most important that when service is required only genuine Zenith parts and tubes be used.

Socket Voltages

TUBE	POSITION	Ef	Ek	Eg1	Eg2	Eg3	Ep
6D6	1st R. F.	6.3	10	0	100	10	270
6D6	2nd R. F.	6.3	3	0	100	3	270
6A7	1st Det.	6.3	3	0	100	-	270
	Osc.			0	-	-	165
6D6	1st I.F.	6.3	3	0	100	3	255
6D6	2nd I.F.	6.3	3	0	100	3	255
76	2nd Det.	6.3	0	0	-	-	0
76	Parallel 1st. Audio	6.3	12	0	-	-	192
42	P.P.Driver	6.3	19	0	-	-	258
45	Power Aud.	2.5	63	0	-	-	330
79	S.A.V.C.	6.3	0	.5	-	-	240
6D6	Shadowmeter Amplifier	6.3	1.3	0	100	1.3	255
6D6	A.V.C. Amplifier	6.3	3	0	100	3	255
85	A.V.C.	6.3	7	0	-	-	100
5Z3	Rect.Power Amplifier	5	-	-	-	-	-
5Z3	Rect. for Upper Chassis.	5	-	-	-	-	-

Line voltage 112. Antenna and Ground shorted.

f - filament; k - cathode; g1 - control grid; g2 - screen grid; g3 - suppressor grid; p - plate.

Balance Procedure: Caution - Test set thoroughly for defective tubes, antenna and ground, check line voltage and chassis voltages before any attempt is made to re-balance.

Set volume control in full position, fidelity control in selective position, tone control at high position. Output meter usually connected across plates of 45 tubes.

Connect 485 K.C. service oscillator to grid of 6A7 and chassis ground, adjust I.F. transformers to maximum output with minimum signal input. Rotate selectivity control to broad position, I.F. output should remain constant six K.C. plus and minus of 485 K.C.

Set band switch on 550 to 1500 scale, rotate gang to 1400 K.C. Set test oscillator at 1400 and connect to aerial and ground.

Adjust oscillator trimmer screw, top padder screw on oscillator coil, to scale.

Rotate gang to 600 K.C., set test oscillator at 600. Adjust padder inside left front corner of shield can, near oscillator coil, for maximum output.

Rotate gang and padder together near 600 K.C. while making this adjustment. Set pointer to exactly 600 K.C. Re-adjust service oscillator to 1400, rotate gang

back to 1400 and re-check for maximum output and scale. The two R. F. and detector gang condenser trimmers should be adjusted to maximum output at 1400 K.C

The short wave bands are adjusted at 3.5 and 9 and 28 Meg. Adjust for maximum signal or noise level. Under no circumstances should wires in oscillator and 5-meter circuits be disturbed. Adjust screws following in sequence below 1400 oscillator screw on oscillator coil.

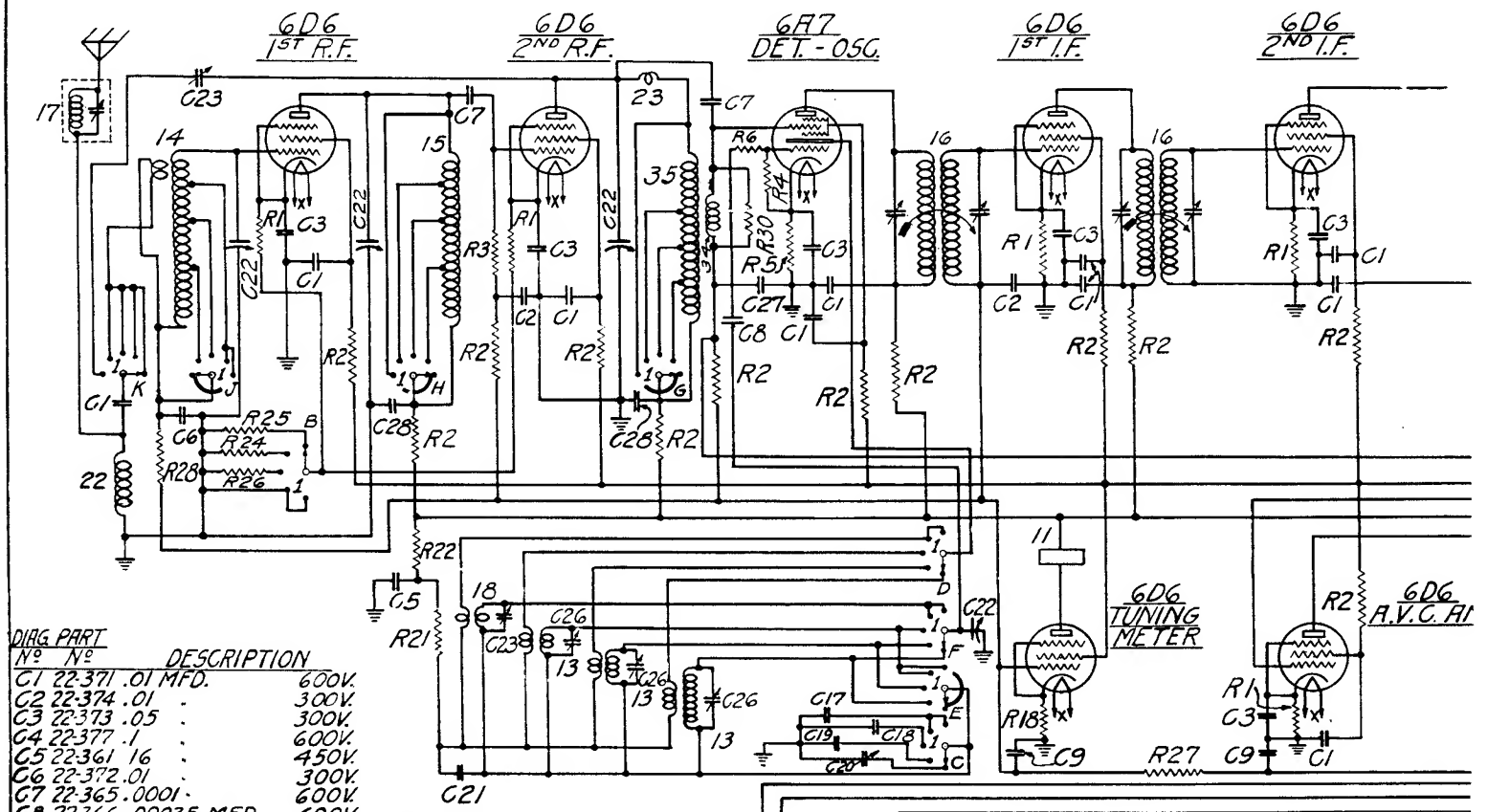
Resistance Checks: The following D. C. resistances are given as help for continuity test, taken with the average type of ohmmeter.

Chassis - Power pack disconnected.
Driver transformer, Part #95-250 - #2853 -- Center tap of secondary to each side, numbers, 5 to 4, and 5 to 6 - 675 and 700 Ohms.
Primary - Center tap to each side 450 and 525 Ohm, numbers 2 to 1 and 2 to 3.
High Boost, #95-252, with low boost disconnected.
Primary (White wire
(White and black tracer - 200 Ohms
Secondary -(Blue - 200 Ohm
(Yellow
Secondary- (Red
(White and Red tracer - 200 Ohms.
Low Boost, #95-251, with high boost and tone control disconnected.
Primary - 650 Ohms.
Secondary center tap to each side 5000 Ohms.
Antenna choke - #20-71 - 15 Ohms.
Wave Trap - #20-101 - 5 Ohms.
Relay - #195-1 - 3000 Ohms.
Detector filter choke - #20-99 - 150 Ohms.
3rd I.F. -#20-100 -(Brown - 7 Ohms
(Green
(Red -
(Blue - 6.5 Ohms
(Black
(Green grid cap wire - 3 Ohms.
High fidelity I.F. - #S-3356 - 2 used.
(Green - Brown - 3.2 Ohms.
(Blue - Red - 3.2 Ohms.

R.F. Coil - Check from Grid cap, green wire to brown wire coming out of bottom of coil 490,000 Ohms. This high resistance is due to series resistor mounted on coil form of 490,000 value. Black to White - Yellow to Blue - $\frac{1}{2}$ ohms approximately.

Oscillator Coil -
Brown to Slate - $\frac{1}{2}$ Ohm.
Brown to Black - 3.9 Ohm.
Brown to White - 1.5 Ohm.
Red Green tracer to Blue - 4.8 Ohms.
Red Green tracer to Yellow - .8 Ohms.
Red Green tracer to Red - 1.5 Ohms.
Red to Blue - 3.2 Ohms.
Red to Yellow - 6.8 Ohms.

(Continued on Page 8)



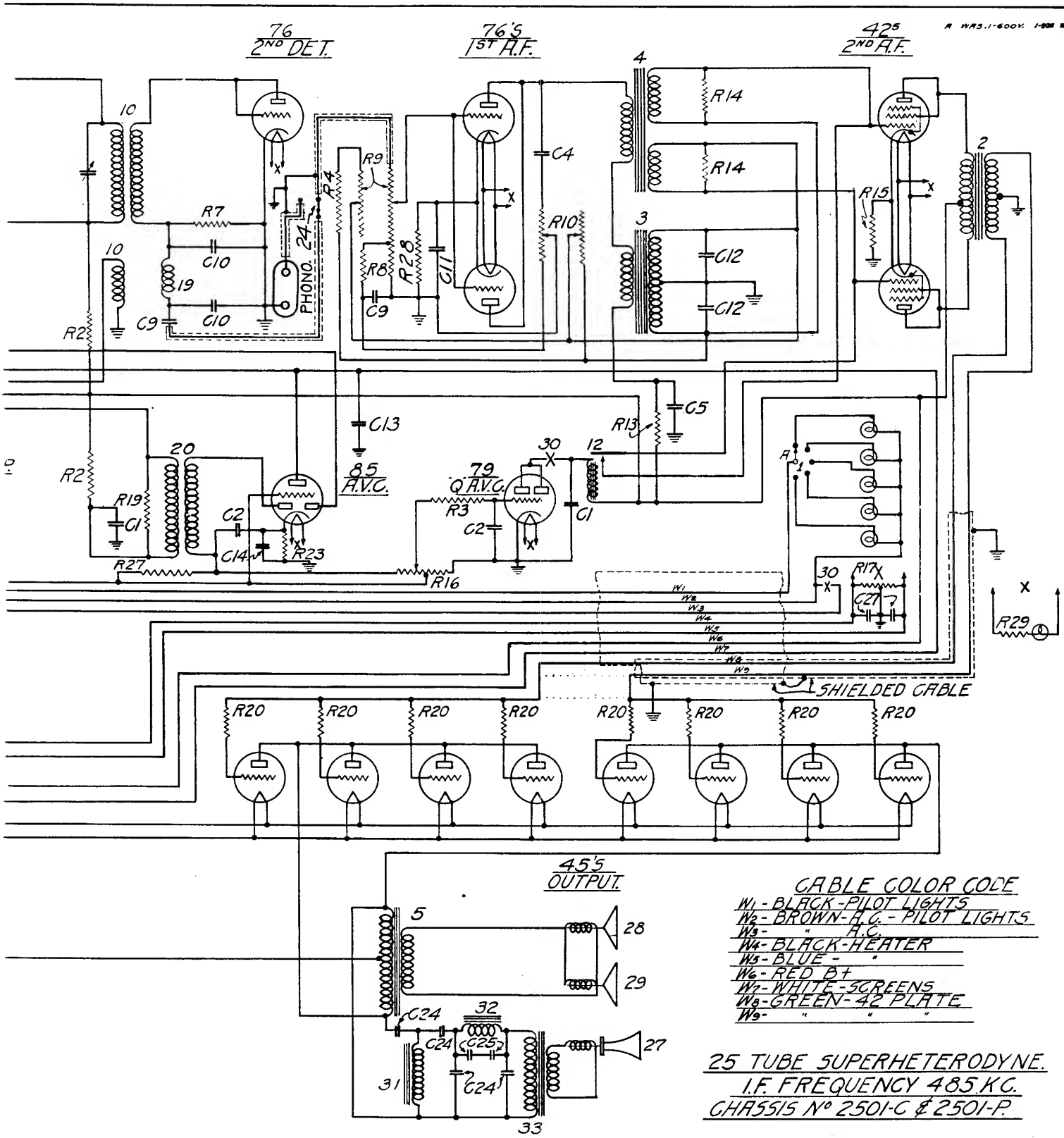
DIAG. PART Nº	Nº	DESCRIPTION	
C1	22-371	.01 MFD.	600V.
C2	22-374	.01 "	300V.
C3	22-373	.05 "	300V.
C4	22-377	.1 "	600V.
C5	22-361	16 "	450V.
C6	22-372	.01 "	300V.
C7	22-365	.0001 "	600V.
C8	22-366	.00035 MFD.	600V.
C9	22-375	.1 MFD.	300V.
C10	22-367	.00005 MFD.	600V.
C11	22-189	20 MFD.	25V.
C12	22-378	.04	600V.
C13	22-362	8 MFD.	300V.
C14	22-225	5 "	25V.
C15	22-360	4 "	600V.
C16	22-379	.002 MFD.	600V.
C17	22-369	.005	600V.
C18	22-370	.00325	600V.
C19	22-364	.0013	600V.
C20	22-205	200-500 MMFD.	
C21	22-368	.003 MFD.	600V.
C22	22-340	452 MMFD. 4 GANG.	
C23	22-305	2-35 MMFD.	
C24	22-383		
C25	22-338		
31-95-266		ORDER BY PART Nº	
32-95-265		ONLY.	
33	95-267	SPECIAL TOLERANCES.	
C26	22-381	2-35 MMFD.	
C27	22-199	.5 MFD.	200V.
C28	22-170	.1 "	400V.®

DIAG. PART Nº	Nº	DESCRIPTION	
R22	63-407	10M OHMS	CANDOHM.
R23	63-396	10M "	½W.
R24	63-180	1M "	½W.
R25	63-241	.5M "	½W.
R26	63-157	100 "	½W.
R27	63-290	260M "	½W.
R28	63-418	1500 "	½W.
R29	63-432	5 "	CANDOHM
R30	63-280	19M "	¼W.

R1	63-362	400 OHMS	¼ W.
R2	63-416	1400 "	¼ W.
R3	63-258	490M. "	½ W.
R4	63-136	50M. "	½ W.
R5	63-357	300 "	½ W.
R6	63-411	20 "	½ W.
R7	63-260	100M "	½ W
R8	63-412	3500 "	½ W
R9	63-390	1MEG. DUAL VOL. CONTROL.	
R10	63-391	" TONE "	
R11	63-387	4 M OHMS-CANDOHM.	
R12	63-389	1M-1857 OHMS-CANDOHM.	
R13	63-406	5M OHMS CANDOHM.	
R14	63-413	4M OHMS	½ W.
R15	63-405	330 " CANDOHM.	
R16	63-408	500M "Q" CONTROL.	
R17	63-404	60 OHMS CANDOHM.	
R18	63-246	150 OHMS	½ W.
R19	63-414	99M "	½ W.
R20	63-417	99 "	½ W.
R21	63-415	10M "	½ W.

1	85-67	BAND SELECTOR SWITCH.
2	95-250	DRIVER TRANS.
3	95-251	LOW BOOST AUDIO TRANS.
4	95-252	HIGH FREQUENCY "
5	95-253	SPEAKER OUTPUT "
6	95-254	POWER CHOKE.
7	95-255	" "
8	95-256	OUTPUT "B" SUPPLY TRANS.
9	95-257	POWER TRANS.
10	95-264	3RD I.F. TRANS.
11	122-9	SHADOWGRAPH.
12	195-1	SINGLE CONTACT RELAY.
13	5-3366	OSC. COIL.
14	5-3340	ANT. COIL.
15	5-3341	R.F. COIL
16	5-3358	VAR. SELECT. I.F. ASSEM.
17	20-101	WAVE TRAP.
18	5-3368	H.F. OSC. COIL ASSEM.
19	20-99	DET. FILTER CHOKE.
20	20-100	UNTUNED I.F. COIL.
21	5-3367	LINE FILTER COIL.
22	20-71	ANT. CHOKE.
23	20-104	S METER DET. COIL
24	85-69	PHONO. SWITCH.
25	FIELD	SPEAKER #49-102 #49-103
26	"	" 49-99
27	49-99	SPEAKER.
28	49-102	#2 " SPEAKER.
29	49-103	#1 "
30	85-67	TOGGLE SWITCH.
34	20-76	R.F. PLATE CHOKE
35	5-3498	DET. COIL.

MODEL Nº 1000-



25 TUBE SUPERHETERODYNE.
I.F. FREQUENCY 485 K.C.
CHASSIS Nº 2501-C & 2501-P.

ZENITH RADIO CORP.
CHICAGO, ILL.
U.S.A.

W.D.-11-19-34

(Continued from Page 5)

Antenna Coil - Check for continuity - Red wire through to Green wire - This will include all coils on this form.

These coil readings are given on coils only, disconnected from associating circuits.

Power pack readings taken with set disconnected and pack cold, tubes in sockets.

Both A. C. primary windings #95-256 and #95-257 less than ½ Ohm. 45 and 6 volt winding practically no D.C. resistance, - check for continuity only and check center tap of 45 winding.

5Z3 filament same as above.
5Z3 plate windings 100 Ohms.
Check center tap, approximately ½ of total winding or 50 Ohms.
Filter chokes - #95-255 - #95-254 - 70 Ohms.
Line filter #S-3367 - Check for continuity.
See voltage readings supplement.

SERVICE NOTES

Hums - Defective tubes and check filters - Voltages, etc.

Hums - Weak and Distorted. Check #95-250 transformer for open winding, weak audio if shorted.

Too Much High, Lacks Low Notes - #95-250 open center tap. #22-225 condenser open 50,000 ohm resistor grounded on tone control to bottom plate. ½ of low boost shorted secondary.

Motorboats On All Bands - #22-228 - .5 condenser to 85 socket open, I. F. shorted, graph won't narrow and set will distort on edge of carrier.

Weak And Distorted All Bands. 1500 Ohm resistor across #22-189 25-volt 2 Mmfd. open.

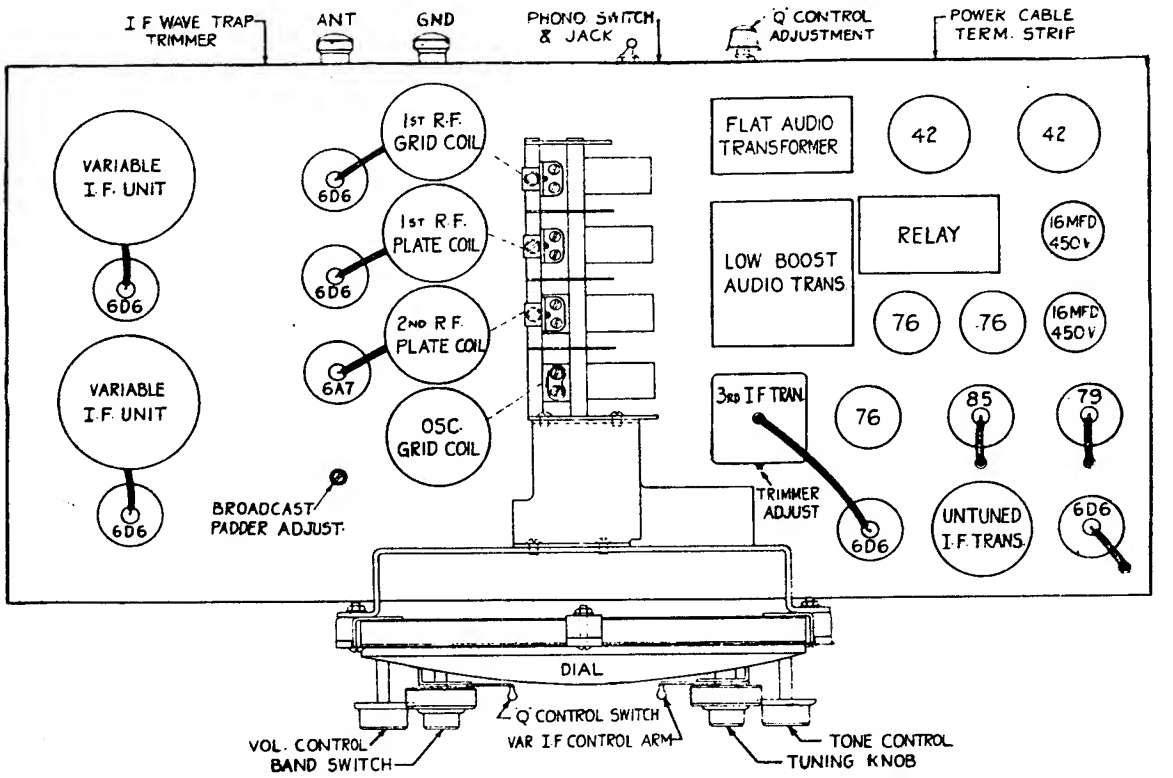
Blocks Up - Tendency to Slow Motorboat. Check red wire from #63-407 to 10,000 ohm on 5-meter coil for ground. Set seems alive but no signal if this resistor is open.

Set Dead- Check tubes, filters, coils and transformers and I.F. for grounds or open.

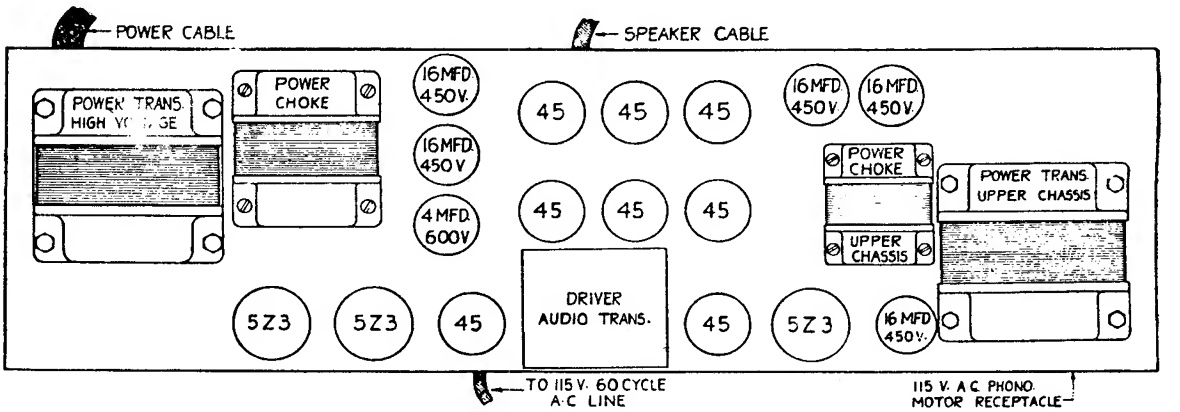
Dead - No Radio - Open 'Phono Switch.

Weak Audio And High Notes - Hum level increases slightly if you pull one push-pull #42 tube. Open secondary on low boost #95-251. Disconnect high boost and tone control circuit before testing.

Tone Control No Effect On Highs. Set flutters as tone control is rotated to bass. Check .1-22 -3770 for open or short.



Receiver Chassis Drawing



Power Pack Chassis Drawing

Parts and Prices

Chassis #2501

MODEL
STRATOSPHERE

Dial Assembly

26-76	Calibrated Glass Scales (includes 6 scales & frame)	$35.00
32-5	Dial Drive Belt	.50
59-30	Split Second Pointer (white)	.50
59-31	Special "Z" Pointer (gold)	5.00
76-153	Planetary Drive Shaft Assembly	3.50
93-230	Dial Glass Cushion Washer	.50
100-28	Special 110 V. Dial Lamp	1.25
126-170	Dial Lamp Reflector Shields	.25
192-5	Dial Glass	1.50

Resistors

63-136	50 M Ohm 1/2 Watt	.25
63-157	100 " 1/2 "	.25
63-180	1 M " 1/2 "	.20
63-241	5 M " 1/2 "	.25
63-246	150 " 1/2 "	.20
63-258	490 M " 1/2 "	.20
63-260	100 M " 1/2 "	.20
63-280	19 M " 1/2 "	.20
63-290	260 M " 1/2 "	.20
63-357	300 " 1/2 "	.20
63-362	400 " 1/2 "	.20
63-387	4 M " Candohm	.45
63-389	1 M - 1857 Ohm Candohm	.45
63-390	1 Megohm Dual Volume Control Assembly	5.00
63-391	Dual Tone Control Assembly	4.50
63-396	10 M Ohm 1/2 Watt	.20
63-404	60 Ohm Candohm	.25
63-405	330 " "	.25
63-406	5 M Ohm Candohm	.40
63-407	10 M " "	.45
63-408	500 M Ohm Q Control Assembly	.80
63-411	20 Ohm 1/2 Watt	.20
63-412	3500 " 1/2 "	.20
63-413	4 M " 1/2 "	.20
63-414	99 M " 1/2 "	.20
63-415	10 M " 1/2 "	.20
63-416	1400 " 1/2 "	.20
63-417	99 " 1/2 "	.20
63-418	1500 " 1/2 "	.20
63-432	5 " Candohm	.25

Condensers

22-170	.1 Mfd. 400 V.	.25
22-189	20. " 25 V.	1.25
22-199	.5 " 200 V.	.35
22-205	200-500 Mmfd.	.35

Condensers Cont'd

22-225	5. Mfd. 25 V.	$ .65
22-305	2 - 35 Mmfd. Padder	.15
22-338	Special	1.00
22-340	Four-Gang Variable	7.00
22-360	4. Mfd. 600 V.	4.00
22-361	16. " 450 V.	1.50
22-362	8. " 300 V.	1.00
22-364	.0013 Mfd. 600 V.	.20
22-365	.0001 " 600 V.	.15
22-366	.00035 " 600 V.	.15
22-367	.00005 " 600 V.	.15
22-368	.003 " 600 V.	.20
22-369	.005 " 600 V.	.35
22-370	.00325 " 600 V.	.25
22-371	.01 " 600 V.	.25
22-372	.01 " 300 V.	.25
22-375	.05 " 300 V.	.25
22-374	.01 " 300 V.	.25
22-375	.1 " 300 V.	.25
22-377	.1 " 600 V.	.35
22-378	.04 " 600 V.	.35
22-379	.002 " 600 V.	.25
22-381	2 - 35 Mmfd. Special Padder	.50
22-383	Special	1.00

Coils and Chokes

20-71	Antenna Choke	.20
20-76	R.F. Plate Choke	.25
20-99	Detector Filter Choke	.45
20-100	Untuned I. F. Coil	.65
20-104	5 Meter Detector Coil	.20
95-264	3rd I. F. Transformer Assembly	2.50
S-3340	Antenna Coil Assembly	3.50
S-3341	R.F. " "	4.00
S-3358	Variable Selector I.F. Assembly	7.00
S-3366	Oscillator Coil Assembly	4.00
S-3367	Line Filter Coil	3.50
S-3368	H.F. Oscillator Coil Assembly	3.00
S-3498	Detector Coil Assembly	4.25

Miscellaneous

8-33	Antenna Binding Post	1.00
8-34	Ground Binding Post	1.00
44-4	Phonograph Jack	.15
46-103	"Q" Control Knob	.15
46-104	Volume and Tone Control Knobs	1.50
46-105	Tuning Knob (front half)	1.50
46-106	" " (rear half)	1.50
46-107	Band Selector Switch Knob	1.50

Miscellaneous Cont'd

49-99	Tweeter Dynamic Speaker	$35.00
49-102	#2 - 12" Concert Dynamic Speaker	30.00
49-103	#1 - 12" " " "	30.00
	Cone and Voice Coil for either 49-102 or 49-103	7.00
52-60	Power Cable	3.00
52-61	Speaker Cable	.75
57-463	Shadowgraph Escutcheon Plate	.35
57-471	Dial Escutcheon Plate	6.00
78-64	85 Tube Socket (for .0625 chassis stock)	.10
78-69	6D6 " " (" " " ")	.10
78-92	42 " " (" " " ")	.10
78-96	6D6 " " (" .0805 " ")	.10
78-105	6A7 " " (" " " ")	.10
78-117	76 " " (" .0625 " ")	.10
78-118	79 " " (" " " ")	.10
78-119	45 " " (" " " ")	.10
78-120	5Z3 " " (" " " ")	.10
80-104	I.F. Unit Plunger Spring	.10
80-105	Control Arm Spring	.10
85-64	Toggle Switch	1.00
85-67	Band Selector Switch	8.00
85-69	S.P. D.T. Phono Switch	.75
95-250	Driver Transformer	4.00
95-251	Low Boost Audio Transformer	4.00
95-252	High Frequency Transformer	2.00
95-253	Main Speaker Transformer	4.00
95-254	Power Choke	6.50
95-255	" "	3.50
95-256	Power Transformer for Output Tubes - 117 V. - 60 Cycle	14.00
95-257	" " " Receiver and Filaments - 117 V. - 60 C.	15.00
95-265	Special Choke for Tweeter Speaker	2.25
95-266	" " " " "	2.25
95-267	Output Transformer for Tweeter Speaker	2.25
95-271	Power Transformer for Receiver and Filaments,117 V. - 25 C.	25.00
95-272	" " " Output Tubes - 117 V. - 25 C.	24.00
122-9	Shadowgraph Meter	2.00
126-127	Tube Shields	.15
126-155	Line Filter Shield	.15
126-171	Tube Shield	.25
195-1	"Q" Control Relay	2.00

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

February 8, 1935

ZENITH RADIO CORPORATION

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

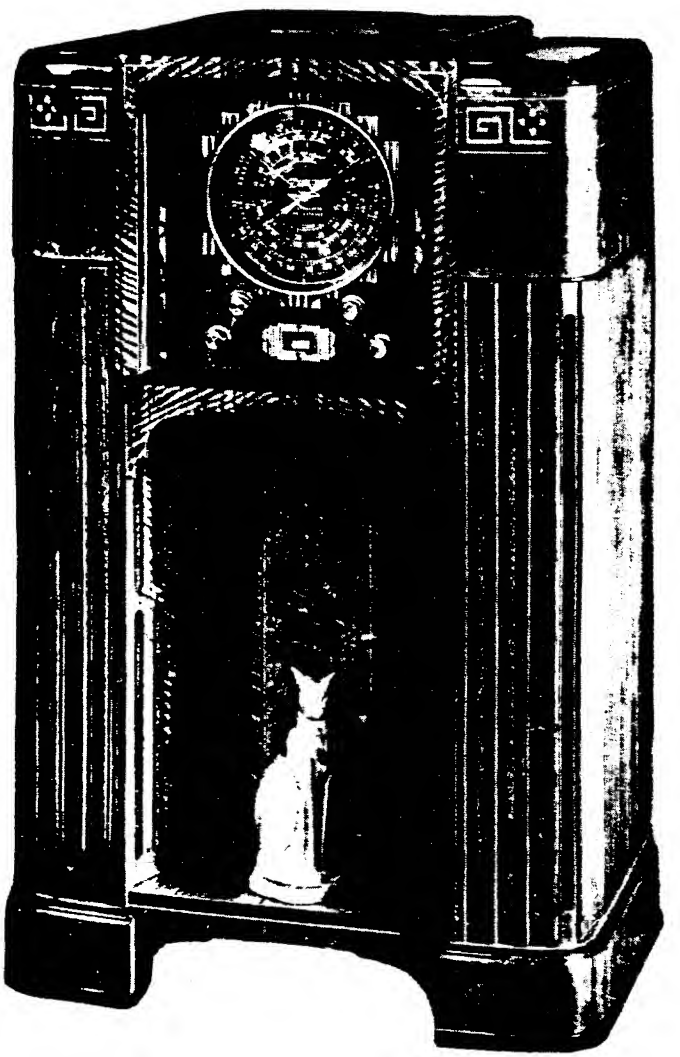
SERVICE BULLETIN

ZENITH

25 Tube

Stratosphere

(SERIAL NOS. AFTER 754106



ZENITH RADIO CORPORATION

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

GENERAL INFORMATION

Tubes used are as follows:

6D6	First Radio Frequency Amplifier
6D6	Second Radio Frequency Amplifier
6A7	First Detector and Oscillator
6D6	First Intermediate Amplifier
6D6	Second Intermediate Amplifier
76	Second Detector
2 - 76	Audio Amplifier
2 - 42	Push-Pull Driver Amplifier
8 - 45	Parallel Push-Pull Power Amplifier
79	Electron Relay for Q Circuit
6D6	Shadowgraph Amplifier
85	Automatic Volume Control
6D6	A.V.C. Amplifier
2 - 5Z3	Rectifier for Power Amplifier
5Z3	Rectifier for remainder for receiver

CIRCUIT

Radio Frequency Amplifier. This receiver uses a preselector and a tuned R.F. stage on the green band, and a single tuned R.F. stage on the orange and yellow bands. Two tuned R.F. stages are employed on the red band. Due to the extreme difficulty of obtaining usable R.F. gain on frequencies below 18 megacycles, the antenna is coupled directly to the grid circuit of the first detector on the blue band. Double shielding is employed on the entire R.F. section to prevent signal or noise pick-up by the wiring.

First Detector and Oscillator. A 6A7 tube is used as first detector and oscillator. The input grid of a 6A7 tube has a tendency to become positive whenever a strong signal is impressed on it, if there is any appreciable resistance in the grid circuit. The grid return side of the input circuit is connected to one diode plate of the 85 A.V.C. tube so that if at any time the input grid of the 6A7 should become positive, the diode plate will allow a low D.C. path to ground, preventing overload distortion.

Intermediate Amplifier. The circuit employed in the two stages of intermediate amplification is conventional. The unusual feature of this portion of the receiver is in the transformers which are so designed that the mechanical coupling, and, in turn, the band width or selectivity may be varied continuously without changing the natural period of either primary or secondary coils. This variation of selectivity has no effect on the sensitivity of the receiver.

Delayed Automatic Volume Control. A pick-up winding is incorporated in the third I.F. transformer which feeds I.F. to the control grid of a 6D6 A.V.C. amplifier. The output of this stage is coupled through an untuned transformer to the diode plate of an 85 tube. The plate of the 85 is connected directly to B plus and the control grid to a tap in the diode load resistor. This tube is biased at approximately 10 volts which places a negative bias on the diode plate and no A.V.C. voltage is developed until a signal is tuned in of a strong enough value to swing the diode plate positive. At this point A.V.C. voltage is developed, which in turn makes the grid of the 85 negative and reduces the plate current which reduces the bias and allows still more A.V.C. voltage to be developed. This accumulative action allows excellent automatic control of the stronger signals and eliminates the detrimental effects of A.V.C. on weak signals.

Q.A.V.C. A portion of the resistance load of the 85 diode is incorporated in a potentiometer on the rear of the upper chassis. The arm of this potentiometer

is connected to the grids of a 79 tube. The two plates of the 79 are connected in parallel and operate a magnetic relay which short-circuits the grids of the push-pull 42 audio driver stage. When a signal is tuned in the grids of the 79 tube become negative stopping the plate current and the relay opens, allowing the audio system of the receiver to operate. The signal level at which this occurs is determined by the setting of the potentiometer arm. A switch, operated by a lever under the band switch knob on the front panel is in series with the 79 plate circuit and when opened makes the Q.A.V.C.circuit inoperative. The shadowmeter is connected in the plate circuit of a separate 6D6 whose control grid is controlled by the A.V.C. voltage. The amplifying action of this tube allows the shadowmeter to operate on very weak stations.

Preamplifier and Audio Driver. The preamplifier consists of two cascade resistance-coupled stages using 76 tubes. The value of the grid resistance on the second stage may be varied by the switch in the upper right-hand corner of the control panel so as to achieve a 400% increase of power sensitivity for use on short wave reception. It is possible to overload the power amplifier when using this high gain. Two audio transformers of special design couple the second audio stage to a push-pull driver stage, using two 42 tubes. The smaller transformer only handles frequencies above 400 cycles and has a rising high characteristic. The large transformer handles frequencies below 400 cycles and is resonated at 30 cycles. The voltage output of each of these transformers is controlled by the tone control.

The Power Output Stage. This consists of eight 45 tubes connected in parallel push-pull. A much better balance is preserved in this stage by using several medium size power tubes rather than a pair of high-power tubes. Also, the voltage requirements are greatly reduced. A 99 ohm resistor is incorporated in the grid circuit of each tube to prevent parasitic oscillation.

Power Supply. There are two rectifying and filtering systems incorporated in the lower power amplifier chassis. One uses a single 5Z3 full wave rectifier and supplies plate current for the upper chassis and bias voltage for the output stage. The second uses two 5Z3 tubes and supplies plate current for the output stage only. Special electrolytic condensers are used in both power supplies. These condensers will make a slight frying sound while the tubes are heating, unlike the more common type of electrolytic condensers. This is not an indication of deterioration.

Reproducers. There are three dynamic reproducers used. The small one in the center reproduces the higher register above 4000 cycles. A filtering system is used in conjunction with this speaker which prevents the lower frequencies from being reproduced. This speaker may be made inoperative whenever desired by means of the switch in the upper left-hand corner of the control panel. The two large concert type dynamics handle all frequencies below 4000 cycles. Two are necessary to handle the 50 watt output of the power stage without distortion. The leads and connections of all three speakers are color coded so as to insure correct connections and proper phasing. These connections must not be reversed.

Tuning Ranges.

Color	Kilocycles	Megacycles	Meters
Green	520 - 1,500	.52 - 1.5	576 - 200
Orange	1,450 - 4,200	1.45 - 4.2	207 - 71
Yellow	3,700 - 10,000	3.7 - 10	81 - 30
Red	8,500 - 23,000	8.5 - 23	35 - 13
Blue	18,000 - 45,000	18 - 45	16.6- 6.5

The high efficiency and unexcelled performance of this receiver has been achieved by the careful selection and high quality of all components. It is therefore most important that when service is required only genuine Zenith parts and tubes be used.

Socket Voltages

TUBE	POSITION	Ef	Ek	Eg1	Eg2	Eg3	Ep
6D6	1st R. F.	6.3	3	0	100	3	300
6D6	2nd R. F.	6.3	3	0	100	3	300
6A7	1st Det.	6.3	3	0	100	-	300
	Osc.			3	-	-	130
6D6	1st I. F.	6.3	7	0	100	7	300
6D6	2nd I. F.	6.3	3	0	100	3	300
76	2nd Det.	6.3	0	0	-	-	0
76	1st A.F.	6.3	8	0	-	-	140
76	2nd A. F.	6.3	14	0	-	-	270
42	Driver	6.3	22	0	300	-	300
45	Power A.F.	2.5	63	0	-	-	330
79	Q.A.V.C.	6.3	0	0	-	-	250 Q on 0 Q off
6D6	Shadowmeter Amplifier	6.3	3	0	100	3	300
6D6	A.V.C.Amplf.	6.3	3	0	100	3	300
85	A.V.C.	6.3	0	0	-	-	100
5Z3	Rect. Power Amplifier	5	-	-	-	-	-
5Z3	Rect.for Upper Chassis	5	-	-	-	-	-

Line Voltage 112. Antenna and Ground shorted.

f - filament; k - cathode; g1 - control grid; g2 - screen grid; g3 - suppressor grid; p - plate.

Balance Procedure: Caution - Test set thoroughly for defective tubes, antenna and ground, check line voltage and chassis voltages before any attempt is made to rebalance. All balancing should be done with a calibrated oscillator capable of a steady signal and minimum attenuation of signal input strength. The screw driver used should be of non metallic type and output meter usually connected across plates of 45 tubes at point where the two green speaker wires come out of power pack.

Warning. Do not rebalance this chassis unless absolutely necessary as all chassis are balanced on an accurate signal generator before shipment. Set volume control in full on position, tone control on treble, high fidelity control in selective position. Band switch set on broadcast position, gang 580 K.C., approximately. Connect 485 K.C. service oscillator to grid of 6A7 and chassis ground, adjust I.F.transformers, to maximum output with minimum input signal. Rotate selectivity control to broad position, I.F. output should remain constant 6 K.C. plus and minus 485 K. C. Next, connect the same 485 K.C. signal directly across aerial and ground binding post. Balance wave trap to minimum signal. Gang set at 550.

Note: Refer to drawing of trimmer assembly to identify trimmers.
Set service oscillator at 600 K.C. Adjust broadcast padder "A" meanwhile rocking pointer past 600 K.C. on dial to combination giving greatest output.

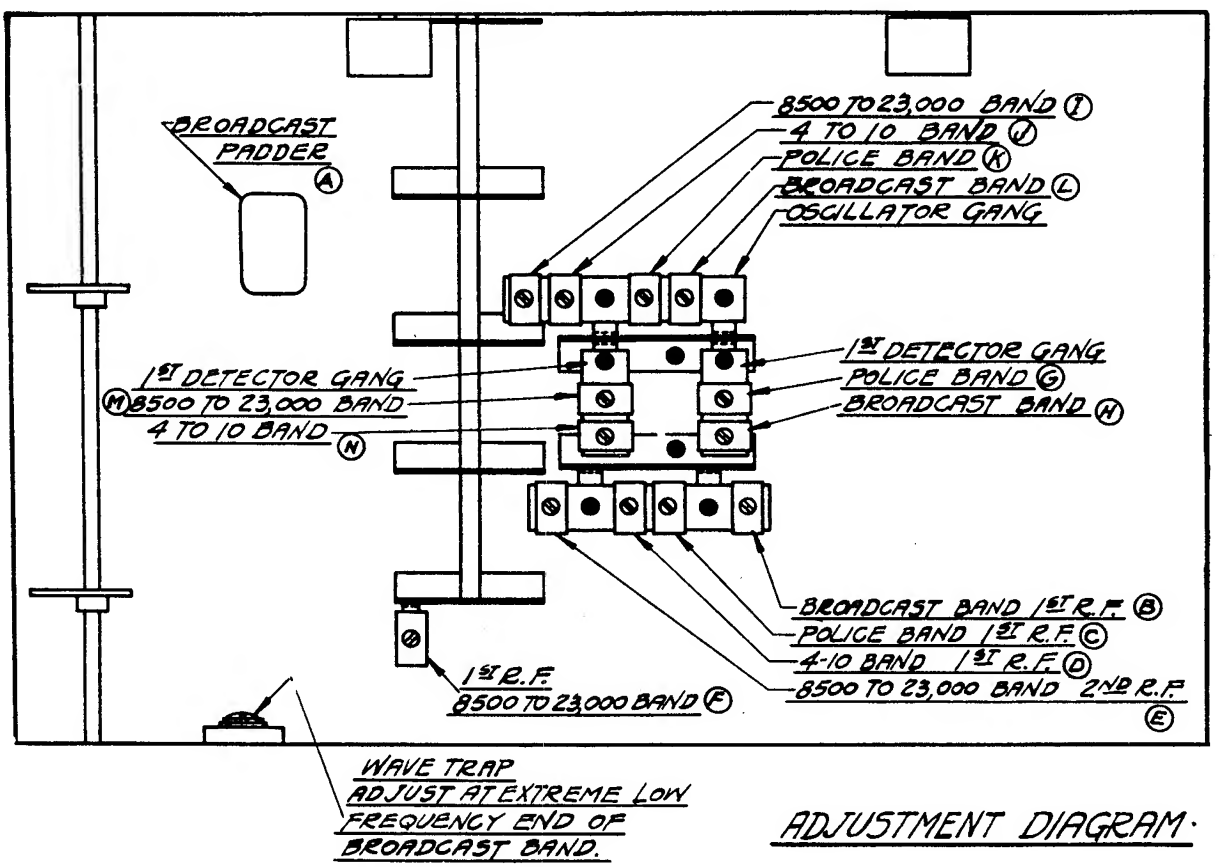
Set chassis dial to exactly 1400 K.C., and service oscillator to 1400 K.C. Balance "L" oscillator trimmer to scale. Reset oscillator to 600 K.C., rotate gang to 600 and re-check 600 padder for maximum output. Next, retune oscillator trimmer at 1400 K.C. Adjust detector trimmer "H" and R.F. trimmer "B" to maximum output.

Police or Orange band. Rotate chassis band switch to police band, gang should be rotated to 3 megacycles, oscillator to 3 megacycles also. Adjust oscillator trimmer "K" to scale, peak "G" detector and "C" R.F. trimmers to maximum peak.

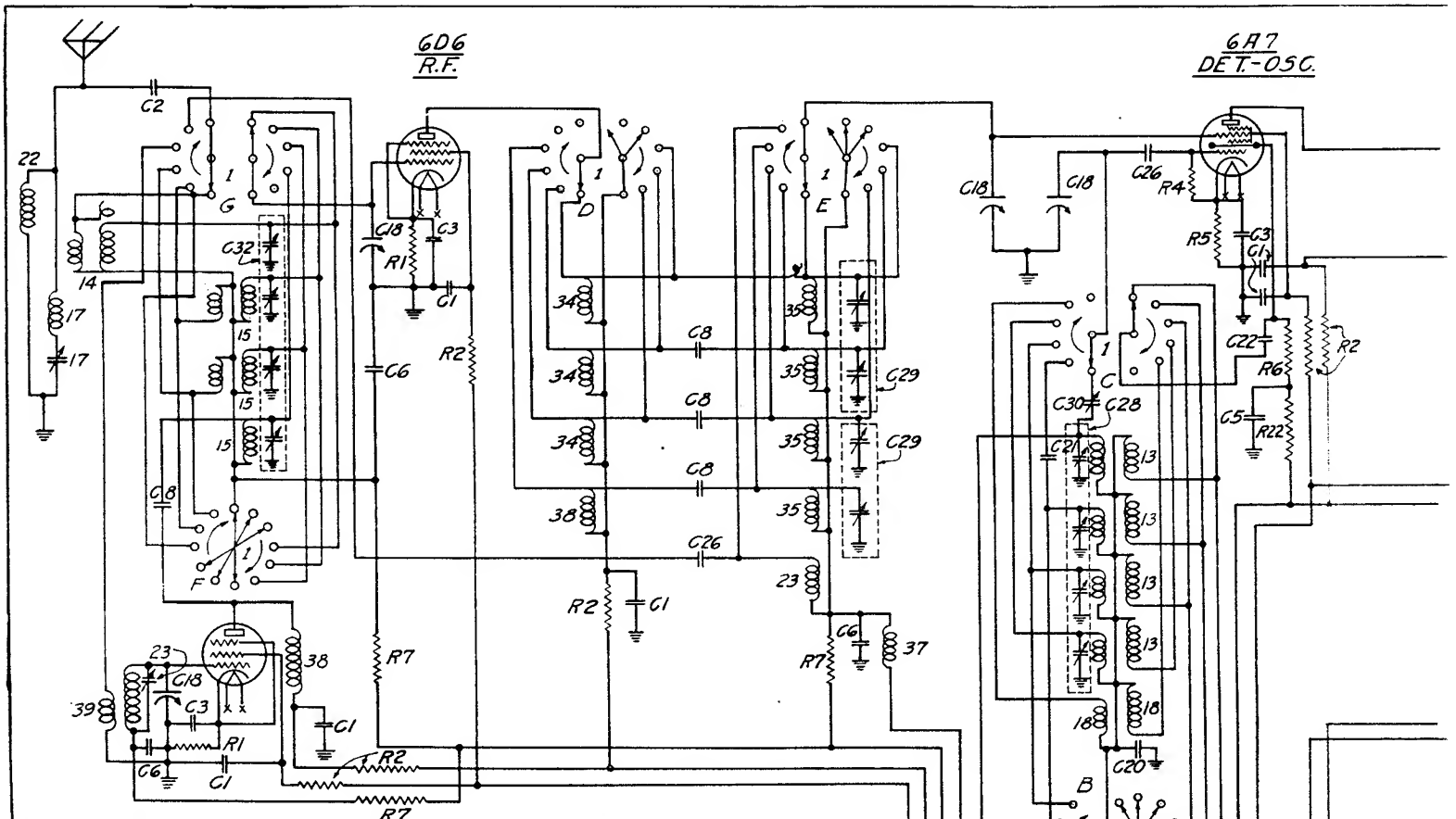
Yellow band. Set dial and oscillator to 9 megacycles, Peak oscillator trimmer "J" for scale, "N" detector and "D" R. F. trimmers for maximum peak.

Red band. Set dial and oscillator at 21 megacycles, peak "I" oscillator for scale, "M" detector and "E" R.F., and trimmer "F" located at back of band switch for maximum peak. There are no adjustments on the Blue band.

On all short wave adjustments be careful not to balance the oscillator circuit to the image frequency of the signal. This is equal to signal frequency minus twice the I.F. frequency.



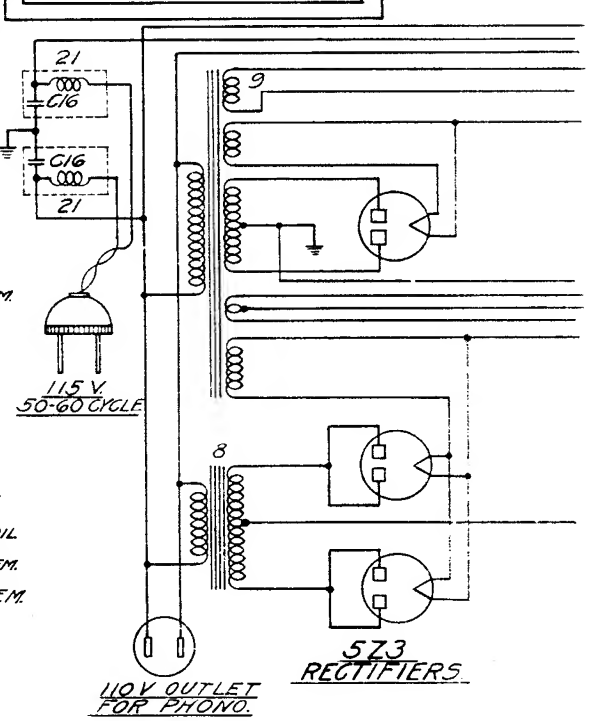
ADJUSTMENT DIAGRAM.

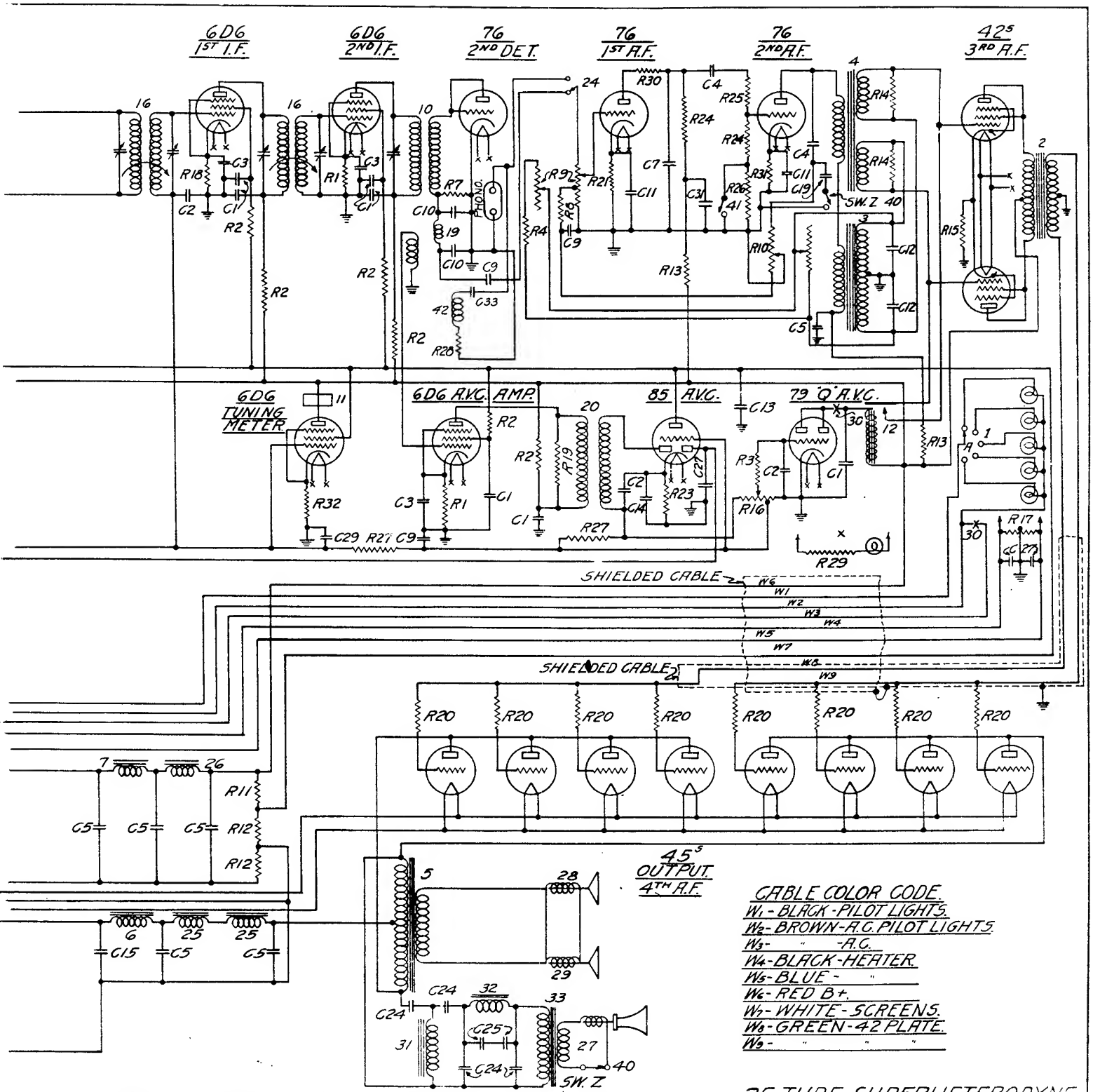


DIAG. Nº	PART Nº	DESCRIPTION
C1	22-371	.01 MFD. 600V.
C2	22-374	.01 " 300V.
C3	22-373	.05 " 300V.
C4	22-377	.1 " 600V.
C5	22-361	.1 " 450V.
C6	22-372	.01 " 300V.
C7	22-365	.0001 " 600V.
C8	22-127	.000025 MFD. 600V.
C9	22-375	.1 MFD. 300V.
C10	22-367	.00005 MFD. 600V.
C11	22-189	20 MFD. 25V.
C12	22-378	.04 " 600V.
C13	22-362	8 MFD. 300V.
C14	22-225	.5 " 25V.
C15	22-360	.4 " 600V.
C16	22-379	.002 MFD. 600V.
C17	22-289	.0005 " 600V.
C18	22-395	450 MMFD. 4GANG
C19	22-287	.03 MFD. 600V.
C20	22-342	.0029 MFD. 600V.
C21	22-341	.00092 " 600V.
C22	22-147	.0005 " 600V.
C23	22-305	2-35 MFD.
C24	22-383	ORDER BY PART Nº ONLY
C25	22-338	SPECIAL TOLERANCES.
C26	22-289	.00005 MFD. 600
C27	22-199	.5 MFD. 200V.
C28	22-397	2-35 MMFD. 4GANG
C29	22-398	2-35 " 2GANG
C30	22-205	200-500 MMFD. PADDER
C31	22-321	8 MFD. 450V.
C32	22-396	2-35 MMFD. 4GANG
C33	22-229	.005 600V.

DIAG. Nº	PART Nº	DESCRIPTION
R1	63-362	400 OHMS ½W.
R2	63-416	1400 " ½W.
R3	63-258	490M " ½W.
R4	63-136	50M " ½W.
R5	63-357	300 " ½W.
R6	63-291	29M " ½W.
R7	63-260	100M " ½W.
R8	63-412	3500 " ½W.
R9	63-390	1MEG. DUAL VOL.C
R10	63-391	" T.C.
R11	63-387	4M OHMS CANDOHM
R12	63-389	1M-1857- CANDOHMS
R13	63-406	5M OHMS CANDOHM
R14	63-413	4M " ½W
R15	63-405	330 " CANDOHM
R16	63-408	500M " Q CONTROL
R17	63-404	60 OHMS CANDOHM
R18	63-279	3M " ½W.
R19	63-414	99M OHMS ½W.
R20	63-417	99 OHMS ½W.
R21	63-326	4M " ½W.
R22	63-407	10M OHMS CANDOHM
R23	63-396	10M " ½W.
R24	63-442	50M " ½W.
R25	63-440	200M " ½W.
R26	63-441	1MEG. ½W.
R27	63-290	260M " ½W.
R28	63-241	5M " ½W.
R29	63-432	5 OHMS CANDOHM
R30	63-430	20M OHMS ½W.
R31	63-439	2700 OHMS ½W.
R32	63-378	250 ½W.

DIAG. Nº	PART Nº	DESCRIPTION
1	85-71	BAND SELECTOR SWITCH
2	95-250	DRIVER TRANS.
3	95-251	LOW BOOST AUDIO TRANS.
4	95-252	HIGH FREQUENCY TRANS.
5	95-253	SPEAKER OUTPUT TRANS.
6	95-254	POWER CHOKE
7	95-255	"
8	95-256	OUTPUT "B" SUPPLY TRANS.
9	95-257	POWER TRANS.
10	95-264	3RD I.F. TRANS.
11	122-9	SHADOWGRAPH
12	195-1	SINGLE CONTACT RELAY
13	5-3587	OSC. COIL ASSEM.
14	5-3593	ANT. COIL
15	5-3589	R.F. COIL ASSEM.
16	5-3358	VAR SELECT. I.F. ASSEM.
17	20-109	WAVE TRAP COIL ASSEM.
18	5-3115	H.F. OSC. COIL ASSEM
19	20-99	DET. FILTER CHOKE
20	20-100	UNTUNED I.F. COIL
21	5-3367	LINE FILTER COIL ASSEM.
22	20-88	ANT. CHOKE
23	20-114	7 METER DET. COIL
24	85-69	PHONO SWITCH
25		SPKR FIELD 49-102-49-103
26		" " 49-99
27	49-99	SPEAKER
28	49-102	#2 JENSEN SPEAKER
29	49-103	#1 "
30	85-64	TOGGLE SWITCH
31	95-266	ORDER BY PART Nº ONLY
32	95-265	SPECIAL TOLERANCES
33	95-267	
34	20-81	R.F. PLATE CHOKE ASSEM.
35	5-3588	DET. COIL ASSEM.
36	20-79	DET. BROADCAST BAND COIL
37	20-71	R.F. CHOKE
38	5-3538	R.F. PLATE CHOKE ASSEM.
39	5-3591	10-23 MEGACYCLE COIL
40	85-75	TWEETER SWITCH ASSEM.
41	85-75	SWITCH
42	20-118	SCRATCH FILTER COIL





CABLE COLOR CODE.

W1 - BLACK - PILOT LIGHTS.
W2 - BROWN - A.C. PILOT LIGHTS.
W3 - " - A.C.
W4 - BLACK - HEATER
W5 - BLUE - "
W6 - RED B+.
W7 - WHITE - SCREENS.
W8 - GREEN - 42 PLATE.
W9 - " " "

SWITCHES SHOWN IN BROADCAST POSITION.

REVISED MODEL Nº 1000Z.

SECTIONS OF SWITCH ARE IN ALPHABETICAL ORDER FROM FRONT TO REAR OF CHASSIS

A = SECTION Nº 1.
B = " " 2
C = " " 3
D = " " 4
E = " " 5
F = " " 6
G = " " 7

25 TUBE SUPERHETERODYNE.
I.F. FREQUENCY 485 KC.
CHASSIS Nº 2501-G & 2501-P

ZENITH RADIO CORP
CHICAGO, ILL.
U.S.A.

RESISTANCE MEASUREMENTS - UPPER CHASSIS

TUBE	POSITION	HEATER	CATHODE	GRID	SCREEN	SUPPRESSOR	PLATE
6D6	1st. R. F.	20	350	600 M.	5 Meg.	350	1 Meg.
6D6	2nd. R. F.	20	350	600 M.	5 Meg.	350	1 Meg.
6A7	1st. Det.	20	275	600 M.	5 Meg.	-	1 Meg.
	Osc.			50 M.	-	-	1 Meg.
6D6	1st. I. F.	20	350	2	5 Meg.	350	1 Meg.
6D6	2nd. I. F.	20	3000	500 M.	5 Meg.	3000	1 Meg.
76	2nd Det.	20	0	100 M.	-	-	100 M.
76	1st. Aud.	20	4000	8000	-	-	1 Meg.
76	2nd. Aud.	20	3000	1 Meg.	-	-	1 Meg.
42	Driver	20	325	3000	-	-	1 Meg.
79	Q.A.V.C.	20	0	1 Meg.	-	-	1 Meg. Q on
6D6	Shadowmeter Amplifier	20	250	500 M.	5 Meg.	250	1 Meg.
6D6	A.V.C.Amplf.	20	250	2	5 Meg.	250	1 Meg.
85	A.V.C.	20	10M	250 M.	400 M.	500 M.	5 Meg.

All Measurements Made With Lower Chassis Disconnected.

SERVICE NOTES

Hums - Defective tubes and check filters - Voltages, etc.

Hums - Weak and Distorted. Check #95-250 transformer for open winding, weak audio if shorted.

Too Much High, Lacks Low Notes - #95-250 open center tap. #22-225 condenser open, 50,000 ohm resistor grounded on tone control to bottom plate. ½ of low boost shorted secondary.

Motorboats on All Bands - #22-228 - .5 condenser to 85 socket open, I.F.shorted, graph won't narrow and set will distort on edge of carrier.

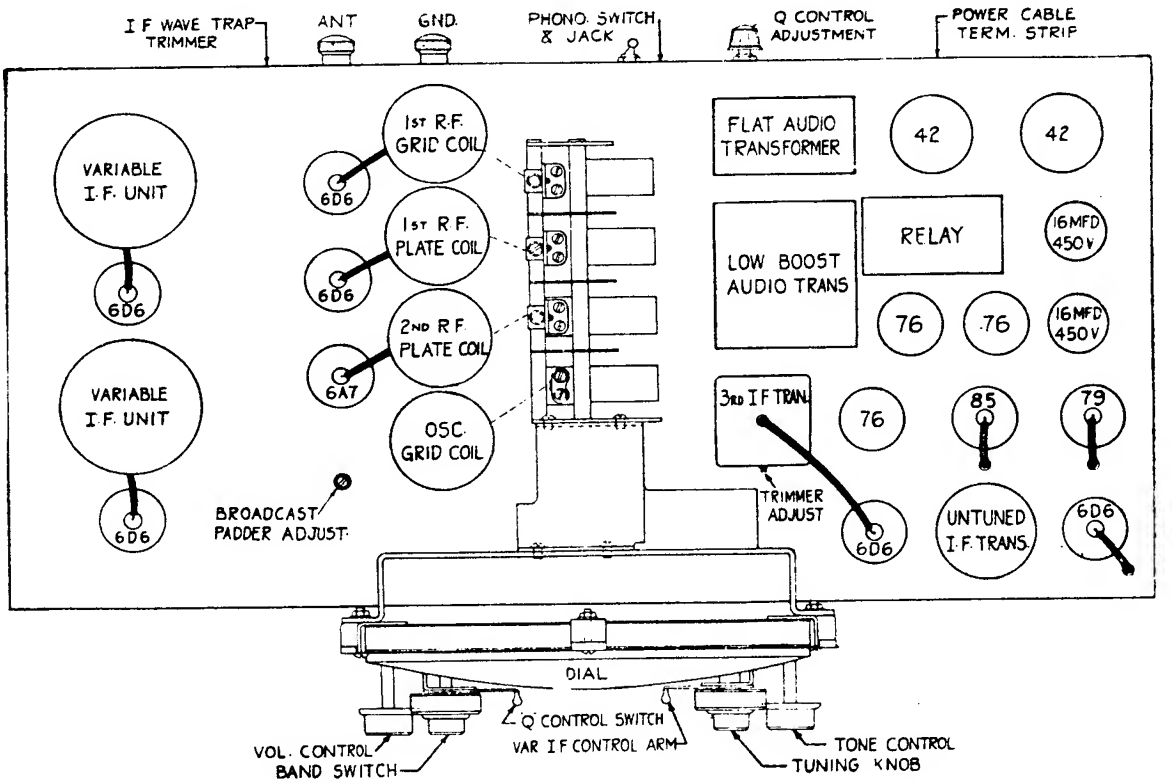
Weak and Distorted - All Bands. Audio bias resistor across #22-189 25-volt 20 Mmfd. open.

Set Dead - Check tubes, filters, coils and transformers and I. F. for grounds or open.

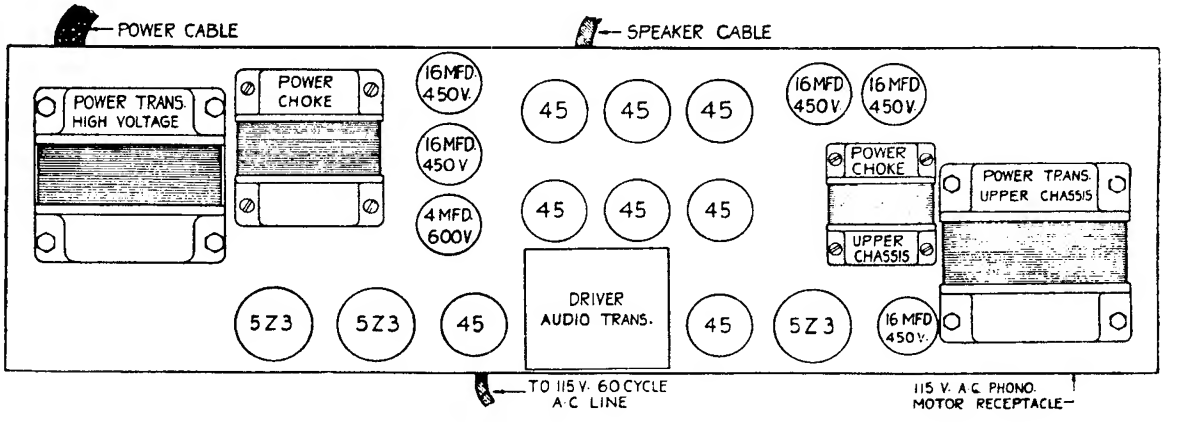
Dead - No Radio - Open 'Phono Switch.

Weak Audio and High Notes - Hum level increases slightly if you pull one push-pull #42 tube. Open secondary on low boost #95-251. Disconnect high boost and tone control circuit before testing.

Tone Control No Effect On Highs. Set flutters as tone control is rotated to bass. Check .1-22 -3770 for open or short.



Receiver Chassis Drawing



Power Pack Chassis Drawing

Parts and Prices

Chassis #2501-C
#2501-P

MODEL 1000Z
STRATOSPHERE

Dial Assembly

26-74	Planetary drive and Dial drive mechanism assemblies	$20.00
26-88	Calibrated Glass Scales (includes 6 scales & frame)	30.00
32-5	Dial Drive Belt	.50
59-30	Split Second Pointer (white)	.50
59-31	Special Z Pointer (gold)	5.00
93-230	Dial Glass Cushion Washer	.50
100-28	Special 110 V. Dial Lamp	1.25
126-170	Dial Lamp Reflector Shields	.25
192-5	Dial Glass	1.50

Resistors

63-136	50 M ohm 1/4 watt	.25
63-241	5 M " 1/4 "	.25
63-258	490 M " 1/4 "	.20
63-260	100 M " 1/4 "	.20
63-279	3 M " 1/4 "	.20
63-290	260 M " 1/4 "	.20
63-291	29 M " 1/4 "	.25
63-326	4 M " 1/4 "	.20
63-357	300 " 1/4 "	.20
63-362	400 " 1/4 "	.20
63-378	250 " 1/4 "	.20
63-387	4 M " Candohm	.45
63-389	1 M - 1857 Ohm Candohm	.45
63-390	1 Megohm Dual Volume Control Assembly	5.00
63-391	Dual Tone Control Assembly	4.50
63-396	10 M ohm 1/4 watt	.20
63-404	60 " Candohm	.25
63-405	330 " "	.25
63-406	5 M " "	.40
63-407	10 M " "	.45
63-408	500 M " "Q" Control Assembly	.80
63-412	3500 " 1/4 watt	.20
63-413	4 M " 1/4 "	.20
63-414	99 M " 1/4 "	.20
63-416	1400 " 1/4 "	.20
63-417	99 " 1/4 "	.20
63-432	5 " Candohm	.25
63-438	20 M " 1/4 watt	.20
63-439	2700 " 1/4 "	.20
63-440	200 M " 1/4 "	.20
63-441	1 Megohm 1/4 "	.20
63-442	50 M ohm 1/4 "	.20

Condensers

22-127	25. Mmfd. 600 V.	.20

Condensers Cont'd

22-147	.0005 Mfd. 600 V.	$ .15
22-189	20. " 25 V.	1.25
22-199	.5 " 200 V.	.35
22-205	200-500 Mmfd. Padder	.35
22-225	5. Mfd. 25 V.	.65
22-229	.005 " 600 V.	.15
22-287	.03 " 600 V.	.15
22-289	.00005 " 600 V.	.12
22-305	2 - 35 Mmfd. Padder	.15
22-321	8. Mfd. 450 V.	1.25
22-341	920 Mmfd. 600 V.	.15
22-342	2900 " 600 V.	.25
22-360	4. Mfd. 600 V.	4.00
22-361	16. " 450 V.	1.50
22-362	8. " 300 V.	1.00
22-365	.0001 " 600 V.	.15
22-367	.00005 Mfd. 600 V.	.15
22-371	.01 " 600 V.	.25
22-372	.01 " 300 V.	.25
22-373	.05 " 300 V.	.25
22-374	.01 " 300 V.	.25
22-375	.1 " 300 V.	.25
22-377	.1 " 600 V.	.35
22-378	.04 " 600 V.	.35
22-379	.002 " 600 V.	.25
22-395	4-Gang Variable Condenser	7.00
22-396	" " Trimmer Condenser	.60
22-397	" " " "	.60
22-398	2-Gang " "	.35
22-383	Special (order by part number only)	1.00
22-338	" " " " " "	1.00

Coils and Chokes

20-71	R.F. Choke	.20
20-79	Detector Broadcast Band Coil	.40
20-81	R.F.Plate Choke	.65
20-88	Antenna Choke	.25
20-99	Detector Filter Choke	.45
20-100	Untuned I.F. Coil	.65
20-109	Wave Trap Coil Assembly	1.00
20-114	7-Meter Detector Coil Assembly	.60
20-118	Phono Scratch Filter Choke	2.00
95-264	3rd I.F. Transformer Assembly	2.50
S-3115	H.F. Oscillator Coil Assembly	.75
S-3367	Line Filter Coil Assembly	3.50
S-3538	R.F. Plate Choke Assembly	.40
S-3587	Oscillator Coil Assembly	4.50
S-3588	Detector Coil Assembly	4.00
S-3589	R.F. " "	3.50
S-3591	10-23 Megacycle R.F. Coil Assembly	.75
S-3593	Antenna Coil Assembly	3.00

Miscellaneous

8-33	Antenna Binding Post	1.00
8-34	Ground " "	1.00
44-10	Phonograph Jack	.15

Miscellaneous Cont'd

46-103	"Q" Control Knob	$ .15
46-104	Volume and Tone Control Knobs	1.50
46-105	Tuning Knob (front half)	1.50
46-106	" " (rear half)	1.50
46-107	Band Selector Switch Knob	1.50
46-120	Tweeter and L.D. Knob	1.50
49-99	Tweeter Dynamic Speaker	35.00
49-102	#2 - 12" Dynamic Speaker	30.00
49-103	#1 - 12" " "	30.00
	Cone and Voice Coil Assembly for 49-102 or 49-103	7.00
52-60	Power Cable	3.00
52-61	Speaker "	.75
57-463	Shadowgraph Escutcheon Plate	.35
57-471	Dial Escutcheon Plate	6.00
78-64	85 Tube Socket (for .0625 chassis stock)	.10
78-69	6D6 " " " " " "	.10
78-92	42 " " " " " "	.10
78-96	6D6 " " " .0805 " "	.10
78-105	6A7 " " " " " "	.10
78-116	Dial Lamp Sockets	.50
78-117	76 Tube " (for .0625 chassis stock)	.10
78-118	79 " " " " " "	.10
78-119	45 " " " " " "	.10
78-120	5Z3 " " " " " "	.10
85-64	Toggle Switch	1.00
85-69	S.P.D.T.Phono Switch	.75
85-71	Band Selector "	8.00
85-75	S.P.S.T.Tweeter Switch	.60
95-250	Driver Transformer	4.00
95-251	Low Boost Audio Transformer	4.00
95-252	High Frequency Transformer	2.00
95-253	Main Speaker Transformer	4.00
95-254	Power Choke	6.50
95-255	" "	3.50
95-256	Power Transformer for Output Tubes, 117 V.,60 Cycle	14.00
95-257	" " " Receiver & Filaments, 117 V., 60 C.	15.00
95-265	Special Choke for Tweeter Speaker	2.25
95-266	" " " " "	2.25
95-267	Output Transformer for Tweeter Speaker	2.25
95-271	Power Transformer for Receiver & Filaments, 117 V.,25 C.	25.00
95-272	" " Output Tubes, 117 V., 25 Cycle	24.00
122-9	Shadowgraph Meter	2.00
126-127	Tube Shields	.15
126-155	Line Filter Shield	.15
126-171	Tube Shield	.25
126-182	" "	.25
191-1	"Q" Control Relay	2.00

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

May 21, 1935

ZENITH RADIO CORPORATION

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

SERVICE MANUAL

ZENITH
TRADE MARK REG.
→LONG DISTANCE← RADIO

1936
AUTOMOBILE RECEIVERS

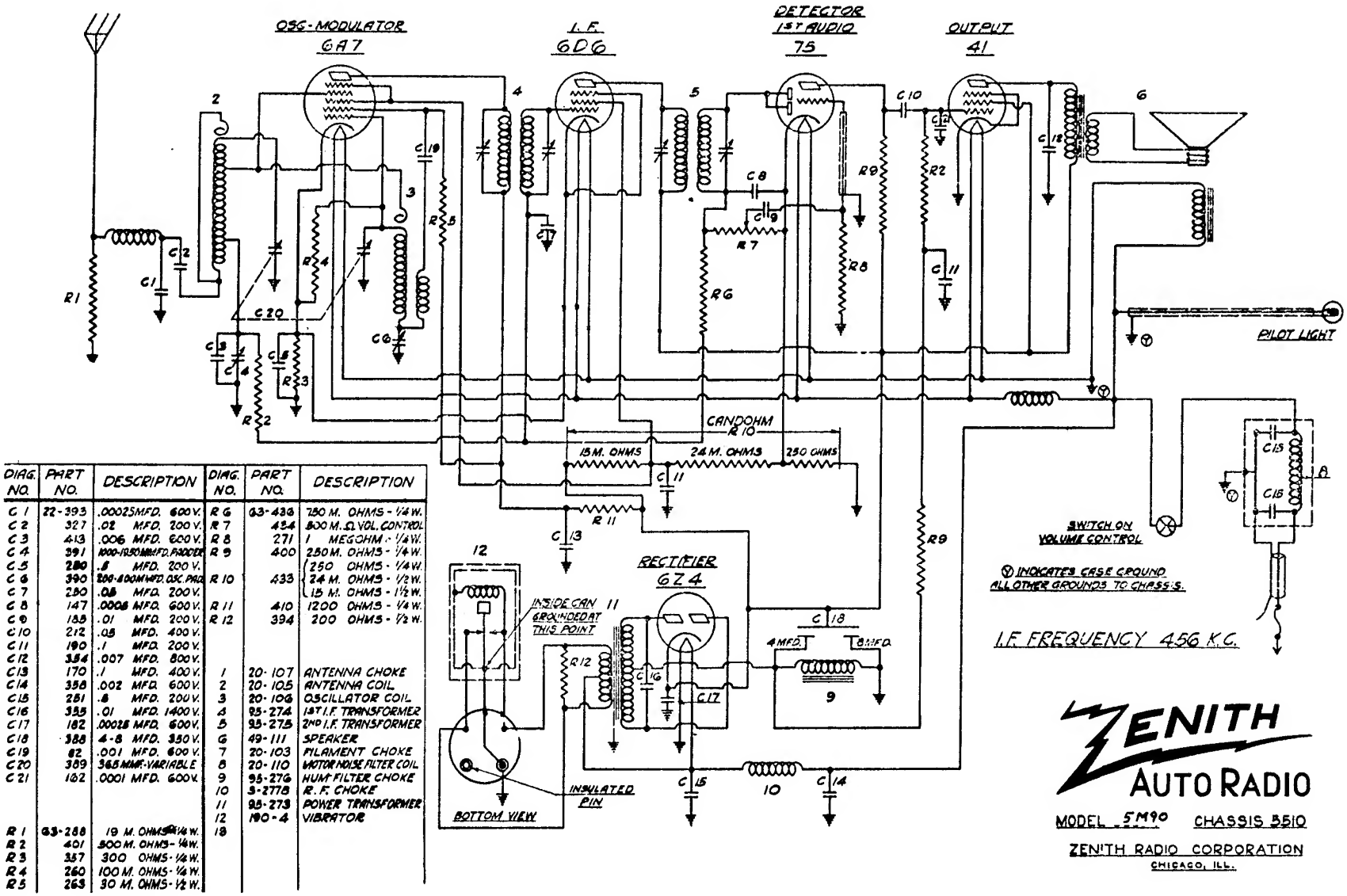
MODELS

5M90
6M90-S
6M90-D
6M91-S
6M91-D
6M92
7M91-S
7M91-D

ZENITH RADIO CORPORATION
CHICAGO, U. S. A.

FORM A6

PRINTED IN U. S. A.



DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
C 1	22-393	.00025MFD. 600 V.	R 6	63-436	750 M. OHMS - 1/4 W.
C 2	327	.02 MFD. 200 V.	R 7	434	500 M. Ω VOL. CONTROL
C 3	413	.006 MFD. 600 V.	R 8	271	1 MEGOHM - 1/4 W.
C 4	391	1000-1850MMFD. PADDER	R 9	400	250 M. OHMS - 1/4 W.
C 5	280	.8 MFD. 200 V.	R 10	433	250 OHMS - 1/4 W. 24 M. OHMS - 1/2 W. 15 M. OHMS - 1 1/2 W.
C 6	390	206-400MMFD. OSC. PAD.			
C 7	280	.08 MFD. 200 V.			
C 8	147	.0008 MFD. 600 V.	R 11	410	1200 OHMS - 1/4 W.
C 9	158	.01 MFD. 200 V.	R 12	394	200 OHMS - 1/2 W.
C 10	212	.05 MFD. 400 V.			
C 11	190	.1 MFD. 200 V.			
C 12	384	.007 MFD. 800 V.			
C 13	170	.1 MFD. 400 V.	1	20-107	ANTENNA CHOKE
C 14	358	.002 MFD. 600 V.	2	20-105	ANTENNA COIL
C 15	281	.8 MFD. 200 V.	3	20-106	OSCILLATOR COIL
C 16	355	.01 MFD. 1400 V.	4	23-274	1ST I.F. TRANSFORMER
C 17	182	.00025 MFD. 600 V.	5	23-275	2ND I.F. TRANSFORMER
C 18	388	4-8 MFD. 350 V.	6	49-111	SPEAKER
C 19	82	.001 MFD. 600 V.	7	20-103	FILAMENT CHOKE
C 20	389	365 MMF. VARIABLE	8	20-110	MOTOR NOISE FILTER COIL
C 21	182	.0001 MFD. 600 V.	9	23-276	HUM FILTER CHOKE
			10	3-2778	R. F. CHOKE
			11	23-273	POWER TRANSFORMER
			12	190-4	VIBRATOR
R 1	63-288	19 M. OHMS - 1/4 W.	18		
R 2	401	500 M. OHMS - 1/4 W.			
R 3	357	300 OHMS - 1/2 W.			
R 4	260	100 M. OHMS - 1/4 W.			
R 5	263	30 M. OHMS - 1/2 W.			

Fig. 1.—Circuit Diagram. Model 5-M-90. (Chassis No. 5510)

SOCKET VOLTAGES 5-M-90

Tube	Position	Ef	Ek	Eg^1	Eg^2	Eg^3	Ep
6A7	1st Det.	5.8	4	0	97	—	205
	Osc.			0	—	—	175
6D6	I. F.	5.8	4	0	97	4	217
75	2nd Det. A. V. C. 1st Audio	5.8	1.1	0	—	—	160
41	PWR.	5.8	0	—15	225	—	215
6Z4	RECT.	5.8	—	225	—	—	—

Line Voltage —6V.

Ef—heaters; Ek—cathode; Eg1—control grid; Eg2—screen grid; Eg3—suppressor grid; Ep—plate.

All measurements taken from point indicated to ground, using a 1000 ohm per volt. D. C. meter.

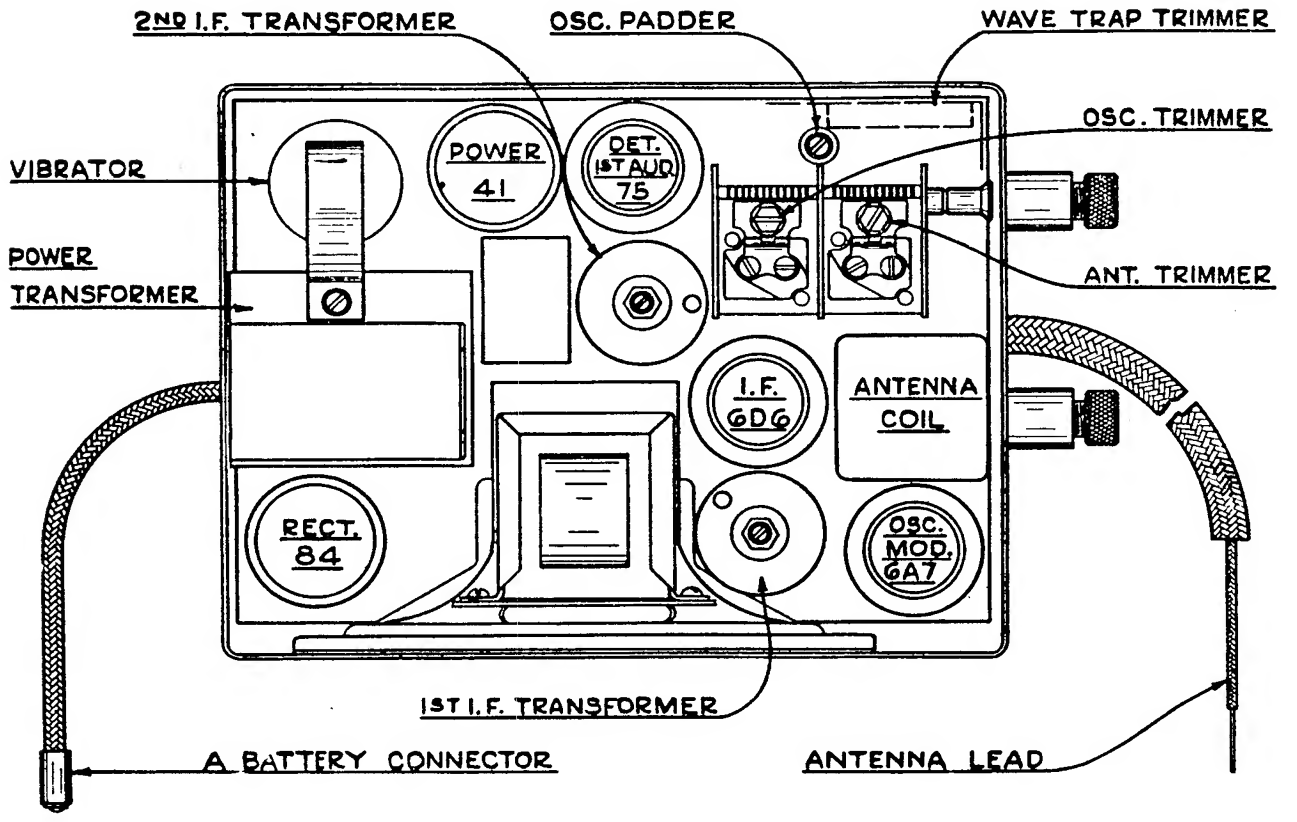
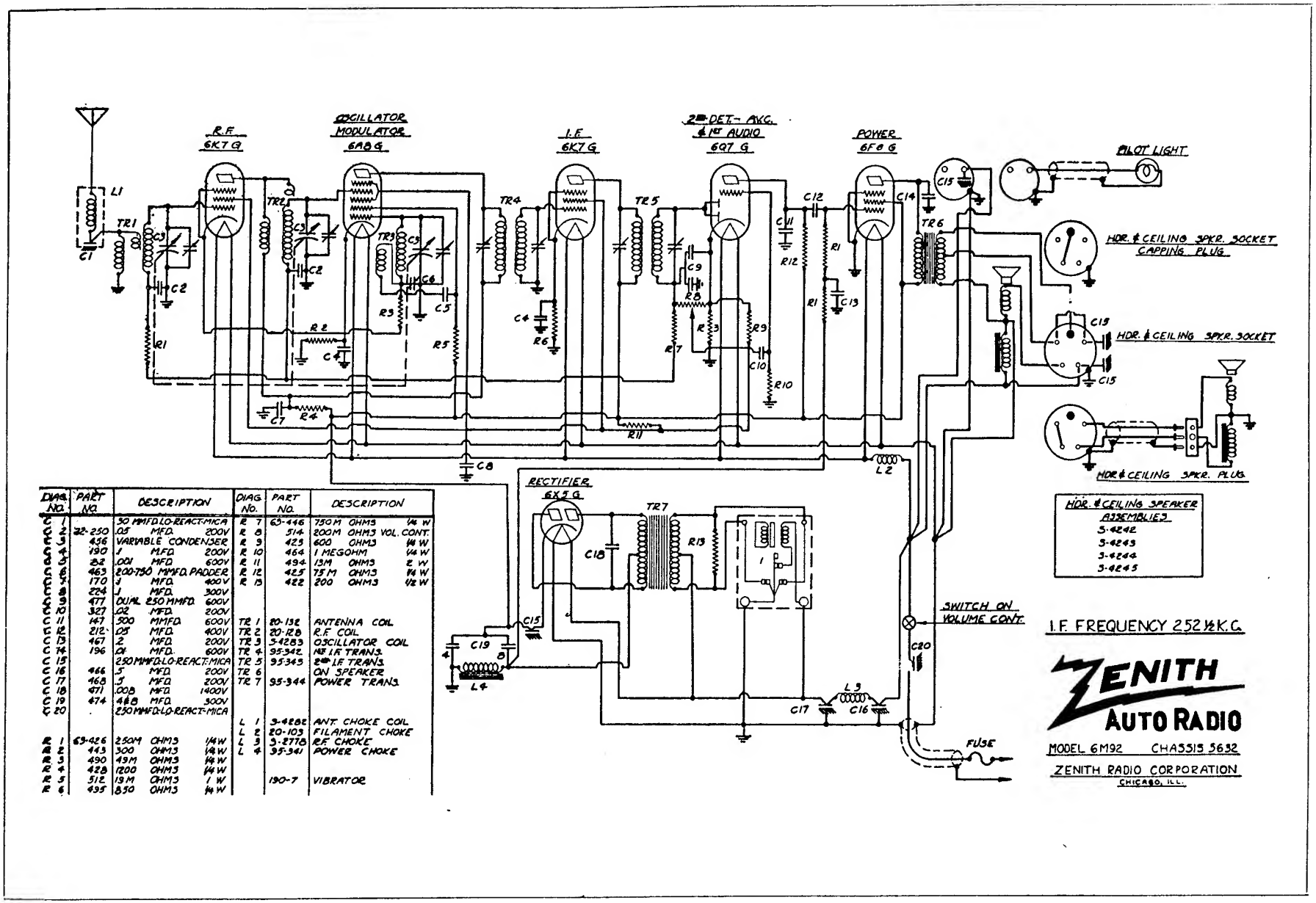


Fig. 2.—Tube Position. 5-M-90

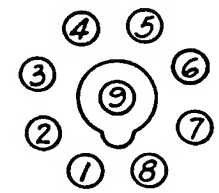


DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
C 1		50 MMFD. LO-REACT-MICA	R 7	65-446	750 M OHMS 1/4 W
C 2	22-250	.05 MFD. 200V	R 8	514	200 M OHMS VOL. CONT.
C 3	436	VARIABLE CONDENSER	R 9	429	600 OHMS 1/4 W
C 4	190	.1 MFD. 200V	R 10	464	1 MEGOHM 1/4 W
C 5	82	.001 MFD. 600V	R 11	494	13 M OHMS 2 W
C 6	463	200-750 MMFD. PADDER	R 12	425	75 M OHMS 1/4 W
C 7	170	.1 MFD. 400V	R 13	422	200 OHMS 1/2 W
C 8	224	.1 MFD. 300V			
C 9	477	DUAL 250 MMFD. 600V			
C 10	327	.02 MFD. 200V			
C 11	147	500 MMFD. 600V	TR 1	80-132	ANTENNA COIL
C 12	212	.05 MFD. 400V	TR 2	20-128	R.F. COIL
C 13	467	.2 MFD. 200V	TR 3	3-4283	OSCILLATOR COIL
C 14	196	.01 MFD. 600V	TR 4	95-342	1ST I.F. TRANS.
C 15		250 MMFD. LO-REACT-MICA	TR 5	95-343	2ND I.F. TRANS.
C 16	466	.5 MFD. 200V	TR 6		ON SPEAKER
C 17	468	.5 MFD. 200V	TR 7	95-344	POWER TRANS.
C 18	471	.008 MFD. 1400V			
C 19	474	4&8 MFD. 300V			
C 20		250 MMFD. LO-REACT-MICA			
			L 1	3-4282	ANT. CHOKE COIL
			L 2	20-103	FILAMENT CHOKE
R 1	69-426	250M OHMS 1/4 W	L 3	3-2778	R.F. CHOKE
R 2	443	300 OHMS 1/4 W	L 4	95-341	POWER CHOKE
R 3	490	49 M OHMS 1/4 W			
R 4	428	1200 OHMS 1/4 W			
R 5	512	1.9 M OHMS 1 W		190-7	VIBRATOR
R 6	495	850 OHMS 1/4 W			

Fig. 3.—Circuit Diagram. Model 6-M-92. (Chassis No. 5632)

SOCKET VOLTAGES 6-M-92

Tube	Position	1	2	3	4	5	6	7	8	9
6K7	R.F. Amp.	0	5.8	175	84	4.6	—	0	4.6	0
6A8	1st Det. Osc.	0	0	175	84	—16	110	5.8	4.6	0
6K7	I. F. Amp.	0	5.8	180	84	3.6	—	0	3.6	0
6Q7	2nd Det. A. V. C. 1st Audio	0	5.8	130	.3	.3	—	0	1.3	0
6F6	Power	0	0	170	180	—3.4	—	5.8	0	—
6X5	RECT.	0	5.8	AC	—	AC	—	0	180	—



BOTTOM VIEW OF SOCKET

Fig. 4

Voltage at Battery 6V.
Voltage at Switch 5.8 V.
Antenna disconnected.
All voltages measured with 1000 ohms per volt D. C. meter.
Total current consumption 6 Amperes.
Sensitivity at one watt output 4 Mv.
Maximum undistorted power output 4 Watts.

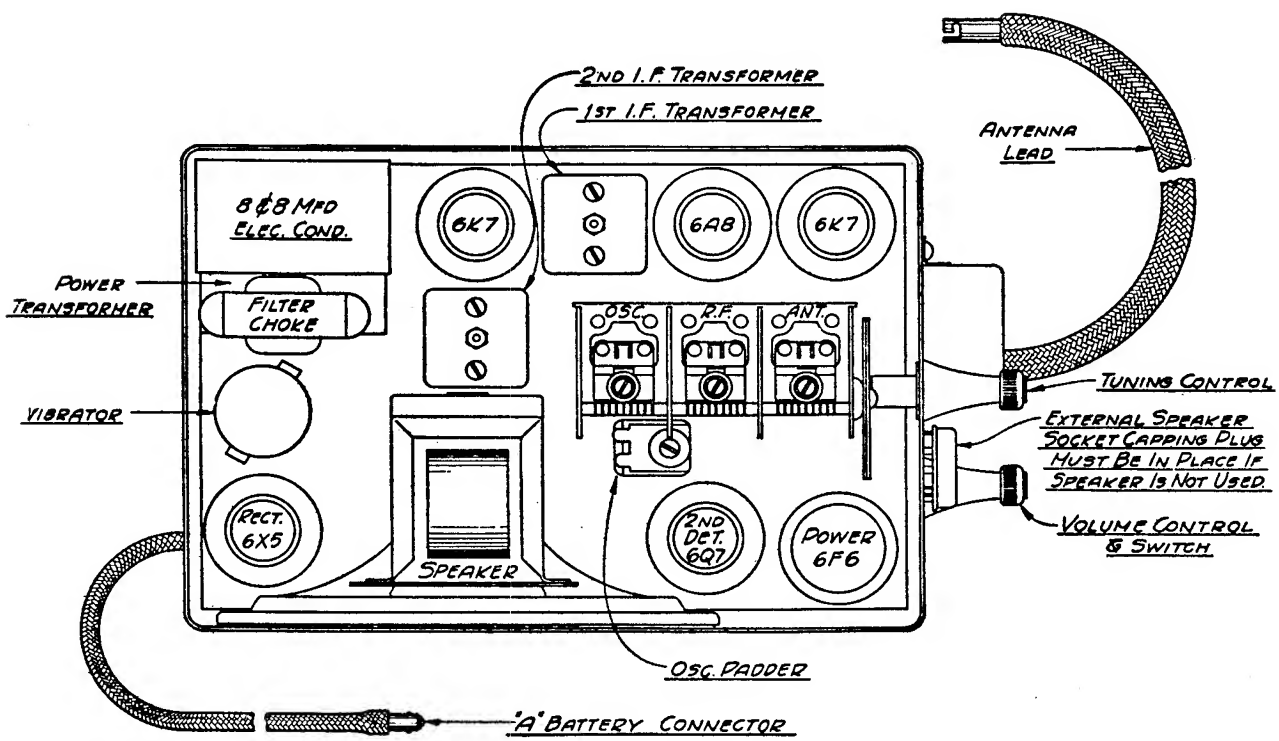
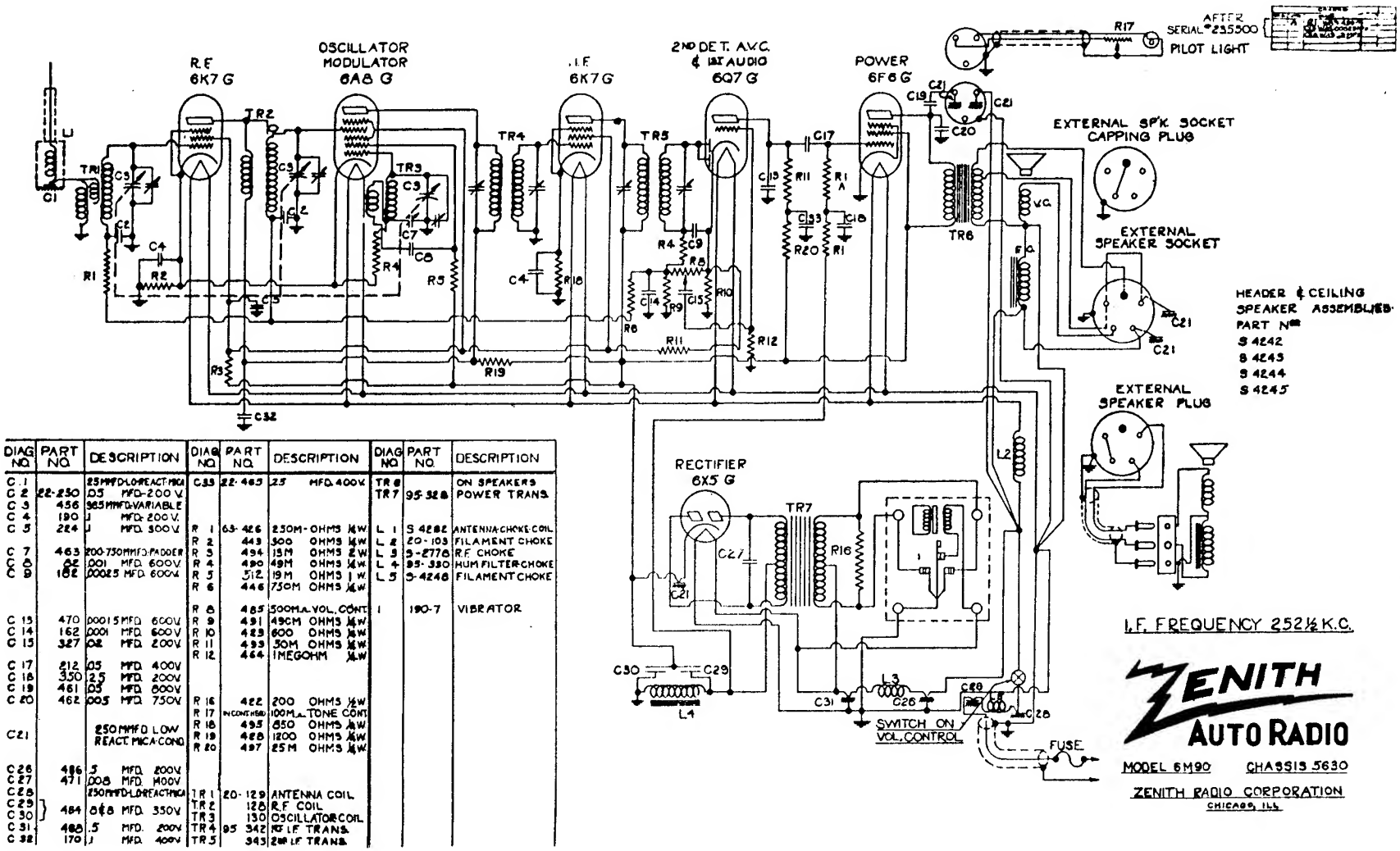


Fig. 5.—Tube Position. 6-M-92



DIAG NO.	PART NO.	DESCRIPTION
C 1		25 MMFD LO-REACT MICA
C 2	22-230	.05 MFD. 200 V.
C 3	456	365 MMFD. VARIABLE
C 4	190	.1 MFD. 200 V.
C 5	224	.1 MFD. 300 V.
C 7	463	200-750 MMFD. PADDER
C 8	62	.001 MFD. 600 V.
C 9	182	.00025 MFD. 600 V.
C 13	470	.0015 MFD. 600 V.
C 14	162	.001 MFD. 600 V.
C 15	327	.02 MFD. 200 V.
C 17	212	.05 MFD. 400 V.
C 18	350	.25 MFD. 200 V.
C 19	461	.05 MFD. 600 V.
C 20	462	.005 MFD. 750 V.
C 21		250 MMFD LOW REACT MICA COND.
C 26	486	.5 MFD. 200 V.
C 27	471	.008 MFD. 1400 V.
C 28		250 MMFD LO-REACT MICA
C 29 } C 30	484	.018 MFD. 350 V.
C 31	488	.5 MFD. 200 V.
C 32	170	.1 MFD. 400 V.

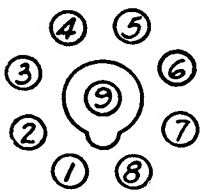
DIAG NO.	PART NO.	DESCRIPTION
C 33	22-483	.25 MFD. 400 V.
R 1	63-426	250M-OHMS ½ W.
R 2	443	300 OHMS ½ W.
R 3	494	15M OHMS 2 W.
R 4	490	49M OHMS ½ W.
R 5	512	19M OHMS 1 W.
R 6	446	750M OHMS ½ W.
R 8	485	500M-A. VOL. CONT.
R 9	491	49CM OHMS ½ W.
R 10	423	600 OHMS ½ W.
R 11	493	30M OHMS ½ W.
R 12	464	1 MEGOHM ½ W.
R 16	422	200 OHMS ½ W.
R 17	IN CONTROL	100M-A. TONE CONT.
R 18	495	850 OHMS ½ W.
R 19	428	1200 OHMS ½ W.
R 20	497	.25 M OHMS ½ W.
TR 1	20-129	ANTENNA COIL
TR 2	128	R.F. COIL
TR 3	130	OSCILLATOR COIL
TR 4	95 342	1ST I.F. TRANS.
TR 5	343	2ND I.F. TRANS.

DIAG NO.	PART NO.	DESCRIPTION
TR 6		ON SPEAKERS
TR 7	95-328	POWER TRANS.
L 1	S 4282	ANTENNA-CHOKE COIL
L 2	20-103	FILAMENT CHOKE
L 3	5-2776	R.F. CHOKE
L 4	95-330	HUM FILTER-CHOKE
L 5	5-4246	FILAMENT CHOKE
1	190-7	VIBRATOR

Fig. 6.—Circuit Diagram. Models 6-M-90S and 6-M-90D (Chassis No. 5630)

SOCKET VOLTAGES 6-M-90S, 6-M-90D

Tube	Position	1	2	3	4	5	6	7	8	9
6K7	R.F. Amp.	0	5.8	215	100	5.7	—	0	5.7	0
6A8	1st Det. Osc.	0	0	215	100	—26	150	5.8	5.9	0
6K7	I. F. Amp.	0	5.8	225	100	5.4	—	0	5.4	0
6Q7	2nd Det. A. V. C. 1st Audio	0	5.8	150	—.2	—.2	—	0	2	0
6F6	Power	0	0	210	220	—.3	—	5.8	0	—
6X5	RECT.	0	5.8	AC	—	AC	—	0	220	—



BOTTOM VIEW OF SOCKET

Fig. 7

Voltage at Battery 6V.
Voltage at Switch 5.8V.
All voltages measured with 1000 ohms per volt D. C. meter.
Total current consumption 6.5 Amperes.
Sensitivity at one watt output 1.5 Mv.
Maximum undistorted power output 4.5 Watts.

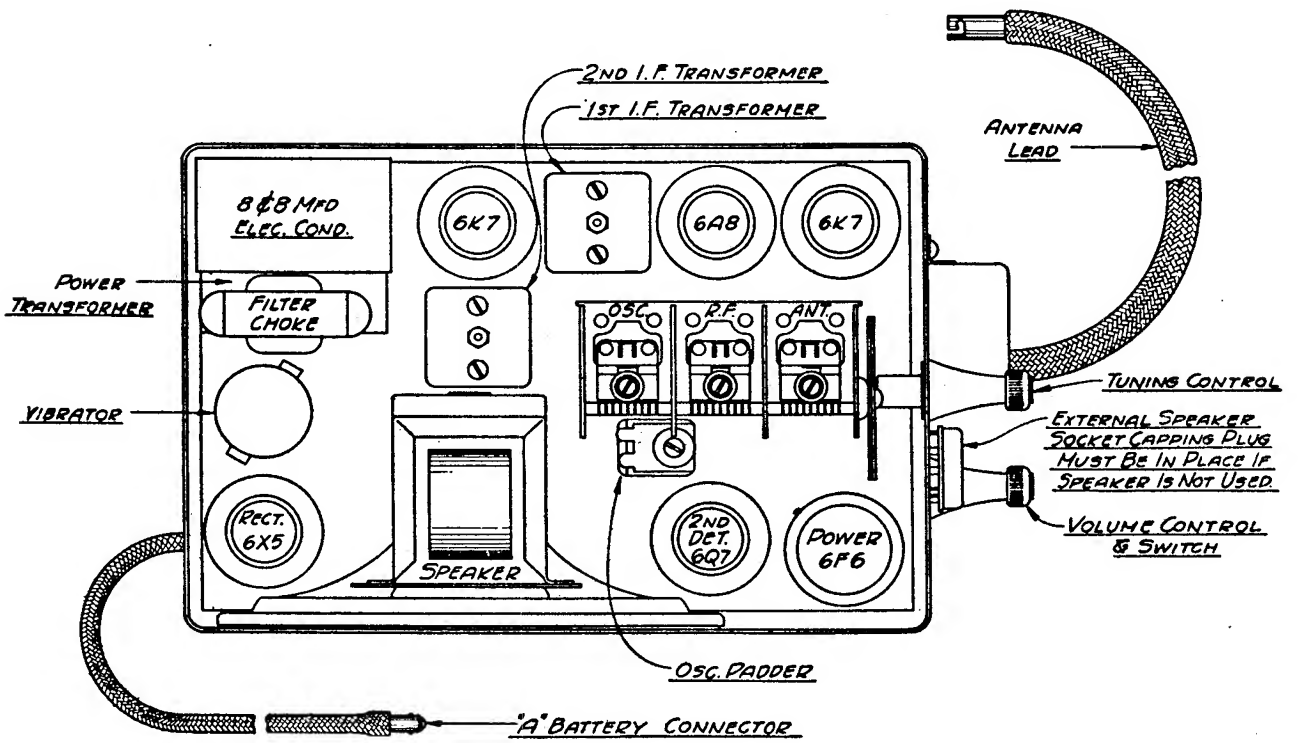
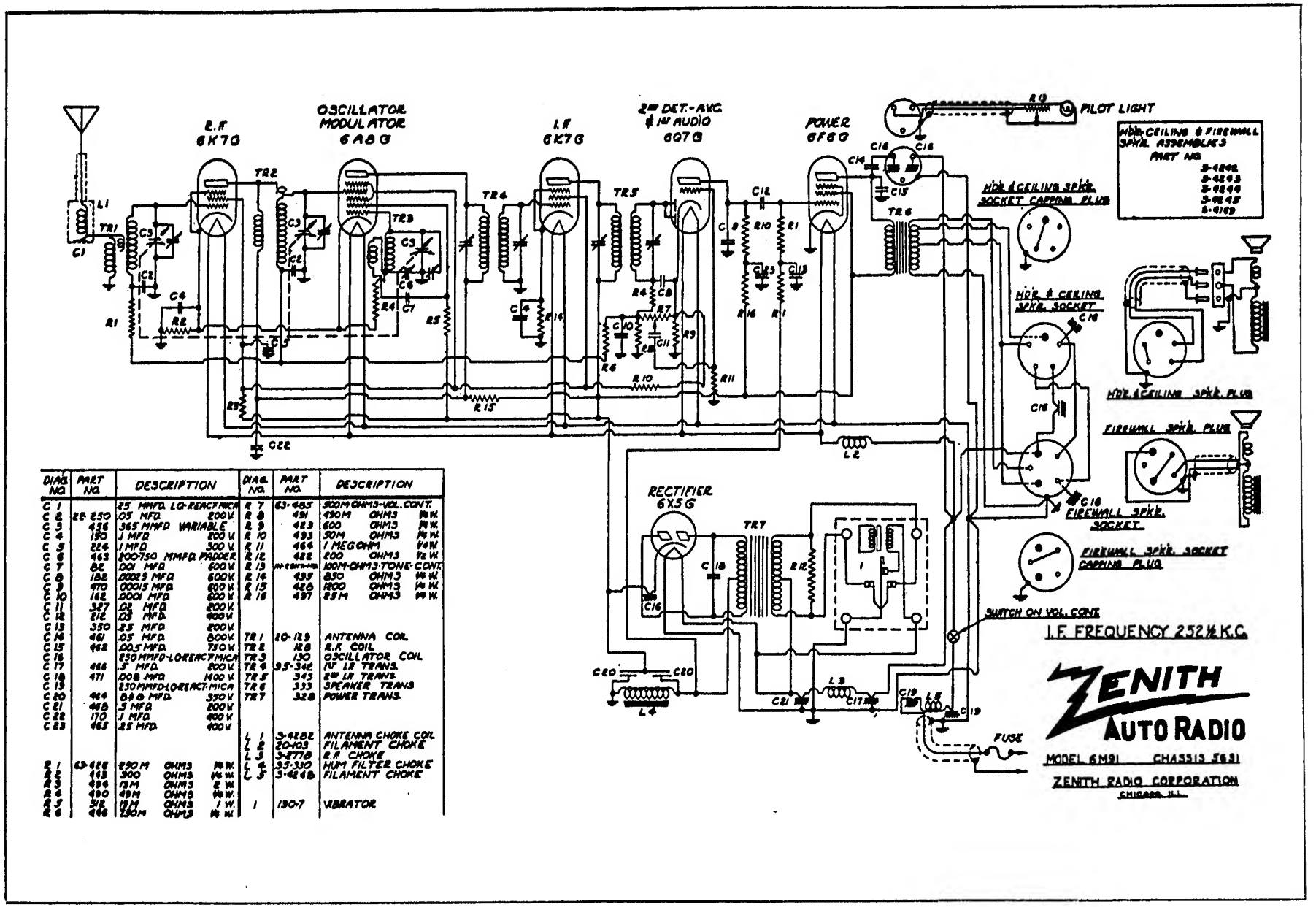


Fig. 8.—Tube Position. 6-M-90S, 6-M-90D

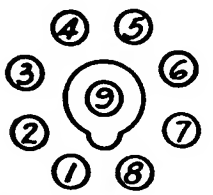


DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
C 1		25 MMFD. LO-REACT MICA	R 7	63-485	500M-OHM-VOL. CONT.
C 2	28-250	.05 MFD. 200 V.	R 8	491	490M OHM 1/2 W.
C 3	456	365 MMFD. VARIABLE	R 9	483	600 OHM 1/2 W.
C 4	190	.1 MFD. 200 V.	R 10	493	50M OHM 1/2 W.
C 5	224	.1 MFD. 300 V.	R 11	464	1 MEG OHM 1/2 W.
C 6	463	200-750 MMFD. PADDER	R 12	422	600 OHM 1/2 W.
C 7	82	.001 MFD. 600 V.	R 13		100M-OHM-TONE CONT.
C 8	182	.00025 MFD. 600 V.	R 14	435	850 OHM 1/2 W.
C 9	470	.00015 MFD. 600 V.	R 15	426	1200 OHM 1/2 W.
C 10	162	.0001 MFD. 600 V.	R 16	437	85M OHM 1/2 W.
C 11	287	.02 MFD. 200 V.			
C 12	212	.03 MFD. 400 V.			
C 13	350	.25 MFD. 200 V.			
C 14	461	.05 MFD. 600 V.	TR 1	20-129	ANTENNA COIL
C 15	462	.005 MFD. 750 V.	TR 2	128	R.F. COIL
C 16		250 MMFD-LO-REACT MICA	TR 3	130	OSCILLATOR COIL
C 17	466	.5 MFD. 200 V.	TR 4	95-342	1ST I.F. TRANS.
C 18	471	.008 MFD. 1400 V.	TR 5	343	2ND I.F. TRANS.
C 19		250 MMFD-LO-REACT MICA	TR 6	333	SPEAKER TRANS.
C 20	464	8-8 MFD. 350 V.	TR 7	328	POWER TRANS.
C 21	468	.5 MFD. 200 V.			
C 22	170	.1 MFD. 400 V.			
C 23	465	.25 MFD. 400 V.			
			L 1	3-4282	ANTENNA CHOKE COIL
			L 2	20-103	FILAMENT CHOKE
			L 3	3-4778	R.F. CHOKE
R 1	69-488	250 M OHM 1/2 W.	L 4	95-330	HUM FILTER CHOKE
R 2	448	300 OHM 1/2 W.	L 5	3-4248	FILAMENT CHOKE
R 3	494	1.3 M OHM 1 W.			
R 4	490	49 M OHM 1/2 W.			
R 5	512	1 M OHM 1 W.	1	130-7	VIBRATOR
R 6	446	250 M OHM 1/2 W.			

Fig. 9.—Circuit Diagram. Models 6-M-91S and 6-M-91D (Chassis No. 5631)

SOCKET VOLTAGES 6-M-91S, 6-M-91D

Tube	Position	1	2	3	4	5	6	7	8	9
6K7	R.F. Amp.	0	5.8	215	100	5.7	—	0	5.7	0
6A8	1st Det. Osc.	0	0	215	100	—26	· 150	5.8	5.9	0
6K7	I. F. Amp.	0	5.8	225	100	5.4	—	0	5.4	0
6Q7	2nd Det. A. V. C. 1st Audio	0	5.8	150	—.2	—.2	—	0	2	0
6F6	Power	0	0	210	220	—.3	—	5.8	0	—
6X5	RECT.	0	5.8	AC	—	AC	—	0	220	—



BOTTOM VIEW OF SOCKET

Fig. 10

Voltage at Battery 6V.
Voltage at Switch 5.8V.
All voltages measured with 1000 ohms per volt D. C. meter.
Total current consumption 6.5 Amperes.
Sensitivity at one watt output 1.5 Mv.
Maximum undistorted power output 4.5 Watts.

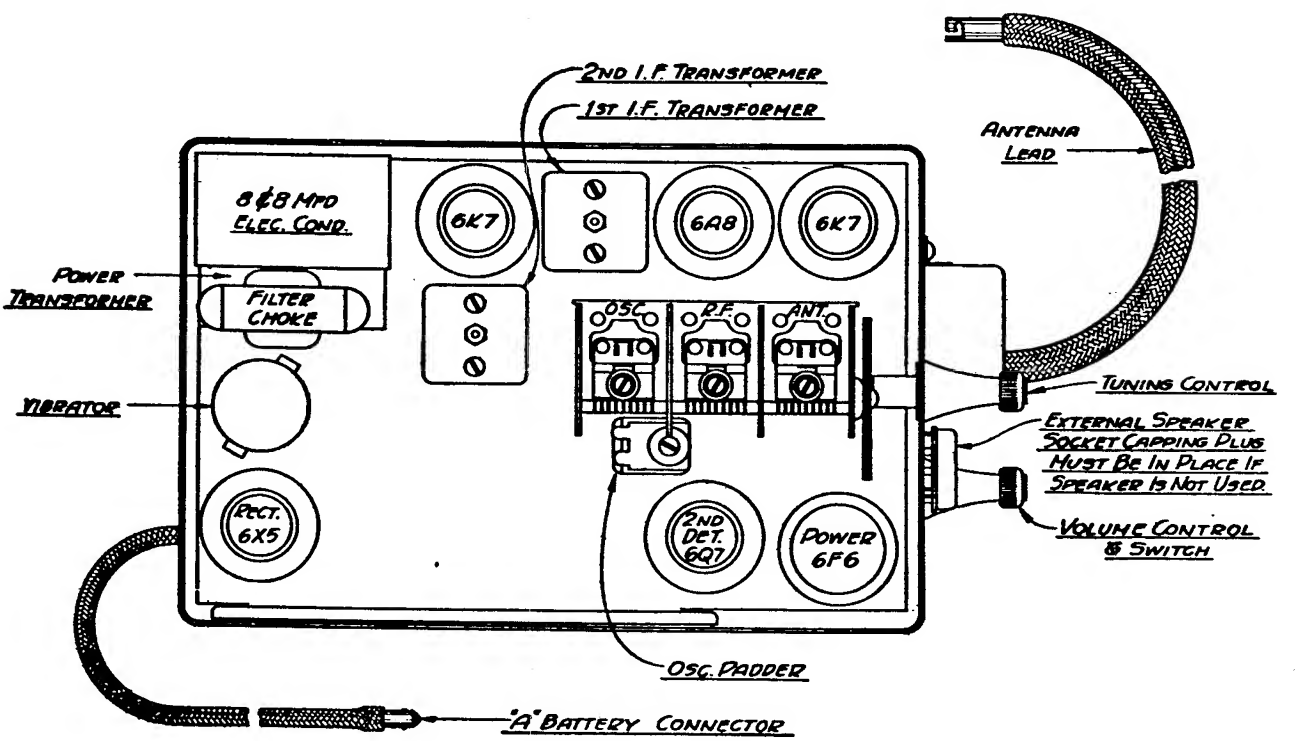
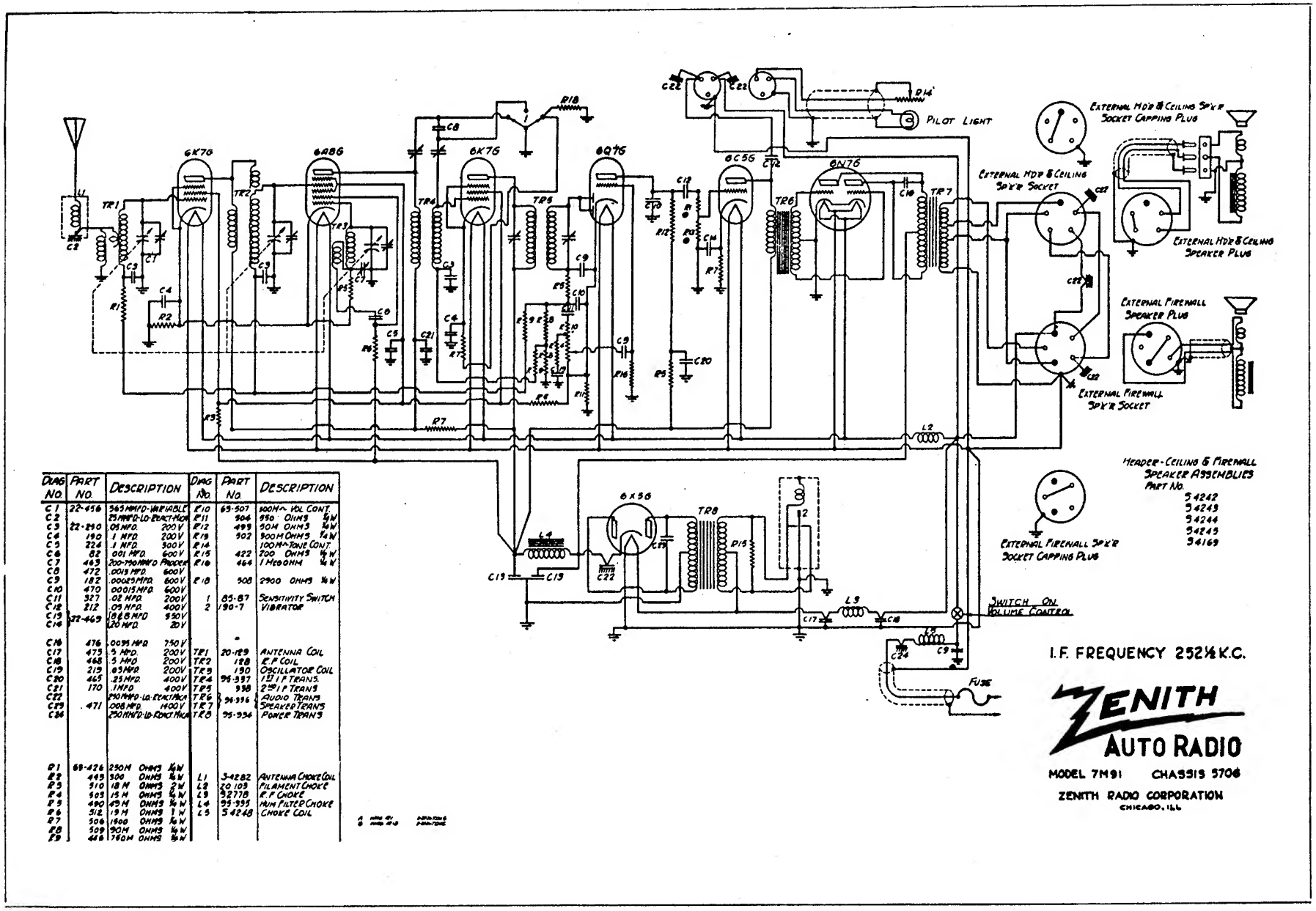


Fig. 11.—Tube Position. 6-M-91S, 6-M-91D

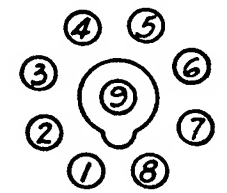


DIAG NO	PART NO.	DESCRIPTION	DIAG NO.	PART NO.	DESCRIPTION
C1	22-456	365 MMFD-VARIABLE	R10	69-507	500M-VOL CONT.
C2		25 MMFD-LO-REACT-MICA	R11	504	950 OHMS ½W
C3	22-390	.05 MFD. 200V	R12	499	50M OHMS ½W
C4	190	.1 MFD. 200V	R13	502	500M OHMS 1W
C5	224	.1 MFD. 300V	R14		100M-TONE CONT.
C6	82	.001 MFD. 600V	R15	422	200 OHMS ½W
C7	463	200-790 MMFD PRODET	R16	464	1 MEGOHM ½W
C8	472	.0019 MFD. 600V			
C9	182	.00025 MFD. 600V	R18	508	2900 OHMS ½W
C10	470	.00015 MFD. 600V			
C11	527	.02 MFD. 200V	1	85-87	SENSITIVITY SWITCH
C12	212	.05 MFD. 400V	2	190-7	VIBRATOR
C13	22-469	188 MFD 350V			
C14		120 MFD. 20V			
C15	476	.0095 MFD 750V			
C17	473	.5 MFD. 200V	TR1	20-189	ANTENNA COIL
C18	468	.5 MFD 200V	TR2	188	R.F. COIL
C19	219	.05 MFD 200V	TR3	190	OSCILLATOR COIL
C20	465	.25 MFD. 400V	TR4	95-397	1ST I.F. TRANS.
C21	170	.1 MFD 400V	TR5	938	2ND I.F. TRANS
C22		250 MMFD-LO-REACTANCE	TR6	94-996	AUDIO TRANS
C23	471	.008 MFD. 1400V	TR7		SPEAKER TRANS
C24		250 MMFD-LO-REACTANCE	TR8	95-954	POWER TRANS
R1	69-426	250M OHMS ½W			
R2	449	500 OHMS ½W	L1	5-4282	ANTENNA CHOKE COIL
R3	510	18 M OHMS 2W	L2	20-109	FILAMENT CHOKE
R4	503	1.5 M OHMS ½W	L3	52778	R.F. CHOKE
R5	490	.49 M OHMS ½W	L4	94-955	HUM FILTER CHOKE
R6	512	.19 M OHMS 1W	L5	5-4248	CHOKE COIL
R7	506	1600 OHMS ½W			
R8	509	90M OHMS ½W			
R9	446	760M OHMS ½W			

Fig. 12.—Circuit Diagram, Models 7-M-91S and 7-M-91D. (Chassis No. 5706)

SOCKET VOLTAGES 7-M-91S, 7-M-91D

Tube	Position	1	2	3	4	5	6	7	8	9
6K7	R.F. Amp.	0	5.8	250	100	5.2	—	0	5.2	0
6A8	1st Det. Osc.	0	0	250	100	—23	165	5.8	5.2	0
6K7	I. F. Amp.	0	5.8	240	100	6.7	—	0	6.7	0
6Q7	2nd Det. A. V. C. 1st Audio	0	0	145	—.2	—.2	—	5.8	1.6	0
6C5	Driver	0	0	240	0	0	—	5.8	8.2	—
6N7	Class B Power	0	0	250	0	0	250	5.8	0	—
6X5	RECT.	0	0	AC	—	AC	—	5.8	250	—



BOTTOM VIEW OF SOCKET

Fig. 13

Voltage at Battery 6V.
Voltage at Switch 5.8V.
Antenna disconnected.
All voltages measured with 1000 ohms per volt D. C. meter.
Total current consumption 8.2 Amperes.
Sensitivity at one watt output 1Mv.
Maximum power output 9 watts at 6 volts.

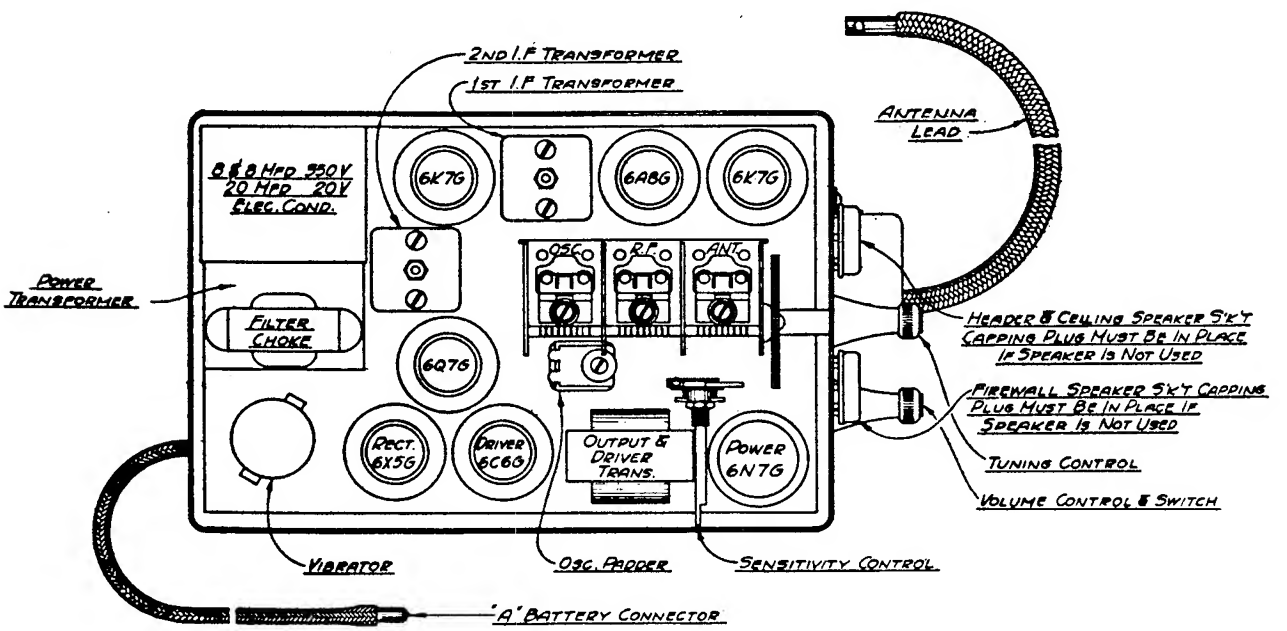


Fig. 14.—Tube Position 7-M-91S, 7-M-91D

ALIGNMENT

Every Zenith receiver is 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 alignment is thus required, an accurately calibrated service oscillator and output meter are essential.

The proper procedure is as follows:

MODEL 5M90

"A" Connect the service oscillator output leads to the control grid of the 6A7 tube, and to the chassis. If the oscillator output is a single shielded lead the shield should connect to the chassis.

Connect the 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 connection from the grid of the 6A7 to the antenna wire, leaving the other lead attached to the chassis.

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 ANTENNA trimmer on the gang condenser to the point given 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".

"E" Reset the service oscillator to 456 K.C., leaving it connected to antenna, and adjust the wave trap trimmer to the point giving the MINIMUM output reading.

MODELS 6-M-90, 6-M-91, 6-M-92

"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 1400 K.C.

Rotate the gang condenser one and one fourth turns from the minimum setting. At the proper position eight teeth on the tuning gear will be visible past the gear bracket.

Adjust the oscillator, R.F. and antenna trimmers in that order to the point giving the greatest output.

"C" Set the service oscillator at 600 K.C. and rotate the gang condenser to tune in this signal. Move the gang condenser to and fro past the signal meanwhile adjusting the oscillator padder condenser until the combination of adjustments giving the greatest reading of the output meter is obtained.

"D" Repeat operation "B."

MODEL 7-M-91

The alignment of this receiver is identical with Model 6M90.

The sensitivity switch should be in the clockwise or sensitive position during adjustment. The output meter may be connected across the voice coil connections at the speaker socket.

IGNITION INTERFERENCE SUPPRESSION

All automobiles develop high frequency disturbance through radiation from the coil, distributor and plugs and it is necessary to minimize this interference by means of suppression. A suppressor is placed in the center distributor lead and, if necessary, on each spark plug. By-pass condensers must be used on the generator, coil and at all electrical gauges and the leads kept as short as possible. Each car, however, presents an individual problem where the technician must use some ingenuity, carefully following instructions.

Apply the standard suppression parts furnished with the receiver. This consists of a resistor for the distributor in addition to a coil condenser and a generator condenser. Lay all high tension leads close to the motor to lessen the possibility of radiation. Be sure the coil condenser is connected from the BATTERY side to ground. The points will become burned and pitted if placed on the coil side. Apply additional condensers to oil, water, gas or other electrical gauges. Carefully shield the aerial lead-in to the receiver, from the running board or the wind-shield post, with large loom and copper shielding. The capacity here MUST be as low as possible. The lead-in shield is grounded at the outer edge of the running board or at a point on the frame as close as possible to the lead-in post if a top antenna is used. Bond the instrument panel thoroughly to the car frame and body on each side.

After the hood is clamped in place to prevent radiation, the receiver should be turned on and dial tuned off a station with the volume control at maximum.

If motor noise is prevalent determine whether it is being conducted through the chassis or from the antenna. This test is made by disconnecting the antenna and grounding it to the shield. If ignition noise is heard upon again starting the motor it indicates chassis pickup which may be removed as follows:

Check distributor points and clean. Set to between .013" minimum and .015" maximum clearance. Next build-up the distributor rotor arm to a clearance of between .002" to .004" clearance to the distributor cap contacts. Solder may be used for this purpose, but it will eventually burn off and the noise will return. In the event low tension leads are bunched or in the same pipe housing with high tension leads, they should be separated as far as possible or removed from the same pipe. Removal and segregation is very effective. In some cases it might be necessary to shield and bond the low tension coil or distributor leads.

Motors mounted on rubber must be bonded with heavy braid to produce a short path to ground in order to break any radiating oscillatory circuit. Such bonds should be placed between the front motor support and frame and between the radiator top hose pipe and to the cylinder head where the water jacket is bolted. Move control cables slightly so that inner shaft contacts outer armour and tape in position under instrument panel.

When chassis pickup has been reduced to a minimum the antenna is then re-connected. Be sure the lead-in shield is grounded as previously mentioned.

Where a running board antenna is used it must be installed under the board farthest from the distributor and high tension system. If a top antenna is used it is usually necessary to by-pass the dome light lead. This should be done as close as possible to the windshield post through which it is wired. It will NOT help remove noise from this source if connected at any distance from the post. Another method is to break the dome lead and install an auxiliary switch at this point. In that case the condenser is not necessary. In many cases a condenser from one side of the ammeter to ground is very effective. Be sure to keep the radio battery cable out of the motor compartment. Running this cable through the motor side may cause severe interference.

The suggestions given need not all be necessary for a satisfactory installation. Therefore, they should be followed in order until the most effective remedy has been found. In any event, these rules should prove helpful in all cases. Spark plug suppressors are not required or furnished due to the added filtering incorporated in the 1936 Receiver. They should be applied only in extremely stubborn cases as a last resort after all bonding and filtering instructions have been followed.

PARTS LIST

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

PART NO.		5M 90	6M 90	6M 91	6M 92	7M 91	PRICE
20-103	Filament Choke	*	*	*	*	*	.15
20-106	Oscillator Coil	*					.50
20-107	Antenna Choke	*					.25
20-110	Motor Noise Filter Coil Only	*					.25
20-128	R.F. Coil		*	*	*	*	1.00
20-129	Antenna Coil		*	*		*	1.25
20-130	Oscillator Coil		*	*		*	.65
20-132	Antenna Coil Assembly				*		.75
95-275	2nd I.F. Transformer	*					1.25
95-337	1st I.F. Transformer					*	1.25
95-338	2nd I.F. Transformer					*	1.25
95-342	1st I.F. Transformer (95-331)		*	*	*		1.25
95-343	2nd I.F. Transformer (95-332)		*	*	*		1.25
S-2778	R.F. Choke	*	*	*	*	*	.15
S-3609	1st I.F. Transformer Assembly	*					1.35
S-3622	Antenna Coil Assembly (20-105)	*					2.00
S-4248	Filament Choke		*	*		*	.35
S-4283	Oscillator Coil and Wire Assembly				*		.60

Condensers—By Pass, Fixed, Variable & Electrolytic

22-82	.001 mfd. 600 Volt	*	*	*	*	*	.25
22-147	.0005 mfd. 600 Volt	*					.15
22-162	.0001 mfd. 600 Volt	*	*	*			.20
22-170	.1 mfd. 400 Volt	*	*	*	*	*	.15
22-182	.00025 mfd. 600 Volt	*	*	*		*	.12
22-185	.01 mfd. 200 Volt	*					.20
22-190	.1 mfd. 200 Volt	*	*	*	*	*	.20
22-193	.5 mfd. Ignition Coil Condenser	*	*	*	*	*	.45
22-194	.5 mfd. Generator Coil Condenser	*	*	*	*	*	.50
22-196	.01 mfd. 600 Volt				*		.15
22-212	.05 mfd. 400 Volt	*	*	*	*	*	.20
22-219	.03 mfd. 200 Volt					*	.15
22-224	.1 mfd. 300 Volt		*	*	*	*	.15
22-250	.05 mfd. 200 Volt	*	*	*	*	*	.15
22-251	.5 mfd. 200 Volt	*					.40
22-280	.5 mfd. 200 Volt	*					.25
22-327	.02 mfd. 200 Volt	*	*	*	*	*	.15
22-350	.25 mfd. 200 Volt		*	*			.20
22-354	.007 mfd. 800 Volt	*					.20
22-355	.01 mfd. 1400 Volt	*					.20
22-358	.002 mfd. 600 Volt	*					.20
22-388	4-8 mfd. 350 Volt Electrolytic	*					1.50
22-389	365 mmfd. 2 gang Variable	*					4.00
22-390	200-400 mmfd. Oscillator Padder	*					.40
22-391	1000-1950 mmfd. Padder	*					.75
22-393	.00025 mfd. 600 Volt	*					.12
22-413	.006 mfd. 600 Volt	*					.15
22-456	365 mmfd. 3 gang Variable		*	*	*	*	4.00
22-461	.05 mfd. 800 Volt		*	*		*	.25
22-462	.004 mfd. 750 Volt		*	*			.15
22-463	200-750 mmfd. Padder		*	*	*	*	.35
22-464	8-8 mfd. 350 Volt Electrolytic		*	*			2.00
22-465	.25 mfd. 400 Volt		*	*		*	.30
22-466	.5 mfd. 200 Volt		*	*	*		.30
22-467	.2 mfd. 200 Volt				*		.20
22-468	.5 mfd. 200 Volt		*	*	*	*	.30
22-469	8-8 mfd. 350 Volt 20 mfd. 20 Volt					*	2.75
22-470	.00015 mfd. 600 Volt		*	*		*	.20
22-471	.008 mfd. 1400 Volt		*	*	*	*	.20
22-472	.0013 mfd. 600 Volt					*	.20
22-473	.5 mfd. 200 Volt					*	.25
22-474	4-8 mfd. 300 Volt				*		1.50
22-476	.0035 mfd. 750 Volt					*	.15
22-477	Dual 250 mmfd. 600 Volt				*		.15

Resistors, Voltage Dividers and Variable Controls

PART NO.		5M 90	6M 90	6M 91	6M 92	7M 91	PRICE
63-260	100 M ohm 1/4 watt	*					.20
63-263	30 M ohm 1/2 watt	*					.20
63-271	1 megohm 1/4 watt	*					.20
63-288	19 M ohm 1/4 watt	*					.20
63-336	Distributor Suppresor	*	*	*	*	*	.35
63-357	300 ohm 1/4 watt	*					.20
63-394	200 ohm 1/2 watt	*					.20
63-400	250 M ohm 1/4 watt	*					.20
63-401	500 M ohm 1/4 watt	*					.20
63-410	1200 ohm 1/4 watt	*					.20
63-422	200 ohm 1/2 watt		*	*	*	*	.20
63-423	600 ohm 1/4 watt		*	*	*		.20
63-425	75 M ohm 1/4 watt				*		.20
63-426	250 M ohm 1/4 watt		*	*	*	*	.20
63-428	1200 ohm 1/4 watt		*	*	*		.20
63-429	Spark Plug Suppresor (Optional)	*					.30
63-433	250 ohm 1/4 watt, 24 M ohm 1/2 watt, 15 M ohm 1 1/2 watt	*					.65
63-434	500 M ohm Volume Control	*					1.00
63-436	750 M ohm 1/4 watt	*					.20
63-443	300 ohm 1/4 watt		*	*	*	*	.20
63-446	750 M ohm 1/4 watt		*	*	*	*	.20
63-464	1 megohm 1/4 watt		*	*	*	*	.20
63-485	500 M ohm Volume Control		*	*			1.00
63-487	100 M ohm Tone Cont. (In Cont. Head)		*	*		*	.75
63-490	49 M ohm 1/4 watt		*	*	*	*	.20
63-491	490 M ohm 1/4 watt		*	*			.20
63-493	50 M ohm 1/4 watt		*	*		*	.20
63-494	13 M ohm 2 watt		*	*	*		.25
63-495	850 ohm 1/4 watt		*	*	*		.20
63-497	25 M ohm 1/4 watt		*	*			.20
63-502	300 M ohm 1/4 watt					*	.20
63-503	15 M ohm 1/4 watt					*	.20
63-504	550 ohm 1/4 watt					*	.20
63-506	1500 ohm 1/4 watt					*	.20
63-507	500 M ohm Volume Control					*	1.25
63-508	2900 ohm 1/4 watt					*	.20
63-509	90 M ohm 1/4 watt					*	.20
63-510	18 M ohm 2 watt					*	.25
63-512	19 M ohm 1 watt		*	*	*	*	.20
63-514	200 M ohm Volume Control and Switch				*		1.25

Speakers and Speaker Parts

49-111	6" Dynamic Speaker with Output Transf.	*					5.00
	Cone & Voice Coil for 49-111	*					2.30
	Output Transformer for 49-111	*					2.00
	Field Coil for 49-111	*					2.00
49-136	6" Dynamic Speaker with Output Transf.		*				5.00
	Cone and Voice Coil for 49-136		*				2.30
	Output Transformer for 49-136		*				2.00
	Field Coil for 49-136		*				2.00
49-137	8" Dynamic Speaker		*	*	*	*	6.00
	Cone & Voice Coil for 49-137		*	*	*	*	2.50
	Field Coil for 49-137 (Output Transformer in set)		*	*	*	*	2.00
49-138	5 3/8" Dynamic Speaker with Output Transf.				*		4.00
	Cone & Voice Coil for 49-138				*		1.75
	Field Coil for 49-138				*		2.00
	Output Transformer for 49-138				*		1.50
49-139	5 1/4" Dynamic Speaker		*	*	*	*	4.00
	Cone & Voice Coil for 49-139		*	*	*	*	1.75
	Field Coil for 49-139 (Output Transformer in Set)		*	*	*	*	2.00

PARTS LIST (Cont'd)

PART NO.		5M 90	6M 90	6M 91	6M 92	7M 91	PRICE
49-140	5¼" Dynamic Speaker (Uses same replacement parts as 49-139)		*	*	*	*	4.00
52-83	Speaker Cable for S-4169 (49-137)		*	*	*	*	1.00
52-84	Speaker Cable for S-4242 (49-140) S-4244, S-4245, S-4243 (49-139)		*	*	*	*	1.00
S-4169	Firewall Speaker Assembly (Uses Speaker 49-137)		*	*	*	*	
S-4242	1936 Ford Header Assembly (Uses Speaker 49-140)		*	*	*	*	
S-4243	General Motors Ceiling Assembly (Uses Speaker 49-139)		*	*	*	*	
S-4244	Dodge, Plymouth & 1935 Ford Header Assembly (Uses Speaker 49-139		*	*	*	*	
S-4245	Nash & Studebaker Header Assembly (Uses Speaker 49-139)		*	*	*	*	

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

Sockets—Tube & Speaker—Plugs

58-36	Speaker Socket Plug		*	*	*	*	.15
58-37	Speaker Socket Plug					*	.15
78-100	Wafer Socket for 6D6 Tube	*					.10
78-101	Wafer Socket for No. 75 Tube	*					.10
78-106	Wafer Socket for 6A7 Tube	*					.10
78-114	Wafer Socket for 6Z4 Tube	*					.10
78-115	Wafer Socket for Vibrator	*	*	*	*	*	.10
78-126	Wafer Socket for 41 Tube	*					.10
78-148	Wafer Socket for 6Q7 Tube		*	*	*	*	.10
78-149	Wafer Socket for 6X5 Tube		*	*	*	*	.10
78-150	Wafer Socket for 6K7 Tube		*	*	*	*	.10
78-151	Wafer Socket for 6A8 Tube		*	*	*	*	.10
78-152	Wafer Socket for 6F6 Tube		*	*	*		.10
78-153	Speaker Plug Socket		*	*	*	*	.10
78-154	Speaker Plug Socket			*		*	.10
78-156	Wafer Socket for 6C5 Tube					*	.10
78-157	Wafer Socket for 6N7 Tube					*	.10

Transformers—Audio & Power

95-273	Power Transformer	*					2.00
95-276	Hum Filter Choke	*					.60
95-328	Power Transformer		*	*			2.25
95-330	Hum Filter Choke		*	*			.75
95-333	Speaker Transformer			*			1.50
95-334	Power Transformer					*	2.75
95-335	Hum Filter Choke					*	.75
95-336	Audio & Speaker Output Transformer					*	3.50
95-341	Power Choke				*		.75
95-344	Power Transformer				*		2.25

CONTROL HEADS

Zenith Safety Control Head

MS-295	Complete Safety Steering Column Control with Cables		*	*		*	12.50
7-9	Dial Glass Gezel (Chromium Plate)		*	*		*	.35
15-19	Steering Column Mtg. Cap		*	*		*	.25
24-107	Steering Col. Mtg. Cover (Upper Half)		*	*		*	1.50
24-108	Steering Col. Mtg. Cover (Lower Half)		*	*		*	1.50
26-112	Celluloid Dial Scale		*	*		*	.50
27-11	Celluloid Pointer Disc		*	*		*	.50
34-55	Celluloid Pointer Gear		*	*		*	.15
34-58	Tuning Control Pinion Gear (15 Teeth)		*	*		*	.15
34-59	Tone Control Gear		*	*		*	.10
46-145	Tuning & Volume Control Knobs		*	*		*	.20
46-146	Pilot Light & Tone Control Knobs		*	*		*	.20
52-78	Pilot Light & Tone Control Cable		*	*		*	.65
54-90	Shaft Sheath Clamping Nut		*	*		*	.05
54-95	Panel Clamping Nut		*	*		*	.08
63-487	100 M ohm Tone Control		*	*		*	.75
69-47	6/32 x ⅝" R.H.M.S. Case Holding Screws per C.		*	*		*	.20
69-123	Contact Screw for Pilot Light		*	*		*	.01
73-2	Control Knob Set Screw		*	*		*	.01
73-25	10/32 x 5/16" Clamp Cap Set Screw		*	*		*	.03
76-192	Tone Control Pinion Shaft and Gear		*	*		*	.40
76-194	Volume Control Knob Shaft		*	*		*	.10
80-122	Tuning Control Head Shaft Spring		*	*		*	.03
80-123	Pilot Light Switch Contact Spring		*	*		*	.10
94-216	Black Fibre Clamp Bushing (Halves)		*	*		*	.15
100-32	Pilot Light Bulb		*	*		*	.15
115-12	10/32 x ½" Clamp Fastening Bolts per C.		*	*		*	.40
192-13	Unbreakable Dial Glass		*	*		*	.15
S-4194	Idler Gears & Washer Assembly		*	*		*	.35

Skeleton Control Head for Panel Mtg. Only For Models 6M90, 6M91 and 7M91 (S-4220)

S-4220	Skeleton Head Only for 6M90, 6M91 & 7M91 (Dash) (Inc. Cables)		*	*		*	8.50
S-4219	Tone Control & Shaft Assembly		*	*		*	1.25
26-114	Calibrated Dial Scale		*	*		*	.20
27-12	Dial Pointer Disc		*	*		*	.10
46-150	Tone Control Knob		*	*		*	.15
52-82	Pilot Light & Tone Control Cable		*	*		*	.75
54-101	Cable Sheath Clamping Nuts		*	*		*	.05
54-102	⅜ - 32 x ½" Hex Nut per C.		*	*		*	.50
93-143	⅜" Shakeproof Washer per C.		*	*		*	.35
100-32	Pilot Light Bulb		*	*		*	.15
147-28	Tuning Control Knob Spacer		*	*		*	.15
170-18	Remote Control Drive Mechanism		*	*		*	2.75

Skeleton Control Head for Panel and Steering Column Mtg., Model 6M92 Only (S-4224)

S-4224	Skeleton Head for 6M92 Steering & Dash Mtg. (Inc. Cables)					*	7.00
S-4249	Volume Control Shaft & Bushing Assem.					*	.30
26-114	Calibrated Dial Scale					*	.20
27-12	Dial Pointer Disc					*	.10
52-81	Pilot Light Cable					*	.50
54-101	Cable Sheath Clamping Nuts					*	.05
100-32	Pilot Light Bulb					*	.15
170-18	Control Drive Mechanism					*	2.75

Steering Column Mounting Accessory Kit

(To be used with S-4224 Only)

(S-4250)

S-4250	Steering Column Mtg. Accessory Kit (Use with S-4224)					*	1.50
12-459	Mounting Bracket					*	.05
12-469	Mounting Bracket (Steering Column)					*	.05
17-38	Retaining Clamp (Steering Column)					*	.05
43-11	Control Mechanism Housing					*	.50
46-160	Tuning & Volume Control Knob - Black					*	.25
54-106	No. 10/32 x ⅜" Hex Nuts Parkerized					*	.01
69-4	No. 6/32 x 3/16" R.H.M.S. N.P.					*	.01
69-124	No. 8/32 x ⅞" R.H.M.S. Parkerized					*	.01
69-125	No. 10/32 x 5/16" R.H.M.S. Parkerized					*	.01
93-126	No. 8 Shakeproof Lockwashers					*	.01
93-127	No. 10 Shakeproof Lockwashers					*	.01

PARTS LIST (Cont'd)

PART NO.		5M 90	6M 90	6M 91	6M 92	7M 91	PRICE
93-312	.010" Shim Washers				*		.01
112-108	No. 3/48 x 7/32" B.H.M.S. Black Nickel Finish				*		.01
192-14	Unbreakable Dial Glass				*		.20

5M90 Remote Control Steering Column Head

170-15	Zenith Remote Control Unit with Knobs, Mtg. Bracket and Pilot Lamp Cable less Shafts	*					4.50
12-423	Comp. Steer. Mounting Bracket Assem.	*					.60
17-29	Mounting Clamp only	*					.35
83-395	Mounting Strip only	*					.20
93-183	1/4" Shakeproof Washer only	*					.01
112-85	Mtg. Clamp Screws (small)	*					.03
112-86	Mtg. Clamp Screws (large)	*					.05
26-90	Dial Scale and Cup Assembly	*					.30
46-121	Volume and Tuning Knobs	*					.20
73-21	Headless Set Screw for 46-121	*					.02
80-110	Tension Springs for 46-121	*					.01
52-72	Dial Lamp Cable Assembly	*					.30
59-37	Dial Pointer	*					.10
100-29	6-8 V. Dial Lamp	*					.15
112-83	Set Screw for Volume Control Coupling Housing	*					.01
112-84	Set Screw for Tuning Control Coupling Housing	*					.01
192-9	Dial Glass	*					.12
196-3	Dial Glass Gasket	*					.03

Control Cables

(5 TUBE SET)

76-171	18" Tuning Control Cable	1.00
76-174	18" Volume Control Cable	1.00
76-172	24" Tuning Control Cable	1.25
76-175	24" Volume Control Cable	1.25
76-173	30" Tuning Control Cable	1.50
76-176	30" Volume Control Cable	1.50

(6 & 7 TUBE SET)

76-200	18" Volume Control Cable (Safety Steering Head) (Black Large Type)	1.00
76-203	18" Tuning Control Cable (Safety Steering Head) (Black Large Type)	1.00
76-201	24" Volume Control Cable (Safety Steering Head) (Black Large Type)	1.25
76-202	30" Volume Control Cable (Safety Steering Head) (Black Large Type)	1.50
76-204	24" Tuning Control Cable (Safety Steering Head) (Black Large Type)	1.25
76-205	30" Tuning Control Cable (Safety Steering Head) (Black Large Type)	1.50
76-206	18" Volume Control Cable (Dash Head) (Grey Small Type)	1.00
76-207	24" Volume Control Cable (Dash Head) (Grey Small Type)	1.25
76-208	18" Tuning Control Cable (Dash Head) (Grey Small Type)	1.00
76-209	24" Tuning Control Cable (Dash Head) (Grey Small Type)	1.25
76-213	30" Volume Control Cable (Dash Head) (Grey Small Type)	1.50
76-214	30" Tuning Control Cable (Dash Head) (Grey Small Type)	1.50
76-217	36" Volume Control Cable (Dash Head) (Grey Small Type)	1.75
76-218	36" Tuning Cable (Dash Head) (Grey Small Type)	1.75

Auto Set Mounting Parts

PART NO.		5M 90	6M 90	6M 91	6M 92	7M 91	PRICE
52-44	A Battery Cable	*	*	*	*	*	.60
57-478	Set Mounting Plate	*	*	*	*	*	.25
58-21	D.R. Cap		*	*	*	*	.01
58-26	D.R. Fuse Bushing	*	*	*	*	*	.01
69-84	10/32 x 1/4" R.H.M. Screws per C.	*	*	*	*	*	.30
93-127	No. 10 Shakeproof Lockwashers per C.	*	*	*	*	*	.35
93-222	7/16 Internal Shakeproof Washer	*					.01
93-233	Set Mounting Bolt Washer	*	*	*	*	*	.02
93-300	White Felt Washer					*	.02
136-6	15 Amp Fuse	*	*	*	*		.06
136-9	20 Amp Fuse					*	.06
144-14	7/16 x 3" Carriage Bolt & Nut	*	*	*	*	*	.05
196-1	Mounting Plate Gasket	*	*	*	*	*	.03

Miscellaneous Chassis Parts

19-51	Goat Tube Shield Clips		*	*	*	*	.03
19-53	Chassis Box Top Cover Spring Clips		*	*	*	*	.02
44-12	Pilot Light & Tone Control Cable Jack		*	*		*	.10
44-13	Pilot Light Cable Jack				*		.10
46-147	Sensitivity Control Knob					*	.25
80-107	Spring for 46-147 Knob					*	.01
52-44	A Battery Cable with Fuse Receptacle	*	*	*	*	*	.60
52-59	Antenna Shielded Loom	*	*	*	*	*	.50
52-66	A Battery Cable Lead on Chassis	*					.25
52-79	Antenna Cable		*	*	*	*	.45
52-80	Battery Cable		*	*	*	*	.25
54-76	1/4 - 20 Knurled Coupling Shaft Nuts	*					.08
54-97	Flexible Shaft Coupling Nuts		*	*	*	*	.08
85-87	Sensitivity Switch					*	.40
80-120	Vibrator Retainer Spring		*	*	*	*	.06
93-220	Bakelite Washer for Chassis Mtg. Screws	*					.02
93-278	Rubber Shoulder Washers for Variable Cond. Mtg.		*	*	*	*	.02
93-279	11/32" x 1/4" x 3/4" Rubber Washers for Variable Cond. Mtg.		*	*	*	*	.02
94-185	Rubber Bushings for Chassis Mtg. Screws	*					.02
97-75	10/32 x 1/4" Wing Screw for Top Cover	*					.02
97-76	Wing Screw for Ground Connections	*					.02
112-69	Chassis Mtg. Screws	*					.02
112-100	Chassis Mtg. Screws		*	*	*	*	.01
112-102	10/32 x 1/4" Thumb Screws		*	*	*	*	.02
114-27	No. 8 x 1/4" Black Screws for Bottom Cover	*					.01
114-36	No. 8 x 1/4" H.H. Slotted Self Tapping Screws for Bottom Cover		*	*	*	*	.005
126-131	Tube Shields Complete with ring (Large)	*	*	*	*	*	.10
126-168	Tube Shields Complete with ring (Small)	*	*	*	*	*	.10
183-2	Rubber Bands for Tube Shields	*	*	*	*	*	.02
190-4	Vibrator	*					5.00
190-7	Vibrator		*	*	*	*	3.75
S-3603	Motor Noise Filter Assem. Comp. with Case & A Batt. Lead	*					1.50
S-4185	Motor Noise Rejection Coil Assem. Comp. with Case & Ant. Cable		*	*	*	*	1.50

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

Zenith Radio Corporation

CHICAGO, ILL.

4-6-36

SERVICE MANUAL

ZENITH
TRADE MARK REG.
→LONG DISTANCE← RADIO

1937 RECEIVERS

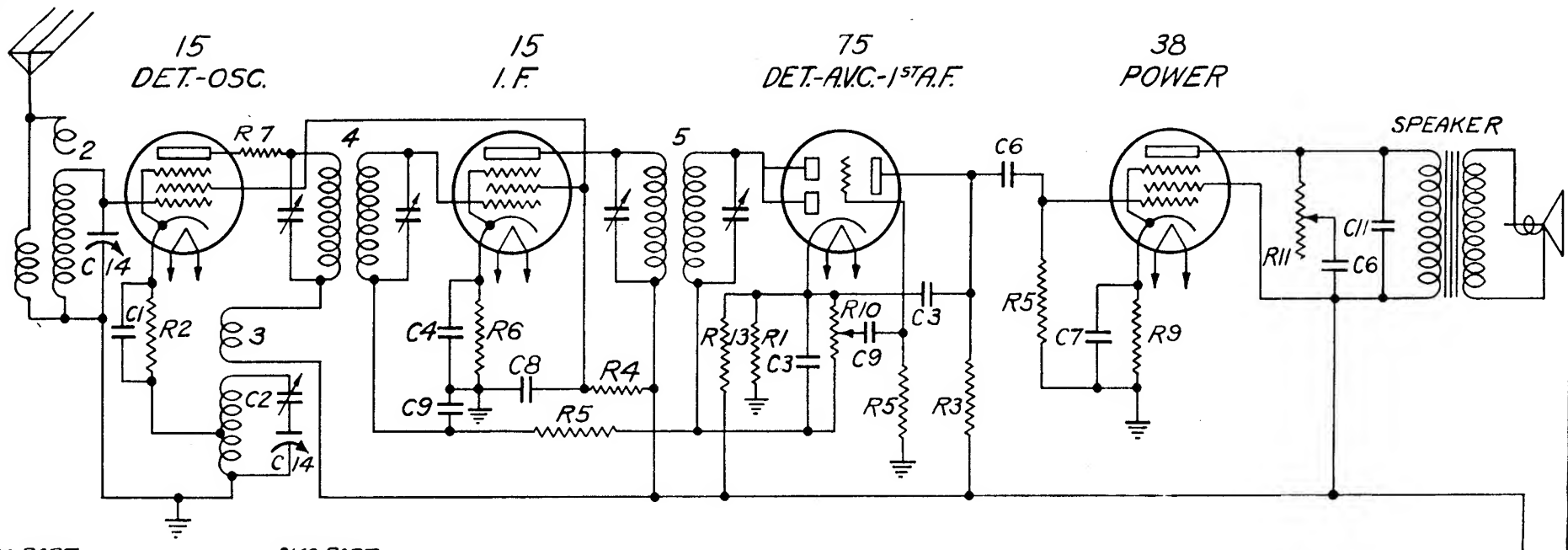
MODELS

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.

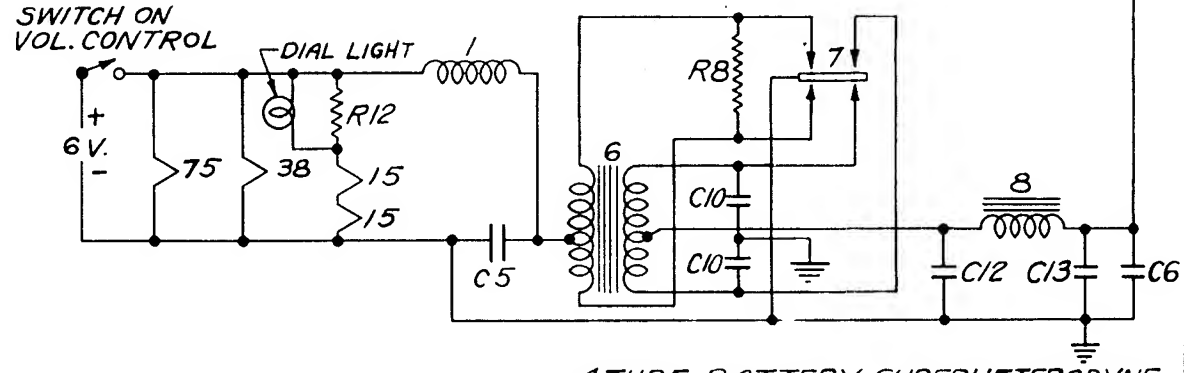
Form H-1

PRINTED IN U.S.A.



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 ELECTLYTIC	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	V/B. 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.

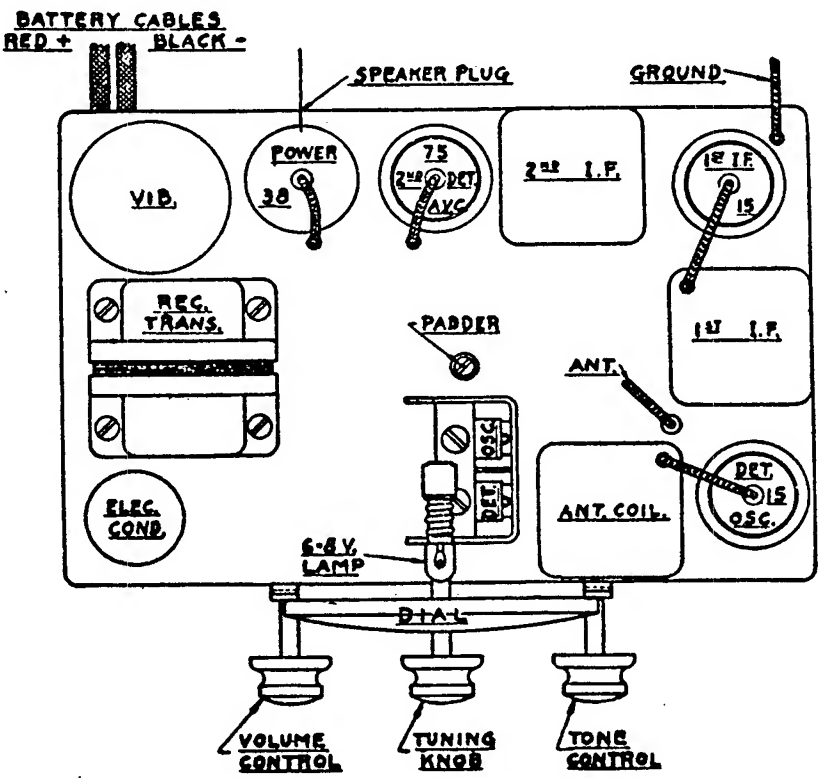
All measurements taken from point indicated to ground using a 1000 ohm per volt D. C. meter with antenna and ground disconnected.

Battery Voltage 6V.

Battery Drain 1.7 amperes.

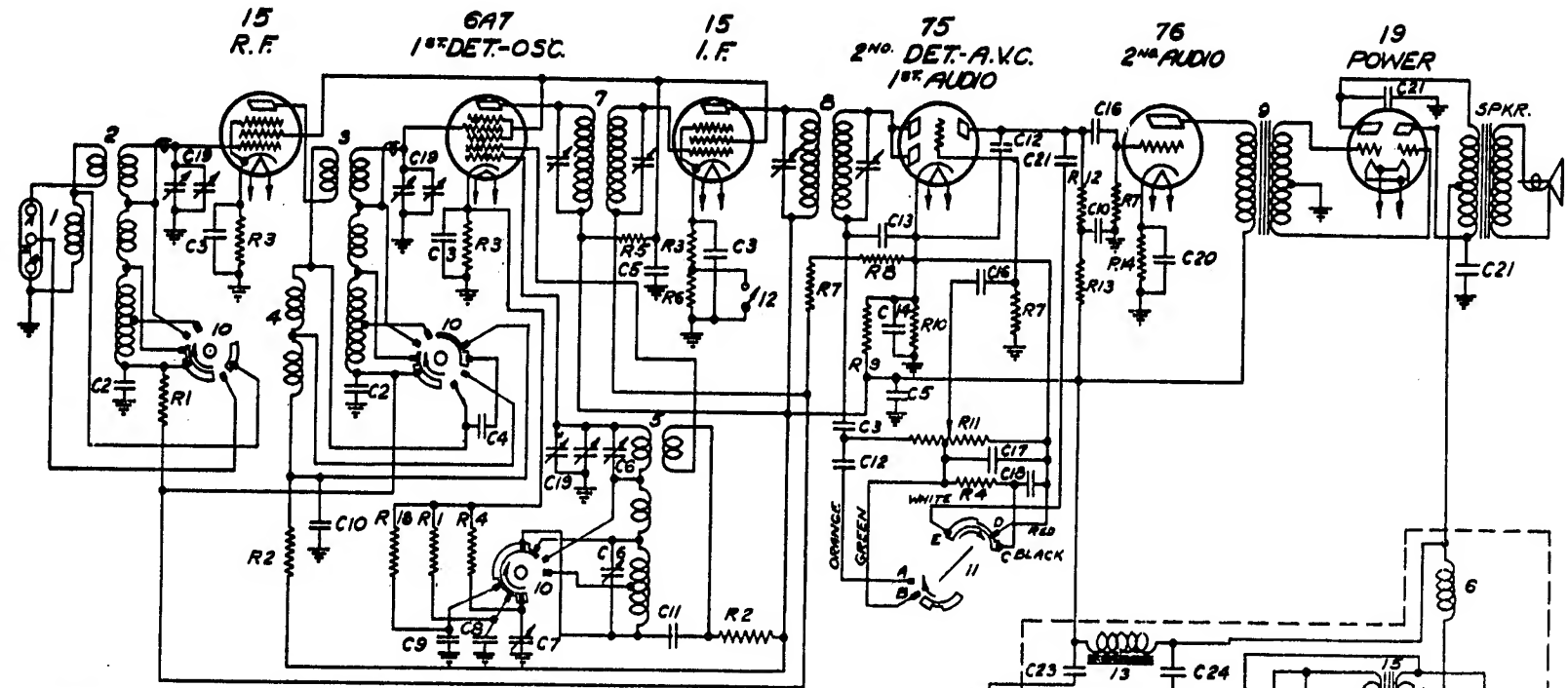
Power Output 1 watt.

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.



DIAG NO	PART NO	DESCRIPTION	
R1	63-278	85M OHMS	1/4W
R2	63-361	5M "	1/4W
R3	63-362	400 "	1/4W
R4	63-280	49M "	1/4W
R5	63-353	19M "	1/2W
R6	63-261	9900 "	1/4W
R7	63-293	990M "	1/4W
R8	63-481	400M "	1/4W
R9	63-260	100M "	1/4W
R10	63-498	800 "	1/4W
R11	63-522	2 MEG. VOL. CONT.	
R12	63-258	490M OHMS	1/4W
R13	63-290	260M "	1/4W
R14	63-360	2M "	1/4W
R15	63-384	200 "	1/2W
R16	63-477	100 n. FLEX. WIRE WND	
R17	63-533	13 " "	"
R18	63-288	19M OHMS @	1/4W

DIAG NO	PART NO	DESCRIPTION	
C2	22-407	.05 MFD	400V
C3	22-230	.05 MFD	200V
C4	22-127	25 MMFD	600V
C5	22-312	.05 MFD	400V
C6	22-403	2-35 MMFD	TRIMMER
C7	22-203	200-550 "	PADDER
C8	22-384	.0015 MFD.	600V
C9	22-405	.005 MFD	600V
C10	22-284	.1 "	300V
C11	22-486	.0012 "	600V
C12	22-182	250 MMFD	600V
C13	22-269	50 "	600V
C14	22-243	.01 MFD	400V
C15	22-280	.5 "	200V
C16	22-186	.02 "	400V
C17	22-147	500 MMFD	600V
C18	22-326	.003 MFD.	400V
C19	22-488	VARIABLE COND.	
C20	22-225	5 MFD ELYTIC	25V
C21	22-492	.002 MFD	600V
C22	22-455	.01 "	1200V
C23	22-459	8 MFD	250V
C24		2 "	250V

DIAG NO	PART NO	DESCRIPTION
1	20-71	ANTENNA CHOKE
2	3-4480	ANT. COIL ASSEM.
3	3-4481	DET. COIL ASSEM.
4	20-135	R.F. PLATE CHOKE
5	3-4482	OSC. COIL ASSEM.
6	20-88	R.F. CHOKE
7	95-371	1ST I.F. TRANS.
8	95-372	2ND I.F. TRANS.

DIAG NO	PART NO	DESCRIPTION
9	95-311	AUDIO TRANS.
10	85-93	BAND SEL. SWITCH
11	85-92	TONE CONT. SWITCH
12	85-91	SENSITIVITY SWITCH
13	95-324	POWER CHOKE
14	180-6	VIBRATOR
15	95-305	RECTIFIER TRANS.
16	3-ET18	R.F. CHOKE

SPEAKER		MODEL
49-155	8" P.M.	6-B-129
49-157	12" DYNAMIC	6-B-164
49-160	8" P.M.	6-B-107

I.F. FREQUENCY 456 K.C.
6 TUBE BATTERY SUPERHETERODYNE
CHASSIS NO. 5635

ZENITH RADIO CORPORATION
CHICAGO, ILL.

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

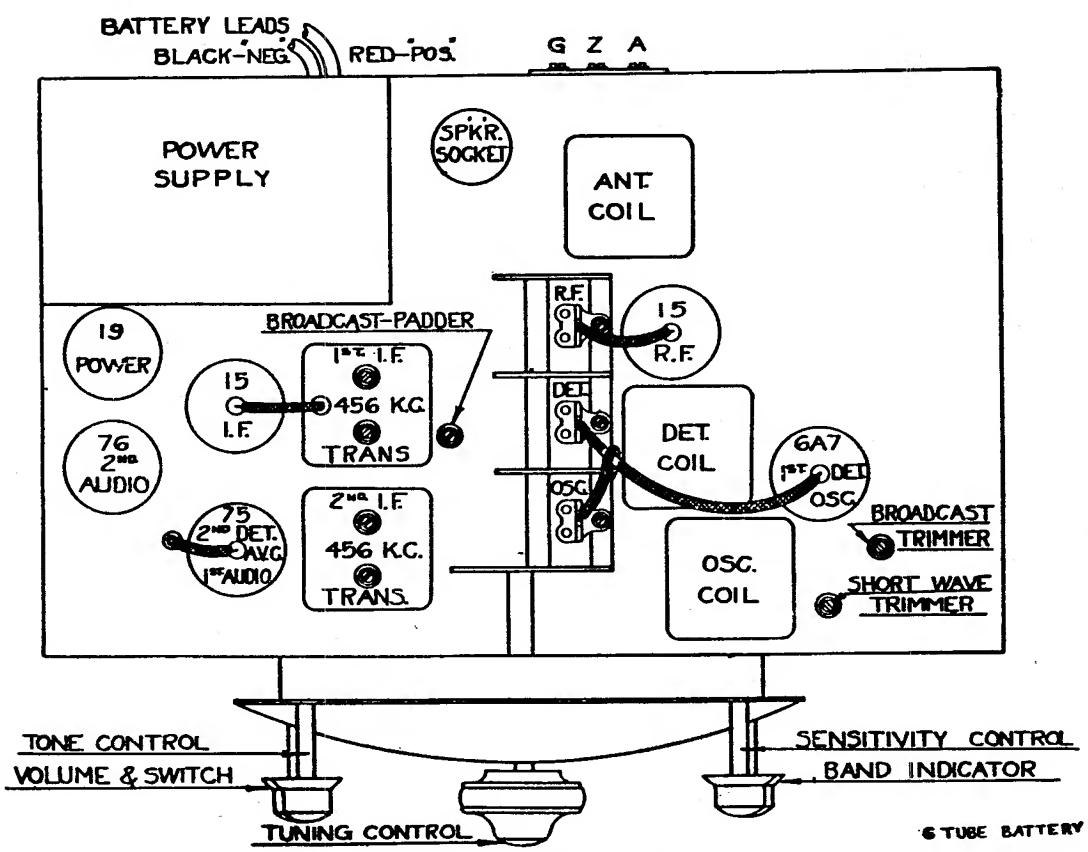
MODELS
6-B-107, 6-B-129, 6-B-164
CHASSIS No. 5635

SOCKET VOLTAGES

Tube	Position	Ef	Eg	Eg^1	Eg^2	Eg^3	Ep
15	R. F.	2	1.5	0	65	—	115
6A7	Det.	6	2.5	0	75	—	115
	Osc.			−5	—	—	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.

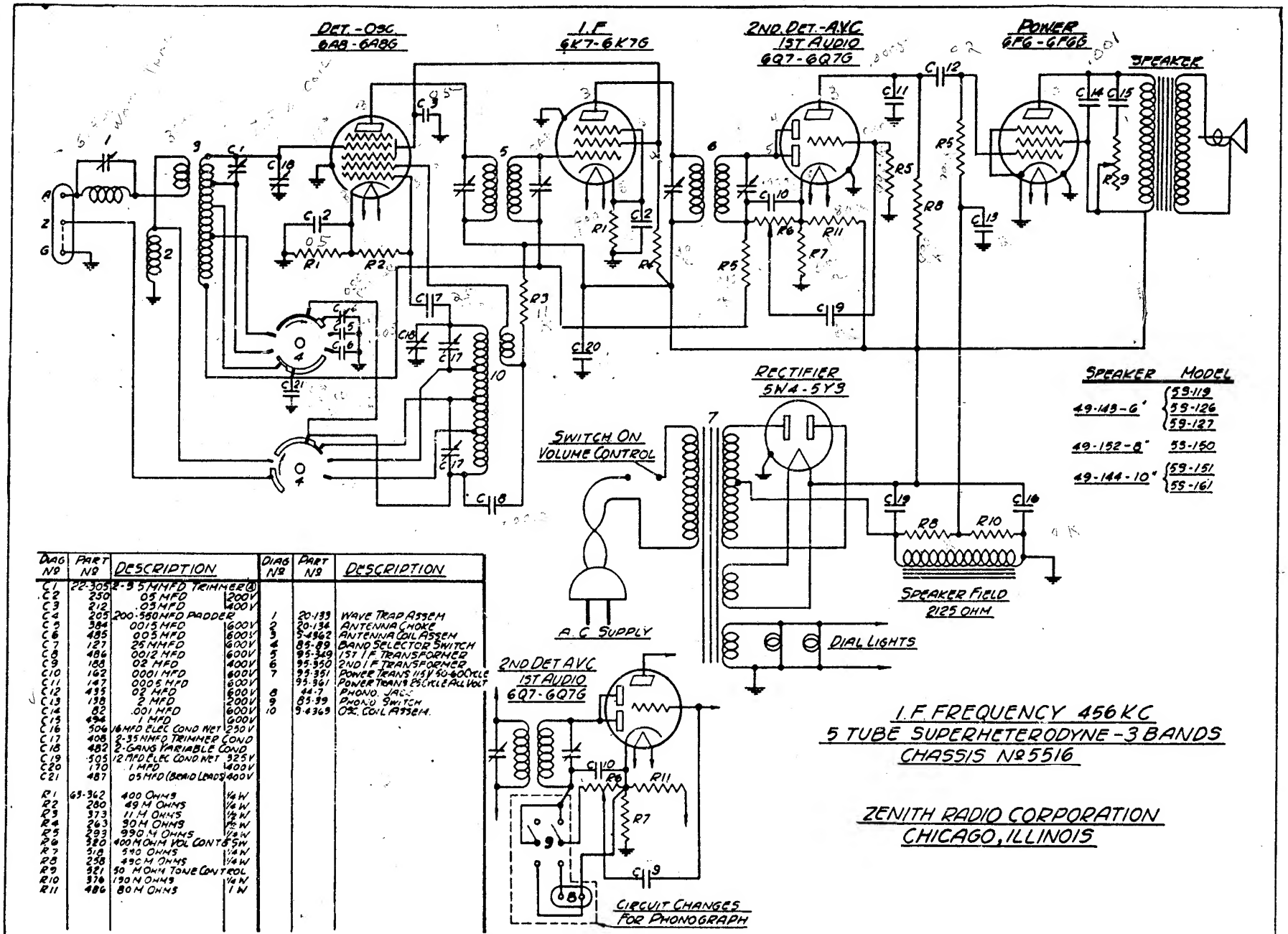
All voltages measured from socket contacts to ground with 1000 ohm per volt D. C. meter. Antenna and ground disconnected.
Battery Voltage 6V.
Battery Drain 2.2 amperes.
Power Output 2 watts.
Alignment procedure on page 27.



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		DIAG NO	PART NO	DESCRIPTION
C1	22-305	2-35 MMFD TRIMMER ④				
C2	250	.05 MFD	200V			
C3	212	.03 MFD	400V			
C4	205	200-560 MFD PADDER		1	20-139	WAVE TRAP ASSEM
C5	384	.0015 MFD	600V	2	20-134	ANTENNA CHOKE
C6	485	.005 MFD	600V	3	5-4962	ANTENNA COIL ASSEM
C7	127	25 MMFD	600V	4	85-89	BAND SELECTOR SWITCH
C8	486	.0012 MFD	600V	5	95-349	1ST I.F. TRANSFORMER
C9	188	.02 MFD	400V	6	95-350	2ND I.F. TRANSFORMER
C10	162	.0001 MFD	600V	7	95-351	POWER TRANS 115V 50-60 CYCLE
C11	187	.0005 MFD	600V		95-361	POWER TRANS 25 CYCLE ALL VOLT
C12	435	.02 MFD	600V	8	44-7	PHONO. JACK
C13	138	.2 MFD	200V	9	85-99	PHONO. SWITCH
C14	82	.001 MFD	600V	10	9-4369	OSC. COIL ASSEM.
C15	494	.1 MFD	600V			
C16	506	16 MFD ELEC COND WET	250V			
C17	408	2-35 MMFD TRIMMER COND				
C18	482	2-GANG VARIABLE COND				
C19	505	12 MFD ELEC COND WET	325V			
C20	170	.1 MFD	400V			
C21	487	.05 MFD (BRAID LEADS)	400V			
R1	69-362	400 OHMS	½ W			
R2	280	.49 M OHMS	½ W			
R3	373	.11 M OHMS	½ W			
R4	263	.90 M OHMS	½ W			
R5	293	.990 M OHMS	½ W			
R6	320	400 M OHM VOL CONTROL	5 W			
R7	518	.590 OHMS	1¼ W			
R8	258	.49 M OHMS	¼ W			
R9	321	.50 M OHM TONE CONTROL				
R10	370	.190 M OHMS	¼ W			
R11	486	.80 M OHMS	1 W			

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

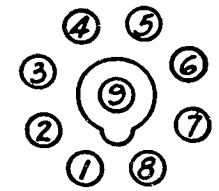
MODELS

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

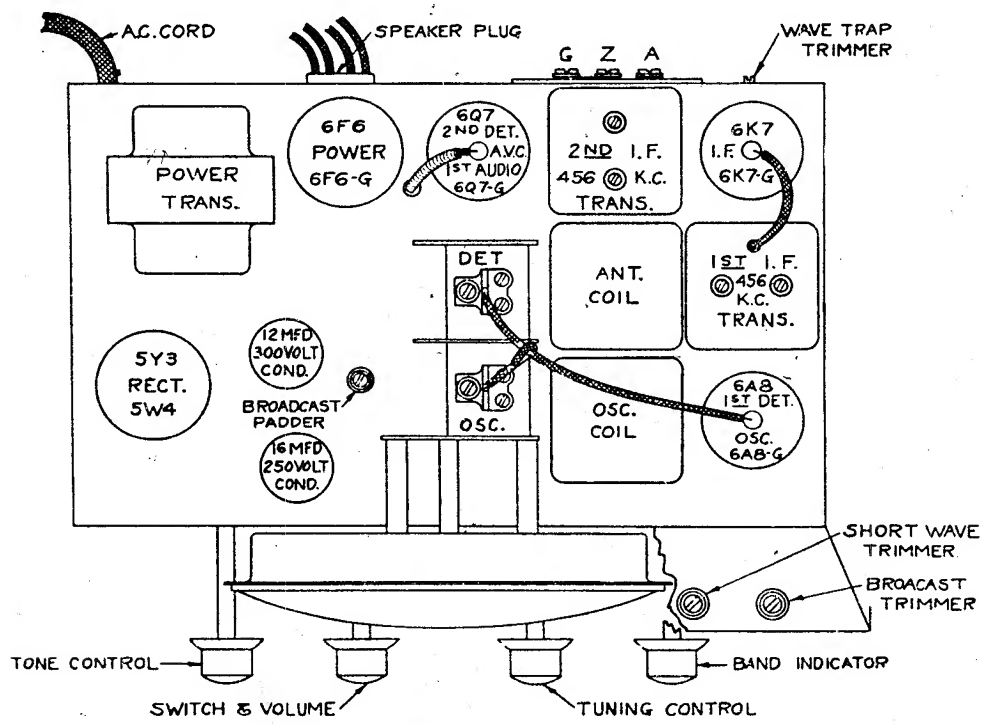
All voltages measured from point indicated to ground, using a 1000 ohm per volt meter with antenna and ground disconnected.

Line Voltage 112V.

Current Consumption 55 watts.

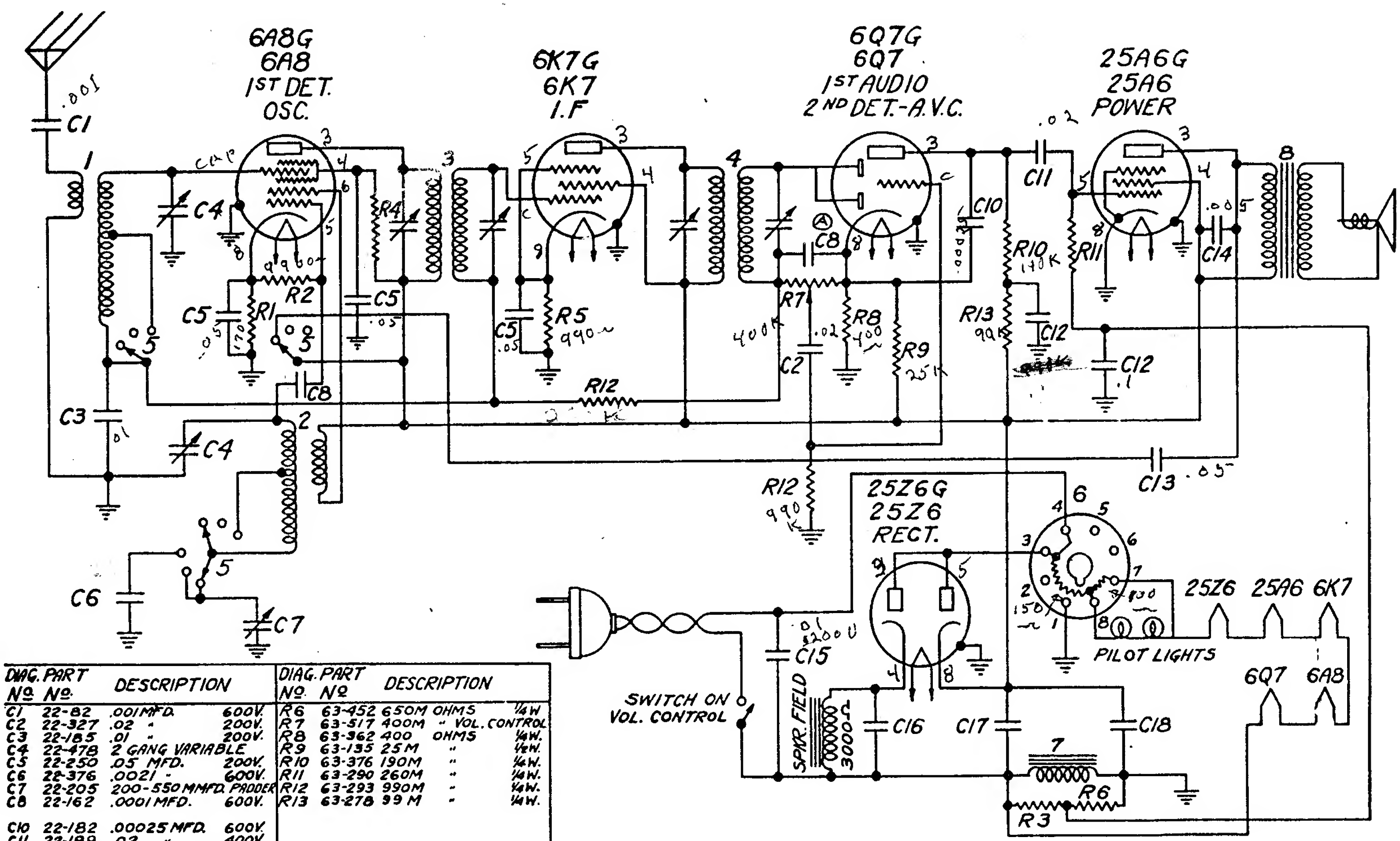
Power Output 3 watts.

Alignment Procedure on page 26.



TUBE POSITION

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



DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-82	.001 MFD.	600V.
C2	22-327	.02 "	200V.
C3	22-185	.01 "	200V.
C4	22-478	2 GANG VARIABLE	
C5	22-250	.05 MFD.	200V.
C6	22-376	.0021 "	600V.
C7	22-205	200-550 MMFD. PADDER	
C8	22-162	.0001 MFD.	600V.
C10	22-182	.00025 MFD.	600V.
C11	22-188	.02 "	400V.
C12	22-190	.1 "	200V.
C13	22-212	.05 "	400V.
C14	22-229	.005 "	600V.
C15	22-455	.01 "	1200V.
C16 } C17 }	22-517	{4 MFD. Ⓐ / 16 "	250V. / 250V.
C18	22-516	8 " ©	250V.
R1	63-377	170 OHMS	1/4 W.
R2	63-261	9900 "	1/4 W.
R3	63-481	400M "	1/4 W.
R4	63-288	19M "	1/4 W.
R5	63-300	990 "	1/4 W.

DIAG. Nº	PART Nº	DESCRIPTION	
R6	63-452	650M OHMS	1/4 W.
R7	63-517	400M " VOL. CONTROL	
R8	63-362	400 OHMS	1/4 W.
R9	63-135	25M "	1/4 W.
R10	63-376	190M "	1/4 W.
R11	63-290	260M "	1/4 W.
R12	63-293	990M "	1/4 W.
R13	63-278	99 M "	1/4 W.
1	S-4302	ANT. COIL ASSEMBLY	
2	S-4304	OSC. COIL ASSEMBLY	
3	95-346	1ST I.F. TRANS.	
4	95-347	2ND I.F. TRANS.	
5	85-88	BAND SELECT. SWITCH	
6	100-37	BALLAST TUBE 115V.	
7	95-345	POWER CHOKE	
8	49-141	SPEAKER	

I.F. FREQUENCY 456 K.C
6 TUBE SUPERHETRODYNE
CHASSIS Nº 5633 AC-DC
MODELS 6-D-116, 6-D-117, 6-D-118

ZENITH RADIO CORPORATION
CHICAGO, ILL.

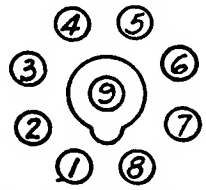
CIRCUIT DIAGRAM—Models 6-D-116, 6-D-117, 6-D-118. (Chassis No. 5633)

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

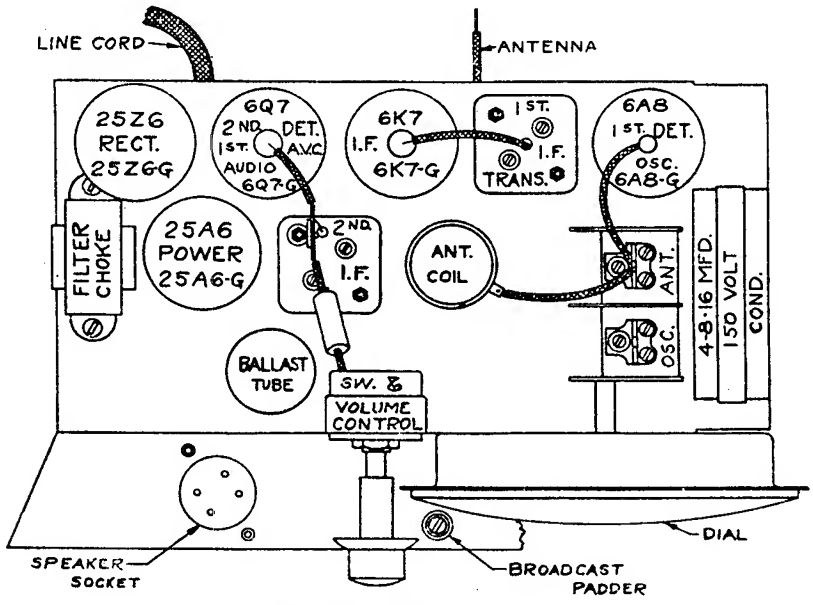
All voltages measured from point indicated to ground, using a 1000 ohm per volt meter. Antenna and ground disconnected.

Line Voltage 112V. (A.C.)

Current Consumption 44 watts.

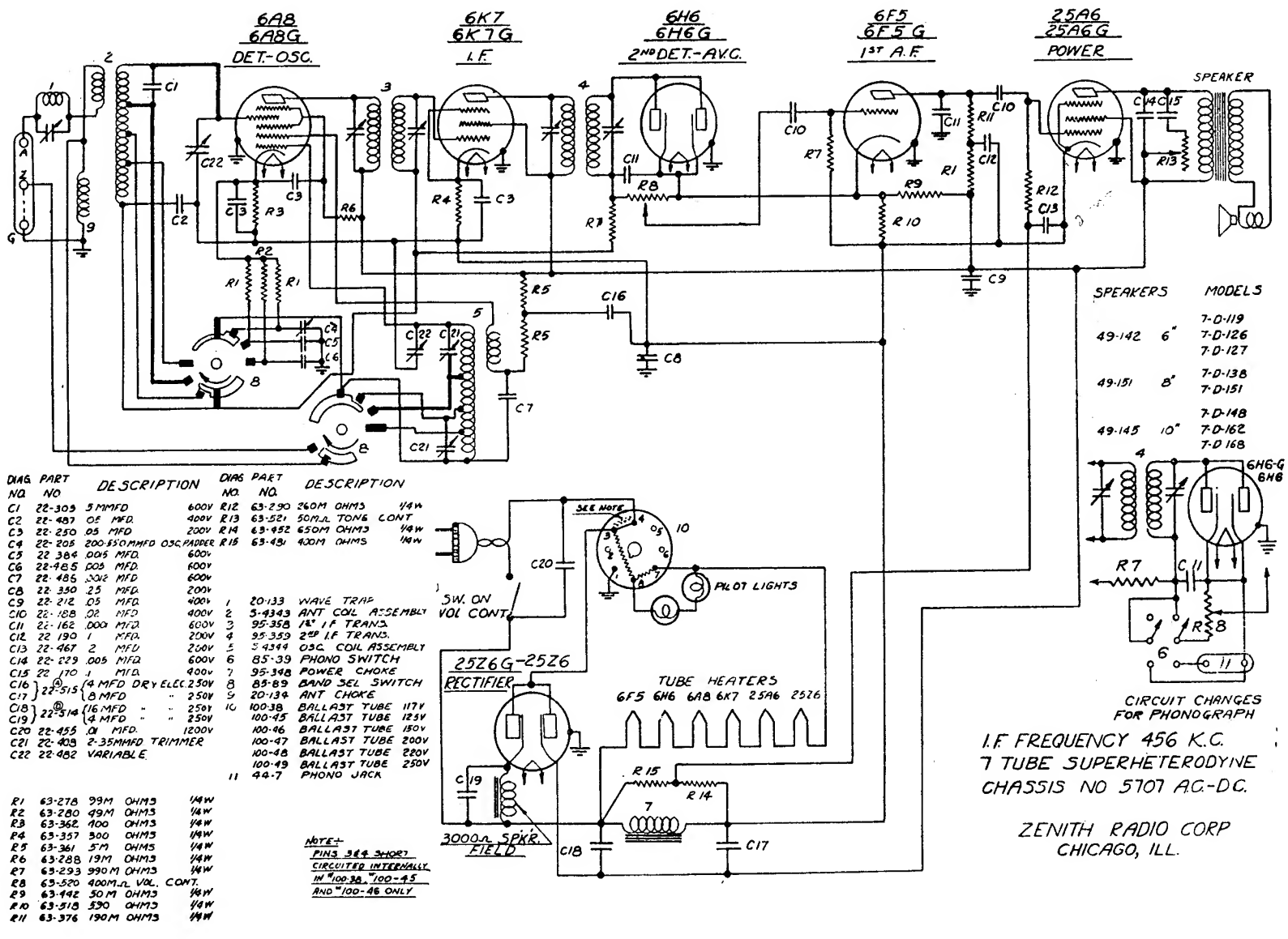
Power Output 1.5 watts.

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	200-550 MMFD OSC. PADDER	
C5	22-384	.005 MFD.	600V
C6	22-485	.005 MFD.	600V
C7	22-485	.002 MFD	600V
C8	22-350	.25 MFD.	200V
C9	22-212	.05 MFD.	400V
C10	22-188	.02 MFD	400V
C11	22-162	.000 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 (A)	4 MFD DRY ELEC.	250V
C17		8 MFD "	250V
C18	22-514 (B)	16 MFD " "	250V
C19		4 MFD " "	250V
C20	22-455	.01 MFD.	1200V
C21	22-408	2-35 MMFD TRIMMER	
C22	22-482	VARIABLE	

DIAG NO.	PART NO.	DESCRIPTION	
R1	63-278	99M OHMS	1/4W
R2	63-280	49M OHMS	1/4W
R3	63-362	400 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	50 M 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	63-452	650M OHMS	1/4W
R15	63-431	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&4 SHORT CIRCUITED INTERNALLY IN "100-38, "100-45 AND "100-46 ONLY

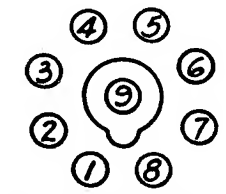
CIRCUIT DIAGRAM—Models 7-D-119, 7-D-126, 7-D-127, 7-D-138, 7-D-151, 7-D-148, 7-D-162, 7-D-168. (Chassis No. 5707)

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

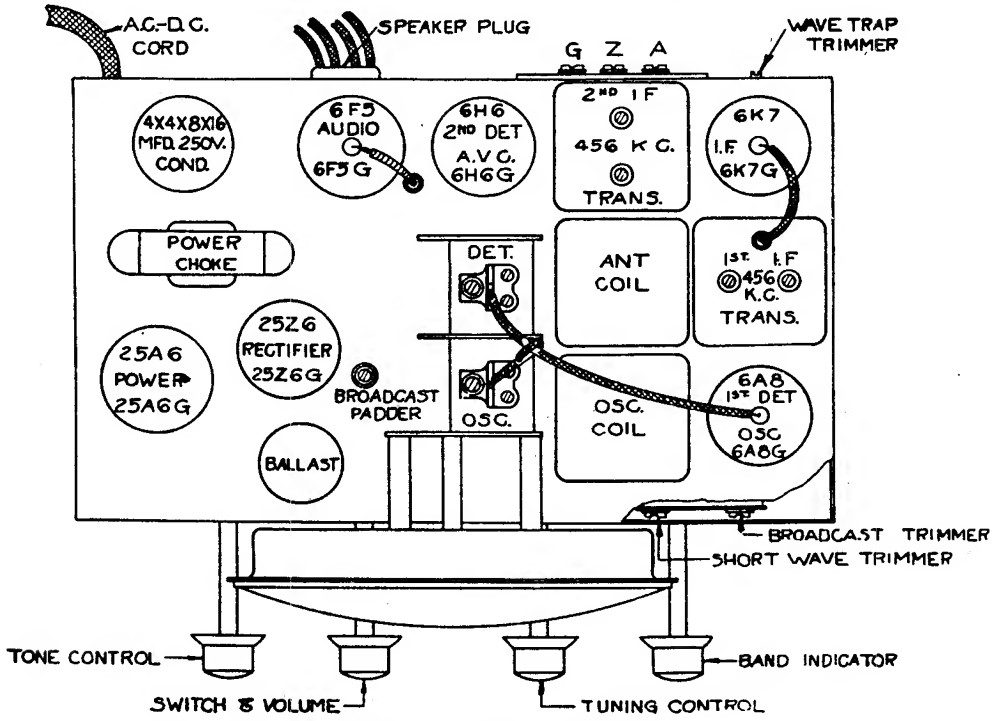
Measured from point indicated to junction of filter choke and speaker field using a 1000 ohm per volt meter.

Line Voltage 112 (A.C.)

Current Consumption 44 watts.

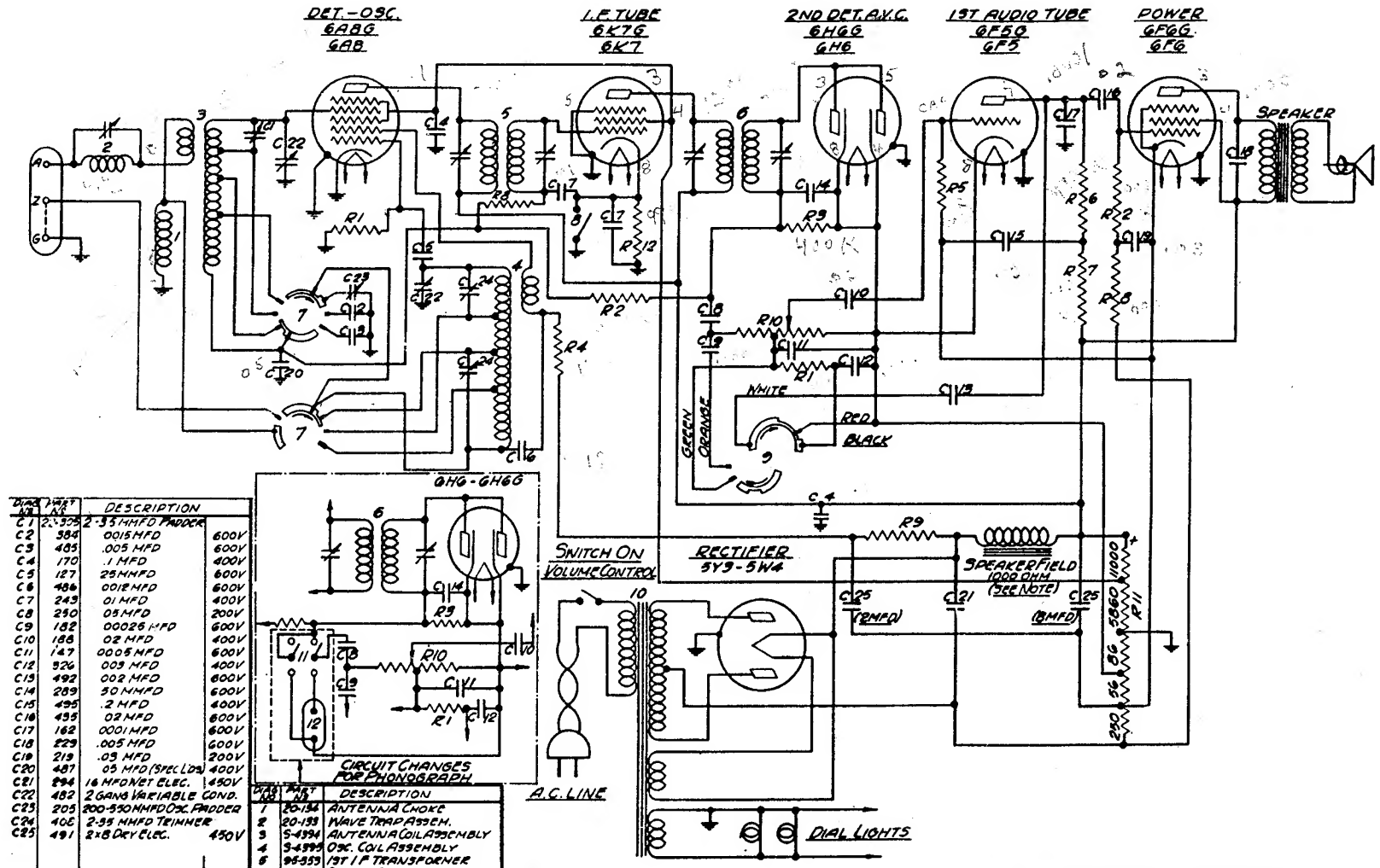
Power Output 1.5 watts.

Alignment procedure on page 26.



TUBE POSITION

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



DIAG. NO.	PART NO.	DESCRIPTION	
C1	2-305	2-35 MMFD PADDER	
C2	384	0015 MFD	600V
C3	485	.005 MFD	600V
C4	170	.1 MFD	400V
C5	127	25 MMFD	600V
C6	486	0012 MFD	600V
C7	249	.01 MFD	400V
C8	250	.05 MFD	200V
C9	182	00026 MFD	600V
C10	188	.02 MFD	400V
C11	147	0005 MFD	600V
C12	526	.003 MFD	400V
C13	492	.002 MFD	600V
C14	289	50 MMFD	600V
C15	495	.2 MFD	400V
C16	495	.02 MFD	600V
C17	162	.0001 MFD	600V
C18	229	.005 MFD	600V
C19	219	.05 MFD	200V
C20	487	.05 MFD (SPEC LOT)	400V
C21	894	16 MFD NET ELEC.	450V
C22	482	2 GANG VARIABLE COND.	
C23	205	200-550 MMFD OSC. PADDER	
C24	406	2-35 MMFD TRIMMER	
C25	491	2x8 DRY ELEC.	450V
R1	63-280	49 M OHMS	½W
R2	299	990 M OHMS	½W
R3	481	400M OHMS	½W
R4	279	1.1 M OHMS	1W
R5	629	2 MEGOHM	½W
R6	258	490M OHMS	1/4W
R7	276	190 M OHMS	½W
R8	278	99 M OHMS	½W
R9	953	1.9M OHMS	½W
R10	922	2 MEGOHM VOL. CONTROL & SW	
R11	919	CANDOHM RESITOR	
R12	261	9900 OHMS	½W

DIAG. NO.	PART NO.	DESCRIPTION
1	20-154	ANTENNA CHOKE
2	20-193	WAVE TRAP ASSEM.
3	5-4394	ANTENNA COIL ASSEMBLY
4	5-4395	OSC. COIL ASSEMBLY
5	95-553	1ST I.F. TRANSFORMER
6	95-554	2ND I.F. TRANSFORMER
7	85-90	BAND SELECT SWITCH
8	85-91	SENSITIVITY CONTROL
9	85-92	TONE CONTROL SWITCH
10	95-289	POWER TRANS. 115V-50-60 CYCLE
	95-290	POWER TRANS. 25 CYCLE ALL VOLT
11	85-89	PHONO. SWITCH
12	44-7	PHONO. JACK

NOTE:— 22-519 16 MFD DRY ELEC. REPLACE BY 22-296 WET ELEC. IN MODEL 6S-147 END TABLE

SPEAKERS	MODELS
49-117-8"	6S-128
	6S-137
49-118-10"	6S-147
	6S-152
	6S-157

I.F. FREQUENCY 456 K.C.
6 TUBE SUPERHETERODYNE - 3 BAND
CHASSIS NO 5634

ZENITH RADIO CORPORATION
CHICAGO, ILLINOIS

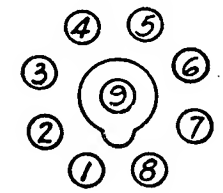
CIRCUIT DIAGRAM—Models 6-S-128, 6-S-137, 6-S-147, 6-S-152, 6-S-157. (Chassis No. 5634)

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

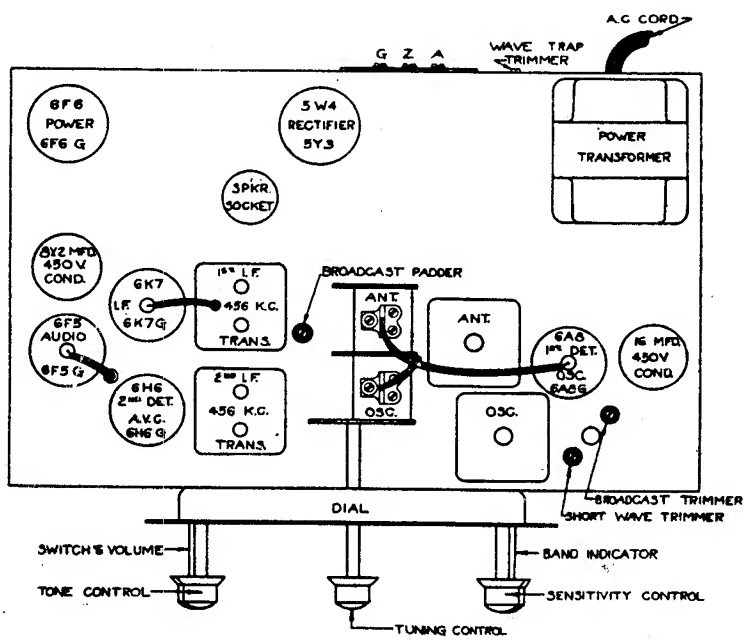
All voltages measured from point indicated to ground, using a 1000 ohm per volt meter. Antenna and ground disconnected.

Line Voltage 112V.

Current Consumption 75 watts.

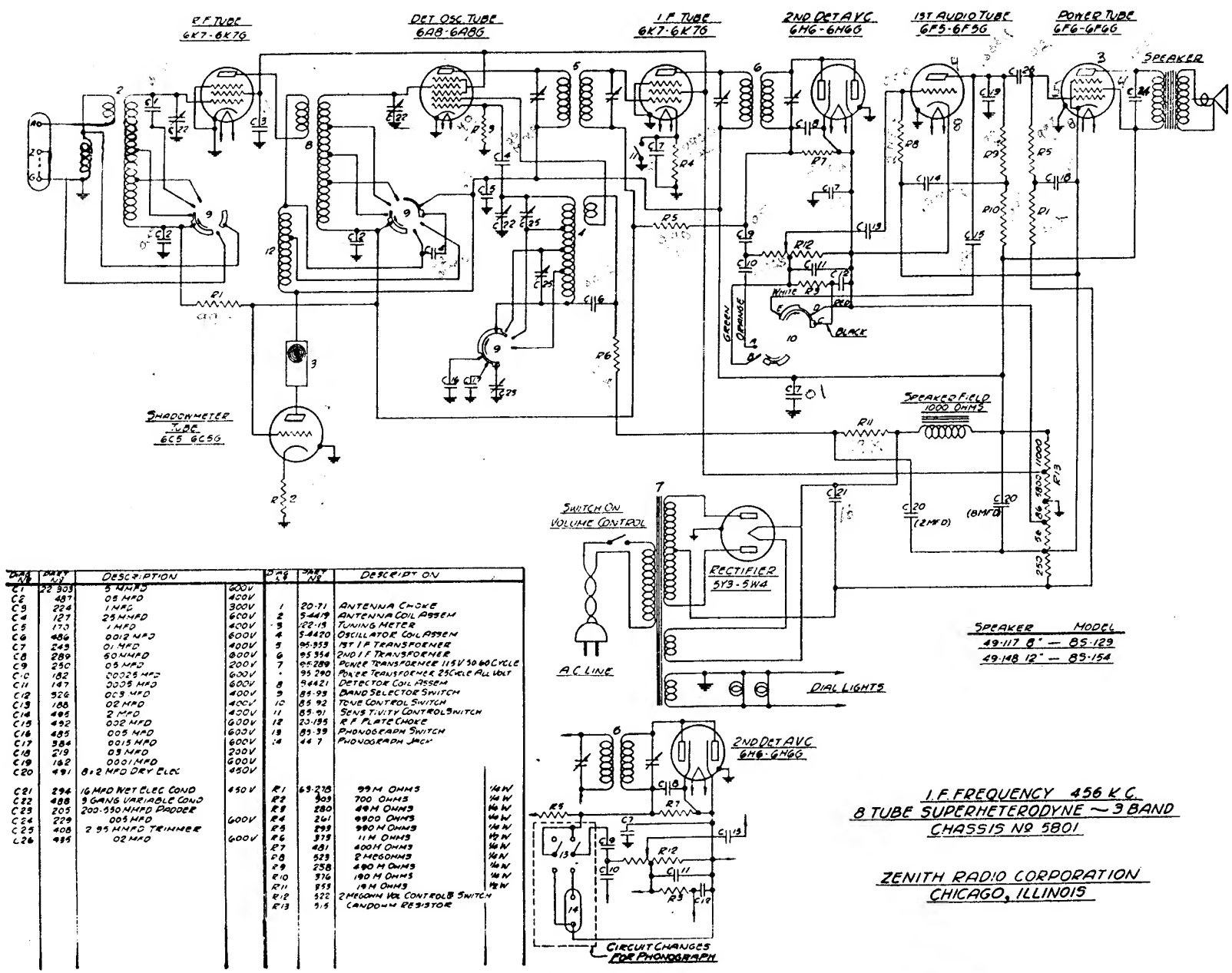
Power Output 4 watts.

Alignment procedure on page 26.



TUBE POSITION

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



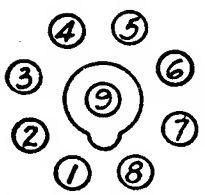
DIAG NO	PART NO	DESCRIPTION		DIAG NO	PART NO	DESCRIPTION	
C1	22 303	5 4MMFD	200V				
C2	487	05 MFD	400V				
C3	224	1 MFD	300V	1	20-71	ANTENNA CHOKE	
C4	127	25 MMFD	600V	2	5-4419	ANTENNA COIL ASSEM	
C5	170	1 MFD	400V	3	22-19	TUNING METER	
C6	486	0012 MFD	600V	4	5-4420	OSCILLATOR COIL ASSEM	
C7	249	01 MFD	400V	5	95-353	1ST I F TRANSFORMER	
C8	289	60 MMFD	600V	6	95 354	2ND I F TRANSFORMER	
C9	250	05 MFD	200V	7	95-289	POWER TRANSFORMER 115V 50 60 CYCLE	
C10	182	00025 MFD	600V	-	95 290	POWER TRANSFORMER 25CYCLE ALL VOLT	
C11	147	0005 MFD	600V	8	94421	DETECTOR COIL ASSEM	
C12	526	003 MFD	400V	9	85-93	BAND SELECTOR SWITCH	
C13	188	02 MFD	400V	10	85 92	TONE CONTROL SWITCH	
C14	495	2 MFD	400V	11	85-91	SENSITIVITY CONTROL SWITCH	
C15	492	002 MFD	600V	12	23-195	R F PLATE CHOKE	
C16	485	005 MFD	600V	13	85-99	PHONOGRAPH SWITCH	
C17	384	0015 MFD	600V	14	44 7	PHONOGRAPH JACK	
C18	219	03 MFD	200V				
C19	182	0001 MFD	600V				
C20	491	8-2 MFD DRY ELEC	450V				
C21	294	16 MFD WET ELEC COND	450 V	R1	69-278	99 M OHMS	1/4 W
C22	488	3 GANG VARIABLE COND		R2	303	700 OHMS	1/4 W
C23	205	200-350 MMFD PADDER		R3	280	49 M OHMS	1/4 W
C24	229	005 MFD	600V	R4	261	9900 OHMS	1/4 W
C25	408	2 95 MMFD TRIMMER		R5	299	990 M OHMS	1/4 W
C26	495	02 MFD	600V	R6	319	11 M OHMS	1/2 W
				R7	481	400 M OHMS	1/4 W
				R8	523	2 MEGOHMS	1/4 W
				R9	258	490 M OHMS	1/4 W
				R10	316	190 M OHMS	1/4 W
				R11	553	19 M OHMS	1/2 W
				R12	522	2 MEGOHM VOL CONTROL & SWITCH	
				R13	515	CANDOHM RESISTOR	

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

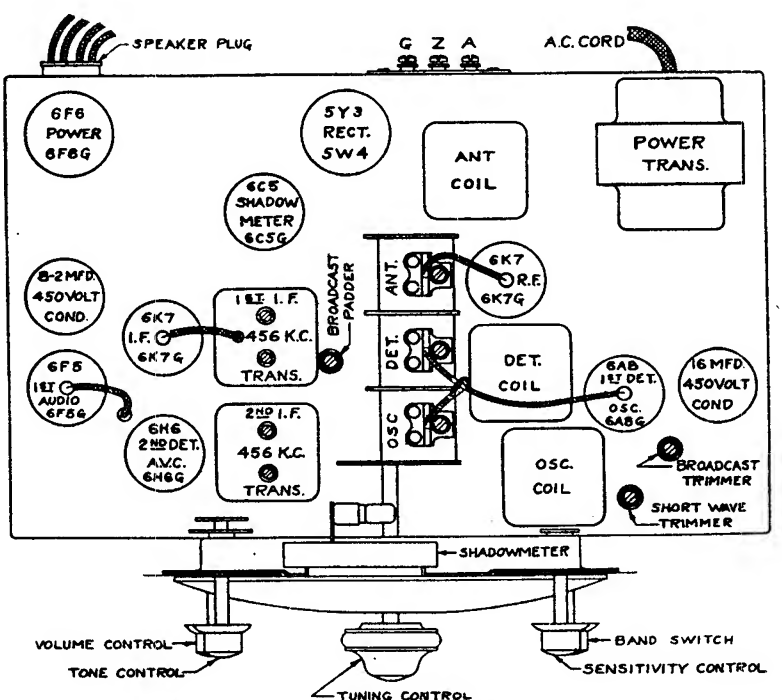
All voltages measured from point indicated to ground, using a 1000 ohm per volt meter. Antenna and ground disconnected.

Line Voltage 112V.

Current Consumption 85 watts.

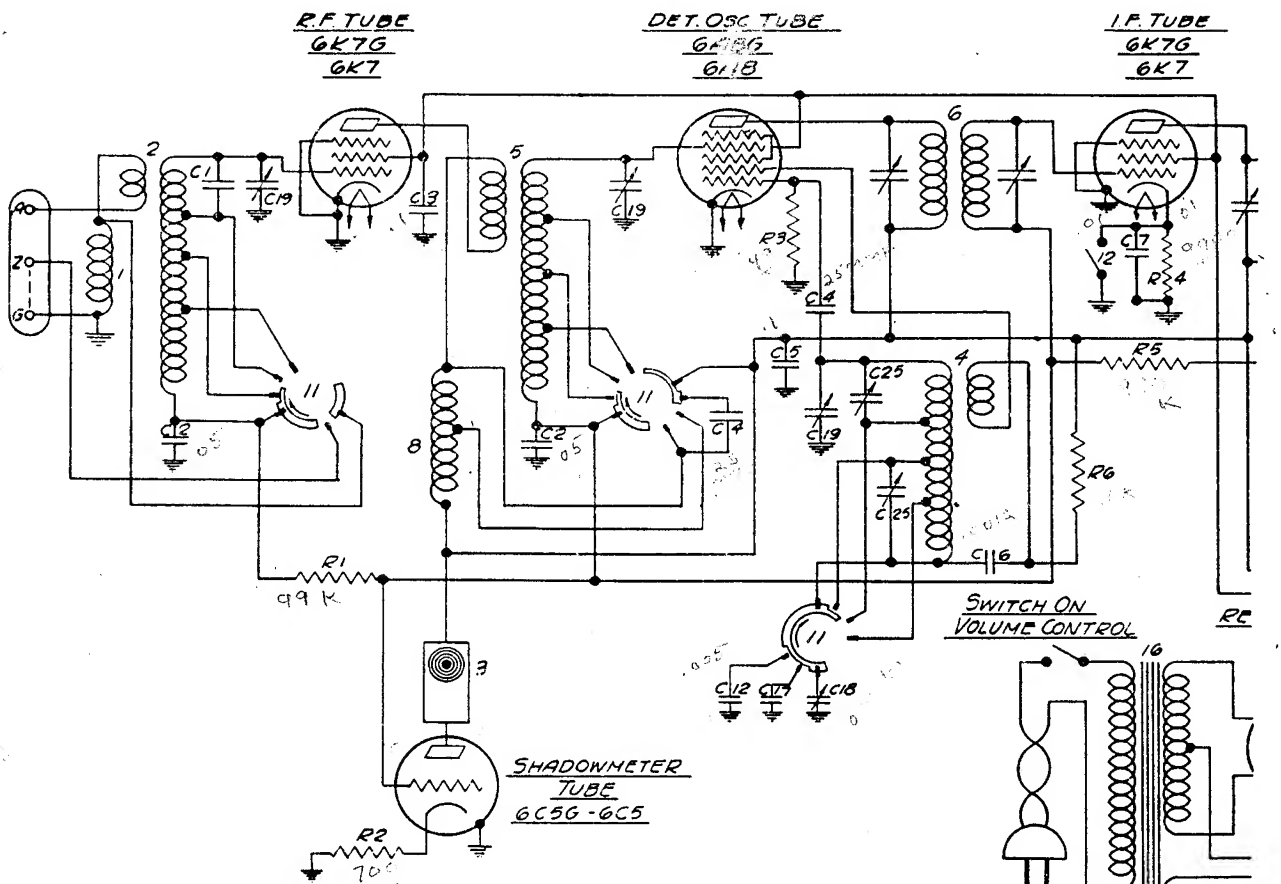
Power Output 5 watts.

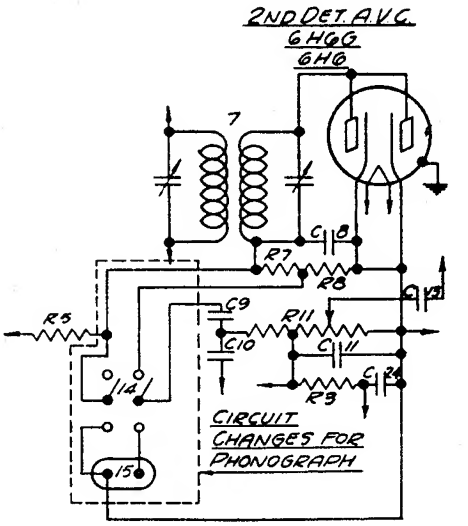
Alignment procedure on page 27.



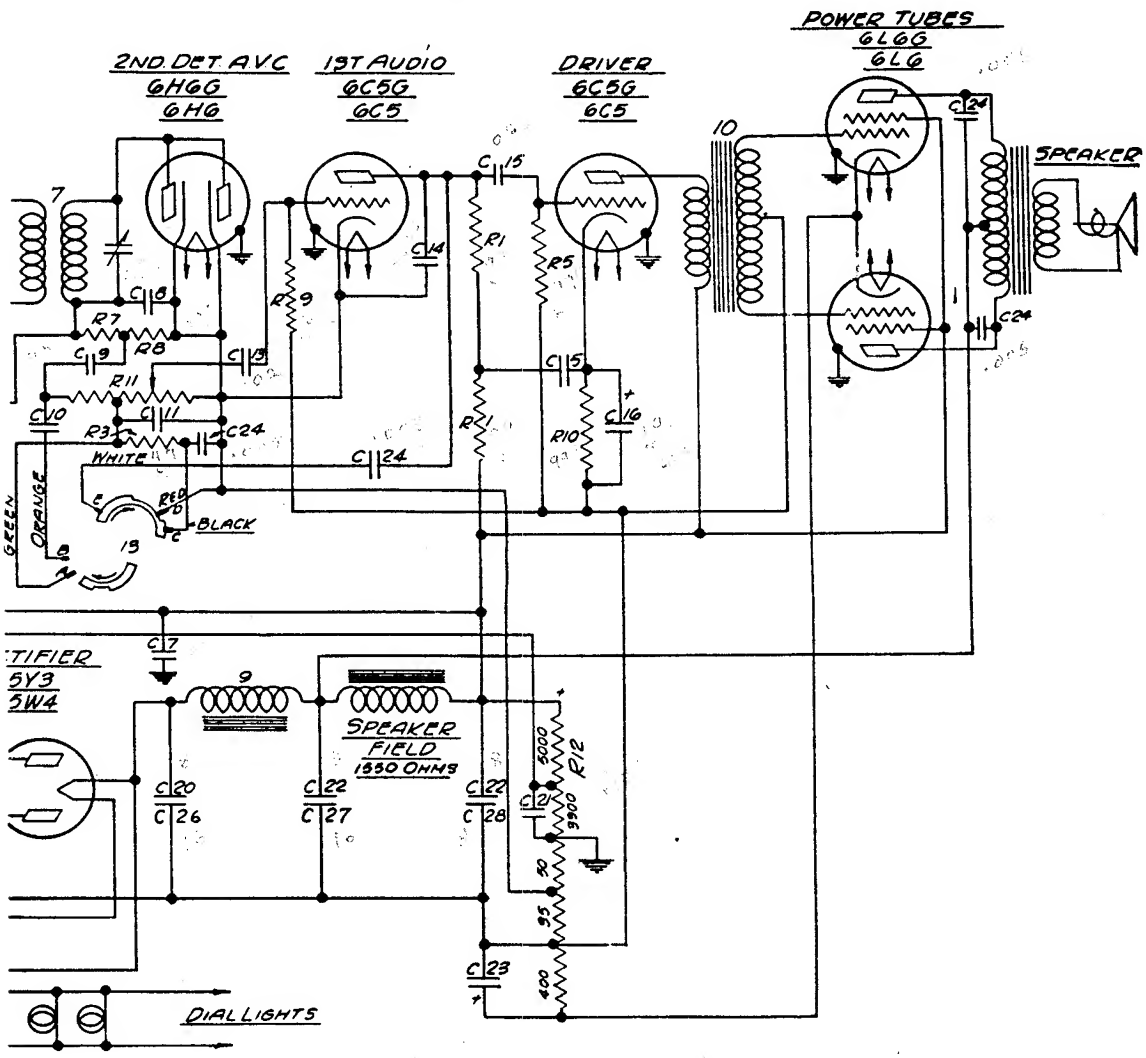
TUBE POSITION

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	122-13	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	13	85-92	TONE CONTROL SWITCH	
C14	162	.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	16	95-355	POWER TRANS 115V 50-60 CYCLE	
C17	384	.0015 MFD	600V		95-365	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 x 8 MFD DRY ELEC. COND 60~	450V				
C23	405	10 MFD DRY ELEC COND	50V				
C24	229	.005 MFD	600V				
C25	408	2-35 MMFD TRIMMER					
R1	69-278	99 M OHMS	1/4 W			NOTE —	
R2	309	700 OHMS	1/4 W			#22-510 8x8x8 MFD DRY ELECTROLYTIC REPLACES #22-493 & #22-506. #22-512 - 8 MFD DRY ELECTROLYTIC REPLACES #22-504 8 MFD WET ELECTROLYTIC IN MODEL #105-147 END TABLE.	
R3	280	49 M OHMS	1/4 W				
R4	261	9900 OHMS	1/4 W				
R5	299	990 M OHMS	1/4 W				
R6	373	11 M OHMS	1/2 W				
R7	260	100 M OHMS	1/4 W				
R8	385	300 M OHMS	1/4 W				
R9	529	2 MEGOHMS	1/4 W				
R10	300	990 OHMS	1/4 W				
R11	522	2 MEGOHM VOLUME CONT & SW					
R12	516	CANDOHM 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"	105155
		105156
		105160
49-156	12"	105147
		105159
		105157

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

ZENITH RADIO CORPORATION
CHICAGO, ILLINOIS

SERVICE NOTES 1004 CHASSIS

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

ACK OF SENSITIVITY ON ALL BANDS—Check tubes, antenna and ground—all coils. Poor con-ıct on sensitivity switch—rebalance.

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

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

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

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

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

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

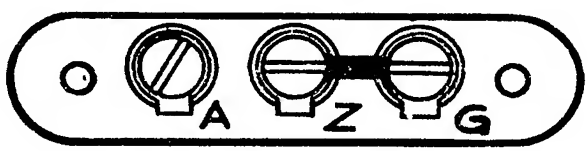
'LUTTERING AT LOW FREQUENCY—Tubes, particularly oscillator tube, rebalance I.F.'s to 456.

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

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

)IAL SLIPS—Loose dial clutch.

IMPORTANT!



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

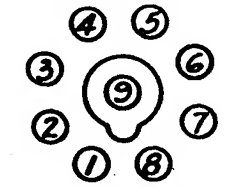
When using a ZENITH DOUBLET ANTENNA, remove jumper wire between Z and G and attach doublet lead-in to A and Z.

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 eft 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

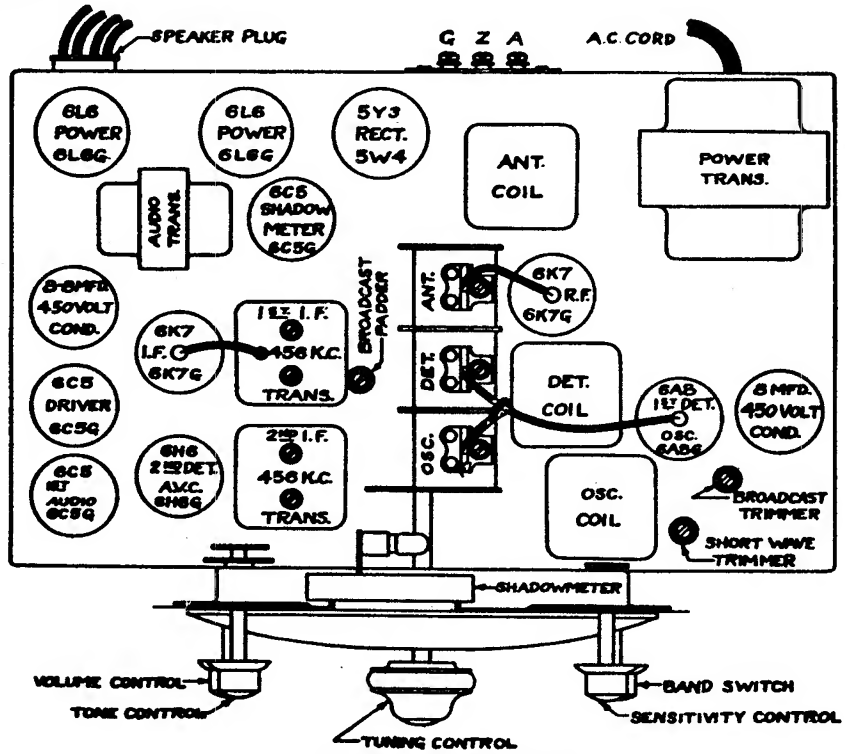
All voltages measured from point indicated to ground, using a 1000 ohm per volt meter. Antenna and ground disconnected.

Line Voltage 112V.

Current Consumption 110 watts.

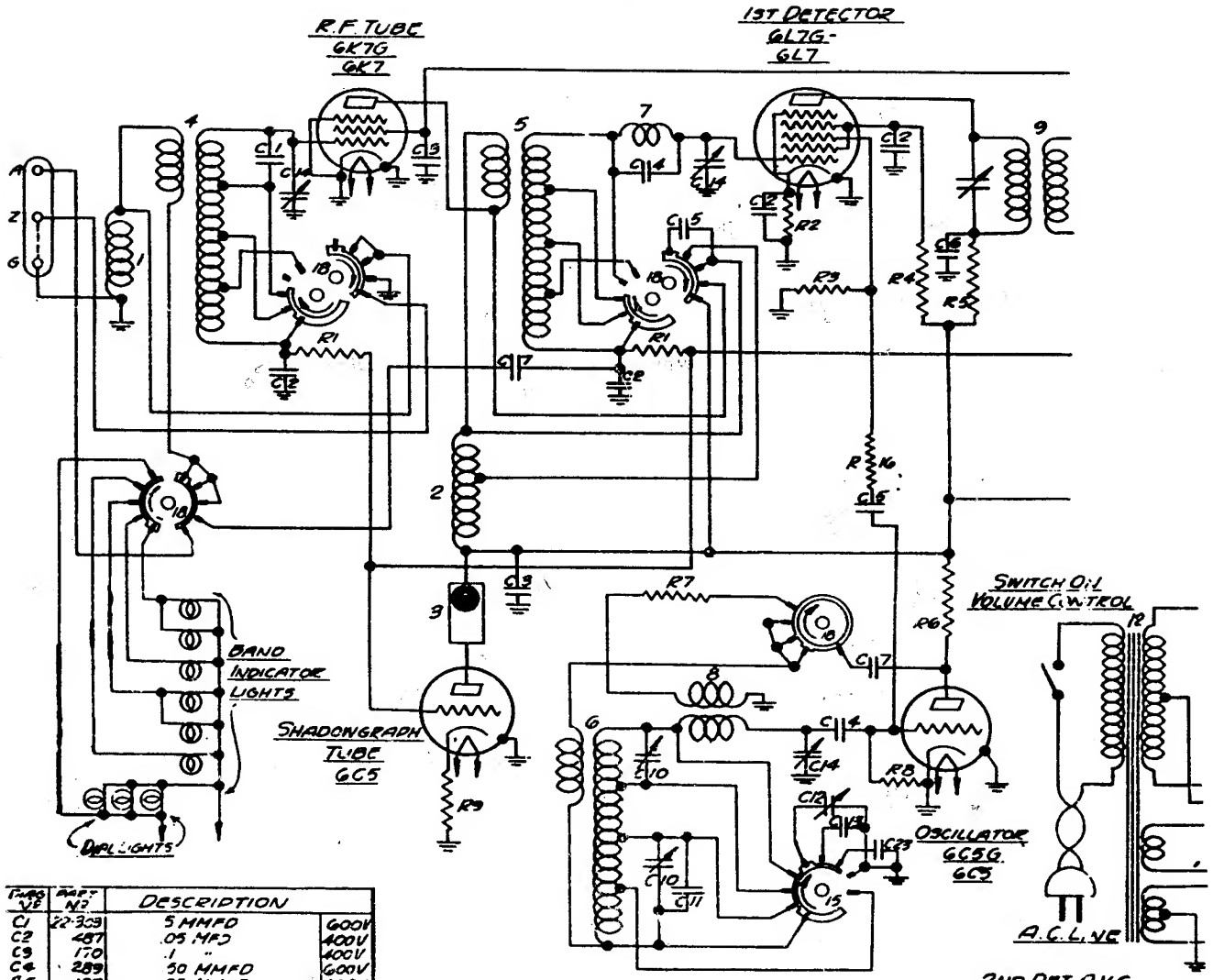
Power Output 12 watts.

Alignment procedure on page 27.



TUBE POSITION

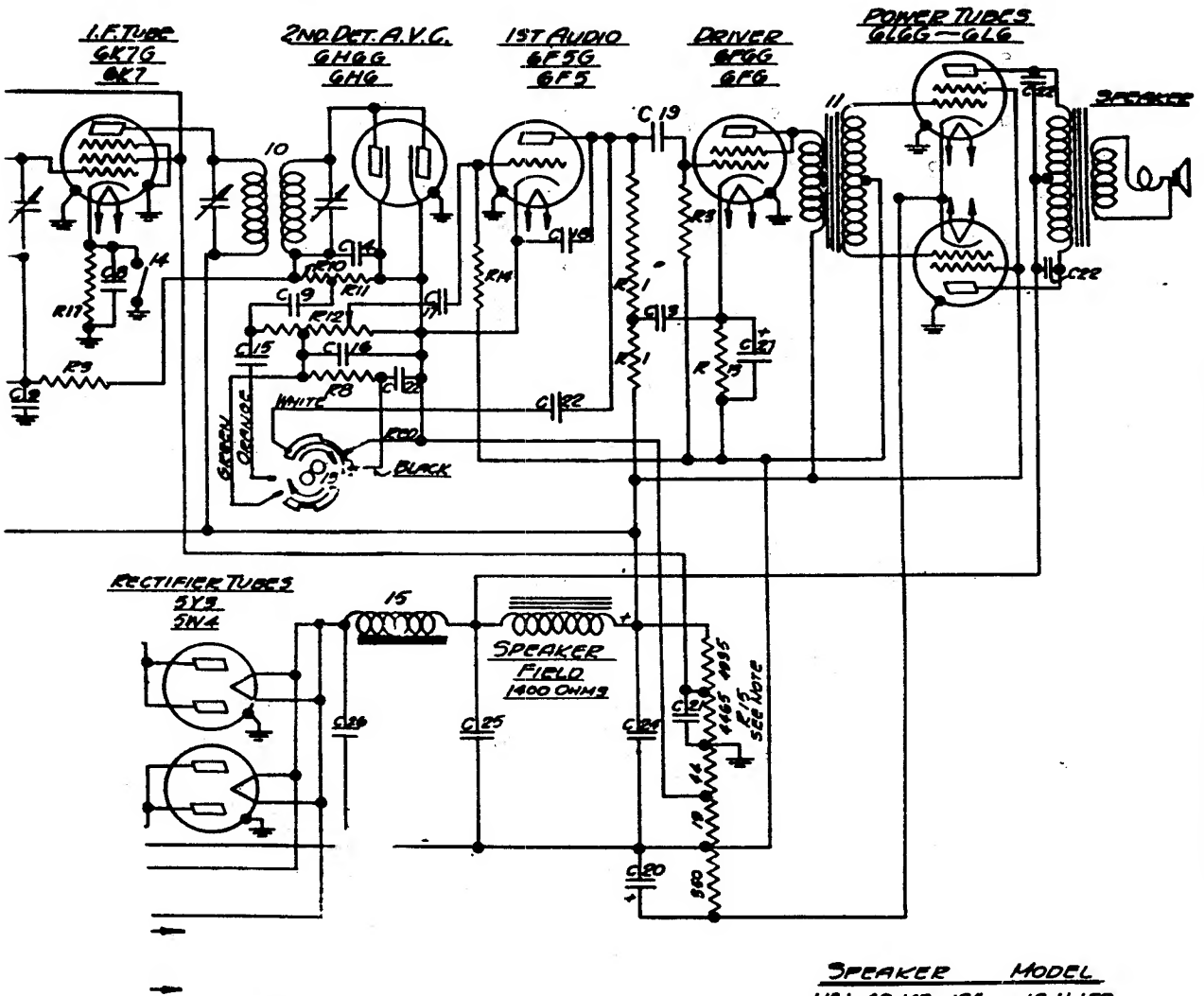
NOTE: See bottom page 18 for details of antenna connector strip.



DIAG. NO.	PART NO.	DESCRIPTION	
C1	22-303	5 MMFD	600V
C2	487	.05 MFD	400V
C3	170	.1 "	400V
C4	289	50 MMFD	600V
C5	187	25 MMFD	600V
C6	212	.05 MFD	400V
C7	486	.0012 "	600V
C8	243	.01 "	400V
C9	250	.05 "	200V
C10	508	TRIMMER COND	
C11	285	10 MMFD	600V
C12	205	200-550 MFD PADDER	
C13	384	.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	435	.02	600V
C20	509	10 MFD DRY ELEC COND	50V
C21	506	16 " WET " "	250V
C22	229	.005 MFD (TUBULAR)	600V
C23	485	.006 "	600V
C24	125	8 MFD WET ELEC. COND	450V
C25	294	16 " " "	450V
C26	304	8 " " " (CHROM)	450V
C27	405	10 " DRY " COND.	50V
R1	69-278	99 M OHM	1/4W
R2	397	500 "	1/4W
R3	293	990 M "	1/4W
R4	208	12 M "	1W
R5	466	990 "	1/2W
R6	392	5100 "	1W
R7	390	5 "	1/4W
R8	280	40 M "	1/4W
R9	903	700 "	1/4W

DIAG. NO.	PART NO.	DESCRIPTION	
R10	69-280	100 M OHMS	1/4W
R11	385	300 M "	1/4W
R12	522	2 MEGOHM VOL. CONT & SW.	
R13	531	650 OHM	1W
R14	523	2 MEGOHM	1/4W
R15	520	CANDOHM	
R16	411	20 OHM	1/4W
R17	261	9900 OHM	1/4W
1	20-71	ANTENNA CHOKE	
2	20-195	R.F. PLATE "	
3	122-14	TUNING METER	
4	54545	ANTENNA COIL ASSEM	
5	54546	DETECTOR " "	
6	54547	OSCILLATOR " "	
7	54387	H.F. DETECTOR " "	
8	54388	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	85-92	TONE CONT SWITCH	
14	95-91	SENSITIVITY CONT SW	
15	95-366	POWER CHOKE	
16	85-89	PHONO SWITCH	
17	44-7	" JACK	
18	86-94	BAND SELECTOR SWITCH	

CIRCUIT DIAGRAM—Models 12-U-158,



SPEAKER	MODEL
N21 49-149 12"	12-U-158
N21 49-150 12"	12-U-159
N22 49-158 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 N° 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.

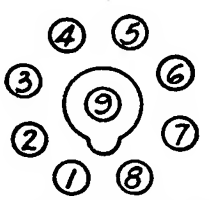
There is also available an adapter and special cabineted permanent magnet dynamic speaker for extension use, and a Volume Limiting Knob for controlling maximum speaker level in hospitals or other installations where subdued response is desirable.

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

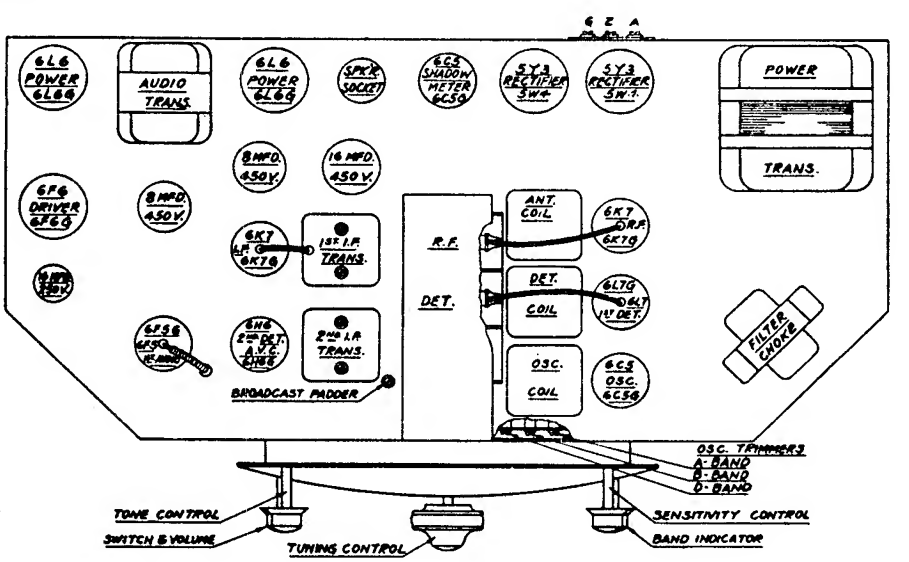
All voltages measured from point indicated to ground, using a 1000 ohm per volt meter. Antenna and ground disconnected.

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.

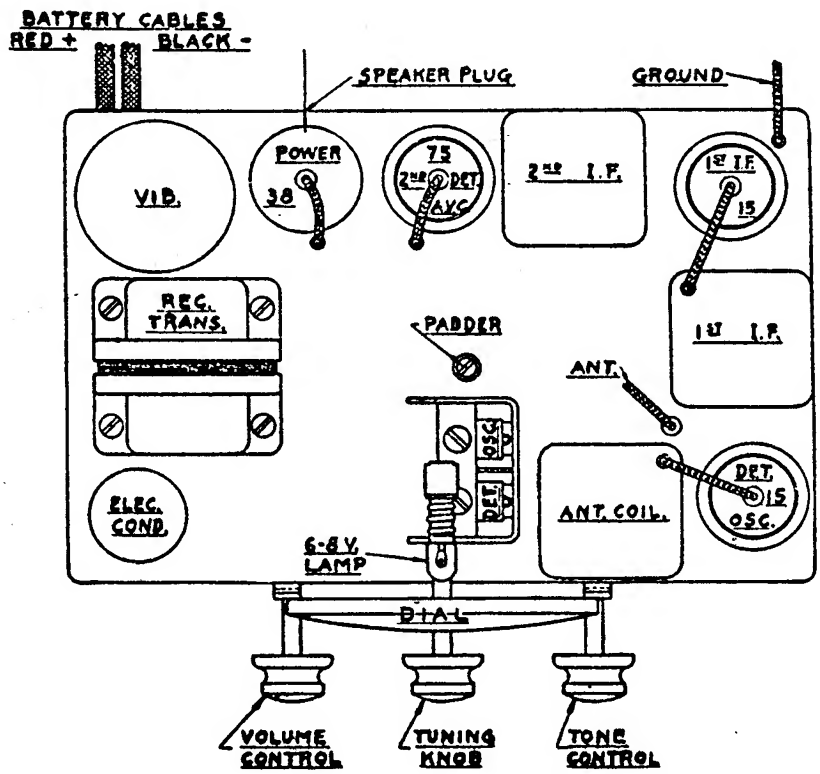
(4) Set the signal generator at 1400 K.C. Set the pointer on the receiver dial at the same frequency.

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.

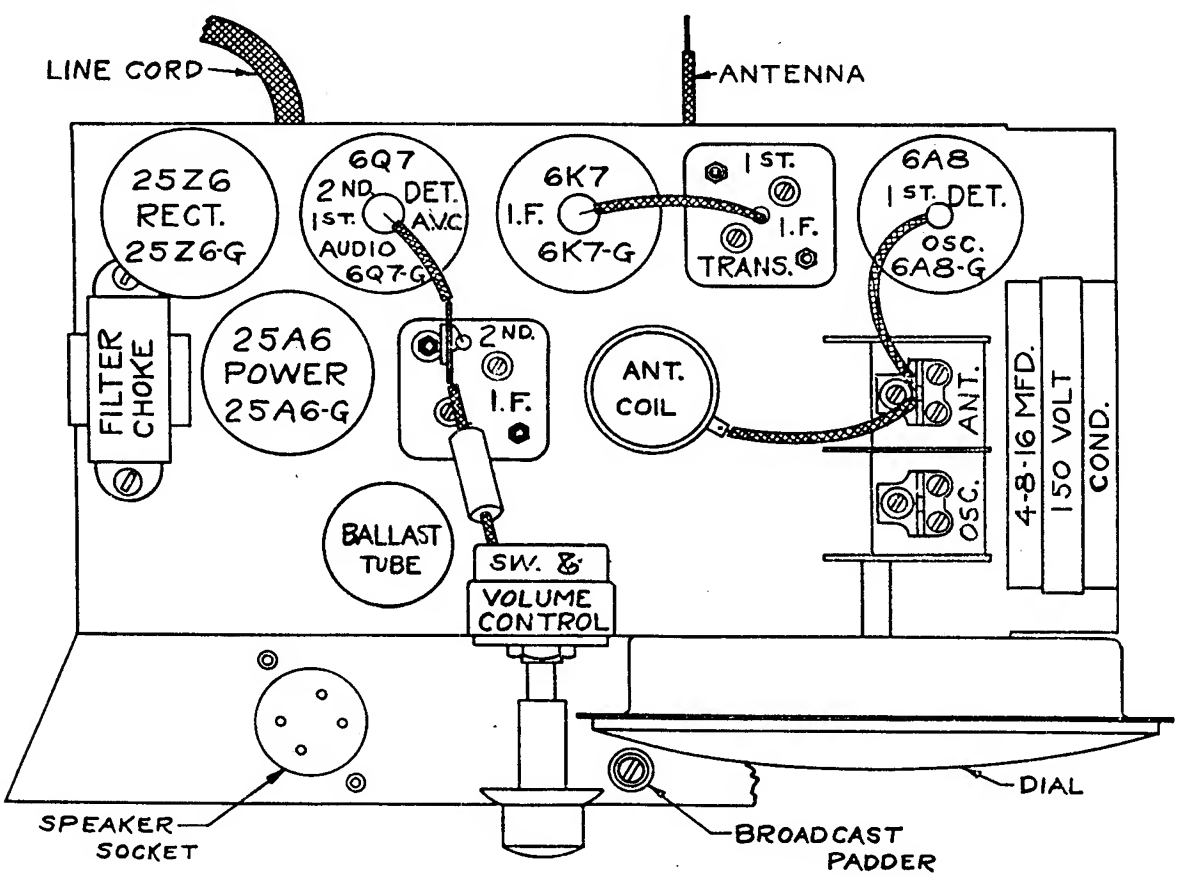
First adjust the oscillator and then the detector trimmers on the gang condenser to the point giving the maximum reading on the output meter, using as weak a signal from the generator as possible so as to prevent the A.V.C. action from affecting the output readings.

(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.

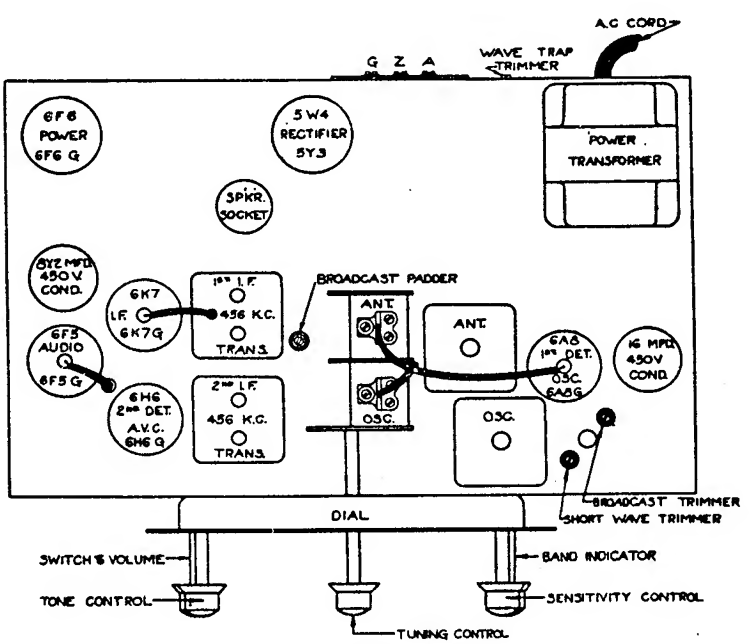
(5) Set signal generator at 6 M.C. Switch receiver to band B, and adjust osc. trimmer on gang for correct dial reading.

(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.

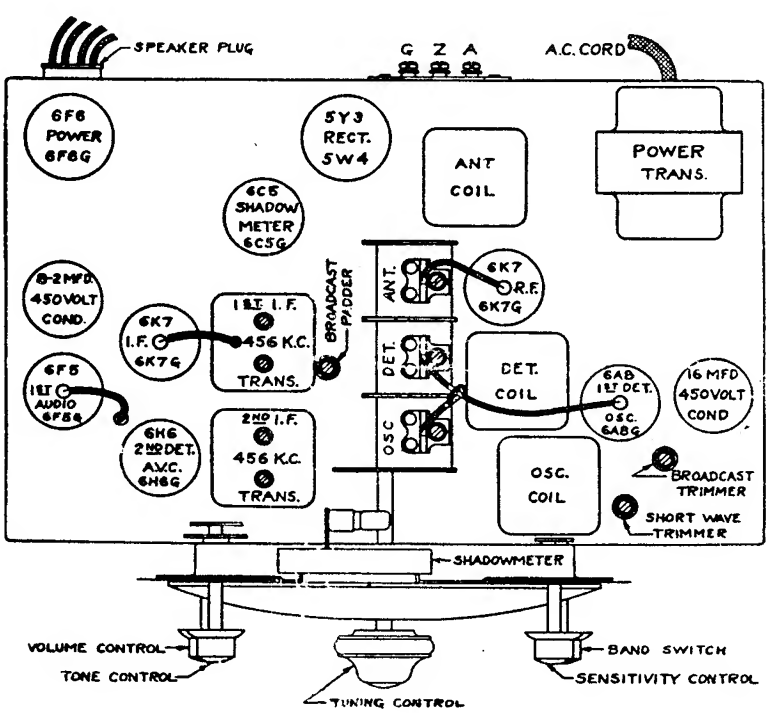
(4) Set signal generator at 6 M.C.—Switch receiver to band B, and adjust osc. trimmer on gang for correct dial reading.

(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.

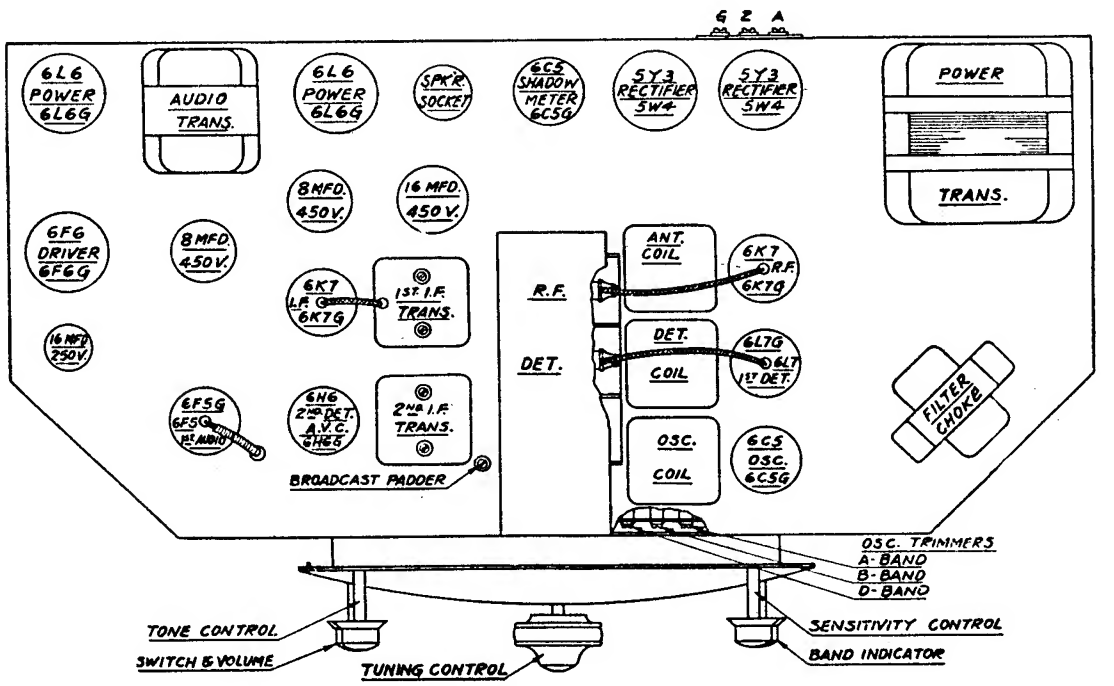
(5) Set signal generator at 600 K.C., and rock pointer past 600 K.C. on dial scale, meanwhile adjusting the broadcast padder until combination is reached which gives the greatest output reading.

(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	5635	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	19 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
95-3[illegible]	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 [illegible] 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)

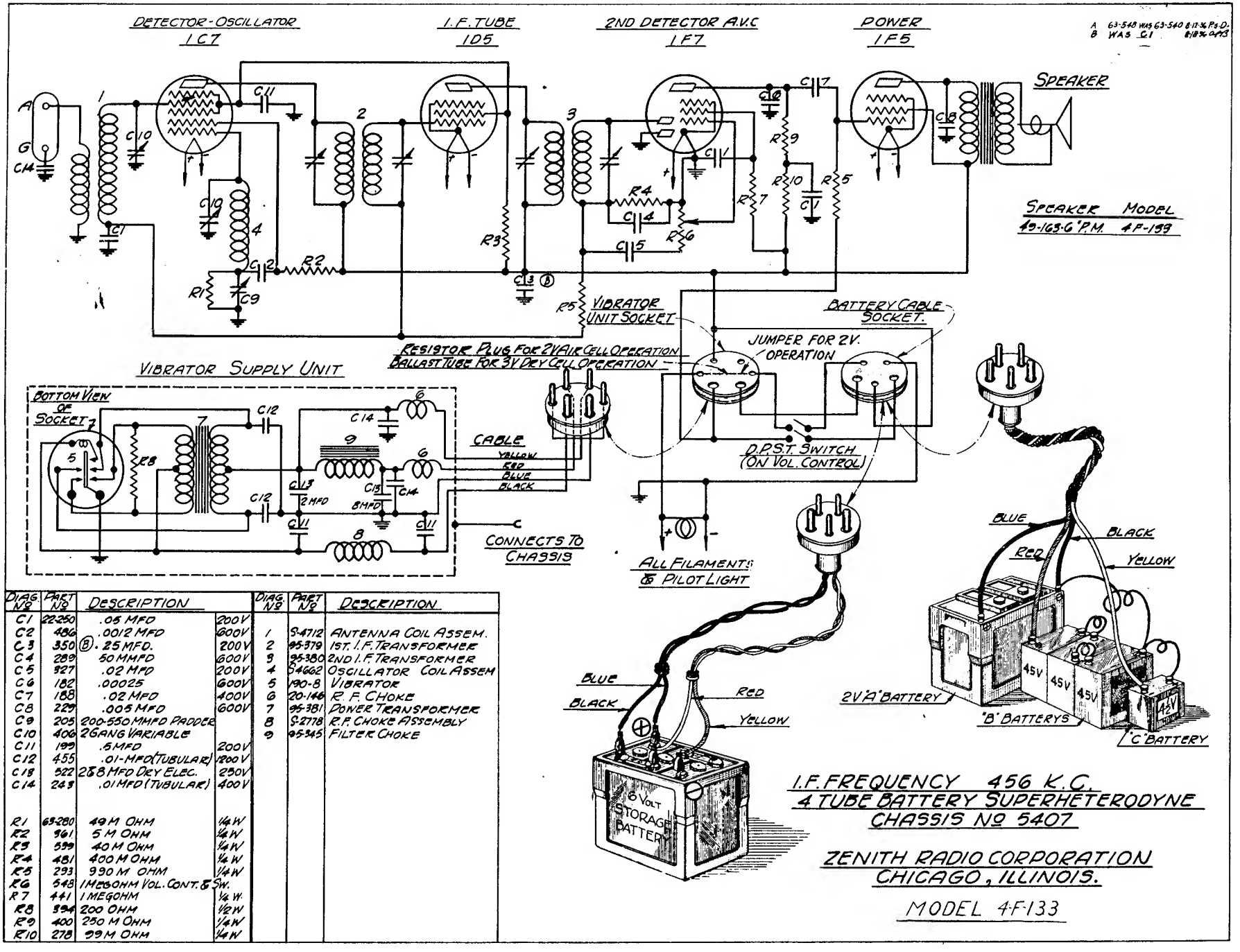
PART NO.	DESCRIPTION	1203	1004	5801	5707	5634	5635	5633	5516	5406	PRICE
78-139	Wafer Socket for 15 Tube						*			*	.10
78-140	Wafer Socket for 38 Tube									*	.10
78-141	Vibrator Socket						*			*	.10
78-144	Wafer Socket for Speaker	*									.15
78-145	Wafer Socket for 6F5 Tube	*		*	*	*					.15
78-148	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

PART NO.	DESCRIPTION	1203	1004	5801	5707	5634	5635	5633	5516	5406	PRICE
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		DIAG. NO	PART NO	DESCRIPTION
C1	22-250	.05 MFD	200V			
C2	486	.0012 MFD	600V	1	S-4712	ANTENNA COIL ASSEM.
C3	350	Ⓑ .25 MFD.	200V	2	95-379	1ST. I.F. TRANSFORMER
C4	289	50 MMFD	600V	3	95-380	2ND I.F. TRANSFORMER
C5	927	.02 MFD	200V	4	S-4662	OSCILLATOR COIL ASSEM
C6	182	.00025	600V	5	190-8	VIBRATOR
C7	188	.02 MFD	400V	6	20-146	R.F. CHOKE
C8	229	.005 MFD	600V	7	95-381	POWER TRANSFORMER
C9	205	200-550 MMFD PADDER		8	S-2778	R.F. CHOKE ASSEMBLY
C10	406	2 GANG VARIABLE		9	95-345	FILTER CHOKE
C11	199	.5 MFD	200V			
C12	455	.01-MFD (TUBULAR)	1200V			
C13	522	2&8 MFD DRY ELEC.	250V			
C14	248	.01 MFD (TUBULAR)	400V			
R1	63-280	49 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	200 OHM	1/2 W			
R9	400	250 M OHM	1/4 W			
R10	278	99 M OHM	1/4 W			

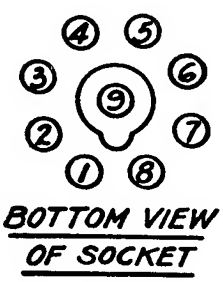
SOCKET VOLTAGES

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	-	

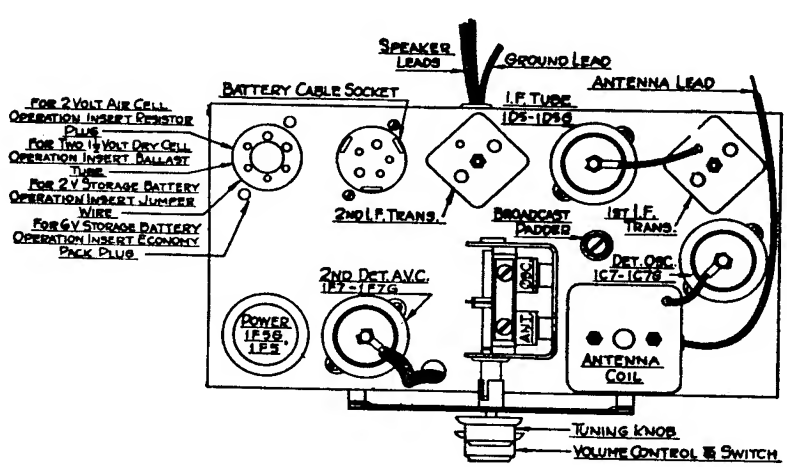
All voltages measured with a 1000 ohm per volt D.C. meter and using the Zenith 6 V. Economy Pack - Antenna and ground disconnected.
Battery Voltage - 6.3 V.
Battery Drain - .98 amp.

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

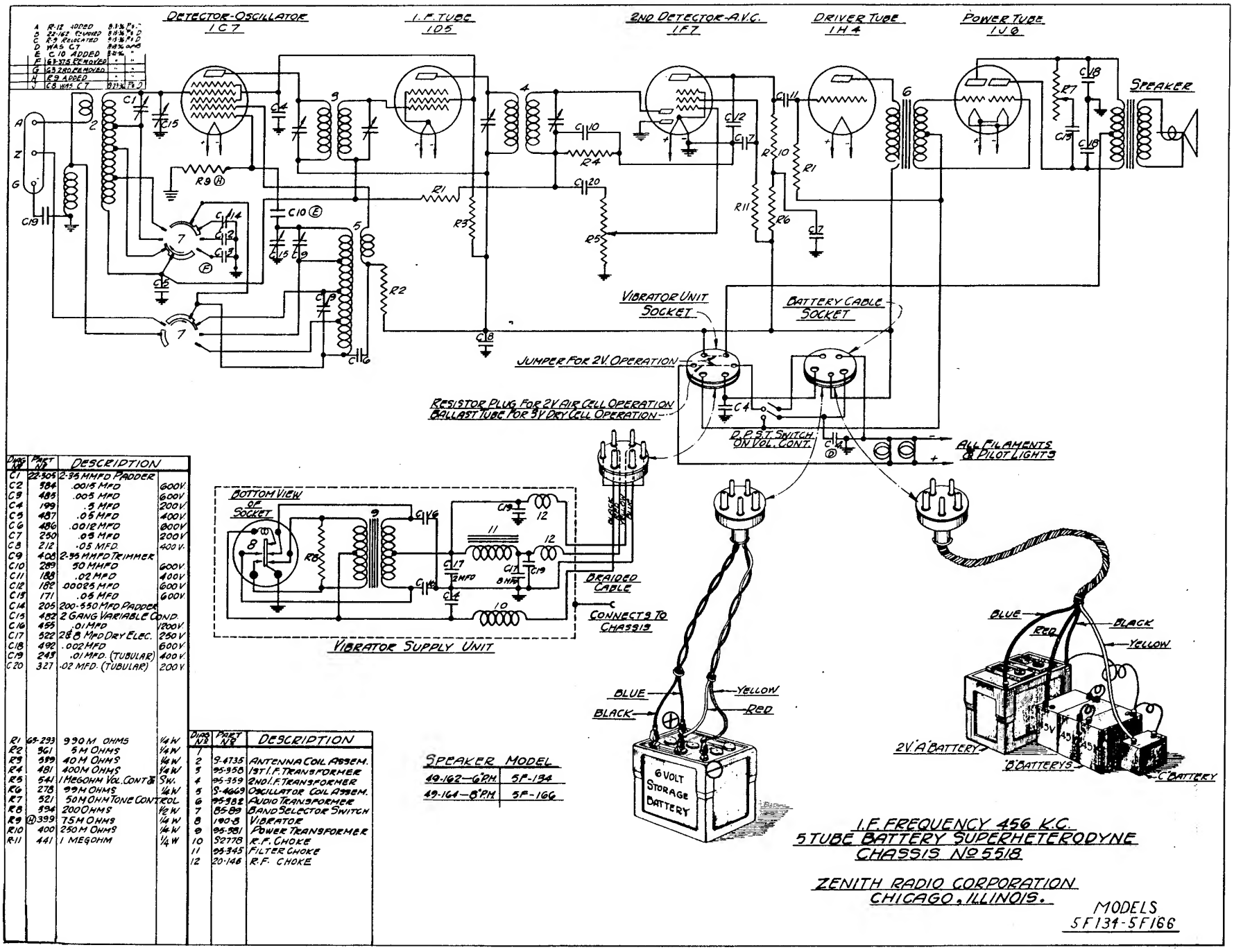
23-12	Tube Socket Contact Jumper	.02
63-544	Resistor Plug (Used With Air Cell Battery)	.50
100-52	Ballast Tube (Used with 3 Volt Dry Cell)	1.25

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



A	R-12 ADDED	8.5% Pri.
B	22-162 REMOVED	8.5% Pri.
C	R-9 RELOCATED	8.5% Pri.
D	WAS C7	8.5% was
E	C-10 ADDED	8.5% "
F	161-375 REMOVED	" "
G	163-280 REMOVED	" "
H	R-9 ADDED	" "
J	C-8 WAS C7	8.5% was C-7

Diag. No.	Part No.	Description	
C1	22-305	2-35 MMFD PADDER	
C2	984	.0015 MFD	600V.
C3	485	.005 MFD	600V.
C4	199	.5 MFD	200V.
C5	487	.05 MFD	400V.
C6	486	.0012 MFD	600V.
C7	250	.05 MFD	200V.
C8	212	.05 MFD.	400V.
C9	408	2-35 MMFD TRIMMER	
C10	289	50 MMFD	600V.
C11	188	.02 MFD	400V.
C12	182	.00025 MFD	600V.
C13	171	.05 MFD	600V.
C14	205	200-550 MFD PADDER	
C15	482	2 GANG VARIABLE COND.	
C16	495	.01 MFD	1200V.
C17	522	2-8 MFD DRY ELEC.	250V.
C18	492	.002 MFD	600V.
C19	243	.01 MFD. (TUBULAR)	400V.
C20	327	.02 MFD. (TUBULAR)	200V.

Diag. No.	Part No.	Description	
R1	69-293	990 M OHMS	1/4 W
R2	961	5 M OHMS	1/4 W
R3	999	40 M OHMS	1/4 W
R4	481	400M OHMS	1/4 W
R5	541	1 MEGOHM VOL. CONT. & SW.	
R6	278	99M OHMS	1/4 W
R7	521	50M OHM TONE CONTROL	
R8	994	200 OHMS	1/2 W
R9	399	75M OHMS	1/4 W
R10	400	250M OHMS	1/4 W
R11	441	1 MEGOHM	1/4 W

Diag. No.	Part No.	Description
1		
2	9-4735	ANTENNA COIL ASSEM.
3	95-958	1ST I.F. TRANSFORMER
4	95-959	2ND I.F. TRANSFORMER
5	S-4669	OSCILLATOR COIL ASSEM.
6	95-982	AUDIO TRANSFORMER
7	85-89	BAND SELECTOR SWITCH
8	190-S	VIBRATOR
9	95-981	POWER TRANSFORMER
10	S2778	R.F. CHOKE
11	95-945	FILTER CHOKE
12	20-148	R.F. CHOKE

SPEAKER MODEL	
49-162—6 P.M.	5F-134
49-164—8 P.M.	5F-166

I.F. FREQUENCY 456 K.C.
5 TUBE BATTERY SUPERHETERODYNE
CHASSIS No 5518

ZENITH RADIO CORPORATION
CHICAGO, ILLINOIS.

MODELS
5F134-5F166

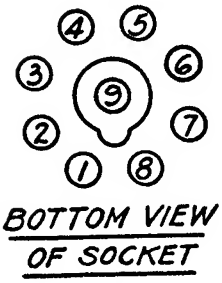
SOCKET VOLTAGES

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	-

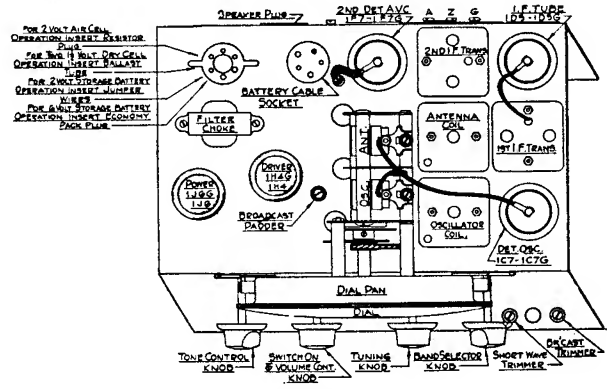
All voltages measured with a 1000 ohm per volt D.C. meter and using the Zenith 6 V. Economy Pack. Antenna and ground disconnected.
Battery Voltage 6.3 V. - Battery Drain 1.1 ampere

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

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. 20[illegible] Volt	.15
22-289	50 Mmfd. [illegible]olt	.12
22-305	2-35 Mm[illegible]. Trimmer	.15
22-327	.02 M[illegible]. 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-4663	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[d]					2.0	110										
6B4-G (6B4)	**RECTIFIER**	**FULL-WAVE HIGH VACUUM**	**F**	**5.0**	**350**[r]					**1.2**	**110**										
6A8-G (6A8)	PENTAGRID CONVERTER	OSCILLATOR MODULATOR	K	6.3	250	-h	250[d]	100[p]	-3	0.3	3.3	4.0	3.2			500[m]			0.03	12.5	12.5
6B6 (A)	DUPLEX DIODE TRIODE	DETECTOR AMPLIFIER	E	6.3	250	-2				0.3	0.8			91000	1100	100			1.70	1.70	3.80
6C5-G (6C5)	TRIODE	AMPLIFIER	K	6.3	250	-8				0.3	8.0			10000	2000	20			1.80	4.00	13.0
6F5-G (6F5)	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	3000			
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
6J7-G (6K7)	PENTODE	VARIABLE-MU AMPLIFIER	K	6.3	250	-3[j]	100	6		0.3	7.0	1.7		800000	1450	1160			.005	7.00	12.0
6L6-G (6L6)	**TETRODE POWER AMPLIFIER**		**K**	**6.3**	**375**	**-17.5**	**250**			**0.9**	**87.0**	**2.5**		**40,000**	**5000**	**200**	**4000**	**11500**			
6L7-G (6L7)	PENTAGRID MIXER		K	6.3	250	-6	150[l]	18[o] -15[p]		0.3	3.3	8.3[c]		1.0x10[6][i]	350[m]				.060	8.5	12.5
6L7-G (6L7)	PENTAGRID VARIABLE MU AMPLIFIER		K	6.3	250	-3[k]	100[c]	-3[j]		0.3	3.3	8.3		800000	1100	880					
6N6-G (6N6)	**DOUBLE TRIODE**	**POWER AMPLIFIER**	**K**	**6.3**	**>00[e]**	**0**				**0.8[f]**	**48[t]**			**24,100**	**2400**	**58**	**7800**	**4000**			
6N7-G (6N7)	DUPLEX TRIODE	AMPLIFIER CLASS B	A	6.3	300	0				0.8	125[t]						10000[j]	10000			
6N7-G (6J7)	DUPLEX TRIODE	AMPLIFIER CLASS A	K	6.3	294	-6				0.8	7.0			11000	3200	7	40000	400			
6P7	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	L	6.3	250	-9				0.3	9.5			8500	1900	16					
6X5-G (6X5)	RECTIFIER	FULL-WAVE HIGH VACUUM	K	6.3	350[q]					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	4500 4000	900 2000			
25Z6-G (25Z6)	RECTIFIER	HIGH VACUUM DOUBLER	L	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
(i) 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

MARCH 1936

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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 45.0 90.0 135.0					0.25									8.1	3.1	2.2
		AMPLIFIER				4.5 9.0					2.5 3.0			11,000 10,000	725 800	8.0 8.0					
10	TRIODE	AMPLIFIER CLASS A	F	7.5	250.0 350.0 425.0	22.0 31.0 39.0				1.25	10.0 16.0 18.0			6,000 5,150 5,000	1330 1550 1600	8.0 8.0 8.0	13,000 11,000 10,200	400 900 1600	7.0	4.0	3.0
12-A	TRIODE	DETECTOR OR AMPLIFIER	F	5.0	90.0 135.0 180.0	4.5 9.0 13.5				0.25	5.2 6.2 7.6			5,400 5,100 4,700	1575 1650 1800	8.5 8.5 8.5	5,300 9,000 10,650	35 130 285	8.1	4.0	2.0
		AMPLIFIER																			
15	PENTODE	AMPLIFIER	H	2.0	67.5 135	1.5 1.5	67.5 67.5			0.220	1.85 1.85	0.5 0.4		630,000 800,000	710 750	450 600			0.01	2.35	7.8
19	DUPLEX TRIODE	AMPLIFIER CLASS B	F	2.0	135.0 135.0 135.0	0.0 3.0 6.0				0.26	10.0 4.0 1.0						10,000(12) 15,000 15,000	2100 1900 1600			
22	TETRODE	AMPLIFIER	D	3.3	135.0 135.0	1.5 1.5	45.0 67.5			0.13	1.7 3.7	0.6 1.3		725,000 325,000	375 500	270.0 160.0			.01	3.0	10.0
24	TETRODE	DETECTOR BIASED (1)	H	2.5	250.0 180.0 180.0 250.0	5.0(3) 1.5 3.0 3.0	20.0(3) 75.0 90.0 90.0			1.75	0.1 4.0 4.0 4.0	1.0 1.5 1.7		400,000 400,000 600,000	1050 1000 1050	420.0 400.0 630.0			.007	5.3	10.5
		AMPLIFIER																			
26	TRIODE	AMPLIFIER	F	1.5	90.0 135.0 180.0	7.0 10.0 14.5				1.05	2.9 5.5 6.2			8,900 7,600 7,300	935 1100 1150	8.3 8.3 8.3			8.1	3.5	2.2
27	TRIODE	DETECTOR BIASED(2)	H	2.5	250.0 275.0	30.0(4) 33.0(4)				1.75	0.2 0.2								3.3	3.5	3.0
		AMPLIFIER			90.0 135.0 180.0 250.0	6.0 9.0 13.5 21.0					2.7 4.5 5.0 5.2			11,000 9,000 9,000 9,250	820 1000 1000 975	9.0 9.0 9.0 9.0	14,000 13,000 18,700 24,000	30 80 165 300			
30	TRIODE	DETECTOR OR AMPLIFIER	F	2.0	90.0 135.0 180.0	4.5 9.0 13.5				0.06	2.5 3.0 3.1			11,000 10,300 10,300	850 900 900	9.3 9.3 9.3	15,000	16	6.0	3.7	2.1
		AMPLIFIER																			
31	TRIODE	POWER AMPLIFIER	F	2.0	135.0 180.0	22.5 30.0				0.13	8.0 12.3			4,100 3,600	925 1050	3.8 3.8	7,000 5,700	185 375	5.7	3.5	2.2
32	TETRODE	DETECTOR BIASED(5)	F	2.0	135.0 180.0	4.5(4) 5.0(4)	45.0 67.5			0.06	0.2 0.2			950,000			100,000 100,000		.015	6.0	11.7
		AMPLIFIER			135.0 180.0	3.0 3.0	67.5 67.5				1.7 1.7	0.4 0.4		950,000 1,200,000	640 650	610.0 780.0					
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	67.5 135.0 180.0	3.0 3.0 3.0	67.5 67.5 67.5			0.06	2.7 2.8 2.8	1.1 1.0 1.0		400,000 600,000 1,000,000	560(6) 600(6) 620(6)	224.0 360.0 620.0			.02	5.8	11.6
35	USE TYPE 51																				
36	TETRODE	DETECTOR BIASED	H	6.3	100.0 180.0 250.0	5.0(21) 6.0(21) 8.0(21)	55.0 67.5 90.0			0.30	0.2 0.2 0.2						250,000 250,000 250,000		.007	3.7	9.2
		AMPLIFIER			100.0 135.0 180.0 250.0	1.5 1.5 3.0 3.0	55.0 67.5 90.0 90.0				1.8 2.8 3.1 3.2	1.7 (max)		550,000 475,000 500,000 550,000	850 1000 1050 1080	470.0 475.0 525.0 595.0					
37	TRIODE	DETECTOR BIASED	H	6.3	90.0 135.0 180.0 250.0	10.0(4) 15.0(4) 20.0(4) 28.0(4)				0.30	0.2 0.2 0.2 0.2								2.0	3.5	2.2
		AMPLIFIER			90.0 135.0 180.0 250.0	6.0 9.0 13.5 18.0					2.5 4.1 4.3 7.5			11,500 10,000 10,200 8,400	800 925 900 1100	9.2 9.2 9.2 9.2					
38	PENTODE	AMPLIFIER CLASS A	H	6.3	100.0 135.0 180.0 250.0	9.0 13.5 18.0 25.0	100.0 135.0 180.0 250.0			0.30	7.0 9.0 14.0 22.0	1.2 1.5 2.4 3.8		140,000 130,000 110,000 100,000	875 925 1050 1200	120.0 120.0 120.0 120.0	15,000 13,500 11,600 10,000	270 550 1000 2500	0.3	3.5	7.5

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 5.8 5.8	1.6 1.4 1.4		375,000 750,000 1,000,000	960(7) 1000(7) 1050(7)	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	3000			
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 1600 2000	7.2	4.5	3.0
46	TETRODE	AMPLIFIER CLASS A AMPLIFIER CLASS B	F	2.5	250.0(15) 300.0 400.0	33.0 ± .0(17) ± .0(18)	250.0(12) ± .0(13) ± .0(13)			1.75	22.0 4.0(15) 6.0(16)			2,380	2350	5.6	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	6.3 6.5	2.5 2.5		300,000 400,000	1160(5) 1110(5)	350.0 445.0			.007	5.0	10.0
53	DUPLEX TRIODE	AMPLIFIER CLASS B	H	2.5	250.0 300.0	±.0 ±.0				2.0	14.0(6,7) 17.5						8,000 10,000	8000 10000			
		AMPLIFIER CLASS A DRIVER(6a)			250.0 300.0	-5.0 -6.0					6.0 7.0			11,300 11,000	3100 3200	35.0 35.0	(6a)	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	13.8			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(21) 1.70(21) 3.86(21) 4.30(21) 3.0	50.0 33.0 100.0 100.0 100.0	(22)		1.00	0.2 0.2 0.2 0.2 2.0	0.5		1,500,000	1225(21)	1500.0	250,000 500,000 250,000 500,000		.007	5.2	6.6
58	PENTODE	VARIABLE-MU AMPLIFIER MODULATOR	H	2.5	250.0 250.0	3.0 10.0(23)	100.0 100.0	(23)		1.00	8.2	3.0		800,000	1600(24)	1280.0			.007	5.2	6.8
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(26)	250.0(25) 250.0(25) ± .0(26)	25(25) (27) 4000(28)		2.00	26.0 35.0 13.0(31)	9.0		2,400 40,000	2600 2500	6.0 100.0	5,000 6,000 6,000(32)	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, +20 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_2 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 -50 is 0.
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 μ-mhos and at -50 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.

TYPE	CLASS	OPERATION	EMITTER	ELECTRODE POTENTIALS (VOLTS)						ELECTRODE CURRENTS				AVERAGE CHARACTERISTICS					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	125 400 790	7.6	3.7	2.1
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) AMPLIFIER	H	6.3	250.0 250.0	20.0 (4) 13.5				0.30	0.2 5.0			9,500	1450	13.8			3.2	3.2	8.2
77	PENTODE	DETECTOR BIASED (1)	H	6.3	100.0 250.0 250.0	1.95 (21) 1.95 (21) 4.30 (21)	36.0 50.0 100.0	(34)		0.30	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)	5500 (43)			
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 (48)						(49)				
83 (AG)	DUPLEX DIODE (MERCURY VAPOR)	RECTIFIER FULL-WAVE	F	5.0	500.0 (47)					3.00	250.0 (50)						(49)				
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	75 150 350	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 (26) 180.0 (26) 250.0 (26)		0.40	17.0 20.0 32.0			3,300 3,000 2,600	1425 1550 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 (52)			3.0 (53)						13,600 (52)	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	2.5	2.5
99 UX	TRIODE	DETECTOR OR AMPLIFIER	F	3.3	90.0	4.5				.06	2.5			15,500	425	6.6			3.3	2.5	2.5
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	8.7	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 2 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 (64)						
1C6	HEPTODE	OSCILLATOR MODULATOR	F	2.0	135.0 180.0	(56)	135.0 (70) 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			1.7	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 (20) R.F. OR I.F.	H	2.5	100.0	3.0	100.0	(34)		0.80	5.8	1.7		300,000	950(49)	285.0					
					180.0	3.0	75.0	(34)			3.4	0.9		1,000,000	840(50)	840.0					
					250.0	3.0	100.0	(34)			6.0	1.5		800,000	1000(51)	800.0					
					250.0	3.0	125.0	(34)			9.0	2.3		650,000	1125(52)	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	±.0				.8	14.0(47)						8,000	8000			
					300.0	±.0					17.5						10,000(48)	10000			
		AMPLIFIER CLASS A DRIVER (48)			250.0	-5.0					6.0			11,300	3100	35.0	(49)	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	0.6		1,500,000	1225(22)	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(24)	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)		0.30	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 (44)	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 FULL-WAVE 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 µ-mhos and at -60 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_{1a} and g_{1b} .
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 3600 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 275 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 20,000 and 40,000 ohms.
70. Applied through 20,000 ohm dropping resistor
71. Conversion Conductance at - 14 volts on G = 4.0

PHYSICAL CHARACTERISTICS													
TYPE	TYPE BULB	TYPE BASE	TERMINAL ARRANGEMENT PIN NO.								OVERALL HEIGHT (MAX.) INCHES	DIAMETER (MAX.) INCHES
			1	2	3	4	5	6	7	TOP CAP		
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					5.625	2.188
12 A	ST-14	M-4	F	P	G_1	F					4.688	1.813
15	ST-12C	S-5	H	P	G_2	K	H			G_1	4.531	1.563
19	ST-12	S-5	H	P_a	G_a	G_b	P_b	H			4.250	1.563
22	S-14C	M-4	F	P	G_2	F				G_1	5.031	1.813
24	ST-14C	M-5	H	P	G_2	K	H			G_1	5.031	1.813
26	ST-14	M-4	F	P	G_1	F					4.688	1.813
27	ST-12	S-5	H	P	G_1	K	H				4.250	1.563
30	ST-12	S-4	F	P	G_1	F					4.250	1.563
31	ST-12	S-4	F	P	G_1	F					4.250	1.563
32	ST-14C	M-4	F	P	G_2	F				G_1	5.031	1.813
33	ST-14	M-5	F	P	G_1	G_2	F				4.688	1.813
34	ST-14C	M-4	F	P	G_2					G_1	5.031	1.813
36	ST-12C	S-5	H	P	G_2	K	H			G_1	4.531	1.563
37	ST-12	S-5	H	P	G_1	K	H				4.250	1.563
38	ST-12C	S-5	H	P	G_2	K	H			G_1	4.531	1.563
39-44	ST-12C	S-5	H	P	G_2	K	H			G_1	4.531	1.563
41	ST-12	S-6	H	P	G_2	G_1	K	H			4.250	1.563
42	ST-14	M-6	H	P	G_2	G_1	K	H			4.688	1.813
43	ST-14	M-6	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-5	F	P	G_1	G_2	F				5.625	2.188
50	S-21	M-4	F	P	G_1	F					6.250	2.563
51	ST-14C	M-5	H	P	G_2	K	H			G_1	5.031	1.831
53	ST-14	M-7	H	P_a	G_1a	K	G_1b	P_b	H		4.688	1.813
55	ST-12C	S-6	H	P	P_1	P_2	K	H		G_1	4.531	1.563
56	ST-12	S-5	H	P	G_1	K	H				4.250	1.563
57	ST-12C	S-6	H	P	G_2	G_3	K	H		G_1	4.937	1.563
58	ST-12C	S-6	H	P	G_2	G_3	K	H		G_1	4.937	1.563
59	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
76	ST-12C	S-6	H	P	P_1	P_2	K	H		G_1	4.531	1.563
76	ST-12	S-5	H	P	G_1	K	H				4.250	1.563
77	ST-12C	S-6	H	P	G_2[25]	G_3	K	H		G_1	4.531	1.563

PHYSICAL CHARACTERISTICS												
TYPE	TYPE BULB	TYPE BASE	TERMINAL ARRANGEMENT PIN NO.								OVERALL HEIGHT (MAX.) INCHES	DIAMETER (MAX.) INCHES
			1	2	3	4	5	6	7	TOP CAP		
78	ST-12C	S-6	H	P	G_2	G_3	K [46]	H		G_1	4.531	1.563
79	ST-12C	S-6	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-19	M-4	F	P	–	F					6.250	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-5	H	P_1	P_2	K	H				4.250	1.563
85	ST-12C	S-6	H	P	P_1	P_2	K	H		G_1	4.531	1.563
89	ST-12C	S-6	H	P	G_2	G_3	K	H		G_1	4.531	1.563
99 UV	T-8	S-4M	F	P	F	G_1					3.500	1.063
99 UX	T-8	S-4	F	P	G_1	F					4.125	1.188
0A	S-14	M-5	F	P	G_1	G_2	F				4.688	1.813
PZ	ST-14	M-5	F	P	G_1	G_2	F				4.688	1.813
PZH	ST-14	M-7	H	P	G_2	G_1	G_3	K	H		4.688	1.813
WUNDERLICH A WUNDERLICH A-AUTO	S-12C S-12	M-5 M-6	H H	G P	P G	G G	H K	H		K	4.438 4.125	1.563 1.563
2A3	ST-16	M-4	F	P	G_1	F					5.375	2.063
2A5	ST-14	M-6	H	P	G_2	G_1	K	H			4.688	1.813
1A6	ST-12C	S-6	F	P	G_2	G_1	G_3G_5	F		G_4	4.531	1.563
1C6	ST-12C	S-6	F	P	G_2	G_1	G_3G_5	F		G_4	4.531	1.563
2A6	ST-12C	S-6	H	P	P_1	P_2	K	H		G_1	4.531	1.563
2A7	ST-12C	S-7	H	P	G_3[37]	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
2Z5	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	H		4.688	1.813
6A7	IDENTICAL TO 2A7 EXCEPT HEATER											
6B7	IDENTICAL TO 2B7 EXCEPT HEATER											
6C6	ST-12C	S-6	H	P	G_2	G_3	K	H		G_1	4.531	1.563
6D6	ST-12C	S-6	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
12A5	ST-12	S-7	H	P	G_2	G_1	K	H[44]	H		4.250	1.563
12A7	ST-12C	S-7	H	P_P	G_{2P}	K_R	P_R	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[44]	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.

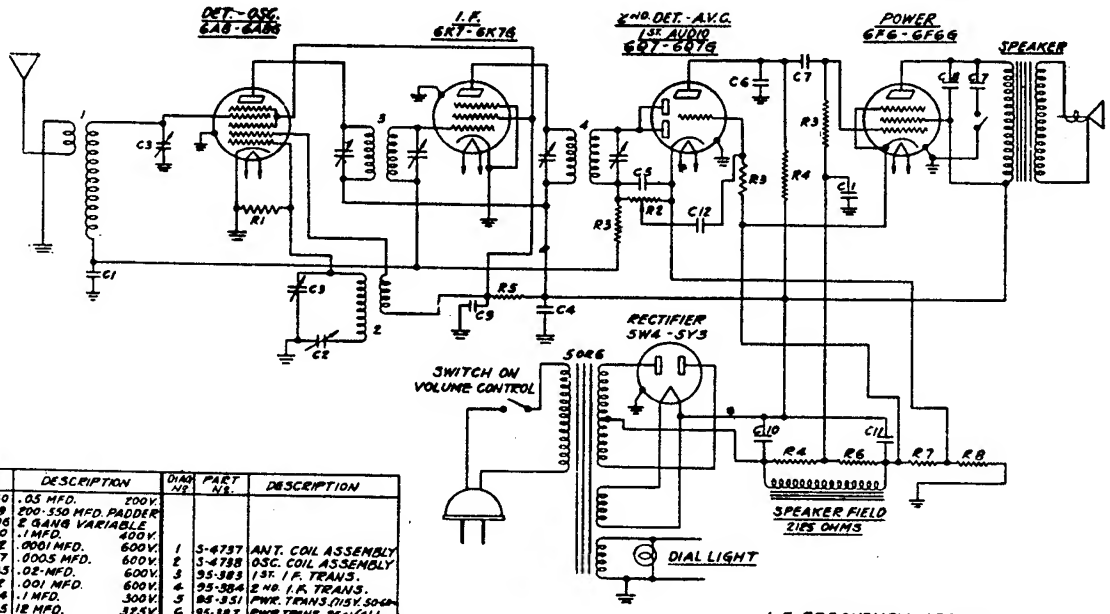
BASING CONNECTIONS FOR ZENITH TUBES WITH OCTAL BASES

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	$P_{(out)}$	$P_{(in)}$	$G_{(in)}$	X	H	K	X		
6N6-G	7	Xa	H	$P_{(out)}$	$P_{(in)}$	$G_{(in)}$	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.

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	.0001 MFD. 600V.
C6	22-147	.0005 MFD. 600V.
C7	22-435	.02 MFD. 600V.
C8	22-82	.001 MFD. 600V.
C9	22-224	.1 MFD. 300V.
C10	22-505	12 MFD. 325V.
C11	22-306	16 MFD. 250V.
C12	22-327	.02 MFD. 200V.
R1	63-289	4.9 M OHMS 1/4 W.
R2	63-447	400 M VOL. CONTROL
R3	63-293	990 M OHMS 1/4 W.
R4	63-258	490 M OHMS 1/4 W.
R5	63-345	12.5 M OHMS 1 W.
R6	63-376	190 M OHMS 1/4 W.
R7	63-346	80 OHMS 1/4 W.
R8	63-246	190 OHMS 1/4 W.

DIAG. NO.	PART NO.	DESCRIPTION
1	5-4737	ANT. COIL ASSEMBLY
2	5-4738	OSC. COIL ASSEMBLY
3	95-383	1ST. I.F. TRANS.
4	95-384	2 ND. I.F. TRANS.
5	85-351	PWR. TRANS. (115 V. 50-60 CY.)
6	95-387	PWR. TRANS. 25 M/A L.L. (VOLTAGE)
7		

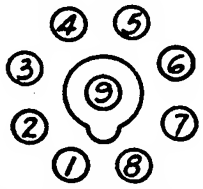
MODEL NO.	SPEAKER NO.	SIZE
5-R-123	49-113	5"
5-R-133	49-132	8"
5-R-165	49-144	10"

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.

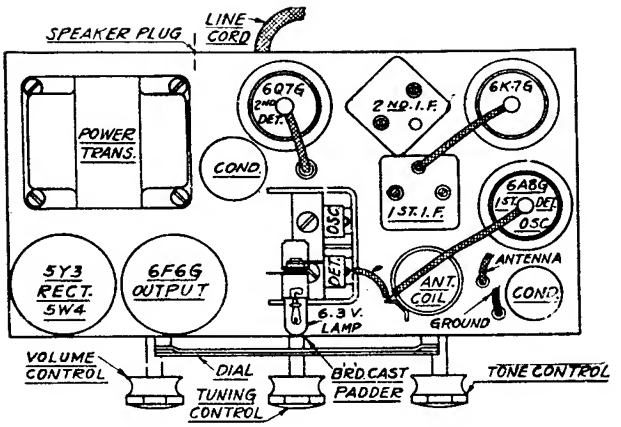
(3) Change the signal generator leads to the antenna and ground leads of the receiver.

(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

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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

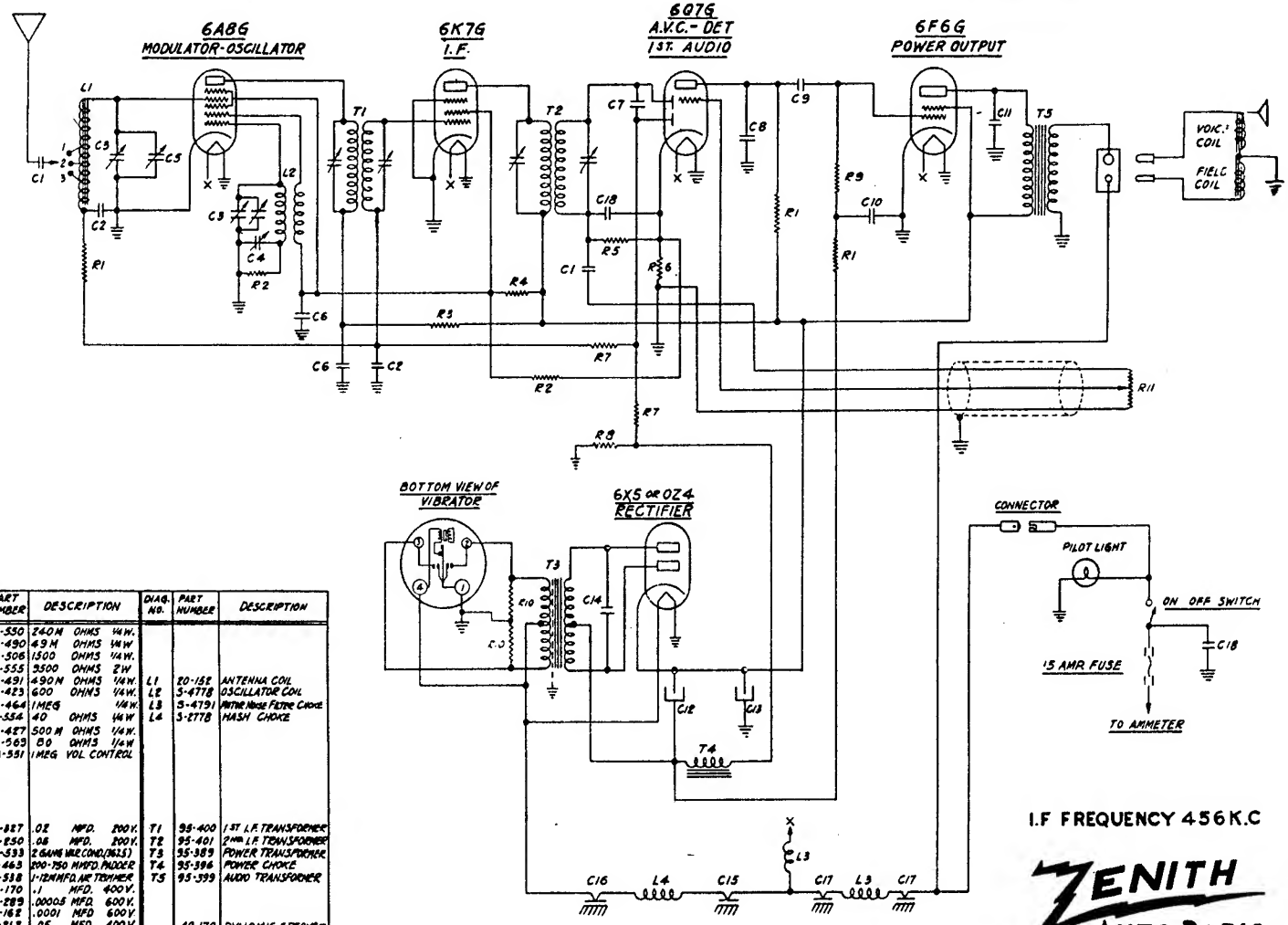
6-M-194

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	240 M OHMS 1/4 W.			
R2	63-490	4.9 M OHMS 1/4 W.			
R3	63-506	1500 OHMS 1/4 W.			
R4	63-555	2500 OHMS 2 W.	L1	20-152	ANTENNA COIL
R5	63-491	490 M OHMS 1/4 W.	L2	5-4778	OSCILLATOR COIL
R6	63-423	600 OHMS 1/4 W.	L3	5-4791	NOISE FILTER CHOKE
R7	63-464	1 MEG 1/4 W.	L4	5-2778	HASH CHOKE
R8	63-554	40 OHMS 1/4 W.			
R9	63-427	500 M OHMS 1/4 W.			
R10	63-563	50 OHMS 1/4 W.			
R11	63-551	1 MEG VOL. CONTROL			
C1	22-827	.02 MFD. 200 V.	T1	95-400	1ST. I.F. TRANSFORMER
C2	22-850	.06 MFD. 200 V.	T2	95-401	2ND I.F. TRANSFORMER
C3	22-533	2 GANG VAR. COND. (3615)	T3	95-389	POWER TRANSFORMER
C4	22-463	200-750 MMFD. PADDER	T4	95-396	POWER CHOKE
C5	22-538	1-12 MMFD. AIR TRIMMER	T5	95-399	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	22-540	.25 MFD. 200 V.		190-9	VIBRATOR
C11	22-229	.005 MFD. 600 V.			
C12	22-528	4 MFD 350 V.			
C13		8 MFD. 350 V.			
C14	22-535	.008 MFD. 1400 V.			
C15	22-468	.5 MFD. 200 V.			
C16	22-530	.5 MFD. 200 V.			
C17		250 M MFD. LO-REACT.			
C18	22-182	.0002 5 MFD. 600 V.			

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

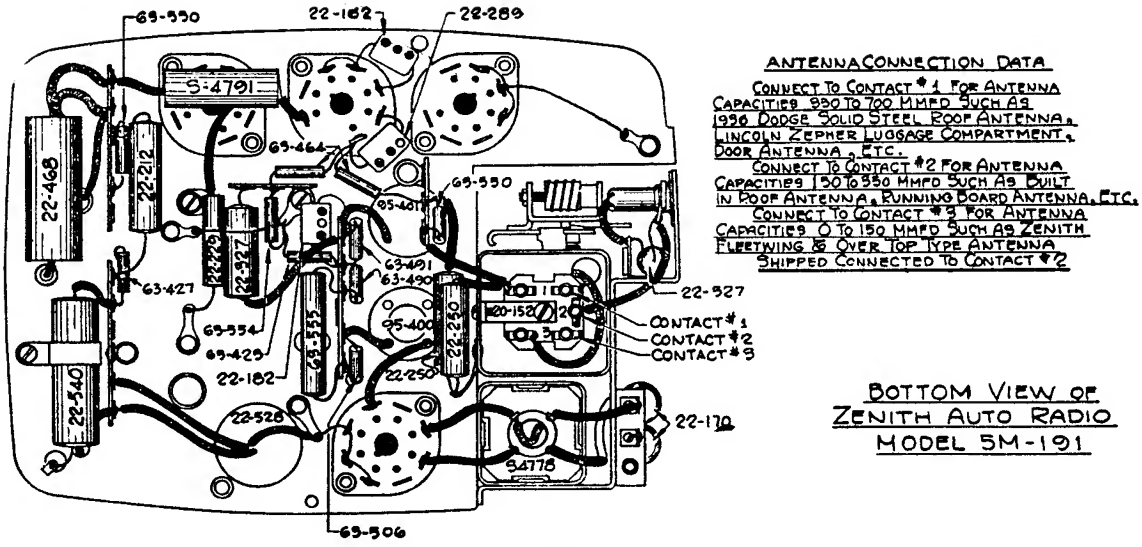
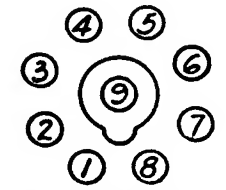


Fig. 2

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.

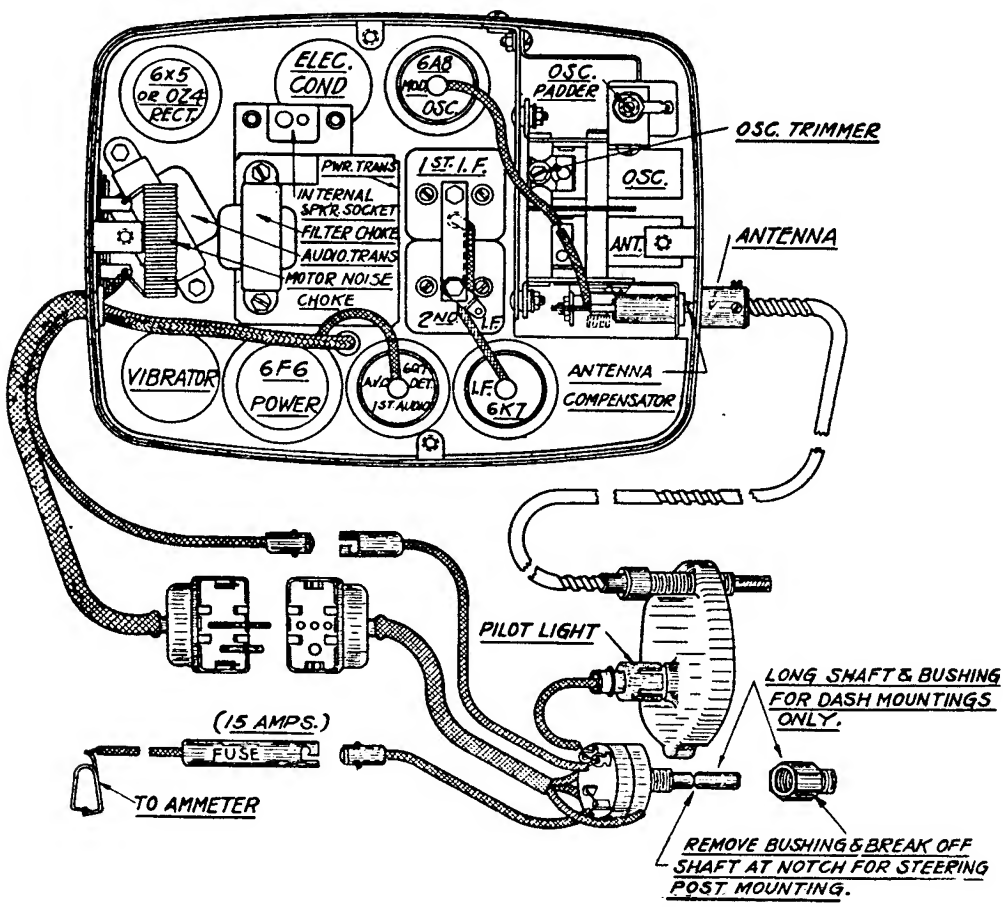
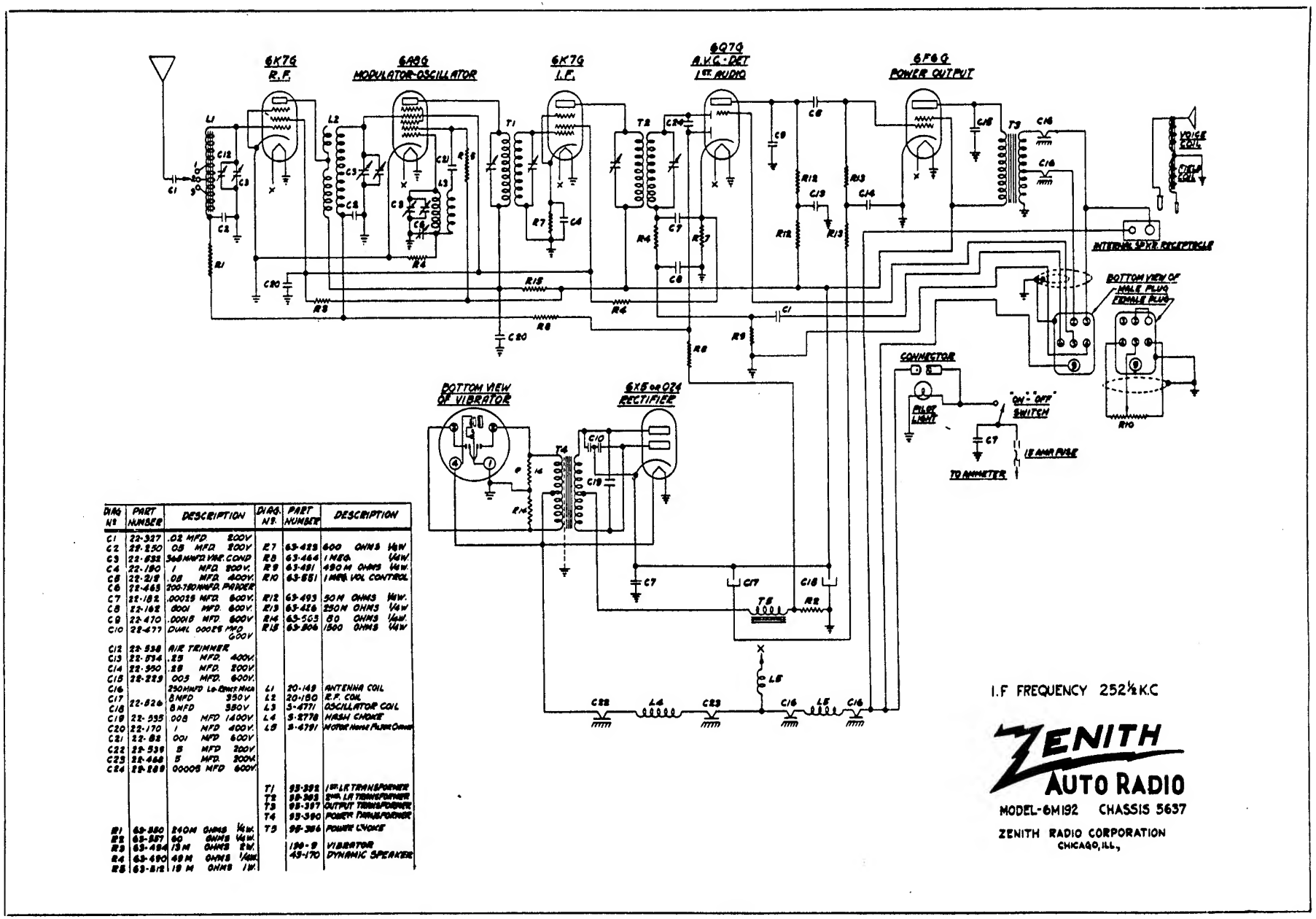


Fig. 3.—Tube Position 5-M-191

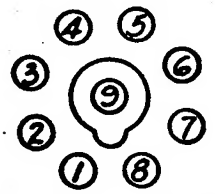


DIAG Nº	PART NUMBER	DESCRIPTION
C1	22-327	.02 MFD. 200V
C2	22-230	.05 MFD. 200V
C3	22-632	365 MMFD VAR. COND
C4	22-180	1 MFD. 200 V.
C5	22-218	.05 MFD. 400V.
C6	22-465	200-780 MMFD. PADER
C7	22-182	.00025 MFD. 600 V.
C8	22-182	.001 MFD. 600 V.
C9	22-470	.0018 MFD. 600V
C10	22-477	DUAL .0025 MFD. 600V
C12	22-538	AIR TRIMMER
C13	22-534	.25 MFD. 400V.
C14	22-350	.25 MFD. 200V.
C15	22-229	.005 MFD. 600V.
C16		250 MMFD Lo-Effect Mica
C17		8 MFD 350 V.
C18	22-826	8 MFD 350 V.
C19	22-535	.008 MFD 1400 V.
C20	22-170	1 MFD 400 V.
C21	22-82	.001 MFD 600 V.
C22	22-539	15 MFD 200 V.
C23	22-468	15 MFD. 200 V.
C24	22-288	.00005 MFD 600V
R1	63-550	240 M OHMS ½ W.
R2	63-557	60 OHMS ½ W.
R3	63-484	13 M OHMS 2 W.
R4	63-490	49 M OHMS ½ W.
R5	63-512	19 M OHMS 1 W.
R7	63-488	600 OHMS ½ W.
R8	63-464	1 MEG. ½ W.
R9	63-481	490 M OHMS ½ W.
R10	63-551	1 MEG VOL CONTROL
R12	63-493	50 M OHMS ½ W.
R13	63-426	250 M OHMS ½ W.
R14	63-503	80 OHMS ½ W.
R15	63-506	1500 OHMS ½ W.
L1	20-149	ANTENNA COIL
L2	20-150	R.F. COIL
L3	5-4771	OSCILLATOR COIL
L4	5-2778	HASH CHOKE
L5	5-4791	MOTOR NOISE FILTER CHOKE
T1	53-393	1ST I.F. TRANSFORMER
T2	53-395	2ND I.F. TRANSFORMER
T3	53-397	OUTPUT TRANSFORMER
T4	53-390	POWER TRANSFORMER
T5	98-386	POWER CHOKE
	130-9	VIBRATOR
	49-170	DYNAMIC SPEAKER

FIG. 4. WIRING DIAGRAM 6-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.

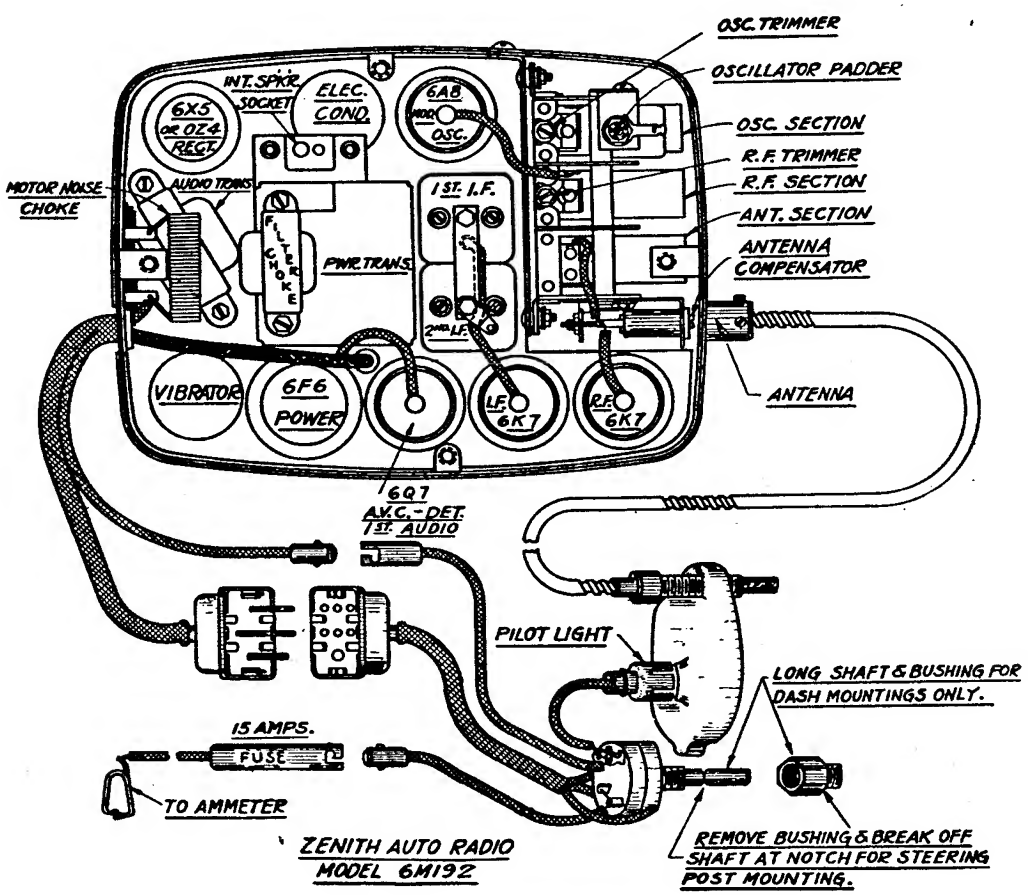


Fig. 5.—Tube Position 6-M-192

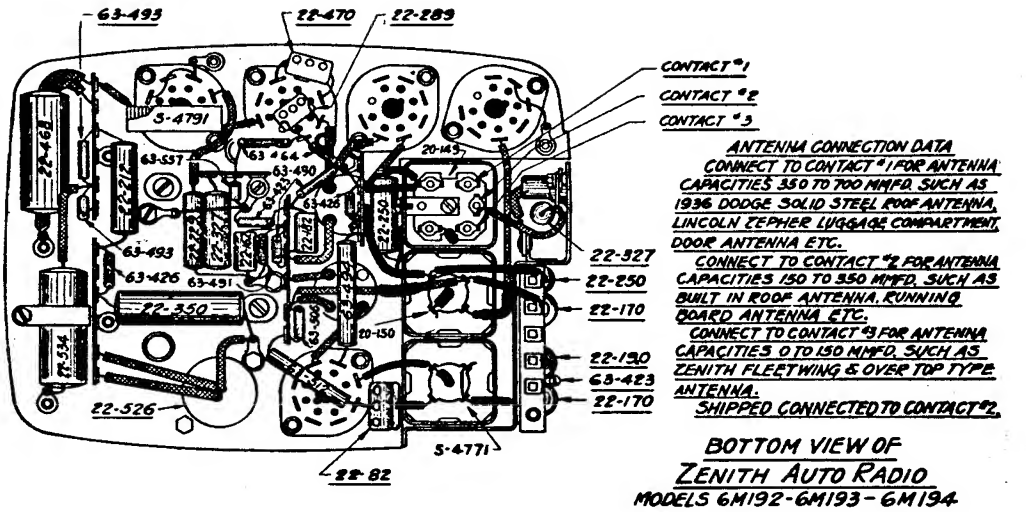


Fig. 6.—Bottom View—6-M-192, 6-M-193, 6-M-194

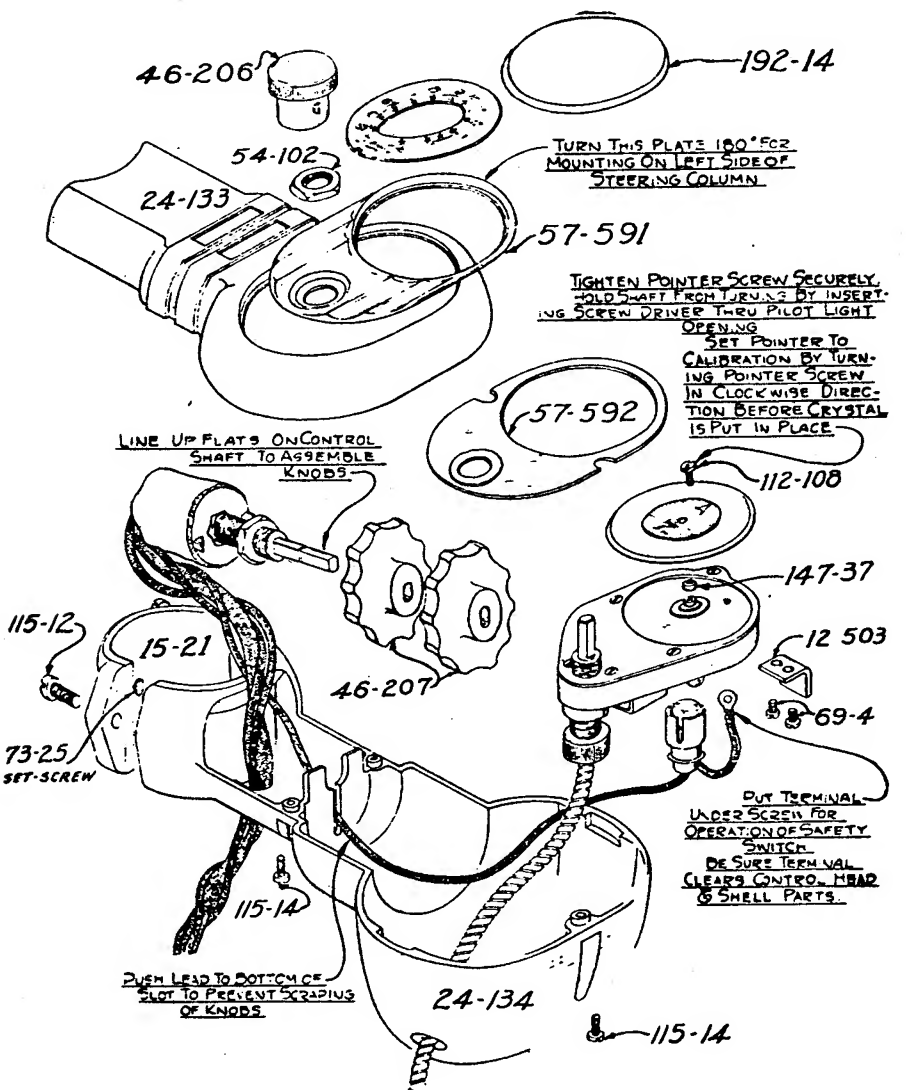
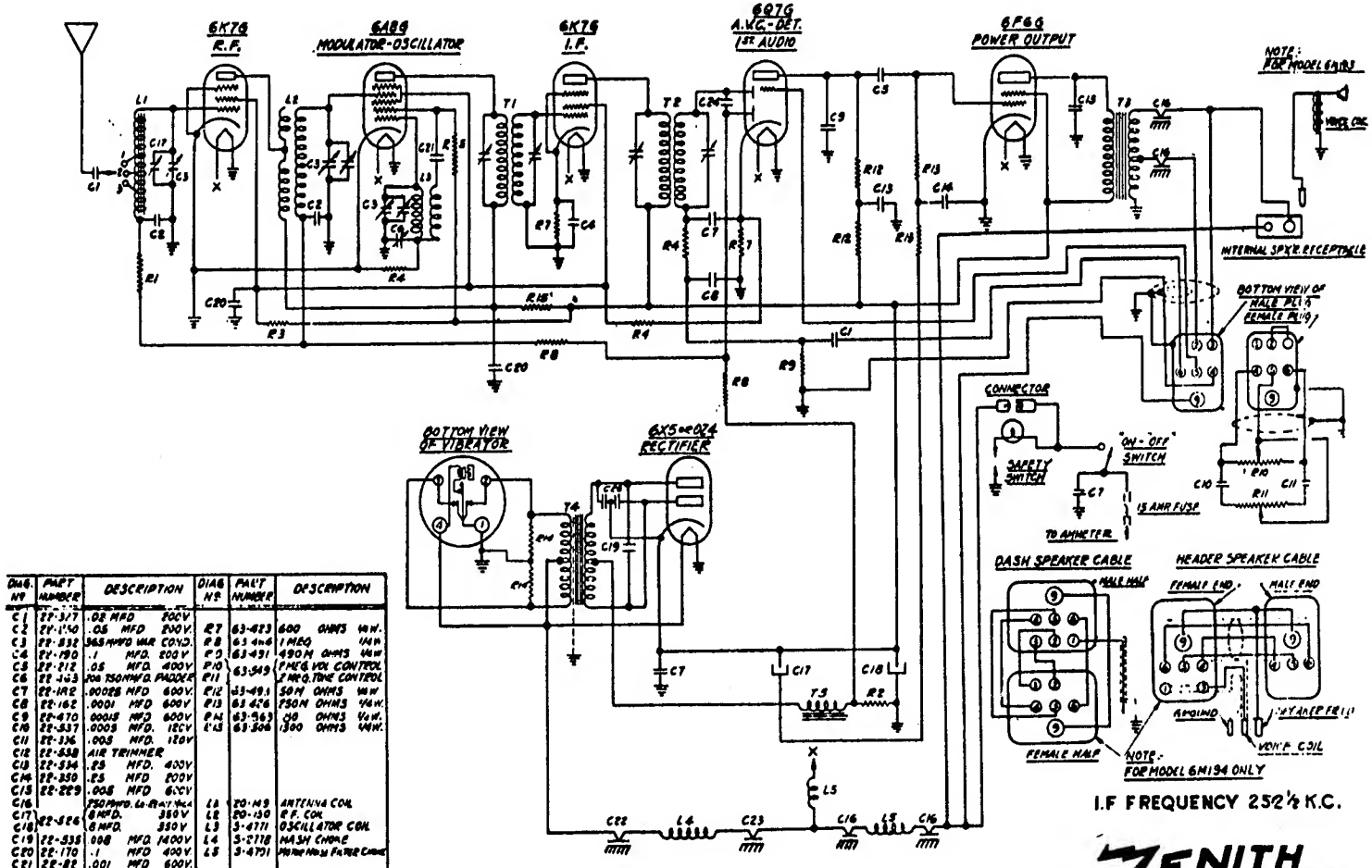


Fig. 7.—Steering Control Assembly

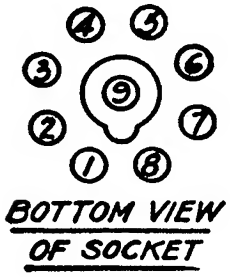


DIAG. NO	PART NUMBER	DESCRIPTION	DIAG NO	PART NUMBER	DESCRIPTION
C1	22-317	.08 MFD. 600V	R7	63-623	600 OHMS 1W.
C2	22-1140	.05 MFD. 200V.	R8	63 4048	1 MEG. 1W.
C3	22-332	365 MMFD VAR. COND.	R9	63-491	490M OHMS 1W.
C4	22-190	.1 MFD. 200V	R10		2 MEG VOL CONTROL
C5	22-212	.05 MFD. 400V	R11	63-549	2 MEG TONE CONTROL
C6	22-343	206 150MMFD. PADDER	R12	63-491	50M OHMS 1W
C7	22-182	.00025 MFD 600V.	R13	63 426	250M OHMS ½W.
C8	22-162	.0001 MFD 600V	R14	63-963	10 OHMS ½W.
C9	22-470	.0015 MFD 600V	R15	63-308	1300 OHMS 1W.
C10	22-537	.0005 MFD. 125V			
C11	22-336	.005 MFD. 125V			
C12	22-538	AIR TRIMMER			
C13	22-534	.25 MFD. 400V			
C14	22-350	.25 MFD 200V			
C15	22-229	.005 MFD 600V			
C16		750 MMFD.	L1	20-149	ANTENNA COIL
C17	22-526	8 MFD. 350V	L2	20-150	R.F. COIL
C18		8 MFD. 350V	L3	3-4771	OSCILLATOR COIL
C19	22-535	.008 MFD 1400V	L4	3-2718	HASH CHOKE
C20	22-170	.1 MFD 400V	L5	3-4791	
C21	22-82	.001 MFD 600V.			
C22	22-539	.5 MFD 200V.			
C23	22-468	.5 MFD 200V			
C24	22-289	.00005 MFD 600V			
C25	22-477				
			T1	98-396	1ST I.F. TRANSFORMER
			T2	98 393	2ND I.F. TRANSFORMER
			T3	98-397	OUTPUT TRANSFORMER
			T4	98-350	POWER TRANSFORMER
			T5	98-396	POWER CHOKE
R1	63-830	240M OHMS ½W			
R2	63-887	60 OHMS ½W.		190-9	VIBRATOR
R3	63-494	13 M OHMS 2W		4911	DYNAMIC SPKR.
R4	63-490	49 M OHMS 1W			
R5	63-812	19 M OHMS 1W.			

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.

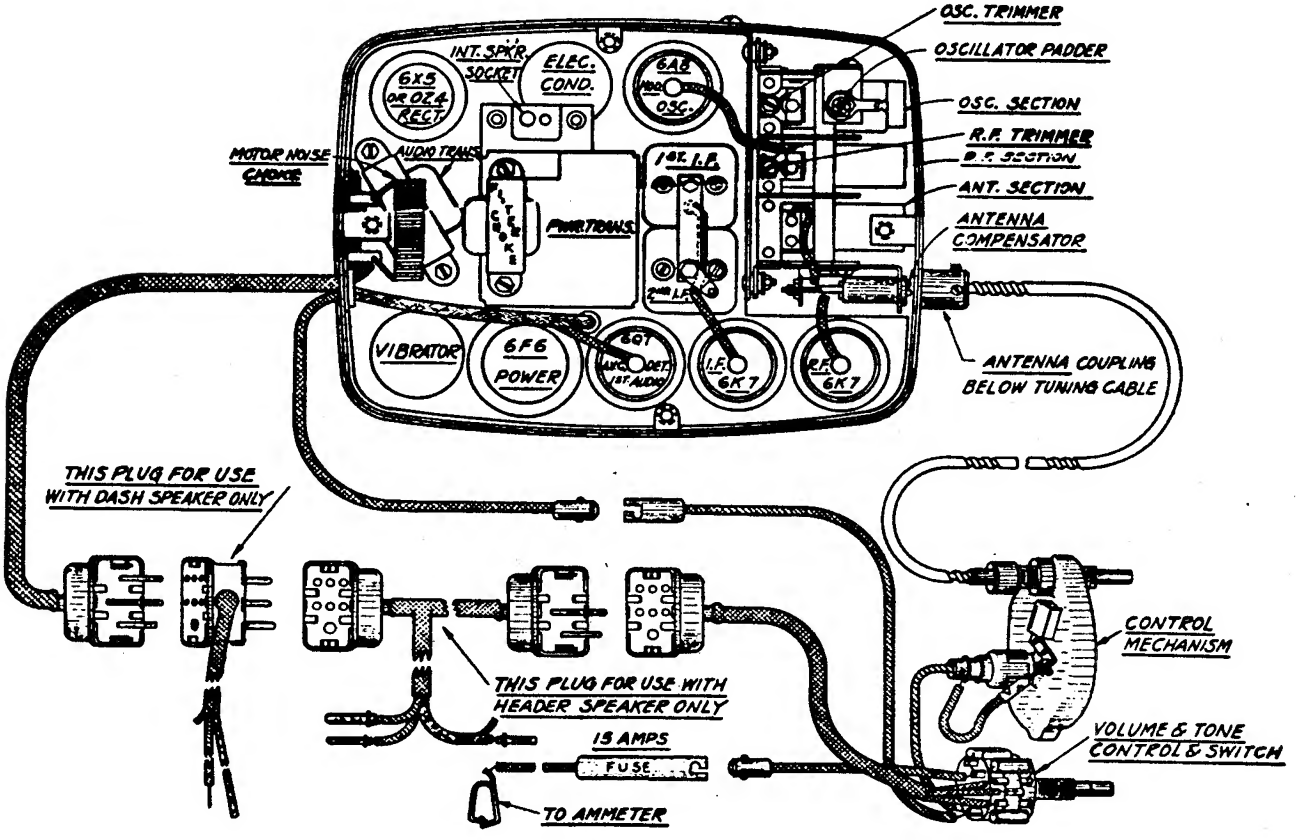
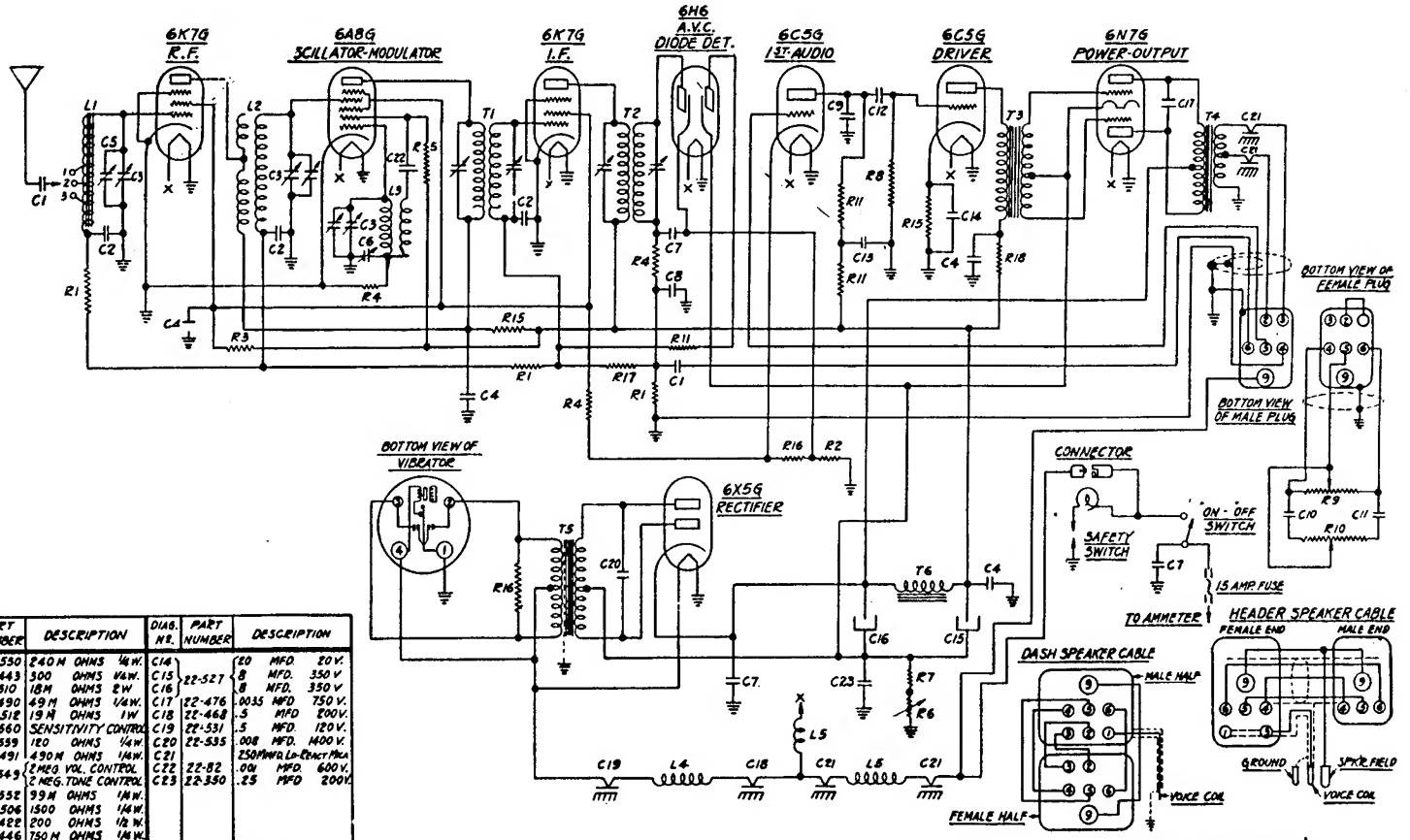


Fig. 9.—Tube Position 6-M-193, 6-M-194



DIAG. No.	PART NUMBER	DESCRIPTION
R1	63-550	240 M OHMS ¼W.
R2	63-443	300 OHMS ½W.
R3	63-510	18M OHMS 2W
R4	63-490	49 M OHMS ¼W.
R5	63-518	19 M OHMS 1W
R6	63-560	SENSITIVITY CONTROL
R7	63-559	120 OHMS ¼W
R8	63-491	490 M OHMS ¼W.
R9	63-549	2 MEG. VOL. CONTROL
R10		2 MEG. TONE CONTROL
R11	63-552	99 M OHMS ½W.
R15	63-506	1500 OHMS ¼W.
R16	63-422	200 OHMS ½ W.
R17	63-446	750 M OHMS ½W.
R18	63-561	4900 OHMS ½W.
C1	22-327	.02 MFD. 200V.
C2	22-250	.05 MFD 200V.
C3	22-532	365 MMFD. VAR. COND.
C4	22-170	.1 MFD. 400V.
C5	22-538	1-12 MMFD. AIR TRIMMER
C6	22-463	200-750 MMFD. PADDER
C7	22-182	.00025 MFD. 600V.
C8	22-162	.0001 MFD 600V.
C9	22-470	.00015 MFD. 600V.
C10	22-537	.0005 MFD 120V.
C11	22-336	.005 MFD. 120V.
C12	22-712	.05 MFD 400V.
C13	22-534	.25 MFD 400V.
C14	22-527	20 MFD. 20V.
C15		8 MFD. 350 V
C16		8 MFD. 350 V
C17	22-476	.0035 MFD 750 V.
C18	22-468	.5 MFD 200V.
C19	22-531	.5 MFD. 120V.
C20	22-535	.008 MFD. 1400 V.
C21		250 MMFD. LO-REACT MICA
C22	22-82	.001 MFD. 600 V.
C23	22-350	.25 MFD 200V.
L1	20 149	ANTENNA COIL
L2	20-150	R.F. COIL
L3	5-4771	OSCILLATOR COIL
L4	5-2778	HASH CHOKE
L5	5-4791	MOTOR NOISE FILTER CHOKE
T1	95-394	1ST I.F. TRANSFORMER
T2	95-395	2ND I.F. TRANSFORMER
T3	95-388	PUSH PULL INPUT TRANS. PUSH PULL OUTPUT TRANS.
T4		
T5	95-391	POWER TRANSFORMER
T6	95-398	POWER CHOKE
	190 9	VIBRATOR

ZENITH AUTO RADIO

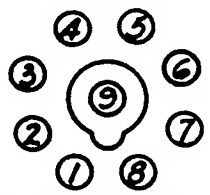
MODEL 6M195 CHASSIS 5803

ZENITH RADIO CORPORATION
CHICAGO, ILL.

FIG. 10. WIRING DIAGRAM MODEL 6-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.			Inaccessible						
6C5	Audio	0	5.9	44	—	0	—	0	1.1	—
6C5	Driver	0	5.9	200	—	0	—	0	6.8	—
6N7	Power	0	0	235	—3.5	—3.5	235	5.9	—3.5	—
6X5	Rectifier			Inaccessible						



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

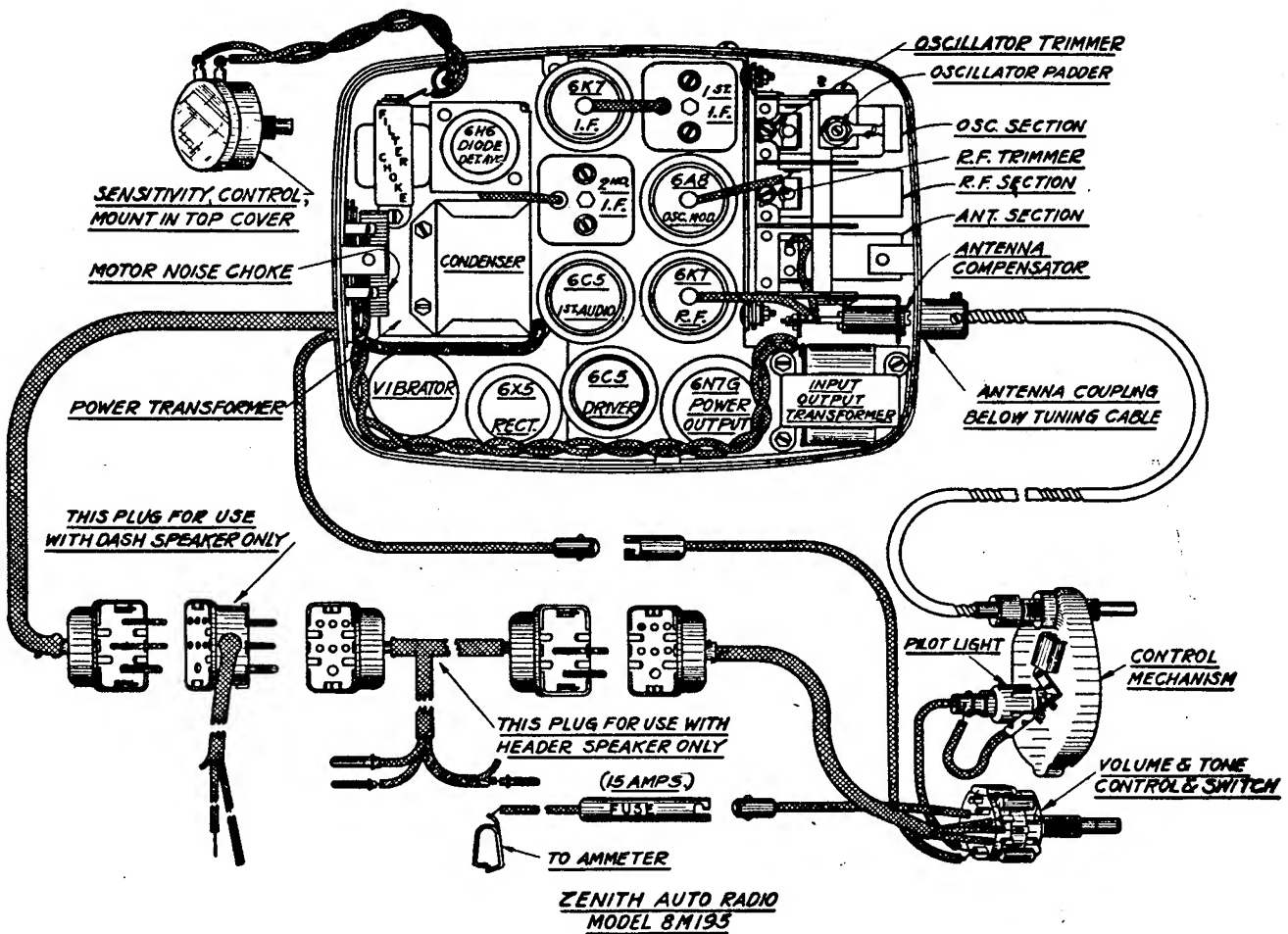
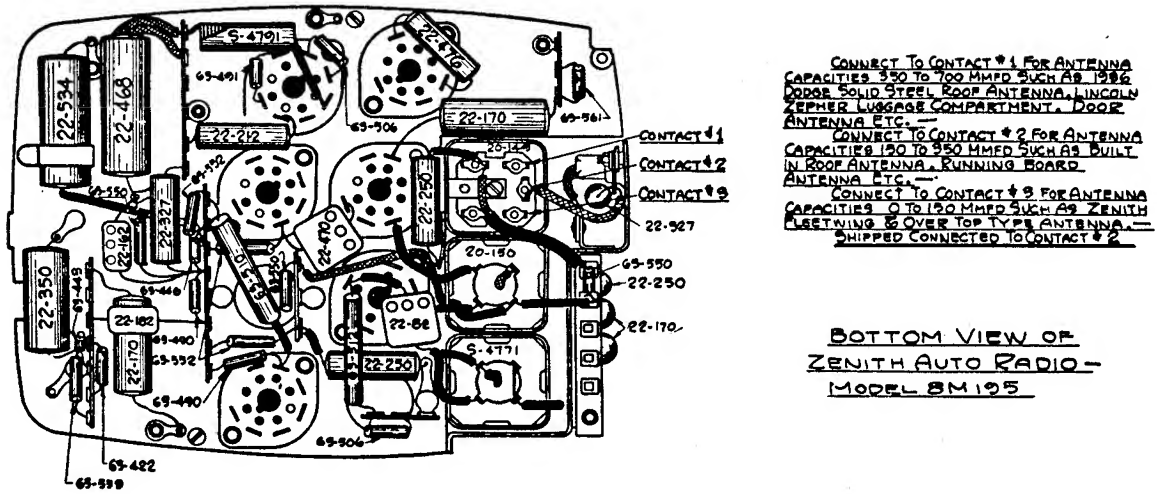


Fig. 11.—Tube Position 8-M-195



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
0-149	Antenna Coil	8	6		$ 1.25
0-150	R.F. Coil	8	6		.60
0-152	Antenna Coil			5	1.25
5-392	1st I.F. Transformer		6		1.25
3-393	2nd I.F. Transformer		6		1.25
5-394	1st I.F. Transformer	8			1.25
5-395	2nd I.F. Transformer	8			1.25
5-400	1st I.F. Transformer			5	1.25
5-401	2nd I.F. Transformer			5	1.25
2778	Hash Choke	8	6	5	.15
4771	Oscillator Coil	8	6		.45
4778	Oscillator Coil			5	.45
4791	Motor Noise Filter Choke	8	6	5	.20

Condensers

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

Resistors

3-422	200 Ohm 1/2 Watt	8	6	5	.20
3-423	600 Ohm 1/4 Watt		6	5	.20
3-426	250 M ohm 1/4 Watt		6		.20
3-427	500 M ohm 1/4 Watt			5	.20
3-443	300 Ohm 1/4 Watt	8			.20
3-446	750 M ohm 1/4 Watt	8			.20
3-464	1 megohm 1/4 Watt		6	5	.20
3-490	49 M ohm 1/4 Watt	8	6	5	.20
3-491	490 M ohm 1/4 Watt	8	6	5	.20
3-493	50 M ohm 1/4 Watt		6		.20
3-494	13 M ohm 2 Watt		6		.25
3-506	1500 ohm 1/4 Watt	8	6	5	.20
3-51_	18 M ohm 2 Watt	8			.25
3-512	19 M ohm 1 Watt	8	6		.20
3-549	2 megohm vol. and tone control (dual)	8	6		2.00
3-550	240 M ohm 1/4 Watt	8	6	5	.20
3-551	1 megohm vol. control (6M192 only)		6	5	1.00
3-552	99 M ohm 1/4 Watt	8			.20
3-554	40 ohm 1/4 Watt			5	.20
3-555	9.500 ohm 2 Watt			5	.25
3-557	60 ohm 1/4 Watt		6		.20
3-559	120 ohm wire wound 1/4 Watt	8			.20
3-560	Sensitivity Control	8			.70
3-561	4900 ohm 1/4 Watt	8			.20

Control Head Assem. Part for Model 5M191

		PRICE
S-4789	Volume Control and Cable Assembly	$ 3.50
	Above Assembly consists of	
	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	$ 4.00
	Above Assembly consists of	
	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	$ 5.00
	Above Assembly consists of	
	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.J.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

		8T.	6T.	5T.	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 Transformer			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

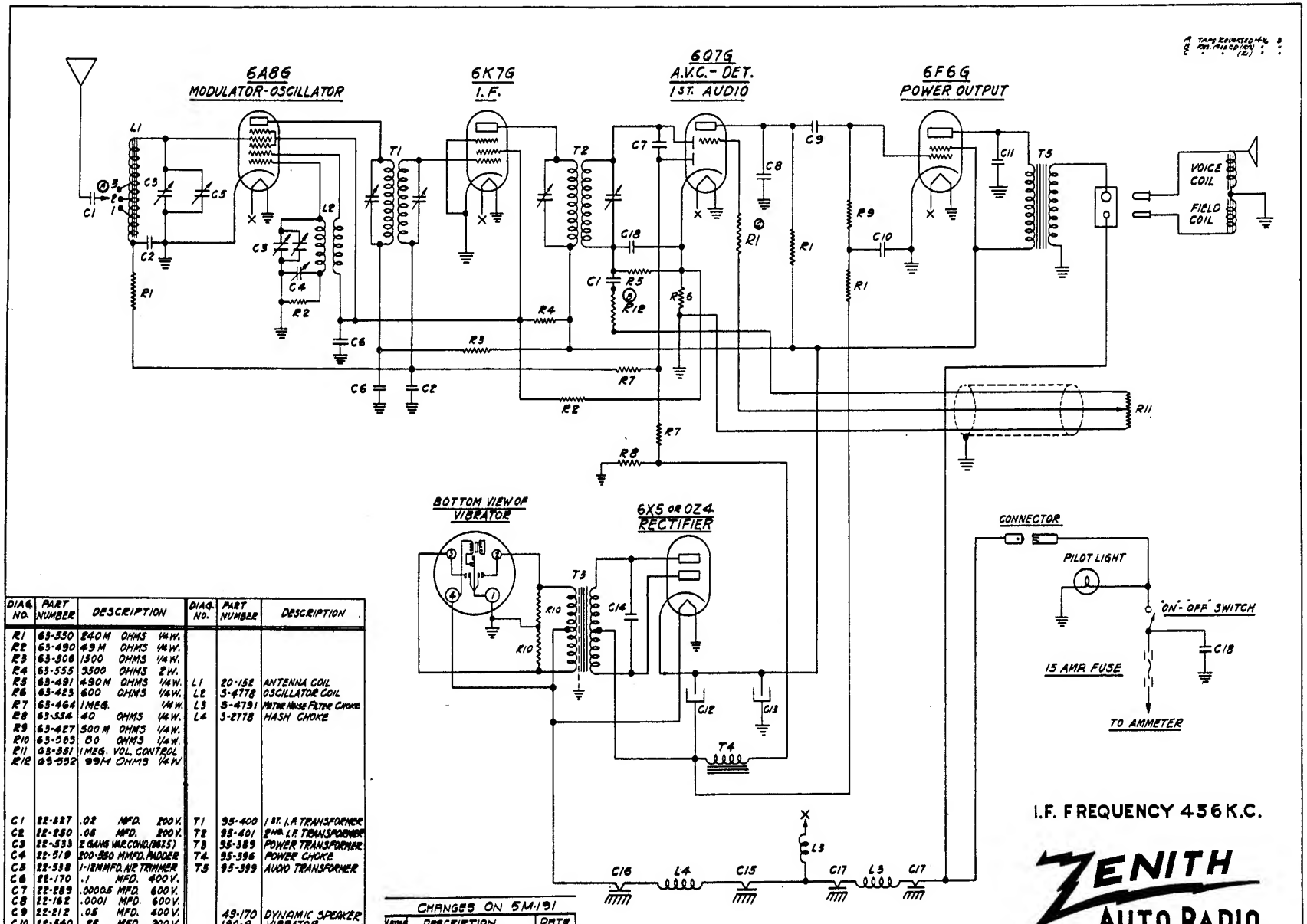
All panel and steering assemblies available @ .65 each net.

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

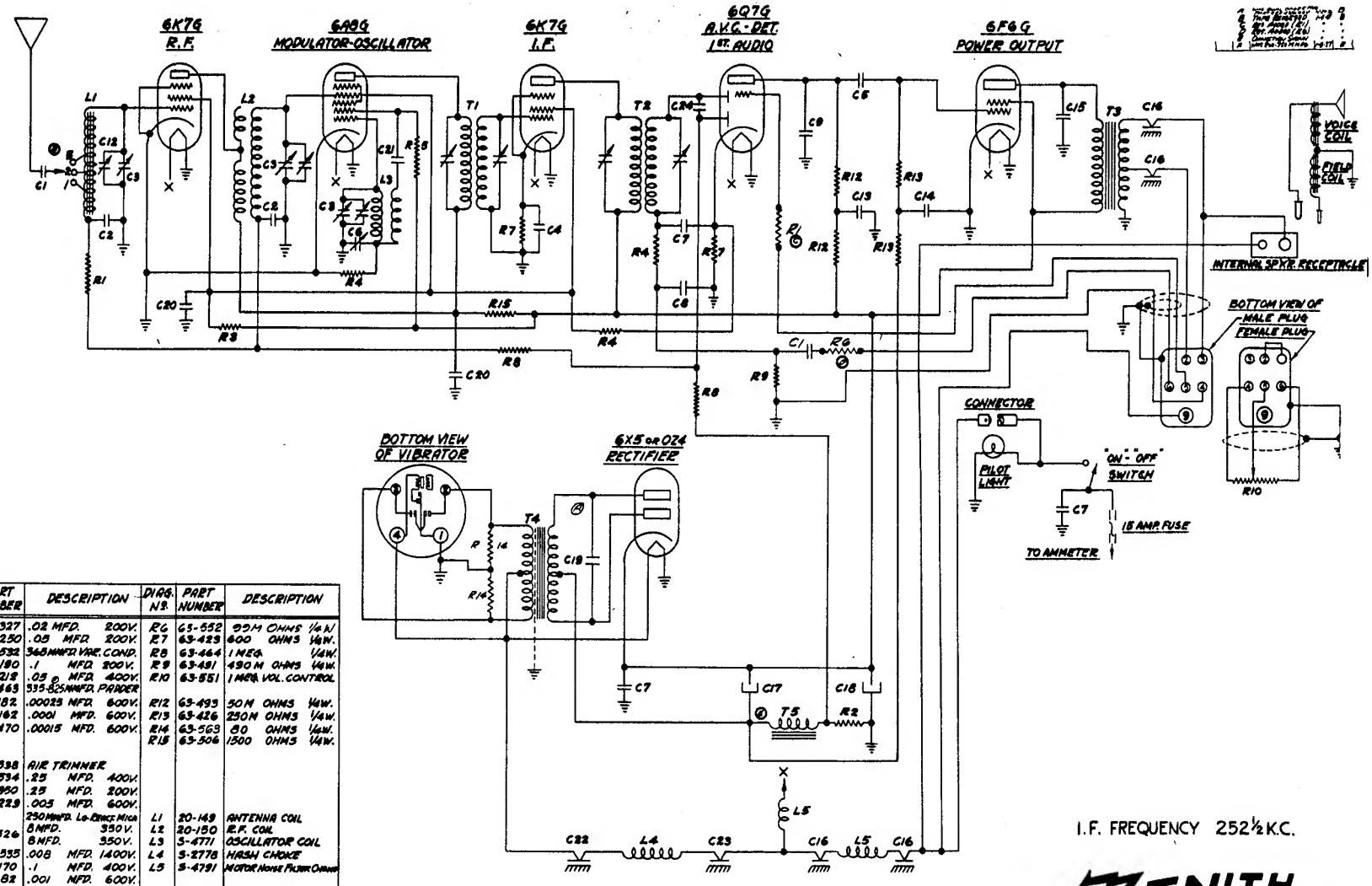


DIAG. NO.	PART NUMBER	DESCRIPTION	DIAG. NO.	PART NUMBER	DESCRIPTION
R1	63-550	240 M OHMS 1/4 W.			
R2	63-490	49 M OHMS 1/4 W.			
R3	63-508	1500 OHMS 1/4 W.			
R4	63-553	3500 OHMS 2 W.			
R5	63-491	490 M OHMS 1/4 W.	L1	20-152	ANTENNA COIL
R6	63-425	600 OHMS 1/4 W.	L2	3-4778	OSCILLATOR COIL
R7	63-464	1 MEG. 1/4 W.	L3	3-4791	MOTOR NOISE FILTER CHOKE
R8	63-554	40 OHMS 1/4 W.	L4	3-2778	HASH CHOKE
R9	63-427	500 M OHMS 1/4 W.			
R10	63-563	80 OHMS 1/4 W.			
R11	63-551	1 MEG. VOL. CONTROL			
R12	63-552	99 M OHMS 1/4 W.			
C1	22-327	.02 MFD. 200 V.	T1	95-400	1 ST. I.F. TRANSFORMER
C2	22-250	.05 MFD. 200 V.	T2	95-401	2 ND I.F. TRANSFORMER
C3	22-333	2 GANG VAR. COND. (363 S)	T3	95-389	POWER TRANSFORMER
C4	22-519	200-550 MMFD. PADDER	T4	95-396	POWER CHOKE
C5	22-538	1-12 MMFD. AIR TRIMMER	T5	95-399	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	22-528	4 MFD. 350 V.			
C13		8 MFD. 350 V.			
C14	22-535	.008 MFD. 1400 V.			
C15	22-468	.5 MFD. 200 V.			
C16	22-539	.5 MFD. 200 V.			
C17		250 MMFD. LO-REACT.			
C18	22-182	.00028 MFD. 600 V.			

CHANGES ON 5M191

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

A7-a



DIAG. NO.	PART NUMBER	DESCRIPTION	DIAG. NO.	PART NUMBER	DESCRIPTION
C1	22-327	.02 MFD. 200V.	R6	65-552	22M OHMS 1/4 W
C2	22-250	.05 MFD. 200V.	R7	63-429	600 OHMS 1/4W.
C3	22-532	368 MMFD. VAR. COND.	R8	63-464	1 MEG. 1/4W.
C4	22-180	.1 MFD. 200V.	R9	63-491	490 M OHMS 1/4W.
C5	22-218	.05 MFD. 400V.	R10	63-551	1 MEG. VOL. CONTROL
C6	22-463	535-825 MMFD. PADDER			
C7	22-182	.00025 MFD. 600V.	R12	63-493	50 M OHMS 1/4W.
C8	22-162	.0001 MFD. 600V.	R13	63-426	250 M OHMS 1/4W.
C9	22-470	.00015 MFD. 600V.	R14	63-569	80 OHMS 1/4W.
			R15	63-506	1500 OHMS 1/4W.
C12	22-538	AIR TRIMMER			
C13	22-534	.25 MFD. 400V.			
C14	22-950	.25 MFD. 200V.			
C15	22-229	.005 MFD. 600V.			
C16		250 MMFD. Lo-Range Mica	L1	20-149	ANTENNA COIL
C17	22-526	8 MFD. 350V.	L2	20-150	R.F. COIL
C18		8 MFD. 350V.	L3	5-4771	OSCILLATOR COIL
C19	22-535	.008 MFD. 1400V.	L4	5-2778	HASH CHOKE
C20	22-170	.1 MFD. 400V.	L5	5-4791	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	95-397	OUTPUT TRANSFORMER
			T4	95-390	POWER TRANSFORMER
R1	63-550	240 M OHMS 1/4W.	T5	95-396	POWER CHOKE
R2	63-557	60 OHMS 1/4W.		190-9	VIBRATOR
R3	63-484	13 M OHMS 2W.		49-170	DYNAMIC SPEAKER
R4	63-490	49 M OHMS 1/4W.			
R5	63-512	19 M OHMS 1W.			

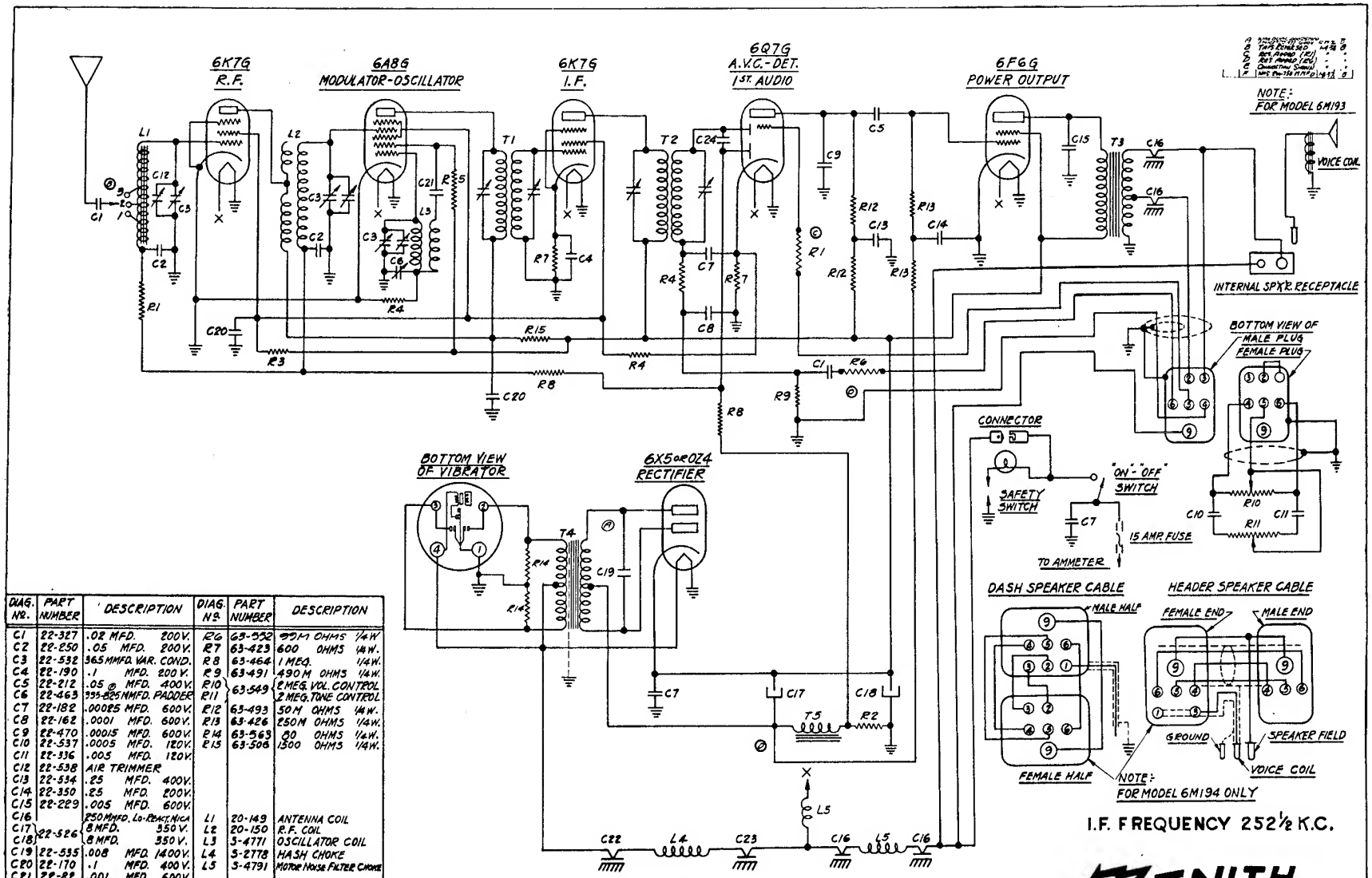
CHANGES ON GM-192		
Letter	Description	Date
A	Was Dual Diodes 6G0V (22-477)	12-29-36
B	Taps Revised	1-6-37
C	Resistor Added (R1)	1-6-37
D	Resistor Added (R6)	1-6-37
E	Connection Shown	1-6-37
F	Cond. #22-463 Was 200-750 MMFD.	1-6-37

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	63-552	25M OHMS 1/4W
C2	22-250	.05 MFD. 200V.	R7	63-423	600 OHMS 1/4W.
C3	22-532	365 MMFD. VAR. COND.	R8	63-464	1 MEG. 1/4W.
C4	22-190	.1 MFD. 200V.	R9	63-491	490M OHMS 1/4W.
C5	22-212	.05 @ MFD. 400V.	R10	63-549	5 MEG. VOL. CONTROL
C6	22-463	395-825 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	63-563	80 OHMS 1/4W.
C10	22-537	.0005 MFD. 120V.	R15	63-506	1500 OHMS 1/4W.
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	.005 MFD. 600V.			
C16		250 MMFD. Lo-REACT. MICA	L1	20-149	ANTENNA COIL
C17	22-526	8 MFD. 350V.	L2	20-150	R.F. COIL
C18		8 MFD. 350V.	L3	3-4771	OSCILLATOR COIL
C19	22-535	.008 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	22-539	.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	95-397	OUTPUT TRANSFORMER
			T4	95-530	POWER TRANSFORMER
R1	63-550	240M OHMS 1/4W.	T5	95-396	POWER CHOKE
R2	63-557	40 OHMS 1/4W.			
R3	63-494	18M OHMS 2W.		190-9	VIBRATOR
R4	63-490	49M OHMS 1/4W.		49-171	DYNAMIC SPKR. FOR MODEL 6M193
R5	63-512	19M OHMS 1W.			

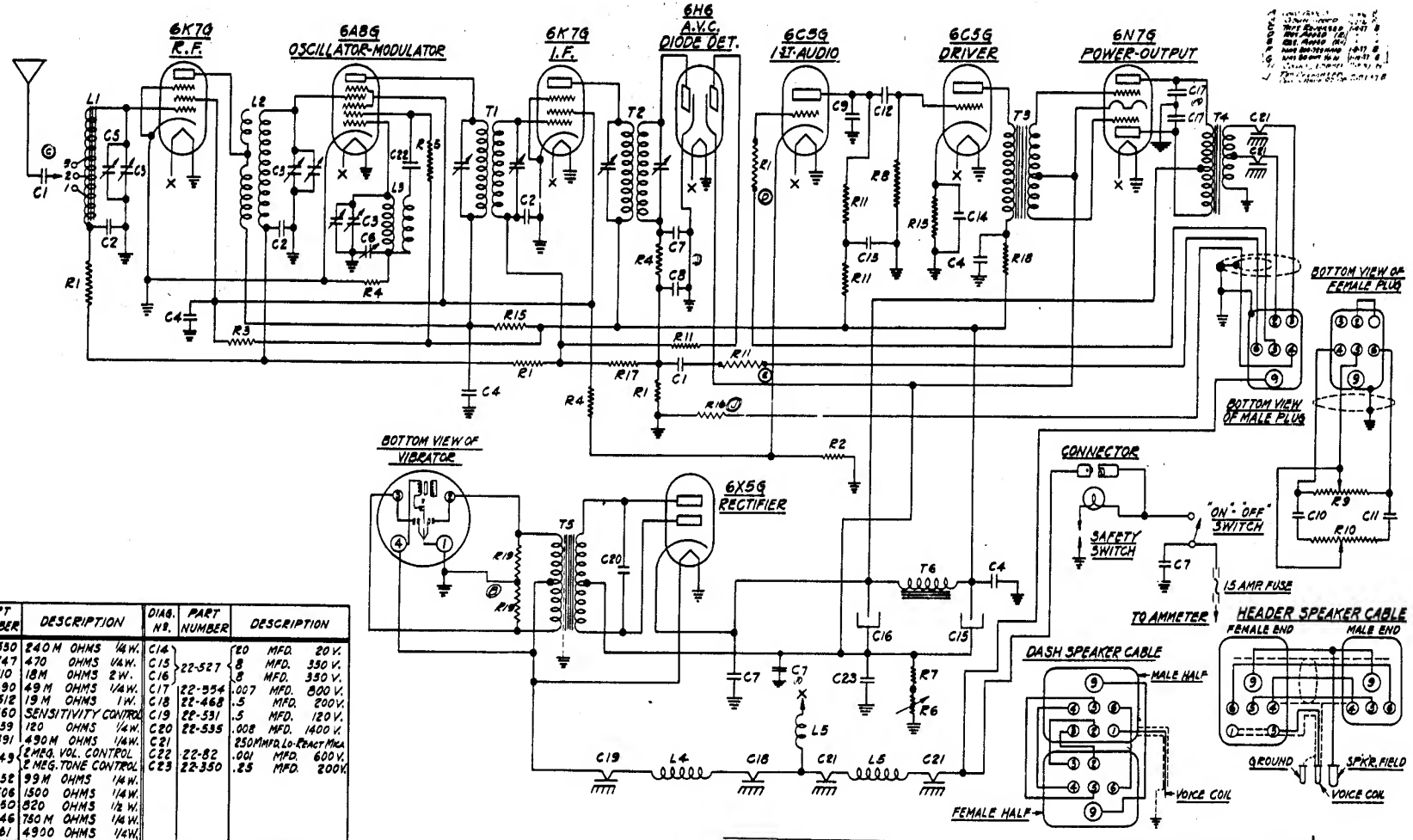
CHANGES ON GM-193-1

LETTER	DESCRIPTION	DATE
A	Kits Dum. .00025 Mfd 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	Changed 22-466 Was 200-750 Mmfd.	1-15-37

ZENITH AUTO RADIO

MODELS 6M193-6M194 CHASSIS 5637

ZENITH RADIO CORPORATION
CHICAGO, ILL.,



DIAG. NO.	PART NUMBER	DESCRIPTION	DIAG. NO.	PART NUMBER	DESCRIPTION
R1	63-350	240 M OHMS 1/4 W.	C14		20 MFD. 20 V.
R2	63-747	470 OHMS 1/4 W.	C15	22-527	8 MFD. 350 V.
R3	63-510	18M OHMS 2 W.	C16		8 MFD. 350 V.
R4	63-490	49 M OHMS 1/4 W.	C17	22-554	.007 MFD. 600 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	22-535	.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		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	820 OHMS 1/2 W.			
R17	63-446	750 M OHMS 1/4 W.			
R18	63-561	4900 OHMS 1/4 W.			
R19	63-564	250 OHMS 1 W.	L1	20-149	ANTENNA COIL
			L2	20-150	R.F. COIL
			L3	5-4771	OSCILLATOR COIL
			L4	5-2778	HASH CHOKE
			L5	5-4791	MOTOR NOISE FILTER CHOKE
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	1-12 MMFD. AIR TRIMMER	T1	95-394	1ST I.F. TRANSFORMER
C6	22-465	335-825 MMFD. PADDER	T2	95-393	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		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 8M195

LETTER	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 NMS 800-750 MMFD	1-8-37
G	RESISTOR 63-564 NMS 800 OHM 1/4 W	1-19-37
H	CONDENSER ADDED (C7)	2-3-37
J	RESISTOR RELOCATED — CONNECTION MADE C7 TO C8	2-21-37

I.F. FREQUENCY 252 1/2 K.C.

ZENITH AUTO RADIO

MODEL 8M195 CHASSIS 5803

ZENITH RADIO CORPORATION
CHICAGO, ILL.

SERVICE MANUAL

ZENITH
TRADE MARK REG.
→LONG DISTANCE← RADIO

1938 RECEIVERS

ZENITH RADIO CORPORATION

CHICAGO, U. S. A.

Form H2 PRICE 10 CENTS [PRINTED IN U.S.A.]

ALIGNMENT INSTRUCTIONS

The proper procedure for the correct alignment of each chassis is outlined on the page opposite each circuit diagram.

The operations are outlined in consecutive order, and the instructions are under the following headings —

OSC. CONNECTED TO — tells where the output of the service oscillator is to be connected.

DUMMY — gives the proper capacity or resistance which should be connected in series with the service oscillator output.

TEST OSC. — Set test oscillator to frequency shown.

BD. SW. — Set the receiver band switch to the position shown.

DIAL — The receiver should be set at the frequency shown.

TRIMMER — This column tells which trimmer (or trimmers) are to be adjusted for each operation. The chassis photo at the bottom of the page has each trimmer indicated by a letter corresponding to the instructions.

REMARKS — This column tells what is being accomplished by each operation.

If these instructions are carefully followed each chassis will be easily and correctly realigned.

PHONO CONNECTIONS

Zenith chassis are not equipped at the factory for phono operation, however, it is possible to make slight wiring changes to accomplish this. On page 432 is a sectional diagram showing the phono circuit adaption for each type chassis. The necessary switch and tip jacks may be mounted on the rear of the chassis base.

ELECTRIC AUTOMATIC TUNING ADJUSTMENTS

1. Make sure that nothing is obstructing the free action of either the belt, the pulley, or the drive shaft, such as wires or component parts.

2. Check the band change shaft for clearance on the 9-12-15 tube models. The die cast bracket through which the brass drive shaft for the motor travels can be centered properly by loosening the two Parker-Kalon screws which hold the bracket to the front of the dial assembly. After centering the above mentioned die cast bracket retighten the two Parker-Kalon screws.

3. Check the 9/16 nut at rear of chassis in this manner; loosen the nut, permit the motor to run and retighten the 9/16 nut while in operation. This will allow the front and rear bearings to align themselves properly.

4. Check for ample clearance between the dial gang drive pulley and the mounting nut for the bearing through the front of the chassis approximately 1/32" clearance. Brass drive shaft should also have ample clearance at the rear of the chassis between the collar mounted on the motor switch.

5. Remove motor drive belt, turn motor armature by hand, if motor action feels tight, oil the felt oil retaining washers on the shaft of the armature with one or two drops of fine oil.
   Wherever we have use for oil only a few drops should be applied in order to eliminate any danger of seepage into the elecrical components of the receiver. We recommend that a zero cold test gear oil be used.

   All bearings, dial mechanism and gears of the gang should be lubricated approximately once a year.

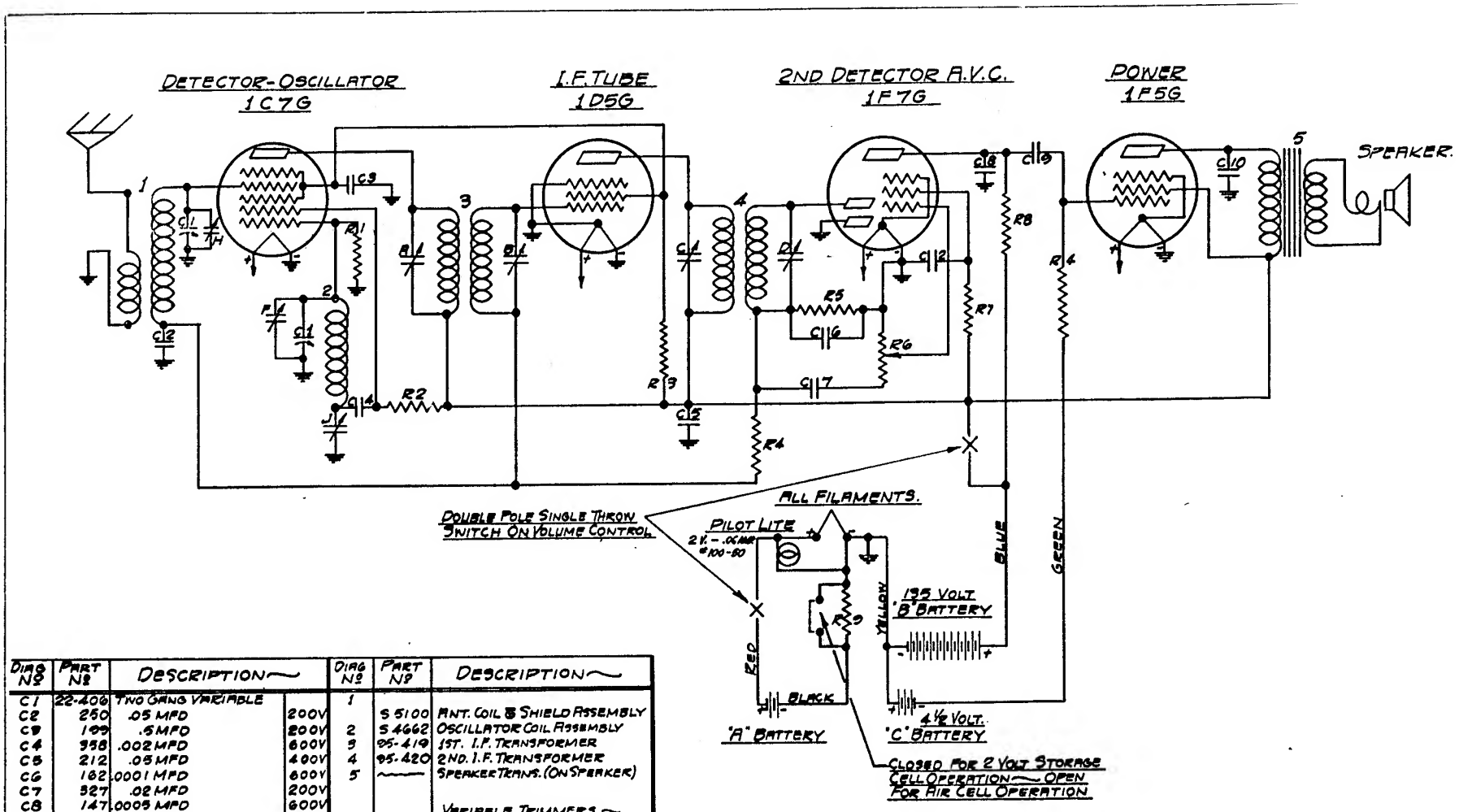
6. The large drive pulley mounted on the rear of the brass shaft should be in line with the small pulley which will be found mounted on the motor armature. Alignment can be accomplished by loosening the two set screws and sliding the large pulley either backward or forward on the brass shaft.

7. The tension of the drive belt for the motor can be adjusted by loosening the two hexagon bolts found at the rear of the chassis and holding the motor assembly. The motor assembly should be moved in the elongated holes until the drive belt has a snug tension but not too tight an action. Then retighten the hexagon headed mounting bolts.

8. It is very important that the four bolts that hold the chassis in the cabinet during shipment be removed entirely on installation thus permitting the chassis to float absolutely free on the four cushion rubbers. This will insure freedom of all working parts and permit centering and aligning chassis in the cabinet.

9. If the drive mechanism has a tendency to slip when using the large manual knob check for a loose spring clutch. All adjustments to the clutch should be made very carefully. The mechanism being essentially the same as last year, should be understood by most service men in the field. Adjustments are made by turning the screw mounted through the blue steel clutch spring found at the front of the brass drive shaft mechanism. By running the screw in, the action will be tightened, and by running the screw out, the action will be loosened, but in all cases only one or two complete turns should be necessary.

10. If at any time it is necessary to change the electric eye tube, care should be taken not to place the tube too far forward as this will cause a strain to be placed on the dial pan causing friction at the center hub of the gang shaft and the motor will not operate freely.



DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION
C1	22-406	TWO GANG VARIABLE		1	S 5100	ANT. COIL & SHIELD ASSEMBLY
C2	250	.05 MFD	200V	2	S 4662	OSCILLATOR COIL ASSEMBLY
C3	199	.5 MFD	200V	3	95-419	1ST. I.F. TRANSFORMER
C4	358	.002 MFD	600V	4	95-420	2ND. I.F. TRANSFORMER
C5	212	.05 MFD	400V	5	——	SPEAKER TRANS. (ON SPEAKER)
C6	182	.0001 MFD	600V			
C7	327	.02 MFD	200V			VARIABLE TRIMMERS.
C8	147	.0005 MFD	600V	A		1ST. I.F. TRANSFORMER PRIMARY
C9	188	.02 MFD	400V	B		1ST. I.F. TRANSFORMER SECONDARY
C10	492	.002 MFD	600V	C		2ND. I.F. TRANSFORMER PRIMARY
				D		2ND. I.F. TRANSFORMER SECONDARY
				F		BROADCAST OSCILLATOR (ON GANG)
R1	GS-693	47 M OHM	½ W ± 20	H		ANTENNA BROADCAST (ON GANG)
R2	658	5600 OHM	¼ W ± 10	J		#22-519 OSCILLATOR PADDER.
R3	647	.5 M OHM	¼ W ± 10			
R4	271	1 MEGOHM	¼ W ± 20			
R5	658	390 M OHM	¼ W ± 10			
R6	548	1 MEGOHM VOLUME CONTROL			MODEL	SPEAKER
R7	441	1 MEGOHM	¼ W ± 10		4F227	49-209 — 6"
R8	657	330 M OHM	¼ W ± 10			
R9	684	.64 OHM (NIKENOUND)	¼ W ± 10			

I.F. FREQUENCY 456 K.C.

4 TUBE BATTERY SUPERHETERODYNE

CHASSIS Nº 5408

ZENITH RADIO CORPORATION

CHICAGO, ILLINOIS

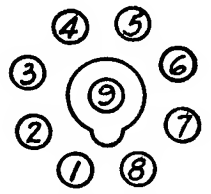
Circuit Diagram — Model 4-F-227 (5408 Chassis)

MODEL 4F227

CHASSIS No. 5408

SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9
1C7	Converter Osc.	—	2	136	42	—6	116	0	—	0
1D5	I. F.	—	2	136	42	—	—	0	—	0
1F7	2nd Det. 1st Audio	—	2	15	0	—.5	11	0	—	0
1F5	Power	—	2	130	136	—.5	—	0	—	—



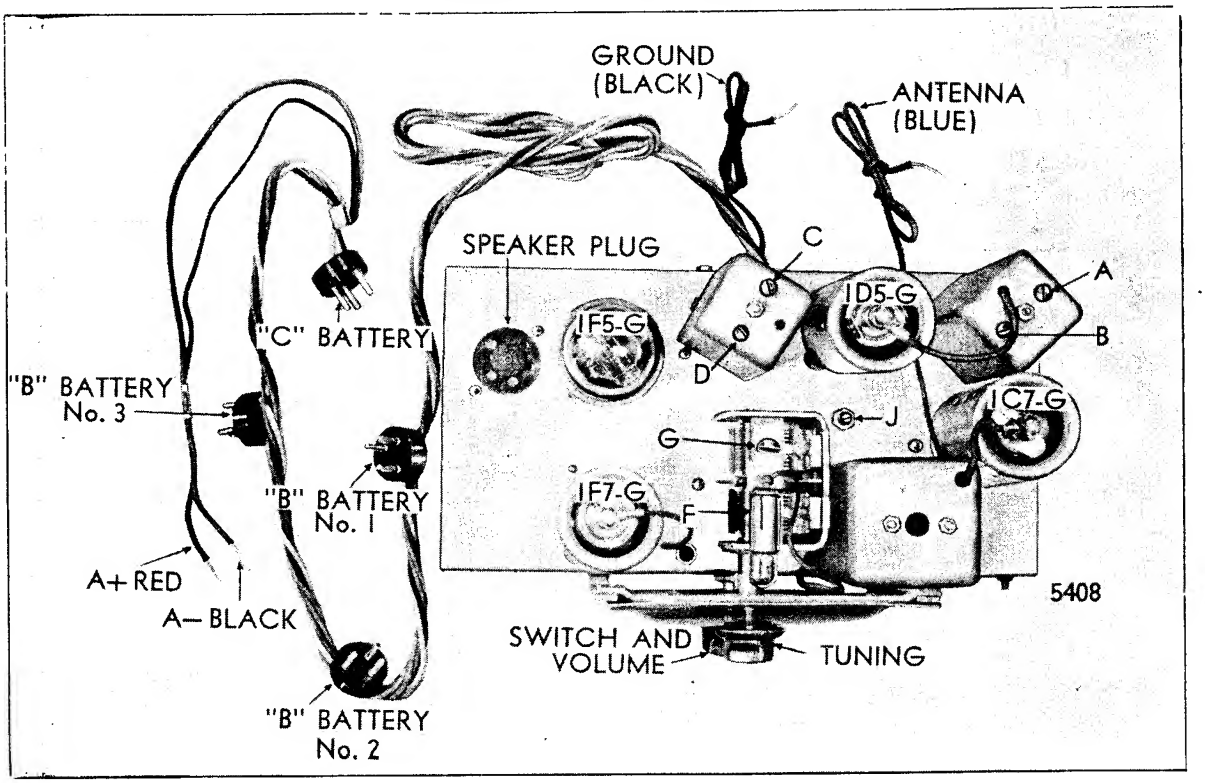
BOTTOM VIEW OF SOCKET

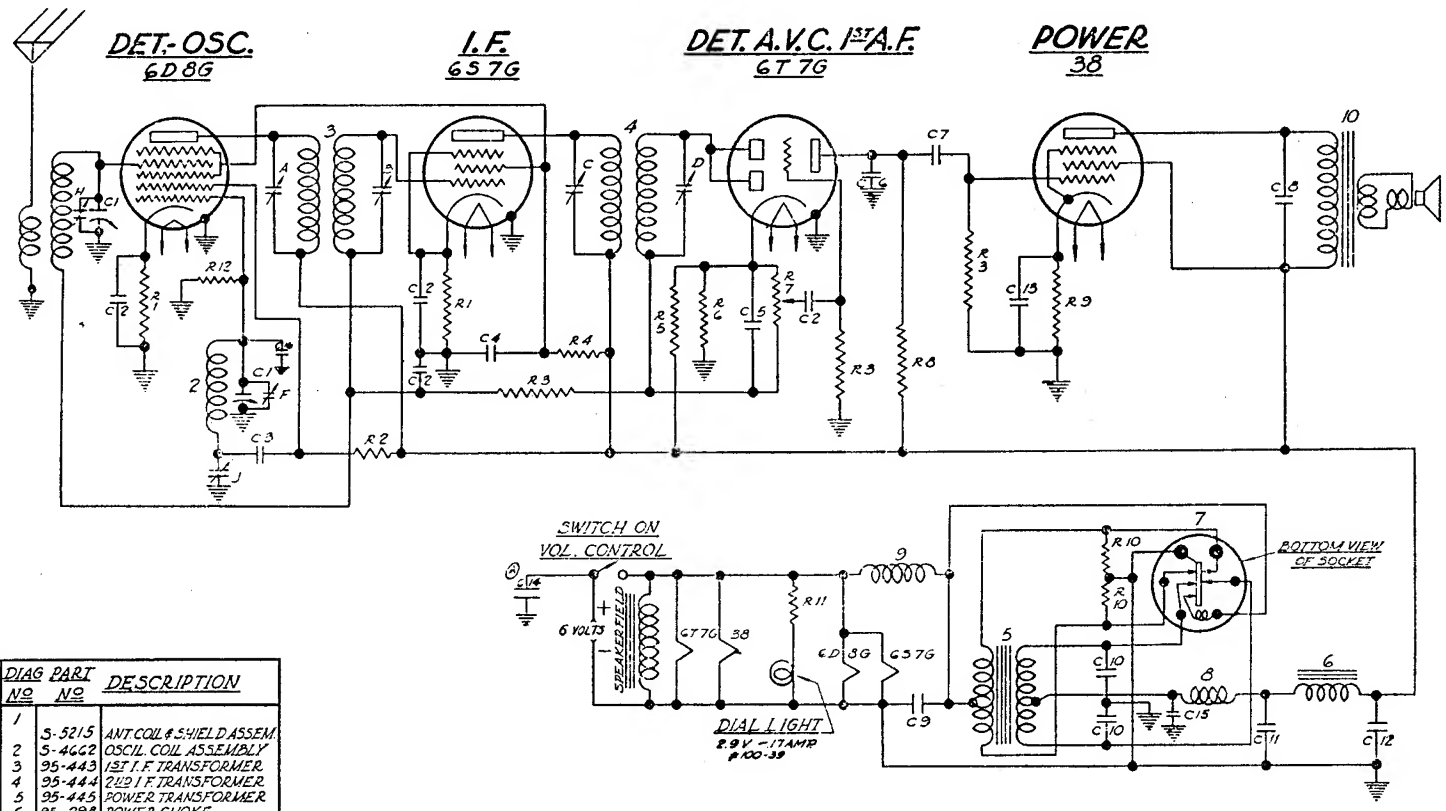
All voltages measured from point indicated to ground using a 1000 Ohm per Volt meter, antenna and ground disconnected. "A" consumption .42 Amp. "B" consumption 19 M.A. Power output .75W.

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to—	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	456	Br'dc't	600	ABCD	I. F. Algm't.
2	Rec. Ant. Lead	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	1500	G	Algm't of Ant.
4	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
5	" " "	200 Mmfd.	1500	"	1500	FG	Rpt. 3 & 4

LOCATION OF TRIMMERS





DIAG NO	PART NO	DESCRIPTION		DIAG NO	PART NO	DESCRIPTION
C-1	22-406	TWO GANG VARI COND.		1		
C-2	22-250	.05 MFD.	200 V.	2	5-5215	ANT COIL & SHIELD ASSEM.
C-3	22-358	.002 MFD.	600 V.	3	5-4662	OSCIL. COIL ASSEMBLY
C-4	22-243	.01 MFD.	400 V.	4	95-443	1ST I.F. TRANSFORMER
C-5	22-162	.0001 MFD.	600 V.	5	95-444	2ND I.F. TRANSFORMER
C-6	22-147	.0005 MFD.	600 V.	6	95-445	POWER TRANSFORMER
C-7	22-212	.05 MFD.	400 V.	7	95-298	POWER CHOKE
C-8	22-492	.002 MFD.	600 V.	8	190-6	VIBRATOR
C-9	22-199	.5 MFD.	200 V.	9	20-82	R.F. CHOKE
C-10	22-455	.01 MFD.	1200 V.	10	5-2778	R.F. CHOKE
C-11		2 MFD. ELECTROLYTIC	250 V.			SPEAKER TRANSFORMER
C-12	22-582	8 MFD. ELECTROLYTIC	250 V.			
C-13		10 MFD. ELECTROLYTIC	25 V.			
C-14	22-330	.25 MFD.	200 V.			
C-15	22-172	.1 MFD.	400 V.			
R-1	63-632	560 OHM	1/4 W. ± 10			VARIABLE TRIMMERS
R-2	63-150	10 M OHM	1/2 W. ± 20	A		1ST I.F. TRANSF. PRIMARY
R-3	63-271	1 MEG OHM	1/4 W. ± 20	B		1ST I.F. TRANSF. SECONDARY
R-4	63-681	56 M	1/2 W. ± 10	C		2ND I.F. TRANSF. PRIMARY
R-5	63-160	100 M	1/2 W. ± 10	D		2ND I.F. TRANSF. SECONDARY
R-6	63-634	820 OHM	1/4 W. ± 10	F		BROADCAST OSCIL. (ON GANG)
R-7	63-547	400 M OHM VOLUME CONTROL		H		ANT. BROADCAST (ON GANG)
R-8	63-597	470 M OHM	1/4 W. ± 20	J	22-519	OSCILLATOR PADDER
R-9	63-418	1500 OHM	1/2 W. ± 10			
R-10	63-577	100 OHM	1/4 W. ± 20			
R-11	63-800	2C OHM WIREWOUND	1 W. ± 5			
R-12	63-593	47 M OHM	1/4 W. ± 20			
C-16	22-585	5 MMFD CERAMIC				

SPEAKER 49-191 - 5"

MODELS 4B 231

4 TUBE BATTERY SUPERHETERODYNE
I.F. - FREQUENCY 456 K.C.
CHASSIS NO 5409

ZENITH RADIO CORP.
CHICAGO, ILLINOIS

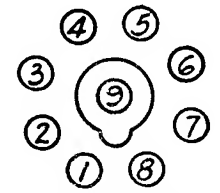
Circuit Diagram — Model 4-B-231 (5409 Chassis)

MODEL 4B231

CHASSIS No. 5409

SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9
6D8	Converter Osc.	0	0	147	98	—9	114	6.3	2	0
6S7	I. F.	0	6.3	146	98	1.5	—	0	1.5	0
6T7	2nd Det. 1st Aud.	0	0	27	—1	—1	—	6.3	.8	0
		H	Ep	Es	Ek	H	Eg			
38	Power	0	143	148	6.5	6.3	0			



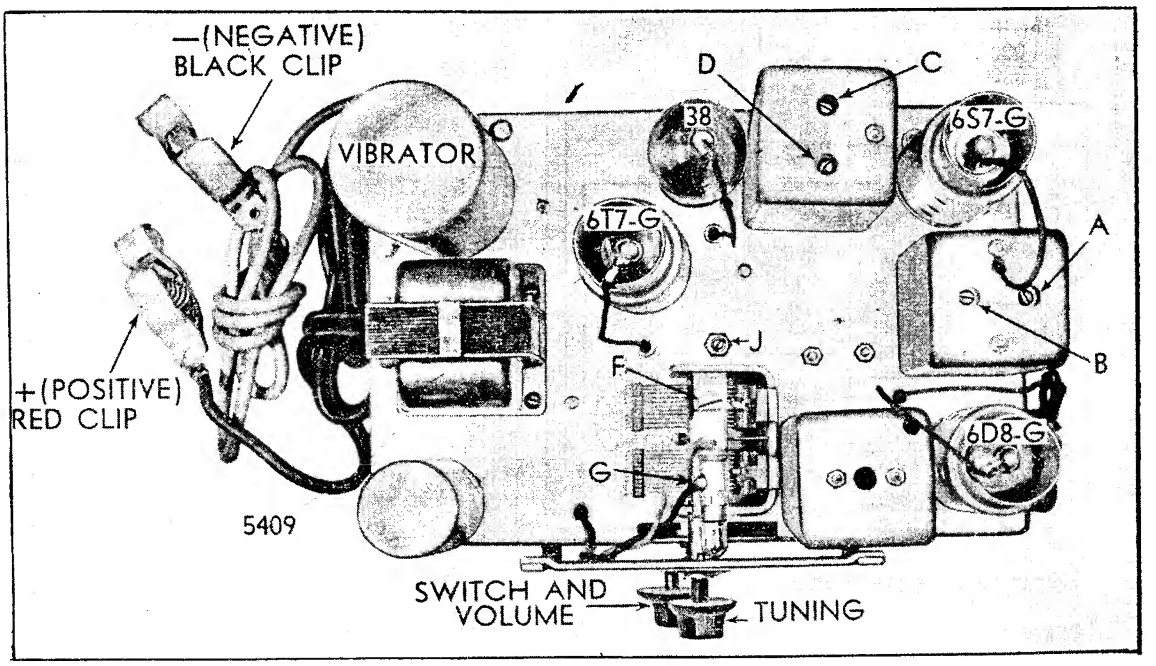
BOTTOM VIEW OF SOCKET

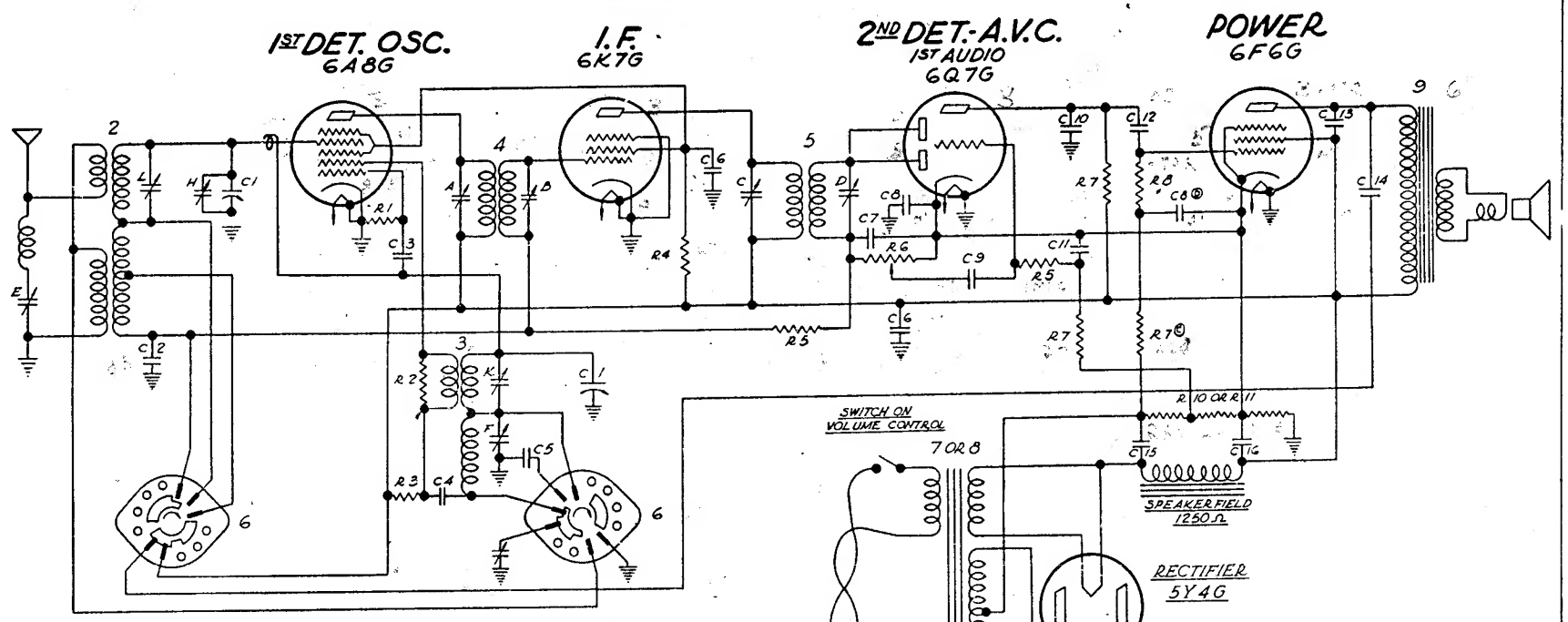
All voltages measured from point indicated to ground using a 1000 Ohm per Volt meter, antenna and ground disconnected. Battery consumption 2.2 Amp. Power output .84W.

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to—	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	456	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Lead	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	1500	G	Al'gment of Ant.
4	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
5	" " "	200 Mmfd.	1500	"	1500	FG	Repeat 3 & 4.

LOCATION OF TRIMMERS





DIAG Nº	PART Nº	DESCRIPTION
C1	22-546	TWO GANG VARIABLE
C2	22-487	.05 MFD. 400V.
C3	22-127	25 MMFD. 600V.
C4	22-353	.002 MFD. 600V.
C5	22-543	FIXED PADDER
C6	22-170	.1 MFD. 400V.
C7	22-162	.0001 MFD. 600V.
C8	22-185	.01 MFD. 200V.
C9	22-327	.02 MFD. 200V.
C10	22-147	.0005 MFD 600V.
C11	22-190	.1 MFD 200V.
C12	22-435	.02 MFD. 600V.
C13	22-492	.002 MFD. 600V.
C14	22-171	.05 MFD. 600V.
Ⓐ C15	22-596	8 MFD DRY ELECTROLYTIC 450 V
Ⓑ C16		1/4 MFD DRY ELECTROLYTIC 450 V

VARIABLE TRIMMERS	
A	1ST I.F. TRANS. PRIMARY
B	1ST I.F. TRANS. SECONDARY
C	2ND I.F. TRANS. PRIMARY
D	2ND I.F. TRANS. SECONDARY
E	#22-570 WAVE TRAP
F	BROADCAST OSCILLATOR (SEE NOTE)
H	ANTENNA BROADCAST (ON GANG)
J	#22-519 BROADCAST PADDER
K	SHORT WAVE OSCILLATOR (SEE NOTE)
L	SHORT WAVE DETECTOR #22-305

TRIMMERS F & K MOUNTED ON BAKELITE STRIP #22-408

DIAG Nº	PART Nº	DESCRIPTION
R1	63-593	47 M OHM 1/4 W ± 20%
R2	63-589	10 M OHM 1/4 W ± 20%
R3	63-610	22 M OHM 1 W ± 20%
R4	63-677	33 M OHM 1 W ± 10%
R5	63-271	1 MEGOHM 1/4 W ± 20%
R6	63-565	400 M OHM VOLUME CONTROL
R7	63-296	220 M OHM 1/4 W ± 20%
R8	63-597	470 M OHM 1/4 W ± 20%
R10	63-613	3 SECTION CANDOHM 50-60 Ω
R11	63-806	3 SECTION CANDOHM 25 Ω
1		WAVE TRAP COIL MOUNTED ON ANTENNA COIL ASSEMBLY
2	S-4934	ANT COIL & SHIELD ASSEMBLY
3	S-4909	OSCILLATOR COIL ASSEMBLY
4	95-407	1ST I.F. TRANSFORMER
5	95-408	2ND I.F. TRANSFORMER
6	85-104	BAND SELECTOR SWITCH
7	95-406	POWER TRANSFORMER 117 VOLT 50-60 CYCLE
8	95-452	POWER TRANSFORMER ALL VOLTAGE 25 CYCLE
9		SPEAKER TRANSFORMER

MODEL	SPEAKER	
5-S-218	49-178	5"
5-S-220	49-178	5"
5-S-228	49-178	5"
5-S-237	49-180	6"
5-S-250	49-179	8"
5-S-252	49-208	10"

I.F.-FREQUENCY 456 K.C.
5 TUBE SUPERHETERODYNE
2 BAND
CHASSIS Nº 5521

ZENITH RADIO CORP.
CHICAGO, ILLINOIS

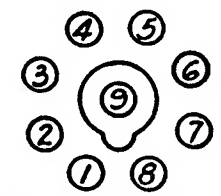
Circuit Diagram — Models 5-S-201, 5-S-218, 5-S-220, 5-S-228, 5-S-237, 5-S-250, 5-S-252 (5521 Chassis)

MODELS 5S201-5S218-5S220-5S228-5S237-5S250-5S252

CHASSIS No. 5521

SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9
6A8	Converter Osc.	0	6.3	244	97	—9	149	0	0	—.5
6K7	I. F.	0	6.3	246	97	0	—	0	0	—.5
6Q7	2nd Det. AVC 1st Audio	0	0	71	—2.5	—2.5	—	6.3	—2.5	—2.5
6F6	Power	0	0	231	246	—3.5	—	6.3	—2.5	—
5Y4	Rect.	0	—	AC	—	AC	—	316	316	—



BOTTOM VIEW OF SOCKET

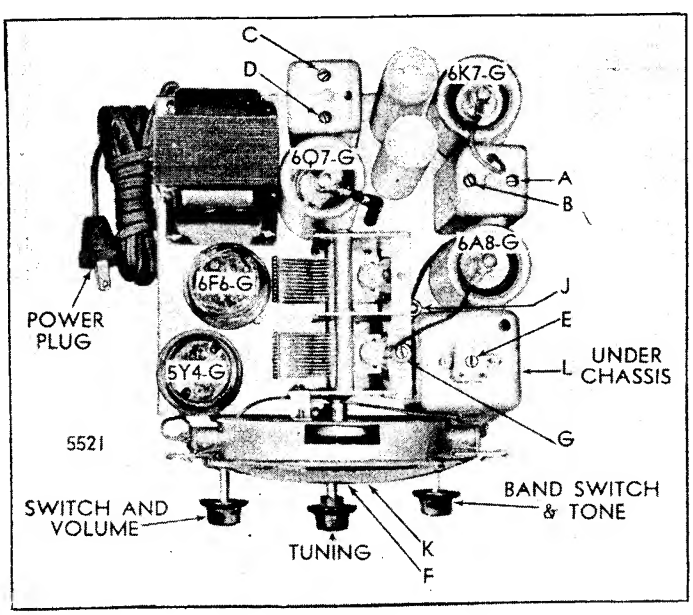
All voltages measured from point indicated to ground using a 1000 Ohm per Volt meter, antenna and ground disconnected. Line voltage 117V. Consumption 65W. Power Output 4.5W.

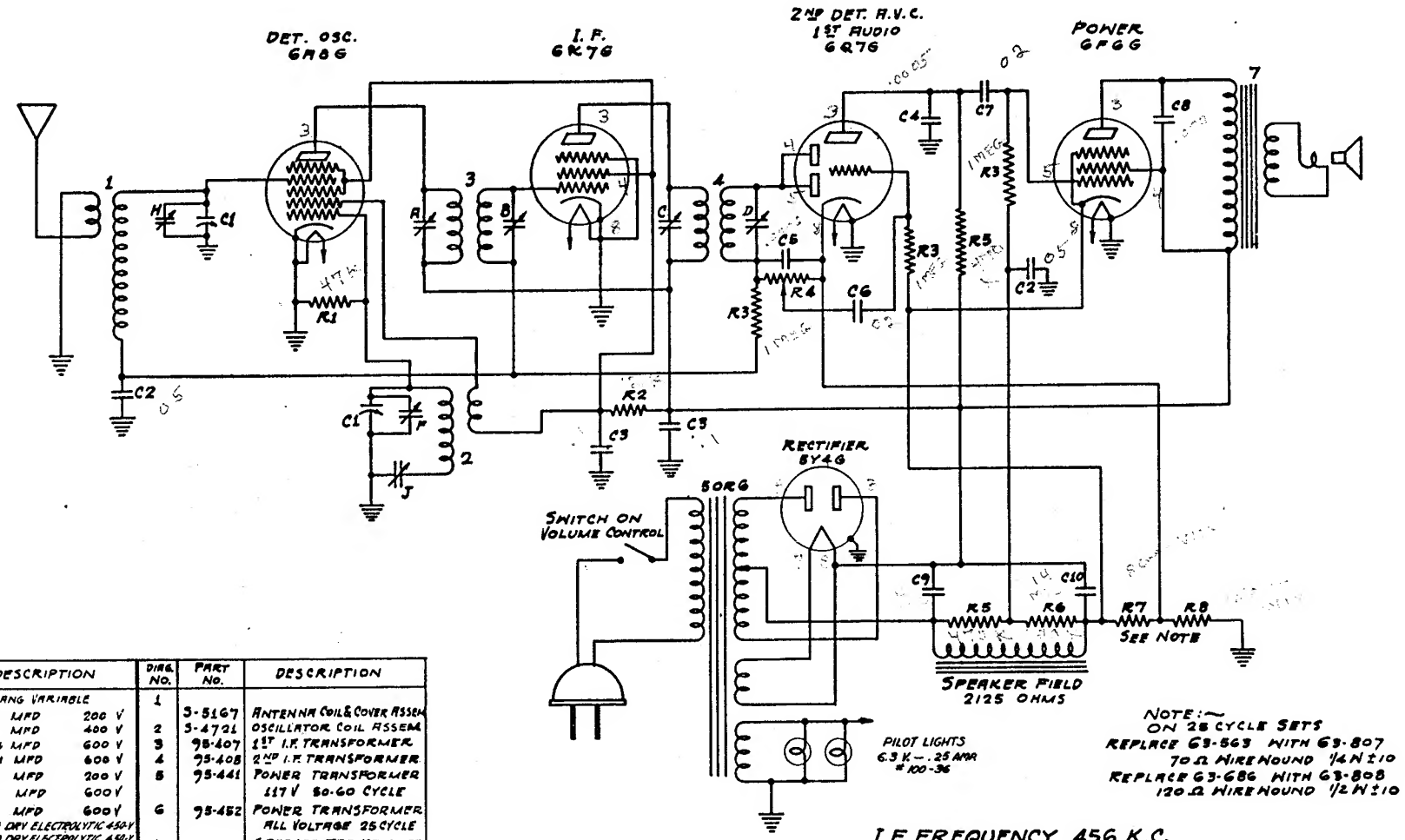
ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to—	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	456	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Lead	200 Mmfd.	456	"	600	E	See Note
3	" " "	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
4	" " "	200 Mmfd.	1500	"	1500	G	Al'gment of Ant.
5	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output.
6				"		FG	Repeat 3 & 4.
7	Rec. Ant. Lead	400 Ohms	18000	S.W.	18000	K	Set Osc. to Scale
8	" " "	400 Ohms	16500	S.W.	16500	L	Rock gang & adj. for max. output.

NOTE: If receiver is used in a location subject to code interference adjust wave trap (E) for minimum interference with antenna connected and receiver operating in broadcast band.

LOCATION OF TRIMMERS





DIAG. NO.	PART NO.	DESCRIPTION		
C1	22-376	TWO GANG VARIABLE		
C2	22-280	.05 MFD		200 V
C3	22-170	.1 MFD		400 V
C4	22-147	.0005 MFD		600 V
C5	22-162	.0001 MFD		600 V
C6	22-327	.02 MFD		200 V
C7	22-435	.02 MFD		600 V
C8	22-492	.002 MFD		600 V
C9	22-596	8 MFD DRY ELECTROLYTIC 450 V		
C10		4 MFD DRY ELECTROLYTIC 450 V		
R1	63-593	47 M.OHMS		1/4 W ±20
R2	63-208	12 M.OHMS		1W ±10
R3	63-271	1 MEGOHM		1/4 W ±20
R4	63-565	300 M.OHMS	VOL. CONTROL	
R5	63-597	470 M.OHMS		1/4 W ±20
R6	63-654	180 M.OHMS		1/4 W ±10
R7	63-563	80 OHM WIRE WOUND		1/4 W ±10
R8	63-686	150 OHM WIRE WOUND		1/2 W ±10

DIAG. NO.	PART NO.	DESCRIPTION
1	5-5167	ANTENNA COIL & COVER ASSEM.
2	5-4721	OSCILLATOR COIL ASSEM.
3	98-407	1ST I.F. TRANSFORMER
4	98-408	2ND I.F. TRANSFORMER
5	98-441	POWER TRANSFORMER 117 V 50-60 CYCLE
6	98-452	POWER TRANSFORMER ALL VOLTAGE 25 CYCLE
7		SPEAKER TRANSFORMER
		VARIABLE TRIMMERS
A		1ST I.F. TRANS. PRIMARY
B		1ST I.F. TRANS. SECONDARY
C		2ND I.F. TRANS. PRIMARY
D		2ND I.F. TRANS. SECONDARY
F		OSCILLATOR (ON GANG)
H		ANTENNA (ON GANG)
J	22-619	OSCILLATOR PADDER

MODEL NO.	SPEAKER NO.	SIZE
5-R-216	49-202	5"
5-R-226	49-202	5"
5-R-236	49-202	5"

I.F. FREQUENCY 456 K.C.
5 TUBE SUPERHETERODYNE
CHASSIS NO. 5526

ZENITH RADIO CORPORATION
CHICAGO, ILLINOIS.

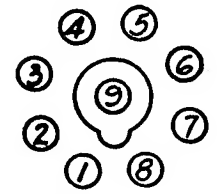
Circuit Diagram—Models 5-R-216, 5-R-226, 5-R-236 (5526 Chassis)

MODELS 5R216-5R226-5R236

CHASSIS No. 5526

SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9
6A8	Converter Osc.	0	6	204	82	11	82	0	0	—.1
6K7	I.F.	0	6	204	82	0	—	0	0	—.1
6Q7	2nd Det. AVC 1st Audio	0	0	38	—2	—2	—	6	—2	—2
6F6	Power	0	0	198	205	—2.5	—	6	—3.5	—
5Y4	Rect.	0	—	AC	—	AC	—	208	208	—



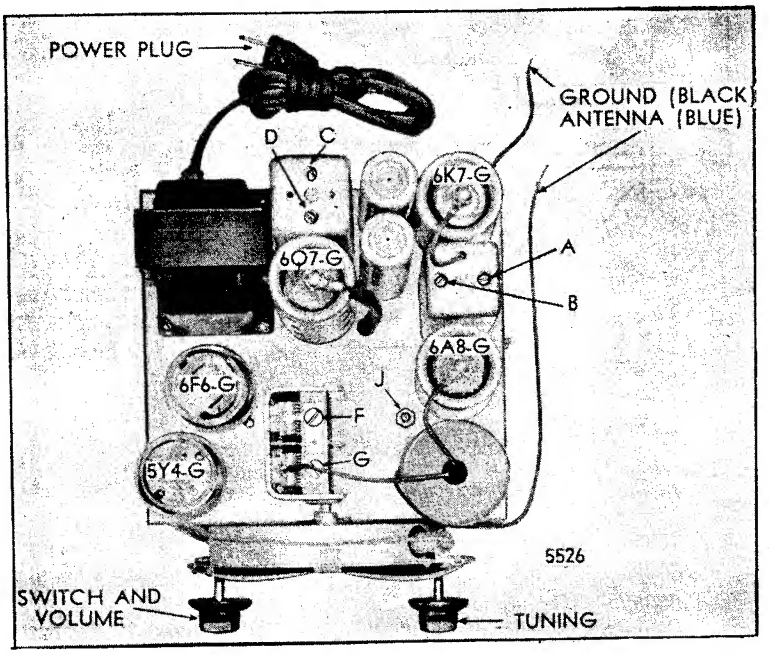
BOTTOM VIEW OF SOCKET

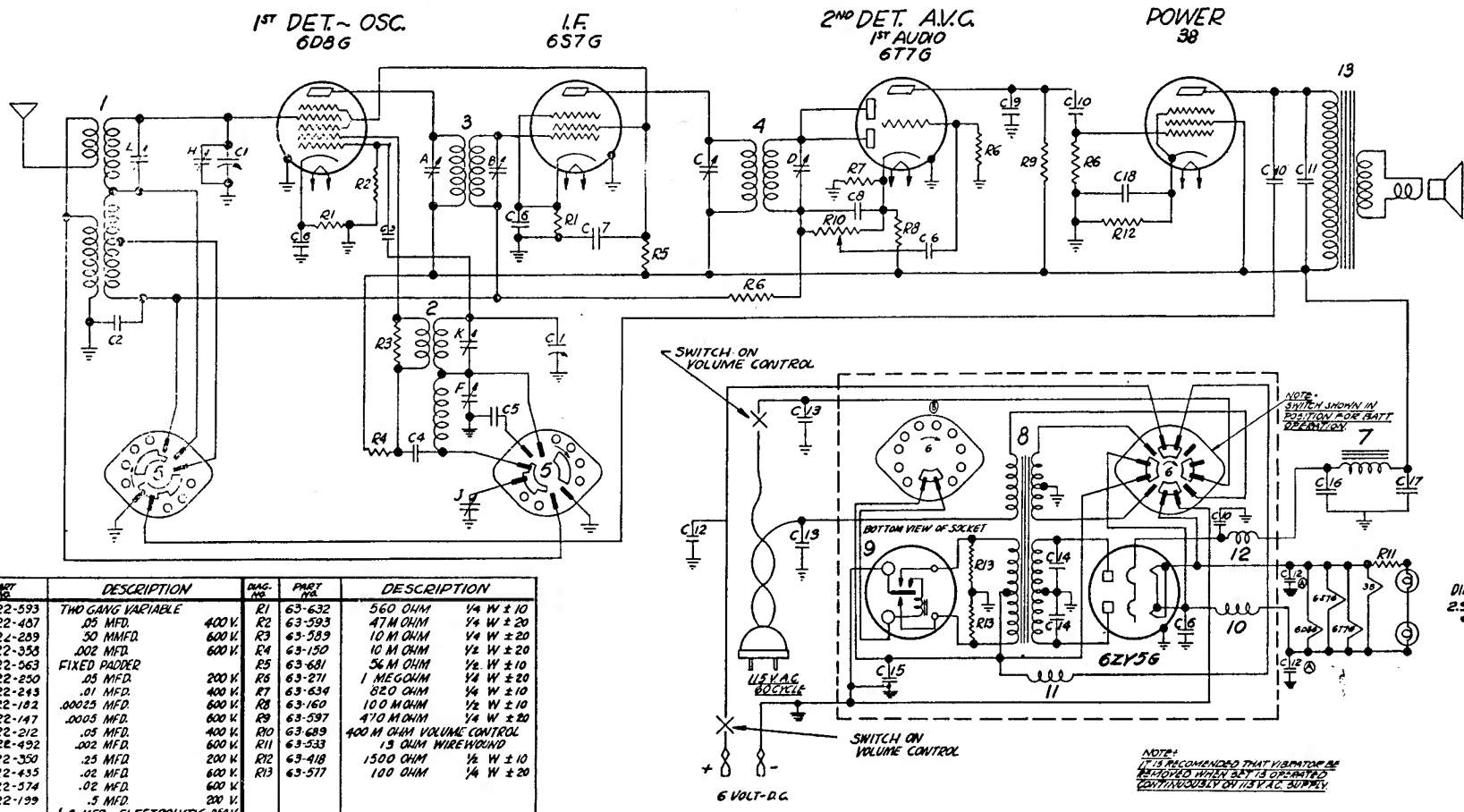
All voltages measured from point indicated to ground using a 1000 Ohm per Volt meter, antenna and ground disconnected. Line voltage 117V. Consumption 50W. Power output 3.5W.

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to—	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	456	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Lead	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	1500	G	Al'gment of Ant.
4	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output.
5	" " "	200 Mmfd.	1500	"	1500	FG	Repeat 3 & 4.

LOCATION OF TRIMMERS





DIAG. NO.	PART NO.	DESCRIPTION		DIAG. NO.	PART NO.	DESCRIPTION	
C1	22-593	TWO GANG VARIABLE		R1	63-632	560 OHM	¼ W ± 10
C2	22-487	.05 MFD.	400 V.	R2	63-593	47 M OHM	¼ W ± 20
C3	22-289	50 MMFD.	600 V.	R3	63-589	10 M OHM	¼ W ± 20
C4	22-358	.002 MFD.	600 V.	R4	63-150	10 M OHM	½ W ± 20
C5	22-563	FIXED PADDER		R5	63-681	56 M OHM	½ W ± 10
C6	22-250	.05 MFD.	200 V.	R6	63-271	1 MEGOHM	¼ W ± 20
C7	22-293	.01 MFD.	400 V.	R7	63-634	820 OHM	¼ W ± 10
C8	22-182	.00025 MFD.	600 V.	R8	63-160	100 M OHM	½ W ± 10
C9	22-147	.0005 MFD.	600 V.	R9	63-597	470 M OHM	¼ W ± 20
C10	22-212	.05 MFD.	400 V.	R10	63-689	400 M OHM VOLUME CONTROL	
C11	22-492	.002 MFD.	600 V.	R11	63-533	13 OHM WIREWOUND	
C12	22-350	.25 MFD.	200 V.	R12	63-418	1500 OHM	½ W ± 10
C13	22-435	.02 MFD.	600 V.	R13	63-577	100 OHM	¼ W ± 20
C14	22-574	.02 MFD.	600 V.				
C15	22-199	.5 MFD.	200 V.				
C16	22-577	8 MFD. ELECTROLYTIC	250 V.				
C17		8 MFD. "	250 V.				
C18		10 MFD. "	25 V.				

	VARIABLE TRIMMERS
A	1ST I.F. TRANSFORMER PRIMARY
B	1ST I.F. TRANSFORMER SECONDARY
C	2ND I.F. TRANSFORMER PRIMARY
D	2ND I.F. TRANSFORMER SECONDARY
F	BROADCAST OSCILLATOR (SEE NOTE)
H	ANTENNA BROADCAST (ON GANG)
J	#22-519 BROADCAST PADDER
K	SHORT WAVE OSCILLATOR (SEE NOTE)
L	SHORT WAVE DETECTOR (SEE NOTE)

NOTE— TRIMMERS F, K, & L MOUNTED ON BAKELITE STRIP #22-324

1		
2	3-5303	ANT. COIL & SHIELD ASSEMBLY
3	3-4909	OSCILLATOR COIL ASSEMBLY
4	95-443	1ST I.F. TRANSFORMER
5	95-444	2ND I.F. TRANSFORMER
6	85-104	BAND SELECTOR SWITCH
7	85-425	POWER SUPPLY SWITCH
8	95-298	POWER CHOKE
9	95-425	POWER TRANSFORMER
10	190-11	VIBRATOR
11	5-2778	R.F. CHOKE ASSEMBLY
12	5-5043	R.F. CHOKE ASSEMBLY
13	20-82.	R.F. CHOKE
		SPEAKER TRANSFORMER

MODEL	SPEAKER	
5-J-217	49-153	6"
5-J-247	49-153	6"
5-J-255	49-210	8"

I.F. FREQUENCY 456 K.C.
5 TUBE BATTERY SUPERHETERODYNE
6 VOLT D.C. + 115 VOLT A.C.
CHASSIS Nº 5524

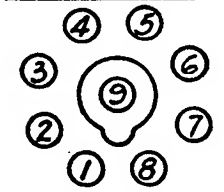
ZENITH RADIO CORP.
CHICAGO, ILLINOIS

Circuit Diagram — Models 5-J-217, 5-J-247, 5-J-255 (5524 Chassis)

MODELS 5J217-5J247-5J255
CHASSIS No. 5524

SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9
6D8	Converter Osc.	0	0	129	42.5	—2	110	6.3	1.5	0
6S7	I. F.	0	0	130	42.5	1.5	—	6.3	1.5	0
6T7	2nd Det. A.V.C. 1st Audio	0	0	23	.1	.1	—	6.3	.5	0
6ZY5G	Rect.	0	6.3	—3.5	—	—3.5	—	0	140	—
		H	P	S	K	H	G			
38	Power	0	124	129	12	6.3	0			



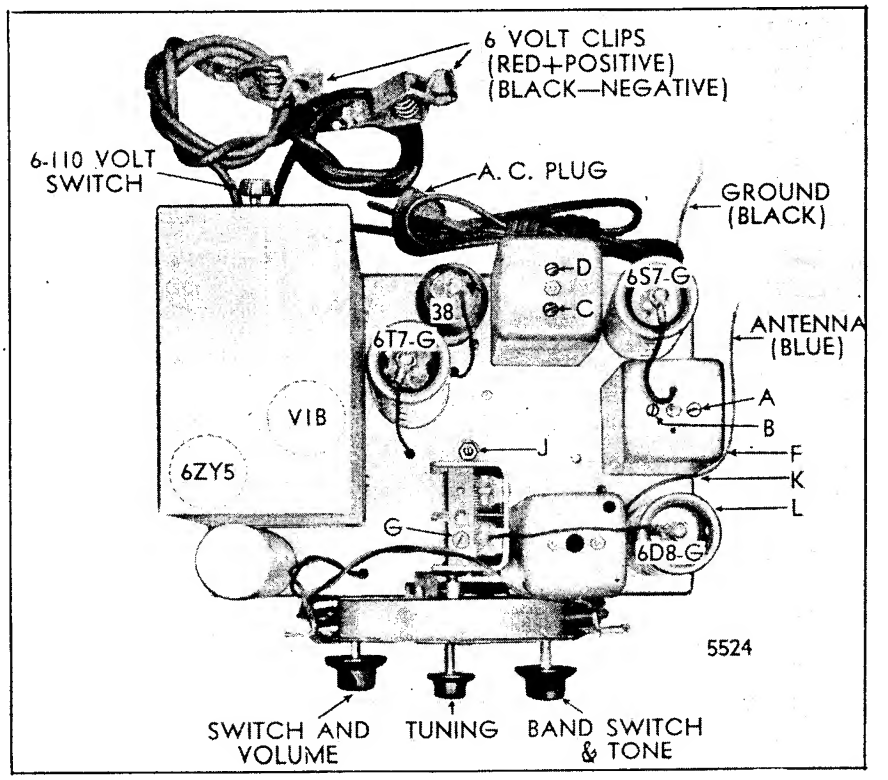
BOTTOM VIEW OF SOCKET

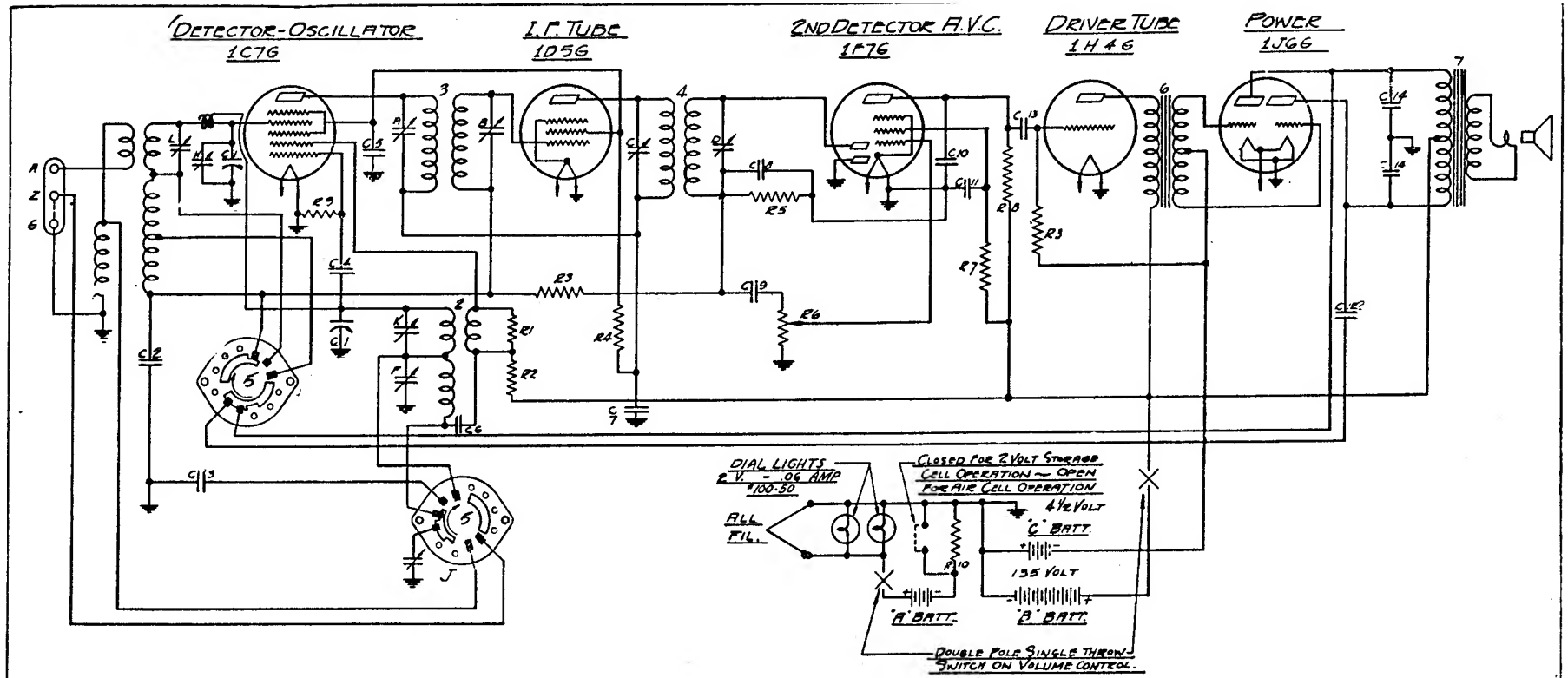
All voltages measured from point indicated to ground using a 1000 Ohm per Volt meter, antenna and ground disconnected. Line voltage 117V. Consumption 16W. Battery voltage 6.3V consumption 2.1 Amp. Power Output .84W.

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to—	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	456	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Lead	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	1500	G	Al'gment of Ant.
4	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output.
5				"		FG	Repeat 2 & 3.
6	Rec. Ant. Lead	400 Ohms	18000	S.W.	18000	K	Set Osc. to Scale
7	" " "	400 Ohms	16500	S.W.	16500	L	Rock gang & adj. for max. output.

LOCATION OF TRIMMERS





DIAG NO	PART NO	DESCRIPTION	
C1	22-446	TWO GANG VARIABLE	
C2	22-487	.05 MFD	400V
C3	22-563	FIXED PADDER	
C4	22-209	50 MMFD	400V
C5	22-199	.5 MFD	200V
C6	22-388	.002 MFD	600V
C7	22-170	.1 MFD	400V
C8	22-168	.0001 MFD	600V
C9	22-327	.02 MFD	200V
C10	22-147	.0005 MFD	600V
C11	22-230	.05 MFD	200V
C12	22-171	.05 MFD	600V
C13	22-188	.02 MFD	400V
C14	22-492	.002 MFD	600V
R1	69-589	10 M OHM	½W ± 20
R2	69-630	5600 OHM	½W ± 10
R3	69-271	1 MEGOHM	½W ± 20
R4	69-648	47 M OHM	½W ± 10
R5	69-658	390 M OHM	½W ± 10
R6	69-541	1 MEGOHM VOLUME CONTROL	
R7	61-461	1 MEGOHM	½W ± 10
R8	61-667	330 M OHM	½W ± 10
R9	61-648	33 M OHM	½W ± 10
R10	69-618	24 OHM (WIREWOUND)	½W ± 10

DIAG NO	PART NO	DESCRIPTION
1		
2	95183	ANT. COIL & SHIELD ASSEMBLY
3	94909	OSCILLATOR COIL ASSEMBLY
4	95-407	1ST I.F. TRANSFORMER
5	95-408	2ND I.F. TRANSFORMER
6	85-106	BAND SELECTOR SWITCH
7	95-446	AUDIO TRANSFORMER
		SPEAKER TRANSFORMER (ON SPK'R)
		VARIABLE TRIMMERS
A		1ST I.F. TRANSFORMER PRIMARY
B		1ST I.F. TRANSFORMER SECONDARY
C		2ND I.F. TRANSFORMER PRIMARY
D		2ND I.F. TRANSFORMER SECONDARY
F		BROADCAST OSCILLATOR (SEE NOTE)
H		ANTENNA BROADCAST (ON GANG)
J	FER-519	BROADCAST PADDER
K		SHORT WAVE OSCILLATOR (SEE NOTE)
L		SHORT WAVE DETECTOR #22-305

NOTE: TRIMMERS F & K MOUNTED ON BAKELITE STRIP PART FER-406

MODEL	SPEAKER
5F-233	49-162 — 6"
5F-231	49-164 — 8"

I.F. FREQUENCY 456 K. C.

5 TUBE BATTERY SUPERHETERODYNE

CHASSIS NO. 5522.

ZENITH RADIO CORPORATION

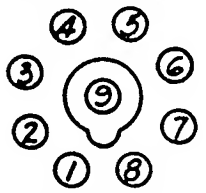
CHICAGO, ILL.

Circuit Diagram — Models 5-F-233, 5-F-231 (5522 Chassis)

MODELS 5F233-5F251
CHASSIS No. 5522

SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9
1C7	Converter Osc.	—	2	137	41	—5	116	0	—	0
1D5	I. F.	—	2	137	41	—	—	0	—	0
1F7	2nd Det. A.V.C. 1st Audio	—	2	14	0	0	11	0	—	0
1H4	2nd Audio	--	0	126	—	—.5	—	2	—	—
1J6	Power	—	0	136	—1.5	—1.5	136	2	—	—



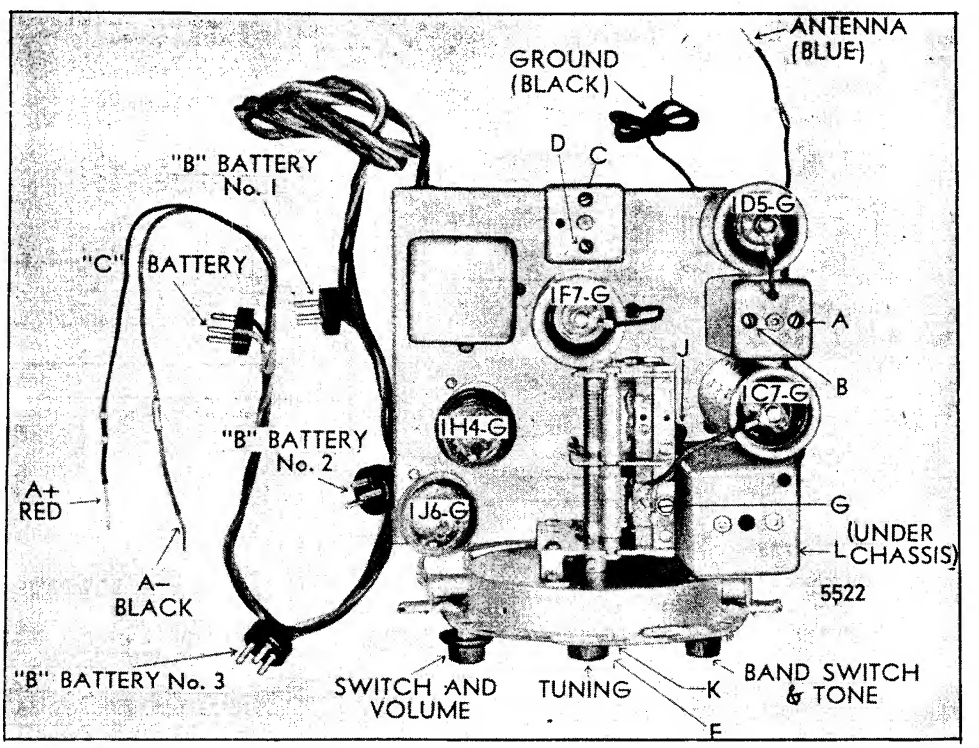
BOTTOM VIEW OF SOCKET

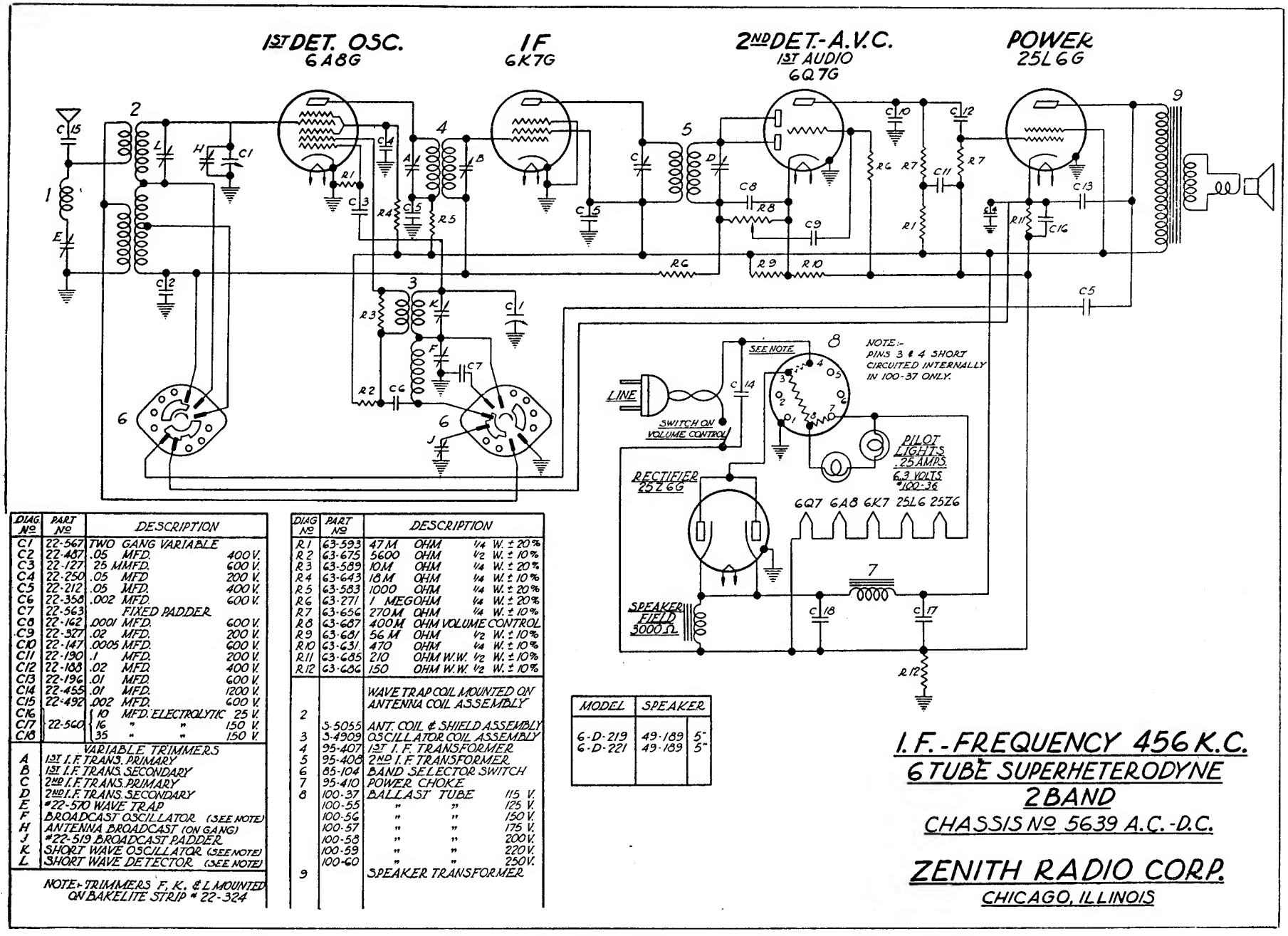
All voltages measured from point indicated to ground using a 1000 Ohm per Volt meter, antenna and ground disconnected. "A" consumption .66 Amp. "B" consumption 19 M.A. Power output 1.75W.

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to—	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	456	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Lead	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	1500	G	Al'gment of Ant.
4	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output.
5				"		FG	Repeat 3 & 4.
6	Rec. Ant. Lead	400 Ohms	18000	S.W.	18000	K	Set Osc. to Scale
7	" " "	400 Ohms	16500	S.W.	16500	L	Rock gang & adj. for max. output.

LOCATION OF TRIMMERS





DIAG Nº	PART Nº	DESCRIPTION
C1	22-567	TWO GANG VARIABLE
C2	22-487	.05 MFD. 400 V.
C3	22-127	25 MMFD. 600 V.
C4	22-250	.05 MFD. 200 V.
C5	22-212	.05 MFD. 400 V.
C6	22-358	.002 MFD. 600 V.
C7	22-563	FIXED PADDER
C8	22-162	.0001 MFD. 600 V.
C9	22-327	.02 MFD. 200 V.
C10	22-147	.0005 MFD. 600 V.
C11	22-190	.1 MFD. 200 V.
C12	22-188	.02 MFD. 400 V.
C13	22-196	.01 MFD. 600 V.
C14	22-455	.01 MFD. 1200 V.
C15	22-492	.002 MFD. 600 V.
C16	22-560	10 MFD. ELECTROLYTIC 25 V.
C17		16 " " 150 V.
C18		35 " " 150 V.
		VARIABLE TRIMMERS
A		1ST I.F. TRANS. PRIMARY
B		1ST I.F. TRANS. SECONDARY
C		2ND I.F. TRANS. PRIMARY
D		2ND I.F. TRANS. SECONDARY
E		#22-570 WAVE TRAP
F		BROADCAST OSCILLATOR (SEE NOTE)
H		ANTENNA BROADCAST (ON GANG)
J		#22-519 BROADCAST PADDER
K		SHORT WAVE OSCILLATOR (SEE NOTE)
L		SHORT WAVE DETECTOR (SEE NOTE)

NOTE:- TRIMMERS F, K, & L MOUNTED ON BAKELITE STRIP # 22-324

DIAG Nº	PART Nº	DESCRIPTION
R1	63-593	47 M OHM 1/4 W. ± 20%
R2	63-675	5600 OHM 1/2 W. ± 10%
R3	63-589	10 M OHM 1/4 W. ± 20%
R4	63-643	18 M OHM 1/4 W. ± 10%
R5	63-583	1000 OHM 1/4 W. ± 20%
R6	63-271	1 MEGOHM 1/4 W. ± 20%
R7	63-656	270 M OHM 1/4 W. ± 10%
R8	63-687	400 M OHM VOLUME CONTROL
R9	63-681	56 M OHM 1/2 W. ± 10%
R10	63-631	470 OHM 1/4 W. ± 10%
R11	63-685	210 OHM W.W. 1/2 W. ± 10%
R12	63-686	150 OHM W.W. 1/2 W. ± 10%
		WAVE TRAP COIL MOUNTED ON ANTENNA COIL ASSEMBLY
2		
	3-5055	ANT. COIL & SHIELD ASSEMBLY
3	3-4909	OSCILLATOR COIL ASSEMBLY
4	95-407	1ST I. F. TRANSFORMER
5	95-408	2ND I. F. TRANSFORMER
6	65-104	BAND SELECTOR SWITCH
7	95-410	POWER CHOKE
8	100-37	BALLAST TUBE 115 V.
	100-55	" " 125 V.
	100-56	" " 150 V.
	100-57	" " 175 V.
	100-58	" " 200 V.
	100-59	" " 220 V.
	100-60	" " 250 V.
9		SPEAKER TRANSFORMER

MODEL	SPEAKER	
6-D-219	49-189	5"
6-D-221	49-189	5"

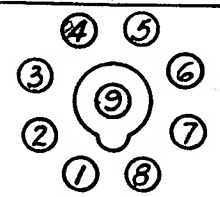
Circuit Diagram — Models 6-D-202, 6-D-219, 6-D-221, 6-D-238 (5639 Chassis)

MODELS 6D202-6D219-6D221-6D238

CHASSIS No. 5639

SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9
6A8	Converter Osc.	0	AC	102	55	—1	85	AC	0	—.1
6K7	I.F.	0	AC	104	104	0	—	AC	0	—.1
6Q7	2nd Det. AVC 1st Audio	0	AC	24	—1	—1	—	AC	—1	—1
25L6	Power	0	AC	94	104	—.5	—	AC	—4	—
25Z6	Rect.	0	AC	AC	119	AC	—	AC	119	—
	Ballast									



BOTTOM VIEW OF SOCKET

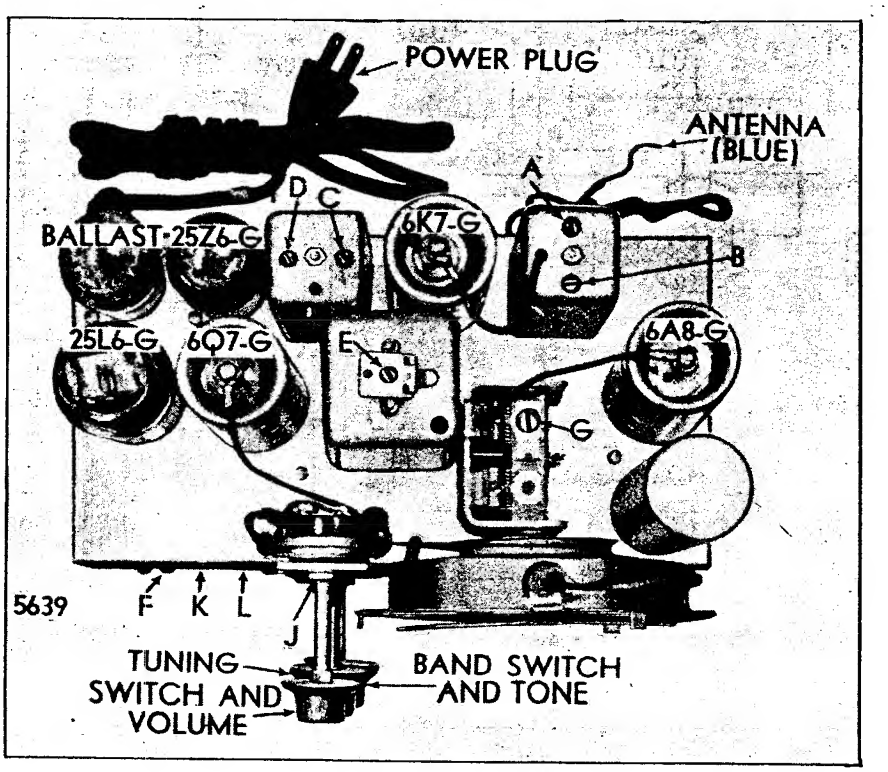
All voltages measured from point indicated to ground using a 1000 Ohm per Volt meter, antenna and ground disconnected. Line voltage 117V. Consumption 55W. Power output 1.75W.

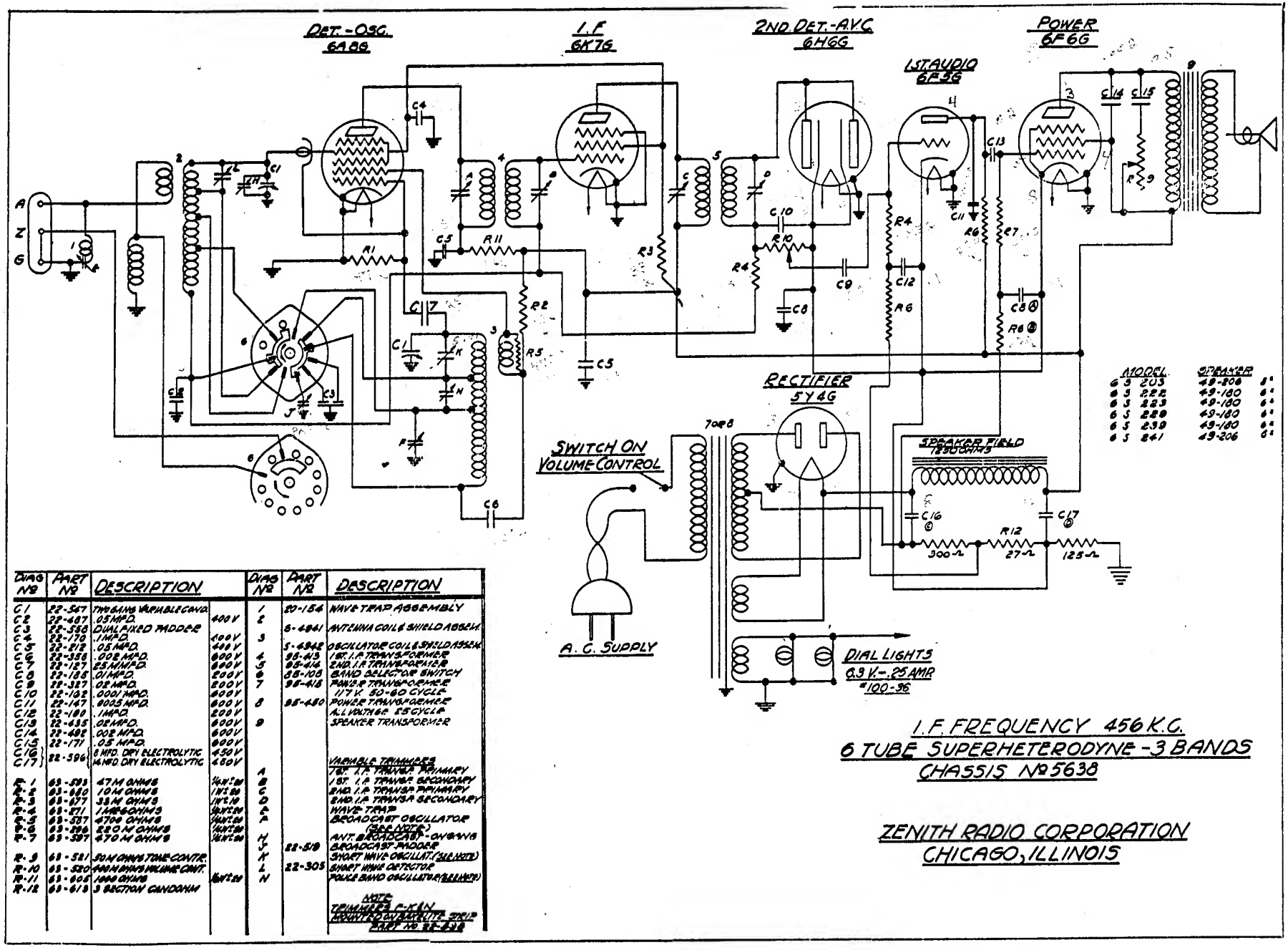
ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to—	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	456	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Lead	200 Mmfd.	456	"	600	E	See Note
3	" " "	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
4	" " "	200 Mmfd.	1500	"	1500	G	Al'gment of Ant.
5	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
6						FG	Repeat 3 & 4
7	" " "	400 Ohms	18000	S.W.	18000	K	Set Osc. to Scale
8	" " "	400 Ohms	16500	S.W.	16500	L	Rock gang & adj. for max. output

NOTE: If receiver is used in a location subject to code interference adjust wave trap (E) for minimum interference with antenna connected and receiver operating in broadcast band.

LOCATION OF TRIMMERS





MODEL	SPEAKER	
6 S 203	49-206	G
6 S 222	49-180	G
6 S 223	49-180	G
6 S 229	49-180	G
6 S 239	49-180	G
6 S 241	49-206	G

DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION
C1	22-567	TWIN GANG VARIABLE CONDS.		1	50-154	WAVE TRAP ASSEMBLY
C2	22-487	.05 MFD.	400 V	2		
C3	22-538	DUAL FIXED PADDER		3	6-4841	ANTENNA COIL & SHIELD ASSEM.
C4	22-170	.1 MFD.	400 V			
C5	22-213	.05 MFD.	400 V		5-4842	OSCILLATOR COIL & SHIELD ASSEM.
C6	22-358	.002 MFD.	600 V	4	95-413	1ST I.F. TRANSFORMER
C7	22-127	25 MMFD.	600 V	5	95-414	2ND I.F. TRANSFORMER
C8	22-185	.01 MFD.	200 V	6	55-108	BAND SELECTOR SWITCH
C9	22-327	.02 MFD.	200 V	7	96-418	PWR. S. TRANSFORMER
C10	22-132	.0001 MFD.	600 V			117 V. 50-60 CYCLE
C11	22-147	.0025 MFD.	600 V	8	95-450	POWER TRANSFORMER
C12	22-180	.1 MFD.	200 V			ALL VOLTAGE 25 CYCLE
C13	22-435	.02 MFD.	600 V	9		SPEAKER TRANSFORMER
C14	22-492	.002 MFD.	600 V			
C15	22-171	.05 MFD.	600 V			
C16	22-596	8 MFD. DRY ELECTROLYTIC	450 V			
C17		16 MFD. DRY ELECTROLYTIC	450 V			VARIABLE TRIMMERS
				A		1ST I.F. TRANS. PRIMARY
R-1	63-593	47 M OHMS	½ W. 5%	B		1ST. I.F. TRANS. SECONDARY
R-2	63-680	10 M OHMS	1/2 W. 5%	C		2ND I.F. TRANS. PRIMARY
R-3	63-677	33 M OHMS	1/2 W. 10	D		2ND I.F. TRANS. SECONDARY
R-4	63-571	1 M. 5% OHMS	½ W. 5%	E		WAVE TRAP
R-5	63-587	4700 OHMS	½ W. 5%	F		BROADCAST OSCILLATOR (SEE NOTE)
R-6	63-596	220 M OHMS	½ W. 5%			
R-7	63-597	470 M OHMS	½ W. 5%	H		ANT. BROADCAST - ON GANG
				J	22-519	BROADCAST PADDER
R-8	63-581	50 M OHMS TONE CONTR.		K		SHORT WAVE OSCILLAT. (SEE NOTE)
R-10	63-520	500 M OHMS VOLUME CONT.		L	22-305	SHORT WAVE DETECTOR
R-11	63-606	1000 OHMS	½ W. 5%	N		POLICE BAND OSCILLATOR (SEE NOTE)
R-12	63-618	3 SECTION CANDOHM				

NOTE
TRIMMERS C-K-N MOUNTED ON ANTENNA COIL SHIELD PART NO. 22-538

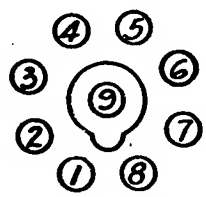
Circuit Diagram — Models 6-S-203, 6-S-222, 6-S-223, 6-S-229, 6-S-239, 6-S-241 (5638 Chassis)

MODELS 6S203-6S222-6S223-6S229-6S239-6S241

CHASSIS No. 5638

SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9
6A8	Converter Osc.	0	6.1	245	83	—9	200	0	0	—.1
6K7	I.F.	0	6.1	247	83	0	—	0	0	—.1
6H6	2nd Det. AVC	0	0	—2	—2	—2	—	6.1	—2	—
6F5	1st Audio	0	0	—	114	—	—	6.1	—2	—2
6F6	Power	0	0	231	247	—3.5	—	6.1	—2	—
5Y4	Rect.	0	—	AC	—	AC	—	322	322	—



BOTTOM VIEW OF SOCKET

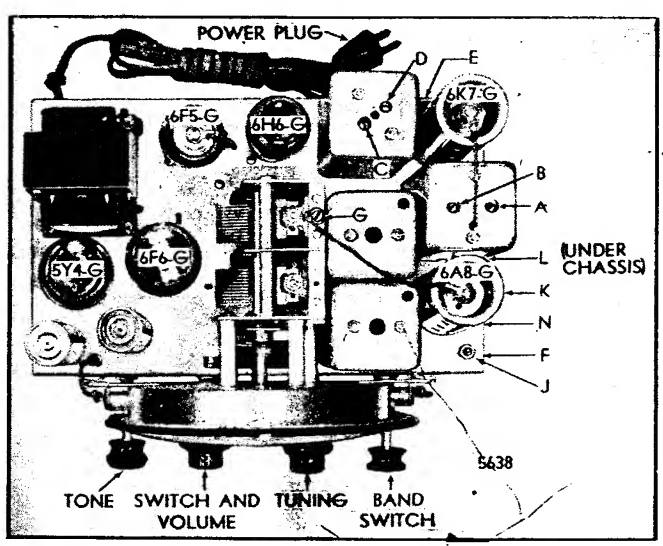
All voltages measured from point indicated to ground using a 1000 Ohm per Volt meter, antenna and ground disconnected. Line voltage 117V. Consumption 65W. Power Output 4.5W.

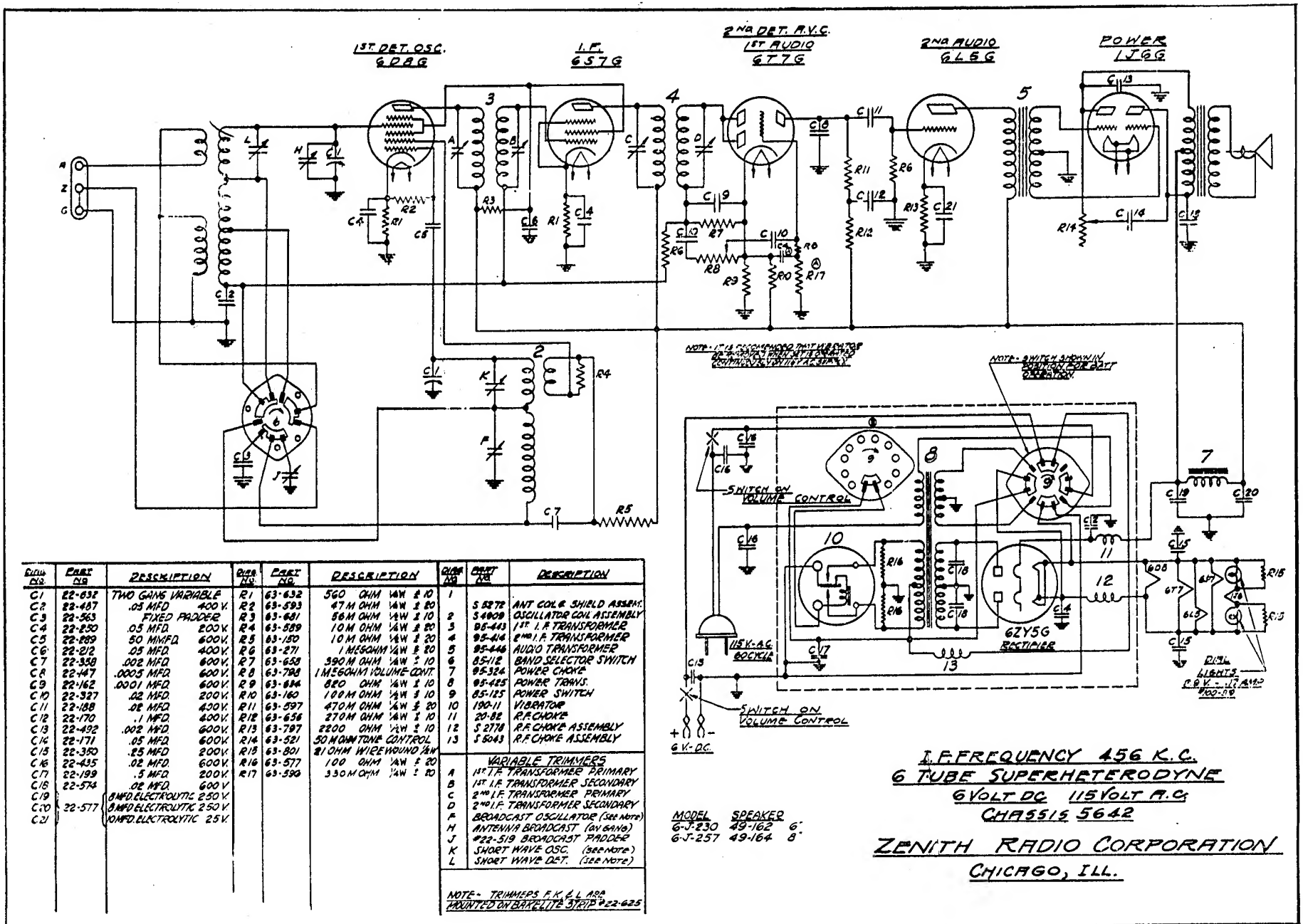
ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to—	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	456	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Post	200 Mmfd.	456	"	600	E	See Note
3	" " "	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
4	" " "	200 Mmfd.	1500	"	1500	G	Al'gment of Ant.
5	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
6	" " "	200 Mmfd.				FG	Repeat 3 & 4
7	" " "	400 Ohms	18000	S.W.	18000	K	Set Osc. to Scale
8	" " "	400 Ohms	16500	S.W.	16500	L	Rock gang & adj. for max. output
9	" " "	400 Ohms	5500	Police	5500	N	Rock gang & adj. for max. output

NOTE: If receiver is used in a location subject to code interference adjust wave trap (E) for minimum interference with antenna connected and receiver operating in broadcast band.

LOCATION OF TRIMMERS





CIRCUIT NO.	PART NO.	DESCRIPTION	CIRCUIT NO.	PART NO.	DESCRIPTION
C1	22-632	TWO GANG VARIABLE	R1	63-632	560 OHM ½W ± 10
C2	22-487	.05 MFD. 400 V.	R2	63-593	47 M OHM ½W ± 20
C3	22-563	FIXED PADDER	R3	63-681	56 M OHM ½W ± 10
C4	22-250	.05 MFD. 200 V.	R4	63-589	10 M OHM ½W ± 20
C5	22-289	50 MMFD. 600 V.	R5	63-150	10 M OHM ½W ± 20
C6	22-212	.05 MFD. 400 V.	R6	63-271	1 MEGOHM ½W ± 20
C7	22-358	.002 MFD. 600 V.	R7	63-658	390 M OHM ½W ± 10
C8	22-447	.0005 MFD. 600 V.	R8	63-798	1 MEGOHM VOLUME CONT.
C9	22-162	.0001 MFD. 600 V.	R9	63-684	820 OHM ½W ± 10
C10	22-327	.02 MFD. 200 V.	R10	63-160	100 M OHM ½W ± 10
C11	22-188	.02 MFD. 400 V.	R11	63-597	470 M OHM ½W ± 20
C12	22-170	.1 MFD. 400 V.	R12	63-656	270 M OHM ½W ± 10
C13	22-492	.002 MFD. 600 V.	R13	63-797	2200 OHM ½W ± 10
C14	22-171	.05 MFD. 600 V.	R14	63-521	50 M OHM TONE CONTROL
C15	22-350	.25 MFD. 200 V.	R15	63-801	21 OHM WIREWOUND ½W
C16	22-435	.02 MFD. 600 V.	R16	63-577	100 OHM ½W ± 20
C17	22-199	.5 MFD. 200 V.	R17	63-590	330 M OHM ½W ± 10
C18	22-574	.02 MFD. 600 V.			
C19	22-577	8 MFD. ELECTROLYTIC 250 V.			
C20		8 MFD. ELECTROLYTIC 250 V.			
C21		10 MFD. ELECTROLYTIC 25 V.			

CIRCUIT NO.	PART NO.	DESCRIPTION
1	S 5272	ANT. COIL & SHIELD ASSEM.
2	S 4909	OSCILLATOR COIL ASSEMBLY
3	95-443	1ST I.F. TRANSFORMER
4	95-414	2ND I.F. TRANSFORMER
5	95-446	AUDIO TRANSFORMER
6	85-112	BAND SELECTOR SWITCH
7	95-324	POWER CHOKE
8	95-425	POWER TRANS.
9	85-125	POWER SWITCH
10	190-11	VIBRATOR
11	20-82	R.F. CHOKE
12	S 2778	R.F. CHOKE ASSEMBLY
13	S 5043	R.F. CHOKE ASSEMBLY

VARIABLE TRIMMERS

A	1ST I.F. TRANSFORMER PRIMARY
B	1ST I.F. TRANSFORMER SECONDARY
C	2ND I.F. TRANSFORMER PRIMARY
D	2ND I.F. TRANSFORMER SECONDARY
F	BROADCAST OSCILLATOR (See Note)
H	ANTENNA BROADCAST (all bands)
J	#22-519 BROADCAST PADDER
K	SHORT WAVE OSC. (See Note)
L	SHORT WAVE DET. (See Note)

NOTE - TRIMMERS F, K & L ARE MOUNTED ON BAKELITE STRIP #22-625

MODEL	SPEAKER	
6-J-230	49-162	6"
6-J-257	49-164	8"

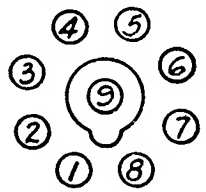
I.F. FREQUENCY 456 K.C.
6 TUBE SUPERHETERODYNE
6 VOLT D.C. 115 VOLT A.C.
CHASSIS 5642

ZENITH RADIO CORPORATION
CHICAGO, ILL.

Circuit Diagram — Models 6-J-230, 6-J-257 (5642 Chassis)

MODELS 6J230-6J257
CHASSIS No. 5642
SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9
6D8	Converter Osc.	0	0	125	35	—1	97	6.3	1.5	0
6S7	I.F.	0	0	124	35	1	—	6.3	1	0
6T7	2nd Det. AVC 1st Audio	0	0	15	.1	.1	—	6.3	.5	0
6L5	2nd Audio	0	0	120	—	0	—	6.3	.2	—
1J6	Power	0	3	137	0	0	137	1	0	—
6ZY5	Rect.	0	6.3	AC	—	AC	—	0	140	—



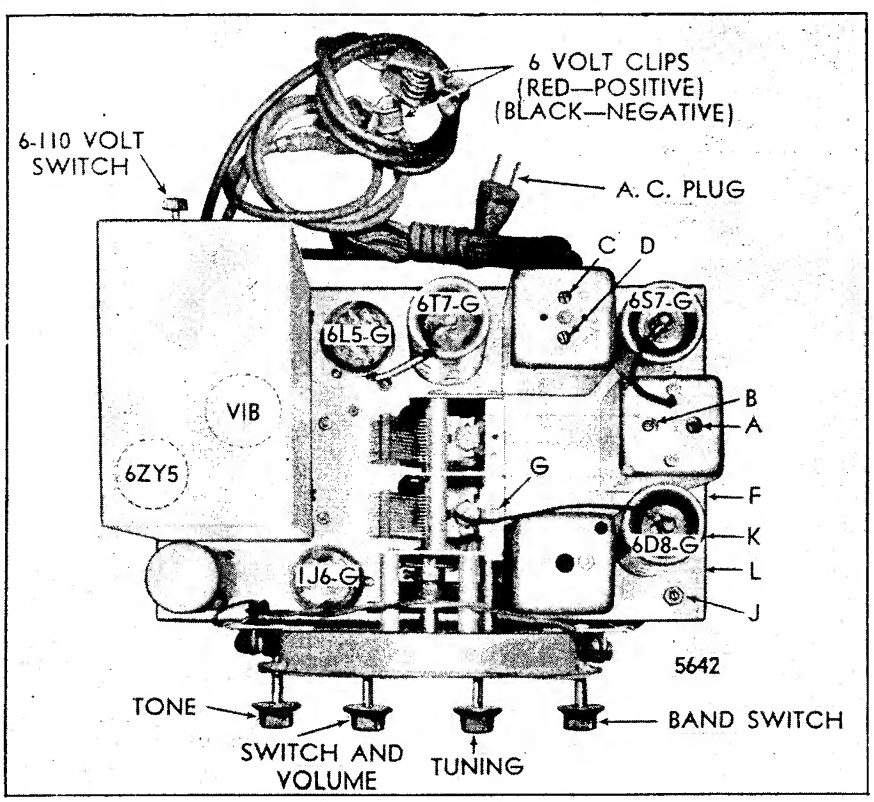
BOTTOM VIEW OF SOCKET

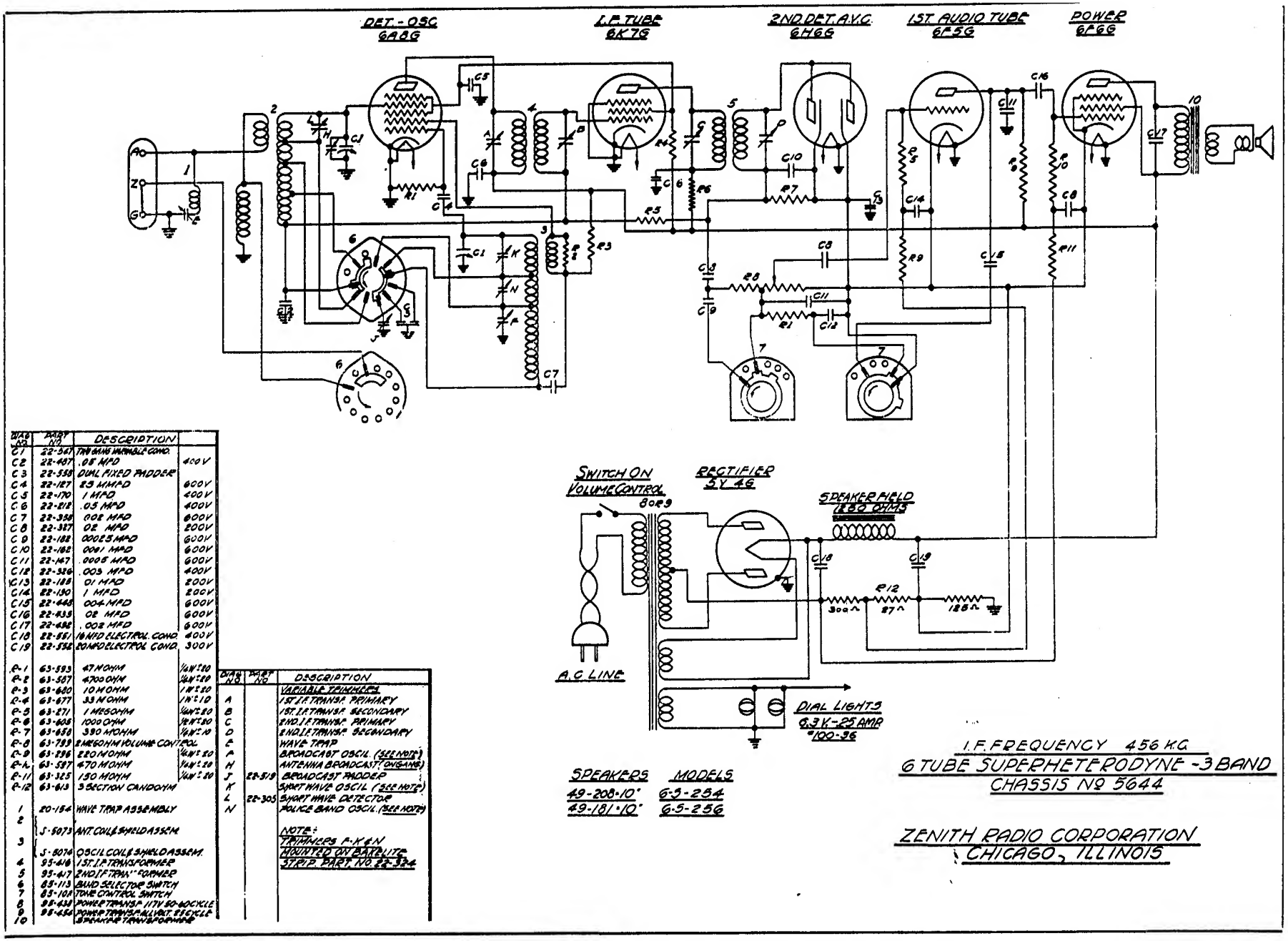
All voltages measured from point indicated to ground using a 1000 Ohm per Volt meter, antenna and ground disconnected. Line voltage 117V. Consumption 17W. Battery voltage 6.3V consumption 2.04 Amp. Power output 1.75W.

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to—	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	456	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Lead	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	1500	G	Al'gment of Ant.
4	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
5				"		FG	Repeat 3 & 4
6	Rec. Ant. Lead	400 Ohms	18000	S.W.	18000	K	Set Osc. to Scale
7	" " "	400 Ohms	16500	S.W.	16500	L	Rock gang & adj. for max. output

LOCATION OF TRIMMERS





DIAG. NO.	PART NO.	DESCRIPTION	
C1	22-547	TWO GANG VARIABLE COND.	
C2	22-487	.05 MFD	400 V
C3	22-538	DUAL FIXED PADDER	
C4	22-127	.25 MMFD	600V
C5	22-170	1 MFD	400V
C6	22-212	.03 MFD	400V
C7	22-338	.002 MFD	600V
C8	22-337	.02 MFD	200V
C9	22-188	.0025 MFD	600V
C10	22-182	.0001 MFD	600V
C11	22-147	.0005 MFD	600V
C12	22-326	.005 MFD	400V
C13	22-188	.01 MFD	200V
C14	22-190	1 MFD	200V
C15	22-448	.004 MFD	600V
C16	22-835	.02 MFD	600V
C17	22-486	.002 MFD	600V
C18	22-851	18 MFD ELECTROL. COND.	400V
C19	22-532	20 MFD ELECTROL. COND.	300V
R-1	63-593	47 OHM	½W ±20
R-2	63-587	4700 OHM	½W ±20
R-3	63-680	10 M OHM	1W ±20
R-4	63-677	33 M OHM	1W ±10
R-5	63-671	1 MEGOHM	½W ±20
R-6	63-608	1000 OHM	½W ±20
R-7	63-658	330 M OHM	½W ±10
R-8	63-793	2 MEGOHM VOLUME CONTROL	
R-9	63-696	220 M OHM	½W ±20
R-10	63-587	470 M OHM	½W ±20
R-11	63-325	150 M OHM	½W ±20
R-12	63-613	3 SECTION CANDOHM	
1	20-154	WAVE TRAP ASSEMBLY	
2	S-5073	ANT. COIL & SHIELD ASSEM.	
3	S-5074	OSCIL. COIL & SHIELD ASSEM.	
4	95-416	1ST I.F. TRANSFORMER	
5	95-417	2ND I.F. TRANS. FORMER	
6	85-113	BAND SELECTOR SWITCH	
7	85-101	TONE CONTROL SWITCH	
8	98-438	POWER TRANS. P. 117 V 60 CYCLE	
9	98-456	POWER TRANS. P. ALL VOLT. 25 CYCLE SPEAKER TRANSFORMER	
10			

DIAG. NO.	PART NO.	DESCRIPTION
		VARIABLE TRIMMERS
A		1ST I.F. TRANS. P. PRIMARY
B		1ST I.F. TRANS. P. SECONDARY
C		2ND I.F. TRANS. P. PRIMARY
D		2ND I.F. TRANS. P. SECONDARY
E		WAVE TRAP
F		BROADCAST OSCIL. (SEE NOTE)
H		ANTENNA BROADCAST (ONE GANG)
J	22-519	BROADCAST PADDER
K		SHORT WAVE OSCIL. (SEE NOTE)
L	22-305	SHORT WAVE DETECTOR
N		POLICE BAND OSCIL. (SEE NOTE)

NOTE: TRIMMERS F, K & N MOUNTED ON PARALLITE STRIP. PART NO. 22-324

SPEAKERS	MODELS
49-208-10"	6-S-254
49-181-10"	6-S-256

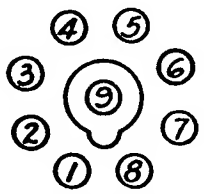
Circuit Diagram — Models 6-S-254, 6-S-256 (5644 Chassis)

MODELS 6S254-6S256

CHASSIS No. 5644

SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9
6A8	Converter Osc.	0	6.2	246	90	—9	190	0	0	—.5
6K7	I.F.	0	6.2	237	90	0	—	0	0	—.5
6H6	2nd Det. A.V.C.	0	0	—2.5	—2	—2.5	—	6.2	—2	—
6F5	1st Audio	0	0	—	104	—	—	6.2	—2	—2
6F6	Power	0	0	231	243	—3	—	6.2	—2	—
5Y4	Rect.	0	—	AC	—	AC	—	314	314	—



BOTTOM VIEW OF SOCKET

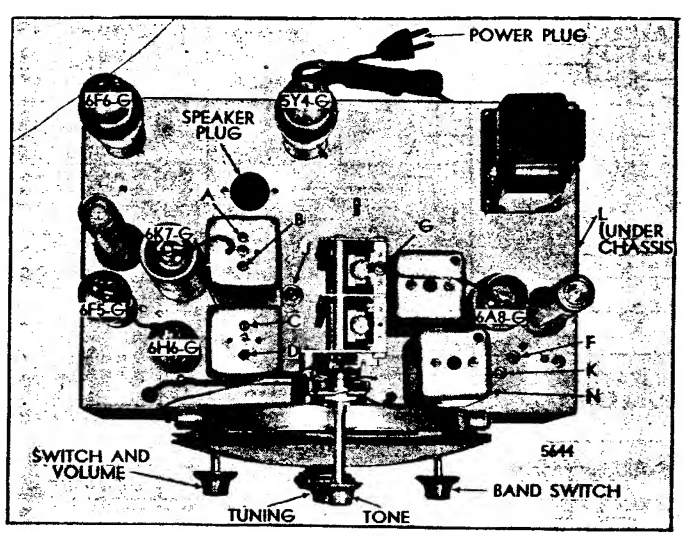
All voltages measured from point indicated to ground using a 1000 Ohm per Volt meter, antenna and ground disconnected. Line voltage 117V. Consumption 65W. Power output 4.5W.

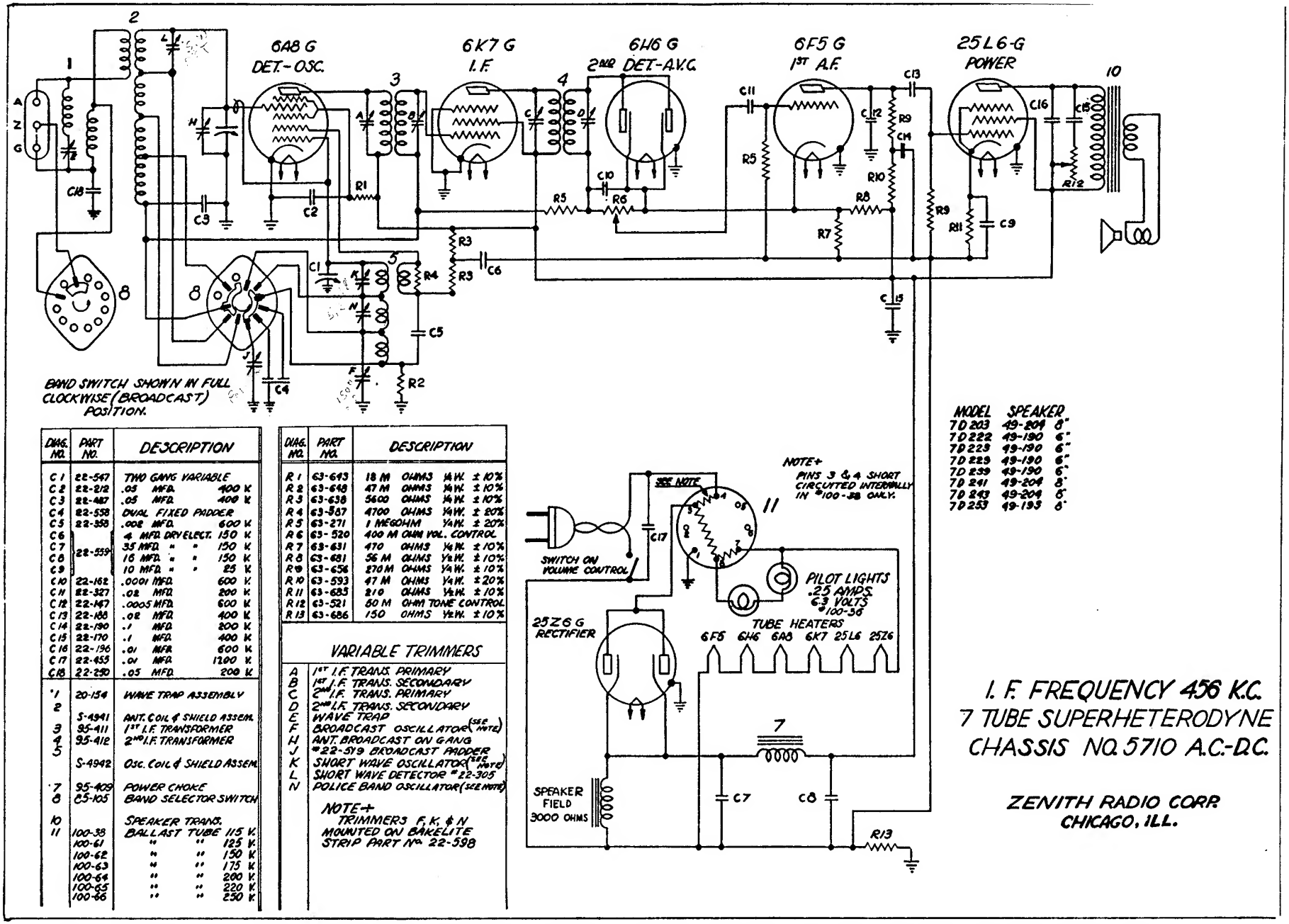
ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to—	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	456	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Post	200 Mmfd.	456	"	600	E	See Note
3	" " "	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
4	" " "	200 Mmfd.	1500	"	1500	G	Al'gment of Ant.
5	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
6	" " "	200 Mmfd.				FG	Repeat 3 & 4
7	" " "	400 Ohms	18000	S.W.	18000	K	Set Osc. to Scale
8	" " "	400 Ohms	16500	S.W.	16500	L	Rock gang & adj. for max. output
9	" " "	400 Ohms	5500	Police	5500	N	Rock gang & adj. for max. output

NOTE: If receiver is used in a location subject to code interference adjust wave trap (E) for minimum interference with antenna connected and receiver operating in broadcast band.

LOCATION OF TRIMMERS





DIAG. NO.	PART NO.	DESCRIPTION
C 1	22-547	TWO GANG VARIABLE
C 2	22-212	.05 MFD. 400 V.
C 3	22-487	.05 MFD. 400 V.
C 4	22-558	DUAL FIXED PADDER
C 5	22-358	.008 MFD. 600 V.
C 6	22-559	4 MFD. DRY ELECT. 150 V.
C 7		35 MFD. " " 150 V.
C 8		16 MFD. " " 150 V.
C 9		10 MFD. " " 25 V.
C 10	22-162	.0001 MFD. 600 V.
C 11	22-327	.02 MFD. 200 V.
C 12	22-467	.0005 MFD. 600 V.
C 13	22-188	.02 MFD. 400 V.
C 14	22-190	.1 MFD. 200 V.
C 15	22-170	.1 MFD. 400 V.
C 16	22-196	.01 MFD. 600 V.
C 17	22-455	.01 MFD. 1200 V.
C 18	22-250	.05 MFD. 200 V.
*1	20-154	WAVE TRAP ASSEMBLY
2	S-4941	ANT. COIL & SHIELD ASSEM.
3	95-411	1ST I.F. TRANSFORMER
4	95-412	2ND I.F. TRANSFORMER
5	S-4942	OSC. COIL & SHIELD ASSEM.
*7	95-409	POWER CHOKE
8	65-105	BAND SELECTOR SWITCH
10		SPEAKER TRANS.
11	100-38	BALLAST TUBE 115 V.
	100-61	" " 125 V.
	100-62	" " 150 V.
	100-63	" " 175 V.
	100-64	" " 200 V.
	100-65	" " 220 V.
	100-66	" " 250 V.

DIAG. NO.	PART NO.	DESCRIPTION
R 1	63-643	18 M OHMS 1/4 W. ± 10%
R 2	63-649	47 M OHMS 1/4 W. ± 10%
R 3	63-638	5600 OHMS 1/4 W. ± 10%
R 4	63-587	4700 OHMS 1/4 W. ± 20%
R 5	63-271	1 MEGOHM 1/4 W. ± 20%
R 6	63-520	400 M OHM VOL. CONTROL
R 7	63-631	470 OHMS 1/4 W. ± 10%
R 8	63-681	56 M OHMS 1/2 W. ± 10%
R 9	63-656	270 M OHMS 1/2 W. ± 10%
R 10	63-593	47 M OHMS 1/4 W. ± 20%
R 11	63-685	210 OHMS 1/2 W. ± 10%
R 12	63-521	50 M OHM TONE CONTROL
R 13	63-686	150 OHMS 1/2 W. ± 10%

VARIABLE TRIMMERS

A	1ST I.F. TRANS. PRIMARY
B	1ST I.F. TRANS. SECONDARY
C	2ND I.F. TRANS. PRIMARY
D	2ND I.F. TRANS. SECONDARY
E	WAVE TRAP
F	BROADCAST OSCILLATOR (SEE NOTE)
H	ANT. BROADCAST ON GANG
J	#22-519 BROADCAST PADDER
K	SHORT WAVE OSCILLATOR (SEE NOTE)
L	SHORT WAVE DETECTOR #22-305
N	POLICE BAND OSCILLATOR (SEE NOTE)

NOTE+
TRIMMERS F, K, & N MOUNTED ON BAKELITE STRIP PART NO. 22-598

MODEL	SPEAKER	
7D 203	49-204	8"
7D 222	49-190	6"
7D 223	49-190	6"
7D 229	49-190	6"
7D 239	49-190	6"
7D 241	49-204	8"
7D 243	49-204	8"
7D 253	49-193	8"

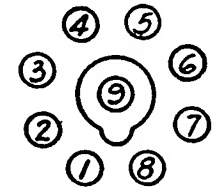
Circuit Diagram — Models 7-D-203, 7-D-222, 7-D-223, 7-D-229, 7-D-239, 7-D-241, 7-D-243, 7-D-253 (5710 Chassis)

MODELS 7D203-7D222-7D223-7D229-7D239-7D241-7D243-7D253

CHASSIS No. 5710

SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9
6A8	Converter Osc.	0	AC	104	63	—5.5	74	AC	0	—.1
6K7	I.F.	0	AC	104	104	0	—	AC	0	—.1
6H6	2nd Det. A.V.C.	0	AC	—1.5	—1	—1.5	—	AC	—1	—
6F5	1st Audio	0	AC	—	24	—	—	AC	—1	—1.5
25L6	Power	0	AC	99	100	—.5	—	AC	4.5	—
25Z6	Rect.	0	AC	AC	119	AC	—	AC	119	—
	Ballast									



BOTTOM VIEW OF SOCKET

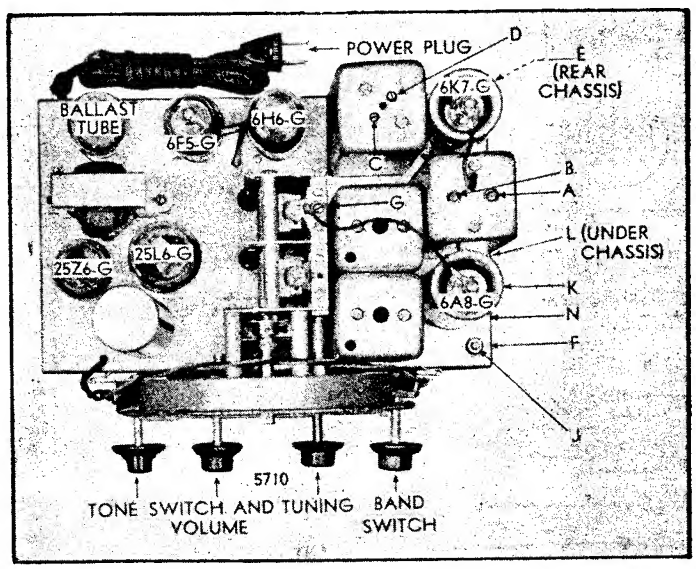
All voltages measured from point indicated to ground using a 1000 Ohm per Volt meter, antenna and ground disconnected. Line voltage 117V. Consumption 55W. Power output 1.75W.

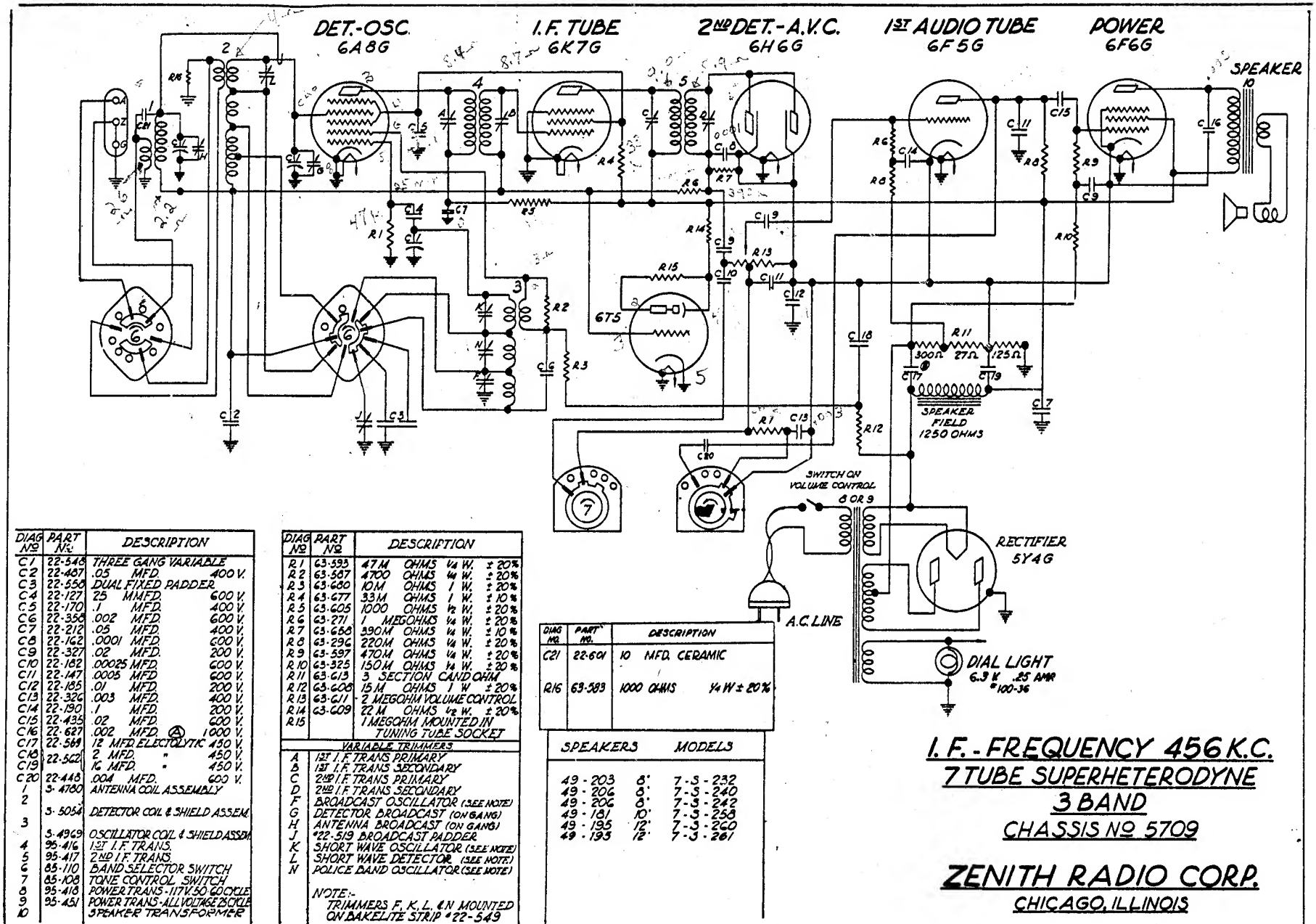
ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to—	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	456	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Post	200 Mmfd.	456	"	600	E	See Note
3	" " "	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
4	" " "	200 Mmfd.	1500	"	1500	G	Al'gment of Ant.
5	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
6	" " "	200 Mmfd.		"		FG	Repeat 3 & 4
7	" " "	400 Ohms	18000	S.W.	18000	K	Set Osc. to Scale
8	" " "	400 Ohms	16500	S.W.	16500	L	Rock gang & adj. for max. output
9	" " "	400 Ohms	5500	Police	5500	N	Rock gang & adj. for max. output

NOTE: If receiver is used in a location subject to code interference adjust wave trap (E) for minimum interference with antenna connected and receiver operating in broadcast band.

LOCATION OF TRIMMERS





DIAG Nº	PART Nº	DESCRIPTION
C1	22-548	THREE GANG VARIABLE
C2	22-487	.05 MFD. 400 V.
C3	22-556	DUAL FIXED PADDER
C4	22-127	.25 MMFD. 600 V.
C5	22-170	.1 MFD. 400 V.
C6	22-356	.002 MFD. 600 V.
C7	22-212	.05 MFD. 400 V.
C8	22-162	.0001 MFD. 600 V.
C9	22-327	.02 MFD. 200 V.
C10	22-182	.00025 MFD. 600 V.
C11	22-147	.0005 MFD. 600 V.
C12	22-185	.01 MFD. 200 V.
C13	22-326	.003 MFD. 400 V.
C14	22-190	.1 MFD. 200 V.
C15	22-435	.02 MFD. 600 V.
C16	22-627	.002 MFD. Ⓐ 1000 V.
C17	22-569	12 MFD ELECTROLYTIC 450 V.
C18	22-562	2 MFD. " 450 V.
C19		1/2 MFD. " 450 V.
C20	22-448	.004 MFD. 600 V.
1	3-4780	ANTENNA COIL ASSEMBLY
2	3-5054	DETECTOR COIL & SHIELD ASSEM.
3	3-4969	OSCILLATOR COIL & SHIELD ASSEM.
4	95-416	1ST I.F. TRANS.
5	95-417	2ND I.F. TRANS.
6	85-110	BAND SELECTOR SWITCH
7	85-108	TONE CONTROL SWITCH
8	95-418	POWER TRANS - 117 V. 50-60 CYCLE
9	95-451	POWER TRANS - ALL VOLTAGE 25 CYCLE
10		SPEAKER TRANSFORMER

DIAG Nº	PART Nº	DESCRIPTION
R1	63-593	47 M OHMS 1/4 W. ± 20%
R2	63-587	4700 OHMS 1/4 W. ± 20%
R3	63-680	10 M OHMS 1 W. ± 20%
R4	63-677	33 M OHMS 1 W. ± 10%
R5	63-605	1000 OHMS 1/2 W. ± 20%
R6	63-271	1 MEGOHMS 1/4 W. ± 20%
R7	63-668	390 M OHMS 1/4 W. ± 10%
R8	63-296	220 M OHMS 1/4 W. ± 20%
R9	63-597	470 M OHMS 1/4 W. ± 20%
R10	63-325	150 M OHMS 1/4 W. ± 20%
R11	63-613	3 SECTION CANDOHM
R12	63-606	15 M OHMS 1 W ± 20%
R13	63-611	2 MEGOHM VOLUME CONTROL
R14	63-609	22 M OHMS 1/2 W. ± 20%
R15		1 MEGOHM MOUNTED IN TUNING TUBE SOCKET
		VARIABLE TRIMMERS
A		1ST I.F. TRANS PRIMARY
B		1ST I.F. TRANS SECONDARY
C		2ND I.F. TRANS PRIMARY
D		2ND I.F. TRANS SECONDARY
F		BROADCAST OSCILLATOR (SEE NOTE)
G		DETECTOR BROADCAST (ON GANG)
H		ANTENNA BROADCAST (ON GANG)
J		#22-519 BROADCAST PADDER
K		SHORT WAVE OSCILLATOR (SEE NOTE)
L		SHORT WAVE DETECTOR (SEE NOTE)
N		POLICE BAND OSCILLATOR (SEE NOTE)

NOTE:- TRIMMERS F, K, L, & N MOUNTED ON BAKELITE STRIP #22-549

DIAG NO.	PART NO.	DESCRIPTION
C21	22-601	10 MFD. CERAMIC
R16	63-583	1000 OHMS 1/4 W ± 20%

SPEAKERS		MODELS
49-203	6"	7-S-232
49-206	6"	7-S-240
49-206	6"	7-S-242
49-181	10"	7-S-258
49-195	12"	7-S-260
49-193	12"	7-S-261

I. F. - FREQUENCY 456 K.C.
7 TUBE SUPERHETERODYNE
3 BAND
CHASSIS Nº 5709

ZENITH RADIO CORP.
CHICAGO, ILLINOIS

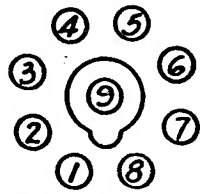
Circuit Diagram — Models 7-S-204, 7-S-232, 7-S-240, 7-S-242, 7-S-258, 7-S-260, 7-S-261 (5709 Chassis)

MODELS 7S204-7S232-7S240-7S242-7S258-7S260-7S261

CHASSIS No. 5709

SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9
6A8	Converter Osc.	0	6.4	255	89	—10	182	0	0	—2
6K7	I.F.	0	6.4	243	89	0	—	0	0	—2
6H6	2nd Det. A.V.C.	0	0	—2	—2	—2	—	6.4	—2	—
6F5	1st Audio	0	0	—	117	—	—	6.4	—1.5	—1.5
6F6	Power	0	0	243	255	—2	—	6.4	—2	—
5Y4	Rect.	0	—	AC	—	AC	—	328	328	—
		H	Ep	Eg	Et	Ek	H			
6T5	Target	0	16	—2	255	—2	6.4			



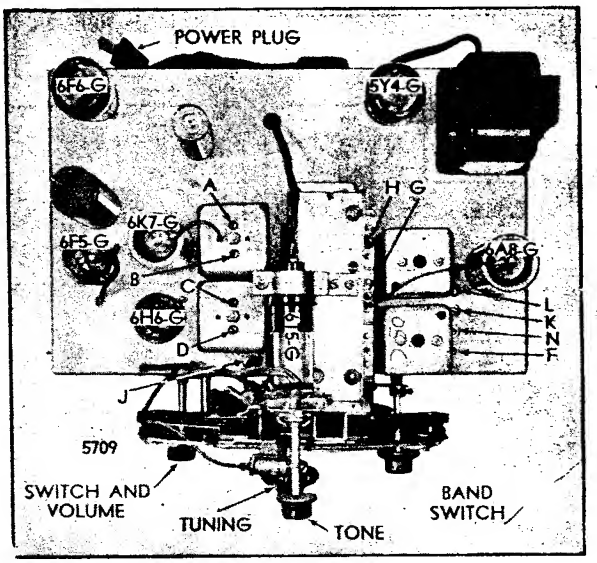
BOTTOM VIEW OF SOCKET

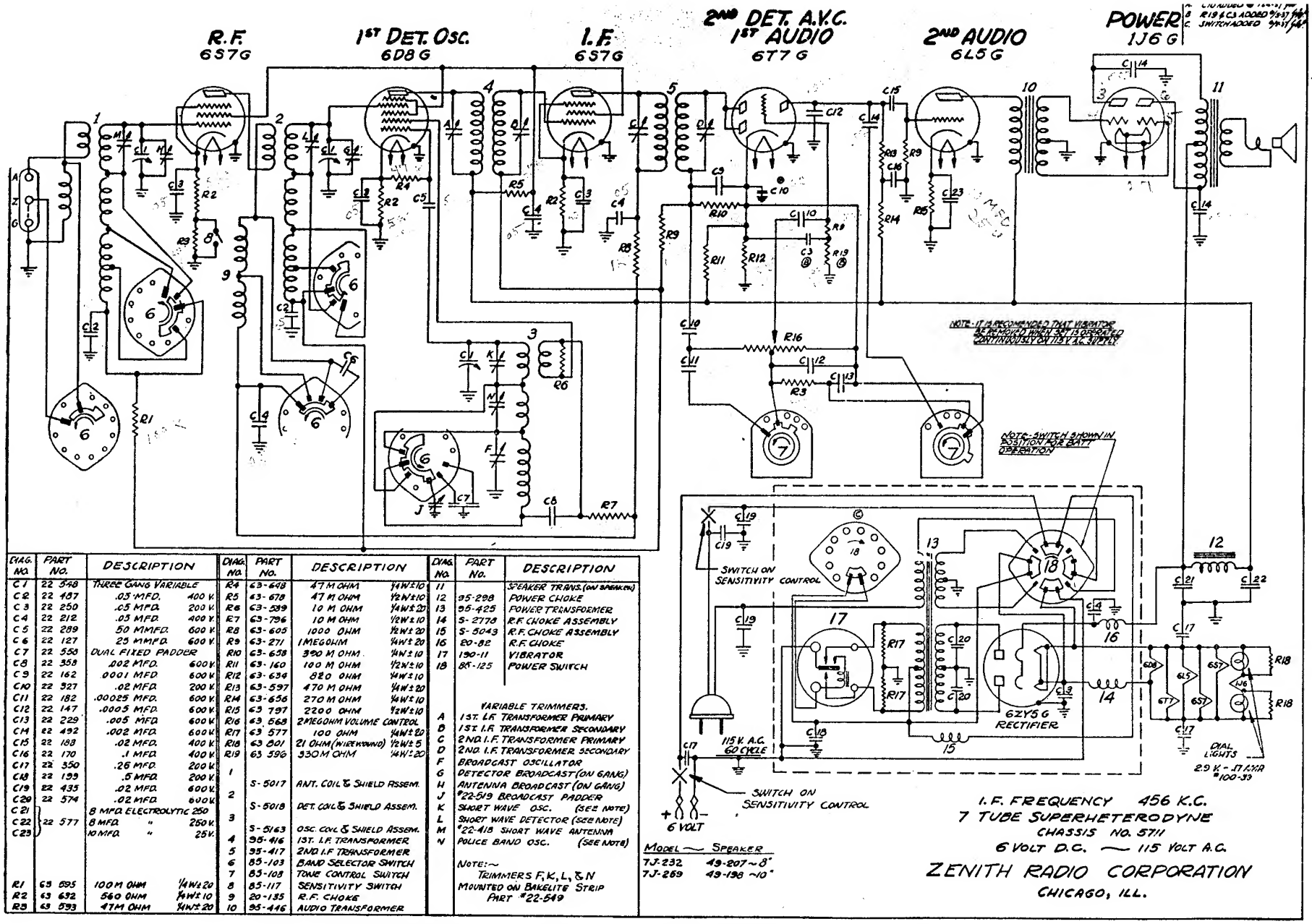
All voltages measured from point indicated to ground using a 1000 Ohm per Volt meter, antenna and ground disconnected. Line voltage 117V. Consumption 75W. Power output 4.5W.

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to—	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	456	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Post	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	1500	GH	Algnt.of Ant.&De.
4	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
5				"		FGH	Repeat 2 & 3
6	" " "	400 Ohms	18000	S.W.	18000	K	Set Osc. to Scale
7	" " "	400 Ohms	16500	S.W.	16500	L	Rock gang & adj. for max. output
8	" " "	400 Ohms	5500	Police	5500	N	Rock gang & adj. for max. output

LOCATION OF TRIMMERS





DIAG. NO.	PART NO.	DESCRIPTION
C1	22 548	THREE GANG VARIABLE
C2	22 487	.03 MFD. 400 V.
C3	22 250	.05 MFD. 200 V.
C4	22 212	.03 MFD. 400 V.
C5	22 289	50 MMFD. 600 V.
C6	22 127	25 MMFD. 600 V.
C7	22 558	DUAL FIXED PADDER
C8	22 358	.002 MFD. 600 V.
C9	22 162	.0001 MFD. 600 V.
C10	22 327	.02 MFD. 200 V.
C11	22 182	.00025 MFD. 600 V.
C12	22 147	.0005 MFD. 600 V.
C13	22 229	.005 MFD. 600 V.
C14	22 492	.002 MFD. 600 V.
C15	22 188	.02 MFD. 400 V.
C16	22 170	.1 MFD. 400 V.
C17	22 350	.25 MFD. 200 V.
C18	22 199	.5 MFD. 200 V.
C19	22 435	.02 MFD. 600 V.
C20	22 574	.02 MFD. 600 V.
C21	22 577	8 MFD. ELECTROLYTIC 250
C22		8 MFD. " 250 V.
C23		10 MFD. " 25 V.
R1	63 595	100 M OHM 1/4 W ± 20
R2	63 692	560 OHM 1/4 W ± 10
R3	63 593	47 M OHM 1/4 W ± 20

DIAG. NO.	PART NO.	DESCRIPTION
R4	63-648	47 M OHM 1/4 W ± 10
R5	63-678	47 M OHM 1/2 W ± 10
R6	63-589	10 M OHM 1/4 W ± 20
R7	63-796	10 M OHM 1/2 W ± 10
R8	63-605	1000 OHM 1/2 W ± 20
R9	63-271	1 MEGOHM 1/4 W ± 20
R10	63-658	390 M OHM 1/4 W ± 10
R11	63-160	100 M OHM 1/2 W ± 10
R12	63-634	820 OHM 1/4 W ± 10
R13	63-597	470 M OHM 1/4 W ± 20
R14	63-656	270 M OHM 1/4 W ± 10
R15	63 797	2200 OHM 1/2 W ± 10
R16	63 568	2 MEGOHM VOLUME CONTROL
R17	63 577	100 OHM 1/4 W ± 20
R18	63 801	21 OHM (WIREWOUND) 1/2 W ± 5
R19	63 596	330 M OHM 1/4 W ± 20
1	S-5017	ANT. COIL & SHIELD ASSEM.
2	S-5018	DET. COIL & SHIELD ASSEM.
3	S-5163	OSC. COIL & SHIELD ASSEM.
4	95-416	1ST. I.F. TRANSFORMER
5	95-417	2ND I.F. TRANSFORMER
6	85-103	BAND SELECTOR SWITCH
7	85-108	TONE CONTROL SWITCH
8	85-117	SENSITIVITY SWITCH
9	20-135	R.F. CHOKE
10	95-446	AUDIO TRANSFORMER

DIAG. NO.	PART NO.	DESCRIPTION
11		SPEAKER TRANS. (ON SPEAKER)
12	95-298	POWER CHOKE
13	95-425	POWER TRANSFORMER
14	S-2778	R.F. CHOKE ASSEMBLY
15	S-5043	R.F. CHOKE ASSEMBLY
16	20-82	R.F. CHOKE
17	190-11	VIBRATOR
18	85-125	POWER SWITCH

VARIABLE TRIMMERS.
A 1ST. I.F. TRANSFORMER PRIMARY
B 1ST I.F. TRANSFORMER SECONDARY
C 2ND I.F. TRANSFORMER PRIMARY
D 2ND. I.F. TRANSFORMER SECONDARY
F BROADCAST OSCILLATOR
G DETECTOR BROADCAST (ON GANG)
H ANTENNA BROADCAST (ON GANG)
J #22-549 BROADCAST PADDER
K SHORT WAVE OSC. (SEE NOTE)
L SHORT WAVE DETECTOR (SEE NOTE)
M #22-418 SHORT WAVE ANTENNA
N POLICE BAND OSC. (SEE NOTE)

NOTE:- TRIMMERS F, K, L, & N MOUNTED ON BAKELITE STRIP PART #22-549

MODEL	SPEAKER
7J-232	49-207 ~ 8"
7J-259	49-198 ~ 10"

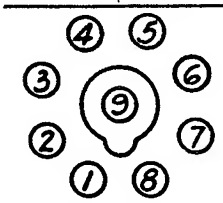
I.F. FREQUENCY 456 K.C.
7 TUBE SUPERHETERODYNE
CHASSIS NO. 5711
6 VOLT D.C. — 115 VOLT A.C.

ZENITH RADIO CORPORATION
CHICAGO, ILL.

Circuit Diagram — Models 7-J-232, 7-J-259 (5711 Chassis)

MODELS 7J232-7J259
CHASSIS No. 5711
SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9
6S7	R.F.	0	6.3	126	34	1.5	—	0	1.5	0
6D8	Converter Osc.	0	6.3	126	34	—.1	106	0	1	0
6S7	I.F.	0	6.3	123	34	1	—	0	1	0
6T7	2nd Det. AVC 1st Audio	0	6.3	15	.1	.1	—	0	1	0
6L5	2nd Audio	0	6.3	122	—	0	—	0	4.5	—
1J6	Power	—	1	133	0	0	133	3	—	—
6ZY5G	Rect.	0	6.3	AC	—	AC	—	0	137	—



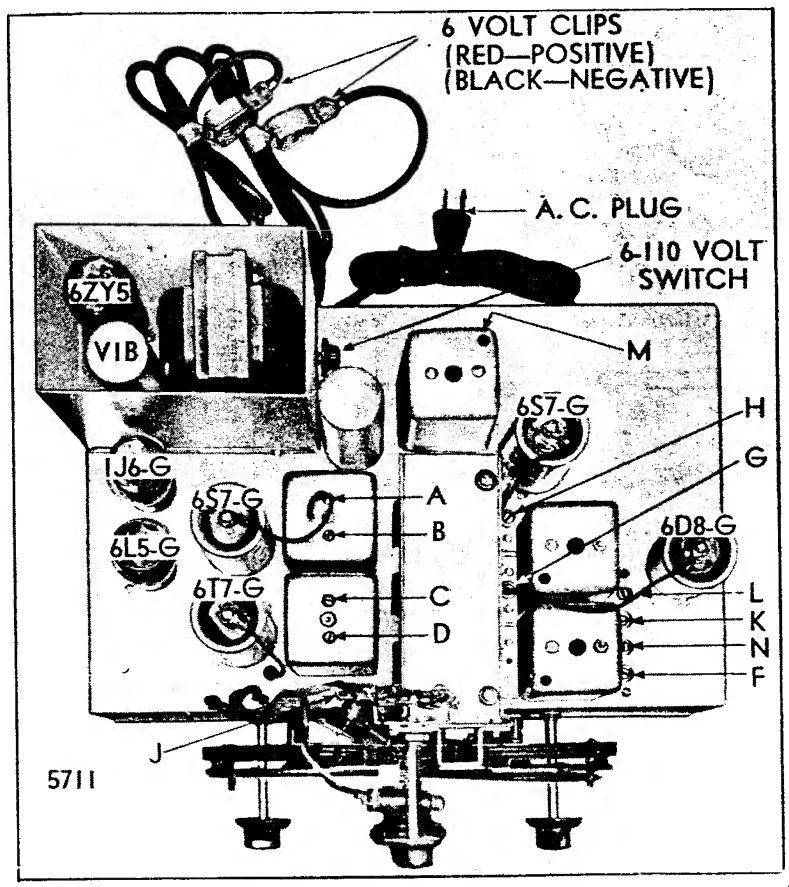
BOTTOM VIEW OF SOCKET

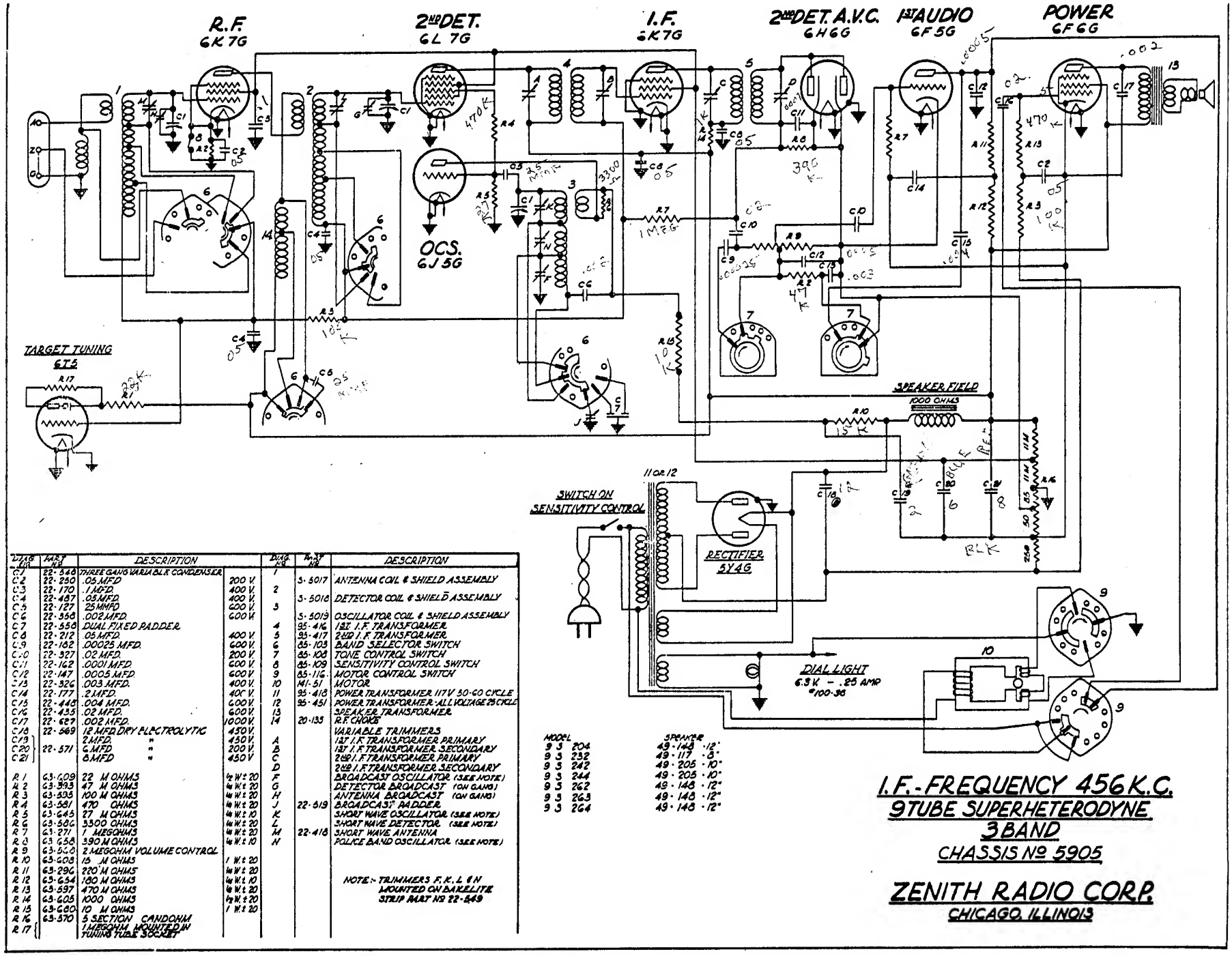
All voltages measured from point indicated to ground using a 1000 Ohm per Volt meter, antenna and ground disconnected. Line voltage 117V. Consumption 19W. Battery voltage 6.3V consumption 2.19 Amp. Power output 1.75W.

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to—	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	456	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Post	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	1500	GH	Algnt.of Ant.&Det
4	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
5				"		FGH	Repeat 2 & 3
6	Rec. Ant. Post	400 Ohms	18000	S.W.	18000	K	Set Osc. to Scale
7	" " "	400 Ohms	16500	S.W.	16500	LM	Rock gang & adj. for max. output
8	" " "	400 Ohms	5500	Police	5500	N	Rock gang & adj. for max. output

LOCATION OF TRIMMERS





DIAG. NO.	PART NO.	DESCRIPTION		DIAG. NO.	PART NO.	DESCRIPTION
C1	22-348	THREE GANG VARIABLE CONDENSER		1	5-5017	ANTENNA COIL & SHIELD ASSEMBLY
C2	22-250	.05 MFD.	200 V.			
C3	22-170	.1 MFD.	400 V.	2	5-5018	DETECTOR COIL & SHIELD ASSEMBLY
C4	22-487	.05 MFD.	400 V.			
C5	22-127	25 MMFD.	600 V.	3	5-5019	OSCILLATOR COIL & SHIELD ASSEMBLY
C6	22-368	.002 MFD.	600 V.			
C7	22-558	DUAL FIXED PADDER		4	95-416	1ST I.F. TRANSFORMER
C8	22-212	.05 MFD.	400 V.	5	95-417	2ND I.F. TRANSFORMER
C9	22-182	.00025 MFD.	600 V.	6	85-103	BAND SELECTOR SWITCH
C10	22-327	.02 MFD.	200 V.	7	85-108	TONE CONTROL SWITCH
C11	22-162	.0001 MFD.	600 V.	8	85-109	SENSITIVITY CONTROL SWITCH
C12	22-147	.0005 MFD.	600 V.	9	85-116	MOTOR CONTROL SWITCH
C13	22-326	.003 MFD.	400 V.	10	141-51	MOTOR
C14	22-177	.2 MFD.	400 V.	11	95-418	POWER TRANSFORMER 117 V 50-60 CYCLE
C15	22-448	.004 MFD.	600 V.	12	95-451	POWER TRANSFORMER ALL VOLTAGE 25 CYCLE
C16	22-435	.02 MFD.	600 V.	13		SPEAKER TRANSFORMER
C17	22-627	.002 MFD.	1000 V.	14	20-133	R.F. CHOKE
C18	22-569	12 MFD DRY ELECTROLYTIC	450 V.			VARIABLE TRIMMERS
C19		2 MFD. "	450 V.	A		1ST I.F. TRANSFORMER PRIMARY
C20	22-571	6 MFD "	200 V.	B		1ST I.F. TRANSFORMER SECONDARY
C21		8 MFD "	450 V	C		2ND I.F. TRANSFORMER PRIMARY
				D		2ND I.F. TRANSFORMER SECONDARY
R1	63-609	22 M OHMS	½ W ± 20	F		BROADCAST OSCILLATOR (SEE NOTE)
R2	63-393	47 M OHMS	½ W ± 20	G		DETECTOR BROADCAST (ON GANG)
R3	63-595	100 M OHMS	½ W ± 20	H		ANTENNA BROADCAST (ON GANG)
R4	63-581	470 OHMS	½ W ± 20	J	22-619	BROADCAST PADDER
R5	63-645	27 M OHMS	½ W ± 10	K		SHORT WAVE OSCILLATOR (SEE NOTE)
R6	63-606	3300 OHMS	½ W ± 20	L		SHORT WAVE DETECTOR (SEE NOTE)
R7	63-271	1 MEGOHMS	½ W ± 20	M	22-418	SHORT WAVE ANTENNA
R8	63-658	390 M OHMS	½ W ± 10	N		POLICE BAND OSCILLATOR (SEE NOTE)
R9	63-600	2 MEGOHM VOLUME CONTROL				
R10	63-608	15 M OHMS	1 W ± 20			
R11	63-296	220 M OHMS	½ W ± 20			
R12	63-654	180 M OHMS	½ W ± 10			
R13	63-597	470 M OHMS	½ W ± 20			
R14	63-605	1000 OHMS	½ W ± 20			
R15	63-660	10 M OHMS	1 W ± 20			
R16	63-570	5 SECTION CANDOHM				
R17		1 MEGOHM MOUNTED IN TUNING TUBE SOCKET				

NOTE:- TRIMMERS F, K, L & N MOUNTED ON BAKELITE STRIP PART NO 22-649

MODEL	SPEAKER
9 S 203	49-148 - 12"
9 S 232	49-117 - 8"
9 S 242	49-205 - 10"
9 S 244	49-205 - 10"
9 S 262	49-148 - 12"
9 S 263	49-148 - 12"
9 S 264	49-148 - 12"

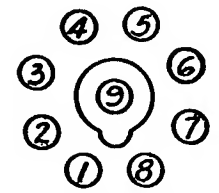
Circuit Diagram — Models 9-S-203, 9-S-232, 9-S-242, 9-S-244, 9-S-262, 9-S-263, 9-S-264 (5905 Chassis)

MODELS 9S204-9S232-9S242-9S244-9S262-9S263-9S264

CHASSIS No. 5905

SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9
6K7	R. F.	0	0	240	80	0	—	6.2	0	—2
6L7	Converter	0	6.2	240	80	—7	—	0	0	—1
6J5	Osc.	0	6.2	130	—	—8	—	0	0	—
6K7	I.F.	0	6.2	237	80	0	—	0	0	—1
6H6	2nd Det. A.V.C.	0	0	—2.5	—2	—2.5	—	6.2	—2	—
6F5	1st Audio	0	0	—	82	—	—	6.2	—2	—2.5
6F6	Power	0	0	225	240	—3.5	—	6.2	—4.5	—
5Y4	Rect.	0	—	AC	—	AC	—	298	298	—
		H	Ep	Eg	Et	Ek	H			
6T5	Target	0	10	—2	240	—2	6.2			



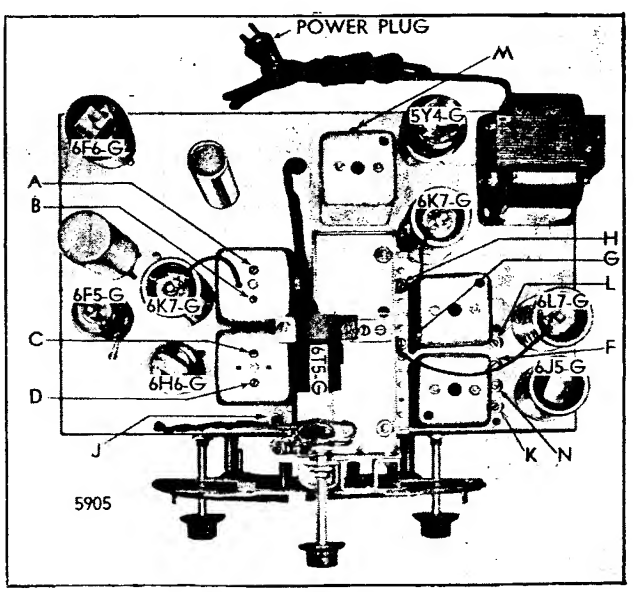
BOTTOM VIEW OF SOCKET

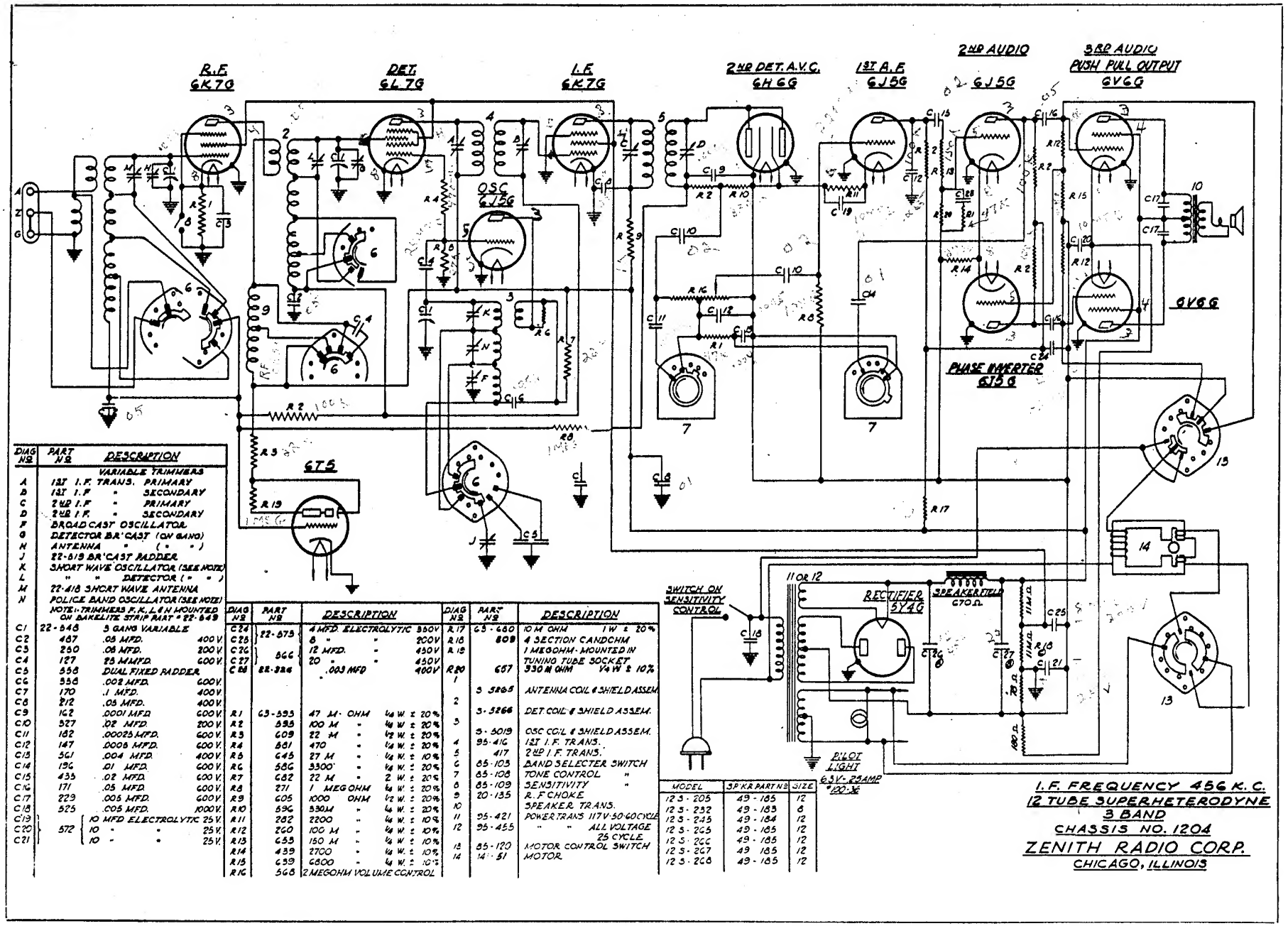
All voltages measured from point indicated to ground using a 1000 Ohm per Volt meter, antenna and ground disconnected. Line voltage 117V. Consumption 75W. Power output 4.5W.

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to—	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	456	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Post	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	1500	GH	Algnt.of Ant.&Det
4	" " "	200 Mmfd.	600	"		J	Rock gang & adj. for max. output
5				"		FGH	Repeat 2 & 3
6	Rec. Ant. Post	400 Ohms	18000	S.W.	18000	K	Set Osc. to Scale
7	" " "	400 Ohms	16500	S.W.	16500	LM	Rock gang & adj. for max. output
8	" " "	400 Ohms	5500	Police	5500	N	Rock gang & adj. for max. output

LOCATION OF TRIMMERS





DIAG NO	PART NO	DESCRIPTION
		VARIABLE TRIMMERS
A		1ST I.F. TRANS. PRIMARY
B		1ST I.F. " SECONDARY
C		2ND I.F. " PRIMARY
D		2ND I.F. " SECONDARY
F		BROAD CAST OSCILLATOR
G		DETECTOR B.R. CAST (ON GANG)
H		ANTENNA " (" ")
J		22-619 BR. CAST PADDER
K		SHORT WAVE OSCILLATOR (SEE NOTE)
L		" " DETECTOR (" ")
M		22-418 SHORT WAVE ANTENNA
N		POLICE BAND OSCILLATOR (SEE NOTE)
		NOTE:- TRIMMERS F, K, L & N MOUNTED ON BAKELITE STRIP PART # 22-649
C1	22-648	3 GANG VARIABLE
C2	487	.05 MFD. 400 V.
C3	250	.06 MFD. 200 V.
C4	127	25 MMFD. 600 V.
C5	556	DUAL FIXED PADDER
C6	556	.002 MFD. 600 V.
C7	170	.1 MFD. 400 V.
C8	212	.05 MFD. 400 V.
C9	162	.0001 MFD. 600 V.
C10	527	.02 MFD. 200 V.
C11	182	.00025 MFD. 600 V.
C12	147	.0008 MFD. 600 V.
C13	561	.004 MFD. 400 V.
C14	196	.01 MFD. 600 V.
C15	435	.02 MFD. 600 V.
C16	171	.05 MFD. 600 V.
C17	229	.005 MFD. 600 V.
C18	525	.005 MFD. 1000 V.
C19	572	10 MFD ELECTROLYTIC 25 V.
C20	572	10 " " 25 V.
C21	572	10 " " 25 V.
C24	22-675	4 MFD. ELECTROLYTIC 350V
C25	22-675	8 " " 200V
C26	566	12 MFD. " 450V
C27	566	20 " " 450V
C28	22-326	.003 MFD 400V
R1	63-593	47 M. OHM ½ W ± 20%
R2	593	100 M " ½ W ± 20%
R3	609	22 M " ½ W ± 20%
R4	601	470 " ½ W ± 20%
R5	645	27 M " ½ W ± 10%
R6	586	3300 " ½ W ± 20%
R7	582	22 M " 2 W ± 20%
R8	271	1 MEGOHM ½ W ± 20%
R9	605	1000 OHM ½ W ± 20%
R10	596	330M " ½ W ± 20%
R11	582	2200 " ½ W ± 10%
R12	560	100 M " ½ W ± 10%
R13	653	150 M " ½ W ± 10%
R14	639	2700 " ½ W ± 10%
R15	639	6800 " ½ W ± 10%
R16	568	2 MEGOHM VOLUME CONTROL
R17	63-680	10 M OHM 1 W ± 20%
R18	809	4 SECTION CANDOHM
R19		1 MEGOHM - MOUNTED IN TUNING TUBE SOCKET
R20	657	330 M OHM ½ W ± 10%
1	3-3265	ANTENNA COIL & SHIELD ASSEM.
2	3-3266	DET. COIL & SHIELD ASSEM.
3	3-3019	OSC COIL & SHIELD ASSEM.
4	95-416	1ST I.F. TRANS.
5	417	2ND I.F. TRANS.
6	85-103	BAND SELECTER SWITCH
7	85-108	TONE CONTROL "
8	85-109	SENSITIVITY "
9	20-135	R.F. CHOKE
10		SPEAKER TRANS.
11	95-421	POWER TRANS 117V-50-60 CYCLE
12	95-455	" " ALL VOLTAGE 25 CYCLE
13	85-120	MOTOR CONTROL SWITCH
14	14-51	MOTOR

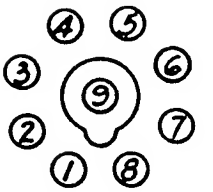
MODEL	SPKR PART NO	SIZE
12 S-205	49-185	12
12 S-232	49-183	6
12 S-245	49-184	12
12 S-265	49-185	12
12 S-266	49-185	12
12 S-267	49-185	12
12 S-268	49-185	12

Circuit Diagram — Models 12-S-205, 12-S-232, 12-S-245, 12-S- 265, 12-S-266, 12-S-267, 12-S-268 (1204 Chassis)

MODELS 12S205-12S232-12S245-12S265-12S266-12S267-12S268

CHASSIS No. 1204

SOCKET VOLTAGES



BOTTOM VIEW OF SOCKET

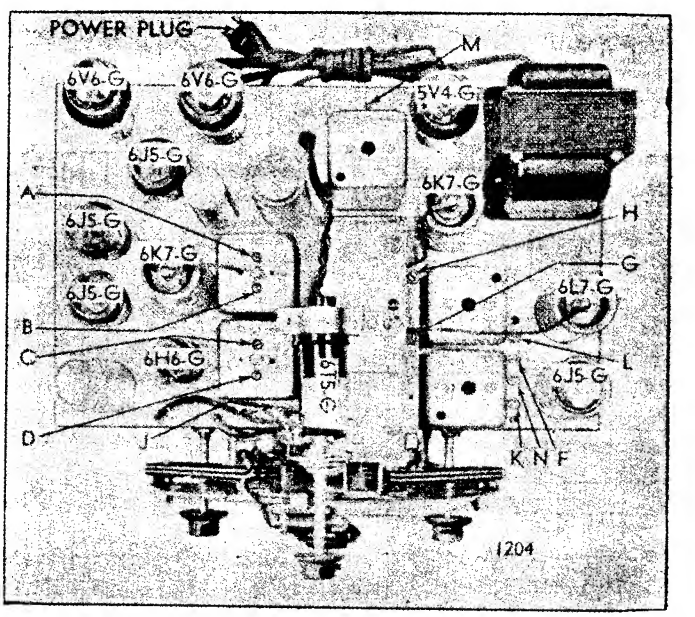
Tube	Position	1	2	3	4	5	6	7	8	9
6K7	R. F.	0	3.2	246	83	0	—	3.2	0	0
6L7	Converter	0	3.2	243	83	—10	—	3.2	0	0
6J5	Osc.	0	3.2	121	—	—10.5	—	3.2	0	—
6K7	I. F.	0	3.2	237	83	0	—	3.2	0	0
6H6	2nd Det. A.V.C.	0	3.2	—2	—1.5	—2	—	3.2	-1.5	—
6J5	1st Audio	0	3.2	70	—	—.5	—	3.2	-1.5	—
6J5	2nd Audio	0	3.2	74	—	—2	—	3.2	-.5	—
6J5	Inverter	0	3.2	76	—	—2	—	3.2	-.5	—
6V6	Power	0	3.2	231	240	—2.5	—	3.2	8	—
6V6	Power	0	3.2	231	240	—2.5	—	3.2	8	—
5Y4	Rect.	0	—	AC	—	AC	—	318	318	—
		H	Ep	Eg	Et	Ek	H			
6T5	Target	3.2	13	—1.5	240	—1.5	3.2			

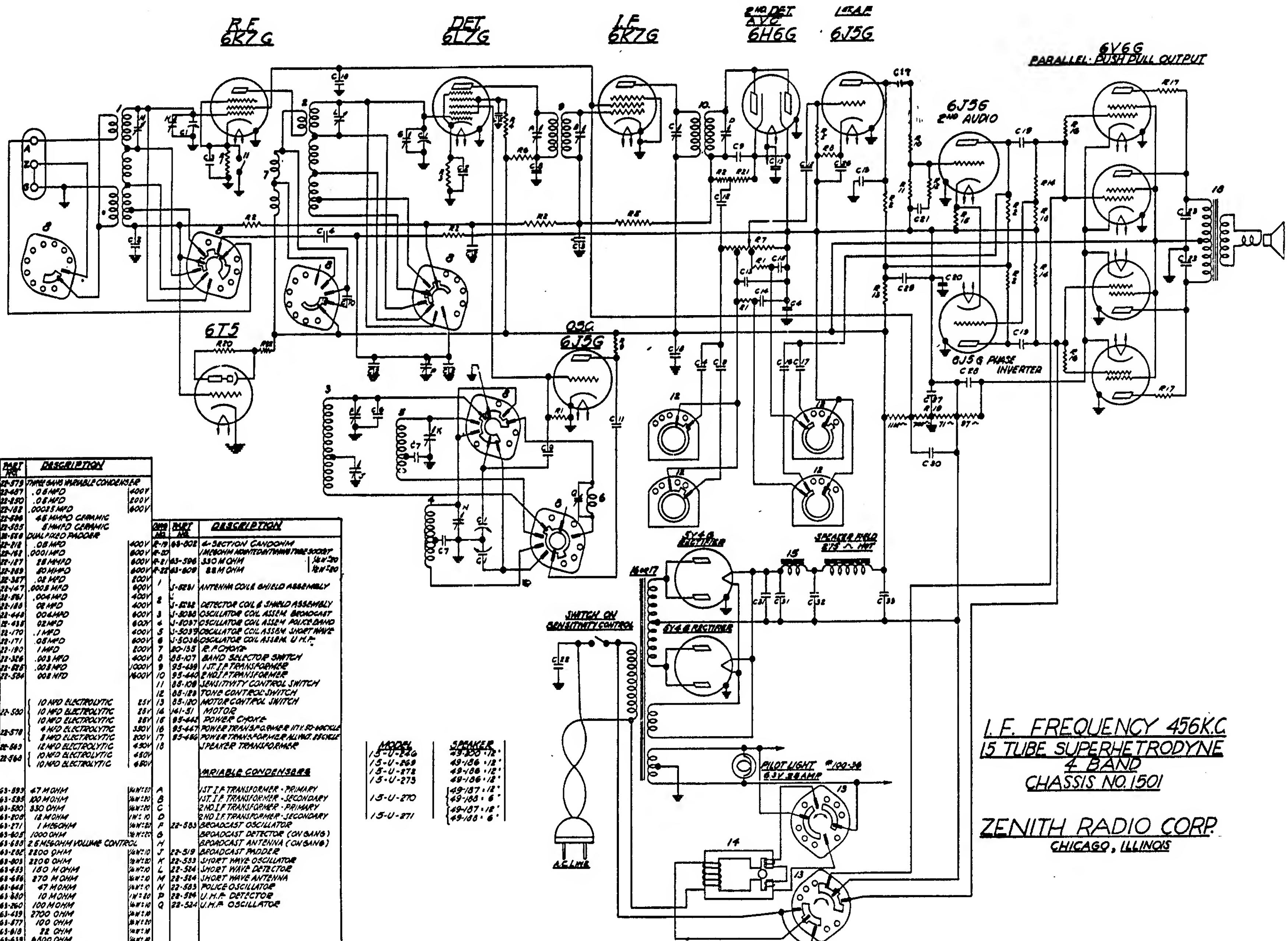
All voltages measured from point indicated to ground using a 1000 Ohm per Volt meter, antenna and ground disconnected. Line voltage 117V. Consumption 110W. Power output 15W.

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to—	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	456	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Post	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	1500	GH	Algnt.of Ant&Det
4	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
5						FGH	Repeat 2 & 3
6	Rec. Ant. Post	400 Ohms	18000	S.W.	18000	K	Set Osc. to Scale
7	" " "	400 Ohms	16500	S.W.	16500	LM	Rock gang & adj. for max. output
8	" " "	400 Ohms	5500	Police	5500	N	Rock gang & adj. for max. output

LOCATION OF TRIMMERS





DIAG. NO.	PART NO.	DESCRIPTION	
C-1	22-573	THREE GANG VARIABLE CONDENSER	
C-2	22-457	.05 MFD	400V
C-3	22-250	.05 MFD	200V
C-4	22-182	.00025 MFD	600V
C-5	22-506	45 MMFD CERAMIC	
C-6	22-505	5 MMFD CERAMIC	
C-7	22-556	DUAL FIXED PADDER	
C-8	22-218	.05 MFD	400V
C-9	22-162	.0001 MFD	600V
C-10	22-127	25 MMFD	600V
C-11	22-263	50 MMFD	600V
C-12	22-327	.02 MFD	200V
C-13	22-147	.0005 MFD	600V
C-14	22-561	.004 MFD	400V
C-15	22-188	.02 MFD	400V
C-16	22-448	.004 MFD	600V
C-17	22-435	.02 MFD	600V
C-18	22-170	.1 MFD	400V
C-19	22-171	.05 MFD	600V
C-20	22-190	1 MFD	200V
C-21	22-326	.003 MFD	400V
C-22	22-525	.003 MFD	1000V
C-23	22-564	.002 MFD	1600V
C-26		10 MFD ELECTROLYTIC	25V
C-27	22-500	10 MFD ELECTROLYTIC	25V
C-28		10 MFD ELECTROLYTIC	25V
C-29	22-578	4 MFD ELECTROLYTIC	350V
C-30		8 MFD ELECTROLYTIC	200V
C-31	22-563	12 MFD ELECTROLYTIC	450V
C-32	22-568	10 MFD ELECTROLYTIC	450V
C-33		10 MFD ELECTROLYTIC	450V
R-1	63-593	47 M OHM	1/4W±20
R-2	63-595	100 M OHM	1/4W±20
R-3	63-580	330 OHM	1/4W±20
R-4	63-206	12 M OHM	1W±10
R-5	63-271	1 MEGOHM	1/4W±20
R-6	63-605	1000 OHM	1/2W±20
R-7	63-688	2.5 MEGOHM VOLUME CONTROL	
R-8	63-262	2200 OHM	1/4W±10
R-9	63-603	2200 OHM	1/2W±20
R-10	63-453	150 M OHM	1/4W±10
R-11	63-656	270 M OHM	1/4W±10
R-12	63-648	47 M OHM	1/4W±10
R-13	63-660	10 M OHM	1W±20
R-14	63-260	100 M OHM	1/4W±10
R-15	63-419	2700 OHM	1/4W±10
R-16	63-577	100 OHM	1/4W±20
R-17	63-618	22 OHM	1/4W±10
R-18	63-633	6800 OHM	1/4W±10

DIAG. NO.	PART NO.	DESCRIPTION	
R-19	63-602	4-SECTION CANDOHM	
R-20		1 MEGOHM MOUNTED ON TUNING TUBE SOCKET	
R-21	63-596	330 M OHM	1/4W±20
R-22	63-609	2.2 M OHM	1/2W±20
1	S-5281	ANTENNA COIL & SHIELD ASSEMBLY	
2	S-5282	DETECTOR COIL & SHIELD ASSEMBLY	
3	S-5035	OSCILLATOR COIL ASSEM. BROADCAST	
4	S-5037	OSCILLATOR COIL ASSEM. POLICE BAND	
5	S-5039	OSCILLATOR COIL ASSEM. SHORT WAVE	
6	S-5036	OSCILLATOR COIL ASSEM. U.H.F.	
7	20-135	R.F. CHOKE	
8	85-107	BAND SELECTOR SWITCH	
9	95-439	1ST. I.F. TRANSFORMER	
10	95-440	2ND I.F. TRANSFORMER	
11	85-108	SENSITIVITY CONTROL SWITCH	
12	85-128	TONE CONTROL SWITCH	
13	85-120	MOTOR CONTROL SWITCH	
14	141-51	MOTOR	
15	95-442	POWER CHOKE	
16	95-447	POWER TRANSFORMER 117V. 50-60 CYCLE	
17	95-466	POWER TRANSFORMER ALL VOLT. 25 CYCLE	
18		SPEAKER TRANSFORMER	
		VARIABLE CONDENSERS	
A		1ST I.F. TRANSFORMER - PRIMARY	
B		1ST. I.F. TRANSFORMER - SECONDARY	
C		2ND I.F. TRANSFORMER - PRIMARY	
D		2ND I.F. TRANSFORMER - SECONDARY	
F	22-583	BROADCAST OSCILLATOR	
G		BROADCAST DETECTOR (ON GANG)	
H		BROADCAST ANTENNA (ON GANG)	
J	22-519	BROADCAST PADDER	
K	22-533	SHORT WAVE OSCILLATOR	
L	22-524	SHORT WAVE DETECTOR	
M	22-524	SHORT WAVE ANTENNA	
N	22-583	POLICE OSCILLATOR	
P	22-524	U.H.F. DETECTOR	
Q	22-524	U.H.F. OSCILLATOR	

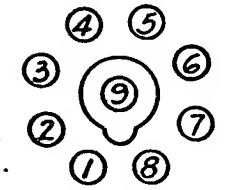
MODEL	SPEAKER
15-U-246	49-200 - 12"
15-U-269	49-186 - 12"
15-U-272	49-186 - 12"
15-U-273	49-186 - 12"
15-U-270	49-187 - 12"; 49-188 - 6"
15-U-271	49-187 - 12"; 49-188 - 6"

Circuit Diagram — Models 15-U-246, 15-U-269, 15-U-270, 15-U-271, 15-U-272, 15-U-273 (1501 Chassis)

MODELS 15U246-15U269-15U270-15U271-15U272-15U273

CHASSIS No. 1501

SOCKET VOLTAGES



BOTTOM VIEW OF SOCKET

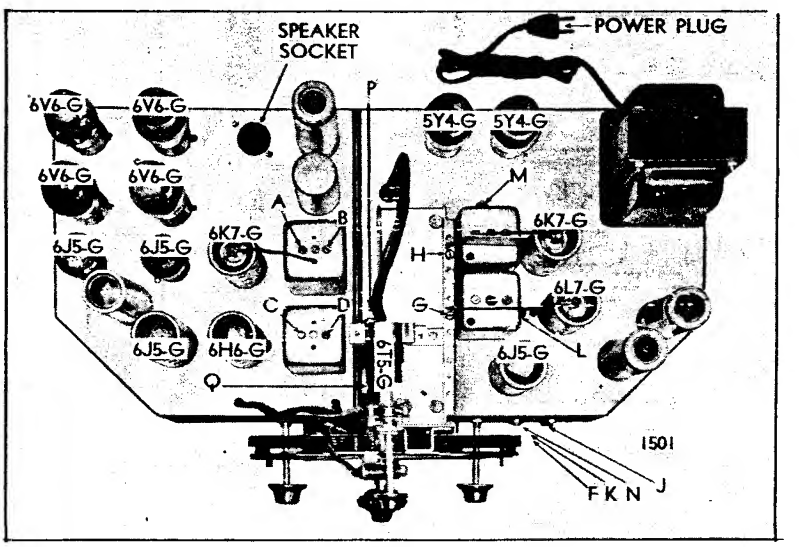
Tube	Position	1	2	3	4	5	6	7	8	9
6K7	R. F.	0	3	250	93	0	—	3	0	—3
6L7	Converter	0	3	250	153	—8	—	3	3	—2
6J5	Osc.	0	3	225	—	—8	—	3	0	—
6K7	I. F.	0	3	250	93	0	—	3	0	—1
6H6	2nd Det. AVC	0	3	—3	—3	—3	—	3	—3	—
6J5	1st Audio	0	3	53	—	—.1	—	3	—.1	—
6J5	2nd Audio	0	3	82	—	—.5	—	3	1.5	—
6J5	Inverter	0	3	82	—	—2.5	—	3	1.5	—
6V6	Power	0	3	243	250	—1	—	3	8	—
6V6	Power	0	3	243	250	—1	—	3	8	—
6V6	Power	0	3	243	250	—1	—	3	8	—
6V6	Power	0	3	243	250	—1	—	3	8	—
5Y4	Rect.	0	—	AC	—	AC	—	320	320	—
5Y4	Rect.	0	—	AC	—	AC	—	320	320	—
		Eh	Ep	Eg	Et	Ek	Eh			
6T5	Target	3	11	—3	216	—3	3			

All voltages measured from point indicated to ground using a 1000 Ohm per Volt meter, antenna and ground disconnected. Line voltage 117V. Consumption 160W. Power output 30W.

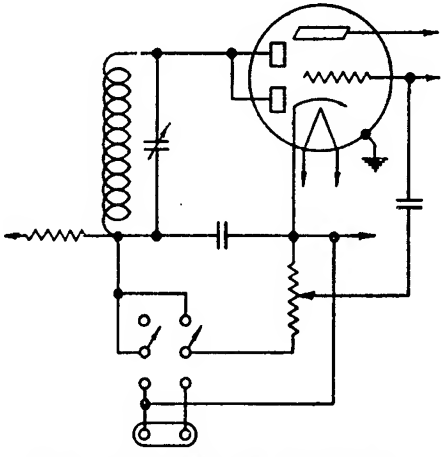
ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to—	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	456	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Post	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	1500	GH	Algnt.of Ant.&Det
4	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
5				"		FGH	Repeat 2 & 3
6	Rec. Ant. Post	400 Ohms	18000	S.W.	18000	K	Set Osc. to Scale
7	" " "	400 Ohms	16500	S.W.	16500	LM	Rock gang & adj. for max. output
8	" " "	400 Ohms	5500	Police	5500	N	Rock gang & adj. for max. output
9	" " "	400 Ohms	40000	U.H.F.	40000	Q	Set Osc. to Scale
10	" " "	400 Ohms	40000	U.H.F.	40000	P	Rock gang & adj. for max. output

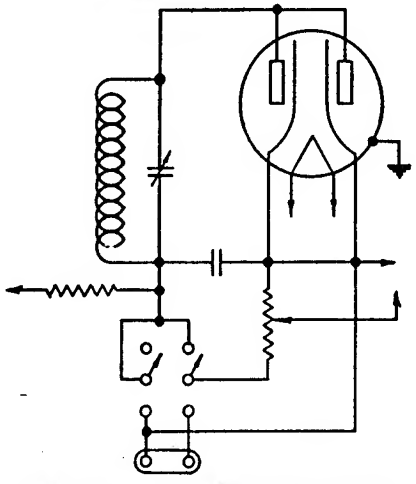
LOCATION OF TRIMMERS



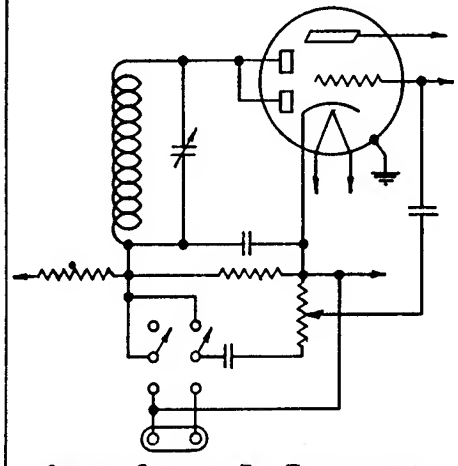
1938 PHONO CIRCUIT DATA



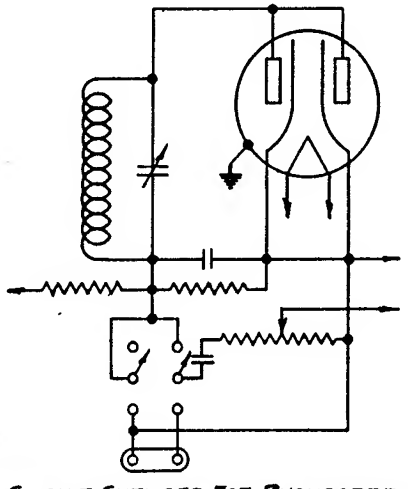
CIRCUIT CHANGES FOR PHONOGRAPH INSTALLATIONS ON CHASSIS MODELS~
5409-5521-5521A-5521AT-5523-5524
5524T-5526-5526A-5527-5639~



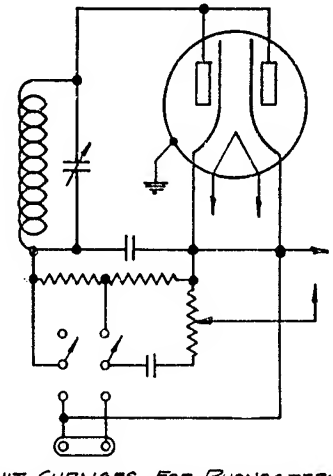
CIRCUIT CHANGES FOR PHONOGRAPH INSTALLATIONS ON CHASSIS MODELS~
5638~5710~
5638A



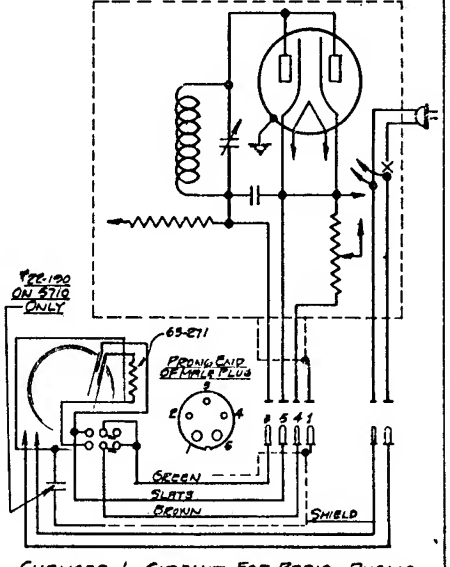
CIRCUIT CHANGES FOR PHONOGRAPH INSTALLATION ON CHASSIS MODELS~
5408-5522
5642-5711-5711T~



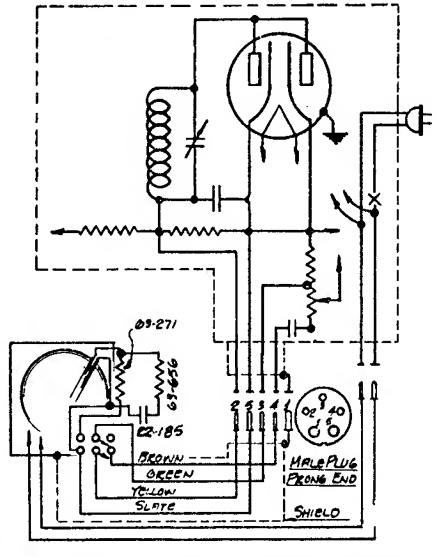
CIRCUIT CHANGES FOR PHONOGRAPH INSTALLATIONS ON CHASSIS MODELS~
5644-5644A-5644AT-5709-5709A
5709AT-5905-5905A-5905AT~



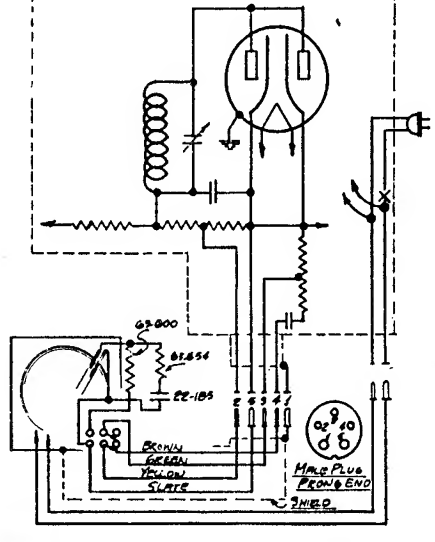
CIRCUIT CHANGES FOR PHONOGRAPH INSTALLATIONS ON CHASSIS MODELS~
1204-1501
1204A-1501A



CHANGES IN CIRCUIT FOR RADIO-PHONO COMBINATIONS ON CHASSIS MODELS~
5638-5638A-5710



CHANGES IN CIRCUIT FOR RADIO-PHONO COMBINATIONS ON CHASSIS MODELS~
5905-5905A



CHANGES IN CIRCUIT FOR RADIO-PHONO COMBINATIONS ON CHASSIS MODELS
1204-1204A

DIAL PARTS AND KNOBS

Models 4-F-227, 4-B-231
(Chassis Numbers 5408 and 5409)

Part No.	Description	Price
93-323	Bakelite Washer	.01
171-4	Dial Glass	.25
S-3717	Dial Pointer	.25
S-4906	Dial Light Socket (5408)	.10
S-4913	Dial Light Socket (5409)	.10
S-5098	Dial Scale Assembly	1.00
46-219	Volume Knob	.15
46-220	Tuning Knob	.15

Models 5-R-126, 5-R-226, 5-R-236
(Chassis Number 5526)

19-68	Dial Clips	.02
59-61	Dial Pointer	.15
76-233	Drive Shaft	.10
80-69	Dial Cord Spring	.02
93-273	Bakelite Washer	.01
94-230	Drive Shaft Bushing	.10
192-15	Dial Glass	.20
196-9	Dial Glass Gasket	.05
MS-308	Dial Drive Pulley	.25
S-5322	Dial Cord and Eyelet	.20

Models 5-S-201, 5-S-218, 5-S-220, 5-S-228, 5-S-237, 5-S-250, 5-S-252, 5-F-233, 5-F-251 5-J-217, 5-J-247, 5-J-255
(Chassis Numbers 5521, 5522, 5524). Same parts as chassis 5526, except the following:

26-143	Dial Scale (5521, 5522)	.50
26-174	Dial Scale (5524)	.50
76-226	Drive Shaft	.05
S-4679	Dial Cord Assembly	.20
46-231	Tone Knob	.15
57-596	Escutcheon Plate	.75

Models 6-S-203, 6-S-222, 6-S-223, 6-S-229, 6-S-239, 6-S-241, 7-D-203, 7-D-222, 7-D-223, 7-D-229, 7-D-239, 7-D-241, 7-D-243, 7-D-253
(Chassis Numbers 5638 and 5710)

19-68	Dial Clips	.02
26-144	Dial Scale	.75
32-13	Dial Drive Belt	.15
34-49	Condenser Shaft Gear	.25
34-51	Lower Pinion & Gear	.15
57-601	Escutcheon Plate	1.50
59-41	Split Second Pointer	.10
59-60	Dial Pointer	.15
61-34	Drive Pulley	.10
73-24	8/32x1/4" H.H. Set Screw	.02
76-227	Drive Shaft	.05
80-60	Tension Pulley Spring	.03
80-118	Dial Spring	.15
80-128	Shaft Pulley Spring	.01
83-407	Dial Diffusion Strip	.03
97-91	Lower Gear Stud	.05
192-16	Dial Glass	.25
196-10	Dial Glass Gasket	.10
S-3780	Pulley Sleeve & Pinion	.35
46-221	Band Switch Knob	.20
46-222	Volume Knob	.15

Models 6-J-230, 6-J-257
(Chassis Number 5642)

Same parts as chassis 5638 and 5710 except following dial scale:

26-188	Dial Scale	.75

Models 6-D-202, 6-D-219, 6-D-221, 6-D-238
(Chassis Number 5639)

Same parts as chassis 5521, 5522 and 5524 except the following:

Part No.	Description	Price
26-157	Dial Scale	.50
MS-321	Dial Drive Pulley	.20
76-231	Drive Shaft	.05

Models 6-S-254 and 6-S-256
(Chassis Number 5644)

19-73	Dial Clips	.02
26-163	Dial Scale	1.25
27-16	Flywheel	1.00
32-17	Condenser Drive Belt	.15
34-49	Condenser Shaft Gear	.25
34-51	Lower Pinion and Gear	.15
59-52	Split Second Pointer	.10
59-53	Dial Pointer	.20
61-43	Condenser Shaft Pulley	.15
76-234	Drive Shaft	.20
80-60	Tension Pulley Spring	.03
80-130	Clutch Spring	.03
94-258	Drive Shaft Bushing	.03
192-17	Dial Glass	.40
196-15	Dial Glass Gasket	.10
S-4906	Dial Light Socket (5408)	.10
S-4984	Volume Control Scale	.35
S-4985	Band Ind. Dial	.35
S-5090	Drive Pulley and Clutch	.35
S-5092	Tone Control Scale	.35
46-191	Tone Knob	.15
46-208	Tuning Knob	.25
46-223	Sensitivity Knob	.15
46-224	Volume Knob	.15
57-601	Escutcheon Plate	1.50

Models 7-J-232 and 7-J-259
(Chassis Number 5711)

26-156	Split Second Scale	.50
27-16	Flywheel	1.00
32-14	Dial Drive Belt	.15
34-68	Condenser Shaft Gear	.20
34-69	Lower Drive Gear	.15
34-72	Frequency Pointer Gear	.30
56-48	Scale Connecting Pins	.01
59-58	Split Second Pointer	.20
59-59	Dial Pointer	.15
61-42	Pointer Shaft Pulley	.20
76-228	Drive Shaft	.25
76-229	Split Second Pointer Shaft	.10
80-136	Scale Return Springs	.05
80-137	Dial Glass Springs	.01
80-138	Hairpin Retainer Springs	.01
80-139	Dial Spring	.05
83-491	Scale Spacer Strip	.05
83-499	Felt Strips	.20
93-339	Black Bakelite Pointer Washer	.01
94-258	Drive Shaft Bushing	.03
159-12	Snap Buttons	.02
192-17	Dial Glass	.40
196-13	Dial Glass Gasket	.10
S-4914	Dial Light Socket	.10
S-4974	Band Switch Lever	1.25
S-4981	Broadcast Scale	.75
S-4982	Short Wave Band Scale	.75
S-4986	Tone Control Dial	.35
S-4989	Complete Dial & Mtg. Plate	4.00
S-4990	Drive Shaft Pulley	.40
S-4991	Drive Pulley & Clutch	.50
S-5007	Control Arm and Pin	.40
S-5041	Vol. Cont. Scale	.35
S-5042	Sensitivity Scale	.35
46-191	Tone Control Knob	.15
46-221	Band Switch Knob	.20
46-223	Sensitivity Knob	.15
46-224	Volume Knob	.15
46-232	Tuning Knob	.20
57-601	Escutcheon Plate	1.50

Models 7-S-204, 7-S-232, 7-S-240, 7-S-242, 7-S-258, 7-S-260, 7-S-261
(Chassis Number 5709)

Same parts as 5711 except the following:

Part No.	Description	Price
12-514	Indicator Brkt. (Female)	.05
12-515	Indicator Brkt. (Male) ..	.05
26-145	Split Second Scale	.50
80-130	Clutch Spring	.03
97-101	Idler Gear Stud	.05
112-3	Spade Lug	.01
118-13	Lever Link	.05
S-4906	Dial Light Socket (5408)	.10
S-4975	Dial Mtg. Plate	1.25
S-4976	Stationary Dial Scale (5905, 1204)	1.50
S-4983	Control Arm & Pin	.40
S-4984	Volume Control Scale	.35
S-4985	Band Ind. Dial	.35
S-5369	Broadcast Scale Assembly (5905, 1204)	.75

Models 9-S-204, 9-S-222, 9-S-242, 9-S-244, 9-S-262, 9-S-263, 9-S-264, 12-S-205, 12-S-232, 12-S-245, 12-S-265, 12-S-266, 12-S-267, 12-S-268, 15-U-246, 15-U-269, 15-U-270, 15-U-271, 15-U-272, 15-U-273
(Chassis Numbers 5905, 1204 and 1501)

Same parts as 5711 and 5709 except the following:

32-14	Dial Drive Belt	.15
32-15	Condenser Drive Belt	.15
32-18	Automatic Drive Belt	.15
61-43	Condenser Shaft Pulley	.15
61-44	Motor Shaft Pulley	.15
76-237	Motor Switch Shaft	.08
76-238	Condenser Drive Shaft	.30
83-499	Felt Strips	.20
85-116	Motor Switch (9 tube)	1.00
85-120	Motor Switch (12 and 15 tube)	1.00
93-339	Black Bakelite Pointer Washer	.01
94-257	Drive Shaft Bushing	.03
97-103	Moveable Scale Pivot	.02
97-107	Motor Mtg. Studs	.05
118-12	Lever Link	.05
MS-321	Dial Drive Pulley	.20
S-4914	Dial Light Socket	.10
S-4976	Stationary Dial Scale (5905, 1204)	1.50
S-5007	Control Arm & Pin	.40
S-5028	Drive Pulley and Clutch	.25
S-5040	Police Dial Assem.	1.00
S-5041	Vol. Control Scale	.35
S-5042	Sensitivity Scale	.35
S-5235	Short Wave Dial Assem. (1501)	.75
S-5238	Broadcast Dial Assem. (1501)	.75
S-5239	Stationary Dial Scale (1501)	.25
S-5264	Complete Motor Assembly	5.00
46-230	Automatic Knob	.15

Important: For knobs other than walnut, add the following letters to part number: Y—ebony, H—maple, W—white, also add 5c to list.

COILS

20-82	R. F. Choke	.25
20-135	R. F. Choke	.50
20-154	Wave Trap Assembly	.65
95-353	1st I. F. Trans.	1.25
95-407	1st I. F. Trans.	1.25

PARTS LIST (Continued)

Part No.	Description	Price
95-408	2nd I. F. Trans.	1.25
95-411	1st I. F. Trans.	1.25
95-412	2nd I. F. Trans.	1.25
95-413	1st I. F. Trans.	1.25
95-414	2nd I. F. Trans.	1.25
95-416	1st I. F. Trans.	1.25
95-417	2nd I. F. Trans.	1.25
95-419	1st I. F. Trans.	1.25
95-420	2nd I. F. Trans.	1.25
95-439	1st I. F. Trans.	1.25
95-440	2nd I. F. Trans.	1.25
95-443	1st I. F. Trans.	1.25
95-444	2nd I. F. Trans.	1.25
S-2778	R. F. Choke	.25
S-4662	Oscillator Coil	.30
S-4721	Oscillator Coil	.50
S-4780	Antenna Coil	1.00
S-4909	Oscillator Coil	.90
S-4934	Antenna Coil & Shield	2.50
S-4941	Antenna Coil & Shield	1.50
S-4942	Oscillator Coil & Shield	1.50
S-4969	Oscillator Coil	1.50
S-5017	Antenna Coil & Shield	1.50
S-5018	Detector Coil & Shield	1.35
S-5019	Oscillator Coil & Shield	1.75
S-5036	Oscillator Coil	.50
S-5037	Oscillator Coil	.50
S-5038	Oscillator Coil	.50
S-5039	Oscillator Coil	.50
S-5043	R. F. Choke	.50
S-5054	Detector Coil	1.50
S-5055	Antenna Coil	2.25
S-5073	Antenna Coil	1.50
S-5074	Oscillator Coil	1.50
S-5100	Antenna Coil	1.25
S-5153	Antenna Coil	1.50
S-5163	Oscillator Coil	1.50
S-5167	Antenna Coil & Cover	1.25
S-5215	Antenna Coil & Shield	1.25
S-5231	Antenna Coil & Shield	1.50
S-5232	Detector Coil & Shield	1.25
S-5265	Antenna Coil & Shield	1.50
S-5266	Detector Coil & Shield	1.50
S-5272	Antenna Coil & Shield	1.50
S-5303	Antenna Coil & Shield	1.50

CONDENSERS

22-127	25 mmfd. 600 volt	.15
22-147	.0005 mfd. 600 volt	.15
22-162	.0001 mfd. 600 volt	.15
22-170	.1 mfd. 400 volt	.20
22-171	.05 mfd. 600 volt	.18
22-177	.2 mfd. 400 volt	.20
22-182	.00025 mfd. 600 volt	.15
22-185	.01 mfd. 200 volt	.12
22-188	.02 mfd. 400 volt	.15
22-190	.1 mfd. 200 volt	.15
22-196	.01 mfd. 600 volt	.18
22-199	.5 mfd. 200 volt	.30
22-212	.05 mfd. 400 volt	.15
22-229	.005 mfd. 600 volt	.18
22-243	.01 mfd. 400 volt	.15
22-250	.05 mfd. 200 volt	.12
22-289	50 mmfd. 600 volt	.15
22-305	2-35 mmfd. Trimmer	.15
22-324	2-35—3 Section Trimmer	.40
22-326	.003 mfd. 400 volt	.15
22-327	.02 mfd. 200 volt	.12
22-350	.25 mfd. 200 volt	.20
22-358	.002 mfd. 600 volt	.18
22-406	Two Gang Variable	2.25
22-408	2-35 mmfd. 2 Section	.30
22-418	2-35 mmfd. Trimmer	.15
22-425	16-8-4 mfd. 450 volts	2.75
22-435	.02 mfd. 600 volt	.18
22-448	.004 mfd. 600 volt	.15
22-455	.01 mfd. 1200 volt	.18
22-487	.05 mfd. 400 volt	.15
22-492	.002 mfd. 600 volt	.18
22-519	200-500 mmfd. Osc. padder	.35
22-524	2-35 mmfd. Trimmer	.15
22-525	.005 mfd. 1000 volt	.18
22-546	Two Gang Variable	2.50
22-547	Two Gang Variable	2.50
22-548	Three Gang Variable	4.00
22-549	2-35 mmfd. 4 Section	.50
22-551	16 mfd. 400 volt	.85
22-552	20 mfd. 300 volt	.75
22-554	20 mfd. 400 volt	.85
22-555	30 mfd. 300 volt	.75
22-558	Double Fixed Padder	.60
22-559	Filter	1.75
22-560	Filter	1.60
22-561	.004 mfd. 400 volt	.15
22-562	2-16 mfd. 450 volt	.45
22-563	Fixed Padder	.50
22-566	20-12 mfd. 450 volt	1.60
22-567	Two Gang Variable	2.00
22-568	10-10 mfd. 450 volt	1.45
22-569	12 mfd. 450 volt	.95
22-570	Wave Trap Trimmer	.15
22-571	Filter	1.25
22-572	10-10-10 mfd. 25 volt	1.00
22-573	Filter	.95
22-574	.02 mfd. 600 volt	.18
22-576	Two gang variable	2.00
22-577	Filter	1.15
22-578	Filter	.95
22-579	3 Gang Variable	4.75
22-580	3-10 mfd. 25 volt	1.00
22-582	Filter	1.25
22-583	Air Trimmer	.25
22-584	.002 mfd. 1600 volt	.18
22-585	5 mmfd. Ceramic	.20
22-586	45 mmfd. Ceramic	.20
22-593	2 Gang Variable	2.00
22-596	8-14 mfd. 450 volt	1.75
22-598	2-35 mmfd. 3 Section Trimmer	.40
22-601	10 mmfd. Ceramic	.15
22-625	2-35 mmfd. 3 Section Trimmer	.40

RESISTORS

63-150	10M ohm 1/2 watt	.08
63-160	100M ohm 1/2 watt	.08
63-208	12M ohm 1 watt	.10
63-260	100M ohm 1/4 watt	.07
63-271	1 megohm 1/4 watt	.07
63-282	2200 ohm 1/4 watt	.07
63-296	220M ohm 1/4 watt	.07
63-325	150M ohm 1/4 watt	.07
63-418	1500 ohm 1/2 watt	.08
63-439	2700 ohm 1/4 watt	.07
63-441	1 megohm 1/4 watt	.07
63-520	400M Volume Control	1.35
63-521	50M Tone Control	.90
63-533	13 ohm Flex. Wirewound	.10
63-541	1 megohm Volume Control	1.35
63-547	400M Volume Control	1.35
63-548	1 megohm Volume Control	1.35
63-563	80 ohm Wirewound	.07
63-565	400M ohm Volume Control	1.35
63-568	2 megohm Volume Control	.90
63-569	Candohm Resistor	.65
63-570	Candohm Resistor	.75
63-577	100 ohm 1/4 watt	.07
63-580	330 ohm 1/4 watt	.07
63-581	470 ohm 1/4 watt	.07
63-583	1000 ohm 1/4 watt	.07
63-586	3300 ohm 1/4 watt	.07
63-587	4700 ohm 1/4 watt	.07
63-589	10M ohm 1/4 watt	.07
63-593	47M ohm 1/4 watt	.07
63-595	100M ohm 1/4 watt	.07
63-596	330M ohm 1/4 watt	.07
63-597	470M ohm 1/4 watt	.07
63-605	1000 ohm 1/2 watt	.08
63-608	15M ohm 1 watt	.10
63-609	22M ohm 1/2 watt	.08
63-610	22M ohm 1 watt	.10
63-611	2 megohm Volume Control	1.35
63-612	.24 ohm Wirewound	.10
63-613	Three Section Candohm	.30
63-618	22 ohm 1/4 watt	.07
63-631	470 ohm 1/4 watt	.07
63-632	560 ohm 1/4 watt	.07
63-634	820 ohm 1/4 watt	.07
63-638	5600 ohm 1/4 watt	.07
63-639	6800 ohm 1/4 watt	.07
63-643	18M ohm 1/4 watt	.07
63-645	27M ohm 1/4 watt	.07
63-646	33M ohm 1/4 watt	.07
63-647	39 ohm 1/4 watt	.07
63-648	47M ohm 1/4 watt	.07
63-653	150M ohm 1/4 watt	.07
63-654	180M ohm 1/4 watt	.07
63-656	270M ohm 1/4 watt	.07
63-657	330M ohm 1/4 watt	.07
63-658	390M ohm 1/4 watt	.07
63-675	5600 ohm 1/2 watt	.08
63-677	33M ohm 1 watt	.10
63-678	47M ohm 1/2 watt	.08
63-680	10M ohm 1 watt	.10
63-681	56 ohm 1/2 watt	.08
63-682	22M ohm 2 watts	.17
63-684	.64 ohm Wirewound	.07
63-685	210 ohm 1/2 watt	.17
63-686	150 ohm 1/2 watt	.17
63-687	Volume control	1.35
63-688	Volume control	1.35
63-689	Volume control	1.35
63-796	10M ohm 1/2 watt	.08
63-797	2200 ohm 1/2 watt	.08
63-798	Volume control	1.35
63-799	Volume control	1.35
63-800	26 ohm Wirewound	.20
63-801	21 ohm Wirewound	.10
63-802	Candohm Resistor	.65
63-803	2200 ohm 1/2 watt	.08
63-806	3 Section Candohm	.30
63-807	70 ohm Wirewound	.17
63-808	120 ohm Wirewound	.17
63-809	Candohm Resistor	.65
63-810	Candohm Resistor	.17

SPEAKERS

49-117	8" Dynamic Speaker	7.50
	Cone & Voice Coil	2.00
	Output Transformer	2.50
	Field Coil	2.50
49-148	12" Dynamic Speaker	12.00
	Cone & Voice Coil	3.00
	Output Transformer	2.50
	Field Coil	5.00
49-153	6" PM Speaker	6.50
	Cone & Vcice Coil	1.75
	Output Transformer	1.50
49-162	6" PM Speaker	6.00
	Cone & Voice Coil	1.75
	Output Transformer	1.50
49-164	8" PM Speaker	6.50
	Cone & Voice Coil	2.00
	Output Transformer	2.50
49-178	5" Dynamic Speaker	4.50
	Cone & Voice Coil	1.50
	Output Transformer	1.50
	Field Coil	1.50
49-179	8" Dynamic Speaker	6.50
	Cone & Voice Coil	2.00
	Output Transformer	2.50
	Field Coil	2.50
49-180	6" Dynamic Speaker	5.00
	Cone & Voice Coil	1.50
	Output Transformer	1.50
	Field Coil	1.50
49-181	10" Dynamic Speaker	8.00
	Cone & Voice Coil	2.50
	Output Transformer	2.50
	Field Coil	2.75

PARTS LIST (Continued)

Part No.	Description	Price
49-183	8" Dynamic Speaker	7.50
	Cone & Voice Coil	2.00
	Output Transformer	2.50
	Field Coil	2.50
49-184	12" Dynamic Speaker	10.00
	Cone & Voice Coil	3.00
	Output Transformer	2.50
	Field Coil	5.00
49-185	12" Dynamic Speaker	13.50
	Cone & Voice Coil	2.50
	Output Transformer	2.50
	Field Coil	5.00
49-186	12" Dynamic Speaker	17.50
	Cone & Voice Coil	3.25
	Output Transformer	3.50
	Field Coil	6.00
49-187	12" Dynamic Speaker	17.50
	Cone & Voice Coil	3.25
	Output Transformer	3.50
	Field Coil	6.00
49-188	6" PM Speaker	6.00
	Cone & Voice Coil	1.75
	Output Transformer	1.50
49-189	5" Dynamic Speaker	4.50
	Cone & Voice Coil	1.50
	Output Transformer	1.50
	Field Coil	1.50
49-190	6" Dynamic Speaker	5.00
	Cone & Voice Coil	1.75
	Output Transformer	1.50
	Field Coil	1.75
49-191	5" Dynamic Speaker	4.50
	Cone & Voice Coil	1.50
	Output Transformer	1.50
	Field Coil	1.50
49-193	8" Dynamic Speaker	6.50
	Cone & Voice Coil	2.00
	Output Transformer	2.50
	Field Coil	2.50
49-195	12" Dynamic Speaker	13.50
	Cone & Voice Coil	3.00
	Output Transformer	2.50
	Field Coil	5.00
49-198	10" PM Speaker	8.50
	Cone & Voice Coil	2.50
	Output Transformer	2.50
49-200	12" Dynamic Speaker	13.50
	Cone & Voice Coil	3.00
	Output Transformer	3.50
	Field Coil	5.00
49-202	5" Dynamic Speaker	4.50
	Cone & Voice Coil	1.50
	Output Transformer	1.50
	Field Coil	1.50
49-203	8" Dynamic Speaker	7.00
	Cone & Voice Coil	2.00
	Output Transformer	2.50
	Field Coil	2.50
49-204	8" Dynamic Speaker	6.50
	Cone & Voice Coil	2.00
	Output Transformer	2.50
	Field Coil	2.00
49-205	10" Dynamic Speaker	8.50
	Cone & Voice Coil	2.50
	Output Transformer	2.50
	Field Coil	2.50
49-206	8" Dynamic Speaker	7.00
	Cone & Voice Coil	2.00
	Output Transformer	2.50
	Field Coil	2.50
49-207	8" PM Speaker	6.50
	Cone & Voice Coil	2.00
	Output Transformer	2.50
49-209	6" PM Speaker	6.00
	Cone & Voice Coil	1.75
	Output Transformer	1.50
49-210	8" PM Speaker	6.50
	Cone & Voice Coil	2.00
	Output Transformer	2.50

MISCELLANEOUS

19-59	Battery Clip (+)	.15
19-60	Battery Clip (—)	15
44-7	Phono Jack	.10
52-112	Battery Cable & Plug	1.50
52-117	Phono Cable & Male Plug	
52-118	A. C. Cable & Plug	
52-119	Phono Cable & Female Plug	
52-120	Phono Cable & Female Plug	
52-121	Phono Cable & Male Plug	
57-11A	Antenna Lead Marker	.05
57-11G	Ground Lead Marker	.05
57-488	Phono-Radio Escutcheon	.35
57-608	Glass Dial Cover Plate	1.25
57-609	Milk-White Glass Plate	
59-56	Station Indicator Pointer	.05
73-8	8/32 x 5/16" H.H. Set Screws	.02
73-21	8/32 x 3/16" Set Screws	.01
73-24	8/32 x 1/4" H.H. Set Screws	.02
78-115	Vibrator Socket	.10
78-128	Speaker Plug Socket	.10
78-133	6H6 Wafer Socket	.10
78-140	No. 38 Wafer Socket	.10
78-141	Vibrator Wafer Socket	.10
78-145	6F5 Wafer Socket	.10
78-148	6Q7 Wafer Socket	.10
78-150	6K7 Wafer Socket	.10
78-151	6A8 Wafer Socket	.10
78-152	6F6 Wafer Socket	.10
78-159	25Z6 Wafer Socket	.10
78-161	Ballast Tube Socket	.10
78-162	6L7 Wafer Socket	.10
78-165	1C7 Wafer Socket	.10
78-166	1D5 Wafer Socket	.10
78-167	1F5 Wafer Socket	.10
78-168	1F7 Wafer Socket	.10
78-169	1H4 Wafer Socket	.10
78-170	1J6 Wafer Socket	.10
78-173	25L6 Wafer Socket	.10
78-174	Indicator Socket & Cable	.75
78-175	6J5 Wafer Socket	.10
78-176	6V6 Wafer Socket	.10
78-182	5Y4 Wafer Socket	.10
78-183	Indicator Socket & Cable	.75
78-184	6T7 Wafer Socket	.10
78-185	6S7 Wafer Socket	.10
78-186	6D8 Wafer Socket	.10
78-187	6L5 Wafer Socket	.10
78-189	Indicator Socket & Cable	.75
78-190	Speaker Plug Socket	.10
78-191	6ZY5 Wafer Socket	.10
78-192	Indicator Socket & Cable (1501)	.75
80-148	Phono Suspension Spring	.02
83-433	Antenna Terminal Strip	.10
85-39	Phono Switch	.85
85-103	Band Selector Switch	1.25
85-104	Band Selector Switch	.75
85-105	Band Selector Switch	.75
85-107	Band Selector Switch	1.75
85-108	Tone Control Switch	.65
85-109	Sensitivity Switch	.65
85-110	Band Selector Switch	1.00
85-112	Band Selector Switch	.65
85-113	Band Selector Switch	.65
85-116	Automatic Switch	1.00
85-117	Sensitivity Switch	1.00
85-120	Motor Switch	1.00
85-123	Tone Switch	.75
85-124	Toggle Switch	1.00
85-125	Power Switch	.65
91-190	No. 10 Battery Wire (Black)	.05
91-191	No. 10 Battery Wire (Red)	.05
93-168	Rubber Cushion Washers	.01
93-215	Rubber Chassis Mtg. Washers	.05
93-229	1/16" x 1/4" x 1 1/4" Felt Washers	.30C
93-320	1/16" x 1/4" x 1" Felt Washers	.20C
93-323	1/32" x 29/64" x 3/4" Bakelite Washer	.01
93-343	3/32" x 33/64" x 7/8" Felt Washers	.40C

TRANSFORMERS, CHOKES

95-298	Power Choke	.75
95-324	Power Choke	.75
95-406	117 Volt 50-60 Cy. Trans.	3.75
95-409	Power Choke	1.25
95-410	Power Choke	1.35
95-415	117 Volt 50-60 Cy. Trans.	3.75
95-418	117 Volt 50-60 Cy. Trans.	4.25
95-421	117 Volt 50-60 Cy. Trans.	5.50
95-425	Power Transformer	3.00
95-438	117 Volt 50-60 Cy. Trans.	3.75
95-441	117 Volt 50-60 Cy. Trans.	3.25
95-442	Power Choke	2.25
95-445	Power Transformer	2.50
95-446	Audio Transformer	1.75
95-447	117 Volt 50-60 Cy. Trans.	7.75
95-450	All Voltage 25 Cy. Trans.	7.00
95-451	All Voltage 25 Cy. Trans.	7.00
95-452	All Voltage 25 Cy. Trans.	6.00
95-454	25 Cy. All Voltage Trans.	7.00
95-455	All Voltage 25 Cy. Trans.	9.00
95-456	All Voltage 25 Cy. Trans.	10.50
100-36	Dial Light 6.3 V. .25 Amp.	.09
100-39	Dial Light 2.9 V. .17 Amp.	.12
100-50	Dial Light 2 V. .06 Amp.	.22
100-37	Ballast tube 115 volt	.75
100-38	Ballast tube 115 volt	.75
100-55	Ballast tube 125 volt	.75
100-56	Ballast tube 150 volt	.75
100-56	Ballast tube 150 volt	.75
100-57	Ballast tube 175 volt	.75
100-58	Ballast tube 200 volt	.75
100-59	Ballast tube 220 volt	.75
100-60	Ballast tube 250 volt	.75
100-61	Ballast tube 125 volt	.75
100-62	Ballast tube 150 volt	.75
100-63	Ballast tube 175 volt	.75
100-64	Ballast tube 200 volt	.75
100-65	Ballast tube 220 volt	.75
100-66	Ballast tube 250 volt	.75
102-23	Station Tab Sheet	.05
114-40	Chassis Bolts (10/32 x 7/8")	.40C
114-41	Chassis Bolts (1/4-20 x 1 1/4")	.02
114-42	Chassis Bolts (10/32 x 1/4")	.60C
114-61	Chassis Bolts (10/32 x 1 1/2")	.02
117-38	Band Selector Lever	.10
117-39	Band Selector Lever	.10
118-12	Lever Connecting Link	.05
126-201	Vibrator Shield	.15
126-239	Tube Shield	.10
126-243	Grid Lead Shield	.05
126-244	Spiral Shields	.05
126-248	Electrolytic Shield	.08
126-251	Spiral Shield	.04
126-254	Grid Lead Shield	.03
142-5	Crystal Pickup (Head only)	
159-12	Snap Buttons	.02
159-14	Snap Buttons	.50C
159-17	Snap Buttons	.05
169-27	Automatic Record Changer	80.00
180-2	Shaft Retaining Ring	.01
190-6	Vibrator	3.50
190-11	Vibrator	3.00
S-4567	Acoustic Adapter	3.50
S-5399	Complete Phono Motor	35.00
S-5404	Complete Phono Motor	50.00
S-5408	Phono Motor Assembly	35.00
S-5409	Acoustic Adapter (1501 only)	3.50

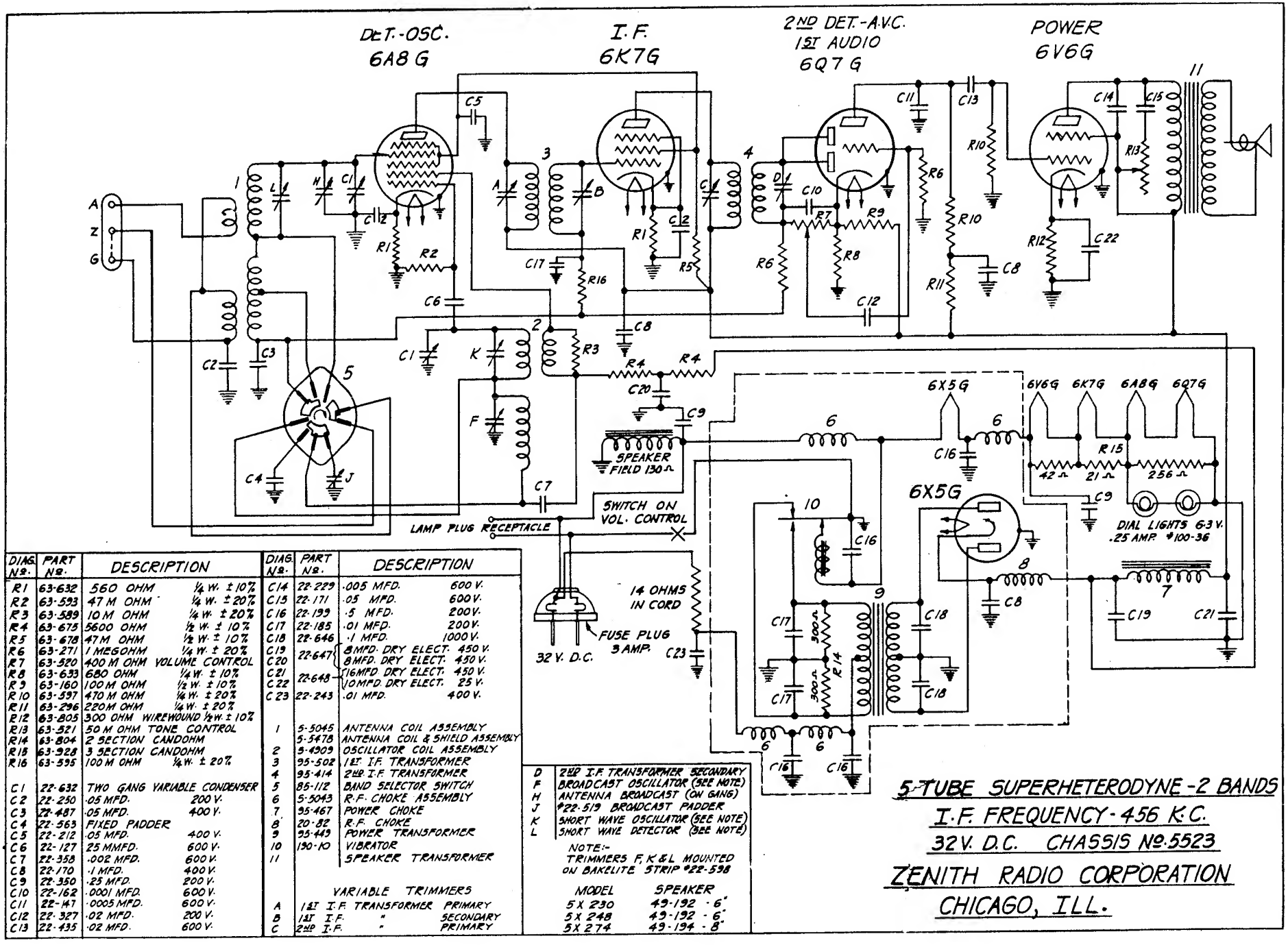
USE ONLY GENUINE

ZENITH

REPLACEMENT PARTS and TUBES

●

ZENITH RADIO CORPORATION
6001 Dickens Avenue
CHICAGO, ILL. U. S. A.



DIAG. NO.	PART NO.	DESCRIPTION
R1	63-632	560 OHM ¼ W. ± 10%
R2	63-593	47 M OHM ¼ W. ± 20%
R3	63-589	10 M OHM ¼ W. ± 20%
R4	63-675	5600 OHM ½ W. ± 10%
R5	63-678	47 M OHM ½ W. ± 10%
R6	63-271	1 MEGOHM ¼ W. ± 20%
R7	63-520	400 M OHM VOLUME CONTROL
R8	63-633	680 OHM ¼ W. ± 10%
R9	63-160	100 M OHM ½ W. ± 10%
R10	63-597	470 M OHM ¼ W. ± 20%
R11	63-296	220 M OHM ¼ W. ± 20%
R12	63-805	300 OHM WIREWOUND ½ W. ± 10%
R13	63-521	50 M OHM TONE CONTROL
R14	63-804	2 SECTION CANDOHM
R15	63-928	3 SECTION CANDOHM
R16	63-595	100 M OHM ¼ W. ± 20%
C1	22-632	TWO GANG VARIABLE CONDENSER
C2	22-250	.05 MFD. 200 V.
C3	22-487	.05 MFD. 400 V.
C4	22-563	FIXED PADDER
C5	22-212	.05 MFD. 400 V.
C6	22-127	25 MMFD. 600 V.
C7	22-358	.002 MFD. 600 V.
C8	22-170	.1 MFD. 400 V.
C9	22-350	.25 MFD. 200 V.
C10	22-162	.0001 MFD. 600 V.
C11	22-147	.0005 MFD. 600 V.
C12	22-327	.02 MFD. 200 V.
C13	22-435	.02 MFD. 600 V.

DIAG. NO.	PART NO.	DESCRIPTION
C14	22-229	.005 MFD. 600 V.
C15	22-171	.05 MFD. 600 V.
C16	22-199	.5 MFD. 200 V.
C17	22-185	.01 MFD. 200 V.
C18	22-646	.1 MFD. 1000 V.
C19	22-647	8 MFD. DRY ELECT. 450 V.
C20		8 MFD. DRY ELECT. 450 V.
C21	22-648	16 MFD. DRY ELECT. 450 V.
C22		10 MFD. DRY ELECT. 25 V.
C23	22-243	.01 MFD. 400 V.
1	5-5045	ANTENNA COIL ASSEMBLY
	5-5478	ANTENNA COIL & SHIELD ASSEMBLY
2	5-4909	OSCILLATOR COIL ASSEMBLY
3	95-502	1ST I.F. TRANSFORMER
4	95-414	2ND I.F. TRANSFORMER
5	85-112	BAND SELECTOR SWITCH
6	5-5043	R.F. CHOKE ASSEMBLY
7	95-467	POWER CHOKE
8	20-82	R.F. CHOKE
9	95-449	POWER TRANSFORMER
10	190-10	VIBRATOR
11		SPEAKER TRANSFORMER

VARIABLE TRIMMERS

A	1ST I.F. TRANSFORMER	PRIMARY
B	1ST I.F. "	SECONDARY
C	2ND I.F. "	PRIMARY
D	2ND I.F. TRANSFORMER	SECONDARY
F	BROADCAST OSCILLATOR (SEE NOTE)	
H	ANTENNA BROADCAST (GANG)	
J	#22-519 BROADCAST PADDER	
K	SHORT WAVE OSCILLATOR (SEE NOTE)	
L	SHORT WAVE DETECTOR (SEE NOTE)	

NOTE:- TRIMMERS F, K & L MOUNTED ON BAKELITE STRIP #22-538

MODEL	SPEAKER
5X230	49-192 · 6"
5X248	49-192 · 6"
5X274	49-194 · 8"

5-TUBE SUPERHETERODYNE - 2 BANDS

I.F. FREQUENCY - 456 K.C.

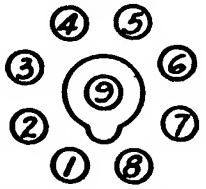
32 V. D.C. CHASSIS NO. 5523

ZENITH RADIO CORPORATION

CHICAGO, ILL.

SOCKET VOLTAGES

TUBE	POSITION	1	2	3	4	5	6	7	8	9
6A8	1st Det. Osc.	0	10	146	50	0	132	5.5	2.5	0
6K7	I.F.	0	16.5	154	50	2	-	10.5	2.	0
6Q7	2nd Det.A.V.C.	0	0	25	0	0	-	5.	1.	0
6V6	Power	0	22	134	154	0	-	16	6	-
6X5	Rect.	0	28	A.C.	-	AC	-	22	166	-

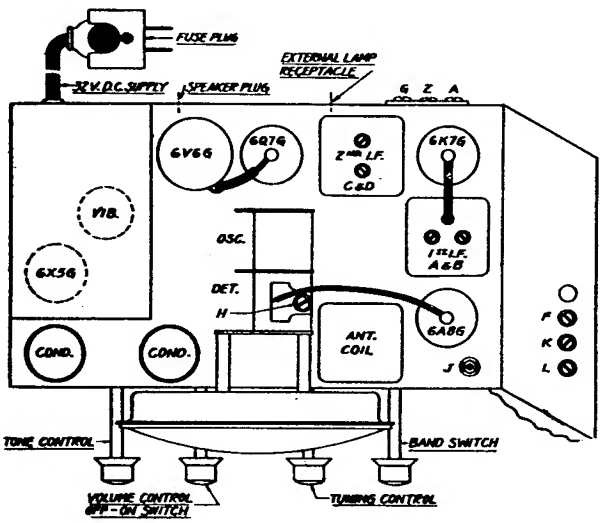


BOTTOM VIEW OF SOCKET

All voltages measured from point indicated to ground using a 1000 Ohm per Volt meter, antenna and ground disconnected.
Line voltage 31.5 volts.
Consumption 3.9 amp.

ALIGNMENT PROCEDURE

Oper-ation	Conn. Test Osc. to	Dumy Ant.	Set Test Osc. to	Band	Set Dial At	Adj. Tr.	Purpose
1	1st Det.Grid	1/2 Mfd.	456	Brdc't	600	ABCD	I.F.Alignment
2	Rec.Ant.Lead	200 Mmfd.	1500	"	1500	F	Set Osc.to Scale
3	" " "	200 Mmfd	1500	"	1500	G	Al'gment of Ant.
4	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
5						FG	Repeat 3 & 4
6	Rec.Ant.Lead	400 Ohms	18000	S.W.	18000	K	Set Osc.to Scale
7	" " "	400 Ohms	16500	S.W.	16500	L	Rock gang & adj. for max. output



LOCATION OF TRIMMERS

PARTS AND PRICES — MODELS 5X230 5X248 5X274
CHASSIS NO. 5523 — 5 TUBE 32 VOLT

	Dial Assembly	
19-68	Dial glass retaining clip	$ .02
26-188	Dial Scale	.75
32-13	Drive belt	.15
34-49	Condenser shaft gear	.25
34-51	Lower pinion and gear	.15
59-41	Split second pointer	.10
59-60	Frequency indicator pointer	.15
61-34	Drive pulley	.10
76-227	Drive shaft	.05
80-60	Tension pulley spring	.03
80-118	Dial spring	.15
80-128	Shaft pulley spring	.01
83-407	Dial light diffusion strips	.03
93-348	Black bakelite pointer washer	.01
94-230	Drive shaft bushing	.10
97-91	Lower gear stud	.05
100-36	Dial lamp 6.3 volt .25 amp.	.09
192-16	Dial glass	.20
196-10	Dial glass gasket	.10
MS-310	Dial reflector & strip assembly	.40
S-3780	Shaft pulley sleeve & pinion assembly	.35
S-4340	Tension pulley & arm assembly	.15
S-4913	Dial light socket & clip assembly	.10
	Coils & Chokes	
20-82	R. F. choke	.25
95-414	2nd I. F. transformer	1.25
95-443	1st I. F. transformer	1.25
S-4909	Oscillator coil assembly	.90
S-5043	R. F. choke assembly	.50
S-5478	Antenna coil & shield assembly	2.00
	Condensers	
22-127	25 mmfd. .....600 volt	.15
22-147	.005 mfd. .....600 volt	.15
22-162	.0001 mfd. .....600 volt	.15
22-170	.1 mfd. .....400 volt	.20
22-171	.05 mfd. .....600 volt	.18
22-185	.01 mfd. .....200 volt	.12
22-199	.5 mfd. .....200 volt	.30
22-212	.05 mfd. .....400 volt	.15
22-229	.005 mfd. .....600 volt	.18
22-250	.05 mfd. .....200 volt	.12
22-327	.02 mfd. .....200 volt	.12
22-350	.25 mfd. .....200 volt	.20
22-358	.002 mfd. .....600 volt	.18
22-435	.02 mfd.....600 volt	.18
22-487	.05 mfd. .....400 volt	.15
22-519	200-550 mmfd. Oscillator padder	.35
22-563	5000 mmfd. padder	.50
22-598	2-35 mmfd. 3 Section trimmer	.40
22-632	Two gang variable condenser	3.00
22-646	.1 mfd. .....1000 volt	.25
22-647	8-8 mfd. dry electrolytic 450 volt	1.35
22-648	16 mfd. 450 volt 10 mfd. 25 volt	1.35

PARTS AND PRICES — MODELS 5X230,5X248,5X274

Resistors

63-160	100,000 ohm ½ watt	$ .08
63-271	1 megohm ¼ watt	.07
63-296	220,000 ohm ¼ watt	.07
63-520	400,000 ohm Volume Control & Switch	1.35
63-521	50,000 ohm Tone control	.90
63-589	10,000 ohm ¼ watt	.07
63-593	47,000 ohm ¼ watt	.07
63-597	470,000 ohm ¼ watt	.07
63-632	560 ohm ¼ watt	.07
63-633	680 ohm ¼ watt	.07
63-675	5600 ohm ½ watt	.08
63-678	47,000 ohm ½ watt	.08
63-804	Candohm resistor	.25
63-805	300 ohm wirewound ½ watt	.15
63-928	Candohm resistor	.50

Miscellaneous

46-220	Tuning control knob	.15
46-222	Volume control knob	.15
46-231	Band Selector & tone control knob	.15
49-192	6" Dynamic Speaker (5X230, 5X248)	5.00
208-192	Cone and voice coil for 49-192	2.00
206-192	Output transformer for 49-192	2.00
207-192	Field coil for 49-192	2.00
49-194	8" Dynamic speaker (5X274)	6.00
208-194	Cone & voice coil for 49-194	2.50
206-194	Output transformer for 49-194	2.50
207-194	Field coil for 49-194	2.00
57-597	Escutcheon Plate	1.00
59-56	Station Indicator pointers	.05
62-9	Lamp Plug Receptacle	.10
78-115	Socket for vibrator	.10
78-128	Socket for Speaker Plug	.10
78-148	Socket for 6Q7 tube	.10
78-149	Socket for 6X5 tube	.10
78-150	Socket for 6K7 tube	.10
78-151	Socket for 6A8 tube	.10
78-176	Socket for 6V6 tube	.10
85-113	Band selector switch	.65
93-320	1/16" x 1/4" x 1" Brown felt knob washers	.20C
95-449	Power transformer	1.75
95-467	Power Choke	1.25
102-23	Station Indicator tab sheet	.05
114-40	Chassis mounting bolts.	.40C
126-239	Tube Shield	.10
126-243	Spiral Grid Lead Shield	.05
136-3	3 Amp. auto type fuse	.08
166-6	Rubber bumper	.03
188-2	Shaft Retaining ring	.01
190-10	Vibrator	3.50

SERVICE MANUAL

ZENITH

RADIO NURSE

THE GUARDIAN THAT NEVER SLEEPS

GENERAL

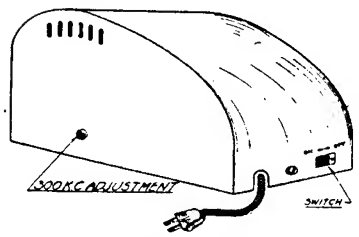


Fig. 1. GUARDIAN EAR

The Zenith Radio Nurse is a super-sensitive sound amplifying system made in two units. The Guardian Ear contains a condenser type microphone, speech amplifier, and modulator-oscillator circuit. The generated signal is conducted by means of the lighting circuit and intercepted by the Radio Nurse. The Radio Nurse unit is composed of a detector, audio amplifier and reproducer. Total amplification from microphone to speaker is on the order of 500,000 times. This gain provides a measure of sensitivity capable of amplifying the slightest sounds. Being purely a sound amplifier no attempt is made to attain high fidelity or high power output. The Zenith Radio Nurse is NOT an inter-communicating system nor intended to be used as such. Its use is primarily for the nursery or sick room. Any attempt to obtain great volume by speaking loudly direct into the Guardian Ear will result in serious distortion and speaker rattle.

To test or demonstrate the Radio Nurse elsewhere than in a home the Guardian Ear must be placed in a soundproof box or separate room. This will prevent howling or feedback which normally results from an amplifier where the speaker and microphone units are in close proximity.

CIRCUIT

The output of the condenser microphone in the Guardian Ear is coupled to one triode of a 79 tube. The plate circuit is capacity coupled to the second triode of the same tube. The plate of this second triode is fed to the grid of a 41 tube which acts as modulator to the screen and plate circuit in the same tube. The R.F. carrier is generated by the oscillating screen and plate circuits and coupled to the light circuit by means of a low impedance coupling coil. A harmonic filter is built into the Guardian Ear to prevent radio receiver interference at 600, 900 and 1200 K.C. The harmonic filter consists of part numbers 4, 5 and C6. (See circuit on page 2.)

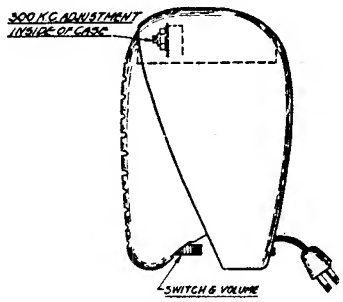


Fig. 2. RADIO NURSE

Bias on both grids of the 79 tube is obtained by the use of Bias Cells. These units have an extremely long life and should not be replaced unless the plate voltages of the 79 tube measure abnormally low. Never test the bias cell with a voltmeter of any kind. The current drawn by the meter will discharge the cell immediately, and no reading will be obtained although the cell may be in good condition. Only a vacuum tube voltmeter will show the true condition of the bias cells.

The receiver is coupled from the line to a 6F5G detector by another low impedance link. The detector is capacity coupled to a 41 output tube.

TUBES

The tubes employed are of standard type, and are used as follows:

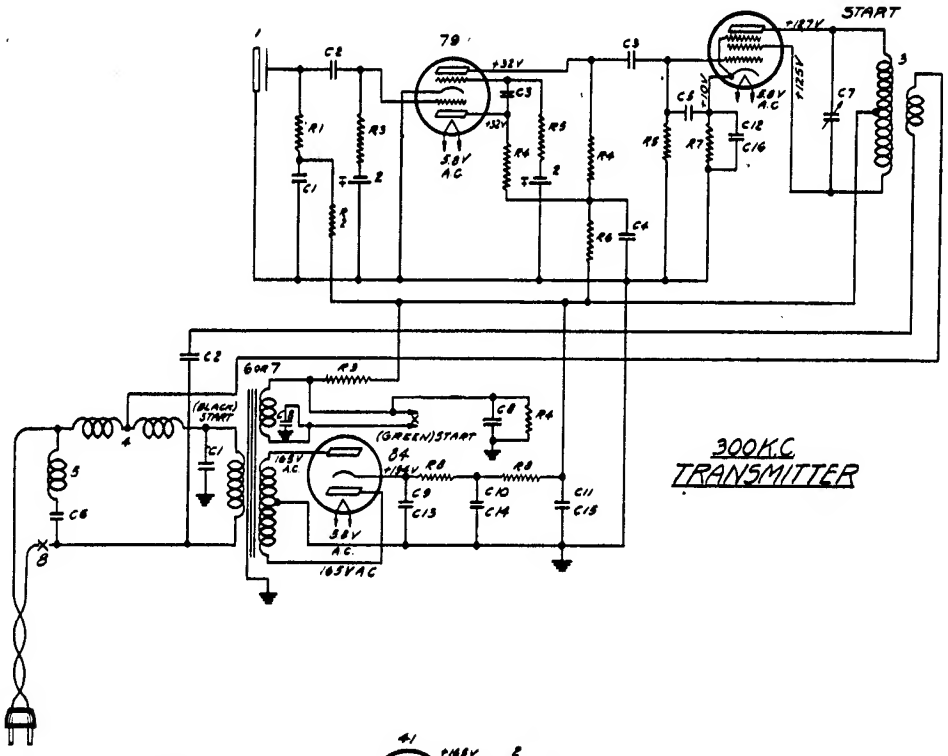
Guardian Ear: 1 type 79, 1st and 2nd audio amplifier;
1 type 41 modulator-oscillator; 1 type 84 rectifier.

Radio Nurse: 1 type 6F5G detector; 1 type 41 power output, 1 type 84 rectifier.

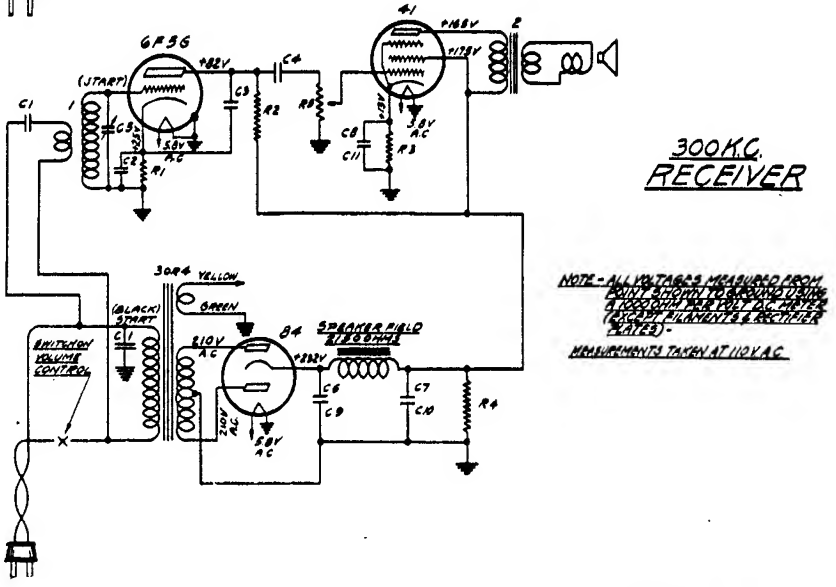
Use only Zenith High Quality tubes for replacement.

FREQUENCY ADJUSTMENT

When shipped from the factory, both units are adjusted accurately to 300 K.C. by means of a variable trimmer in each unit. If either trimmer adjustment is moved separately, the circuits will be detuned and loss of sensitivity will result. If for any reason it is suspected that either of the units is not tuned to resonance it is only necessary to readjust the trimmer on the side of the Guardian Ear, until maximum sensitivity is reached. (See Fig. 1.)



DIAG. NO.	PART NO.	DESCRIPTION	
C-1	22-670	.1 MFD.	400 V
C-2	22-669	.01 MFD.	600 V
C-3	22-635	.02 MFD.	600 V
C-4	22-130	.2 MFD.	200 V
C-5	22-162	.0001 MFD.	600 V
C-6	22-673	.00255 MFD.	600 V
C-7	22-463	PADDER CONDENSER	
C-8	22-180	1 MFD.	200 V
C-9	22-667	4 MFD. ELECTROLYTIC	250 V (50-60 ~)
C-10		6 " "	200 V
C-11		6 " "	150 V
C-12		5 " "	25 V (25 ~)
C-13	22-675	8 MFD. ELECTROLYTIC	250 V
C-14		12 " "	200 V
C-15		12 " "	150 V
C-16		5 " "	25 V
R-1	63-722	2.2 MEGOHM	1/4 W
R-2	63-726	10 MEGOHM	1/4 W
R-3	63-464	1 MEGOHM	1/4 W
R-4	63-718	330 M OHMS	1/4 W
R-5	63-719	470 M OHMS	1/4 W
R-6	63-715	100 M OHMS	1/4 W
R-7	63-748	680 OHMS	1/4 W
R-8	63-949	2200 OHMS	1 W
1	J-5762	MICROPHONE ASSEM.	
2	5-18	BASS CELL	
3	20-172	OSCILLATOR COIL	
4	20-173	LINE FILTER CHOKE	
5	J-5767	CHOKE COIL	
6	95-510	POWER TRANS. 50-60 ~	117 V
7	95-511	" " 25 ~	117 V
8	85-136	SWITCH	



NOTE - ALL VOLTAGES MEASURED FROM POINT SHOWN TO GROUND USING A 1000 OHM PER VOLT D.C. METER (EXCEPT FILAMENTS & RECTIFIER PLATES).

MEASUREMENTS TAKEN AT 110 V.A.C.

DIAG. NO.	PART NO.	DESCRIPTION	
C-1	22-669	.01 MFD.	600 V
C-2	22-180	.1 MFD.	200 V
C-3	22-162	.0001 MFD.	600 V
C-4	22-635	.02 MFD.	600 V
C-5	22-463	PADDER CONDENSER	
C-6	22-666	4 MFD. ELECTROLYTIC	300 V (50-60 ~)
C-7		4 " "	250 V
C-8		5 " "	25 V (25 ~)
C-9	22-676	8 MFD. ELECTROLYTIC	300 V
C-10		8 " "	250 V
C-11		5 " "	25 V
R-1	63-719	470 M OHMS	1/4 W
R-2	63-718	330 M OHMS	1/4 W
R-3	63-944	680 OHMS	1/2 W
R-4	63-510	18 M OHMS	2 W
R-5	63-951	400 M OHMS VOLUME CONT.	
1	20-174	R.F. COIL	
2	49-231	5" DYNAMIC SPEAKER	
3	95-509	POWER TRANS. 50-60 ~	117 V
4	95-512	POWER TRANS. 25 ~	117 V

Fig. 3. CIRCUIT DIAGRAM

Maximum sensitivity may be found by placing a watch on the Guardian Ear, and after raising the volume on the Radio Nurse to a point just below feedback (howl) adjust the Guardian Ear trimmer for maximum volume of the watch tick.

The trimmers have a tuning range of from 250 to 450 K.C. If interference from another Radio Nurse is encountered, it may be eliminated by readjusting either pair of units in the following manner. Shift the frequency of one Radio Nurse (Bakelite unit) slightly or until the interference drops out. The bakelite shell of the Nurse must be removed in order to reach the trimmer. The Guardian Ear of the pair is then tuned to resonance as previously outlined.

THREE WIRE SYSTEMS

In cases where the electric service to the home or apartment is of the 3 wire, 220 volt type, and the transmitter is used on one 110 volt circuit and the receiver on the other, it is sometimes necessary to install a bridging condenser across the outside 220 volt leads to form a path for the signals. To accomplish this, a special bridging condenser was developed.

This condenser is a special oil impregnated unit made for continuous operation on 250 volts A.C. and has a 2.5 ampere fuse sealed inside the condenser case, Zenith part number S-5766.

The condenser is connected to the line by first removing a fuse on one side of the 220 volt circuit and inserting the metal tab into the shell of the fuse socket so that when the fuse is screwed back into place the metal strip makes contact with the shell of the fuse. The remaining condenser wire is fastened under a fuse on the opposite side of the 220 volt circuit in the same manner.

In some installations, fuses are used on both the live side of the line as well as the neutral or ground circuit. In such cases it is imperative that the two fuses to which the condenser is connected be in the live leads and not in the ground side.

The diagram shows a typical installation. If it is found difficult to trace the wiring of the fuse box, simply try the condenser under various pairs of fuses until you find a combination that properly couples the 220 V. circuit, or until a combination is obtained which produces satisfactory operation of the Radio Nurse. This condenser is fully protected by its internal fuse, and even if improperly installed will cause no difficulty whatsoever from short circuits, etc.

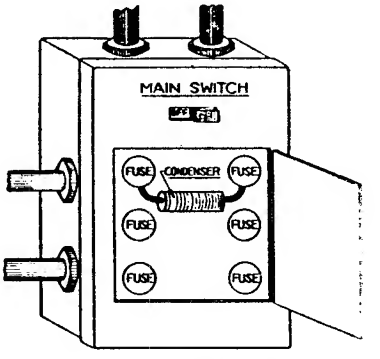


Fig. 4. FUSE BOX

IMPORTANT INFORMATION

If The Radio Nurse Lacks Sensitivity: The Radio Nurse is designed to operate under normal home conditions. When it is operated in a commercial establishment, lack of sensitivity may result due to heavy light loads, heavy power loads, high line capacities, split wiring circuits and heavily by-passed or filtered wiring commonly used to reduce line disturbances in radio receivers. The Radio Nurse being a radio frequency operated device depends on freedom of loads or capacity on the line which factors partially or completely bypass the signal. To overcome this condition and obtain proper efficiency from the Radio Nurse in commercial installations, the various factors must be eliminated. If, however, this is not possible, then an isolated power line must be used. Isolation can be accomplished by placing an R.F. choke in each 110 volt lead of the wall outlet, and running the 110 volt leads from the chokes to both the Guardian Ear and the Radio Nurse direct. Such an isolation unit is manufactured under the Zenith part number S-6114. Do not determine that the Radio Nurse lacks sensitivity unless such isolation has been made, and the units separated far enough, and well isolated by separate closed rooms to avoid howl with the volume control set at maximum.

Interference from ACDC receivers. Due to the type of circuit, and rectification system employed in AC-DC receivers, they may cause loud interference in the form of a hum to be heard in the Radio Nurse. This can be overcome by connecting a Zenith filter part No. 22-677 at the socket to which the AC-DC receiver is attached. A soldering iron or curling iron may also cause this interference in which case the same filter units may be applied to the interfering device.

PARTS LIST

Model TA Guardian Ear - 60 Cycle

Condensers

2-138	.2 mfd. 200 volt	$ .15
2-162	.0001 mfd. 600 volt	.15
2-190	.1 mfd. 200 volt	.15
2-435	.02 mfd. 600 volt	.18
2-463	Padder condenser	.30
2-667	4.x 6.x 6.x 5. Electrolytic	1.25
2-669	.01 mfd. 600 volt	.18
2-670	.1 mfd. 400 volt	.20

Resistors

3-464	1. megohm 1/4 watt	.15
3-715	100 M ohm 1/4 watt	.15
3-718	330 M ohm 1/4 watt	.15
3-719	470 M ohm 1/4 watt	.15
3-722	2.2 megohm 1/4 watt	.15
3-726	10. megohm 1/4 watt	.15
3-749	680 ohm 1/4 watt	.15
3-949	2200 ohm 1 watt	.17

Chassis Parts

5-15	Bias cells	.10
0-172	Oscillator coil assembly	.50
0-173	Line filter choke	.40
8-217	#84 tube socket	.12
8-218	#41 tube socket	.12
8-220	#79 tube socket	.12
8-221	Microphone socket	.07
5-136	On and off switch	.25
5-510	117 volt 50-60 cycle power transformer	2.50
5-17	Rubber grommets for transformer mounting	.01
6-168	Goat tube shield	.10
5762	Complete microphone and housing assembly	2.00
5767	Choke coil assembly	.25

Model TAZ Guardian Ear (25 Cycle)

Same as Model TA 60 cycle with the exception of the following

2-675	8.x 12.x 12.x 5. electrolytic condenser (replaces 22-667)	1.25
6-266	Electrolytic condenser shield (replaces 126-248)	.10
5-511	117 volt 25 cycle power transformer (replaces 95-510)	3.00

Model RA Radio Nurse — 60 cycle

Condensers

22-162	.0001 mfd. 600 volt	$ .15
22-190	.1 mfd. 200 volt	.15
22-435	.02 mfd. 600 volt	.18
22-463	Padder Condenser	.30
22-666	4. x 4. x 5 Electrolytic condenser	.85
22-669	.01 mfd. 600 volt	.18

Resistors

63-510	18 M ohm 2 watt	.25
63-718	330 M ohm 1/4 watt	.15
63-719	470 M ohm 1/4 watt	.15
63-944	680 ohm 1/2 watt	.15
63-951	400 M ohm Volume control	1.35

Miscellaneous Chassis Parts

12-545	Volume control bracket	.05
19-81	Knob tension spring	.01
20-174	R.F. coil assembly	.50
49-231	Dynamic speaker	3.50
208-231	Cone and voice coil	1.00
206-231	Output transformer	1.50
207-231	Field coil assembly	1.00
78-145	6F5 tube socket	.12
78-217	#84 tube socket	.12
78-218	#41 tube socket	.12
95-509	117 volt 50-60 cycle transformer	2.50
110-63	Speaker dust cloth	.10
126-264	Electrolytic shield	.05

Receiver Cabinet Assembly

36-4	Bakelite handle	.50
43-22	Housing Front	1.50
43-23	Housing Rear	2.00
46-241	Knob	.10
112-160	8/32x7/8 Cabinet holding screws	.01
112-162	10/32x27/16 Cabinet holding screws	.02

Model RAZ Radio Nurse (25 Cycle)

Same as Model RA 60 cycle excepting the following

22-674	8.x 8.x 5. Electrolytic condenser (replaces 22-666)	1.10
95-612	117 volt 25 cycle power transformer (replaces 95-509)	3.25
12-547	Volume control mounting bracket (replaces 12-547)	.05

1 Prices Subject to Regular Parts Discount and Change Without Notice

ZENITH RADIO CORPORATION

CHICAGO, U. S. A.

SERVICE MANUAL

1938

AUTOMOBILE RECEIVERS

MODELS

5-M-291

5-M-294

6-M-292

6-M-293

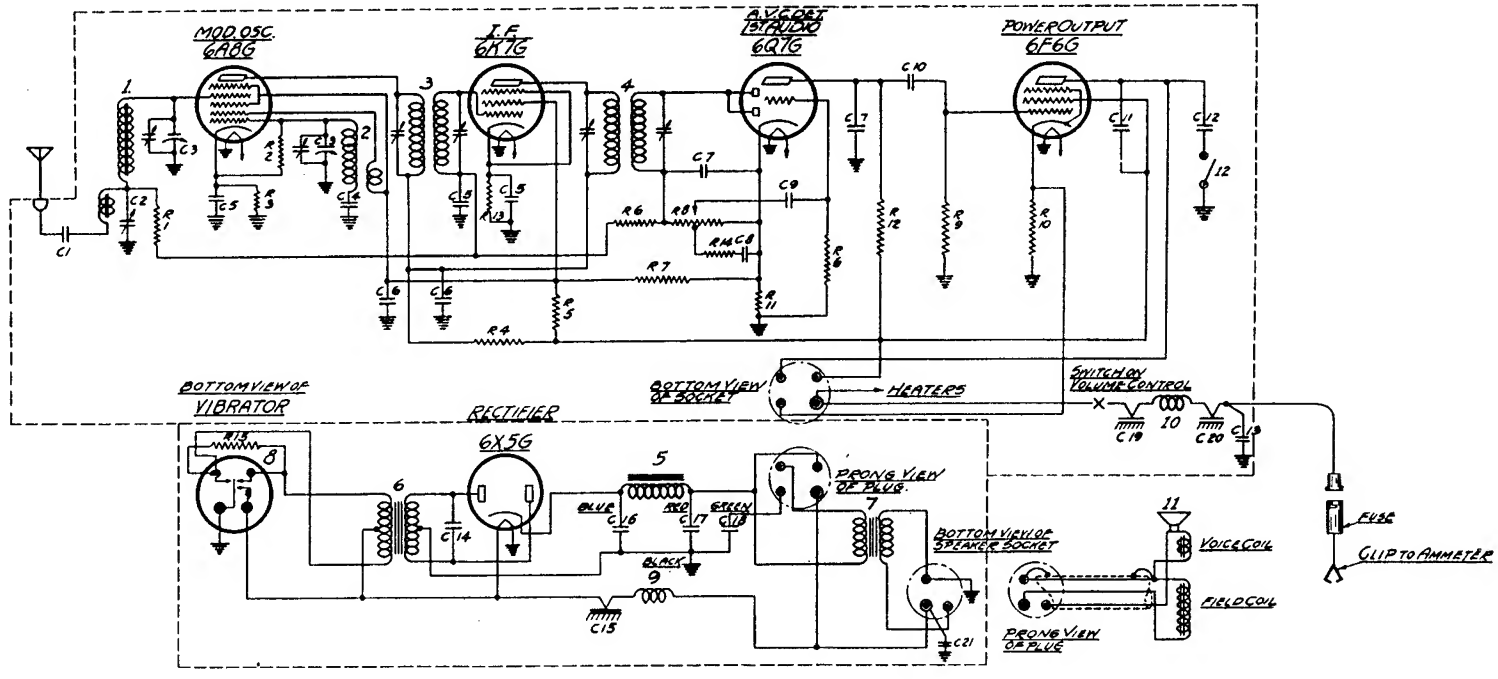
6-M-295

ZENITH RADIO CORPORATION

CHICAGO, U. S. A.

Form A-8

Printed in U. S. A.



DIAG. No.	PART No.	DESCRIPTION	
C 1	22-219	.03 MFD	200 V
C 2	22-662	600 K.C. ANTENNA TRIMMER	
C 3	22-661	TWO GANG VARIABLE	
C 4	22-663	OSCILLATOR PADDER	
C 5	22-230	.05 MFD	200 V
C 6	22-170	.1 MFD	400 V
C 7	22-188	.0005 MFD	600 V
C 8	22-218	.005 MFD	200 V
C 9	22-347	.02 MFD	200 V
C 10	22-435	.02 MFD	600 V
C 11	22-229	.005 MFD	600 V
C 12	22-227	.03 MFD	600 V
C 13	22-678	.25 MFD	200 V
C 14	22-660	.006 MFD	400 V
C 15	22-654	.5 MFD	120 V
C 16	22-699	7 MFD DRY ELECTROLYTIC	400 V
C 17		8 " " "	350 V
C 18		10 " " "	25 V
C 19	5-5737	400 MMFD LOW REACTOR	
C 20		400 " " "	
C 21	22-147	.0003 MFD	600 V
R 1	63-717	220 M OHM	1/4 W
R 2	63-713	100 M OHM	1/4 W
R 3	63-748	560 OHM	1/4 W
R 4	63-704	15000 OHM	1/4 W
R 5	63-805	1.5 M OHM	2 W
R 6	63-644	1 MEGOHM	1/4 W
R 7	63-760	39 M OHM	1/4 W
R 8	63-999	400 M OHM VOLUME CONTROL	
R 9	63-719	470 M OHM	1/4 W
R 10	63-941	390 OHM	1 W
R 11	63-749	680 OHM	1/4 W

DIAG. No.	PART No.	DESCRIPTION	
R 12	63-775	270 M OHM	1/4 W
R 13	63-750	820 OHM	1/4 W
R 14	63-718	.47 M OHM	1/4 W
R 15	63-960	220 OHM	1/2 W
1	20-179	ANTENNA COIL	
2	20-169	OSCILLATOR COIL	
3	95-496	1 ST. I.F. TRANS.	
4	95-505	2ND. "	
5	95-506	POWER CHOKE	
6	95-508	POWER TRANS.	
7	95-507	AUDIO TRANS.	
8	190-13	VIBRATOR	
9	20-176	HASH CHOKE COIL	
10	20-176	NOT. NOISE CHOKE COIL	
11	69-232	8" DYNAMIC SPEAKER (8, 9, & 27 ARE WALL MOUNTING)	
12	85-134	TONE CONTROL SWITCH	

NOTE: 1500 K.C. ANT. TRIMMER ON C 1

I.F. FREQUENCY-455-K.C.

ZENITH AUTO RADIO

MODEL-5-M-291 CHASSIS-5527

ZENITH RADIO CORPORATION
CHICAGO, ILL.

FIG. 1. CIRCUIT DIAGRAM MODEL 5-M-291

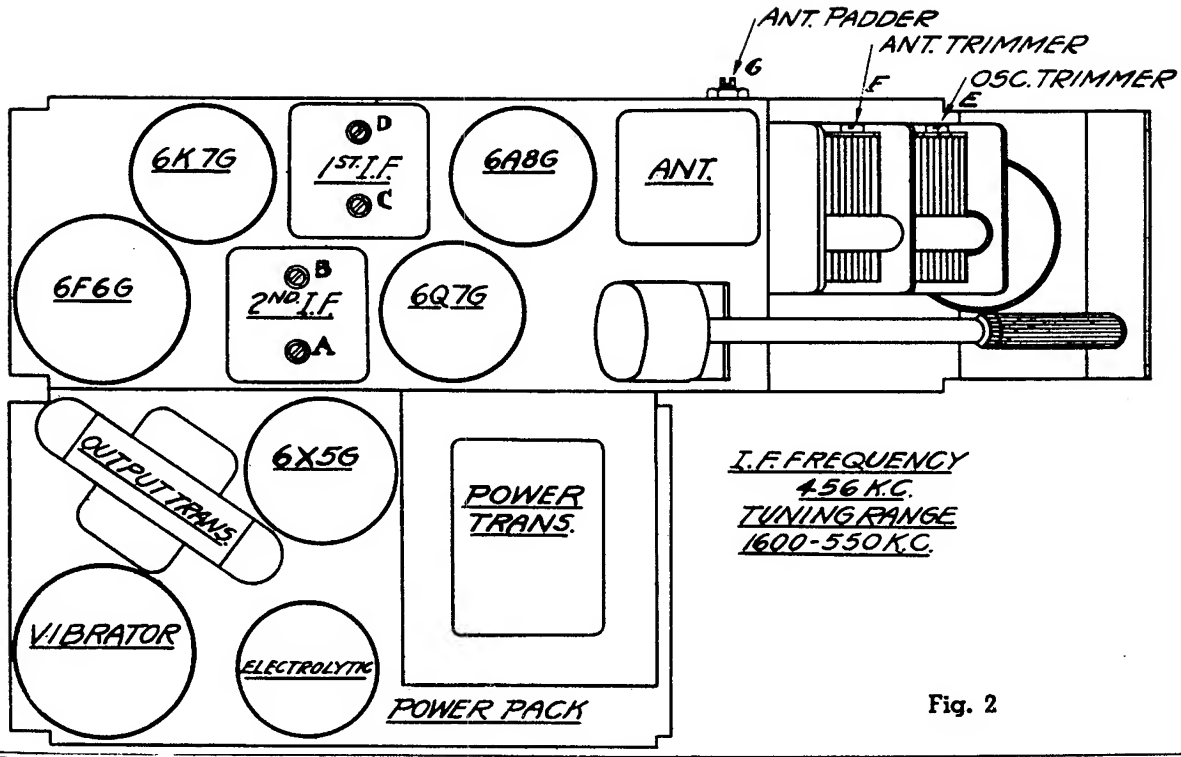
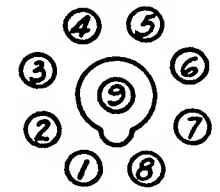


Fig. 2

Tube	Position	1	2	3	4	5	6	7	8	9
6A8G	Mixer Osc.	0	0	240	93.0	*	147	6.0	**	—
6K7G	I. F.	0	0	240	93.0	***	—	6.0	***	—
6Q7G	Det. A. V. C. Audio	0	0	112	—	—	—	6.0	—	1.8
6F6G	Power	0	0	235	250	—	—	6.0	—	16.0
6X5G	Rectifier	—	0	—	—	—	—	6.0	250	—



BOTTOM VIEW OF SOCKET

Voltage at Battery 6.2V

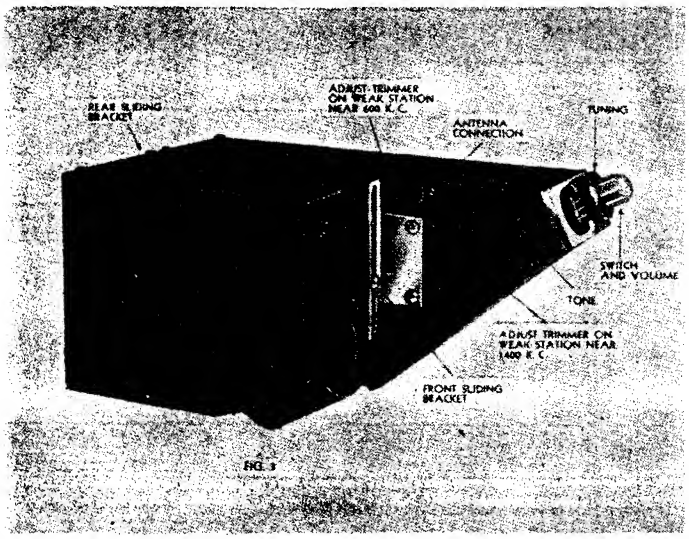
* { —5.8 manual / +4.2 automatic

** { +4.4 manual / +5.0 automatic

Voltage at Receiver 6V

Antenna disconnected *** { +5.2 manual / +4.9 automatic

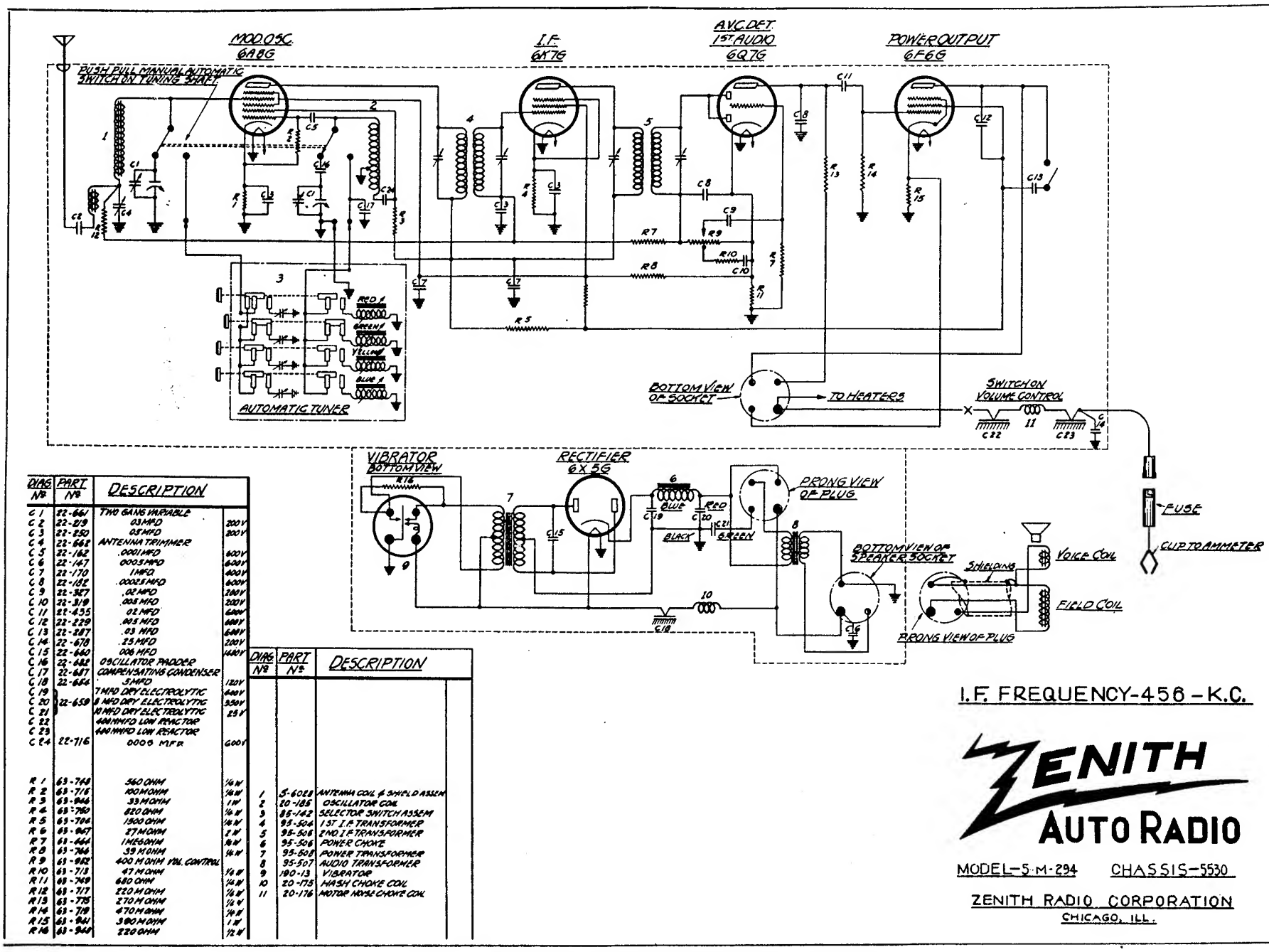
All voltages measured with 1000 ohms per volt D. C. meter
Total current consumption 7.1 amperes
Sensitivity at 1 watt out put 5-10M
Maximum power output 3.2 watts.



ANTENNA ALIGNMENT

(Models 5-M-291 and 5-M-294)

There is such a great variation in the capacity of different antennas that it is impossible to meet every condition without some means of variable antenna alignment. To accomplish this, 2 screw adjustments are provided on the receiver case as shown in Figure 3. After the set has been completely installed, the proper method of antenna alignment is as follows: Tune in a weak signal at or near 1400 K.C., and carefully adjust the lower screw as indicated in Figure 3 to loudest signal strength. Turn the tuning dial to a station at or near 600 K.C., and carefully adjust the upper left screw, also shown in Figure 3. Do not use a loud local signal for either of the adjstments. The adjustments at both 600 and 1400 K.C. should be repeated not only as a recheck but for more perfect alignment.



DIAG Nº	PART Nº	DESCRIPTION	
C 1	22-661	TWO GANG VARIABLE	
C 2	22-219	.03 MFD	200 V
C 3	22-220	.05 MFD	200 V
C 4	22-668	ANTENNA TRIMMER	
C 5	22-162	.0001 MFD	600 V
C 6	22-147	.0005 MFD	600 V
C 7	22-170	.1 MFD	400 V
C 8	22-182	.00025 MFD	600 V
C 9	22-387	.02 MFD	200 V
C 10	22-319	.005 MFD	200 V
C 11	22-455	.02 MFD	600 V
C 12	22-229	.005 MFD	600 V
C 13	22-287	.03 MFD	600 V
C 14	22-678	.25 MFD	200 V
C 15	22-660	.006 MFD	1400 V
C 16	22-682	OSCILLATOR PADDER	
C 17	22-687	COMPENSATING CONDENSER	
C 18	22-664	.5 MFD	120 V
C 19		7 MFD DRY ELECTROLYTIC	440 V
C 20	22-659	8 MFD DRY ELECTROLYTIC	350 V
C 21		10 MFD DRY ELECTROLYTIC	25 V
C 22		400 MMFD LOW REACTOR	
C 23		400 MMFD LOW REACTOR	
C 24	22-716	.0006 MFD	600 V
R 1	63-749	560 OHM	½ W
R 2	63-715	100 M OHM	½ W
R 3	63-946	33 M OHM	1 W
R 4	63-762	820 OHM	½ W
R 5	63-704	1500 OHM	½ W
R 6	63-967	27 M OHM	2 W
R 7	63-464	1 MEGOHM	½ W
R 8	63-746	39 M OHM	½ W
R 9	63-982	400 M OHM VOL. CONTROL	
R 10	63-713	47 M OHM	½ W
R 11	63-749	680 OHM	½ W
R 12	63-717	220 M OHM	½ W
R 13	63-775	270 M OHM	½ W
R 14	63-719	470 M OHM	½ W
R 15	63-941	390 M OHM	1 W
R 16	63-940	220 OHM	½ W

DIAG Nº	PART Nº	DESCRIPTION
1	5-6028	ANTENNA COIL & SHIELD ASSEM
2	20-185	OSCILLATOR COIL
3	85-142	SELECTOR SWITCH ASSEM
4	95-506	1ST I.F. TRANSFORMER
5	95-506	2ND I.F. TRANSFORMER
6	95-506	POWER CHOKE
7	95-508	POWER TRANSFORMER
8	95-507	AUDIO TRANSFORMER
9	190-13	VIBRATOR
10	20-175	HASH CHOKE COIL
11	20-176	MOTOR NOISE CHOKE COIL

FIG. 4. CIRCUIT DIAGRAM MODEL 5-M-294

MODEL 5-M-294

NOTE: All Socket Voltages identical with 5-M-291 given on page 447. Also tube layout and electrical specifications.

IMPORTANT — ANTENNA ALIGNMENT

Due to the large variation in electrical capacity of different automobile antennas it is necessary to adjust the receiver to the particular antenna used after installation has been made for maximum performance. Model 5-M-294 is equipped with two adjusting screws to accomplish this alignment. The green tag on the side of the receiver case shows the location of the two adjusting screws.

To align, first turn the receiver on with the center knob shown in Fig. 3. Press the tuning knob IN. This places the tuning mechanism in the **manual** operating position. Tune to a weak station near 1400 K.C. and adjust the trimmer directly below the antenna connector to maximum volume. Next tune the receiver to a weak station near 600 K.C. and adjust the trimmer nearest the power pack case for maximum volume. Repeat the adjustments for greatest accuracy.

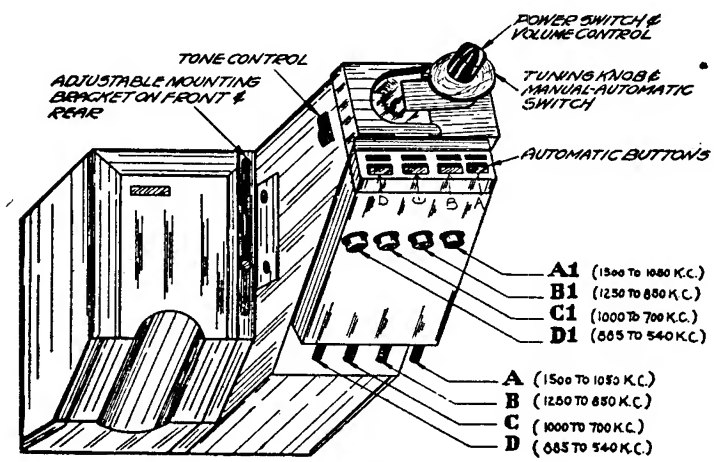
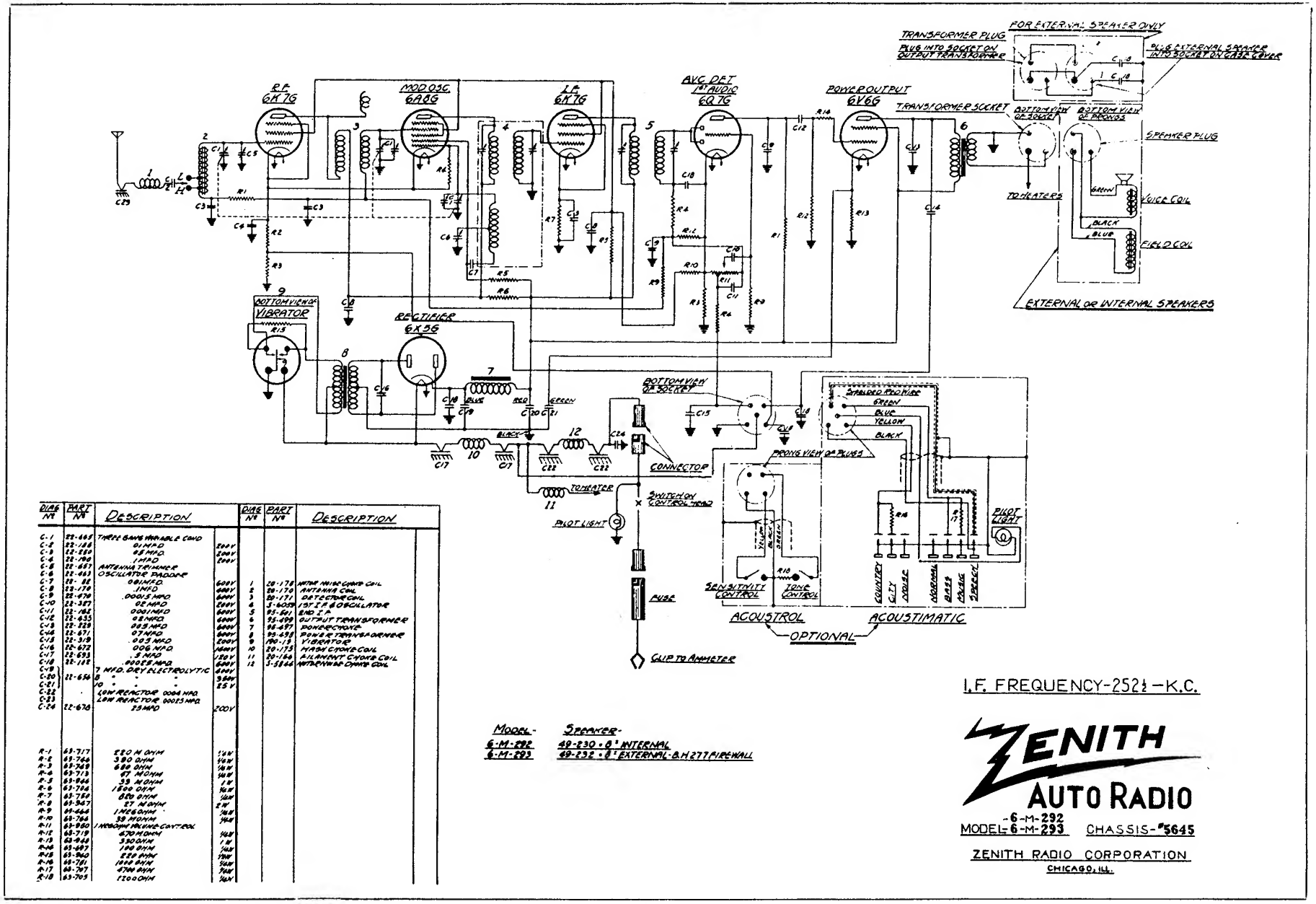


Fig. 5

AUTOMATIC

To set the automatic buttons, first pull the tuning knob OUT. This shifts the tuning mechanism to the **Automatic** position. Press Automatic button A and turn the volume up and with a small screw driver carefully adjust screw A at bottom of the Automatic unit shown in Fig. 3 to a local station between 1500 to 1050 K.C. Set to exact position of maximum volume and clearest tone. Next adjust trimmer A1 for maximum volume and clearest tone **on the same station.** It should be noted that there are two trimmer adjustments to each station button. To set the second button press B and tune trimmer B to a local station between 1250 to 850 K.C. Trim with adjustment B1 to best volume and tone on the same station. To set the third button press C and tune trimmer screw C to a station between 1000 to 700 K.C. and corresponding adjustment C1 again for maximum volume of the selected station. Follow the same procedure for the fourth button by pressing button D and using trimmers D and D1 on a local station between 885 to 540 K.C. After all four button have been set, cut the call letters of stations selected from the gummed call letter sheet supplied with the receiver. Remove the escutcheon over the automatic buttons by taking out the three screws which hold it in position. Remove the celluloid strip and paste the station call letters in their proper positions by wetting the back of the call letter sticker. The four outlines on the celluloid strip provide the exact points at which the gummed labels are placed. After the call letter stickers are attached replace the celluloid and the escutcheon plate.



DIAG. No.	PART No.	DESCRIPTION		DIAG. No.	PART No.	DESCRIPTION
C-1	22-665	THREE GANG VARIABLE COND.				
C-2	22-184	.01 MFD.	2000 V.			
C-3	22-230	.05 MFD.	2000 V.			
C-4	22-198	.1 MFD.	600 V.			
C-5	22-667	ANTENNA TRIMMER				
C-6	22-663	OSCILLATOR PADDER				
C-7	22-82	.001 MFD.	600 V.	1	20-178	MIXER MISC. COMB. COIL
C-8	22-170	.1 MFD.	400 V.	2	20-170	ANTENNA COIL
C-9	22-679	.0005 MFD.	600 V.	3	20-171	DET. & 1ST AUDIO COIL
C-10	22-387	.02 MFD.	1500 V.	4	5-6059	1ST I.F. & OSCILLATOR
C-11	22-188	.0001 MFD.	600 V.	5	95-661	2ND I.F.
C-12	22-655	.08 MFD.	600 V.	6	95-699	OUTPUT TRANSFORMER
C-13	22-228	.025 MFD.	600 V.	7	98-497	RECTIFIER
C-14	22-671	.07 MFD.	600 V.	8	95-658	POWER TRANSFORMER
C-15	22-319	.002 MFD.	2000 V.	9	190-13	VIBRATOR
C-16	22-672	.006 MFD.	400 V.	10	20-173	HASH CHOKE COIL
C-17	22-693	.5 MFD.	150 V.	11	20-166	ANTENNA CHOKE COIL
C-18	22-115	.0005 MFD.	600 V.	12	5-5846	INTERWAVE CHOKE COIL
C-19		7 MFD. DRY ELECTROLYTIC	400 V.			
C-20	22-656	8 " "	350 V.			
C-21		10 " "	25 V.			
C-22		LOW REACTOR .0004 MFD.				
C-23		LOW REACTOR .00025 MFD.				
C-24	22-676	.25 MFD.	200 V.			
R-1	69-717	550 M OHM	1/2 W.			
R-2	69-766	390 OHM	1/2 W.			
R-3	69-768	680 OHM	1/2 W.			
R-4	69-713	.27 M OHM	1/2 W.			
R-5	69-966	.33 M OHM	1 W.			
R-6	69-776	1800 OHM	1/2 W.			
R-7	69-782	850 OHM	1/2 W.			
R-8	69-967	.27 M OHM	2 W.			
R-9	69-664	1 MEGOHM	1/2 W.			
R-10	69-766	.33 M OHM	1/2 W.			
R-11	69-980	1 MEGOHM VOLUME CONTROL				
R-12	69-719	.470 M OHM	1/2 W.			
R-13	69-968	5300 OHM	1 W.			
R-14	69-687	190 OHM	1/2 W.			
R-15	69-960	220 OHM	10 W.			
R-16	69-781	1000 OHM	1/2 W.			
R-17	69-707	47 M OHM	1/2 W.			
R-18	69-703	11000 OHM	1/2 W.			

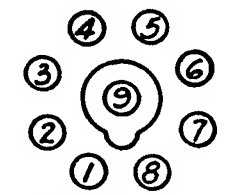
MODEL-	SPEAKER-
6-M-292	49-230 - 8" INTERNAL
6-M-293	49-232 - 8" EXTERNAL - B.H. 277 FIREWALL

ZENITH
AUTO RADIO
-6-M-292
MODEL-6-M-293 CHASSIS-"5645
ZENITH RADIO CORPORATION
CHICAGO, ILL.

FIG. 6. CIRCUIT DIAGRAM MODELS 6-M-292, 6-M-293

SOCKET VOLTAGES 6-M-292, 6-M-293

Tube	Position	1	2	3	4	5	6	7	8	9
6K7G	R. F.	0	6.0	250	78	*	—	0	*	
6A8G	Mixer Osc.	0	6.0	250	78	**	132	0	*	
6K7G	I. F.	0	0	250	78	-3.8	—	6.0	3.5	
6Q7G	Det. A. V. C. Audio	0	0	95	0	—	—	6.0	1.6	
6V6G	Power	0	6.0	240	250	—	—	0	11.5	
6X5G	Rectifier	—	0	—	—	—	—	6.0	255	



Voltage at Battery 6.3
Voltage at Receiver 6.0
Antenna disconnected
All Voltages measured with 1000 ohm per volt meter
Total current consumption 7.4 amperes
Sensitivity at 1 watt output - 1 microvolt
Maximum power output 6 watts.

*Sensitivity position { —4.96 country; —8.0 city; —9.5 noise

**Sensitivity position { —18.5 country; —17.5 city; —15.0 noise

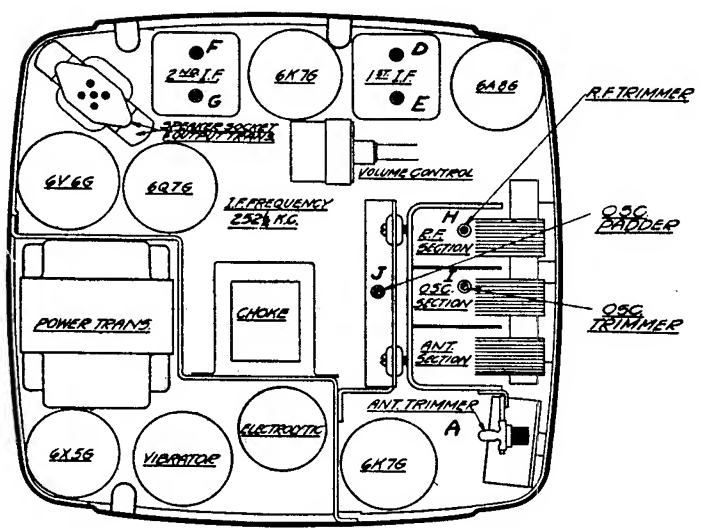


Fig. 7

Tube Position

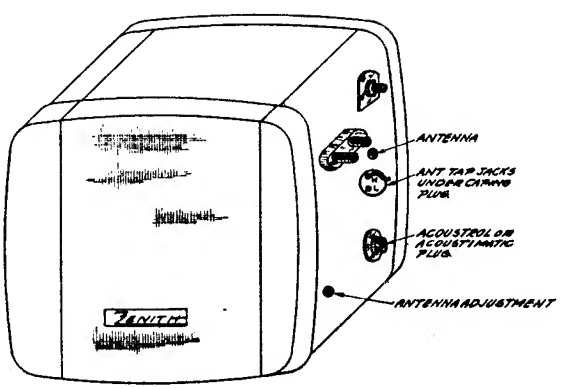
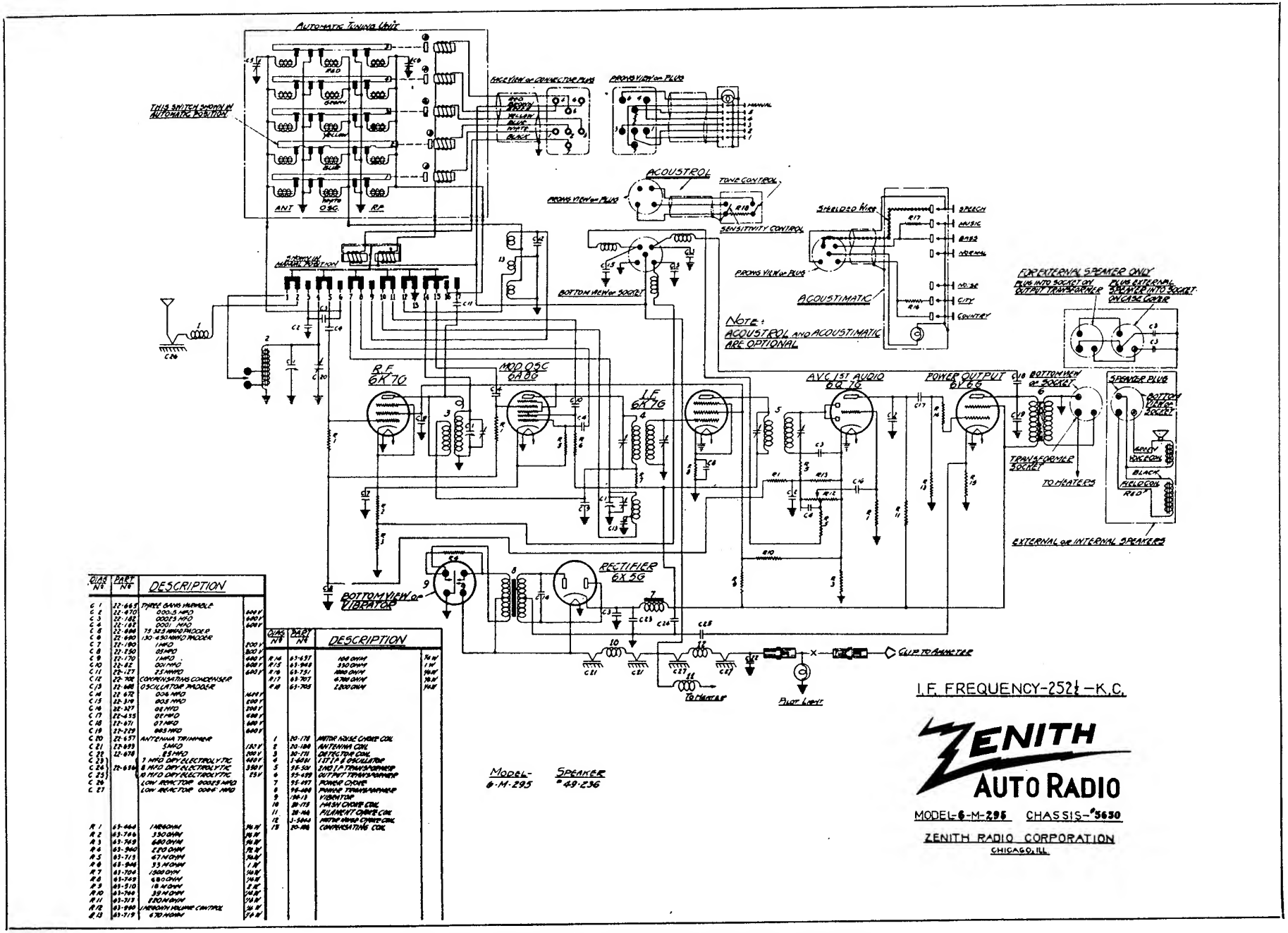


Fig. 8

ANTENNA ALIGNMENT

Fig. 8 shows the location of the antenna tap jacks on the side of the receiver case. Remove the capping plug from over this jack assembly, and insert the antenna pin lead in the "H" or "L" position, depending on the capacity of the antenna being used The "H" position must be used for antennas with a capacity in the range of from 100 to 500 mmfd. The "L" connection must be used for low capacity antennas of from 0 to 125 mmfd. Compare this listing with that given under the various antennas, and the proper position will easily be recognized. After selecting the position desired, place the capping plug back over the hole to prevent motor noise from entering into the antenna circuit of the receiver. Connect the antenna proper by means of the Delco-Remy connector shown in Fig. 8.



CIRC. NO.	PART NO.	DESCRIPTION	
C 1	32-665	THREE GANG VARIABLE	
C 2	32-670	0005 MFD	600 V
C 3	32-182	00025 MFD	600 V
C 4	32-185	0001 MFD	600 V
C 5	32-686	75 TO 323 MMFD TRIMMER	
C 6	32-690	130 TO 430 MMFD TRIMMER	
C 7	32-180	1 MFD	200 V
C 8	32-150	05 MFD	200 V
C 9	32-170	1 MFD	400 V
C 10	32-82	001 MFD	600 V
C 11	32-127	23 MMFD	600 V
C 12	32-708	COMPENSATING CONDENSER	
C 13	32-688	OSCILLATOR TRIMMER	
C 14	32-672	006 MFD	400 V
C 15	32-378	003 MFD	200 V
C 16	32-327	04 MFD	200 V
C 17	32-435	01 MFD	400 V
C 18	32-671	07 MFD	600 V
C 19	32-229	003 MFD	600 V
C 20	32-677	ANTENNA TRIMMER	
C 21	32-699	5 MFD	150 V
C 22	32-678	25 MFD	200 V
C 23	32-698	2 MFD DRY ELECTROLYTIC	400 V
C 24		8 MFD DRY ELECTROLYTIC	350 V
C 25		10 MFD DRY ELECTROLYTIC	15 V
C 26		LOW REACTOR 0005 MFD	
C 27		LOW REACTOR 0004 MFD	

CIRC. NO.	PART NO.	DESCRIPTION	
1	30-178	ANTENNA NOISE CHOKE COIL	
2	30-180	ANTENNA COIL	
3	30-179	DETECTOR COIL	
4	1-6011	1ST I.F. & OSCILLATOR	
5	98-504	2ND I.F. TRANSFORMER	
6	95-499	OUTPUT TRANSFORMER	
7	95-497	POWER CHOKE	
8	96-486	POWER TRANSFORMER	
9	80-13	VIBRATOR	
10	30-175	1 MH SW CHOKE COIL	
11	30-146	FILAMENT CHOKE COIL	
12	3-5066	ANTENNA NOISE CHOKE COIL	
13	30-181	COMPENSATING COIL	

CIRC. NO.	PART NO.	DESCRIPTION	
R 1	63-464	1 MEGOHM	½ W
R 2	63-766	330 OHM	½ W
R 3	63-769	680 OHM	½ W
R 4	63-940	6.80 OHM	1 W
R 5	63-713	47 K OHM	½ W
R 6	63-948	33 K OHM	1 W
R 7	63-704	1500 OHM	½ W
R 8	63-749	680 OHM	½ W
R 9	63-510	18 K OHM	1 W
R 10	63-760	39 K OHM	½ W
R 11	63-213	2.20 K OHM	½ W
R 12	63-980	1 MEGOHM VOLUME CONTROL	½ W
R 13	63-719	470 K OHM	½ W

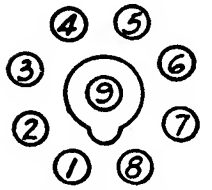
CIRC. NO.	PART NO.	DESCRIPTION	
R 14	63-437	100 OHM	½ W
R 15	63-948	330 OHM	1 W
R 16	63-751	1000 OHM	½ W
R 17	63-707	4.70 K OHM	½ W
R 18	63-705	2.200 OHM	½ W

FIG. 9. CIRCUIT DIAGRAM MODEL 6-M-295

SOCKET VOLTAGES MODEL 6-M-295

Tube	Position	1	2	3	4	5	6	7	8	9
6K7G	R. F.	0	6.1	245	100	0	—	0	*	
6A8G	Mixer Osc.	0	6.1	245	100	**	128	0	*	
6K7G	I. F.	0	0	250	100	4.2	—	6.1	4.2	
6Q7G	Det. A. V. C. Audio	0	0	155	0	0	—	6.1	1.9	
6V6G	Power	0	6.1	240	250	0	—	0	12.5	
6X5G	Rectifier	—	0	—	—	—	—	6.1	255	

Sensitivity * { 5.2 Country, 9.2 City, 11.2 Noise } ** Automatic { 11.2 Country, 8.3 City, 6.5 Noise } ** Manual { 18.5 Country, 17.5 City, 15.0 Noise }



BOTTOM VIEW OF SOCKET

All other electrical characteristics identical to models 6-M-292 and 6-M-293 shown on page 451.

ANTENNA ALIGNMENT

Manual Tuning: Press the MANUAL button on the automatic key board. This disconnects the automatic system and allows operation of the receiver from the standard tuning mechanism. After adjusting the dial calibration accurately, turn the volume control up full and tune to a weak station near 1400 K.C. Adjust the antenna trimmer A (Fig. 8) to the point of greatest volume. This completes antenna alignment for manual operation. The trimmer does not have to be adjusted at any other point on the dial.

Automatic Tuning: Press automatic button 2 (Fig. 8) This will disconnect the manual tuning mechanism and place the automatic buttons into service. After button 2 has been pressed, turn adjusting screw 2 in either direction until a weak station between 1100 to 1000 K.C. is heard. Now adjust trimmers B and C on the automatic assembly for maximum signal strength of the weak station tuned in by the number 2 adjusting screw. The automatic is in complete resonance with the antenna over the entire automatic button range and need not be resonated at any other button setting. Adjusting screw 2 may now be tuned to a local station as outlined under "AUTOMATIC" with no further attention to adjustments B or C.

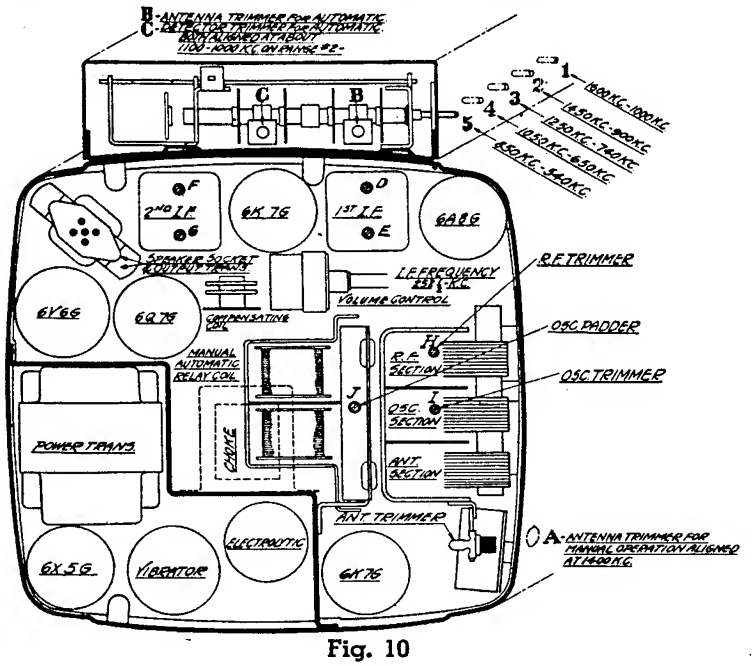


Fig. 10

AUTOMATIC

Study Fig. 8 carefully. Although simple in adjustment, best results will only be obtained if made accurately and by the following procedure.

1. Press button 1. (This button will be on the left if automatic unit is mounted on edge of instrument panel.)

2. Adjust automatic trimmer screw (until a desired local station between 1600 and 1000 K.C. is heard. Turn the screw slowly back and forth over the station as if tuning the dial of a receiver, for clearest reception and best tone quality and allow the screw setting to remain at that point.

3. Press button 2 and tune for a station between 1450 and 900 K.C. on automatic adjusting screw 2.

4. Follow above procedure for buttons 3, 4 and 5 using the ranges shown on Fig. 8.

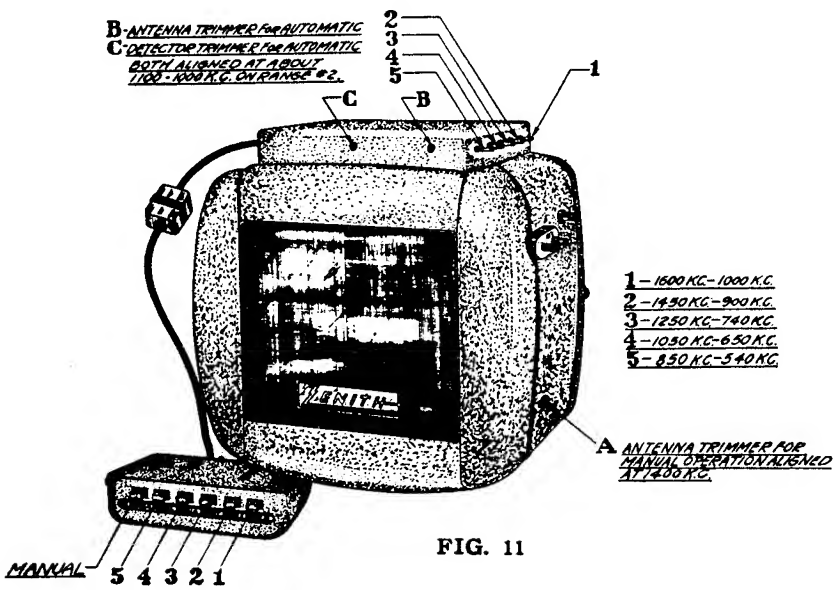


FIG. 11

5. Remove the chrome bezel over the parts adjacent to the automatic buttons and insert the station call letters cut from the sheet supplied. After placing the proper station calls in correct order over the port holes, fasten the escutcheon back in place.

6. Repeat careful adjustment of each automatic trimmer pressing the corresponding button in order from 1 to 5 to obtain best tone, loudest signal and greatest freedom from noise.

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.

CIRCUIT ALIGNMENT

MODELS 5-M-291, 5-M-294

Operation	Connect Test Oscillator To	Dummy Antenna	Set Test Osc. To	Manual or Automatic Position	Set Gang Cond.	Adjust Trimmers	Purpose
1	1st Det. Grid	½ Mfd.	456	Manual	Max. Cap.	A.B.C.D.	I. F. Alignment
2	Rec. Ant. Lead	50 Mmfd.	1530	Manual	Min. Cap.	E	Trim Oscillator
3	Rec. Ant. Lead	50 Mmfd.	1400	Manual	1400	F	Trim Ant. Stage
4	Rec. Ant. Lead	50 Mmfd.	600	Manual	600	G	Adjust Ant. Padder For Max. Output
5	Connect Car Antenna to Set — Tune to Weak Station Around 1400 K. C. — Trim Antenna Trimmer "F" for Maximum Peak Output.						
6	With Set Connected to Car Antenna—Tune To Weak Station Around 600 K. C. —Trim Antenna Padder "G" for Mamimum Peak Output.						

See tube layout page 447 for location of aligning trimmers

MODELS 6-M-292, 6-M-293, 6-M-295

Operation	Connect Test Oscillator To	Dummy Antenna	Set Test Osc. To	Manual or Automatic Position	Set Gang Cond.	Adjust Trim-mers	Purpose
1	1st Det. Grid	½ Mfd.	252.5	Manual	Max. Cap.	DEFG	I. F. Alignment
2	Rec. Ant. Lead	50 Mmfd.	1600	Manual	Min. Cap.	I	Trim Oscillator
3	Rec. Ant. Lead	50 Mmfd.	1400	Manual	1400	AH	Trim Ant. & R. F. Stage
4	Rec. Ant. Lead	50 Mmfd.	600	Manual	600	J	Rock Gang & Adjust Osc. Padder for Max. Output
5	Rec. Ant. Lead	50 Mmfd.	——	Manual	Tune To A Station Around 900 K. C. and Set Dial for Calibration		
6	Rec. Ant. Lead	50 Mmfd.	1000	Automatic	Range #2	Trim Ant. & R.F. of Automatic Unit — Trimmers "B" - "C"	
7	Connect Car Antenna to Set — Tune to Weak Station Around 1400 K. C. — Trim Antenna Trimmer "A" for Maximum Peak Output.						
8	Trim Automatic Antenna Trimmer "B" to Car Antenna on a Weak Station around 1000 K. C. on Range #2.						

See tube layouts pages 451 and 453 for location of aligning trimmers

PARTS PRICE LIST
1939 AUTOMOBILE SETS AND ACCESSORIES

Model 5M291 Chassis 5527 (Code A)
Model 5M294 Chassis 5530 (Code B)
Model 6M292 Chassis 5645 (Code C)
Model 6M293 Chassis 5645 (Code D)
Model 6M295 Chassis 5650 (Code E)

Coils and Chokes

PART NUMBER	DESCRIPTION	USED IN MODEL	LIST PRICE
20-166	Filament choke	C-D-E	$ .15
20-169	Oscillator coil	A	.65
20-170	Antenna coil	C-D	.75
20-171	Detector coil	C-D-E	.50
20-175	Hash choke coil	A-B-C-D-E	.20
20-176	Motor noise choke (R.F. Amp.)	A-B	.10
20-178	Motor noise choke	E	.10
20-184	Antenna coil	E	.75
20-185	Oscillator	B	.65
20-186	Compensating coil	E	.50
*20-188	Oscillator coil assy. (Serial Nos. Above 656501)	C-D	.35
20-188	Oscillator coil assy.	E	.35
*95-500	1st I. F. Transformer & Oscillator Coil (Serial No. Above 656501)	C-D	1.50
95-501	2nd I.F. Transformer assy.	C-D-E	1.25
95-504	1st I.F. Transformer assy.	A-B	1.25
95-505	2nd I.F. Transformer assy.	A-B	1.25
95-517	1st I.F. Transformer assy.	E	1.25
*95-524	1st I.F. Transformer assy. (Serial Nos. Above 656501)	C-D	1.25
S5844	Motor noise choke coil	C-D-E	.15
S5952	Antenna coil assy.	A	1.25
S6028	Antenna coil assy.	B	1.25

Condensers

22-82	.001 mfd. 600 volt	C-D-E	.15
22-127	25 mmfd.	E	.15
22-147	.0005 mfd. 600 volt	A-B	.15
22-162	.0001 mfd. 600 volt	B-C-D-E	.15
22-170	.1 mfd. 400 volt	A-B-C-D-E	.20
22-182	.00025 mfd. 600 volt	A-B-C-D-E	.15
22-185	.01 mfd. 200 volt	C-D	.15
22-190	.1 mfd. 200 volt	C-D-E	.15
22-212	.05 mfd. 400 volt	A-B-C-D	.15
22-219	.03 mfd. 200 volt	A-B	.12
22-229	.005 mfd. 600 volt	A-B-C-D-E	.18
22-250	.05 mfd. 200 volt	A-B-C-D-E	.15
22-287	.03 mfd. 600 volt	A-B	.18
22-319	.005 mfd. 200 volt	A-B-C-D-E	.15
22-327	.02 mfd. 200 volt	A-B-C-D-E	.12
22-435	.02 mfd. 600 volt	E	.18
22-463	Oscillator Padder	C-D	.45
22-47-	.00015 mfd. 600 volt	C-D-E	.15
22-654	.5 mfd. 120 volt (Power Pack)	A-B-	.20
22-656	7. x 8. x 10. Electrolytic	C-D-E	1.25
22-659	7. x 8. x 10. mfd. Electrolytic	A-B	1.25
22-660	.006 mfd. 1400 volt	A	.20
22-661	Two Gang Variable	A-B	1.75
22-662	600 K.C. Antenna trimmer	A-B	.35
22-663	Oscillator padder	A	.25
22-665	Three Gang Variable	C-D-E	3.50
22-671	.07 mfd. 600 volt	C-D-E	.23
22-672	.006 mfd. 1400 volt	C-D-E	.20
22-678	.25 mfd. 300 volt	A-B-C-D-E	.20
22-682	Oscillator padder	B	.25
22-687	Compensator	B	.25
22-688	Oscillator padder	E	.25
22-690	130-450 mmfd. padder (In selector unit)	E	.25
22-693	.5 mfd. 120 volt	C-D-E	.25
22-694	75-325 mmfd. padder (In selector unit)	E	.25
22-702	Compensator	E	.20
S-5828	22-657 antenna trimmer & bracket	C-D-E	.30

Resistors

63-464	1 megohm ¼ watt	A-B-C-D-E	.10
63-697	100 ohms ¼ watt	C-D-E	.10
63-704	1500 ohms ¼ watt	A-B-C-D-E	.10
63-705	2200 ohms ¼ watt (In TS288 Acoustrol)		.10
63-707	4700 ohms ¼ watt (In X288 Acoustimatic		.10
63-713	47000 ohms ¼ watt	A-B-C-D-E	.10
63-715	100,000 ohms ¼ watt	A-B-	.10
63-717	220,000 ohms ¼ watt	A-B-C-D-E	.10
63-719	470,000 ohms ¼ watt	A-B-C-D-E	.10
63-746	390,000 ohms ¼ watt	C-D-E	.10
63-748	560,000 ohms ¼ watt	A-B	.10
63-749	680,000 ohms ¼ watt	A-B-C-D-E	.10
63-750	820,000 ohms ¼ watt	A-B-C-D-E	.10
63-766	39,000 ohms ¼ watt	A-B-C-D-E	.10
63-775	270,000 ohms ¼ watt	A-B-	.10
63-939	400,000 ohms Volume control with switch	A	1.35
63-940	220 ohms ½ w. (In Power Pack)	A-B-C-D-E	.10
63-941	390 ohms 1 watt	A-B	.15
63-942	15,000 ohms 2 watt	A	.25
63-946	33,000 ohms 1 watt	B-C-D-E	.15
63-947	27,000 ohms 2 watt	B-C-D-E	.25
63-948	330 ohms 1 watt	C-D-E	.15
63-950	1 megohm volume control	C-D-E	1.35
63-952	400,000 ohms volume control	B	1.35

Miscellaneous

12-540	Connecting bracket (P. P. to R. F. Amp.)	A-B	.05
46-242	Tuning knob	A-B	.10
46-247	Volume knob	A-B	.10
49-230	8" Dynamic speaker (less O.P. Trans.)	C	4.00
	207-230 Field coil		1.50
	208-230 Cone & voice coil		2.50
49-232	8" Dynamic used in BH277	A-B-D	4.00
	207-232 Field coil		1.50
	208-232 Cone & voice coil		2.50
49-236	8" Dynamic speaker (less O. P. Trans.)	E	4.00
	207-232 Field coil		1.50
	208-236 Cone & voice coil		2.50
52-126	Power supply cable & plug assy.	A-B	.45
58-21	D. R. Male connector		.01
58-22	D. R. Spring		.005
58-23	D. R. Female connector		.01
58-24	D. R. Contact		.01
58-25	D. R. Washer		.01
58-26	D. R. Insulator		.01
58-28	D. R. Fuse holder		.01
78-148	Socket 6Q7G	C-D-E	.10

PARTS PRICE LIST (Cont'd.)

PART NUMBER	DESCRIPTION	USED IN MODEL	LIST PRICE
78-149	Socket 6X5G	A-B-C-D-E	.10
78-207	Socket Vibrator	A-B-C-D-E	.12
78-208	Socket 3 contact speaker plug	C-D-E	.12
78-209	Socket power supply cable plug (R. F. chassis)	A-B	.12
78-210	Socket 6Q7G	A-B	.12
78-211	Socket 6K7G	A-B-C-D-E	.12
78-212	Socket 6A8G	A-B-C-D-E	.12
78-213	Socket 6F6G	A-B	.12
78-215	Socket 6V6G	C-D-E	.12
78-219	Socket 5 contact for Acoustimatic Acoustrol	C-D-E	.12
78-222	Socket 2 contact antenna adjuster	C-D-E	.12
83-531	Connecting strip (R.F. Amp. Amp. & P. P.) rear	A-B	.05
93-309	#10 Shakeproof washer	A-B	.20C
95-497	Power choke	C-D-E	.85
95-498	Power Transformer	C-D-E	3.00
95-499	Audio output transformer	C-D-E	1.25
95-506	Power choke (Power Pack)	A-B	.85
95-507	Audio transformer (Power Pack)	A-B	.85
95-508	Power Transformer (Power Pack)	A-B	2.75
112-43	#6-32x1/4" B.H. Machine screw Pkzd.	A-B-	.25C
112-56	#6x1/4" Slotted H.H. Parker-Kalon screw	A-B-C-D-E	.25C
112-147	#10-32x1/4" B.H. Machine screws - Pkzd.	A-B	.35C
112-148	#2x3/16" R.H. Parker-Kalon screw - Cadmium	A-B-	.65C
112-149	#8-32x3/16"B.H. Machine screw - Pkzd.	A-B-	.25C
112-169	#2x3/16" B. H. Parker-Kalon Screw - Statuary Bronze	A-B	.65C
114-48	#6-32x1/4" Slotted H.H. Machine screw	A-B	.35C
114-64	#6x1/4" Parker-Kalon Acorn Hd. screw - Pkzd.	A-B	.25C
114-66	#6x3/8" Parker-Kalon Acorn Hd. screw - Pkzd.	A-B	.25C
114-68	#8x1/4" Slotted H.H. self-tapping case screw	C-D-E	.30C
114-69	#4x 1¼" P-K acorn head screws Pkzd.	A-B	.25C
126-131	Goat tube shield (large)	A-B-C-D-E	.10
126-168	Goat tube shield (small)	C-D-E	.10
159-21	Cinch snap buttons	A-B	.02
159-24	Plug button (antenna trimmer)	C-D-E	.05
183-10	Rubber band	C-D-E	.02
190-13	Vibrator	A-B-C-D-E	2.75
S5737	Low reactance condenser & brkt.	A-B	.25
S5739	Battery Cable assy. (R.F. chassis)	A-B	.20
S5749	Tone control switch assy.	A-B	.35
S5838	Shield for electrolytic condenser	C-D-E	.15
S5857	Rubber coupling-pin assy.	C-D-E-	.10
S5860	Battery cable - chassis end	C-D-E	.10
S6066	Manual & automatic switch assy.	E	2.25

Dial Parts For 5M291 - 5M294

19-82	Tuning shaft tension clip	A-B	.07
*26-191	Dial scale	A	.15
*26-195	Dial scale	A-B	.15
*27-22	Dial pointer disc	A-B	.10
34-74	Drive pinion	A	.35
54-112	Tuning Shaft lock nut	B	.04
57-626	Dial escutcheon plate	B	.20
73-32	#8-32x3/16" self-locking slotted set screw	A-B	.02
93-2	Spacer washer (used with 26-195)	A-B	.05C
100-36	Dial lamp 6.3 volt bayonet type	A-B	.09
114-69	#4-40x1/4" screws (used with 27-22)	A-B	.04
192-26	Dial crystal	A-B	.05
*MS407	Dial pointer	A	.35
S4906	Dial lamp socket & clip assy.	A-B	.10
S5735	Condenser Gear and bushing assem.	A-B	.20
S5738	Dial cover & escutcheon	A-B	.65

*-Early 5M291 models used 26-191 scale and MS407 dial pointer. Later models used 26-195 scale & 27-22 pointer disc.

Control Head Components 6M292 - 6M293 - 6M295

S5741	Tuning shaft gears & housing (mtd. on chassis box)	C-D-E	2.00
S5742	Volume control coupling shaft — switch and battery cable assembly consisting of	C-D-E-	3.00
	1 #52-127 battery cable (fuse to ammeter)	C-D-E	.30
	1 #52-136 battery cable (fuse to switch)	C-D-E	.30
	1 #52-137 battery cable (switch to set)	C-D-E	.50
	1 #52-138 dial light cable & socket	C-D-E	.30
	1 #58-26 D.R. Fuse bushing	C-D-E	.01
	1 #76-256 volume control coupling shaft & bracket	C-D-E	1.50
	1 - #85-138 S.P.S.T. switch	C-D-E	.40
	1 - #100-36 dial lamp	C-D-E	.09
	1 - #136-6 15 ampere fuse	C-D-E	.05
S5743	Dial drive gears - housing & scale assy.	C-D-E	2.25
	26-192 dial scale & hub assy.	C-D-E	.65
76-247	Volume control flexible shaft 24"	C-D-E	1.00
76-250	Scale drive flexible shaft 23 1/8"	C-D-E	1.00
76-253	Tuning control flexible shaft 25 1/2"	C-D-E	1.00

Optional Control Shafts

76-248	Volume control flexible shaft 30"	C-D-E	1.00
76-249	Volume control flexible shaft 36"	C-D-E	1.00
76-251	Scale drive flexible shaft 29 1/8"	C-D-E	1.00
76-252	Scale drive flexible shaft 35 1/8"	C-D-E	1.00
76-254	Tuning control flexible shaft 31 1/2"	C-D-E	1.00
76-255	Tuning control flexible shaft 37 1/2"	C-D-E	1.00

6M295 Selector Unit Assembly (On Chassis)

22-690	130-450 mmfd. padder condenser	E	.25
22-694	75-325 mmfd. padder condenser	E	.25
52-140	Cable & plug assembly	E	1.00
57-650	Terminal plate	E	1.00
80-164	Switch bar tension spring	E	.03
80-165	Latch bar tension spring	E	.03
83-555	Latch bar	E	.10
112-167	Inductance coil adjusting screw	E	.03
158-2	Magnet armature	E	.01
S5943	Electro-magnet coils		.75
S5970	Inductance coil & core assembly (red)	E	1.00
S5971	Inductance coil & core assembly (green)	E	1.00
S5972	Inductance coil & core assembly (yellow)	E	1.00
S5973	Inductance coil & core assembly (blue)	E	1.00
S5974	Inductance coil & core assembly (white)	E	1.00
S6130	Switch contact bar & pin		.10

PARTS PRICE LIST (Cont'd.)

6M295 Automatic Control Switch Assembly

46-248	Station selector knob	E	.05
46-249	Station selector knob (Manual)	E	.05
52-139	Cable & plug assembly	E	1.00
80-168	Knob thrust spring	E	.25C
83-553	Celluloid strip (printed)	E	.05
83-579	Celluloid strip (plain)	E	.02
100-36	6.3 volt pilot lamp	E	.09
102-40	Station indicator call letter sheet	E	.25

Parts For Automatic Tuner - 5M294

46-239	Selector Switch knob	B	.03
57-641	Selector switch escutcheon plate	B	.15
83-552	Celluloid dial strip	B	.05
85-142	Selector switch assembly	B	2.00
102-40	Station indicator call letter sheet	B	.25
112-174	Inductance adjusting screw	B	.10
112-177	Trimmer adjusting screw	B	.10
184-3	Steel ball	B	.01
S5954	Inductance coil (red) 915-1550 K.C.	B	.15
S5955	Inductance coil (green) 820-1400 K.C.	B	.15
S5956	Inductance coil (yellow) 630-1050 K.C.	B	.15
S5957	Inductance coil (blue) 535-860 K.C.	B	.15
S6031	Manual-automatic switch frame (With contact strip)	B	.60
S6033	Manual-automatic switch arm	B	.25

TS288 — Zenith Acoustrol

S5923	Housing & switch assembly	.75
52-134	Cable & plug assembly	.75
57-632	Mounting plate (back)	.25
63-705	2200 ohm ¼ watt resistor	.10
112-115	6/32 x 1/4 B.H. machine screws	.30C

X288 — Zenith Acoustimatic

S5931	Dial light socket - bulb & wire assembly	.15
100-36	Dial light bulb	.09
52-129	Cable & plug assembly	.75
57-632	Mounting plate (back)	.25
63-707	4700 ohm ¼ watt resistor	.10
63-751	1000 ohm ¼ watt resistor	.10
83-545	Celluloid strip	.10
83-575	Celluloid diffusion strip (green)	.05
85-135	Switch	2.25
114-45	#8 x 3/8" H.H. slotted self tapping screws	.30C

Z288 — Zenith Steering Column Shell

15-24	Mounting cap	.75
33-71	Housing frame & holding clamp	.75
46-240	Control knob	.15
54-102	3/8 x 32 x 1/2 hex nuts	.25C
57-631	Control mounting plate	.05
73-25	10/32 x 5/16 headless set screws	.02
94-238	Paper bushings	.01
112-131	8/32 x 1/4" B. H. machine screws (N.P.)	.50C
112-155	6/32x1/4" B.H. machine screws (chromized)	.20C
115-16	10/32 x 3/4 fillister head machine screws	.75C

BH277 — 8" Firewall Speaker (S-5721)

43-25	Composition housing assembly	2.00
49-232	8" dynamic speaker assembly	4.00
208-232	Cone & voice coil assembly	2.00
207-232	Field coil assembly	1.50
52-128	Cable & plug assembly	.75
54-30	8/32 x 5/16 hex nuts	.25C
54-77	5/16-18 x 1/2 hex nuts	.01
74-18	Grill screens	.10
97-110	Mounting stud	.08
147-60	Wood spacer block	.10

Set Mounting Parts 6M292 - 6M293 - 6M294

22-194	Generator condenser	.50
22-565	Ignition coil condenser	.30
58-21	D. R. male connector	.01
58-24	D. R. bushing & ferrule	.01
63-336	Distributor suppressor	.30
93-222	7/16" Internal shakeproof washer	.60C
93-233	Set mounting bolt washer	.05
144-14	7/16" x 3" carriage bolt & nut	.05

Installation Accessories - 5M291 - 5M294

22-194	.5 mfd. 200 volt generator condenser	.50
52-97	Battery cable (ammeter end)	.25
58-21	D.R. male connector	.01
58-24	D.R. bushing & ferrule	.01
58-26	D.R. fuse bushing	.01
63-336	Distributor suppressor	.30
73-18	10/32 x 3/16" cuppoint headless set screw	.01
94-261	Black paper bushing (small)	.05
94-262	Black paper bushing (large)	.05
115-15	10/32 x 1/2" fillister head machine screw	.40C
136-6	15 Ampere fuse	.05
S5750	Mounting U clamp with set screw	.25

All prices are subject to regular discount and change without notice.

ZENITH RADIO CORPORATION

CHICAGO, U. S. A.

SERVICE MANUAL

ZENITH RADIO

→LONG DISTANCE←

1939 RECEIVERS

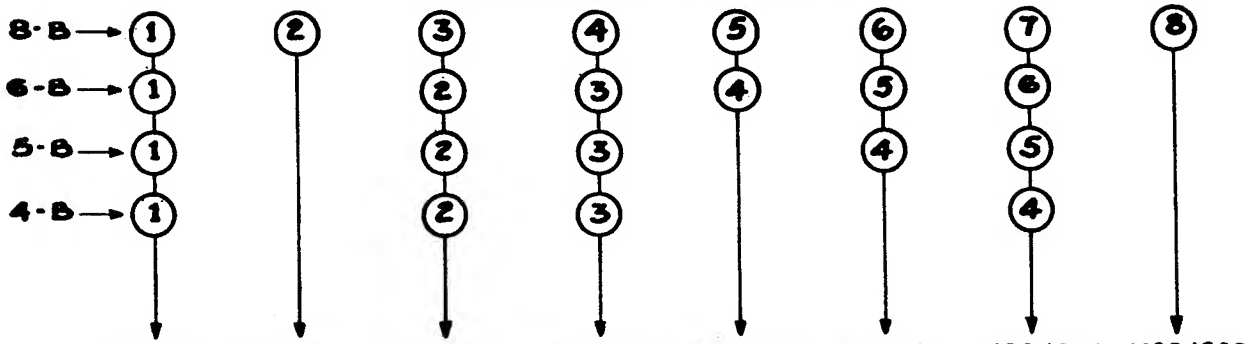
All prices contained herein were effective at time of receiver production. Check your Zenith distributor for latest prices.

ZENITH RADIO CORPORATION

CHICAGO, U. S. A.

Form H8 PRICE 10 CENTS [PRINTED IN U.S.A.]

AUTOMATIC RANGES



NOTE—Buttons numbered from left to right, or top to bottom as they appear on receivers, except on model 6B321 (Chassis 5653) and Models 6S322 and 6S357 (Chassis 5654) which are reversed.

ALIGNMENT INSTRUCTIONS

The proper procedure for the correct alignment of each chassis is outlined on the page opposite each circuit diagram.

The operations are outlined in consecutive order, and the instructions are under the following headings —

OSC. CONNECTED TO — tells where the output of the service oscillator is to be connected.

DUMMY — gives the proper capacity or resistance which should be connected in series with the service oscillator output.

TEST OSC. — Set test oscillator to frequency shown.

BAND — Set the receiver band switch to the position shown.

DIAL — The receiver should be set at the frequency shown.

TRIMMER — This column tells which trimmer (or trimmers) are to be adjusted for each operation. The chassis drawing has each trimmer indicated by a letter corresponding to the instructions.

PURPOSE—This column tells what is being accomplished by each operation.

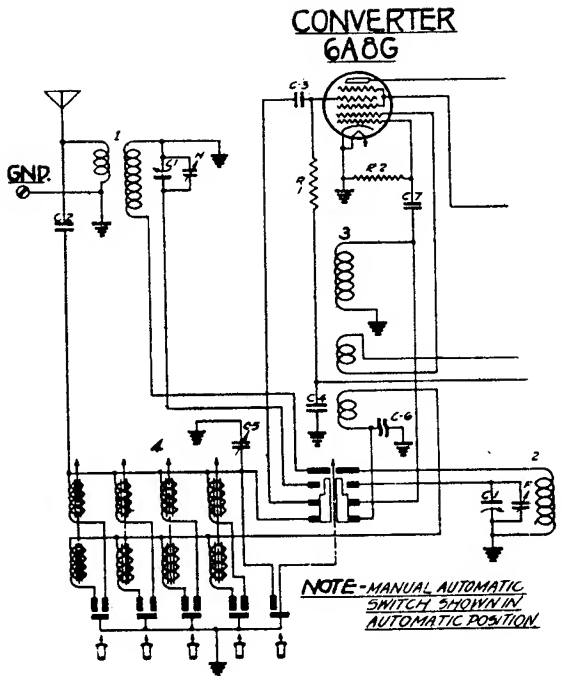
If these instructions are carefully followed each chassis will be easily and correctly realigned.

SERVICE HINTS

Chassis	Complaint	Cause and Remedy
5907 & 1206 only	Distortion	Very much like blocking AVC action. Can usually be traced to open filter section.
1502 only	Won't log	Can be traced to loose PK screw in gang hub gear.
5714 only	Noisy automatic or automatic dead	Dirt on contacts or warped strip. Shorted at switch to ground or shorted compensating condenser.
	Automatic dead 1 or more positions Automatic weak	Open coils — usually broken leads or poor contact at switch. Open leads to R. F. section of automatic or leaky or open compensating condenser. Padder loose — out of adjustment or all plates not soldered.
	Eye flutters	Open filter.
	Eye overlaps on strong signal	Open AVC resistors
	No eye action	Shorted condenser (C7.)
	Chirps on medium to loud signal	Leaky condenser across speaker
Radiorgan	No effect	Insulation on 33m resistor cut through and shorts to cathode lug. Open leads, poor contact at switch, open condenser. 5714 only — plate lead of I.F. too far away from chassis. Push down close to metal base.
	Too much change on some, none on others.	Condenser shorted or leads shorting to switch.
	Tone changes with different settings of volume control.	Defective volume control or shorted terminal either of tone switch or volume control. Poor contacts and defective or shorted volume control taps.
	Noisy when tuning	Dirty wipers or gang plates. Flywheel touching band switch lug. Volume control or drive shaft not making good contact to ground. 5714 — Volume control shaft and drive shaft out of line.
	Volume control has two peaks and distorts at low volume.	Isolate 6F5 grid circuit from I.F. plate leads. (Later sets have I.F. plate lead shielded.)
5714 only	Set whistles at medium volume. Noisy between signals	Open filter condenser. —Loose connection or open condenser across RF choke.
Battery Sets	Hash	Loose cover of power pack.
	Hash on automatic position.	Automatic assembly touching power pack. Insulate at point of contact.

ZENITH

AUTOMATIC TUNING SYSTEM



The Zenith automatic tuning system is designed so as to be very simple in adjustment, and to remain in adjustment regardless of changes in humidity, temperature or vibration. This system makes use of the fact that the inductance of a winding varies directly with any change in the permeability of the core material of the coil. A switch is incorporated in each receiver which allows the normal tuned circuits, consisting of a coil and variable condenser in the oscillator, first detector, and, in some cases, the R.F. section of the receiver to be disconnected and replaced by very small fixed windings which may be tuned over a considerable range of frequency by means of a change in the core material.

Specially prepared iron slugs which have very low losses at radio frequency are so arranged that they may be mechanically moved in and out of the field of the afore mentioned coils. The permeability of these iron slugs is naturally much higher than that of air, and as they are moved in or out of the field of the coil, the inductance and natural period of the coil varies accordingly. It is quite easy to arrange such coils and iron slugs so that they may be tuned in tandem, that is, two or more iron slugs moved simultaneously into corresponding coils. This allows the receiver to be designed having only one tuning adjustment for each bank of coils and corresponding button.

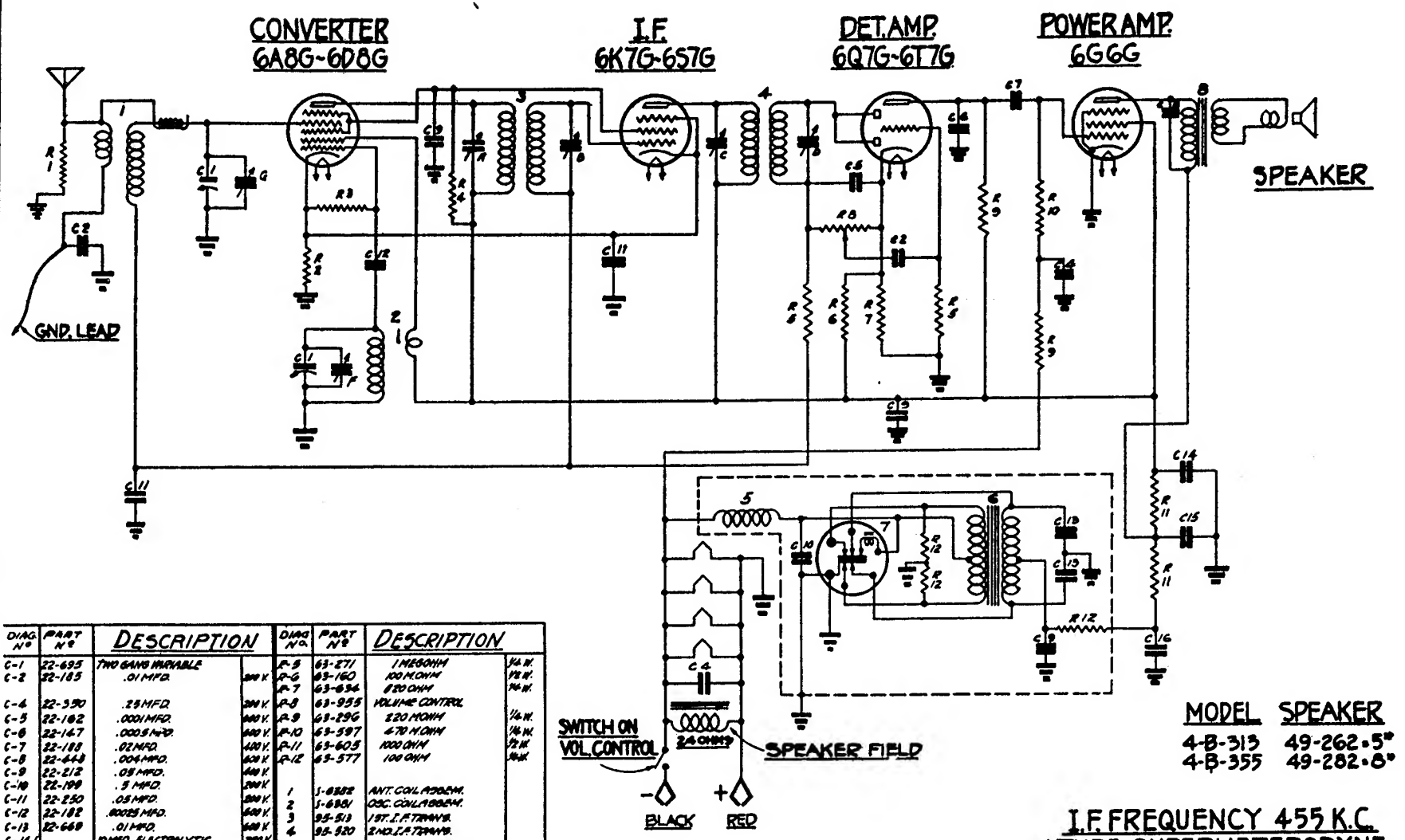
As you will see on the circuit above, one button can be pressed to disconnect all automatic coils, and allows the normal tuning system of a coil and variable condenser to operate. On those receivers having short wave band, this switch is a part of the band switch. When the band switch is turned to the automatic position, or, in the smaller receivers, when one of the automatic buttons is pushed, this tuned circuit is disconnected, and the automatic coils are in circuit. The range of each set of coils will vary from 300 k.c. to 600 k.c., depending over which portion of the broadcast band they are designed to operate, and after being adjusted for a certain station within their range will come into operation whenever the corresponding button is pushed in.

The antenna is coupled to the input of the 1st detector by means of a 50 mmfd. condenser (C2) and an antenna compensating condenser (C5) is used to compensate for variations in antenna capacity. This condenser is preset at the factory, and under most conditions it will not be necessary to change it. However, where there is a seeming lack of sensitivity when tuning automatically, the condenser may very easily be reset by setting one of the automatic buttons at approximately the center of the broadcast band, tuning the button to a point where no station is heard, and readjusting the antenna compensating condenser to a point where the background noise is loudest. The button may then be re-set for whatever station is desired. This setting of the antenna condenser will be effective over the entire broadcast band and for all buttons.

In the oscillator circuit, it is necessary to alter the tuning curve so as to provide for tracking between the oscillator and first detector circuits. In the normal tuned circuit, this may be easily accomplished by means of a trimmer and padding condenser working in conjunction with the oscillator section of the variable condenser. However, as no variable condenser is used with the iron core coils, a different method must be resorted to. A small winding connected in series with the grid end of the automatic windings, and so placed as not to be affected by the iron core will, if properly designed, alter the shape of the tuning curve at the high frequency portion of the coil's range. Also, when two inductances are connected in parallel, the maximum inductance is limited by the size of the smaller of the two inductances. The upper portion of coil No. 3 in the above drawing is the padder winding, and also serves as a means of coupling to the oscillator plate circuit, and when used in conjunction with the smaller winding mentioned above alters the shape of the tuning curve so as to allow excellent tracking.

Variations in humidity and temperature are compensated for by means of condenser C6 which consists of a small fixed condenser composed of silver surfaces sprayed on a special ceramic tube which changes its capacity in the opposite way from any changes in the coil, and will compensate for the same.

This automatic system is remarkably simple and trouble free, and once set up for a customer should not require any further attention until it is desired to reset for other stations which can be easily accomplished by the customer himself.



DIAG. Nº	PART Nº	DESCRIPTION	
C-1	22-695	TWO GANG VARIABLE	
C-2	22-185	.01 MFD.	600 V.
C-4	22-350	.25 MFD.	200 V.
C-5	22-182	.0001 MFD.	600 V.
C-6	22-147	.0005 MFD.	600 V.
C-7	22-188	.02 MFD.	400 V.
C-8	22-448	.004 MFD.	600 V.
C-9	22-212	.05 MFD.	400 V.
C-10	22-199	.1 MFD.	200 V.
C-11	22-250	.05 MFD.	600 V.
C-12	22-182	.0025 MFD.	600 V.
C-13	22-669	.01 MFD.	600 V.
C-14		10 MFD. ELECTROLYTIC	250 V.
C-15	22-739	15 MFD. "	250 V.
C-16		15 MFD. "	250 V.
R-1	63-587	4700 OHM	1/2 W.
R-2	63-629	330 OHM	1/2 W.
R-3	63-583	47 M. OHM	1/2 W.
R-4	63-960	68 M. OHM	1/2 W.

DIAG. Nº	PART Nº	DESCRIPTION	
R-5	63-271	1 MEGOHM	1/4 W.
R-6	63-160	100 M. OHM	1/2 W.
R-7	63-694	820 OHM	1/4 W.
R-8	63-955	VOLUME CONTROL	
R-9	63-296	220 M. OHM	1/4 W.
R-10	63-597	470 M. OHM	1/4 W.
R-11	63-605	1000 OHM	1/2 W.
R-12	63-577	100 OHM	1/4 W.
1	S-6332	ANT. COIL ASSEM.	
2	S-6981	OSC. COIL ASSEM.	
3	95-513	1ST. I.F. TRANS.	
4	95-520	2ND. I.F. TRANS.	
5	S-5049	CHOKE COIL ASSEM.	
6	95-552	POWER TRANS.	
7	130-6	VIBRATOR	
8		SPEAKER TRANS.	
A		1ST. I.F. TRANS. PRI.	
B		1ST. I.F. TRANS. SEC.	
C		2ND. I.F. TRANS. PRI.	
D		2ND. I.F. TRANS. SEC.	
E		BROADCAST OSC. (INSIDE)	
G		ANT. BROADCAST (OUTSIDE)	

Chassis No. 5410

Model 4B313

CHASSIS No. 5410

SOCKET VOLTAGES

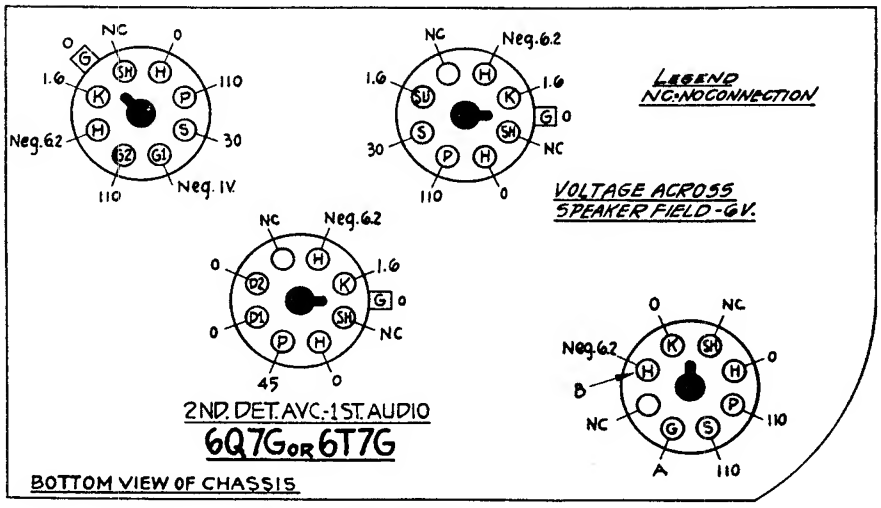
NOTE

Voltages measured with a 1000 ohm per volt meter from chassis to socket contacts. Antenna disconnected — volume control on full.

Battery Voltage at chassis 6.2 v.

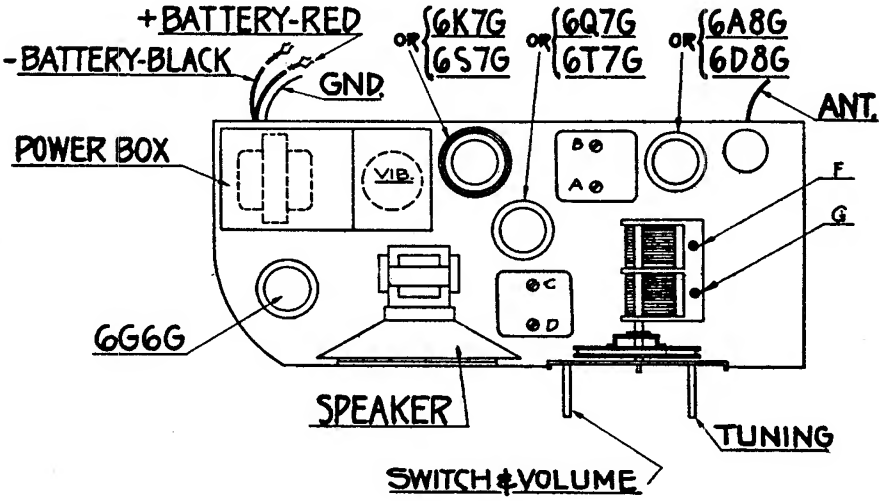
Battery Consumption 2.3 ampere.

(A) Bias for 6G6 measured from point "B" to chassis.



LEGEND

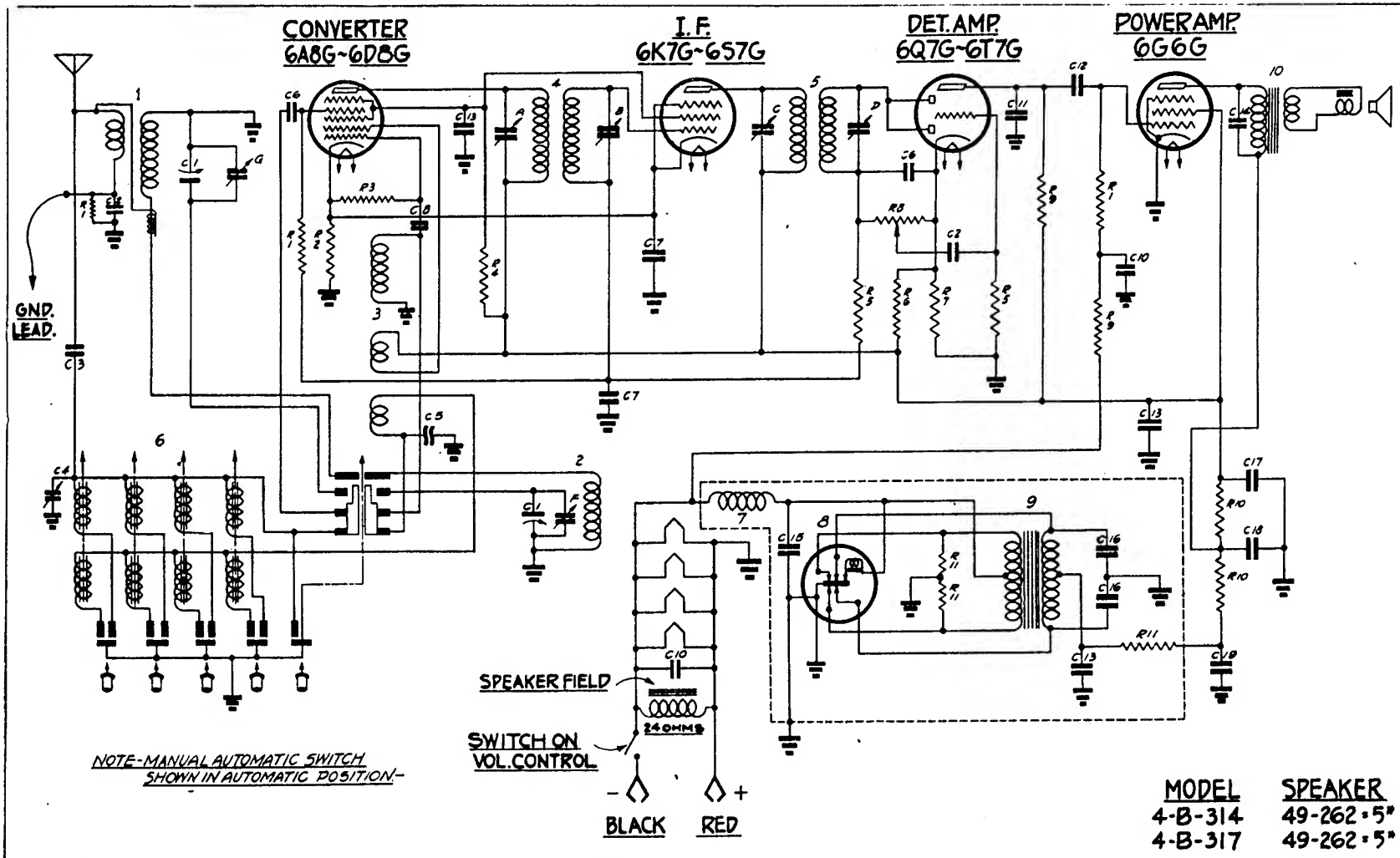
SH — Shield
H — Heater
P — Plate
S — Screen
G — Grid
SU — Suppressor
D — Diode
K — Cathode
NC — No Connection



Location of Tubes and Trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	455	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Lead	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	1500	G	Al'gment of Ant.



MODEL	SPEAKER
4-B-314	49-262 • 5"
4-B-317	49-262 • 5"

DIAG NO.	PART NO.	DESCRIPTION		DIAG NO	PART NO.	DESCRIPTION		DIAG NO.	PART NO.	DESCRIPTION
C-1	22-695	TWO GANG VARIABLE						4	95-513	1ST. I.F. TRANS.
C-2	22-186	.01 MFD.	200V					5	95-520	2ND. I.F. TRANS
C-3	22-289	50 MMFD.	600V					6		
C-4	22-519	TRIMMER CONDENSER		R-1	63-597	470 OHM	1/4 W	7	S-5043	CHOKE ASSEM.
C-5	22-729	COMPENSATING CONDENS.		R-2	63-629	330 OHM	1/4 W	8	190-6	VIBRATOR
C-6	22-182	.0001 MFD.	600V	R-3	63-593	47 M OHM	1/4 W	9	95-552	POWER TRANS
C-7	22-250	.05 MFD.	200V	R-4	63-960	68 M OHM	1/2 W	10		SPEAKER TRANS.
C-8	22-182	.00025 MFD.	600V	R-5	63-271	1 MEGOHM	1/4 W			
C-9	22-243	.01 MFD.	400V	R-6	63-160	100 M OHM	1/2 W			
C-10	22-350	.25 MFD.	200V	R-7	63-634	820 OHM	1/4 W	A		1ST. I.F. TRANS PRI.
C-11	22-147	.0005 MFD.	600V	R-8	63-955	220 M OHM VOL. CONT.		B		1ST. I.F. TRANS. SEC.
C-12	22-188	.02 MFD.	400V	R-9	63-296	220 M OHM	1/4 W	C		2ND I.F. TRANS PRI
C-13	22-212	.05 MFD.	400V	R-10	63-605	1000 OHM	1/2 W	D		2ND. I.F. TRANS SEC.
C-14	22-448	.004 MFD.	600V	R-11	63-577	100 OHM	1/4 W	F		BROADCAST OSC. (6W SAME)
C-15	22-199	.5 MFD	200V					G		ANT. BROADCAST (6W SAME)
C-16	22-669	.01 MFD.	600V							
C-17	22-739	(10 MFD ELECTROLYTIC	250V	1	S-6560	ANTENNA COIL ASSEM.				
C-18		(15 MFD "	250V	2	S-6039	OSC. COIL ASSEM.				
C-19		(15 MFD "	250V	3	20-187	COMPENSATING COIL				

I.F. FREQUENCY 455 K.C.
4 TUBE SUPERHETERODYNE
CHASSIS Nº 5411 – 6V-SINGLE BAND
ZENITH RADIO CORPORATION
CHICAGO, ILLINOIS

Chassis No. 5411

Models 4B314, 4B317

CHASSIS No. 5411

SOCKET VOLTAGES

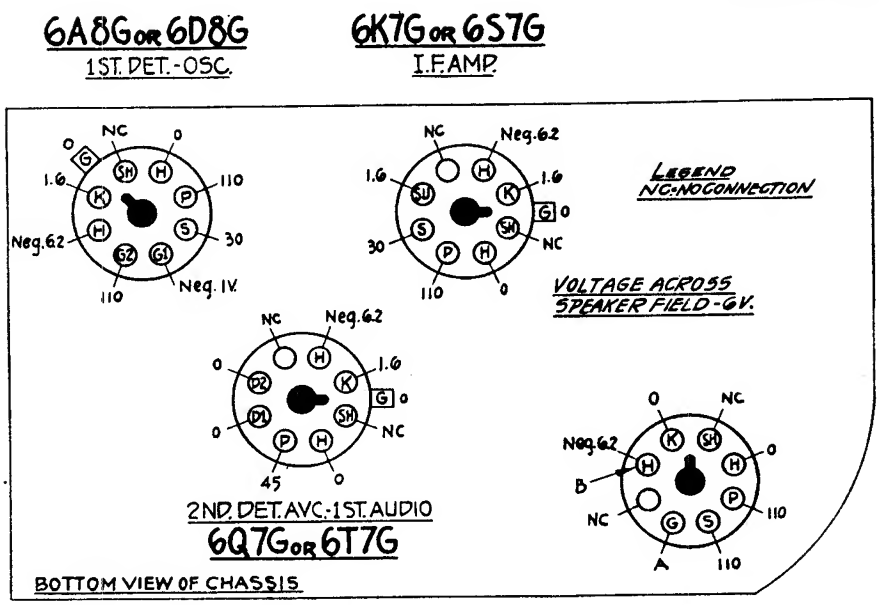
NOTE

Voltages measured with a 1000 ohm per volt meter from chassis to socket contacts. Antenna disconnected — volume control on full.

Battery Voltage at chassis 6.2 v.

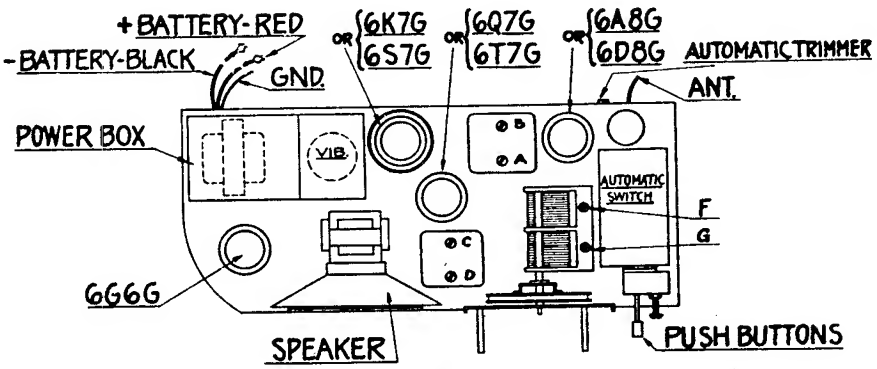
Battery Consumption 2.3 ampere.

(A) Bias for 6G6 measured from point "B" to chassis.



LEGEND

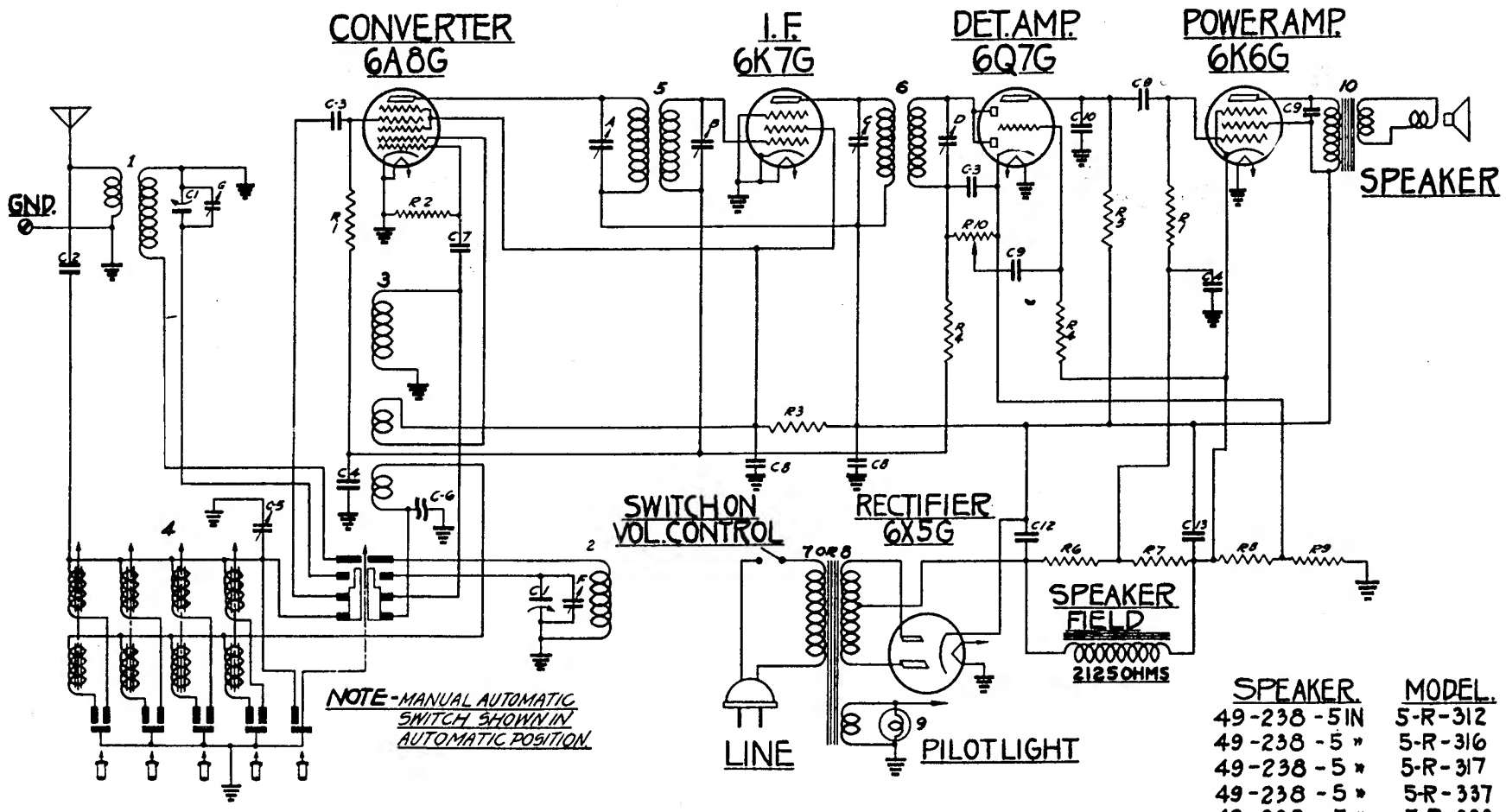
SH — Shield
H — Heater
P — Plate
S — Screen
G — Grid
SU — Suppressor
D — Diode
K — Cathode
NC — No Connection



Location of Tubes and Trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	455	Br'dc't	600	ABCD	I. F. Aligment
2	Rec. Ant. Lead	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	1500	G	Al'gment of Ant.



SPEAKER	MODEL
49-238-5 IN	5-R-312
49-238-5 "	5-R-316
49-238-5 "	5-R-317
49-238-5 "	5-R-337
49-238-5 "	5-R-303

DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION
C-1	22-695	TWO GANG VAR. COND.		R-1	63-597	470 M OHM	1/4 W	4		
C-2	22-289	.50 MFD.	600V	R-2	63-593	47 M OHM	1/4 W	5	95-515	1 ST. I.F. TRANS.
C-3	22-162	.0001 MFD.	600V	R-3	63-208	12 M OHM	1 W	6	95-520	2 ND I.F. TRANS.
C-4	22-250	.05 MFD.	200V	R-4	63-271	1 MEGOHM	1/4 W	7	95-521	POWER TRANS. (117V. 50-60~
C-5	22-519	TRIMMER COND.		R-5	63-296	220 M OHM	1/4 W	8	95-523	POWER TRANS 25~
C-6	22-729	COMPENSATING COND		R-6	63-658	390 M OHM	1/4 W	9	100-36	PILOT LIGHT .25A 6.3V
C-7	22-182	.00025 MFD.	600V	R-7	63-260	100 M OHM	1/4 W	10		SPEAKER TRANS
C-8	22-212	.05 MFD.	400V	R-8	63-563	80 OHM WIRE WOUND	1/4 W			
C-9	22-196	.01 MFD.	600V	R-9	63-686	130 OHM WIRE WOUND	1/2 W	A		1 ST. I.F. TRANS. PRI.
C-10	22-147	.0005 MFD	600V	R-10	63-955	220 M OHM VOL. CONT.		B		1 ST. I.F. TRANS SEC.
								C		2 ND I.F. TRANS. PRI
C-12	22-691	8 MFD. ELECTROLYTIC	450V	1	5-5808	ANTENNA COIL ASSEM.		D		2 ND I.F. TRANS. SEC
C-13	22-692	8 MFD. ELECTROLYTIC	350V	2	5-6039	OSC. COIL ASSEM.		F		BROADCAST OSC (3 GANG)
				3	20-187	COMPENSATING COIL		G		ANTENNA - BRD CAST (3 GANG)

I.F. FREQUENCY 455 K.C.
5 TUBE SUPERHETERODYNE
CHASSIS Nº 5528 A.C.
ZENITH RADIO CORPORATION
CHICAGO, ILL.

Chassis No. 5528

SOCKET VOLTAGES

NOTE

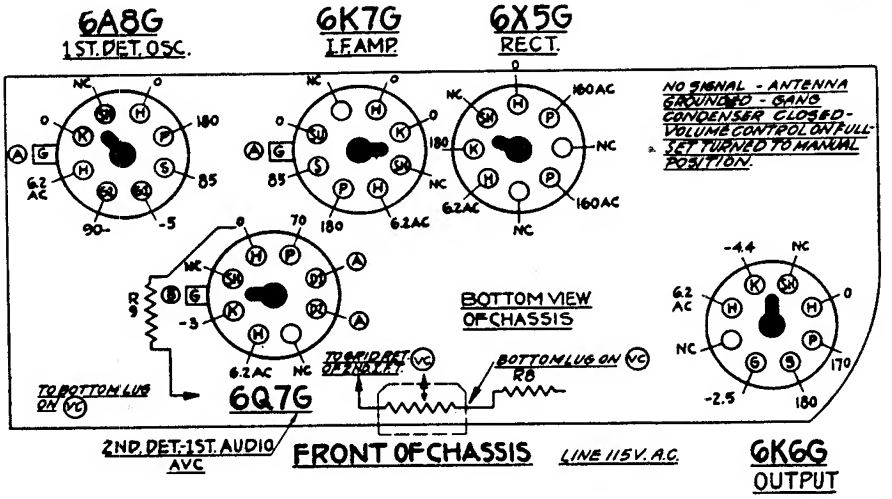
Voltages measured with a 1000 ohm per volt meter from chassis to socket contacts. Antenna disconnected — volume control on full.

Line voltage 115 v. Consumption 45 watts.

Power output 3.5 watts.

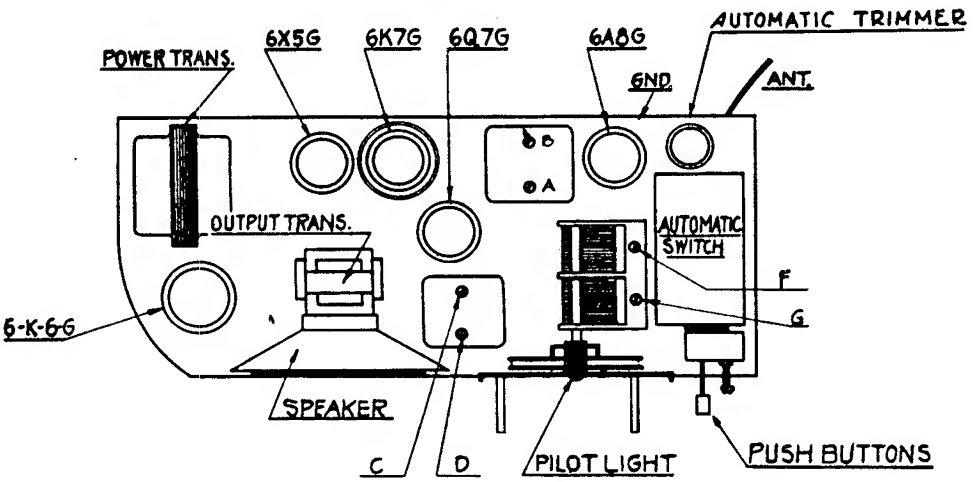
(A) Bias for 6A8 — 6K7 and diodes of 6Q7 measured across resistor R9.

(B) Bias for triode section of 6Q7 and 6K6 measured across R8 and R9.



LEGEND

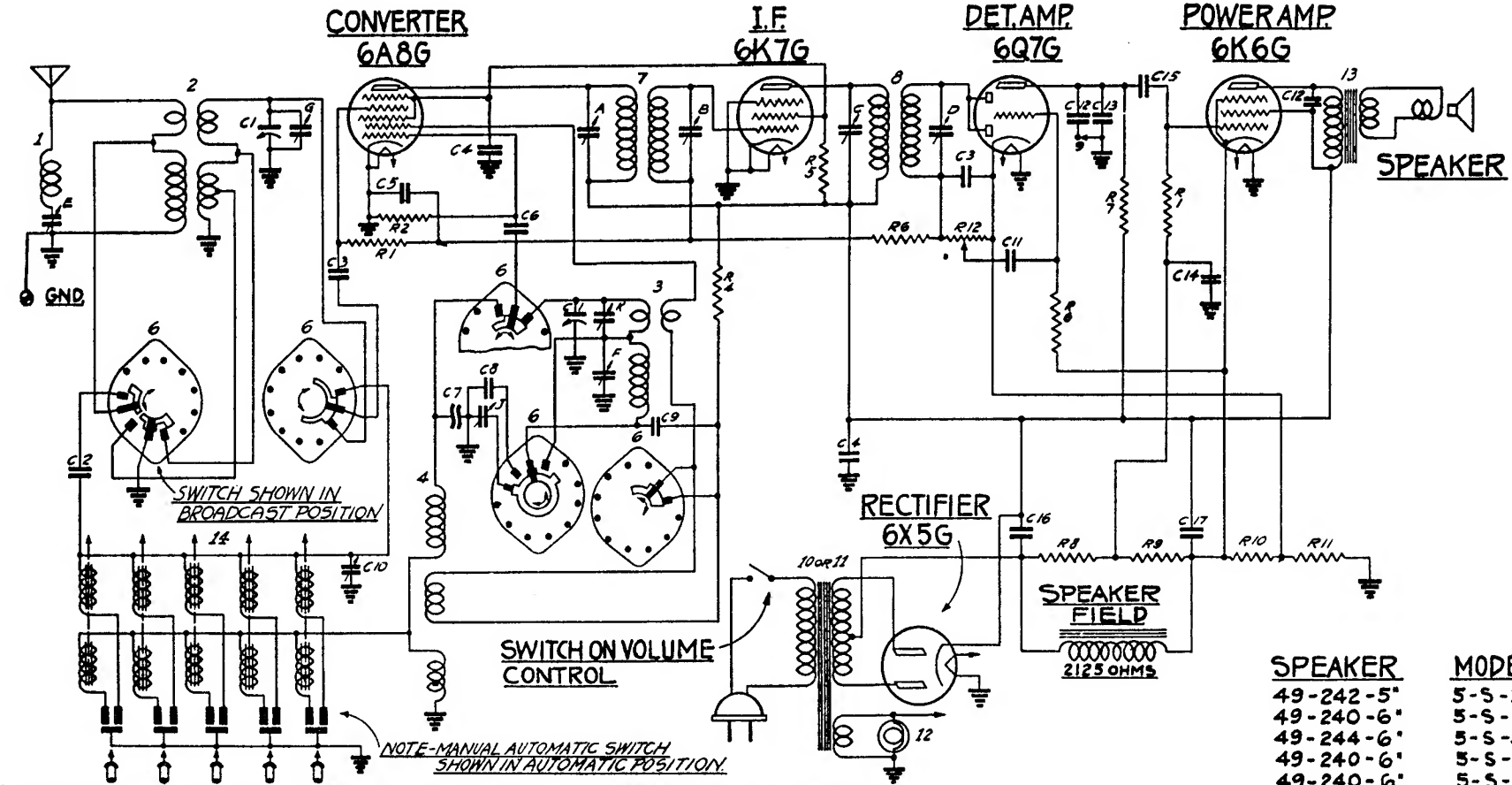
NC — No Connection
VC — Volume Control
SH — Shield
H — Heater
P — Plate
S — Screen
G — Grid
SU — Suppressor
D — Diode
K — Cathode
F — Filament



Location of Tubes and Trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	455	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Lead	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	1500	G	Al'gment of Ant.



SPEAKER	MODEL
49-242-5"	5-S-319
49-240-6"	5-S-320
49-244-6"	5-S-327
49-240-6"	5-S-338
49-240-6"	5-S-339

DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION
C-1	22-696	TWO GANG VAR. COND.		R-1	63-397	470 M OHM	1/4 W	6	85-146	BAND SELECTOR SWITCH
C-2	22-289	30 MMFD.	600V	R-2	63-593	47 M OHM	1/4 W	7	95-513	1 ST. I.F. TRANS.
C-3	22-162	.0001 MFD.	600V					8	95-514	2 ND. I.F. TRANS.
C-4	22-212	.05 MFD.	400V	R-4	63-151	15 M OHM	1 W	9	85-145	TONE CONTROL SWITCH
C-5	22-250	.05 MFD.	200V	R-5	63-958	22 M OHM	1 W	10	95-521	POWER TRANS. 50-60~117 VOLT
C-6	22-127	25 MMFD.	600V	R-6	63-271	1 MEGOHM	1/4 W	11	95-523	POWER TRANS. 25~115 V To 235 V
C-7	22-705	COMPENSATING COND.		R-7	63-296	220 M OHM	1/4 W	12	100-36	PILOT LIGHT. 25 A - 6.3 V
C-8	22-563	FIXED PADDER		R-8	63-658	390 M OHM	1/4 W	13		SPEAKER TRANS.
C-9	22-358	.002 MFD.	600V	R-9	63-260	100 M OHM	1/4 W	14		
C-10	22-519	TRIMMER COND.		R-10	63-563	80 OHM WIREWOUND	1/2 W	A		1ST. I.F. TRANS. PRI.
C-11	22-196	.01 MFD.	600V	R-11	63-686	150 OHM WIREWOUND	1/2 W	B		1ST. I.F. TRANS. SEC.
C-12	22-448	.004 MFD.	600V	R-12	63-956	220 MOHM VOLUME CONT.		C		2 ND. I.F. TRANS. PRI.
C-13	22-147	.0005 MFD.	600V					D		2 ND. I.F. TRANS. SEC.
C-14	22-190	.1 MFD.	200V	1		WAVE TRAP (ON ANT. COIL)		E	22-570	WAVE TRAP
C-15	22-695	.02 MFD.	600V	2	5-6161	ANT. COIL & SHIELD ASSEM.		F		BROADCAST OSC. (SEE NOTE)
C-16	22-700	8 MFD. ELECTROLYTIC	450V					G		ANT. BROADCAST (ON GANG)
C-17	22-701	8 MFD. ELECTROLYTIC	350V	3	5-6118	OSC. COIL ASSEM.		J	22-519	BROADCAST PADDER
				4	20-183	COMPENSATING COIL		K		SHORT WAVE OSC. (SEE NOTE)

NOTE-
TRIMMERS "F & K" MOUNTED ON BAKELITE STRIP #22-695-

I.F. FREQUENCY 455 K.C.
5 TUBE SUPERHETERODYNE
CHASSIS Nº 5529 A.C.-2 BAND
ZENITH RADIO CORPORATION
CHICAGO, ILLINOIS

Chassis No. 5529

SOCKET VOLTAGES

NOTE

Voltages measured from chassis to socket contacts using a 1000 ohm per volt meter. Antenna disconnected — volume control on full.

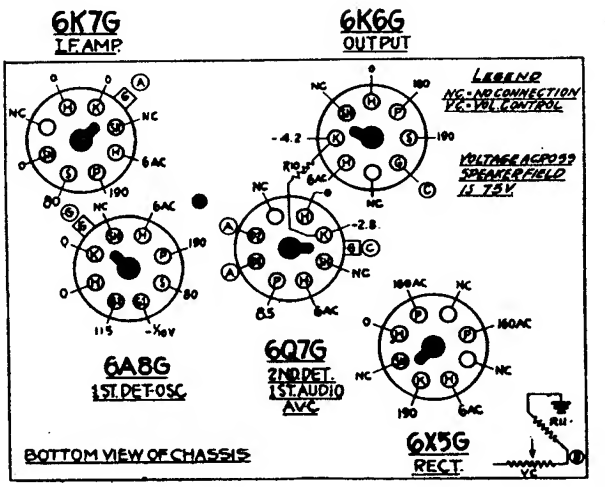
Line voltage 115 v. Consumption 45 watts.

Power output 3 watts.

(A) Bias for 6A8 — 6K7 and diodes measured across R11.

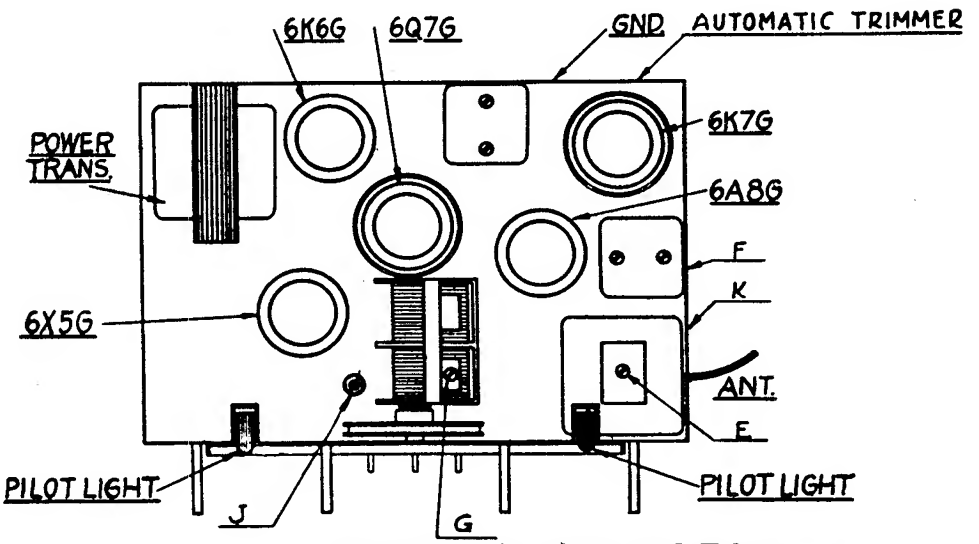
(B) Low side of volume control.

(C) Bias for triode section of 6Q7 and 6K6 measured across R10 and R11.



LEGEND

NC — No Connection
SH — Shield
H — Heater
P — Plate
S — Screen
G — Grid
SU — Suppressor
D — Diode
K — Cathode
F — Filament

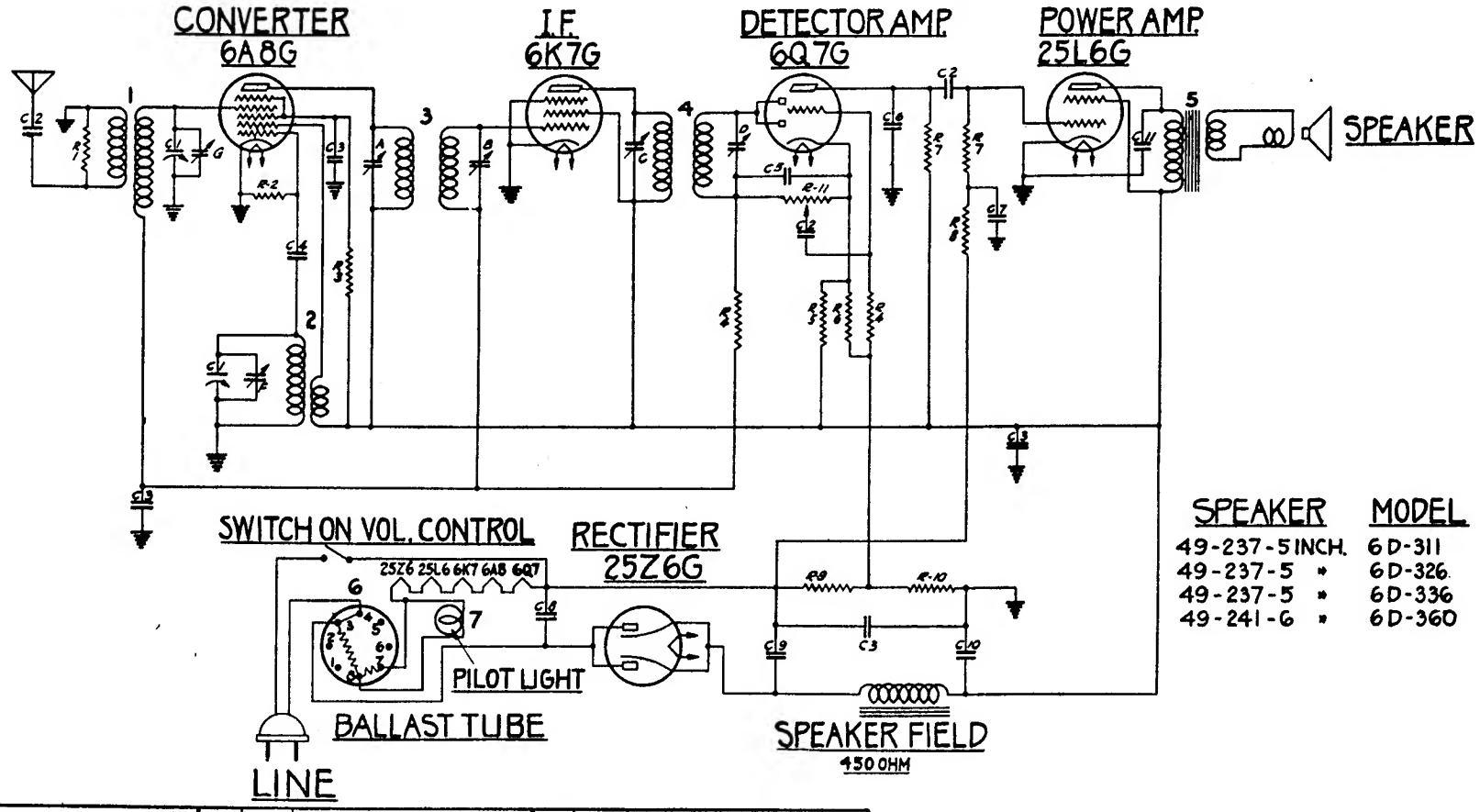


Location of Tubes and Trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	455	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Lead	200 Mmfd.	455	"	600	E	See Note
3	" " "	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
4	" " "	200 Mmfd.	1500	"	1500	G	Al'gment of Ant.
5	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
6	" " "	200 Mmfd.		"		FG	Repeat 3.& 4
7	" " "	400 Ohms	18000	S.W.	18000	K	Rock gang & adj. for max. output

NOTE: If receiver is used in location subject to code interference adjust wave trap (E) for minimum interference with antenna connected and receiver operating in broadcast band.



SPEAKER	MODEL
49-237-5 INCH.	6D-311
49-237-5 "	6D-326
49-237-5 "	6D-336
49-241-6 "	6D-360

DIAG. Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION
C-1	22-679	TWO GANG VARIABLE COND.		R-3	63-643	18 M. OHM	1/4W	2	5-5938	OSCILLATOR COIL ASSEM.
C-2	22-196	.01 MFD.	600V	R-4	63-271	1 MEG OHM	1/4W	3	95-513	1ST. I.F. TRANSFORMER
C-3	22-280	.05 MFD.	200V	R-5	63-681	56 M OHM	1/2W	4	95-514	2ND. I.F. TRANSFORMER
C-4	22-182	.00025 MFD.	600V	R-6	63-653	680 OHM	1/4W	5		SPEAKER TRANSFORMER
C-5	22-162	.0001 MFD.	600V	R-7	63-296	220 M OHM	1/4W	6	100-70	BALLAST TUBE -115V
C-6	22-147	.0005 MFD.	600V	R-8	63-585	100 M OHM	1/4W	7	100-36	PILOT LIGHT .25A-6.3V
C-7	22-327	.02 MFD.	200V	R-9	63-557	60 OHM WIREWOUND	1/2W	A		1ST. I.F. TRANS. PRI
C-8	22-435	.02 MFD.	600V	R-10	63-954	50 OHM WIREWOUND	1/2W	B		1ST. I.F. TRANS. SEC.
C-9	22-681	40 MFD. ELECTROLYTIC	150V	R-11	63-953	220 M OHM VOL. CONTROL		C		2ND. I.F. TRANS. PRI.
C-10	22-440	16 MFD. ELECTROLYTIC	150V					D		2ND. I.F. TRANS. SEC.
C-11	22-750	.04 MFD.	600V							
R-1	63-587	4700 OHM	1/4W					F		BRDCAST OSC. (ON GANG)
R-2	63-593	47 M OHM	1/4W	1	5-5807	ANTENNA COIL ASSEM.		G		ANT. BRDCAST (ON GANG)

I.F. FREQUENCY-455 K.C.
6-TUBE SUPERHETERODYNE
CHASSIS Nº5646-A.C.D.C.

ZENITH RADIO CORPORATION
CHICAGO, ILL.

Chassis No. 5646

Models 6D302, 6D311, 6D326, 6D336, 6D360

CHASSIS No. 5646

NOTE

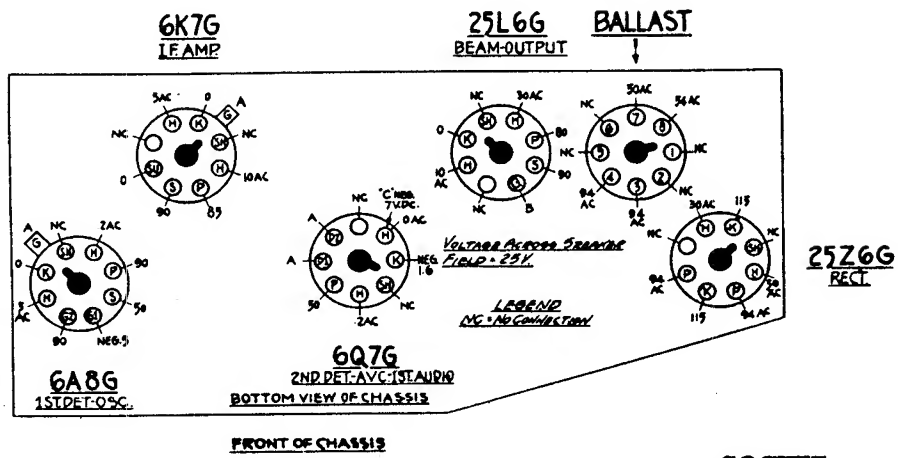
Voltages measured from socket contacts to chassis using a 1000 ohm per volt meter. Antenna disconnected — volume control on full.

Line voltage 115 v. Consumption 55 watts.

Power Output 1.6 watts.

(A) Bias for 6A8 — 6K7 and 6Q7 measured at 6Q7 cathode.

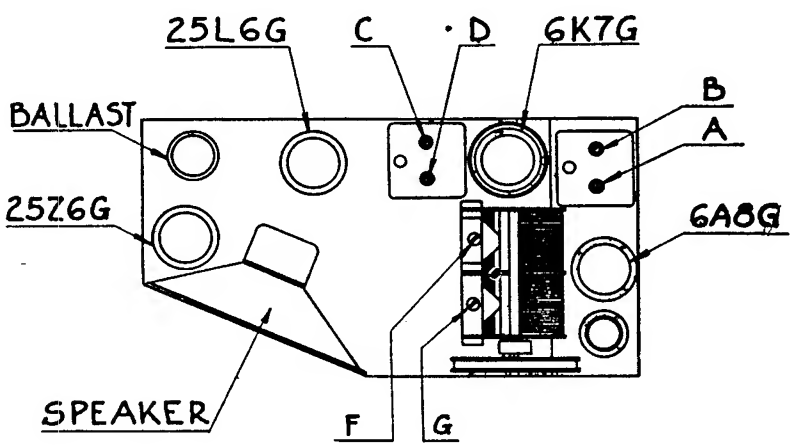
(B) Bias for 26L6 measured between "C" at 6Q7 socket and chassis.



SOCKET VOLTAGES

LEGEND

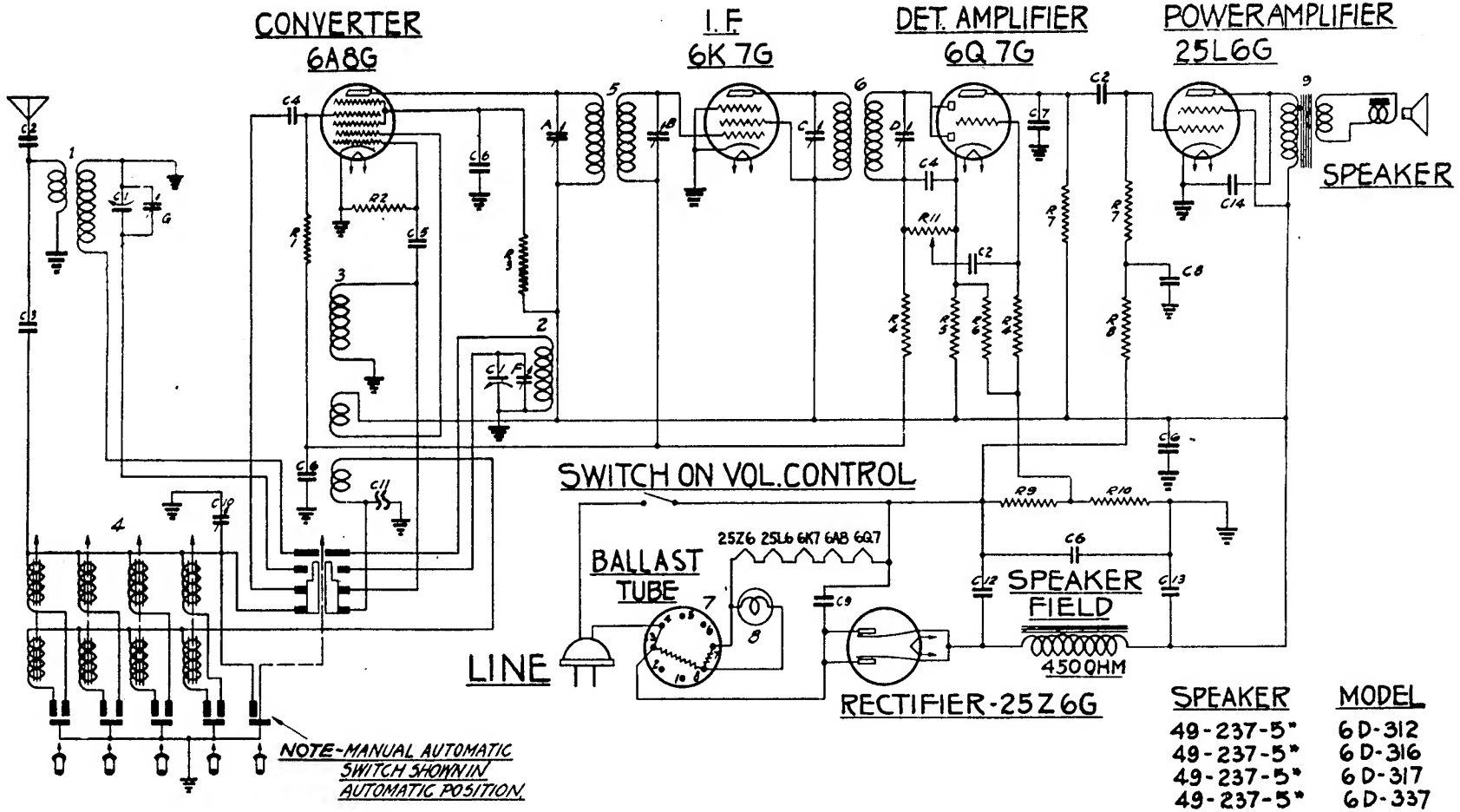
NC — No Connection
SH — Shield
H — Heater
P — Plate
S — Screen
G — Grid
SU — Suppressor
D — Diode
K — Cathode
F — Filament



Location of Tubes and Trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	455	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Lead	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	1500	G	Al'gment of Ant.



SPEAKER	MODEL
49-237-5*	6D-312
49-237-5*	6D-316
49-237-5*	6D-317
49-237-5*	6D-337

DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION
C-1	22-695	TWO GANG VAR. COND.		R-1	63-597	470 M OHM	1/4 W	3	20-1A7	COMPENSATING COIL
C-2	22-196	.01 MFD.	600V	R-2	63-593	47 M OHM	1/4 W	4		
C-3	22-289	50MMFD.	600V	R-3	63-643	18 M OHM	1/4 W	5	95-513	1 ST. I.F. TRANS.
C-4	22-162	.008 MFD.	600V	R-4	63-271	1 MEGOHM	1/4 W	6	95-520	2 ND. I.F. TRANS.
C-5	22-182	.00025 MFD.	600V	R-5	63-681	56M OHM	1/2 W	7	100-70	BALLAST TUBE-115V
C-6	22-250	.05 MFD.	200V	R-6	63-633	680 OHM	1/4 W	8	100-36	PILOT LIGHT .25A-6.3V
C-7	22-147	.0005 MFD.	600V	R-7	63-206	220 M OHM	1/4 W	9		SPEAKER TRANS
C-8	22-327	.02 MFD	200V	R-8	63-595	100 M OHM	1/4 W			
C-9	22-435	.02 MFD	600V	R-9	63-557	60 OHM WIREWOUND	1/2 W	A		1 ST I.F. TRANS. PRI
C-10	22-519	VARIABLE TRIMMER		R-10	63-954	50 OHM WIREWOUND	1/2 W	B		1 ST I.F. TRANS. SEC.
C-11	22-729	COMPENSATING COND.		R-11	63-955	220 M OHM VOL CONT.		C		2 ND I.F. TRANS. PRI
C-12	22-681	40 MFD ELECTROLYTIC	150V					D		2 ND I.F. TRANS SEC
C-13	22-680	16 MFD "	150V	1	5-5808	ANTENNA COIL ASSEM		F		BROADCAST OSCILLATOR (4 GANG)
C-14	22-730	.04 MFD.	600V	2	5-6039	OSC. COIL ASSEM.		G		ANTENNA BROADCAST (4 GANG)

I.F. FREQUENCY 455 K.C.
6-TUBE SUPERHETERODYNE
CHASSIS Nº 5647-AC, DC.
ZENITH RADIO CORPORATION
CHICAGO, ILL.

Chassis No. 5647

NOTE

Voltages measured from socket contacts to chassis using a 1000 ohm per volt meter. Antenna disconnected — volume control on full.

Line voltage 115 v. Consumption 55 watts.

Power output 1.6 watts.

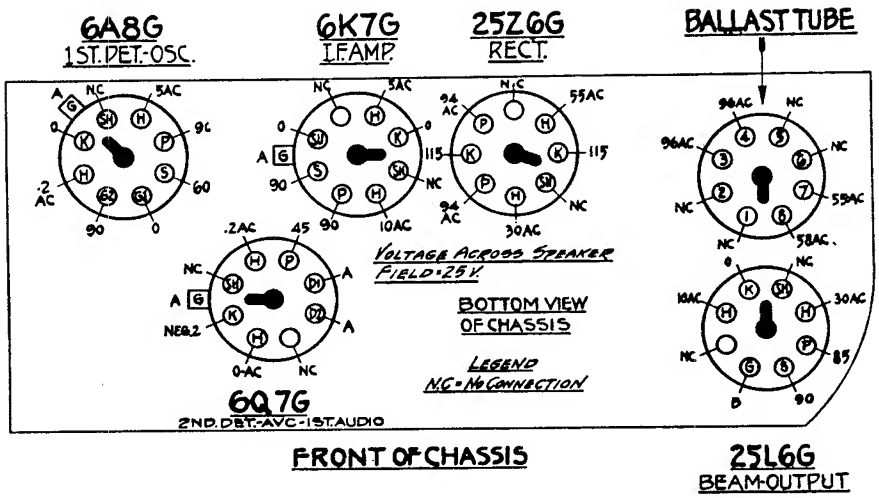
(A) Bias for 6A8 — 6K7 and 6Q7 measured at 6Q7 cathode.

(B) Bias for 25L6 measured at point C on 6Q7 socket.

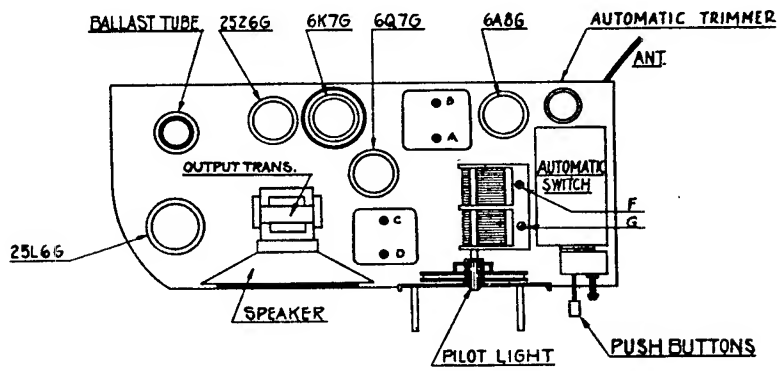
Filament voltages measured across heaters of 25L6 and 25Z6 is 22 volts A.C. Other tubes 6 v A.C.

LEGEND

NC — No Connection
SH — Shield
H — Heater
P — Plate
S — Screen
G — Grid
SU — Suppressor
D — Diode
K — Cathode
F — Filament



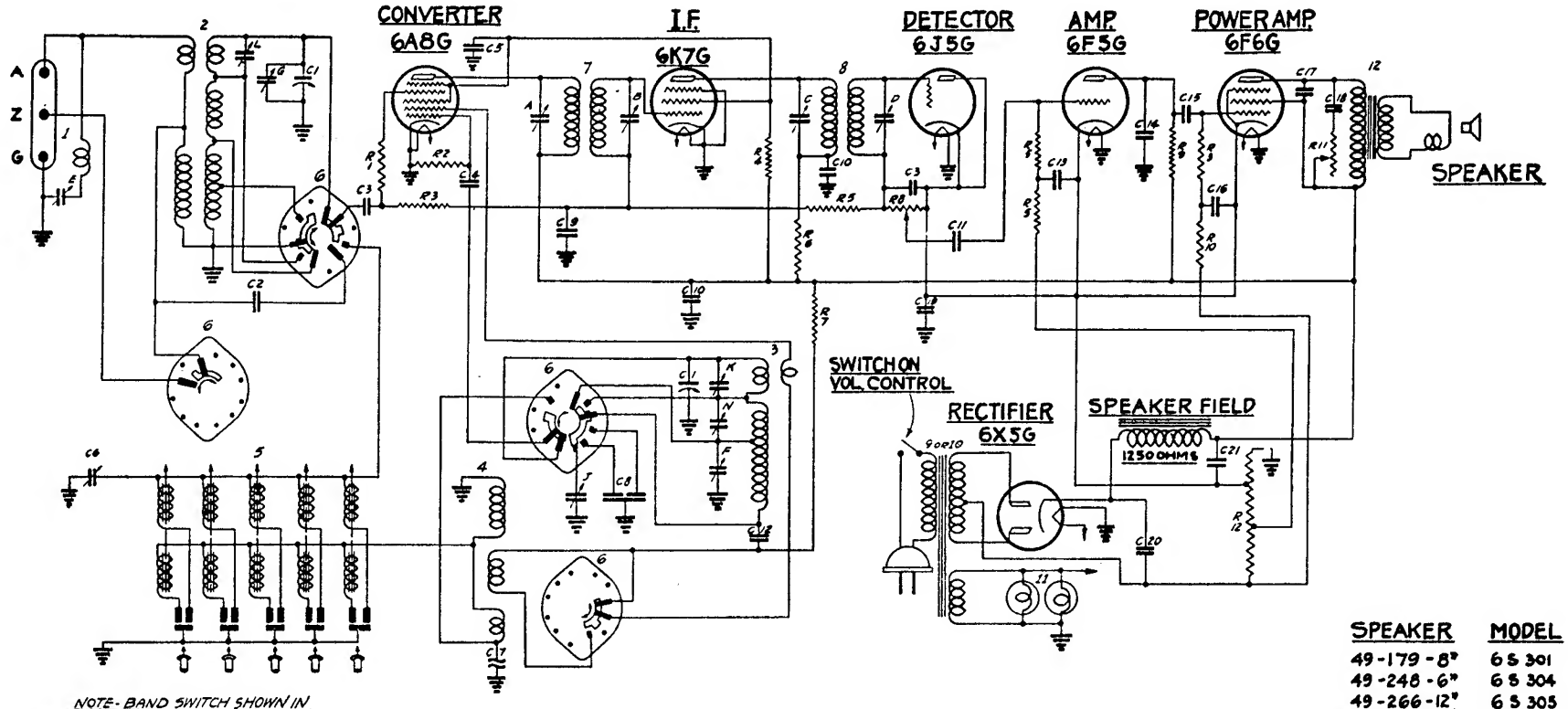
SOCKET VOLTAGES



Location of Tubes and Trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	455	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Lead	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	1500	G	Al'gment of Ant.



SPEAKER	MODEL
49-179-8"	6 S 301
49-248-6"	6 S 304
49-266-12"	6 S 305
49-248-6"	6 S 321
49-248-6"	6 S 322
49-248-6"	6 S 340
49-255-12"	6 S 306

DIAG NO	PART NO	DESCRIPTION		DIAG NO	PART NO	DESCRIPTION		DIAG NO	PART NO	DESCRIPTION	DIAG NO	PART NO	DESCRIPTION
C-1	22-717	TWO GANG VARIABLE		C-21	22-719	16 MFD. ELECTROLYTIC	350V	1	20-184	WAVE TRAP	A		1 ST I.F. TRANS. PR.
C-2	22-289	.50 MMFD.	600V					2			B		1 ST I.F. TRANS. SEC.
C-3	22-162	.0001 MFD.	600V						5-6266	ANT. COIL & SHIELD ASSEM.	C		2 ND I.F. TRANS. PRI.
C-4	22-187	25 MMFD.	600V					3			D		2 ND I.F. TRANS. SEC.
C-5	22-170	.1 MFD.	400V						5-6267	OSC. COIL & SHIELD ASSEM.	E		WAVE TRAP
C-6	22-519	TRIMMER COND.		R-1	63-621	39 OHM	1/4W	4	20-196	COMPENSATING COIL	F		BROADCAST OSC. (SEE NOTE)
C-7	22-760	COMPENSATING COND.		R-2	63-892	33 M OHM	1/4W	5			G		ANTENNA BROADCAST (SEE NOTE)
C-8	22-708	DIAL FIXED PADDER		R-3	63-397	470 M OHM	1/4W	6	85-180	BAND SELECTOR SWITCH	J	22-403	BROADCAST PADDER
C-9	22-230	.05 MFD.	200V	R-4	63-477	33 M OHM	1W	7	95-528	1 ST. I.F. TRANSFORMER	K		SHORT WAVE OSC. (SEE NOTE)
C-10	22-218	.05 MFD.	400V	R-5	63-711	1 MEGOHM	1/4W	8	95-530	2 ND I.F. TRANSFORMER	L	22-305	SHORT WAVE DETECTOR
C-11	22-327	.02 MFD.	200V	R-6	63-605	1000 OHM	1/2W	9	95-526	POWER TRANS. 117V-50-60 ~	N		POLICE BAND OSC (SEE NOTE)
C-12	22-358	.002 MFD.	600V	R-7	63-680	10 M OHM	1W	10	95-595	POWER TRANS. ALL VOLTAGE 25 CYCLE			
C-13	22-190	.1 MFD.	200V	R-8	63-983	220 OHM VOL CONT.							
C-14	22-167	.0005 MFD.	600V	R-9	63-296	220 M OHM	1/4W	11	100-56	DIAL LIGHT .25A - 6.3V			NOTE - TRIMMERS "C-K & N" MOUNTED ON BAKELITE STRIP PART NO 22-326
C-15	22-438	.02 MFD.	600V	R-10	63-595	100 M OHM	1/4W	12		SPEAKER TRANS.			
C-16	22-219	.03 MFD.	200V	R-11	63-982	TONE CONTROL							
C-17	22-492	.002 MFD.	600V	R-12	63-984	3 SECTION CANDOHM							
C-18	22-171	.05 MFD.	600V										
C-19	22-189	.01 MFD.	200V										
C-20	22-718	12 MFD. ELECTROLYTIC	450V										

I.F. FREQUENCY 455 K.C.
6 TUBE SUPERHETERODYNE
CHASSIS NO 5651-A.C. 3-BAND
ZENITH RADIO CORPORATION
CHICAGO, ILL.

Chassis No. 5651

SOCKET VOLTAGES

NOTE

Voltages measured for socket contacts to chassis using a 1000 ohm per volt meter. Antenna disconnected — volume control on full.

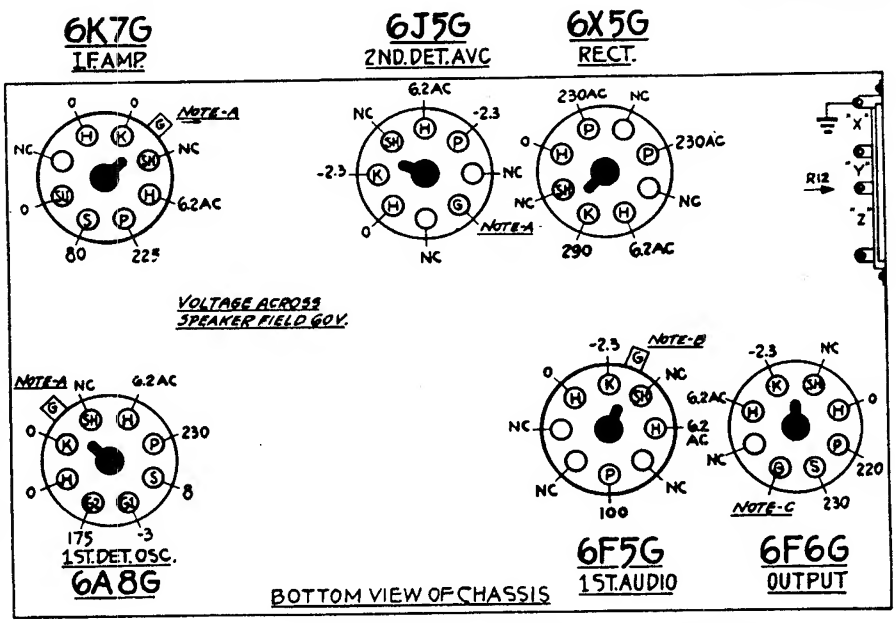
Line voltage 115 v. Consumption 60 watts.

Power Output 4.5 watts.

(A) Bias for 6A8 — 6K7 and 6J5 measured across X which is neg. 2.3 volts.

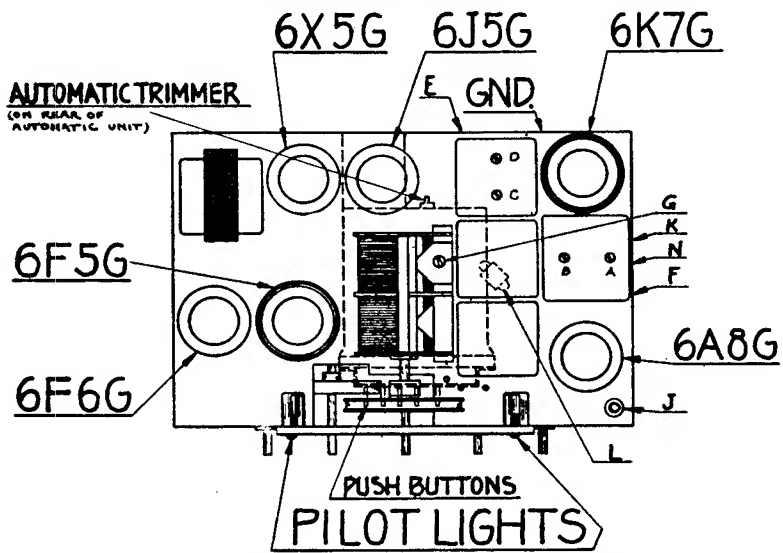
(B) Bias for 6F5 measured across X and Y which is neg. 3.8 volts.

(C) Bias for 6F6 measured across XY and Z which is neg. 16 volts.



LEGEND

NC — No Connection
SH — Shield
H — Heater
P — Plate
S — Screen
G — Grid
SU — Suppressor
D — Diode
K — Cathode
F — Filament

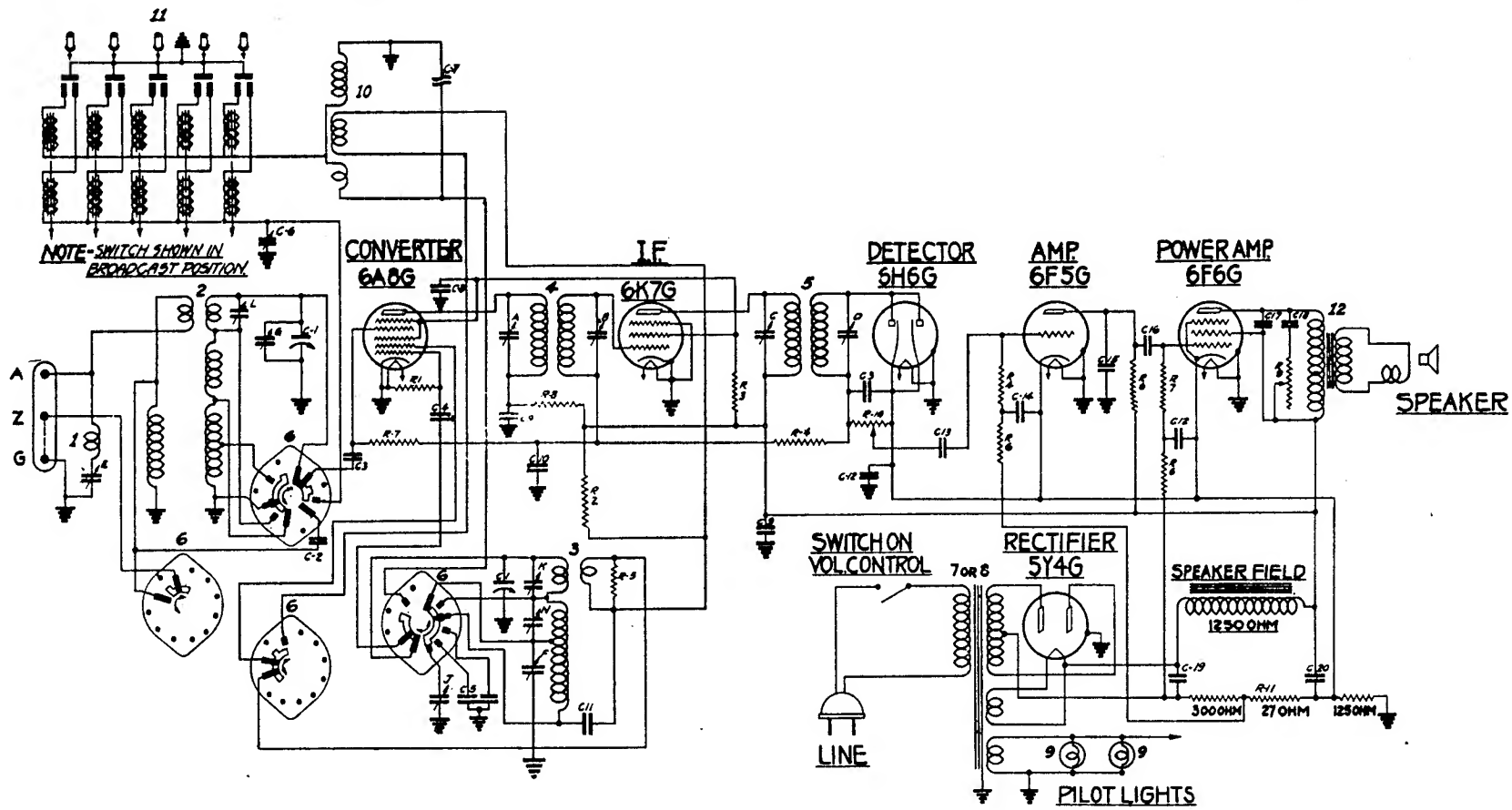


Location of Tubes and Trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	455	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Post	200 Mmfd.	455	"	600	E	See Note
3	" " "	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
4	" " "	200 Mmfd.	1500	"	1500	G	Al'gment of Ant.
5	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output.
6	" " "	200 Mmfd.		"		FG	Repeat 3 & 4
7	" " "	400 Ohms	18000	S.W.	18000	K	Set Osc. to Scale
8	" " "	400 Ohms	18000	S.W.	18000	L	Rock Gang & adj. for max. output.
9	" " "	400 Ohms	6000	Police	6000	N	Rock Gang & adj. for max. output.

NOTE: If receiver is used in location subject to code interference adjust wave trap (E) for minimum interference with antenna connected and receiver operating in broadcast band.



SPEAKER	MODEL
49-180-6"	6S-330
49-181-10"	6S-361

DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION	DIAG Nº	PART Nº	DESCRIPTION
C-1	22-547	TWO GANG VAR. COND.						1	70-154	WAVE TRAP ASSEM.	A		1ST I.F. TRANS. PRI.
C-2	22-289	.50 MMFD.	400 V					2	5-4941	ANT. COIL & SHIELD ASSEM.	B		1ST I.F. TRANS. SEC.
C-3	22-162	.0001 MFD.	1,000 V								C		2ND I.F. TRANS. PRI.
C-4	22-127	25 MMFD.	1,000 V					3	5-4942	OSC. COIL & SHIELD ASSEM.	D		2ND I.F. TRANS. SEC.
C-5	22-550	DUAL FIXED PADDER		R-1	63-593	47 M OHM	½ W	4	95-613	1ST I.F. TRANSFORMER	E		WAVE TRAP
C-6	22-519	TRIMMER CONDENSER		R-2	63-680	10 M OHM	1 W	5	95-614	2ND I.F. TRANSFORMER	F		BROADCAST OSC. (SEE NOTE)
C-7	22-705	COMPENSATING COND.		R-3	63-677	33 M OHM	1 W	6	85-139	BAND SELECTOR SWITCH	G		ANT. BROADCAST (ON GANG)
C-8	22-170	.1 MFD.	400 V	R-4	63-271	1 MEG OHM	½ W	7	95-615	POWER TRANS. 117 V - 50-60 CYCLE	J	22-519	BROADCAST PADDER
C-9	22-212	.05 MFD.	400 V	R-5	63-587	4700 OHM -	1/4 W	8	95-450	POWER TRANSFORMER ALL VOLTAGE - 25 CYCLE	K		SHORT WAVE OSC. (SEE NOTE)
C-10	22-230	.05 MFD.	1500 V	R-6	63-296	220 M OHM	1/4 W				L	22-305	SHORT WAVE DETECTOR
C-11	22-358	.002 MFD.	600 V	R-7	63-597	4.70 M OHM	1/4 W	9	100-36	PILOT LIGHT. 25 A 6.3 V.	N		POLICE BAND OSC. (SEE NOTE)
C-12	22-185	.01 MFD.	600 V	R-8	63-605	1000 OHM	½ W	10	20-183	COMPENSATING COIL			
C-13	22-327	.02 MFD.	600 V	R-9	63-521	2M OHM TONE CONTROL		11					NOTE - TRIMMERS "F-K & N" MOUNTED ON BAKELITE STRIP - PART # 28-596
C-14	22-190	.1 MFD.	1,000 V	R-10	63-520	500 M OHM VOL. CONTROL		12		SPEAKER TRANSFORMER			
C-15	22-147	.0005 MFD.	600 V	R-11	63-613	2500 OHM RESISTOR							
C-16	22-435	.02 MFD.	600 V										
C-17	22-492	.002 MFD.	600 V										
C-18	22-171	.05 MFD.	600 V										
C-19	22-596	8 MFD. DRY ELECTROLYTIC	450 V										
C-20		16 MFD. DRY ELECTROLYTIC	450 V										

I.F. FREQUENCY 456 K.C.
6-TUBE SUPERHETERODYNE
CHASSIS Nº 5648-A.C.
ZENITH RADIO CORPORATION
CHICAGO, ILL.

Chassis No. 5648

Models 6S330, 6S361
CHASSIS No. 5648

SOCKET VOLTAGES

NOTE

Voltages measured for socket contacts to chassis using a 1000 ohm per volt meter. Antenna disconnected — volume control on full.

Line voltage 115 v. Consumption 65 watts.

Power Output 4.5 watts.

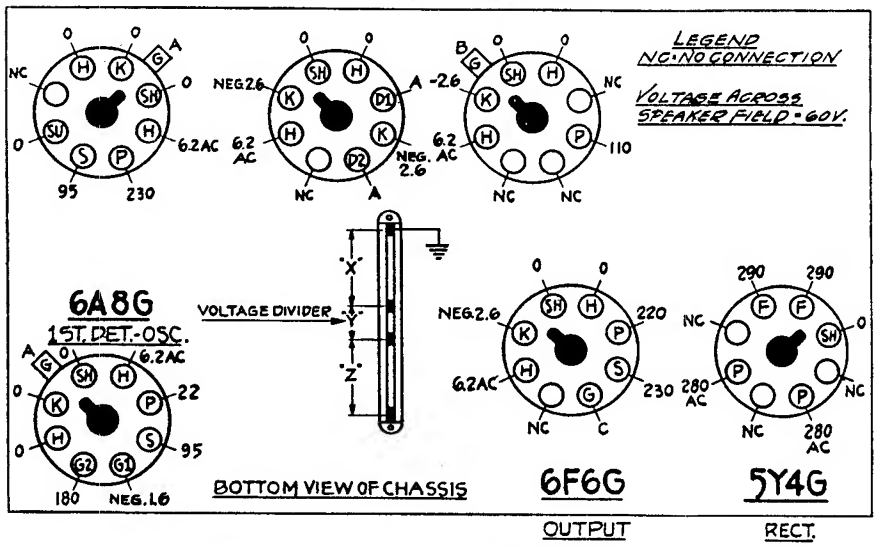
(A) Bias for 6A8 — 6K7 and 6H6 tubes measured across X which is neg. 2.6 volts.

(B) Bias for 6F5 tube measured across X and Y which is neg. 4 volts.

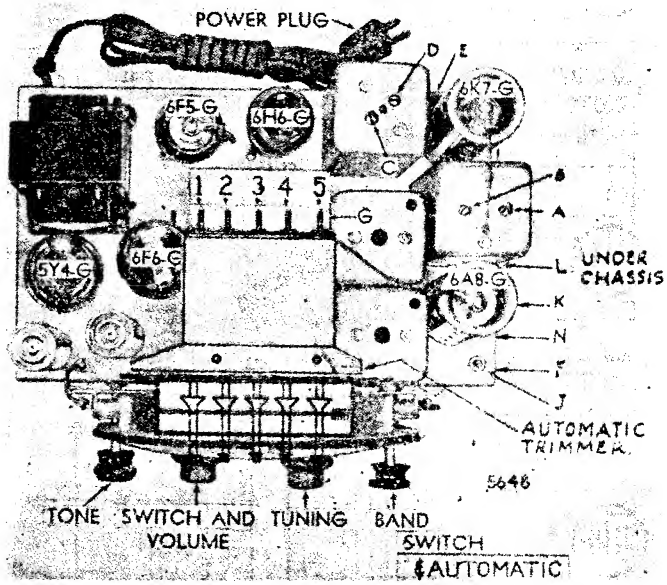
(C) Bias for 6F6 tube measured across X-Y and Z which is neg. 16 volts.

LEGEND

NC — No Connection
SH — Shield
H — Heater
P — Plate
S — Screen
G — Grid
SU — Suppressor
D — Diode
K — Cathode
F — Filament



FRONT OF CHASSIS

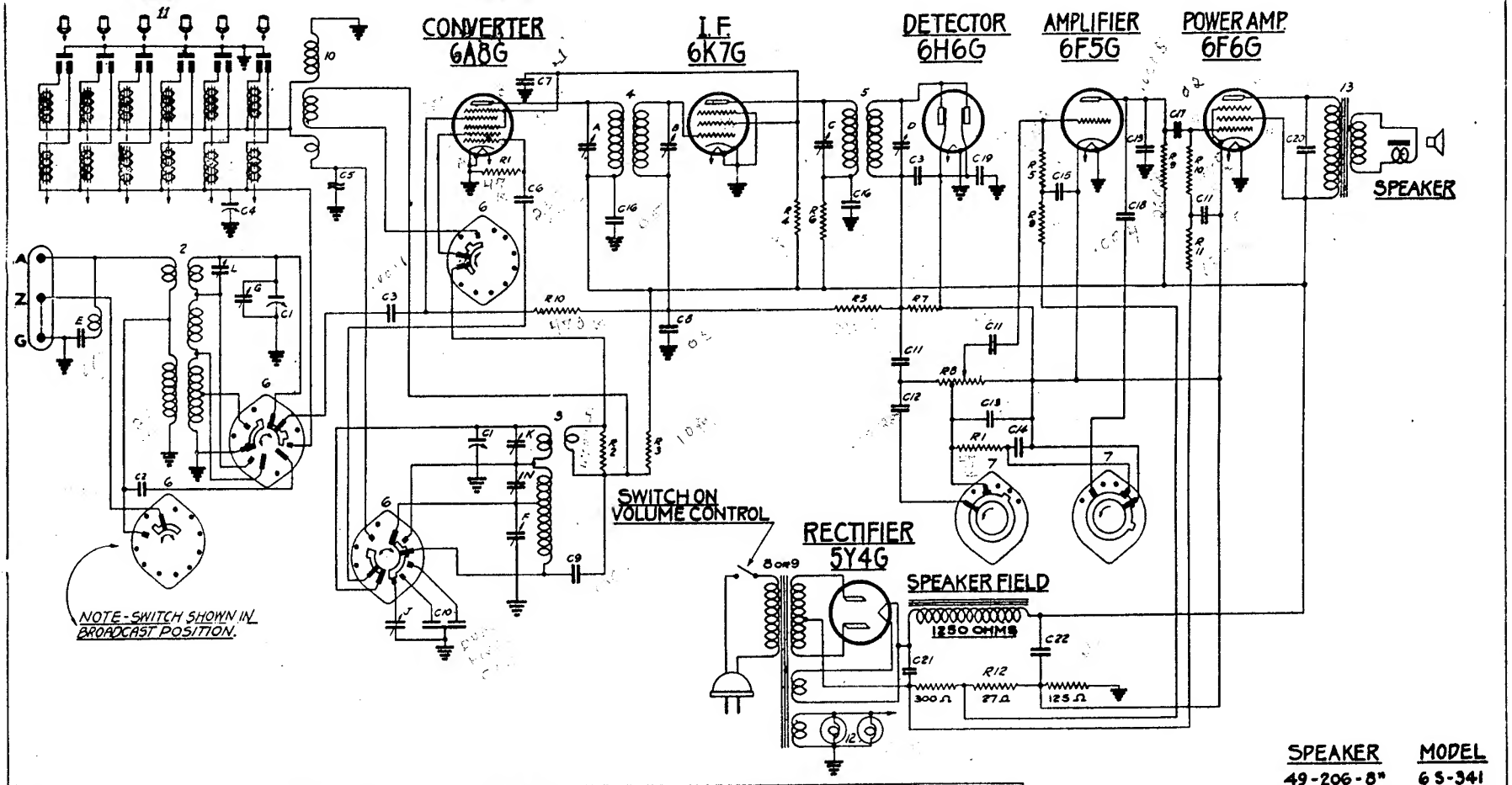


Location of Tubes and Trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	456	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Post	200 Mmfd.	456	"	600	E	See Note
3	" " "	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
4	" " "	200 Mmfd.	1500	"	1500	G	Al'gment of Ant.
5	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
6	" " "	200 Mmfd.		"		FG	Repeat 3 & 4
7	" " "	400 Ohms	18000	S.W.	18000	K	Set Osc. to Scale
8	" " "	400 Ohms	16500	S.W.	16500	L	Rock Gang & adj. for max. output
9	" " "	400 Ohms	5500	Police	5500	N	Rock Gang & adj. for max. output

NOTE: If receiver is used in location subject to code interference adjust wave trap (E) for minimum interference with antenna connected and receiver operating in broadcast band.



DIAG NO.	PART NO.	DESCRIPTION	
C-1	22-347	TWO GANG VARIABLE	
C-2	22-289	50 MMFD.	600 V
C-3	22-162	.0001 MFD.	600 V
C-4	22-319	TRIMMER CONDENSER	
C-5	22-705	COMPENSATING COND.	
C-6	22-127	25 MMFD.	600 V
C-7	22-170	.1 MFD.	400 V
C-8	22-250	.05 MFD.	200 V
C-9	22-358	.002 MFD.	600 V
C-10	22-558	DUAL FIXED PADDER	
C-11	22-327	.02 MFD.	200 V
C-12	22-182	.00025 MFD.	600 V
C-13	22-147	.0005 MFD.	600 V
C-14	22-326	.003 MFD.	400 V
C-15	22-190	.1 MFD.	200 V
C-16	22-212	.05 MFD.	400 V
C-17	22-435	.02 MFD.	600 V
C-18	22-448	.004 MFD.	600 V
C-19	22-185	.01 MFD.	200 V
C-20	22-492	.002 MFD.	600 V
C-21	22-551	16 MFD. WET ELECTROL.	400 V
C-22	22-552	20 MFD. WET ELECTROL.	300 V
R-1	63-593	47 M OHM	1/4 W
R-2	63-587	4700 OHM	1/2 W
R-3	63-680	10 M OHM	1 W
R-4	63-677	33 M OHM	1 W
R-5	63-271	1 MEGOHM	1/4 W
R-6	63-605	1000 OHM	1/2 W
R-7	63-638	390 M OHM	1/4 W
R-8	63-799	2 MEGOHM VOL. CONTROL	
R-9	63-296	220 M OHM	1/4 W
R-10	63-597	470 M OHM	1/4 W
R-11	63-325	150 M OHM	1/4 W
R-12	63-613	3 SECTION CANDOHM	

DIAG NO.	PART NO.	DESCRIPTION
1	20-154	WAVE TRAP ASSEMBLY
2	3-5073	ANTENNA COIL & SHIELD ASSEM.
3	3-5074	OSC. COIL & SHIELD ASSEMBLY
4	95-416	1ST. I.F. TRANS. PRIMARY
5	95-417	2ND I.F. TRANS. PRIMARY
6	85-140	BAND SELECTOR SWITCH
7	85-108	TONE CONTROL SWITCH
8	95-438	POWER TRANS. (ALL WDGS.) 75 ~
9	95-434	POWER TRANS. (ALL WDGS.) 25 ~
10	20-183	COMPENSATING COIL
11		
12	100-36	PILOT LIGHT .25 A - 6.3 V
13		SPEAKER TRANSFORMER

DIAG NO.	PART NO.	DESCRIPTION
A		1ST. I.F. TRANS. PRI.
B		1ST. I.F. TRANS. SEC.
C		2ND I.F. TRANS. PRI.
D		2ND I.F. TRANS. SEC.
E		WAVE TRAP
F		BROADCAST OSC. (SEE NOTE)
G		ANT. BROADCAST (ON GANG)
J	22-319	BROADCAST PADDER
K		SHORT WAVE OSC. (SEE NOTE)
L	22-305	SHORT WAVE DETECTOR
N		POLICE BAND OSC. (SEE NOTE)

NOTE - TRIMMERS P-K & N MOUNTED ON GANG UNIT.

SPEAKER	MODEL
49-206-8"	6 S-341
49-208-10"	6 S-362

I.F. FREQUENCY 456 K.C.
6-TUBE SUPERHETERODYNE
CHASSIS Nº 5649-A.C. 3-BAND
ZENITH RADIO CORPORATION
CHICAGO, ILL.

Chassis No. 5649

Models 6S341, 6S362

CHASSIS No. 5649

NOTE

Voltages measured from socket contacts to chassis using a 1000 ohm per volt meter with tenna disconnected — volume control on full.

Line voltage 115 v. Consumption 65 watts.

Power output 4.5 watts.

(A) Bias for 6A8 — 6K7 and 6H6 measured across X which is — 2.5 volts.

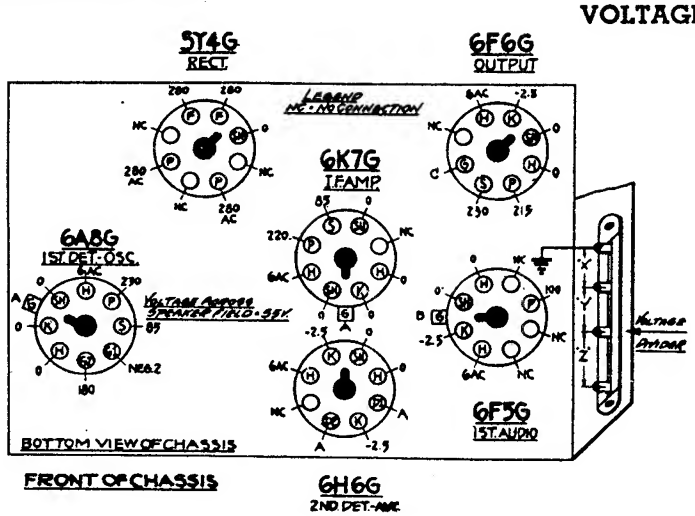
(B) Bias for 6F5 measured across X and Y which is neg. 4 volts.

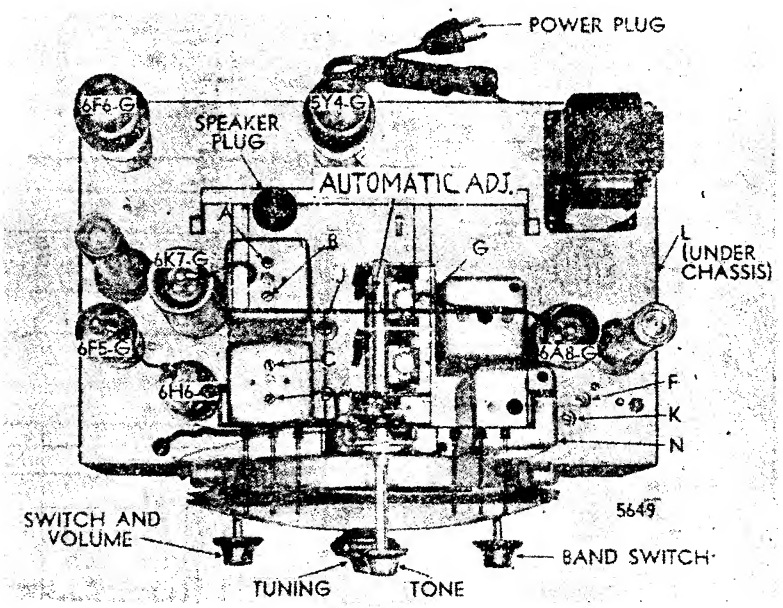
(C) Bias for 6F6 measured across XY and Z which is neg. 16 volts.

LEGEND

NC — No Connection
SH — Shield
H — Heater
P — Plate
S — Screen
G — Grid
SU — Suppressor
D — Diode
K — Cathode
F — Filament

SOCKET VOLTAGES



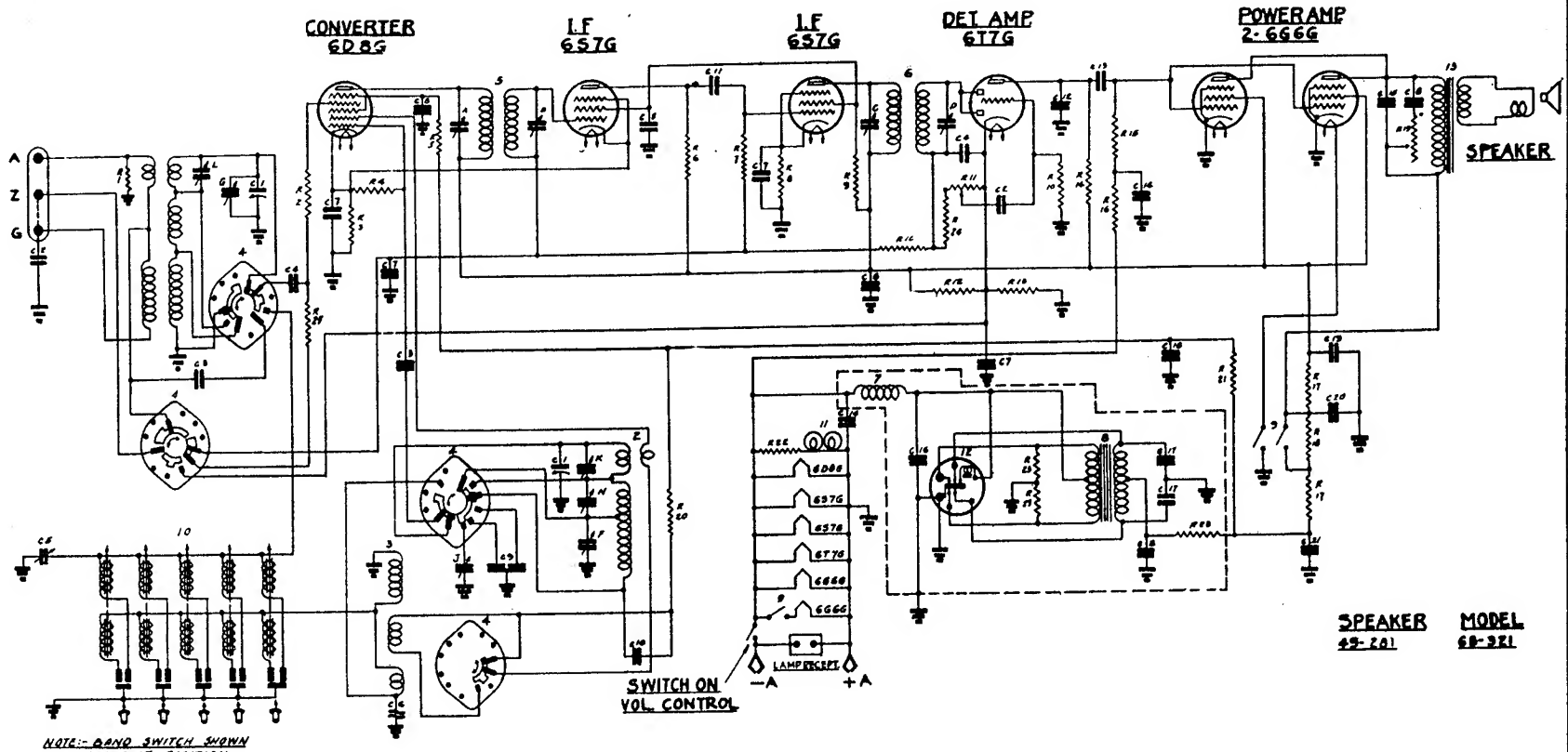


Location of Tubes and Trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	456	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Post	200 Mmfd.	456	"	600	E	See Note
3	" " "	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
4	" " "	200 Mmfd.	1500	"	1500	G	Al'gment of Ant.
5	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
6	" " "	200 Mmfd.		"		FG	Repeat 3 & 4
7	" " "	400 Ohms	18000	S.W.	18000	K	Set Osc. to Scale
8	" " "	400 Ohms	16500	S.W.	16500	L	Rock Gang & adj. for max. output
9	" " "	400 Ohms	5500	Police	5500	N	Rock Gang & adj. for max. output

NOTE: If receiver is used in location subject to code interference adjust wave trap (E) for minimum interference with antenna connected and receiver operating in broadcast band.



DIAG NO	PART NO	DESCRIPTION		DIAG NO	PART NO	DESCRIPTION		DIAG NO	PART NO	DESCRIPTION		DIAG NO	PART NO	DESCRIPTION
C-1	22-717	TWO GANG VARIABLE		C-10		.10 MFD ELECT	250V	R-17	63-605	1000 OHM	1/2W	10		
C-2	22-788	.01 MFD	200V	C-11	22-742	.15 MFD ELECT	250V	R-18	63-962	4700 OHM	1W	11	198-39	PILOT LIGHT 6.3V - .17A
C-3	22-289	.50 MMFD	600V	C-12		.15 MFD ELECT	250V	R-19	63-982	TONE CONTROL		12	190-6	VIBRATOR
C-4	22-162	.0001 MFD	600V					R-20	63-676	.4600 OHM	1W	13		SPEAKER TRANS.
C-5	22-819	TRIMMER COND		R-1	63-587	4700 OHM	1/2W	R-21	63-736	18000 OHM	1/2W			
C-6	22-760	COMPENSATING COND.		R-2	63-681	30 OHM	1/2W	R-22	63-939	19 OHM WIRE WOUND		A		1ST I.F. TRANS. PRIMARY
C-7	22-250	.06 MFD	200V	R-3	63-629	330 OHM	1/2W	R-23	63-977	100 OHM	1/2W	B		1ST I.F. TRANS. SECONDARY
C-8	22-812	.05 MFD	400V	R-4	63-892	33M OHM	1/2W	R-24	63-593	47M OHM	1/2W	C		2ND I.F. TRANS. PRIMARY
C-9	22-706	DUAL FIXED PADDER		R-5	63-681	30 M OHM	1/2W	R-25	63-597	470 OHM	1/2W	D		2ND I.F. TRANS. SECONDARY
C-10	22-558	.002 MFD	600V	R-6	63-150	10M OHM	1/2W	1				F		BROADCAST OSC. (SEE NOTE)
C-11	22-127	.95 MMFD	600V	R-7	63-589	10M OHM,	1/2W		5-6808	ANT COIL & SHIELD ASSEM		G		ANT. BROADCAST (ON GANG)
C-12	22-147	.0005 MFD.	600V	R-8	63-632	560 OHM	1/2W	2				J	22-663	BROADCAST PADDER
C-13	22-188	.02 MFD	400V	R-9	63-888	82 M OHM	1/2W		5-6807	OSC COIL & SHIELD ASSEM		K		SHORT WAVE OSC (SEE NOTE)
C-14	22-560	.25 MFD	200V	R-10	63-271	1 MEGOHM	1/2W	3	20-196	COMPENSATING COIL		L	22-305	SHORT WAVE DETECTOR
C-15	22-648	.004 MFD	600V	R-11	63-983	VOLUME CONTROL		4	85-163	BAND SELECTOR SWITCH		N		POLICE BAND OSC (SEE NOTE)
C-16	22-199	.5 MFD	200V	R-12	63-160	100 M OHM	1/2W	5	95-569	1ST I.F. TRANS.				
C-17	22-669	.01 MFD	600V	R-13	63-634	820 OHM	1/2W	6	95-580	2ND I.F. TRANS.				
C-18	22-741	8MFD ELECTROLYTIC	250V	R-14	63-296	220 M OHM	1/2W	7	5-8063	CHOKE ASSEM.				NOTE: TRIMMERS F, K & N ARE MOUNTED ON BAKELITE STRIP PART #22-324
				R-15	63-658	330 M OHM	1/2W	8	95-535	POWER TRANSFORMER				
				R-16	63-595	100M OHM	1/2W	9	85-187	BATTERY CONSERVER SW				

I.F FREQUENCY 455 K.C.
6 TUBE SUPERHETERODYNE
CHASSIS No 5653 6V 3 BAND
ZENITH RADIO CORPORATION
CHICAGO, ILL.

Chassis No. 5653

Model No. 6B321

CHASSIS No. 5653

NOTE

Voltages measured from socket contacts to chassis using a 1000 ohm per volt meter. Antenna disconnected — volume control on full.

Battery voltage at chassis 6v.

Consumption — switch on normal—2.3 amperes.

Consumption — switch on conserv. 1.7 amperes.

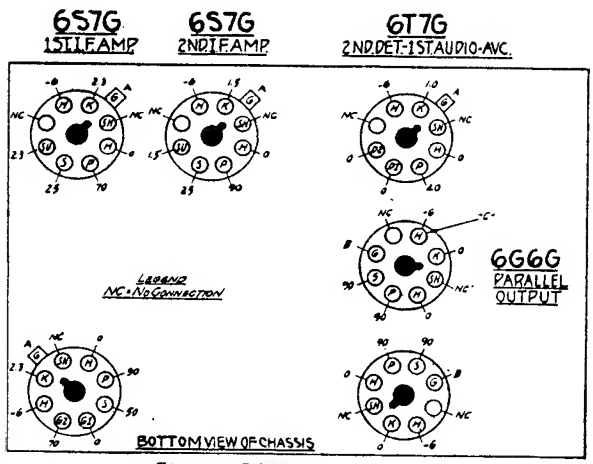
Power output 1 watt.

(A) Bias voltage measured from cathode to chassis.

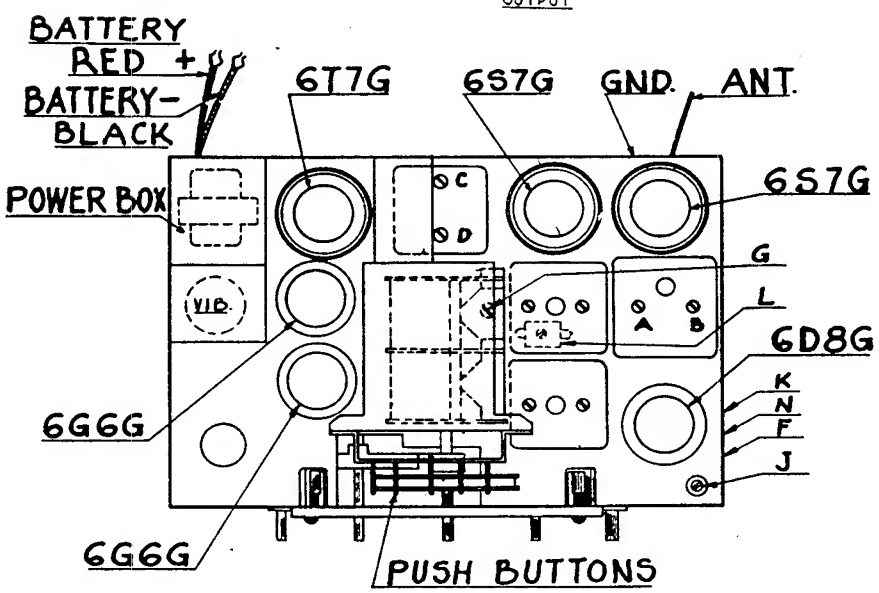
(B) Bias for 6G6 measured between point C and chassis and is —6 volts.

LEGEND

NC — No Connection
SH — Shield
H — Heater
P — Plate
S — Screen
G — Grid
SU — Suppressor
D — Diode
K — Cathode
F — Filament



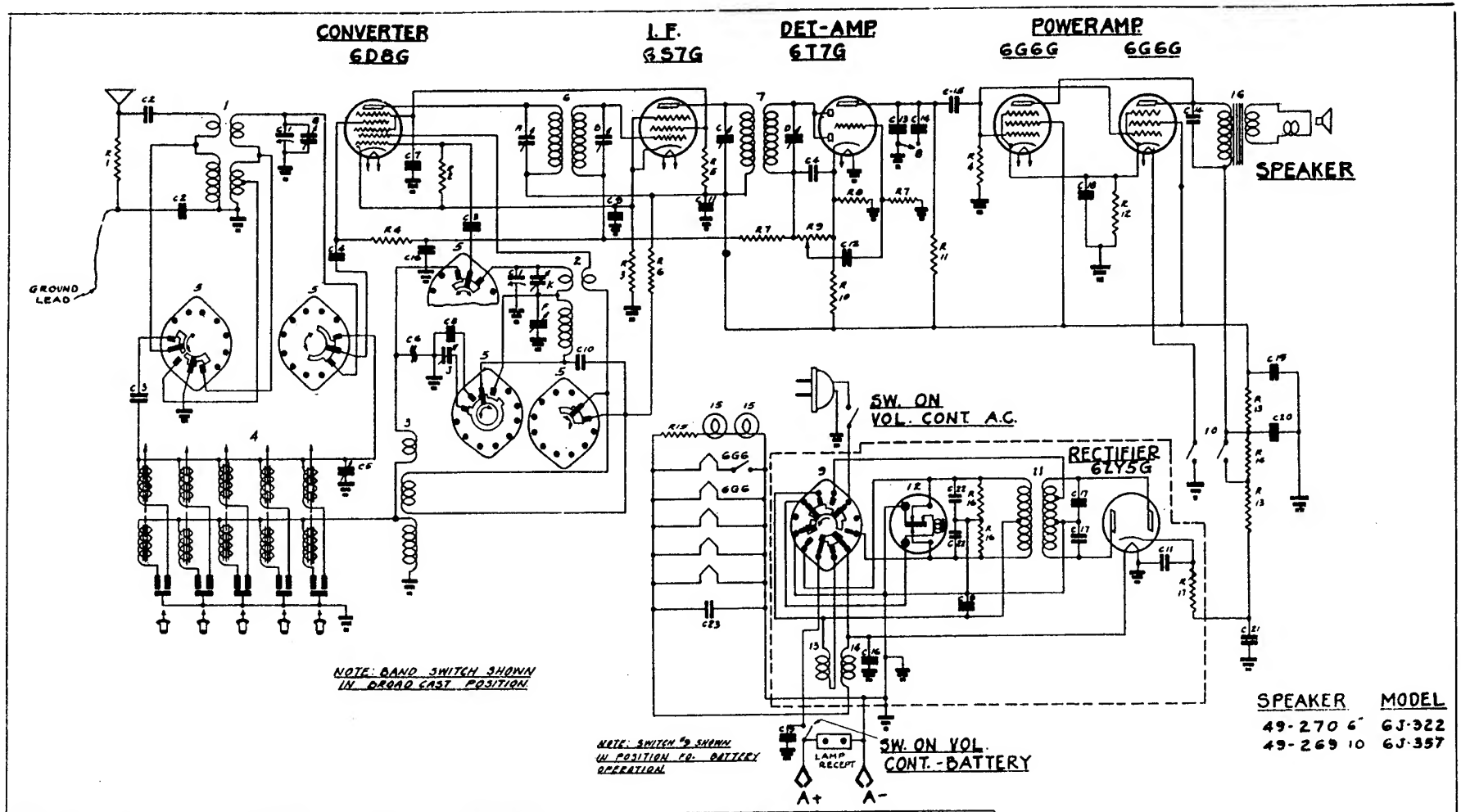
SOCKET VOLTAGES



Location of Tubes and Trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	455	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Post	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	1500	G	Al'gment of Ant.
4	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
5	" " "	200 Mmfd.		"		FG	Repeat 2 & 3
6	" " "	400 Ohms	18000	S.W.	18000	K	Set Osc. to scale
7	" " "	400 Ohms	18000	S.W.	18000	L	Rock gang & adj. for max. output
8	" " "	400 Ohms	6000	Police	6000	N	Rock gang & adj. for max. output



SPEAKER	MODEL
49-270 6"	GJ-322
49-269 10	GJ-357

DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION
C-1	22-744	TWO GANG VARIABLE		C-19		10 MFD ELECT	250V	R-15	63-533	13 OHM WIREWOUND		1A	5-2778	CHOKE ASSEM.
C-2	22-196	.01 MFD	600V	C-20	22-742	18 MFD ELECT	250V	R-16	63-965	120 OHM	1/2 W	15	100-39	PILOT LIGHT 2.9V .17A
C-3	22-289	.00MMFD	600V	C-21		18 MFD. ELECT	250V	R-17	63-877	100 OHM	1/4 W	16		SPEAKER TRANS.
C-4	22-162	.0001 MFD	600V	C-22	22-319	003 MFD.	200V							
C-5	22-319	TRIMMER COND.		C-23	22-199	.5MFD.	200V							
C-6	22-740	COMPENSATING COND.						1				A		1ST I.F. TRANS. PRIMARY
C-7	22-245	.01 MFD.	400V	R-1	63-587	4700 OHM		1/4 W	5-6333	ANT. COIL & SHIELD ASSEM.		B		1ST I.F. TRANS. SECONDARY
C-8	23-365	PHCO PADDER COND.		R-2	63-593	47M OHM		1/4 W	5-6118	OSCILLATOR COIL ASSEM.		C		2ND I.F. TRANS. PRIMARY
C-9	22-380	.25 MFD.	200V	R-3	63-620	270 OHM		1/4 W	3	20-196 COMPENSATING COIL		D		2ND I.F. TRANS. SECONDARY
C-10	22-338	.002 MFD.	600V	R-4	63-597	470M OHM		1/2 W	4			P		BROAD CAST OSC. (SEE NOTE)
C-11	22-212	.05 MFD.	400V	R-5	63-601	56M OHM		1/2 W				Q		ANT BROADCAST (BAND)
C-12	22-186	.01 MFD	200V	R-6	63-151	15M OHM		1 W	5	85-160 BAND SWITCH		J	22-619	BROAD CAST PADDER
C-13	22-147	.0005 MFD.	600V	R-7	63-271	1 MEGOHM		1/4 W	6	95-558 1ST I.F. TRANS.		K		SHORT WAVE OSC. (SEE NOTE)
C-14	22-648	.004 MFD	600V	R-8	63-634	820 OHM		1/4 W	7	95-559 2ND I.F. TRANS				
C-15	22-186	.01 MFD	400V	R-9	63-991	VOL. CONT. & SW. 220M			8	85-165 TONE CONTROL SWITCH				
C-16	22-280	.05 MFD	200V	R-10	63-160	100 M OHM		1/2 W	9	85-165 POWER SUPPLY SWITCH				
C-17	22-674	.02 MFD	600V	R-11	63-296	220 M OHM		1/2 W	10	85-157 BATTERY CONSERVER SW.				
C-18	22-405	10 MFD ELECTROLYTIC	50V	R-12	63-633	680 OHM		1/2 W	11	95-585 POWER TRANS				NOTE: TRIMMERS P & K ARE
				R-13	63-605	1000 OHM		1/2 W	12	190-11 VIBRATOR				MOUNTED ON BAKELITE
				R-14	63-962	4700 OHM		1 W	13	5-5043 CHOKE ASSEM.				STRIP PART Nº 22-648

6 VOLT-D.C. 110 VOLT-A.C.

I.F. FREQUENCY 455 K.C.

6 TUBE SUPERHETERODYNE

CHASSIS Nº 5654 2-BAND

ZENITH RADIO CORPORATION

CHICAGO, ILL.

Chassis No. 5654

NOTE

Voltages measured from socket contacts to chassis using a 1000 ohm per volt meter with chassis operating on 110 volt A.C.

Antenna disconnected — volume control on full.

Line voltage 115 v. Consumption 18 watts.

Battery voltage at chassis 6v.

Consumption — switch on normal 2.3 amperes.

Consumption — switch on conserv. 1.95 amperes.

Power Output 1 watt.

(A) Bias for 6D8 and 6S7 measured at K contacts of respective sockets which is +1.8 volts.

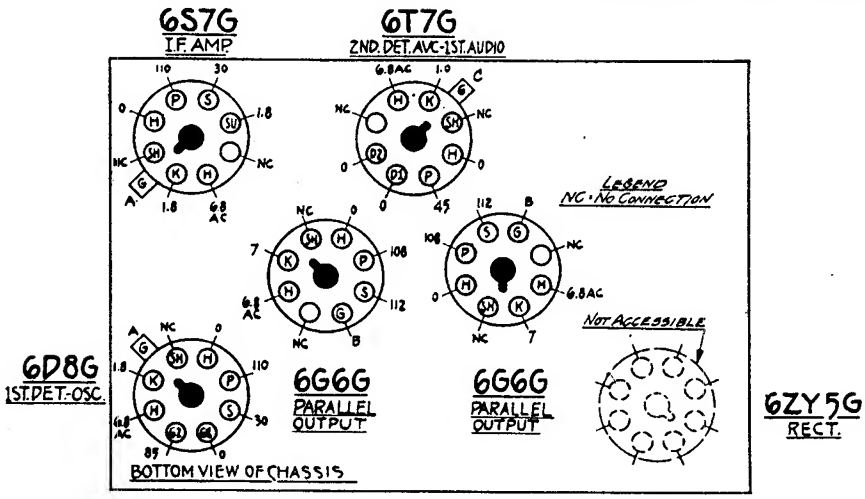
(B) Bias for 6G6 tubes measured at K contact of sockets which is +7 volts.

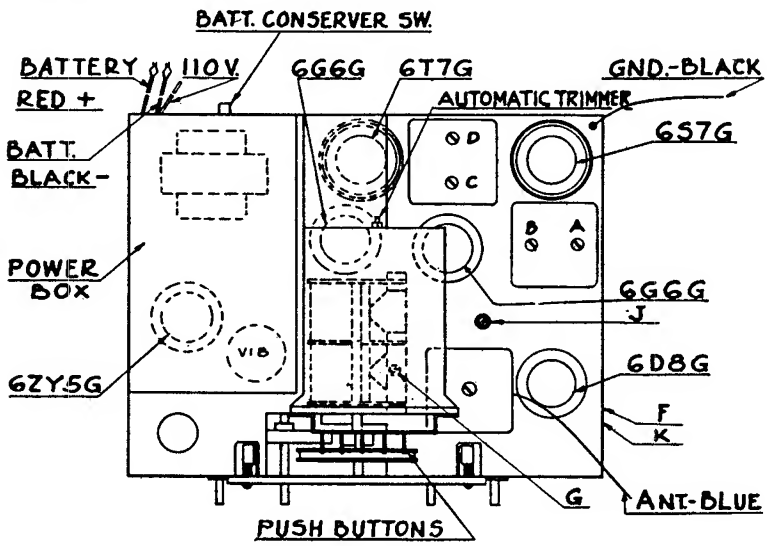
(C) Bias for 6T7 triode measured at K contact of same socket which is +1 volt.

LEGEND

NC — No Connection
SH — Shield
H — Heater
P — Plate
S — Screen
G — Grid
SU — Suppressor
D — Diode
K — Cathode
F — Filament

SOCKET VOLTAGES

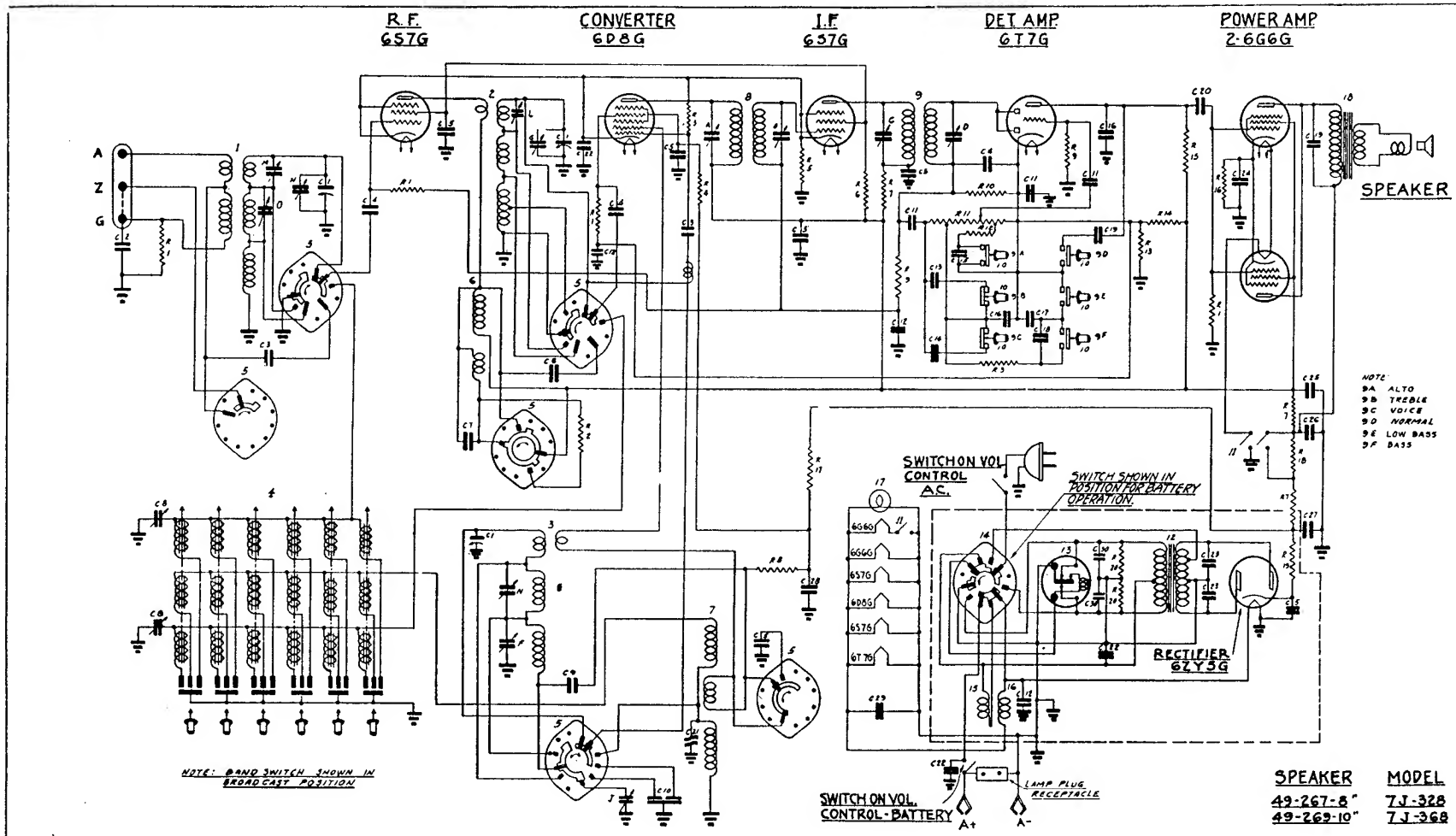




Location of Tubes and Trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	455	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Lead	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	1500	G	Al'gment of Ant.
4	" " "	200 Mmfd.	600	"	600	J	Rock Gang & adj. for max. output
5	" " "	200 Mmfd.		"		FG	Repeat 3 & 4
6	" " "	400 Ohms	18000	S.W.	18000	K	Rock gang & adj. for max. output



SPEAKER	MODEL
49-267-8"	7J-328
49-269-10"	7J-368

DIAG NO	PART NO	DESCRIPTION		DIAG NO	PART NO	DESCRIPTION		DIAG NO	PART NO	DESCRIPTION		DIAG NO	PART NO	DESCRIPTION		DIAG NO	PART NO	DESCRIPTION
C-1	22-146	THREE GANG VAR		C-21	22-155	COMPENSATING COND		R-11	63-990	VOL CONT		5	85-147	BAND SELECTOR SW.		F		BROADCAST OSC (SEE NOTE)
C-2	22-196	61 MFD	450V	C-22	22-380	.25 MFD	200V	R-12	63-391	22,000 OHM	1W	6	20-185	R.F. CHOKE		G		DETECTOR BROADCAST (ON GANG)
C-3	22-289	58 MMFD	600V	C-23	22-374	.02 MFD	600V	R-13	63-636	820 OHM	1/2W	7	20-186	COMPENSATING COIL		H		ANT BROADCAST (ON GANG)
C-4	22-162	.0001 MFD	600V	C-24	22-405	10 MFD ELECT.	50V	R-14	63-160	100 M OHM	1/2W	8	95-362	1ST I.F. TRANS.		I	22-463	BROADCAST PADDER
C-5	22-212	.05 MFD	400V	C-25		10 MFD ELECT.	250V	R-15	63-296	220 M OHM	1/2W	9	95-361	2ND. I.F. TRANS.		L		SHORT WAVE DET. (SEE NOTE)
C-6	22-285	10 MMFD	600V	C-26	22-742	15 MFD ELECT.	250V	R-16	63-585	680 OHM	1/2W	10	3-6226	TONE CONTROL SW ASSEM		M	22-305	SHORT WAVE ANTENNA
C-7	22-127	25 MMFD	600V	C-27		15 MFD ELECT.	250V	R-17	63-796	10 M OHM	1/2W	11	85-157	BATT CONSERVER SW		N		POLICE BAND OSC. (SEE NOTE)
C-8	22-519	TRIMMER COND.		C-28	22-741	8 MFD ELECT.	250V	R-18	63-962	4700 OHM	1W	12	95-555	POWER TRANSFORMER				
C-9	22-358	.002 MFD	600V	C-29	22-199	.5 MFD	200V	R-19	63-577	100 OHM	1/2W	13	190-11	VIBRATOR		O	22-385	POLICE BAND ANTENNA
C-10	22-706	DUAL FIXED PADDER		C-30	22-319	.005 MFD	200V	R-20	63-963	120 OHM	1/2W	14	85-155	POWER SUPPLY SW.				
C-11	22-327	.02 MFD	200V	R-1	63-597	470 M OHM	1/2W					15	5-5043	CHOKE ASSEMBLY				
C-12	22-250	.05 MFD	200V	R-2	63-585	2200 OHM	1/2W					16	5-2718	CHOKE ASSEM.				
C-13	22-182	.00025 MFD	600V	R-3	63-593	.47 M OHM	1/2W					17	180-67	PILOT LIGHT 6.3V .15A.				
C-14	22-470	.00015 MFD	600V	R-4	63-649	56000 OHM	1/2W	1				18		SPEAKER TRANS.				
C-15	22-185	.01 MFD	200V	R-5	63-627	180 OHM	1/2W		5-6541	ANT COIL & SHIELD ASSEM								
C-16	22-147	.0005 MFD	600V	R-6	63-885	82000 OHM	1/2W	2										
C-17	22-498	.006 MFD	600V	R-7	63-605	1800 OHM	1/2W		5-6208	DET. COIL & SHIELD ASSEM		A		1ST I.F. TRANS. PRI.				
C-18	22-326	.003 MFD	400V	R-8	63-673	5600 OHM	1/2W	3				B		1ST I.F. TRANS. SEC.				NOTE: TRIMMERS F, L & N.
C-19	22-448	.006 MFD	600V	R-9	63-271	1 MEGOHM	1/2W		5-6601	OSC COIL & SHIELD ASSEM		C		2ND I.F. TRANS. PRI.				ARE MOUNTED ON BAKELITE
C-20	22-188	.02 MFD	400V	R-10	63-655	22,000 OHM	1/2W	4				D		2ND. I.F. TRANS. SEC.				STRIP PART # 22-598.

6 VOLT D.C. 110 VOLT A.C.
I.F FREQUENCY 455 K.C.
7 TUBE SUPERHETERODYNE
CHASSIS Nº 5715 3 BAND
ZENITH RADIO CORPORATION
CHICAGO, ILL.

Chassis No. 5715

NOTE

Voltages measured from socket contacts to chassis using a 1000 ohm per volt meter with chassis operating on 110 volt A.C.

Line voltage 115 V. A.C. consumption 18 watts.

Battery voltage at chassis 6 volts.

Consumption with switch in normal position 2.6 amperes.

Consumption with switch in conserv. position 2.2 amperes.

Power output 1 watt.

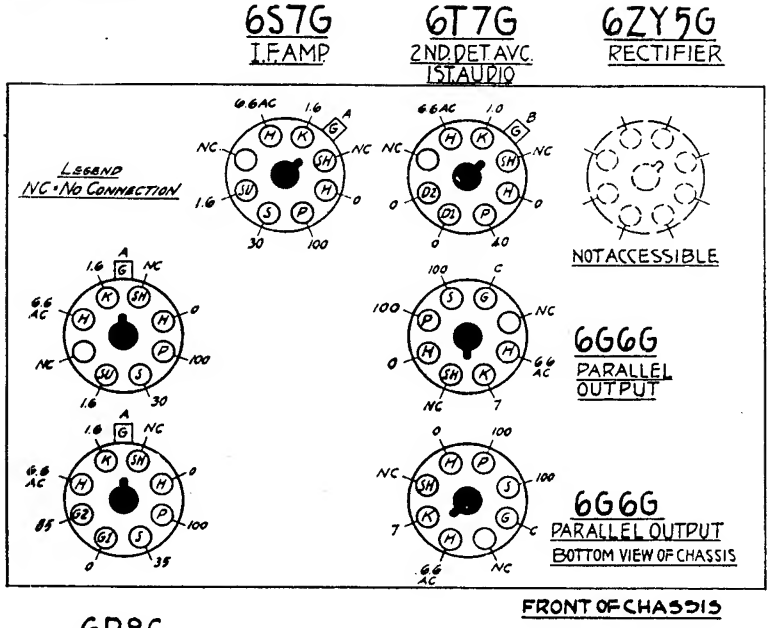
(A) Bias for 6D8 and 6S7 R.F. and I.F. tubes measured at K of respective sockets which is +1.6 volts.

(B) Bias for 6T7 triode section measured at K of 6T7 socket which is +1 volt.

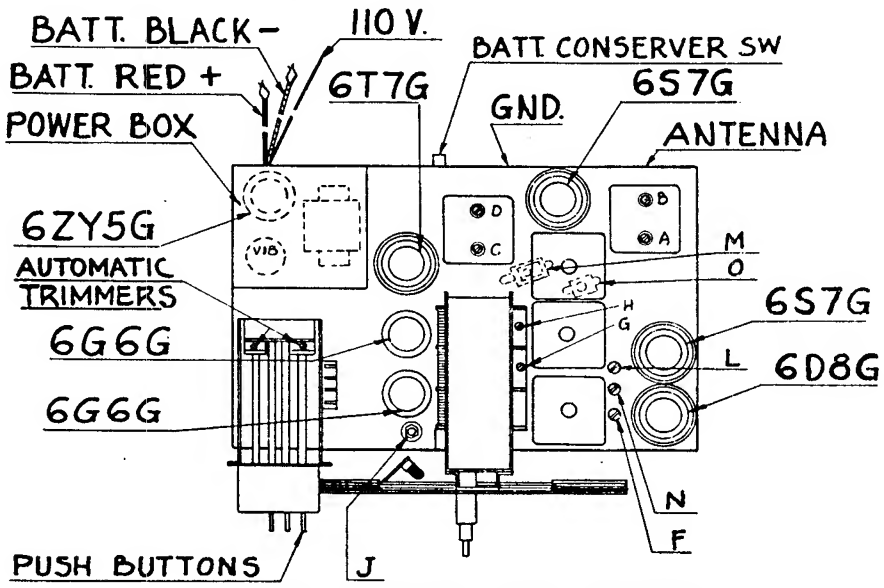
(C) Bias for 6G6 tubes measured at K of respective sockets which is +7 volts

LEGEND

NC — No Connection
SH — Shield
H — Heater
P — Plate
S — Screen
G — Grid
SU — Suppressor
D — Diode
K — Cathode
F — Filament



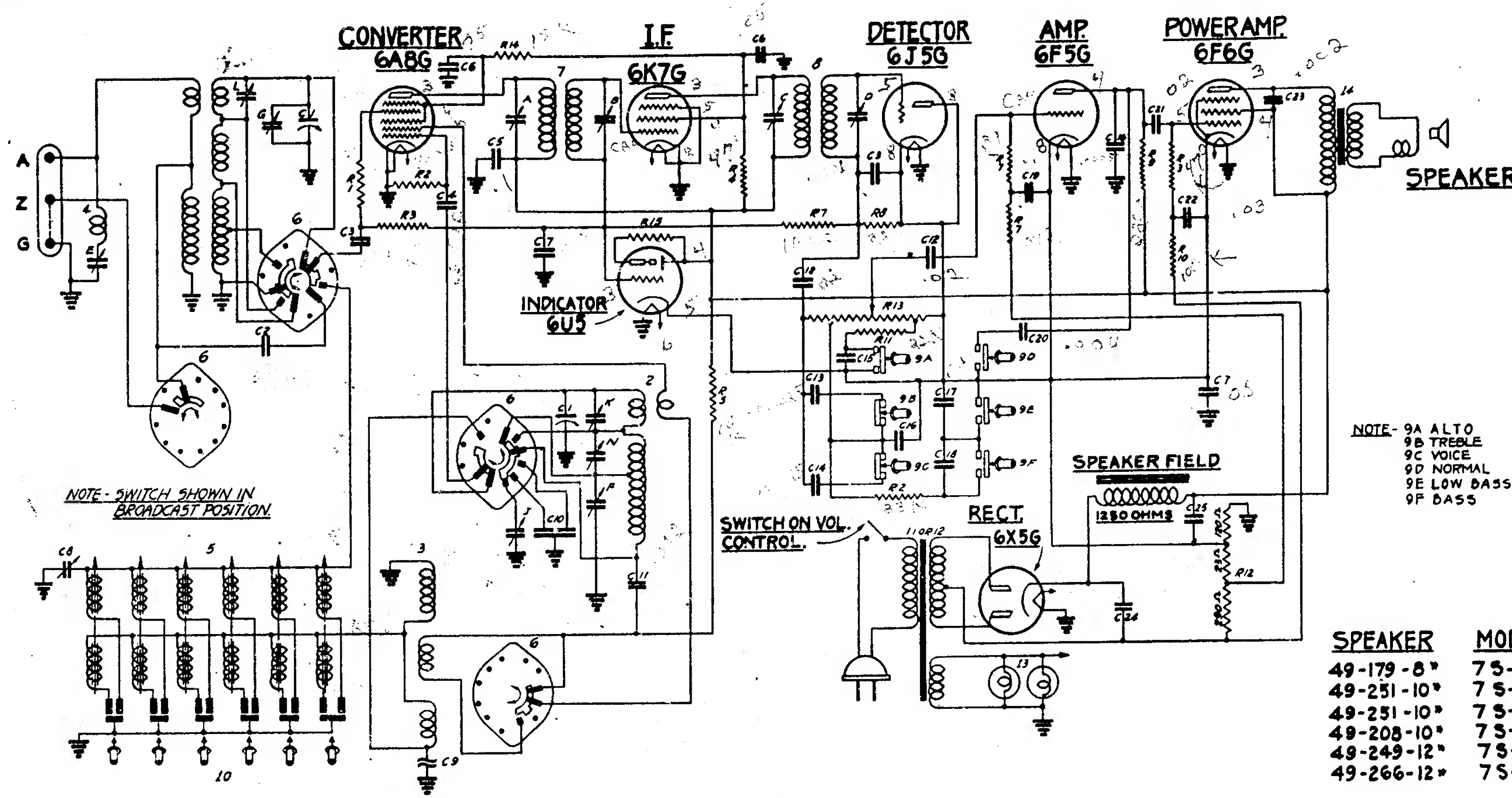
SOCKET VOLTAGES



Location of Tubes and Trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	455	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Post	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	1500	GH	Al'gment of Ant. and Det.
4	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
5	" " "	200 Mmfd.		"		FGH	Repeat 2 & 3
6	" " "	400 Ohms	18000	S.W.	18000	K	Set Osc. to scale
7	" " "	400 Ohms	18000	S.W.	18000	M	Rock gang & adj. for max. output
8	" " "	400 Ohms	6000	Police	6000	NO	Rock gang & adj. for max. output



SPEAKER	MODEL
49-179 - 8"	7S-323
49-251 - 10"	7S-342
49-251 - 10"	7S-343
49-208 - 10"	7S-363
49-249 - 12"	7S-366
49-266 - 12"	7S-364

DIAG. No	PART No	DESCRIPTION		DIAG No	PART No	DESCRIPTION		DIAG No	PART No	DESCRIPTION		DWG No	PART No	DESCRIPTION
C-1	22-717	TWO GANG VAR. COND.		[illegible]	22-435	.02 MFD.	600V	R-13	63-985	VOLUME CONTROL				
C-2	22-289	50 MMFD.	600V	C-22	22-219	.03 MFD	200V	R-14	63-643	18 M OHM	[illegible]			
C-3	22-162	.0001 MFD.	600V	C-23	22-492	.002 MFD.	600V	R-15		1 MEGOHM MOUNTED IN		A		1ST. I.F. TRANS. PRI.
C-4	22-127	25 MMFD	600V	C-24	22-718	12 MFD. ELECTROLYTIC	450V			TUNING TUBE BASE		B		1ST. I.F. TRANS. SEC.
C-5	22-170	.1 MFD.	400V	C-25	22-719	16 MFD ELECTROLYTIC	350V	1				C		2ND I.F. TRANS. PRI.
C-6	22-212	.05 MFD	400V						5-6284	ANTENNA COIL & SHIELD ASSEM.		D		2ND I.F. TRANS. SEC.
C-7	22-250	.05 MFD.	200V					2				E		WAVE TRAP
C-8	22-519	TRIMMER COND.							5-6295	OSC. COIL & SHIELD ASSEM.		F		BROADCAST OSC. (SEE NOTE)
C-9	22-760	COMPENSATING COND.		R-1	63-621	39 OHM	1/4 W	3	20-196	COMPENSATING COIL		G		ANTENNA BROADCAST (ON GANG)
C-10	22-708	DUAL FIXED PADDER		R-2	63-592	33 M OHM	1/4 W	4	90-164	WAVE TRAP		J	22-443	BROADCAST PADDER
C-11	22-358	.002 MFD.	600V	R-3	63-597	470 M OHM	1/4 W	5				K		SHORT WAVE OSC. (SEE NOTE)
C-12	22-327	.02 MFD.	200V	R-4	63-961	47 M OHM	1 W	6	85-151	BAND SELECTOR SWITCH		L	22-305	SHORT WAVE DETECTOR
C-13	22-162	.00025 MFD	600V	R-5	63-680	10 M OHM	1 W	7	95-536	1ST. I.F. TRANSFORMER		N		POLICE BAND OSC. (SEE NOTE)
C-14	22-470	.00015 MFD.	600V					8	95-537	2ND I.F. TRANSFORMER				
C-15	22-185	.01 MFD.	200V	R-7	63-271	1 MEGOHM	1/4 W	9	5-6224	TONE CONTROL SW. ASSEM.				
C-16	22-147	.0005 MFD	600V	R-8	63-655	220 M OHM	1/4 W	10	85-152	AUTOMATIC TUNING SWITCH				
C-17	22-458	.006 MFD.	600V	R-9	63-296	220 M OHM	1/4 W	11	95-526	POWER TRANS. 117V 50-60 ~				NOTE - TRIMMERS "F-K & N"
C-18	22-326	.003 MFD	400V	R-10	63-585	100 M OHM	1/4 W	12	95-535	POWER TRANS. ALL VOLTAGE 25 ~				MOUNTED ON BAKELITE
C-19	22-190	.1 MFD.	200V	R-11	63-591	22 M OHM	1/4 W	13	100-36	PILOT LIGHT .25 A - 6.3V				STRIP - PART No 22-324
C-20	22-444	.004 MFD.	600V	R-12	63-984	3 SECTION CANDOHM		14		SPEAKER TRANS.				

I.F. FREQUENCY 455 K.C.
7 TUBE SUPERHETERODYNE
CHASSIS No 5714-A.C. 3-BAND
ZENITH RADIO CORPORATION
CHICAGO, ILL.

Chassis No. 5714

Models 7S323, 7S342, 7S343, 7S363, 7S364, 7S366

CHASSIS No. 5714

NOTE

Voltages measured with a 1000 ohm per volt meter from chassis to socket contacts. Antenna disconnected — volume control on full.

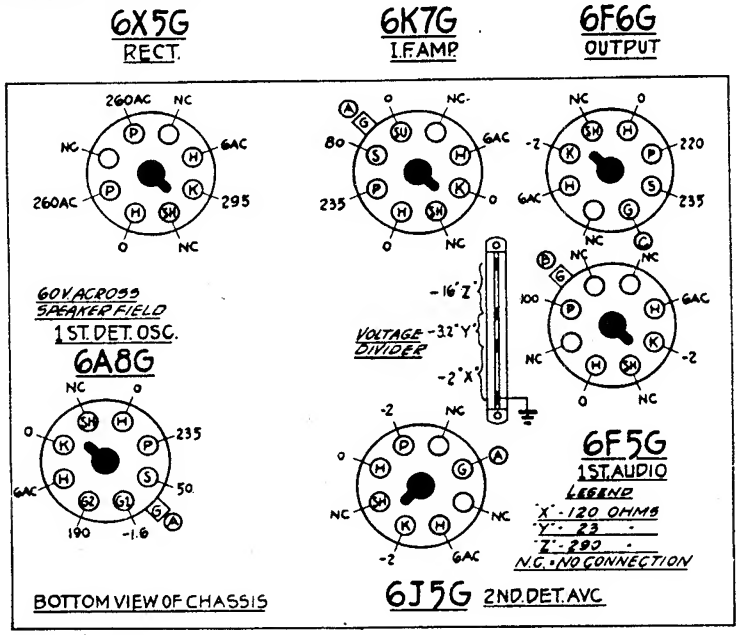
Line voltage 115 V. Consumption 65 watts.

Power Output 4.5 watts.

(A) Bias for 6J5 — 6K7 and 6A8 measured across X of voltage divider is—2 volts.

(B) Bias for 6F5 measured across X and Y sections of voltage divider is—3.2 volts.

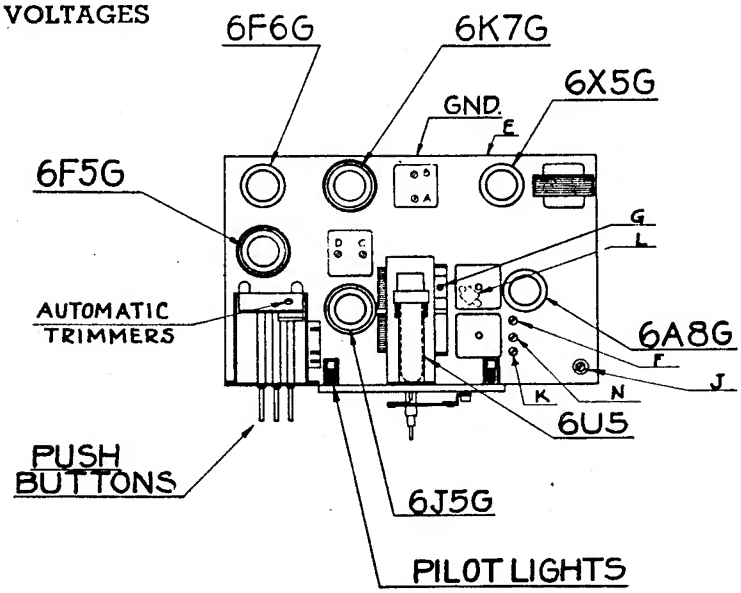
(C) Bias for 6F6 measured across XY and Z sections of voltage divider is—16 volts.



LEGEND

SH — Shield
H — Heater
P — Plate
S — Screen
G — Grid
SU — Suppressor
D — Diode
K — Cathode
NC — No Connection
F — Filament

SOCKET VOLTAGES

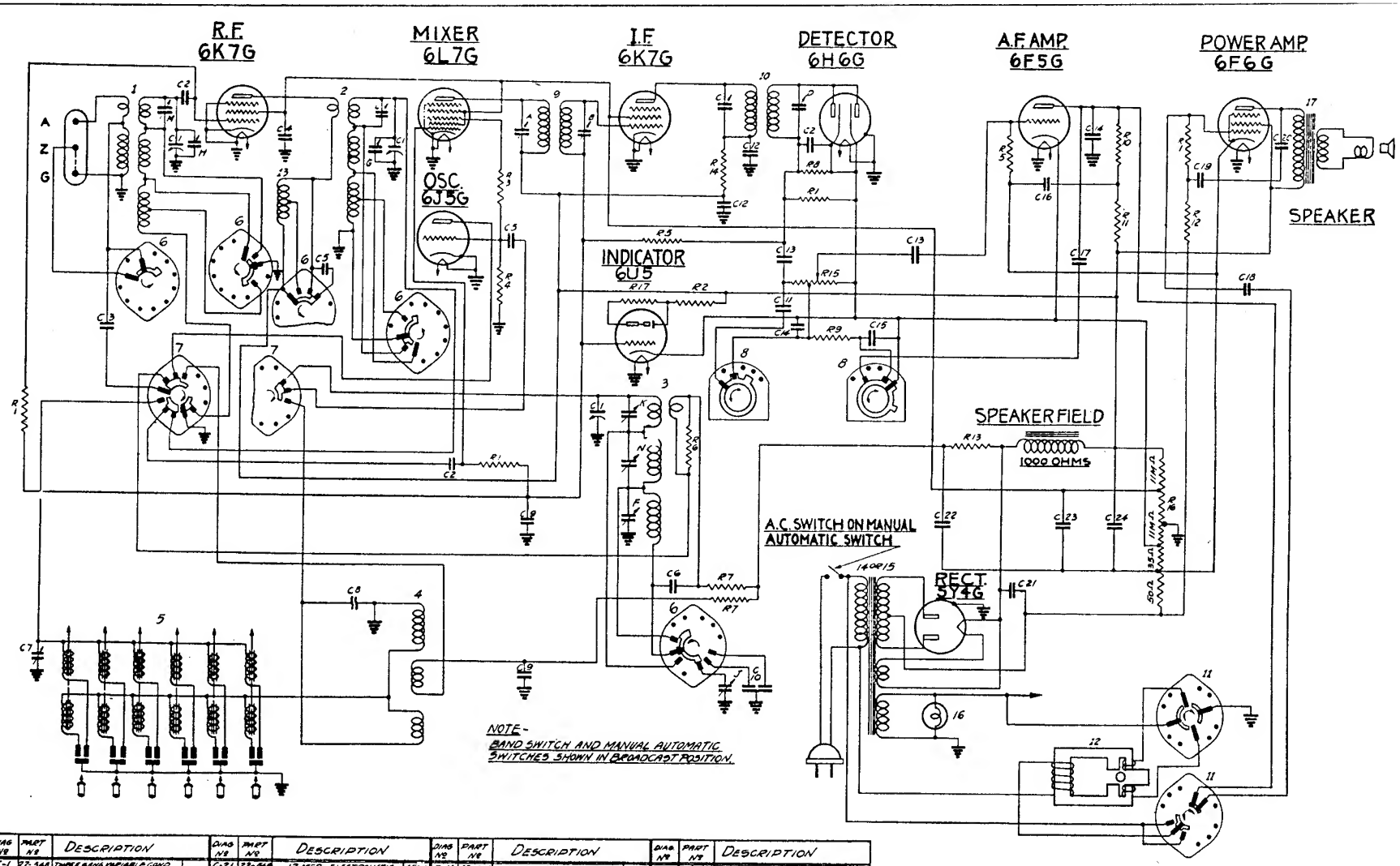


Location of Tubes and Trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	455	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Post	200 Mmfd.	455	"	600	E	See Note
3	" " "	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
4	" " "	200 Mmfd.	1500	"	1500	G	Al'gment of Ant.
5	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output.
6	" " "	200 Mmfd.		"		FG	Repea 3 & 4
7	" " "	400 Ohms	18000	S.W.	18000	K	Set Osc. to Scale
8	" " "	400 Ohms	18000	S.W.	18000	L	Rock Gang & adj. for max. output.
9	" " "	400 Ohms	6000	Police	6000	N	Rock Gang & adj. for max. output.

NOTE: If receiver is used in location subject to code interference adjust wave trap (E) for minimum interference with antenna connected and receiver operating in broadcast band.



DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION
C-1	22-548	THREE GANG VARIABLE COND.		C-21	22-548	.12 MFD. ELECTROLYTIC	450V	R-14	63-603	1000 OHM	1/2W	11	83-116	MOTOR CONTROL SWITCH
C-2	22-162	.0001 MFD.	600V	C-22		2 MFD ELECTROLYTIC	450V	R-15	63-568	2 MEGOHM VOL CONTROL		12	141-81	MOTOR
C-3	22-289	50 MMFD.	600V	C-23	22-571	6 MFD ELECTROLYTIC	200V	R-16	63-570	CANOHM RESISTOR		13	20-135	P.A. CHOKE
C-4	22-170	.1 MFD.	400V	C-24		8 MFD ELECTROLYTIC	450V	R-17		1 MEGOHM (IN TWIN TUBE SOCKET)		14	95-618	POWER TRANS. 117V- 50-60~
C-5	22-127	25 MMFD.	600V									15	95-651	POWER TRANS. 25% ALL VOLTAGE
C-6	22-358	.002 MFD.	600V									16	100-56	PILOT LIGHT
C-7	22-519	TRIMMER COND.												
C-8	20-609	COMPENSATING COND.		R-1	63-587	470 M OHM	1/4 W	1				A		1ST I.F. TRANS. PRI.
C-9	22-487	.05 MFD.	400V	R-2	63-609	22 M OHM	1/2 W		5-507	ANTENNA COIL & SHIELD ASSEM		B		1ST I.F. TRANS. SEC.
C-10	22-558	DUAL FIXED PADDER		R-3	63-581	470 OHM	1/4 W	2				C		2ND I.F. TRANS. PRI.
C-11	22-182	.00025 MFD.	600V	R-4	63-645	27 MOHM	1/4 W		5-508	DET. COIL & SHIELD ASSEMBLY		D		2ND I.F. TRANS. SEC.
C-12	22-212	.05 MFD.	400V	R-5	63-271	1 MEGOHM	1/4 W	3				F		BROADCAST OSC. (SEE NOTE)
C-13	22-327	.02 MFD.	200V	R-6	63-586	3300 OHM	1/4 W		5-509	OSC. COIL & SHIELD ASSEM		G		DET. BROADCAST (GV GANG)
C-14	22-167	.0005 MFD.	600V	R-7	63-680	10 M OHM	1 W	4	20-183	COMPENSATING COIL		H		ANT. BROADCAST (GV GANG)
C-15	22-326	.003 MFD.	400V	R-8	63-658	390 M OHM	1/4 W	5				J	22-519	BROADCAST PADDER
C-16	22-177	.2 MFD.	400V	R-9	63-593	47 M OHM	1/4 W	6	83-103	BAND SELECTOR SWITCH		K		SHORT WAVE OSC. (SEE NOTE)
C-17	22-448	.004 MFD.	600V	R-10	63-596	220 M OHM	1/4 W	7	83-141	MANUAL AUTOMATIC SWITCH		L		SHORT WAVE DET. (SEE NOTE)
C-18	22-435	.02 MFD.	600V	R-11	63-654	180 M OHM	1/4 W	8	83-108	TONE CONTROL SWITCH		M	22-418	SHORT WAVE ANTENNA
C-19	22-250	.05 MFD.	200V	R-12	63-595	100 M OHM	1/4 W	9	95-416	1ST I.F. TRANSFORMER		N		POLICE BAND OSC. (SEE NOTE)
C-20	22-647	.002 MFD.	400V	R-13	63-608	15 M OHM	1 W	10	95-417	2ND I.F. TRANSFORMER				

NOTE - TRIMMERS "F-K-L & N" MOUNTED ON BAKELITE STRIP PART # 22-549 -

SPEAKER	MODEL
49-148-12"	95-365

I.F. FREQUENCY 455 K.C.
9 TUBE SUPERHETERODYNE
CHASSIS Nº 5906 A.C. 3 BAND
ZENITH RADIO CORPORATION
CHICAGO, ILLINOIS

Chassis No. 5906

Model 9S365
CHASSIS No. 5906

NOTE

Voltages measured with a 1000 ohm per volt meter from chassis to socket contacts. Antenna disconnected — volume control on full.

Line voltage 115 v. Consumption 75 watts.

Power Output 4.5 watts.

(A) Bias for 6A8—6K7 R.F. and I.F. and 6H6 measured at X is—2.6 volts.

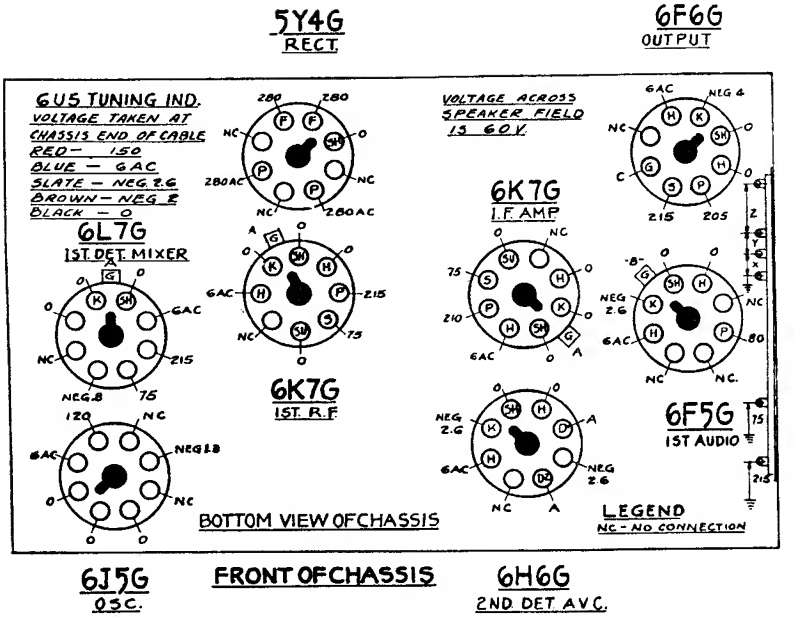
(B) Bias for 6F5 measured at X and Y is—4 volts.

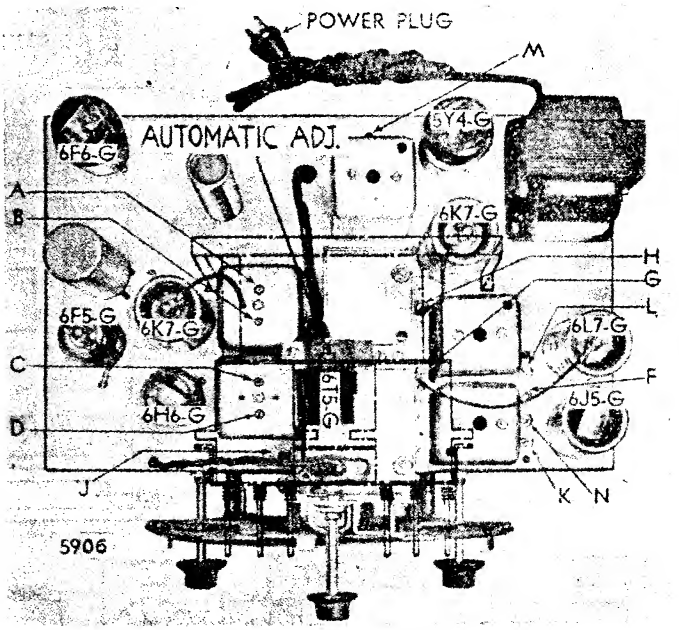
(C) Bias for 6F6 measured across XY and Z is—16 volts.

LEGEND

SH — Shield
H — Heater
P — Plate
S — Screen
G — Grid
SU — Suppressor
D — Diode
K — Cathode
NC — No Connection
F — Filament

SOCKET VOLTAGES

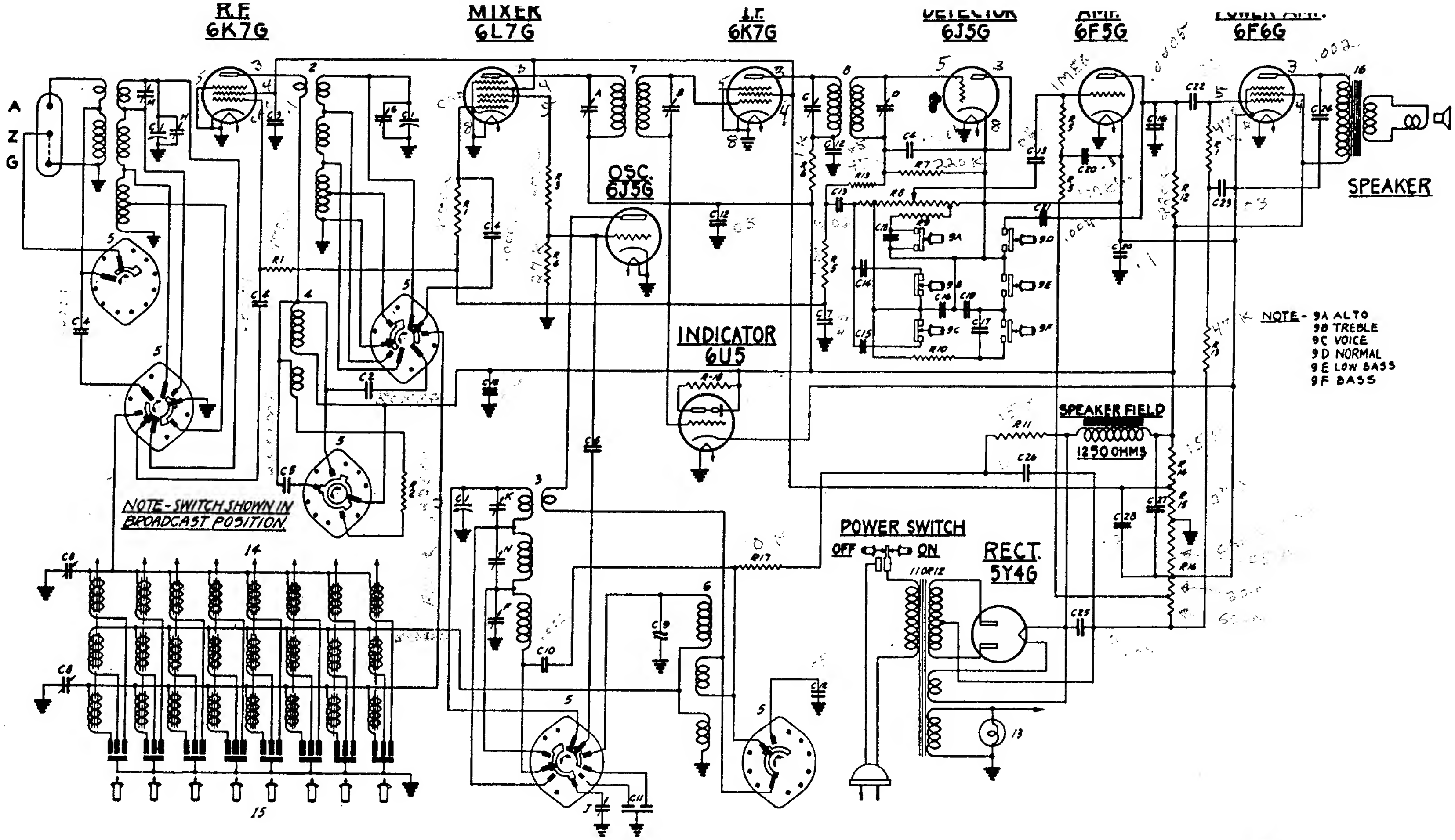




Location of Tubes and Trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	456	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Post	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	1500	GH	Al'gment of Ant. and Det.
4	" " "	200 Mmfd.	600	"		J	Rock gang & adj. for max. output
5				"		FGH	Repeat 2 & 3
6	Rec. Ant. Post	400 Ohms	18000	S.W.	18000	K	Set Osc. to Scale
7	" " "	400 Ohms	16500	S.W.	16500	LM	Rock gang & adj. for max. output
8	" " "	400 Ohms	5500	Police	5500	N	Rock gang & adj. for max. output



MODEL	SPEAKER
9 S 307	49-249-12"
9 S 324	49-179-8"
9 S 344	49-251-10"
9 S 367	49-249-12"
9 S 369	49-249-12"

I.F. FREQUENCY 455 K.C.
9-TUBE SUPERHETERODYNE
CHASSIS Nº 5907 A.C. 3-BAND
ZENITH RADIO CORPORATION
CHICAGO, ILL.

DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION
C-1	22-746	THREE GANG VAR. COND.		C-24	22-627	.002 MFD	1000V	R-16	63-992	3 SECTION CANDOHM		14		
C-2	22-209	50 MMFD	600V	C-25	22-711	10 MFD ELECTROLYTIC	450V	R-17	63-680	10 M OHM	1W	15	85-469	AUTOMATIC TUNING UNIT SWITCH
C-3	22-170	.1 MFD	400V	C-26		5 MFD. ELECTROLYTIC	450V	R-18		1 MEGOHM (MTD. IN TUBE SOCKET		16		SPEAKER TRANSFORMER
C-4	22-162	.0001 MFD	600V	C-27	22-710	16 MFD. ELECTROLYTIC	450V							
C-5	22-127	25 MMFD	600V	C-28		10 MFD. ELECTROLYTIC	250V							
C-7	22-250	.05 MFD	200V											
C-8	22-510	TRIMMER COND.						1						
C-9	22-738	COMPENSATING COND.		R-1	63-597	470 M OHM	¼W		S-6207	ANT. COIL & SHIELD ASSEMBLY		A		1ST I.F. TRANSFORMER PRI.
C-10	22-358	.002 MFD	600V	R-2	63-586	2200 OHM	¼W	2				B		1ST I.F. TRANSFORMER SEC.
C-11	22-708	DUAL FIXED PADDER		R-3	63-581	470 OHM	¼W		S-6208	DET. COIL & SHIELD ASSEMBLY		C		2ND I.F. TRANSFORMER PRI.
C-12	22-212	.05 MFD	400V	R-4	63-643	27 M OHM	¼W	3				D		2ND I.F. TRANSFORMER SEC.
C-13	22-327	.02 MFD	200V	R-5	63-271	1 MEGOHM	¼W		S-6209	OSC. COIL & SHIELD ASSEMBLY		F		BROADCAST OSC. (SEE NOTE)
C-14	22-182	.00025 MFD	600V	R-6	63-605	1000 OHM	½W	4	20-189	R.F. PLATE CHOKE		G		DETECTOR BROADCAST (ON GANG)
C-15	22-470	.00015 MFD	600V	R-7	63-658	220 M. OHM	¼W	5	85-167	BAND SELECTOR SWITCH		H		ANTENNA BROADCAST (ON GANG)
C-16	22-147	.0005 MFD	600V	R-8	63-578	VOLUME CONTROL		6	20-196	COMPENSATING COIL		J	22-463	BROADCAST PADDER
C-17	22-326	.003 MFD	400V	R-9	63-591	22 M OHM	¼W	7	95-636	1ST I.F. TRANSFORMER		K		SHORT WAVE OSC. (SEE NOTE)
C-18	22-185	.01 MFD	200V	R-10	63-602	33 M OHM	¼W	8	95-539	2ND I.F. TRANSFORMER		M	22-418	SHORT WAVE ANTENNA
C-19	22-458	.006 MFD	600V	R-11	63-606	15 M OHM	1W	9	S-6224	TONE CONTROL SWITCH ASSEM.		N		POLICE BAND OSC. (SEE NOTE)
C-20	22-190	.1 MFD	200V	R-12	63-206	220 M OHM	¼W	10	S-6248	A.C. SWITCH ASSEMBLY				
C-21	22-440	.004 MFD	600V	R-13	63-603	47 M OHM	¼W	11	95-525	POWER TRANS. 110V 50-60 ~				NOTE - TRIMMERS "F-K & N" ARE
C-22	22-435	.02 MFD	600V	R-14	63-908	15 M OHM WIREWOUND		12	95-545	POWER TRANS. 25 ~ ALL VOLTAGE				MOUNTED IN BAKELITE STRIPS
C-23	22-219	.03 MFD	200V	R-15	63-676	27 M OHM	1W	13	100-36	PILOT LIGHT .25A 6.3V				PART Nº 22-390 —

Chassis No. 5907

NOTE

Voltages measured with a 1000 ohm per volt meter from chassis to socket contacts. Antenna disconnected — volume control on full.

Line voltage 115 v. Consumption 75 watts

Power Output 4.5 watts.

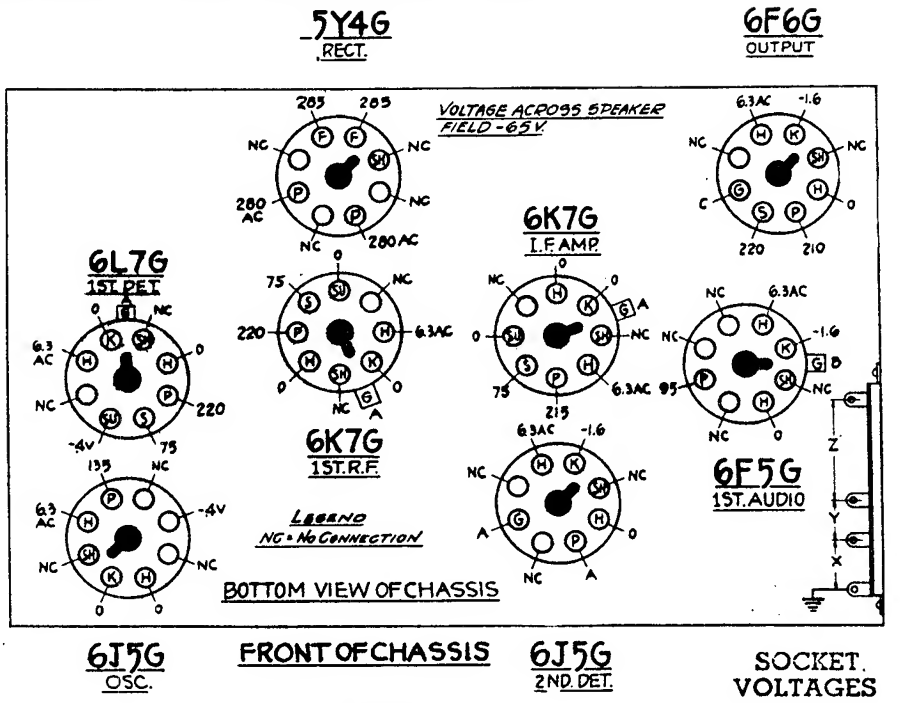
(A) Bias for 6K7 R. F. and I.F. —6L7—6U5 and 6J5 second det. measured across X and is—1.6 volt.

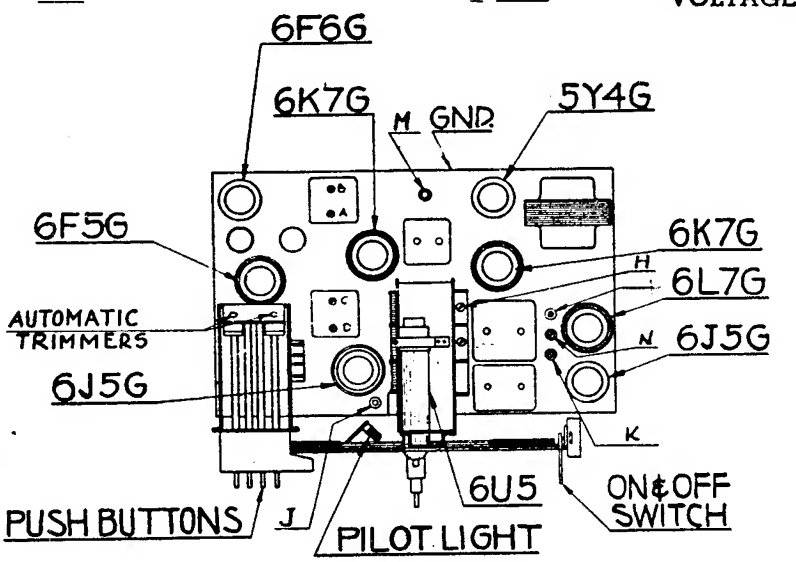
(B) Bias for 6F5 measured across X and Y and is—3 volts.

(C) Bias for 6F6 measured across XY and Z and is—16 volts.

LEGEND

SH — Shield
H — Heater
P — Plate
S — Screen
G — Grid
SU — Suppressor
D — Diode
K — Cathode
NC — No Connection
F — Filament

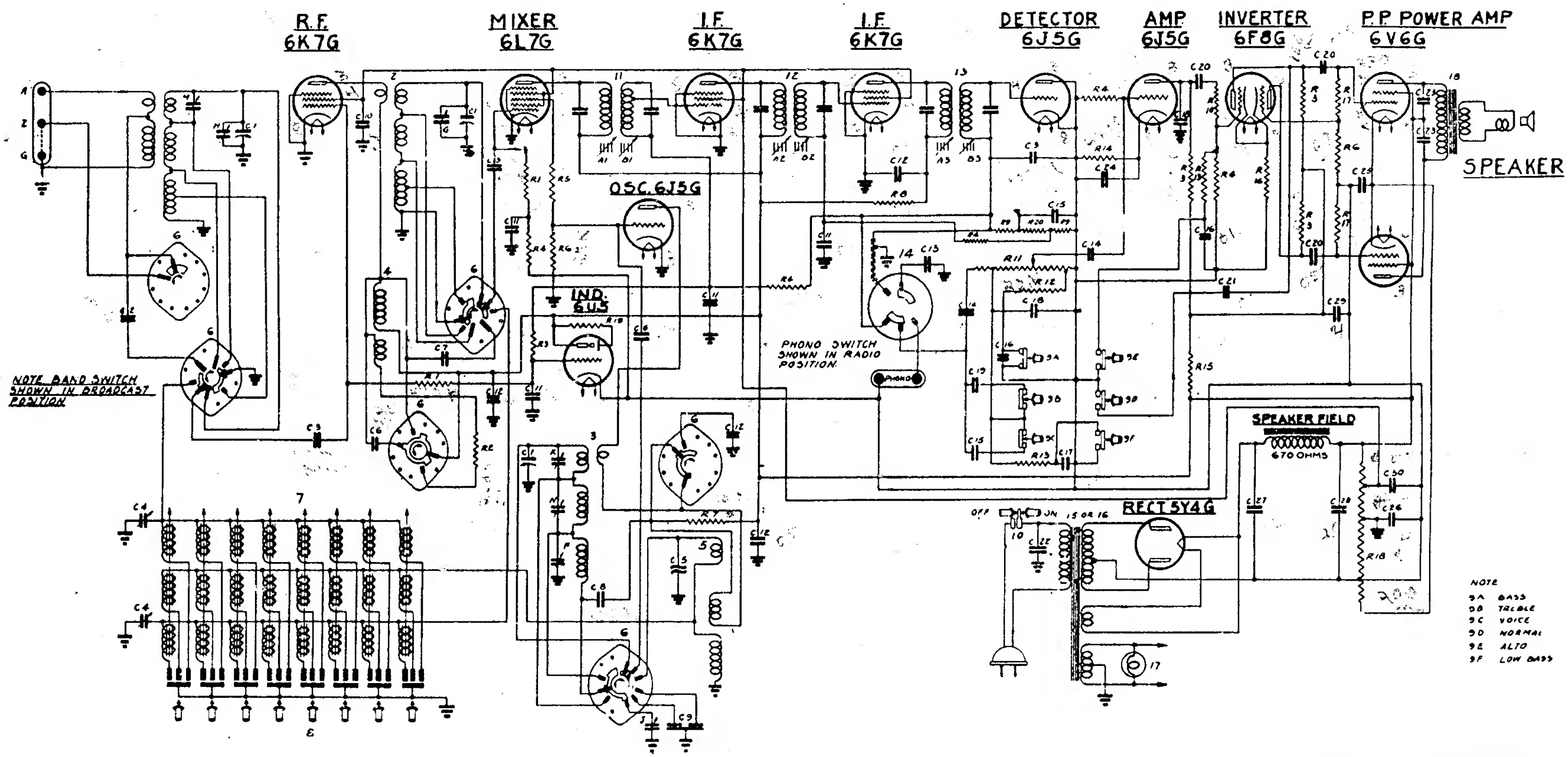




Location of Tubes and Trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	455	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Post	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	1500	GH	Al'gment of Ant. and Det.
4	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
5	" " "	200 Mmfd.		"		FGH	Repeat 2 & 3
6	" " "	400 Ohms	18000	S.W.	18000	K	Set Osc. to scale
7	" " "	400 Ohms	18000	S.W.	18000	M	Rock gang & adj. for max. output
8	" " "	400 Ohms	6000	Police	6000	N	Rock gang & adj. for max. output



NOTE
9A BASS
9B TREBLE
9C VOICE
9D NORMAL
9E ALTO
9F LOW BASS

MODEL	SPEAKER
125-345	49-253 - 12"
125-370	49-188 - 12"
125-371	49-185 - 12"

I.F. FREQUENCY 455 K.C.
12 TUBE SUPERHETERODYNE
CHASSIS Nº 1206 A.C. 5 BAND
ZENITH RADIO CORPORATION
CHICAGO, ILL.

DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION	DIAG Nº	PART Nº	DESCRIPTION
C-1	22-746	THREE GANG VAR. COND		C-21	22-196	.01 MFD	1000V	R-6	63-645	27 M OHM	1/4W	1			17	100-36	PILOT LIGHT 25A-6V
C-2	22-289	50 MMFD	600V	C-22	22-326	.004 MFD	600V	R-7	63-646	15 M OHM	W		5-6327	ANT COIL AND SHIELD ASSEM	18		SPEAKER TRANS
C-3	22-162	.0001 MFD	600V	C-23	22-229	.006 MFD	600V	R-8	63-605	1000 OHM	1/2W	2					
C-4	22-519	TRIMMER COND		C-24		20 MFD ELECTROLYTIC	25V	R-9	63-609	56 M OHM	1/4W		5-6328	DET COIL & SHIELD ASSEM	A1		1ST IF TRANS PRI
C-5	22-743	COMPENSATING COND		C-25	22-748	20 MFD ELECTROLYTIC	25V	R-10	63-685	220 M OHM	1/4W	3			B1		1ST IF TRANS SEC
C-6	22-127	25 MMFD	600V	C-26		40 MFD ELECTROLYTIC	25V	R-11	63-980	VOLUME CONTROL			5-6329	OSC COIL & SHIELD ASSEM	A2		2ND IF TRANS PRI
C-7	22-285	10 MMFD	600V	C-27	22-714	12 MFD ELECTROLYTIC	450V	R-12	63-591	22 M OHM	1/4W	4	20-189	RF PLATE CHOKE	B2		2ND IF TRANS SEC
C-8	22-358	.002 MFD	600V	C-28		20 MFD ELECTROLYTIC	450V	R-13	63-593	47 M OHM	1/4W	5	20-196	COMPENSATING COIL	A3		3RD IF TRANS PRI
C-9	22-708	DUAL FIXED PADDER		C-29		4 MFD ELECTROLYTIC	450V	R-14	63-705	2200 OHM	1/4W	6	85-147	BAND SELECTOR SWITCH	B3		3RD IF TRANS SEC
C-10	22-170	.1 MFD	400V	C-30	22-728	40 MFD ELECTROLYTIC	200V	R-15	63-680	10 M OHM	1W	7			F		BROADCAST OSC (SEE NOTE)
C-11	22-290	.05 MFD	200V					R-16	63-639	2700 OHM	1/4W				G		DETECTOR BRDCST (SEE NOTE)
C-12	22-212	.05 MFD	400V					R-17	63-657	330 M OHM	1/4W	8	85-149	AUTOMATIC TUNING SW	H		ANT BRDCST (ON GANG)
C-13	22-190	.1 MFD	200V					R-18	63-981	4 SECTION CANDOHM		9	5-6224	TONE CONTROL SWITCH	J	22463	BROADCAST OSC PADDER
C-14	22-327	.02 MFD	200V					R-19		1 MEGOHM MOUNTED IN		10	5-6333	A C SWITCH ASSEMBLY	K		SHORT WAVE OSC (SEE NOTE)
C-15	22-132	.00025 MFD	600V							TUNING SOCKET		11	5-6374	1ST I F TRANS ASSEM	M	22-524	SHORT WAVE ANTENNA
C-16	22-185	.01 MFD	200V	R-1	63-597	470 M OHM	1/4W	R-20	63-653	150 M OHM	1/4W	12	5-6375	2ND I F TRANS ASSEM	N		POLICE BAND OSC (SEE NOTE)
C-17	22-448	.006 MFD	600V	R-2	63-585	2200 OHM	1/4W					13	5-6376	3RD I F TRANS ASSEM			NOTE TRIMMERS F, H &
C-18	22-147	.0005 MFD	600V	R-3	63-595	100 M OHM	1/4W					14	85-158	PHONO SWITCH			N ARE MOUNTED ON
C-19	22-470	.00015 MFD	500V	R-4	63-271	1 MEGOHM	1/4W					15	95-578	POWER TRANS 117V-50-60~			BAKELITE STRIP "Z"731
C-20	22-171	.05 MFD	600V	R-5	63-581	470 OHM	1/4W					16	95-543	POWER TRANS ALL VOLTAGE 25 CYCLE			

Chassis No. 1206

Models 12S345, 12S370, 12S371

CHASSIS No. 1206

NOTE

Voltages measured with a 1000 ohm per volt meter from chassis to socket contacts. Antenna disconnected — volume control on full.

Line voltage 115 volts. Consumption 110 watts.

Power Output 15 watts.

(A) Bias for 6J5 first audio is measured across R14 and is +2.3 volts.

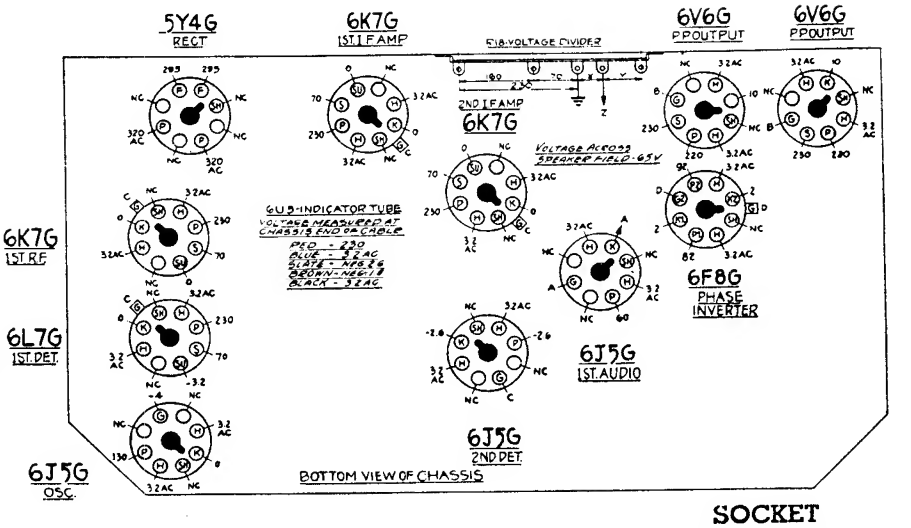
(B) Bias for 6V6 tubes measured across Y is +10 volts.

(C) Bias for 6K7 R.F. and I.F. and 6L7 measured across X is —2.6 volts.

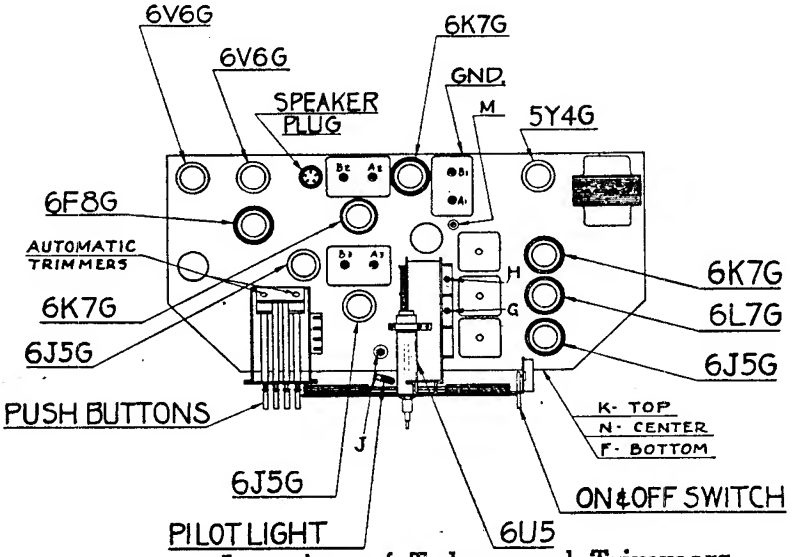
(D) Bias for 6F8 grids shown at cathodes of 6F8 sockets.

LEGEND

SH — Shield
H — Heater
P — Plate
S — Screen
G — Grid
SU — Suppressor
D — Diode
K — Cathode
NC — No Connection
F — Filament



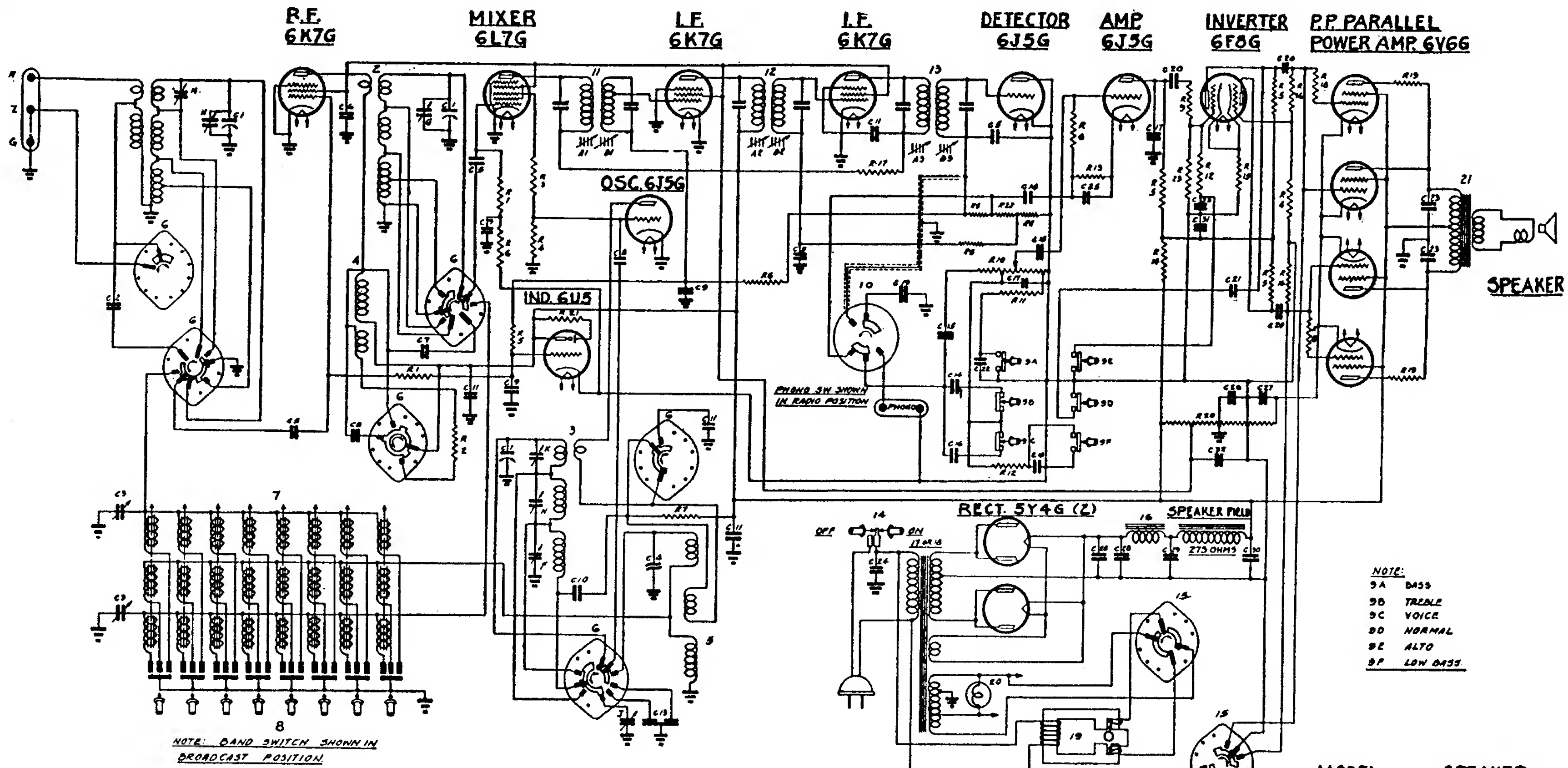
SOCKET VOLTAGES



Location of Tubes and Trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	455	Br'dc't	600	ABABAB 112233	I. F. Alignment
2	Rec. Ant. Post	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	1500	GH	Al'gment of Ant. and Det.
4	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
5	" " "			"		FGH	Repeat 2 & 3
6	" " "	400 Ohms	18000	S.W.	18000	K	Set. Osc. to Scale
7	" " "	400 Ohms	18000	S.W.	18000	M	Rock Gang & adj. for max. output
8	" " "	400 Ohms	6000	Police	6000	N	Rock gang & adj. for max. output



MODEL	SPEAKER
155-308	49-186-12"
155-346	49-284-12"
155-372	49-186-12"
155-375	49-186-12"

DIAG NO.	PART NO.	DESCRIPTION	
C-1	22-746	THREE GANG VARIABLE	
C-2	22-289	80 MMFD	600V
C-3	22-519	TRIMMER COND.	
C-4	22-743	COMPENSATING COND	
C-5	22-162	.0001 MFD	600V
C-6	22-170	.1 MFD	400V
C-7	22-256	10 MMFD	600V
C-8	22-127	26 MMFD	600V
C-9	22-254	.05 MFD	200V
C-10	22-350	.002 MFD	600V
C-11	22-212	.05 MFD	400V
C-13	22-700	DUAL FIXED PADDER	
C-14	22-182	.00025 MFD	600V
C-15	22-327	.02 MFD	200V
C-16	22-470	.00015 MFD	600V
C-17	22-167	.0005 MFD	600V
C-18	22-448	.006 MFD	600V
C-19	22-190	.1 MFD	200V
C-20	22-171	.25 MFD	600V
C-21	22-196	.01 MFD	600V

DIAG NO.	PART NO.	DESCRIPTION	
C-22	22-326	.003 MFD	400V
C-23	22-459	.01 MFD	1200V
C-24	22-529	.008 MFD	1000V
C-25		20 MFD ELECTROLYTIC	25V
C-26	22-748	40 MFD ELECTROLYTIC	25V
C-27		20 MFD ELECTROLYTIC	25V
C-28	22-964	12 MFD ELECTROLYTIC	450V
C-29	22-727	10 MFD ELECTROLYTIC	450V
C-30		10 MFD ELECTROLYTIC	450V
C-31		16 MFD ELECTROLYTIC	450V
C-32	22-747	60 MFD ELECTROLYTIC	200V
C-33	22-106	.01 MFD	200V
R-1	63-597	470 M OHM	1/2W
R-2	63-585	2200 OHM	1/4W
R-3	63-501	470 OHM	1/2W
R-4	63-665	27 M OHM	1/2W
R-5	63-695	100 M OHM	1/4W
R-6	63-571	1 MEGOHM	1/2W

DIAG NO.	PART NO.	DESCRIPTION	
R-7	63-600	15 M OHM	1W
R-8	63-609	56 M OHM	1/2W
R-9	63-635	220 M OHM	1/2W
R-10	63-980	VOLUME CONTROL	
R-11	63-591	22 M OHM	1/2W
R-12	63-593	47 M OHM	1/2W
R-13	63-202	2200 OHM	1/2W
R-14	63-600	10 M OHM	1W
R-15	63-639	2700 OHM	1/4W
R-16	63-657	330 M OHM	1/4W
R-17	63-605	1000 OHM	1/2W
R-18	63-577	100 OHM	1/4W
R-19	63-618	22 OHM	1/2W
R-20	63-806	4 SECTION CANDOHM	
R-21		1 MEGOHM MOUNTED IN TUNING TUBE BASE	
R-22	63-699	150 M OHM	1/4W
R-23	63-600	500 M OHM	1/4W

DIAG NO.	PART NO.	DESCRIPTION
1		
	S-6327	ANT. COIL & SHIELD ASSEM.
2		
	S-6328	DET. COIL & SHIELD ASSEM.
3		
	S-6329	OSC. COIL & SHIELD ASSEM.
4	20-189	R.F. CHOKE COIL
5	20-196	COMPENSATING COIL
6	85-167	BAND SELECTOR SW.
7		
8	85-149	AUTOMATIC TUNING SW.
9	S-6224	TONE CONTROL SW. ASSEM.
10	85-150	PHONO SWITCH
11	S-6374	1ST I.F. TRANSFORMER
12	S-6375	2ND I.F. TRANSFORMER
13	S-6376	3RD I.F. TRANSFORMER
14	S-6387	A.C. SWITCH ASSEM.
15	85-156	MOTOR CONTROL SWITCH
16	95-612	POWER CHOKE

DIAG NO.	PART NO.	DESCRIPTION
17	95-533	POWER TRANS. 117V-50-60~
18	95-550	POWER TRANS. ALL VOLTAGE 25~
19	141-31	MOTOR
20	100-36	PILOT LIGHT .25A. 6.3V
21		SPEAKER TRANS.
A1		1ST I.F. TRANS. PRI.
B1		1ST I.F. TRANS. SEC.
A2		2ND I.F. TRANS. PRI.
B2		2ND I.F. TRANS. SEC.
A3		3RD I.F. TRANS. PRI.
B3		3RD I.F. TRANS. SEC.
F		BROADC'ST OSC. (SEE NOTE)
G		DET. BROADC'ST (ON GANG)
H		ANT. " (ON GANG)
J	22-663	BROADCAST PADDER
K		SHORT WAVE OSC. (SEE NOTE)
M	22-526	SHORT WAVE ANTENNA.
N		POLICE BAND OSC. (SEE NOTE)

NOTE: TRIMMERS F, K & N ARE MOUNTED ON BAKELITE STRIP PART NO. 22-781

I.F. FREQUENCY 455 K.C.
15 TUBE SUPERHETERODYNE
CHASSIS No. 1502 A.C. 3 BAND
ZENITH RADIO CORPORATION
CHICAGO, ILLINOIS.

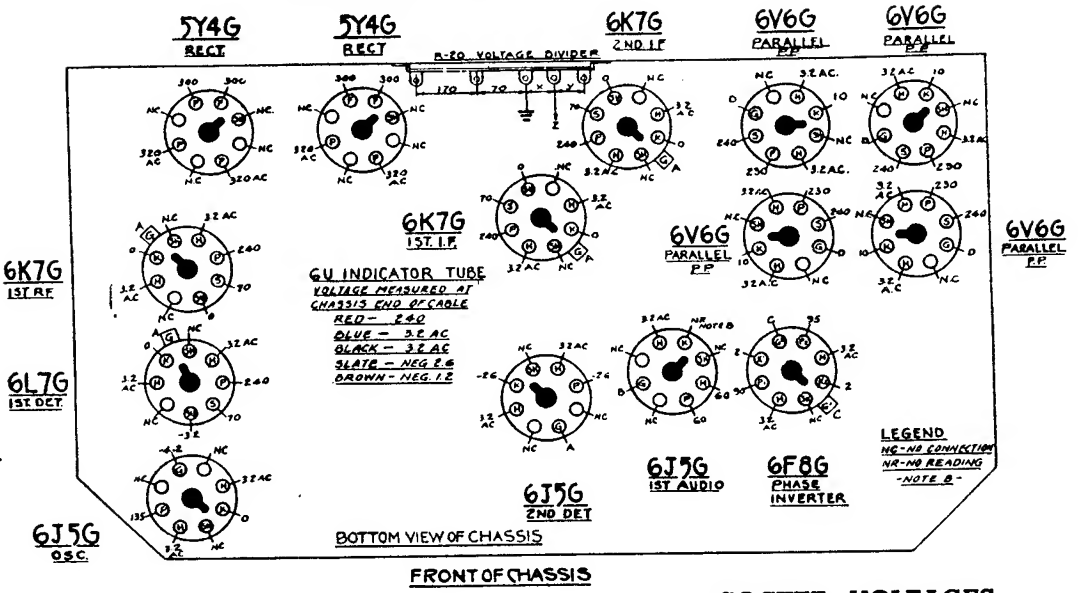
Chassis No. 1502

Models 15S308, 15S346, 15S372, 15S373

CHASSIS No. 1502

LEGEND

SH — Shield
H — Heater
P — Plate
S — Screen
G — Grid
SU — Suppressor
D — Diode
K — Cathode
NC — No Connection
F — Filament
NR — No reading



NOTE

Voltages measured with a 1000 ohm per volt meter from chassis to socket contacts. Antenna disconnected — volume control on full.

Line voltage 115 volts. Consumption 160 watts.

Power Output 30 watts.

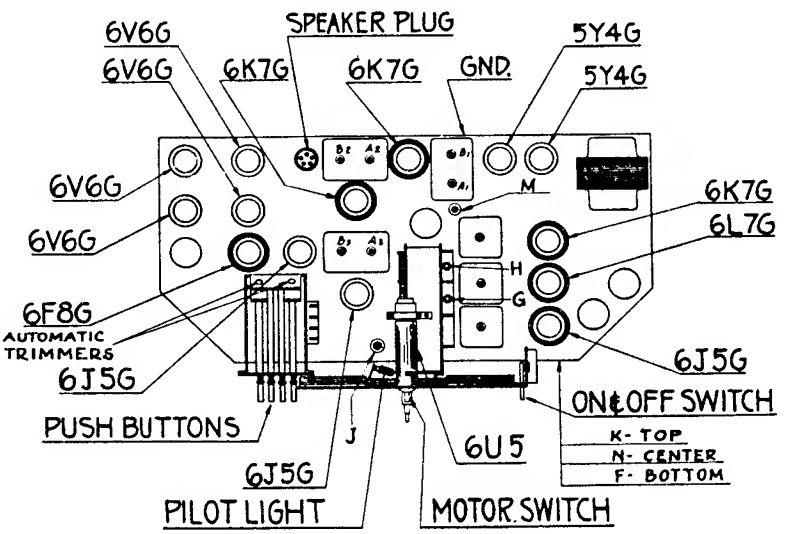
(A) Bias for 6K7 R.F. and I.F. — 6L7 — 6V5 triode and 6J5 second detector is measured across X and is—2.6 volts.

(B) Bias for 6J5 first audio is measured between points K of 6J5 socket and Z and is 2.4 volts.

(C) Bias for 6F8 measured at K^1 and K^2 and is 2 volts.

(D) Bias for the four 6V6 measured across X and Y and is 10 volts.

SOCKET VOLTAGES



Location of Tubes and Trimmers

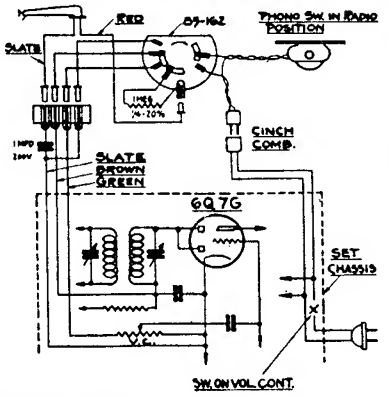
ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	455	Br'dc't	600	ABABAB 112233	I. F. Alignment
2	Rec. Ant. Post	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	1500	GH	Al'gment of Ant. and Det.
4	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
5	" " "			"		FGH	Repeat 2 & 3
6	" " "	400 Ohms	18000	S.W.	18000	K	Set Osc. to Scale
7	" " "	400 Ohms	18000	S.W.	18000	M	Rock Gang & adj. for max. output
8	" " "	400 Ohms	6000	Police	6000	N	Rock gang & adj. for max. output

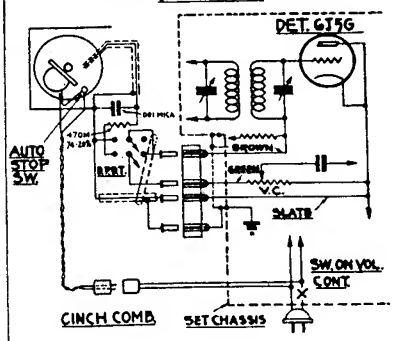
WIRING CHANGES NECESSARY FOR PHONO PICKUP

CIRCUIT CHANGES FOR PHONO PICKUP CONNECTIONS

CIRCUIT #3A
MODEL #60-302 - CHASSIS #5646
WIRING OF PHONO CKT. COMPONENTS

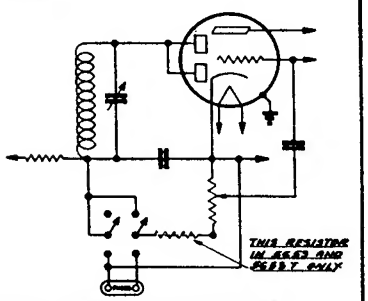


CIRCUIT #3B
MODEL #65-301 & MODEL #69-309
CHASSIS #5651



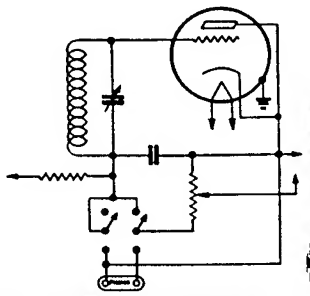
1939 PHONO CIRCUIT DATA.

CIRCUIT #1A



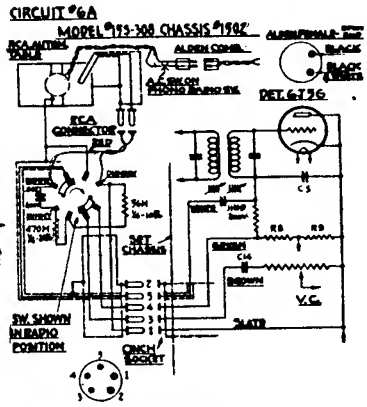
CIRCUIT CHANGES FOR PHONOGRAPH INSTALLATIONS ON CHASSIS MODELS 5410-6411-5820-5828 AT-5829-5829 AT 5646-5647-5693-5663T AND 5654.

CIRCUIT #1B



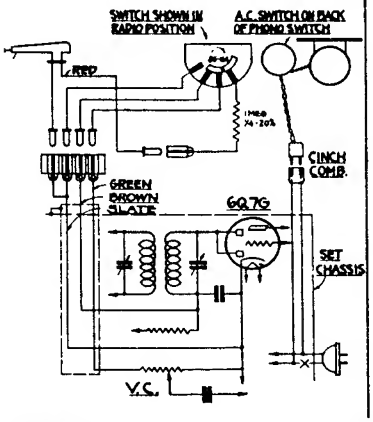
CIRCUIT CHANGES FOR PHONOGRAPH INSTALLATIONS ON CHASSIS MODELS 6681-5681 AT. 5644 SAME AS 1940M EXCEPT DIODE TUBE IS 6H6G.

CIRCUIT #6A
MODEL #93-308 CHASSIS #5902

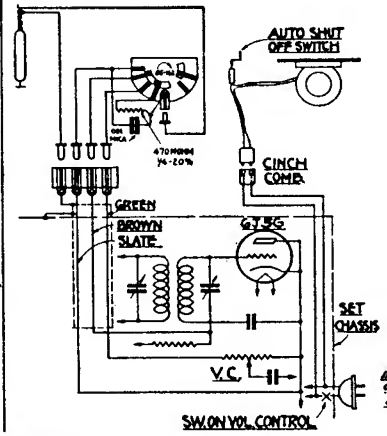


PRONG END OF CINCH MALE PLUG.

MODEL #5R-303-CHASSIS-5528
CIRCUIT #4A

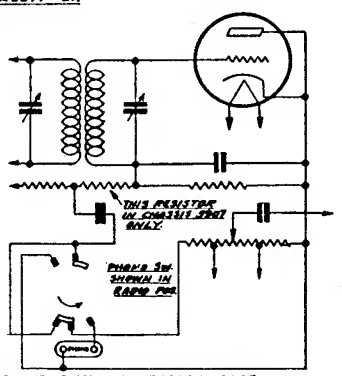


MODEL #6S-304-CHASSIS-5651
CIRCUIT #4B



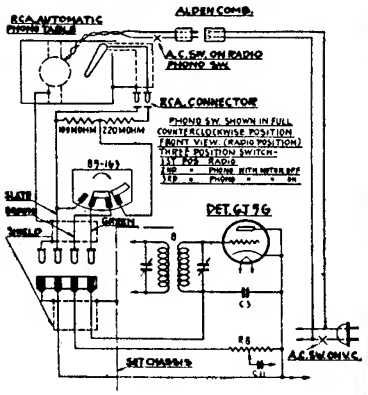
CIRCUIT #2A

DET. 6J5G

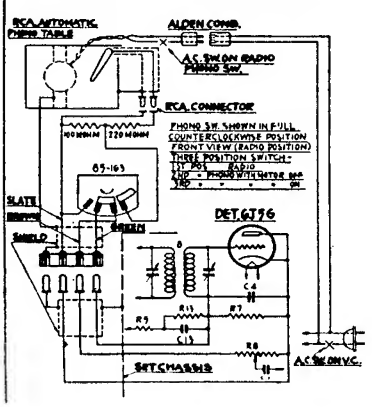


CIRCUIT CHANGES NECESSARY FOR INSTALLATION OF PHONO SW. AND JACK ON CHASSIS #5714-5907-5715 & 5715T SAME EXCEPT 6T7G DETAMP TUBE.

CIRCUIT #5A
MODEL 65-306 CHASSIS #5651

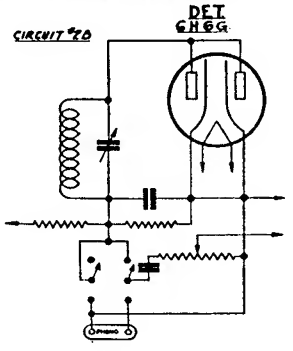


CIRCUIT #5B
MODEL 95-307 CHASSIS #5907



CIRCUIT #2B

DET. 6H6G



CIRCUIT CHANGES FOR PHONOGRAPH INSTALLATIONS ON CHASSIS MODELS 5649-5906

PARTS PRICE LIST

1939 MODELS

FOR CHASSIS MODEL CHART SEE FRONT COVER

Chassis No.	Code	Chassis No.	Code	Chassis No.	Code
1206	A	5646	G	5654	M
1502	B	5647	H	5714	N
5410	C	5648	I	5715	O
5411	D	5649	J	5906	P
5528	E	5651	K	5907	R
5529	F	5653	L		

Note—25 cycle sets are designated by the number '2' following the code letter . Example — A2—1206A.

DIAL ASSEMBLIES

12-514	Resonance ind. mtg. brkt. (lower)	P	$ .05
12-515	Resonance ind. mtg. brkt. (upper)	P	.05
19-68	Dial glass retaining clip	I	.02
19-73	Dial glass retaining clip	J	.02
26-144	Dial scale	I	.75
26-145	Dial scale	P	.50
26-163	Dial scale	J	1.25
26-196	Dial scale	G	.15
26-199	Dial scale	C-D-E-H	.15
26-200	Dial scale	F	.30
26-201	Dial scale	N	.35
26-209	Dial scale	K-L	.35
26-215	Dial scale	M	.35
27-16	Flywheel disc	A-B2-J-N-O	1.00
27-28	Flywheel disc	K-L	.30
32-13	Drive belt	I	.15
32-15	Dial belt	A-B-B2-O-P	.15
32-17	Dial belt	J	.15
32-18	Motor drive belt	B-P	.15
34-49	Condenser shaft gear	I-J	.25
34-51	Lower pinion & gear	I-J	.15
34-68	Condenser shaft gear & bush.	A-B-B2-O-P	.20
34-69	Lower drive gear & pinion	P	.15
34-72	Frequency pointer gear & sht.	P	.30
34-79	Frequency pointer gear & sht.	A-B-B2	.30
34-80	Lower drive gear & pinion	A-B-B2-O	.15
54-108	Palnut	B	.50C
56-54	Fiber clutch pin	A-B-B2	.02
56-56	Fiber clutch pin	A	.02
59-41	Split second pointer	I	.10
59-52	Split second pointer	J	.10
59-53	Frequency indicator pointer	J	.20
59-58	Split second pointer	P	.20
59-59	Frequency indicator pointer	P	.15
59-60	Frequency indicator pointer	I	.15
59-65	Dial pointer	G	.10
59-66	Dial pointer	C-D-E-H	$ .15
59-67	Dial pointer	F	.15
59-69	Station indicator pointer	A-B-B2-O-R	.08
59-70	Pointer & spring assy.	N	.10
59-71	Dial pointer	K-L-M	.15
61-34	Drive pulley	I	.10
61-42	Pointer shaft pulley	A-B-B2-O-P	.20
61-43	Drive pulley (part of S-5090)	J-P	.15
61-44	Motor shaft pulley	B-P	.15
61-51	Drive shaft pulley	A-B	.10
61-61	Drive shaft pulley	B2	.15
73-8	Dial pulley set screw	C-L-M	.02
73-16	8/32 x 1/8" headless set screw	A-O	.01
73-24	8/32 x 1/4" H.H. set screw	I	.02
73-28	Pointer pulley set screw	A-B2-O	.01
73-30	6/32 x 1/4" H.H. set screw	N	.02
76-227	Drive shaft	I	.05
76-229	Split second pointer sht. & pin.	A-B-O-P	.10
76-234	Drive shaft	J	.20
76-237	Motor switch control shaft	P	.08
76-238	Condenser drive shaft	P	.30
76-257	Tuning control shaft	G	.03
76-258	Tuning control shaft	D-E-H	.08
76-259	Tuning control shaft	F	.10
76-262	Volume control shaft	A-B-O	.10
76-263	Drive shaft	K	.10
76-265	Volume control shaft	N	.10
76-266	Condenser drive shaft	B	.10
78-226	Dial lamp socket	L-M	.10
80-60	Tension pulley spring	I-J	.03
80-69	Dial cord tension spring	C-D-E-F-G-H-K-L-M-N	.02
80-116	Dial spring	J	.03
80-118	Dial spring	I	.15
80-128	Shaft pulley spring	I	.01
80-130	Clutch spring	A-B-B2-J-P	.03
80-136	Movable scale return spring	P	.05
80-137	Dial glass retaining spring	P	.01
80-138	Retainer spring (hairpin type)	A-B-B2-O-P-R	.01
80-139	Dial spring	A-B-B2-O-P	.05
80-151	Movable scale return spring	A-B-B2-O-R	.06
83-407	Dial light diffusion strip	I-J	.03
83-490	Movable scale spacer strip	A-B-B2-O-R	.75C
83-491	Movable scale spacer strip	P	.05
83-499	Felt strip	P	.20
83-516	Brass spacer strip (bent)	A-B-B2-O-R	.02
83-522	Brass spacer strip (straight)	A-B-B2-O-R	.01
83-523	Movable scale spacer strip	A-B-B2-O-R	.03
83-538	Dial support strip	F	.005
85-116	Motor control switch	P	1.00
85-156	Motor switch	B	1.00
93-273	Black bakelite pointer washer	I-J	.01
93-339	1/32 x .234 x 3/4" bake. wshr.	P	.01
93-360	1/32 x .243 x .355 brass wshr.	G	.50C
93-371	Dial pointer bakelite wshr.	C-D-E-F-K-L-M	.25C
94-230	Drive shaft bushing	I	.10
94-257	Shaft bushing	P	.03
94-258	Drive shaft bushing	J-P	$ .03
94-267	Brass spacer bushing	A-B2	.01
94-271	Volume control shaft coupling	A-B-B2-N-O	.04
94-557	Brass bushing	B	.01
97-91	Lower gear stud	I-J	.05
97-101	Idler gear stud	P	.05
97-103	Movable scale pivot stud	P	.02
97-107	Motor mounting stud	P	.05
100-36	6.3 volt pilot lamp	A-B-B2-E-F-G-H-I-J-K-N-P-R	.09
100-39	2.9 volt pilot lamp	L-M	.12
100-67	6.3 volt pilot lamp	O	.12
114-47	#6 x 3/16" slotted P.K. screws	A-B-B2-O-R	.30C
114-52	8/32 x 3/16" slotted mach. scr.	A-B2-O	.25C
114-60	6/32 x 3/16" slotted P.K. scr.	A-B-B2-O-R	.25C
114-62	#8 x 1/4" slotted self tap. screw	A-B2-O	.40C
117-38	Band selector lever	A-B-B2-N-R	.10
117-48	Band switch lever arm	A-B-B2-O-R	.20
118-16	Band switch lvr. conn. link	A-B-B2-N-O-R	.01
148-25	Band switch control arm	N	.10
159-12	Band switch lvr. arm link but.	A-B-B2-N-O-P-R	.02
188-2	Retaining ring	B	.01
188-27	Retaining ring	D-E-G-K	.05C
192-16	Dial glass	I	.20
192-17	Dial glass	J-P	.40
192-28	Dial crystal	G	.20
192-29	Dial crystal	C-D-E-H	.15
192-30	Dial glass	F	.25
192-32	Dial glass	K-L-M	.35
192-33	Dial glass	A-B-B2-N-O-R	.35
196-10	Dial glass	I	.10
196-13	Dial glass gasket	P	.10
196-15	Dial glass gasket	J	.10
196-16	Dial glass gasket	F	.25
196-17	Dial glass gasket	A-B-B2-N-O-R	.15
196-18	Dial glass gasket	K	.15
199-11	Rubber sleeve for 61-51	B	.01
199-13	Movable scle.retrn.rubbr.bump	A-B-B2-O-R	.02
S-3780	Shaft pulley sleeve assembly	I-J	.35
S-4340	Tension pulley assembly	I-J	.15
S-4906	Dial light socket & clip assem.	J	.10
S-4913	Dial light socket & clip assem.	O-P	.10
S-4914	Dial light socket & clip assem.	P	.10
S-4974	Band switch lever & bushing	P	.40
S-4975	Dial mtg. plate & stud assem.	P	1.25
S-4976	Stationary dial scle. & liht. brkt.	P	1.50

PARTS LIST (Continued)

4981	Brdcst. band scale assy. (26—147+148)	P	.75
4982	Short wave bnd. scale assy. (26—154)	P	.75
4984	Volume cntrl. scale & bshng. (26—254)	J	.35
4986	Tone cntrl. scale & bshng. (26—152)	P	.35
4989	Complete dial scale & mtg. plate assembly	P	4.00
-5007	Movable scale cntrl. arm & pin assembly	P	.40
-5009	Motor & cover assembly (141—51)	P	5.00
-5041	Volume cntrl. scale & bushng. (26—151)	P	.35
-5090	Drive pulley & clutch assem.	J	.35
-5092	Tone control scale & bushing (26—165)	J	.35
-5998	Manual automatic scle. & bushing (26-198)	P	$ .35
-5999	Dial light socket & clip assem.	K-N	.10
-6002	Dial cord & eyelet assem.	G	.10
-6011	Band indicator & autoc. switch (26-197)	J	.35
-6109	Dial cord & eyelet assem.	C-D-E-H	.15
-6122	Condenser drive shaft & bush. assembly	A-O	.35
-6175	Dial cord & eyelet assem.	F	.15
-6181	Oscillator Coil Assem.	C	.50
-6182	Antenna Coil Assem.	C	.50
-6210	Dial mtg. plate & stud assem.	A-B-B2-O-R	.75
-6211	Dial scale assembly (26-208	A-B-B2-O-R	2.00
-6216	Dial scale assem. (26-204 & 5)	A-B-B2-O-R	.75
-6217	Dial scale assem. (26-206 & 7)	A-B-O-R	.75
-6218	Dial scale control arm & pin	O	.40
-6220	Condenser drive shaft pulley & clutch	A-O	.20
-6221	Station pointer gear & pin ass.	A-O	.30
-6223	Tuning shaft & bush. assem.	N	.20
-6284	Dial cord & eyelet assem.	K-L-N	.25
-6379	Large split second pointer	A-B-B2-R	.10
-6394	Dial scale assem. (26-211 & 12)	A2-B2-R2	.75
-6398	Motor switch lever arm & bracket	B	.20
-6399	Motor Switch & Bracket	B	1.25
-6402	Motor & cover assembly	B	5.00
-6556	Dial cord & eyelet assembly	N	.15
MS-321	Pulley assembly (motor drive)	P	.20
MS-418	Dial pulley & bracket assem.	C-D-E-F-H	.10
MS-449	Dial pulley & bracket assem.	K-L-M-N	.35
MS-452	Drive shaft pulley assembly	B	.75

COILS & CHOKES

20-135	R. F. Choke	P	$ .50
20-154	Wave trap assembly	I-J-K-N	.65
20-183	Compensating coil	F-I-J-P	.50
20-187	Compensating coil	D-E-H	.45
20-189	R. F. Choke coil	A-B-O-R	.35
20-196	Compensating coil assembly	A-B-K-L-M-N-O-R	.50
95-413	1st I. F. transformer	I	1.50
95-414	2nd I. F. transformer	I	1.50
95-416	1st I. F. transformer	J-P	1.25
95-417	2nd I. F. transformer	J-P	1.25
95-513	1st I. F. transformer	C-D-E-F-G-H	.75
95-514	2nd I. F. transformer	F-G	.75
95-520	2nd I. F. transformer	C-D-E-H	.75
95-529	1st I. F. transformer	K-L	1.25
95-530	2nd I. F. transformer	K-L	1.25
95-536	1st I. F. transformer	N	1.00
95-537	2nd I. F. transformer	N	1.00
95-538	1st I. F. transformer	R	1.00
95-539	2nd I. F. transformer	R	1.00
95-553	1st I. F. transformer	R2	1.00
95-554	2nd I. F. transformer	R2	1.00
95-558	1st I. F. transformer	K-M	1.25
95-559	2nd I. F. transformer	M	1.25
95-560	1st I. F. transformer	N	1.00
95-561	2nd I. F. transformer	K-N-O	1.25
95-562	1st I. F. transformer	O	1.25
S-4941	Antenna coil & shield assem.	I	1.50
S-4942	Oscillator coil assem.	I	1.50
S-5017	Antenna coil & shield assem.	P	1.50
S-5018	Detector coil & shield assem.	P	1.35
S-5019	Oscillator coil & shield assem.	P	1.75
S-5073	Antenna coil & shield assem.	J	1.50
S-5074	Oscillator coil & shield assem.	J	1.50
S-5808	Antenna coil assembly	E-H	.50
S-5958	Antenna coil assembly	G	.50
S-5959	Oscillator coil assembly	G	.65
S-6039	Oscillator coil assembly	E-H	.35
S-6118	Oscillator coil assembly	F	.75
S-6161	Antenna coil assembly	F	2.00
S-6207	Antenna coil & shield assem.	R	1.50
S-6208	Detector coil & shield assem.	O-R	1.25
S-6209	Oscillator coil & shield assem.	R	1.25
S-6266	Antenna coil & shield assem.	K	1.50
S-6267	Oscillator coil & shield assem.	K	1.25
S-6294	Antenna coil & shield assem.	N	1.50
S-6295	Oscillator coil & shield assem.	N	1.25
S-6327	Antenna coil & shield assem.	A-B	1.50
S-6328	Detector coil & shield assem.	A-B	1.25
S-6329	Oscillator coil & shield assem.	A-B	1.25
S-6374	I. F. transformer	A-B	2.00
S-6375	I. F. transformer	A-B	2.00
S-6376	I. F. transformer	A-B	2.00
S-6381	Oscillator coil assembly	C	.50
S-6382	Antenna coil assembly	C	.50
S-6442	Oscillator coil assembly	D	.60
S-6508	Antenna coil & shield assem.	L	1.50
S-6541	Antenna coil & shield assem.	O	1.50
S-6553	Antenna coil & shield assem.	M	1.50
S-6554	Oscillator coil & wire assem.	M	.75
S-6560	Antenna coil assembly	D	.60
S-6607	Oscillator coil & shield assem.	L	1.25
S-6608	Oscillator coil & shield assem.	O	1.25

CONDENSERS

22-127	25 mmfd.	600 volt		$ .15
22-147	.0005 mfd.	600 volt		.15
22-162	.0001 mfd.	600 volt		.15
22-170	.1 mfd.	400 volt		.20
22-171	.05 mfd.	600 volt		.18
22-177	.2 mfd.	400 volt		.20
22-182	.00025 mfd.	600 volt		.15
22-185	.01 mfd.	200 volt		.15
22-188	.02 mfd.	400 volt		.15
22-190	.1 mfd.	200 volt		.15
22-196	.01 mfd.	600 volt		.15
22-199	.5 mfd.	200 volt		.25
22-212	.05 mfd.	400 volt		.15
22-219	.03 mfd.	200 volt		.12
22-229	.005 mfd.	600 volt		.18
22-243	.01 mfd.	400 volt		.15
22-250	.05 mfd.	200 volt		.15
22-285	10 mmfd.	600 volt		.15
22-289	50 mmfd.	600 volt		.15
22-305	2-35 mmfd. trimmer		F-I-J-K-L-N-O	.15
22-324	Three sec. trimr. 2-35 mmfd.		J-L	.30
22-326	.003 mfd.	400 volt		.15
22-327	.02 mfd.	200 volt		.12
22-350	.25 mfd.	200 volt		.15
22-358	.002 mfd.	600 volt		.25
22-405	10 mfd. 50 volt electrolytic		M-O	.75
22-408	2-35 mmfd. two sec. trimmer		M	.30
22-418	2-35 mmfd. trimmer		P-R	.10
22-435	.02 mfd.	600 volt		.18
22-448	.004 mfd.	600 volt		.18
22-455	.01 mfd.	1200 volt		.20
22-458	.006 mfd.	600 volt		.18
22-463	335-825 mmfd. padder		A-K-L-N-O-R	.30
22-470	.00015 mfd.	600 volt		.15
22-487	.05 mfd.	400 volt		.15
22-492	.002 mfd.	600 volt		.15
22-519	200-550 mmfd. trimmer		A-B-D-E-F-H-I-J-K-L-M-N-O-P-R	.35
22-524	2-35 mmfd. trimmer		A	.15
22-525	.005 mfd.	600 volt		.20
22-547	Two gang variable		I-J	2.50
22-548	Three gang variable		P	4.00
22-549	Four section 2-35 mmfd. trim.		P	.40
22-551	16 mfd.	400 volt		.75
22-552	20 mfd.	300 volt		.75
22-558	Dual fixed padder		I-J-R	.60
22-563	5000 mmfd. fixed padder		F-M	.50
22-569	12 mfd. 450 volt electrolytic		B-P	.95
22-570	15-70 mmfd. trimmer		F	.15

PARTS LIST—(Continued)

22-571	2x8 mfd. 450 volt—6 mfd. 250 volt	P	1.25
22-596	8. x 14. mfd. 450 volt	I	1.75
22-598	2-35 mmfd. Three sec. trim.	I-O-R	.30
22-599	14 x 8 mfd. 450 volt electrolytic	J	1.75
22-627	.002 mfd. 1000 volt		.15
22-669	.01 mfd. 600 volt		.18
22-679	Two gang variable	G	1.85
22-680	16 mfd. 150 volt elctrlytic	G-H	$ .35
*22-681	40 mfd. 150 volt elctrlytic (G)	B-G-H	.50
22-685	2-35 mmfd. 2 sec. trimmer	F	.30
22-691	8 mfd. 450 volt electrolytic	E	.50
22-692	8 mfd. 350 volt electrolytic	E	.45
22-695	Two gang variable	C-D-E-H	2.00
22-696	Two gang variable	F	2.00
22-698	Compensating condenser	F	.30
22-699	Compensating condenser	P	.50
22-700	8 mfd. 450 volt elctrlytic (B)	B-F	.50
22-701	8 mfd. 350 volt elctrlytic	F	.50
22-703	Compensating condenser	E-H	.50
22-704	Three gang variable	A-B	5.00
22-705	Compensating condenser	I-J	.50
22-708	Dual fixed padder	A-B-K-L-N-O-R	.65
22-710	15 mfd. 450 volt x 10 mfd. 250 v.	R	1.00
22-711	10 mfd. 450 volt x 5 mfd. 450 v.	R	1.00
*22-712	10 x 10 x 10 mfd. 25 volt (A)	A-B	.75
22-714	12 x 20 mfd. 450 volt elctrlytic	A	1.75
22-717	Two gang variable	K-L-N	3.00
22-718	12 mfd. 450 volt electrolytic	K-N	.55
22-719	16 mfd. 350 volt electrolytic	K-N	.50
22-727	10 x 10 mfd. 450 volt elctrlytic	B	1.25
*22-728	4 mfd. 350 volt x 40 mfd. 450 v. electrolytic (A-B)	A-B	.75
22-729	Compensating condenser	D	.50
22-731	2-35 mfd. Three sec. trimmer.	A-K-N	.40
22-738	Compensating condenser	R	.55
22-739	10 x 15 x 15 mfd. 250 v. electrol.	C-D	1.00
22-740	Compensating condenser	K-L-M-N	.55
22-741	8 mfd. 250 volt electrolytic	L-O	.45
22-742	10x15x15 mfd. 250 v. electrol.	L-M-O	1.00
22-743	Compensating condenser	A-B	.50
22-744	Two gang variable	M	2.50
22-746	Three gang variable	O-R	3.00
*22-747	16 mfd. 450 v. x 40 mfd. 200 v. electrolytic (C)	B	1.00
*22-748	20x20x40 mfd. 25 volt (B-F)	A-B	.85
22-749	Two gang variable (export)	K	3.00
22-750	Three gang variable	R-R2	3.00
22-751	Two gang variable (export)	F	2.00
22-753	2-35 mmfd. Three section trim.	R2	.40
22-754	2-35 mmfd. Two section trim.	F	.30
22-755	Compensating condenser		.50

RESISTORS & VOLUME CONTROLS

63-150	10 M ohm	½ watt	L	$ .08
63-151	5 M ohm	1 watt	F-M	.10
63-160	100 M ohm	½ watt	C-D-L-M-O	.08
63-208	12 M ohm	1 watt	E	.10
63-260	100M ohm	¼ watt	E-F	.07
63-270	7 megohm	¼ watt	L	.07
63-271	1 megohm	¼ watt	A-B-C-D-G-H-I-J-K-M-N-O-P-R	.07
63-282	2200 ohm	¼ watt	A-B	.07
63-296	220 M ohm	¼ watt	C-D-E-F-G-H-I-J-K-L-M-N-O-P-R	07
63-325	150 M ohm	¼ watt	J	.07
63-439	2700 ohm	¼ watt	A-B	.07
63 461	47 M ohm	1 watt	N	.10
63-520	400M ohm volume control & switch		I	1.35
63-521	50 M ohm tone cntrl. assem.		I	.90
63-533	13 ohm (wire wound)		L-M	.08
63-557	60 ohm	½ watt	G-H	.08
63-563	80 ohm	¼ watt	E-F	.07
63-568	2 megohm volume control		P	.90
63-570	Candohm resistor		P	.75
63-577	100 M ohm	¼ watt	B-C-D-L	.07
63-581	470 ohm	¼ watt	A-B-P-R	.07
63-582	680 ohm	¼ watt	O	.07
63-585	2200 ohm	¼ watt	A-B-O-R	.07
63-586	3300 ohm	¼ watt	P	.07
63-587	4700 ohm	¼ watt	C-I-J-L-M	.07
63-589	10 M ohm	¼ watt	L	.07
63-591	22 M ohm	¼ watt	A-B-N-O-R	.07
63-592	30 M ohm	¼ watt	K-L-N-O-R	.07
63-593	47 M ohm	¼ watt	A-B-C-D-E-F-G-H-I-J-K-L-M-P-R	.07
63-595	100 M ohm	¼ watt	B-G-H-K-L-N-P	.07
63-597	470 M ohm	¼ watt	A-B-C-D-E-F-H-I	.07
63-605	1000 ohm	½ watt	A-B-C-D-I-J-K-L-M-N-O-P-R	.08
63-608	15 M ohm	1 watt	A-B-P-R	.10
63-609	22 M ohm	½ watt	P	.08
63-610	22 M ohm	1 watt	K	.10
63-613	Three section candohm resistor		I-J	.30
63-618	22 ohm	¼ watt	B	.07
63-621	39 ohm	¼ watt	K-L-N	.07
63-627	180 ohm	¼ watt	O	.07
63-628	270 ohm	¼ watt	M	.07
63-629	330 ohm	¼ watt	C-D-L	.07
63-632	560 ohm	¼ watt	L	.07
63-633	680 ohm	¼ watt	G-H-M	.07
63-634	820 ohm	¼ watt	C-D-L-M-O	.07
63-643	18 M ohm	¼ watt	G-H-L-N	.07
63-645	27 M ohm	¼ watt	A-B-P-R	.07
63-649	56 M ohm	¼ watt	A-B-O	.07
63-653	150 M ohm	¼ watt	A	.07
63-654	180 M ohm	¼ watt	P	.07
63-655	220 M ohm	¼ watt	B-N-O-R	.07
63-657	330 M ohm	¼ watt	A-B	$ .07
63-658	390 M ohm	¼ watt	E-F-J-L-P	.07
63-660	560,000 ohm	¼ watt	B	.07
63-671	1 megohm	¼ watt	F	.07
63-675	5600 ohm	½ watt	L-O	.08
63-676	27 M ohm	1 watt	R	.10
63-677	33 M ohm	1 watt	I-J-K	.10
63-680	10 M ohm	1 watt	A-B-I-J-K-N-P-R	.10
63-681	56 M ohm	½ watt	G-H-M	.08
63-686	150 ohm	½ watt	E-F	.08
63-796	10 M ohm	½ watt	L-O	.07
63-799	2 megohm volume contl. & switch		J	1.35
63-885	82 M ohm	½ watt	L-O	.08
63-953	400 M ohm volume contl. & switch		G	.85
63-954	50 ohm	½ watt	G-H	.08
63-955	400 M ohm v. contl. & switch		C-D-E-H	.85
63-956	400 M ohm v. contl. & switch		F	.85
63-958	22 M ohm	1 watt	F	.10
63-960	68 M ohm	½ watt	C-D	.08
63-962	4700 ohm	1 watt	L-M-O	.10
63-978	Volume control		R	.65
63-979	Candohm resistor		R	.35
63-980	Volume control assembly		A-B	1.25
63-981	Candohm resistor		A	.75
63-982	Tone control		K-L	.90
63-983	Volume control & switch 220 M ohm		K-L	1.35
63-984	Three section candohm resistor		K-N	.35
63-985	Volume contl. & switch assem.		N	1.35
63-986	Four section candohm resistor		B	.75
63-988	15 M ohm	3 watt	R	.35
63-990	Volume contl. & switch assem.		O	.85
63-991	Volume contl. & switch assem.		M	1.00
63-992	Candohm resistor		R	.30

AUTOMATIC PARTS

12-570	Latch bar retaining bracket	D-E-F-H-I-J-K-L-M	$ .02
12-603	Mounting bracket	K	.20
22-519	Padder condenser	A-B-I-J-K-M-N-O-P-R	.35
24-158	Metal cover for automatic coil	I	.25
24-159	Coil cover	J-P	.30
24-161	Automatic adjusting cover	J-P	.03
24-164	Adjustment screw cover	A-B-O-R	.03
24-167	Inductance coil cover	K	.20
46-246	Push button knob	I-J-K-L-M-P	.03
46-250	Automatic knob	D-E-F-H	.03
46-255	Automatic AC switch button	A-B-N-O-R	.03
46-262	Automatic push button	D	03
80-161	Latch bar spring	D-E-F-H-I-J-K-L-M-P	.25C

A—Used in First Run Sets
A-B—Used in Second Run Sets
C—Used in Third Run Sets
E—Used in First Run Sets
E-G—Used in Second Run Sets
F—Used in Third Run Sets

PARTS LIST—(Continued)

-176	Push lever spring	D-E-F-H-I-J-K-L-M-P	.40C
-557	Latch bar strip	I	.04
-561	Latch bar strip	J-P	.06
-584	Latch bar strip	D-E-F-H	.01
-596	Latch bar	K-L-M	.04
-600	Pin-jack terminal strip	A-B-O-R	.15
-603	Pin-jack terminal strip	K-N	.10
-149	Automatic selec. switch assem.	A-B-R	2.00
-152	Station selector switch	N	1.50
-159	Automatic selec. switch assem.	O	2.00
-216	Latch bar spring steel washer	D-E-F-H-L-M	.15C
-364	Felt washer for push button	P	.20C
-370	Felt washer for push button	D-H	.20C
-385	Felt washer for push button	A-B-N-O-R	.15C
2-41	Call letter sheet	D-E-F-H-I-K-L-M	.25
2-42	Call letter sheet	J-P	.25
2-45	Call letter sheet	A-B-N-O-R	.25
2-56	#6 1/4" H.H. slotted P.K. scr.	J-P	.25C
2-173	Inductance adjusting screw	I	.02
2-179	Inductance adjusting screw	J-P	.03
2-183	Inductance adjusting screw	D-E-F-H-K-L-M	.01
2-188	Inductance adjusting screw	A-B-O-R	.03
2-190	Inductance adjusting screw	N	.03
7-41	Push button lever	I-K-L-M	.03
7-42	Push button lever	I-P	.02
7-44	Push lever	D-E-F-H	.25C
9-25	Adjusting screw cap (plain)	D-E-F-H-K-L-M	.03
9-26	Adjusting screw cap (dial)	D-E-H	.03
5975	Bakelite strip & termal. assem.	I	.15
5976	Switch contact spring & brkt.	I	.50
6010	Brkt. & contact spring assem.	J-P	1.00
6012	Bakelite termal strip & contact	J-P	.15
6093	Fiber & terminal strip assem.	D-E-H	.15
6094	Metal switch brkt. & contact	D-E-H	.50
6095	Manual automatic switch blade	D-E-H	.07
6095	Manual automatic switch contact & terminal strip	D-E-H	.25
6103	Automatic coil & core (Red)	D-E-F-H-I-J-K-L-M-N-P	.50
6104	Automatic coil & core (Green)	D-E-F-H-I-J-K-L-M-N-P	.50
6105	Automatic coil & core(Yellow)	D-E-F-H-I-J-K-L-M-N-P	.50
6106	Automatic coil & core (Blue)	F-I-J-K-L-M-N-P	.50
6107	Automatic coil & core (White)	D-E-F-H-I-J-K-L-M-N-P	.50
6146	Automatic coil & core (Red)	A-B-O-R	.75
6147	Automatic coil & core (Green)	A-B-O-R	.75
6148	Automatic coil & core(Yellow)	A-B-O-R	.75
6149	Automatic coil & core (Blue)	A-B-O-R	.75
6150	Automatic coil & core (White)	A-B-O-R	.75
6163	Switch bracket & contact sprg.	F	.50
6164	Fiber strip & terminal assem.	F	.15
6173	Switch bracket & contact sprg.	L	.50
6196	Automatic coil & core(Orange)	A-B-O-R	.75
6273	Bakelite strip & lug assem.	K-M	.20
6274	Fiber strip & terminal assem.	L-M	.15
6287	Frequency coil & core assem.	J-N-P	.50

MISCELLANEOUS

19	Bakelite cabinet back (312)	E	$ .15
-371	Walnut cabinet (312)	E-H	2.75
-372	Walnut cabinet (311)	G	2.50
-383	Cabinet (313)	C	3.50
-384	Cabinet (314)	D	3.50
	Note: White or Ebony—bakelite Cabinets—2.25 List. Add.		
-59	Battery clip (positive)	C-D-L-M-O	.15
-60	Battery clip (negative)	C-D-L-M-O	.15
-15	Antenna strip connector	O-R	.02
-120	Electrolytic condenser cover	I	.10
-164	Auto. adjust. screw cover	N-O	.03
-174	AC switch indicator (on)	A-B-R	.05
-175	AC switch indicator (off)	A-B-R	.05
-176	Tone switch ind. (voice)	A-B-N-O-R	.05
-177	Tone switch ind. (normal)	A-B-N-O-R	.05
-178	Tone switch ind. (treble)	A-B-N-O-R	.05
-179	Tone switch ind. (lo-bass)	A-B-N-O-R	.05
-180	Tone switch ind. (bass)	A-B-N-O-R	.05
-181	Tone switch ind. (alto)	A-B-N-O-R	.05
-7	Phono jack	A-N-R2	.10
-208	Tuning control knob	J	.25
46-220	Tuning control knob	I	.15
46-221	Band selector switch knob	I-M-O	.20
46-222	Volume control knob	I	.15
46-223	Band sel. & auto. switch knob	J-P	.15
46-224	Volume control knob	J-P	.15
46-229	Tuning control knob	P	.20
46-230	Motor switch control knob	P	.15
46-231	Tone control knob	I	.15
46-233	Tone control knob	J-P	.20
46-239	Motor control switch knob	B	.05
46-244	Tuning control knob	G	.15
46-245	Tuning knob	C-D-E-F-G-H-K-L-M	.10
46-251	Manual tun. & vol. control knob	E-H	.15
46-252	Tuning control knob	N	.15
46-253	Volume control knob	N	.10
46-254	Radiorgan knob	A-B-N-O-R	.02
46-255	AC switch knob	B-O	.03
46-257	Band switch knob	K-L-M	.10
46-260	Phono switch knob	A-B-N-R2	.10
46-261	Tuning knob	C-D	.10
46-263	Manual tuning knob	A-B-O-R	.15
46-264	Vol. Control Knob	B-R	.10
49-148	12" Dynamic speaker (9S365)		12.00
	206-148 output transformer		2.50
	207-148 field coil		5.00
	208-148 cone & voice coil		3.00
49-179	8" Dynamic speaker (6S301-7S323-9S324)		$6.50
	206-179 output transformer		2.50
	207-179 field coil		2.50
	208-179 cone & voice coil		2.00
49-180	10" Dynamic speaker (9S361)		8.00
	206-180 output transformer		2.50
	207-180 field coil		2.50
	208-180 cone & voice coil		2.50
49-185	12" Dynamic speaker (12S370-12S371)		13.50
	206-185 output transformer		2.50
	207-185 field coil		5.00
	208-185 cone & voice coil		2.50
49-186	12" Dynamic speaker (15S308-15S372-15S373)		17.50
	206-186 output transformer		3.50
	207-186 field coil		6.00
	208-186 cone & voice coil		3.25
49-206	8" Dynamic speaker (6S341)		7.00
	206-206 output transformer		2.50
	207-206 field coil		2.50
	208-206 cone & voice coil		2.00
49-208	10" Dynamic speaker (6S362-7S363)		8.00
	206-208 output transformer		2.50
	207-208 field coil		2.75
	208-208 cone & voice coil		2.50
49-216	10" Dynamic speaker (7S363AT)		10.00
	206-216 output transformer		2.50
	207-216 field coil		4.50
	208-216 cone & voice coil		3.00
49-219	8" Dynmc. spkr. (9S324AT-6S301AT-7S323AT)		8.00
	206-219 output transformer		2.50
	207-219 field coil		3.00
	208-219 cone & voice coil		2.50
49-220	12" Dynamic speaker (6S306AT-9S307AT)		13.50
	206-220 output transformer		3.50
	207-220 field coil		2.50
	208-220 cone & voice coil		5.00
49-237	5" Dynamic speaker (6D311)		2.75
	206-237 output transformer		1.00
	207-237 field coil		1.00
	208-237 cone & voice coil		1.00
49-238	5" Dynamic speaker (5R312-5R316-5R317-5R337)		3.00
	206-238 output transformer		1.00
	207-238 field coil		1.00
	208-238 cone & voice coil		1.00
49-240	6" Dynamic speaker (5S320-5S338-5S339)		3.50
	206-240 output transformer		1.00
	207-240 field coil		1.00
	208-240 cone & voice coil		1.00
49-241	6" Dynamic speaker (6D360)		3.50
	206-241 output transformer		1.00
	207-241 field coil		1.00
	208-241 cone & voice coil		1.50
49-242	5" Dynamic speaker (5S319)		3.50
	206-242 output transformer		1.25
	207-242 field coil		1.25

PARTS LIST—(Continued)

	208-242 cone & voice coil	$ 1.50
49-244	6" Dynamic speaker (5S327)	4.00
	206-244 output transformer	1.25
	207-244 field coil	1.25
	208-244 cone & voice coil	1.50
49-248	6" Dynamic speaker (6S321-6S322-6S340-6S304)	5.50
	206-248 output transformer	1.50
	207-248 field coil	1.50
	208-248 cone & voice coil	2.50
49-249	12" Dynamic speaker (7S366-9S367-9S369)	13.25
	206-249 output transformer	2.50
	207-249 field coil	2.50
	208-249 cone & voice coil	3.25
49-251	10" Dynamic speaker (7S342-7S343-9S344)	8.00
	206-251 output transformer	2.50
	207-251 field coil	2.50
	208-251 cone & voice coil	3.00
49-253	12" Dynamic Speaker (12S345)	10.00
	206-253 output transformer	2.50
	207-253 field coil	4.00
	208-253 cone & voice coil assem.	3.50
49-254	12" Dynamic speaker (15S346)	15.00
	206-254 output transformer	3.50
	207-254 field coil	6.00
	208-254 cone & voice coil	3.25
49-255	12" Dynamic speaker (6S306-9S307)	10.00
	206-255 output transformer	2.50
	207-255 field coil	2.50
	208-255 cone & voice coil	3.25
49-257	6" Dynamic speaker (6S340AT-6S304AT-6S322AT-6S321AT)	5.50
	206-257 output transformer	1.50
	207-257 field coil	2.00
	208-257 cone & voice coil	1.50
49-258	10" Dynamic speaker (9S344AT-7S343AT-7S342AT)	8.50
	206-258 output transformer	2.50
	207-258 field coil	3.00
	208-258 cone & voice coil	2.50
49-259	12" Dynamic speaker (7S366AT-9S367AT-9S369AT)	10.00
	206-259 output transformer	2.50
	207-259 field coil	4.00
	208-259 cone & voice coil	3.50
49-262	5" Dynamic speaker (4B313)	3.00
	206-262 output transformer	1.00
	207-262 field coil	1.00
	208-262 cone & voice coil	1.00
49-263	6" Dynamic speaker (5S320AT-5S338AT-5S339AT)	4.00
	206-263 output transformer	1.50
	207-263 field coil	1.00
	208-263 cone & voice coil	1.50
49-264	5" Dynamic speaker (5S319AT)	4.00
	206-264 output transformer	1.50
	207-264 field coil	1.00
	208-264 cone & voice coil	1.50
49-265	6" Dynamic speaker (5S327AT)	4.00
	206-265 output transformer	1.50
	207-265 field coil	1.00
	208-265 cone & voice coil	1.50
49-266	12" Dynamic speaker (6S305-7S364)	8.50
	206-266 output transformer	3.00
	207-266 field coil	3.25
	208-266 cone & voice coil	2.00
49-267	8" P.M. speaker (7J328)	6.00
	206-267 output transformer	2.00
	208-267 cone & voice coil	2.00
49-269	10" P.M. speaker (7J368-6J357)	8.50
	206-269 output transformer	2.50
	208-269 cone & voice coil	3.50
49-270	6" P.M. speaker (6J322)	5.00
	206-270 output transformer	1.50
	208-270 cone & voice coil	2.00
49-271	12" Dynamic speaker (12S345AT)	12.00
	206-271 output transformer	2.50
	207-271 field coil	4.00
	208-271 cone & voice coil	3.25
49-272	12" Dynamic spkr. (12S370AT-12S371AT)	15.00
	206-272 output transformer	3.00
	207-272 field coil	6.00
	208-272 cone & voice coil	4.00
49-273	12" Dynamic speaker (15S346AT)	15.00
	206-273 output transformer	3.00
	207-273 field coil	$6.00
	208-273 cone & voice coil	4.00
49-274	12" Dnmc. spkr. (15S308AT-15S372AT-15S373AT)	17.50
	206-274 output transformer	3.50
	207-274 field coil	6.00
	208-274 cone & voice coil	4.50
49-275	12" Dynamic spkr. (6S305AT-7S364AT)	10.00
	206-275 output transformer	2.50
	207-275 field coil	4.00
	208-275 cone & voice coil	3.50
49-280	6" P.M. speaker (6B321AT)	5.00
	206-280 output transformer	1.50
	208-280 cone & voice coil	2.00
49-281	6" P.M. speaker (6B321)	4.00
	206-281 output transformer	1.25
	208-281 cone & voice coil	1.50
49-282	6" Dynamic speaker (4B355)	4.00
	206-282 output transformer	1.25
	207-282 field coil	1.25
	208-282 cone & voice coil	1.50

Note: Speakers used in Models with A.T. affixed — for export only.

52-144	Speaker cable & plug	G	.30
52-146	Shielded lead	A	.15
52-147	Shielded lead	A	.15
52-149	Speaker cable & plug	C	.40
54-117	Mtg. nut for dial crystal	G-H	.50
56-654	Escutcheon plate (316-317-337)	H	.75
57-645	Escutcheon plate	I	1.50
57-647	Escutcheon plte. (less glss & gasket)	J-P	1.75
57-651	Escutcheon plate (311-336)	G	.35
57-652	Escutcheon plte (less glss & gasket)	K-L	1.75
57-653	Escutcheon plte. (less glss. & gasket)	F	.75
57-654	Escutcheon plate (317)	D-E	.75
57-655	Escutcheon plate (326-360)	G	.35
57-657	Escutcheon plate (less glass & gasket)	A-B-R	2.00
57-660	Escutcheon plate (less glass & gasket)	N-O	2.00
57-661	Escutcheon plate (motor switch)	B	.30
57-666	Escutcheon plate	M	1.75
62-9	Lamp plug receptacle	L-M-O	.10
73-8	3/32x5/16 H.H. set screw	J	.02
73-21	8/32x3/16 H.H. set screw	J	.01
73-24	8/32x1/4" H.H. set screw	J	.02
78-115	Vibrator socket	M-O	.10
78-128	Speaker plug socket	A-B-F-J-I-K-L-N-P-R	.10
78-133	6H6 tube socket	I-J-P	.10
78-141	Vibrator socket	C-D-L	.10
78-145	6F5 tube socket	I-J-K-N-P-R	.10
78-148	6Q7 tube socket	E-F-G-H	.10
78-149	6X5 tube socket	E-F-K-N	.10
78-150	6K7 tube socket	A-B-E-F-G-H-I-J-K-N-P-R	.10
78-151	6A8 tube socket	E-F-G-H-I-J-K-N	.10
78-152	6F6 tube socket	I-J-K-N-P-R	.10
78-159	25Z6 tube socket	G-H	.10
78-161	Ballast tube socket	G-H	.10
78-162	6L7 tube socket	A-B-P-R	.10
78-171	Voltage indicator socket	A2-B2-J-N-R2	.10
78-173	25L6 tube socket	G-H	.10
78-175	6J5 tube socket	A-B-K-N-P-R	.10
78-176	6V6 tube socket	A-B	.10
78-182	5Y4 tube socket	A-B-I-J-P-R	.10
78-183	Resonance ind. sock. & cable	P	.75
78-184	6T7 tube socket	L-M-O	.10
78-185	6S7 tube socket	F-K-L-M-N-O-R2	.10
78-186	6D8 tube socket	L-M-O	.10
78-190	Speaker plug socket	M-O	.10
78-191	6ZY5 tube socket	M-O	.10
78-224	6K6 tube socket	E-F	.10
78-227	Resonance ind. sock. & cable	A-B	.75
78-228	6F8 tube socket	A-B	.10
78-229	Electrolytic condenser socket	L-M-O	.02
78-230	Resonance ind. sock.& cable	N	.50
78-232	6A8-6D8 tube socket	C-D	.10

-233	6K7-6S7 tube socket	C-D	$ .10
-234	6Q7-6T7 tube socket	C-D	.10
-235	6G6 tube socket	C-D-L-M	.10
-178	Knob spring		.01
-433	Antenna ground term. strip	A-B-I-J-K-N-P-R	.10
-585	Line cord tension strip	K	.05
-613	Power pack shipping strip	L	.02
-614	Power pack shipping strip	C	.02
-35	Phono switch (5649A only)	J	.85
-103	Band selector switch	P	1.25
-108	Tone control switch	J-P	.65
-111	Phono switch	R2	.65
-116	Motor switch	P	1.00
-139	Band sel. & manual auto. switch	I	.85
-140	Band sel. & manual auto. switch	J	.85
-141	Manual auto. on & off switch	P	.85
-145	Tone control switch	F-M	.30
-146	Band selector switch	F	1.00
-147	Band selector switch	A-B-O-R	1.50
-148	AC switch (S-6387)	A-B-R	.60
-150	Band selector switch	K	1.00
-151	Band selector switch	N	1.00
-152	Phono switch	B	2.00
-153	Band switch	L	1.00
-155	110 volt to 6 volt switch	M-O	.65
-157	Battery conservator switch	L-M-O	.25
-158	Phono switch	A-N	.15
-160	Band change switch	M	1.00
-267	#14 battery wire (red)	C-D-L-M	.05 ft.
-268	#14 battery wire (black)	C-D-L-M	.05 ft.
-168	Chassis mtg. washer (rubber)	A-B	.01
-215	Chassis floating washer(rubber)	A-B-R	.05
-229	1/16 x 1/4 brown felt washer	J-P	.30C
-320	1/16x1/4"x1" brown felt washer	I-J-P	.20C
-343	3/32x33/64x7/8 brown felt washer	P	.40C
-344	Rubber washer (chassis mtg.)	I-J-P	.01
-364	Small b. felt wash. for auto. but.	I-J	.20C
-392	Felt washer	B-N	.75C
-415	117 volt 50-60 cycle pwr. transf.	I	3.75
-418	117 volt 50-60 cycle pwr. transf.	P	4.25
-438	117 volt 50-60 cycle pwr. transf.	J	3.75
-442	Power choke	B	2.25
-450	Power transf. (25 cycle all v.)	I	7.00
-451	Power transf. (25 cycle all v.)	P	7.00
-454	Power transf. (25 cycle all v.)	J	7.00
-521	Pwr. transf. (50-60 cycle 117 v.)	E-F	2.25
-523	Pwr. transf. (25 cycle 120-240 v.)	E-F	4.50
-525	Pwr. transf. (50-60 cycle 117 v.)	R	3.75
-526	Pwr. transf. (50-60 cycle 117 v.)	K-N	3.00
-528	Pwr. transf. (50-60 cycle 117 v.)	A	5.50
-533	Pwr. transf. (50-60 cycle 117 v.)	B	7.00
-535	Pwr. transf. (25 cycle all v.)	K-N	6.00
-545	Pwr. transf. (25 cycle all v.)	R2	7.00
-549	Pwr. transf. (25 cycle all v.)	A2	11.75
-550	Pwr. transf. (25 cycle all v.)	B2	3.25
-552	Power transformer	C-D-L	1.50
-555	Power transformer	M-O	2.50
0-70	Ballast tube (115 volt)	G-H	.75
	11-29-150 v. ext. resistor cord		1.25
	11-30-175 v. ext. resistor cord		1.25
	11-31-220 v. ext. resistor cord		1.25
	11-32-250 v. ext. resistor cord		1.25
2-25	Chassis mtg. screw (346)	B	.03
2-187	#10-32x1 1/4" mtg. screw (337)	H	.01
2-189	10/32x1-3/8" mtg. scr. (326-336)	G	.01
4-40	Chassis mtg. bolt (355)	C-G-K-L	.40C
4-41	Chassis mtg. bolt	J-P	.02
4-42	Chassis mtg. bolt	M	.25C
4-43	10/32x3/8" mtg. screw (311)	G-H	.40C
4-75	#10-32x5/8 mach. screw	D-H	.45C
4-80	Chassis mtg. bolt	A-B-O	.03
4-85	Chassis mtg. bolt (313)	C-D	.005
7-38	Band selector lever	O-P	.10
7-46	AC switch lever arm	A	.01
7-48	Band switch lever	A	.20
8-16	Lever connecting link	A	.01
5-19	Rubber grommet for 311	G-H	.75C
6-239	Tube shield	A-B-E-F-H-J-K-L-M-N-O-P-R	.10
6-243	Grid lead shield	I	.05
6-245	Electrolytic cond. shield	B	.10
126-254	Grid lead shield	P	$ .03
126-256	Tube shield	C-D-F-K-L-M-N-O-R2	.10
139-48	Speaker baffle	C-E	.02
159-17	Snap button	I	.05
188-2	Shaft retaining ring	I-J-P	.01
190-6	Vibrator	C-D-L	3.50
190-11	Vibrator	M	2.75
202-79	Instruction book	G	.10
202-84	Instruction book	H	.10
202-87	Instruction book	P	.10
202-89	Instruction book	R	.10
202-92	Instruction book	B	.10
202-93	Instruction book	N	.10
202-94	Instruction book	K	.10
202-98	Instruction book	C	.10
202-99	Instruction book	D	.10
202-100	Instruction book	L	.10
202-101	Instruction book	M	.10
202-102	Instruction book	O	.10
9268-360	#14 battery cable (black)	C-D	.05 ft.
9268-376	#14 battery cable (black)	L	.05 ft.
S-2778	Choke (A battery)	M-O	.25
S-5043	Choke (A battery)	C-D-L-M-O	.25
S-5129	Antenna ground & connector	L	.12
S-5346	Voltage ind. lead & eyelet	A2-B2	.06
S-5356	Voltage ind. lead & eyelet	R2	.06
S-6224	Radiorgan switch & knob assem.	A-B-N-O-R	1.00

PHONO MODELS CABINET ASSEMBLY PARTS

Model	Code	Model	Code
5R303	A	6S305	E
6D302	B	6S306	F
6S301	C	9S307	G
6S304	D	15S308	H

22-82	.001 mfd. 600 volt condenser	C-D	$ .15
22-190	.1 mfd. 200 volt condenser	B	.15
22-492	.002 mfd. 600 volt condenser	H	.18
24-142	Needle cup cover	C-D-E	.25
29-1	Turntable (8 inch)	A-B	1.00
29-2	Turntable (8 inch)	D	1.00
29-4	Turntable (10 inch)	C-D-E	1.50
41-1	Needle cup	C-D-E	.10
44-15	Phono jack	F-G-H	.10
46-265	Knob (phono radio)	A-B-D-F-G-H	.10
57-488	Escutcheon plate (phono)	C	.35
57-668	Escutcheon plate (phono)	A-B-D	.10
57-669	Escutcheon plate (phono)	F-G-H	.10
58-39	Five prong cinch plug	H	.10
63-271	1 megohm 1/4 watt resistor	B	.07
63-296	220 M ohm 1/4 watt resistor	F-G	.07
63-595	100 M ohm 1/4 watt resistor	F-G	.07
63-597	470 M ohm 1/4 watt resistor	C-D-H	.07
63-649	56 M ohm 1/4 watt resistor	H	.07
78-236	Two contact socket	F-G-H	.10
80-148	Spring-suspension for phono motor	C-D-E	.02
83-619	Pin-jack terminal strip	A-B-C-D-F-G	.10
85-124	Switch (D.P.D.T. toggle)	C	1.00
85-161	Switch (automatic stop)	C-D	2.00
85-162	Switch (phono radio)	C-D	.55
85-163	Switch (phono radio)	F-G	1.00
85-164	Switch (phono radio)	A	1.00
85-165	Switch (phono radio)	H	.65
*141-68	Motor—110 volt 60 cycle (less turntable & pick-up assem.)	D	10.00
141-69	Motor — 110 volt 60 cycle (less turntable & pick-up assem.)	A-B-C-D-E	10.00
142-6	Pick-up & arm assem. (compl.)	A-B	6.50
142-7	Pick-up & arm assem. (compl.)	C-D-E	6.50
142-9	Pick-up & arm assem. (cartridge only)	A-B	4.50
142-11	Pick-up & arm assem. (cartridge only)	F-G-H	4.50
152-117	Wood shipping block	C-D-E	.05
152-124	Wood shipping block	F-G-H	.03
169-31	Automatic record changer (complete)	E-F-G-H	85.00
202-103	Instruction book	C-E-F	.10
202-104	Instruction book (record changer)	F-G-H	.10

*MODEL 6D301 ONLY.

INSTRUCTIONS
FOR
INSTALLATION, OPERATION AND SERVICE
ZENITH AUTOMATIC RECORD CHANGER 169-31

used in

Models 6-S-306; 9-S-307; 15-S-308

This Record Changer will automatically play a series of eight 10- or seven 12-inch records of the 78 revolutions-per-minute type or, if you so desire, you may change records, of any size up to 12 inches, manually. Records of the last few years with the standard eccentric or spiral stopping groove will operate the automatic mechanism and change your records for you.

INSTALLATION

The Automatic Record Changer as supplied consists of two units.

1. **The Motorboard Unit** which includes the automatic record changer mechanism, the turntable, and the pickup.
2. **The Motor Unit** which includes the support plate assembly.

The units are supplied ready for mounting on a cabinet rail. This rail must be drilled in accordance with the information and dimensions shown on page 4. Wooden support blocks as shown, must be provided by the customer. All other necessary parts are included in your purchase. It is essential for proper operation that the rail and support blocks provide for the mounting of the motor support plate exactly 2¾ inches below the top surface of the motorboard. The support blocks should be attached to the rail with heavy wood screws. Details of this mounting, with all necessary dimensions, are given on page 4.

1. Install the Motor Unit with support plate loosely in position as shown on page 4. Do not tighten the mounting screws.
2. Loosen the two set screws in the collar of the flexible coupling on the Motorboard Unit, a detail of which is shown on page 3.
3. Place the Motorboard Unit in position on the cabinet rail with the upper mounting springs in place as shown on page 4. Make sure that the guide pins extending from the motor support plate enter the rubber grommets in the Motorboard Unit without binding.
4. Secure Motorboard in position using the screws and lower mounting springs as shown on page 4. Tighten up the four motorboard mounting screws to compress all eight mounting springs to the dimensions shown. *Make sure that the Motorboard Assembly is level in the cabinet.*
5. Tighten up the mounting screws on the Motor Unit support plate assembly so that they are firmly down against the spacers.
6. Check the installation to be sure that there is no binding between the collar of the flexible coupling and the collar of the motor spindle. See page 3.
7. Tighten the two set screws of the flexible coupling down on the spindle of the Motor Unit.

Needle Box

The needle box is in a separate package. Place the box in the hole in the motorboard with the needle ejector tab toward the front. To do this tilt the box upwards at front and lower into hole with the lug on back of box in the slot in the motorboard. Slide the lug under the motorboard and the box drops in place.

Speed Regulation and Lubrication

There are three holes in the top of the turntable which give access to oil holes and a speed regulating screw in the motor mechanism beneath. Revolve the turntable slowly until you can see the holes and screw through the turntable. A few drops of good quality light machine oil should be applied in the oil holes at regular intervals, about once every six months.

Speed Regulation.—After the phonograph is in operation the speed should be checked while playing a record.

1. Place a piece of white paper under edge of record so that it is plainly visible.
2. Count the number of revolutions per minute with the aid of a watch.
3. If not 78, stop the turntable, lift off the record and set the turntable to give access to the speed regulator screw through one of the holes.
4. Insert a screwdriver through the hole in the turntable into the groove in the speed regulator screw and turn to right (clockwise) to decrease speed, or to the left (counter-clockwise) to increase speed.
5. Replace and replay record, recount and adjust until speed is checked at 78 r. p. m.

Shipping

Shipping blocks as shown on page 4 should be used in all cases of reshipment.

OPERATION

Before operating the phonograph, either automatically or manually, be sure that the pickup is down and can be moved by hand. If not, a "cycle" must be completed to bring it down. To do this, throw Turntable Switch "on." The turntable will start to revolve and the cycle of motion on the pickup arm will be resumed. When the pickup arm comes down, turn off the Turntable Switch.

Cautions

1. Never use force to start or stop the motor or any part of the record-changing mechanism or pickup arm.

2. The use of records which have become warped or damaged through improper care may cause the mechanism to jam and damage the instrument. In addition, records which have become warped will slide on one another when playing, resulting in unsatisfactory reproduction.

3. This instrument is not recommended for playing 10-inch and 12-inch records in mixed sequence. If the user desires this service he must be positive that all records are perfectly flat and free from warp. The Index and Record Reject Lever must be set at "10" and after playing the last selection the pickup will come down in position for a 10-inch record and repeat the playing of the record on a 10-inch diameter unless the Turntable Switch is turned off. Any jamming of the mechanism under these conditions indicates that the records used are not perfectly flat or that their edges are not sufficiently smooth to permit normal operation of the separators in dropping each record in sequence onto the turntable.

4. Do not leave records on the record holder posts, as they are liable to warp, particularly so in warmer climates. Keep your records in a record file (album or cabinet) when not in use. If any records should become warped, place them on a flat surface with a flat heavy article, such as a large book, on top and leave them in this position for a few days.

Controls and Moving Mechanism

Index and Record Reject Lever.—This lever is located near the right front corner of the motorboard with its index plate marked for four positions—"MANUAL," "12," "10," and "REJECT." When you desire to change record selections manually, this lever should be set in the "MANUAL" position. With the lever in the "12" position, the mechanism is set to play a series of 12-inch records automatically. To play either a series of 10-inch records, or 10- and 12-inch records mixed, the lever should be set at the "10" position.

To reject a record being played, or to start the record-changing cycle in case the record just played does not have the standard eccentric or spiral stopping groove, simply push the lever to the "REJECT" position and let go. The pickup will raise up and swing outwards and the next record will drop down. Upon releasing the lever, it will automatically return to the "10" position. If you are playing a series of 12-inch records, the lever should be returned to the "12" position after rejecting a record. Keep the lever in its "MANUAL" position when not actually playing records automatically.

(Continued on page 4)

Automatic Record Changer

GENERAL INFORMATION

Before servicing the automatic record changer, inspect the assembly to see that all levers, parts, gears, springs, etc., are in good order and are correctly assembled.

A bind or jam in the mechanism can usually be relieved by rotating the turntable in the reverse direction.

The changer can be conveniently rotated through its change cycle by pushing the index lever to "Reject" and revolving the turntable by hand. Six turntable revolutions are required for one change cycle.

The turntable, spindle, and pinion gear are assembled by means of a 3/32 inch straight pin. This pin may be removed by gently driving with a standard pin punch.

If the record changer or cabinet is not perfectly level, normal operation is likely to be affected.

The 10 and 12 inch records must be absolutely flat for smooth operation when using a mixture of the two sizes.

A shorting switch, located in the pickup head, operates due to pressure when the pickup is placed on the pickup rest.

ADJUSTMENTS

A. Main Lever.—This lever is basically important in that it interlinks the various individual mechanisms which control needle landing, tripping, record separation, etc. One adjustment is provided for the main lever. Rotate the turntable until the changer is out-of-cycle; and adjust rubber bumper bracket (A) so that the roller clears the nose of the cam plate by 1/16 inch.

B. Friction Clutch.—The motion of the tone arm toward the center of the record is transmitted to the trip pawl "22" by the trip lever "7" through a friction clutch "5." If the motion of the pickup is abruptly accelerated or becomes irregular due to swinging in the eccentric groove, the trip finger "7" moves the trip pawl "22" into engagement with the pawl on the main gear, and the change cycle is started. Proper adjustment of the friction clutch "5" occurs when movement of the tone arm causes positive movement of the trip pawl "22" without tendency of the clutch to slip. The friction should be just enough to prevent slippage, and is adjustable by means of screw "B." If adjustment is too tight, the needle will repeat grooves; if too loose, tripping will not occur at the end of the record.

C. Pickup Lift Cable Screw.—During the record change cycle, lever "16" is actuated by the main lever "15" so as to raise the tone arm clear of the record by means of the pickup lift cable. To adjust pickup for proper elevation, stop the changer "in-cycle" at the point where pickup is raised to the maximum height above turntable plate, and has not moved outward; at this point adjust locknuts "C" to obtain 1 inch spacing between needle point and turntable top surface.

D. & E. Needle Landing on Record. — The relation of coupling between the tone arm vertical shaft and lever "20" determines the landing position of the needle on a 10 inch record. Position of eccentric stud "E" governs the landing of the needle on a 12 inch record; this, however, is dependent on the proper 10 inch adjustment.

To adjust for needle landing, place 10 inch record on turntable; push index lever to reject position and return to the 10 inch position: see that pickup locating lever "17" is tilted fully toward turntable; rotate mechanism through cycle until needle is just ready to land on the record; then see that pin "V" on lever "14" is in contact with "Step T" on lever "17." The correct point of landing is 4-11/16 inches from the nearest side of the turntable spindle; loosen the two screws "D" and adjust horizontal position of tone arm to proper dimension, being careful not to disturb levers "14" and "17". Leave approximately 1/32 inch end play between hub of lever "20" and pickup base bearing, and tighten the blunt nose screw "D"; run mechanism through several cycles as a check, then tighten cone pointed screw "D".

After adjusting for needle landing on a 10 inch record, place 12 inch record on turntable; push index lever to reject and return to 12 inch position; rotate mechanism through cycle until needle is just ready to land on the record; the correct point of landing is 5-11/16 inches from nearest side of spindle. If the landing is incorrect, turn stud "E" until the eccentric end adjusts lever "14" to give correct needle landing. The eccentric end of the stud must always be toward the rear of the motor board, otherwise incorrect landing may occur with 10 inch records.

F. & G. Record Separating Knife. — The upper plate (knife) "25" on each of the record posts serves to separate the lower record from the stack and to support the remaining records during the change cycle. It is essential that the spacing between the knife and the rotating record shelf "27" be accurately maintained. The spacing for the 10 inch record is nominally .055 inch, and for the 12 inch record is .075 inch.

To adjust, rotate the knife to the point of minimum vertical separation from the record shelf and turn screw and locknut "F" to give .052—.058 inch separation. Screw "G" must not be depressed during this adjustment. After setting screw "F" adjust screw "G" so that when its tip is depressed flush with top of record shelf, the vertical spacing between the knife, in its lowest rotational position, and the shelf, is .072—.078 inch.

H. Record Support Shelf.—The record shelf revolves during the change cycle to allow the lower record to drop onto the turntable. Both posts are rotated simultaneously by a gear and rack coupled to the main lever "15," and it is necessary that adjustments be such that the record is released from both shelves at the same instant. To adjust, place a 12 inch record on the turntable, rotate mechanism into cycle to the point where tone arm is at maximum distance outward from turntable; lift record upward until it is in contact with both separating knives, then loosen screws "H" and shift record shelves so that the curved inner edges of the shelves are uniformly spaced at least 1/16 inch from record edge. Tighten the blunt nose screw "H," run mechanism through cycle several times to check action, then tighten cone pointed screw "H".

If record shelves or knives are bent, or not perfectly horizontal, improper operation and jamming of mechanism will occur.

J. Tone Arm Rest Support (not shown).—When the changer is out-of-cycle, the front lower edge of the pickup head should be 5/16 inch above surface of motor board. This may be adjusted by bending the tone arm support bracket, which is associated with the tone arm mounting base, in the required direction.

K. Trip Pawl Stop Pin.—The position of the trip pawl stop pin "K" in relation to the main lever "15" governs the point at which the roller enters the cam. By bending the pin support either toward or away from trip pawl bearing stud, the roller can be made to enter the cam later or earlier, respectively. This adjustment should be made so that the roller definitely clears the cam outer guide as well as the nose of the cam plate.

Lubrication.—Petrolatum or petroleum jelly should be applied to cam, main gear, spindle pinion gear, and gears of record posts.

Light machine oil should be used in the tone arm vertical bearing, record post bearings, and all other bearings of various levers on underside of motor board.

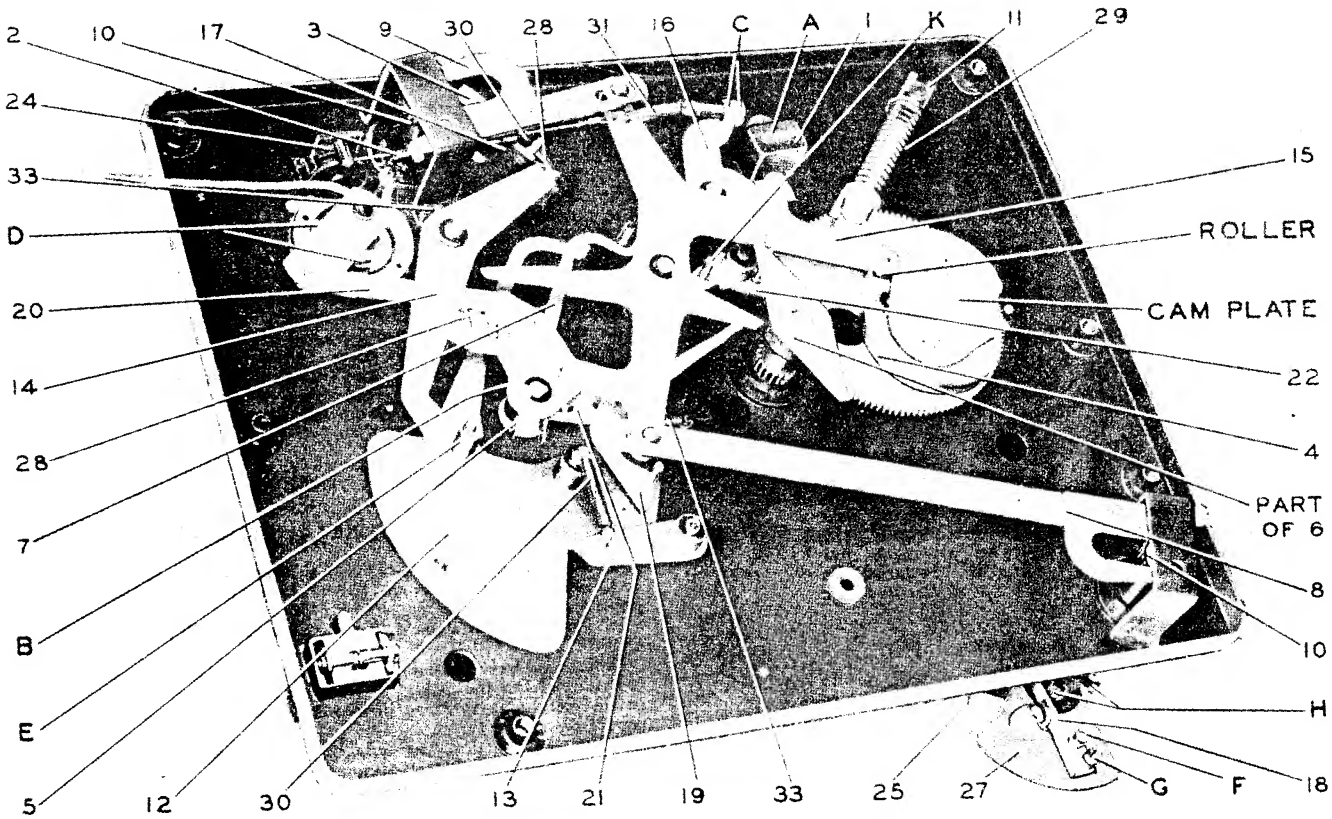
The felt washer between the turntable and spindle bearing should be soaked in light engine oil whenever the turntable is removed, or as required for proper operation.

Do not allow oil or grease to come in contact with, rubber mounting of tone arm base, rubber bumper, or flexible coupling of drive motor.

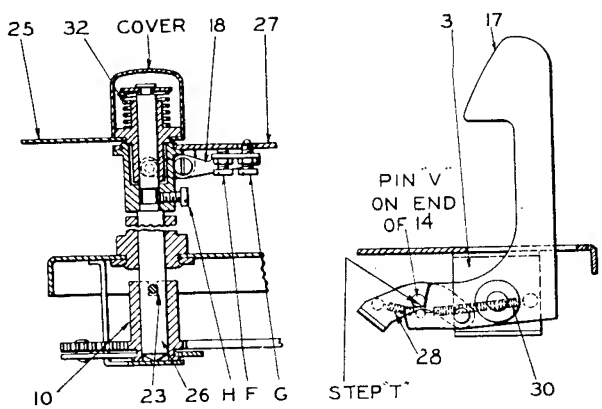
MISCELLANEOUS SERVICE HINTS

Incorrect adjustment of a particular mechanism of the changer is generally exhibited in a specific mode of improper operation. The following relations between effects on operation and the usual mis-adjustments will enable ready adjustment in most cases.

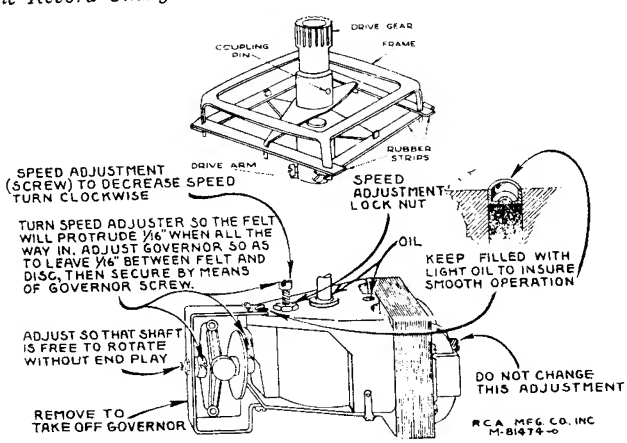
1. For any irregularity of operation, the adjustment of the main lever "15" should be checked first as in "A".
2. Needle does not land properly on both 10 and 12 inch records—Make complete adjustments "D" and "E".
3. Needle does not land properly on 12 inch record but correct on 10 inch—Effect adjustment "E".
4. Failure to trip at end of record—Increase clutch "5" friction by means of screw "B". Also, see that levers "7" and "12" are free to move without touching each other.
5. Pickup strikes lower record of stack or drags across top record on turntable—Adjust lift cable per adjustment "C".
6. Needle does not track after landing—Friction clutch "5" adjustment "B" may be too tight; bind in tone arm vertical bearing; levers "7" and "12" fouled; or pickup output cable twisted.
7. Cycle commences before record is complete—Record is defective, or adjustment "B" of friction clutch "5" is too tight.
8. Wow in record reproduction—Record is defective; flexible coupling between motor and changer mechanism not correctly assembled; or instrument is not being operated at normal room temperature (65° F).
9. Record knives strike edge of records—Records warped; record edges are rough; or knife adjustments "F" and "G" are incorrect.
10. Record not released properly—Adjust record shelf assemblies in respect to shaft by means of adjustment "H".
11. Needle lands in 10 inch position on 12 inch record or misses record when playing both types mixed—Increase tension of pickup locating lever spring "30".



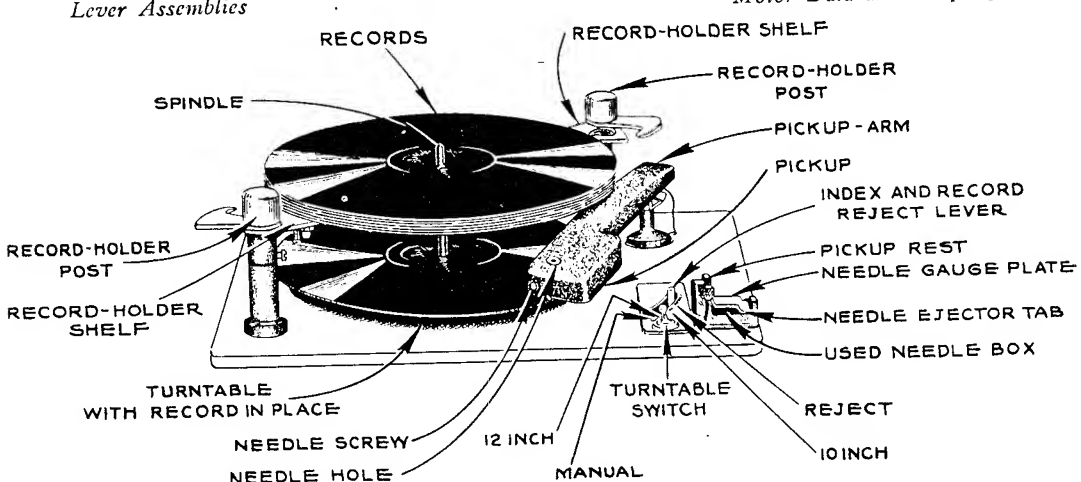
Bottom View of Automatic Record Changer



Details of Record Shelf Posts, and Locating Lever Assemblies



Motor Data and Coupling



Top View of Automatic Record Changer

NOTE: Numbers refer to parts—letters refer to adjustments.

Turntable Switch.—The toggle switch located just in front of the Index and Record Reject Lever controls the current to the turntable motor. To start the turntable, throw the switch to the "ON" position. To stop the turntable throw the switch to the "OFF" position.

Pickup and Top-Loading Needle Socket.—The pickup is the new crystal type, with a hole in the top for insertion of needles. When not playing records, the pickup arm should be moved out to the right beyond the turntable and placed at rest on the support with the edge of the pickup arm in the groove and the pickup over the needle gauge plate. The pickup must be in this position to change needles.

To insert a needle initially, loosen the needle screw on the front of the pickup, place needle in hole at top so that it drops down against the needle gauge plate and then tighten up the needle screw.

Needle Ejector.—The extending tab on the needle gauge plate of the needle box operates the needle ejector. To change a needle, place pickup in rest position, loosen needle screw and press the extending tab on the needle gauge plate to drop the used needle into the box below. Release tab, allowing the needle gauge plate to swing back, and then insert a new needle in the pickup as described above.

Record Holder Shelves.—To place a record on the turntable or to remove records, raise the record holder shelves, by lifting with the fingers under the shelf, and swing clear of outer edge of record. Also push back vertical lever adjacent to the rear record holder post. You now have clear access to the turntable. Before loading the magazine for Automatic Operation swing the record holder shelves back into position.

Automatic Operation

1. See that pickup is over needle gauge plate with needle properly in place. If not, complete a "cycle" as explained in the first paragraph under "OPERATION."
2. With Index and Record Reject Lever at "MANUAL," place the first of the series of records on the turntable and the remainder of the series (up to seven 10-inch or six 12-inch records) on the record holder posts (as shown in Figure 1). The records should be arranged in the desired order with the desired selection face up and the last selection on top.
3. Set the Index and Record Reject Lever to the proper position. (See CONTROLS: — INDEX AND RECORD REJECT LEVER.)
4. Throw Turntable Switch to the left—"ON"—turntable should commence to revolve.
5. When turntable has attained speed, lift pickup and lower gently on to the record so that the needle point enters the outside groove.
6. Close the lid of the cabinet to eliminate mechanical reproduction of sound by the needle.

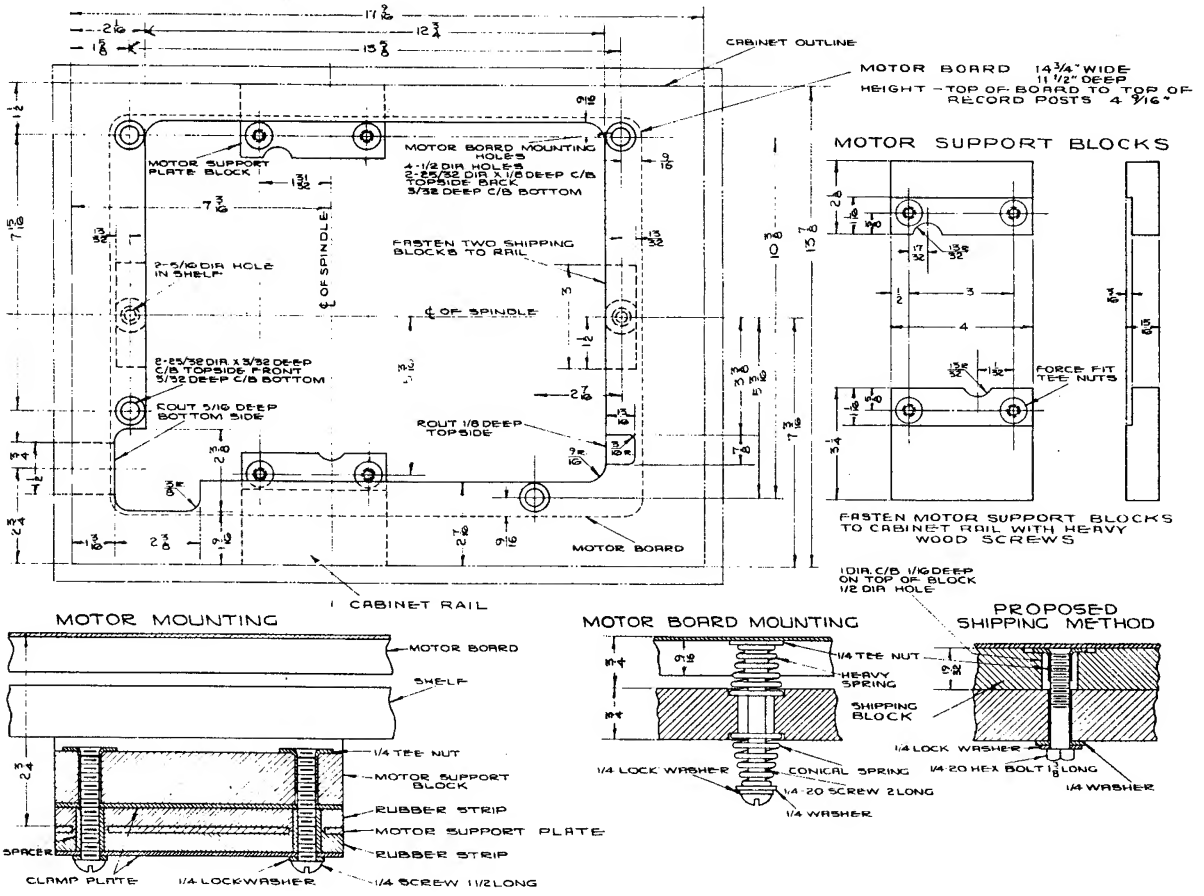
The whole series of records will now play without further attention, and the last record will repeat until the Turntable Switch is turned off. Allow the record-changing mechanism to complete its cycle before the turntable is stopped. Then lift the pickup, swing the arm to the right beyond the edge of the record and lower it onto the pickup rest with pickup over needle gauge plate. The record player is then ready for reloading, or for manual operation.

Manual Operation

To play records manually:
1. Proceed as in step 1, under "AUTOMATIC OPERATION."
2. Place record on turntable with desired selection upwards.
3. Set Index and Record Reject Lever to "MANUAL" position.
4. Proceed as in steps 4, 5 and 6 under "AUTOMATIC OPERATION."

When you have finished playing, be sure that the turntable has stopped and the pickup is in the rest position over needle gauge plate. Never leave pickup with needle resting on a record or on the turntable.

Good reproduction can only be obtained with the turntable revolving at 78 revolutions per minute. For speed check and regulation see INSTALLATION, page 1.



MOUNTING DETAILS FOR

SERVICE MANUAL

ZENITH

AUTOMATIC RECORD CHANGER

ZENITH RADIO CORPORATION
CHICAGO, U. S. A.

ZENITH

AUTOMATIC RECORD CHANGER

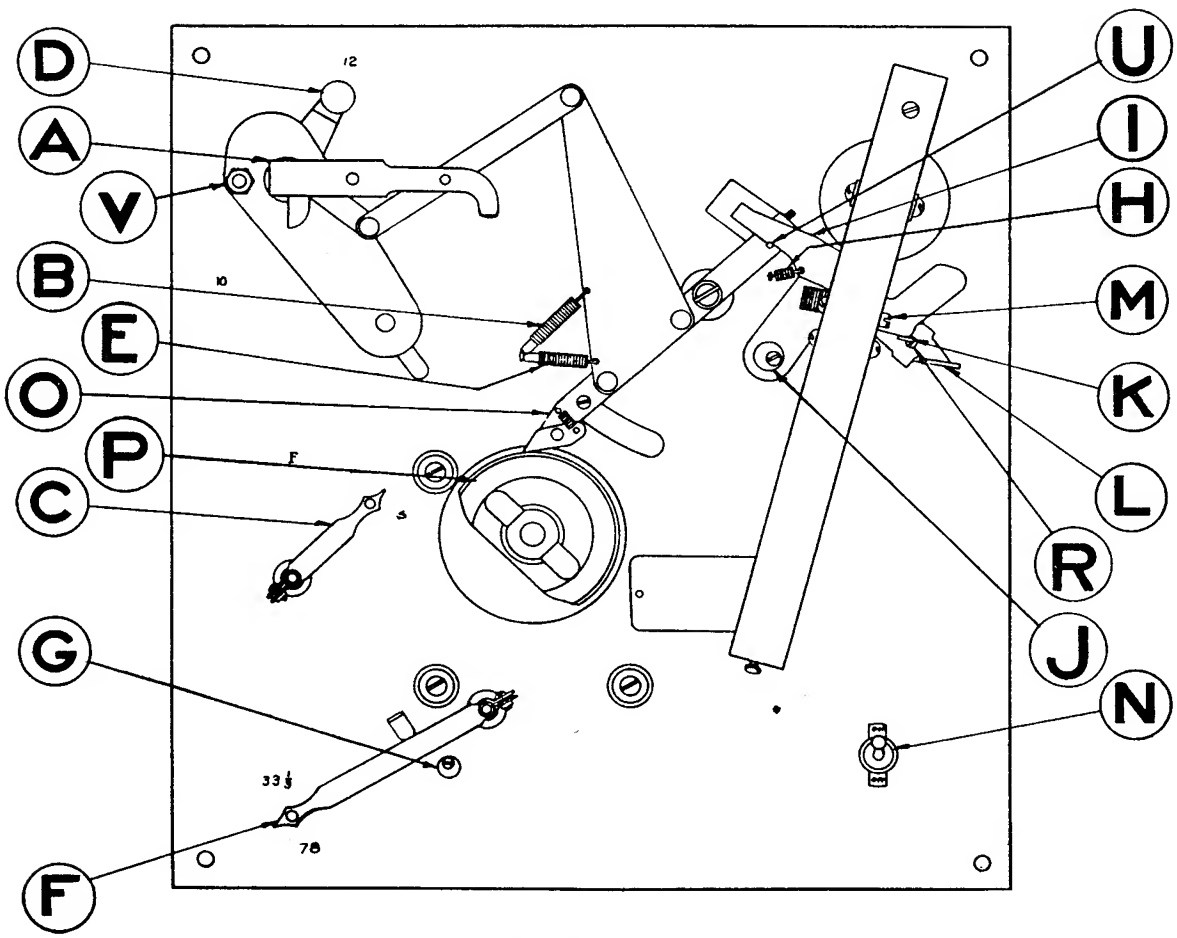


FIGURE NO. 1

OPERATING INSTRUCTIONS

The Zenith Record Changer plays seven 12" or eight 10" Records automatically. The last record remains on the turntable and repeats as long as the Record Changer is in operation.

Records may be repeated as often as desired by raising the record removing arm at A Fig. 1 to the upright position.

To reject a record and play the next record below it, pull the latch lever at L Fig. 1 forward.

To adjust the record removing arm to handle 10" records set the record removing arm change lever at D Fig. 1 opposite the number 10 stamped on the base plate. For 12" records set the lever opposite the number 12.

To adjust the pickup to play 10" records, push the pickup stop at K Fig. 1 back. (Away from the pickup needle) . For 12" records pull the stop forward (toward the needle) as far as it will go.

Some units are equipped with two speed motors, and others with 78 RPM motors. When the two speed motor is used change from one speed to the other by simply moving lever at F Fig. 1 to position desired.

To start motor, throw switch (supplied on some models) at N Fig. 1 on the "on" position.

MOTOR LUBRICATION

The motor installed in the Record Changer is governor controlled, with all gearing enclosed, and leaves the factory lubricated for proper operation. For maximum satisfaction, lubricate the motor at regular intervals with SAE No. 10 oil. Please do not use any other grade of oil.

The governor disc engages with a ring of hard felt. This felt is impregnated with a lubricating solution sufficient for proper operation for approximately a year under normal conditions. It may be necessary, however, if the motor shows a tendency to chatter or waiver, to apply a drop or two of oil to this felt ring.

MOTOR SPEED

The motor speed is adjusted by means of a lever at C Fig. 1 which is mounted under the turntable. The direction of swing to fast or slow is indicated by the legends F and S on the base plate.

33-1/3 RPM — 78 RPM SHIFT

(Two-speed motors only)

Move the speed change lever at F Fig. 1 as far as it will go in the direction of swing indicated by the legends 33-1/3 and 78 on the base plate.

If adjustment of the speed change lever is required for any reason, proceed as follows: First loosen the screw which clamps the lever to the motor shaft. This shaft is provided with a screw-driver slot in the end. Next, using a screw driver, turn this shaft in a clockwise direction until you feel it strike the stop. The motor is now in the 33-1/3 RPM position. Now set the lever against the lug provided in the base plate and opposite the legend 33-1/3 and tighten the clamp screw. This places the lever in the correct position on the motor shaft. The final step is the adjustment of the eccentric bushing at G Fig. 1 which limits the throw of the lever. First loosen the screw which holds the eccentric bushing. Next, throw the speed change lever to its farthest 78 RPM position, (using care that the lever does not slip on the motor shaft). Then turn the eccentric bushing around until it touches the side of the lever, and tighten it in place with the screw provided.

TRIP MECHANISM

The trip mechanism is the trigger that sets the Record Changer in motion. This is done by allowing the latch bar at O Fig. 1 to drop in front of, and be actuated by the cam at P Fig. 1. This cam is driven by the motor and is in motion as long as the motor is running. If this mechanism does not operate smoothly, the precautions outlined in succeeding paragraphs should be observed.

First of all, make sure that the square pin in the latch lever at U Fig. 1 latches properly in the notch in the lift lever at I Fig. 1. When latched, the notch should be engaged approximately one-half of its depth. The depth of engagement is adjusted by means of the eccentric washer and locking screw at J Fig 1. Now run the Record Changer through its cycle. If the square pin fails to engage the notch in the lift lever, first check the tension of the latch spring at H Fig. 1 to insure that the notch can engage the pin. Next check the tension of the reset spring at E Fig. 1. This reset spring should not be under tension when the latch bar is latched but should have enough tension when the latch bar drops back off of the cam to cause the square pin to over travel the notch in the lift lever.

IMPORTANT — Before attempting to change the tension of any spring, be sure that the parts involved work freely without any tendency to bind, as of course any binding condition would preclude proper operation.

The Record Changer is adjusted at the factory to trip on a spiral trip groove record when the phonograph needle is 1¾" from the edge of the hole in the center of the record.

When eccentric or oscillating trip groove records are used, tripping is effected by means of the hardened steel pin in the end of tone arm lift crank at S Fig. 2 engaging the serrated block on the trip lever at T Fig. 2. There must be a minimum of 1/32" play between the end of the pin and the block, when, with a short needle, (5/8" Minimum Length) the pickup is resting on one record on the turntable. If the pressure of the pin on the block is not sufficient to insure operation, then check the pressure spring which is located up under the pickup.

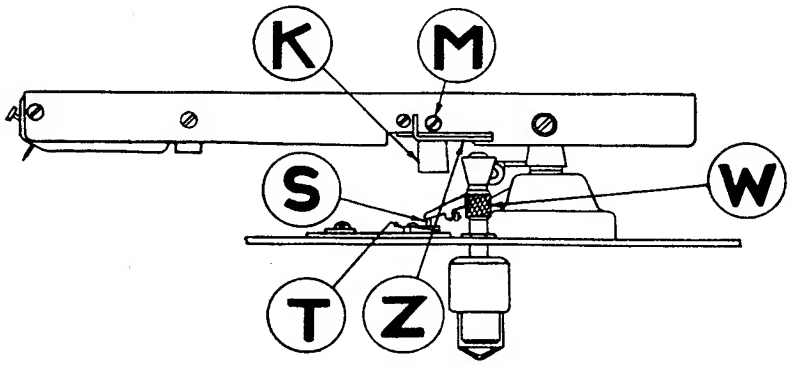


FIG NO. 2

The oval head pivot screw at R Fig. 1 serves as a pivot for the lift lever at I Fig. 1. This screw should allow the lift lever to be raised by the latch bar to its maximum height without binding but also without any additional play.

If the Record Changer fails to trip, see if the phonograph needle is jumping out of a worn record trip groove. Next make certain that all parts of the mechanism work freely and smoothly. If it is found that the latch bar at O Fig. 1 is not dropping in far enough to engage the cam at P Fig. 1, then check the tension of the trip spring at B Fig. 1.

RECORD REMOVING MECHANISM

The Record Changer is adjusted so that it will always leave one record on the turntable. This is done to prevent the phonograph needle from damaging the covering on the turntable.

In case the Record Removing Mechanism fails to operate smoothly, proceed as follows: First make certain that all parts work freely with no binding in pivots or bearings, and that the record removing arm assembly rests on the stop screw at Q Fig. 3. Next stop the motor in such a position that the latch bar at O Fig. 1 can swing by and clear the cam at P Fig. 1. Place just one record on the turntable and measure from the top of this record down to the base plate. This distance should be one inch. Now by pulling the reject lever at L Fig. 1 first, it will be found possible to swing the record removing finger at Y Fig. 3 over to where it just touches the edge of the record. If the adjustment is correct, the record removing finger should just barely rise over the edge of the first record. If adjustment is required it can be made by means of the stop screw at Q Fig. 3. In the event the record removing arm raises the record from the turntable and drops it back in place without removing it, check the lift adjustment at V Fig. 1. This adjustment consists of an eccentric stud which is provided with a lock nut, and is made by loosening the lock nut and turning the eccentric stud. The lift adjustment should be set so that the hole in the center of the record just clears turntable spindle when the Record Changer is in operation.

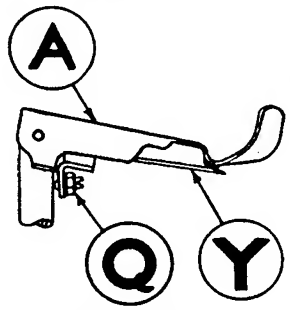


FIG. NO. 3

PICKUP LOWERING MECHANISM

The pickup lowering mechanism has two functions. First, it lowers the phonograph needle gently to the surface of the record. Second, it feeds the needle toward the center of the record so that it will enter the playing groove.

If the pickup descends too fast or too slow, adjust the speed of descent by turning the knurled thumb nut on the dashpot sleeve at W Fig. 2.

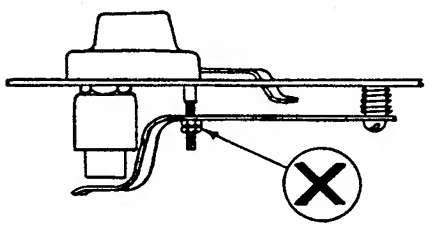


FIG. NO. 4

The unit is adjusted at the factory so that the needle will be set down approximately 3/32" in from the edge of the record. An adjusting screw is provided on the side of the pickup at M Fig. 2. If the needle is being lowered onto the playing surface of the record, and the adjusting screw at M Fig. 2 fails to correct the condition proceed as follows: First stop the record changer, with the pickup in the maximum raised position and check the clearance between the underside of the pickup shelf at Z Fig. 2 and the tip of the dashpot. This clearance should be very small as otherwise the pickup will tend to bounce as it is lowered. There must be sufficient clearance however to prevent the pickup shelf from rubbing on the tip of the dash pot, or the pickup will not swing out far enough to allow the adjustable stop at K Fig. 2 to come to rest against the dashpot. Check this clearance in both 10" and 12" record positions. If adjustment is required, the height of the dashpot may be regulated by loosening the nuts on the bottom of the lift lever stud at X Fig. 4 and changing their position on the stud. To raise the dashpot turn the nuts clockwise, to lower the dashpot turn the nuts counter-clockwise. Be sure to lock the nuts tightly together after the adjustment is made.

SERVICE MANUAL

MODEL
6 - M - 390

ZENITH AUTO-RADIO

Built for
FORD MOTOR CO.
Dearborn, Mich.

Made by ZENITH RADIO CORPORATION, Chicago, Ill., U.S.A.

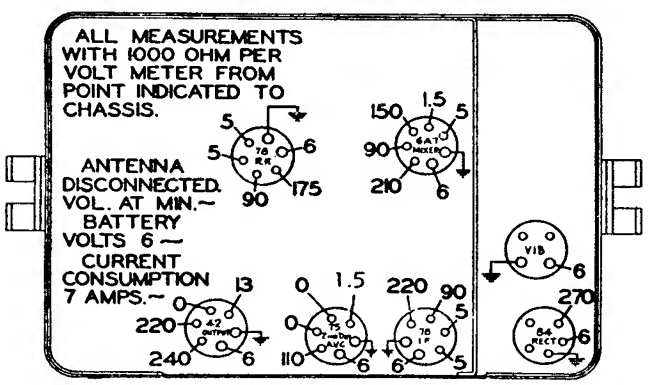
ELECTRICAL SPECS: Rotomatic Tuning—Provides a means of selecting either manual or any one of five pre-selected stations using a single push-button. The automatically controlled circuits consist essentially of permeability tuned inductances in the oscillator circuit and mica type trimmers in the detector stage. Switching is accomplished electrically by coincidental solenoid operation of band-switch type segments.

Sensitivity—10 microvolts at 1 watt output. **Tuning range** 540—1580 K.C. **Power output**—3 watts measured at voice coil. **Speaker**—8" dynamic. **I.F.**—455 K.C. **Automatic**—Five positions and "Dial."

Tube complement—78 R.F., 6A7 mixer, 78 I.F., 75 2nd det. and audio, 42 output, 84 rectifier. **Current Consumption**—7 amp. at 6 volts.

NOTE: This receiver is equipped with a fixed-variable sensitivity control located on the chassis base below the tuning control shaft of the variable condenser. (See Fig. 5.) The control can be adjusted with a screw driver either from above or below the chassis, and is set at the factory to a position which gives a sensitivity of 10 microvolts at 1 watt output. In practice it is found advisable to hold the receiver to this level as any higher sensitivity might result in increased motor noise or excessive background noise. Unless laboratory equipment capable of accurately measuring the input and output of the receiver is available, it is not advisable to alter this setting.

MANUAL DIAL ADJUSTMENT: The manual control dial must be aligned with the receiver for correct calibration. To do this, turn the manual tuning knob in one direction as far as it will go. Now do the same in the opposite direction. Then tune in a station of known frequency, and note if the dial reading corresponds. If the frequency reading is not correct, hold the tuning knob firmly and move the dial drum with your fingers through the bezel to the correct frequency reading of the station being received.



SOCKET VOLTAGES

FIG. 1 BOTTOM VIEW OF CHASSIS

AUTOMATIC DIAL SYNCHRONIZATION: Before setting the station adjusting screws for automatic tuning, it may be necessary to synchronize the automatic dial to the receiver which is done as follows: Turn on the receiver, and try to tune in a station with the manual tuning control. If no station

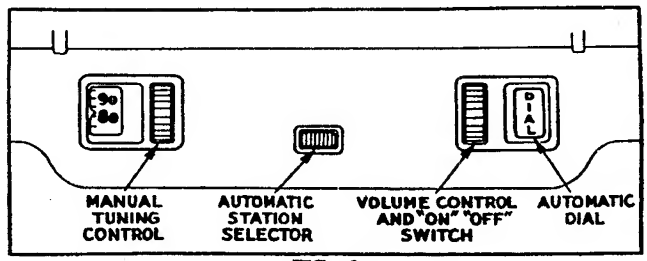


FIG. 2

can be picked up, push the automatic station selector button until a position is found where stations can be tuned in manually. Remove the automatic dial assembly by pulling out from the rear and turn the station indicator drum downward until the word "Dial" appears in the opening. The adjusting screws in the receiver can now be resonated for the stations shown around the automatic dial as the automatic button is operated. It is very important that these adjusting screws be set on a weak signal from the station so that the circuit may be sharply tuned. A very short piece of wire used as an antenna will hold down the signal strength. Always be sure the antenna characteristics are similar to actual car conditions. A 38 mmfd. condenser from antenna to ground will provide the necessary input capacity.

AUTOMATIC TUNING ADJUSTMENTS: 1. Turn the receiver on and allow it to operate until thoroughly heated. Loosen the screws holding the cover plate over the automatic adjustments, and slide it upward exposing the adjusting screws and recording strip. This plate is on the front of the receiver. (See Fig. 4.)

2. Push the automatic station selector button until the word "Dial" is at the automatic dial window. Tune in manually the station whose call letters are in the No. 1 position on the dial (the lowest frequency station—see Fig. 3) and note the program so that it can be identified. Push the automatic station selector button once, and this station's call letters will appear at the automatic window.

3. With a small screw driver, turn the station setting screw A (see Fig. 4) in the upper row to the right or left until that station is tuned in accurately.

Now adjust the corresponding screw A1 in the lower row until maximum volume is obtained. Make these adjustments very carefully as it is quite easy to pass the resonant point due to the unusual selectivity of the receiver.

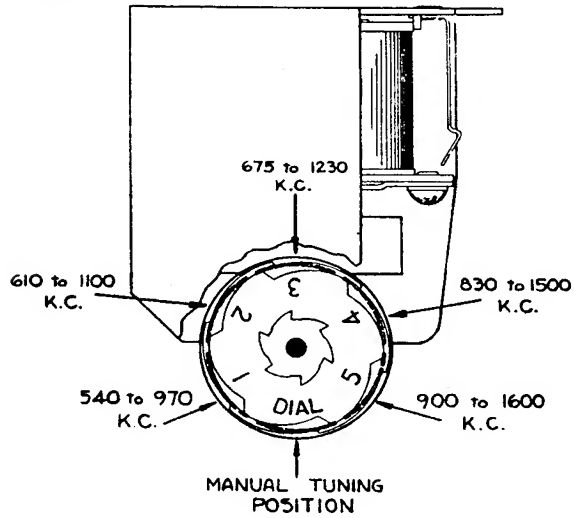


FIG. 3

4. Press the automatic station selector button until "Dial" again is at the automatic window and tune in manually the station whose call letters are in the No. 2 position (the next higher frequency) on the automatic dial. Press the automatic station selector button twice to bring the No. 2 station's call letters in view, and adjust B and B1 screws to this station. Repeat this procedure until each of the five pairs of adjusting screws have been carefully set to their respective stations. It is necessary that the setting of the adjusting screws be repeated in the order given to be sure that they are properly set for maximum performance.

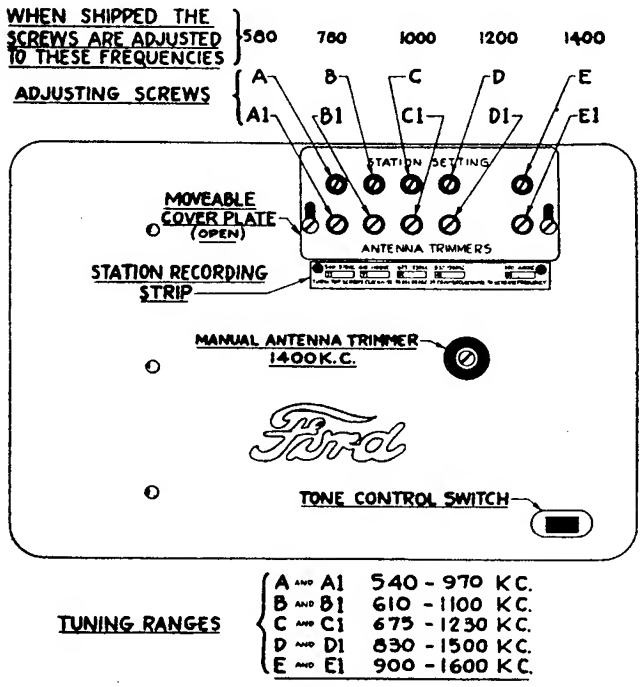


FIG. 4

If the station setup on the automatic tuning dial should appear in the wrong position, the dial can easily be re-synchronized to the receiver as explained under "Dial Synchronization." If it is necessary to examine the automatic dial mechanism or change call letters it may easily be removed from the speaker housing by pressing the spring catch directly beneath the assembly and pulling out from the rear.

If difficulty is experienced in setting the adjusting screws for the desired station, first turn the antenna trimmer screw down tight, and then adjust the station setting screw (oscillator) to the station, and follow with a readjustment of the antenna trimmer screw for resonance.

ALIGNMENT: I. F. Connect signal generator set at 455 K. C. through .1 mfd. condenser direct to 6A7 grid cap. Adjust I. F. trimmers A, B, C, D, (Fig. 5) to resonance. This should be done with the volume control of the receiver on full, and the generator signal reduced to a weak level.

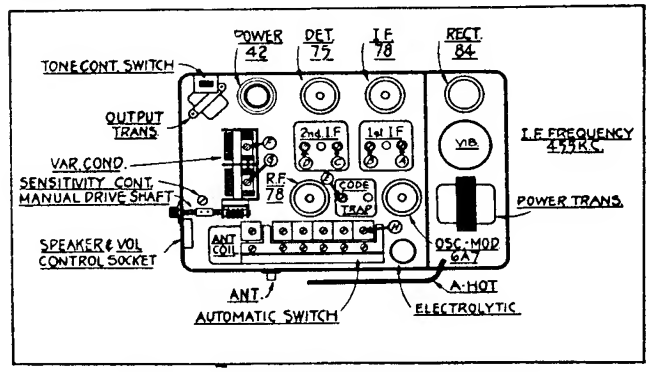


FIG. 5 TUBE AND TRIMMER LAYOUT

Wave Trap: Remove signal generator lead from 6A7 grid, and attach to 78 R. F. tube grid. Using the same signal frequency of 455 K. C. carefully adjust the wave trap trimmer E for minimum response with a strong generator signal.

R. F. Press the automatic button to where the "Dial" position shows, or until the set can be tuned manually. Now rotate the manual tuning control until the condenser plates are completely out of mesh. Remove the generator lead from the 78 R. F. tube and connect it direct through a Zenith dummy antenna unit (Zenith part No. S6740) to the antenna socket on the receiver. Set the signal generator to 1580 K. C., and adjust the oscillator trimmer F on the gang condenser to resonance. Reset the signal generator to 1400 K. C. turn the dial until the signal is heard and adjust the gang condenser trimmer G to maximum response. Reset the signal generator to 600 K. C., and again turn the manual dial until the signal is heard. Rock the condenser gang slightly while adjusting padder H to maximum response at this point.

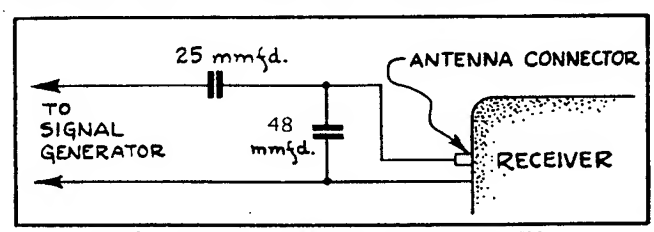
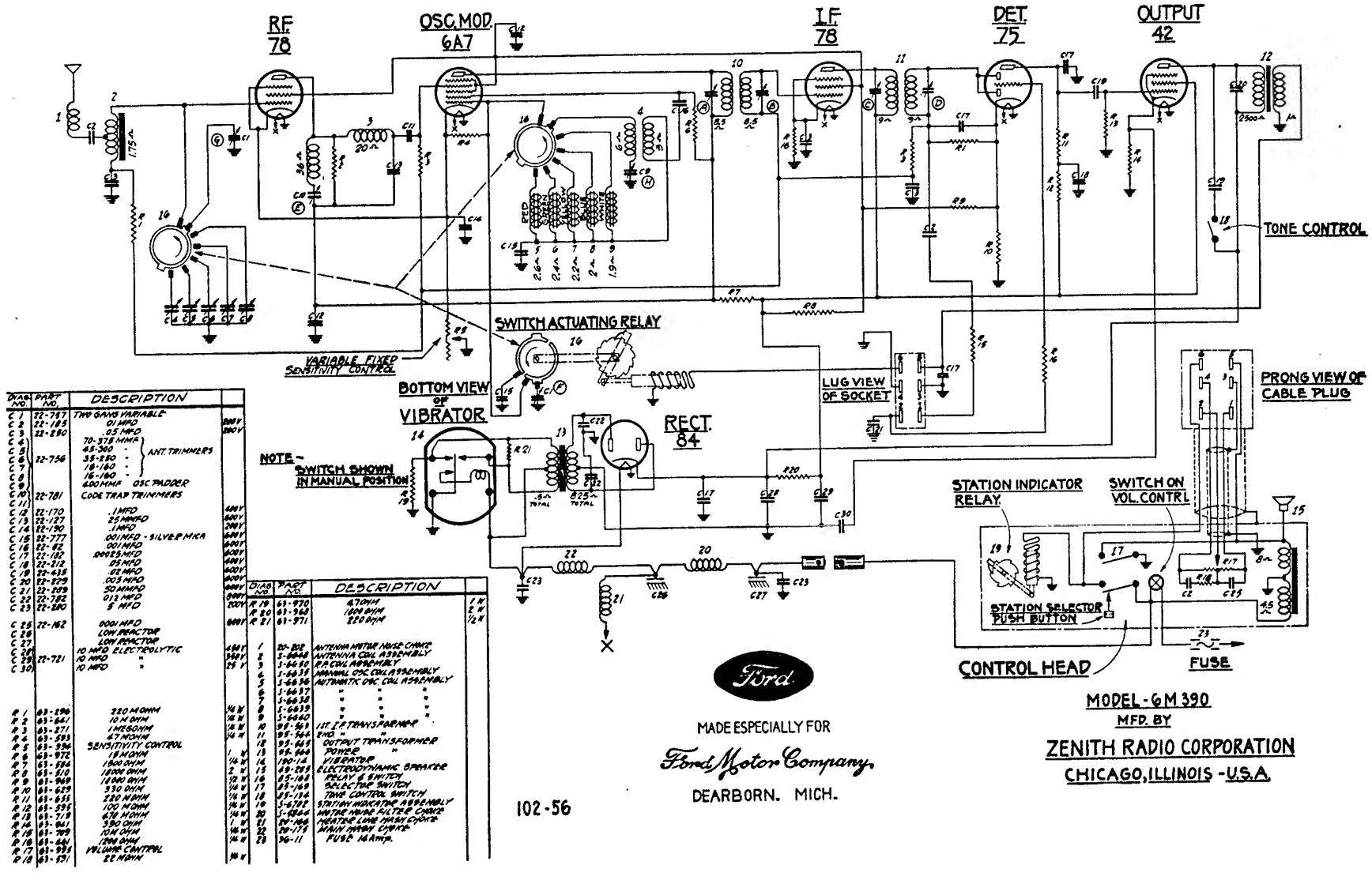


FIG 6 DUMMY ANTENNA REQUIREMENTS.

Figure 6 shows the dummy antenna requirements necessary where the special Zenith dummy connector S6740 is not available.



DIAG NO	PART NO	DESCRIPTION	
C 1	22-767	TWO GANG VARIABLE	
C 2	22-185	.01 MFD	200 V
C 3	22-280	.05 MFD	200 V
C 4		70-375 MMFD	
C 5		45-300 "	ANT. TRIMMERS
C 6	22-756	35-250 "	
C 7		18-160 "	
C 8		16-160 "	
C 9		400 MMFD OSC PADDER	
C 10	22-781	CODE TRAP TRIMMERS	
C 11			
C 12	22-170	.1 MFD	400 V
C 13	22-127	25 MMFD	600 V
C 14	22-190	.1 MFD	200 V
C 15	22-777	.001 MFD - SILVER MICA	600 V
C 16	22-182	.001 MFD	600 V
C 17	22-182	.0025 MFD	600 V
C 18	22-212	.05 MFD	400 V
C 19	22-438	.02 MFD	600 V
C 20	22-229	.005 MFD	400 V
C 21	22-289	.50 MMFD	600 V
C 22	22-782	.013 MFD	600 V
C 23	22-280	.5 MFD	200 V
C 25	22-162	.001 MFD	600 V
C 26		LOW REACTOR	
C 27		LOW REACTOR	
C 28		10 MFD ELECTROLYTIC	450 V
C 29	22-721	10 MFD "	350 V
C 30		10 MFD "	25 V

DIAG NO	PART NO	DESCRIPTION	
R 1	63-296	220 M OHM	1/4 W
R 2	63-241	10 M OHM	1/2 W
R 3	63-271	1 MEGOHM	1/2 W
R 4	63-293	47 M OHM	1/4 W
R 5	63-296	SENSITIVITY CONTROL	
R 6	63-272	1 M OHM	1/4 W
R 7	63-284	1500 OHM	1/4 W
R 8	63-210	18000 OHM	2 W
R 9	63-269	15000 OHM	10 W
R 10	63-229	330 OHM	1/4 W
R 11	63-251	220 M OHM	1/4 W
R 12	63-296	100 M OHM	1/4 W
R 13	63-218	470 M OHM	1/4 W
R 14	63-241	330 OHM	1/4 W
R 15	63-289	10 M OHM	1/4 W
R 16	63-299	1200 OHM	1/4 W
R 17	63-293	VOLUME CONTROL	
R 18	63-291	22 M OHM	1/4 W

DIAG NO	PART NO	DESCRIPTION	
R 19	63-270	470 OHM	1 W
R 20	63-249	1000 OHM	2 W
R 21	63-271	220 OHM	1/2 W
1	20-818	ANTENNA METER NOISE CHOKE	
2	3-6648	ANTENNA COIL ASSEMBLY	
3	3-6650	R.F. COIL ASSEMBLY	
4	3-6635	MANUAL OSC. COIL ASSEMBLY	
5	3-6636	AUTOMATIC OSC. COIL ASSEMBLY	
6	3-6637	" " " "	
7	3-6638	" " " "	
8	3-6639	" " " "	
9	3-6640	" " " "	
10	95-963	1ST. I.F. TRANSFORMER	
11	95-964	2ND. " "	
12	95-965	OUTPUT TRANSFORMER	
13	95-966	POWER "	
14	190-14	VIBRATOR	
15	49-289	ELECTRODYNAMIC SPEAKER	
16	25-183	RELAY & SWITCH	
17	25-169	SELECTOR SWITCH	
18	25-134	TONE CONTROL SWITCH	
19	5-6782	STATION INDICATOR ASSEMBLY	
20	5-6844	MOTOR MAIN FILTER CHOKE	
21	20-198	MOTOR LINE FILTER CHOKE	
22	20-179	MAIN HUM CHOKE	
23	36-11	FUSE 1/4 Amp.	

FIG. 7 MODEL 6-M-390 WIRING DIAGRAM

IMPORTANT: Unless certain dummy antenna capacities are employed with either the signal generator or in making adjustments on stations, the receiver will not respond properly. The values provided in the Zenith dummy antenna unit shown in Fig. 6 are identical with the conditions in the Ford car, and if adjusted accordingly the instrument will operate properly when reinstalled in the automobile. The Zenith dummy antenna S6740 is especially priced at 25c net to service stations, and should be purchased for use in servicing Zenith built Ford receivers.

PARTS LIST

Tuning Control Head & Speaker Assembly

S6623	Dial clutch gear assy. (for manual tuning)	$ .25
S6628	Magnet assy. (for automatic dial drum)	1.00
S6653	Magnet plunger & rachet pawl assy.	.25
22-162	Condenser .0001 mfd. 600 volt	.15
22-185	Condenser .01 mfd. 200 volt	.15
26-216	Dial scale for manual tuning dial drum	.20
34-83	Volume control shaft gear	.02
35-1	Drum—manual tuning indicator	.10
35-2	Drum—automatic station indicator	.10
46-268	Knob—volume control	.15
46-269	Knob—tuning control (manual)	.15
46-270	Knob—automatic push button	.02
49-285	Speaker—8" dynamic	4.00
	208-285—cone & voice coil for 49-285	2.25
52-151	Cable & six prong plug assembly	.80
52-152	Cable—battery (control unit to set)	.15
52-153	Cable—battery (control unit to fuse)	.15
52-154	Cable—battery (fuse to battery)	.15
63-591	Resistor—22M ohm ¼ watt	.07
63-995	Volume control & switch assembly	.90
76-273	Flexible drive shaft assembly	.90
80-188	Spring—retainer for S6623	.005
80-189	Spring—manual dial drum take up	.03
80-191	Spring—return for S6628	.04
83-632	Speaker cloth cover retaining strip	.03
85-169	Switch—automatic station selector	2.25
100-31	Bulb—dial light Madza #55	.12
100-32	Bulb—dial light Madza #51	.12
110-67	Speaker grill cloth	.03
110-68	Speaker dust cloth	.15
112-207	Screw—volume control shaft	.005
102-58	Tab—marked dial	.005
136-11	Fuse—14 ampere	.06
188-13	Retaining washer (automatc dial drum)	.01
188-30	Retaining washer (volume control knob)	.01
196-20	Speaker gasket (rubber)	.20

Automatic Coils & Switch Assembly

22-756	Six section trimmer condenser assembly	1.10
22-777	Condenser—1000 mmfd.	.45
85-168	Complete switch & relay assembly	2.15
	80-199—magnet coil plunger spring	.05
	85-174—automatic coil switch segment	.50
	85-175—trimmer condenser switch segment	.50
	93-412—magnet coil plunger spring retainer washer	.05
	149-10—magnet coil plunger	.10
	S6681—magnet coil & bracket	1.00
	S6682—ratchet arm & spring assembly	.75
	S6683—ratchet gear & shaft assembly	.75
S6226	Adjustment screw & bushing assembly	.45
S6635	Manual tuning oscillator coil assembly	.25
S6636	Auto. tuning oscillator coil assy.—red	.15
S6637	Auto. tuning oscillator coil assy.—green	.15
S6638	Auto. tuning oscillator coil assy.—yellow	.15
S6639	Auto. tuning oscillator coil assy.—blue	.15
S6640	Auto. tuning oscillator coil assy.—White	.15
S6663	Fibre terminal strip assembly	.25

Coils & Chokes

20-166	Heater line hash choke (on R. F. base)	.03
20-175	Main hash choke (large on P. P. base)	.15
20-202	Antenna motor noise choke (on R. F. base)	.03
95-563	1st I. F. coil assembly	1.10
95-564	2nd I. F. coil assembly	1.10
S5844	Motor noise choke (small on P. P. base)	.15
S6648	Antenna coil assembly (less shield)	.85
S6650	Untuned R. F. & wave trap assembly	1.75

Condensers

22-82	.001	mfd.	600	volt	.15
22-127	.25	mfd.	600	volt	.15
22-162	.0001	mfd.	600	volt	.15
22-170	.1	mfd.	400	volt	.20
22-182	.00025	mfd.	600	volt	.15
22-185	.01	mfd.	200	volt	.15
22-190	.1	mfd.	200	volt	.15
22-212	.05	mfd.	400	volt	.15
22-229	.005	mfd.	600	volt	.18
22-250	.05	mfd.	200	volt	.15
22-280	.5	mfd.	200	volt	.30
22-289	50	mmfd.	600	volt	.15
22-435	.02	mfd.	600	volt	.18
22-721	10 mfd. 450 volt x 10 mfd. 350 volt x 10 mfd. 25 V. (dry electrolytic)				1.00
22-756	Adjustable trimmer condenser				1.00
22-757	Two gang variable condenser (less gear & worm gear)				2.25
22-777	1000 mfd. 600 volt				.45
22-781	R. F. coil trimmer				.25
22-782	.012 mfd. 800 volt				.25

Variable Condenser & Gear Assembly

22-757	Two gang variable condenser only	2.25
34-86	Gear—condenser shaft	.25
34-87	Gear—worm	.25
54-125	Worm gear lock nut	.02
73-34	Worm gear adjusting screw	.02
83-499	Felt strip	.001
94-286	Brass bushing (used with 22-757 only)	.03
94-293	Brass bushing (used with 22-757 only)	.03
184-3	Ball—steel	.02

Resistors

63-271	1	megohm	¼	watt	.07
63-296	220	M ohm	¼	watt	.07
63-461	1200	ohm	¼	watt	.07
63-510	18	M ohm	2	watt	.25
63-584	1500	ohm	¼	watt	.07
63-591	22	M ohm	¼	watt	.07
63-593	47	M ohm	¼	watt	.07
63-595	100	M ohm	¼	watt	.07
63-629	330	ohm	¼	watt	.07
63-641	10	M ohm	¼	watt	.07
63-655	220	M ohm	¼	watt	.07
63-709	10	M ohm	¼	watt	.07
63-719	470	M ohm	¼	watt	.07
63-941	390	ohm	1	watt	.08
63-968	1800	ohm	2	watt	.18
63-969	18	M ohm	½	watt	.08
63-970	47	ohm	1	watt	.08
63-971	220	ohm	½	watt	.08
63-972	15	M ohm	1	watt	.08
63-994	Sensitivity control				.35
63-995	Volume control & switch assembly				.90

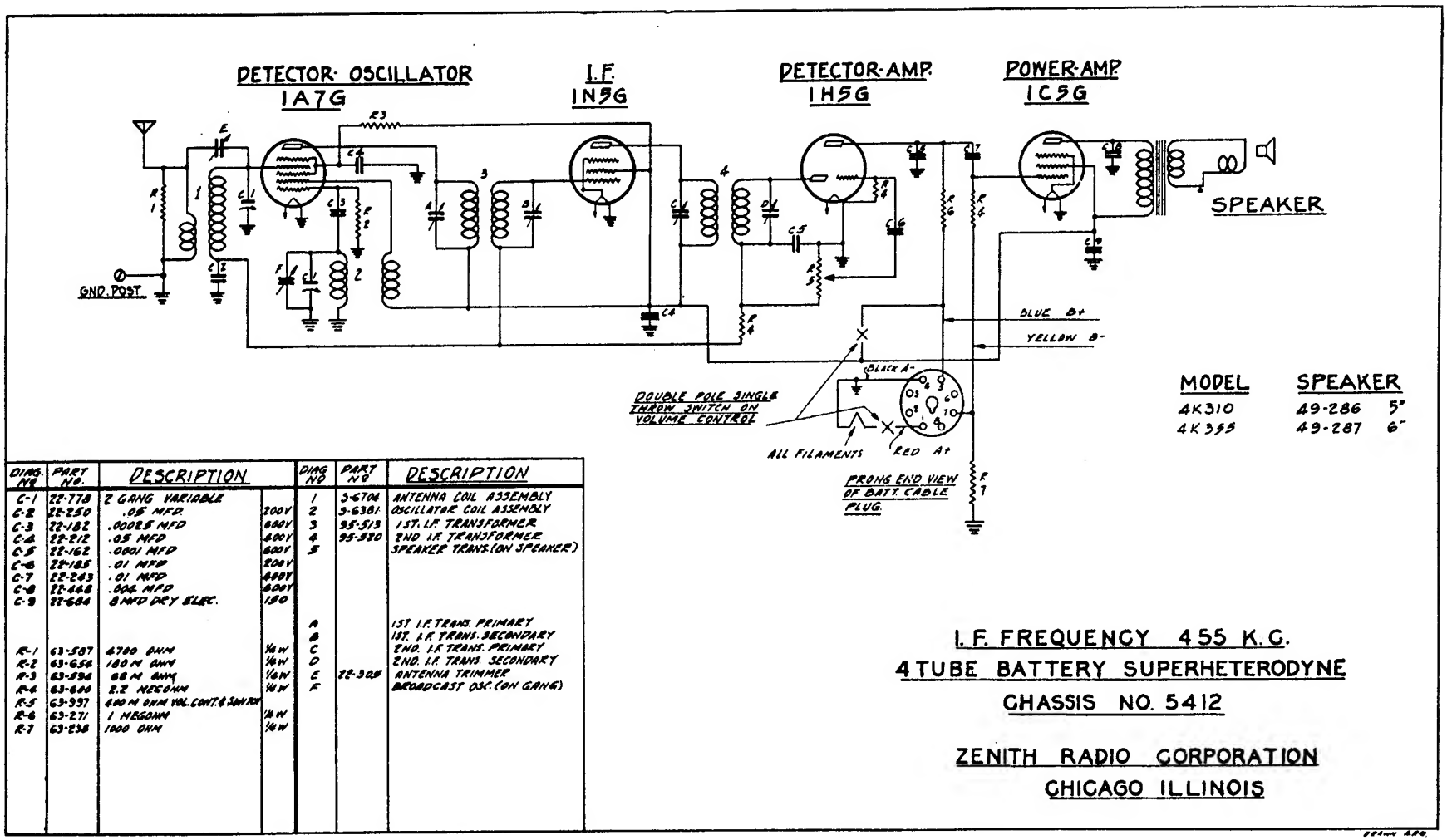
Miscellaneous

56-56	Pins—for rubber coupling	.01
58-21	Delco Remy—cap	.01
58-24	Delco Remy—bushing & ferrule	.01
78-238	Socket—78 tube	.10
78-239	Socket—6A7 tube	.10
78-240	Socket—75 tube	.10
78-241	Socket—42 tube	.10
78-242	Socket—84 tube	.10
78-243	Socket—vibrator	.10
78-251	Socket—antenna connector	.10
85-134	Switch—tone control	.15
95-565	Transformer—speaker output	1.10
95-566	Transformer—power	2.25
126-179	Shield—goat tube	.10
136-11	Fuse—14 ampere	.04
143-36	Rubber coupling	.02
190-14	Vibrator	2.60

Accessory parts

22-271	Condenser—voltage regulator	.45
22-497	Condenser—oil gauge	.40
54-122	Nuts—hex cadium plated ⅜" x 16 x 11/16"	.04
54-123	Nuts—wing	.02
93-399	Washer—steel	.04
93-409	Lockwasher—#⅜ cadium plated	.02
93-410	Washer—rubber	.02
112-205	Hooks—screw	.03
144-15	Set mounting bolts	.03
102-53	Station call letter tab sheet	.40
202-110	Instruction book	.05
S-6740	Dummy antenna	net .25

All Prices Subject to Regular Discount and Change Without Notice.



DIAG. NO	PART NO.	DESCRIPTION		DIAG NO	PART NO	DESCRIPTION
C-1	22-778	2 GANG VARIABLE		1	3-6704	ANTENNA COIL ASSEMBLY
C-2	22-250	.05 MFD.	200V	2	3-6381	OSCILLATOR COIL ASSEMBLY
C-3	22-182	.00025 MFD	600V	3	95-513	1ST. I.F. TRANSFORMER
C-4	22-212	.05 MFD	400V	4	95-320	2ND I.F. TRANSFORMER
C-5	22-162	.0001 MFD	600V	5		SPEAKER TRANS. (ON SPEAKER)
C-6	22-185	.01 MFD	200V			
C-7	22-243	.01 MFD	400V			
C-8	22-468	.006 MFD	600V			
C-9	22-684	8 MFD DRY ELEC.	150			
				A		1ST I.F. TRANS. PRIMARY
				B		1ST. I.F. TRANS. SECONDARY
R-1	63-587	4700 OHM	½ W	C		2ND. I.F. TRANS. PRIMARY
R-2	63-656	180 M OHM	½ W	D		2ND. I.F. TRANS. SECONDARY
R-3	63-594	68 M OHM	½ W	E	22-308	ANTENNA TRIMMER
R-4	63-600	2.2 MEGOHM	½ W	F		BROADCAST OSC. (ON GANG)
R-5	63-937	400 M OHM VOL. CONT. & SW.	½ W			
R-6	63-271	1 MEGOHM	½ W			
R-7	63-238	1000 OHM	½ W			

Models 4K310, 4K331, 4K355. Chassis No. 5412

Models 4K310, 4K331, 4K355

CHASSIS No. 5412

NOTE

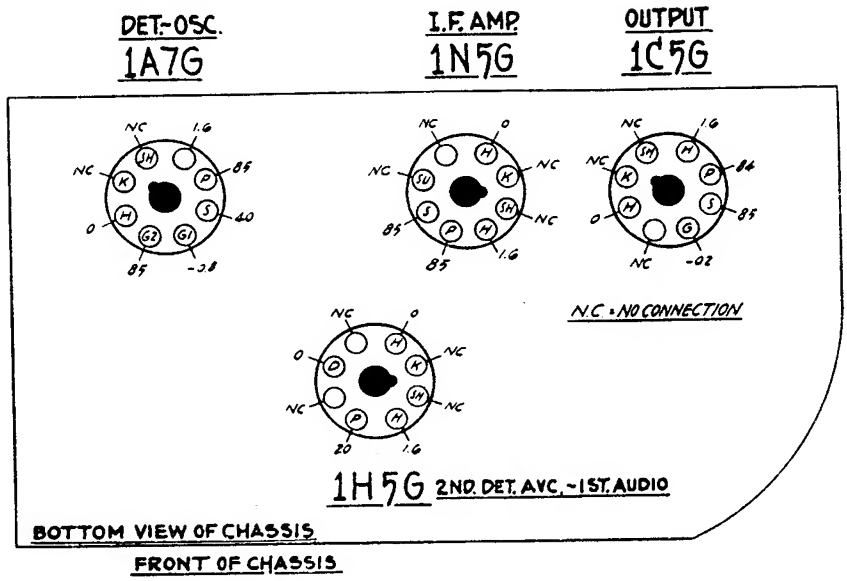
All voltages measured from point indicated to chassis using a 1000 ohm per volt meter.

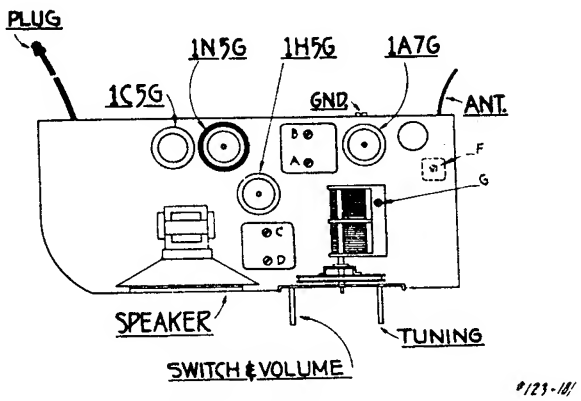
Antenna disconnected — volume control at minimum and condenser plates in full mesh.

All voltages measured using Zenith No. Z28 battery pack.

LEGEND

NC — No Connection
SH — Shield
H — Heater
P — Plate
S — Screen
G — Grid
SU — Suppressor
D — Diode
K — Cathode
F — Filament

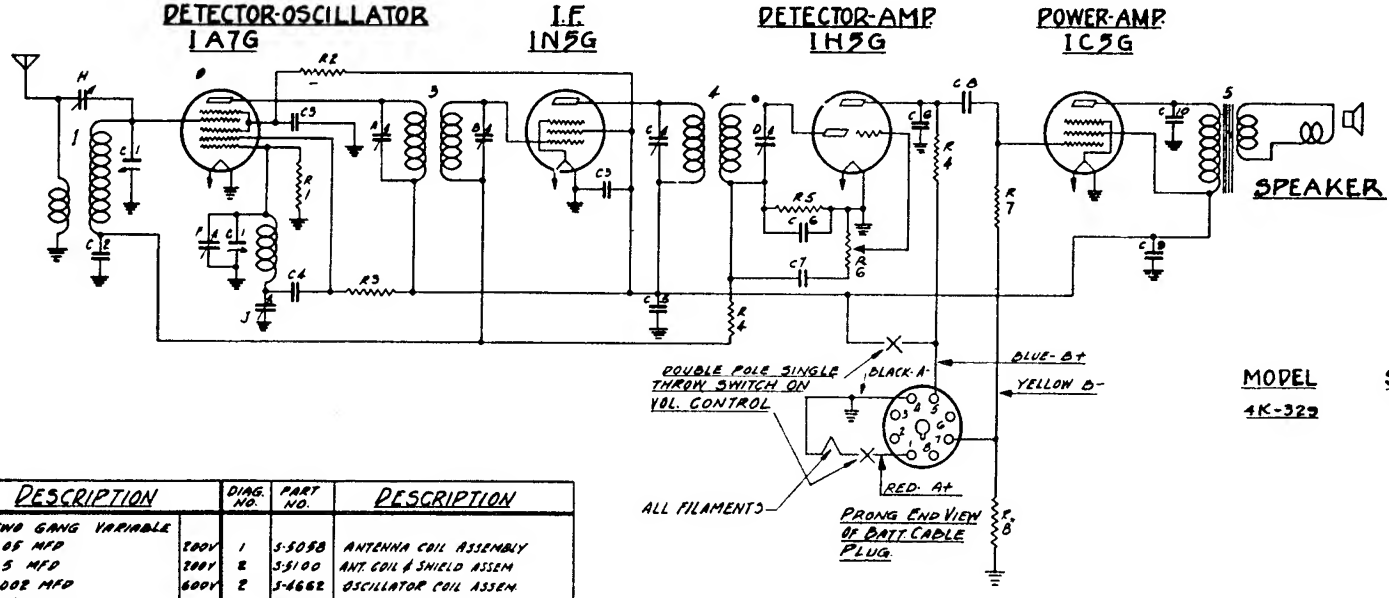




Location of tubes and trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	455	Br'dc't	600	ABCD	I. F. Aligment
2	Rec. Ant. Lead	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	1500	G	Al'gment of Ant.



MODEL	SPEAKER
4K-329	49-209- 6"

DIAG. NO.	PART NO.	DESCRIPTION		DIAG. NO.	PART NO.	DESCRIPTION
C-1	22-650	TWO GANG VARIABLE				
C-2	22-250	.05 MFD	200V	1	3-5058	ANTENNA COIL ASSEMBLY
C-3	22-199	.5 MFD	200V	2	3-5100	ANT. COIL & SHIELD ASSEM
C-4	22-358	.002 MFD	600V	2	3-6662	OSCILLATOR COIL ASSEM.
C-5	22-212	.05 MFD	400V	3	95-419	1ST. I.F. TRANSFORMER
C-6	22-162	.0001 MFD	600V	4	95-420	2ND I.F. TRANSFORMER
C-7	22-327	.02 MFD	600V	5		SPEAKER TRANS. (ON SPEAKER.)
C-8	22-168	.02 MFD	600V			
C-9	22-684	8 MFD ELECTROLYTIC	150V			
C-10	22-492	.002 MFD	600V	A		1ST. I.F. TRANS. PRI.
				B		1ST. I.F. TRANS. SEC.
				C		2ND I.F. TRANS. PRI.
				D		2ND. I.F. TRANS. SEC.
R-1	63-325	150 M OHM	½W	F	22-305	BROADCAST OSCILLATOR
R-2	63-694	68 M OHM	½W	H	"	ANTENNA BROADCAST
R-3	63-638	5600 OHM	½W	J	22-519	OSCILLATOR PADDER.
R-4	63-271	1 MEGOHM	½W			
R-5	63-658	990 M OHM	½W			
R-6	63-548	1 MEGOHM VOL CONTROL				
R-7	63-600	2.2 MEGOHM	½W			
R-8	63-238	1000 OHM	½W			

I.F. FREQUENCY 456 K.C.
4 TUBE BATTERY SUPERHETERODYNE
CHASSIS NO. 5413
ZENITH RADIO CORPORATION
CHICAGO, ILL.

Model 4K329. Chassis No. 5413

Model 4K329

CHASSIS No. 5413

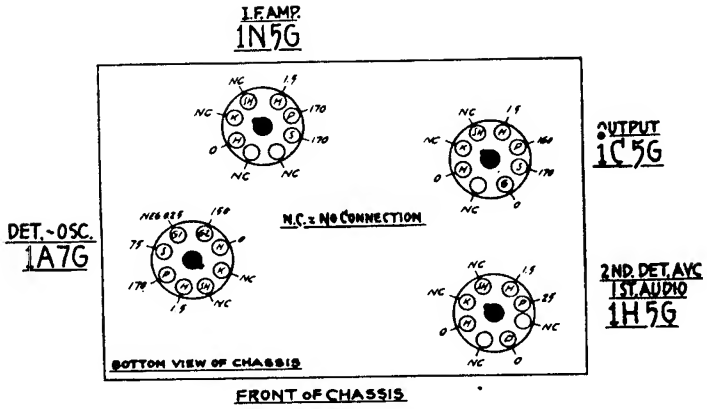
NOTE

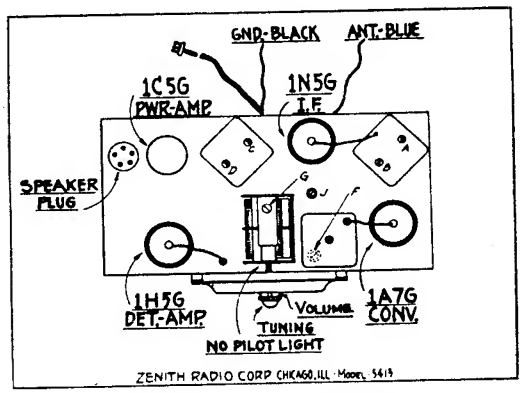
All voltages measured with a 1000 ohm per volt meter from chassis to point indicated using a Z28 battery pack.

Antenna disconnected — vol. control at minimum and condenser plates in full mesh.

LEGEND

NC — No Connection
SH — Shield
H — Heater
P — Plate
S — Screen
G — Grid
SU — Suppressor
D — Diode
K — Cathode
F — Filament

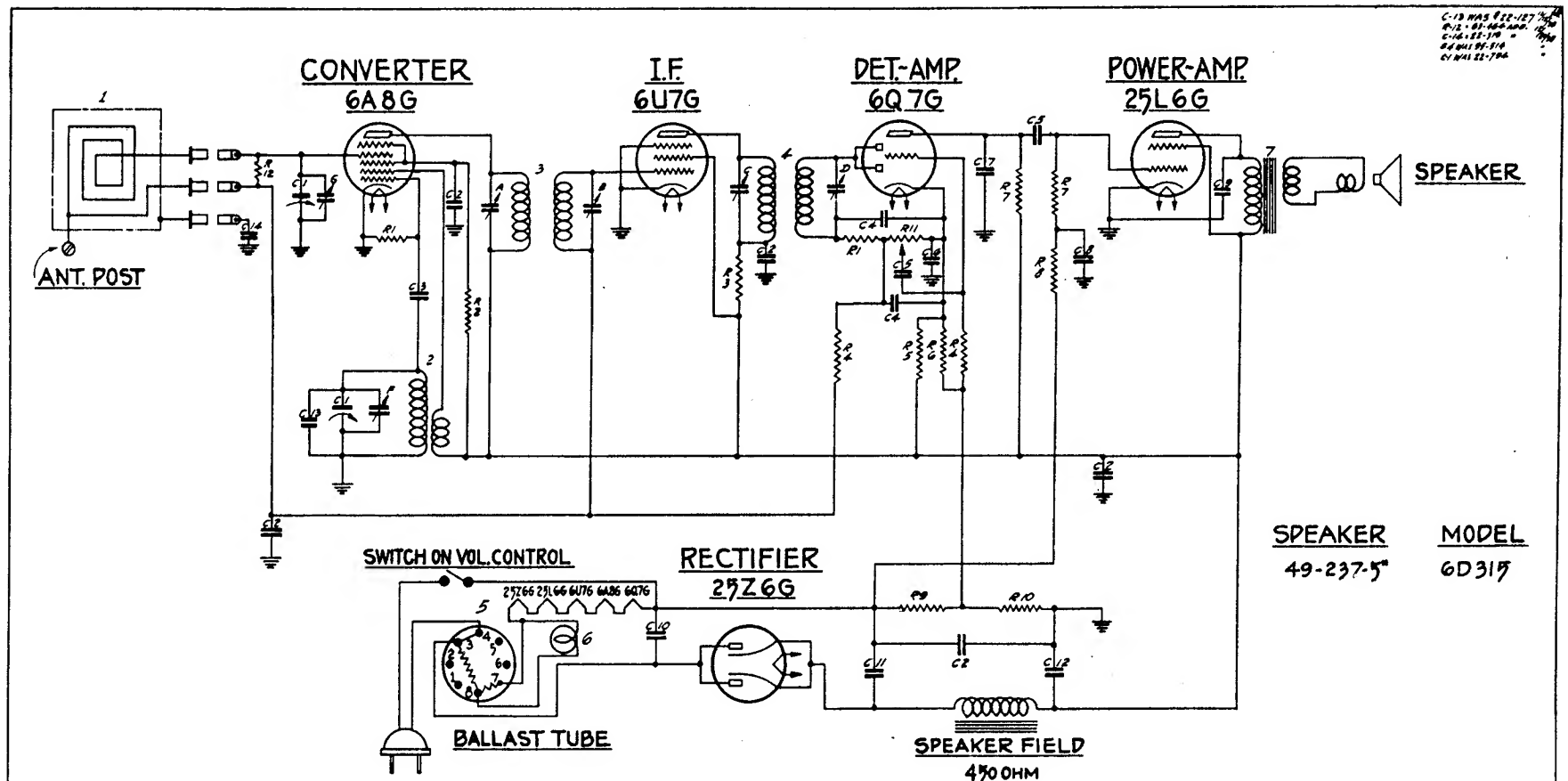




Location of tubes and trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to—	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	½ Mfd.	456	Br'dc't	600	ABCD	I. F. Algm't.
2	Rec. Ant. Lead	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	1500	G	Algm't of Ant.
4	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
5	" " "	200 Mmfd.	1500	"	1500	FG	Rpt. 3 & 4



DIAG. NO.	PART NO.	DESCRIPTION		DIAG. NO.	PART NO.	DESCRIPTION		DIAG. NO.	PART NO.	DESCRIPTION
C-1	22-801	TWO GANG VARIABLE		R-1	69-593	47 M OHM	1/4 W	5	100-70	BALLAST TUBE
C-2	22-250	.05 MFD.	200 V	R-2	69-643	18 M OHM	1/4 W	6	100-36	PILOT LIGHT. 25A-6.3 V.
C-3	22-182	.00025 MFD.	600 V	R-3	69-609	1000 OHM	1/2 W	7		SPEAKER TRANS.
C-4	22-162	.0001 MFD.	600 V	R-4	69-271	1 MEGOHM	1/4 W			
C-5	22-196	.01 MFD.	600 V	R-5	69-681	56 M OHM	1/2 W			
C-6	22-185	.01 MFD.	200 V	R-6	69-689	680 OHM	1/4 W	A		1ST. I.F. TRANS. PRI.
C-7	22-147	.0005 MFD.	600 V	R-7	69-296	220 M OHM	1/4 W	B		1ST. I.F. " SEC.
C-8	22-327	.02 MFD.	200 V	R-8	69-595	100 M OHM	1/4 W	C		2ND I.F. " PRI
C-9	22-730	.04 MFD.	600 V	R-9	69-557	60 OHM WIREWOUND		D		2ND I.F. " SEC.
C-10	22-439	.02 MFD.	600 V	R-10	69-954	30 OHM "		F		BROADCAST OSC. (GANGED)
C-11	22-681	40 MFD. ELECTROLYTIC	150 V	R-11	69-1004	500 M OHM VOL. CONTROL		G	22-926	ANT. BROADCAST
C-12	22-680	16 MFD. "	150 V	R-12	69-464	1 MEGOHM	1/4 W			
C-13	22-802	30 MMFD	600 V							
C-14	22-319	.005 MFD	200 V	1	5-6780	LOOP ANT. ASSEM.				
				2	5-6761	OSC. COIL ASSEM.				
				3	95-588	1ST. I.F. TRANS.				
				4	95-591	2ND I.F. TRANS.				

I.F. FREQUENCY - 455 K.C.
6-TUBE SUPERHETERODYNE
CHASSIS Nº 5657-A.C.D.C.

ZENITH RADIO CORPORATION
CHICAGO, ILL.

Model 6D315. Chassis No. 5657

Model 6D315

CHASSIS No. 5657

5413
123-200

NOTE

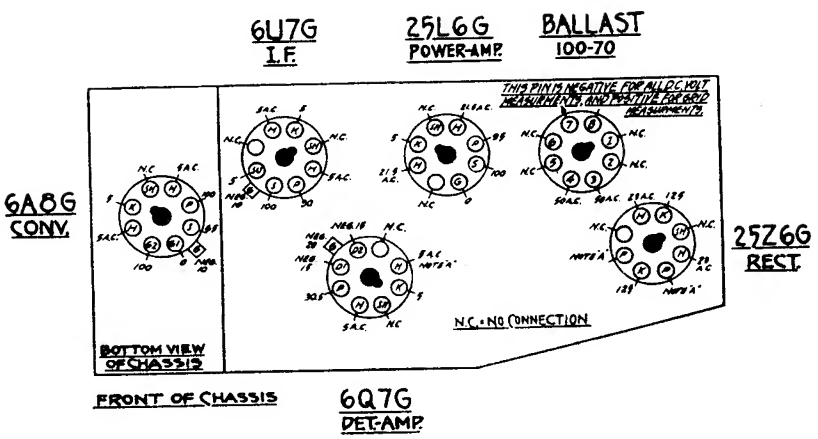
Voltages measured from No. 7 pin on ballast tube to point indicated using a 1000 ohm per volt meter. Vol. control at minimum. Antenna disconnected.

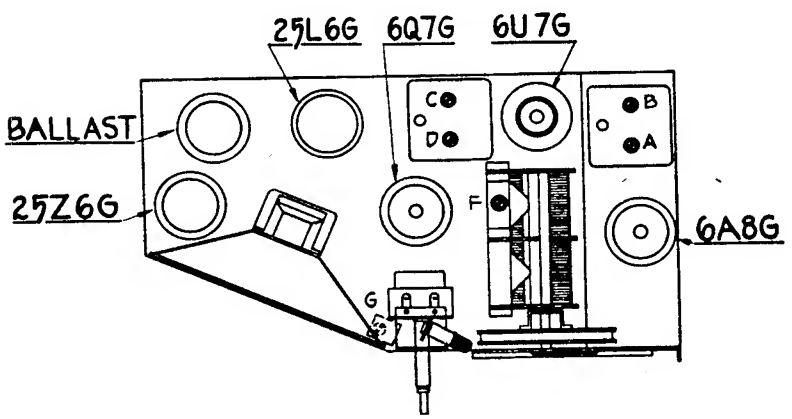
All filament voltages measured across each respective tube, using a 0-30 A.C. voltmeter.

(A) Plate voltage of 25Z6 shows 110 v. A.C. measured from plate of 25Z6 to No. 7 pin of 6Q7 socket.

LEGEND

NC — No Connection
SH — Shield
H — Heater
P — Plate
S — Screen
G — Grid
SU — Suppressor
D — Diode
F — Filament
K — Cathode

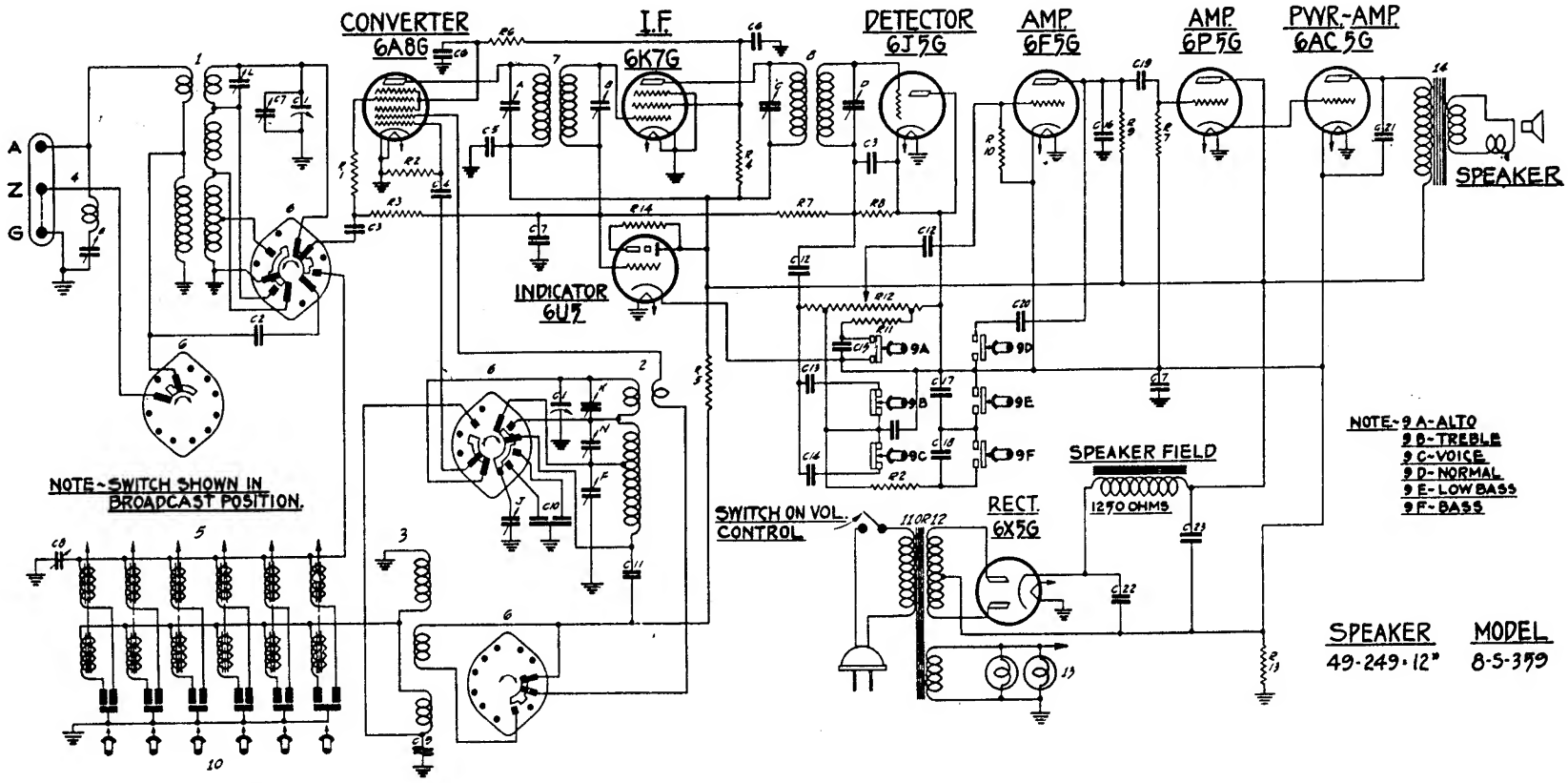




Location of tubes and trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	455	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Lead	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	1500	G	Al'gment of Ant.



DIAG NO	PART NO	DESCRIPTION		DIAG NO	PART NO	DESCRIPTION		DIAG NO	PART NO	DESCRIPTION		DIAG NO	PART NO	DESCRIPTION
C-1	22-717	TWO GANG VARIABLE		C-21	22-492	.002 MFD	600 V	1	1-6124	ANT. COIL ASSEM.		C		2ND. I.F. TRANS. - PRI.
C-2	22-289	50 MMFD	600 V	C-22	22-718	12 MFD ELECTROLYTIC	450 V		1-6294	ANT. COIL & SHIELD ASSEM.		D		2ND. I.F. TRANS. - SEC.
C-3	22-182	.0001 MFD	600 V	C-23	22-719	18 MFD "	350 V	2	1-6155	OSC. COIL ASSEM.		E		WAVE TRAP
C-4	22-187	28 MMFD	600 V						1-6295	OSC. COIL & SHIELD ASSEM.		F		BROADCAST OSC. - SEE NOTE
C-5	22-170	.1 MFD	600 V					3	20-196	COMPENSATING COIL		G		ANT. BROADCAST - 6V GANG
C-6	22-212	.05 MFD	400 V	R-1	63-621	18 OHM	1/4 W	4	20-154	WAVE TRAP		J	22-463	BROADCAST PADDER
C-7	22-240	.05 MFD	200 V	R-2	63-592	33 MOHM	1/4 W	5	1-6289	AUTOM. TUNING UNIT ASSEM.		K		SHORT WAVE OSC. - SEE NOTE
C-8	22-519	TRIMMER COND		R-3	63-587	470 MOHM	1/4 W	6	85-191	BAND SELECTOR SW.		L	22-305	SHORT WAVE DET.
C-9	22-740	COMPENSATING COND		R-4	63-961	47 MOHM	1 W	7	95-516	1ST I.F. TRANS.		N		POLICE BAND OSC. - SEE NOTE
C-10	22-708	DUAL FIXED PADDER		R-5	63-680	10 MOHM	1 W	8	95-517	2ND I.F. TRANS.				
C-11	22-378	.002 MFD	600 V	R-6	63-643	18 MOHM	1/4 W	9	1-6224	TONE CONT. SW. ASSEM.				
C-12	22-327	.08 MFD	200 V	R-7	63-271	1 MEGOHM	1/4 W	10	85-152	AUTOM. TUNING SW.				
C-13	22-182	.00025 MFD	600 V	R-8	63-655	820 MOHM	1/4 W	11	95-526	POWER TRANS. -117V-50-60~				
C-14	22-470	.0001 MFD	600 V	R-9	63-296	220 MOHM	1/4 W	12		" " -ALL VOLTAGES-				
C-15	22-189	.01 MFD	200 V	R-10	63-976	15 MEGOHM	1/4 W	13		PILOT LIGHT .25A - 6.3V.				
C-16	22-167	.0005 MFD	600 V	R-11	63-591	22 MOHM	1/4 W	14		SPEAKER TRANS.				NOTE - TRIMMERS "F, K & N" MOUNTED ON BAKELITE STRIP PART # 22-324 -
C-17	22-458	.006 MFD	600 V	R-12	63-985	VOLUME CONTROL								
C-18	22-526	.003 MFD	400 V	R-13	63-975	82 OHM W/REWIND	1/2 W							
C-19	22-436	.02 MFD	600 V	R-14		1 MEGOHM MOUNTED IN TUNING TUBE BASE		A		1ST I.F. TRANS. - PRI.				
C-20	22-448	.004 MFD	600 V					B		1ST I.F. TRANS. - SEC.				

I.F. FREQUENCY 455 K.C.
8-TUBE SUPERHETERODYNE
CHASSIS No. 5807-A.C. 3-BAND
ZENITH RADIO CORPORATION
CHICAGO, ILL.

Model 8S359. Chassis No. 5807

Model 8S359—Chassis 5807

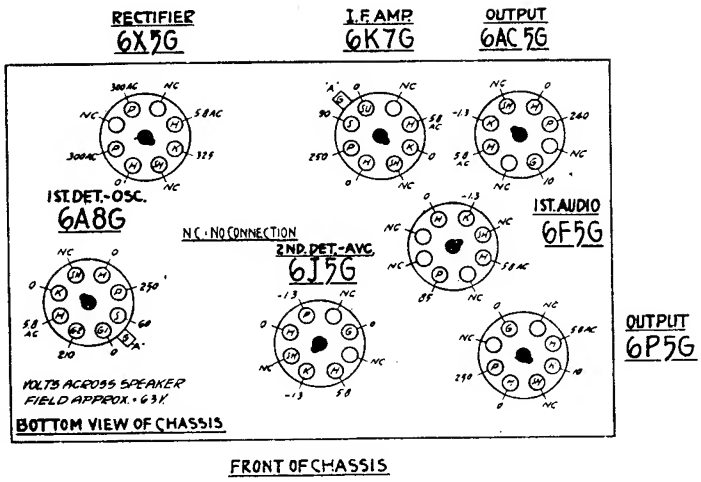
CHASSIS No. 5807

NOTE

All voltages measured from chassis to point indicated using a 1000 ohm per volt meter. Antenna disconnected. Volume control at minimum. Band switch on manual B.C. position.

Line voltage 114 v.

(A) Grid bias for 6A8 and 6K7 tubes measured from chassis to K of 6J5 tube is neg. 1.3 volts.



LEGEND

NC — No Connection
SH — Shield
H — Heater
P — Plate
S — Screen
G — Grid
SU — Suppressor
D — Diode
F — Filament
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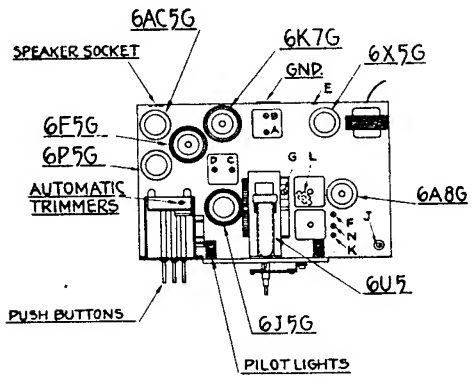


Location of tubes and trimmers

ALIGNMENT PROCEDURE

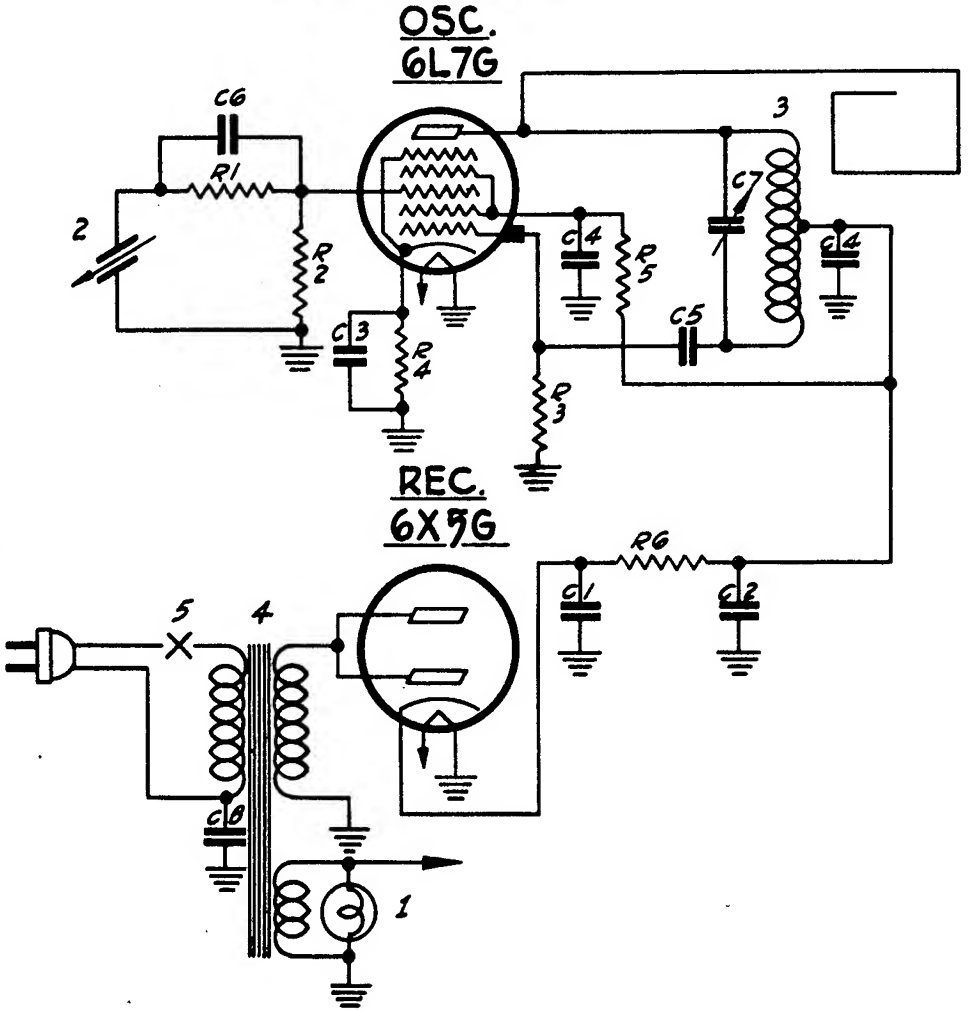
Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	455	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Post	200 Mmfd.	455	"	600	E	See Note
3	" " "	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
4	" " "	200 Mmfd.	1500	"	1500	G	Al'gment of Ant.
5	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output.
6	" " "	200 Mmfd.		"		FG	Repea 3 & 4
7	" " "	400 Ohms	18000	S.W.	18000	K	Set Osc. to Scale
8	" " "	400 Ohms	18000	S.W.	18000	L	Rock Gang & adj. for max. output.
9	" " "	400 Ohms	6000	Police	6000	N	Rock Gang & adj. for max. output.

NOTE: If receiver is used in location subject to code interference adjust wave trap (E) for minimum interference with antenna connected and receiver operating in broadcast band.

PHONOGRAPH OSCILLATOR

MODEL-S6622

DIAG. Nº	PART Nº	DESCRIPTION	
C-1	22-768	16MFD. ELECTROLYTIC	200V
C-2	22-768	40MFD. "	150V
C-3	22-250	.05MFD	200V
C-4	22-196	.01 MFD	600V
C-5	22-182	.00025MFD	600V
C-6	22-147	.0005 MFD	600V
C-7	22-463	TRIMMER	
C-8	22-525	.005 MFD	1000V
R-1	63-658	390M OHM	1/4W
R-2	63-654	180M OHM	1/4W
R-3	63-593	47M OHM	1/2W
R-4	63-583	1000 OHM	1/2W
R-5	63-587	4700 OHM	1/2W
R-6	63-964	4700 OHM	1/2W
1	100-36	PILOT LIGHT-6.3V. .25A.	
2	142-14	PICK-UP ARM - COMPLETE	
	142-16	CRYSTAL UNIT ONLY	
3	S-6625	OSC. COIL ASSEM.	
4	95-567	POWER TRANS.	
5	85-170	SWITCH	



Wireless Record Player
Model S-6622

PARTS PRICE LIST

Models 4K310, 4K355,—Chassis 5412

DIAL ASSEMBLY

26-199	Dial scale	$ .15
59-66	Dial pointer	.15
76-258	Dial control shaft	.08
80-69	Dial cord tension spring	.02
93-371	Dial spacer bakelite washer	.25C
188-27	Dial retainer	.05C
192-29	Dial crystal	.15
MS-418	Dial pulley & bracket assembly	.10
S6109	Dial cord & eyelet assembly	.15

COILS

95-513	1st I. F. Transformer assembly	.75
95-520	2nd I. F. Transformer assembly	.75
S-6381	Oscillator coil assembly	.65
S-6704	Antenna coil assembly	.65

CONDENSERS

22-162	.0001 mfd. 600 volt	.15
22-182	.00025 mfd. 600 volt	.15
22-185	.01 mfd. 200 volt	.15
22-212	.05 mfd. 400 volt	.15
22-243	.01 mfd. 400 volt	.15
22-250	.05 mfd. 200 volt	.15
22-305	2-35 mmfd. trimmer condenser	.15
22-448	.004 mfd. 600 volt	.18
22-684	8. mfd. 150 volt electrolytic	.45
22-778	Two gang variable condenser	1.75

RESISTORS

63-238	1000 ohm ¼ watt	.07
63-271	1 megohm ¼ watt	.07
63-587	4700 ohm ¼ watt	.07
63-594	68 M ohm ¼ watt	.07
63-600	2.2 megohm ¼ watt	.07
63-654	180 ohm ¼ watt	.07
63-997	Volume control & switch assembly	.75

MISCELLANEOUS

2-19	Back for 310 cabinet	.15
14-458	Cabinet for model 310	3.50
46-245	Knob—tuning (Model 355)	.10
46-251	Knob—tuning (Model 310)	.15
46-257	Knob—volume (Model 355)	.10
46-271	Knob—volume (Model 310)	.10
49-286	Speaker—5" PM (Model 310)	4.00
	206-286 output transformer	1.00
	208-286 cone & voice coil assembly	1.25
49-287	Speaker—6" PM (Model 355)	5.00
	206-287 output transformer	$1.00
	208-287 cone & voice coil assembly	1.50
52-156	Battery cable & Plug assembly	.35
52-157	Speaker cable & Plug assembly (Model 355)	.25
57-654	Escutcheon plate (Model 355)	.75
78-246	Socket—1A7G tube	.10
78-247	Socket—1N5G tube	.10
78-248	Socket—1H5G tube	.10
78-249	Socket—1C5G tube	.10
126-239	Tube shield	.10
139-48	Speaker baffle (cardboard)	.02
202-116	Instruction book	.10

Model 4K329—Chassis 5413

4 TUBE BATTERY SET

171-4	Dial scale lens	$ .25
S3717	Dial pointer & bushing assembly	.25
S5098	Dial scale & bracket assembly (26-168)	1.00

COILS & CHOKES

95-419	1st I. F. Transformer assembly	1.25
95-420	2nd I. F. Transformer assembly	1.25
S4662	Oscillator coil assembly	.30
S5100	Antenna coil & shield assembly	1.25

CONDENSERS

22-162	.0001 mfd. 600 volt	.15
22-188	.02 mfd. 400 volt	.15
22-199	.5 mfd. 200 volt	.25
22-212	.05 mfd. 400 volt	.15
22-305	2-35 mmfd. trimmer condenser	.15
22-327	.02 mfd. 200 volt	.15
22-358	.002 mfd. 600 volt	.20
22-406	Two gang variable condenser	2.25
22-492	.002 mfd. 600 volt	.15
22-519	Oscillator padder condenser	.30

RESISTORS

63-238	1000 ohm ¼ watt	.07
63-271	1 megohm ¼ watt	.07
63-325	150 M ohm ¼ watt	.07
63-441	1 megohm ¼ watt	.07
63-548	1 megohm volume control assembly	1.35
63-594	68 M ohm ¼ watt	.07
63-600	2.2 megohm ¼ watt	.07
63-638	5600 ohm ¼ watt	.07
63-647	39 ohm ¼ watt	.07
63-658	390 M ohm ¼ watt	.07

MISCELLANEOUS

46-219	Volume control knob	.15
46-220	Tuning control knob	.15
49-209	6" PM speaker	6.00
	206-209 Cone & voice coil	1.75
	208-209 Output transformer	1.50
78-190	Speaker plug socket	.10
78-246	1A7G tube socket	.10
78-247	1N5G tube socket	.10
78-248	1H5G tube socket	.10
78-249	1C5G tube socket	.10
93-323	1/32" x 29/64" x ¾" bakelite washer	.01
126-239	Tube shield	.10
159-14	Snap button	.50C
202-115	Instruction book	.10
S6170	Cable & Male Plug Assembly	.25

Model 6D315—Chassis 5657

DIAL ASSEMBLY

26-218	Dial Scale	.15
59-73	Dial pointer	.15
76-257	Dial tuning control shaft	.03
80-69	Dial cord tension spring	.02
93-360	1/32 x .273 x .355 brass washer	.50C
94-279	Pointer bushing	
100-36	6.3 volt pilot lamp	.09
188-2	Retaining ring	.01
192-28	Dial crystal	.20
MS-418	Pulley & bracket	.10
S-6002	Dial cord & eyelet assembly (11-3)	.10

COILS

S-6847	1st I. F. Transformer	1.00
95-514	2nd I. F. Transformer	.75
S-6750	Oscillator coil assembly	.65

CONDENSERS

22-127	25 mmfd. 600 volt	.15
22-147	.0005 mfd. 600 volt	.15
22-162	.0001 mfd. 600 volt	.15
22-182	.00025 mfd. 600 volt	.15
22-185	.01 mfd. 200 volt	.15
22-196	.01 mfd. 600 volt	.15
22-250	.05 mfd. 200 volt	.15
22-327	.02 mfd. 200 volt	.12
22-435	.02 mfd. 600 volt	.18
22-524	2-35 mmfd. trimmer condenser	.15
22-680	16 mfd. 150 volt electrolytic	.35
22-681	40 mfd. 150 volt electrolytic	.50
22-730	.04 mfd. 600 volt	.18
22-794	Two gang variable condenser	1.75

RESISTORS

63-271	1 megohm ¼ watt	.07
63-296	220 M ohm ¼ watt	.07
63-557	60 ohm ½ watt (wire wound)	.08
63-593	47 M ohm ¼ watt	.07
63-595	100 M ohm ¼ watt	.07
63-605	1 M ohm ¼ watt	.07
63-633	680 ohm ¼ watt	.07
63-643	18 M ohm ¼ watt	.07
63-681	56 M ohm ½ watt	.08
63-954	50 ohm ½ watt (wire wound)	.08
63-1004	500 M ohm volume control & switch assembly	.75
46-244	Tuning control knob	$ .15
46-245	Volume control knob	.10
49-237	Dynamic speaker—5"	2.75
	206-237 Output transformer for 49-237	1.00
	207-237 Field coil for 49-237	1.00
	208-237 Cone & voice coil for 49-237	1.00
57-651	Escutcheon plate	.35
78-148	Socket—6Q7 tube	.10
78-151	Socket—6A8 tube	.10
78-159	Socket—25Z6 tube	.10
78-161	Socket—ballast tube	.10
78-173	Socket—25L6 tube	.10
78-253	Socket—6U7G tube	.10
100-70	115 volt ballast tube	.75
	11-29—150 volt external resistor cord	1.25
	11-30—175 volt external resistor cord	1.25
	11-31—220 volt external resistor cord	1.25
	11-32—250 volt external resistor cord	1.25
126-191	Tube shield	.10
202-117	Instruction book	.10

CABINET & WAVE MAGNET ASSEMBLY

14-385	Model 315 bakelite cabinet (less back & handle)	2.50
36-6	Cabinet handle	.35
43-38	Housing for wave magnet assembly	1.50
S6780	Wave magnet coil assembly	1.50
126-295	Shields (2 used)	.50

Model 8S359

DIAL & DRIVE ASSEMBLY

26-201	Dial scale	$ .35
26-265	Volume control shaft	.10
27-16	Flywheel disc	1.00
59-70	Pointer & spring assembly	.10
73-30	6/32 x ¼ H.H. set screws (cuppoint)	.02
80-69	Dial core tension spring	.02
94-271	Volume control shaft coupling	.05
100-36	6.3 volt pilot lamp	.09
117-38	Band selector lever arm	.05
118-16	Lever connecting link	.05
148-25	Band switch & control arm	.10
159-12	Cinch snap button	.02
192-33	Dial glass	.35
196-17	Dial glass gasket	.15
S5999	Dial light socket & clip assembly	.10
S6223	Tuning shaft & bushing assembly	.20
S6284	Dial cord & eyelet assembly (11-3)	.20
MS449	Pulley & bracket assembly	.35

COILS & CHOKES

20-154	Wave trap	.65
20-196	Compensating coil	.50
95-536	1st I. F. transformer	1.00
95-537	2nd I. F. transformer	1.00
S6294	Antenna coil & shield assembly	1.50
S6295	Oscillator coil & shield assembly	1.25

CONDENSERS

22-127	25 mmfd. 600 volt	.15
22-147	.0005 mfd. 600 volt	.15
22-162	.0001 mfd. 600 volt	.15
22-170	.1 mfd. 400 volt	.20
22-182	.00025 mfd. 600 volt	.15
22-185	.01 mfd. 200 volt	.15
22-212	.05 mfd. 400 volt	.15
22-250	.05 mfd. 200 volt	.15
22-289	50 mmfd. 600 volt	.15
22-305	2-35 mmfd. trimmer condenser	.15
22-326	.003 mfd. 400 volt	.15
22-327	.02 mfd. 200 volt	.12
22-358	.002 mfd. 600 volt	.25
22-435	.02 mfd. 600 volt	.18
22-448	.004 mfd. 600 volt	.18
22-458	.006 mfd. 600 volt	.18
22-463	335-825 mmfd. oscillator padder	.30
22-470	.00015 mfd. 600 volt	.15
22-492	.002 mfd. 600 volt	.18
22-519	200-550 mmfd. padder (on auto. assy.)	.35
22-708	Dual fixed padder	$ .65
22-717	Two gang variable condenser	3.00
22-718	12. mfd. 450 volt electrolytic	.55
22-719	16. mfd. 350 volt electrolytic	.50
22-731	2-35 mmfd. trimmer condenser (3 section)	.40
22-740	Compensating condenser	.55

MISCELLANEOUS

63-296	220 M ohm ¼ watt	.07
63-461	47 M ohm 1 watt	.10
63-591	22 M ohm ¼ watt	.07
63-592	33 M ohm ¼ watt	.07
63-605	1000 ohm ½ watt	.08
63-621	39 M ohm ¼ watt	.07
63-643	18 M ohm ¼ watt	.07
63-655	220 M ohm ¼ watt	.07
63-680	10 M ohm 1 watt	.10
63-975	8 M ohm ½ watt (wire wound)	.08
63-976	15 M ohm ¼ watt	.07
63-985	Volume control & switch assembly	1.35
24-199	Adjustment screw cover	.03
24-202	Tone control switch indicator (voice)	.05
24-203	Tone control switch indicator (normal)	.05
24-204	Tone control switch indicator (treble)	.05
24-205	Tone control switch indicator (lo bass)	.05
24-206	Tone control switch indicator (bass)	.05
24-207	Tone control switch indicator (alto)	.05
46-252	Knob—tuning control	.15
46-253	Knob—volume control	.10
46-254	Knob—radiorgan switch	.03
46-255	Knob—automatic selector switch	.03
49-249	12" dynamic speaker	13.25
	206-249—output transformer for 49-249	2.50
	207-249—field coil for 49-249	2.50
208-	208-249—cone & voice coil for 49-249	3.25
57-660	Escutcheon plate (for glass & gasket see dial parts)	2.00
78-128	Socket—speaker plug	.10
78-145	Socket—6F5 tube	.10
78-149	Socket—6X5 tube	.10
78-150	Socket—6K7 tube	.10
78-151	Socket—6A8 tube	.10
78-175	Socket—6J5 tube	.10
78-230	Socket—resonance indicator & cable assy.	.50
78-257	Socket—6P5 tube	.10
78-258	Socket—6AC5 tube	.10
80-198	Chassis mounting springs	$ .005
80-199	Chassis mounting springs	.005
83-433	Antenna & ground terminal strip assembly	.10
85-151	Switch—band selector	1.00
95-526	117 volt 50-60 cycle power transformer	3.00
126-239	Tube shield	.10
202-120	Instruction book	.10
S6224	Radiorgan switch & knob assembly	1.00

AUTOMATIC PARTS

22-519	Padder condenser	.35
46-255	Automatic push button knob	.03
83-605	Pin Jack terminal strip assembly	.10
85-152	Station selector switch	1.50
93-385	Felt washer for auto. push lever	.15C
102-45	Station call letter sheet	.25
112-190	Inductance adjustment screw	.03
S6103	Automatic coil & core assy. (red)	.50
S6104	Automatic coil & core assy. (green)	.50
S6105	Automatic coil & core assy. (yellow)	.50
S6106	Automatic coil & core assy. (blue)	.50
S6107	Automatic coil & core assy. (white)	.50
S6287	Automatic coil & core assy. (orange)	.50

PHONO RECORD PLAYER
Model S-6222

CONDENSERS

22-147	.0005 mfd. 600 volt	$ .15
22-182	.00025 mfd. 600 volt	.15
22-196	.01 mfd. 600 volt	.15
22-250	.05 mfd. 200 volt	.15
22-463	Trimmer condenser	.30
22-525	.005 mfd. 1000 volt	.20
22-768	16. mfd.-200 volt x 40. mfd.-150 volt	.95

RESISTORS

63-583	1 M ohm ¼ watt	.07
63-587	4700 ohm ¼ watt	.07
63-593	47 M ohm ¼ watt	.07
63-654	180 M ohm ¼ watt	.07
63-658	390 M ohm ¼ watt	.07
63-964	4700 ohm ½ watt	.08

MISCELLANEOUS

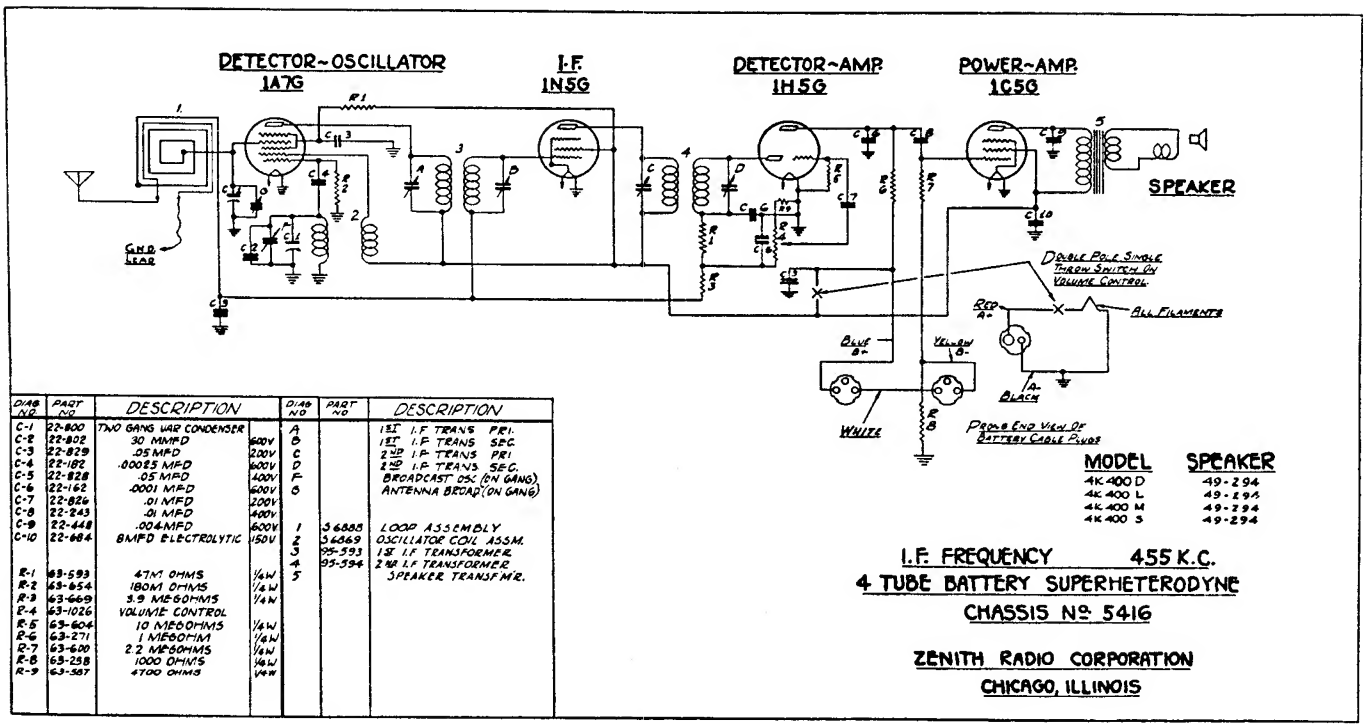
S-6625	Oscillator coil assembly	.30
12-634	Pickup support arm	.05
14-457	Cabinet	7.00
24-142	Needle cup cover	.05
29-5	8" Turntable	1.00
41-1	Needle cup	.10
46-265	Switch knob	.10
57-684	Escutcheon plate	.10
78-149	Socket—6X5G tube	.10
78-162	Socket—6L7G tube	.10
85-170	On & Off switch	.70
95-567	110 volt 60 cycle power transformer	1.75
100-36	Pickup light bulb	.09
141-63	110 volt 60 cycle phono motor	8.50
142-14	Phono pickup & arm assembly	7.50
142-16	Pickup cartridge only	4.50
202-112	Instruction book	.05

OSCILLATOR ASSEMBLY

22-182	.00025 mfd. 600 volt condenser	$ .15
22-196	.01 mfd. 600 volt condenser	.15
22-250	.05 mfd. 200 volt condenser	.15
22-285	10 mmfd. 600 volt condenser	.15
22-463	Trimmer condenser	.30
22-525	.005 mfd. 1000 volt condenser	.20
22-768	16 mfd. 200 volt x 40 mfd. 150 volt condenser	.95
63-583	1 M ohm ¼ watt resistor	.07
63-587	4700 ohm ¼ watt resistor	.07
63-593	47 M ohm ¼ watt resistor	.07
63-654	180 M ohm ¼ watt resistor	.07
63-568	390 M ohm ¼ watt resistor	.07
63-964	4700 ohm ½ watt resistor	.08
95-567	110 volt 60 cycle power transformer	1.75
12-634	Pickup support arm	.05
24-142	Needle cup cover	.05
29-5	8" turntable	1.00
41-1	Needle holder	.10
46-265	Switch knob	.10
57-684	Escutcheon plate	.10
78-149	Socket—6X5G tube	.10
78-162	Socket—6L7G tube	.10
85-170	On & Off switch	.70
100-36	Pickup light bulb	
141-63	110 volt 60 cycle phono motor	8.50
142-14	Phono pickup & arm assembly	7.50
142-16	Pickup cartridge only	4.50
202-112	Instruction book	.05

All Prices Subject to Regular Parts Discount and Change Without Notice.

MODELS 4K400D, 4K400S, 4K400L, 4K400M
Chassis 5416



DIAG NO.	PART NO.	DESCRIPTION		DIAG NO.	PART NO.	DESCRIPTION
C-1	22-800	TWO GANG VAR CONDENSER		A		1ST I.F. TRANS PRI.
C-2	22-802	30 MMFD	600V	B		1ST I.F. TRANS SEC.
C-3	22-829	.05 MFD	200V	C		2ND I.F. TRANS PRI.
C-4	22-182	.00085 MFD	600V	D		2ND I.F. TRANS SEC.
C-5	22-828	.05 MFD	400V	F		BROADCAST OSC. (ON GANG)
C-6	22-162	.0001 MFD	600V	G		ANTENNA BROAD. (ON GANG)
C-7	22-826	.01 MFD	200V			
C-8	22-243	.01 MFD	400V			
C-9	22-448	.004 MFD	600V	1	36888	LOOP ASSEMBLY
C-10	22-664	8 MFD ELECTROLYTIC	150V	2	36869	OSCILLATOR COIL ASSM.
				3	95-593	1ST I.F. TRANSFORMER
				4	95-594	2ND I.F. TRANSFORMER
R-1	63-593	47M OHMS	1/4W	5		SPEAKER TRANSF'MR.
R-2	63-654	180M OHMS	1/4W			
R-3	63-669	3.9 MEGOHMS	1/4W			
R-4	63-1026	VOLUME CONTROL				
R-5	63-604	10 MEGOHMS	1/4W			
R-6	63-271	1 MEGOHM	1/4W			
R-7	63-600	2.2 MEGOHMS	1/4W			
R-8	63-258	1000 OHMS	1/4W			
R-9	63-387	4700 OHMS	1W			

MODEL	SPEAKER
4K400D	49-294
4K400L	49-294
4K400M	49-294
4K400S	49-294

I.F. FREQUENCY 455 K.C.
4 TUBE BATTERY SUPERHETERODYNE
CHASSIS NO. 5416

ZENITH RADIO CORPORATION
CHICAGO, ILLINOIS

NOTE:

All measurements with 1000 ohms per voltmeter — loop antenna not connected — volume at minimum — All readings made with fresh Zenith (part No. Z-59) battery pack with speaker in circuit.

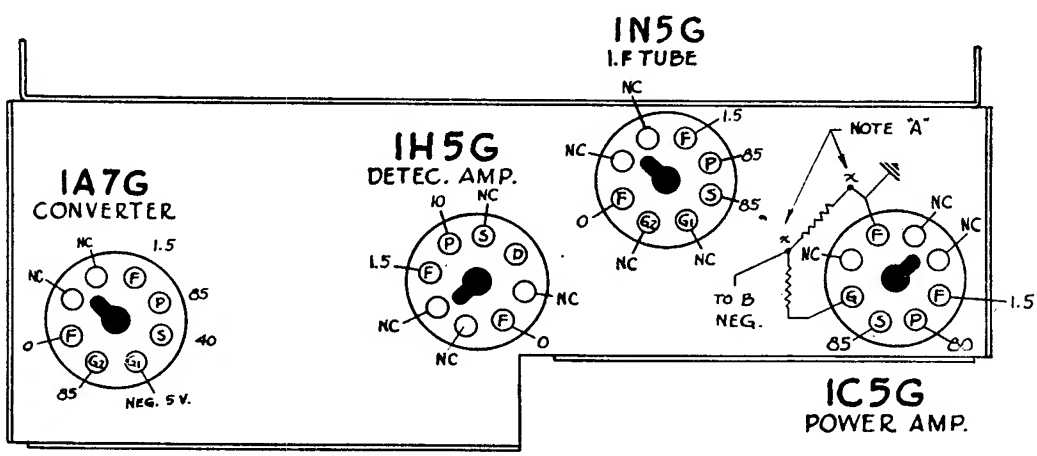
NOTE: "A"

Bias for 1C5 measured across 1000 ohm resistor at points marked X—X.

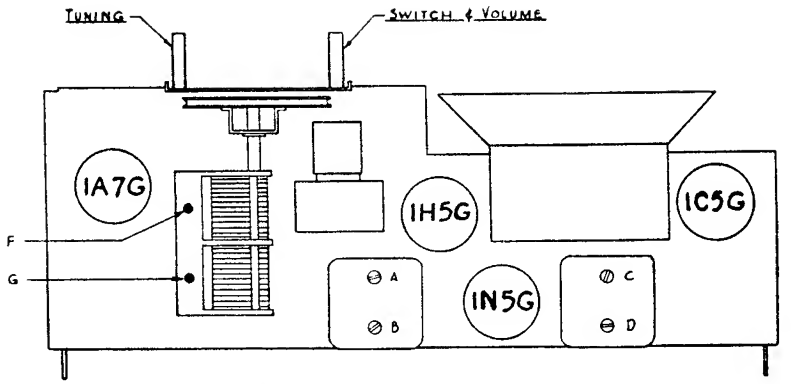
Bias is neg. 10 volts.

LEGEND

F — FILAMENT
P — PLATE
S — SCREEN
G — GRID
D — DIODE
NC — NO CONNECTION



FRONT OF CHASSIS



ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	455	Br'dc't	600	ABCD	I. F. Alignment
2	Separate 3 foot antenna		1500	"	1500	F	Set Osc. to Scale
3	Separate 3 foot antenna		1500	"	1500	G	Al'gment of Ant.

PARTS LIST

Chassis 5416

MODELS 4K400D, 4K400S, 4K400L, 4K400M

Dial Assembly

26-220	Dial scale	$ .20
59-75	Dial pointer	.10
76-278	Dial drive shaft	.10
80-69	Dial cord tension spring	.02
93-371	Dial spacer bakelite washer	.25
192-38	Dial crystal	.15
MS-418	Pulley and bracket assembly	.10
S-6870	Indicator disc and bushing	.15
S-6893	Dial cord and eyelet assembly	.15

Coils

95-593	1st I. F. Transformer	1.00
95-594	2nd I. F. Transformer	1.00
S-6869	Oscillator coil assembly	.60
S-6888	Loop antenna assembly	1.35

Condensers

22-162	.0001 mfd. ... 600 volt	.15
22-182	.00025 mfd. .. 600 volt	.15
22-243	.01 mfd. ..... 400 volt	.15
22-448	.004 mfd. .... 600 volt	.18
22-684	8. mfd. ..... 150 volt Dry Electrolytic	.45
22-800	Two gang variable	2.00
22-802	30 mmfd. .... 600 volt	1.00
22-826	.01 mfd. ..... 200 volt	.12
22-828	.05 mfd. ..... 400 volt	.15
22-829	.05 mfd. ..... 200 volt	.12

Resistors

63-238	1000 ohm .... ¼ watt	.07
63-271	1 megohm .... ¼ watt	.07
63-593	47 M ohm .... ¼ watt	.07
63-600	2.2 megohm .. ¼ watt	.07
63-604	10 megohm ... ¼ watt	.07
63-654	180 M ohm ... ¼ watt	.07
63-669	3.9 megohm .. ¼ watt	.07
63-1026	Volume control and switch	1.50

Miscellaneous

46-273	Tuning control knob	.10
49-294	Speaker—5½" PM—all models	6.25
	208-294 cone and voice coil	1.50
	206-294 output transformer	1.25
78-208	Speaker plug socket	.10
78-246	Socket 1A7G tube	.10
78-247	Socket 1N5G tube	.10
78-248	Socket 1H5G tube	.10
78-249	Socket 1C5G tube	.10
83-658	Pin jack terminal strip	.06
126-297	Tube shield	.10
S-6872	Battery cable and plugs	.45

ALL PRICES LIST SUBJECT TO REGULAR PARTS DISCOUNT
AND CHANGE WITHOUT NOTICE

ZENITH RADIO CORPORATION

Chicago, Ill.

ALIGNMENT INSTRUCTIONS

The proper procedure for the correct alignment of each chassis is outlined on the page opposite each circuit diagram.

In order to obtain proper alignment of the chassis when using a wavemagnet the signal generator should be coupled to the wavemagnet by means of a single turn loop approximately one foot in diameter. The leads of the signal generator may be connected together forming a satisfactory loop which should be placed about two feet from the receiver.

The operations are outlined in consecutive order, and the instructions are under the following headings —

OSC. CONNECTED TO — tells where the output of the service oscillator is to be connected.

DUMMY — gives the proper capacity or resistance which should be connected in series with the service oscillator output.

TEST OSC. — Set test oscillator to frequency shown.

BAND — Set the receiver band switch to the position shown.

DIAL — The receiver should be set at the frequency shown.

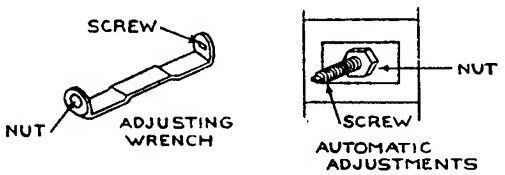
TRIMMER — This column tells which trimmer (or trimmers) are to be adjusted for each operation. The chassis drawing has each trimmer indicated by a letter corresponding to the instructions.

PURPOSE—This column tells what is being accomplished by each operation.
If these instructions are carefully followed each chassis will be easily and correctly realigned.

AUTOMATIC RANGES

Button No.	1	tunes	from	550	K.C.	to	950 K.C.
"	2	"	"	600	K.C.	"	1100 "
"	3	"	"	650	K.C.	"	1200 "
"	4	"	"	730	K.C.	"	1390 "
"	5	"	"	900	K.C.	"	1550 "

The use of a wavemagnet requires two adjustments for each automatic button. These adjustments are made with a special wrench (part No. 68-1) supplied with each receiver. The center or screw adjustment controls the oscillator circuit and the nut tunes the wavemagnet or antenna input — see illustration at right.



The minimum tuning range covered by each pair of adjustments is shown above and will usually exceed the frequencies shown.

The adjustments covering the highest frequency range is in all cases either at the bottom when the buttons are vertical or closest to the band switch when the buttons are arranged horizontally.

SERVICE NOTES

In many cases a ground lead may be eliminated by connecting the ground terminal on the wavemagnet to the chassis base.

The operation of the bass radiorgan button in chassis 5719-5721 can often be improved by connecting a 1 megohm resistor from the high side of the volume control to the tap on same.

Noisy operation of the automatic tuning may be caused by the leads to the automatic assembly or coil leads laying against the metal frame of the assembly.

Excessive oscillation in Model 4K401 will be caused by the 1A7 tube which should be replaced.

Motorboating in Model 4K401 will be due to a poor ground connection on the electrolytic condenser at the rivet which fastens it to the chassis.

Care should be taken that the leads from the tone control condenser and switch in all six tube bakelite models be kept away from the 6Q7 tube, otherwise the tone will be affected.

Excessive hum in AC-DC or voltage doubler chassis can be corrected by reversing the power plug in the light socket.

Cutting out in the portable receivers will usually be due to poor connections at the battery pack plug. Slight bending of the prongs will correct this condition.

Excessive regeneration in 5659 chassis may be corrected in most cases by moving the 12A8G grid lead away from the oscillator section of the gang condenser.

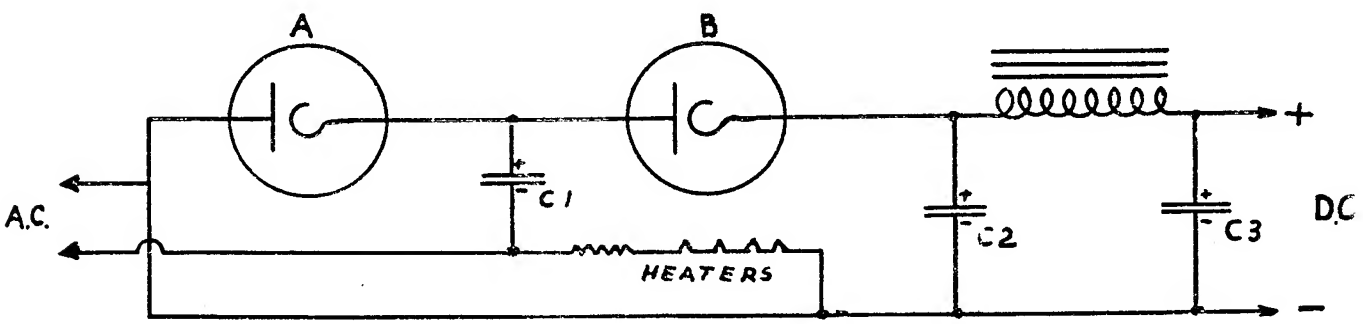
The Theory Of The Voltage Doubler

The voltage doubler circuit is a means of simultaneously rectifying and doubling the voltage of an alternating current without the use of a transformer.

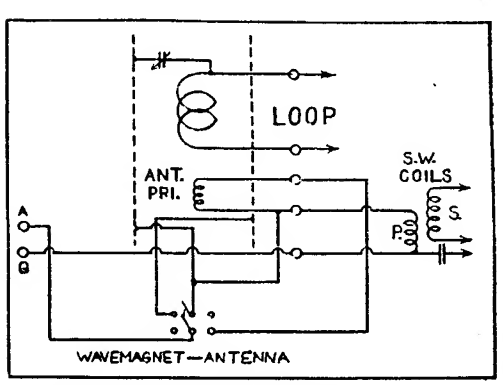
Referring to the circuit below, on one alteration of the A.C. input voltage, tube A will pass current charging condenser C1 to 110 volts. On the next alternation the polarity is reversed and tube A is inoperative due to the negative voltage on its plate. The input voltage (110 V.) being in series with condenser C1 places a 220 volt positive charge on the plate of tube B which then passes current to the filter system comprising a choke or speaker field and condensers C2 and C3.

The current handling ability of this circuit is limited only by the size of the rectifier tubes and condenser C1. In smaller chassis requiring but a few milliamperes plate current, a single 25Z6 is satisfactory, and in larger chassis 2 - 25Z6's are used with the plates and cathodes of each tube in parallel as in chassis #5721.

This circuit obviously will not operate on direct current (D.C.) inasmuch as the plate of tube B never becomes positive when so connected, and, therefore, does not pass current.



WAVEMAGNET



WAVEMAGNET CIRCUIT

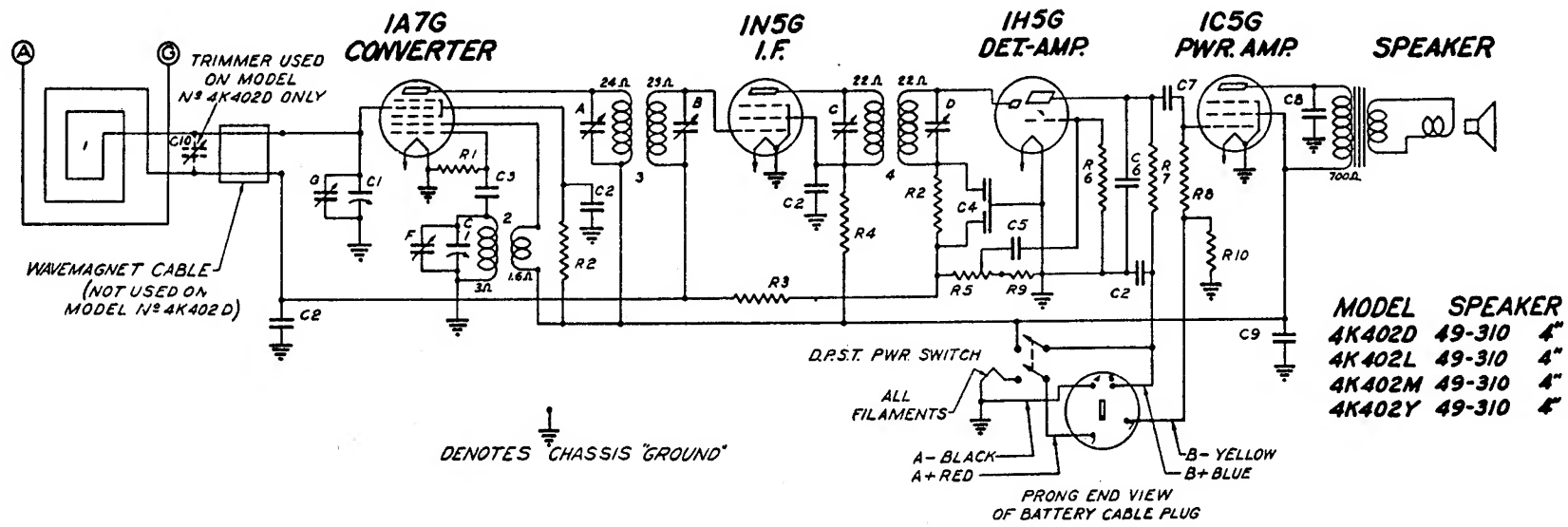
The circuit diagram on the right shows the switching arrangement used on the Wavemagnet in chassis employing more than one waveband.

With the Wavemagnet-Antenna switch in the Wavemagnet position, the two shields surrounding the loop winding are connected together and grounded to the chassis through the short wave primary winding and an isolation condenser of .05 mfd. The reactance of the short wave primary is negligible at broadcast frequencies and the shield is effectively grounded although this primary winding is in the circuit.

When the receiver is switched to short wave the entire Wavemagnet assembly acts as a small antenna coupled to the short wave input winding by means of the aforementioned primary winding.

The trimmer condenser connected between the shield and the grid end of the loop winding is used to compensate for unavoidable variation of distributed capacity between the shield and the loop winding and preserves tracking over the high frequency portion of the broadcast band.

With the Wavemagnet-Antenna switch in the Antenna position, the connection between the two shields is broken and the outer shield acts as an antenna connected to the loop by means of the trimmer condenser which in this case also acts as a coupling condenser. In many cases an increase of signal strength will be apparent with this connection but at the expense of increased pickup of interference inasmuch as the shielding action of the shield is no longer effective. The antenna primary winding which is associated with the loop winding is not effective unless an outside antenna is connected to the antenna terminal on the Wavemagnet.



DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION
C1	22-885	TWO-GANG VARIABLE		R1	63-652	120 M OHM	½ W.	1		WAVEMAGNET ASSEMBLY
C2	22-829	.05 MFD.	200V.	R2	63-593	4.7 M OHM	½ W.	2	S7029	OSCILLATOR COIL ASSEM.
C3		100 MMFD.		R3	63-669	3.9 MEGOHM	½ W.	3	S7030	1ST I.F. TRANS. ASSEM.
C4		DUAL 100 MMFD		R4	63-583	1000 OHM	½ W.	4	95-606	2ND I.F. TRANS.
C5	22-826	.01 MFD.	200V.	R5	63-1034	VOLUME CONTROL				
C6	22-162	.0001 MFD.	600V.	R6	63-604	10 MEGOHM	½ W.			
C7	22-243	.01 MFD.	400V.	R7	63-271	1 MEGOHM	½ W.	A		1ST I.F. TRANS. PRI.
C8	22-448	.004 MFD.	600V.	R8	63-600	2.2 MEGOHM	½ W.	B		1ST I.F. TRANS. SEC.
C9	22-684	8 MFD. ELECTROLYTIC	150V.	R9	63-587	4700 OHM	½ W.	C		2ND I.F. TRANS. PRI.
C10	22-882	TRIMMER COND.		R10	63-238	1000 OHM	½ W.	D		2ND I.F. TRANS. SEC.
								F		BROADCAST OSC. (ON GANG)
								G		ANTENNA BROADCAST (ON GANG)

1½ V. BATTERY PORTABLE
I.F. FREQUENCY 455 KC.
4 TUBE SUPERHETERODYNE
CHASSIS Nº 5419
ZENITH RADIO CORPORATION
CHICAGO, ILL.

MODEL 4K402 (Chassis No. 5419)

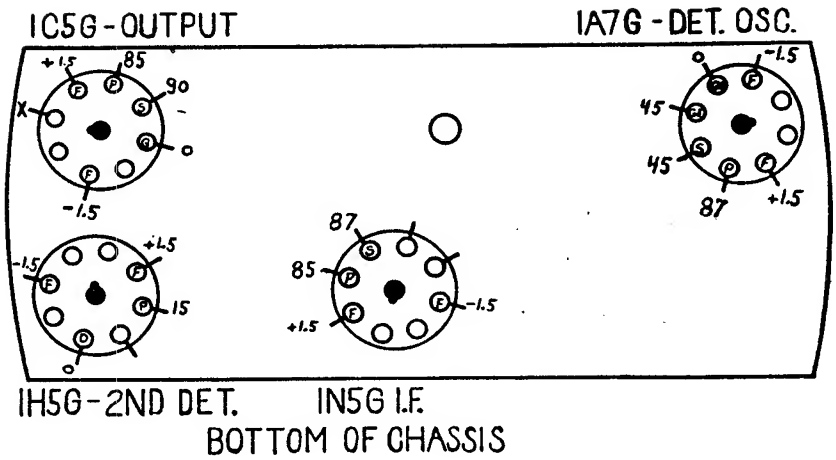
Model 4K402

CHASSIS No. 5419

NOTE

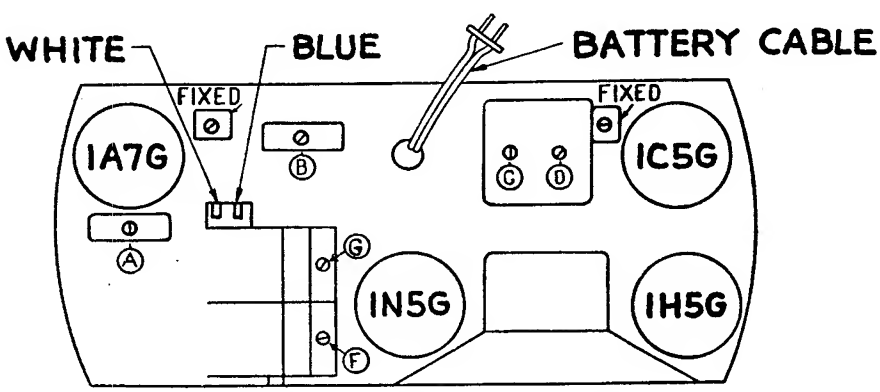
All measurements with 1000 ohms per volt meter — loop antenna not connected—volume at minimum — All readings made with fresh Zenith (part No. Z-59) battery pack with speaker in circuit.

All voltages measured from contact X on 1C56 tube socket to point indicated.



LEGEND

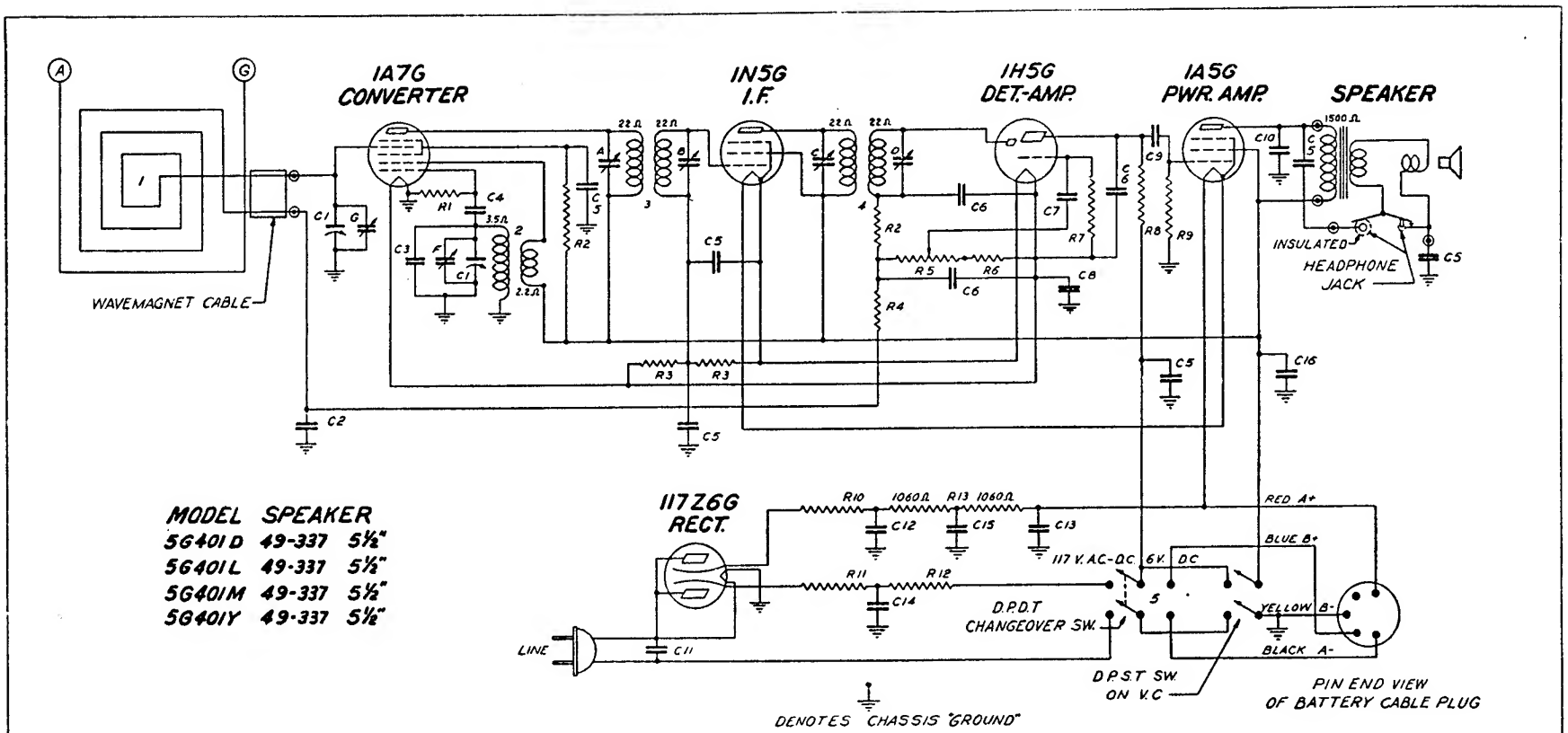
SH—Shield
H—Heater
P—Plate
S—Screen
G—Grid
SU—Suppressor
D—Diode
K—Cathode
NC—No Connection



Location of tubes and trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Oscillator to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	.5 mfd.	455	—	600	A B C D	I. F. Alignment
2	Single Turn Loop Loosely Coupled to Wave Magnet	—	1400	—	1400	F	Set Osc. to Scale
3		—	1400	—	1400	G	Alignment of Ant.



MODEL	SPEAKER
5G401D	49-337 5½"
5G401L	49-337 5½"
5G401M	49-337 5½"
5G401Y	49-337 5½"

DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION
C1	22-800	TWO GANG VARIABLE		C14	22-871	20 MFD. ELECTROLYTIC	150V	R8	63-271	1 MEGOHM	¼ W	5	85-190	POWER SWITCH
C2	22-138	.2 MFD.	200V	C15		20 MFD "	150V	R9	63-600	2.2 MEGOHM	¼ W			
C3	22-802	30 MMFD.	600V	C16		20 MFD "	150V	R10	63-1022	150 OHM WIREWOUND	1 W			
C4	22-182	.00025 MFD.	600V					R11	63-605	1000 OHM	½ W			
C5	22-829	.05 MFD	200V					R12	63-803	2200 OHM	½ W	A		1ST I.F. TRANS. PRI
C6	22-162	.0001 MFD	600V					R13	63-1033	2-SECTION CANDOHM		B		1ST I.F. " SEC
C7	22-826	.01 MFD	200V	R1	63-652	120 M OHM	¼ W					C		2ND I.F. " PRI
C8	22-350	.25 MFD	200V	R2	63-593	47 M OHM	¼ W					D		2ND I.F. " SEC
C9	22-243	.01 MFD	400 W	R3	63-296	220 M OHM	¼ W					F		BROADCAST OSC. (ON GANG)
C10	22-492	.002 MFD	600V	R4	63-669	3.9 MEGOHM	½ W	1		WAVEMAGNET ASSEMBLY		G		ANTENNA B'DCAST (-)
C11	22-869	.05 MFD	400 V	R5	63-1026	VOLUME CONTROL		2	57027	OSC COIL ASSEMBLY				
C12	22-918	40 MFD ELECTROLYTIC	150 V	R6	63-567	4700 OHM	¼ W	3	95-593	1ST I.F. TRANS				
C13		20 MFD "	25 V	R7	63-604	10 MEGOHM	¼ W	4	95-594	2ND I.F. "				

110 VOLT A.C. BATTERY PACK
UNIVERSAL PORTABLE
I.F. FREQUENCY 455 KC.
5 TUBE SUPERHETERODYNE
CHASSIS Nº 5537
ZENITH RADIO CORPORATION
CHICAGO, ILL.

MODEL 5G401 (Chassis No. 5537)

Model 5G401

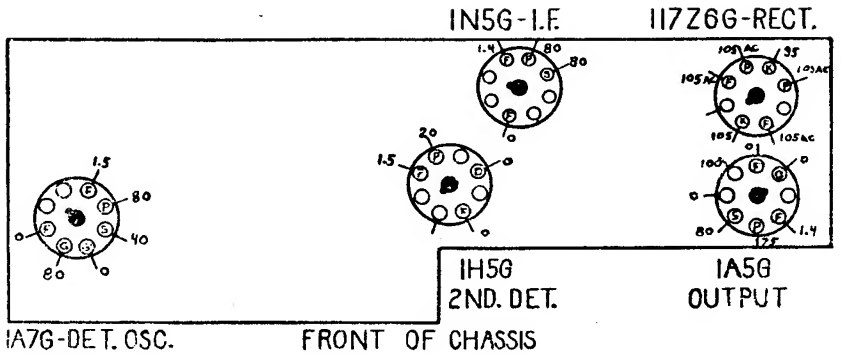
CHASSIS No. 5537

NOTE

All voltages measured from point indicated to chassis using a 1000 ohm per volt meter.

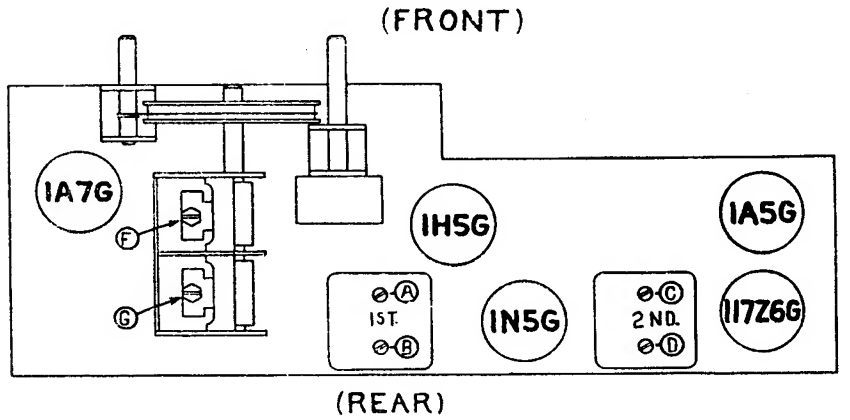
Antenna disconnected — volume control at minimum and condenser plates in full mesh.

Line voltage — 110v.



LEGEND

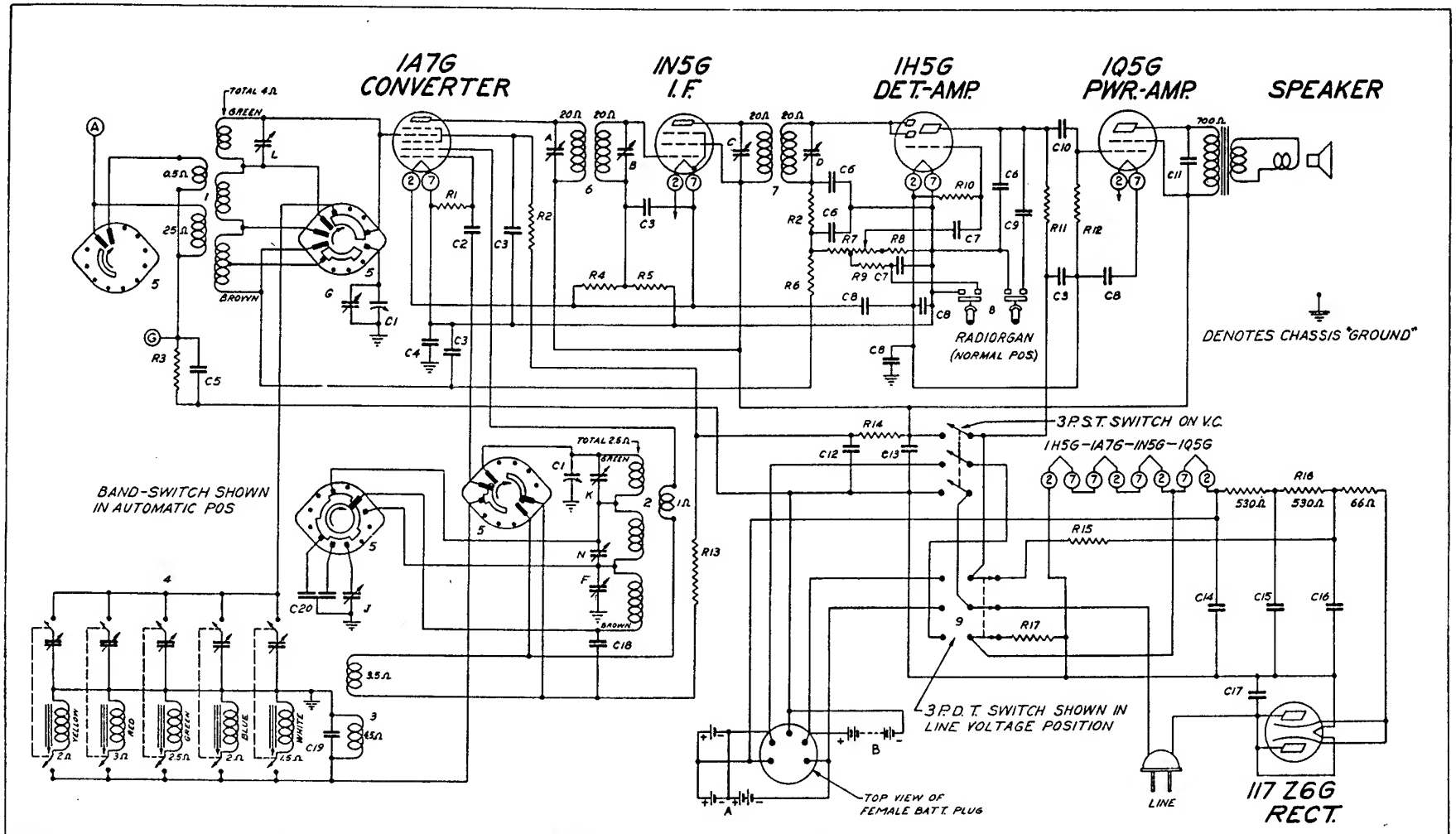
NC—No Connection
SH—Shield
H—Heater
P—Plate
S—Screen
G—Grid
SU—Suppressor
D—Diode
K—Cathode
F—Filament



Location of tubes and trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Oscillator to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	.5 mmfd.	455	—	600	A B C D	I. F. Alignment
2	Single Turn Loop Coupled Loosely to Wave Magnet	—	1400	—	1400	F	Set Osc. to Scale
3		—	1400	—	1400	G	Alignment of Antenna



DIAG. Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION
C1	22-878	TWO-GANG VARIABLE		C19	22-868	COMPENSATING COND.		R14	63-586	3300 OHM	¼ W.	A		1ST I.F. TRANS. PRI.
C2	22-269	.50 MMFD.	600V	C20	22-708	OSC PADDER		R15	63-605	1000 OHM	½ W.	B		1ST I.F. " SEC
C3	22-829	.05 MFD.	200V					R16	63-1036	3-SECTION CANDOHM		C		2ND I.F. " PRI.
C4	22-350	.25 MFD.	200V					R17	63-1012	90 OHM WIREWOUND	½ W.	D		2ND I.F. " SEC.
C5	22-196	.01 MFD.	600V									F		B'DCAST OSC. (SEE NOTE)
C6	22-162	.100 MMFD.	600V.	R1	63-654	180 M OHM	¼ W					G		ANT. B'DCAST (ON GANG)
C7	22-826	.01 MFD.	200V	R2	63-593	47M OHM	¼ W					J		B'DCAST PADDER (SEE NOTE)
C8	22-827	.1 MFD.	200V.	R3	63-597	470M OHM	¼ W.	1	57257	ANTENNA COIL ASSEMBLY		K		S.W. OSC. (SEE NOTE)
C9	22-887	.001 MFD.	600V	R4	63-649	56 M OHM	¼ W.	2	57252	OSC. COIL ASSEMBLY		L	22-788	S.W. DETECTOR
C10	22-243	.01 MFD.	400V.	R5	63-296	220M OHM	¼ W.	3	56992	OSC. COUPLING COIL ASSEM.		N		POL. BAND OSC. (SEE NOTE)
C11	22-448	.004	600V.	R6	63-669	39 MEGOHM	¼ W.	4	57044	AUTO TUNING UNIT ASSEM.				
C12		20 MFD. ELECTROLYTIC	150V.	R7	63-1080	VOLUME CONTROL		5	85-195	BAND SELECTOR SW.				
C13	22-880	20 " "	150V	R8	63-587	4700 OHM	¼ W.	6	95-607	1ST I.F. TRANSFORMER				NOTE -
C14		20 " "	25V	R9	63-591	22 M OHM	¼ W	7	95-614	2ND I.F TRANSFORMER				TRIMMERS F, J, K, & N
C15		60 MFD "	150V	R10	63-604	10 MEGOHM	½ W.	8	56994	TONE CONTROL SW				ARE MOUNTED ON STRIP
C16	22-879	60 " "	150V	R11	63-271	1 MEGOHM	½ W	9	85-196	POWER SW.				*22-881.
C17	22-869	.05 MFD.	400V.	R12	63-600	2.2 MEGOHM	½ W.							
C18	22-358	.002 MFD.	600V	R13	63-640	8200 OHM	½ W.							

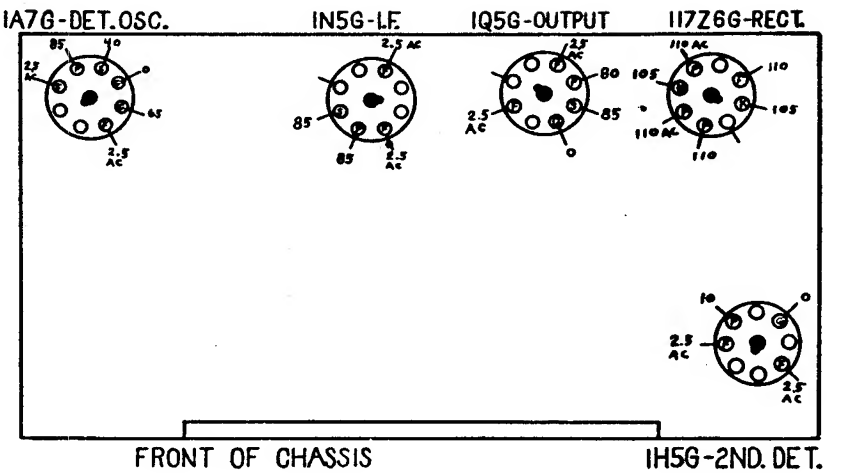
MODEL	SPEAKER	
5G441	49-316	8"
5G442	49-317	10"
5G461	49-318	10"

I.F. FREQUENCY 455 KC
5 TUBE SUPERHETERODYNE
110 V. A.C.-BATT. PACK-UNIVERSAL
CHASSIS Nº 5539 – 3 BAND
ZENITH RADIO CORPORATION
CHICAGO, ILL.

MODELS 5G441, 5G442, 5G461 (Chassis No. 5539)

Models 5G441, 5G442, 5G461

CHASSIS No. 5539



NOTE

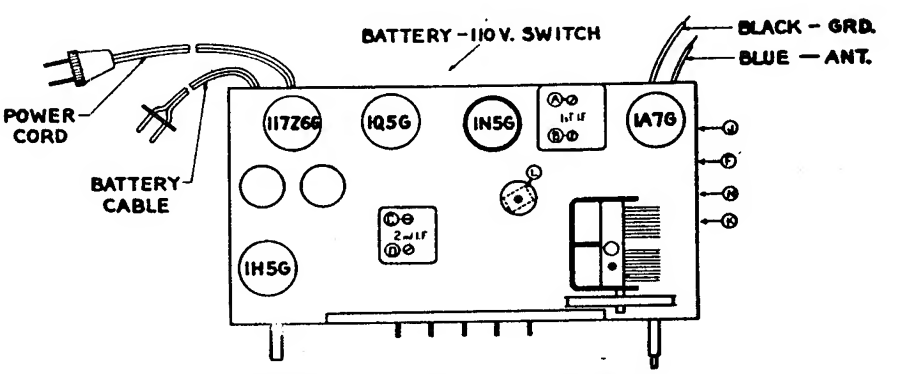
All voltages measured with a 1000 ohm per volt meter from chassis to point indicated.

Antenna disconnected — volume control at minimum and condenser plates in full mesh.

Line voltage — 110v.

LEGEND

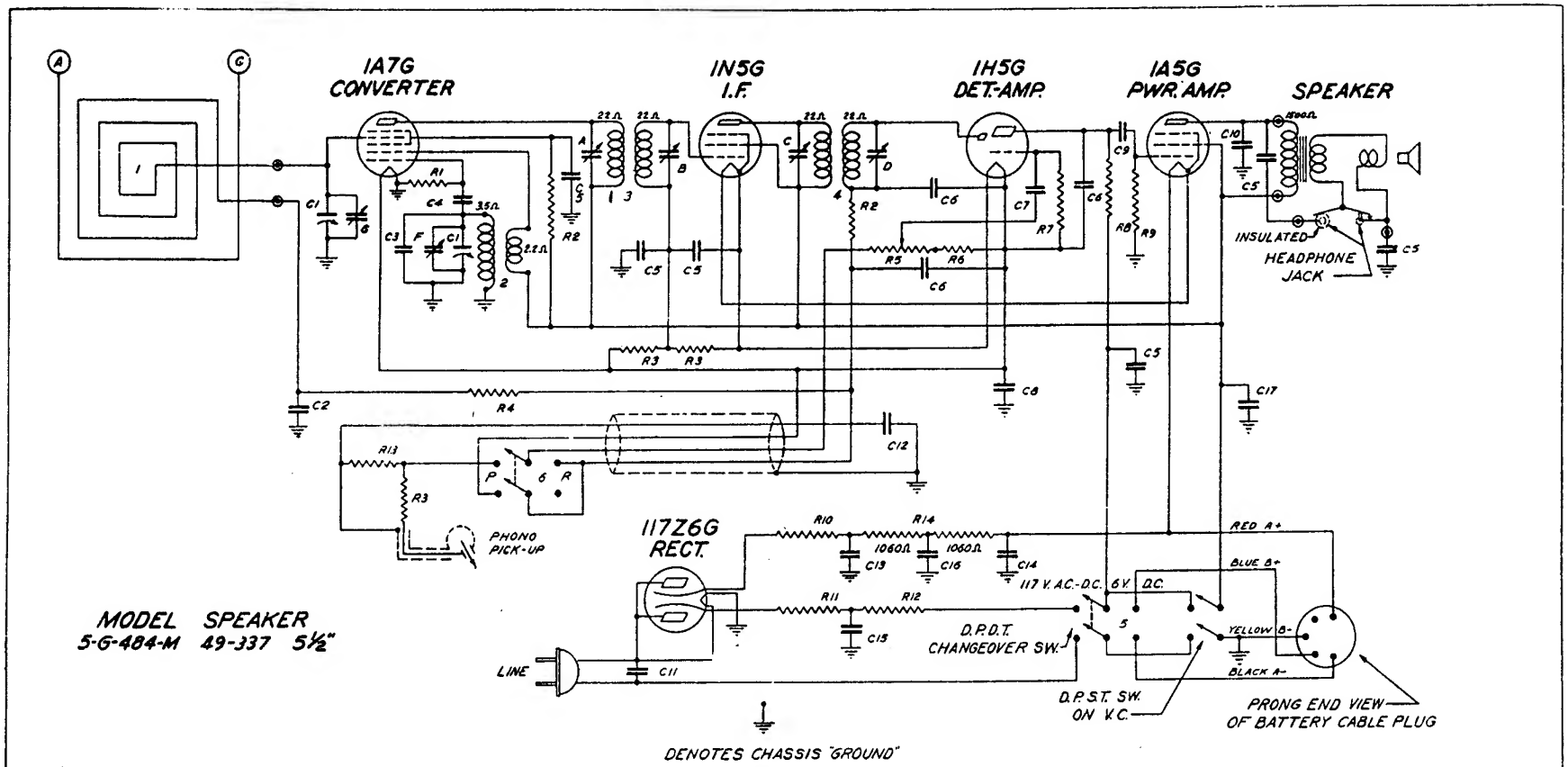
NC—No Connection
SH—Shield
H—Heater
P—Plate
S—Screen
G—Grid
SU—Suppressor
D—Diode
K—Cathode
F—Filament



Location of tubes and trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Oscillator to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 mfd.	455	Br'dc't	600	A B C D	I. F. Alignment
2	Rec. Ant. Wire	400 ohms	18000	S. W.	18000	K	Set. Osc. to Scale
3	" " "	400 ohms	16000	S. W.	16000	L	Rock gang & adj. for max. output Alignment of Ant.
4	" " "	400 ohms	6000	Police	6000	N	Rock gang & adj. for max. output
5	" " "	200 mmf.	1400	Br'dc't	1400	F	Rock gang & adj. for max. output
6	" " "	200 mmf.	600	"	600	J	Rock gang & adj. for max. output
7	" " "	200 mmf.		"		Repeat F & J	



DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION
C1	22-800	TWO-GANG VARIABLE		C15	22-871	20 MFD ELECTROLYTIC	150V.	R9	63-600	2.2 MEGOHM	½ W.	6	85-197	PHONO SWITCH
C2	22-138	.2 MFD.	200V.	C16		20 " "	150V.	R10	63-1022	150 OHM WIREWOUND	1 W.			
C3	22-802	.30 MMFD.	600V.	C17		20 " "	150V.	R11	63-605	1000 OHM	½ W.			
C4	22-162	.00025 MFD.	600V.					R12	63-803	2200 OHM	½ W.			
C5	22-829	.05 MFD.	200V.					R13	63-591	.22 M OHM	½ W.	A		1ST I.F. TRANS. PRI.
C6	22-162	.0001 MFD.	600V.					R14	63-1033	2-SECTION CANDOHM		B		1ST I.F. " SEC.
C7	22-826	.01 MFD.	200V.	R1	63-652	120 M OHM	½ W.					C		2ND I.F. " PRI.
C8	22-350	.25 MFD.	200V.	R2	63-593	47 M OHM	½ W.					D		2ND I.F. " SEC.
C9	22-243	.01 MFD.	400V.	R3	63-296	220 M OHM	½ W.					F		BROADCAST OSC. (ON GANG)
C10	22-492	.002 MFD.	600V.	R4	63-649	3.9 MEGOHM	½ W.	1		WAVEMAGNET ASSEMBLY		G		ANTENNA B'CAST (" ")
C11	22-869	.05 MFD.	400V.	R5	63-1026	VOLUME CONTROL		2	S7027	OSC. COIL ASSEMBLY				
C12	22-827	.1 MFD.	200V.	R6	63-587	4700 OHM	½ W.	3	95-593	1ST I.F. TRANS.				
C13	22-910	40 MFD. ELECTROLYTIC	150V.	R7	63-604	10 MEGOHM	½ W.	4	95-594	2ND I.F. "				
C14		20 MFD. "	25V.	R8	63-271	1 MEGOHM	½ W.	5	85-190	POWER SWITCH				

110 VOLT A.C. BATTERY PACK
PORTABLE PHONO
I.F. FREQUENCY 455 KC.
5 TUBE SUPERHETERODYNE
CHASSIS Nº 5538
ZENITH RADIO CORPORATION
CHICAGO, ILL.

MODEL 5G484 (Chassis No. 5538)

Model 5G484

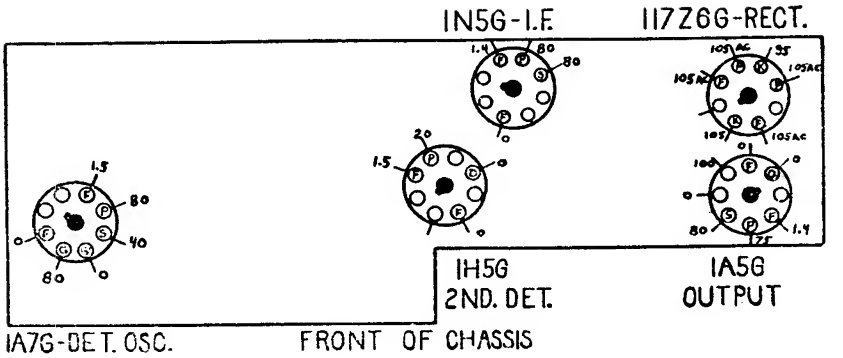
CHASSIS No. 5538

NOTE

All voltages measured from point indicated to chassis using a 1000 ohm per volt meter.

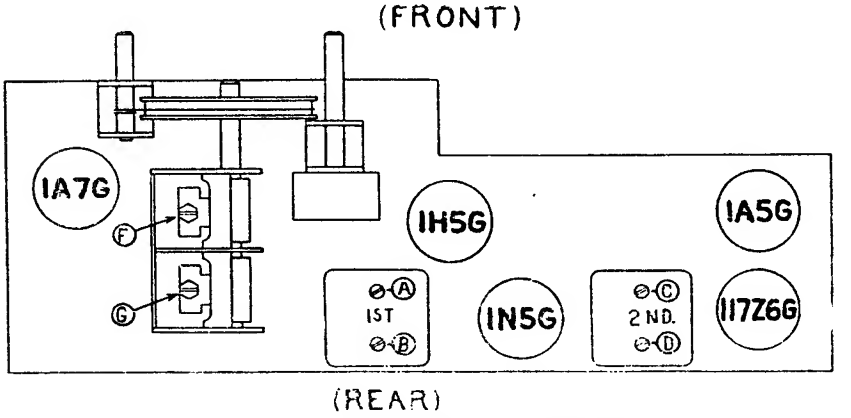
Antenna disconnected — volume control at minimum and condenser plates in full mesh.

All voltages measured using Zenith No. Z659 battery pack.



LEGEND

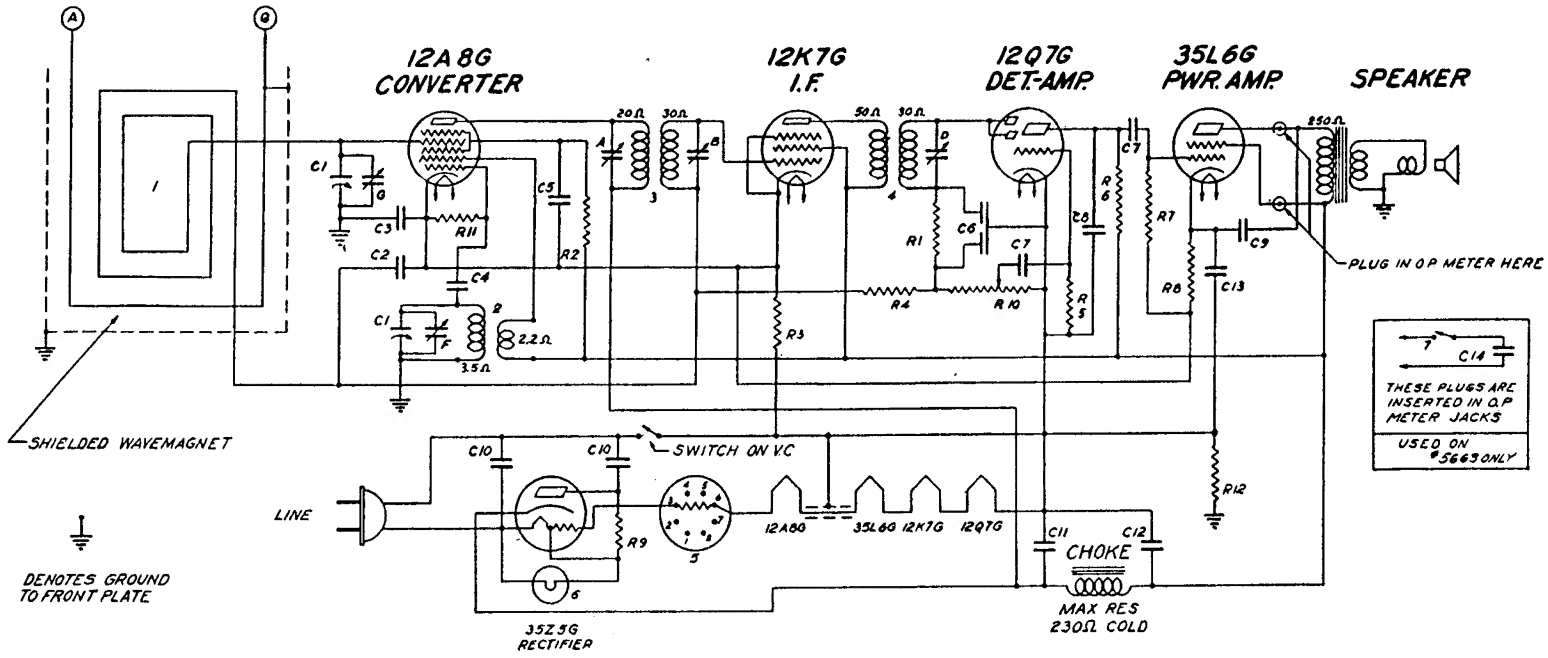
NC—No Connection
SH—Shield
H—Heater
P—Plate
S—Screen
G—Grid
SU—Suppressor
D—Diode
K—Cathode
F—Filament



Location of tubes and trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Oscillator to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	.5 Mfd.	455	—	600	A-B-C-D	I. F. Alignment
2	Single Turn Loop coupled loosely to Wave Magnet		1400	—	1400	F	Set Osc. to Scale
3	"		1400	—	1400	G	Alignment of Antenna



DIAG NO	PART NO	DESCRIPTION		DIAG NO.	PART NO.	DESCRIPTION		DIAG NO.	PART NO	DESCRIPTION
C1	22-885	2-GANG VARIABLE		R1	63-593	47 M OHM	1/4 W	4	56903	2ND I.F. TRANS
C2	22-250	.05 MFD.	200V	R2	63-591	22 M OHM	1/4 W	5	100-77	BALLAST TUBE
C3	22-190	.1 MFD.	200V	R3	63-572	15 OHM	1/4 W	6	100-67	PILOT LIGHT 6.3 V. .15 A.
C4		100 MMFD.		R4	63-600	2.2 MEGOHM	1/4 W	7	MS 517	TONE CONTROL SWITCH
C5	22-841	.02 MFD.	200V	R5	63-602	4.7 MEGOHM	1/4 W			
C6		DUAL 100 MMFD.		R6	63-296	220 M OHM	1/4 W			
C7	22-837	.01 MFD.	400V	R7	63-597	470 M OHM	1/4 W			
C8	22-833	.0005 MFD.	600V	R8	63-686	150 OHM WIREWOUND	1/2 W	A		1ST I.F. TRANS PRI
C9	22-836	.03 MFD.	400V	R9	63-1017	27 OHM "	1/2 W	B		1ST I.F. TRANS SEC
C10	22-839	.05 MFD.	400V	R10	63-1028	VOLUME CONTROL		D		2ND I.F. TRANS SEC
C11	22-835	40 MFD.	150V	R11	63-713	47 M OHM	1/4 W.	F		BROADCAST OSC. (ON GANG)
C12		16 MFD.	150V	R12	63-717	220 M OHM	1/4 W	G		" ANT (- -)
C13		20 MFD.	25V	1		WAVEMAGNET ASSEM.				
C14	22-844	TONE CONTROL COND		2	56901	OSC. COIL "				
				3	56902	1ST I.F. TRANS				

MODEL	SPEAKER	
6D410	49-323	4"
6D411	49-323	4"
6D425	49-323	4"

I.F. FREQUENCY 455 KC.
6 TUBE SUPERHETERODYNE
CHASSIS Nº 5659-5663 AC-D.C.
ZENITH RADIO CORPORATION
CHICAGO, ILL.

MODELS 6D410, 6D411, 6D425 (Chassis No. 5659)

Models 6D410, 6D411, 6D425

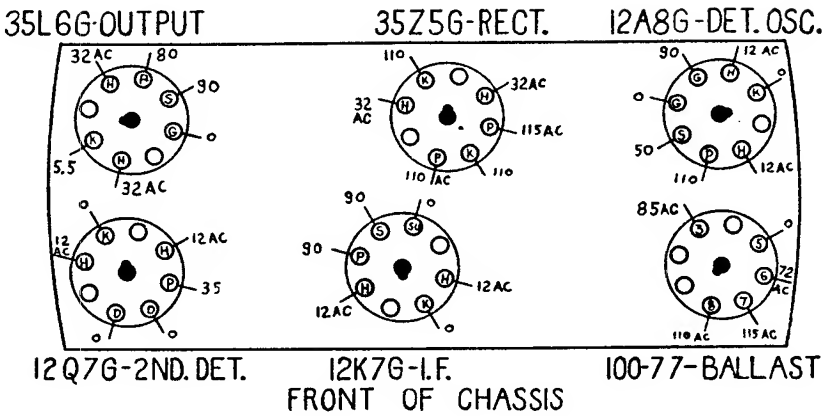
CHASSIS No. 5659

NOTE

Voltages measured from line switch to point indicated using a 1000 ohm per volt meter. Vol. control at minimum. Antenna disconnected.

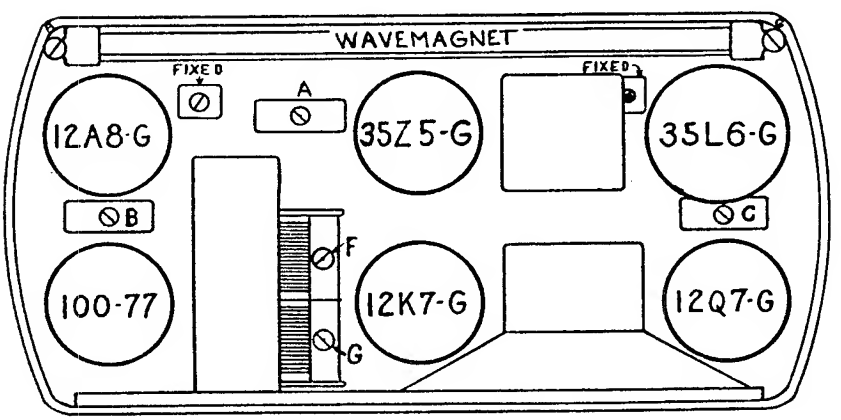
All filament voltages measured across each respective tube, using an A.C. volt-meter.

Line voltage — 110v.



LEGEND

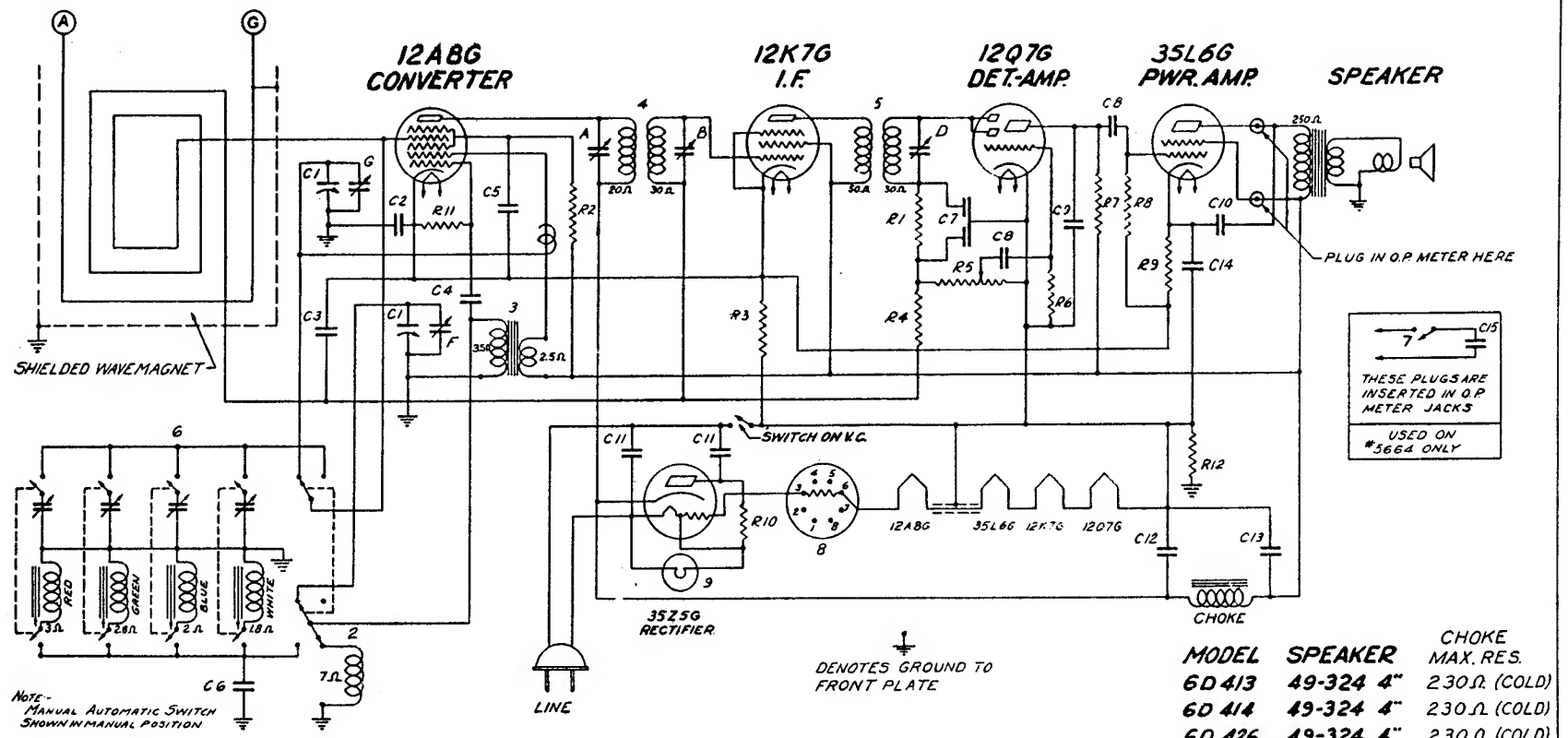
NC—No Connection
SH—Shield
H—Heater
P—Plate
S—Screen
G—Grid
SU—Suppressor
D—Diode
F—Filament
K—Cathode



Location of tubes and trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Oscillator to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	.5 Mfd.	455	B'dcast	600	A B C	I. F. Alignm't
2	Single Turn Loop Loosely Coupled to Wave Magnet	—	1500	"	1500	F	Set Osc. to Scale
3		—	1500	"	"	G	Alignment of Ant.



DIAG. No	PART No	DESCRIPTION	
C 1	22-886	TWO GANG VARIABLE	
C 2	22-939	.1 MFD.	200 V.
C 3	22-250	.05 MFD.	200 V.
C 4		100 MMFD.	
C 5	22-841	.02 MFD.	200 V.
C 6	22-868	COMPENSATING CONDENSER DUAL 100 MMFD	
C 7	22-837	.01 MFD.	400 V.
C 8	22-833	.0005 MFD.	600 V.
C 9	22-836	.03 MFD.	400 V.
C 10	22-839	.05 MFD.	400 V.
C 11		40 MFD. ELECTROLYTIC	150 V.
C 12	22-835	16 " "	150 V.
C 13		20 "	25 V.
C 14	22-844	TONE CONTROL CONDENSER	
C 15			

DIAG. No.	PART No.	DESCRIPTION	
R 1	63-593	47 M OHM	¼ W
R 2	63-591	22 M OHM	¼ W
R 3	63-572	.15 OHM	¼ W
R 4	63-600	2.2 MEGOHM	¼ W.
R 5	63-1028	VOLUME CONTROL	
R 6	63-602	4.7 MEGOHM	¼ W
R 7	63-296	220 M OHM	¼ W
R 8	63-597	470 M OHM	¼ W
R 9	63-686	150 OHM WIREWOUND	½ W
R 10	63-1017	27 OHM WIREWOUND	½ W
R 11	63-713	47 M OHM	½ W
R 12	63-717	220 M OHM	½ W
1		WAVEMAGNET ASSEMBLY	
2	56927	OSCILLATOR COIL ASSEMBLY	
3	56942	OSC COUPLER COIL ASSEMBLY	
4	56902	1ST I.F. TRANS. ASSEMBLY	

DIAG. NO.	PART NO.	DESCRIPTION	
5	56903	2ND I.F TRANS ASSEMBLY	
6	56997	AUTOMATIC TUNING UNIT ASSEM.	
7	MS 517	TONE CONTROL SWITCH	
8	100-77	BALLAST TUBE	
9	100-67	PILOT LIGHT BULB	6.3 V. - .15 AMP
A		1ST I.F. TRANS	PRI
B		1ST I.F. TRANS.	SEC.
C		2ND I.F. TRANS.	SEC.
F		BROADCAST OSC.	(ON GANG)
G		ANTENNA BROADCAST	(ON GANG)

MODEL	SPEAKER	CHOKE MAX. RES.
6D413	49-324 4"	230Ω (COLD)
6D414	49-324 4"	230Ω (COLD)
6D426	49-324 4"	230Ω (COLD)
6D427	49-324 4"	230Ω (COLD)
6D446	49-336 5"	325Ω (HOT)
6D455	49-324 4"	230Ω (COLD)

I.F. FREQUENCY 455KC.
6 TUBE SUPERHETERODYNE
CHASSIS *5660 & *5664 A.C.-D.C.
ZENITH RADIO CORPORATION
CHICAGO, ILL.

MODELS 6D413, 6D414, 6D426, 6D427, 6D446, 6D455 (Chassis No. 5660)

Models 6D413, 6D414, 6D426, 6D427, 6D446, 6D455

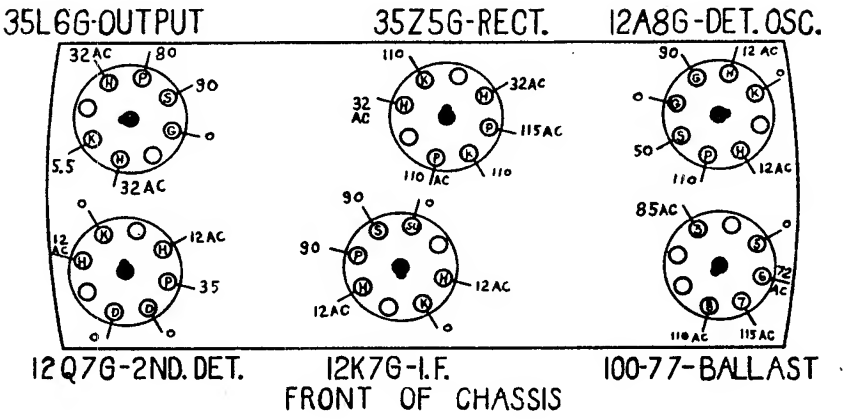
CHASSIS No. 5660

NOTE

Voltages measured from No. 7 pin on ballast tube to point indicated using a 1000 ohm per volt meter. Vol. control at minimum. Antenna disconnected.

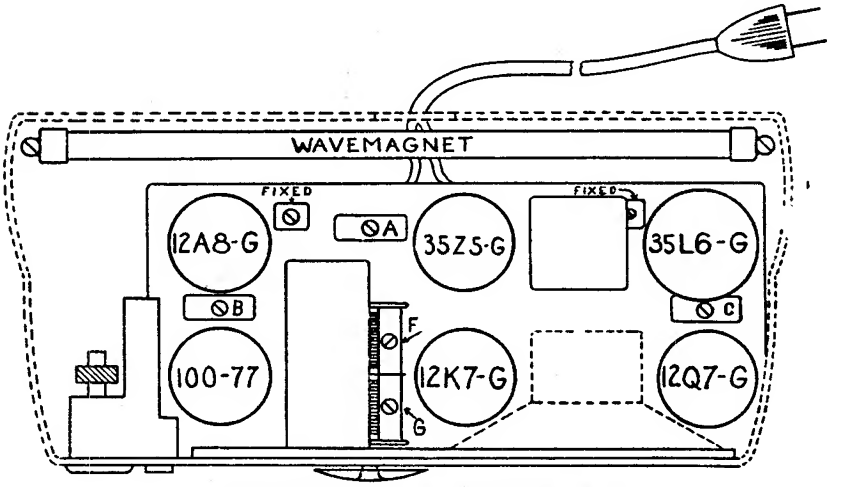
All filament voltages measured across each respective tube, using an A.C. volt-meter.

Line voltage — 110v.



LEGEND

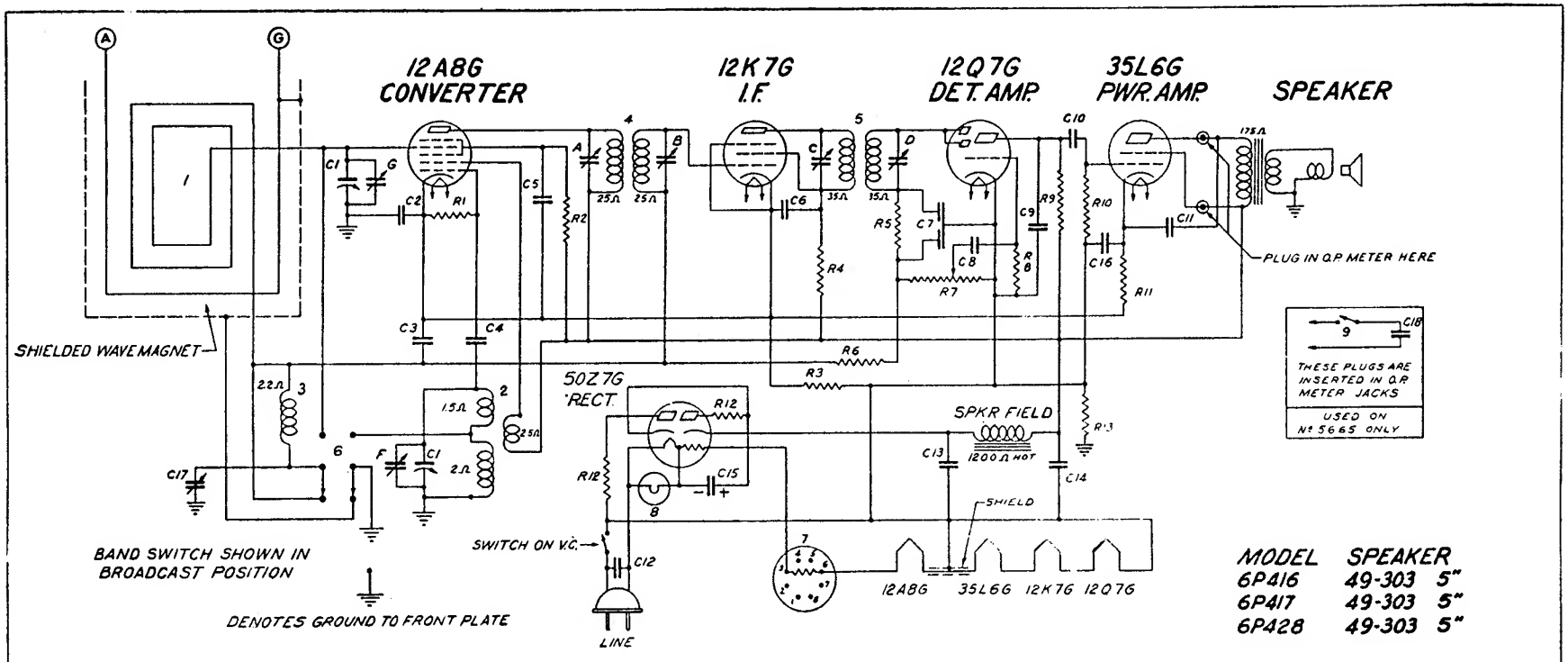
NC—No Connection
SH—Shield
H—Heater
P—Plate
S—Screen
G—Grid
SU—Suppressor
D—Diode
F—Filament
K—Cathode



Location of tubes and trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Oscillator to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	.5 Mfd.	455	B'dcast	600	A B C	I. F. Alignm't.
2	Single Turn Loop Loosely	—	1500	"	1500	F	Set Osc. to Scale
3	Coupled to Wave Magnet	—	1500	"	"	G	Alignment of Ant.



MODEL	SPEAKER
6P416	49-303 5"
6P417	49-303 5"
6P428	49-303 5"

DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION
C1	22-845	TWO GANG VARIABLE		C13	22-840	20 MFD ELECTROLYTIC	350V.	R5	63-593	47 M OHM	½ W	5	95-598	2ND I.F. TRANS
C2	22-190	.1 MFD	200V	C14		20 MFD "	250V.	R6	63-722	2.2 MEGOHM	¼ W	6	M5515	BAND SWITCH
C3	22-250	.05 MFD	200V	C15		20 MFD "	200V.	R7	63-1028	VOLUME CONTROL		7	100-79	BALLAST TUBE
C4		100 MMFD.		C16		20 MFD	25V.	R8	63-976	.15 MEGOHM	¼ W.	8	100-39	PILOT LIGHT 29V-.17A
C5	22-842	.02 MFD	400V	C17	22-788	TRIMMER CONDENSER		R9	63-296	220 M OHM	¼ W	9	M5517	TONE CONTROL SWITCH
C6	22-212	.05 MFD	400V	C18	22-867	TONE CONTROL COND.		R10	63-597	470 M OHM	¼ W			
C7		DUAL 100 MMFD						R11	63-686	150 OHM WIREWOUND	½ W			
C8	22-838	.005 MFD.	600V					R12	63-1023	22 OHM "	½ W	A		1ST I.F. TRANS PRI.
C9	22-833	.0005 MFD	600V					R13	63-717	2.2 M OHM	¼ W	B		1ST I.F. " SEC.
C10	22-837	.01 MFD	400V	R1	63-712	3.3 M OHM	½ W	1		WAVEMAGNET ASSEMBLY		C		2ND I.F. " PRI.
C11	22-836	.03 MFD	400V	R2	63-591	2.2 M OHM	¼ W	2	56913	OSCILLATOR COIL ASSEM.		D		2ND I.F. " SEC
C12	22-875	.15 MFD	400V	R3	63-572	15 OHM	¼ W	3	56914	SHUNT ANT. " "		F		BROADCAST OSC. (ON GANG)
				R4	63-583	1000 OHM	¼ W	4	56915	1ST I.F. TRANS.		G		ANTENNA B'CAST (")

I.F. FREQUENCY 455KC
6 TUBE SUPERHETERODYNE
VOLTAGE DOUBLER A.C.
CHASSIS Nº5661 & 5665
ZENITH RADIO CORPORATION
CHICAGO, ILL.

MODELS 6P416, 6P417, 6P418, 6P419 (Chassis No. 5661)

Models 6P416, 6P417, 6P418, 6P419

CHASSIS No. 5661

NOTE

Voltages measured from No. 7 pin on ballast tube to point indicated using a 1000 ohm per volt meter. Vol. control at minimum. Antenna disconnected.

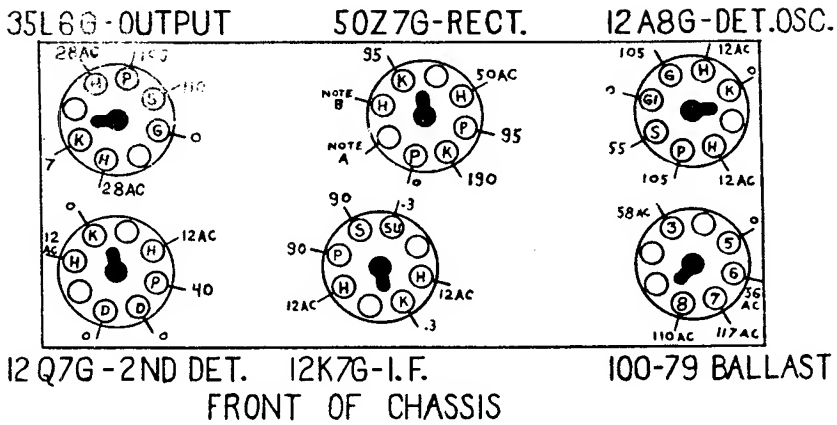
All filament voltages measured across each respective tube, using a 0-50 A. C. voltmeter.

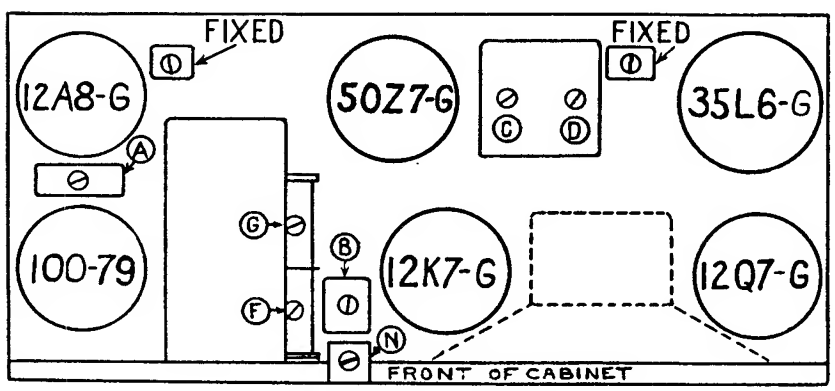
A. This lug is C.T. of fil. and is one side of pilot light supply line.
Lug No. 7 is return for pilot light.

B. This lug (No. 8) has a 50 v. A. C. potential with respect to lug No. 2 and also a 117 v. A.C. potential with respect to line switch.

LEGEND

NC—No Connection
SH—Shield
H—Heater
P—Plate
S—Screen
G—Grid
SU—Suppressor
D—Diode
F—Filament
K—Cathode

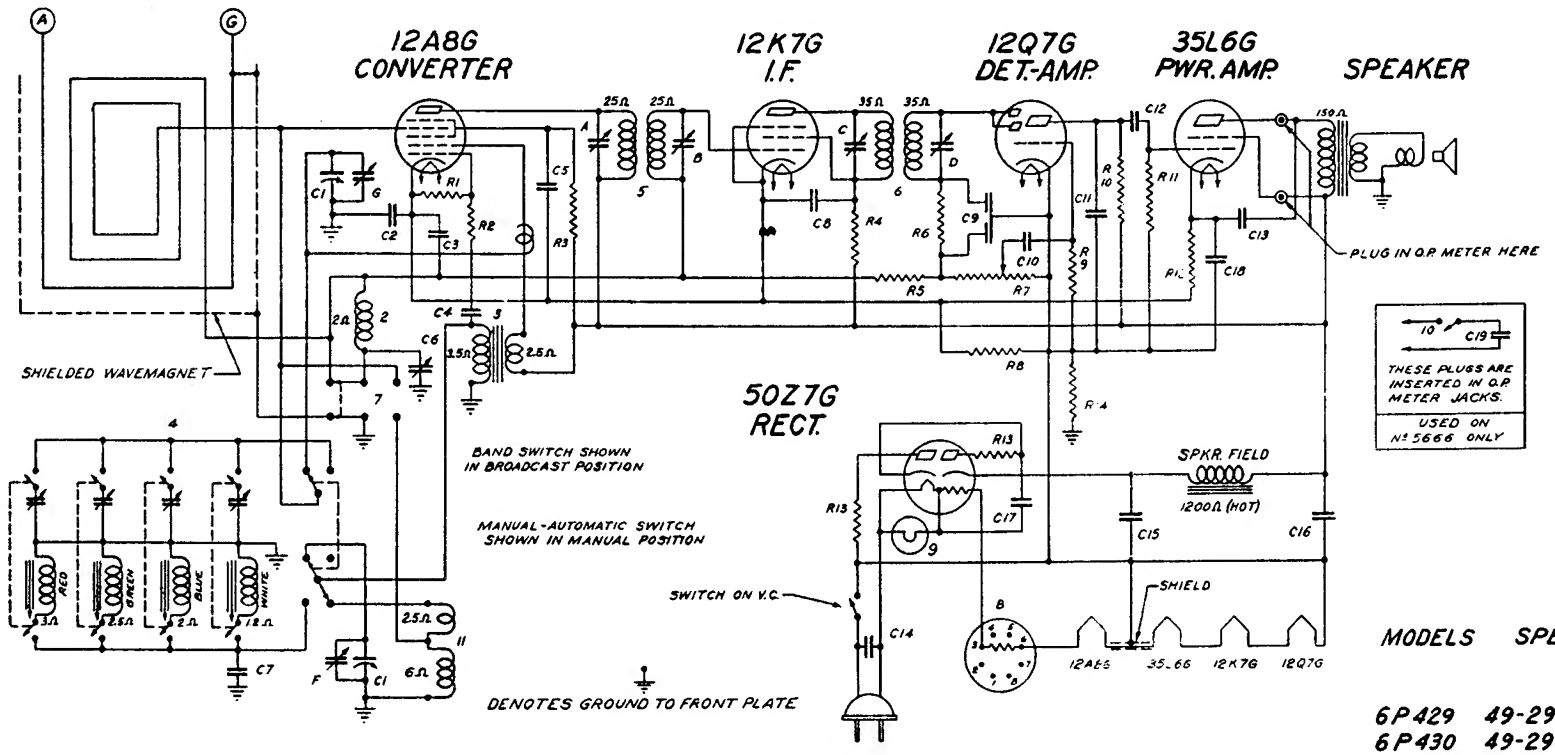




Location of tubes and trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Oscillator to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	.5 mfd.	455	B'dcast	600	ABCD	I. F. Alignment
2	Single Turn		1500	"	1500	F	Set Osc. to Scale
3	Loop Coupled		"	"	"	G	Alignm't of Ant.
4	Loosely to		2700	Police	2700	N	Algn't of S. W.
	Wave Magnet						



DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION
C1	22-845	TWO-GANG VARIABLE		C15		20 MFD ELECTROLYTIC	350V	R9	63-976	15 MEGOHM	1/4 W	9	100-39	PILOT LIGHT 2.9 V. - .17 A.
C2	22-190	.1 MFD.	200V	C16	22-840	20 " "	250V	R10	63-296	220 M OHM	1/4 W	10	MS-517	TONE CONTROL SWITCH
C3	22-850	.05 MFD	200V	C17		20 " "	200V	R11	63-597	470 M OHM	1/4 W	11	5-7006	OSCILLATOR COIL ASSEMBLY
C4		100 MMFD.		C18		20 " "	25V	R12	63-686	150 OHM WIREWOUND	1/2 W			
C5	22-842	.02 MFD.	400V	C19	22-948	TONE CONTROL COND		R13	63-1083	22 OHM WIREWOUND	1/2 W			
C6	22-877	TRIMMER CONDENSER						R14	63-717	220 M OHM	1/4 W.			
C7	22-868	COMPENSATING COND.										A		1ST I.F. TRANS. PRI
C8	22-212	.05 MFD.	400V									B		1ST I.F. - SEC
C9		DUAL 100 MMFD.		R1	63-712	33 M OHM	1/4 W	1		WAVEMAGNET ASSEMBLY		C		2ND I.F. PRI
C10	22-838	.005 MFD.	600V	R2	63-581	470 OHM	1/4 W	2	S7004	ANTENNA SHUNT COIL ASSEMBLY		D		2ND I.F. - SEC
C11	22-839	.0005 MFD.	600V	R3	63-591	22 M OHM	1/4 W	3	S6942	OSC. COUPLER COIL ASSEMBLY		F		BROADCAST OSC (ON GANG)
C12	22-837	.01 MFD.	400V	R4	63-583	1000 OHM	1/4 W	4	S7024	AUTOMATIC TUNING UNIT ASSEM		G		ANTENNA BROADCAST (- -)
C13	22-836	.03 MFD.	400V	R5	63-722	2.2 MEGOHM	1/4 W	5	36915	1ST I.F. TRANS. ASSEMBLY				
C14	22-875	.15 MFD	400V	R6	63-595	47 M OHM	1/4 W.	6	95-598	2ND I.F. TRANSFORMER				
				R7	63-1028	VOLUME CONTROL		7	MS-515	BAND SWITCH				
				R8	63-572	15 OHM	1/4 W	8	100-79	BALLAST TUBE				

MODELS	SPEAKER	
6P429	49-298	5"
6P430	49-298	5"
6P447	49-298	5"
6P448	49-305	5"
6P457	49-307	10"

I.F. FREQUENCY 455KC
6 TUBE SUPERHETERODYNE
VOLTAGE DOUBLER A.C.
CHASSIS Nº5662 & 5666
ZENITH RADIO CORPORATION
CHICAGO, ILL.

MODELS 6P418, 6P419, 6P428, 6P429, 6P430, 6P447, 6P448, 6P457 (Chassis No. 5662)

Models 6P418, 6P419, 6P428, 6P429, 6P430, 6P447, 6P448, 6P457

CHASSIS No. 5662

NOTE

Voltages measured from No. 7 pin on ballast tube to point indicated using a 1000 ohm per volt meter. Vol. control at minimum. Antenna disconnected.

All filament voltages measured across each respective tube, using an A.C. voltmeter.

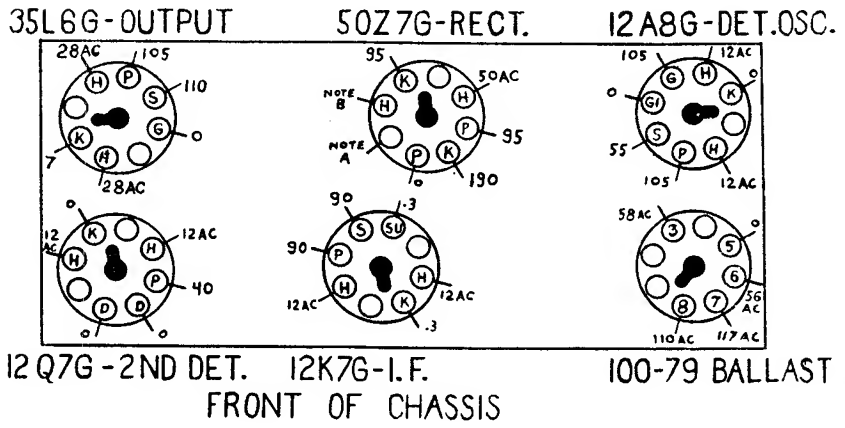
A. This lug is C.T. of fil. and is one side of pilot light supply line.

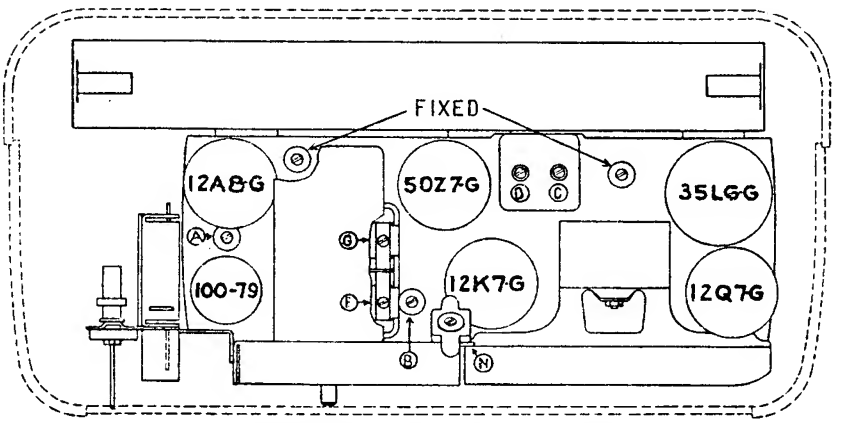
Lug No. 7 is return for pilot light.

B. This lug (No. 8) has a 50 v. A. C. potential with respect to lug No. 2 and also a 117 v. A.C. potential with respect to line switch.

LEGEND

NC—No Connection
SH—Shield
H—Heater
P—Plate
S—Screen
G—Grid
SU—Suppressor
D—Diode
F—Filament
K—Cathode

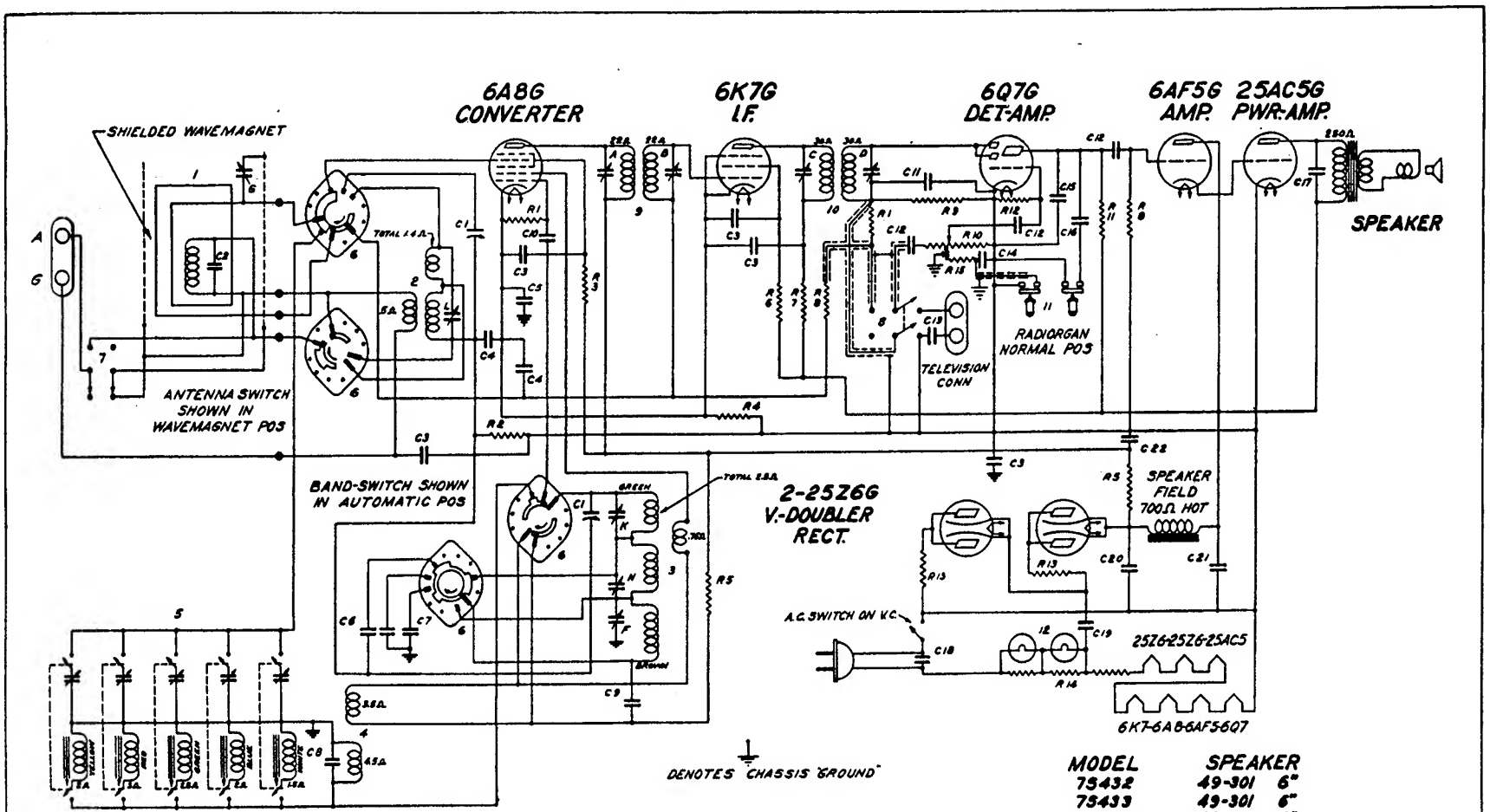




Location of tubes and trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Oscillator to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	.5 mfd.	455	B'dcast	600	A B C D	I. F. Alignment
2	Single Turn		1500	"	1500	F	Set Osc. to Scale
3	Loop Coupled		"	"	"	G	Alignm't of Ant.
4	Loosely to Wave Magnet		2700	Police	2700	N	Algn't of S. W.



DIAG. NO	PART NO	DESCRIPTION		DIAG. NO	PART NO	DESCRIPTION		DIAG. NO	PART NO	DESCRIPTION		DIAG. NO	PART NO	DESCRIPTION
C-1	22-849	TWO-GANG VAR.		C-20		30 MFD ELECTROLYTIC	350 V.	R-12	63-976	15 MEGOHMS	½ W			
C-2	22-182	.00025 MFD.	600 V.	C-21	22-859	20 " "	250 V.	R-13	63-1023	22 OHM WIREWOUND	½ W.			
C-3	22-828	.05 MFD.	400 V.	C-22		10 " "	250 V.	R-14	63-1039	3-SECTION CANOHM				
C-4	22-829	.05 MFD.	200 V.					R-15	63-713	47 M OHM	½ W.	A		1ST. I.F. TRANS PRI.
C-5	22-594	.15 MFD.	200 V.									B		1ST. I.F. " SEC.
C-6	22-863	OSC PADDER						1		WAVEMAGNET ASSEMBLY		C		2ND I.F. " PRI.
C-7	22-864	" "						2	56936	ANTENNA COIL "		D		2ND I.F. " SEC.
C-8	22-866	COMPENSATING CAP.						3	56937	OSCILLATOR " "		F		BROADCAST OSC. (SEE NOTE)
C-9	22-858	.002 MFD.	600 V.					4	56998	OSC COUPLER " "		G	22-865	ANTENNA BROADCAST
C-10	22-289	50 MMFD.	400 V.	R-1	63-593	47 M OHM	½ W.	5	57044	AUTOMATIC TUNING		K		SHORT WAVE OSC. (SEE NOTE)
C-11	22-462	.0001 MFD.	600 V.	R-2	63-325	150 M OHM	½ W.			UNIT ASSEMBLY		L	22-786	SHORT WAVE DETECTOR
C-12	22-196	.01 MFD.	600 V.	R-3	63-1019	68 M OHM	½ W.	6	85-185	BAND SELECTOR SWITCH		N		POLICE BAND OSC (SEE NOTE)
C-13	22-327	.02 MFD.	200 V.	R-4	63-1020	68 OHM WIREWOUND	½ W.	7	85-171	WAVEMAGNET "				
C-14	22-229	.005 MFD.	600 V.	R-5	63-150	10 M OHM	½ W.	8	85-171	TELEVISION "				
C-15	22-854	.0006 MFD.	600 V.	R-6	63-591	2.2 M OHM	½ W.	9	95-600	1ST I.F. TRANSFORMER				
C-16	22-448	.006 MFD.	600 V.	R-7	63-605	1000 OHM	½ W.	10	95-618	2ND I.F. TRANSFORMER				
C-17	22-449	.01 MFD.	600 V.	R-8	63-271	1 MEGOHM	½ W.	11	5-6994	TONE CONTROL SWITCH				
C-18	22-670	.1 MFD.	400 V.	R-9	63-655	220 M OHM	½ W.	12	100-36	PILOT LIGHT 6.3V. 85A.				
C-19	22-852	30 MFD ELECTROLYTIC	250 V.	R-10	63-1030	VOLUME CONTROL								
				R-11	63-296	220 M OHM	½ W.							

MODEL	SPEAKER	
7S432	49-301	6"
7S433	49-301	6"
7S434	49-301	6"
7S449	49-301	6"
7S450	49-314	8"
7S458	49-308	10"
7S459	49-314	8"
7S460	49-311	10"
7S461	49-309	12"
7S462	49-311	10"

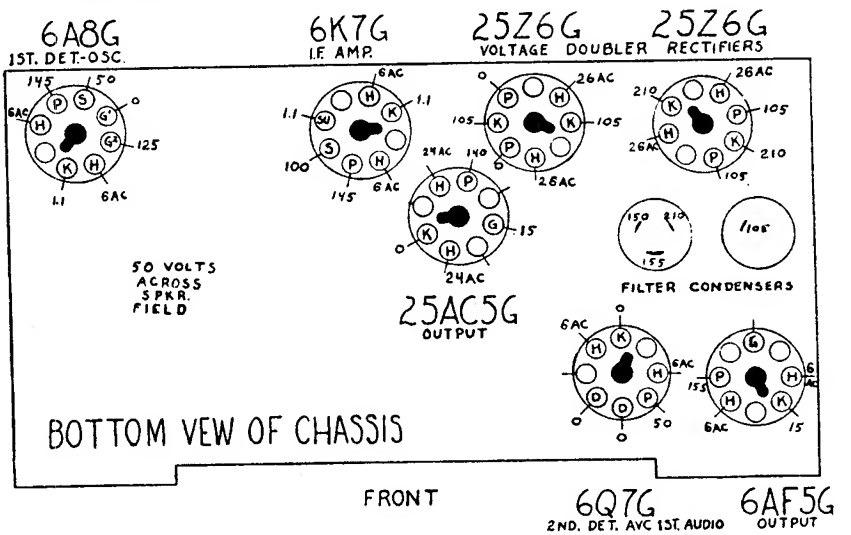
I.F. FREQUENCY 455 KC.
7 TUBE SUPERHETERODYNE
CHASSIS No. 5719 VOLTAGE DOUBLER A.C.
ZENITH RADIO CORPORATION
CHICAGO, ILL.

NOTE. TRIMMERS F, K & N ARE MOUNTED ON STRIP @ 22-852.

MODELS 7S432, 7S433, 7S434, 7S449, 7S450, 7S458, 7S459, 7S460, 7S461, 7S462 (Chassis No. 5719)

Models 7S432, 7S433, 7S434, 7S449, 7S450, 7S458, 7S459 7S460, 7S461, 7S462

(Chassis No. 5719)



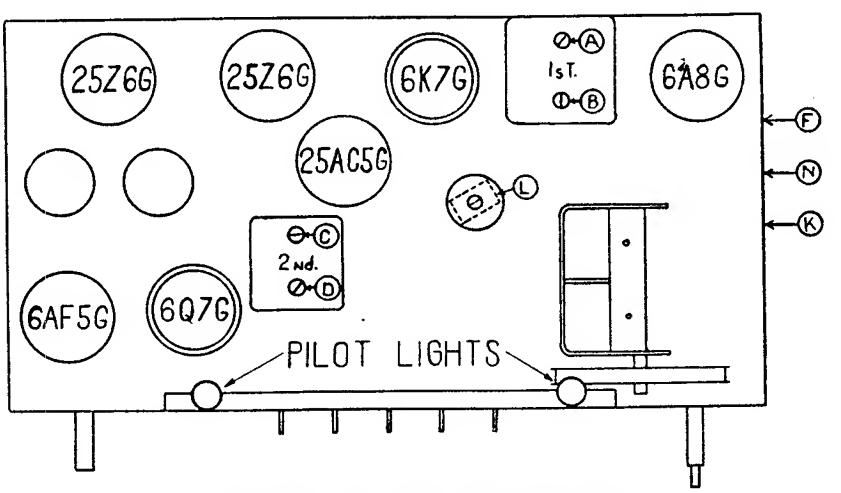
NOTE

Voltages measured from line switch to point indicated using a 1000 ohm per volt meter. Vol. control at minimum. Antenna disconnected.

All filament voltages measured across each respective tube, using an A.C. volt-meter.

LEGEND

NC—No Connection
SH—Shield
H—Heater
P—Plate
S—Screen
G—Grid
SU—Suppressor
D—Diode
F—Filament
K—Cathode

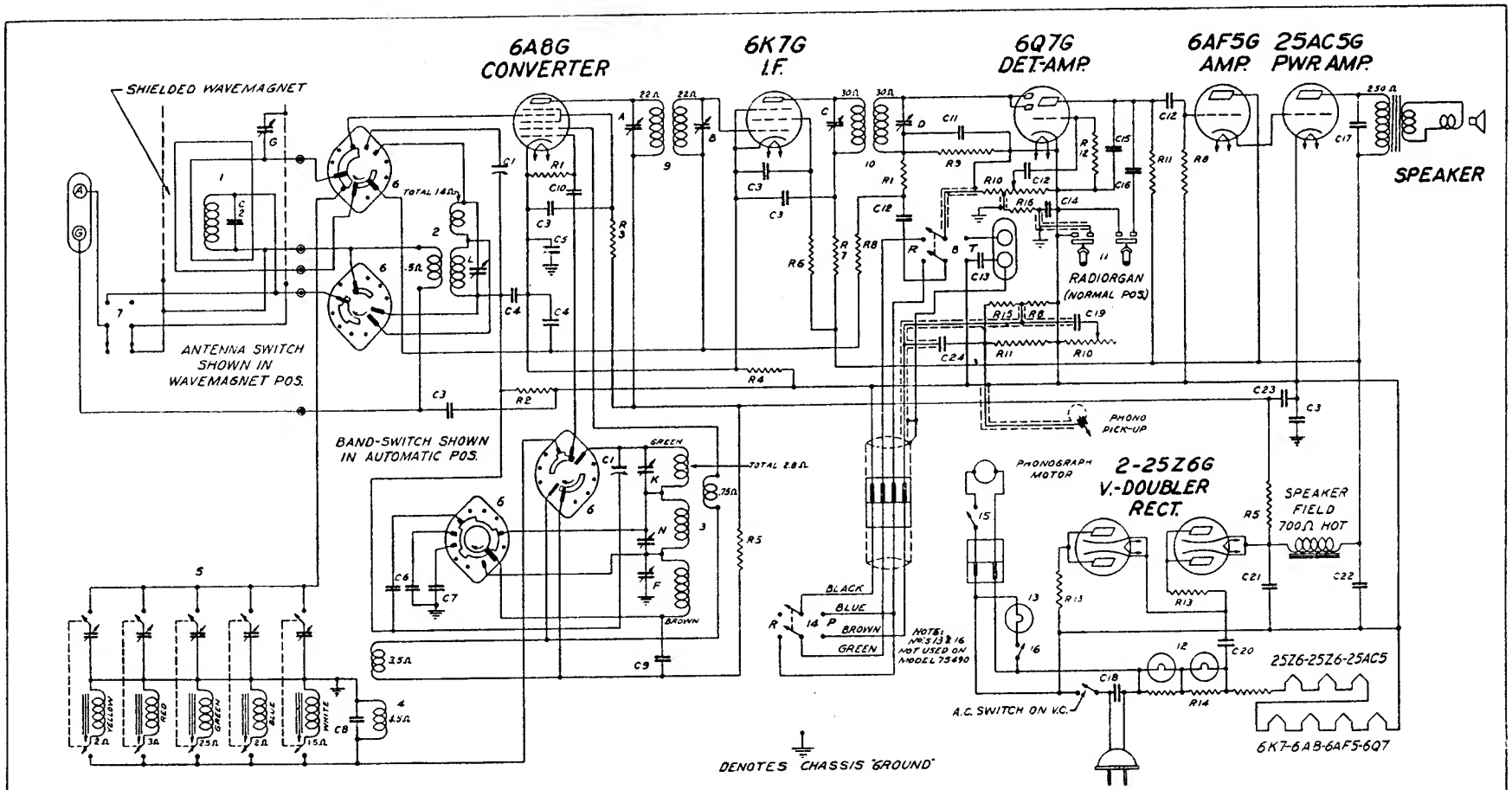


Location of tubes and trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Oscillator to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	5 mfd.	455	B'dcast	600	A B C D	I. F.
2	Single *x Turn Coil	—	1500	"	1500	F	Set Osc. to Scale
3	" "	—	1500	"	1500	On Wave Magnet	Alignment of Wave Magnet
4	Rec. Ant. Post **	400 ohms	18000	S.W.#2	18000	K	Set Osc. to Scale
5	"	"	16000	"	16000	L	Rock gang & adj. for max. output
6	"	"	4,500	S.W. #1	4,500	N	"

*** Loosely coupled to Wave Magnet**
x Switch in Wave Magnet Position
**** Switch in Antenna Position**



DIAG. Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION
C1	22-849	TWO GANG VARIABLE		C21		30 MFD ELECTROLYTIC	350V	R15	63-596	330 M OHM	½ W.	16	85-204	DOOR SWITCH (MODEL 7S487)
C2	22-182	.00025 MFD	600V	C22	22-831	20 MFD "	250V	R16	63-713	47 M OHM	¼ W.		85-203	DOOR SWITCH (MODEL 7S488)
C3	22-928	.05 MFD	400V	C23		10 MFD "	250V					A		1ST I.F. TRANS. PRI.
C4	22-829	.05 MFD.	200V	C24	22-470	150 MMFD	600V					B		1ST I.F. " SEC.
C5	22-594	.15 MFD	200V									C		2ND I.F. " PRI.
C6	22-863	OSCILLATOR PADDER										D		2ND I.F. " SEC.
C7	22-866	OSCILLATOR PADDER		R1	63-593	47 M OHM	½ W.	1		WAVEMAGNET ASSEMBLY		F		BROADCAST OSC. (SEE NOTE)
C8	22-868	COMPENSATING COND.		R2	63-525	150 M OHM	½ W	2	S6936	ANTENNA COIL ASSEMBLY		G	22-865	ANTENNA BROADCAST
C9	22-358	.002 MFD	600V	R3	63-1019	68 M OHM	½ W	3	S6937	OSCILLATOR COIL ASSEM.		K		SHORT WAVE OSC. (SEE NOTE)
C10	22-289	50 MMFD	600V	R4	63-1020	68 OHM WIREWOUND	½ W.	4	S6932	OSC. COUPLER COIL ASSEM.		L	22-788	SHORT WAVE DETECTOR
C11	22-162	.0001 MFD.	600V	R5	63-150	10 M OHM	½ W	5	37044	AUTO. TUNING UNIT ASSEM.		N		POLICE BAND OSC. (SEE NOTE)
C12	22-196	.01 MFD	600V	R6	63-591	22 M OHM	½ W	6	85-185	BAND SELECTOR SWITCH				
C13	22-827	.1 MFD.	200V	R7	63-605	1000 OHM	½ W	7	85-171	WAVEMAGNET SWITCH				
C14	22-229	.005 MFD.	600V	R8	63-271	1 MEGOHM	½ W	8	85-171	TELEVISION SWITCH				
C15	22-854	.0005 MFD	600V	R9	63-655	220 M OHM	½ W	9	95-600	1ST I.F. TRANS.				
C16	22-448	.004 MFD	600V	R10	63-1035	VOLUME CONTROL		10	95-612	2ND I.F. TRANS.				
C17	22-669	.01 MFD.	600V	R11	63-296	220 M OHM	½ W.	11	S6994	TONE CONTROL SWITCH				NOTE: TRIMMERS F, K & N ARE MOUNTED ON STRIP 422-850
C18	22-670	.1 MFD	400V	R12	63-976	15 MEGOHM	½ W	12	100-36	PILOT LIGHT 6.3 V. .25A				
C19	22-326	.003 MFD	400V	R13	63-1023	22 OHM WIREWOUND	½ W	13	100-80	PILOT LIGHT 110 V. 7W.				
C20	22-852	30 MFD ELECTROLYTIC	250V	R14	63-1039	3 SECTION CANDOHM		14	85-192	PHONO SWITCH				
								15	85-191	MOTOR SWITCH				

MODEL	SPEAKER	
7S487	49-312	10"
7S488	49-309	12"
7S490	49-314	8"

I.F. FREQUENCY 455KC
7 TUBE SUPERHETERODYNE
CHASSIS Nº5721 3 BAND
VOLTAGE DOUBLER A.C.
ZENITH RADIO CORPORATION
CHICAGO. ILL.

MODELS 7S487, 7S488, 7S490 (Chassis No. 5721)

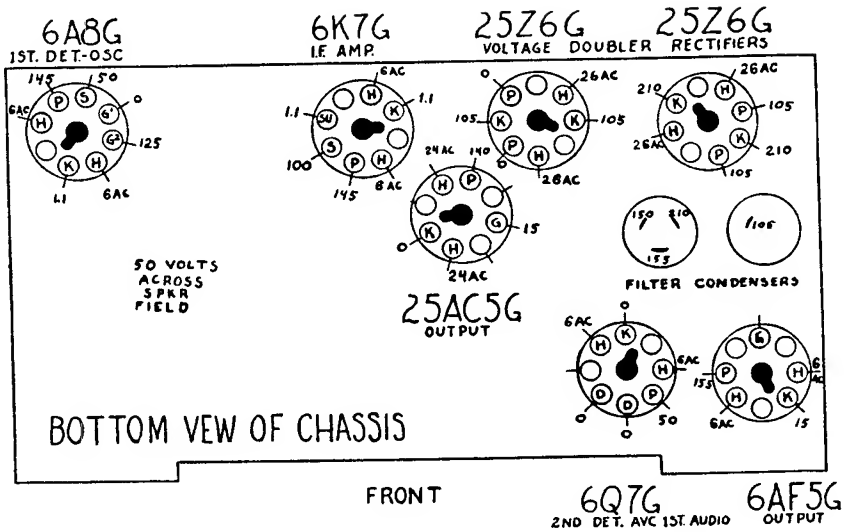
Models 7S487, 7S488, 7S490

CHASSIS No. 5721

NOTE

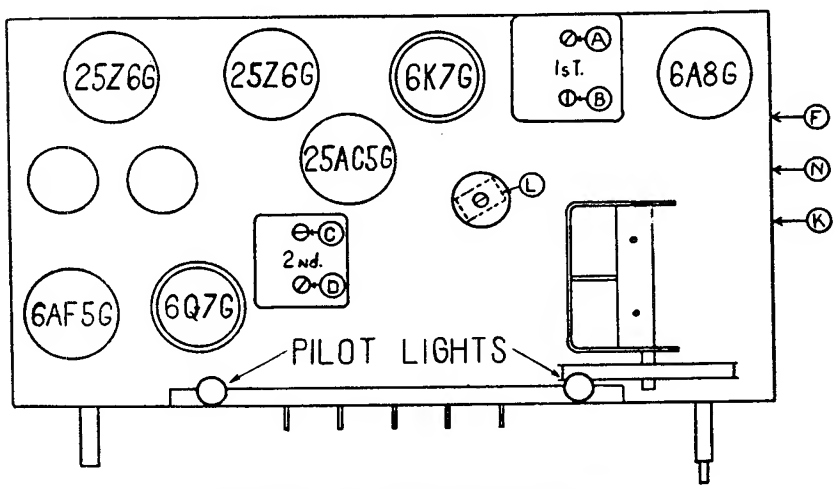
Voltages measured from line switch to point indicated using a 1000 ohm per volt meter. Vol. control at minimum. Antenna disconnected.

All filament voltages measured across each respective tube, using an A.C. volt-meter.



LEGEND

NC—No Connection
SH—Shield
H—Heater
P—Plate
S—Screen
G—Grid
SU—Suppressor
D—Diode
F—Filament
K—Cathode

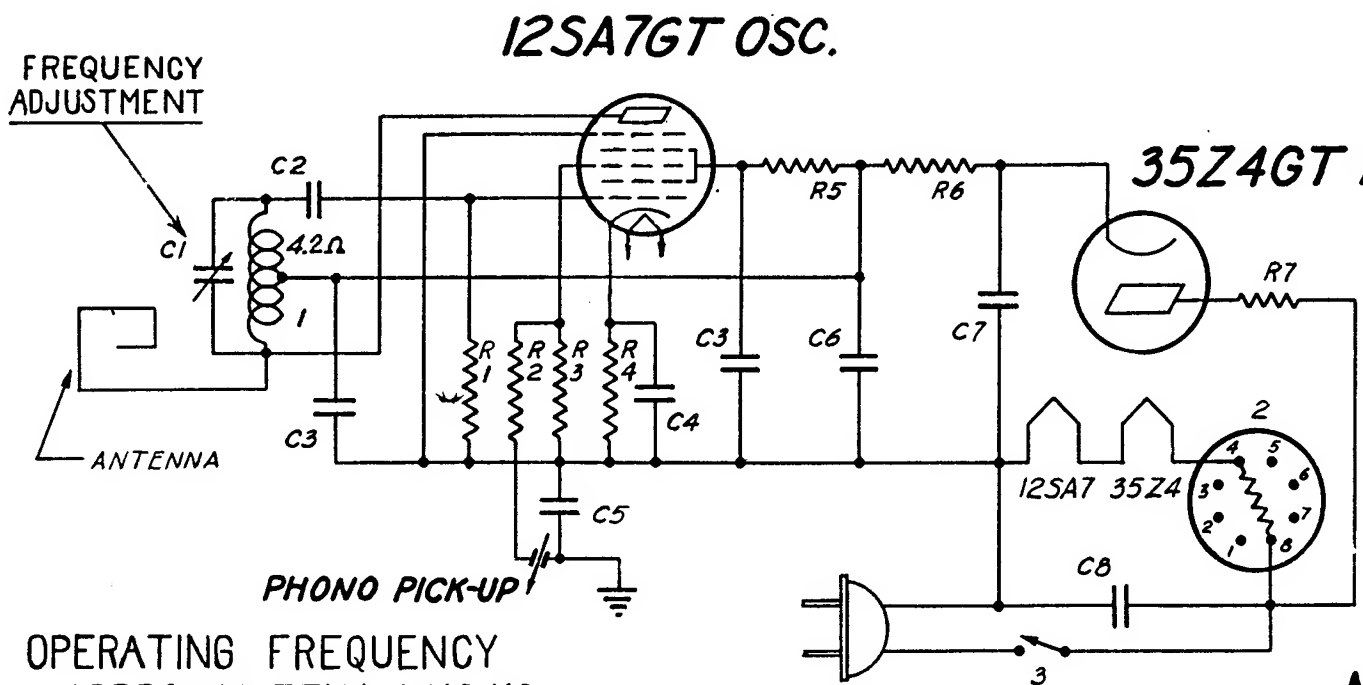


Location of tubes and trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Oscillator to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	.5 mfd.	455	B'dcast	600	ABCD	I. F.
2	Single *x Turn Coil	—	1500	"	1500	F	Set Osc. to Scale
3	" "	—	1500	"	1500	On Wave Magnet	Alignment of Wave Magnet
4	Rec. Ant. Post **	400 ohms	18000	S.W. #2	18000	K	Set Osc. to Scale
5	"	"	16000	"	16000	L	Rock gang & adj. for max. output
6	"	"	4,500	S.W. #1	4,500	N	"

* Loosely coupled to Wave Magnet
x Switch in Wave Magnet Position



OPERATING FREQUENCY
APPROXIMATELY 1540 KC.

DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-690	TUNING CONDENSER		R2	63-658	390M OHM	¼ W.
C2	22-182	.00025 MFD.	600V.	R3	63-260	100M OHM	¼ W.
C3	22-243	.01 MFD.	400V.	R4	63-583	1000 OHM	¼ W.
C4	22-829	.05MFD.	200V.	R5	63-964	4700 OHM	½ W.
C5	22-827	.1MFD.	200V.	R6	63-803	2200 OHM	½ W.
C6	22-876	8MFD. ELECTROLYTIC	150V.	R7	63-575	47 OHM	¼ W
C7		40MFD. "	150V.				
C8	22-670	.1MFD.	400V.	1	S6854	OSC. COIL ASSEM	
				2	100-76	BALLAST TUBE	
				3	85-170	AC SWITCH	
R1	63-591	22 M OHM	¼ W.				

MODELS
S-7000
S-7001
S-7002
S-7003

PHONOGRAPH OSCILLATOR
ZENITH RADIO CORPORATION
CHICAGO, ILL.

PARTS PRICE LIST
1940 ZENITH RECEIVERS

CHASSIS 5419—A, 5537—B, 5538—C, 5539—D, 5659—E, 5663—F

CHASSIS 5659U—G, 5663U—H, 5660—I, 5664—J, 5665—K

CHASSIS 5661—L, 5662—M, 5666—N, 5719—O, 5721—P, S7000—Q

DIAL PARTS

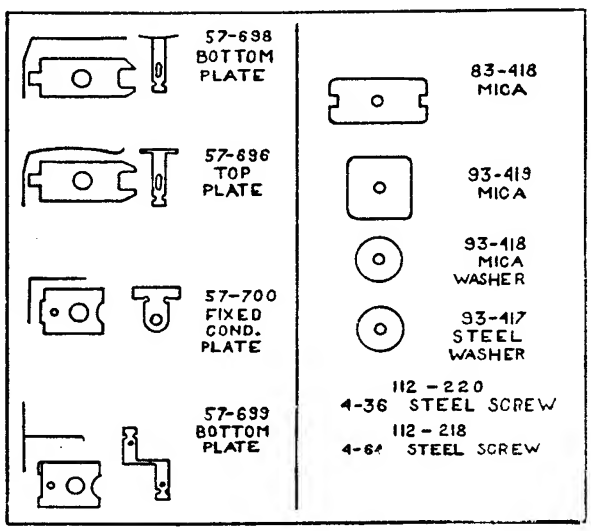
Part No.		Model	List Price
26-221	Scale	A-G-I-E	$ .70
26-222	Scale	K-L-M	.10
26-223	Scale	F-H-J	.45
26-224	Scale (See #S6959)	O-P	.30
26-225	Scale	K-N	.45
26-227	Scale	B-C	.25
26-228	Scale (See #S7243)	D	.35
57-709	Scale Add - mounting plate	A-E-F-I-J	.05
57-711	Scale Add - mounting plate	K-L-M-N	.03
59-75	Pointer - dial	B-C	.10
59-77	Pointer - dial	O-P	.10
59-78	Pointer - dial	A-E-F-G-H-I-J	.05
59-81	On indicator	D	.03
S6935	Pointer & pulley assembly	K-L-M-N	.15
61-55	Pulley idler	D-O-P	.03
76-278	Shaft - dial drive	B-C	.10
76-281	Shaft - control (flat end)	K-L	.05
76-282	Shaft - control	B-O-P	.06
76-284	Shaft - control (flat end)	M-N	.05
76-286	Shaft - control (knurled end)	K-L	.05
76-287	Shaft - control (knurled end)	M-N	.06
78-260	Socket - dial light	K-L-M-N	.18
78-267	Socket - dial light	E-F-G-H-I-J	.18
78-286	Socket - dial light	O-P	.45
80-69	Spring - dial cord tension	B-C-D-K-L-M-N-O-P	.01
80-207	Spring - indicator	D	.02
83-666	Strip - dial light diffusion	E-F-G-H-	.02
93-371	Washer - bakelite	B-C	.45C
97-119	Stud - idler pulley	D	.03
97-120	Stud - mounting	O	1.40C
100-36	Lamp - dial (6.3 volt)	O-P	.09
100-39	Lamp - dial (2.9 volt)	K-L-M-N	.12
100-67	Lamp - dial (6.3 volt)	E-F-G-H-I-J	.12
188-13	Clip - shaft retaining	D-O-P	.15C
188-27	Clip - shaft retaining	B-C-K-L-M-N	.01
192-38	Dial crystal	B-C	.15
192-39	Dial crystal	A-E-F-G-H-I-J	.15
192-40	Dial crystal	Model 416-417	.15
192-41	Dial crystal	D-O	.50
192-42	Dial crystal	M-N	.15
192-44	Dial crystal	Model 428 only	.25
196-23	Dial glass gasket	O	.15
S6870	Disc - indicator	B-C	.15
S6935	Pulley & pointer	K-L-M-N	.15
S6959	Scale & idler	O-P	.30
S6976	Cord & eyelet assembly	K-L-M-N	.05
S7046	Cord & eyelet assembly	D-O-P	.15
S7071	Cord & eyelet assembly	B-C	.05
S7243	Scale & pulley assembly	D	.35
S7262	Cam - indicator	D	.05
MS418	Pulley & bracket assembly	B-C	.10
MS506	Pulley & bracket assembly	O-P	.15

CONDENSERS

22-138	.2 mfd.	200 volt	B-C	$ .25
22-162	.0001 mfd.	600 volt	A-B-C-D-O-P	.15
22-182	.00025 mfd.	600 volt	B-C-Q	.20
22-190	.1 mfd.	200 volt	E-F-I-J-K-L-M-N	.18
22-196	.01 mfd.	600 volt	D-O-P	.15
22-212	.05 mfd.	400 volt	K-L-M-N	.15
22-229	.005 mfd.	600 volt	O-P	.15
22-243	.01 mfd.	400 volt	A-B-C-D-Q	.15
22-250	.05 mfd.	200 volt	E-F-G-H-I-J-K-L-M-N	.15
22-289	50 mmfd.	600 volt	D-O-P	.15
22-326	.003 mfd.	400 volt	P	.15
22-327	.02 mfd.	200 volt	O	.15
22-350	.25 mfd.	200 volt	B-C-D-O-P	.20
22-358	.002 mfd.	600 volt	D-O-P	.30
22-448	.004 mfd.	600 volt	A-D-O-P	.15
22-470	.00015 mfd.	600 volt	P	.15
22-492	.002 mfd.	600 volt	B-C	.15
22-534	.25 mfd.	400 volt	O	.25
22-594	.15 mfd.	200 volt	O-P	.22
22-669	.01 mfd.	600 volt	O-P	.30
22-670	.1 mfd.	400 volt	O-P-Q	.20
22-684	8 mfd.	450 volt	A	.40
22-690	Trimmer condenser		Q	.25
22-708	Dual fixed padder		D	.65
22-788	Trimmer condenser		D-K-L-O-P	.15
22-800	Two gang variable		B-C	2.00
22-802	30 mmfd.	600 volt	B-C	.15
22-826	.01 mfd.	200 volt	A-B-C-D	.15
22-827	.1 mfd.	200 volt	B-C-D-P-Q	.18
22-828	.05 mfd.	400 volt	O-P	.15
22-829	.05 mfd.	200 volt	A-B-C-D-O-P-Q	.15
22-833	.0005 mfd.	600 volt	E-F-G-H-I-J-K-L-M-N	.20
22-834	Two gang variable (flat shaft)		E-F-G-H-I-J	2.00
22-835	40 x 16 mfd. 150 volt 20 mfd. 25 volt		E-F-G-H-I-J	.85
22-836	.03 mfd.	400 volt	E-F-G-H-I-J-K-L-M-N	.15
22-837	.01 mfd.	400 volt	E-F-G-H-I-J-K-L-M-N	.15
22-838	.005 mfd.	600 volt	K-L-M-N	.15
22-839	.05 mfd.	400 volt	E-F-G-H-I-J	.15
22-840	20 mfd. 350 volt - 20 mfd. 250 volt - 20 mfd. 200 volt 20 mfd. 25 volt		K-L-M-N	2.00
88-841	.02 mfd	200 volt	E-F-G-H-I-J	.15
22-842	.02 mfd.	400 volt	K-L-M-N	.15
22-844	.05 mfd.	400 volt	E-F-G-H-I-J	.15
22-845	Two gang variable		K-L-M-N	2.00
22-846	Trimmer condenser (automatic)		O-P	.15
22-847	Trimmer condenser (automatic)		O-P	.20
22-848	Trimmer condenser (automatic)		O-P	.25
22-849	Two gang variable		O-P	2.50
22-850	Three section trimmer		O-P	.50
22-851	30 mfd. 350 volt - 20 mfd. 250 volt 10 mfd. 250 volt dry electrolytic		O-P	1.35
22-852	30 mfd.	250 volt	O-P-(electrolytic)	.85
22-853	Dual fixed padder		O-P	.60
22-854	.005 mfd.	600 volt	O-P	.15
22-859	Trimmer condenser (automatic)		O-P	.20
22-863	Dual fixed padder		O-P	.55
22-866	Broadcast oscillator padder		O-P	.30
22-868	480 mmfd. compensator		O-P	.30
22-869	.05 mfd.	400 volt	B-C-D	.15
22-871	20-20-20 mfd.	150 volt	B-C-(electrolytic)	1.00
22-873	Trimmer (automatic)		O-P	.25
22-875	.15 mfd.	400 volt	K-L-M-N	.20
22-876	8-40 mfd.	150 volt	Q-(electrolytic)	.85
22-877	9-180 mmfd. trimmer		M-N	.15
22-878	Two gang variable		D	2.25
22-879	60-60 mfd.	150 volt	D-(electrolytic)	1.25
22-880	20-20 mfd. 150 volt - 20 mfd. 25 volt (electrolytic)		D	1.00
22-881	Four section trimmer		D	.75
22-885	Two gang variable (knurled shaft)		A-E-F-G-H-I-J	2.00
22-887	.001 mfd.	600 volt	D	.15
22-918	40 mfd. 150 volt - 20 mfd. 25 volt (electrolytic)		B-C	.85
22-939	.1 mfd.	200 volt	G-H	.18
22-948	.05 mfd.	400 volt	K-L-M-N	.20

TRIMMER CONDENSER ASSEMBLIES
(Bakelite Models)

54-126		$ .30C
54-127		.30C
57-696		.20C
57-697		.20C
57-698		.15C
57-699		.20C
57-700		.20C



Parts Price List (Con't)

Part No.	Model	List Price
83-663		.80C
86-30		.25C
93-217		.25C
93-417		.50C
83-418		.50C
93-419		1.00C
93-449		1.00C
93-450		1.00C
112-218		.25C
112-220		.20C

RF & IF COILS

95-593	1st IF coil	B-C	$1.00
95-594	2nd IF coil	B-C	1.00
95-598	2nd IF coil	K-L-M-N	.85
95-600	1st IF coil	O-P	1.00
95-606	2nd IF coil	A	.85
95-607	1st IF coil	D	1.00
95-612	2nd IF coil	O-P	1.00
95-614	2nd IF coil	D	1.00
S6854	Oscillator coil	Q	.55
S6901	Oscillator coil only	E-F-G-H	.55
S6902	1st IF coil only	E-F-G-H-I-J	.60
S6903	2nd IF coil only	E-F-G-H-I-J	.60
S6913	Oscillator coil	K-L	.65
S6914	Shunt antenna coil	K-L-M-N	.40
S6915	1st IF coil	K-L-M-N	.50
S6936	Antenna coil	O-P	1.00
S6937	Oscillator coil	O-P	1.25
S6942	Oscillator coupling coil	M-N	.50
S6992	Oscillator coupler coil	D-G-I-O-P	.45
S7029	Oscillator coil	A	.50
S7030	1st IF coil	A	.65
S7027	Oscillator coil	B-C	.75
S7252	Oscillator coil	D	1.10
S7257	Antenna coil	D	1.35

RESISTORS

63-150	10M ohm	1/2 watt	O-P	$ .08
63-238	1000 ohm	1/4 watt	A	.07
63-260	100M ohm	1/4 watt	Q	.07
63-271	1 megohm	1/4 watt	A-B-C-D-O-P	.07
63-296	220M ohm	1/4 watt	All but A & Q	.07
63-325	150M ohm	1/4 watt	O-P	.07
63-572	15 ohm	1/4 watt	E-F-G-H-I-J-K-L-M-N	.07
63-575	47 ohm	1/4 watt	Q	.07
53-581	470 ohm	1/4 watt	M-N	.07
53-583	1000 ohm	1/4 watt	A-K-L-M-N-Q	.07
63-586	3300 ohm	1/4 watt	D	.07
63-587	4700 ohm	1/4 watt	A-B-C-D	.07
63-591	22M ohm	1/4 watt	All but A-B-C	.07
63-593	47M ohm	1/4 watt	A-B-C-D-I-J-K-L-M-N-O-P	.07
63-596	330M ohm	1/4 watt	P	.07
63-597	470M ohm	1/4 watt	D-E-F-G-H-I-J-K-L-M-N	.07
63-598	680M ohm	1/4 watt	P	.07
63-599	1.5 megohm	1/4 watt	P	.07
63-600	2.2 megohm	1/4 watt	A-B-C-D-E-F-G-H-I-J	.07
63-602	4.7 megohm	1/4 watt	E-F-G-H-I-J	.07
63-604	10 megohm	1/4 watt	A-B-C-D	.07
63-605	1000 ohm	1/2 watt	B-C-D-O-P	.08
63-640	8200 ohm	1/4 watt	D	.07
53-649	56M ohm	1/4 watt	D	.07
63-652	120M ohm	1/4 watt	A-B-C	.07
63-654	180M ohm	1/4 watt	D	.07
63-655	220M ohm	1/4 watt	O-P	.07
63-658	390M ohm	1/4 watt	Q	.07
63-669	3.9 megohm	1/4 watt	A-B-C-D	.07
63-686	150 ohm	1/2 watt	E-F-G-H-I-J-K-L-M-N	.17
63-712	33M ohm	1/4 watt	G-H-K-L-M-N	.15
63-713	47M ohm	1/4 watt	E-F-G-H-I-J	.07
63-717	220M ohm	1/4 watt	G-H	.15
63-722	2.2 megohm	1/4 watt	K-L-M-N	.07
63-803	2200 ohm	1/2 watt	B-C-Q	.08
63-964	4700 ohm	1/2 watt	Q	.08
63-976	15 megohm	1/4 watt	K-L-M-N-O-P	.07
63-1012	90 ohm	1/2 watt (W.W.)	D	.17
63-1015	140 ohm	1/2 watt (W.W.)	K-L	.08
63-1017	27 ohm	1/2 watt (W.W.)	E-F-G-H-I-J	.08
63-1019	68M ohm	1/2 watt	O-P	.08
63-1020	68 ohm	1/2 watt (W.W.)	O-P	.08
63-1021	33 ohm	2 watt (W.W.)	O-P	.12
63-1022	150 ohm	1 watt (W.W.)	B-C	.20
63-1023	22 ohm	1/2 watt (W.W.)	K-L-M-N-O-P	.08
63-1026	Volume control & switch		B-C	1.50
63-1028	Volume control strip & base		E-F-G-H-I-J-K-L-M-N	.35
63-1029	Candohm resistor		O-P	.45
63-1030	Volume control assembly		O	1.00
63-1033	Candohm resistor		B-C	.45
63-1034	Volume control strip & base		A	.35
63-1035	Volume control & switch		P	1.50
63-1036	Candohm resistor		D	.40
63-1047	Volume control & switch		D	1.50
63-1039	Candohm resistor		O-P	.45
63-1080	Volume Control		D	1.50

MISCELLANEOUS

12-692	Chassis retaining bracket	A	$ .03
14-481	Bakelite cabinet - Model 416 (brown)		3.00
14-490	Bakelite cabinet - Model 410 (brown)		2.00
14-491	Bakelite cabinet - Model 411 (mahogany)		2.50

Part No.	Model	List Price
14-491W	Bakelite cabinet - Model 411W (white)	3.00
14-491D	Bakelite cabinet - Model 411D (grey)	3.00
14-491G	Bakelite cabinet - Model 411G (green)	3.00
14-493	Bakelite cabinet - Model 413 (brown)	3.00
14-494	Bakelite cabinet - Model 414 (mahogany)	3.50
14-494W	Bakelite cabinet - Model 414W (white)	4.00
14-494D	Bakelite cabinet - Model 414D (grey)	4.00
14-494G	Bakelite cabinet - Model 414G (green)	4.00
14-497	Bakelite cabinet - Model 417 (mahogany)	3.50
14-497W	Bakelite cabinet - Model 417W (white)	4.00
14-497D	Bakelite cabinet - Model 417D (grey)	4.00
14-497G	Bakelite cabinet - Model 417G (green)	4.00
15-22	Plug cap - P	.05
15-23	Plug cap - P	.10
15-28	Volume control cap - A-E-F-G-H-I-J-K-L-M-N	.02
24-209	Automatic adjustment screw cap I-J-M-N	.10
24-219	Bottom cover (Model 490)	.10
44-16	Phono jack - O-P	.20
44-17	Phono jack - B-C	.20
46-265	Knob - power switch - B	.10
46-273	Knob - tuning - B-C	.10
46-275	Knob - volume (spring type) - E-F-G-H-I-J-K-L-M-N	.10
46-276	Knob - tuning (spring type) - E-F-G-H-I-J-K-L-M-N	.10
46-277	Knob - volume (spring type) - K-L (bakelite cabinets)	.10
46-279	Knob - band switch - D	.10
46-280	Knob - volume - D-O-P	.10
46-281	Knob - tuning - D	.10
46-285	Knob - tone - D	.03
46-286	Knob - tuning (knurled type) - A-E-F-G-H-I-J-K-L-M-N	.10
46-287	Knob - volume (knurled type) - A-E-F-G-H-I-J-K-L-M-N	.10
46-288	Knob - volume (knurled type) - K-L (bakelite cabinets)	.10
49-298	Speaker - 5" dynamic (Models 429-30-47-48)	3.50
	206-298 output transformer	1.25
	207-298 field coil	1.25
	208-298 cone & voice coil	1.25
49-301	Speaker - 6½" dynamic (Models 432-33-34-49)	4.00
	206-301 output tranformer	1.25
	208-301 cone & voice coil	1.50
49-303	Speaker - 5" dynamic (Models 416-17-18)	3.25
	206-303 output transformer	1.25
	207-303 field coil	1.25
	208-303 cone & voice coil	1.25
49-307	Speaker - 10" dynamic (Model 457)	7.00
	206-307 output transformer	1.25
	207-307 field coil	2.25
	208-307 cone & voice coil	2.50
49-308	Speaker - 10" dynamic (Model 458)	7.50
	206-308 output transformer	1.50
	207-308 field coil	2.25
	208-308 cone & voice coil	2.50
49-309	Speaker - 12" dynamic (Models 461-88)	8.00
	206-309 output transformer	1.50
	207-309 field coil	2.25
	208-309 cone & voice coil	3.50
49-310	Speaker - 4" P. M. - A	2.50
	206-310 output transformer	1.25
	208-310 cone & voice coil	1.00
49-311	Speaker - 10" dynamic (Models 460-62)	7.50
	206-311 output transformer	1.50
	207-311 field coil	2.25
	208-311 cone & voice coil	2.50
49-312	Speaker - 10" dynamic (Model 487)	7.50
	206-312 output transformer	1.50
	207-312 field coil	2.25
	208-312 cone & voice coil	2.50
49-314	Speaker - 8" dynamic (Models 450-59-90)	5.50
	206-314 output transformer	1.50
	207-314 field coil	1.75
	208-314 cone & voice coil	2.00
49-316	Speaker - 8" P. M. (Model 5G441)	8.00
	206-316 output transformer	1.25
	208-316 cone & voice coil	2.00
49-317	Speaker - 10" P. M. (Model 5F442)	10.00
	206-317 output transformer	1.65
	208-317 cone & voice coil	2.50
49-318	Speaker - 10" P. M. (Model 5G461)	10.00
	206-318 output transformer	1.65
	208-318 cone & voice coil	2.50
49-323	Speaker - 4" P. M. - E-F	3.75
	206-323 output transformer	1.25
	208-323 cone & voice coil	1.00
49-324	Speaker - 4" P. M. (Models 413-14-26-27-55)	4.00
	206-324 output transformer	1.25
	208-324 Cone & voice coil	1.00
49-327	Speaker - 8" P. M. (Model 456)	7.00
	206-327 output transformer	1.25
	208-327 cone & voice coil	2.00
49-336	Speaker - 5" P. M. (Model 446)	5.00
	206-336 output transformer	1.25
	208-336 cone & voice coil	1.25
49-337	Speaker - 5½" P. M. (replaces 49-315) B-C	5.00
	206-337 output transformer	1.25
	208-337 cone & voice coil	1.25
52-164	Cable - speaker (Model 446-56)	.40
52-165	Cable - speaker (Model 457)	.35
54-128	Nut - speed - I-J-M-N	1.25C
57-11A	Antenna lead marker - D	.03
57-11G	Ground lead marker - D	.03
57-703	Escutcheon plate (Model 416-17)	.30
57-708	Television radio escutcheon - O-P	.03
57-712	Escutcheon plate (less glass) - D-O-P	.60
57-715	Escutcheon plate - E-F-G-H	1.00
57-716	Escutcheon plate (Models 426-27-46-56)	1.50
57-717	Escutcheon plate (Model 428)	1.25

Parts Price List (Con't)

Part No.		Model	List Price
57-718	Escutcheon plate	M-N	1.95
57-724	Escutcheon plate	A	.60
57-749	Power switch plate	D	.05
58-73	Plug - battery	B-C-D	.10
58-74	Plug - battery	A	.10
62-10	Plug - female	E-F-G-H-P	.20
68-1	Wrench - auto. adjustment	D-I-J-M-N-O-P	.05
76-280	Shaft - volume control (flat)	E-F-G-H-I-J-K-L-M-N	.15
76-285	Shaft - vol. control (knurled)	A-E-F-G-H-I-J-K-L-M-N	.18
78-128	Socket - speaker	O-P	.10
78-148	Socket - 6Q7G tube	O-P	.10
78-150	Socket - 6K7G tube	O-P	.10
78-151	Socket - 6A8G tube	O-P	.10
78-159	Socket - 25Z6G tube	O-P	.10
78-190	Socket - speaker	D	.10
78-193	Socket - five contact	P	.10
78-194	Socket - two contact	P	.10
78-229	Socket - electrolytic cond.	D-O-P	.02
78-246	Socket - 1A7G tube	B-C-D	.10
78-247	Socket - 1N5G tube	B-C-D	.10
78-248	Socket - 1H5G tube	B-C-D	.10
78-261	Socket - 25Z5G tube	O-P	.10
78-263	Socket - 6AF5G tube	O-P	.10
78-265	Socket - two contact	O-P	.10
78-266	Socket - four contact	O-P	.10
78-268	Socket - 1A5G tube	B-C	.10
78-269	Socket - 117Z6G tube	B-C-D	.10
78-270	Socket - speaker plug	B-C	.10
78-273	Socket - 1Q5G tube	D	.10
80-206	Spring - knob (46-275 & 46-276)		.55C
83-568	Strip - single lug terminal	B-C	.02
83-658	Strip - pin jack terminal	A	.06
83-689	Strip - antenna pin jack	B-C	.07
85-171	Switch - television	O-P	.25
85-185	Switch - band	O-P	1.25
85-190	Switch - battery	B-C	.45
85-195	Switch - band selector	D	1.25
85-196	Switch - power	D	.55
93-215	Washer - chassis mounting	D-O-P	.06
93-229	Washer - felt	O-P	.01
100-77	Ballast tube - 110 volt	E-F-G-H-I-J	.75
100-79	Ballast tube - 110 volt	K-L-M-N	.75
112-221	Screw - chassis mounting (5G401)		.55C
112-222	Screw - chassis mounting (5G400)		1.25C
114-40	Screw - chassis mounting (5G441-61 & 7 tube sets)		.50C
114-61	Screw - chassis mounting (Model 490)		.03
114-85	Screw - chassis mounting (5G442)		.65C
126-191	Shield - tube	O-P	.15
126-256	Shield - tube	O-P	.15
126-297	Shield - tube	B-C-D	.12
127-15	Contact - tube socket	A-E-F-G-H-I-J-K-L-M-N	.30C
127-16	Contact - power switch - (straight)	E-F-G-H-I-J-K-L-M-N	.01
127-17	Contact - power switch (bent)	E-F-G-H-I-J-K-L-M-N	.01
188-32	Retainer ring (for 76-285)	A-E-F-G-H-I-J-K-L-M-N	.85C
188-33	Speaker ring	A	.06
196-23	Escutcheon plate gasket (for 57-712)		.15
202-127	Instruction book	E-F-G-H	.01
202-128	Instruction book	K-L	.02
202-129	Instruction book	I-J	.15
202-130	Instruction book	M-N	.20
202-131	Instruction book	B-C	.05
202-132	Instruction book	O-P	.15
202-136	Instruction book (Model 4K402)		.05
202-138	Instruction book	D	.20
202-140	Instruction book (Model 4K400)		.05
S6910	Shield - tube	A-E-F-G-H-I-J-K-L-M-N	.10
S6911	Shield - condenser	E-F-G-H-I-J	.12
S6912	Shield - I F transformer	E-F-G-H-I-J	.12
S6945	Escutcheon plate (complete)	O-P	1.25
S6975	Escutcheon - electrolytic cond.	K-L-M-N	.15
S6994	Switch - tone control	D-O-P	.25
MS515	Switch - band selector (85-188)	K-L-M-N	.30
MS517	Switch - tone control (85-189)	E-F-G-H-I-J-K-L-M-N	.25
MS524	Switch & bracket assy. (85-194)	A	.35

WAVEMAGNET PARTS

12-645	Loop retaining bracket (antenna)	(410-11-12-16-17)	$ .02
12-651	Loop retaining bracket (antenna)	(413-14)	.02
12-686	Loop retaining bracket (ground)	(410-11-12-16-17)	.02
12-687	Loop retaining bracket (ground)	(413-14)	.02
12-689	AC cord clip	B-C	.06
22-182	.00025 mfd. 600 volt condenser	O-P	.20
22-865	Trimmer condenser (456-57-87-88-90)		.25
22-882	Trimmer condenser (4K402)	A	.15
40-15	Brass hinge	B-C	.12
54-79	Brass nuts	E-F-G-H-I-J-K-L-M-N	.30C
56-68	Spade pin for cabinet back	A	.02
57-719	Switch plate	O-P	.03
57-727	Loop mounting plate (429)		.10
57-728	Loop mounting plate (430)		.10
57-731	Loop mounting plate (428)		.10
58-69	Four prong plug	O-P	.04
58-72	Two prong plug	O-P	.03
69-149	6-32 x 1 7/8" RH M. screw (bronze)	E-F-G-H	.02
70-34	#6 x 5/8 wood screw	O	.55C
71-41	6-32 x 1 11/16" FH screw	E-F-G-H-I-J-K-L-M-N	.15C
83-334	A-G terminal strip (446-47-48-55-56-57-87-88-90)		.12
83-686	Loop retaining strip (antenna)	(425-26-27-28-29-30-80)	.02
83-687	Loop retaining strip (ground)	(425-26-27-28-29-30-80)	.02
83-692	Pin Jack A-G terminal strip	B-C	.05
84-61	Suction cup support	B-C	.04
85-171	Switch	O-P	.25

Part No.		Model	List Price
86-66	Cinch terminals	E-F-G-H-M-N	1.50C
93-125	#6 lockwasher	E-F-G-H-I-J-K-L-M-N-O	.25C
93-350	#6 finishing washer	O	.01
93-414	Fibre washer	E-F-G-H	.50C
93-424	Fibre washer	I-J-K-L-M-N-O	.30C
112-227	#6-32 x 2 3/4 ornamental screw	E-F-G-H-I-J	.02
114-48	6-32 x 1/4 hex acorn head screw	E-F-G-H	.25C
114-100	#6 x 1/2" self tapping screw	I-J	.90C
114-104	1/4"-20 x 4" machine screw (457-87-88-90)		.05
114-105	1/4"-20 x 3" Hex head machine screw	O	.05
114-106	1/4"-20 x 3" machine screw (448)		.05
144-17	1/4"-20 x 3 1/4" carriage bolt and nut	O	.02
144-19	1/4"-20 x 4 1/4" carriage bolt and nut	P	.05
147-71	Wood spacer - 1/2"	E-F-G-H-K-L-M-N	.01
147-72	Wood spacer - 29/32	E-F-G-H-M-N	.01
147-73	Wood spacer - 1 1/8"	E-F-G-H-M-N-O-P	.01
147-74	Wood spacer - 1 7/32	E-F-G-H-O-P	.01
147-75	Wood spacer	B-C	.75C
147-76	Wood spacer - 3/4	E-F-G-H-K-L	1.25C
147-77	Wood spacer	A	.15
159-25	Plug button (401D-M-Y)	A-B-C	.35C
159-33	Plug button (401L)	B-C	.35C
197-8	Rubber suction cup	A	.04
197-9	Rubber suction cup	B-C	.06
S6904	Loop winding assembly (410-11-12)		1.25
S6905	Loop shield assembly (410-11-12)		.85
S6916	Loop winding assembly (416-17)		1.25
S6938	Loop shield assembly (413-14)		1.10
S6941	Loop winding assembly (413-14)		1.40
S6951	Loop winding assembly (427-29-30)		1.15
S6952	Loop shield assembly (427-29-30)		1.25
S6983	Rear shield & frame (433-34-60-88)		1.75
S6984	Front shield assembly (433-34-46-49-50-56-57-58-60-61 (62-87-88-90)		1.15
S6985	Loop winding assembly (433-34-49-58-60-61)		1.85
S7031	Loop winding assembly	B-C	1.00
S7045	Partition plate	B-C	.35
S7048	Loop winding assembly (425-28)		1.50
S7049	Loop shield assembly (425-26-28)		1.25
S7074	Loop winding assembly (426)		1.50
S7079	Rear shield & frame (432)		1.50
S7080	Front shield assembly (455-48-32-59)		.85
S7082	Loop winding assembly (432-59)		1.95
S7092	Rear shield assembly (446)		1.85
S7095	Rear shield assembly (447)		1.25
S7098	Loop winding assembly (448-55)		1.85
S7099	Rear shield assembly (455)		1.65
S7106	Loop winding assembly (4K402D)		1.95
S7113	Loop cover plate	B-C	1.15
S7122	Rear shield & frame (450-90)		1.85
S7131	Loop shield assembly (480)		1.00
S7143	Shield & plate assembly (458-61)		2.00
S7146	Loop winding assembly (458-61)		3.75
S7166	Loop winding assembly (446)		1.85
S7167	Loop winding assembly (450-90)		1.75
S7171	Loop winding assembly (447)		1.50
S7174	Loop winding assembly (480)		1.00
S7208	Loop cover & strip (402L-M-Y)		.35
S7241	Rear shield & frame (459)		1.45
S7247	Loop winding assembly (402L-M-Y)		1.50
S7317	Loop winding assembly (487-88)		1.85
S7321	Rear shield & plate (487)		1.75
S7322	Loop winding assembly (462)		1.75
S7326	Wavemagnet assembly (484M)		1.85
S7335	Loop winding assembly (456-57)		1.40
S7345	Loading coil (456-57)		.15
S7348	Plate & condenser assembly (457)		1.50
S7357	Plate & strip assembly (448)		.45
S7364	Antenna cable (402L-M-Y)	B-C	.85
S7389	Partition plate	A	.35
22-846	Trimmer condenser	D-I-J-M-N-O-P	$ .15
22-847	Trimmer condenser	D-I-J-M-N-O-P	.20

AUTOMATIC TUNER PARTS

22-848	Trimmer condenser	D-I-J-M-N-O-P	.25
22-859	Trimmer condenser	D-I-J-M-N-O-P	.20
22-868	480 mmfd compensator	D-I-J-M-N-O-P	.30
22-873	Trimmer condenser	D-O-P	.25
24-209	Automatic adjustment cover	D	.10
46-278	Automatic tuning knob	D-I-J-M-N-O-P	.10
57-707	Front plate	D-I-J-M-N-O-P	.06
80-161	Latch bar spring	D-I-J-M-N-O-P	.25C
80-202	Push lever spring	D-I-J-M-N-O-P	.25C
80-203	Push lever spring	I-J-M-N	.25C
83-321	Two lug terminal strip	D-O-P	.02
83-669	Coil retaining strip	D-I-J-M-N-O-P	.03
83-671	Fibre strip	D-I-J-M-N-O-P	.02
83-672	Latch bar	D-I-J-M-N-O-P	.35C
93-216	Steel washer	D-I-J-M-N-O-P	30C
93-421	Felt washer for 24-209	P	.01
112-223	Adjustment screw & core	D-I-J-M-N-O-P	.08
114-37	#6 x 1/4 hex self-tapping screw	D-I-J	.40C
114-46	#6 x 3/16 hex self-tapping screw	D-I-J-M-N-P	.40C
114-102	#6 x 3/8 hex self-tapping screw	M-N-P	.40C
S6926	Contact spring & base assembly	I-J	.75
S6927	Manual oscillator coil	I-J	.40
S6928	Auto. tuning coil (red)	D-I-J-M-N-O-P	.15
S6929	Auto. tuning coil (green)	D-I-J-M-N-O-P	.15
S6930	Auto. tuning coil (blue)	D-I-J-M-N-O-P	.15
S6931	Auto. tuning coil (white)	D-I-J-M-N-O-P	.15
S6932	Push lever assembly	D-I-J-M-N-O-P	.12
S6933	Push lever (manual)	I-J-M-N	.04
S6934	Switch base assembly & spring	D-O-P	.65

Parts Price List (Con't)

Part No.	Model	List Price
S7006	Manual oscillator coil (orange) ——M-N	.40
S7021	Auto. tuning coil (yellow) ——D-O-P	.15
S7023	Contact spring & base assy. ——M-N	.75

PHONOGRAPH PARTS

12-613	Pickup arm support bracket (480-84-90)	$ .20
12-701	Bracket for 62-12	.05
12-730	Switch bracket (phono compartment - 487)	.05
12-731	Switch bracket (phono compartment - 488)	.05
15-22	Plug cap for 58-39 - All models	.05
15-23	Plug cap for 58-50 (480-90)	.10
15-25	Oscillator coil cap (record player)	.01
19-32	Lamp socket retaining clip (487-88)	.01
22-182	.0005 mfd. 600 volt condenser (record player)	.20
22-243	.01 mfd. 400 volt condenser (record player)	.15
22-670	.1 mfd. 400 volt condenser (record player)	.20
22-690	Trimmer condenser (record player)	.25
22-827	.1 mfd. 200 volt condenser (record player)	.18
22-829	.05 mfd. 200 volt condenser (record player)	.15
22-876	8 x 40 mfd. 150 volt condenser (record player)	.85
24-142	Needle cup cover (487-88) (record player)	.05
24-213	Switch cover (490) (record player)	.06
29-9	Turntable - 9" (480-90) (record player)	1.75
29-10	Turntable - 9" (487)	1.75
29-11	Turntable - 11½" (488)	2.25
29-12	Turntable - 9" (484M)	1.75
41-1	Needle holder (all)	.05
41-6	Needle holder (484M)	.05
46-265	Switch knob (record player)	.10
57-684	Escutcheon for switch (record player)	.10
57-721	Escutcheon for switch (480-90)	.05
57-740	Speed regulator plate (484M)	.10
57-743	Escutcheon for switch (484)	.02
57-744	Switch plate (487-88)	.10
57-746	Turntable support bracket (484)	.05
58-39	Plug - five prong (All)	.07
58-50	Plug - two prong (480-90)	.05
58-73	Plug - battery cable (484M)	.10
59-80	Speed regulator pointer (484M)	.03
62-12	Lamp receptable with switch (487)	.45

Part No.	Model	List Price
63-260	100M ohm 1/4 watt resistor (record player)	.07
63-575	47 ohm 1/4 watt resistor (record player)	.07
63-583	1000 ohm 1/4 watt resistor (record player)	.07
63-591	22M ohm 1/4 watt resistor (record player)	.07
63-658	390M ohm 1/4 watt resister (record player)	.07
63-803	2200 ohm 1/2 watt resistor (record player)	.08
63-964	4700 ohm 1/2 watt resistor (record player)	.08
78-161	Socket - ballast tube (record player)	.10
78-271	Socket - 35Z4GT tube (record player)	.10
78-272	Socket - 12SA7GT tube (record player)	.10
78-291	Lamp socket & wire assembly (488)	.12
83-342	Strip - two lug terminal	.05
85-170	Switch (record player)	.70
85-181	Switch - automatic stop (490) (record player)	1.00
85-190	Switch (484M)	.40
85-191	Switch - A C (480-90)	.25
85-192	Switch - phono (All)	.35
85-193	Turntable brake (484M)	.25
85-197	Switch - phono (484M)	.25
85-203	Switch - for phono lamp (488)	.55
85-204	Switch - for phono lamp (487)	.55
100-76	Ballast tube - (record player)	.75
100-78	Lamp - bulb (phono compartment) (487)	.50
100-80	Lamp - bulb (phono compartment) (488)	.25
112-238	Turntable screw (484M)	.04
117-53	Motor - crank (484M)	.65
141-77	Phono motor only 115 volt 60 cycle (480-90)	6.75
141-78	Phono motor only 115 volt 50 cycle (record player)	6.75
141-79	Phono motor only (484M)	6.75
142-17	Pickup arm assembly (record player)	6.25
142-19	Pickup arm assembly (484M)	6.25
142-22	Pickup arm assembly (480-90)	6.25
142-23	Pickup cartridge only for 142-22 142-17	5.00
142-24	Pickup cartridge only for 169-36	6.00
159-25	Plug button (record player)	.35C
169-36	Automatic recrod changer (115 volt 60 cycle) (487-88)	50.00
169-37	Automatic record changer (115 volt 50 cycle) (487-88)	50.00
199-20	Rubber sleeve	.03
199-134	Instruction book (487-88)	.03
199-135	Instruction book (record player)	.03
S6854	Oscillator coil assembly (record player)	.55

All price Lists Subject to Regular Parts Discount and Change Without Notice. SEPTEMBER 6, 1939

SERVICE MANUAL SUPPLEMENT

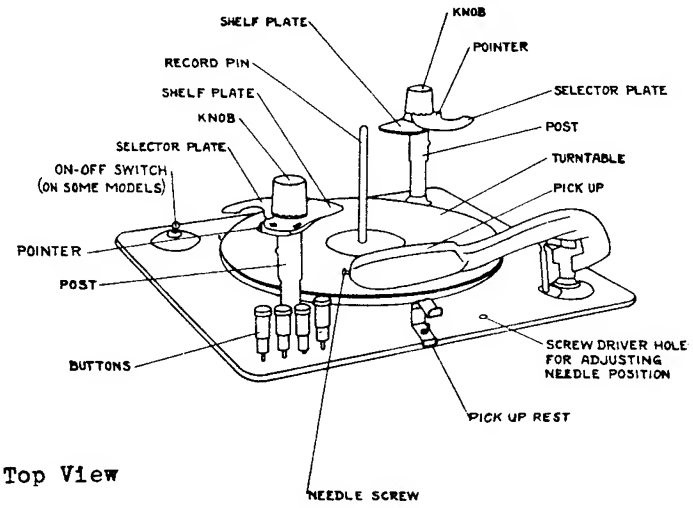
ZENITH
TRADE MARK REG.
→LONG DISTANCE← RADIO

SERVICING CHART

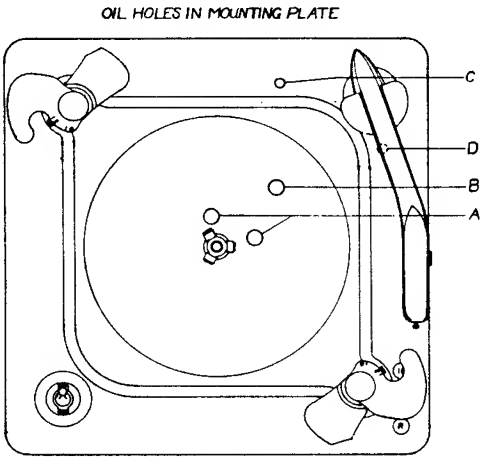
Automatic Record Changer

ZENITH RADIO CORPORATION
CHICAGO, U. S. A.

Printed in U. S. A.



Top View



Oiling Diagram

For the Service Man

This Chart is designed for the use of the Service Mechanic only, and is intended to facilitate as far as possible his work of caring for the Changer mechanism, whether he is called in for the purpose of insuring its continued satisfactory operation, or to remedy some difficulty which has appeared. For his convenience, the "Operating Instructions," supplied to each user by the factory, may be summarized as follows:

The Changer plays twelve 10" or ten 12" records. . . . To reload, revolve the two posts slightly, grasping them underneath the Shelf Plates. Turn them back after the played records are removed; they will fall and lock when in proper position. Then place the new records on the Shelf Plates, and push "R" button to put Changer in operation. . . . To play the other size records, turn the knob at top of each post until proper figure is opposite pointer, and press the "10" or "12" button, to agree with pointer setting. . . . To reject a record (or to start a change cycle as for testing purposes) simply press the "R" (Release or Reject) button, at ny time while needle is upon a record. . . . To play manually, turn plates out of the way as for reloading, and press "M" button.

Oiling (reprinted from Operating Instructions)

The changer should be lubricated once a year with about a dozen drops of a good light machine oil at each of the following 6 points. All points can be reached from above, through holes in the mounting plate, as follows:

No. 1) Three oil holes on motor gear
No. 2) housing. Reach all three through
No. 3) two holes marked "A" on drawing.

No. 4 Through hole marked "B", drop the oil upon flat surface of cam. It will distribute itself to proper points.

No. 5 Through holes marked "C", see felt wick, and drop the oil directly upon it.

No. 6 Through hole marked "D", see felt wick, and drop the oil directly upon it.

To Check Oiling

If squeaks are heard compare the squeak with and with a load of records; stacked records themselves sometimes squeak against a center pin. See that all five wicks are in position, including three ¼" wicks in frame of Motor. See that each wick is thoroughly saturated (as it may not be if insufficient oil or too heavy oil has been used). Lift out all three motor wicks, with tweezers; see if old oil has become gummy (commonly due to use of low-grade oil). If necessary, clean gummed-up wicks with kerosene. See that each is saturated with good oil; then, before replacing them, drop a little good oil into the holes.

Adjustments

There are three adjustments that can be made. All are correctly made at the factory, and ordinarily need never be altered. Should it become necessary to remake any of these adjustments, due to accident or tampering, proceed as follows:

A. ADJUSTING LANDING POSITION OF NEEDLE ON THE RECORD. (See Top View. This adjustment is made with a screwdriver from above--does not require removing Changer from cabinet.) If needle comes down too far from

edge of record, playing of records will not start at their beginning. Turn Needle-Landing Adjusting Screw very slightly counter-clockwise. If needle comes down too close to edge of record, needle may slip off edge of record. Turn the adjusting screw clockwise.

Compare also Paragraph 12 below.

B. ADJUSTING DISTANCE FROM RECORD PIN AT WHICH TRIGGER WILL TRIP AND CHANGE CYCLE WILL BEGIN. Turn Trip Adjusting Screw 18, toward the trigger for earlier tripping, or away from it for later tripping. This Changer does not depend, for automatic tripping, on the records being provided with any special grooves at end; it trips whenever needle comes within a certain distance of Record Pin. The factory adjustment is for 1-7/8" from center of Record Pin. This is the most generally satisfactory distance; no modern record will then be cut off before playing is finished, and none will fail to trip at end. For certain records of early manufacture, it may not be possible to find an adjustment that will always trip and never cut off.

TO OBTAIN REPLACEMENT PARTS

Order by name and number, as given on the photos (names given to parts are "handy" names only, and do not completely distinguish them.)

C. ADJUSTING HEIGHT TO WHICH PICKUP ARM RISES. The arm should rise, during the change cycle, high enough so that it clears by only 1/8" the record above it, next to be played. (Be careful, before deciding that adjustment is necessary, to see that the record at bottom of stack is not a warped one.) To make this adjustment, loosen the lock-nut on Pickup Sleeve 22 (see photographs) and turn the Sleeve to lengthen or shorten Pickup Plunger 21. When correct adjustment is found, tighten lock nut again.

Replacing Motor

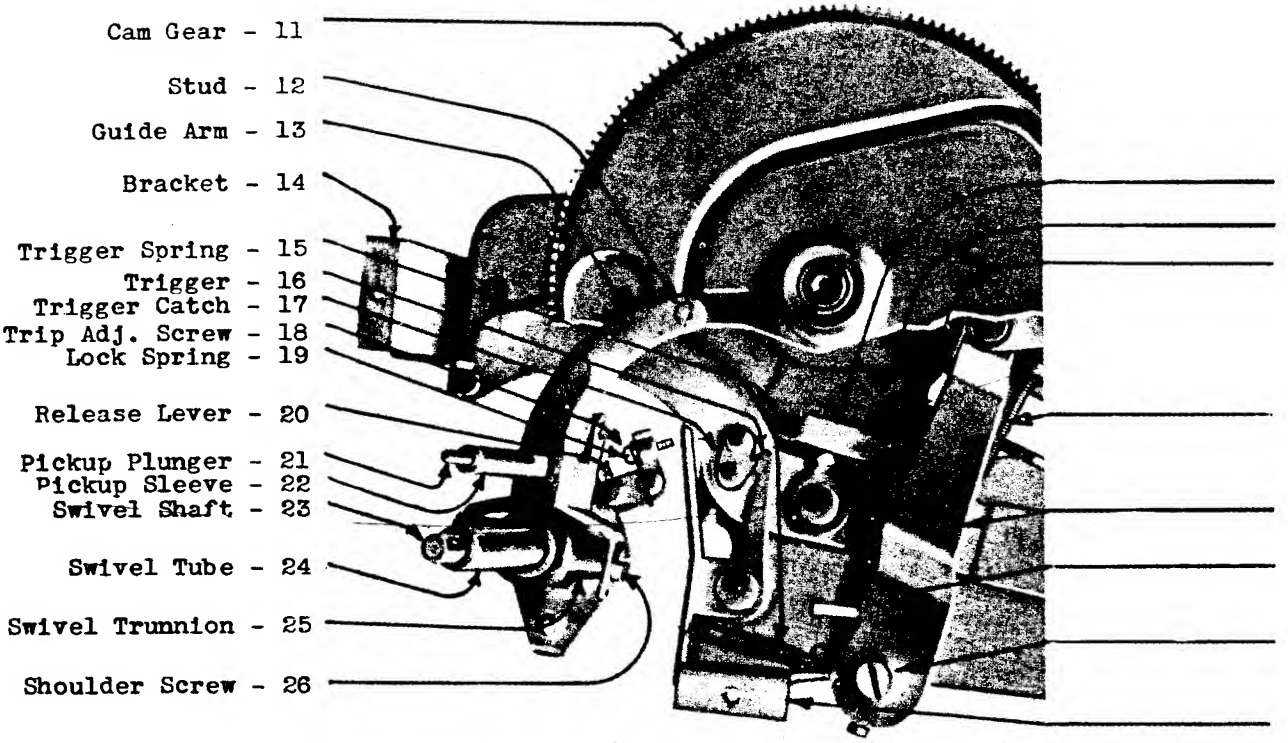
The service mechanic may be called upon to adapt the Changer to a different power supply. For this purpose, or in case of any service fault within Motor, remove entire Motor (with Record Pin and connecting gear drive) from the Changer, and replace it with a suitable new Motor. (In ordering a replacement Motor, specify the power supply and make and model number of phono-radio or other type of installation.)

When mounting replacement Motor, it is most important to see that Record Pin is centered between the two Posts of the Changer, that it stands perpendicular to Main Plate 53, and that it has not become bent so as to wobble. Even though the Posts are stout and not easy to bend, it is well to check them also, with a 12" combination square laid clear across the concave upper surface of Main Plate. When the new Motor has been attached, with three screws through Grommet Sleeves 51 (spacers) into its frame, and Record Pin is seen to revolve without appreciable wobble (a wobble would indicate that it has been bent in transit from factory) the correct position of Pin midway between the Posts can be accurately checked in this way: Place a single 12" record on the Shelf Plates, press "R" button, and turn turntable forward by hand. Immediately after the Shelf Plates open and let it fall, turn Turntable slightly backward, and with other hand support the record between the Shelf Plates; it can then be readily seen whether Record Pin is off center. If it is, remove the record and Turntable, and loosen slightly the screw or screws nearest the Shelf Plate to which record appeared closest. This should improve evenness of operation. However, unless the unevenness was very slight, it will be necessary for a permanent repair to insert a shim or two on one or more of the three screws (or change shims from one screw to another). The shims used are shaped like an ordinary washer, cut out at one side (see cut-away view at 52 on photo, showing a shim in place upon one of the Grommet Sleeves). Shims can readily be cut out with shears and punch from thin metal or cord-board--or an assortment of shims of different thicknesses can be had from factory (order "Assortment of P-1397 Shims"). They should be inserted, around proper screws (when screws have been sufficiently loosened) between Motor Frame and the metal Grommet Sleeve. Do not insert shims next to rubber grommet. In wiring up, consult wiring diagram for particular installation. Use only Underwriters' approved wire.

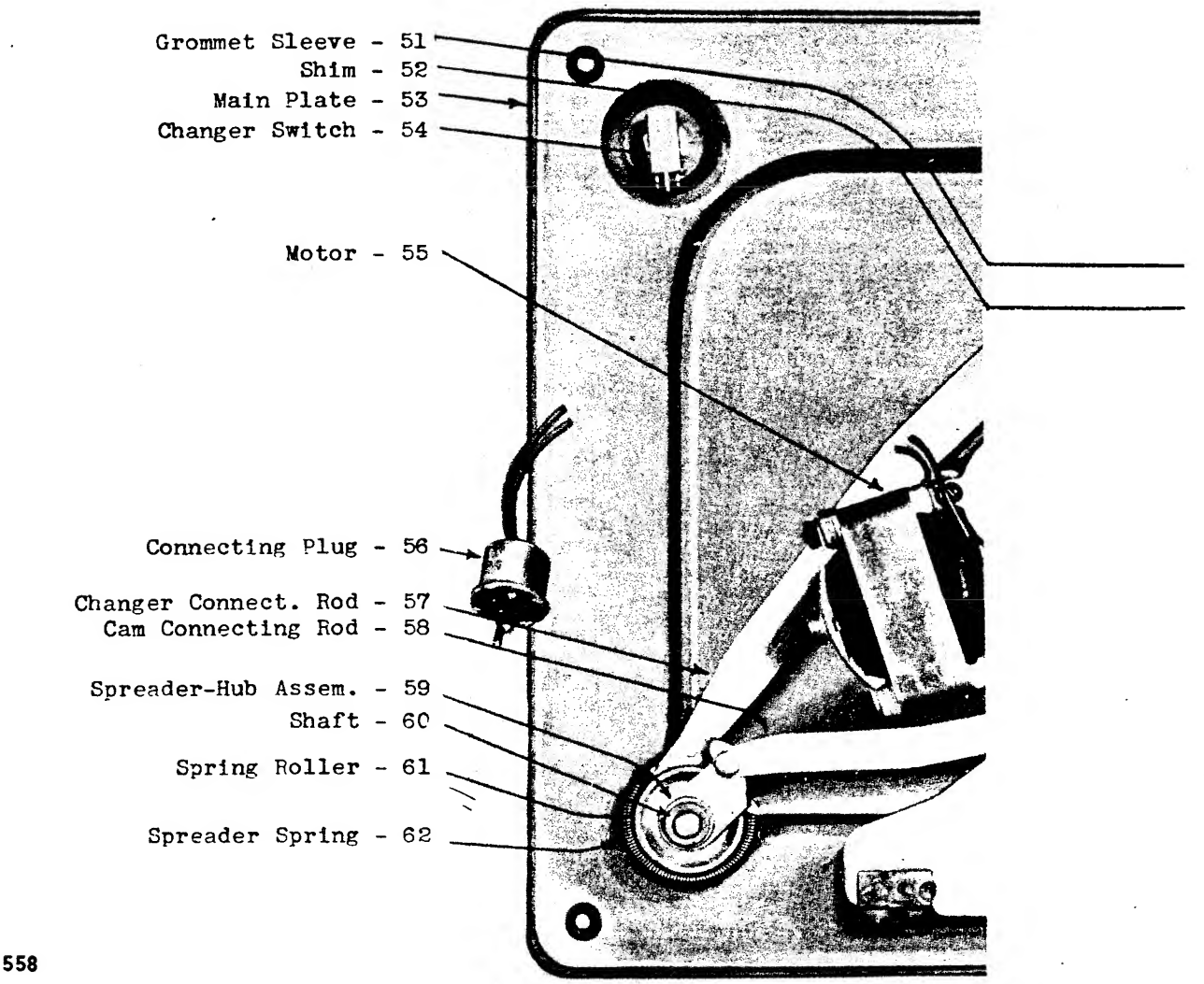
Trouble Shooting

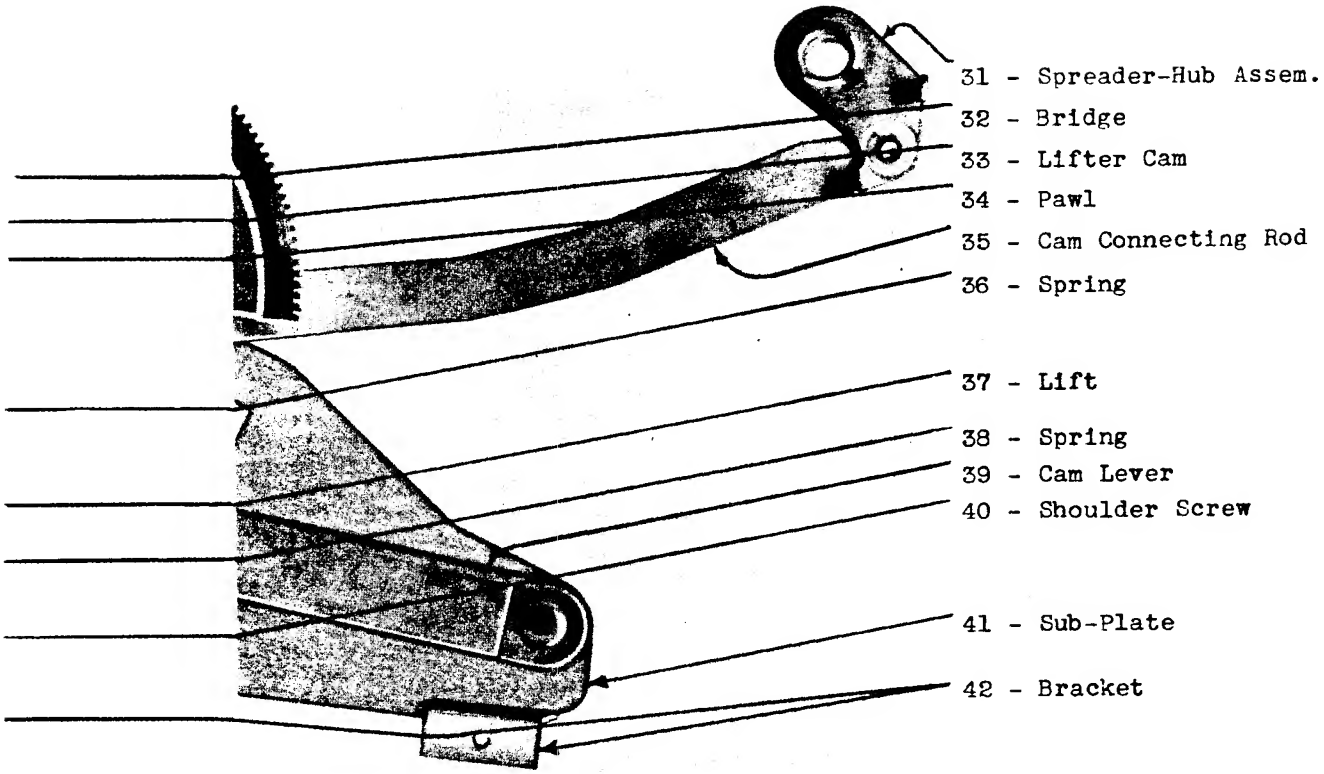
Cases of failure to operate satisfactorily will generally be found due either to neglect of proper lubrication, or to tampering with the mechanism after it leaves the factory, or to injuries accidentally sustained as by external vibration or by impact of some heavy object. In addition there is always the possibility that any kind of spring may "go dead" (cease to operate without any visible breakage) even though the utmost factory precautions are taken against it--or that setscrews may work loose due to some external vibration. Damage from tampering is likely to take the form of bent parts; never bend any part during examination. Be careful, especially, never to push upward from below on Cam Connecting Rod Lift 37 while mechanism is operating; bending may result, and even slight bending here might interfere with correct timing of the cycle operations.

Among the principal trouble symptoms to which such causes may give rise, are the following:

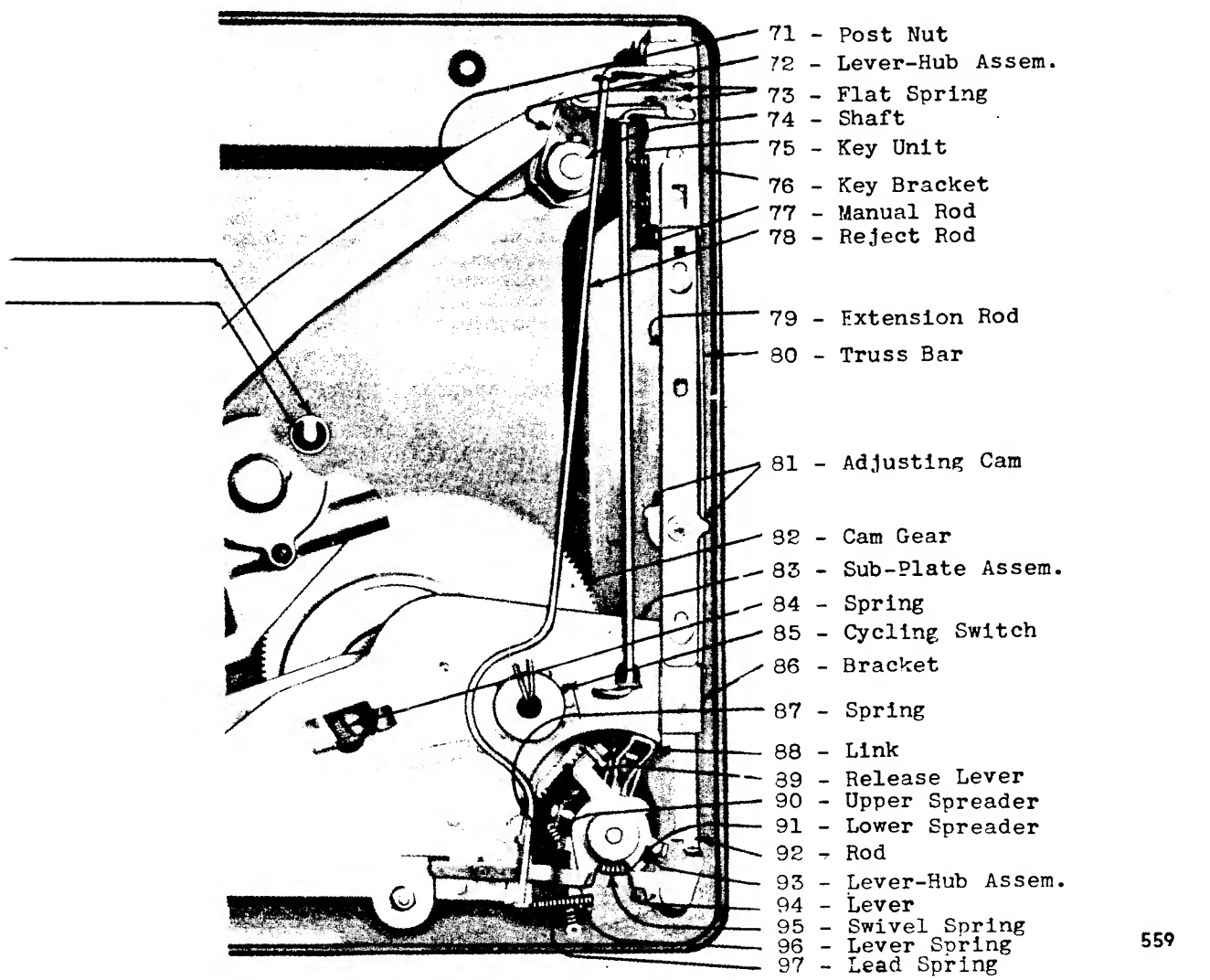

Cam Gear - 11
Stud - 12
Guide Arm - 13
Bracket - 14
Trigger Spring - 15
Trigger - 16
Trigger Catch - 17
Trip Adj. Screw - 18
Lock Spring - 19
Release Lever - 20
Pickup Plunger - 21
Pickup Sleeve - 22
Swivel Shaft - 23
Swivel Tube - 24
Swivel Trumnion - 25
Shoulder Screw - 26

Sub-Plate A


Grommet Sleeve - 51
Shim - 52
Main Plate - 53
Changer Switch - 54
Motor - 55
Connecting Plug - 56
Changer Connect. Rod - 57
Cam Connecting Rod - 58
Spreader-Hub Assem. - 59
Shaft - 60
Spring Roller - 61
Spreader Spring - 62


31 - Spreader-Hub Assem.
32 - Bridge
33 - Lifter Cam
34 - Pawl
35 - Cam Connecting Rod
36 - Spring
37 - Lift
38 - Spring
39 - Cam Lever
40 - Shoulder Screw
41 - Sub-Plate
42 - Bracket

ssembly


71 - Post Nut
72 - Lever-Hub Assem.
73 - Flat Spring
74 - Shaft
75 - Key Unit
76 - Key Bracket
77 - Manual Rod
78 - Reject Rod
79 - Extension Rod
80 - Truss Bar
81 - Adjusting Cam
82 - Cam Gear
83 - Sub-Plate Assem.
84 - Spring
85 - Cycling Switch
86 - Bracket
87 - Spring
88 - Link
89 - Release Lever
90 - Upper Spreader
91 - Lower Spreader
92 - Rod
93 - Lever-Hub Assem.
94 - Lever
95 - Swivel Spring
96 - Lever Spring
97 - Lead Spring

1. MECHANISM IS SLOW IN STARTING, OR STALLS DURING A CHANGE CYCLE, BUT A SLIGHT FORWARD PUSH WITH THE HAND STARTS IT AGAIN. May be caused by

a. Failure to lubricate properly. Oil thoroughly, per instructions above.

b. Loose setscrews.

c. Weakness of drive: line voltage may be abnormally low, or motor windings damaged. If windings are found damaged, remove motor and return it to factory for repair or replacement. See above: "Replacing Motor."

2. MOTOR FAILS TO RUN, EVEN WHEN IT IS ENTIRELY DISCONNECTED FROM OTHER WIRING AND PROPER VOLTAGE IS APPLIED DIRECTLY TO THE TWO ENDS OF ITS WINDINGS. This indicates trouble in Motor windings. Unless the damage is easily seen and repaired, replace Motor, as above described.

3. MOTOR IS SLOW IN STARTING.

a. Check oiling, as directed above. It may not have been properly done; old oil may have become gummy.

b. Changer may have been in a very cold place, and may not yet have reached room temperature. Give it a fair chance to get warmed up, before concluding that Motor is defective, and proceeding as in Paragraph 2 above.

4. SQUEAKS OR OTHER NOISES, DURING PLAYING OF RECORDS.

a. Check oiling, as directed above. (If squeaks are heard, they will usually be found to come from the records--not from the mechanism).

b. See that all setscrews are tight.

c. Examine Motor windings; especially the shading coils (not visible in photos) which encircle a portion of each laminated pole and make the Motor self-starting. If coils have been jarred loose at any point, they may be tightened accordingly.

5. CHANGER IS NOISY WHEN IN CYCLE. Check oiling.

6. MOTION OF PICKUP TOWARD RECORD PIN WILL NOT TRIP CHANGER MECHANISM.

a. It may be found that, instead of trigger being actuated, there is stretching of Swivel Spring 95 (joining the lugs at ends of Swivel Spreaders 90 and 91), allowing the spreaders to open. Increase tension of Spring 95, by bending slightly the lug on either Spreader. If this increased tension causes needle to jump across the record, needle may be a little out of vertical, radially--it may "lean" toward center of record. To remedy this, grasp Pickup arm and twist it, very slightly, in a clockwise direction, so that it stands vertical, or even leans a little in outward direction.

b. If trigger is being properly actuated, probably Cam Lever 39 is binding against Sub-Plate 41. Look for dirt or obstructions; see that rivets are working freely. If the Lever engages Cam Lever Pawl 34, so that Lift 37 forces its roller up into the groove on Cam Gear 82, and if setscrews are tight, the change cycle must operate, as Cam Gear turns.

7. PRESSING "R" BUTTON DOESN'T TRIP CHANGER MECHANISM.

a. Check Key Control Unit 75: see whether there is an obstruction or a bent part which prevents "R" button from going clear down to the end of its travel.

b. Examine Reject Rod 78. If it does not trip, even when properly revolved by complete depressing of "R" button, the rod has probably been bent, and must be restored in same way. Grasp the two ends and twist it slightly.

c. If Trigger 16 is being properly actuated but without starting a change cycle, see directions above, Paragraph 6-b.

8. PRESSING "M" BUTTON FAILS TO PUT CHANGER MECHANISM OUT OF ACTION SO AS TO ENABLE MANUAL OPERATION. Check Key Control Unit as in preceding paragraph. First see that button goes clear down; then follow its action through Manual Rod 77.

9. MOTOR STOPS IMMEDIATELY WHEN CHANGER SWITCH IS TURNED OFF DURING A CHANGE CYCLE (instead of continuing to run, as it should, until needle is again upon a record, and then stopping). Or--

10. TURNING CHANGER SWITCH OFF FAILS TO STOP CHANGER AT ALL. Either of these two conditions would indicate failure of Cycling Switch 85. Cycling Switch operates normally to short-circuit the manual Changer Switch (which may be located in position shown at 54, or elsewhere) during change cycle only. Such damage to Cycling Switch (not likely to occur) would necessitate returning the entire Changer to factory.

11. CHANGER FAILS TO REPEAT LAST RECORD. See Paragraph 6, above.

12. NEEDLE LANDS PROPERLY ON RECORD BUT FAILS TO MOVE OVER INTO RECORD GROOVE. Pickup arm is normally impelled toward center of records by Lead Spring 97. Should a slight increase in its tension be found necessary, this can be easily obtained by bending the lug, to which it is attached, down against Main Plate. If tendency then appears for needle to jump across record, check angle of needle (see Paragraph 6-a above).

13. RECORDS FALL UNEVENLY UPON TURNTABLE. Seldom objectionable, this is due to Record Pin not being correctly centered between Posts. If necessary, it can be corrected as described above; see "Replacing Motor."

14. LAST RECORD DROPS ON ONE SIDE ONLY. This suggests a Post bent out of perpendicular to Main Plate. Test with square as directed (see "Replacing Motor"). If Post must be straightened, be careful not to bend other parts.

15. CHANGER CONTINUES CYCLING. Due to failure of Lift 37 to fall back out of engagement with Cam Gear. Check the various rivets at which motion occurs, to find the point where friction or binding is interfering with freedom of motion.

16. RECORD IS DRIVEN, BUT NOT HEARD, OR NOT HEARD WITH PROPER VOLUME. See that Pickup cord is plugged in. Check amplifier and speaker and connections to them, thoroughly. If then trouble is still suspected in pickup, test its output with a vacuum-tube voltmeter. Playing an average record, output should test 1 to 2.5 volts if pickup cartridge is of crystal type, or 0.5 volt if of magnetic type. If pickup cartridge is found not to deliver proper output, remove it and install another.

17. SELECTOR PLATE FAILS TO SEPARATE BOTTOM RECORD FROM STACK. This is due either to a badly warped condition of the record, or to its being of a thickness very considerably different from those now in standard use. The design of both Selector and Shelf Plates is such as to accommodate a maximum variation in thickness and flatness of records, but certain records may be found which are so far out as to be impracticable for use in automatic changers.

If Necessary to Disassemble the Changer

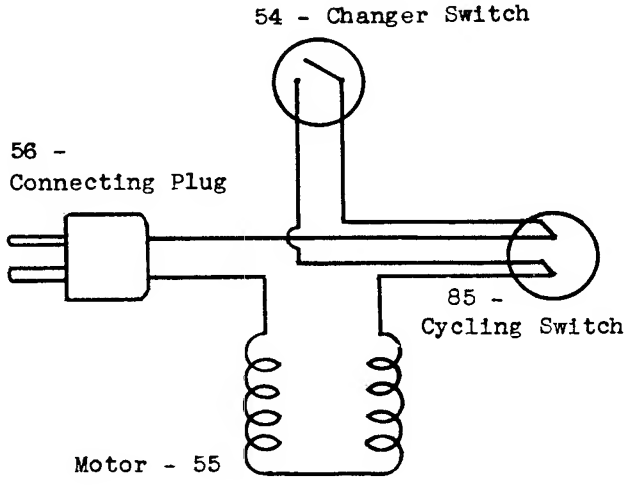
Before attempting to remove Sub-Plate Assembly 83, detach Key Control Unit 75 from Main Plate. To do this, start with Control Unit Truss Bar 80. Then take out the screw which holds left end of Adjusting Rod Lever 94. Next remove Adjusting Rod 92 and Adjusting Rod Extension 79. Take out the screw holding Spring 73; then the screws holding Key Control Unit 75 to Main Plate. Rods 77 and 78 can then, with due care, be extracted without bending. Free the Cam Connecting Rod 58 by loosening setscrew holding Spreader and Hub Assembly 59. Sub-Plate Assembly can then be detached without bending parts. In reassembling, reverse the procedure.

Replacement parts

When spare parts or sub-assemblies are required, order them direct from the factory, by number and name as given on photos. Where no number is given, order by full and exact description, specifying model on which part is to be used.

Questions Not Covered

The service mechanic should not hesitate to inquire of the factory regarding any difficulty encountered which does not seem to be covered by this Servicing Chart.



Typical Wiring Diagram

SERVICE MANUAL

1940 Models
6-MN-496 (DeLuxe AC4289)
6-MN-495 (Special AC4389)

ZENITH AUTO-RADIO

Built for
NASH MOTORS
Division of Nash-Kelvinator Corp.
Kenosha, Wis.

Made by ZENITH RADIO CORPORATION, Chicago, Ill., U.S.A.

IMPORTANT — Be sure the warranty service tag is properly filled out and accompanies each receiver where free warranty service is expected by the customer or dealer.

Zenith Model 6-MN-496
Nash DeLuxe AC4289

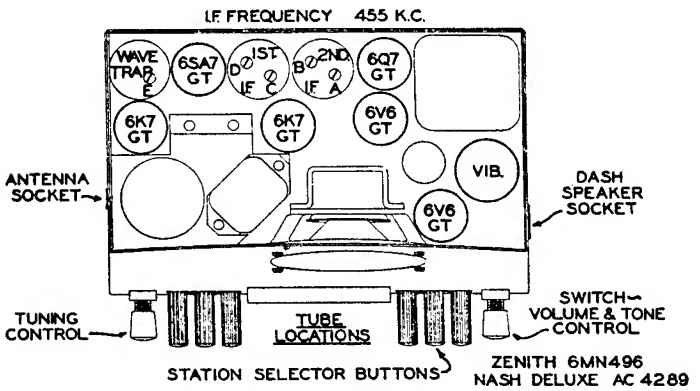


Fig. 1. Tube and Trimmer Location

Tuning Range: 540 to 1580 K.C.

Sensitivity: 8 microvolts at 1 watt output

Power Output: 9 watts measured at the voice coil

Speaker: 2 full dynamic matched speakers

I.F.: 455 K.C.

Tube Complement: 6K7GT R.F. — 6SA7GT oscillator and modulator — 6K7GT I.F. — 6Q7GT 2nd Det. and A.V.C. — 2 6V6GT beam power push-pull output

Current Consumption: 8 amperes at 6 volts.

Zenith Model 6-MN-495
Nash Special AC4389

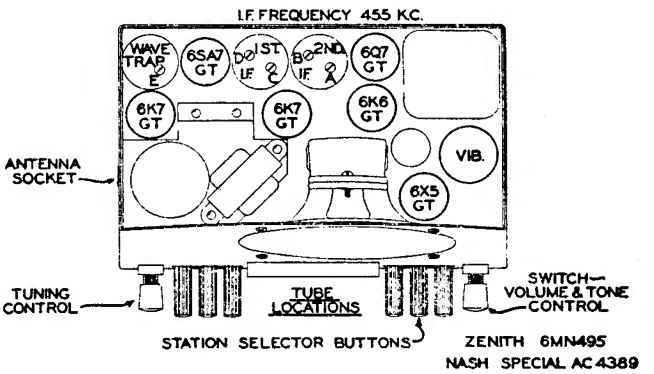


Fig. 2. Tube and Trimmer Location

Tuning Range: 540 to 1580 K.C.

Sensitivity: 10 microvolts at 1 watt output

Power Output: 3.5 watts measured at the voice coil

Speaker: Full size dynamic

I.F.: 455 K.C.

Tube Complement: 6K7GT R.F. — 6SA7GT oscillator and modulator—6K7GT I.F.—6Q7GT 2nd Det. and A.V.C.—6K6GT Pentode Output—6X5GT Rectifier.

Current Consumption: 6.8 amperes at 6 volts

We would suggest that the service man procure a 3/8" box wrench (small size) for removing the cap screws from the grille of the car. This may be purchased from any automotive supply store and is the only standard wrench which can be used when the receiver is to be removed from the car for service.

ALIGNMENT

The alignment of a receiver is one of the most important functions that a service man performs and the following instructions must be carefully followed for both models.

I. F. — The volume control is placed in the maximum position, and the tone control in the brilliant position for all the following adjustments:

A weak signal at 455 K.C. is fed directly into the grid cap of the 6K7GT R.F. tube through a .1 mfd condenser. The wave trap trimmer, E, (see Fig. 1 and 2) is adjusted for maximum response. The I. F. trimmers are then adjusted in the following order A, B, C and D, for greatest output. The signal level is then increased double or more and the wave trap trimmer, E, see Fig. 1 and 2, is adjusted to minimum response on the output meter.

IMPORTANT — Unless certain dummy antenna capacities are employed with either the signal generator, or in making the adjustments on stations, a receiver will not respond properly. The capacities provided in the Zenith dummy antenna part No. S7694 shown in Fig. 3 are identical with the conditions found in the Nash car, and if adjusted accordingly, the instrument will operate properly when reinstalled in the automobile. The Zenith dummy antenna is especially priced very low, and should be purchased at once for use in servicing the Zenith built Nash receiver.

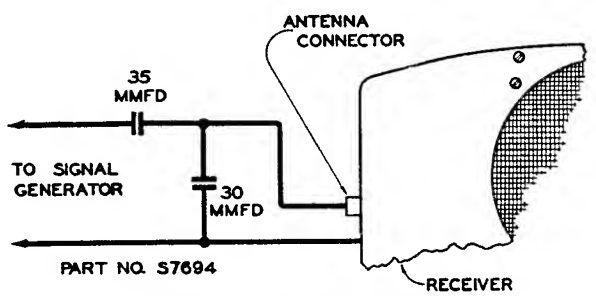
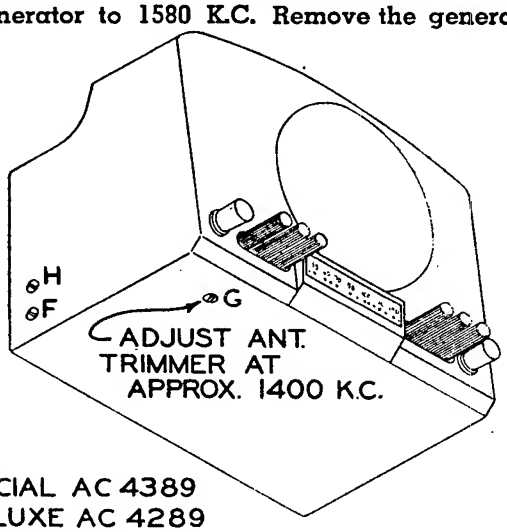


Fig. 3. Dummy Antenna

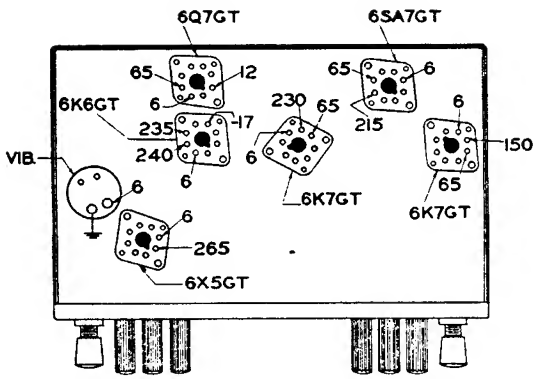
R. F. — The tuning condenser is rotated until the plates are completely out of mesh (1580 K.C.) Set the signal generator to 1580 K.C. Remove the generator leads from the R.F. tube, remove the .1 mfd. condenser from the leads, and connect the leads to a Zenith dummy antenna, part No. S-7694 to the antenna socket on the receiver. The high frequency oscillator trimmer F (See Fig. 4) is then peaked for maximum response on the output meter. Reset the signal generator to 1400 K.C., rotate the tuning control until a signal is heard, and adjust the 1400 antenna trimmer G (Fig. 4) for maximum response.



NASH SPECIAL AC 4389
NASH DELUXE AC 4289
ZENITH 6MN495
ZENITH 6MN496

Fig. 4. Antenna Adjustment

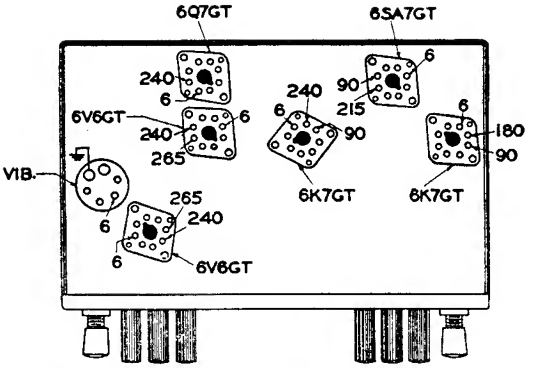
Reset the signal generator to 600 K.C. and rotate the tuning control until a signal is heard. The condenser gang is then rocked slightly when adjusting the 600 K.C. oscillator padder H (see Fig. 4) to maximum resonance on the output meter.



ANTENNA DISCONNECTED, VOL. AT MIN. BATTERY 6 VOLTS MEASURMENTS MADE FROM CHASSIS TO POINT INDICATED WITH 1000 OHM PER VOLT METER

ZENITH 6MN495
NASH SPECIAL AC 4389

Fig. 5.



ANTENNA DISCONNECTED VOL. AT MIN. BATTERY 6 VOLTS MEASUREMENTS MADE FROM CHASSIS TO POINT INDICATED WITH 1000 OHM PER VOLT METER

ZENITH 6MN496
NASH DELUXE AC 4289

Fig. 6.

Figures 5 and 6 show the voltage measured at the socket. The resistance measurements are shown on the schematics on the following pages. Figures 7 and 8 show how the dial cable is strung on both receivers.

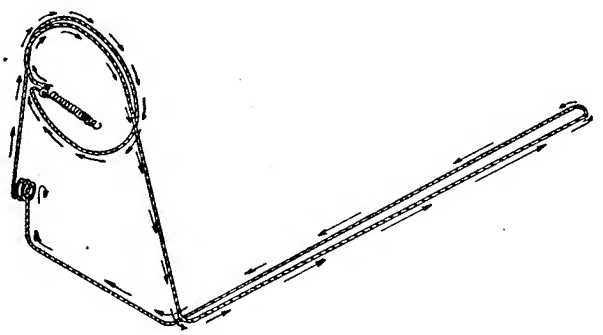


Fig. 7.

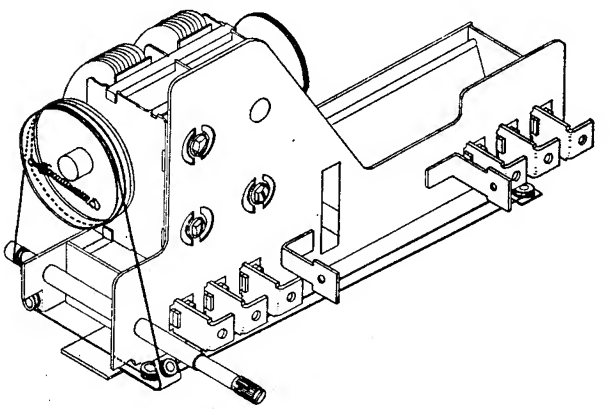


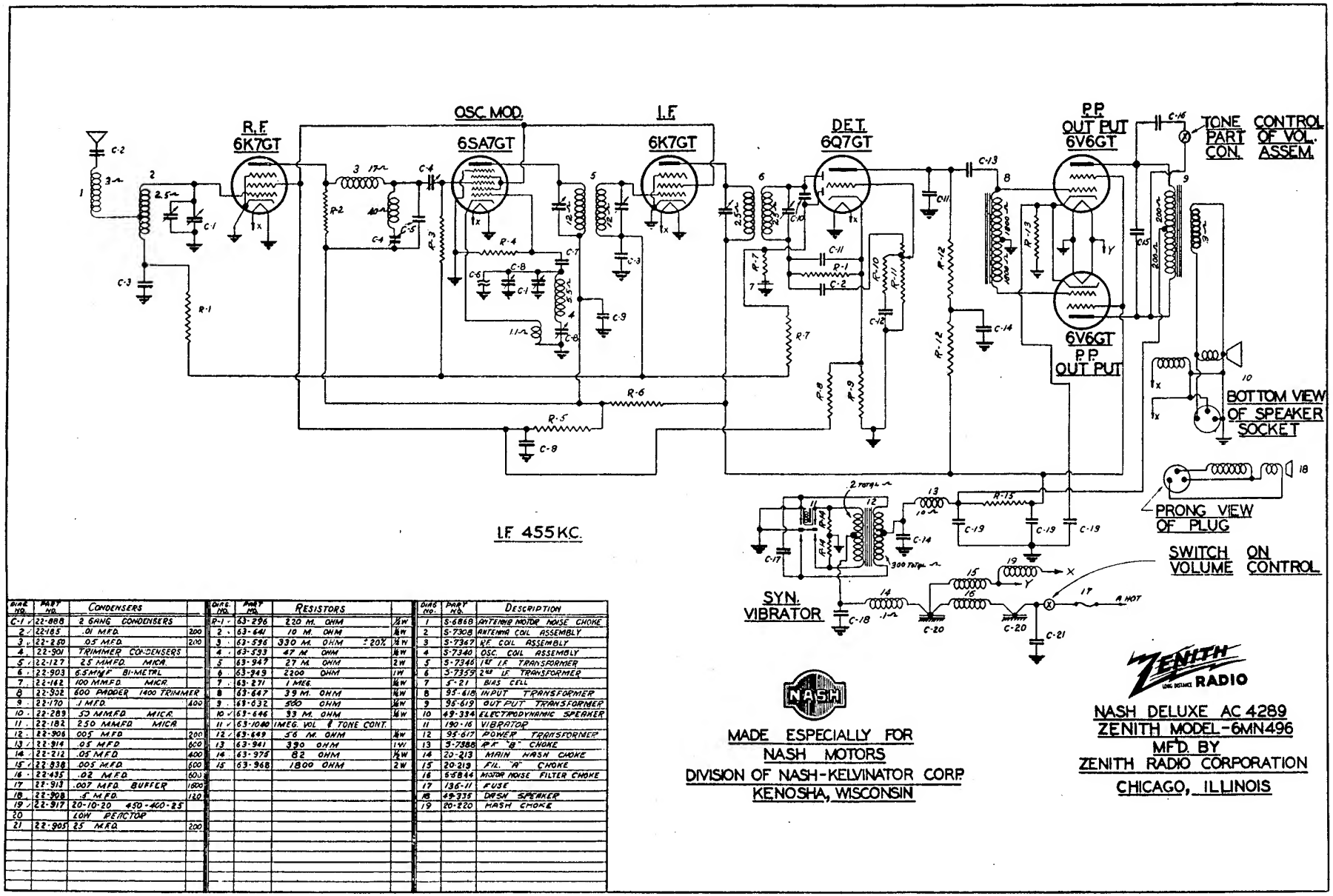
Fig. 8.

AUTOMATIC TUNING — The automatic tuning mechanism, being entirely mechanical and extremely simple in construction, will require no attention except the original adjustments for the desired stations.

It consists of push rods which operate a cam and gear assembly which rotates the tuning condenser to any prearranged position. Each automatic button or push rod may be set for any station in the tuning range of the receiver.

To set the automatic buttons, first select six desired stations. Unscrew the left hand automatic button one-half turn and press all the way in. While holding the button in this position, manually tune in the selected station of lowest frequency. Then release the button and tighten. This button will then automatically tune this station whenever it is pushed in.

The same procedure should be followed on the five remaining buttons and stations. The station which has been tuned automatically will be indicated by the dial pointer.

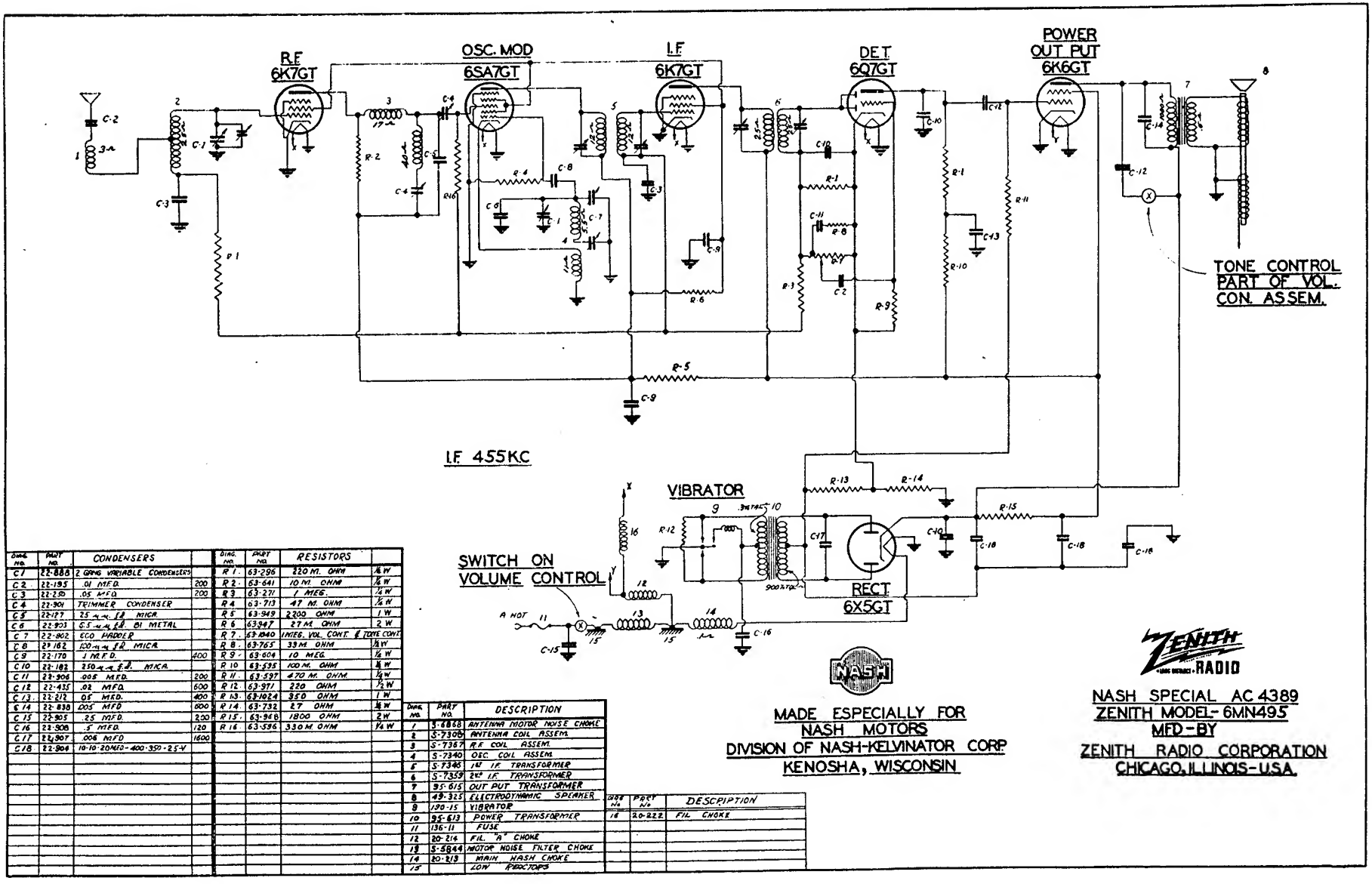


DIAG. NO.	PART NO.	CONDENSERS	
C-1	22-888	2 GANG CONDENSERS	
2	22-185	.01 MFD.	200
3	22-250	.05 MFD.	200
4	22-901	TRIMMER CONDENSERS	
5	22-127	25 MMFD. MICA	
6	22-903	6.5 MMFD BI-METAL	
7	22-182	100 MMFD MICA	
8	22-932	600 PADDER 1400 TRIMMER	
9	22-170	.1 MFD.	400
10	22-289	50 MMFD MICA	
11	22-182	250 MMFD MICA	
12	22-906	.005 MFD	200
13	22-914	.05 MFD	600
14	22-212	.05 MFD	400
15	22-838	.005 MFD	600
16	22-435	.02 MFD	600
17	22-913	.007 MFD BUFFER	1600
18	22-908	.5 MFD	160
19	22-917	20-10-20 450-400-25	
20		LOW REACTOR	
21	22-905	.25 MFD	200

DIAG. NO.	PART NO.	RESISTORS	
R-1	63-296	220 M. OHM	1/2 W
2	63-641	10 M. OHM	1/2 W
3	63-596	330 M. OHM ±20%	1/2 W
4	63-593	47 M OHM	1/2 W
5	63-947	27 M. OHM	2 W
6	63-949	2200 OHM	1 W
7	63-271	1 MEG.	1/2 W
8	63-647	39 M. OHM	1/2 W
9	63-632	500 OHM	1/2 W
10	63-646	33 M. OHM	1/2 W
11	63-1080	IMEG. VOL & TONE CONT.	
12	63-649	56 M. OHM	1/2 W
13	63-941	330 OHM	1 W
14	63-975	82 OHM	1/2 W
15	63-968	1800 OHM	2 W

DIAG. NO.	PART NO.	DESCRIPTION
1	5-6868	ANTENNA MOTOR NOISE CHOKE
2	5-7308	ANTENNA COIL ASSEMBLY
3	5-7367	R.F. COIL ASSEMBLY
4	5-7340	OSC. COIL ASSEMBLY
5	5-7346	1ST I.F. TRANSFORMER
6	5-7359	2ND I.F. TRANSFORMER
7	5-21	BIAS CELL
8	95-618	INPUT TRANSFORMER
9	95-619	OUT PUT TRANSFORMER
10	49-334	ELECTRODYNAMIC SPEAKER
11	190-16	VIBRATOR
12	95-617	POWER TRANSFORMER
13	5-7388	P.F. "B" CHOKE
14	20-213	MAIN HASH CHOKE
15	20-213	FIL. "A" CHOKE
16	56844	MOTOR NOISE FILTER CHOKE
17	136-11	FUSE
18	49-335	DASH SPEAKER
19	20-220	HASH CHOKE

Fig. 9. CIRCUIT DIAGRAM — MODEL 6-MN-496 (DeLuxe AC4289)



DIAG. NO.	PART NO.	CONDENSERS		DIAG. NO.	PART NO.	RESISTORS	
C 1	22-888	2 GANG VARIABLE CONDENSERS		R 1	63-296	220 M. OHM	½ W
C 2	22-195	.01 MFD.	200	R 2	63-641	10 M. OHM	½ W
C 3	22-230	.05 MFD.	200	R 3	63-271	1 MEG.	½ W
C 4	22-901	TRIMMER CONDENSER		R 4	63-713	47 M. OHM	½ W
C 5	22-177	35 μμ fd MICA		R 5	63-949	2200 OHM	1 W
C 6	22-903	6.5 μμ fd. DI METAL		R 6	63-947	27 M. OHM	2 W
C 7	22-802	ECO PADDER		R 7	63-1040	INTER. VOL. CONT. & TONE CONT.	
C 8	22-182	100 μμ fd MICA		R 8	63-765	33 M. OHM	½ W
C 9	22-170	.1 MFD.	400	R 9	63-604	10 MEG.	½ W
C 10	22-183	250 μμ fd. MICA		R 10	63-535	100 M. OHM	½ W
C 11	22-906	.005 MFD.	200	R 11	63-597	470 M. OHM	½ W
C 12	22-435	.02 MFD.	600	R 12	63-971	220 OHM	1/2 W
C 13	22-212	.05 MFD.	400	R 13	63-1024	350 OHM	1 W
C 14	22-838	.005 MFD	600	R 14	63-732	27 OHM	½ W
C 15	22-905	.25 MFD.	200	R 15	63-968	1800 OHM	2 W
C 16	22-906	.5 MFD.	120	R 16	63-596	330 M. OHM	½ W
C 17	22-907	.006 MFD	1600				
C 18	22-904	10-10-20MFD-400-350-25-V					

DIAG. NO.	PART NO.	DESCRIPTION
1	5-6868	ANTENNA MOTOR NOISE CHOKE
2	5-7306	ANTENNA COIL ASSEM.
3	5-7367	R.F. COIL ASSEM.
4	5-7340	OSC. COIL ASSEM.
5	5-7345	1st I.F. TRANSFORMER
6	5-7359	2nd I.F. TRANSFORMER
7	95-615	OUT PUT TRANSFORMER
8	49-325	ELECTRODYNAMIC SPEAKER
9	190-15	VIBRATOR
10	95-613	POWER TRANSFORMER
11	136-11	FUSE
12	20-214	FIL. "A" CHOKE
13	5-5844	MOTOR NOISE FILTER CHOKE
14	20-213	MAIN HASH CHOKE
15		LOW FREQ. TRAPS

DIAG. NO.	PART NO.	DESCRIPTION
16	20-222	FIL. CHOKE

Fig. 10. CIRCUIT DIAGRAM — MODEL 6-MN-495 (Special AC4389)

PARTS PRICE LIST

ZENITH-NASH AUTOMOBILE RECEIVERS

Model	Nash No.	Zenith No.	Chassis No.	Code
Special	AC4389	6MN495	5673	S
DeLuxe	AC4289	6MN496	5676	D

TUNING UNIT ASSEMBLY

22-888	Two gang variable condenser (with pulley & gear)	SD..	$2.75
26-230	Dial scale	SD..	.10
46-289	Automatic tuning knob & screw	SD..	.10
59-82	Dial pointer	SD..	.10
76-288	Tuning control shaft	SD..	.12
80-209	Dial cord tension spring	SD..	.02
80-210	Condenser gear spring	SD..	.005
93-125	No. 6 Shakeproof lockwasher	SD..	.25C
93-126	No. 8 Shakeproof lockwasher	SD..	.30C
100-36	Pilot lamp	SD..	.09
114-52	No. 8-32 x 3/16" Hex acorn head machine screw	SD..	.25C
114-63	No. 6-32 x 3/16" Hex acorn head machine screw	SD..	.20C
188-34	Retaining ring for 76-288	SD..	.10C
S7258	Automatic tuning unit mechanism	SD..	3.50
S7461	Dial cord & eyelet	SD..	.15
S7518	Dial light socket assembly	SD..	.35

COILS

20-213	Main hash choke	SD..	.20
20-214	Filament "A" choke	S ..	.10
20-219	Hash choke	D..	.10
20-220	Hash choke	D..	.10
S5844	Motor noise filter choke	SD..	.15
S6868	Antenna motor noise choke	SD..	.25
S7308	Antenna coil assembly (less shield)	SD..	.75
S7340	Oscillator coil assembly	SD..	.50
S7346	1st I F transformer assembly	SD..	1.35
S7359	2nd I F transformer assembly	SD..	1.35
S7367	R F coil assembly	SD..	1.50
S7388	R F "B" choke	D..	.50

CONDENSERS

22-127	25 mmfd.	600 volt	SD..	.15
22-162	.0001 mfd.	600 volt	SD..	.15
22-170	.1 mfd.	400 volt	SD..	.20
22-182	.00025 mfd.	600 volt	SD..	.20
22-185	.01 mfd.	200 volt	SD..	.15
22-212	.05 mfd.	400 volt	SD..	.15
22-250	.05 mfd.	200 volt	SD..	.15
22-289	50 mmfd.	600 volt	D..	.15
22-435	.02 mfd.	600 volt	SD..	.15
22-838	.005 mfd.	600 volt	SD..	.15
22-888	Two gang variable condenser		SD..	2.75
22-899	Trimmer condenser (Part of S7346 1st I F)		SD..	.25
22-900	Trimmer condenser (part of S7359 2nd I F)		SD..	.25
22-901	Trimmer condenser (part of S7367 R F coil)		SD..	.25
22-902	Oscillator padder condenser		SD..	.40
22-903	6.5 mmfd. ceramic condenser		SD..	.30
22-904	10 mfd. 400 volt — 10 mfd. 350 volt 20 mfd. 25 volt — dry electrolytic		S ..	1.15
22-905	.25 mfd.	200 volt	SD..	.20
22-906	.005 mfd.	200 volt	SD..	.15
22-907	.007 mfd.	1600 volt	S ..	.20
22-908	.5 mfd.	120 volt	SD..	.25
22-913	.007 mfd.	1600 volt	D..	.35
22-914	.05 mfd.	600 volt	D..	.20
22-917	20 mfd. 450 volt — 10 mfd. 400 volt 20 mfd. 25 volt — dry electrolytic		D..	1.35

RESISTORS

63-271	1 megohm	¼ watt	SD..	$ .07
63-296	220M ohm	¼ watt	SD..	.07
63-593	47M ohm	¼ watt	D..	.07
63-593	100M ohm	¼ watt	S ..	.07
63-596	330M ohm	¼ watt	SD..	.07
63-597	470M ohm	¼ watt	S ..	.07
63-604	10 Megohm	¼ watt	S ..	.07
63-632	560 ohm	¼ watt	D..	.07
63-643	18M ohm	¼ watt	SD..	.07
63-646	33M ohm	¼ watt	D..	.07
63-647	39M ohm	¼ watt	D..	.07
63-649	56M ohm	¼ watt	D..	.07
63-713	47M ohm	¼ watt	S ..	.15
63-732	27M ohm	¼ watt	S ..	.15
63-765	33M ohm	¼ watt	S ..	.15
63-941	390 ohm	1 watt	D..	.20
63-947	27M ohm	2 watt	SD..	.30
63-949	2200 ohm	1 watt	SD..	.20
63-968	1800 ohm	2 watt	SD..	.30
63-971	220 ohm	½ watt	S ..	.08
63-975	82 ohm	½ watt	D..	.17
63-1024	350 ohm	1 watt	S ..	.20
63-1040	Volume control-tone switch & shaft assembly		SD..	1.50

INTERNAL SPEAKER UNIT ASSEMBLY

24-217	Dial cover	SD..	.02
49-325	6" Dynamic speaker (less output transf.)	S ..	3.75
	207-325 field coil	S ..	2.00
	208-325 cone & voice coil	S ..	1.50
49-334	4" Dynamic speaker (less output transf.)	D..	2.50
	207-334 field coil	D..	1.00
	208-334 cone & voice coil	D..	1.25
54-30	No. 3-32 x 5/16" Hex nuts	SD..	.25C
74-22	Speaker grill screen	S ..	.13
74-22	Speaker grill screen	D..	.15
93-126	No. 8 Shakeproof lockwasher	SD..	.30C
94-307	Tuning shaft bushing	SD..	.08
94-308	Volume control shaft bushing	SD..	.08
112-246	No. 4 x 3/16" R.H. self-tapping screw	SD..	.35C
114-114	No. 8-32 x ½" Hex acorn head machine screw	SD..	.30C
192-45	Dial crystal	SD..	.05

MISCELLANEOUS

5-15	Bias cell	D..	.15
12-702	Set mounting bracket	SD..	.05
46-290	Tuning control knob	SD..	.06
52-153	Battery cable (set to fuse)	SD..	.15
52-168	Battery cable (fuse to battery)	SD..	.25
78-208	Socket — external speaker plug	D..	.10
78-275	Socket — electrolytic condenser	S ..	.02
78-276	Socket — tube 6K7GT	SD..	.10
78-277	Socket — tube 6SA7GT	SD..	.10
78-278	Socket — tube 6Q7GT	SD..	.10
78-281	Socket — vibrator	S ..	.10
78-283	Socket — antenna connector	SD..	.10
78-284	Socket — synchronous vibrator	D..	.10
78-298	Socket — electrolytic condenser	D..	.20C
95-613	Power transformer	S ..	2.50
95-615	Output transformer	S ..	1.00
95-617	Power transformer	D..	2.50
95-618	Input transformer	D..	1.65
95-619	Output transformer	D..	1.00

PARTS LIST — cont'd

.14-46	No. 6 x 3/16" Hex acorn head self-tapping screw	SD..	.30C
.14-58	No. 6-32 x ⅜" Hex acorn head machine screw	SD..	.20C
.14-109	No. 6 x ¼" Hex acorn head self-tapping screw	SD..	.35C
.32-18	Bias cell retainer	D..	.10
.36-11	Fuse — 14 ampere	SD..	.03
.59-37	Plug button (small)	SD..	.03
.59-38	Plug button (large)	SD..	.03
.90-15	Vibrator	S ..	2.25
.90-16	Vibrator — synchronous	D..	3.25
202-139	Instruction book	SD..	.15
37472	Shield assembly (antenna coil)	SD..	.12
37473	Volume control knob & set screw (46-291 73-26)	SD..	.15

FIREWALL SPEAKER ASSEMBLY (AC4289-6MN496)

43-40	Housing	D..	1.25
49-335	8" Dynamic speaker	D..	4.00
	207-335 Field coil	D..	2.00
	208-335 cone & voice coil	D..	2.00
52-170	Speaker cable	D..	.75
54-30	No. 8-32 x 5/16" Hex nuts	D..	.25C
74-23	Screen	D..	.50
93-126	No. 8 Shakeproof lockwasher	D..	.30C
112-130	Speaker mounting screws	D..	.75C
147-83	Brass spacers	D..	.02

SPEAKER INSTALLATION KIT

54-77	5/16"-18 x ½" Hex nuts	D..	.01
93-443	3/16" Internal-External shakeproof lockwasher	D..	1.50C
93-444	Steel washer	..	2.00C
97-110	Mounting stud	..	.10
147-80	Wood spacer	..	.10

INSTALLATION ACCESSORIES

22-919	Ammeter condenser	SD..	.35
22-920	Generator condenser	SD..	.40
54-132	7/16"-32 round nuts	SD..	.04
63-1046	Distributor suppressor	SD..	.25
68-2	Installation tool	SD..	.02
80-145	Motor Hood band spring	SD..	.02
112-243	Thumb screws	SD..	.03

All Prices List Subject to Regular Discount and Change Without Notice.

SERVICE NOTES

9-39

Printed in U.S.A.

SERVICE MANUAL

Built for
FORD MOTOR CO.
Detroit, Mich.

ZENITH
AUTO-RADIO

Model
6MF490

Made by ZENITH RADIO CORPORATION, Chicago, Ill., U. S. A.

ELECTRICAL SPECIFICATIONS

Sensitivity—7 Micro-volts at one watt output. **Power Output**—4.5 watts measured at the voice coil. **Tuning Range**—540-1520 K.C. **Speaker**—full size electro-dynamic. **I.F.**—455 K.C. **Roto-matic tuning**—single button tuning for five stations. **Tube Complement**—7A7 R.F.; 7B8 Oscillator and Modulator; 7A7 I.F.; 7B6 second detector; and AVC; 7C5 Beam Power output; 7Y4 rectifier. **Current Consumption**—7 Amp.

Mr. Warranty Service Man:

The following information is furnished you so you may restore original performance to the Ford receiver.

The alignment procedure is new so study it carefully before trying to make any adjustments.

IMPORTANT:

Be sure the Warranty service tag is properly filled out and accompanying each receiver where free warranty service is expected by the customer or dealer.

NOTE:

This receiver is equipped with a fixed-variable sensitivity control located on the side of the chassis as shown in Fig. 3B. The control is set at the factory to a position which gives sensitivity of 7 micro-volts at one watt output. It is found advisable to hold the receiver at this level as any higher sensitivity may result in motor noise or excessive background noise and unless laboratory equipment is available for measuring sensitivity, it is not advisable to change this setting.

MANUAL DIAL CALIBRATION:

If the frequency of a station does not correspond with the dial reading, it may be corrected by holding the tuning control securely and turning the dial drum with the forefinger until it reads correctly.

SOCKET VOLTAGES:

Fig. 1 shows approximate voltages at the socket terminals. The resistance measurements are shown on the schematic on page 574.

ALL MEASUREMENTS WITH 1000 OHM PER VOLT METER FROM CHASSIS GROUND TO POINT INDICATED

ANTENNA DISCONNECTED VOL. AT MIN. BATTERY VOLTS-6

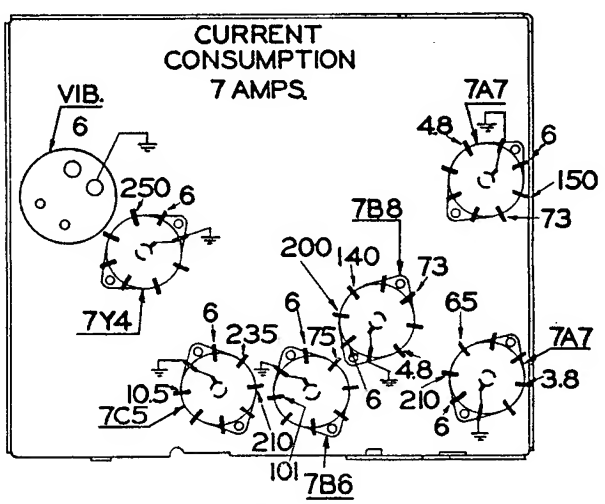


FIG. 1

ALIGNMENT:

The signal for the entire alignment procedure, both I.F. and R.F., is fed through a special Zenith dummy. Part number S7832. The capacities in the Zenith dummy antenna as shown in Fig. 2 are identical

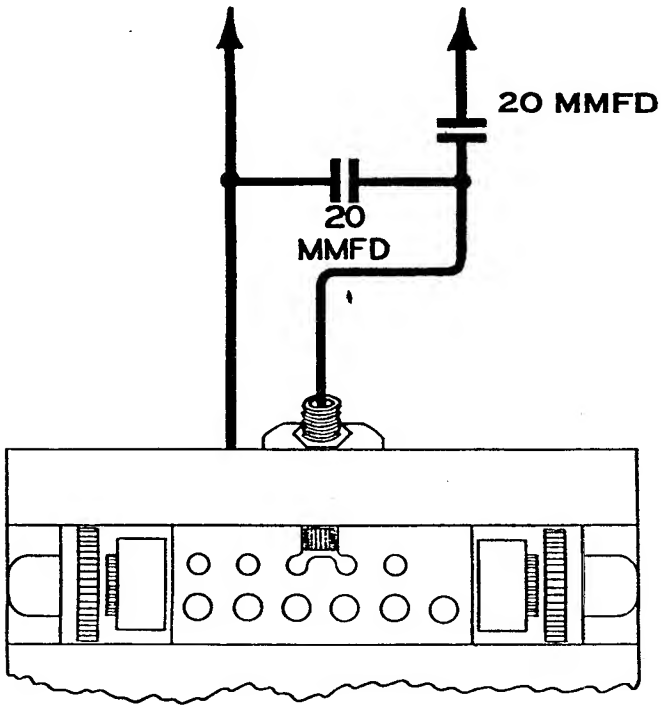


FIG. 2

with the standard Ford antenna. If the Zenith dummy is not available at your Zenith distributor, you can substitute the values shown.

CAUTION:

Care should be taken while making all adjustments on the receiver to have the volume control turned full on. The intensity of the signal should be reduced only at the signal generator.

I.F.:

The tuning condenser is fully meshed (540 K.C.). The word "dial" must appear in the Roto-matic window. The signal generator is set at 455 K.C. and fed through the special Zenith antenna dummy to the receiver. The wave trap adjustment screw

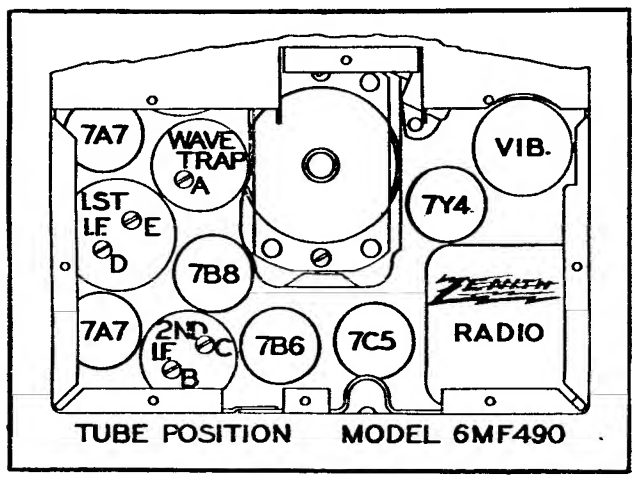


FIG. 3A

A, see Fig. 3A-3B, is adjusted for maximum response. The adjusting screws B, C, D and E are then adjusted in order for maximum response on the output meter. (See Fig. 3A-3B.)

The wave trap A is then adjusted for minimum response.

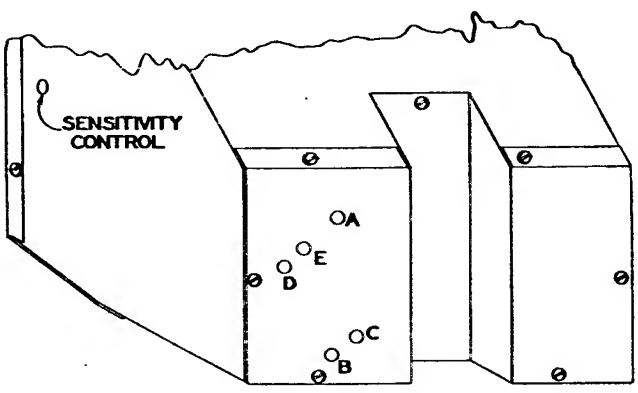


FIG. 3B

R.F.:

The tuning control is rotated until the condenser plates are completely out of mesh (1520 K.C.). Set the signal generator

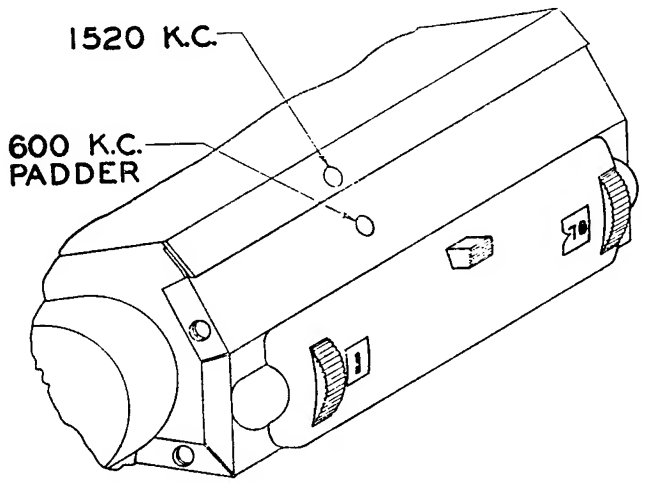


FIG. 4

to 1520 K.C. Adjust the 1520 K.C. trimmer shown in Fig. 4 for maximum response.

Set the signal generator to 1400 K.C. Rotate the tuning control until the signal is heard and adjust the 1400 antenna trimmer (see Fig. 5), for maximum response.

Reset the signal generator to 600 K.C. and rotate the tuning control until a signal is heard. The condenser gang is then rocked slightly while adjusting the 600 K.C. padder (see Fig. 4) to maximum reading on the output meter.

The opening below the speaker on the front of the receiver is provided so that the output meter may be connected to the voice coil (see Fig. 6).

If you have the type of output meter which is usually connected to the plate of the output tube, it may be adapted for this type of connection by following the instructions shown in Fig. 7.

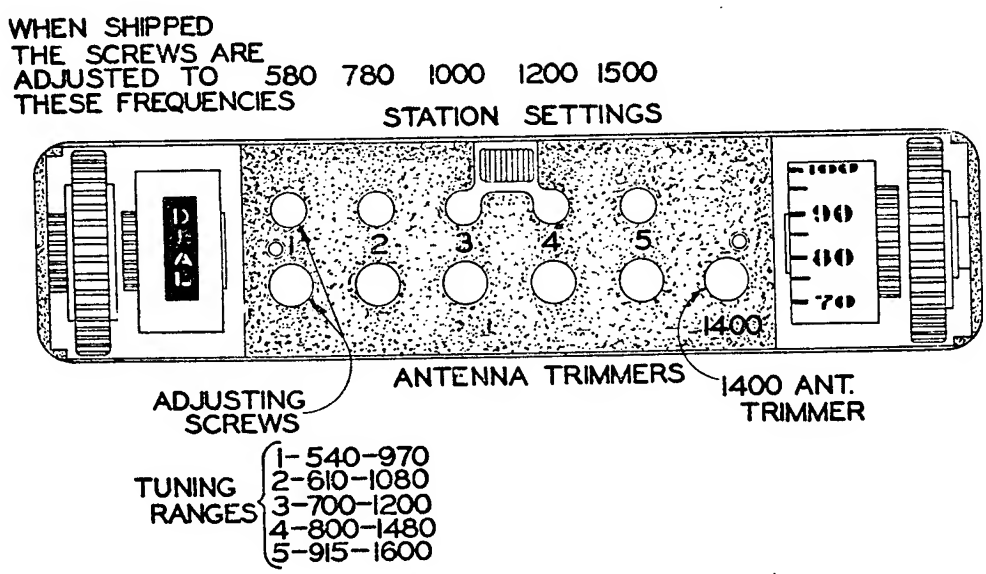


FIG. 5

ROTO-MATIC TUNING ADJUSTMENT:

The receiver should be turned on and allowed to warm up at least 30 minutes before the automatic tuning controls are adjusted.

It is essential that the adjusting screws be set on a weak signal in order to obtain accuracy and the maximum sensitivity. If

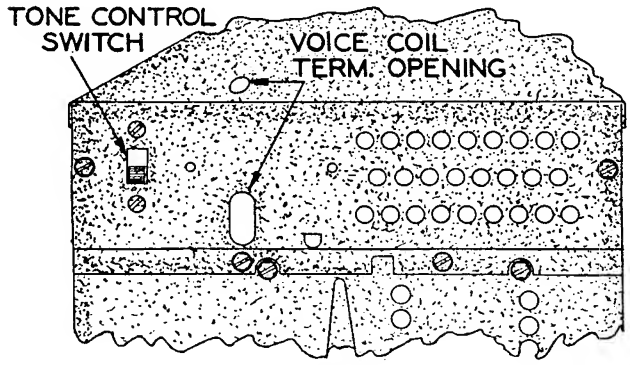


FIG. 6

the received signal is too strong, the antenna should be collapsed to its shortest position. The two screws which hold the escutcheon to the instrument panel are now removed (see Fig. 8). The escutcheon plate is removed, making the adjustment screws accessible. They are then adjusted in the following order:

For a station close to 580 K.C. the adjustment screw over 1 (see Fig. 5) is first adjusted to the desired station. The adjustment screw below 1 is then adjusted for maximum amount of signal.

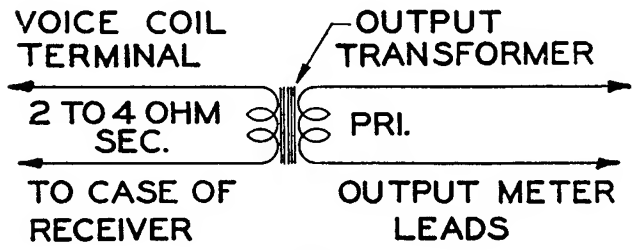


FIG. 7

Number 1 on the adjustment screw (see Fig. 5) corresponds to Fig. 1 on the Roto-matic tuner. For stations 2, 3, etc., on the Roto-matic tuner, set the adjusting screws 2 and 3, the same as for station 1.

IMPORTANT:

The above procedure should be repeated after the entire five stations are set. This is necessary to make sure that the adjustment screws are peaked for maximum performance.

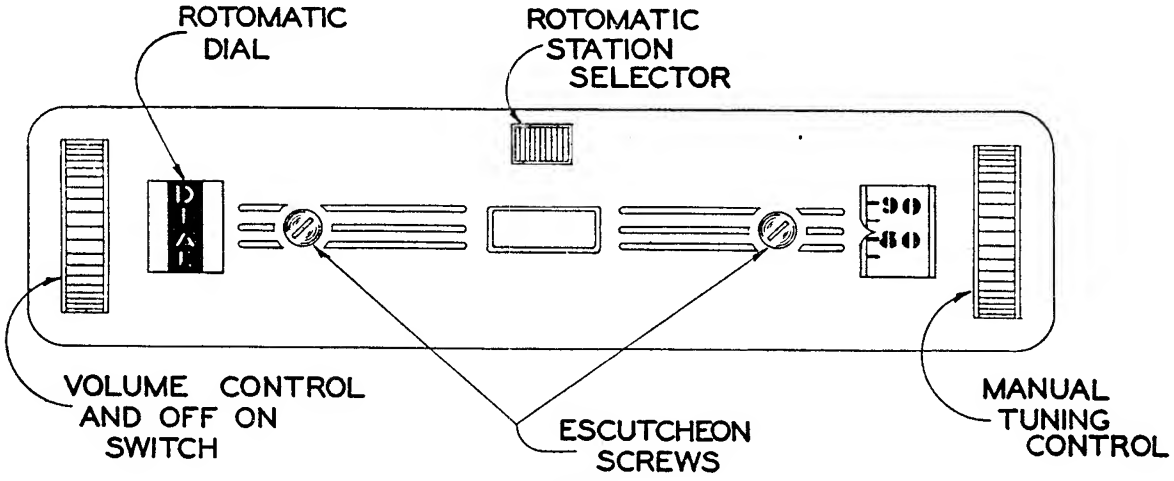
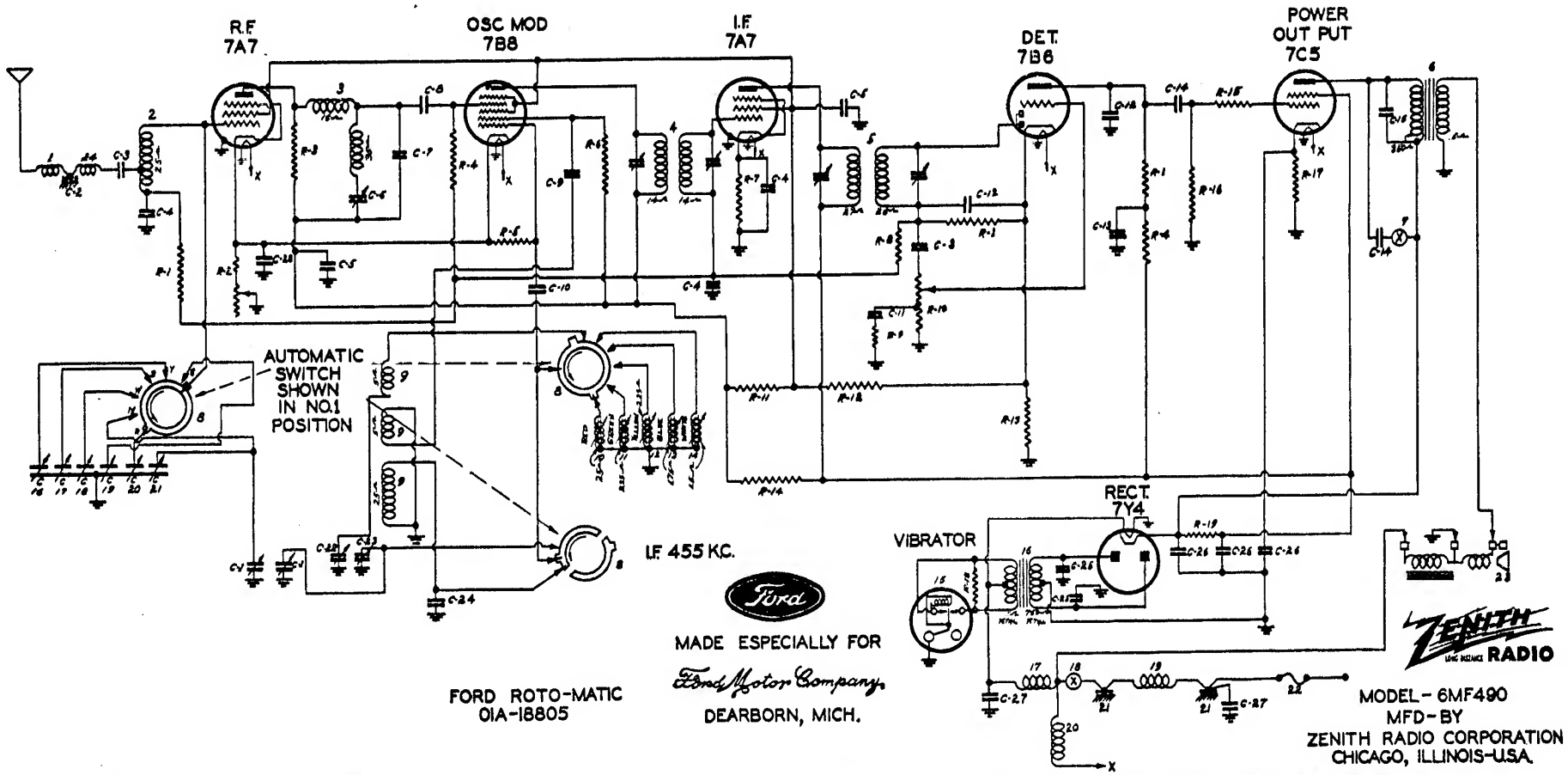


FIG. 8

If difficulty is experienced in setting up the adjusting screws for a desired station, first turn the bottom adjustment screw down tight and then adjust the top screw to the station and follow with an adjustment of the bottom screw for greatest volume.



DIAG. NO.	PART NO.	DESCRIPTION
C-1	22-949	2 GANG VARIABLE
2		5MMFD-LOW REACT.
3	22-185	.01 MFD. -200 V
4	22-250	.05 MFD. -200 V
5	22-170	.1 MFD. -400 V
6	22-901	45MMFD. TRIMMER
7	22-988	20MMFD. MICA
8	22-901	115MMFD. TRIMMER
9	22-82	.001 MFD. - 600 V
10	22-162	100 MMFD. MICA
11	22-906	.005 MFD. - 200 V
12	22-182	250 MMFD. MICA
13	22-212	.05 MFD. - 400 V
14	22-435	.02 MFD. - 600 V
C-15	22-838	.005 MFD. - 600 V
16	22-947	70-375 MMFD. ANTENNA AUTO. TRIMMER STRIP
17		50-300 MMFD.
18		35-250 MMFD.
19		18-160 MMFD.
20		13-160 MMFD.
21		2-18 MMFD.
22	22-902	MAN. OSC. PADDER
23	22-902	MAN. OSC. TRIMMER
24	22-956	500 MMFD. SILVER MICA
25	22-782	.012 MFD. - 600 V
26	22-955	10-1020 MMFD. 400-350 25 V
27	22-908	.5 MFD. - 120 V
28	22-190	1.1 MFD. - 200 V

DIAG. NO.	PART NO.	DESCRIPTION
R-1	63-717	220 M. OHMS 1/4 W
2	63-994	SEN. CONT.
3	63-640	8200 OHMS 1/4 W
4	63-595	100 M. OHMS 1/4 W
5	63-695	47 M. OHMS 1/4 W
6	63-972	15 M. OHMS 1 W
7	63-410	1200 OHMS 1/4 W
8	63-271	1 MEG OHM 1/4 W
9	63-592	33 M. OHMS 1/4 W
10	63-073	VOL. CONT. & SW.

DIAG. NO.	PART NO.	DESCRIPTION
R-11	63-947	27 M. OHMS 2 W
12	63-1059	39 M. OHMS 1/2 W
13	63-632	560 OHMS 1/4 W
14	63-584	500 OHMS 1/4 W
15	63-695	47 OHMS 1/4 W
16	63-719	470 M. OHMS 1/4 W
17	63-94	330 OHMS 1 W
18	63-971	220 OHMS 1/4 W
19	63-968	1800 OHMS 2 W

DIAG. NO.	PART NO.	DESCRIPTION
1	S-6868	ANT. MOTOR NOISE CHOKE
2	S-7588	ANT. COIL ASSEM.
3	S-7572	R.F. COIL ASSEM.
4	S-7573	1ST I.F. TRANS.
5	S-7574	2ND I.F. TRANS.
6	95-640	OUTPUT TRANS.
7	85-208	TONE CONT. SWITCH
8	85-207	AUTOMATIC SWITCH
9	S-7544	MAN. OSC. COIL ASSEM.
10	S-7745	AUTO. OSC. COIL ASSEM.
11	S-7746	
12	S-7747	
13	S-7748	
14	S-7749	

DIAG. NO.	PART NO.	DESCRIPTION
15	190-15	VIBRATOR
16	95-641	POWER TRANS.
17	20-213	MAIN HASH CHOKE
18		SWITCH ON VOL. CONT.
19	S-5844	MOTOR NOISE CHOKE
20	20-217	HEATER LINE CHOKE
21		LOW REACTOR
22	136-11	FUSE
23	49-341	SPEAKER
24	S-7760	MOTOR NOISE CHOKE

FIG. 9—CIRCUIT DIAGRAM

MODEL 6MF490
FORD ROTO-MATIC
O1A—18805

MANUAL TUNING ASSEMBLY

12-737	Bracket—condenser mounting	$0.10
12-738	Bracket—dial drum support	.04
22-949	Condenser—two gang variable	2.25
26-237	Scale—manual tuning	.05
34-91	Gear—idler	.04
34-94	Gear—clutch	.12
35-4	Drum—manual tuning	.12
46-307	Knob—manual tuning control	.20
80-217	Spring—for 34-91 gear	.25 C
80-213	Spring—for 34-94 clutch	.01
93-125	No. 6 Shakeproof lockwasher	.25 C
94-313	Bushing—dial drum	.03
94-317	Bushing—condenser mounting	.02
97-130	Stud—dial drum retaining	.06
97-133	Stud—tuning knob retaining	.08
112-38	Screws—No. 6-32 x 5/16" for studs	.25 C
114-63	Screws—No. 6-32 x 3/16" Hex acorn head	.25 C
114-67	Screws—No. 6-32 x 7/16" Hex acorn head	.35 C
125-24	Rubber grommet for mounting condenser	.015
188-34	Retaining ring	.01
S7828	Bracket and stud for idler gear	.10

VOLUME CONTROL ASSEMBLY

22-906	Condenser—.005 mfd. 200 volts	.15
34-92	Gear—volume control shaft	.08
34-93	Gear—idler	.04
46-306	Knob—volume control	.20
54-62	Nut—3/8"-32 x 5/16" Hex	1.25 C
63-592	Resistor—33M ohms 1/4 watt	.07
63-1073	Volume control	1.50
93-125	No. 6 Shakeproof lockwasher	.25 C
93-143	3/8" Shakeproof lockwasher	.40 C
93-455	Insulating washer for volume control	.01
94-314	Bushing—for 46-306 knob	.45 C
97-134	Stud—for 46-306 knob	.07
112-38	Screw—No. 6-32 x 5/16" Binding head N. P.	.25 C
112-207	Screw—No. 4-40 x 3/16" Binding head brass	.03
188-34	Retaining ring	.01
S7839	Bracket and stud for idler gear	.10

AUTOMATIC TUNING COIL ASSEMBLY

S6226	Adjustment screw and bushing	.25
S7745	Automatic coil (red)	.20
S7746	Automatic coil (green)	.20
S7747	Automatic coil (yellow)	.20
S7748	Automatic coil (blue)	.20
S7749	Automatic coil (white)	.20
S7822	Mounting bracket and terminal strip	.15
22-947	Trimmer condenser (6 section)	1.00
54-124	No. 12-32 x 3/8" Hex nut	.30 C
80-214	Spring	.02
83-734	Armite strip	.005
93-125	No. 6 Shakeproof lockwasher	.25 C
93-372	No. 12 Shakeproof lockwasher	.50 C
112-82	No. 6-32 x 1/8" Binding head machine screw N. P.	.40 C

AUTOMATIC TUNING SWITCH AND DRUM ASSEMBLY

12-742	Bracket—condenser locking	.03
22-162	Condenser—.0001 mfd. 600 volt	.15
22-983	Condenser—oscillator padder	.35
26-236	Scale—automatic tuning	.04
35-3	Drum—automatic dial	.12
46-309	Switch knob	.03
85-207	Switch—automatic	1.65
93-125	No. 6 Shakeproof lockwasher	.25 C
93-149	Washer—fibre	.65 M
94-315	Bushing—dial drum	.04
97-131	Stud—dial drum retaining	.08
112-38	Screw—No. 6-32 x 5/16" Binding head	.25 C
114-113	Screw—No. 6-32 x 3/4" Hex acorn head S. B.	.40 C

COILS

20-213	Main hash choke	.20
20-217	Heater line hash choke	.15
S6868	Motor noise choke coil	.25
S7544	Manual oscillator coil assembly	
S7572	R.F. coil and shield assembly	1.75
S7573	1st I.F. transformer	1.35
S7574	2nd I.F. transformer	1.35
S7588	Antenna coil—less shield	.75
S7760	Motor noise choke	.25

SPEAKER COVER ASSEMBLY

49-341	7" Dynamic speaker	4.00
	*207-341 field coil	2.00
	*208-341 cone and voice coil	2.00
	*Note—when ordering field coil or cone assy. give complete number and letters shown on part.	
54-30	No. 8-32 x 5/16" Hex nut	.25 C
78-300	Socket and bracket—dial lamp	.10
78-302	Socket and bracket—dial lamp	.10
80-141	Spring for socket	.30 C
83-724	Pin jack terminal strip	.15
85-208	Switch—tone control	.20
93-337	Washer for socket	.35 C
94-252	Bushing for socket	.02
100-36	Pilot lamp	.09
114-111	No. 8-32 x 1/2" Hex acorn head machine screw S.B.	.45 C
126-349	Shield for pilot lamp	.015
196-27	Rubber gasket for speaker grille	.45

CONDENSERS

22-82	.001 mfd. moulded condenser—600 volt	.20
22-127	25 mfd. moulded condenser—600 volt	.15
22-162	.0001 mfd. moulded condenser—600 volt	.15
22-170	.1 mfd. tubular condenser—400 volt	.20
22-182	.00025 mfd. moulded condenser—600 volt	.20
22-185	.01 mfd. tubular condenser—200 volt	.15
22-190	.1 mfd. tubular condenser—200 volt	.18
22-212	.05 mfd. tubular condenser—400 volt	.15
22-250	.05 mfd. tubular condenser—200 volt	.15
22-271	Voltage regulator condenser	.50
22-435	.02 mfd. tubular condenser—600 volt	.15
22-497	Oil gauge condenser	.50
22-782	.012 mfd. tubular condenser—600 volt	.15
22-899	1st I.F. transformer trimmer condenser	.25
22-900	2nd I.F. transformer trimmer condenser	.20
22-901	R.F. coil trimmer condenser	.25

3-906	.005 mfd. tubular condenser—200 volt	.15
3-908	.5 mfd. tubular condenser—120 volt	.25
3-947	Multiple section trimmer condenser	1.00
3-949	Two gang variable condenser	2.25
3-955	10 mfd. dry electrolytic—400 volt	
	10 mfd. dry electrolytic—350 volt	
	20 mfd. dry electrolytic—25 volt	1.25
2-956	500 mmfd. Silvercap condenser	.35
2-957	.02 mfd. tubular condenser—600 volt	.25
2-963	.005 mfd. tubular condenser—600 volt	.15
2-971	Distributor condenser	.35
2-983	Oscillator padder condenser	.35

RESISTORS

3-271	1 megohm—¼ watt	.07
3-296	220M ohm—¼ watt	.07
3-410	1200 ohm—¼ watt	.07
3-584	1500 ohm—¼ watt	.07
3-590	15M ohm—¼ watt	.07
3-592	33M ohm—¼ watt	.07
3-593	47M ohm—¼ watt	.07
3-595	100M ohm—¼ watt	.07
3-695	47 ohm—¼ watt	.15
3-717	220M ohm—¼ watt	.15
3-719	470M ohm—¼ watt	.15
3-738	560 ohm—¼ watt	.15
3-947	27M ohm—2 watt	.30
3-948	330 ohm—1 watt	.20
3-968	1800 ohm—2 watt	.30
3-971	220 ohm—½ watt	.08
3-972	15M ohm—1 watt	.20
3-994	Sensitivity control	1.00
3-1059	39M ohm—½ watt	.17
3-1073	Volume control and switch	1.50

MISCELLANEOUS

52-153	Battery cable—set to fuse	.15
52-154	Battery cable—fuse to ammeter	.15
54-134	Antenna connector retaining nut	.015
57-785	Escutcheon plate	.35
78-281	Socket—vibrator	.10
78-294	Socket—locktal tubes	.15
93-456	Cushion washer—vibrator	.015
95-640	Output transformer	1.10
95-641½	Power transformer	2.50
112-239	No. 4-36 x ¼" oval binding head screw S.B.	.20 C
112-256	Set mounting screw	.01
114-46	No. 6 x $\frac{3}{16}$" Hex acorn head self tapping screw	.30 C
114-109	No. 6 x ¼" Hex acorn head self tapping screw	.35 C
114-110	No. 4-40 x $\frac{7}{32}$" Hex head slotted screw	.40 C
114-112	No. 6-32 x ½" Hex acorn head machine screw	.50 C
125-17	Rubber grommet	.015
125-24	Rubber grommet	.015
136-11	Fuse—14 ampere	.06
159-37	Plug button	.03
190-15	Vibrator	2.95
196-28	Gasket for escutcheon	.02
202-159	Owners manual	.10
S7701	Antenna connector assembly	.25
S7823	Power pack shield	.40
S7832	Dummy antenna	
S7837	Sensitivity control and bracket (63-994)	1.00
S7787	Condenser kit	
	22-271 voltage regulator condenser	.45
	22-497 oil gauge condenser	.40
	22-971 distributor condenser	.35
S7846	Installation kit	
	54-123 No. 10-24 wing nuts	.02
	94-312 Antenna connector insulating bushing	.04
	97-127 Antenna connector stud	.30
	112-256 Hook mounting screw	1.20 C

All Price Lists Subject to Regular Discount and Change Without Notice

SERVICE MANUAL

ZENITH
LONG DISTANCE RADIO
TRADE MARK REG

1940 RECEIVERS

SEE FORM H5R FOR 1940 ADVANCE LINE DATA

ZENITH RADIO CORPORATION

CHICAGO, U.S.A.

Form H6 PRICE 10 CENTS Printed in U.S.A.

ALIGNMENT INSTRUCTIONS

The proper procedure for the correct alignment of each chassis is outlined on the page opposite each circuit diagram.

In order to obtain proper alignment of the chassis when using a wavemagnet the signal generator should be coupled to the wavemagnet by means of a single turn loop approximately one foot in diameter. The leads of the signal generator may be connected together forming a satisfactory loop which should be placed about two feet from the receiver.

The chassis drawing shows all trimmers to correspond to the alignment chart. Corresponding letters are also shown adjacent to each trimmer on the circuit diagrams.

The operations are outlined in consecutive order, and the instructions are under the following headings —

OSC. CONNECTED TO — tells where the output of the service oscillator is to be connected.

DUMMY — gives the proper capacity or resistance which should be connected in series with the service oscillator output.

INPUT SIGNAL FREQUENCY — Set test oscillator to frequency shown.

BAND — Set the receiver band switch to the position shown.

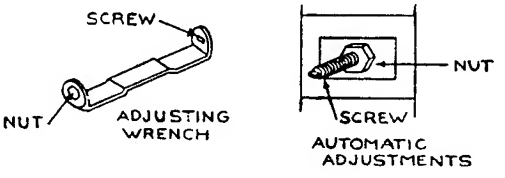
DIAL — The receiver should be set at the frequency shown.

TRIMMER — This column tells which trimmer (or trimmers) are to be adjusted for each operation. The chassis drawing has each trimmer indicated by a letter corresponding to the instructions.

PURPOSE — This column tells what is being accomplished by each operation.

If these instructions are carefully followed each chassis will be easily and correctly realigned.

The use of a wavemagnet requires two adjustments for each automatic button. These adjustments are made with a special wrench (part No. 68-1) supplied with each receiver. The center or screw adjustment controls the oscillator circuit and the nut tunes the wavemagnet or antenna input — see illustration at right.



VOLTAGE CHARTS

The voltages appearing on each socket contact are shown on the chassis drawings. Voltages are measured with a 1000 ohm per volt meter and allowance should be made for variations in line voltage or if a voltmeter of different rating is used in making tests.

SERVICE NOTES

GENERAL:

Noisy when jarred — orange resistor on loop loading coil grounding against chassis.

Broken or loose leads in 6U5 socket.

Black wire on S.W. antenna coil not grounded properly to aeroplane terminal.

Noisy wavemagnet—rubber insulation of loop lead touching trimmer lug, antenna terminal, or other end of loop winding. Noise will be most noticeable at higher frequencies.

Poor connection to loop shields.

CHASSIS 5808 — 1005 — 1103

Oscillates at 550 K.C.—improper adjustment of wave trap—too high resistance in plate circuit of 1232 tube.

Automatic dead or antenna trimmer won't peak—usually due to open winding on compensating coil.

SERVICE NOTES — (Continued)

Noisy tuning—Ground braid of gang rubbing against flywheel—Burrs on drive shaft shorting to volume control shaft.

Dial pulley rubbing against dial or chassis.

Tuning Indicator inoperative—resistor inside socket shorting to socket prong—loose lead in socket—cathode lug on voltage divider grounded by solder.

Set blocks—usually due to broken resistor in A.V.C. circuit of first detector.

CHASSIS 5724 — 5725

Noisy tuning on automatic.
- Poor contact in speaker socket.
- Washer on latch bar grounding lug.
- Poor contact on band switch.
- Aeroplane lug on automatic grounding to No. 5 push rod.
- Automatic trimmer shorting.

Signal cuts out above 1400 K.C.
- 5 megacycle trimmer screwed in too tight.

Signal cuts out on local—distance switch.
- Defective 6A8 tube.

No change on treble button.
- Insulation of blue tone control lead cut by fastening lug.

Weak audio.
- Poor contact in television switch.
- Open coupling condenser.

Oscillates.
- Open screen bypass.
- Grid lead of 6K7 near A.V.C. lug or near plate lead of 6A8.
- Wave trap open or not properly adjusted.

PHONO MODELS

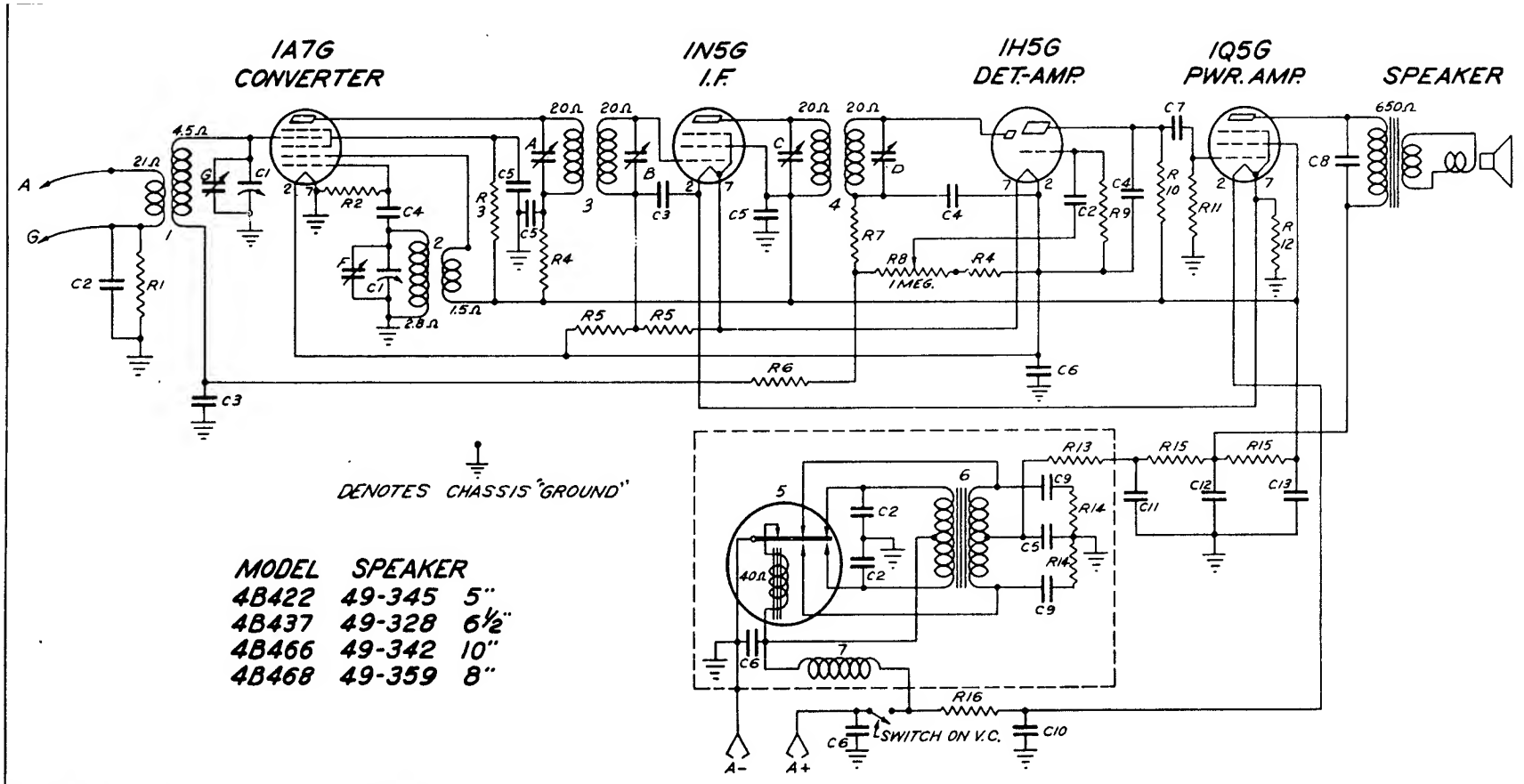
Insensitivity—check phono switch and plug contacts.

Weak phono—check shield on lead from crystal for poor ground.

1205 — 1503 CHASSIS

Improper action of volume control is usually caused by 6J5G in audio stage.

Poor radiorgan action is often caused by defective 6F8G in audio.



DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION
C1	22-695	TWO GANG VARIABLE		R2	63-595	100M OHM	¼ W.			
C2	22-826	.01 MFD.	200V.	R3	63-594	68M OHM	¼ W.	1	20-208	ANTENNA COIL ASSEMBLY
C3	22-829	.05 MFD.	200V.	R4	63-583	1000 OHM	¼ W.	2	S 6381	OSCILLATOR COIL ASSEM.
C4	22-162	.0001 MFD.	600V.	R5	63-296	220M OHM	¼ W.	3	95-589	1ST I.F. TRANS.
C5	22-828	.05 MFD.	400V.	R6	63-669	3.9 MEGOHM	¼ W.	4	95-590	2ND I.F. TRANS.
C6	22-199	.5 MFD.	200V.	R7	63-593	47M OHM	¼ W.	5	190-17	VIBRATOR
C7	22-243	.01 MFD.	400V.	R8	63-1079	VOLUME CONTROL		6	95-635	POWER TRANSFORMER
C8	22-448	.004 MFD.	600V.	R9	63-604	10 MEGOHM	¼ W.	7	S 5043	CHOKE ASSEMBLY
C9	22-966	.04 MFD.	600V.	R10	63-271	1 MEGOHM	¼ W.			
C10	22-961	500MFD. ELECTROLYTIC	15V.	R11	63-600	2.2 MEGOHM	¼ W.			
C11		15MFD. "	250V.	R12	63-1060	90 OHM WIREWOUND	1 W.			
C12	22-742	15MFD. "	250V.	R13	63-577	100 OHM	¼ W.	A		1ST I.F. TRANS. PRI.
C13		10MFD. "	250V.	R14	63-697	100 OHM	¼ W.	B		1ST I.F. TRANS. SEC.
				R15	63-605	1000 OHM	½ W.	C		2ND I.F. TRANS. PRI.
				R16	63-1061	7 OHM	½ W.	D		2ND I.F. TRANS. SEC.
								F		B'DCAST OSC. (ON GANG)
R1	63-597	470M OHM	¼ W.					G		ANT. B'DCAST (ON GANG)

I.F. FREQUENCY 455 KC.
4 TUBE SUPERHETERODYNE
CHASSIS Nº 5417-6V.-SINGLE BAND
ZENITH RADIO CORPORATION
CHICAGO, ILL.

Models 4B422—4B437—4B466—4B468
Chassis No. 5417

NOTE

All voltages measured with a 1000 ohm per volt meter from chassis to socket contacts.

Voltage readings are all positive D.C. unless otherwise indicated.

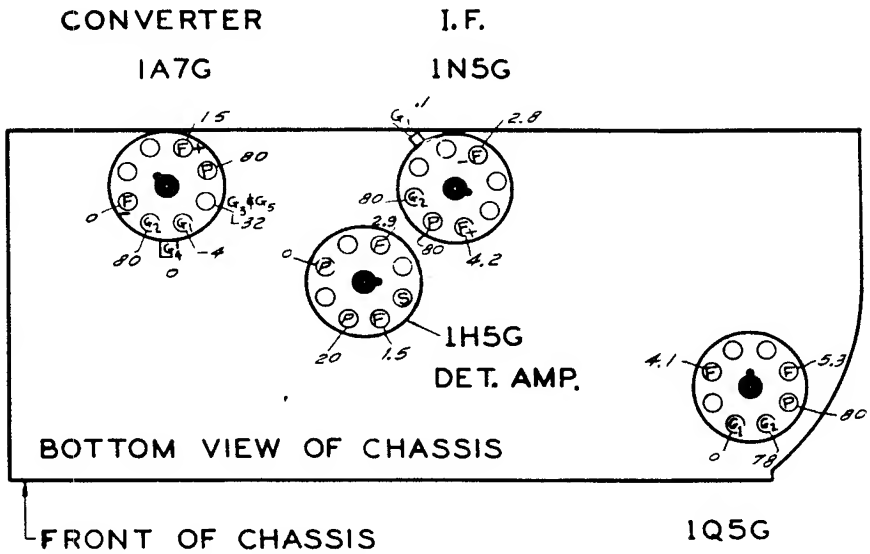
Antenna disconnected volume control full on.

Battery voltage 6 volt.

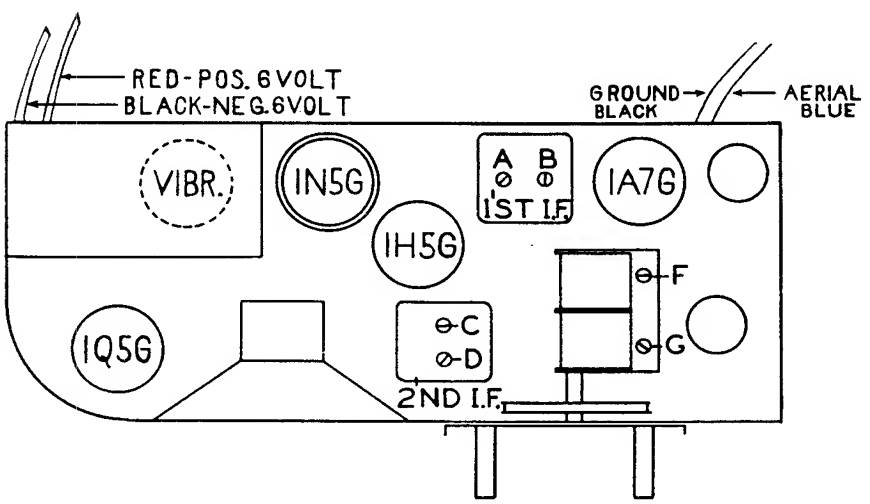
Battery consumption — .4 ampere.

LEGEND

D—Diode
F—Filament
G1—Control Grid
G2—Screen Grid
P—Plate



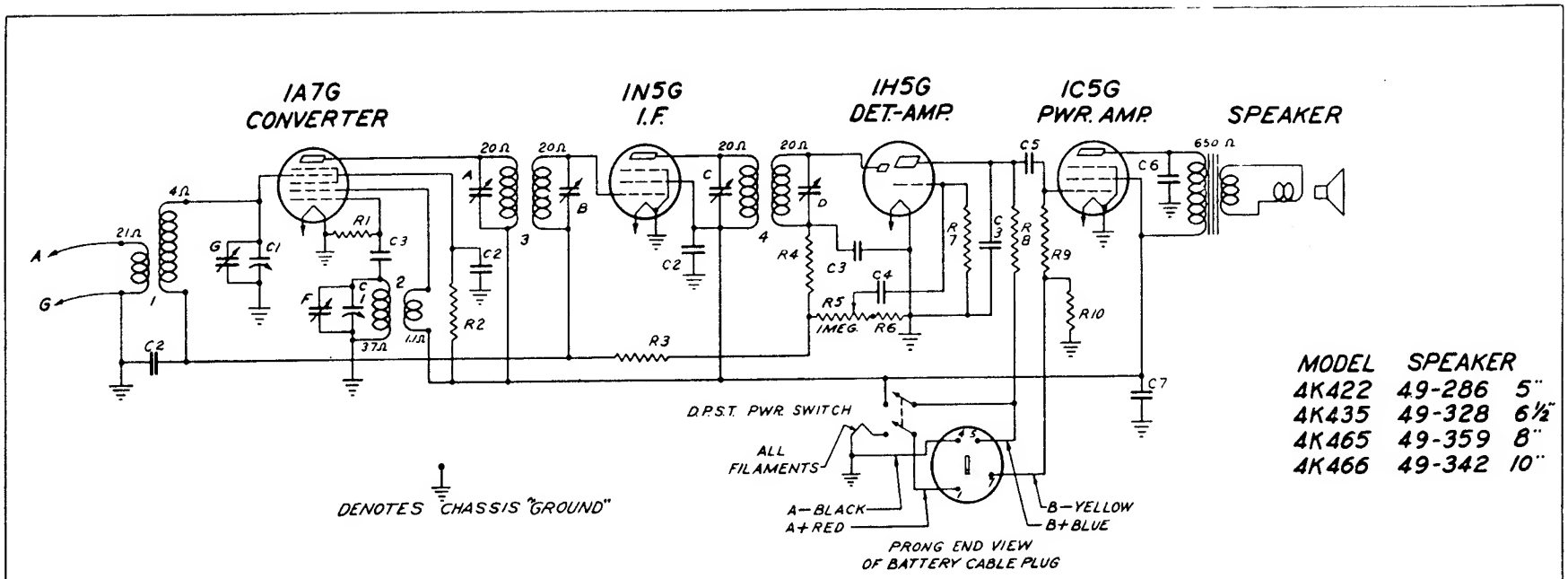
Socket Voltages



Location of Tubes and Trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Adjust Trimmers	Purpose
1	1A7 Grid	½ Mfd.	455 Kc.	Broadcast	600 Kc.	A, B, C, D	I. F. Alignment
2	Antenna	200 Mmf.	1500 Kc.	Broadcast	1500 Kc.	F	Set Oscillator to Scale
3	Antenna	200 Mmf.	1400 Kc.	Broadcast	1400 Kc.	G	Alignment of Antenna



MODEL	SPEAKER	
4K422	49-286	5"
4K435	49-328	6½"
4K465	49-359	8"
4K466	49-342	10"

DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION
C1	22-695	TWO GANG VARIABLE		R4	63-593	47M OHM	¼ W	4	95-590	2ND I.F. TRANS. ASSEM.
C2	22-829	.05 MFD.	200V.	R5	63-1072	VOLUME CONTROL				
C3	22-162	.0001 MFD.	600V.	R6	63-587	4700 OHM	¼ W.			
C4	22-826	.01 MFD.	200V.	R7	63-604	10 MEGOHM	¼ W.			
C5	22-243	.01 MFD.	400V.	R8	63-271	1 MEGOHM	¼ W.	A		1ST I.F. TRANS. PRI.
C6	22-448	.004 MFD.	600V.	R9	63-600	2.2 MEGOHM	¼ W.	B		1ST I.F. TRANS. SEC.
C7	22-684	8 MFD. ELECTROLYTIC	150V.	R10	63-238	1000 OHM	¼ W.	C		2ND I.F. TRANS. PRI.
								D		2ND I.F. TRANS. SEC.
								F		B'DCAST OSC. (ON GANG)
								G		ANT. B'DCAST (ON GANG)
R1	63-654	180M OHM	¼ W.	1	20-208	ANTENNA COIL				
R2	63-594	68M OHM	¼ W.	2	S-7815	OSCILLATOR COIL ASSEM.				
R3	63-669	3.9 MEGOHM	¼ W.	3	95-589	1ST I.F. TRANS. ASSEM.				

1½V. BATTERY PORTABLE
I.F. FREQUENCY 455 KC.
4 TUBE SUPERHETERODYNE
CHASSIS Nº 5420
ZENITH RADIO CORPORATION
CHICAGO, ILL.

Models 4K422—4K435—4K465—4K466

Chassis No. 5420

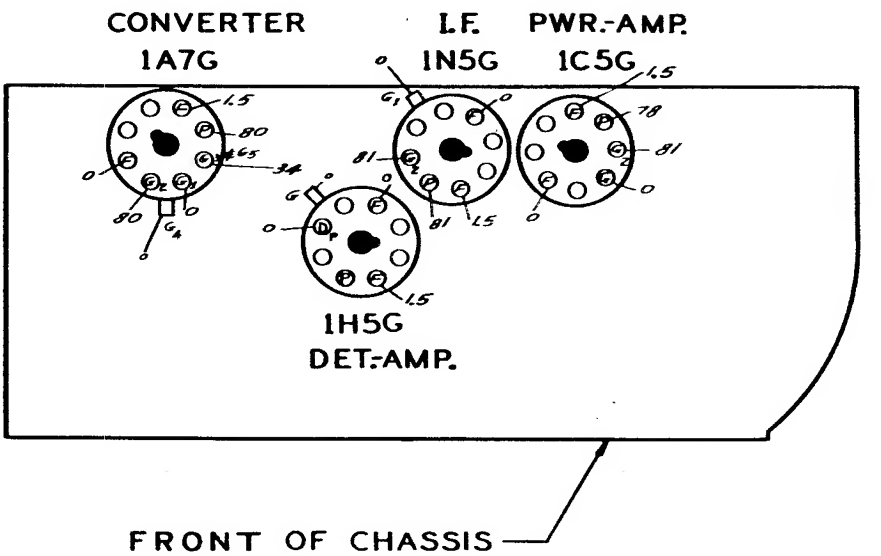
NOTE

All voltages measured with a 1000 ohm per volt meter from chassis to socket contacts using a fresh Z28 battery pack.

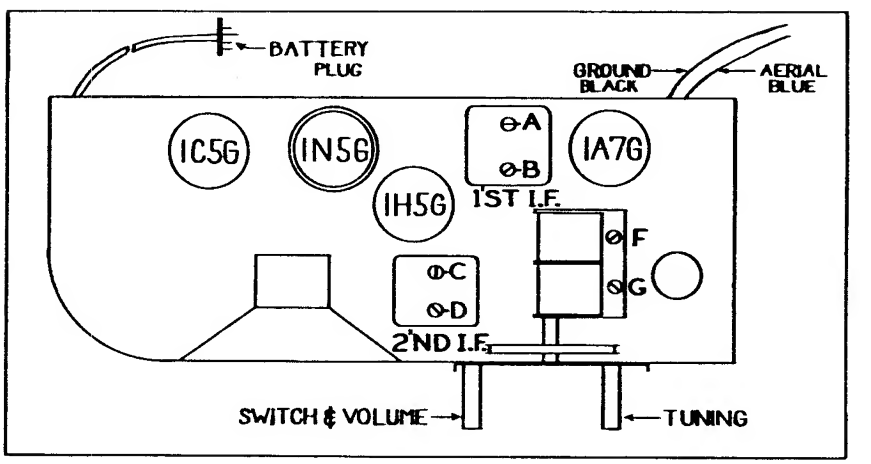
Antenna disconnected — volume control full on.

LEGEND

F—Filament
D—Diode
G1—Control Grid
G2—Screen Grid
P—Plate



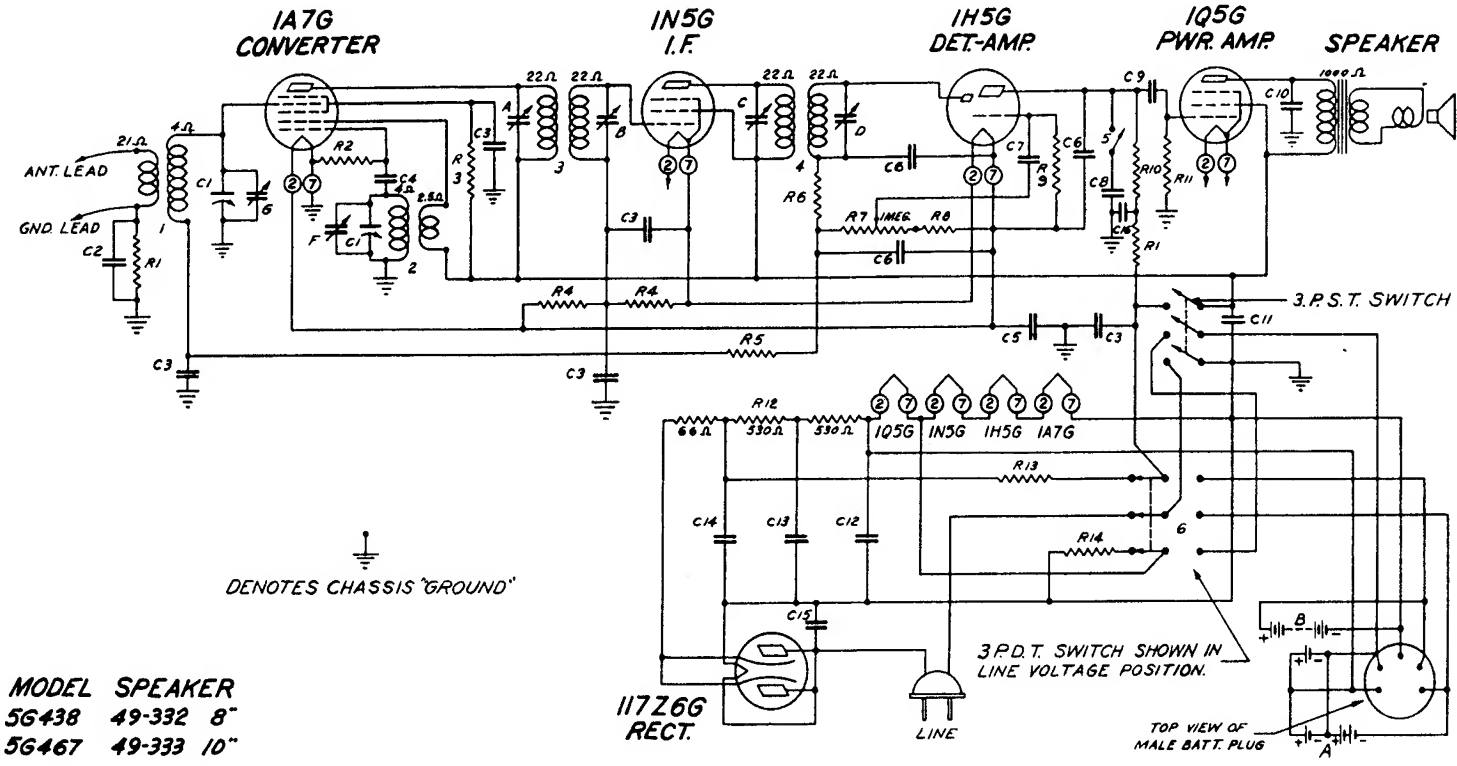
Socket Voltages



Location of Tubes and Trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Adjust Trimmers	Purpose
1	1A7 Grid	½ Mfd.	455 Kc.	Broadcast	600 Kc.	A, B, C, D	I. F. Alignment
2	Antenna	200 Mmf.	1500 Kc.	Broadcast	1500 Kc.	F	Set Oscillator to Scale
3	Antenna	200 Mmf.	1400 Kc.	Broadcast	1400 Kc.	G	Alignment of Scale



MODEL SPEAKER
5G438 49-332 8"
5G467 49-333 10"

DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION
C1	22-910	TWO GANG VARIABLE		R1	63-597	470 M OHM	½ W.	1	20-208	ANTENNA COIL
C2	22-196	.01 MFD.	600V.	R2	63-652	120 M OHM	½ W.	2	5-6381	OSC. COIL ASSEMBLY
C3	22-829	.05 MFD.	200V.	R3	63-713	47 M OHM	½ W.	3	95-593	1ST I.F. TRANS.
C4	22-182	.00025 MFD.	600V.	R4	63-296	220 M OHM	½ W.	4	95-594	2ND I.F. TRANS.
C5	22-350	.25 MFD.	200V.	R5	63-669	3.9 MEGOHM	½ W.	5	85-187	TONE CONTROL SWITCH
C6	22-166	.0001 MFD.	600V.	R6	63-593	47 M OHM	½ W.	6	85-198	POWER SWITCH
C7	22-826	.01 MFD.	200V.	R7	63-1081	VOLUME CONTROL				
C8	22-887	TONE CONTROL COND.		R8	63-583	1000 OHM	½ W.			
C9	22-243	.01 MFD.	400V.	R9	63-604	10 MEGOHM	½ W.	A		1ST I.F. TRANS. PRI.
C10	22-448	.004 MFD.	600V.	R10	63-271	1 MEGOHM	½ W.	B		1ST I.F. - SEC.
C11	22-928	40 MFD. ELECTROLYTIC	150V.	R11	63-600	2.2 MEGOHM	½ W.	C		2ND I.F. - PRI.
C12		20 MFD. -	25V.	R12	63-1041	3 SECTION CANDOHM		D		2ND I.F. - ½ SEC.
C13	22-879	60 MFD. -	150V.	R13	63-605	1000 OHM	½ W.	F		BROADCAST OSC. (ON GANG)
C14		60 MFD. -	150V.	R14	63-1012	90 OHM WIREWOUND	½ W.	G		ANTENNA BDCAST (ON GANG)
C15	22-869	.05 MFD.	400V.							
C16	22-138	.2 MFD.	200V.							

I.F. FREQUENCY 455KC
5 TUBE SUPERHETERODYNE
110V. A.C.-BATT. PACK-UNIVERSAL
CHASSIS Nº 5536
ZENITH RADIO CORPORATION
CHICAGO, ILL.

Models 5G438—5G467

Chassis No. 5536

NOTE

All voltages measured with a 1000 ohm per volt meter from chassis to socket contact indicated.

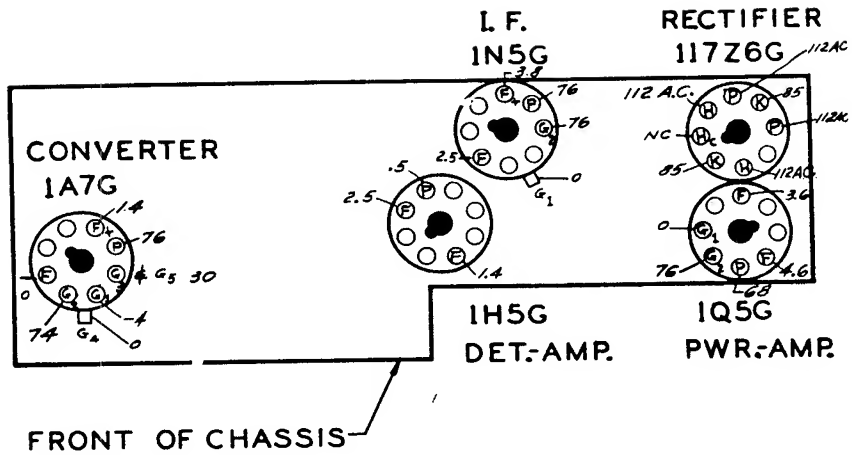
All voltages are positive D.C. unless marked otherwise.

Volume control on full.

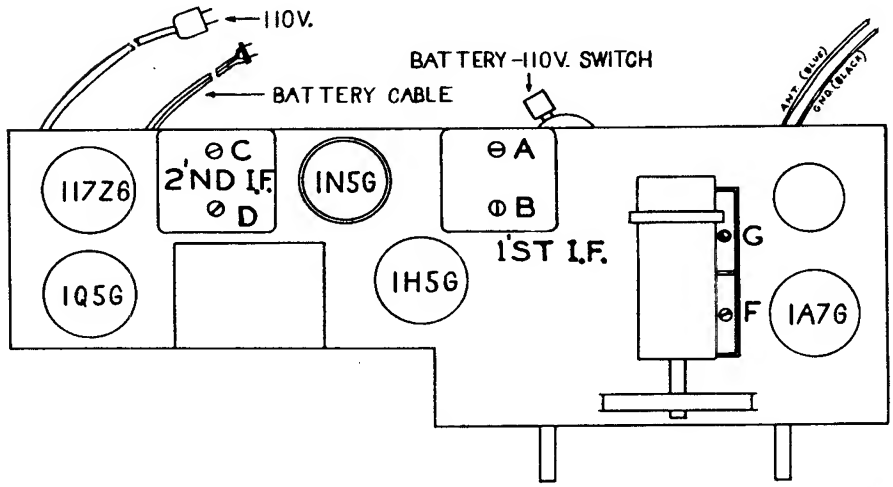
Line voltage 112 v. A.C.

LEGEND

F—Filament
H—Heater
D—Diode
G1—Control Grid
G2—Screen Grid
G3—Suppressor Grid
P—Plate
K—Cathode



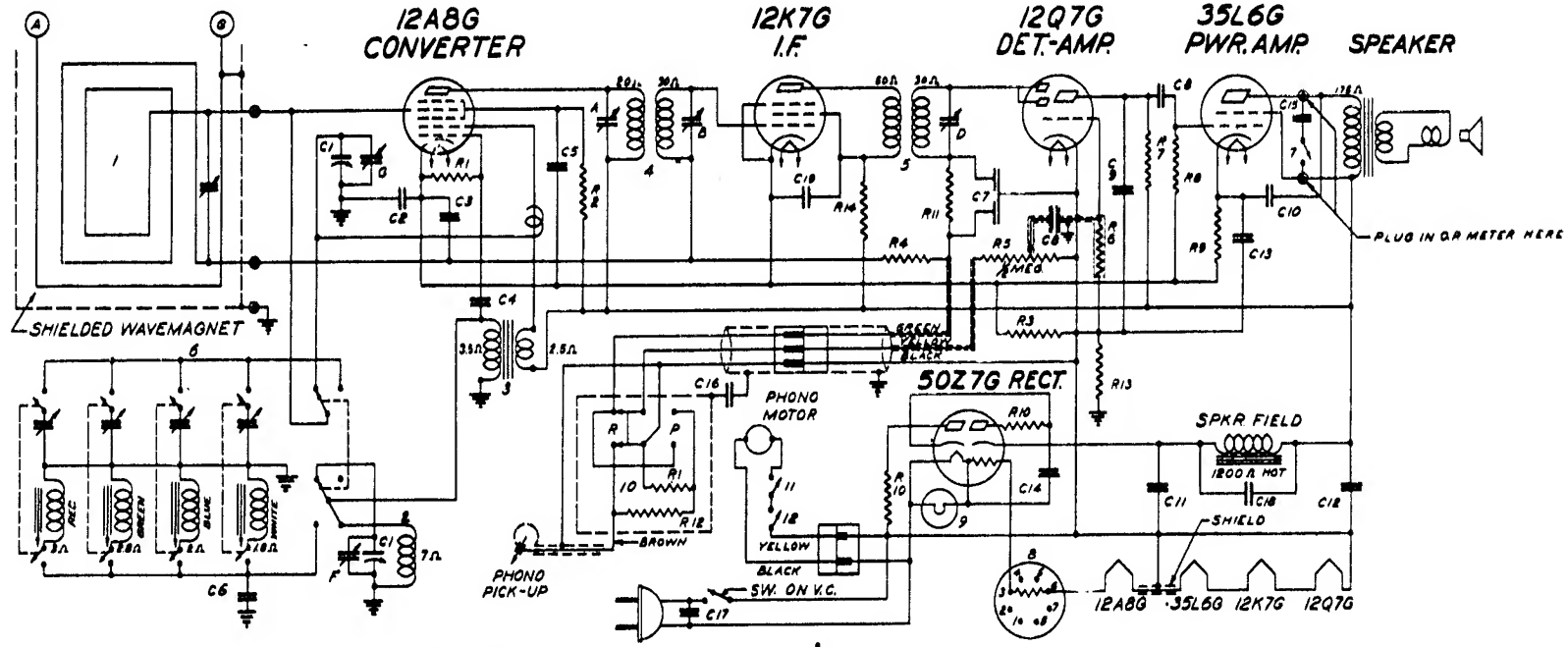
Socket Voltages



Location of Tubes and Trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Adjust Trimmers	Purpose
1	1A7 Grid	½ Mfd.	455 Kc.	Broadcast	600 Kc.	A, B, C, D	I. F. Alignment
2	Antenna	200 Mmf.	1500 Kc.	Broadcast	1500 Kc.	F	Set Oscillator to Scale
3	Antenna		1400 Kc.	Broadcast	1400 Kc.	G	Alignment of Antenna



DIAG. NO	PART NO	DESCRIPTION		DIAG NO	PART NO	DESCRIPTION		DIAG NO	PART NO	DESCRIPTION
C1	22-885	TWO-GANG VARIABLE						4	56902	1ST I.F. TRANS. ASSEMBLY
C2	22-938	.8MFD.	200V.					5	56903	2ND I.F. TRANS. "
C3	22-850	.05MFD.	200V.	R1	63-713	47M OHM	½W.	6	56997	AUTOMATIC TUNING UNIT ASSEM.
C4		100 MMFD.		R2	63-591	22M OHM	½W.	7	MS517	TONE CONTROL SWITCH
C5	22-841	.02 MFD.	200V.	R3	63-572	15 OHM	½W.	8	100-79	BALLAST TUBE
C6	22-866	COMPENSATING COND.		R4	63-600	2.2 MEGOHM	½W.	9	100-39	PILOT LIGHT BULB 2.9V. .17A.
C7		DUAL 100 MMFD.		R5	63-1028	VOLUME CONTROL		10	85-192	PHONO SWITCH
C8	22-837	.01 MFD.	400V.	R6	63-724	4.7 MEGOHM	½W.	11	85-181	AUTOMATIC STOP SWITCH
C9	22-833	.0005 MFD.	600V.	R7	63-696	220 M OHM	½W.	12	85-191	A.C. SWITCH
C10	22-836	.03 MFD.	400V.	R8	63-597	470 M OHM	½W.			
C11		(20 MFD. ELECTROLYTIC	250V.	R9	63-686	150 OHM WIREWOUND	1W.			
C12	22-894	20 " "	150V.	R10	63-1023	2.2 OHM "	1W.			
C13		20 " "	25V.	R11	63-593	47 M OHM	½W.	A		1ST I.F. TRANS PRI.
C14	22-893	20 MFD. "	200V.	R12	63-719	470M OHM	½W.	B		1ST I.F. " SEC.
C15	22-844	TONE CONTROL COND.		R13	63-717	220M OHM	½W.	D		2ND I.F. " SEC.
C16	22-185	.01 MFD.	200V.	RM	63-588	1000 OHM	½W.	F		BROADCAST OSC. (ON GANG)
C17	22-875	.15 MFD.	400V.	1		WAVEMAGNET ASSEMBLY		G		ANTENNA BROADCAST (ON GANG)
C18	22-880	.04 MFD.	400V.	2	56927	OSCILLATOR COIL ASSEM.				
C19	22-812	.05MFD.	400V.	3	56942	OSC. COUPLER COIL ASSEM.				

MODEL 6R485 SPEAKER 49-320 8"

I.F. FREQUENCY 455KC
6 TUBE SUPERHETERODYNE
VOLTAGE DOUBLER A.C.
CHASSIS Nº5672-P
ZENITH RADIO CORPORATION
CHICAGO, ILL.

Model 6R485

Chassis No. 5672P

Model 6R485

CHASSIS No. 5672P

NOTE

All voltages measured with a 1000 ohm per volt meter from chassis to socket contact indicated.

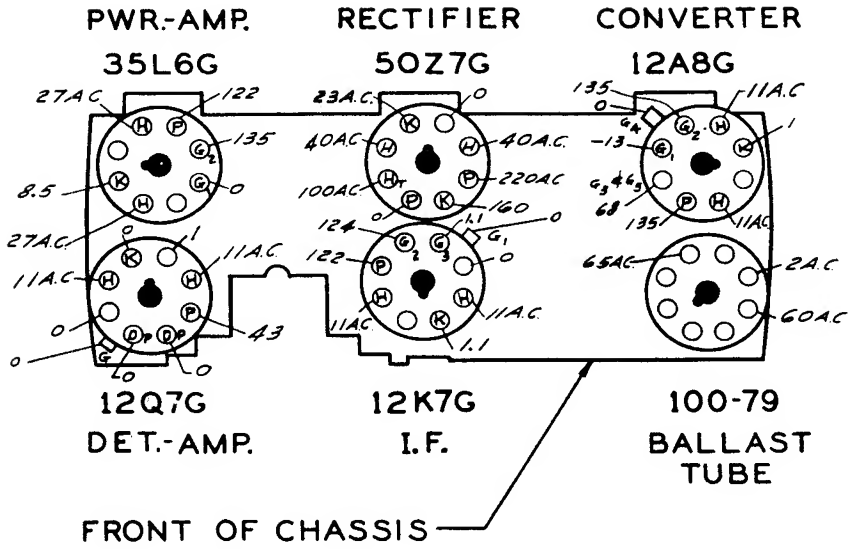
All voltages are positive D.C. unless marked otherwise.

Volume control on full.

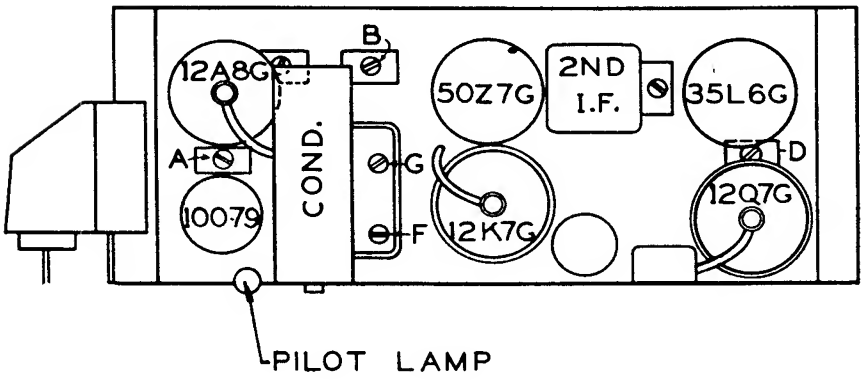
Line voltage 112 v. A.C.

LEGEND

F—Filament
H—Heater
D—Diode
G1—Control Grid
G2—Screen Grid
G3—Suppressor Grid
P—Plate
K—Cathode



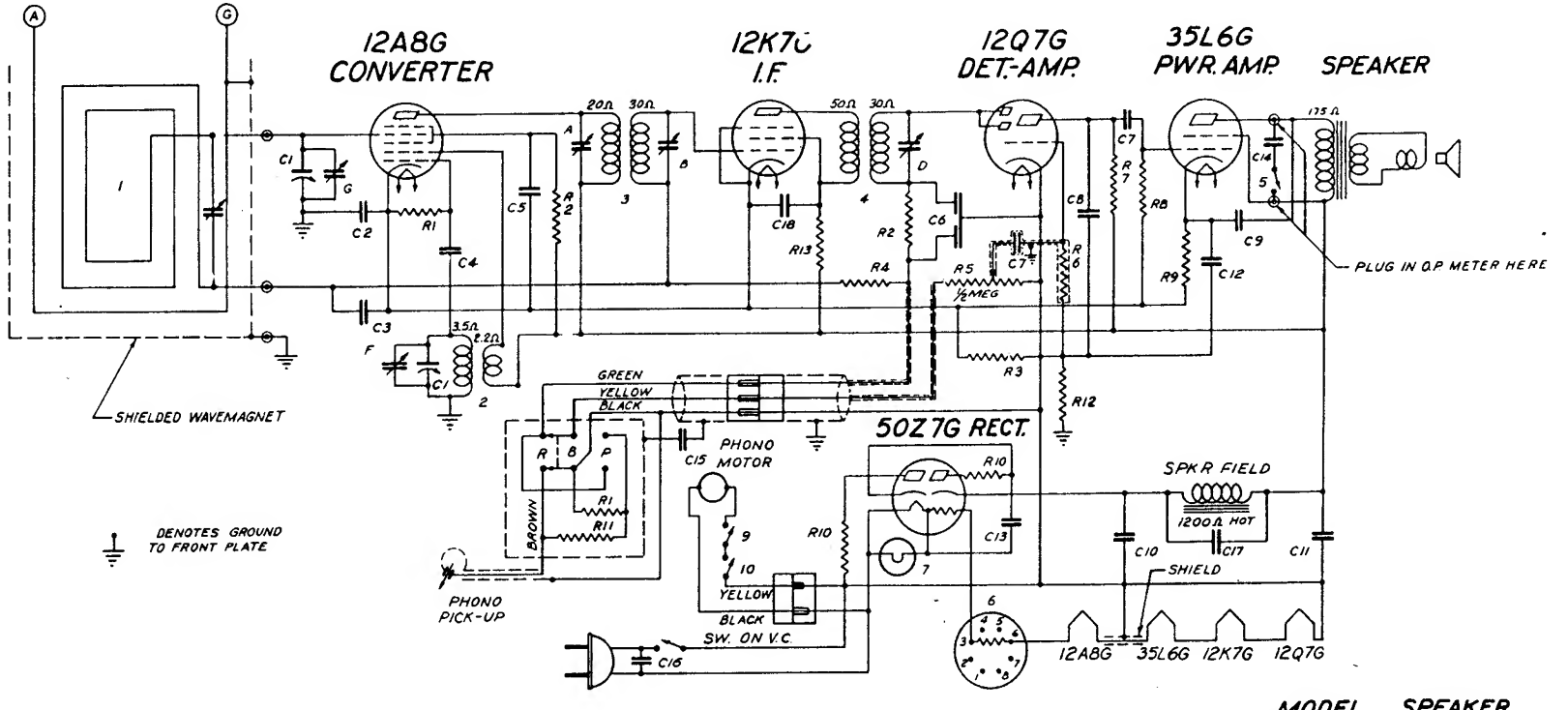
Socket Voltages



Location of Tubes and Trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	.5 Mfd.	455 Kc.	Broadcast	600 Kc.	A, B, D	I. F. Alignment
2	Single Turn Loop Loosely	——	1500 Kc.	Broadcast	1500 Kc.	F	Set Oscillator to Scale
3	Coupled to Wave Magnet	——	1500 Kc.	Broadcast	1500 Kc.	G	Alignment of Antenna



MODEL 6R481 SPEAKER 49-326 5"

DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION
C1	22-885	TWO-GANG VARIABLE		C15	22-185	.01 MFD.	200V.	R10	63-1023	22 OHM WIREWOUND	1/2 W.	9	85-181	AUTOMATIC STOP SW.
C2	22-938	.2 MFD.	200V.	C16	22-875	.15 MFD.	400V	R11	63-719	470M OHM	1/4 W.	10	85-191	A.C. SWITCH
C3	22-250	.05 MFD.	200V.	C17	22-980	.04 MFD.	400V	R12	63-717	220M OHM	1/4 W.			
C4		100 MMFD.		C18	22-212	.05 MFD.	400V	R13	63-583	1000 OHM	1/4 W.			
C5	22-841	.02 MFD.	200V.									A		1ST I.F. TRANS. PRI.
C6		DUAL 100 MMFD.		R1	63-713	47M OHM	1/4 W.					B		1ST I.F. " SEC.
C7	22-837	.01 MFD.	400V.	R2	63-593	47 M OHM	1/2 W.	1		WAVEMAGNET ASSEMBLY		C		2ND I.F. " SEC.
C8	22-833	.0005 MFD.	600V.	R3	63-572	15 OHM	1/4 W.	2	56901	OSC. COIL "		D		B'DCAST OSC (ON GANG)
C9	22-836	.03 MFD.	400V.	R4	63-600	2.2 MEGOHM	1/4 W.	3	56902	1ST I.F. TRANS. "		F		ANT. B'DCAST (ON GANG)
C10	22-894	20 MFD. ELECTROLYTIC	250V.	R5	63-1028	VOLUME CONTROL		4	56903	2ND I.F. TRANS. "		G		
C11		20 " "	150V.	R6	63-724	47 MEGOHM	1/4 W	5	MS517	TONE CONTROL SWITCH				
C12		20 " "	25V.	R7	63-296	220M OHM	1/4 W	6	100-79	BALLAST TUBE				
C13	22-893	20 MFD. "	200V.	R8	63-597	470M OHM	1/4 W	7	100-39	PILOT LIGHT 2.9V. 0.17A.				
C14	22-844	TONE CONTROL COND.		R9	63-686	150 OHM WIREWOUND	1/2 W.	8	85-192	PHONO SWITCH				

I.F. FREQUENCY 455KC
6 TUBE SUPERHETERODYNE
VOLTAGE DOUBLER A.C.
CHASSIS Nº5675
ZENITH RADIO CORPORATION
CHICAGO. ILL.

Model 6R481

Chassis No. 5675

Model 6R481

CHASSIS No. 5675

NOTE

All voltages measured with a 1000 ohm per volt meter from chassis to socket contact indicated.

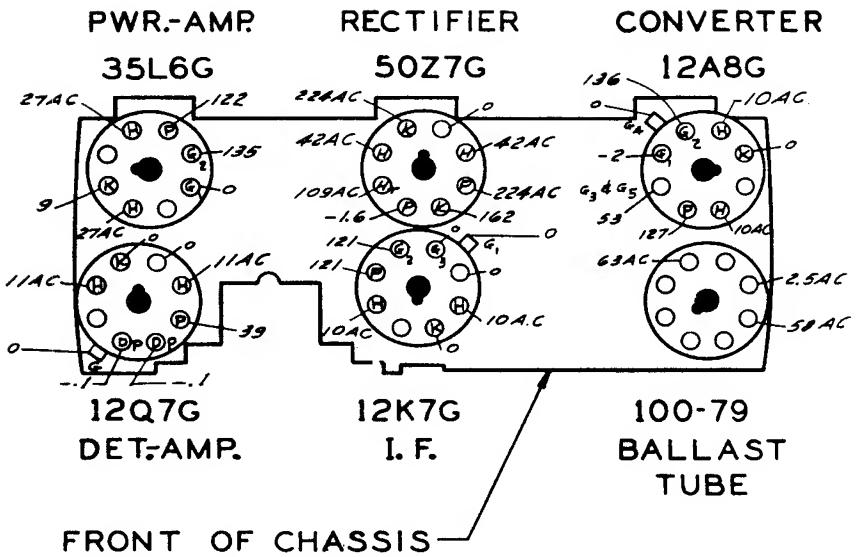
All voltages are positive D.C. unless marked otherwise.

Volume control on full.

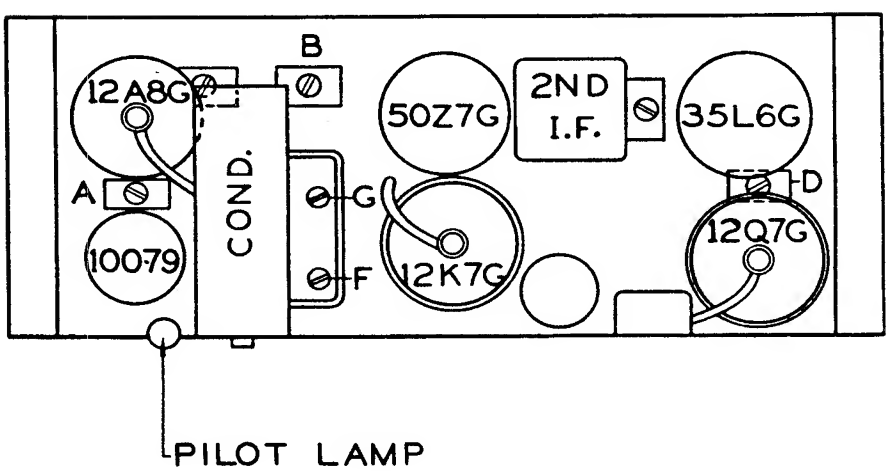
Line voltage 120 A.C.

LEGEND

F—Filament
H—Heater
D—Diode
G1—Control Grid
G2—Screen Grid
G3—Suppressor Grid
P—Plate
K—Cathode



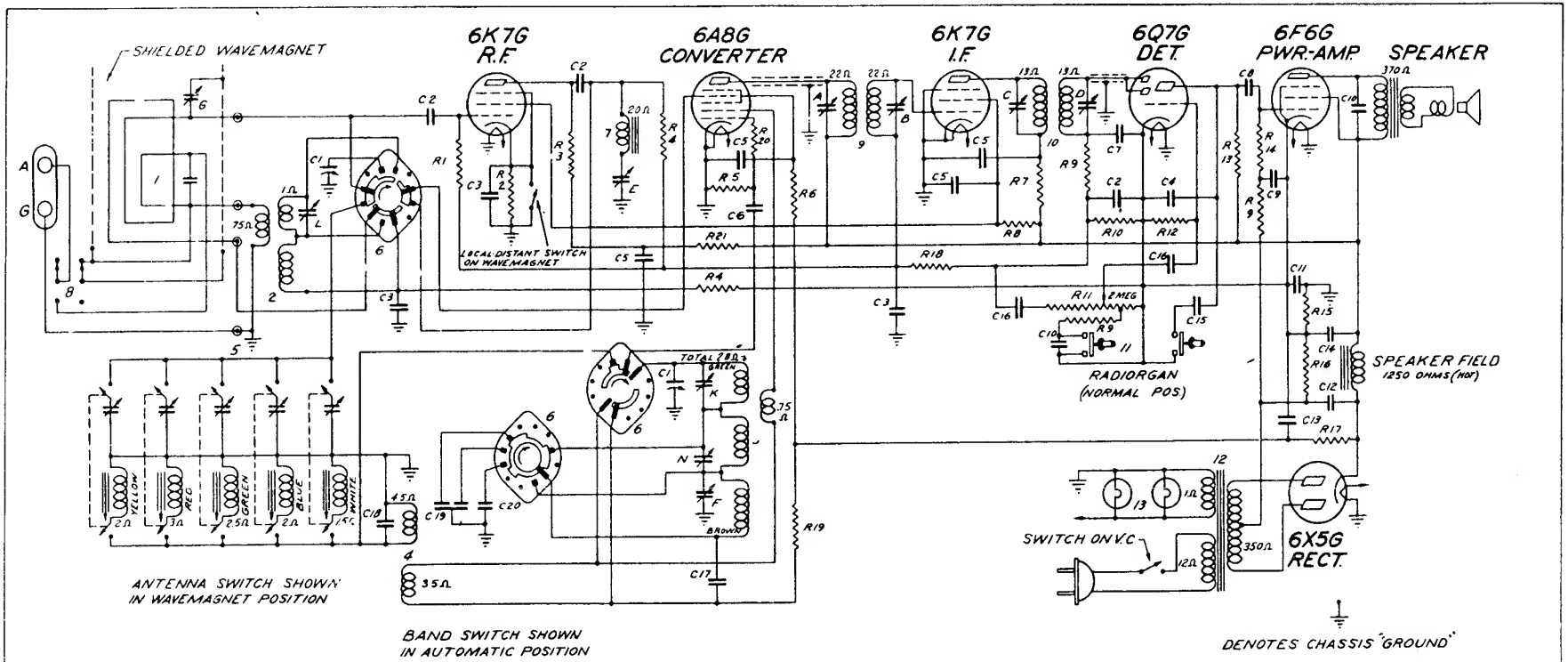
Socket Voltages



Location of Tubes and Trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Adjust Trimmers	Purpose
1	12A8 Grid	½ Mfd.	455 Kc.	Broadcast	600 Kc.	A, B, D	I. F. Alignment
2	Single Turn Loosely	.....	1500 Kc.	Broadcast	1500 Kc.	F	Set Oscillator to Scale
3	Coupled to Loop	.....	1500 Kc.	Broadcast	1500 Kc.	G	Alignment of Antenna



DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION
C 1	22-849	2 GANG VARIABLE		C 20	22-866	OSCILLATOR PADDER		R 16	63-1056	280 OHM WIREWOUND	1/2 W.	13	100-36	PILOT LIGHT 6.3V .25A.
C 2	22-162	.0001 MFD.	600V					R 17	63-151	.15 M. OHM	1 W.			
C 3	22-829	.05 MFD.	200V					R 18	63-599	1.5 MEGOHM	1/2 W.			
C 4	22-716	.0005 MFD.	600V					R 19	63-1054	10 M. OHM	1/2 W.			
C 5	22-828	.05 MFD.	400V	R 1	63-271	1 MEGOHM	1/2 W.	R 20	63-739	100 OHM	1/2 W.	A		1ST I.F. TRANS. PRI.
C 6	22-289	.50 MMFD.	600V	R 2	63-588	6800 OHM	1/2 W.	R 21	63-585	2200 OHM	1/2 W.	B		1ST I.F. " SEC.
C 7	22-182	.00025 MFD.	600V	R 3	63-607	15 M. OHM	1/2 W.					C		2ND I.F. " PRI.
C 8	22-830	.02 MFD.	600V	R 4	63-595	100 M. OHM	1/2 W.	1		WAVEMAGNET ASSEMBLY		D		2ND I.F. " SEC.
C 9	22-819	.03 MFD.	200V	R 5	63-592	33 M. OHM	1/2 W.	2	S 7546	ANTENNA COIL ASSEMBLY		E		WAVE TRAP
C 10	22-229	.005 MFD.	600V	R 6	63-381	100 M. OHM	1/2 W.	3	S 6937	OSCILLATOR COIL ASSEMBLY		F		BROADCAST OSC. (SEE NOTE)
C 11	22-827	.1 MFD.	200V	R 7	63-583	1000 OHM	1/2 W.	4	S 6992	OSC. COUPLER COIL ASSEM.		G		ANTENNA BROADCAST
C 12	22-975	20 MFD. ELECTROLYTIC	450V	R 8	63-361	47 M. OHM	1 W.	5	S 7044	AUTOMATIC TUNING ASSEM.		K		SHORT WAVE OSC. (- -)
C 13	22-976	10 MFD. ELECTROLYTIC	450V	R 9	63-593	47 M. OHM	1/2 W.	6	85-205	BAND SELECTOR SWITCH		L	22-788	SHORT WAVE DET.
C 14		25 MFD. ELECTROLYTIC	350V	R 10	63-659	470 M. OHM	1/2 W.	7	S 7500	WAVE TRAP COIL ASSEMBLY		N		POLICE BAND OSC (- -)
C 15	22-448	.004 MFD.	600V	R 11	63-1030	VOLUME CONTROL	1/2 W.	8	85-171	WAVEMAGNET SWITCH				
C 16	22-196	.01 MFD.	600V	R 12	63-976	15 MEGOHM	1/2 W.	9	95-600	1ST I.F. TRANS.				NOTE: TRIMMERS F, K & N ARE MOUNTED ON STRIP #22-850
C 17	22-358	.002 MFD.	600V	R 13	63-296	220 M. OHM	1/2 W.	10	95-596	2ND I.F. TRANS.				
C 18	22-868	COMPENSATING COND.		R 14	63-597	470 M. OHM	1/2 W.	11	S 6994	TONE CONTROL SW. ASSEM.				
C 19	22-853	DUAL OSC. PADDER		R 15	63-1057	470 OHM WIREWOUND	1/2 W.	12	95-634	POWER TRANS. 60~ 115V.				

MODEL	SPEAKER
6S439	49-364 6"
6S469	49-344 10"

I.F. FREQUENCY 455 KC.
6 TUBE SUPERHETERODYNE
CHASSIS Nº 5678 3BAND
ZENITH RADIO CORPORATION
CHICAGO, ILL.

Models 6S439—6S469

Chassis No. 5678

Models 6S439—6S469

CHASSIS No. 5678

NOTE

All voltages measured with a 1000 ohm per volt meter from chassis to socket contact indicated.

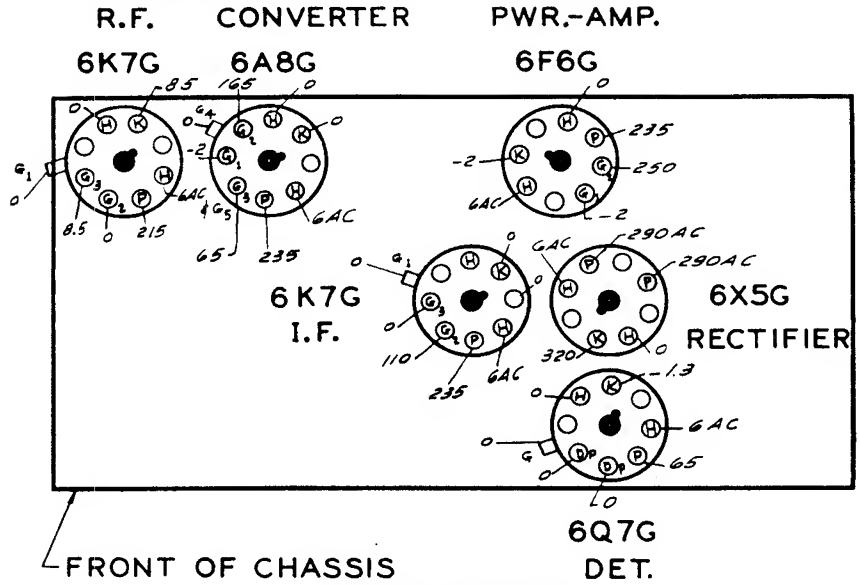
All voltages are positive D.C. unless marked otherwise.

Volume control full on.

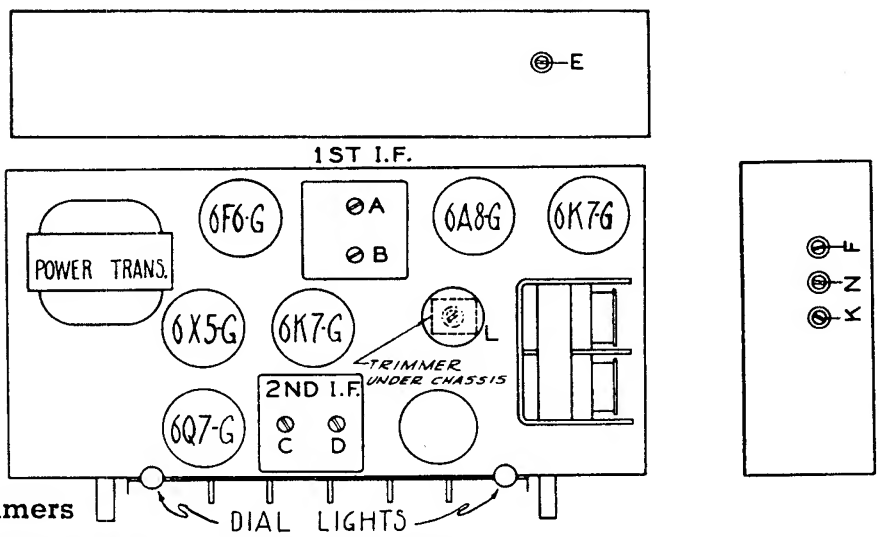
Line voltage 112 A.C.

LEGEND

F—Filament
H—Heater
D—Diode
G1—Control Grid
G2—Screen Grid
G3—Suppressor Grid
P—Plate
K—Cathode



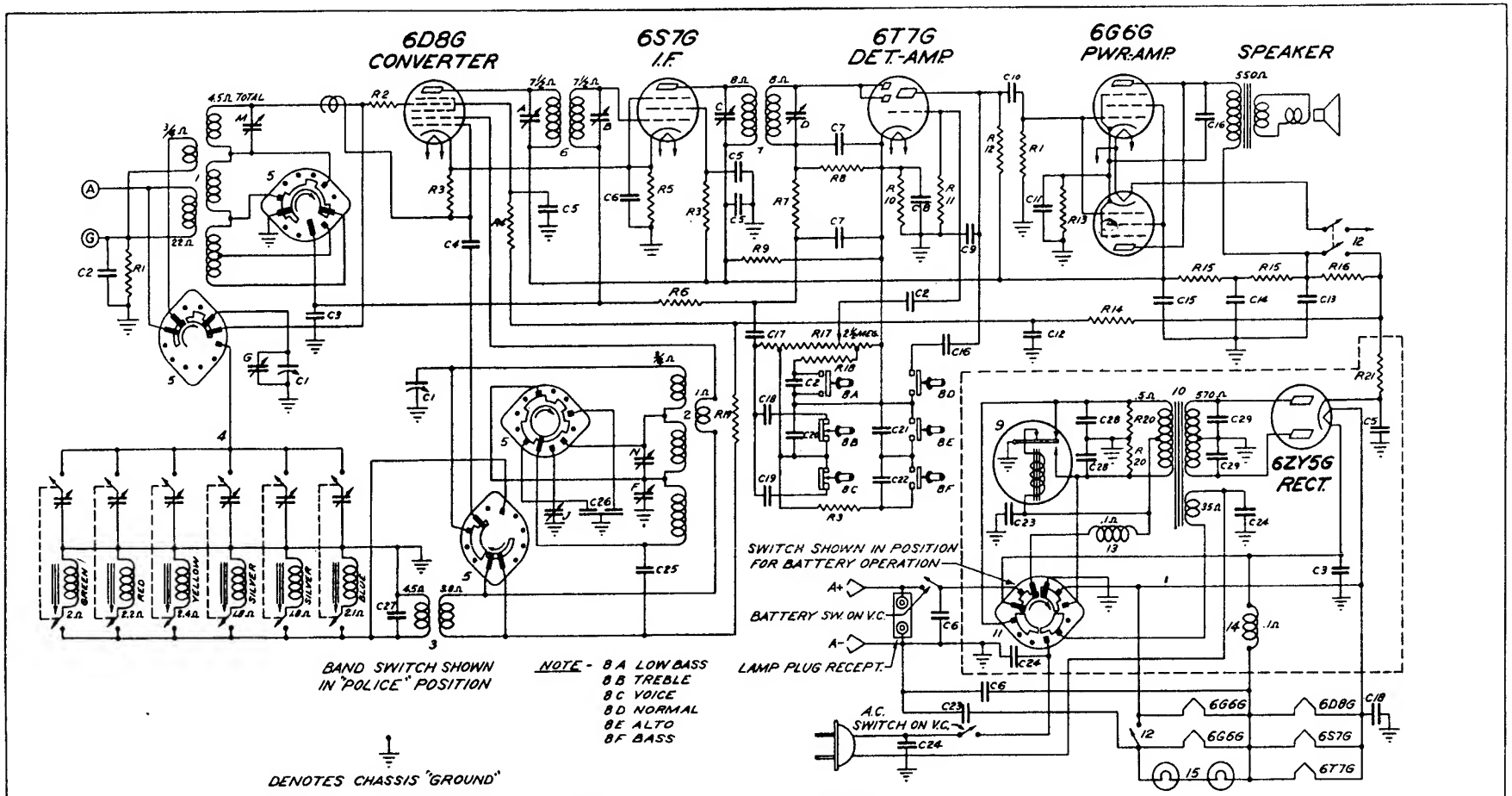
Socket Voltages



Location of Tubes and Trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Adjust Trimmers	Purpose
1	6A8 Grid	½ Mfd.	455 Kc.	Broadcast	600 Kc.	A, B, C, D	I. F. Alignment
2	R. F. 6K7 Grid	½ Mfd.	455 Kc.	Broadcast	600 Kc.	E	Adjust Wavetrap for Minimum
3	Antenna Post (On Loop)	400 Ohms	18000 Kc.	S. W.	18000 Kc.	K	Set Oscillator to Scale
4	Antenna Post (On Loop)	400 Ohms	16000 Kc.	S. W.	16000 Kc.	L	Rock Gang and Adjust for Max.
5	Antenna Post (On Loop)	400 Ohms	4500 Kc.	Police	4500 Kc.	N	Rock Gang and Adjust for Max.
6	Generator Loosely Coupled to Loop		1500 Kc.	Broadcast	1500 Kc.	F	Set Oscillator to Scale
7	Thru One or Two Turns		1400 Kc	Broadcast	1400 Kc.	G	Alignment of Antenna



DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION
C1	22-964	TWO GANG VARIABLE		C24	22-830	.02 MFD.	600V.	R15	63-605	1000 OHM	½W.	14	S2778	CHOKE ASSEMBLY
C2	22-826	.01 MFD.	200V.	C25	22-358	.002 MFD.	600V.	R16	63-966	4700 OHM	1W.	15	100-39	PILOT LIGHT 2.9V. .17A.
C3	22-829	.05 MFD.	200V.	C26	22-973	DUAL OSC. PADDER		R17	63-990	VOLUME CONTROL				
C4	22-289	50 MMFD.	600V.	C27	22-868	COMPENSATING COND.		R18	63-591	22M OHM	½W.			
C5	22-828	.05 MFD.	400V.	C28	22-319	.005 MFD.	200V.	R19	63-675	5600 OHM	1W.			
C6	22-350	.25 MFD.	200V.	C29	22-972	.015 MFD.	600V.	R20	63-963	120 OHM	2W.	A		1ST I.F. TRANS. PRI.
C7	22-162	.0001 MFD.	600V.					R21	63-577	100 OHM	½W.	B		1ST I.F. " SEC.
C8	22-827	.1 MFD.	200V.									C		2ND I.F. " PRI.
C9	22-854	.0005 MFD.	600V.									D		2ND I.F. " SEC.
C10	22-188	.02 MFD.	400V.	R1	63-597	470 M OHM	½W.					F		B'DCAST OSC. (SEE NOTE)
C11	22-974	20 MFD. ELECTROLYTIC	25V.	R2	63-576	68 OHM	½W.	1	S7811	ANTENNA COIL ASSEMBLY		G		ANT. B'DCAST (ON GANG)
C12		20 MFD. "	250V.	R3	63-593	47M OHM	½W.	2	S8007	OSCILLATOR COIL ASSEMBLY		J		B'DCAST PADDER (SEE NOTE)
C13		30 MFD. ELECTROLYTIC	250V.	R4	63-649	56M OHM	½W.	3	S7507	OSC. COUPLER COIL ASSEMBLY				
C14	22-771	15 MFD. "	250V.	R5	63-628	270 OHM	½W.	4	S7649	AUTOMATIC TUNING UNIT ASSEM.		M	22-788	S.W. ANTENNA
C15		10 MFD. "	250V.	R6	63-599	1.5 MEGOHM	½W.	5	85-210	BAND SELECTOR SWITCH		N		POL. BAND OSC. (SEE NOTE)
C16	22-448	.004 MFD.	600V.	R7	63-711	22M OHM	½W.	6	95-649	1ST I.F. TRANSFORMER				
C17	22-327	.02 MFD.	200V.	R8	63-659	470 M OHM	½W.	7	95-650	2ND I.F. TRANSFORMER				
C18	22-182	.00025 MFD.	600V.	R9	63-160	100 M OHM	½W.	8	S8013	TONE CONTROL SWITCH				NOTE-
C19	22-470	.00015 MFD.	600V.	R10	63-634	820 OHM	½W.	9	190-11	VIBRATOR				TRIMMERS F, J & N
C20	22-716	.0005 MFD.	600V.	R11	63-271	1 MEGOHM	½W.	10	95-645	POWER TRANSFORMER				ARE MOUNTED ON STRIP
C21	22-458	.006 MFD.	600V.	R12	63-296	220M OHM	½W.	11	85-177	POWER SUPPLY SWITCH				SEE-1002
C22	22-326	.003 MFD.	400V.	R13	63-977	270 OHM WIREWOUND	1½W.	12	85-171	BATT. CONSERVER SWITCH				
C23	22-199	.5 MFD.	200V.	R14	63-796	10M OHM	½W.	13	S5043	CHOKE ASSEMBLY				

MODEL	SPEAKER
6J436	49-350 8"
6J463	49-348 10"

I.F. FREQUENCY 455 KC.
6 TUBE SUPERHETERODYNE
CHASSIS Nº5679 6V.-D.C. 110V.-A.C. 3 BAND
ZENITH RADIO CORPORATION
CHICAGO, ILL.

Models 6J436—6J463

Chassis No. 5679

Models 6J436—6J463

CHASSIS No. 5679

NOTE

All voltages measured with a 1000 ohm per volt meter from chassis to socket contact indicated.

All voltages are positive D.C. unless marked otherwise.

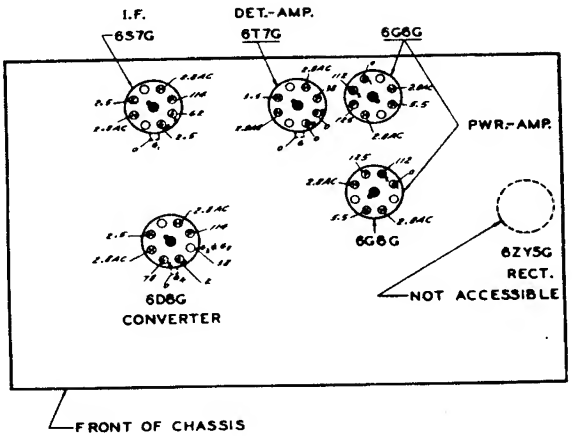
Battery conserver switch in NORMAL position.

Volume control full on.

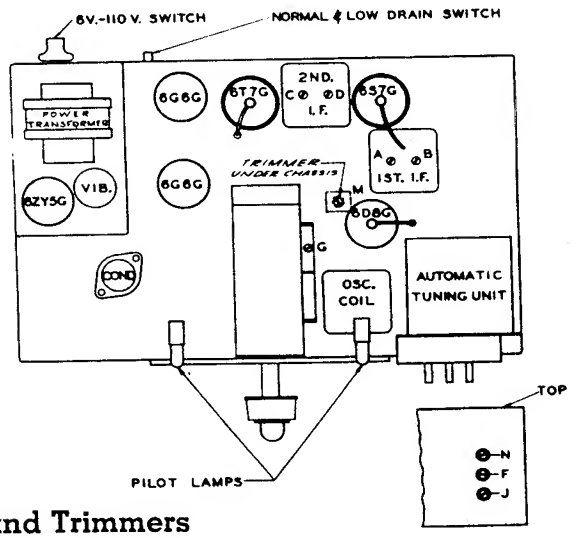
Line voltage 112 v. A.C.

LEGEND

F—Filament
H—Heater
D—Diode
G1—Control Grid
G2—Screen Grid
G3—Suppressor Grid
P—Plate
K—Cathode



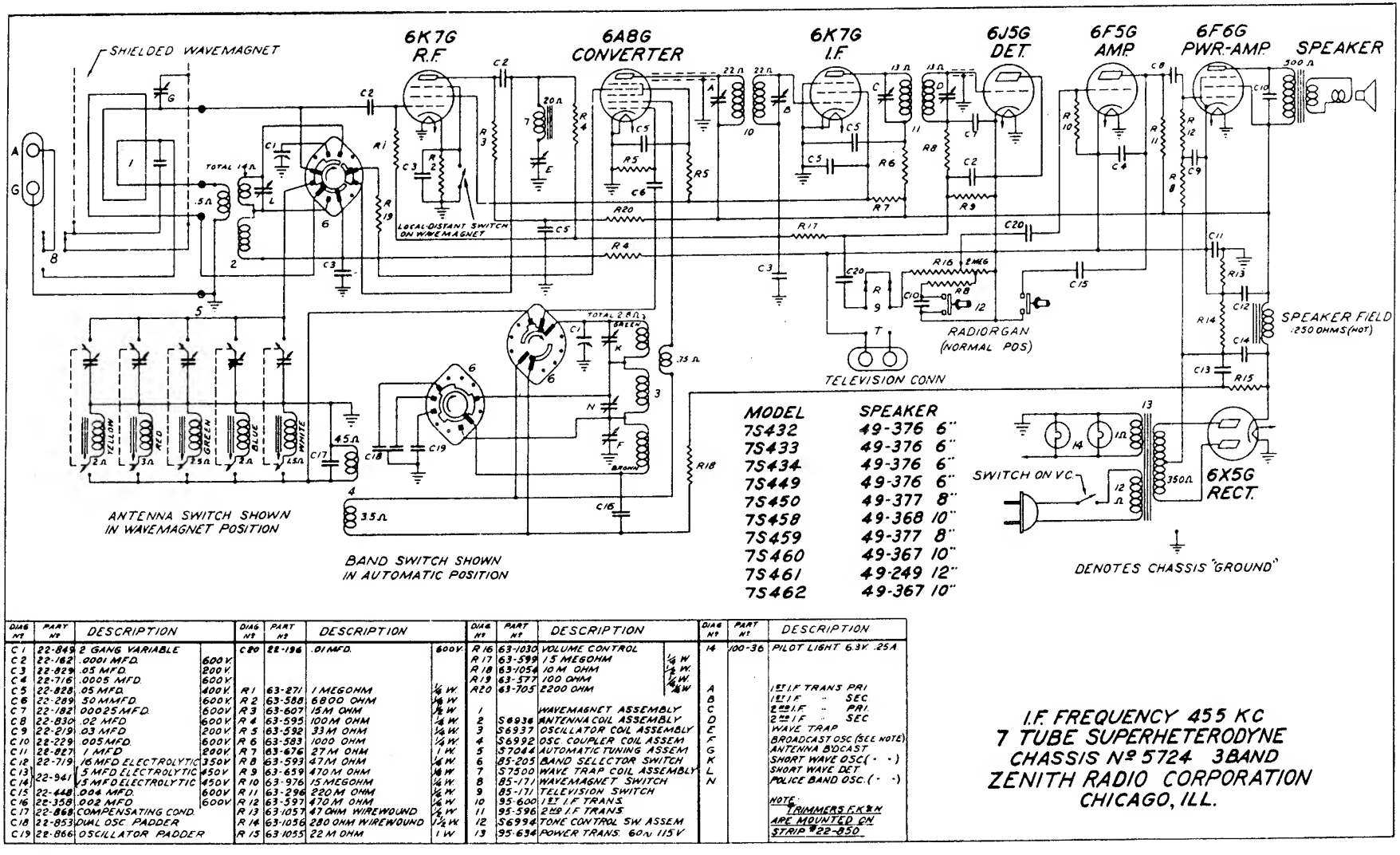
Socket Voltages



Location of Tubes and Trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Adjust Trimmers	Purpose
1	6D8 R. F. Grid	0.5 Mfd.	455 Kc.	I. F.	600 Kc.	A, B, C, D	I. F. Alignment
2	Rec. Ant. Post	200 Mfd.	1500 Kc.	Broadcast	1500 Kc.	F	Set Oscillator to Scale
3	Rec. Ant. Post	200 Mfd.	1500 Kc.	Broadcast	1500 Kc.	G	Alignment of Antenna
4	Rec. Ant. Post	200 Mfd.	600 Kc.	Broadcast	600 Kc.	J	Rock Gang and Adjust for Max. Output
5	Rec. Ant. Post	200 Mfd.		Broadcast		F, G	Repeat 2 and 3
6	Rec. Ant. Post	400 Ohms	18000 Kc.	S. W.	18000 Kc.	M	Rock gang & adj. for max. output
7	Rec. Ant. Post	400 Ohms	16000 Kc.	S. W.	16000 Kc.	L	Rock Gang and Adjust for Max. Output
8	Rec. Ant. Post	400 Ohms	6000 Kc.	Police	6000 Kc.	N	Rock Gang and Adjust for Max. Output



MODEL	SPEAKER
7S432	49-376 6"
7S433	49-376 6"
7S434	49-376 6"
7S449	49-376 6"
7S450	49-377 8"
7S458	49-368 10"
7S459	49-377 8"
7S460	49-367 10"
7S461	49-249 12"
7S462	49-367 10"

DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION
C 1	22-849	2 GANG VARIABLE		C 20	22-196	.01 MFD.	600V.	R 16	63-1030	VOLUME CONTROL		14	100-36	PILOT LIGHT 6.3V. .25A
C 2	22-162	.0001 MFD.	600V.					R 17	63-599	1.5 MEGOHM	1/4 W.			
C 3	22-829	.05 MFD.	200V.					R 18	63-1054	10 M OHM	1/4 W.			
C 4	22-716	.0005 MFD.	600V.					R 19	63-577	100 OHM	1/4 W.			
C 5	22-828	.05 MFD.	400V.	R 1	63-271	1 MEGOHM	1/4 W.	R 20	63-705	2200 OHM	1/4 W.	A		1ST I.F. TRANS PRI.
C 6	22-289	50 MMFD.	600V.	R 2	63-588	6800 OHM	1/4 W.					B		1ST I.F. " SEC.
C 7	22-182	.00025 MFD.	600V.	R 3	63-607	1.5 M OHM	1/4 W.	1		WAVEMAGNET ASSEMBLY		C		2ND I.F. " PRI.
C 8	22-830	.02 MFD.	600V.	R 4	63-595	100 M OHM	1/4 W.	2	S6936	ANTENNA COIL ASSEMBLY		D		2ND I.F. " SEC.
C 9	22-219	.03 MFD.	200V.	R 5	63-592	.33 M OHM	1/4 W.	3	S6937	OSCILLATOR COIL ASSEMBLY		E		WAVE TRAP
C 10	22-229	.005 MFD.	600V.	R 6	63-583	1000 OHM	1/4 W.	4	S6992	OSC. COUPLER COIL ASSEM.		F		BROADCAST OSC (SEE NOTE)
C 11	22-827	.1 MFD.	200V.	R 7	63-676	27 M OHM	1 W.	5	S7044	AUTOMATIC TUNING ASSEM.		G		ANTENNA B'DCAST
C 12	22-719	.16 MFD. ELECTROLYTIC	350V.	R 8	63-593	47 M OHM	1/4 W.	6	85-205	BAND SELECTOR SWITCH		K		SHORT WAVE OSC (· ·)
C 13	22-941	.5 MFD. ELECTROLYTIC	450V.	R 9	63-659	470 M OHM	1/4 W.	7	S7500	WAVE TRAP COIL ASSEMBLY		L		SHORT WAVE DET.
C 14		.5 MFD. ELECTROLYTIC	450V.	R 10	63-976	15 MEGOHM	1/4 W.	8	85-171	WAVEMAGNET SWITCH		N		POLICE BAND OSC. (· ·)
C 15	22-448	.004 MFD.	600V.	R 11	63-296	220 M OHM	1/4 W.	9	85-171	TELEVISION SWITCH				
C 16	22-358	.002 MFD.	600V.	R 12	63-597	470 M OHM	1/4 W.	10	95-600	1ST I.F. TRANS.				NOTE: TRIMMERS F, K & N ARE MOUNTED ON STRIP #22-850
C 17	22-868	COMPENSATING COND.		R 13	63-1057	47 OHM WIREWOUND	1/2 W.	11	95-596	2ND I.F. TRANS.				
C 18	22-853	DUAL OSC. PADDER		R 14	63-1058	280 OHM WIREWOUND	1/2 W.	12	S6994	TONE CONTROL SW ASSEM.				
C 19	22-866	OSCILLATOR PADDER		R 15	63-1055	22 M OHM	1 W.	13	95-634	POWER TRANS. 60~ 115V.				

I.F. FREQUENCY 455 KC
7 TUBE SUPERHETERODYNE
CHASSIS Nº 5724 3 BAND
ZENITH RADIO CORPORATION
CHICAGO, ILL.

Models 7S432—7S433—7S434—7S449—7S450—7S458—7S459—7S460—7S461—7S462

Chassis No. 5724

Models 7S432—7S433—7S434—7S449—7S450—7S458—7S459—7S460—7S461—7S462

CHASSIS No. 5724

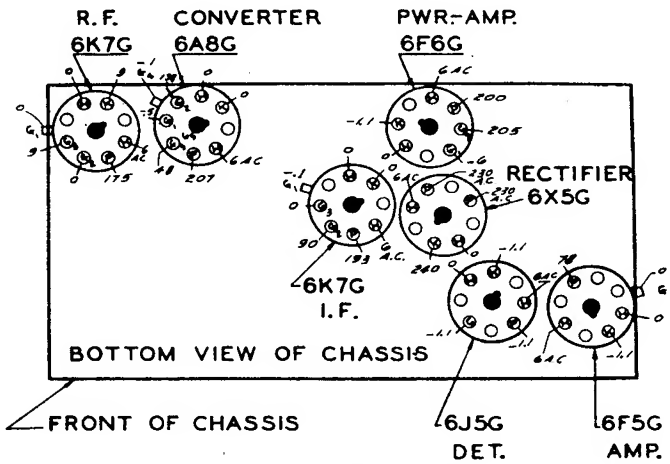
NOTE

All voltages measured with a 1000 ohm per volt meter from chassis to socket contact indicated.

All voltages are positive D.C. unless marked otherwise.

Volume control full on.

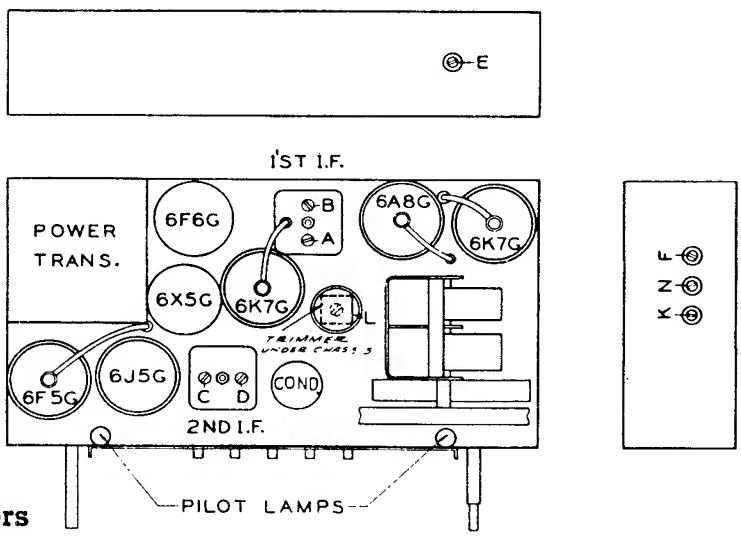
Line voltage 112 A.C.



Socket Voltages

LEGEND

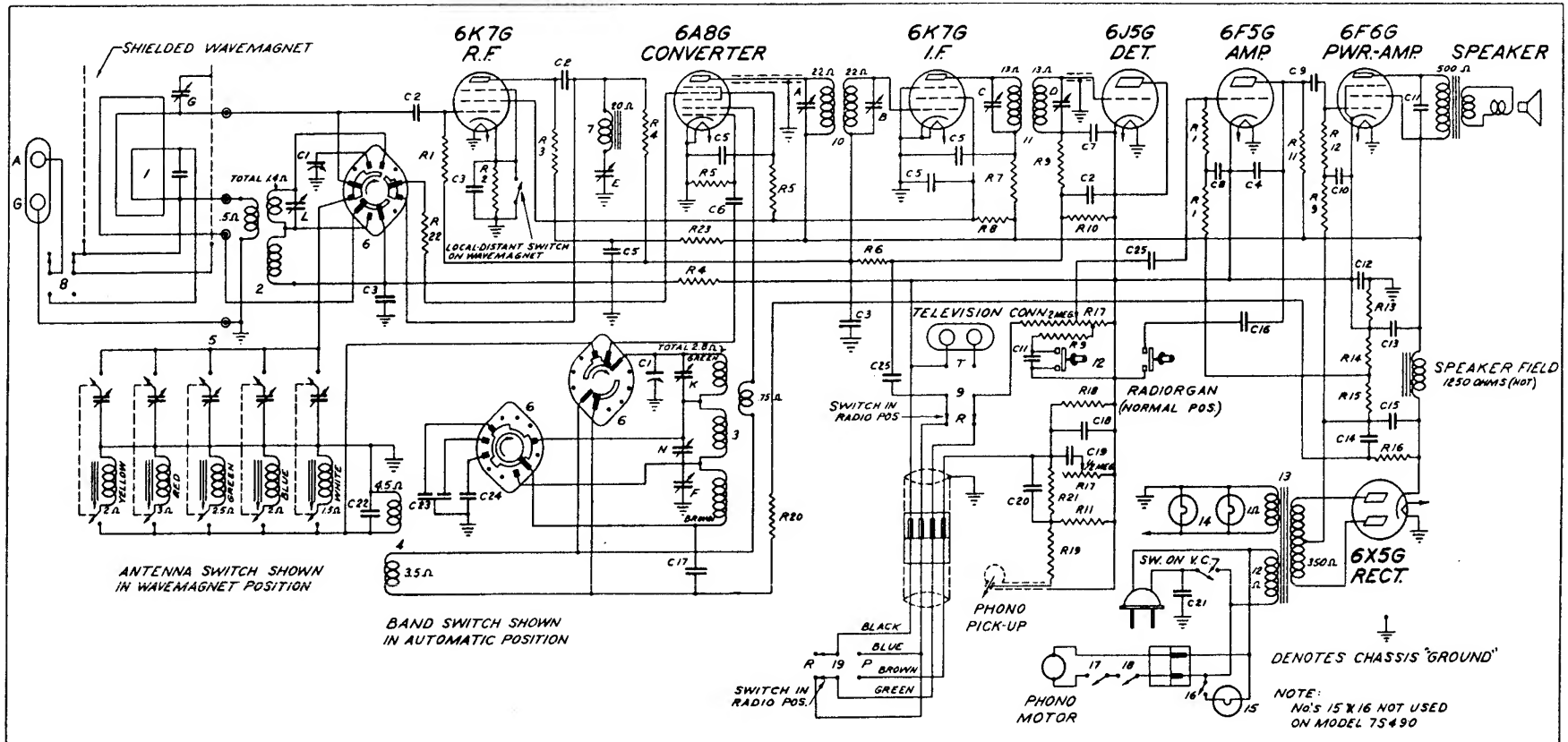
F—Filament
H—Heater
D—Diode
G1—Control Grid
G2—Screen Grid
G3—Suppressor Grid
P—Plate
K—Cathode



Location of Tubes and Trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Adjust Trimmers	Purpose
1	6A8 Grid	½ Mfd.	455 Kc.	Broadcast	600 Kc.	A, B, C, D	I. F. Alignment
2	R. F. 6K7 Grid	½ Mfd.	455 Kc.	Broadcast	600 Kc.	E	Adjust Wavetrap for Minimum
3	Antenna Post (On Loop)	400 Ohms	18000 Kc.	S. W.	18000 Kc.	K	Set Oscillator to Scale
4	Antenna Post (On Loop)	400 Ohms	16000 Kc.	S. W.	16000 Kc.	L	Rock Gang and Adjust for Max.
5	Antenna Post (On Loop)	400 Ohms	4500 Kc.	Police	4500 Kc.	N	Rock Gang and Adjust for Max.
6	Generator Loosely Coupled to Loop		1500 Kc.	Broadcast	1500 Kc.	F	Set Oscillator to Scale
7	Thru One or Two Turns		1400 Kc	Broadcast	1400 Kc.	G	Alignment of Antenna



DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION
C 1	22-849	TWO GANG VARIABLE		C 23	22-853	DUAL OSC. PADDER		R 17	63-1035	VOLUME CONTROL		16	85-204	DOOR SWITCH MODEL 7S487
C 2	22-162	.0001 MFD.	600 V.	C 24	22-866	OSCILLATOR PADDER		R 18	63-464	1 MEGOHM	½ W.		85-203	DOOR SWITCH MODEL 7S488
C 3	22-829	.05 MFD.	200 V.	C 25	22-196	.01 MFD.	600 V.	R 19	63-717	220 M OHM	½ W.	17	85-181	AUTOMATIC STOP SW.
C 4	22-716	.0005 MFD.	600 V.					R 20	63-1058	10 M OHM	½ W.	18	85-191	MOTOR SWITCH
C 5	22-820	.05 MFD.	400 V.					R 21	63-718	470 M OHM	½ W.	19	85-192	PHONO SWITCH
C 6	22-289	.50 MMFD.	600 V.					R 22	63-577	100 OHM	½ W.			
C 7	22-182	.0025 MFD.	600 V.	R 1	63-271	1 MEGOHM	½ W.	R 23	63-705	2200 OHM	½ W.			
C 8	22-190	.1 MFD.	200 V.	R 2	63-588	6800 OHM	½ W.	1		WAVEMAGNET ASSEMBLY		A		1ST I.F. TRANS. PRI.
C 9	22-830	.02 MFD.	600 V.	R 3	63-607	15 M OHM	½ W.	2	S6936	ANTENNA COIL ASSEMBLY		B		1ST I.F. " SEC.
C 10	22-219	.03 MFD.	200 V.	R 4	63-595	100 M OHM	½ W.	3	S6937	OSCILLATOR COIL ASSEMBLY		C		2ND I.F. " PRI.
C 11	22-229	.005 MFD.	600 V.	R 5	63-592	33 M OHM	½ W.	4	S6992	OSC. COUPLER COIL ASSEM.		D		2ND I.F. " SEC.
C 12	22-827	.1 MFD.	200 V.	R 6	63-599	1.5 MEGOHM	½ W.	5	S7044	AUTOMATIC TUNING ASSEM.		E		WAVE TRAP
C 13	22-719	.15 MFD. ELECTROLYTIC	350 V.	R 7	63-583	1000 OHM	½ W.	6	85-205	BAND SELECTOR SWITCH		F		BROADCAST OSC (SEE NOTE)
C 14	22-941	.5 MFD. "	450 V.	R 8	63-676	27 M OHM	1 W.	7	S7500	WAVE TRAP COIL ASSEMBLY		G		ANTENNA BROADCAST
C 15		.5 MFD. "	450 V.	R 9	63-593	47 M OHM	½ W.	8	85-171	WAVEMAGNET SWITCH		K		SHORT WAVE OSC. (- -)
C 16	22-468	.004 MFD.	600 V.	R 10	63-659	470 M OHM	½ W.	9	85-171	TELEVISION SWITCH		L		SHORT WAVE DET.
C 17	22-358	.002 MFD.	600 V.	R 11	63-596	220 M OHM	½ W.	10	95-600	1ST I.F. TRANS.		N		POLICE BAND OSC. (- -)
C 18	22-954	.00035 MFD.	600 V.	R 12	63-597	470 M OHM	½ W.	11	95-596	2ND I.F. TRANS.				
C 19	22-326	.003 MFD.	400 V.	R 13	63-1057	47 OHM WIREWOUND	½ W.	12	S6994	TONE CONTROL SW. ASSEM.				NOTE:
C 20	22-953	.0002 MFD.	600 V.	R 14	63-1056	280 OHM WIREWOUND	1½ W.	13	95-634	POWER TRANS. 60~ 115 V.				TRIMMERS F, K & N
C 21	22-525	.005 MFD.	1000 V.	R 15	63-1060	18 OHM WIREWOUND	½ W.	14	100-36	PILOT LIGHT 6.3 V. .25 A.				ARE MOUNTED ON
C 22	22-868	COMPENSATING COND.		R 16	63-1053	22 M OHM	1 W.	15	100-80	PILOT LIGHT 110 V. 7 W.				STRIP #22-850

MODEL	SPEAKER
7S487	49-369 10"
7S488	49-249 12"
7S490	49-377 8"

I.F. FREQUENCY 455 KC
7 TUBE SUPERHETERODYNE
CHASSIS Nº 5725 PHONO
ZENITH RADIO CORPORATION
CHICAGO. ILL.

Models 7S487—7S488—7S490

Chassis No. 5725

Models 7S487—7S488—7S490

CHASSIS No. 5725

NOTE

All voltages measured with a 1000 ohm per volt meter from chassis to socket contact indicated.

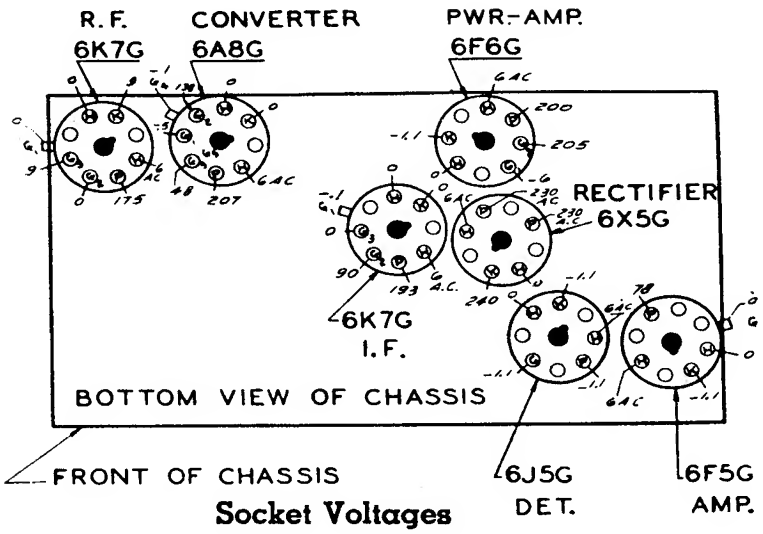
All voltages are positive D.C. unless marked otherwise.

Volume control full on.

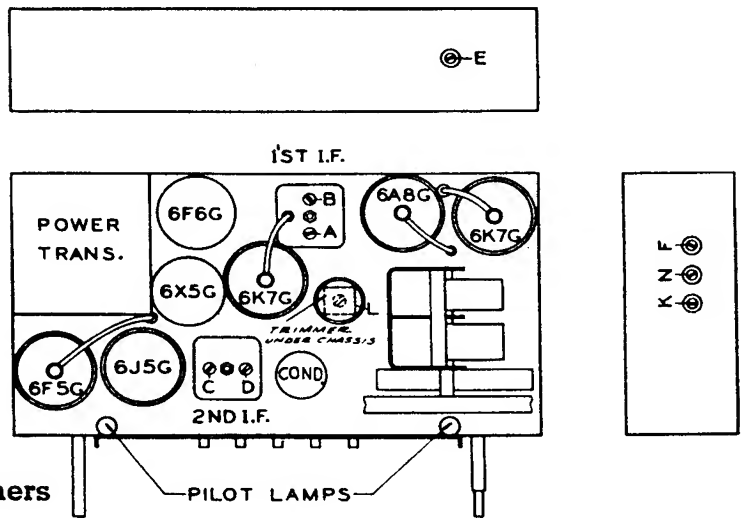
Line voltage 112 A.C.

LEGEND

F—Filament
H—Heater
D—Diode
G1—Control Grid
G2—Screen Grid
G3—Suppressor Grid
P—Plate
K—Cathode



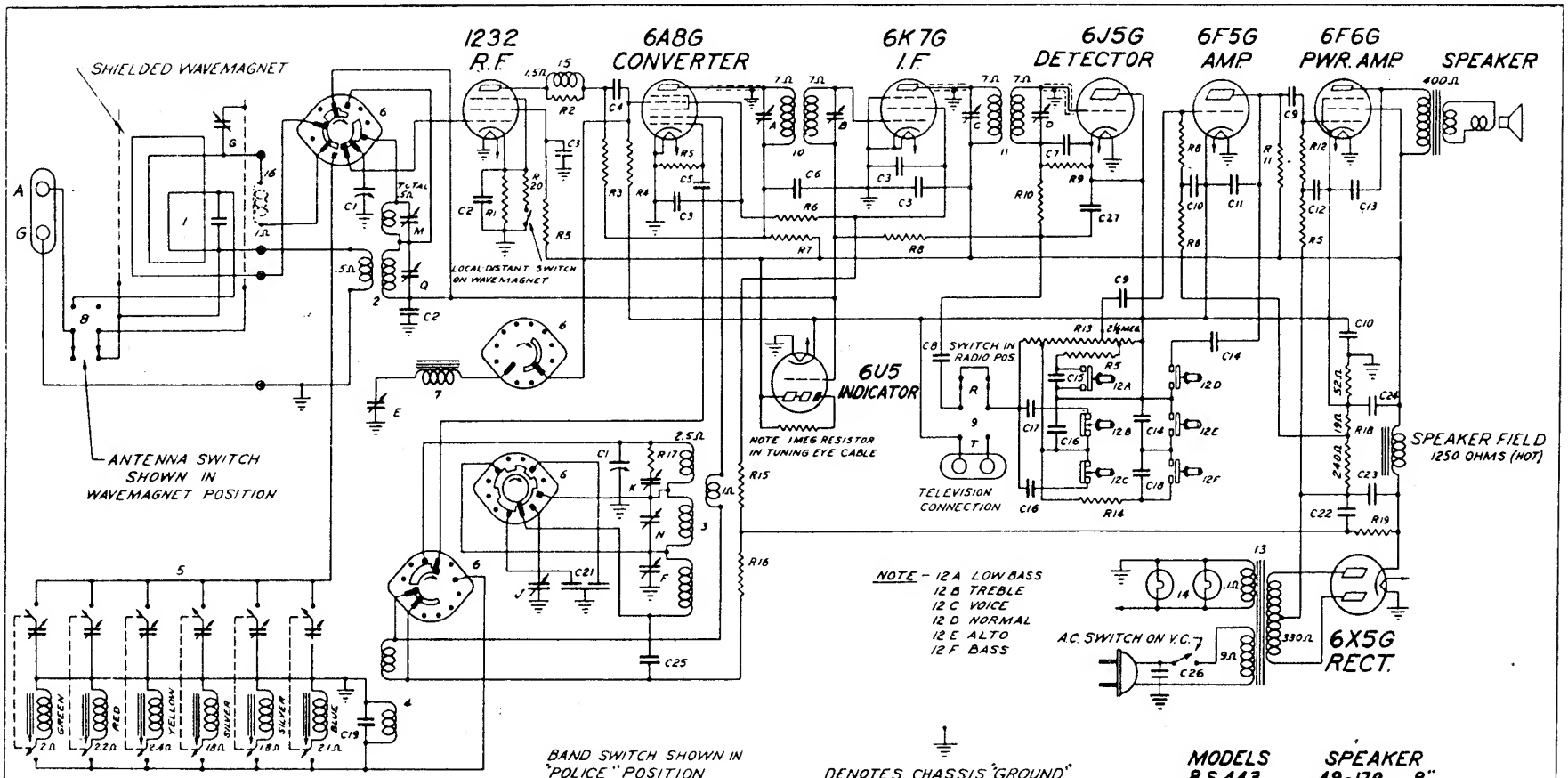
Socket Voltages



Location of Tubes and Trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Adjust Trimmers	Purpose
1	6A8 Grid	½ Mfd.	455 Kc.	Broadcast	600 Kc.	A, B, C, D	I. F. Alignment
2	R. F. 6K7 Grid	½ Mfd.	455 Kc.	Broadcast	600 Kc.	E	Adjust Wavetrap for Minimum
3	Antenna Post (On Loop)	400 Ohms	18000 Kc.	S. W.	18000 Kc.	K	Set Oscillator to Scale
4	Antenna Post (On Loop)	400 Ohms	16000 Kc.	S. W.	16000 Kc.	L	Rock Gang and Adjust for Max.
5	Antenna Post (On Loop)	400 Ohms	4500 Kc.	Police	4500 Kc.	N	Rock Gang and Adjust for Max.
6	Generator Loosely Coupled to Loop		1500 Kc.	Broadcast	1500 Kc.	F	Set Oscillator to Scale
7	Thru One or Two Turns		1400 Kc	Broadcast	1400 Kc.	G	Alignment of Antenna



DIAG. Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION
C1	22-927	TWO GANG VARIABLE		C22	22-933	6 MFD ELECTROLYTIC	450 V	R14	63-594	68 M OHM	½ W.	13	95-627	POWER TRANS. 60~/115 V.
C2	22-829	.05 MFD.	200 V	C23		16 MFD "	450 V	R15	63-677	33 M OHM	1 W	14	100-36	PILOT LIGHT 6.3 V. .25 A
C3	22-828	.05 MFD.	400 V	C24	22-719	16 MFD	350 V	R16	63-796	10 M OHM	½ W	15	S7526	R.F. CHOKE
C4	22-716	.0005 MFD.	600 V	C25	22-358	.002 MFD.	600 V	R17	63-576	68 OHM	½ W.	16	S8142	LOOP LOADING COIL ASSEM. (NOTE: USED ON SOME MODELS)
C5	22-127	25 MMFD.	600 V	C26	22-525	.005 MFD.	1000 V	R18	63-992	3 SECTION CANDOHM				
C6	22-825	.1 MFD.	400 V	C27	22-162	.0001 MFD.	600 V	R19	63-131	15 M OHM	1 W			
C7	22-182	.00025 MFD.	600 V					R20	63-574	33 OHM	½ W	A		1ST I.F. TRANS. PRI.
C8	22-327	.02 MFD.	200 V									B		1ST I.F. " SEC.
C9	22-830	.02 MFD.	600 V	R1	63-589	10 M OHM	½ W					C		2ND I.F. " PRI.
C10	22-827	.1 MFD.	200 V	R2	63-1077	18 M OHM	1 W	1		WAVEMAGNET ASSEMBLY		D		2ND I.F. " SEC.
C11	22-854	.0005 MFD.	600 V	R3	63-587	4700 OHM	½ W	2	S7504	ANTENNA COIL ASSEMBLY		E		WAVE TRAP
C12	22-219	.03 MFD.	200 V	R4	63-595	100 M OHM	½ W	3	S7641	OSCILLATOR COIL ASSEMBLY		F		BROADCAST OSC. (SEE NOTE)
C13	22-627	.002 MFD.	1000 V	R5	63-593	47 M OHM	½ W	4	S7507	OSC. COUPLER COIL ASSEM.		G		ANTENNA BROADCAST
C14	22-448	.004 MFD.	600 V	R6	63-643	18 M OHM	½ W	5	S7649	AUTOMATIC TUNING UNIT "		K		SHORT WAVE OSC. (SEE NOTE)
C15	22-229	.005 MFD.	600 V	R7	63-605	1000 OHM	½ W	6	85-205	BAND SELECTOR SWITCH		M	22-982	SHORT WAVE DET.
C16	22-470	.00015 MFD.	600 V	R8	63-271	1 MEGOHM	½ W	7	S7559	WAVE TRAP COIL ASSEMBLY		N		POLICE BAND OSC. (SEE NOTE)
C17	22-954	.00035 MFD.	600 V	R9	63-774	220 M OHM	½ W	8	85-171	WAVEMAGNET SWITCH		Q	22-962	POLICE BAND DET.
C18	22-492	.002 MFD.	600 V	R10	63-711	22 M OHM	½ W	9	85-171	TELEVISION SWITCH		J	22-463	BROADCAST PADDER
C19	22-868	COMPENSATING COND.		R11	63-296	220 M OHM	½ W	10	95-625	1ST I.F. TRANS.				NOTE: TRIMMERS F K & N ARE MOUNTED ON STRIP # 22-850
				R12	63-597	470 M OHM	½ W	11	95-663	2ND I.F. TRANS.				
C21	22-930	DUAL OSC. PADDER		R13	63-1075	VOLUME CONTROL		12	S7643	TONE CONTROL SW. ASSEM.				

I.F. FREQUENCY 455 KC
8 TUBE SUPERHETERODYNE
CHASSIS Nº 5808 3 BAND
ZENITH RADIO CORPORATION
CHICAGO, ILL.

MODELS	SPEAKER
8S443	49-179 8"
8S451	49-179 8"
8S463	49-380 10"

Models 8S443—8S451—8S463

Chassis No. 5808

NOTE

All voltages measured with a 1000 ohm per volt meter from chassis to socket contact indicated.

All voltages are positive D.C. unless marked otherwise.

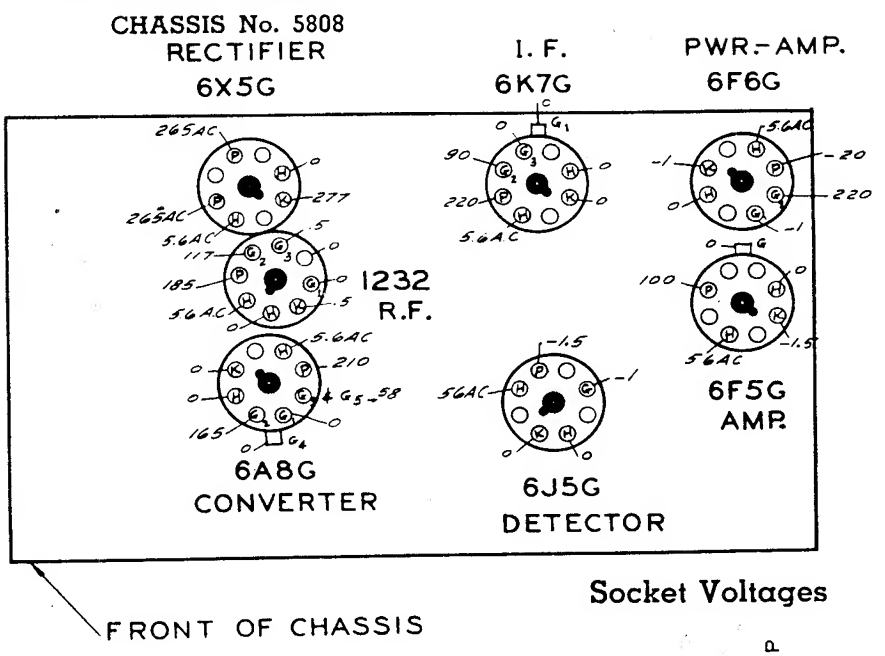
Sensitivity switch in distance position.

Volume control full on.

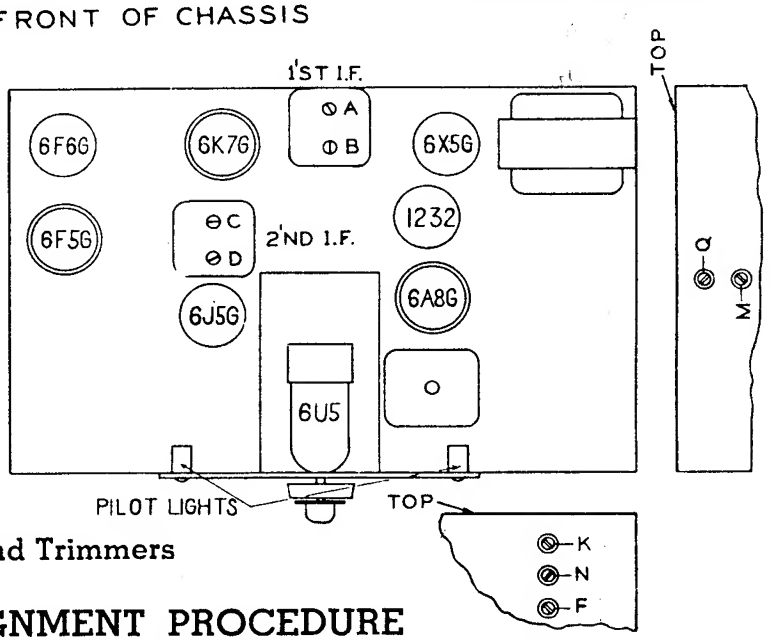
Line voltage 112 A.C.

LEGEND

F—Filament
H—Heater
D—Diode
G1—Control Grid
G2—Screen Grid
G3—Suppressor Grid
P—Plate
K—Cathode



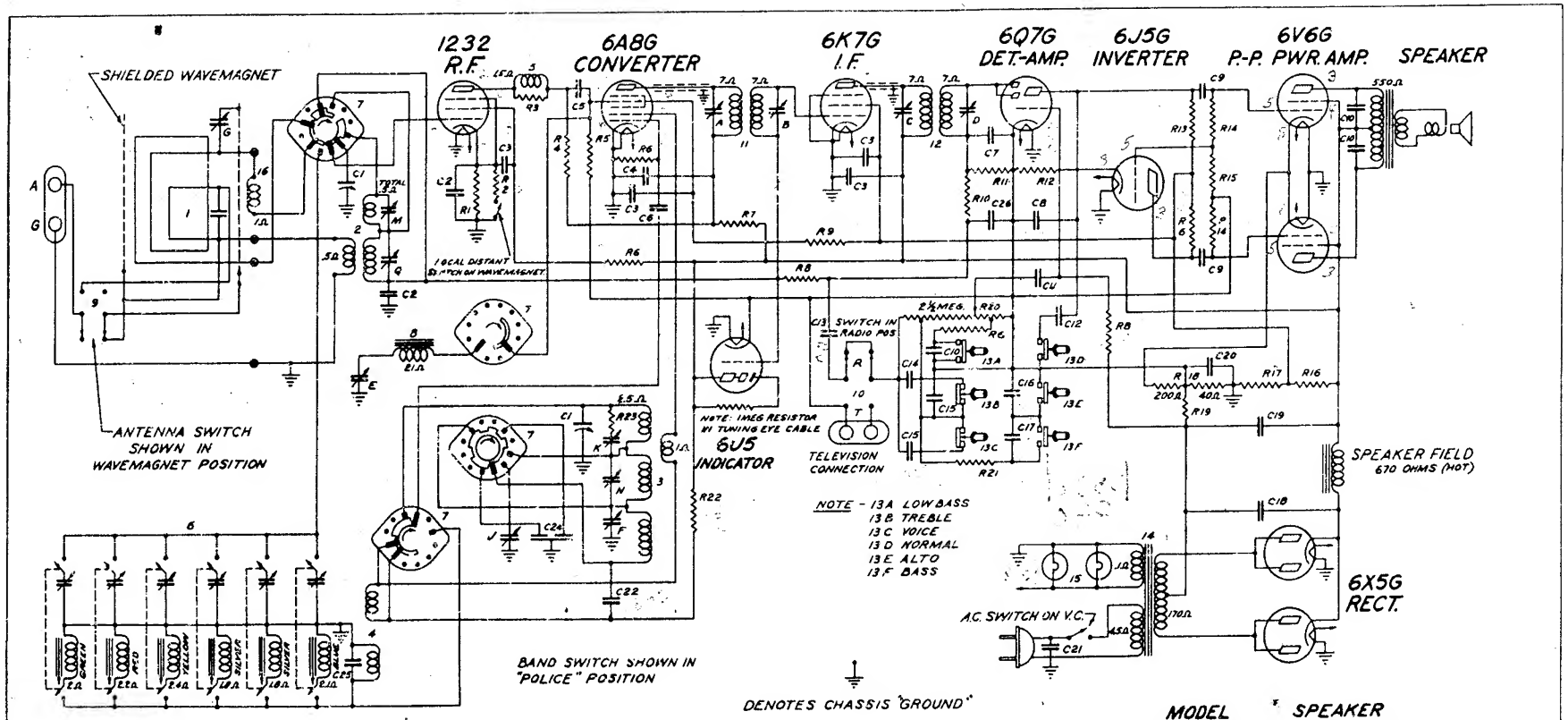
Socket Voltages



Location of Tubes and Trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	½ Mfd.	455 Kc.	Broadcast	600 Kc.	A, B, C, D	I. F. Alignment
2	Antenna Post (On Loop)	200 Mmf.	18000 Kc.	S. W.	18000 Kc.	K	Set Oscillator to Scale
3	Antenna Post (On Loop)	200 Mmf.	16000 Kc.	S. W.	16000 Kc.	M	Alignment of Antenna
4	Antenna Post (On Loop)	200 Mmf.	4500 Kc.	Police	4500 Kc.	N	Set Oscillator to Scale
5	Antenna Post (On Loop)	200 Mmf.	4500 Kc.	Police	4500 Kc.	Q	Alignment of Antenna
6	Single Turn Coupled Loosely to Loop		1400 Kc.	Broadcast	1400 Kc.	F	Set Oscillator to Scale
7	Loop Switch in Wave Magnet Position		1400 Kc.	Broadcast	1400 Kc.	G (On Loop)	Alignment of Antenna



MODEL	SPEAKER
10S443	49-346 8"
10S452	49-351 10"
10S470	49-353 12"
10S464	49-379 10"
10S491	49-356 15"
10S492	49-352 12"

I.F. FREQUENCY 455 K.C.
10 TUBE SUPERHETERODYNE
CHASSIS No. 1005 A.C. 3 BAND
ZENITH RADIO CORPORATION
CHICAGO, ILL.

DIAG. NO.	PART NO.	DESCRIPTION	
C1	22-927	TWO GANG VARIABLE	
C2	22-889	.05 MFD.	200 V.
C3	22-828	.05 MFD.	400 V.
C4	22-825	.1 MFD.	400 V.
C5	22-147	.0005 MFD.	600 V.
C6	22-127	25 MMFD.	600 V.
C7	22-186	.00025 MFD.	600 V.
C8	22-856	.0005 MFD.	600 V.
C9	22-171	.05 MFD.	600 V.
C10	22-229	.005 MFD.	600 V.
C11	22-830	.02 MFD.	600 V.
C12	22-468	.004 MFD.	600 V.
C13	22-327	.08 MFD.	200 V.
C14	22-956	.00035 MFD.	600 V.
C15	22-470	.00015 MFD.	600 V.
C16	22-468	.004 MFD.	600 V.
C17	22-492	.002 MFD.	600 V.
C18	22-934	20 MFD. ELECTROLYTIC	450 V.
C19		20 MFD. ELECTROLYTIC	350 V.
C20	22-827	.1 MFD.	200 V.
C21	22-525	.005 MFD.	1000 V.
C22	22-358	.002 MFD.	600 V.
C24	22-950	DUAL OSC. PADDER	
C25	22-368	COMPENSATING COND.	600 K
C26	22-162	.0001 MFD.	600 K
R1	63-529	10M OHM	½ W.
R2	63-574	33 OHM	½ W.
R3	63-1077	1.5 M OHM	1 W.
R4	63-587	4700 OHM	½ W.
R5	63-595	100 M OHM	½ W.
R6	63-593	47 M OHM	½ W.
R7	63-605	1000 OHM	½ W.
R8	63-271	1 MEGOHM	½ W.
R9	63-643	18 M OHM	½ W.
R10	63-711	22 M OHM	½ W.
R11	63-774	220 M OHM	½ W.
R12	63-585	2200 OHM	½ W.
R13	63-696	220 M OHM	½ W.
R14	63-657	330 M OHM	½ W.
R15	63-648	47 M OHM	½ W.
R16	63-1038	22 M OHM	2 W.
R17	63-676	27 M OHM	1 W.
R18	63-1048	2-SECTION CANDOHM	
R19	63-1062	10 OHM WIREWOUND	½ W.
R20	63-1074	VOLUME CONTROL	
R21	63-594	68 M OHM	½ W.
R22	63-151	1.5 M OHM	1 W.
R23	63-576	68 OHM	½ W.
1		WAVEMAGNET ASSEMBLY	
2	S7504	ANTENNA COIL ASSEMBLY	
3	S7505	OSCILLATOR COIL ASSEMBLY	
4	S7507	OSC. COUPLER COIL ASSEM.	
5	S7526	R.F. CHOKE	
6	S7649	AUTOMATIC TUNING UNIT	
7	85-202	BAND SELECTOR SWITCH	
8	S7559	WAVE TRAP COIL ASSEMBLY	
9	85-171	WAVEMAGNET SWITCH	
10	85-171	TELEVISION SWITCH	
11	95-625	1ST I.F. TRANSFORMER	
12	95-664	2ND I.F. TRANSFORMER	
13	S7643	TONE CONTROL SW. ASSEM.	
14	95-630	POWER TRANS. 60~ 115 V.	
15	100-36	PILOT LIGHT 6.3 V. .25 A.	
16	S8142	LOOP LOADING COIL ASSEM.	
		NOTE: USED ON SOME MODELS.	
A		1ST I.F. TRANS. PRI.	
B		1ST I.F. - SEC.	
C		2ND I.F. - PRI.	
D		2ND I.F. - SEC.	
E		WAVE TRAP	
F		BROADCAST OSC. (SEE NOTE)	
G		ANTENNA BROADCAST	
K		SHORT WAVE OSC. (SEE NOTE)	
M	22-382	SHORT WAVE ANTENNA	
N		POLICE BAND OSC. (SEE NOTE)	
Q	22-382	POLICE BAND ANTENNA	
J	22-463	BROADCAST PADDER	
		NOTE: TRIMMERS F, K & N ARE MOUNTED ON STRIP # 22-850	

Models 10S443—10S452—10S464—10S470—10S491—10S492

CHASSIS No. 1005

Models 10S443—10S452—10S464—10S470—10S491—10S492

Chassis No. 1005

NOTE

All voltages measured with a 1000 ohm per volt meter from chassis to socket contact indicated.

All voltages are positive D.C. unless marked otherwise.

Sensitivity switch in distance position.

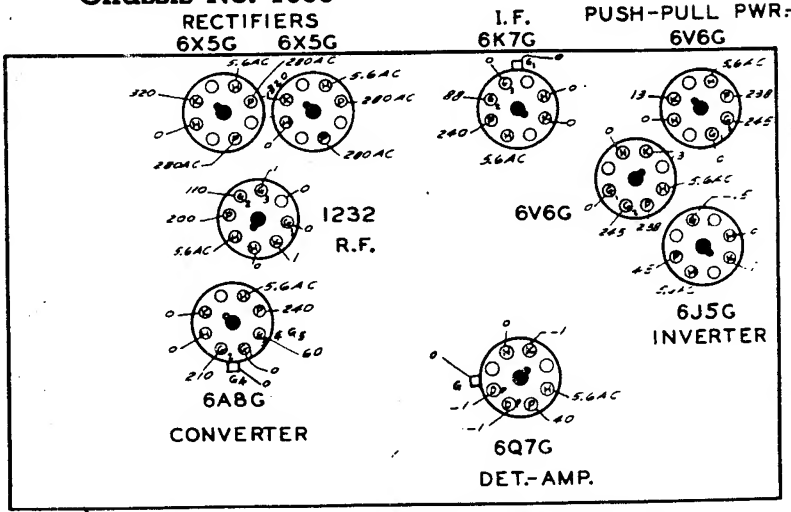
Volume control full on.

Line voltage 112 A.C.

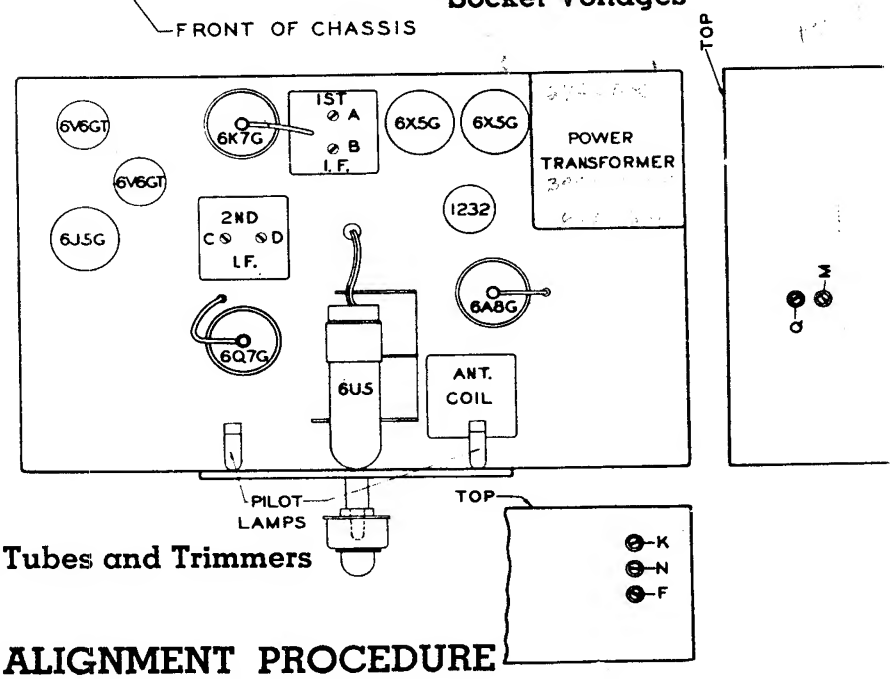
LEGEND

F—Filament
H—Heater
D—Diode
G1—Control Grid
G2—Screen Grid
G3—Suppressor Grid
P—Plate
K—Cathode

Socket Voltages

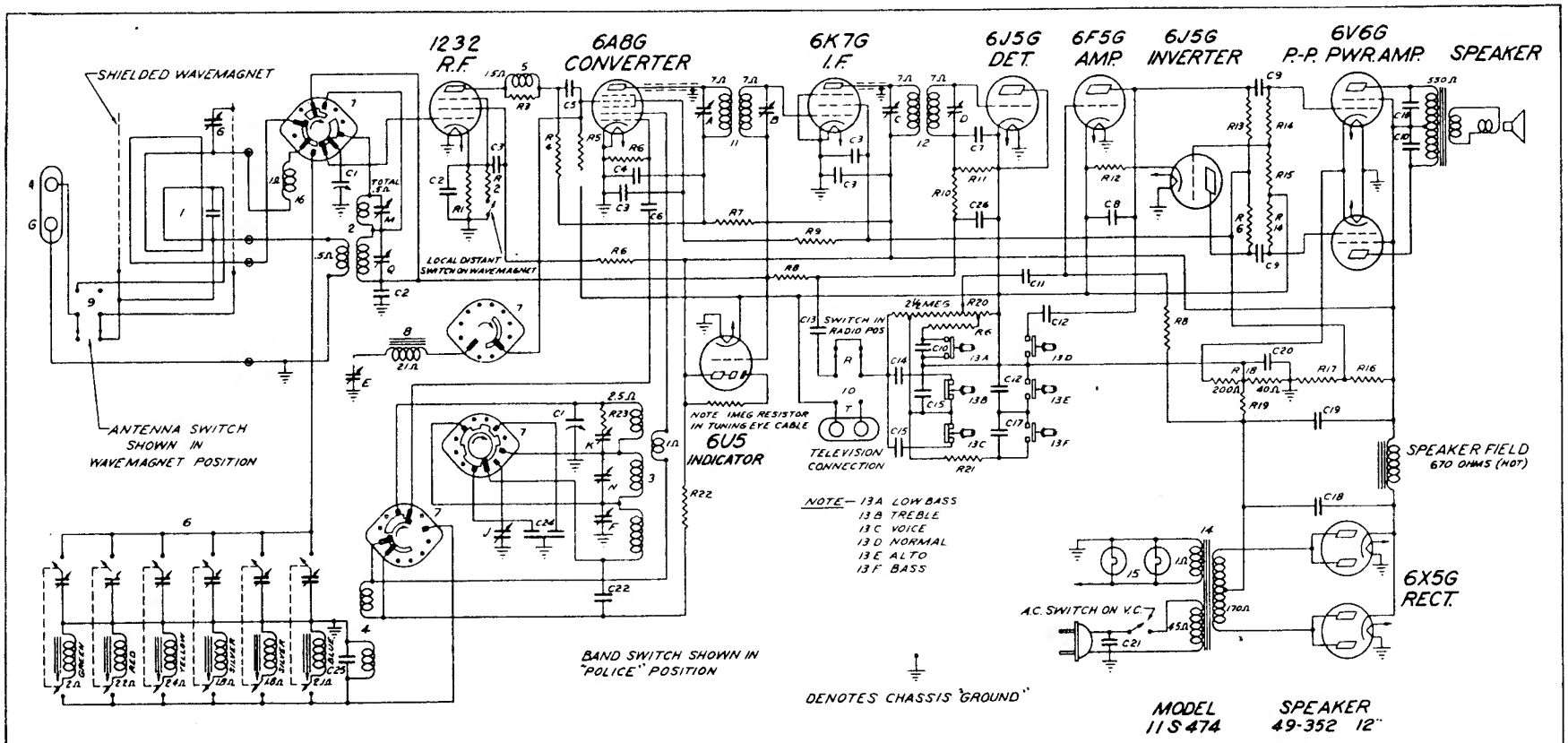


Location of Tubes and Trimmers



ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	½ Mfd.	455 Kc.	Broadcast	600 Kc.	A, B, C, D	I. F. Alignment
2	Antenna Post (On Loop)	200 Mmf.	18000 Kc.	S. W.	18000 Kc.	K	Set Oscillator to Scale
3	Antenna Post (On Loop)	200 Mmf.	16000 Kc.	S. W.	16000 Kc.	M	Alignment of Antenna
4	Antenna Post (On Loop)	200 Mmf.	4500 Kc.	Police	4500 Kc.	N	Set Oscillator to Scale
5	Antenna Post (On Loop)	200 Mmf.	4500 Kc.	Police	4500 Kc.	Q	Alignment of Antenna
6	Single Turn Coupled Loosely to Loop		1400 Kc.	Broadcast	1400 Kc.	F	Set Oscillator to Scale
7	Loop Switch in Wave Magnet Position		1400 Kc.	Broadcast	1400 Kc.	G (On Loop)	Alignment of Antenna



DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION		DIAG Nº	PART Nº	DESCRIPTION
C1	22-927	TWO GANG VARIABLE		C22	22-358	.002 MFD	600V	R16	63-1058	22M OHM	2W	12	95-864	2ND I.F. TRANSFORMER
C2	22-829	.05 MFD.	200V					R17	63-676	27M OHM	1W.	13	S7643	TONE CONTROL SW. ASSEM.
C3	22-828	.05 MFD.	400V	C24	22-930	DUAL OSC. PADDER		R18	63-1048	2-SECTION CANOHM		14	95-630	POWER TRANS 60~ 115V.
C4	22-825	.1 MFD.	400V	C25	22-868	COMPENSATING COND.		R19	63-1062	10 OHM WIREWOUND	½W.	15	100-36	PILOT LIGHT 6.3V. .25A
C5	22-147	.0005 MFD.	600V	C26	22-162	.0001 MFD.	600V	R20	63-1074	VOLUME CONTROL		16	S8142	LOOP LOADING COIL ASSEM.
C6	22-127	.25 MMFD.	600V					R21	63-594	68M OHM	⅛W			
C7	22-182	.00025 MFD.	600V	R1	63-589	10M OHM	⅛W	R22	63-151	15M OHM	1W	A		1ST I.F. TRANS PRI.
C8	22-856	.0003 MFD.	600V	R2	63-574	33 OHM	⅛W	R23	63-576	68 OHM	⅛W	B		1ST I.F. " SEC
C9	22-171	.05 MFD.	600V	R3	63-1077	18M OHM	1W					C		2ND I.F. " PRI
C10	22-229	.005 MFD.	600V	R4	63-587	4700 OHM	⅛W					D		2ND I.F. " SEC
C11	22-830	.02 MFD.	600V	R5	63-595	100M OHM	⅛W	1		WAVEMAGNET ASSEMBLY		E		WAVE TRAP
C12	22-448	.004 MFD.	600V	R6	63-593	47M OHM	⅛W	2	S7504	ANTENNA COIL ASSEMBLY		F		BROADCAST OSC (SEE NOTE)
C13	22-327	.02 MFD.	200V	R7	63-605	1000 OHM	½W	3	S7505	OSCILLATOR COIL ASSEMBLY		G		ANTENNA BROADCAST
C14	22-954	.00035 MFD.	600V	R8	63-271	1 MEGOHM	½W	4	S7507	OSC. COUPLER COIL ASSEM.		K		SHORT WAVE OSC (SEE NOTE)
C15	22-470	.00015 MFD.	600V	R9	63-643	18M OHM	⅛W	5	S7526	R.F. CHOKE		M	22-982	SHORT WAVE ANTENNA
				R10	63-711	22M OHM	⅛W	6	S7849	AUTOMATIC TUNING UNIT		N		POLICE BAND OSC (SEE NOTE)
C17	22-492	.002 MFD.	600V	R11	63-774	220M OHM	⅛W	7	85-202	BAND SELECTOR SWITCH		Q	22-982	POLICE BAND ANTENNA
C18	22-934	20MFD ELECTROLYTIC	450V	R12	63-585	2200 OHM	½W	8	S7559	WAVE TRAP COIL ASSEMBLY		J	22-463	BROADCAST PADDER
C19		20MFD ELECTROLYTIC	350V	R13	63-296	220M OHM	⅛W	9	85-171	WAVEMAGNET SWITCH				NOTE: TRIMMERS F & N ARE MOUNTED ON STRIP Nº 22-850
C20	22-827	.1 MFD.	200V	R14	63-657	330M OHM	⅛W	10	85-171	TELEVISION SWITCH				
C21	22-525	.005 MFD.	1000V	R15	63-648	47M OHM	⅛W	11	95-625	1ST I.F. TRANSFORMER				

I.F. FREQUENCY 455 KC.
11 TUBE SUPERHETERODYNE
CHASSIS Nº1103 A.C. 3 BAND
ZENITH RADIO CORPORATION
CHICAGO, ILL.

Model 11S474

Chassis No. 1103

Model 11S474

CHASSIS No. 1103

NOTE

All voltages measured with a 1000 ohm per volt meter from chassis to socket contact indicated.

All voltages are positive D.C. unless marked otherwise.

Sensitivity switch in distance position.

Volume control full on.

Line voltage 112 A.C.

LEGEND

F—Filament
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G1—Control Grid
G2—Screen Grid
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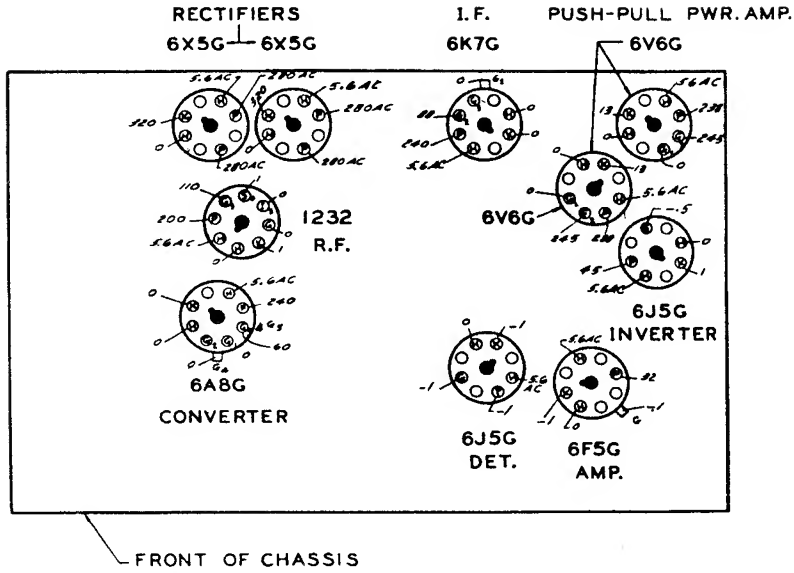
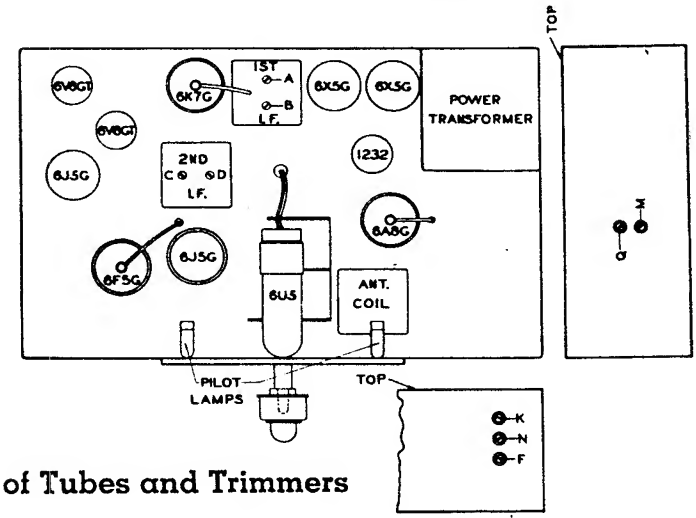


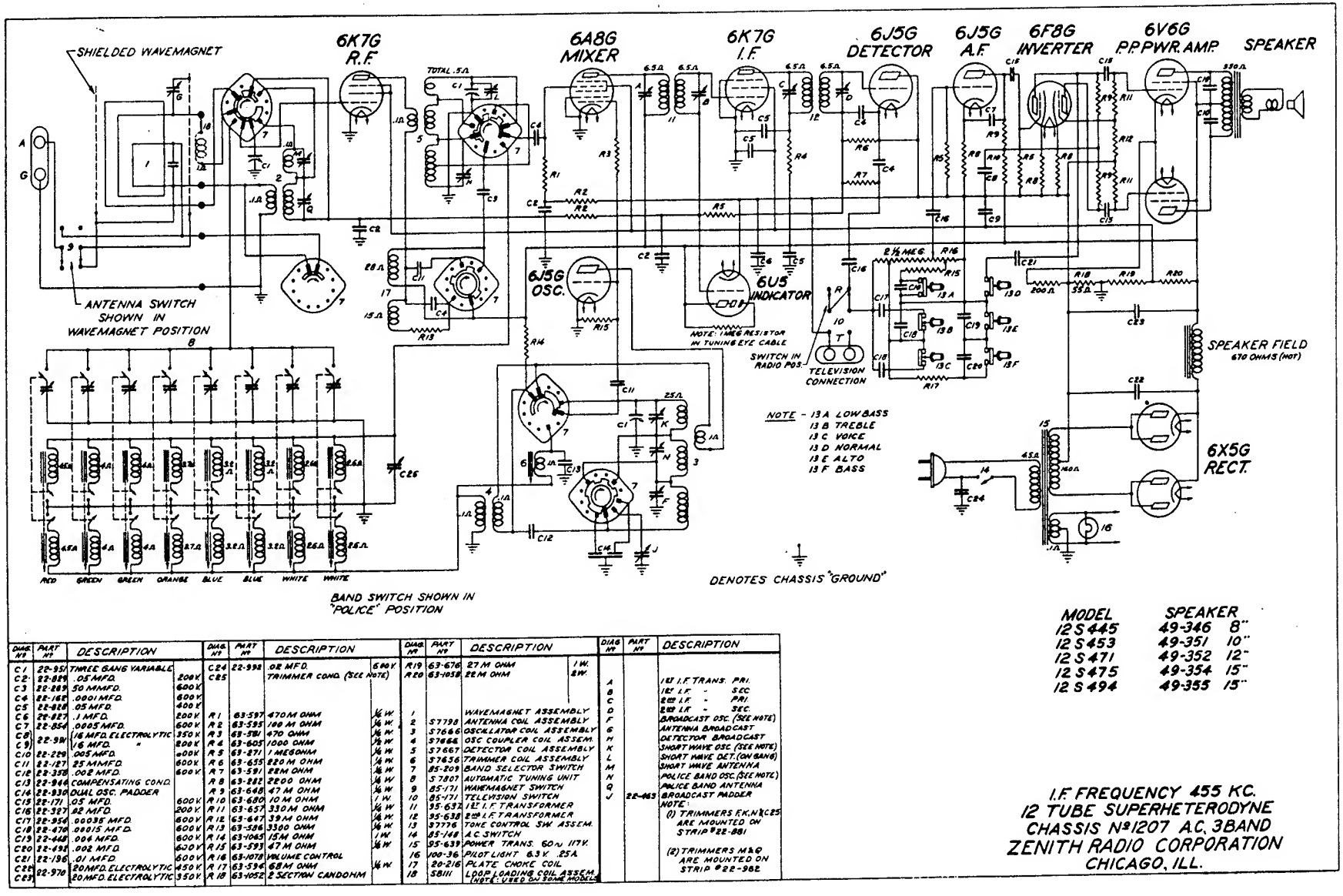
Socket Voltages



Location of Tubes and Trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	½ Mfd.	455 Kc.	Broadcast	600 Kc.	A, B, C, D	I. F. Alignment
2	Antenna Post (On Loop)	200 Mmf.	18000 Kc.	S. W.	18000 Kc.	K	Set Oscillator to Scale
3	Antenna Post (On Loop)	200 Mmf.	16000 Kc.	S. W.	16000 Kc.	M	Alignment of Antenna
4	Antenna Post (On Loop)	200 Mmf.	4500 Kc.	Police	4500 Kc.	N	Set Oscillator to Scale
5	Antenna Post (On Loop)	200 Mmf.	4500 Kc.	Police	4500 Kc.	Q	Alignment of Antenna
6	Single Turn Coupled Loosely to Loop		1400 Kc.	Broadcast	1400 Kc.	F	Set Oscillator to Scale
7	Loop Switch in Wave Magnet Position		1400 Kc.	Broadcast	1400 Kc.	G (On Loop)	Alignment of Antenna



DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-951	THREE GANG VARIABLE	
C2	22-889	.05 MFD.	200 V.
C3	22-889	50 MMFD.	600 V.
C4	22-168	.0001 MFD.	600 V.
C5	22-828	.05 MFD.	400 V.
C6	22-827	.1 MFD.	200 V.
C7	22-854	.0005 MFD.	600 V.
C8	22-598	(16 MFD. ELECTROLYTIC	350 V.
C9		(16 MFD. "	200 V.
C10	22-229	.005 MFD.	400 V.
C11	22-127	25 MMFD.	600 V.
C12	22-358	.002 MFD.	600 V.
C13	22-946	COMPENSATING COND.	
C14	22-930	DUAL OSC. PADDER	
C15	22-171	.05 MFD.	600 V.
C16	22-927	.02 MFD.	200 V.
C17	22-956	.00035 MFD.	600 V.
C18	22-479	.00015 MFD.	600 V.
C19	22-448	.004 MFD.	600 V.
C20	22-492	.002 MFD.	600 V.
C21	22-196	.01 MFD.	600 V.
C22	22-970	20 MFD. ELECTROLYTIC	450 V.
C23		20 MFD. ELECTROLYTIC	350 V.
C24	22-998	.08 MFD.	600 V.
C25		TRIMMER COND. (SEE NOTE)	
R1	63-597	470 M OHM	½ W.
R2	63-595	180 M OHM	½ W.
R3	63-581	470 OHM	½ W.
R4	63-605	1000 OHM	½ W.
R5	63-671	1 MEGOHM	½ W.
R6	63-655	220 M OHM	½ W.
R7	63-591	22M OHM	½ W.
R8	63-882	2200 OHM	½ W.
R9	63-648	47 M OHM	1 W.
R10	63-680	10 M OHM	1 W.
R11	63-657	330 M OHM	½ W.
R12	63-647	39 M OHM	½ W.
R13	63-586	3300 OHM	½ W.
R14	63-1065	15M OHM	1 W.
R15	63-593	47 M OHM	½ W.
R16	63-1078	VOLUME CONTROL	
R17	63-596	68M OHM	½ W.
R18	63-1052	2 SECTION CANDOHM	
R19	63-676	27 M OHM	1 W.
R20	63-1058	22M OHM	2 W.
1		WAVEMAGNET ASSEMBLY	
2	S7798	ANTENNA COIL ASSEMBLY	
3	S7666	OSCILLATOR COIL ASSEMBLY	
4	S7666	OSC COUPLER COIL ASSEM.	
5	S7667	DETECTOR COIL ASSEMBLY	
6	S7636	TRIMMER COIL ASSEMBLY	
7	85-209	BAND SELECTOR SWITCH	
8	S 7807	AUTOMATIC TUNING UNIT	
9	85-171	WAVEMAGNET SWITCH	
10	85-171	TELEVISION SWITCH	
11	95-692	1ST I.F. TRANSFORMER	
12	95-638	2ND I.F. TRANSFORMER	
13	97776	TONE CONTROL SW. ASSEM.	
14	85-168	A.C. SWITCH	
15	95-639	POWER TRANS. 60 ~ 117 V.	
16	100-36	PILOT LIGHT 6.3 V. .25 A.	
17	20-216	PLATE CHOKE COIL	
18	SB111	LOOP LOADING COIL ASSEM. (NOTE: USED ON SOME MODELS)	
A		1ST I.F. TRANS. PRI.	
B		1ST I.F. - SEC.	
C		2ND I.F. - PRI.	
D		2ND I.F. - SEC.	
F		BROADCAST OSC. (SEE NOTE)	
G		ANTENNA BROADCAST	
H		DETECTOR BROADCAST	
K		SHORT WAVE OSC. (SEE NOTE)	
L		SHORT WAVE DET. (ON BAND)	
M		SHORT WAVE ANTENNA	
N		POLICE BAND OSC. (SEE NOTE)	
Q		POLICE BAND ANTENNA	
J	22-463	BROADCAST PADDER	

NOTE:
(1) TRIMMERS F, K, N & C25 ARE MOUNTED ON STRIP #22-881
(2) TRIMMERS M & Q ARE MOUNTED ON STRIP #22-982

MODEL	SPEAKER
12S445	49-346 8"
12S453	49-351 10"
12S471	49-352 12"
12S475	49-354 15"
12S494	49-355 15"

I.F. FREQUENCY 455 KC.
12 TUBE SUPERHETERODYNE
CHASSIS Nº1207 A.C. 3BAND
ZENITH RADIO CORPORATION
CHICAGO, ILL.

Models 12S445—12S453—12S471—12S475—12S494

CHASSIS No. 1207

Models 12S445—12S453—12S471—12S475—12S494

CHASSIS No. 1207

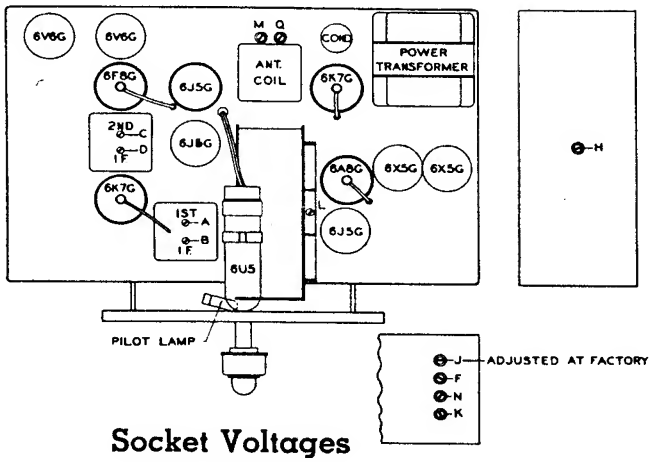
NOTE

All voltages measured with a 1000 ohm per volt meter from chassis to socket contact indicated.

All voltages are positive D.C. unless marked otherwise.

Volume control full on.

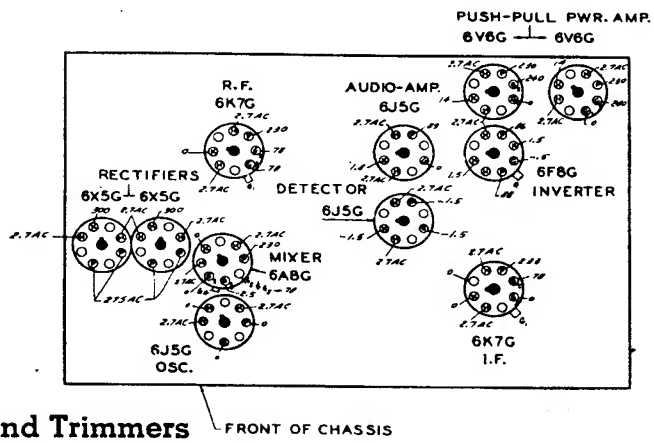
Line voltage 112 A.C.



Socket Voltages

LEGEND

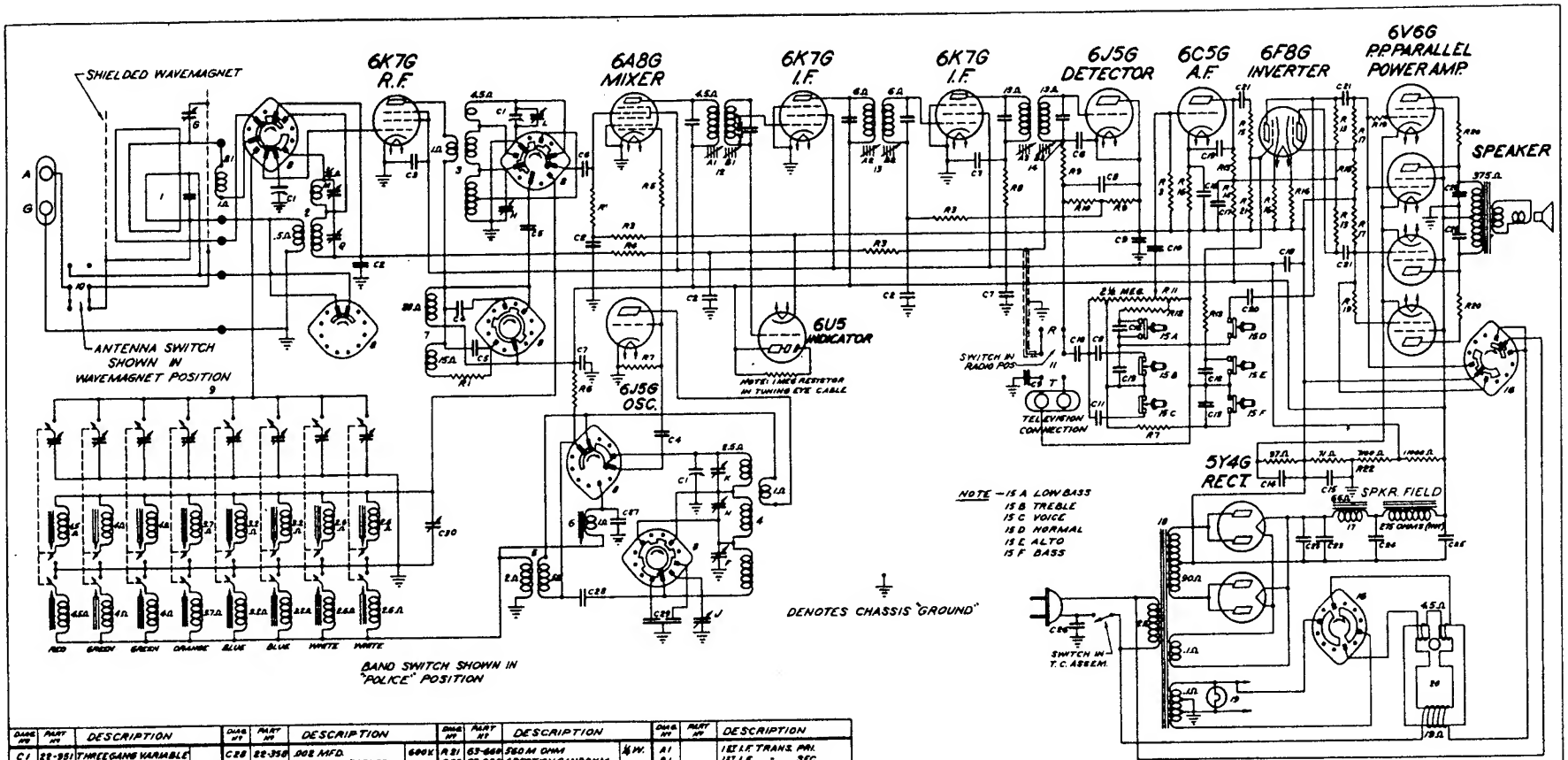
F—Filament
H—Heater
D—Diode
G1—Control Grid
G2—Screen Grid
G3—Suppressor Grid
P—Plate
K—Cathode



Location of Tubes and Trimmers

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Loop Switch	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	½ Mfd.	455 Kc.	Broadcast	.....	600 Kc.	A, B, C, D	I. F. Alignment
2	Antenna Post (On Loop)	200 Mmf.	18000 Kc.	S. W.	Ant.	18000 Kc.	K	Set Oscillator to Scale
3	Antenna Post (On Loop)	200 Mmf.	16000 Kc.	S. W.	Ant.	16000 Kc.	L-M	Alignment of Det.—Rock Gang & Adjust for Max.
4	Antenna Post (On Loop)	200 Mmf.	4500 Kc.	Police	Ant.	4500 Kc.	N	Rock Gang & Adjust for Max. Output
5	Antenna Post (On Loop)	200 Mmf.	4500 Kc.	Police	Ant.	4500 Kc.	Q	Alighnment of Antenna
6	Single Turn Coupled Loosely to Loop		1400 Kc.	Broadcast	Wave Magnet	1400 Kc.	F	Set Oscillator to Scale
7	Single Turn Coupled Loosely to Loop		1400 Kc.	Broadcast	Wave-Magnet	1400 Kc.	H	Alignment of R. F.
8	Single Turn Coupled Loosely to Loop		1400 Kc.	Broadcast	Wave-Magnet	1400 Kc.	G (On Loop)	Alignment of Loop
9							J Adjusted at Factory	



CHASS. NO.	PART NO.	DESCRIPTION	
C1	22-981	THREEGANG VARIABLE	
C2	22-829	.05 MFD.	200 V
C3	22-825	.1 MFD.	400 V
C4	22-187	25 MMFD.	600 V
C5	22-289	50 MMFD.	600 V
C6	22-168	.0001 MFD.	600 K
C7	22-828	.05 MFD.	400 V
C8	22-185	.00025 MFD.	600 V
C9	22-827	.1 MFD.	200 V
C10	22-367	.02 MFD.	200 V
C11	22-470	.00015 MFD.	600 V
C12	22-326	.003 MFD.	400 K
C13	22-648	.004 MFD.	600 K
C14		40 MFD. ELECTROLYTIC	25 V
C15	22-960	40 MFD. "	25 V
C16		20 MFD. "	25 V
C17	22-747	16 MFD. "	450 V
C18		40 MFD. "	200 V
C19	22-167	.0005 MFD.	600 K
C20	22-196	.01 MFD.	600 K
C21	22-171	.05 MFD.	600 K
C22	22-455	.01 MFD.	1200 K
C23	22-569	12 MFD. ELECTROLYTIC	450 V
C24		10 MFD. "	450 V
C25	22-727	20 MFD. "	450 V
C26	22-932	.02 MFD.	600 K
C27	22-964	COMPENSATING COND.	
C28	22-358	.002 MFD.	600 K
C29	22-930	DUAL OSC. PADDER	
C30		TRIMMER CONDENSER (SEE NOTE 1)	
R1	63-536	3300 OHM	½ W.
R2	63-597	470 M OHM	½ W.
R3	63-271	1 MEGOHM	½ W.
R4	63-595	100 M OHM	½ W.
R5	63-551	470 OHM	½ W.
R6	63-609	15 M OHM	1 W.
R7	63-593	47 M OHM	½ W.
R8	63-606	1000 OHM	½ W.
R9	63-649	56 M OHM	½ W.
R10	63-653	150 M OHM	½ W.
R11	63-500	VOLUME CONTROL	
R12	63-591	22 M OHM	½ W.
R13	63-648	47 M OHM	½ W.
R14	63-580	10 M OHM	1 W.
R15	63-655	220 M OHM	½ W.
R16	63-282	2200 OHM	½ W.
R17	63-647	330 M OHM	½ W.
R18	63-647	39 M OHM	½ W.
R19	63-577	100 OHM	½ W.
R20	63-616	22 OHM	½ W.
R21	63-668	560 M OHM	½ W.
R22	63-986	4 SECTION CANDOHM	
1		WAVEMAGNET ASSEMBLY	
2	57959	ANTENNA COIL ASSEMBLY	
3	57960	DETECTOR COIL ASSEMBLY	
4	57966	OSCILLATOR COIL ASSEMBLY	
5	57759	OSC. COUPLER COIL ASSEM.	
6	57858	TRIMMER COIL ASSEMBLY	
7	20-816	PLATE CHOKE COIL	
8	85-209	BAND SELECTOR SWITCH	
9	37807	AUTOMATIC TUNING UNIT	
10	85-171	WAVEMAGNET SWITCH	
11	85-171	TELEVISION SWITCH	
12	58103	1ST I.F. TRANSFORMER	
13	26375	2ND I.F. TRANSFORMER	
14	36376	3RD I.F. TRANSFORMER	
15	37998	TONE CONTROL SW. ASSEM.	
16	85-158	MOTOR CONTROL SWITCH	
17	35-445	POWER CHOKE	
18	35-533	POWER TRANS. 50-60~, 117 V	
19	100-38	PILOT LIGHT 6.3 V .25 A	
20	MU-51	MOTOR	
21	58111	LOOP LOADING COIL ASSEM.	
A1		1ST I.F. TRANS. PRI.	
B1		1ST I.F. - SEC.	
A2		2ND I.F. - PRI.	
B2		2ND I.F. - SEC.	
A3		3RD I.F. - PRI.	
B3		3RD I.F. - SEC.	
F		BROADCAST OSC. (SEE NOTE 1)	
G		ANTENNA BROADCAST	
H	22-969	DETECTOR BROADCAST	
K		SHORT WAVE OSC. (SEE NOTE 1)	
L		SHORT WAVE DET. (2ND GANG)	
M		SHORT WAVE ANT. (SEE NOTE)	
N		POLICE BAND OSC. (SEE NOTE 1)	
Q		POLICE BAND ANT. (SEE NOTE)	
J	22-465	BROADCAST PADDER	

NOTE:
(1) TRIMMERS F, K, N, & C30 ARE MOUNTED ON STRIP #22-881
(2) TRIMMERS M & Q ARE MOUNTED ON STRIP #22-982

MODEL	SPEAKER
15S479	49-374 15"
15S495	49-375 15"

I.F. FREQUENCY 455 KC.
15 TUBE SUPERHETERODYNE
CHASSIS Nº1503 A.C. 3BAND
ZENITH RADIO CORPORATION
CHICAGO, ILL.

Models 15S479—15S495

Chassis No. 1503

Models 15S479—15S495

CHASSIS No. 1503

NOTE

All voltages measured with a 1000 ohm per volt meter from chassis to socket contact indicated.

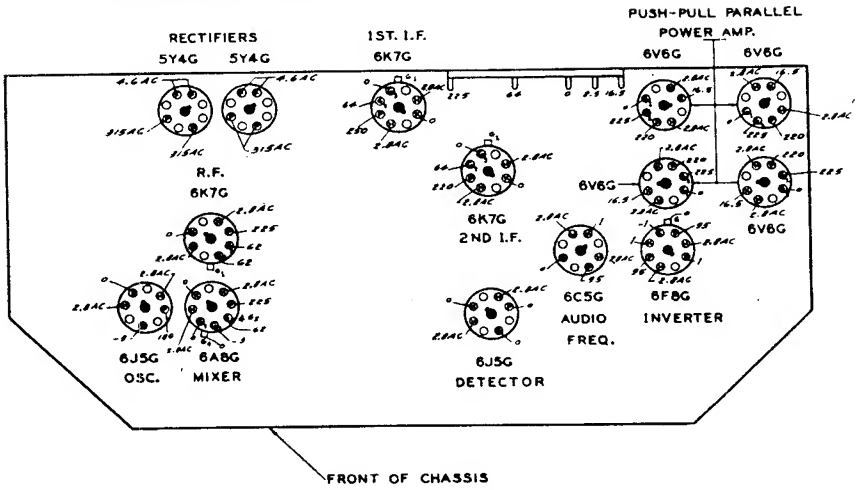
All voltages are positive D.C. unless marked otherwise.

Volume control full on.

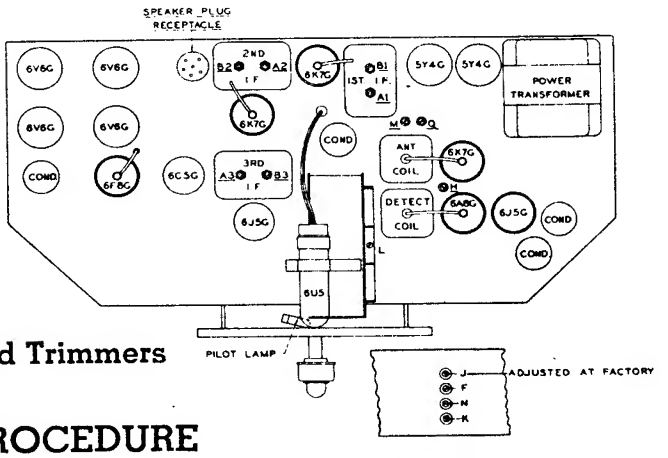
Line voltage 112 A.C.

LEGEND

F—Filament
H—Heater
D—Diode
G1—Control Grid
G2—Screen Grid
G3—Suppressor Grid
P—Plate
K—Cathode



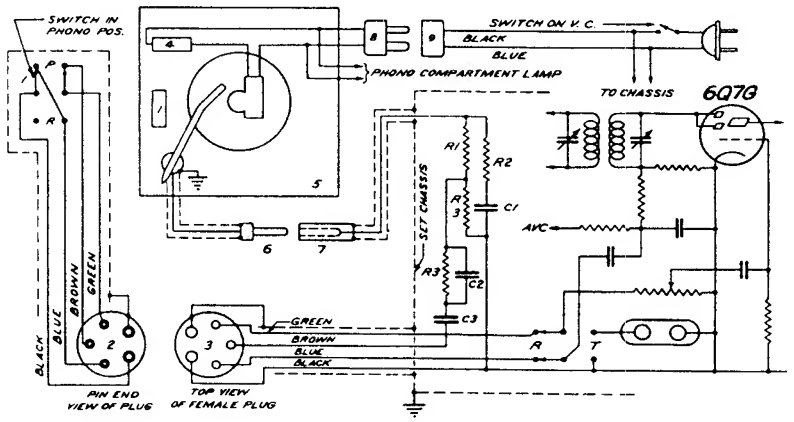
Socket Voltages



Location of Tubes and Trimmers

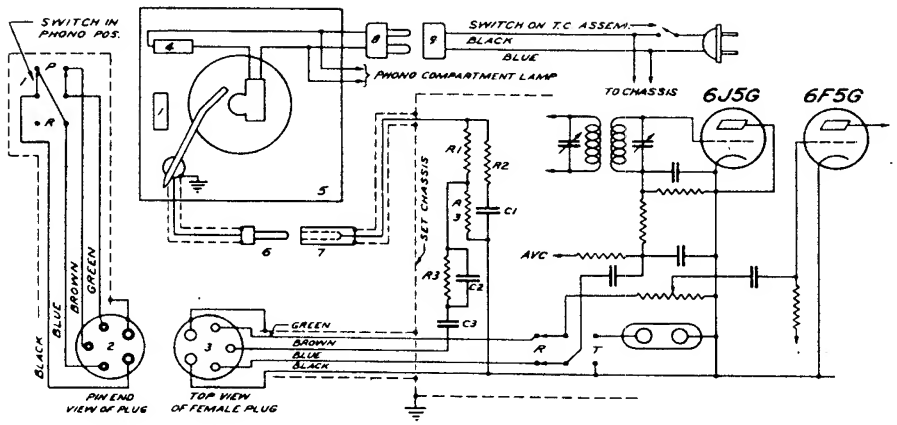
ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Test Osc. Set at ..... KC	Band	Loop Switch	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	½ Mfd.	455 Kc.	Broadcast	.....	600 Kc.	A, B, C, D, E, F	I. F. Alignment
2	Antenna Post (on Loop)	200 Mmf.	18000 Kc.	S. W.	Antenna	18000 Kc.	K	Set Oscillator to Scale
3	Antenna Post (on Loop)	200 Mmf.	16000 Kc.	S. W.	Antenna	16000 Kc.	L-M	Alignment of Ant. & Det.—Rock Gang & Adjust for Max.
4	Antenna Post (on Loop)	200 Mmf.	4500 Kc.	Police	Antenna	4500 Kc.	N	Rock Gang & Adjust for Max. Output
5	Antenna Post (on Loop)	200 Mmf.	4500 Kc.	Police	Antenna	4500 Kc.	Q	Alignment of Antenna
6	Single Turn Coupled Loosely to Loop		1400 Kc.	Broadcast	Wave-Magnet	1400 Kc.	200 Mmf. F	Set Oscillator to Scale
7	Single Turn Coupled Loosely to Loop		1400 Kc.	Broadcast	Wave-Magnet	1400 Kc.	H	Alignment of R. F.
8	Single Turn Coupled Loosely to Loop		1400 Kc.	Broadcast	Wave-Magnet	1400 Kc.	G (On Loop)	Alignment of Loop
9						J Adjusted at Factory		



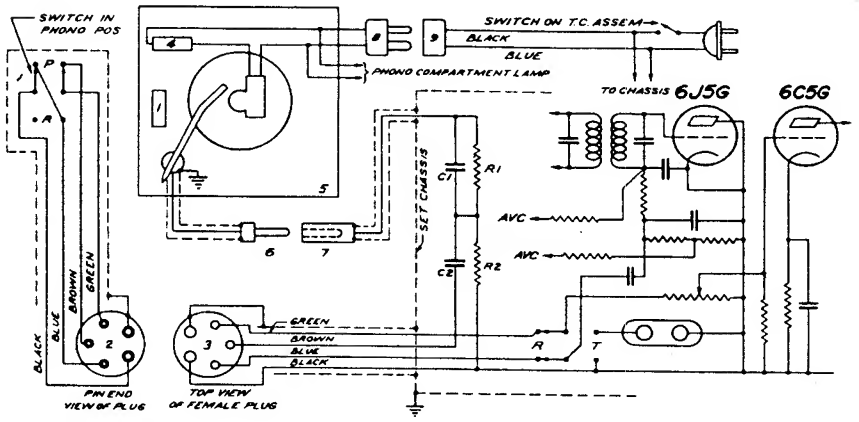
DIAG. NO	PART NO	DESCRIPTION	
C1	22-319	.005 MFD.	200V
C2	22-954	.00035 MFD.	600V
C3	22-887	.001 MFD.	600V
R1	63-719	470 M OHM	1/2 W.
R2	63-649	56 M OHM	1/2 W.
R3	63-271	1 MEGOHM	1/2 W.
1	S7224	PHONO SW. & WIRE ASSEMBLY	
2			
3	S8070	PLUG & WIRE ASSEMBLY	
4	85-191	A.C. SWITCH	
5	169-36	WEBSTER AUTOMATIC RECORD PLAYER	
6		CINCH #M-93 PLUG	
7	S8069	RECEPTACLE & WIRE ASSEM.	
8		CINCH #M-21 PLUG WITH P-7002 CAP & LINER	
9	S8068	PLUG & WIRE ASSEMBLY	

PHONO CIRCUIT DATA
MODEL SPEAKER
10S491 49-356 15"
10S492 49-352 12"
CHASSIS Nº1007



DIAG. NO	PART NO	DESCRIPTION	
C1	22-319	.005 MFD.	200V
C2	22-954	.00035 MFD.	600V
C3	22-887	.001 MFD.	600V
R1	63-719	470 M OHM	1/2 W.
R2	63-649	56 M OHM	1/2 W.
R3	63-271	1 MEGOHM	1/2 W.
1	S7224	PHONO SW. & WIRE ASSEMBLY	
2			
3	S8094	PLUG & WIRE ASSEMBLY	
4	85-191	A.C. SWITCH	
5	169-36	WEBSTER AUTOMATIC RECORD PLAYER	
6		CINCH #M-93 PLUG	
7	S8093	RECEPTACLE & WIRE ASSEM.	
8		CINCH #M-21 PLUG WITH P-7002 CAP & LINER	
9	S8092	PLUG & WIRE ASSEMBLY	

PHONO CIRCUIT DATA
MODEL SPEAKER
12S494 49-355 15"
CHASSIS Nº1208



DIAG. NO	PART NO	DESCRIPTION	
C1	22-182	.00025 MFD.	600V
C2	22-887	.001 MFD.	600V
R1	63-597	470M OHM	1/2 W.
R2	63-649	56M OHM	1/2 W.
1	S7224	PHONO SW. & WIRE ASSEMBLY	
2			
3	S8108	PLUG & WIRE ASSEMBLY	
4	85-191	A.C. SWITCH	
5	169-36	WEBSTER AUTOMATIC RECORD PLAYER	
6		CINCH #M-93 PLUG	
7	S8107	RECEPTACLE & WIRE ASSEM	
8		CINCH #M-21 PLUG WITH P-7002 CAP & LINER	
9	S8106	PLUG & WIRE ASSEMBLY	

PHONO CIRCUIT DATA
MODEL SPEAKER
15S495 49-375 15"
CHASSIS Nº1504

PARTS PRICE LIST

MODELS

FOR CHASSIS MODEL CHART SEE FRONT COVER

Chassis No.	Code	Chassis No.	Code	Chassis No.	Code
5417	A	5678	F	1005	K
5420	B	5679	G	1103	L
5536	C	5724	H	1207	M
5672P	D	5725	I	1503	N
5675	E	5808	J		

DIAL PARTS

26-223	Dial scale	D-E	.45
26-232	Dial scale	C	.30
26-235	Dial scale	J-K-L	.25
26-238	Dial scale	A-B	.15
26-239	Stationary dial scale	M-N	.15
26-245	Dial scale	G	.25
27-16	Flywheel disc	G-J-K-L-M	1.00
32-15	Drive belt	M-N	.15
32-18	Drive belt	G-J-K-L-N	.15
34-68	Condenser shaft gear & bushing	M-N	.20
34-80	Lower drive gear & pinion	M-N	.20
57-709	Dial scale mounting plate	D-E	.05
57-776	Resonance indicator plate	M-N	.30
59-66	Dial pointer	A-B-C	.10
59-77	Dial pointer	F-H-I	.10
59-78	Dial pointer	D-E	.05
59-84	Frequency indicator pointer	M-N	.10
59-85	Split second pointer	M-N	.20
59-86	"On" indicator	A-B	.05
61-42	Pointer shaft pulley	M-N	.12
61-44	Motor shaft pulley	N	.12
61-53	Drive pulley (brass)	G-J-K-L	.15
61-55	Idler pulley (part of S-6959)	F-H-I	.10
73-8	Dial pulley set screw	A-B-C-G-J-K-L	.02
73-16	#8-32x1/8" headless set screw	M-N	.60 C
73-24	#8-32x1/4" H.H. set screw	G-J-K-L	1.50 C
73-28	Set screw-pointer pulley	M-N	.02
73-33	Set screw for 117-48	M-N	.02
76-229	Split second pointer shaft & pinion		.30
76-258	Tuning control shaft	A-B	.10
76-278	Tuning control shaft	C	.10
76-282	Dial drive shaft	F-H-I	.06
76-289	Volume control shaft	M-N	.08
76-292	Volume control shaft	G-J-K-L	.10
78-226	Dial light socket	G	.08
78-260	Dial light socket & wire	D-E	.18
78-297	Dial light socket & wire	M-N	.20
78-304	Dial light socket & wire	F	.45
80-69	Dial cord tension spring	A-B-C-F-G-H-I-J-K-L	.01
80-130	Clutch spring	M-N	.02
80-138	Retainer spring—movable scales	M-N	.01
80-139	Dial spring	M-N	.07
80-151	Return spring—movable scales	M-N	.02
80-181	Spring-pointer clamp	G-J-K-L	.65 C
80-207	Indicator spring	A-B	.02
83-516	Brass spacer strip	M-N	.02
83-666	Dial light diffusion strip	D-E	.02
83-707	Movable scale spacer strip	M-N	.65 C
83-708	Movable scale spacer strip	M-N	.03
93-371	Bakelite washer for dial pointer	A-B-C	.45 C
94-271	Coupling-volume control shaft	G-J-K-L-M-N	.06
97-117	Mtg. stud—MS452 pulley	G-J-K-L	.10
97-120	Mtg stud for 61-55 (Part of S-6959)	F-H-I	1.40 C
100-36	Dial lamp 6.3 volts	F-H-I-J-K-L-M-N	.09
100-39	Dial lamp 2.9 volt	D-E-G	.12
114-46	#6x7/16" hex. acorn head self tapping screw	M-N	.45 C
114-47	#6x7/16" H.H. slotted P. K. screw		.50 C
114-52	#8-32x3/16" H.H. slotted mach. screw	M-N	.35 C
114-62	#8x1/4" H.H. slotted self tapping screw	M-N	.60 C
114-115	#6x1/4" hex. acorn head self tapping screw	M-N	.45 C
117-48	Lever-band switch shaft	G-J-K-L-M-N	.02
118-16	Lever connecting link	G-J-K-L-M-N	.01
126-329	Center shield for dial glass	M-N	.05
142-49	Dial crystal	B	.20
159-12	Snap button	G-J-K-L-M-N	.01
183-9	Rubber band	M-N	.50 C
188-2	Retaining ring	G-J-K-L-M-N	.01
188-13	Retainer ring for 76-282	F-H-I	.15 C
192-39	Dial crystal	D-E	.15
192-47	Dial glass	M-N	.60
192-48	Dial crystal	C	.15
192-49	Dial crystal	A	.20
196-26	Gasket—dial glass	M-N	.15
199-10	Motor pulley rubber sleeve	N	.02
199-11	Rubber pulley sleeve	G-J-K-L-M-N	.75 C
199-14	Sleeve—MS452 mtg.	G-J-K-L	.03
199-21	Rubber bumper sleeve	M-N	.03
S-4915	Dial light socket & clip	H-I	.10
S-5999	Dial light socket & clip	J-K-L	.08
S-6220	Drive pulley & clutch assembly	M-N	.25
S-6221	Frequency pointer gear & shaft	M-N	.35
S-6223	Tuning shaft & bushing	G-J-K-L	.25
S-6440	Control arm & bushing for band switch (die cast)	G-J-K-L	.15
S-6870	Indicator disc & bushing	C	.15
S-6959	Dial scale & idler assy. (26-224)	F-H-I	.30
S-7046	Dial cord & eyelet assembly	F-H-I	.15
S-7071	Dial cord & eyelet assembly	C	.05
S-7262	Indicator cam & bushing	A-B	.05
S-7575	Dial cord & eyelet assembly	A-B	.05
S-7594	Broadcast band scale assembly (26-242 & 26-243)	M-N	.55
S-7595	Short wave band scale assembly (26-240 & 26-241)	M-N	.60
S-7645	Dial cord & eyelet	G-J-K-L	.10
S-7648	Dial pointer & clip	G-J-K-L	.12
S-7766	Dial scale mtg. plate assy.	M-N	.55
S-7768	Condenser drive shaft & bushing	M	.20
S-7777	Control arm & pin assembly (die cast)	M-N	.45
S-7948	Condenser drive shaft & bushing	N	.30
MS-418	Dial pulley & bracket assy.	A-B-C	.10
MS-452	Pulley & bracket assy.—Mtd. on chassis	G-J-K-L	.15
MS-506	Dial pulley & bracket assy.	F-H-I	.15
MS-577	Pulley & bracket assy.—Mtd. on gang shaft	G-J-K-L	.15

AUTOMATIC AND RADIORGAN EUSATCHEON ASSEMBLIES

12-729	Catch bracket	G-J-K-L-M-N	.01
46-293	A.C. switch knob (ON)	M-N	.10
46-294	A.C. switch knob (OFF)	M-N	.10
46-295	Automatic tuning knob	G-J-K-L-M-N	.04
46-296	Automatic tuning knob	G-J-K-L-M-N	.04
57-751	Escutcheon plate—dial	M-N	2.00
57-767	Zenith nameplate	M-N	.25
57-769	Escutcheon plate—auto. tuning	G-J-K-L	.30
57-770	Escutcheon plate—auto. tuning	M-N	.30
57-771	Escutcheon plate—tone control	G-J-K-L	.50
57-772	Escutcheon plate—tone control	M-N	.30

PARTS LIST—(Continued)

76-293	Shaft for knobs	G-J-K-L	.01
76-294	Knob shaft	M-N	.03
80-211	Spring for catch	G-J-K-L-M-N	.25 C
80-212	Spring retainer	G-J-K-L-M-N	.02
114-110	#4-40x7/32" H. H. slotted self tapping screw	G-J-K-L-M-N	.40 C
156-3	Escutcheon catch	G-J-K-L-M-N	.03
S-7882	"Alto" knob & eyelet	G-J-K-L	.10
S-7883	"Normal" knob & eyelet	G-J-K-L	.10
S-7884	"Treble" knob & eyelet	G-J-K-L	.10
S-7885	"Lo-Bass" knob & eyelet	G-J-K-L	.10
S-7886	"Bass" knob & eyelet	G-J-K-L	.10
S-7887	"Voice" knob & eyelet	G-J-K-L	.10
S-8026	"Alto" knob & eyelet	M-N	.10
S-8027	"Normal" knob & eyelet	M-N	.10
S-8028	"Treble" knob & eyelet	M-N	.10
S-8029	"Lo-Bass" knob & eyelet	M-N	.10
S-8030	"Bass" knob & eyelet	M-N	.10
S-8031	"Voice" knob & eyelet	M-N	.10

CONDENSERS

22-127	25 mmfd. 600 volts	J-K-L-M-N	.15
22-138	.2 mfd. 200 volts	C	.25
22-147	.0005 mfd. 600 volts	K-L-N	.20
22-162	.0001 mfd. 600 volts	A-B-C-D-F-G-H-I-J-K-L-M-N	.15
22-171	.05 mfd. 600 volts	M-N	.20
22-182	.00025 mfd. 600 volts	C-F-G-H-I-J-K-L-N	.20
22-185	.01 mfd. 200 volts	D-E	.15
22-188	.02 mfd. 400 volts	G	.15
22-190	.1 mfd. 200 volts	D-I	.12
22-196	.01 mfd. 600 volts	C-F-H-I-M-N	.15
22-199	.5 mfd. 200 volts	A-G	.40
22-212	.05 mfd. 400 volts	E	.15
22-219	.03 mfd. 200 volts	F-H-I-J	.15
22-229	.005 mfd. 600 volts	F-H-I-J-K-L-M	.15
22-243	.01 mfd. 400 volts	A-B-C	.15
22-250	.05 mfd. 200 volts	D-E	.15
22-289	50 mmfd. 600 volts	F-G-H-I-M-N	.15
22-319	.005 mfd. 200 volts	G-M	.15
22-326	.003 mfd. 400 volts	G-I-N	.15
22-327	.02 mfd. 200 volts	G-J-K-L-M-N	.15
22-350	.25 mfd. 200 volts	C-G	.20
22-358	.002 mfd. 600 volts	F-G-H-I-J-K-L-M-N	.30
22-448	.004 mfd. 600 volts	A-B-C-F-G-H-I-J-K-L-M-N	.15
22-455	.01 mfd. 1200 volts	N	.20
22-458	.006 mfd. 600 volts	G	.15
22-463	Oscillator padder	N	.35
22-470	.00015 mfd. 600 volts	G-J-K-L-M-N	.15
22-492	.002 mfd. 600 volts	J-K-L-M	.15
22-525	.005 mfd. 1000 volts	I-J-K-L-M	.45
22-569	12 mfd. 450 volts Dry Electrolytic	N	1.00
22-627	.002 mfd. 1000 volts	J	.20
22-684	8 mfd. 150 V. dry electrolytic	B	.35
22-695	Two gang variable	A-B	2.25
22-716	.0005 mfd. 600 volts	F-G-H-I-J	.20
22-719	16 mfd. 350 volts	H-I-J-M	.55
22-727	10-10 mfd. 450 volts dry electrolytic	N	1.25
22-733	.0001 mfd. 500 volts		.20
22-736	.00043 mfd. 500 volts		.45
22-737	.00075 mfd. 500 volts		.35
22-742	10-15-15 mfd. 250 V. dry electrolytic	A	1.25
22-747	16 mfd. 450 V.—40 mfd. 200 V. dry electrolytic		1.25
22-771	30-15-10 mfd. 250 V. dry electrolytic	G	1.25
22-788	2-35 mmfd. ceramic trimmer	F-G-H-I	.15
22-823	.25 mfd. 200 volts		.25
22-825	.1 mfd. 400 volts	J-K-L-N	.20
22-826	.01 mfd. 200 volts	A-B-C-G	.15
22-827	.1 mfd. 200 volts	F-G-H-I-J-K-L-M-N	.18
22-828	.05 mfd. 400 volts	A-F-G-H-I-J-K-L-M-N	.15
22-829	.05 mfd. 200 volts	A-B-C-F-G-H-I-J-K-L-M-N	.15
22-830	.02 mfd. 600 volts	F-G-H-I-J-K-L	.15
22-833	.0005 mfd. 600 volts	D-E	.20
22-836	.03 mfd. 400 volts	D-E	.15
22-837	.01 mfd. 400 volts	D-E	.15
22-841	.02 mfd. 200 volts	D-E	.15
22-844	.05 mfd. 400 volts	D-E	.15
22-846	Trimmer—auto. tuning	F-G-H-I-J-K-L-M-N	.15
22-847	Trimmer—auto. tuning	F-G-H-I-J-K-L-M-N	.20
22-848	Trimmer—auto. tuning	F-G-H-I-J-K-L-M-N	.25
22-849	Two gang variable	F-H-I	2.50
22-850	Ceramic trimmer—3 section	F-H-I-J-K-L	.50
22-853	Dual fixed padder	F-H-I	.60
22-854	.0005 mfd. 600 volts	G-J-K-L-M	.15
22-859	Trimmer—auto. tuning	F-G-H-I-J-K-L-M-N	.20
22-866	Broadcast oscillator padder	F-H-I	.30
22-868	480 mmfd. silver cap auto. tuning	F-G-I-J-K-L	.30
22-869	.05 mfd. 400 volts	C-H	.15
22-873	Trimmer—auto. tuning	F-G-H-I-J-K-L-M-N	.25
22-875	.15 mfd. 400 volts	D-E	.20
22-879	60-60 mfd. 150 volt dry electrolytic	C	1.25
22-881	Ceramic trimmer—4 section	G-M-N	.75
22-885	Two gang variable	D-E	2.00
22-887	.001 mfd. 600 volts	C-M-N	.15
22-893	20 mfd. 200 volt electrolytic	D-E	.85
22-894	20 mfd. 250 V.—20 mfd. 150 V. 20 mfd. 25 V.	C	2.00
22-910	Two gang variable	D-E	1.25
22-927	Two gang variable	J-K-L	3.50
22-928	40 mfd. 150 volt 20 mfd. 25 volt dry electrolytic	C	.85
22-929	Padder—broadcast oscillator	J-K-L-M	.30
22-930	Padder—dual fixed	J-K-L-M-N	.65
22-931	Ceramic trimmer—2 section		.35
22-933	6-16 mfd. 450 volt dry electrolytic	J	.85
22-934	20 mfd. 450 volt—20 mfd. 350 volt dry electrolytic	K-L	1.10
22-939	.1 mfd. 200 volts	E	.15
22-940	R. F. coil trimmer	F-H-I	.15
22-941	5 mfd. x 15 mfd. 450 volts	H-I	1.00
22-944	Compensator	M-N	.40
22-951	Three gang variable	M-N	5.50
22-953	200 mmfd. 600 volts	I	.12
22-954	350 mmfd. 600 volts	I-J-K-L-M	.12
22-958	Trimmer—wave trap	J-K-L	.20
22-959	Ceramic trimmer—single section	M-N	.15
22-960	40-40-20 mfd. 25 volt dry electrolytic	N	.75
22-961	500 mfd. 15 volt electrolytic	A	1.50
22-964	Two gang variable	G	3.25
22-966	.04 mfd. 600 volts	A	.20
22-970	20 mfd. 450 volts—20 mfd. 350 V. dry electrolytic	M	1.15
22-972	.015 mfd. 600 volts	G	.15
22-973	Dual fixed padder	G	.65
22-974	20 mfd. 25 V.—20 mfd. 250 V. dry electrolytic	G	.85
22-975	20 mfd. 450 V. dry electrolytic	F	.75
22-976	10 mfd. 450 volt—15 mfd. 350 volt dry electrolytic	F	1.00
22-982	Trimmer—ceramic—2 section	J-K-L-N	.30
22-992	.02 mfd. 600 volts	N	.25

R. F. AND I. F. COILS

20-208	Antenna coil	A-B-C	.45
20-216	R. F. plate choke coil	M-N	.45
95-589	1st I. F. transf.	A-B	1.25
95-590	2nd I. F. transf.	A-B	1.25
95-593	1st I. F. transf.	C	1.00
95-594	2nd I. F. transf.	C	1.00
95-596	2nd I. F. transf.	F-H-I	1.00
95-600	1st I. F. transf.	F-H-I	1.00
95-625	1st I. F. transf.	J-K-L	1.25
95-637	1st I. F. transf.	M	1.25
95-638	2nd I. F. transf.	M	1.25
95-649	1st I. F. transf.	G	1.25
95-650	2nd I. F. transf.	G	1.25

95-663	2nd I. F. transf.	J	1.25
95-664	2nd I. F. transf.	K-L	1.25
S-5043	Choke assembly—power pack	A	.25
S-6375	2nd I. F. transf.	N	2.25
S-6376	3rd I. F. transf.	N	2.25
S-6381	Oscillator coil	A-C	.65
S-6901	Oscillator coil	E	.55
S-6902	1st I. F. transf.	D-E	.60
S-6903	2nd I. F. transf.	D-E	.60
S-6936	Antenna coil assembly	F-H-I	1.00
S-6937	Oscillator coil assembly	F-H-I	1.25
S-6942	Oscillator coupling coil	D	.55
S-6992	Oscillator coupler coil assy.	F-H-I	.45
S-7500	Wave trap coil assembly	F-H-I	.85
S-7504	Antenna coil assembly	J-K-L	1.00
S-7507	Oscillator coupler coil & bracket	G-J-K-L	.75
S-7559	Wave trap coil	J-K-L	.50

COILS

S-7635	Choke coil & res. assembly.	J-K-L	.40
S-7641	Oscillator coil & shield	J-K-L	1.50
S-7656	Trimmer coil	M-N	.50
S-7665	Oscillator coupl. coil & brkt.	M	.65
S-7666	Oscillator coil	M-N	1.00
S-7667	Detector coil	M	1.10
S-7759	Oscillator coupl. coil & brkt.	N	.85
S-7798	Antenna coil & shield assy.	M	1.50
S-7811	Antenna coil	G	1.50
S-7815	Osc. coil assembly	B	.65
S-7959	Antenna coil & shield assy.	N	1.25
S-7960	Det. coil & shield assy.	N	1.25
S-8007	Oscillator coil & shield assy.	G	1.50
S-8103	1st I. F. transf.	N	2.25
S-8111	Loading coil	J-K-L-M-N	.45

RESISTORS

63-151	15M ohms 1 watt	F-J-K-L	.07
63-160	100M ohms ½ watt	G	.08
63-238	1000 ohms ¼ watt	B	.07
63-271	1 megohm ¼ watt	A-B-C-F-G-H-I-J-K-L-M-N	.07
63-282	2200 ohms ¼ watt	M-N	.07
63-296	220M ohms ¼ watt	A-C-D-E-F-G-H-I	.07
63-381	100M ohms ½ watt	F	.08
63-464	1 megohm ¼ watt	I	.15
63-572	15 ohms ¼ watt	D-E	.07
63-574	33 ohms ¼ watt	J-K-L	.07
63-576	68 ohms ¼ watt	G-J-K-L	.07
63-577	100 ohms ¼ watt	A-G-N	.07
63-581	470 ohms ¼ watt	M-N	.07
63-583	1000 ohms ¼ watt	A-C-E-F-H-I	.07
63-585	2200 ohms ¼ watt	F-K-L	.07
63-586	3300 ohms ¼ watt	M-N	.07
63-587	4700 ohms ¼ watt	B-J-K-L	.07
63-588	6800 ohms ¼ watt	F-H-I	.07
63-589	10M ohms ¼ watt	J-K-L	.07
63-591	22M ohms ¼ watt	D-G-M-N	.07
63-592	33M ohms ¼ watt	F-H-I	.07
63-593	47M ohms ¼ watt	A-B-C-D-E-F-G-H-I-J-K-L-M-N	.07
63-594	68M ohms ¼ watt	A-B-J-K-L-M	.07
63-595	100M ohms ¼ watt	A-F-H-I-J-K-L-M-N	.07
63-597	470M ohms ¼ watt	A-C-D-E-F-G-H-I-J-M-N	.07
63-599	1.5 megohms ¼ watt	F-G-H-I	.07
63-600	2.2 megohms ¼ watt	A-B-C-D-E	.07
63-602	4.7 megohms ¼ watt	D	.07
63-604	10 megohms ¼ watt	A-B-C	.07
63-605	1000 ohms ½ watt	A-C-G-J-K-L-M-N	.08
63-607	15M ohms ½ watt	F-H-I	.08
63-608	15M ohms 1 watt	N	.10
63-618	22 ohms ¼ watt	N	.07
63-628	270 ohms ¼ watt	G	.07
63-634	820 ohms ¼ watt	G	.07
63-643	18M ohms ¼ watt	J-K-L	.07
63-647	39M ohms ¼ watt	M-N	.07
63-648	47M ohms ¼ watt	K-L-M-N	.07
63-649	56M ohms ¼ watt	G-M-N	.07
63-652	120M ohms ¼ watt	C	.07
63-653	150M ohms ¼ watt	N	.07
63-654	180M ohms ¼ watt	B	.07
63-655	220M ohms ¼ watt	J-K-L-M-N	.07
63-657	330M ohms ¼ watt	K-L-M-N	.07
63-659	470M ohms ¼ watt	F-G-H-I	.07
63-660	560M ohms ¼ watt	N	.07
63-669	3.9 megohms ¼ watt	A-B-C	.07
63-675	5600 ohms ½ watt	G	.08
63-676	27M ohms 1 watt	H-I-K-L-M	.10
63-677	33M ohms 1 watt	J	.10
63-680	10M ohms 1 watt	M-N	.10
63-686	150 ohms ½ watt wirewound	D-E	.17
63-697	100 ohms ¼ watt	A	.15
63-711	22M ohms ¼ watt	G-J-K-L	.15
63-713	47M ohms ¼ watt	C-E	.15
63-717	220M ohms ¼ watt	E-I	.15
63-719	470M ohms ¼ watt	E-I-M	.15
63-724	4.7 megohms ¼ watt	E	.15
63-739	100 ohms ¼ watt	F	.15
63-774	220M ohms ¼ watt	J-K-L	.15
63-796	10M ohms ½ watt	G-J	.08
63-961	47M ohms 1 watt	F	.10
63-963	120 ohms ½ watt	G	.08
63-966	4700 ohms 2 watt	G	.15
63-976	15 megohms ¼ watt	F-H	.07
63-977	270 ohms ½ watt wirewound	G	.17
63-980	Volume control	N	1.00
63-986	Candohm	N	.75
63-990	Volume control & switch	G	1.50
63-992	Candohm resistor		.30
63-1012	90 ohms ½ watt wirewound	C	.17
63-1023	22 ohms ½ watt wirewound	D-E	.17
63-1028	Vol. cont. resistance element	D-E	.35
63-1030	Volume cont. & switch	F-H	1.00
63-1035	Volume control & switch	I	1.50
63-1041	Candohm	C	.45
63-1042	1 megohm ¼ watt	D	.15
63-1048	Candohm	K-L	.30
63-1054	10M ohm ½ watt	F-H-I	.17
63-1052	Candohm	M	.30
63-1055	22M ohm 1 watt	H-I	.20
63-1056	280 ohm 1½ watt wirewd.	F-H-I	.20
63-1057	47 ohms ½ watt wirewd.	F-H-I	.17
63-1058	22M ohms 2 watt	K-M	.20
63-1060	90 ohms 1 watt (wirewd.)	A	.20
63-1061	7 ohms ½ watt (wirewd.)	A	.17
63-1062	10 ohms ¼ watt (wirewd.)	K-L	.15
63-1065	15M ohms 1 watt	M	.20
63-1066	18 ohms ½ watt	I	.17
63-1072	Volume control & switch	B	1.50
63-1074	Volume control & switch	K-L	1.50
63-1075	Vol. control & switch	J	1.50
63-1077	18M ohms 1 watt	J-K-L	.10
63-1078	Volume control	M	1.00
63-1079	Volume control & switch	A	1.50
63-1081	Volume control & switch	C	1.50

MISCELLANEOUS

2-25	Back for 422 cabinet	A-B	.10
14-550	Bakelite cabinet (Mod. 422)		3.75
15-22	Plug cap	D-I-M-N	.05
15-23	Plug cap	D-E-I-M-N	.10
15-28	Volume control cover	D-E	.02
15-29	Tube shield cap	G-H-I	.02
19-51	Goat tube shield cap	G	.03
19-59	Battery clip—positive	A-G	.15
19-60	Battery clip—negative	A-G	.15
24-209	Automatic adj. cover plate	D-F-H-I	.10
44-16	Phono. jack	H-I-J-K-L-M-N	.20
46-221	Power switch knob	G	.20
46-239	Knob—motor cont. switch	N	.05
46-280	Volume control knob	F-H-I	.10
46-286	Tuning control knob	D-E	.10
46-287	Volume control knob	D-E	.10
46-292	Tuning control knob	C	.10
46-304	Power switch knob	C	.04
46-310	Control knob	A-B	.10
49-179	8" Dyn. Speaker (8S443-451)		5.75
	206-179 Output transformer		1.25
	207-179 Field coil		1.75
	208-179 Cone & voice coil		2.00
49-208	10" dyn. speaker (8S463)		7.50
	206-208 Output transformer		1.65
	207-208 Field coil		2.75
	208-208 Cone & voice coil		2.50
(a)49-249	12" dyn. speaker (7S461-488)		8.00

PARTS LIST—(Continued)

"Note: Power transformers for chassis 5724 and 5725 are narked (a) or (b) above. Speakers for these chassis are also narked (a) or (b) and should be used only with the correponding transformer."

b)49-301	6½" dyn. spkr. (7S-432-433-434-449)		4.00
	206-301 Output transformer		1.25
	207-301 Field coil (not replaceable)		
	208-301 Cone & voice coil		1.50
b)49-308	10" dyn. speaker (7S458)		7.50
	206-308 output transformer		1.50
	207-308 field coil		2.25
	208-308 cone & voice coil		2.50
b)49-309	12" dyn. spkr. (7S458-461)		8.00
	206-309 output transformer		1.50
	207-309 field coil		2.25
	208-309 cone & voice coil		3.50
b)49-311	10" dyn. spkr. (7S460-462)		7.50
	206-311 output transformer		1.50
	207-311 field coil		2.25
	208-311 cone & voice coil		2.50
b)49-312	10" dyn. spkr. (7S458)		7.50
	206-312 output transformer		1.50
	207-312 field coil		2.25
	208-312 cone & voice coil		2.50
b)49-314	8" dyn. spkr. (7S450-459)		5.50
	206-314 output transformer		1.50
	207-314 field coil		1.75
	208-314 cone & voice coil		2.00
49-320	8" dynamic speaker	D	5.50
	206-320 output transformer		1.50
	207-320 field coil		1.75
	208-320 cone & voice coil		2.00
49-326	5" dynamic speaker	E	3.50
	206-326 output transformer		1.25
	207-326 field coil (not repl.)		
	208-326 cone & voice coil		1.25
49-328	6½" P. M. speaker (Models 437-435)		5.50
	206-328 output transformer		1.25
	208-328 cone & voice coil		1.50
49-332	8" P. M. speaker (Mod. 438)		6.75
	206-332 output transformer		1.25
	208-332 cone & voice coil		2.00
49-333	10" P. M. spkr. (Mod. 467)		10.00
	206-333 output transformer		1.65
	208-333 cone & voice coil		2.50
49-342	10" P. M. spkr. (Mod. 466)		10.00
	206-342 output transformer		1.65
	208-342 cone & voice coil		2.50
49-344	10" dynamic spkr. (6S469)		7.00
	206-344 output transformer		1.25
	207-344 field coil		2.75
	208-344 cone & voice coil		2.50
49-345	5" P. M. speaker (Mod. 422)		4.25
	206-345 output transformer		1.25
	208-345 cone & voice coil		1.25
49-346	8" dynamic speaker (10S443) (12S445)		7.25
	206-346 output transformer		1.25
	207-346 field coil		2.75
	208-346 cone & voice coil		2.00
49-348	10" P. M. speaker (Model 6J463)		8.75
	206-348 output transformer		1.65
	208-348 cone & voice coil		2.50
49-350	8" P. M. speaker (Model 6J436)		7.00
	206-350 output transformer		1.25
	208-350 cone & voice coil		2.00
49-351	10" dynamic speaker (10S452-12S453)		8.00
	206-351 output transformer		1.50
	207-351 field coil		2.75
	208-351 cone & voice coil		2.50
49-352	12" dynamic speaker (10S492-11S474-12S471)		8.50
	206-352 output transformer		1.50
	207-352 field coil		2.75
	208-352 cone & voice coil		3.50
49-353	12" dynamic speaker (10S470)		8.50
	206-353 output transformer		1.50
	207-353 field coil		2.75
	208-353 cone & voice coil		3.50
49-354	15" dynamic speaker (12S475)		15.50
	206-354 output transformer		2.50
	207-354 field coil		2.75
	208-354 cone & voice coil		4.50
49-355	15" dynamic spkr. (12S494)		15.50
	206-355 output transformer		2.50
	207-355 field coil		2.75
	208-355 cone & voice coil		4.50
49-356	15" dynamic spkr. (10S491)		15.50
	206-356 output transformer		2.50
	207-356 field coil		2.75
	208-356 cone & voice coil		4.50
49-359	8" P. M. Speaker (Models 468-465)		7.00
	206-359 output transformer		1.25
	208-359 cone & voice coil		2.00
	206-364 output transformer		4.25
49-364	6" dynam. speaker (6S439)		1.25
	207-364 field coil (not replaceable)		
	208-364 cone & voice coil		1.50
(a)49-367	10" dyn. spkr. (7S460-462)		7.50
	206-367 output transformer		1.50
	207-367 field coil		2.25
	208-367 cone & voice coil		2.50
	206-368 output transformer		7.50
(a)49-368	10" dyn. spkr. (7S458)		1.50
	207-368 field coil		2.25
	208-368 cone & voice coil		2.50
49-369	10" dynamic spkr. (7S487)		7.50
	206-369 output transformer		1.50
	207-369 field coil		2.25
	208-369 cone & voice coil		2.50
49-374	15" dynamic spkr. (15S479)		17.00
	206-374 output transformer		2.50
	207-374 field coil		3.75
	208-374 cone & voice coil		5.50
49-375	15" dynamic spkr. (15S495)		18.50
	206-375 output transformer		2.50
	207-375 field coil		3.75
	208-375 cone & voice coil		5.50
(a)49-376	6½" dynamic speaker 7S432-433-434-449)		4.00
	206-376 output transformer		1.25
	207-376 field coil		1.25
	208-376 cone & voice coil		1.50
(a)49-377	8" dynamic speaker (7S450-459-490)		5.50
	206-377 output transformer		1.50
	207-377 field coil		1.75
	208-377 cone & voice coil		2.00
49-379	10" dyn. spkr. (10S464)		8.00
	206-379 output transformer		1.50
	207-379 field coil		2.75
	208-379 cone & voice coil		2.50
52-160	Speaker cable & plug	A-B	.30
52-164	Speaker cable	D	.40
52-165	Speaker cable	E	.35
52-181	Shielded lead for phono	M	1.00
52-182	Shielded lead for phono	N	.15
57-11A	Antenna lead marker	A-B-C	.02
57-11G	Ground lead marker	A-B-C	.02
57-661	Motor switch plate	N	.35
57-708	Television-radio sw. plate	H-I-J-K-L-M-N	.03
57-712	Escutcheon plate less glass (See S-6945)	F-H-I	.60
57-715	Escutcheon plate	E	1.00
57-716	Escutcheon plate	D	1.50
57-718	Plate	I	1.95
57-752	Escutcheon only less glass	J-K-L	2.00
57-768	Escutcheon plate	C	.25
57-781	Escutcheon plate	A-B	.60
57-793	Battery conserver sw. plate	G	.04
58-73	Battery cable plug	C	.10
62-9	Lamp plug receptacle	G	.12
62-10	Receptacle—female phono	D-E-I-M-N	.20
68-1	Autom. adjustment wrench	F-G-H-I-J-K-L-M-N	.02
76-285	Vol. control shaft & wiper	D-E	.18
78-115	Socket—vibrator in P.P.	G	.10
78-128	Socket—speaker plug	F-H-I-J-K-L-M-N	.10
78-141	Socket—vibrator	A	.10
78-145	Socket—6F5G tube	H-I-J-L	.10
78-148	Socket—6Q7G tube	F-K	.10
78-149	Socket—6X5G tube	F-H-I-J-K-L-M	.10

PARTS LIST—(Continued)

78-150	Socket—6K7G tube	F-H-I-J-K-L-M-N	.10
78-151	Socket—6A8G tube	J-K-L-M-N	.10
78-152	Socket—6F6G tube	F-H-I-J	.10
78-156	Socket—6C5 tube	N	.10
78-175	Socket—6J5G tube	H-I-J-K-L-M-N	.10
78-176	Socket—6V6G tube	K-L-M-N	.10
78-182	Socket—5Y4G tube	N	.10
78-184	Socket—6T7G tube	G	.10
78-185	Socket—6S7G tube	G	.10
78-186	Socket—6D8G tube	G	.10
78-190	Socket—speaker plug	G	.10
78-191	Socket—6ZY5G tube	G	.10
78-193	Socket—five contact	D-I-M-N	.10
78-194	Socket—two contact	D-E-I-M-N	.10
78-208	Socket—speaker	C	.10
78-219	Socket—5 contact for wavemagnet	F-H-J-K-L-M-N	.10
78-228	Socket—6F8 tube	M-N	.10
78-229	Socket—for electrolytic	F-H-I-M	.02
78-230	Socket & cable—resonance indicator	J-K-L	.55
78-235	Socket—6G6G tube	G	.10
78-246	Socket—1A7G tube	A-B-C	.10
78-247	Socket—1N5G tube	A-B-C	.10
78-248	Socket—1H5G tube	A-B-C	.10
78-249	Socket—1C5G tube	B	.10
78-250	Socket—electrolytic condenser	G	.05
78-269	Socket—117Z6G tube	C	.10
78-273	Socket—1Q5G tube	A-C	.10
78-290	Socket—7G7 tube	J-K-L	.15
78-296	Socket & cable—resonance indicator	M	.55
78-301	Socket—6A8G tube	F-H-I	.10
78-307	Socket & cable—resonance indicator	N	.50
80-198	Chassis mtg. springs	J-K-L-M-N	.01
80-199	Chassis mtg. springs	J-K-L-M	.01
80-215	Chassis mtg. springs	N	.02
83-334	Antenna-ground term. strip	G	.12
85-148	A. C. switch only	M-N	.35
85-156	Motor control switch	N	.90
85-171	Switch—battery conserver & television	G-H-I-J-K-L-M-N	.25
85-177	Switch—power supply	G	.70
85-187	Tone control switch	C	.20
85-198	Power switch	C	.85
85-202	Switch—band selector	J-K-L	1.50
85-205	Switch—band selector	F-H-I	1.10
85-209	Switch—band selector	M-N	1.85
85-210	Switch—band selector	G	1.00
90-169	Paper tube—res. indicator.	J-K-L-M-N	.02
93-168	Rubber shoulder washer	K-L-M	.05
93-215	Rubber chassis mtg. washer	F-G-H-I	.06
93-344	Rubber washer	K-L	.05
93-392	Brown felt washer	K-L	.01
93-421	Felt washer	H-I	.01
93-457	Insulating disc for 15-29 tube shield cap	H-I	.35 C
95-442	Power choke	N	2.50
95-533	Power transf. 117 V. 50-60 cy.	N	8.25
95-627	Power transf. 115 V. 60 cy.	J	3.75
95-630	Power transf. 115 V. 60 cy.	K-L	5.00
(b)95-631	Power transf. 115 V. 60 cy.	H	3.25
(a)95-634	Power transf. 115 V. 60 cy.	F-H-I	3.25
95-635	Power transformer	A	1.75
95-639	Power transf. 117 V. 60 cy.	M	5.00
95-645	Power transformer	G	3.25
(b)95-646	Power transf. 115 V. 25 cy.	H	6.75
95-651	Power transf. 115 V. 25 cy.	J	7.85
95-653	Power transf. 117 V. 25 cy.	K-L	11.25
95-660	Power transf. 117 V. 25 cy.	M	11.25
(a)95-661	Power transf. 115 V. 25 cy.	F-H-I	6.75
100-79	Ballast tube—117 volt	D-E	.50
112-25	1/4"-20x1 7/8" hex. head chassis mtg. bolt	J-K-L-M-N	.04
112-232	#10x1" chassis mtg screws.	C	.01
114-37	#6x1/4" hex. acorn head self tapping screw	G-J-K-L-M-N	.45 C
114-40	#10-32x7/8" chassis mtg. bolt	A-B-F-H-I	.50 C
114-48	#6-32x1/4" hex. acorn head machine screw	J-K-L-M-N	.35 C
114-80	1/4"-20x1 3/8" hex. washer head chassis mtg. bolts		.04
114-85	#10-32x1 1/8" chassis mtg. bolt	A-B	.65 C
117-38	Band selector lever	G-J-K-L-M-N	.30
125-19	Rubber feet	A-B	.01
126-191	Tube shield	G	.15
126-239	Tube shield	F-H-I-J-K-L-M-N	.08
126-245	Electrolytic cond. shield	N	.12
126-248	Electrolytic cond. shield	N	.15
126-297	Tube shield	A-B-C	.12
126-326	Goat tube shield	E-F-H-I	.10
126-337	Antenna coil shield	G	.15
126-341	Goat tube shield	F-G-H-I	.10
127-15	Contact—tube socket	D-E	.30 C
127-16	Contact—power switch (straight)	D-E	.01
127-17	Contact—power switch (bent)	D-E	.01
127-28	Contact—power switch	E	.01
139-48	Cardboard speaker baffle (422)		.05
159-27	Plug buttons—stat. bronze	M	.10
159-35	Snap button	A-B	.65 C
188-27	Retaining ring	A-B-C	.03
188-32	Retaining clip for vol. cont.	D-E	.85 C
190-11	Vibrator	G	2.95
190-17	Synchronous vibrator	A	3.50
192-41	Dial glass	F-H-I	.50
192-46	Dial glass	J-K-L	.60
196-23	Dial glass gasket	F-H-I	.15
196-25	Dial glass gasket	J-K-L	.15
202-133	Phono instruction book	D	.03
202-144	Phono instruction sheet	E	.50 C
202-147	Instruction book	C	.04
202-150	Instruction book & call let.	J	.20
202-153	Instruction book	B	.04
202-154	Instruction book & call let.	K	.20
202-155	Instruction book & call let.	M	.20
202-157	Instruction book & call let.	H-I	.15
202-162	Instruction book	A	.04
202-165	Instruction book & call let.	N	.20
202-166	Instruction book	F	.15
202-169	Instruction book & call let.	G	.20
202-171	Instruction book & call let.	L	.20
202-172	Short wave instruction sheet		.01
9267-352	#14 battery cable—red	A	.10 ft.
9268-324	#14 battery cable—black	A	.10 ft.
S-2778	Choke assy.—power pack	G	.25
S-5043	Choke assy.—power pack	G	.25
S-6398	Lever arm & br. for mot. sw.	N	.35
S-6910	Shield—tube	D-E	.10
S-6911	Shield—electrolytic	D	.12
S-6912	Shield—I. F. coil	E	.12
S-6945	Escutcheon plate comp.	F-H-I	1.25
S-6994	Tone cont. sw. & knob assy.	F-H-I	.25
S-7314	Band sel. knob (46-279 with 73-36)	F-H-I	.10
S-7315	Tuning Knob (46-281 with 73-36)	F-H-I	.10
S-7350	Escutcheon assy.—dial	G-J-K-L	2.75
S-7411	Shield—electrolytic		.12
S-7642	Tone cont. cont. & str. assy.	G-J-K-L	.30
S-7773	A.C. sw. & bracket assembly	M	.75
S-7774	Tone cont. cont. & str. assy.	M-N	.25
S-7880	Vol. cont. knob & set screw (46-303 & 73-37)	G-J-K-L-M-N	.15
S-7881	Tuning control knob & set screw (46-252 & 73-37)	G-J-K-L-M-N	.15
S-7985	A.C. switch & bracket	N	.90
S-7991	Tuning motor & cover	N	5.00
MS-517	Tone control switch	D-E	.25

WAVEMAGNET PARTS

22-182	Cond. .00025 mfd.	F-H-I-K-L-M-N	.20
22-865	Trimmer condenser	D-E-F-H-I	.25
22-962	Trimmer condenser	J-K-L-M-N	.15
52-166	Antenna cable (450)		.60
54-79	#6-32x1/4" brass nut	D-E-F	.30 C
57-719	Switch plate for 85-171 sw.	F-H-I-J-K-L-M-N	.03
57-760	Cover plate	D	.15
57-786	Sw. plate for 85-189 sw.	F-H-I-J-K-L	.03
58-54	Five prong plug	F-H-I-J-K-L-M-N	.10
70-7	#6x1/2" R.H. wood screw	H-I	.20 C
	206-249 Output transformer		1.50
	207-249 Field coil		2.25
	208-249 Cone & voice coil		3.50
49-286	5" P. M. speaker (Mod. 422)		4.50
	206-286 Output transformer		1.25
	208-286 Cone & voice coil		1.25

PARTS LIST—(Continued)

70-34	#6x⅝" oval head wood scr.	F-H-I	.55 C
70-69	#2x⅜" oval head wood scr.	F-H-I	.35 C
83-334	Ant.-Gnd. terminal strip	D-E-F-H-I	.12
85-171	Switch—wavemagnet	F-H-I-J-K-L-M-N	.25
85-189	Switch—local-distance	F-H-I-J-K-L	.20
86-66	Cinch terminals	E	1.50 C
86-79	Antenna terminal	J-K-L-M-N	.75 C
86-80	Ground terminal	J-K-L-M-N	.75 C
93-125	#6 shakeproof lock washers	E-F-H-I-J	.25 C
93-350	#6 read finishing washer	H-I	.01
93-414	Fibre washer	E	.50 C
110-85	Cloth cover (463)	K-L-M-N	.30
112-227	#6-32x2¾" ornamental head screws	F	.02
112-261	#6-32x3" ornamental head screw	J	.02
147-73	Wood spacer	D-E-F-H-I	.01
147-82	Wood spacer	F-J	.01
147-84	Wood spacer	J	.01
S-6984	Loop shield & frame assembly (433-487-488)	D	1.00
S-7080	Front shield & frame assembly (439-432-459)	E	.85
S-7082	Wavemagnet winding assembly (439-432-459)		1.95
S-7098	Loop winding assembly	E	1.85
S-7099	Rear shield & frame assy.	E	1.65
S-7317	Loop winding assembly (487-488)		1.85
S-7335	Loop winding assembly	D	1.40
S-7345	Loop coil assembly	D	.15
S-7431	Antenna loading coil (433-49-58-60-61-62)		.45
S-7458	Wavemagnet winding assy. (469-33-49-50-58-60-61-62-90)		1.35
S-7565	Rear frame & switch assy. (433-460-488)		1.35
S-7566	Plate & switch assy. (458-61)		1.50
S-7611	Plate & switch assy. (462)		2.25
S-7614	Rear frame & sw. assy. (449)		1.35
S-7624	Plate & switch assy. (487)		1.50
S-7652	Frame & sw. assy. (439-32)		1.25
S-7658	Plate & switch assy. (459)		1.35
S-7677	Rear fr. & sw. assy. (450-490)		1.50
S-7877	Plate & switch assy. (443)		1.25
S-7878	Loop wdng. assy. (443-445)		2.25
S-7913	Loading coil assy. (463)		.55
S-7916	Loop winding assembly (463-64-91-92-74)		2.25
S-7917	Plate & switch assy. (463) Replace with S-8074		1.25
S-7920	Front shield & frame assy. (469-490)		.85
S-7922	Plate & switch assy. (469)		1.50
S-7964	Loop winding assy. (451)		1.75
S-7965	Plate & switch assy. (451)		1.00
S-7967	Wavemagnet wdg. (10S452)		1.75
S-7968	Plate & switch assy. (10S452)		1.25
S-8019	Plate & brack. assy. (10S470)		1.25
S-8022	Wavemagnet winding (10S470)		1.75
S-8024	Plate & switch assy. (10S470)		1.25
S-8035	Wavemagnet winding (471-475-494-479)		2.00
S-8036	Plate & sw. assy. (475)		1.75
S-8074	Plate & switch assembly (464-91-92-74)		1.25
S-8081	Wavemagnet winding (453)		2.00
S-8082	Plate & sw. assy. (453)		.75
S-8084	Plate & switch assembly (471-494-495)		1.00
S-8089	Plate & switch assy. (445)		1.25
S-8100	Wavemagnet wdg. assy. (495)		2.00

AUTOMATIC TUNING PARTS

10-77	Cardboard box	G-J-K-M-N	.05
12-718	Unit retaining bracket	M-N	.06
12-719	Unit retaining bracket	G-J-K	.10
12-720	Switch mounting bracket	G-J-K	.15
19-94	Cover retaining clip	F-H-I	.01
22-846	Trimmer condenser	D-H-I	.15
22-847	Trimmer condenser	D-H-I	.20
22-848	Trimmer condenser	D-H-I	.25
22-859	Trimmer condenser	D-H-I	.20
22-868	490 mmfd. compens. cond.	D-H-I	.30
22-873	Trimmer condenser	H-I	.25
24-225	Switch cover	F-H-I	.02
46-278	Automatic knob	D-F-H-I	.05
57-707	Automatic adj. cover	D-F-H-I	.06
68-1	Automatic adj. wrench	D-F-G-H-I-J-K-L-M-N	.02
80-161	Latch bar spring	D-F-H-I	.25 C
80-202	Push lever spring (for S6932)	D-F-H-I	.25 C
80-203	Push lever spring (for S6933)	D	.25 C
83-321	Two contact airpl. term.	F-H-I	.02
83-669	Coil retaining strip	D-F-H-I	.03
83-671	Fibre strip	D-F-H-I	.02
83-672	Latch bar	D-F-H-I	.35 C
83-709	Pin jack terminal	G-J-K	.10
83-710	Coil retaining strip	M-N	.20 C
83-711	Coil retaining strip	G-J-K	.02
83-712	Fibre strip	M-N	.01
83-713	Fibre strip	G-J-K	.01
83-732	Armite strip	M-N	.35 C
83-740	Pin jack terminal strip	M-N	.12
85-201	Automatic switch	G-J-K	2.00
85-206	Automatic switch	M-N	2.50
86-69	Terminals	M-N	.30 C
93-216	Steel washer (latch bar)	D-F-H-I	.30 C
112-223	Adjustment screw & core	D-F-G-H-I-J-K	.08
112-250	#4-40x7/32" R. H. self tapping screw	G-J-K-M-N	.40 C
114-37	6-32x⅜" self tapping screw	D-F-H-I	.40 C
114-39	#8x¼" hexagon head self tapping screw	G-J-K-M-N	.50 C
114-46	6-32x⅛" self tapping screw	D-F-H-I	.40 C
114-84	#6-32x¼" hex. head machine screw	G-J-K	.01
149-13	Adjustment screw & core	M-N	.15
S-6926	Contact spr. & base assy.	D	.75
S-6927	Manual osc. coil assembly	D	.40
S-6928	Autom. tuning coil (red)	D-F-H-I	.15
S-6929	Autom. tuning coil (green)	D-F-H-I	.15
S-6930	Autom. tuning coil (blue)	D-F-H-I	.15
S-6931	Autom. tuning coil (white)	D	.15
S-6932	Push lever assy.—autom.	D-F-H-I	.15
S-6933	Push lever assy.—manual	D	.04
S-6934	Cont. spr. & base assembly	F-H-I	.65
S-7021	Autom. tuning coil (yellow)	F-G-H-I-J-K	.15
S-7536	Autom. tuning coil (silver)	H-I	.15
S-7589	Autom. tuning coil (red)	M-N	.30
S-7590	Autom. tuning coil (green)	M-N	.30
S-7591	Autom. tuning coil (orange)	M-N	.30
S-7592	Autom. tuning coil (blue)	M-N	.30
S-7593	Autom. tuning coil (white)	M-N	.30
S-7857	Autom. tuning coil (red)	G-J-K	.20
S-7858	Autom. tuning coil (green)	G-J-K	.20
S-7859	Autom. tuning coil (blue)	G-J-K	.20
S-7860	Autom. tuning coil (silver)	G-J-K	.20

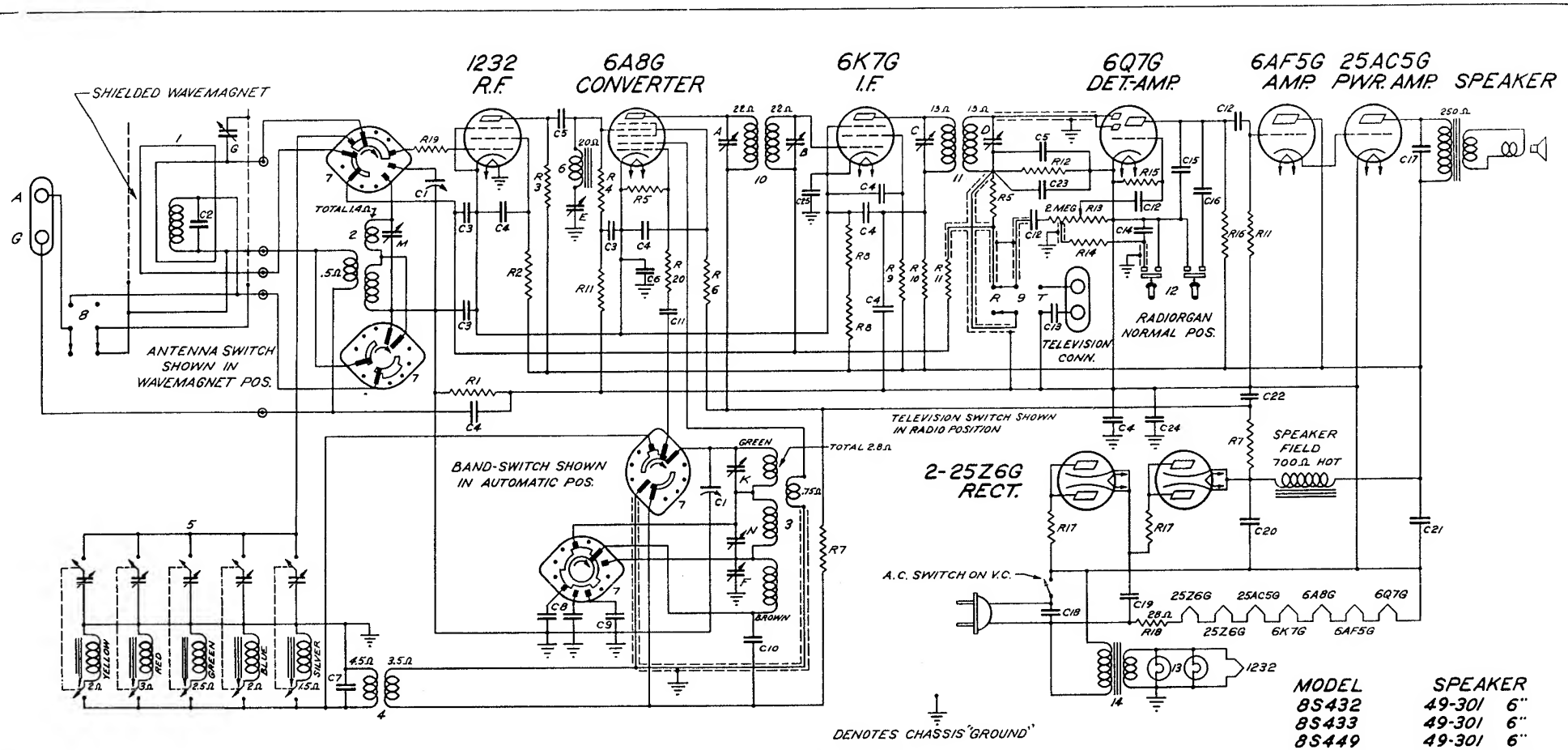
PHONO. PARTS

12-613	Pickup support bracket	D-E-I	.20
12-730	Switch mtg. brkt. for lamp (487)		.05
12-731	Switch mtg. brkt. for lamp (488)		.05
15-22	Plug cap for 58-59 & 78-193	I-K	.05
15-23	Plug cap for 58-50 & 78-194	E-I-K	.05
19-32	Lamp socket retaining clip (487-488-491-492-494)	N	.01
22-319	Cond. .005 mfd. 200 volt	K	.15
22-887	Cond. .001 mfd. 600 volt	K	.15
22-954	Cond. 350 mmfd. 600 volt	K	.12
24-142	Needle cup cover	D-E-I-K-M-N	.05
24-213	Stop switch cover (490)	D-E	.06
29-9	9" turntable (490)	D-E	1.25
29-10	9" turntable (487)		1.75
29-11	11½" turntable (488-491-492-494)	N	2.25
41-1	Needle cup	D-E-I-K-M-N	.05
52-179	Shielded lead (491-492)		.15
57-721	Radio-phono escutcheon	D-E-I	.05
57-744	Switch plate—rad.-phono. (487-88-91-92-94)	N	.10
57-777	Switch plate—motor (487-88-91-92-94)	N	.03
58-39	Plug—five prong (491-492)	I	.07
58-50	Plug—two prong (490)	E	.05

PARTS LIST—(Continued)

62-10	Female receptacle (491-492)		.20
63-271	Res. 1 megohm ¼ watt	K	.07
63-649	Res. 56M ohm ¼ watt	K	.07
63-719	Res. 470M ohm ¼ watt	K	.15
70-71	#6x½" R.H. wood screw—bronze	I	.50 C
70-72	#6x⅜" R.H. wood screw—bronze	I	.50 C
78-193	Five contact socket	K	.10
78-194	Two contact socket	K	.10
78-291	Light socket & wire	I-K-M-N	.12
83-534	Five lug terminal strip	K	.06
85-181	Autom. stop switch (490)	D-E	1.00
85-191	A.C. switch	D-E-I-K-M-N	.25
85-192	Phono. switch	I-K	.35
85-203	Light switch (488-491-492-494)	N	.55
85-204	Light switch (487)		.55
100-80	Lamp bulb (491-492-494)	I-N	.25
141-77	Motor assy.—115 V. 60 cy. (490)	D-E	6.75
141-78	Motor assy. 115 V 50 cy.	D-E	6.75
142-21	Pickup & arm assembly	D	6.25
142-22	Pickup & arm assembly 490	E	6.25
142-23	Cartridge only for 142-21-22 (490)	D-E	5.00
142-24	Cartridge only for 169-36 (487-488-491-492-494)	N	6.00
169-36	Automatic record player 115 V. 60 cy. (487-488-491-492-494)	N	50.00
169-37	Automatic record player 115 V. 60 cy. (487-488-491-492-494)	N	50.00
199-20	Rubber sleeve for compartment lamp	I	.03
202-133	Phono instruction book (490)	D-E	.03
202-134	Phono instruction book (487-488-491-492-494)	N	.03

All Price List subject to Regular Discount and Change w/o notice (10-25-39)



DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-849	TWO-GANG VARIABLE	
C2	22-182	.00025 MFD.	600V
C3	22-829	.05 MFD.	200V
C4	22-828	.05 MFD.	400V
C5	22-162	.0001 MFD.	600V
C6	22-594	.15 MFD.	200V
C7	22-868	COMPENSATING COND.	
C8	22-863	DUAL OSC. PADDER	
C9	22-866	OSCILLATOR PADDER	
C10	22-358	.002 MFD.	600V
C11	22-289	50 MMFD.	600V
C12	22-196	.01 MFD.	600V
C13	22-327	.02 MFD.	200V
C14	22-229	.005 MFD.	600V
C15	22-854	.0005 MFD.	600V
C16	22-448	.004 MFD.	600V
C17	22-669	.01 MFD.	600V
C18	22-670	.1 MFD.	400V
C19	22-852	30 MFD. ELECTROLYTIC	250V
C20	22-851	30MFD. ELECTROLYTIC	350V
C21		20MFD. ELECTROLYTIC	250V
C22		10MFD. ELECTROLYTIC	250V
C23	22-470	150 MMFD.	600V
C24	22-350	.25 MFD.	200V
C25	22-827	.1 MFD.	200V
R 1	63-325	150M OHM	½W.
R 2	63-712	33M OHM	½W.
R 3	63-709	10M OHM	½W.
R 4	63-715	100M OHM	½W.
R 5	63-593	47M OHM	½W.
R 6	63-1019	68M OHM	½W.
R 7	63-150	10M OHM	½W.
R 8	63-1020	68 OHM WIREWOUND	½W.
R 9	63-539	22M OHM	½W.
R 10	63-605	1000 OHM	½W.
R 11	63-271	1 MEGOHM	½W.
R 12	63-655	220M OHM	½W.
R 13	63-1030	VOLUME CONTROL	
R 14	63-713	47M OHM	½W.
R 15	63-976	15 MEGOHMS	½W.
R 16	63-296	220 M OHM	½W.
R 17	63-1023	22 OHM WIREWOUND	½W.
R 18	63-1039	CANDOHM	
R 19	63-577	100 OHM	½W.
R 20	63-576	68 OHM	½W.
1		WAVEMAGNET ASSEMBLY	
2	S6936	ANTENNA COIL ASSEMBLY	
3	S6937	OSCILLATOR COIL ASSEM.	
4	S6992	OSC. COUPLER COIL ASSEM.	
5	S7044	AUTOMATIC TUNING ASSEM.	
6	S7500	WAVE TRAP ASSEMBLY	
7	85-185	BAND SELECTOR SWITCH	
8	85-171	WAVEMAGNET SWITCH	
9	85-171	TELEVISION SWITCH	
10	95-600	1ST I.F. TRANSFORMER	
11	95-596	2ND I.F. TRANSFORMER	
12	S6994	TONE CONTROL SWITCH	
13	100-36	PILOT LIGHT 6.3V. .25 A.	
14	95-678	FILAMENT TRANS. 117 VOLTS 50-60 CYCLE	
A		1ST I.F. TRANS. PRI.	
B		1ST I.F. TRANS. SEC.	
C		2ND I.F. TRANS. PRI.	
D		2ND I.F. TRANS. SEC.	
E		WAVE TRAP	
F		BROADCAST OSC. (SEE NOTE)	
G	22-865	ANTENNA BROADCAST	
K		SHORT WAVE OSC. (SEE NOTE)	
M	22-788	SHORT WAVE ANTENNA	
N		POLICE BAND OSC. (SEE NOTE)	

NOTE: TRIMMERS F, K & N ARE MOUNTED ON STRIP #22-850.

MODEL	SPEAKER	
8S432	49-301	6"
8S433	49-301	6"
8S449	49-301	6"
8S450	49-314	8"
8S458	49-308	10"
8S459	49-314	8"
8S460	49-311	10"
8S461	49-309	12"
8S462	49-311	10"

I.F. FREQUENCY 455 KC.
8 TUBE SUPERHETERODYNE
CHASSIS Nº 5810 A.C. 3 BAND
ZENITH RADIO CORPORATION
CHICAGO, ILL.

Models 8S432—8S433—8S434—8S449—8S450—8S458—8S459—8S460—8S461—8S462

Chassis No. 5810

Models 8S432, 8S433, 8S434, 8S449, 8S450, 8S458, 8S459 8S460, 8S461, 8S462

(Chassis No. 5810)

NOTE

All voltages measured with a 1000 ohm per volt meter from chassis to socket contact indicated.

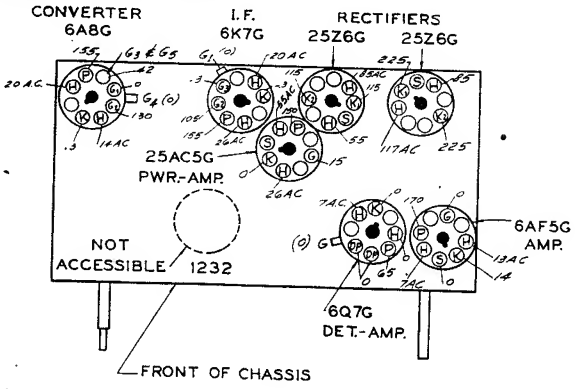
All voltages are positive D.C. unless marked otherwise.

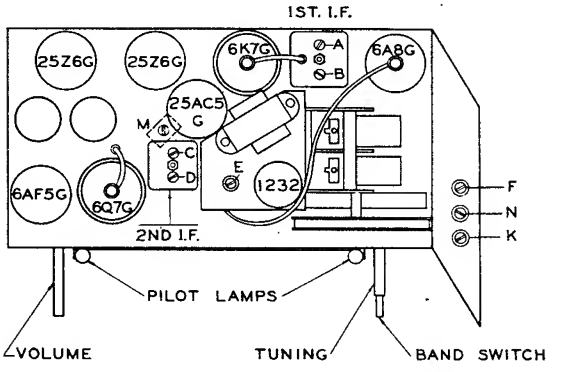
Volume control on full.

Line voltage 120 A.C.

LEGEND

F—Filament
H—Heater
D—Diode
G1—Control Grid
G2—Screen Grid
G3—Suppressor Grid
P—Plate
K—Cathode





ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to	Dummy Antenna	Set Test Oscillator to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	5 mfd.	455	B'dcast	600	A B C D	I. F.
2	Single *x Turn Coil	—	1500	"	1500	F	Set Osc. to Scale
3	" "	—	1500	"	1500	On Wave Magnet	Alignment of Wave Magnet
4	Rec. Ant. Post **	400 ohms	18000	S.W.#2	18000	K	Set Osc. to Scale
5	"	"	16000	"	16000	L	Rock gang & adj. for max. output
6	"	"	4,500	S.W. #1	4,500	N	"

x Switch in Wave Magnet Position * Loosely coupled to Wave Magnet ** Switch in Antenna Position

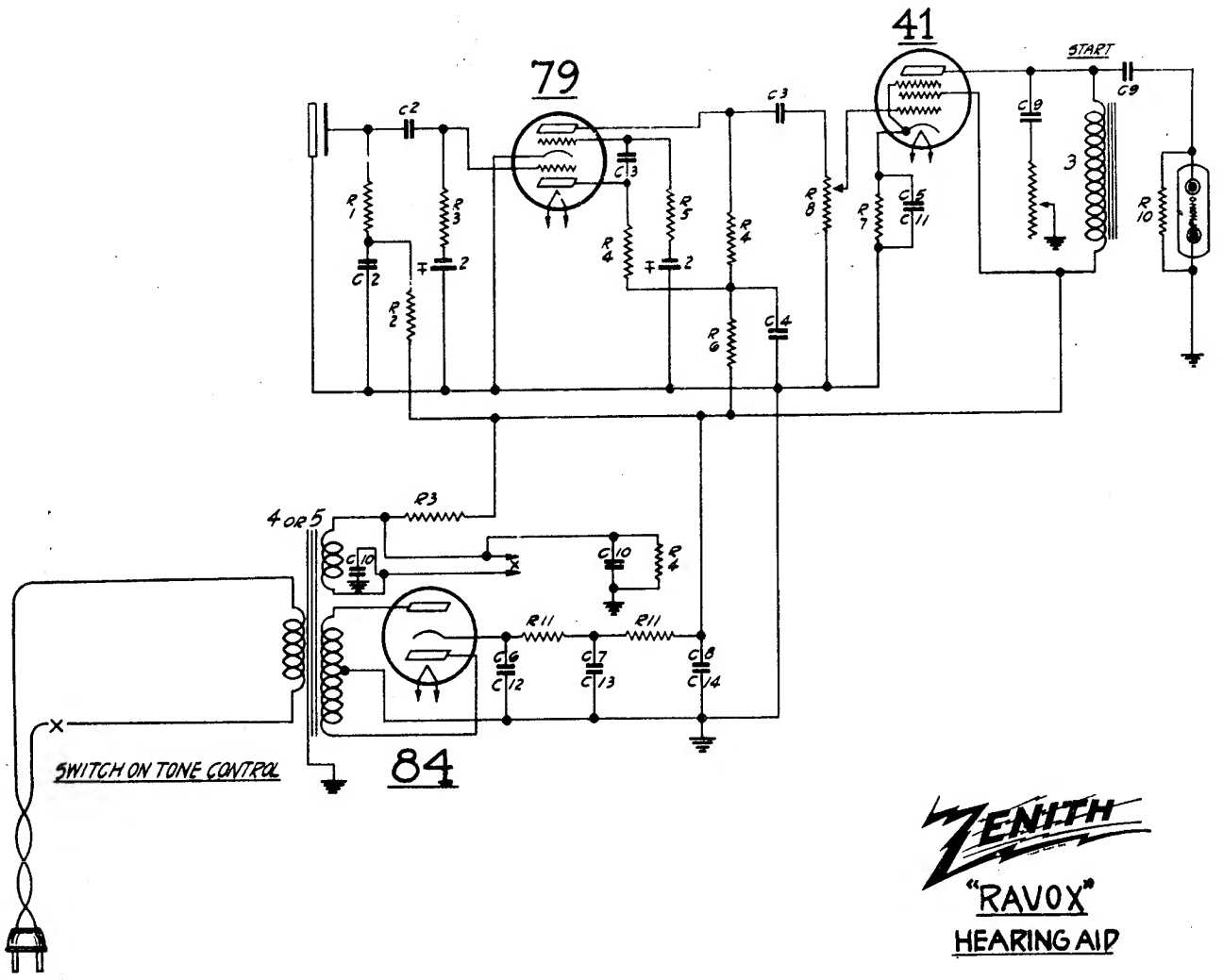
PARTS PRICE LIST

See Chassis 5719 in Service Manual H5R for all parts with the addition of the following.

22-940	- Trimmer condenser	.15
63-709	- 10M ohm 1/4 watt.	.15
63-715	- 100M " "	.15
78-314	- 1232 tube socket	.10
95-678	- Power transformer	1.00
S-7496	- R.F. Coil Assembly	.65

DIAG. NO.	PART NO.	DESCRIPTION	
C-1	22-670	.1 MFD	400 V.
C-2	22-669	.01 MFD	600 V.
C-3	22-435	.02 MFD	600 V.
C-4	22-138	.2 MFD	200 V.
C-5	22-667	5 MFD. ELECTROLYTIC	25 V.
C-6		4 " "	250 V.
C-7		6 " "	200 V.
C-8		6 " "	150 V.
C-9	22-171	.05 MFD	600 V.
C-10	22-190	.1 MFD	200 V.
R-1	63-722	2.2 MEGOHM	1/4 W.
R-2	63-726	10 MEGOHM	1/4 W.
R-3	63-464	1 MEGOHM	1/4 W.
R-4	63-718	330 M OHM	1/4 W.
R-5	63-719	470 M OHM	1/4 W.
R-6	63-715	100 M OHM	1/4 W.
R-7	63-749	680 OHM	1/4 W.
R-8	63-998	VOLUME CONTROL	
R-9	63-537	TONE CONTROL	
R-10	63-271	1 MEGOHM	1/4 W.
R-11	63-949	2200 OHM	1 W.
1	5-6819	MICROPHONE ASSEM.	
2	5-15	BIAS CELL	
3	95-582	OUTPUT TRANS.	
4	95-510	POWER TRANS. 50-60~	
5	95-511	POWER TRANS. 25~	
C-11	22-675	3 MFD. ELECTROLYTIC	250 V.
C-12		8 " "	250 V.
C-13		12 " "	200 V.
C-14		12 " "	150 V.

25 CYC.



ZENITH

"RAVOX"

HEARING AID

11/21-38

PARTS PRICES LISTED HEREIN ARE AS PER DATE OF MODEL. FOR LATEST PRICES CONSULT ZENITH PARTS PRICE LIST FORM P1 OR YOUR ZENITH DISTRIBUTOR.

ZENITH RADIO CORP. CHICAGO, ILL.

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